JAGUAR

Workshop Manual



XJ40

2.9L, 3.2L, 4.0L

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BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH II
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY ENGLAND

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH
THE QUEEN MOTHER
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY ENGLAND

BY APPOINTMENT TO
HIS ROYAL HIGHNESS THE PRINCE OF WALES
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY



XJ6

SERVICE MANUAL

VOLUME 1

Contains Sections

01. INTRODUCTION

04. GENERAL SPECIFICATION DATA

05. ENGINE TUNING AND DATA

06. TORQUE FIGURE CONVERSION CHARTS

07. GENERAL FITTING INSTRUCTIONS

08. LIFTING, JACKING AND TOWING

09. RECOMMENDED LUBRICANTS FLUIDS CAPACITIES AND DIMENSIONS

10. MAINTENANCE SUMMARY

11. SERVICE TOOLS

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INTRODUCTION

This Service Manual covers the Jaguar and Daimler 2.9 Litre, 3.2 Litre and 4.0 Litre Saloon **Car range** of vehicles. It is primarily designed to assist skilled technicians in the efficient repair and maintenance of Jaguar and Daimler vehicles.

Using the appropriate service tools and carrying out the procedures as detailed will enable the operations to be completed within the time stated in the 'Repair Operation Times'.

The Service Manual has been produced in 6 volumes thus allowing the information to be distributed throughout the specialist areas of the modern service facility.

A table of contents in Book 1 lists the major components and systems together with the section and volume numbers in which they are contained. Each section starts with a list of operations in alphabetical order.

OPERATION NUMBERING

A master index of numbered operations has been compiled for universal application to all vehicles manufactured by Jaguar Cars Ltd., and, therefore, because of the different specifications of various models, continuity of the numbering sequence is not maintained throughout the manual.

Each operation described in this manual is allocated a number from the master index and cross-refers with identical number in the 'Repair Operation Times'. The number consists of six digits arranged in three pairs.

Each operation is laid out in the sequence required to complete the operation in the minimum time, as specified in the 'Repair Operation Times'.

SERVICE TOOLS

Where performance of an operation requires the use of service tool the tool number is quoted under the operation heading and is repeated in, or following, the instruction involving its use. A list of all necessary tools is included in Volume 1, Section 11.

REFERENCES

References to the left or right-hand side of the vehicle are made when viewing from the rear. With the engine and gearbox assembly removed the timing cover end of the engine is referred to as the front. A key to abbreviations and symbols is given in Volume 1, Section 01.

REPAIRS AND REPLACEMENTS

When service parts are required it is essential that only genuine Jaguar/Daimler replacements are used.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories.

1. Safety features embodied in the vehicle may be impaired if other than genuine parts are fitted. In certain territories, legislation prohibits the fitting of parts not to the vehicle manufacturer's specification.

2. Torque wrench setting figures given in this Service Manual must be strictly adhered to.

3. Locking devices, where specified, must be fitted. If the efficiency of a locking device is impaired during removal it must be renewed.

4. Owners purchasing accessories while travelling abroad should ensure that the accessory and its fitted location on the vehicle confirm to mandatory requirements existing in their country of origin.

5. The vehicle warranty may be invalidated by the fitting of other than genuine Jaguar/Daimler parts. All Jaguar/Daimler replacements have the full backing of the factory warranty.

6. Jaguar/Daimler Dealers are obliged to supply only genuine service parts.

ANTI-THEFT LABELS (USA)

All Jaguar cars for export to the **USA** are fitted with anti-theft labels, **as** required by the National Highway Traffic Safety Administration.

ANTI-THEFT LABELS ON NEW VEHICLES

The following procedures/precautions must be observed when dealing with anti-theft labels on new vehicles.

Note: It is vital that these procedures/precautions are strictly adhered to. Manufacturer's and dealer's obligations may be affected in regard to sections 607(a)(1), and 607(a)(4)(B) of the Cost Saving Act. Violation of these sections render the manufacturer and the dealer liable for **selling** a vehicle not in compliance with the theft prevention standard, and also falsely certifying that the vehicle complies with the aforementioned standard.

1. If any painting or rustproofing is carried out on the vehicle prior to first sale, then the labels must be protected.

2. After painting or rustproofing has been completed, the masking tape must be removed from the labels prior to handover to the customer.

ANTI-THEFT LABELS ON REPLACEMENTS PARTS

Jaguar replacement Parts - panels, etc. are supplied to the **USA** in electrocoat primer fitted with anti-theft labels CBC 4149 in specific locations. **A** protective mask is used to prevent the label from being damaged or obscured by paint and rustproofing material.

The following procedures/precautions must be observed with anti-theft labels when fitting replacement parts to vehicles.

1. The protective mask on the anti-theft label must not be removed until all preparation, painting and rustproofing work has been carried out.

2. The protective mask must be removed from the anti-theft label prior to vehicle handover to the customer.

Note: It cannot be stressed too highly that federal law requires dealers to remove paint masks from anti-theft labels after performing painting and rustproofing operations. Failure to comply renders manufacturer and dealer liable for violations of the law.

FOR A DETAILED DESCRIPTION **AND** LABEL LOCATION. **REFER** TO VOLUME 4, SECTION 77 BODY REPAIR.

SPECIFICATION

Purchasers are advised that the specification details set out in this Manual apply to a range of vehicles and not to any one. For the specification of a particular vehicle, purchasers should consult their Dealer.

The Manufacturers reserve the right to vary their specifications with or without notice, and at such times and in such manner as they think fit. Major as well as minor changes may be involved in accordance with the Manufacturers's policy of constant improvement.

Whilst every effort is made to ensure the accuracy of the particulars contained in this Manual, neither the Manufacturer nor the Dealer, by whom this Manual is supplied, shall in any circumstances be held liable for any inaccuracy or the consequences thereof.

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STANDARDIZED ABBREVIATIONS AND SYMBOLS USED IN THIS MANUAL

Abbreviation or Symbol	Term
A	Ampere
A.B.D.C.	After bottom dead centre
ABS	Anti-lock Braking System
a.c.	Alternating current
A.F.	Across flats (bolt/nut size)
Ah	Ampere hour
A.T.D.C.	After top dead centre
Atm	Atmospheres
Auto	Automatic transmission
B.A.	British Association (screw thread)
B.B.D.C.	Before bottom dead centre
B.D.C.	Bottom dead centre
b.h.p.	Brake horse-power
b.m.e.p.	Brake mean effective pressure
B.S.	British Standards
B.S.F.	British Standard Fine (screw thread)
B.S.P.	British Standard Pipe (thread)
B.S.W.	British Standard Whitworth (screw thread)
B.T.D.C.	Before top dead centre
C	Celsius (Centigrade)
cm	Centimetres
cm2	Square centimetres
cm3	Cubic centimetres
c/min	Cycles per minute
CO	Carbon monoxide
cwt	Hundredweight
d.c.	Direct current
deg.	Degree (angle or temperature)
dia.	Diameter
DIN	Deutsche Industrie Norm (Standard)
E.C.U.	Electronic Control Unit
E.G.R.	Exhaust Gas Recirculation
E.S.M.P.	Engine speed at maximum power
E.T.C.	Engine torque control
F	Fahrenheit
F.I.	Fuel injection
Fig.	Figure (illustration)
ft	Feet
ft/min	Feet per minute
g	Grammes (mass)
gal	Imperial gallons
gf	Grammes (force)
gcm	gramme centimetre
h.c.	High compression
hp	Horse-power
H.S.M.O	Hydraulic system mineral oil
h.t.	High tension (electrical)
Hz	Hertz (frequency)
i.dia	Internal diameter
i.f.s.	Independent front suspension
in	inches
in2	Square inches

Abbreviation or Symbol	Term
in3	Cubic inches
inHg	Inches *of* mercury
I.S.O.	International Standards Organization
kg	Kilogrammes (mass)
kgf/cm2	Kilogrammes per square centimetre
kgf m	Kilogramrne metres
km	Kilometres
km/h	Kilometres per hour
kN/m2	Kilonewtons per square metre
kPa	Kilopascals
k.p.i.	King pin inclination
kV	Kilovolts
kW	Kilowatts
lb	Pounds (mass)
lbf	Pounds (force)
lbf ft	Pounds force per foot (torque)
lb/ft2	Pounds per square foot
lbf in	Pounds force per inch (torque)
lb/in2	Pounds per square inch
l.c.	Low compression
L.H.	Left-hand
L.H.Stg.	Left-hand steering
L.H.Thd.	Left-hand thread
l.t.	Low tension (electrical)
M	Metric (screw thread)
m	Metres
max.	Maximum
MES	Miniature Edison Screw
min.	Minimum
mm	Millirnetres
mmHg	Millimetres *of* mercury
m.p.g.	Miles per gallon
m.p.h.	Miles per hour
N	Newton
N.A.S.	North American Specification
N.E.P.	Net engine power
Nm	Newton metres
No.	Numbers
Nox	Oxides *of* nitrogen
N.P.T.F.	American Standard Taper Pipe (thread)
O2	Oxygen
O/D	Overdrive
o.dia	Outside diameter
oz	Ounces (mass)
orf	Ounces (force)
ozf in	Ounces inch (torque)
oz in	Ounce inch
para.	Paragraph
Part no.	Part number
PAS	Power assisted steering
P.I.	Petrol injection
pt	Imperial pints

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Abbreviation or Symbol	Term
r	Radius
ref.	Reference
rev/min	Revolutions per minute
R.H.	Right-hand
R.H.Stg.	Right-hand steering
S.A.E.	Society *of* Automotive Engineers
S.C.	Single carburetter
sp.gr.	Specific gravity
Std.	Standard
s.w.g.	Standard wire gauge
Synchro	Synchronizer
Synchro	Synchromesh
T.D.C.	Top dead centre
t.p.i.	Threads per inch
U.N.C.	Unified Coarse (screw thread)
U.N.F.	Unified Fine (screw thread)
U.K.	United Kingdom
U.S.gal	Gallons (US)
U.S.pt	Pints (US)

Abbreviation or Symbol	Term
V	Volts
W	Watts
1st	First
2nd	Second
3rd	Third
4th	Fourth
5th	Fifth
°	Degree (angle or temperature)
∞	Infinity
	Minute (angle)
	Minus (tolerance)
	Negative (electrical)
%	Percentage
+	Plus (tolerance)
+ve	Positive (electrical)
-ve	Negative (electrical)
+/-	Plus or minus (Tolerance)
	Second (angle)
Ω	Ohms

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Engine (See Engine tuning and data, Section 05)

Final Drive Unit **Ratio**

2.9 Litre Auto	4.09: 1
3.2 Litre Auto	4.09: 1
4.0 Litre Auto	3.58: 1
2.9 Litre Manual	3.77:1
3.2Litre Manual	3.77:1
4.0Litre Manual	3.58:1

Manual Gearbox Ratios

	2.9 Litre and 3.2 Litre	4.0 Litre
First gear	3.573:1	3.553:1
Second gear	2.055:1	2.041:1
Third gear	1.391:1	1.400:1
Fourth gear	1.000: 1	1.000:1
Fifth gear	0.759: 1	0.755:1
Reverse	3.463: 1	3.553: 1

Cooling System

Water pump- type	Centrifugal
Water pump- drive	Belt
Cooling fan	One 11-bladed fan, driven through viscous coupling
Cooling system control	Thermostat
Auxiliary cooling	One fan blowing air through radiator, controlled by sensor in radiator
Thermostat opening temperature	88°C (190°F)
Filler cap: pressure rating	1.05 kgf/cm^2(15lbf/in^2)
Make	Western Thomson

Engine Management System

2.9 litre cars	Bosch
3.2 litre cars	Lucas
4.0 litre cars	Lucas
Automatic transmission ECU	Bosch

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Fuel System Pump (90MY)

Make and type	Electrical, Bosch EKP3 roller cell pump with integral relief valve and non-return valve
Fuel pressure	3.0 bar (43lbf/in2)

Fuel System Pump (91MY)

Electrical; module type, fitted 'in tank'. Integral 70 micron filter.

Make	Walbro Automotive
Fuel Pressure	3.0 bar (43lbf/in2)

Braking System

Front brakes	
Type	Power assisted, ventilated discs, single piston sliding calipers.
Rear brakes	
Type	Power assisted solid discs, single piston sliding calipers.
Hand brake	
Type	Mechanical, operating on rear **drums** within bell of the rear brake discs.
Disc diameter	
Front	295mm (11.61 in)
Rear	294mm (11.57 in)
Disc thickness	
Front	28mm (1.1 in)
Rear	10mm (0.39 in)
Master cylinder	
Bore dia.	23.81 mm (0.937 in)s
Brake operation	Hydraulic
Hydraulic fluid	Castrol DOT 4 brake and clutch fluid
Main brake friction pad material	Jurid 518
Handbrake friction shoe material	Ferodo 3405/1
Brake servo	
Booster assembly	
Type	Motor and pump (combined with **ABS *system)***
Boost ratio	5: 1
Operating pressure	140-180 bar (2030-2611 lbf/in2)
Accumulator	
Type	Gas charged
Volume	0.25 litre (0.44 pint, 0.26 US quart)
Anti-lock braking **system (ABS)**	
Wheel **sensors**	Electrical inductive sensors at the wheels which detect rotational speed
ECU type	Solid state digital unit

Braking **System** (continued)

ABS modulator unit (integral with brake servo booster)	
Type	Hydraulic, contains three solenoid valves, **one for** each front wheel and one for both rear wheels
Pump	See modulator unit above

Front **Suspension**

Type	Independent coil springs
Castor angle	3.50 to 4.50
Camber angle	0 to -0.5°
Front wheel alignment	Parallel to 1.6mm toe in (inclusive)
Dampers	Telescopic, gas filled

Rear Suspension

Type	Independent coil springs, co-axial with dampers
Camber angle	-0.5° to -1.0°
Rear wheel alignment	parallel to 1.6mm toe in (inclusive)
Dampers	Telescopic. **Gas** filled self-levelling suspension optional
Unloader valve	Solenoid operated spool valve

Power **Assisted Steering**

Type	Rack and Pinion
Number of turns lock to lock	*2.768*
Turning circle - wall to wall	12.34m (40ft 6in)
Turning circle - kerb to kerb	11.63m (38ft 2in)

Electrical Equipment

Battery

Make (90MY)	Chloride
Make (91MY)	Varta
Nominal voltage	12v
Nominal Capacity (90MY)	50Ah (420CCA 75 Mins. reserve)
Nominal Capacity (91MY)	52Ah (430CCA 85 Mins. reserve)
Earth Polarity	Negative

Alternator

Make and type	Bosch N1 14V 40/115A
Nominal voltage	13.5 V at 20°C
Earth Polarity	Negative
Maximum output	115A at 6000 rpm
Maximum operating speed	17500 rpm
Pulley Ratio	2.5:1
Regulator Temp. coef.	-10m V/°C
Max Quiescent Current	3mA

Starter

Make and type	Bosch DW 1.7K gear reduced
Free spin speed	3000 rpm
Free spin current	90A maximum
Load running current	420A maximum
Stall current	1050A maximum
Internal gear reduction	3.8: 1

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Distributor

Make and type:	
2.9 litre cars	Bosch (Engine Management)
3.2 litre cars	Lucas (Engine Management)
4.0 litre cars	Lucas (Engine Management)

Windscreen Wiper Motor

Make and type	Electrolux
Light running speed rack disconnected (after 60 secs from cold)	Slow mode 40 to **45** revlmin, fast mode greater than 60 rev/min
Light running current (after 60 secs from cold)	**Slow** mode 3A, fast mode 2A

TYRE DATA

Tyre replacement and Wheel Interchanging

When replacement of tyres is necessary, it is preferable to fit a complete car set. Should either front or rear tyres only show a necessity for replacement, new tyres must be fitted to replace the worn ones. No attempt must be made to interchange tyres from front to rear or vice-versa, **as** tyre wear produces characteristic patterns depending upon their position and if such position is changed after wear has occured, the performance of the tyre will be adversely affected. It should be remembered that new tyres require to be balanced.
The radial-ply tyres specified here are designed to meet the high-speed performance of which this car is capable.
Only tyres of identical specification as shown under 'TYRE **DATA'** must be fitted as replacements: tyres of the same manufacturer and tread pattern must be **used** in sets of four - NOT INTERMIXED.

UNDER NO CIRCUMSTANCES SHOULD CROSS-PLY TYRES BE FITTED

Tyre Designation (Fitted as complete sets only)

U.K., Europe and Rest of World

1990 MY: Dunlop or Michelin 220/65 VR 390 TD
1991 MY: Pirelli 225/65 **VR** 15
1991 MY Optional Fits (not Canada): Dunlop or Michelin 220/65 VR 390 TD. Pirelli 225/55 ZR 16

North America only

Pirelli 205/70 VR 15.

Inflation Pressures (cold)

U.K.,Europe and Rest of World (non TD tyres)

Front (90MY)

2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar).

Front (91MY)

2,24 kgf/cm^2 (32 lbf/in^2, 2.21 bar)

Rear (90 & 91MY)

2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar

The pressures quoted for U.K., Europe and Rest of World non-TD tyres may be reduced by (90MY) 0,56 kgf/cm^2, *8* lbf/in^2, 0,55 bar (91MY reduce by 0,42kgf/cm^2, 6 lbf/in2, 0,41 bar) on the front, and 0,42 kgf/cm^2, 6 lbf/in, 0,41 bar (both 90MY and 91MY) on the rear tyres to obtain maximum comfort. When using these reduced pressures, however, 160 km/h (100 mph) must not be exceeded.

U.K., Europe and Rest of World (TD tyres)

Front	Rear	
2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar)	2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar)	These pressures may be reduced by 0,56 kgf/cm^2, 8 lbf/in^2, 0,55 bar on the front, and by 0,42 kgf/cm^2, 6 lbf/in^2, 0,41 bar on the rear tyres to obtain maximum comfort provided the speed does not exceed 160 km/h (100 mph)

North America

Front	Rear	
228 kPa (33 lbf/in^2)	248 kPa (36 lbf/in^2)	These pressures may be reduced by 41 kPa (6 lbf/in^2) on the front and rear tyres to obtain maximum comfort provided the speed does not exceed 160 km/h (100 rnph)

Recommended Snow Tyres

Note: The use of snow tyres fitted with studs is not permitted in certain countries.

U.K.. Europe and Rest of World (fitted in complete sets only)

Tyre Designation

Dunlop TD SP88 M&S 220/65 R 390 T, or Pirelli 215/65 Winter 190

Tyre Pressures

Up to 160 km/h (100 rnph)	Front 1,83 kgf/cm^2 26 lbf/in^2 1.79 bar	Rear 1,97 kgf/cm^2 28 lbf/in^2 1.93 bar	Snow chains may be fitted to rear wheels only. Use Jaguar snow chains (Champion 26 12-SM or Shur-grip). Maximum speed with snow chains fitted, 48km/h (30 mph).
Up to maximum of 190km/h (120 mph)	Front 2,39 kgf/cm^2 34 lbf/in^2 2.35 bar	Rear 2,39 kgf/cm^2 34 lbf/in^2 2.35 bar	Tyres may be fitted with studs provided maximum speed does not exceed 145 km/h (90mph). Studs must be of the parallel shank type, 1Omm long, 8mm diameter, single flange.

North American Cars (fitted in complete sets only)

Tyre Designation

Pirelli M&S Winter 190 215/65 R15T

Tyre Pressures

Up to 160 km/h (100 mph)	Front 1,90 kgf/cm^2 27 lbf/in^2 186 kPa	Rear 2,11 kgf/cm^2 30 lbf/in^2 207 kPa	Snow chains may be fitted to rear wheels only. Use Jaguar snow chains (Champion 26 12-SM or Shur-grip). Maximum speed with snow chains fitted, 30 mph.

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Tyre **Pressures** (North American, Winter, continued)

Up to maximum of 190 km/hr (120 mph)	Front 1,90 kgf/cm^2 27 lbf/in^2 **1.86 bar**	Rear 2,53 kgf/cm^2 36 lbf/in^2 2.48 **bar**

Stopping Distance **from *60* mph**

a.	Fully operational service brake:	
	Light load	45.1m. (148ft)
	Maximum load	57.3m. (1*88* ft)
b.	Emergency service **brakes:**	
	(Front sub system **failed)**	108.5m. (356ft)
c.	Brake power unit **failure:**	
	Maximum load	73.76m. (242ft)

BULB CHART

DESCRIPTION	CAPACITY	TYPE	PART NO
Headlamp (Quadruple)			
France Only Inner	12V 60W	Halogen Yellow 476	JLM9599
France Only Outer	12V 60W/55W	Halogen Yellow 476	JLM9599
USA and Canada Inner	12V 50W	Sealed Beam	JLM216
USA and Canada Outer	12V 35/35W	Sealed Beam	JLM215
Japan Only Inner	12V 50W	Sealed Beam	JLM844
Japan Only Outer	12V 37.5/60W	Sealed Beam	JLM845
Rest of World (R.O.W.) Inner	12V 60W	Halogen 472	JLM9598
R.O.W. Outer	12V 60/55W	Halogen 472	JLM9598
front Flasher and Side Lamp (Canada and **USA)**	12v 5/21W	Double Filament 380	JLM9594
R.O.W. Side Lamp	12v 5w	Regular 207	JLM9587
R.O.W. Flasher Lamp	12v 21W	Regular 382	C9126
Headlamp (Rectangular)			
France	12V 60/55W	Halogen Yellow 476	JLM9599
Rest of World	12V 60/55W	Halogen 472	JLM9598
Fog Lamps			
Front	12v 55w	Halogen 479	JLM9588
Rear	12v 21w	Regular 382	C9126
Underbonnet Lamp	12V 5W	Regular 989	JLM9601
Sidemarker Lamp (USA and Canada)	12V 4W	Regular 233	JLM9589
Side Repeater Lamp	12V **4W**	Regular 233	JLM9589
Door Hazard Lamp	12V 5 w	Festoon 239	JLM9590
Instrument Illumination	12v 1.2W	Bulb/Holder (White)	JLM1929
Instrument Illumination	12v 1.2W	Bulb/Holder (Brown)	JLM1928
Gear Selector Illumination	12v 1.5W	Capless	JLM1223
Glove Compartment Lamp	12v 5w	Festoon 239	JLM9590
Cigar Lighter Illumination	12v 1.2W	Capless 286	C38966
Roof *Console* Map Lamp	12V 5W	Halogen 468	JLM846
Roof Console Courtesy Lamp	12V 10W	Festoon 265	JLM847
Interior Lamp Seat Headrest	12v 5 w	Festoon 239	JLM9590
Rear Quarter Reading Lamp	12V 4W	Regular 233	JLM9589
High Mounted Stop Lamp	12v 5W	Capless 501	JLM9600
Luggage Compartment Lamp	12v 5W	Festoon 239	JLM9590
Stop Lamp	12v 21w	Regular 382	C9126
Reverse Lamp	12v 21w	Regular 382	C9126
Rear Flasher Lamp	12V 21w	Regular 382	C9126
Tail Lamp	12v 5W	**Regular** 207	JLM9587
Number Plate Lamp Japan	12v 10W	Festoon 265	JLM9591
Number Plate Lamp R.O.W.	12V 5 w	Festoon 239	JLM9590
Sun Visor Vanity Mirror	12V1.2V	Capless 286	C38966

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FUSE PART NUMBERS

3 amp - ADU 1872J
5 amp - ADU 1874J
7.5 amp - ADU 1875J
10 amp - ADU 1876J
15 amp - ADU 1877J
20 amp - ADU 1878J
25 amp - ADU 1879J
30 amp - ADU 1880J

FUSE CHARTS (1990MY)

RIGHT-HAND FUSEBLOCK (1990MY)

Fuse No.	Fuse Colour Code	Value	Circuit
A1	Grey	2A	Rear ride levelling (where fitted).
A2	Yellow	20A	Right-hand air conditioning fan (where fitted)/heater fan.
A3	Yellow	20A	front and rear cigar lighters.
A4	Yellow	20A	Spare position.
A5	Light Blue	15A	Cooling fan and air conditioning clutch (where fitted).
A6	White	25A	Headlamp power wash (where fitted).
A7	Yellow	20A	Heated rear screen.
A8	Red	10A	Caravan/Trailer.
B1	Tan	5A	Luggage compartment remote release (where fitted).
B2	Light Blue	15A	Right-hand front door window lift and mirror motors if driver's door.
B3	Violet	3A	Spare position.
B4	Light Blue	15A	Doors, luggage compartment and fuel filter locks.
B5	Light Blue	15A	Right-hand rear door window lift.
B6	Tan	5A	Windscreen washer.
B7	Red	10A	Right-hand rear lamps (stop, reverse, direction indicators and fog [where fitted]) and high mounted stop lamp (where fitted).
B8	Light Blue	15A	Right-hand main beam headlamp.
C1	Red	10A	Radio.
c2	Brown	7.5A	Interior, luggage compartment, under bonnet and door guard lamps.
c3	Violet	3A	Right-hand rear lamps (tail, number plate and side marker [where fitted]).
c4	Violet	3A	Instrument illumination dimmer and auxiliary side light relay.
c5	Tan	5A	Right-hand front lamps (side, side marker [where fitted] direction indicators and repeater).
C6	Violet	3A	Aerial.
c7	Red	10A	Right-hand dip beam headlamp, right-hand front fog lamp (where fitted).
C8	Tan	5A	Door mirror heaters.

LEFT-HAND FUSEBLOCK (1990MY)

Fuse No.	Fuse Colour Code	Value	Circuit
A1	Light Green	30A	Left-hand front seat motors (where fitted) and seat heater (where fitted).
A2	Yellow	20A	Left-hand air conditioning fan (where fitted)/heater fan.
A3	Violet	3A	Spare position.
A4	Yellow	20A	Spare position.
A5	Red	10A	Horns.
A6	White	25A	Accessory fuse box (where fitted).
A7	Red	10A	Left-hand rear lamps (stop, reverse, direction indicators and fog [where fitted]).
A8	Violet	3A	Spare position.

LEFT-HAND FUSEBLOCK (1990MY) (continued)

Fuse No.	Fuse Colour Code	Value	Circuit
B1	Light Green	30A	Right-hand front seat motors (where fitted) and seat heater (where fitted).
B2	Light Blue	15A	Left-hand front door window lift and mirror motors if driver's door.
B3	Tan	5A	Instrument pack.
B4	Yellow	20A	Sunroof.
B5	Light Blue	15A	Left-hand rear window lift and fuel filler flap interface
B6	Tan	5A	Left-hand front lamps (side, side marker [where fitted] direction indicators and repeater)
B7	Light Blue	15A	Windscreen wiper
B8	Light Blue	15A	Left-hand main beam headlamp
C1	Violet	3A	Spare position
c2	Grey	2A	Diagnostic memory - automatic transmission (XJ6 4.0 litre)
c3	Red	10A	Main fuse - automatic transmission (XJ6 4.0 litre)
c4	Violet	3A	Spare position
c5	Violet	3A	Left-hand rear lamps (tail, number plate and side marker [where fitted])
C6	Violet	3A	Breather heater
c7	Red	10A	Left-hand dip beam headlamp, left-hand front fog lamp [where fitted])
C8	Violet	3A	Spare position

CENTRE FUSEBLOCK (1990MY)

Fuse No.	Fuse Colour Code	Value	Circuit
1	Violet	3A	Lamp modules right-hand rear and left-hand front, alternator control
2	Violet	3A	Lamp modules right-hand front and left-hand rear, radio illumination
3	Tan	5A	Speed control (where fitted)
4	Violet	3A	Ride levelling (where fitted)
5	Violet	3A	Cooling fan relay, heated windscreen washer jets and breather pipe heater relay
6	Tan	5A	Instrument pack
7	Violet	3A	Cigar lighter relay
8	Violet	3A	Anti-lock braking system ECU ignition supply and main relay coil
9	Violet	3A	Spare position
10	Violet	3A	Spare position

IN-LINE FUSES (1990MY)

Protected Circuit	Location	Fuse Colour Code	Value
Wiper logic unit	Adjacent to wiper logic module below the glove compartment	Brown	7.5A
Anti-lock braking system (ABS) main feed	Behind the front door pillar fuse box on the driver's side	Light Green	30A
Braking system pump motor	Behind the front door pillar fuse box on the driver's side	Light Green	30A
Radio (where fitted)	Below centre console		5A
Radio mernorv	Below centre console		1A

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ACCESSORY FUSE BOX (1990MY) (WHERE FITTED)

FUSE NUMBER	FUSE COLOUR CODE	FUSE CAPACITY	PART NUMBER
1	Violet	3A	ADU 87213
2	Violet	3A	ADU 872/J
3	Violet	3A	ADU 872/J
4	Violet	3A	ADU 872/J
5	Violet	3A	ADU 872/J
6	Violet	3A	ADU 872/J
7	Violet	3A	ADU 872/J
8	Violet	3A	ADU 872/J
9	Violet	3A	ADU 1872/J
10	Violet	3A	ADU 1872/J

CAUTION: The total maximum fuses in use in the accessory fuse box must not exceed 20A.

FUSE CHARTS (1991MY)

RIGHT-HAND FUSEBLOCK (1991MY)

Fuse No.	Fuse Colour Code	Value	Circuit
A1	Grey	2A	Rear ride levelling (where fitted).
A2	Yellow	20A	Right-hand air conditioning fan (where fitted)/heater fan.
A3	Yellow	20A	Front and rear cigar lighters,
A4	Yellow	20A	Spare position.
A5	Light Blue	15A	Cooling fan and air conditioning clutch (where fitted).
A6	White	25A	Headlamp power wash (where fitted).
A7	Yellow	20A	Heated rear screen.
A8	Violet	3A	Aerial.
B1	Yellow	20A	L.H. air Conditioning fan (where fitted) / heater fan,
B2	Light Blue	15A	Right-hand front door window lift and mirror motors if driver's door.
B3	White	25A	Starter motor solenoid.
B4	Yellow	20A	Central processor unit (CPU).
B5	Light Blue	15A	Right-hand rear door window lift.
B6	Tan	5A	Windscreen washer.
B7	Red	10A	Right-hand rear lamps (stop, reverse, direction indicators and fog [where fitted]) and high mounted stop lamp (where fitted (NAS)).
68	Light Blue	15A	Right-hand main beam headlamp.
C1	Red	10A	Radio/cassette player/CD changer (where fitted).
c2	Brown	7.5A	Interior/map lamps, headrest lamps, cubby box, boot, sun visor, puddle, RH and LH 'E' post and under-bonnet lamps.
c3	Violet	3A	Right-hand rear lamps (tail, number plate and side marker [where fitted, NASI).
c4	Violet	3A	Instrument illumination dimmer and auxiliary side lamp relay and side lamps power-on relay.
c5	Tan	5A	Right-hand front lamps (side, side marker [where fitted, NASI, direction indicators and repeater).
C6	Red	10A	Caravan/trailer module
c7	Red	10A	Right-hand dip beam headlamp, right-hand front fog lamp (where fitted).
C8	Tan	5A	Door mirror heaters.

LEFT-HAND FUSEBLOCK (1991MY)

Fuse No.	Fuse Code		Circuit
A1	Light Green	30A	Left-hand front seat motors (where fitted) and seat heater (where fitted).
A2	Tan	5A	Luggage compartment remote release.
A3		3A	Speed warning (where fitted), fascia switch pack, ignition-on relay (coil) and petrol injection memory (engine management ECU)
A4	Yellow	20A	Spare position.
A5	Light Blue	15A	Horns.
A6	White	25A	Accessory fuse box (where fitted).
A7	Red	10A	Left-hand rear lamps (stop, reverse, direction indicators and *fog*
A8	Grey	2A	Purge valve.
B1	Light Green	30A	Right-hand front seat motors and seat heater (where fitted).
B2	Light Blue	15A	Left-hand front door window lift and mirror motors if driver's door.
B3	Violet	3A	Instrument pack memory.
B4	Yellow	20A	Sunroof (where fitted).
B5	Light Blue	15A	Left-hand rear window lift and fuel filler flap interface
B6	Brown	7.5A	Breather heater, air pump relay (catalyst vehicles only).
B7	Light Blue	15A	Windscreen wiper motor.
B8	Light Blue	15A	Left-hand main beam headlamp.
C1	Light Blue	15A	Petrol injection circuit.
c2	Tan	5A	JDS power supply - automatic transmission (XJ6 4.0 litre)
c3	Brown	7.5A	Main fuse - automatic transmission (XJ6 4.0 litre)
c4	Light Blue	15A	Door locking control
c5	Violet	3A	Left-hand rear lamps (tail, number plate and side marker [where fitted, NASI)
C6	Tan	5A	L.H. front lamps (side, side marker (where fitted, NASI, direction indicator and repeater
c7	Red	10A	Left-hand dip beam headlamp, left-hand front fog lamp [where fitted])
C8	Natural	25A	Fuel pump relay and lambda sensor (where fitted)

CENTRE FUSEBLOCK (1991MY)

Fuse No.	Fuse Colour Code	Value	Circuit
1	Violet	3A	Right-hand rear lamp relay and bulb fail module (fog and reverse lamps). LH front lamp relay and bulb fail module (dipped beam, fog (where fitted)), and dim/dip pulse width modulator. Load dump module.
2	Violet	3A	Left-hand rear lamp relay and bulb fail module (fog and reverse lamps). RH front lamp relay and bulb fail module (dipped beam, fog and dim/dip pulse width modulator.
3	Tan	5A	Cruise control ECU (where fitted)
4	Violet	3A	Ride levelling circuitry (where fitted)
5	Violet	3A	Cooling fan relay and thermostat. Screenwash and headlamp powerwash heater elements, breather pipe heater relay
6	Tan	5A	Instrument pack
7	Violet	3A	Cigar lighter relay coil, automatic speed control relay (4.0L auto only), starter motor relay coil, catalyst switching module (Japan only) and screenwash relay coil.
8	Violet	3A	Anti-lock braking system ECU ignition supply and main relay coil
9	Violet	3A	Wiper logic module supply, lighting logic ignition supply, air conditioning aspirator, microprocessor unit ignition input, accessory fusebox relay coil (where fitted). Passive restraint module inhibit relay coil (NAS).
10	Violet	3A	Right-hand front seat heater module, left-hand front seat heater module and automatic transmission linear switch (XJ6 4.0 Litre)

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IN-LINE FUSES (1991MY)

Protected Circuit	Location	Fuse Colour Code	Value
Anti-lock braking system (ABS) main feed	Above the inertia switch on driver's side.	Light Green	30A
Braking system pump motor	Above the inertia switch .on driver's side.	Light Green	30A

ACCESSORY FUSE BOX (1991MY) (WHERE FITTED)

Ten accessory positions are available in the accessory fuse box, with fuse positions 1, 3, 5, 7 and 9 fed from the battery, and positions 2, 4, 6, 8 and 10 fed from the ignition.

When replacing any of the fuses with higher value items, the substituted fuse value(s) should be noted in the Driver's Handbook.

CAUTION: The total maximum fuse rating for the accessory fusebox should not exceed *20* amps.

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ENGINE TUNING AND DATA

Ignition timing	**Fully** mapped digital ignition	2.9 litre engine - **Bosch** engine management 3.2 litre engine - Lucas engine management 4.0 litre engine - Lucas engine management
Valve clearances	Inlet and exhaust	0.30 to 0.36mm (0.012 to 0.014 in)
Spark plugs	Make/type: 2.9 litre cars	Champion **N3C**
	3.2 litre cars	Champion **RC9YC**
	4.0 litre cars	Champion **RC9YC**
	Gap: 2.9 litre cars	0.64mm (0.025 in)
	3.2 litre cars	0.9mm (0.035 in)
	4.0 litre cars	0.9mm (0.035 in)
Ignition coil	Make/type: 2.9 litre cars	Bosch (blue self-adhesive label)
	3.2 litre cars	Bosch (yellow self-adhesive label)
	4.0 litre cars	Bosch (yellow self-adhesive label)
	Primary resistance at 20°C (68°F)	0.5 ohms +/- 10%
	Secondary resistance	**6k** ohms +/- 10%
	Secondary inductance	31H +/- 20%
	Consumption: stationary	5.0 to 6.5 amps
	Consumption: running	2.5 to 3.0 amps
Distributor	Make/type: 2.9 litre cars	Bosch PVF6
	3.2 litre cars	Lucas DHT6
	4.0 litre cars	Lucas DHT6
	Rotation of rotor (looking down at rotor)	Clockwise
	Resistance rotor arm 2.9 litre vehicles	1k ohm (Bosch type)
	Resistance rotor arm 3.2 litre vehicles	1k ohm (Lucas type)
	Resistance rotor arm 4.0 litre vehicles	1k ohm (Lucas type)
	Firing order	1,5,3,6,2,4 (No 1 cylinder at front)

Spark plug lead resistances	2.9 litre engine	3.2 litre engine	4.0 litre engine
	No.	No.	No.
	1 9.8 to 23.0k ohm	1 5.6 to 13.2k ohm	1 5.6 to 13.2k ohm
	2 8.3 to 19.5k ohm	2 6.0 to 14.0k ohm	2 6.0 to 14.0k ohm
	3 8.3 to 19.5k ohm	3 6.6 to 15.5k ohm	3 6.6 to 15.5k ohm
	4 10.0 to 29.5k ohm	4 7.7 to 18.2k ohm	4 7.7 to 18.2k ohm
	5 10.2 to 24.0k ohm	5 9.5 to 22.3k ohm	5 **9.5** to 22.3k ohm
	6 10.8 to 25.3k ohm	6 9.1 to 21.4k ohm	6 9.1 to 21.4k ohm
	Kinglead 1.8 to 4.1 k ohm	Kinglead 1.8 to 4.1 k ohm	Kinglead 1.8 to 4.1 k ohm

Fuel injection equipment	Microprocessor controlled	2.9 engine - Bosch engine management 3.2 engine - Lucas engine management **4.0** engine - Lucas engine management
	Fuel pressure	3 bar (43 lbf/in^2)
Exhaust emission	Exhaust gas analyser reading at engine idle speed	1 to 2% rnax **CO** at 700 rev/min without air injection - (not catalyst cars)
Idle speed	(auto) 700 +/- 50 rev/min (manual) 800 +/-50 rev/min	

Compression pressure	2.9 litre engine	3.2 litre engine	4.0 litre engine
	210-230 lbf/in^2	160-170 lbf/in^2	160-170 lbf/in^2
Differential between cylinders	10 lbf/in^2 (max)	10 lbf/in^2 (max)	10 lbf/in^2 (max)

Note: Compressions to be checked with all sparking plugs removed, throttle wide open, engine at operating temperature and cranking speed of 300 rev/min (minimum).

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ENGINE DATA
4.0 LITRE ENGINE

General data	Number of cylinders	6
	Bore	91mm
	Stroke	102mm
	Cubic capacity	3980cm^3
	Compression ratio	9.5:1
	Firing order	1,5,3,6,2,4 (No 1 cylinder at front)
Cylinder block	Material (cylinder block)	Aluminium alloy
	Bore diameters after honing:	
	Piston grade	
	A	91,002 to 90,990mm
	B	91.018 to 91,005mm
	+0.010in	91,272 to 91,259mm
	+0.020in	91,526 to 91,513mm
Cylinder head	Material	Aluminium alloy
	Valve seat angle (inclusive)	89°30' to 89°00'
Crankshaft	Material	Steel
	Number of main bearings	7
	Main bearing type	Vandervell VP2C
	Journal diameter	76,230 to 76,218mm
	Journal length (over 3/32 in radii)	
	Front	30,48mm
	Centre	36,233 to 36,182
	Remainder	30,53 to 30,43mm
	Thrust washer material	VP10 or VP2
	Thrust washer diameter	3,888 to 3,898mm
	Thrust washer thickness	2,57 to 2,62mm (0.101 to 0.103in)
	Permissible end-float	0.10 to 0.25mm (0.004 to 0.010in)
	Width of main bearing:	
	Front intermediate and rear	24,71 to 24,33mm
	Centre	30,48 to 30,10mm
	Balancing	Crankshaft to be balanced to 15gm cm (¼ oz in) Unbalance to be corrected by drilling up to 4 holes in each balance weight 9,5 x 29mm rnax depth
	Diametrical clearance	0,041 to 0,084mm
	Crankpin:	
	Diameter	52,987 to 52,974mm
	Length	30,193 to 30,142mm
Connecting rods	Length between centres	166,42 to 164,32mm
	Big end bearing material	Vandervell VP2C
	Bore for big end bearing	56,731 mm
	Width of big end bearing	24,77 to 24,38mm (0.975 to 0.960in)
	Big end diametrical clearance	0,001 to 0,0027mm
	Big end side clearance	0,132 to 0,233mm
	Small end bush material	VP10
	Bore for small end bush	27,000 to 26,975mm
	Width of small end bush	25,3 to 25,5mm
	Fitted I/D of small end bush	23,818 to 23,814mm
	Bore diameter of small end bush	23,48 to 23,38mm
Oil pressure	At idle Speed	30lb/in^2 (207 kN/m^2) minimum
	At 4000 rev/min	70lb/in^2 (483 kN/m^2) minimum

Pistons	Type	HG4 13(BS 1490-1970-LM13TF) (phosphorus modified)
	Diameter:	
	Grade	
	A	90,976 to 90,964mm
	B	90,991 to 90,979mm
	+0.010in	91,245 to 91,218mm
	+0.020in	91,499 to 91,472mm
Piston rings	No. of compression rings	2
	No. of oil control rings	1
	Top compression ring	
	Gap	0,4 to 0,65mm
	Width	1,490 to 1,495mm
	Diameter	91,00mm
	Depth of chrome	0,06mm
	Tangential load of 5.8N to 8.75N to close gap to	0,40 to 0,65mm
	Material	Cast Iron HG22C
	Second compression ring:	
	Gap	0,4 to 0,65mm
	Width	1,990 to 1,975mm
	Diameter	91,00mm
	Tangential load of 5.8N to 8.75N to close gap to	0,40 to 0,65mm
	Material	Cast Iron HG10
	Oil control ring	
	Gap	0,3 to 0,55mm
Gudgeon pins	Type	Chamfer locking type
	Length	77,25 to 77,12mm
	Outside diameter	23,812 to 23,807mm
	Inside diameter	14,81 to 14,30mm
	Permissible offset of centre web	1,0mm
	Material	EN32
Camshafts	Number of journals	7
	Journal diameter	26,950 to 29,937mm
	Diametrical clearance	0,063 to 0,037mm
	Material	Cast iron
	Nominal lift	9,0mm (0.360in)
Valves	Inlet valve material	EN52
	Exhaust valve material	Steel 21-4-N
	Inlet valve head diameter	35,43 to 35,17mm
	Exhaust valve head diameter	29,90mm
	Valve Stem diameter	
	Inlet and exhaust	7,879 to 7,866mm
	Valve lift	9,525mm
	Inlet valve clearance	0,031 to 0,036mm (0.012 to 0.014in)
	Exhaust valve clearance	0,031 to 0,036mm (0.012 to 0.014in)
	Valve stem seal	
	Material	Viton
	Internal diameter	7,90 to 7,85mm
Valve guides	Valve guide material	Brico alloy 2 or BS 152/12 (Brinell hardness 190 to 260)
	Guide length	48,51mm (1,910in)
	Circlip material	18 SWG (0.048in) zinc coated

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Valve guide identification	No groove-Standard	12,75 to 12,74mm (0.5020 to 0.5015in)
	1 groove-First oversize (Production)	12,80 to 12,79mm (0.5040 to 0.5035in)
	2 grooves-Second oversize (Service)	12,88 to 12,87mm (0.5070 to 0.5065in)
	3 grooves-Third oversize (Service)	13,00 to 12,99mm (0.5120 to 0.5115in)
Valve guide (service)	Bore to be concentric with the outside diameter of the guide within 0.001 in i.e. total indicator reading of 0.002in	
Valve seats	Inlet valve seat outside diameter:	
	Standard	36,404 to 36,388mm
	Service	36,785 to 36,769mm
	Interference fit in cylinder head	0,077mm (0.003in)
	Exhaust valve seat outside diameter:	
	Standard	32,884 to 32,868mm
	Service	33,265 to 33,249mm
	Interference fit in cylinder head	0,077mm (0.003in)
	Valve seat angle (inclusive)	89°30' to 89°00'
Tappets	Outer diameter of tappet	33,34 to 33,35mm (1.3125 to 1.3130in)
	Diametrical clearance of tappet	0,051 to 0,020mm (0.002 to 0.0008in)
Valve spring	Wire diameter	3,76mm (0.148in)
	Inside diameter	20,62 +/- 0,25mm (0.812 +/- 0.010in)
	Total No. of coils	6
	No. of working coils	3.75
	Helix	RH
	Rate	35,51N/mm (202.5lb/in)
	Natural frequency	603.4 Hz (36,203 c/min)
	Free length	40,13mm (1.580in)
	Material	OTEVA60
Camshaft sprocket	No of teeth	30
	Pitch of teeth	9,525mm (0.375in)
	Pitch circle diameter	91,135mm (3.588in)
	Internal surrations	131
	Pitch circle diameter	66,675mm (2.625in)
	Pitch of teeth	1,6mm (0.063in)
	o.dia of sprocket	95,25mm +/- 0.050mm (3.75in +/- 0.002in)
	Total width	18,6531mm (0.734)
	Total width across both teeth	15,341 to 15,570mm (0.604 to 0.613in)
	Concentricity of teeth and sprocket not to exceed	0,076mm (0,003in)
Crankshaft sprocket	No. of teeth	21
	Pitch	9,525mm (0.375in)
	Pitch circle diameter	63,906mm (2.516in)
	Root diameter	57,556mm (2.266in)
	Roller diameter	6,35mm (0.25in)
	Measured over 6,35mm (0.25in) dia pins	70,008 to 69,95mm (2.759 to 2.754in)
	Tooth profile cut to	BS228
	Internal diameter	42,875 to 42,857mm
	Width across 1 tooth	5,33 to 5,10mm
	Width across all the teeth	38,43 to 38,00mm
	Width across 2 teeth (timing chain)	15,57 to 15,34mm
Crankshaft damper oil seal spacer	Inside diameter	42,875 to 42,860mm (1.6880 to 1.6874in)
	Outside diameter	52,00 to 51,81mm (2.047 to 2.040in)
	Width	17,10 to 16,90mm
	All chamfers to be polished and free from burrs	

Intermediate shaft bush	Inside diameter (when fitted)	22,010 to 21,964mm (0.8665 to 0.8647in)
	Outside diameter	25,083 to 25,057mm (0.9875 to 0.9865in)
	Width	17,25 to 16,25mm (0.679 to 0.659in)
	Press fit	0,036 to 0,083mm (0.0015 to 0.0033in)
	Shaft size	22mm (0.8645 to 0.8637in)
	Running clearance	0,071 to 0,005mm (0.0028 to 0.0002in)
	Material	Vandervell No L10083/3
intermediate sprocket inner teeth	Number of teeth	28
	Pitch	9,525mm (0.375in)
	Pitch circle diameter	85,063mm (3.349in)
	Root diameter	78,70mm (3.009in)
	Roller diameter	6,35mm (0.25in)
	Measured over 6,35mm (0.25in) dia pins	91,41 to 91,29mm (3.599 to 3.594in)
	Tooth profile cut to	BS228
	Width across the depth	15,57 to 15,34mm (0.613 to 0.604in)
	Overall diameter	89,20 to 89,10mm (3.512 to 3.508in)
Intermediate sprocket outer teeth	Number of teeth	20
	Pitch	9,525mm (0.375in)
	Pitch circle diameter	60,884mm (2.397in)
	Root diameter	54,53mm (2.147in)
	Roller diameter	6,35mm (0.25in)
	Measured over 6,35mm (0.25in) dia pins	67,23 to 67,11rnm (2.647 to 2.642in)
	Tooth profile cut to	BS228
	Overall diameter	65,07 to 64,97mm (2.562 to 2.558in)
	Width across both teeth	15,57 to 15,34mm (0.613 to 0.604in)
	Total width of sprocket	48,80 to 48,70mm (1.921 to 1.917in)
Primary timing chain	Pitches	80
	Roller diameter	6,35mm (0.25in)
	Pitch	9,525mm (0.375in)
	Type	Endless duplex chain
Secondary timing chain	Pitches	86
	Roller diameter	6,35mm (0.25in)
	Pitch	9,525mm (0.375in)
	Type	Endless duplex chain
Oil pump chain	Pitches	52
	Roller diameter	6,35mm (0.25in)
	Pitch	9,525mm (0.375in)
	Type	Endless simplex chain
Dampers and tensioners	Backing material	Steel BS1449 CR4
	Damper material	Rubber
Hydraulic chain tensioner housing	Bore diameter	21,38 to 21,36mm (0.842 to 0.841in)
Hydraulic chain tensioner	Overall length	45mm (1.771in)
	Overall length to bottom of groove in piston	41mm (1.614in)
	Diameter	21,349 to 21.323mm (0.8405 to 0.8395in)
	Width of groove in piston	15mm (0.59in)
Non-return valve primary ball diameter		4,762mm (0.1875in)
	Ball free movement	0,74 to 0,45mm (0.290 to 0.018in)
Non return valve secondary ball diameter		4,762mm (0.1875in)
	Ball free movement	0,74 to 0,45mm (0.29 to 0.018in)

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Oil pressure relief valve	Relief valve	
	o.dia	17,98 to 17,95mm (0.7079 to 0.7067in)
	i.dia	15,00 to 14,50mm (0.591 to 0.571in)
	Overall length	35mm (1.378in)
	Working length	30mm (1.181in)
	Bore depth	27mm (1.063in)
	Material	EN1A
	Cyanide harden depth	0,020 to 0,013mm (0.008to 0.005in)
	Mandrel: Length	57mm (2.244in)
	Mandrel: Diameter	11,11rnm (0.437in)
	Material	Steel tube to BS970 (CDS2 or ERW 1)
	Spring: Wall thickness	1,63 (0.064in, 16SWG) or 1,22 (0.048, 18SWG)
	Free length	106mm (4.173in)
	Outside diameter	16,34mm (0.643in)
	Wire diameter	2,34mm (0.092in, 13SWG)
	Mean diameter coils	14,0mm (0.551in)
	Total number of coils	26
	Number of active coils	24
	Helix of coil	Left
	Spring rate	4,49 N/mm (25.65lb/in)

	Length		Load		Stress	
	mm	inches	kg	lbs	N/mm^2	lb/in^2
Fitted	76,00	2.992	13,74	30.29	472	68.395
Valve opening	72,00	2.835	15,58	34.35	535	77.543
Max opening	62,00	2.441	20,15	44.43	692	100.304
Solid (ref)	60,80	2.392	20,71	45.66	711	103.083

Material BS970/735/A50(EN47) Spring steel wire. Ends to be close coiled and ground square to axis, feather edges to be removed to a minimum thickness of 0.5mm (0.020in).

Oil filter	Oil filter type	Full flow disposable canister
Canister specification	Maximum working pressure	100lb/in^2
	Relief valve setting	13 to 16lb/in^2 (0.90 to 1,1kgf/cm^2)
	Canister to withstand	17,60kgf/cm^2 (250lb/in^2) pressure
	Element filtration area	3555cm^2 (55lb/in^2)
	Canister diameter	95,70mm (3.78in)
	Canister length	148,00 to 145,50mm (5.827 to 5.728in)
	Canister case material thickness	24 SWG
	Adaptor thread	1 in 12 UNF- 2B
Oil pump	Oil pump	Rotor type
	Outer rotor outside diameter	69,825 to 69,774mm (2.749 to 2.747in)
	Outer rotor width	27,975 to 27,962mm (1.1014 to 1.1009in)
	Inner rotor width	27,975 to 27,962mm (1.1014 to 1.1009in)
	Clearance outer rotor to body	0,1mm (0.01Oin)
	Oil pump body rotor bore	69,951 to 69,926mm (2.7539 to 2.7529in)
	End float	0,1mm (0.005in)
	2 horn clearance	0,2mm (0.010in)
	3 horn clearance	0,2mm (0.010in)

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ENGINE DATA
3.2LITRE ENGINE

General data	Number of cylinders	6
	Bore	91mm
	Stroke	83mm
	Cubic capacity	3239cm^3
	Compression ratio	9.75:1
	Firing order	1,5,3,6,2,4 (No 1 cylinder at front)
Cylinder block	Material (cylinder block)	Aluminium alloy
	Bore diameters after honing:	
	Piston grade	
	A	91,002 to 90,990mm
	B	91,018 to 91,005mm
	+0.010in	91,272 to 91,259mm
	+0.020in	91,526 to 91,513mm
Cylinder head	Material	Aluminium alloy
	Valve seat angle (inclusive)	89°30′ to 89°00′
Crankshaft	Material	Cast iron
	Number of main bearings	7
	Main bearing type	Vandervell VP2C
	Journal diameter	76,230 to 76,218mm
	Journal length (over 3/32 in radii)	
	Front	30,48mm
	Centre	36,233 to 36,182
	Remainder	30,53 to 30,43mm
	Thrust washer material	VP10 or VP2
	Thrust washer diameter	3,888 to 3,898mm
	Thrust washer thickness	2,57 to 2,62mm (0.101 to 0.103in)
	Permissible end-float	0.10 to 0.25mm (0.004 to 0.010in)
	Width of main bearing:	
	Front'intermediate and rear	24,71 to 24,33mm
	Centre	30,48 to 30,10mm
	Balancing	Crankshaft to be balanced to 20gm cm (¼oz in) Unbalance to be corrected by drilling up to 4 holes in each balance weight 9,5 x 29mm max depth
	Diametrical clearance	0,041 to 0,084mm
	Crankpin:	
	Diameter	52,987 to 52,974mm
	Length	30,193 to 30,142mm
Connecting rods	Length between centres	175,285 to 175,185mm
	Big end bearing material	Vandervell VP2C
	Bore for big end bearing	56,731 mm
	Width of big end bearing	24,77 to 24,38mm (0.975 to 0.960in)
	Big end diametrical clearance	0,001 to 0,0027mm
	Big end side clearance	0,132 to 0,233mm
	Small end bush material	VP10
	Bore for small end bush	27,000 to 26,975mm
	Width of small end bush	25,3 to 25,5mm
	Fitted i.dia of small end bush	23,818 to 23,814mm
	Bore diameter of small end bush	23,48 to 23,38mm
Oil pressure	At idle Speed	30lb/in^2 (207 kN/m^2) minimum
	At 4000 rev/min	70lb/in^2 (483kN/m^2) minimum

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Pistons	Type	HG4 13(BS 1490-1970-LM13TF) (phosphorus modified)
	Diameter:	
	Grade	
	A	90,976 to 90,964mm
	B	90,991 to 90,979mm
	+0.010in	91,245 to 91,218mm
	+0.020in	91,499 to 91,472mm
Piston rings	No. of compression rings	2
	No. of oil control rings	1
	Top compression ring	
	Gap	0,4 to 0,65mm
	Width	1,490 to 1,495mm
	Diameter	91,00mm
	Depth of chrome	0,06mm
	Tangential load of 5.8N to 8.75N to close gap to	0,40 to 0,65mm
	Material	Steel
	Second compression ring:	
	Gap	0,4 to 0,65mm
	Width	1,499 to 1,522 mm
	Diameter	91,00mm
	Tangential load of 5.8N to 8.75N to close gap to	0.40 to 0,65mm
	Material	Cast Iron HG10
	Oil control ring	
	Gap	0,3 to 0,55mm
Gudgeon pins	Type	Chamfer locking type
	Length	68.50 to 68,37mm
	Outside diameter	23,812 to 23,807mm
	Inside diameter	14,81 to 14,30mm
	Permissible offset of centre web	1,0mm
	Material	EN32
Camshafts	Number of journals	7
	Journal diameter	26,950 to 29,937mm
	Diametrical clearance	0,063 to 0,037mm
	Material	Cast iron
	Nominal lift	9,0mm (0.360in)
Valves	Inlet valve material	EN52
	Exhaust valve material	Steel 21-4-N
	Inlet valve head diameter	35,43 to 35,17mm
	Exhaust valve head diameter	29,90mm
	Valve Stem diameter	
	Inlet and exhaust	7,879 to 7,866mm
	Valve lift	9,525mm
	Inlet valve clearance	0,030 to 0,036mm (0.012 to 0.014in)
	Exhaust valve clearance	0,030 to 0,036mm (0.012 to 0.014in)
	Valve stem seal	
	Material	Viton
	Internal diameter	7,90 to 7,85mm
Valve guides	Valve guide material	Brico alloy 2 or BS 152/12 (Brinell hardness 190 to 260)
	Guide length	48.51 mm (1,910in)
	Circlip material	18 SWG (0.048in) zinc coated

Valve guide identification	No groove-Standard	12,75 to 12,74mm (0.5020 to 0.5015in)
	1 groove-First oversize (Production)	12,80 to 12,79mm (0.5040 to 0.5035in)
	2 grooves-Second oversize (Service)	12,88 to 12,87mm (0.5070 to 0.5065in)
	3 grooves-Third oversize (Service)	13,00 to 12,99mm (0.5120 to 0.5115in)
Valve guide (service)	Bore to be concentric with the outside diameter of the guide within 0.001in i.e. total indicator reading of 0.002in	
Valve seats	Inlet valve seat outside diameter:	
	Standard	36,404 to 36,388mm
	Service	36,785 to 36,769mm
	Interference fit in cylinder head	0,077mm (0.003in)
	Exhaust valve seat outside diameter;	
	Standard	32,884 to 32,868mm
	Service	33,265 to 33,249mm
	Interference fit in cylinder head	0,077mm (0.003in)
	Valve seat angle (inclusive)	89°30′ to 89°00′
Tappets	Outer diameter of tappet	33,34 to 33,35mm (1.3125 to 1.3130in)
	Diametrical clearance of tappet	0,051 to 0,020mm (0.002 to 0.0008in)
Valve spring	Wire diameter	3,76mm (0.148in)
	Inside diameter	20,62 +/- 0,25mm (0.812 +/- 0.010in)
	Total No. of coils	6
	No. of working coils	3.75
	Helix	RH
	Rate	35,51N/mm (202.5lb/in)
	Natural frequency	603,4 Hz (36,203 c/min)
	Free length	40,13mm (1.580in)
	Material	OTEVA60
Camshaft sprocket	No of teeth	30
	Pitch of teeth	9,525mm (0.375in)
	Pitch circle diameter	91,135mm (3.588in)
	Internal surrations	131
	Pitch circle diameter	66,675mm (2.625in)
	Pitch of teeth	1,6mm (0.063in)
	o.dia of sprocket	95,25mm +/- 0.050mm (3.75in +/- 0.002in)
	Total width	18,6531 mm (0.734)
	Total width across both teeth	15,341 to 15,570mm (0.604 to 0.613in)
	Concentricity of teeth and sprocket not to exceed	0,076mm (0,003in)
Crankshaft sprocket	No. of teeth	21
	Pitch	9,525mm (0.375in)
	Pitch circle diameter	63,906mm (2.516in)
	Root diameter	57,556mm (2.266in)
	Roller diameter	6,35mm (0.25in)
	Measured over 6,35mm (0.25in) dia pins	70,008 to 69,95mm (2.759 to 2.754in)
	Tooth profile cut to	BS228
	Internal diameter	42,875 to 42,857mm
	Width across 1 tooth	5,33 to 5,10rnm
	Width across all the teeth	38,43 to 38,00mm
	Width across 2 teeth (timing chain)	15,57 to 15,34mm
Crankshaft damper oil seal spacer	Inside diameter	42,875 to 42,860mm (1.6880 to 1.6874in)
	Outside diameter	52,00 to 51,81mm (2.047 to 2.040in)
	Width	17,10 to 16,90mm
	All chamfers to be polished and free from burrs	

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Intermediate shaft bush	Inside diameter (when fitted)	22,010 to 21,964mm (0.8665 to 0.8647in)
	Outside diameter	25,083 to 25,057mm (0.9875 to 0.9865in)
	Width	17,25 to 16,25mm (0.679 to 0.659in)
	Press fit	0,036 to 0,083mm (0.0015 to 0.0033in)
	Shaft size	22mm (0.8645 to 0.8637in)
	Running clearance	0,071 to 0,005mm (0.0028 to 0.0002in)
	Material	Vandervell No L10083/3
Intermediate sprocket inner teeth	Number of teeth	28
	Pitch	9,525mm (0.375in)
	Pitch circle diameter	85,063mm (3.349in)
	Root diameter	78,70mm (3.009in)
	Roller diameter	6,35mm (0.25in)
	Measured over 6,35mm (0.25in) dia pins	91.41 to 91,29mm (3.599 to 3.594in)
	Tooth profile cut to	BS228
	Width across the depth	15,57 to 15,34mm (0.613 to 0.604in)
	Overall diameter	89,20 to 89,10mm (3.512 to 3.508in)
Intermediate sprocket outer teeth	Number of teeth	20
	Pitch	9,525mm (0.375in)
	Pitch circle diameter	60,884mm (2.397in)
	Root diameter	54,53mm (2.147in)
	Roller diameter	6,35mm (0.25in)
	Measured over 6,35mm (0.25in) dia pins	67,23 to 67,11mm (2.647 to 2.642in)
	Tooth profile cut to	85228
	Overall diameter	65.07 to 64,97mm (2.562 to 2.558in)
	Width across both teeth	15,57 to 15,34mm (0.613 to 0.604in)
	Total width of sprocket	48,80 to 48,70mm (1.921 to 1.917in)
Primary timing chain	Pitches	80
	Roller diameter	6,35mm (0.25in)
	Pitch	9,525mm (0.375in)
	Type	Endless duplex chain
Secondary timing chain	Pitches	86
	Roller diameter	6,35mm (0.25in)
	Pitch	9,525mm (0.375in)
	Type	Endless duplex chain
Oil pump chain	Pitches	52
	Roller diameter	6,35mm (0.25in)
	Pitch	9,525mm (0.375in)
	Type	Endless simplex chain
Dampers and tensioners	Backing material	Steel BS1449 CR4
	Damper material	Rubber
Hydraulic chain tensioner housing	Bore diameter	21,38 to 21,36mm (0.842 to 0.841in)
Hydraulic chain tensioner	Overall length	45mm (1.771in)
	Overall length to bottom of groove in piston	41mm (1.614in)
	Diameter	21,349 to 21.323mm (0.8405 to 0.8395in)
	Width of groove in piston	15mm (0.59in)
Non-return valve primary ball diameter		4,762mm (0.1875in)
	Ball free movement	0,74 to 0,45mm (0.290 to 0.018in)
Non return valve secondary ball diameter		4,762mm (0.1875in)
	Ball free movement	0,74 to 0,45mm (0.29 to 0.018in)

Oil pressure relief valve	Relief valve	
	o.dia	17,98 to 17,95mm (0.7079 to 0.7067in)
	i.dia	15,00 to 14,50mm (0.591 to 0.571in)
	Overall length	35mm (1.378in)
	Working length	30mm (1.181in)
	Bore depth	27mm (1.063in)
	Material	EN1A
	Cyanide harden depth	0,020 to 0,013mm (0.008 to 0.005in)
	Mandrel: Length	57mm (2.244in)
	Mandrel: Diameter	11,11mm (0.437in)
	Material	Steel tube to BS970 (CDS2 or ERW 1)
	Spring: Wall thickness	1,63 (0.064in, 16SWG) or 1,22 (0.048, 18SWG)
	Free length	106mm (4.173in)
	Outside diameter	16,34mm (0.643in)
	Wire diameter	2,34mm (0.092in, 13SWG)
	Mean diameter coils	14,0mm (0.551in)
	Total number of coils	26
	Number of active coils	24
	Helix of coil	Left
	Spring rate	4,49 N/mm (25.65lb/in)

	Length		Load		Stress	
	mm	inches	kg	lbs	N/mm^2	lb/in^2
Fitted	76,00	2.992	13.74	30.29	472	68.395
Valve opening	2,00	2.835	15,58	34.35	535	77.543
Max opening	62,00	2.441	20,15	44.43	692	100.304
Solid (ref)	60,80	2.392	20,71	45.66	711	103.083

Material BS970/735/A50(EN47) Spring steel wire. Ends to be close coiled and ground square to axis, feather edges to be removed to a minimum thickness of 0.5mm (0.020in).

Oil filter	Oil filter type	Full flow disposable canister
Canister specification	Maximum.working pressure	100lb/in^2
	Relief valve setting	13 to 16lb/in^2 (0.90 to 1,1kgf/cm^2)
	Canister to withstand	17,60kgf/cm^2 (250lb/in^2) pressure
	Element filtration area	3555cm^2 (55lb/in^2)
	Canister diameter	95,70mm (3.78in)
	Canister length	148,00 to 145,50mm (5.827 to 5.728in)
	Canister case material thickness	24 SWG
	Adaptor thread	1 in 12 UNF - 2B
Oil pump	Oil pump	Rotor type
	Outer rotor outside diameter	69,825 to 69,774mm (2.749 to 2.747in)
	Outer rotor width	27,975 to 27,962mm (1.1014 to 1.1009in)
	Inner rotor width	27,975 to 27,962mm (1.1014 to 1.1009in)
	Clearance outer rotor to body	0,1mm (0.010in)
	Oil pump body rotor bore	69,951 to 69,926mm (2.7539 to 2.7529in)
	End float	0,1mm (0.005in)
	2 horn clearance	0,2mm (0.010in)
	3 horn clearance	0,2mm (0.010in)

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ENGINE DATA
2.9 LITRE ENGINE

General data	Number of cylinders:	6
	Bore:	91mm
	Stroke:	74.8mm
	Cubic capacity:	2919cm^3
	Compression ratio:	
	High Compression	12.6: 1
	Standard Compression	11.17:1
	Firing Order	1,5,3,6,2,4 (No 1 cylinder at front)
Cylinder block	Material	Aluminium alloy
	Bore Diameter:	
	A grade	91,002-90,990mm (3.5828-3.5823in)
	B grade	91,018-91,005mm (3.5834-3.5829in)
Cylinder head	Material	Aluminium alloy
	Minimum head thickness	3.640in
	Standard thickness	3.650in
	(0.01Oin skim allowable, but valve seats should be set 0.01 Oin lower into cylinder head	
Crankshaft	Material	Cast Iron
	Number of main bearings:	7
	Main bearing type:	Vandervell VP2C
	Journal diameter:	76,230-76,218mm (3.0012-3.0007in)
	Journal length:	
	Front:	30,48mm (1.200in)
	Centre:	36,233-36,182mm (1.4265-1.4244in)
	Remainder:	30,53-30,43mm (1.202-1.198in)
	Thrust Washer material	Lead Indium Vandervell
	diameter	3,888-3,898mm
	thickness	2,57-2,62mm (0.101-0.103in)
	Permissible end float	0,10-0,25mm (0.004-0.010in)
	Width of main bearing	
	Front, inter and	24,33-24,71mm
	rear centre	30,10-30,48mm
	Balancing	Crankshaft to be balanced to 10gm cm (0.35 oz in)
	Diametrical clearance	0,041-0,084mm
	Crankpins diameter	52,987-52,974mm (2.0861-2.0856in)
	Crankpins length	30,193-30,142mm (1.1887-1,1867in)
Connecting rods	Length between centres	175,285-175,185mm (6.901-6.897in)
	Big end bearing material	Vandervell VP2C
	Bore of big end bearing	56,72-56,73mm
	Width of big end bearing	24,38-24,77mm
	Big end diametrical clearance	0,025-0,050mm
	Big end side clearance	0,132-0233mm
	Small end bush material	VP 10
	Bore of small end bush	26,975-27,000mm
	Width of small end bush	29,50-30,00mm
	Bore diameter of small end bush	23,814-23.81 8mm (machined)
Oil pressure	At idle Speed	30lb/in^2 (207 kN/m^2) minimum
	At 4000 rev/min	70lb/in^2 (483 kN/m^2) minimum

Pistons	Material type	HG 413 Phosphorus treated
	Diameter Grade **A**	90,964-90,976mm
	Grade B	90,979-90,997mm
	Maximum rebore	0,50mm or 0,020in
	Skirt clearance: (measured midway down bottom of piston skirt)	0,018-0,042mm
Piston rings	No. **of** cornpression rings:	2
	No. of oil control rings:	1
	Top compression ring width	1,475-1,490mm
	diameter	91,00mm
	ring gap	0,40-0,65mm
	material	Cast Iron HG 22C
	depth of chrome	0,06mm
	Second compression ring width	1,975-1,990mm
	diameter	91,00mm
	ring gap	0,40-0,65mm
	material	Cast iron HG 10
	Rings to be assembled with ring gap tangentially opposite spring gap.	
	Oil control ring width	2,975-2,980mm
	diameter	91,00mm
	ring gap	0,30-0,60mm
	material	Cast iron **HG** 10/12
Gudgeon pins	Type:	**Full** floating - chamber locking
	Length:	77,12-77,25mm
	Outside diameter	23,807-23,812mm
	Inside diameter	14,30-14,81mm
	Gudgeon pin offset in piston	1,524mm (0.060in) to thrust side
	Material	EN32
	Permissable offset **of** centre web	1,0mm (0.039in)
Camshaft	No. of journals	7
	Journal diameter	26,96-26,97mm
	Diametrical clearance	0,03-0,07mm
	Material	Cast iron
Valves	Inlet valve material	Steel EN52
	Exhaust valve material	Steel 21-4N Sodium filled 50-60% of total volume
	Inlet valve head diameter	41,40-41,15mm
	Exhaust head diameter	34,67-34,42mm
	Valve stem diameter - inlet	6,27-6,17mm
	exhaust	6,30-6,10mm
	Valve lift	9,5-0,375mm
	Inlet valve clearance	0.012-0.014in
	Exhaust valve clearance	0.012-0.014in
	Valve stem seals (inlet valves only)	
	Material	Viton
	Internal diameter	7,85-7,9mm
Valve springs	Valve spring wire diameter	
	Inner spring	12 SWG (0.104in)
	Outer spring	10 SWG (0.128in)
	Inside diameter	0.636in inner, 0.872in outer
	Total No. of coils	6 inner, 5 outer
	Free length	1.734in inner, 2.103in outer
	Spring rate	69.3lbs/in Def inner, 77.4lbs/in Def outer
	Helix	Right hand

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Valve guides	Valve guide material:	Brico Alloy 2 or BS/452/12 (exhaust)
	Guide length:	Inlet 48.51 mm (1.91 Oin), Exhaust 43.81 5mm (1.725in)
	Outside diameter. No groove (standard)	12,75-12,74mm (0.502-0.5035in)
	one groove (1st oversize)	12.80-12,78mm (0.504-0.5035in)
	two grooves (2nd oversize)	12.85-12,88mm (0.506-0.507in)
	three grooves (3rd oversize)	12,98-13,00mm (0.511-0.512in)
Valve seats	Inlet valve seat outside diameter	42,53-42,55mm (1.6748-1.6753in)
	Exhaust valve seat outside diameter	37,80-37,81mm (1.4882-1.4887in)
	Valve seat material	Sintered iron
	Valve seat angle	44.50
	Valve face angle	45°
Tappets	Outside diameter	34,87-34,90mm (1.373-1.374in)
	Diametrical clearance of tappet in guide	0,02-0,04mm (0.001-0.002in)
Timing chains and sprockets	Type	Duplex
	Pitch	9,525mm (0.375in)
	No. of Pitches - Lower Chain	80
	No. of Pitches - Upper Chain	70
Oil pump chain	Type	Simplex
	Pitch	9,525mm (0.375in)
	Number of pitches	52
Camshaft sprocket	No. of teeth	21
Oil pump sprocket	No. of teeth	33
Intermediate sprocket	No. of teeth inner	28
	No. of teeth outer	22
Camshaft sprocket	No. of teeth	33
Auxiliary shaft sprocket	No. of teeth	21
Oil pressure relief valve	Relief valve	
	o.dia	17,98 to 17,95mm (0.7079 to 0.7067in)
	i.dia	15,00 to 14,50mm (0.591 to 0.571in)
	Overall length	35mm (1.378in)
	Working length	30mm (1.181in)
	Bore depth	27mm (1.063in)
	Material	EN1A
	Cyanide harden	0,020 to 0,013mm (0.008 to 0.005in) deep
	Mandrel length	57mm (2.244in)
	diameter	11,11mm (0.437in)
	Material	Steel tube to BS970 (CDS2 or ERW1)
	Spring: Wall thickness	1,63 (0.064in, 16SWG) or 1,22 (0.048, 18SWG)
	Free length	106mm (4.173in)
	Outside diameter	16,34mm (0.643in)
	Wire diameter	2,34mm (0.092in) 13SWG
	Mean diameter coils	14,0mm (0.551in)
	Total number of coils	26
	Number of active coils	24
	Helix of coil	Left
	Spring rate	4,49 N/mm (25.65 lb/in)

Oil pressure relief valve (spring, continued)

	Length		Load		Stress	
	mm	inches	kg	lbs	N/mm^2	lb/in^2
Fitted	76,00	2.992	13,74	30.29	472	68.395
Valve opening	72,00	2.835	15,58	34.35	535	77.543
Max opening	62,00	2.441	20,15	44.43	692	100.304
Solid (ref)	60,80	2.392	20,71	45.66	711	103.083

Material BS970/735/A50(EN47) Spring steel wire. Ends to be close coiled and ground square to axis, feather edges to be removed to a minimum thickness of 0.5mm (0.020in).

Oil filter	Type	Full flow disposable canister
Canister specification	Maximum working pressure	100lb/in^2
	Relief valve setting	13 to 16lb/in^2 (0.90 to 1,1kgf/cm^2)
	Canister to withstand	17,60kgf/cm^2 (250lb/in^2 pressure)
	Element filtration area	3555cm^2 (551lb/in^2)
	Canister diameter	95,70mm (3.78in)
	Canister length	148,00 to 145,50mm (5.827 to 5.728in)
	Canister case material thickness	24 SWG
	Adaptor thread	1 in 12 UNF - 2B
	Torque: Oil filter canister	8.1Nm or ⅜ to ½ turn after initial contact
Oil pump	Make/type	Hobourne Eaton Rotor type
	Outer rotor outside diameter	69,825 to 69,774mm (2.749 to 2.747in)
	Outer rotor width	27,975 to 27,962mm (1.1014 to 1.1009in)
	Inner rotor width	27,975 to 27,962mm (1.1014 to 1.1009in)
	Clearance outer rotor to body	0,2mm (0.008in)
	Material	Cast iron grade 12
	Oil pump body rotor bore	69,951 to 69,926mm (2.7539 to 2.7529in)
	End float	0,1mm (0.004in)
	2 horn clearance	0,2mm (0.008in)
	3 horn clearance	0,2mm (0.008in)

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TORQUE FIGURE ILLUSTRATIONS

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Note: All figures shown in this section are in Newton Metres. **Conversion charts** to **Pounds** Force Feet start on Page 06-31.

0010N

ENGINE

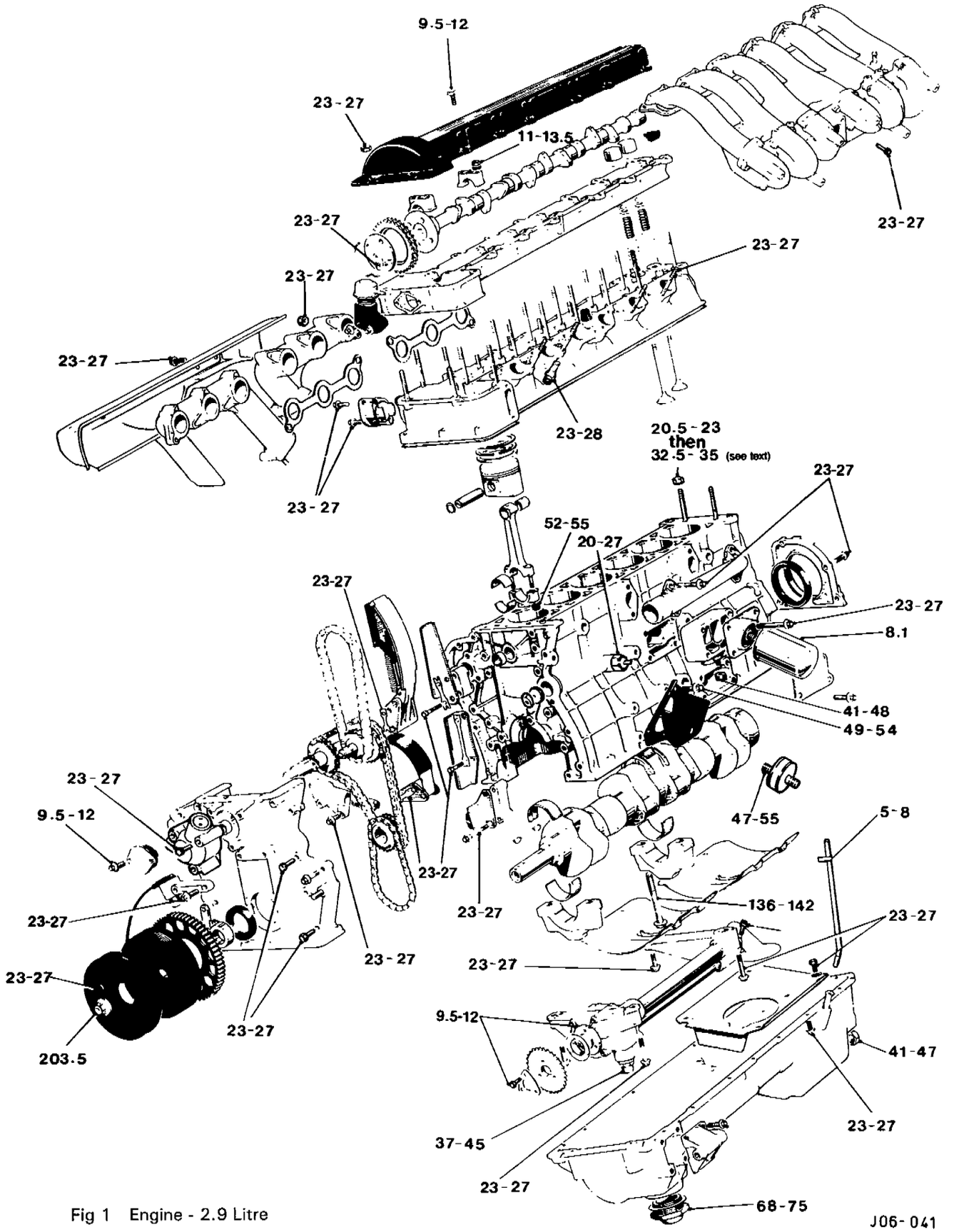


Fig 1 Engine - 2.9 Litre

J06-041

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ENGINE

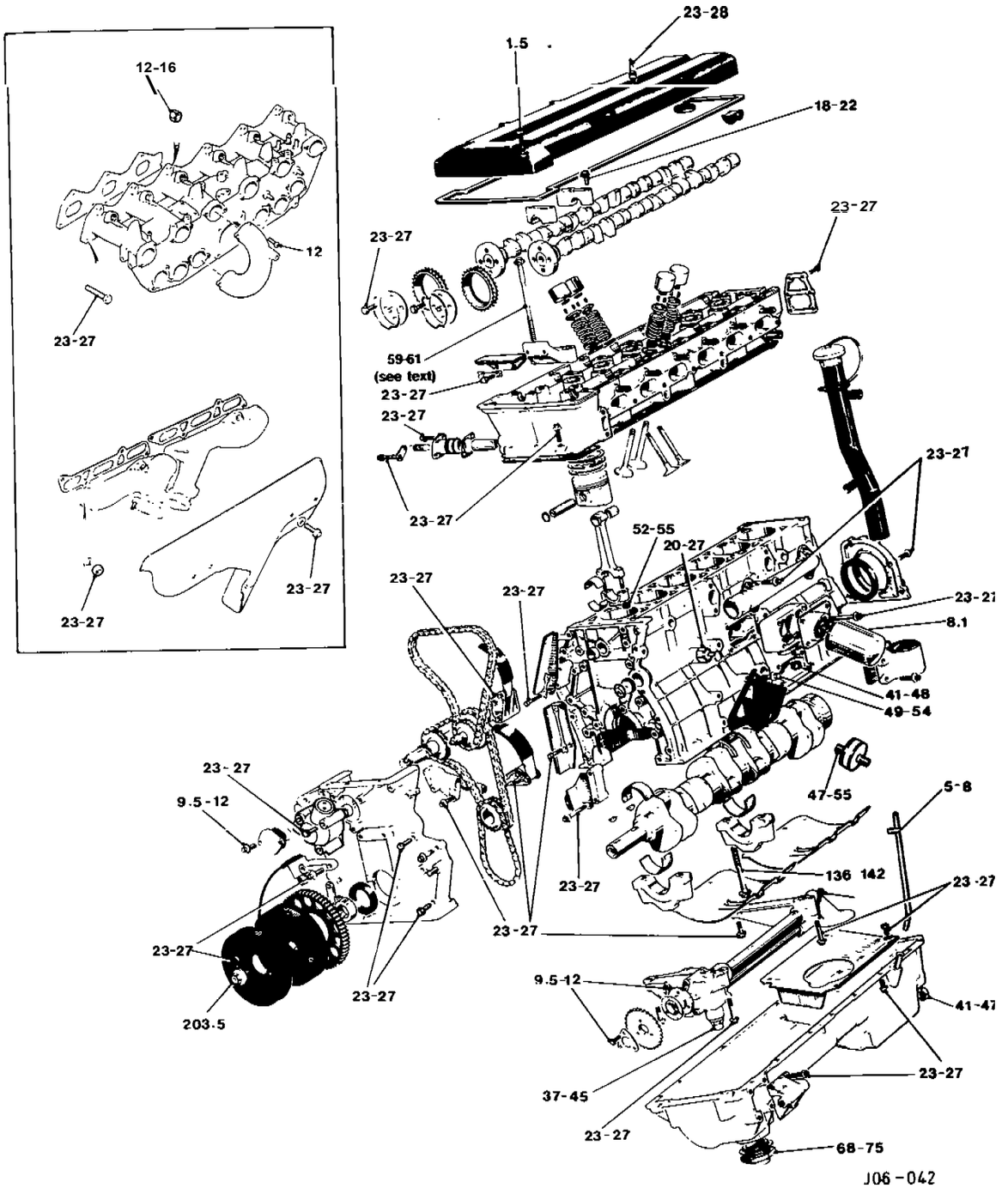


Fig 2 Engine - **3.2 Litre and 4.0** Litre

FUEL SYSTEM

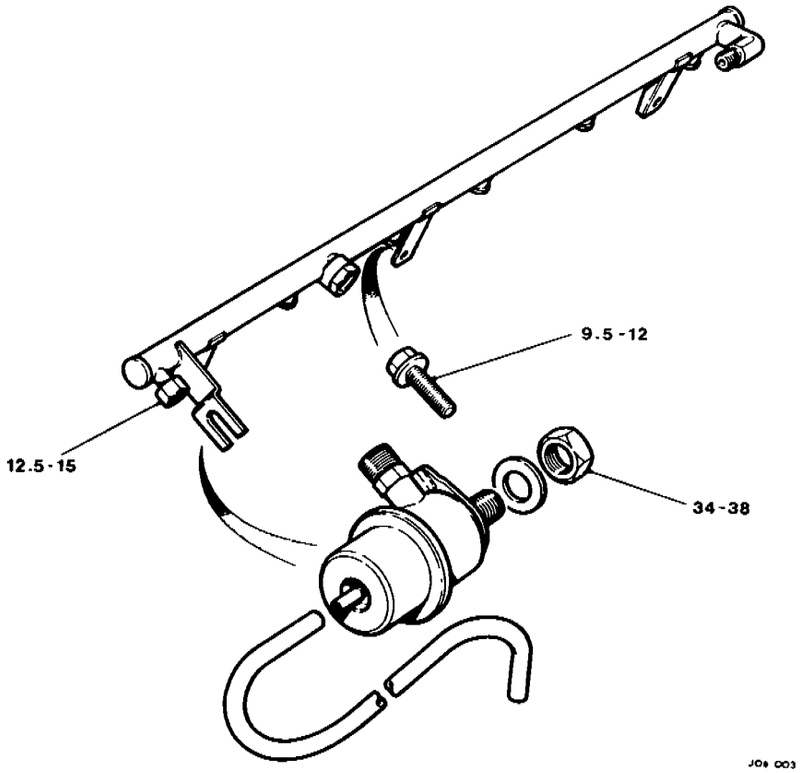


Fig. 1 Regulator and Rail - 2.9 Litre

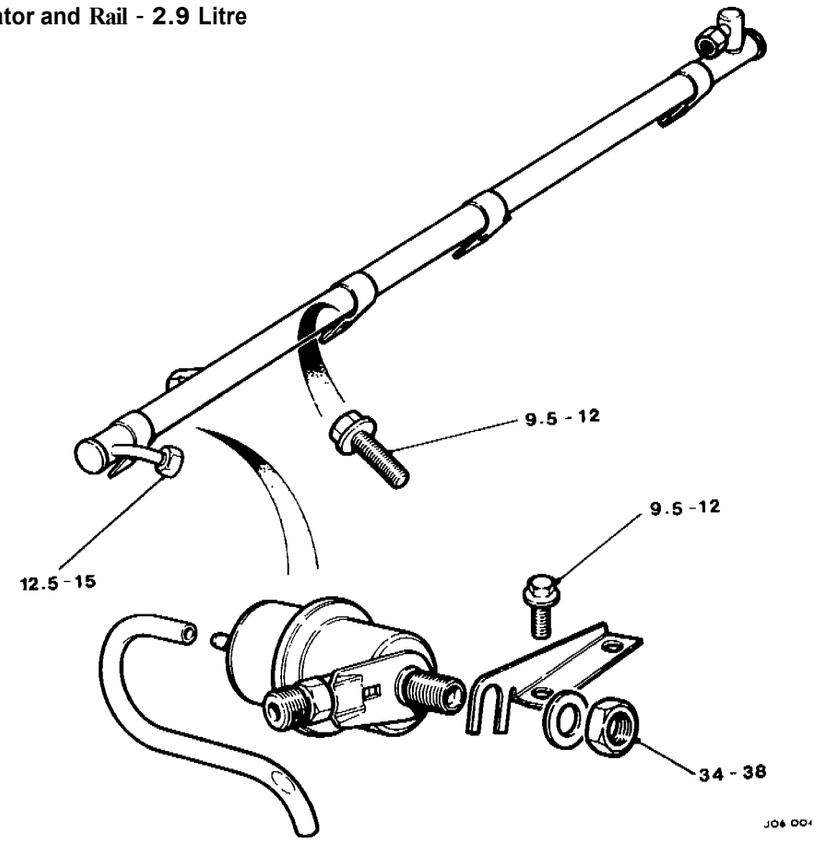


Fig. 2 Regulator and Rail - 3.2 Litre and 4.0 Litre

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FUEL SYSTEM

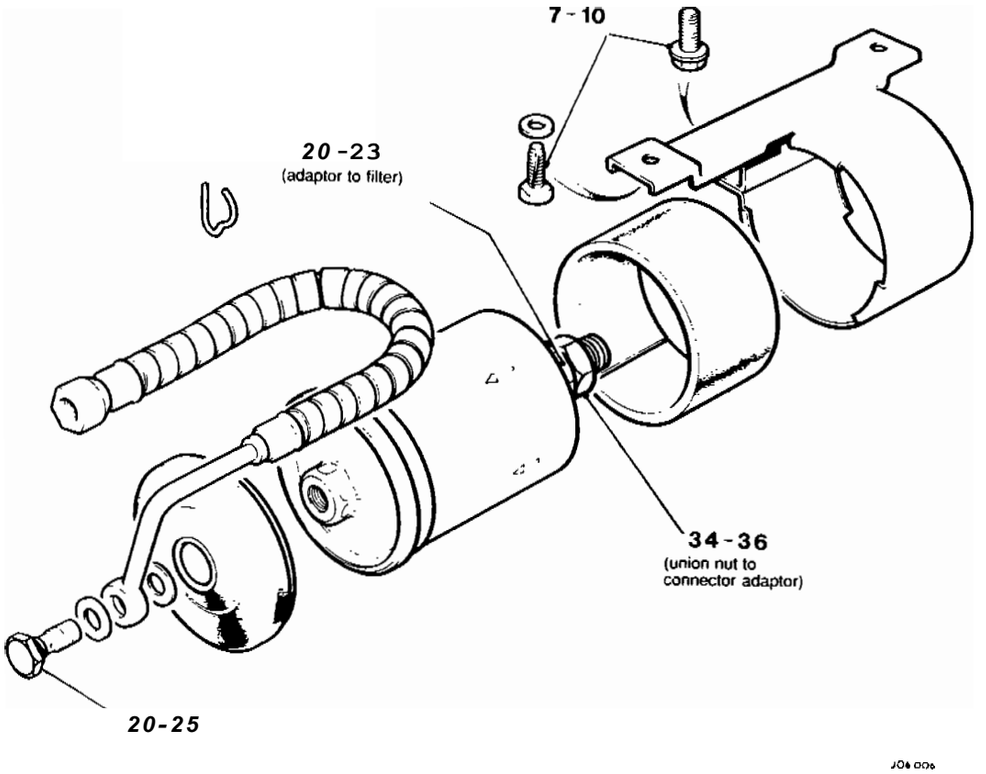


Fig. 3 Fuel **Filter** (90MY)

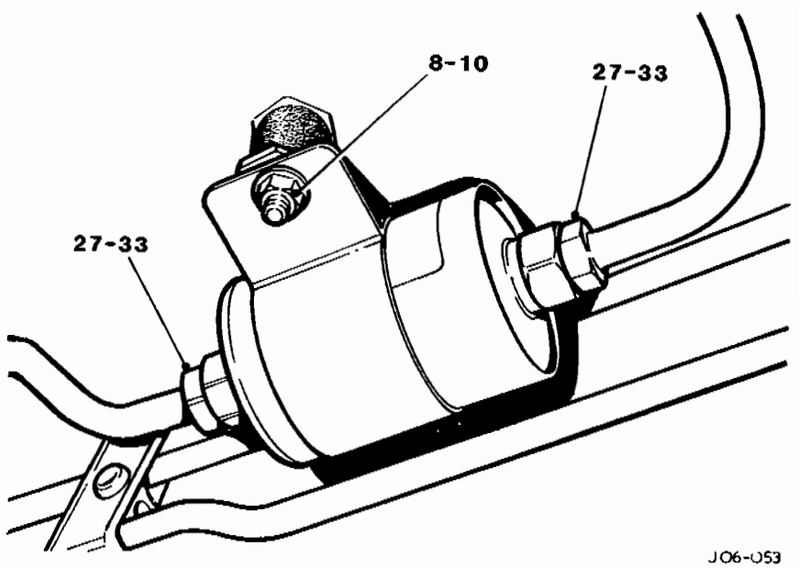


Fig. 4 Fuel **filter** (91MY)

FUEL SYSTEM

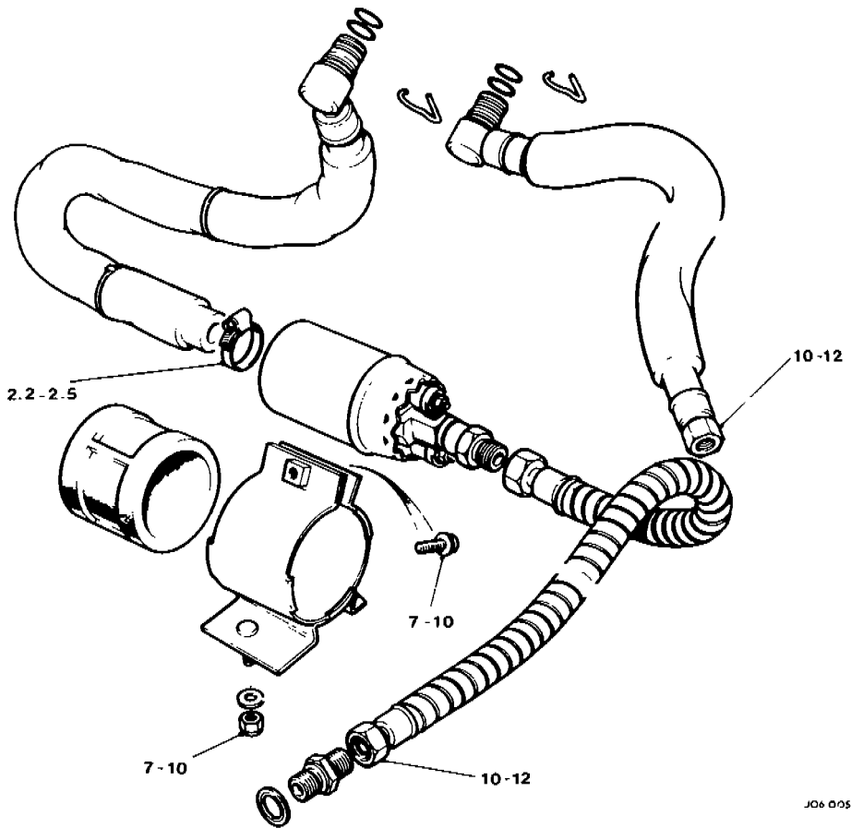


Fig. 4 Fuel Pump and Lines (90MY)

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COOLING SYSTEM

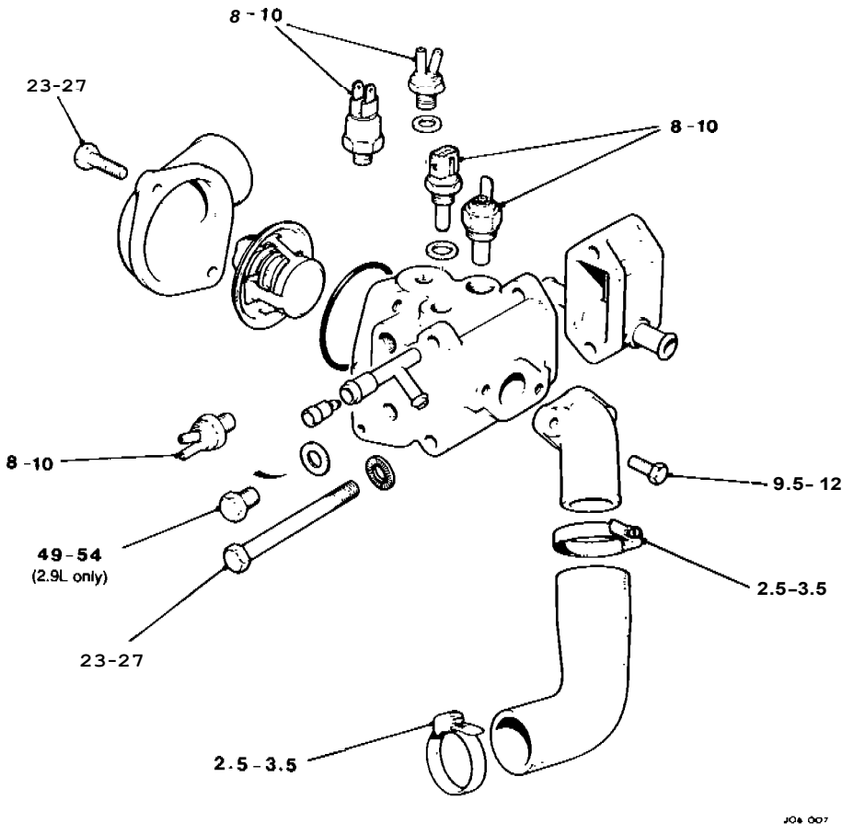


Fig. 1 **Thermostat Housing**

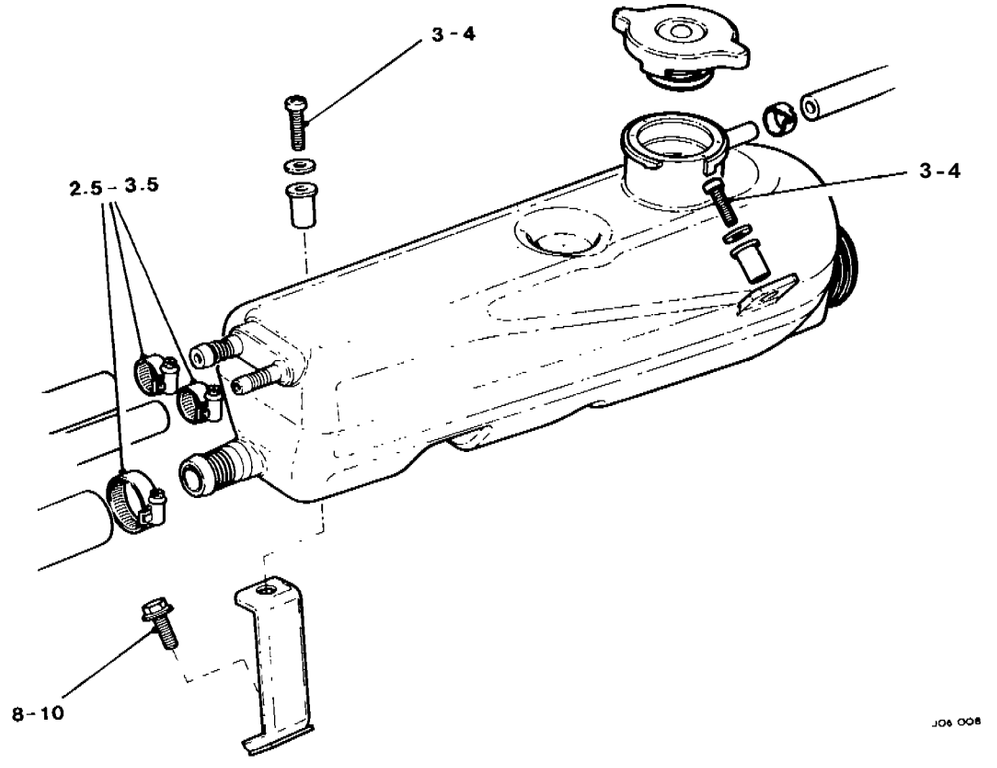


Fig. **2** **Coolant Expansion Tank**

COOLING SYSTEM

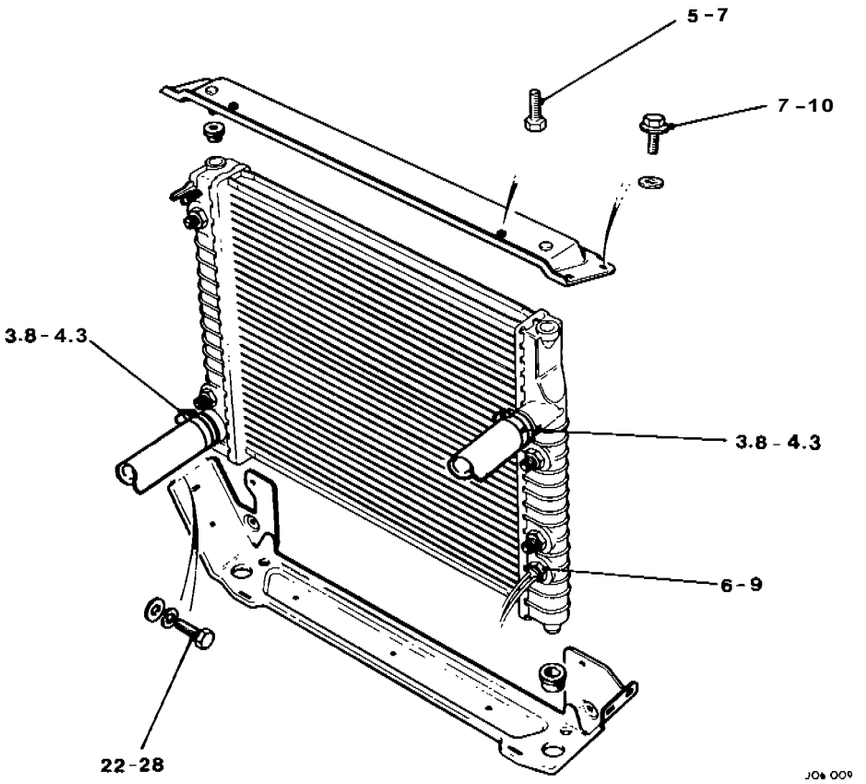


Fig. 3 Radiator

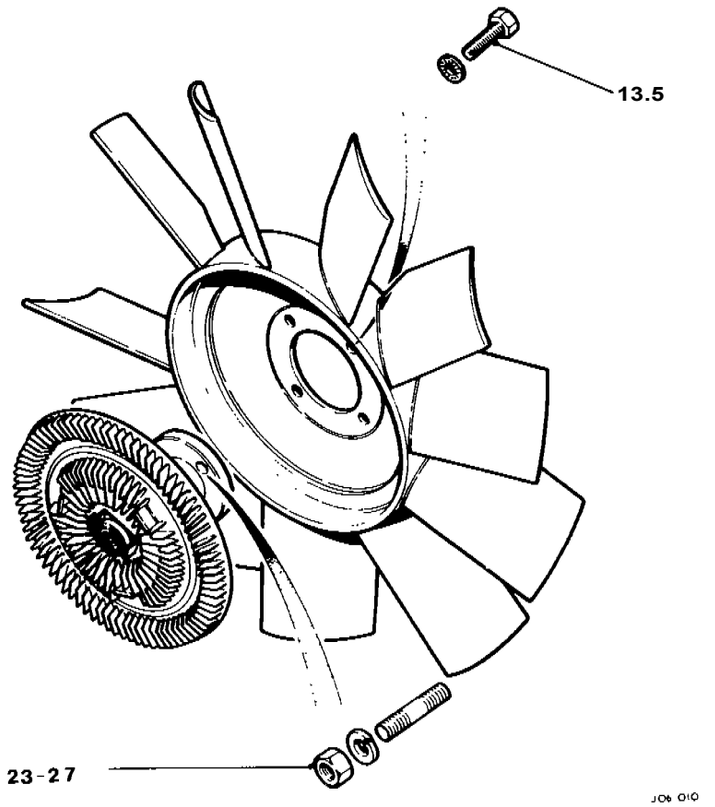


Fig. 4 Cooling Fan

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EXHAUST SYSTEM (2.9L)

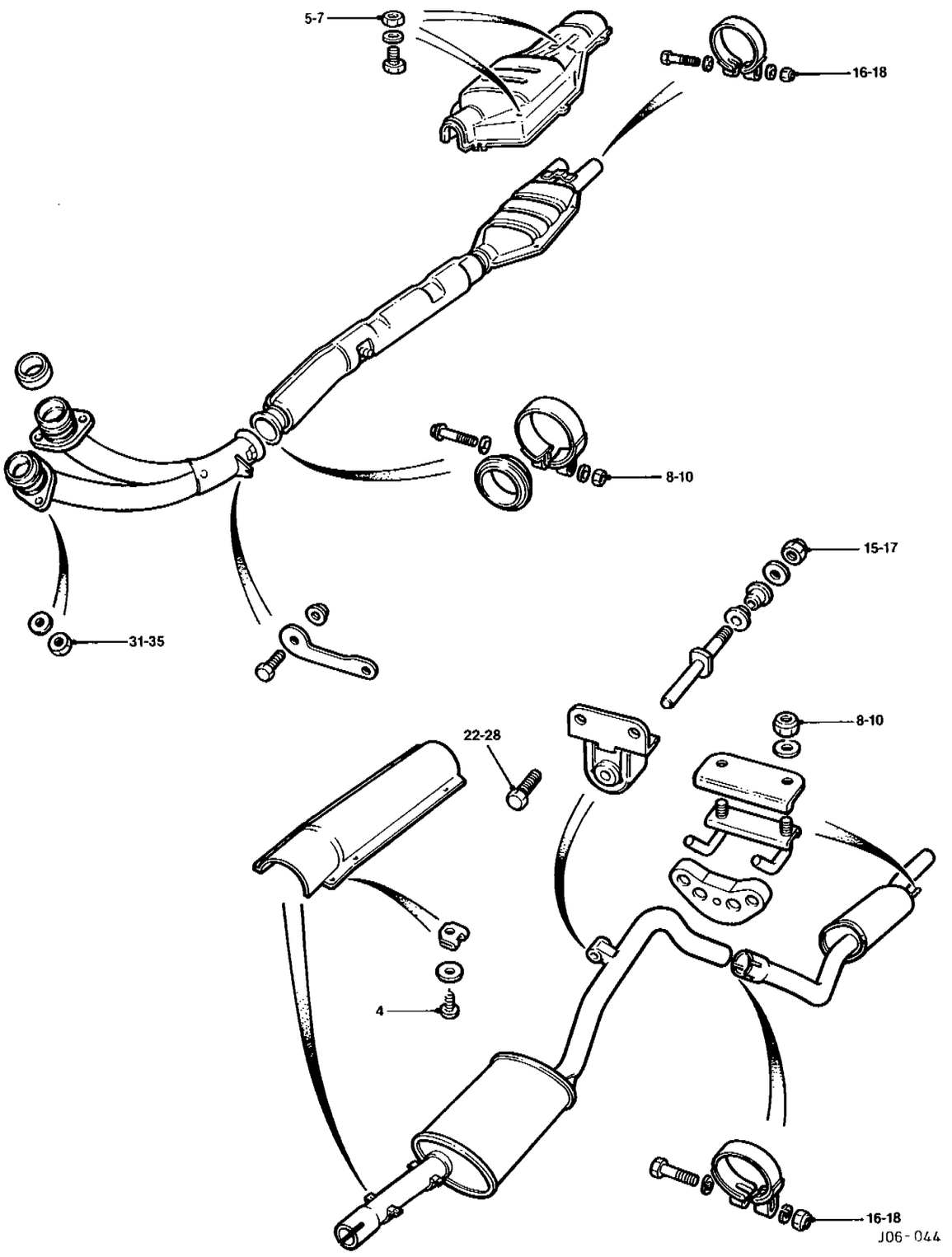


Fig. 1 Exhaust System

EXHAUST SYSTEM (3.2L and 4.0L)

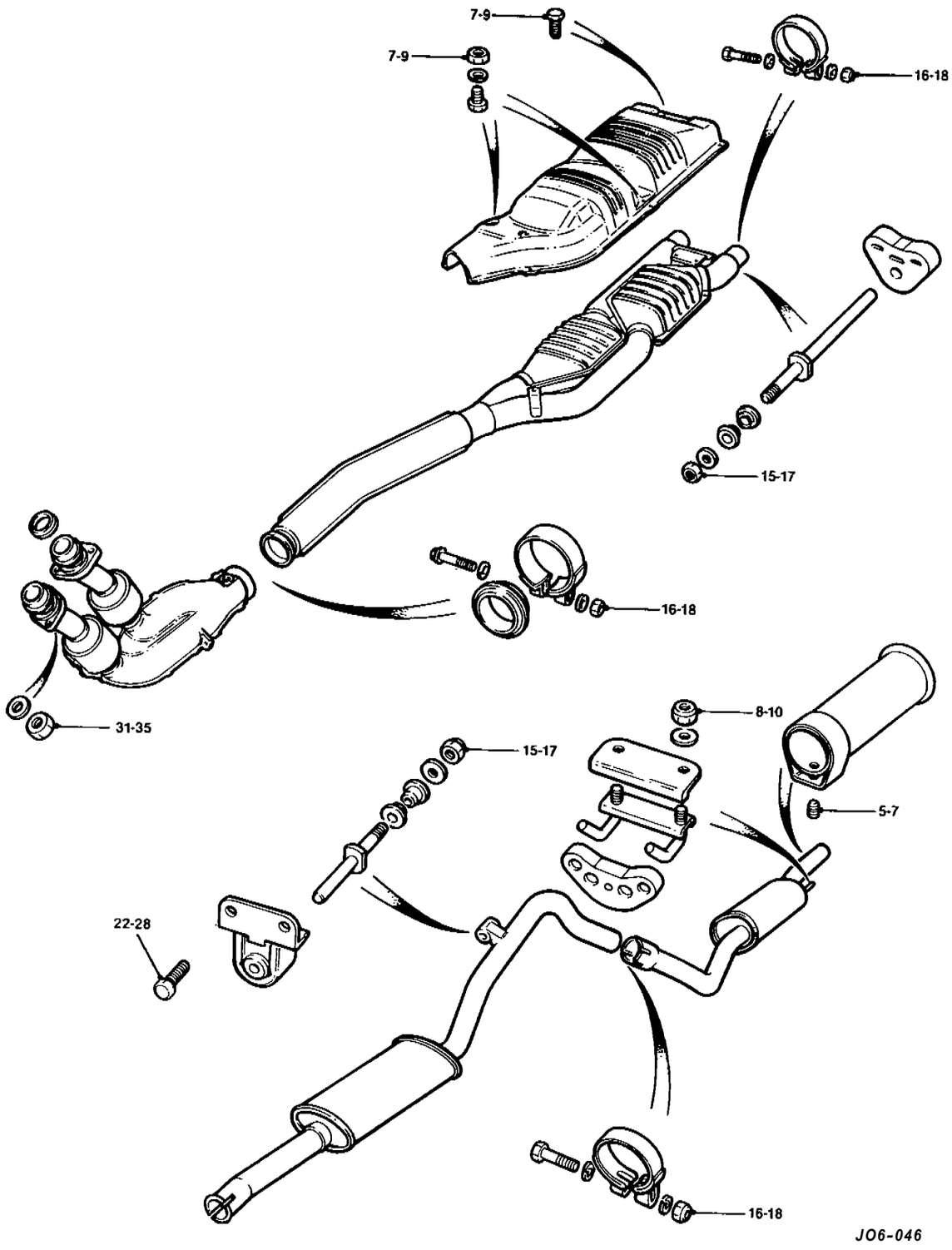


Fig. 1 Exhaust System (Catalyst Type)

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EXHAUST SYSTEM (4.0L)

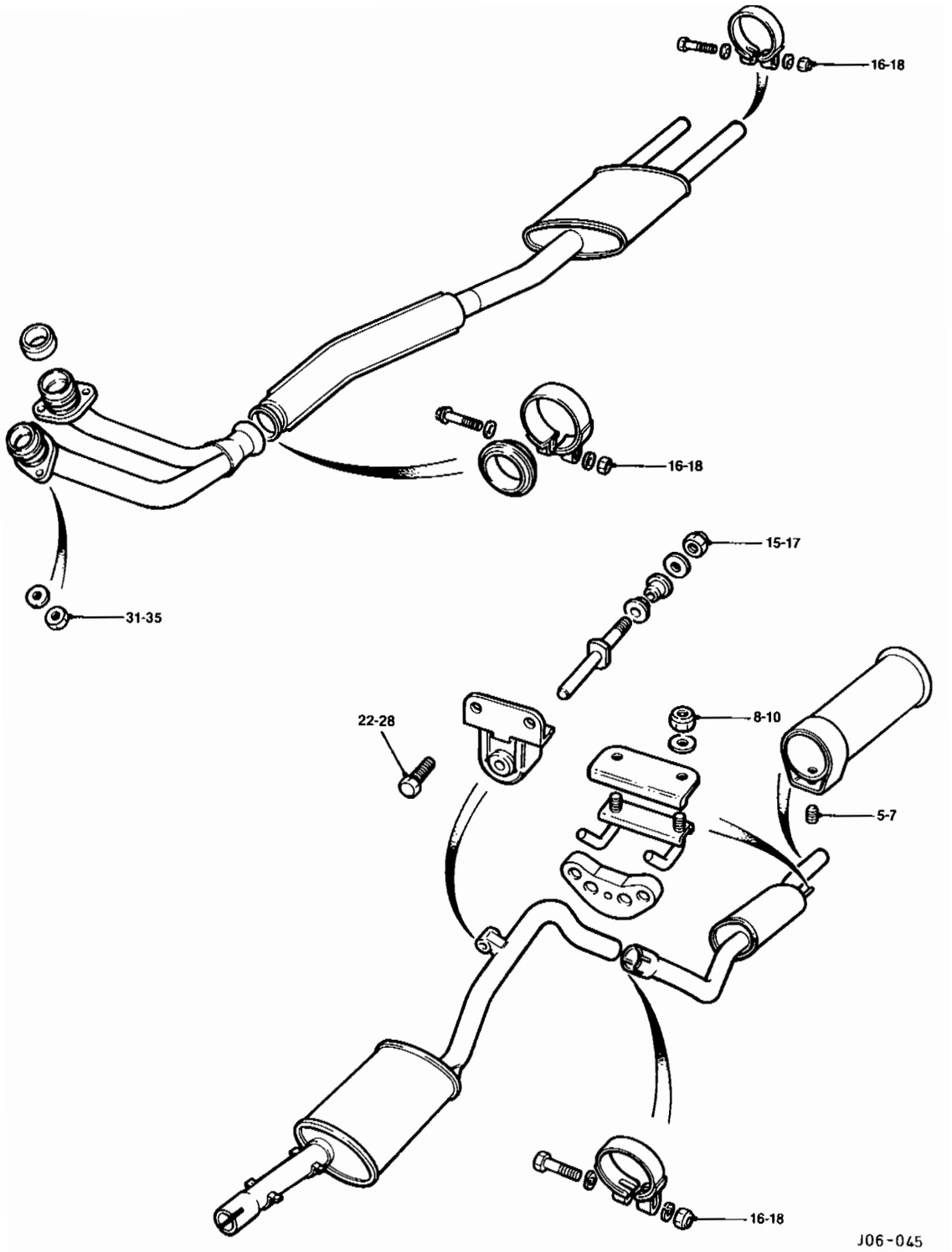


Fig. 1 **Exhaust System** (Non-Catalyst **Type**)

CLUTCH AND MANUAL GEARBOX

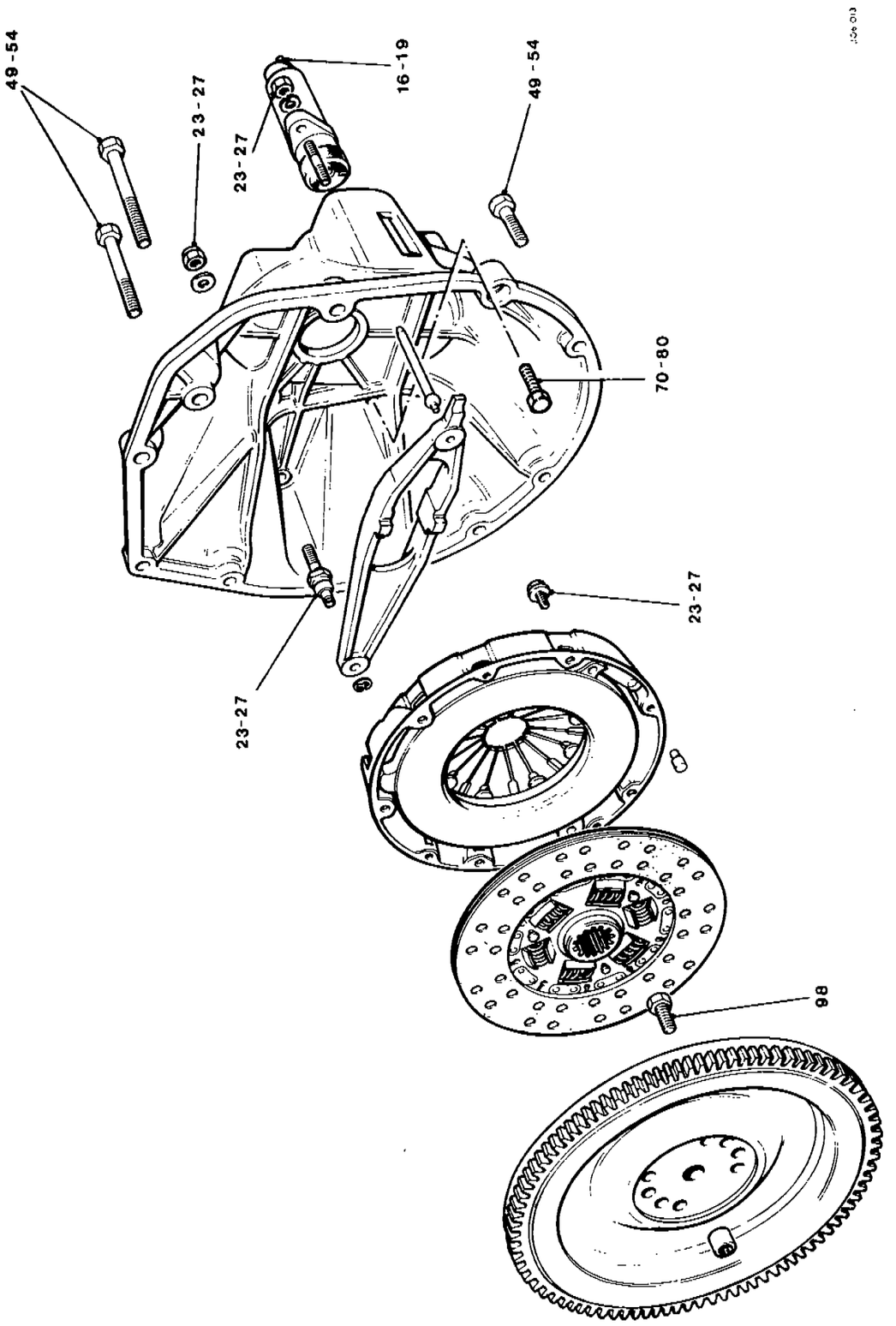


Fig 1 Manual **Gearbox** Bellhousing and Clutch

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CLUTCH AND MANUAL GEAR BOX

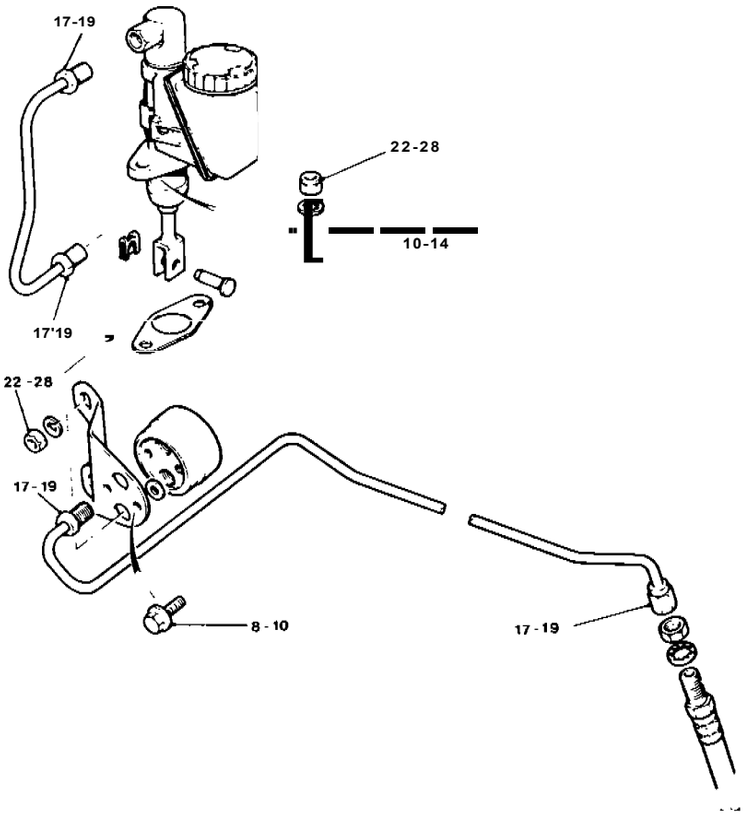


Fig. 2 **Clutch Master Cylinder**

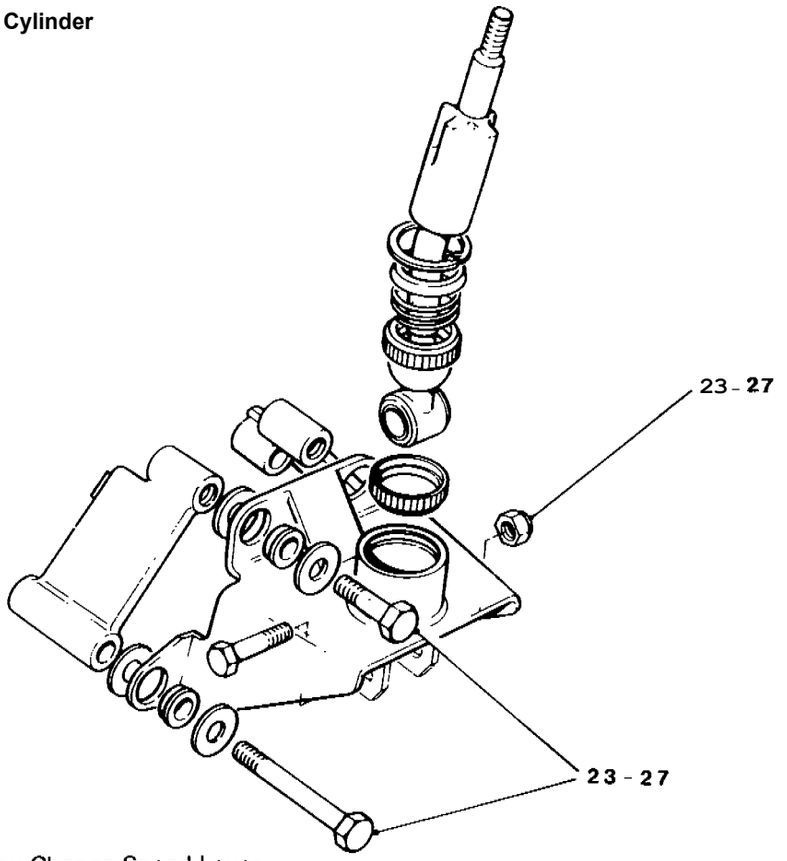


Fig. 3 Manual Gearbox Change Speed Lever

J06 016

CLUTCH AND MANUAL GEAR BOX

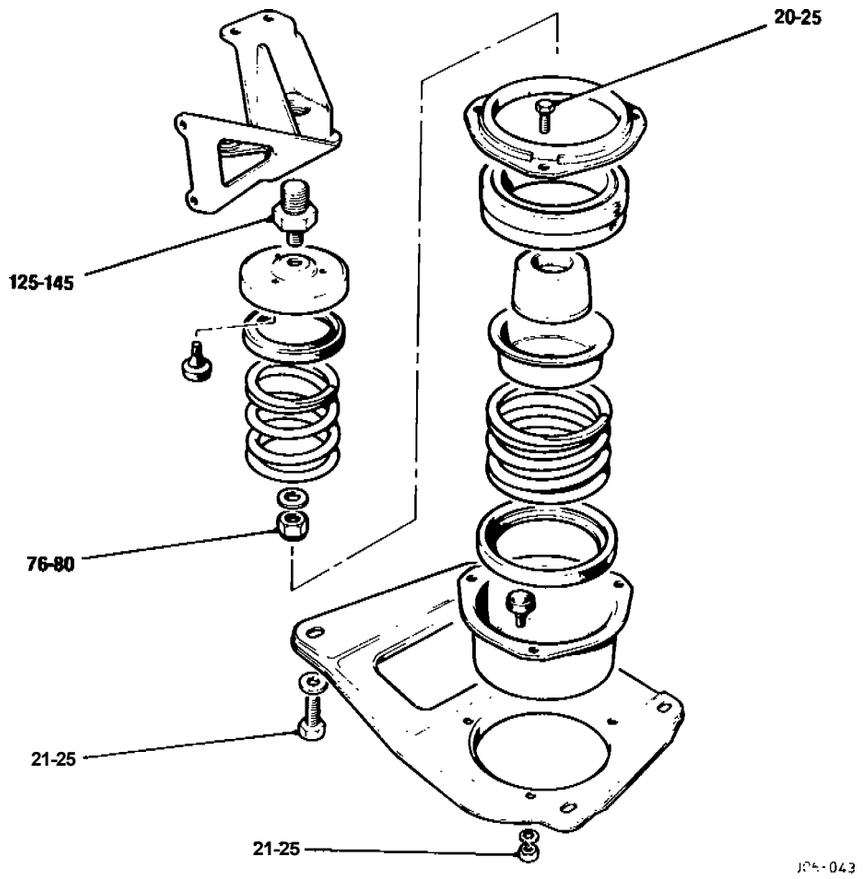


Fig. 4 Gearbox (Engine Rear) Mounting (Manual)

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AUTOMATIC TRANSMISSION

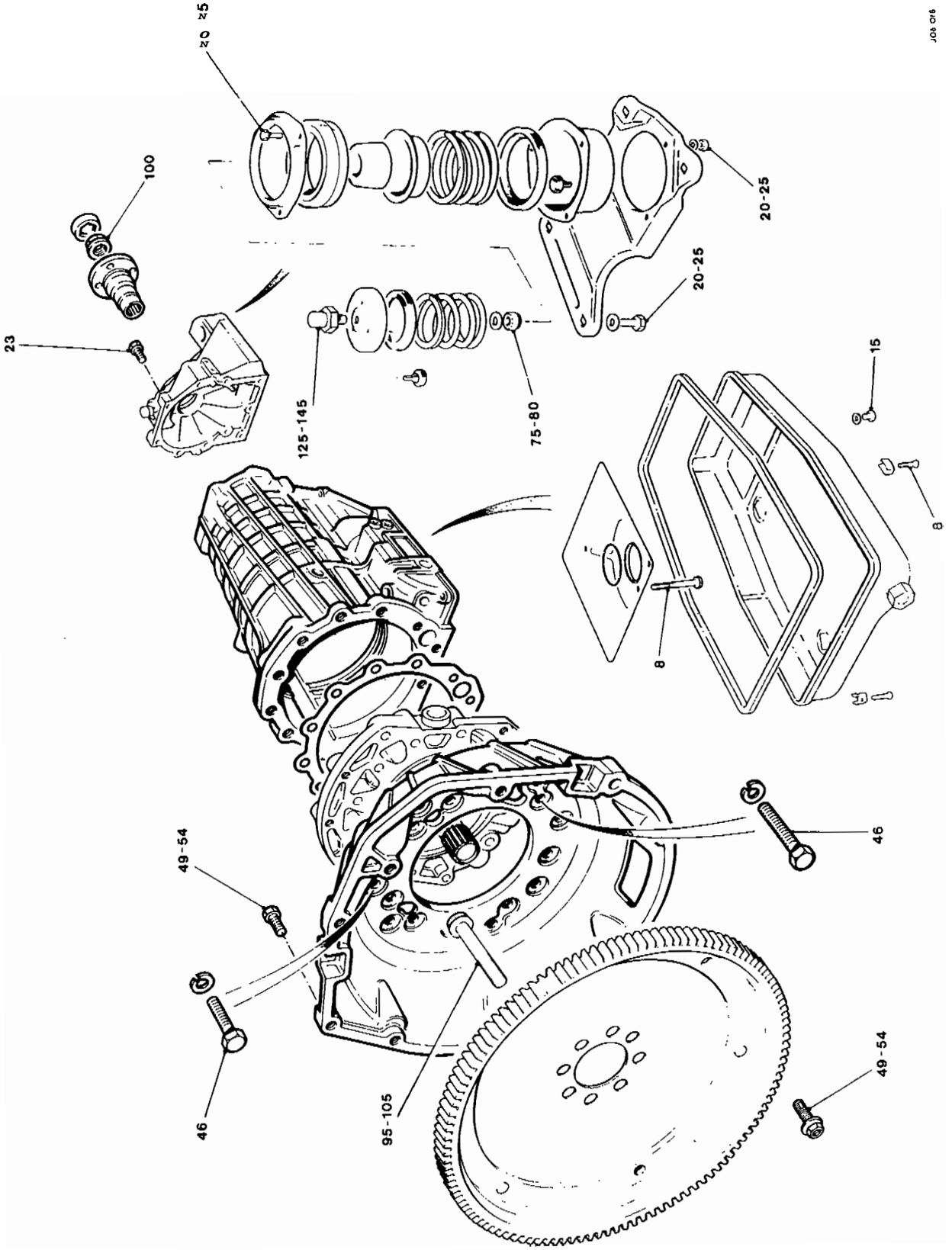


Fig 1 Automatic Transmission

AUTOMATIC TRANSMISSION

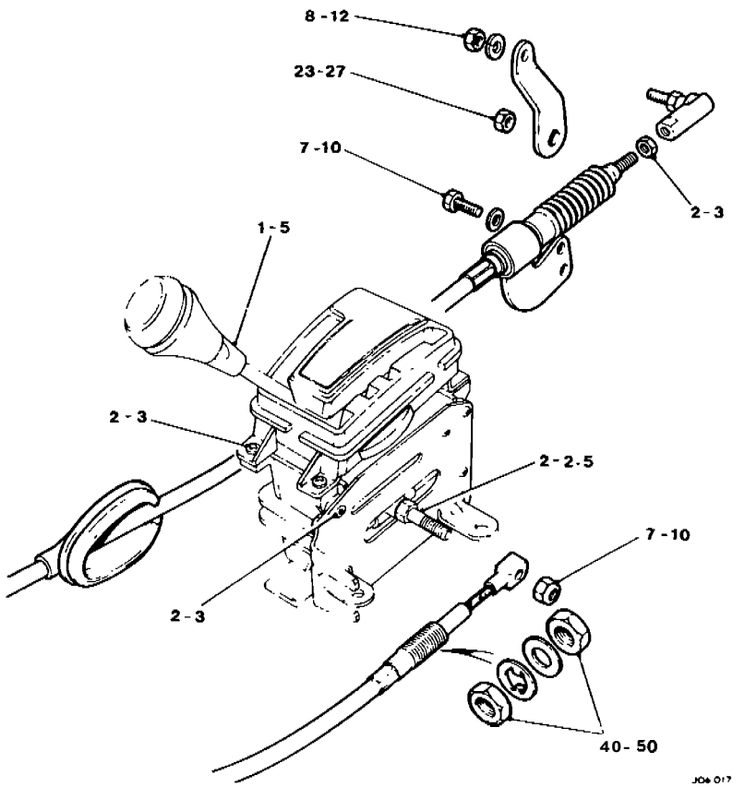


Fig. 2 Automatic Transmission Control Lever and Cable

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PROPELLOR SHAFT AND FINAL DRIVE

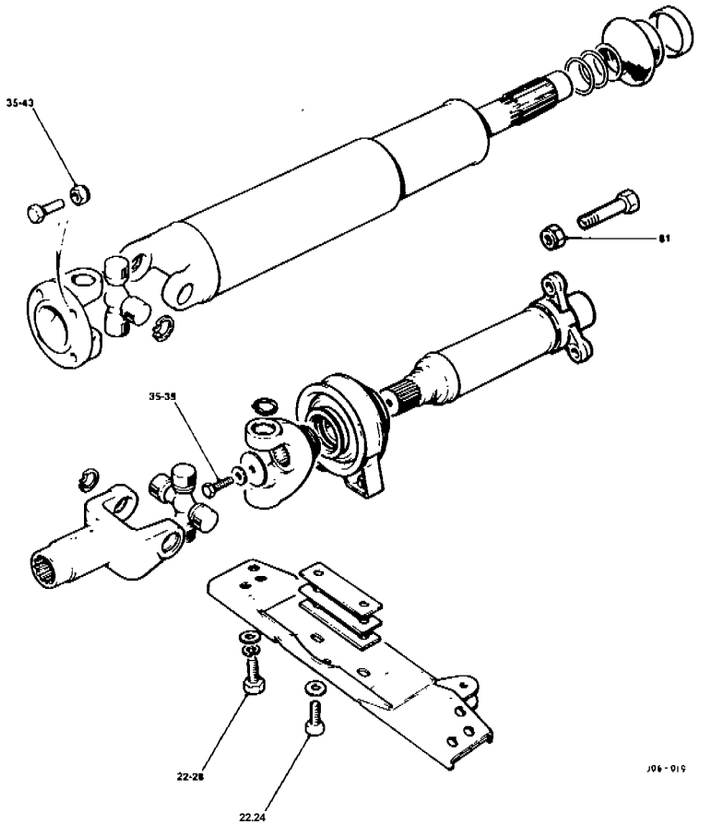


Fig. 1 Propellor **Shaft**

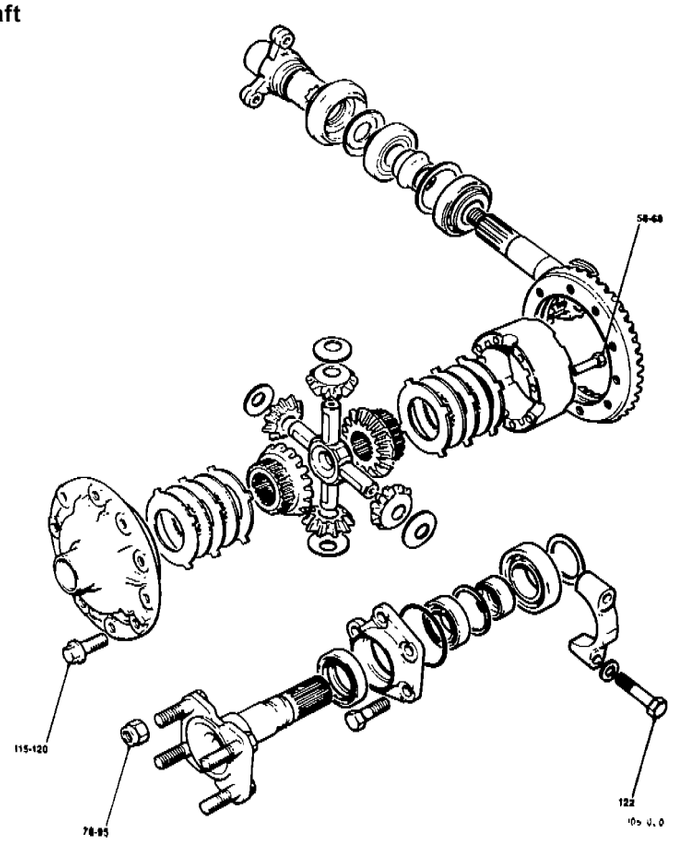


Fig. 2 Differential Unit

STEERING

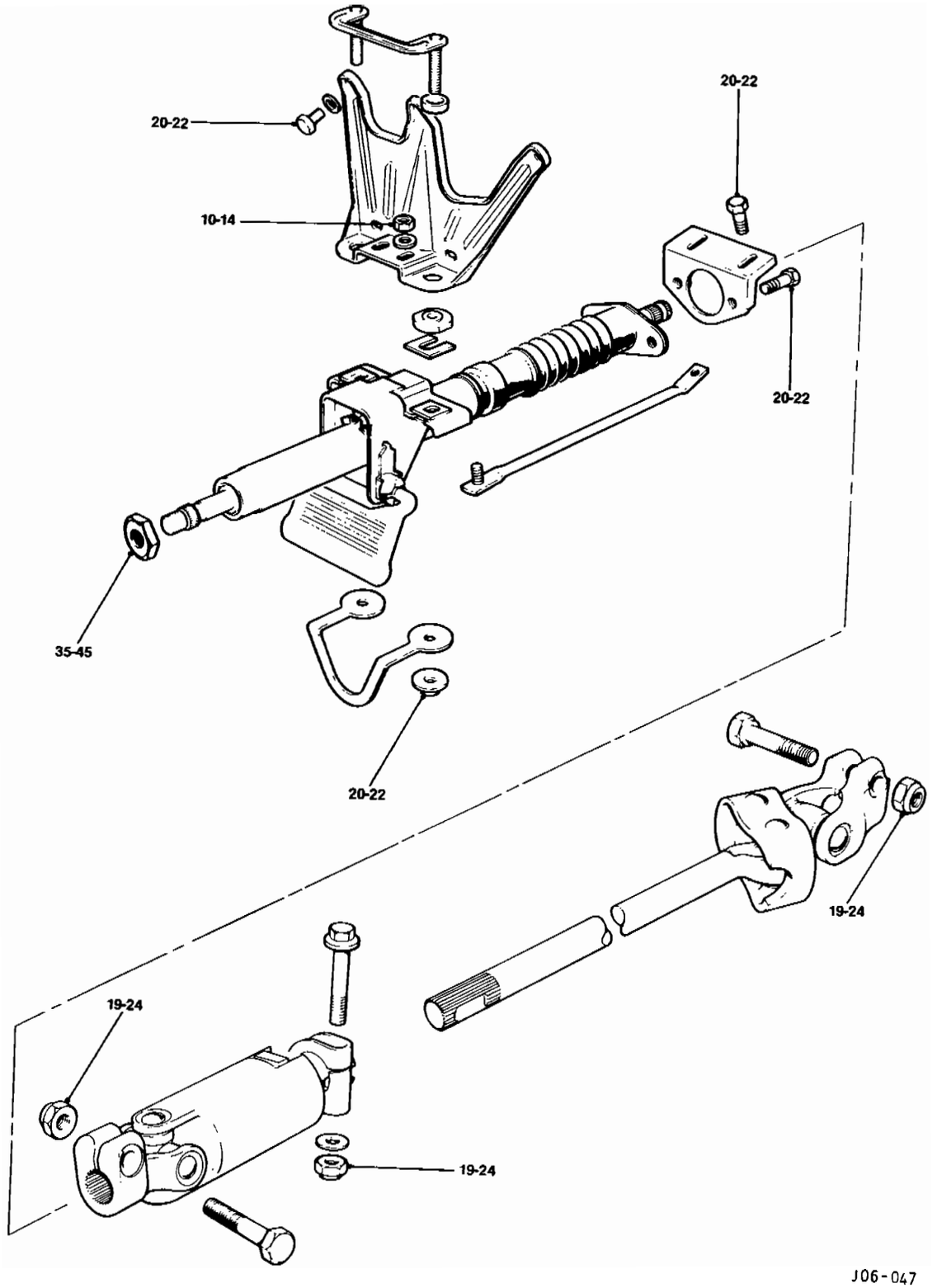


Fig 1 **Steering** Column

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STEERING

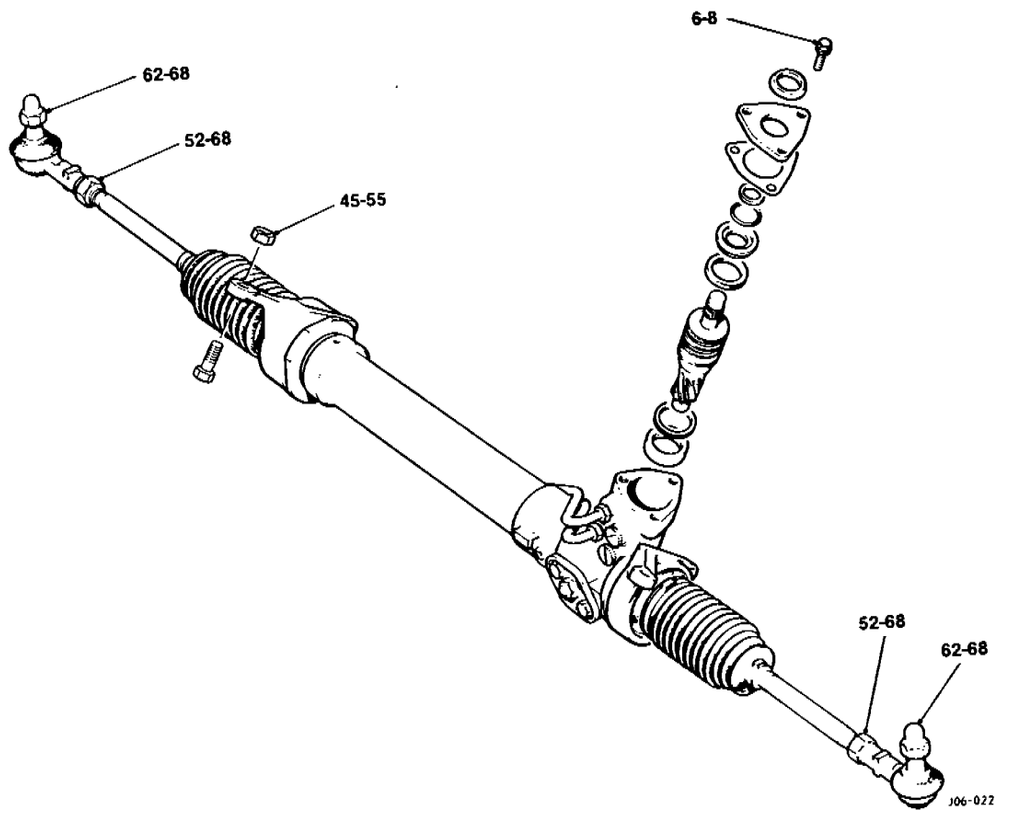


Fig. 2 **Steering Rack**

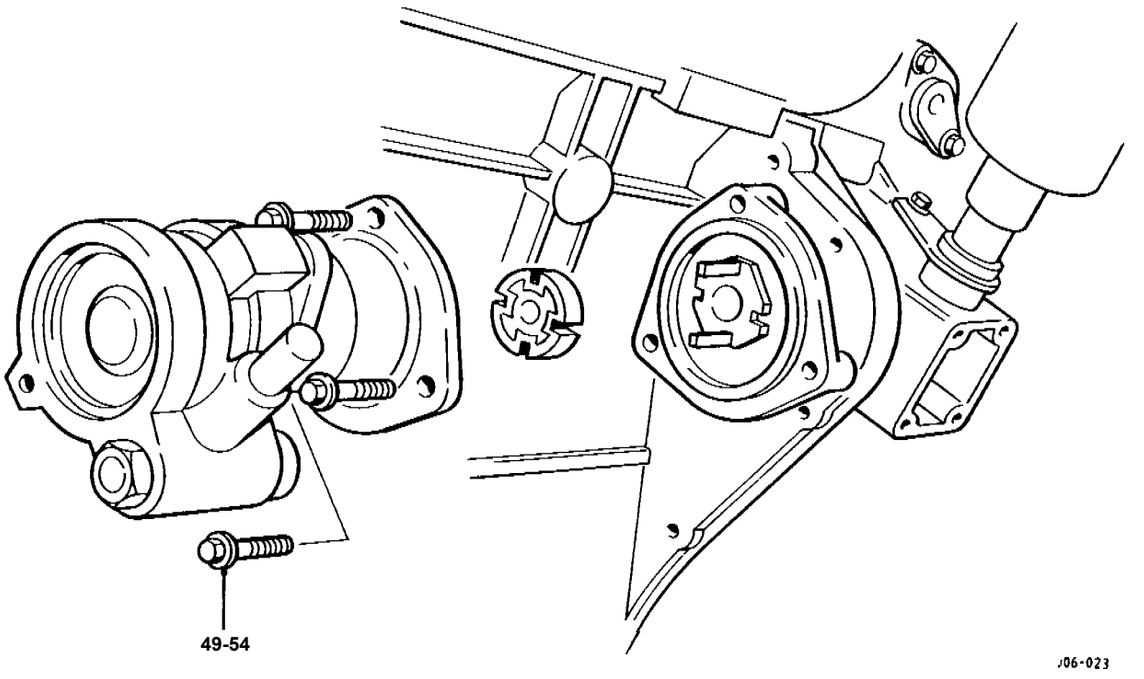


Fig. 3 Power Steering Pump

STEERING

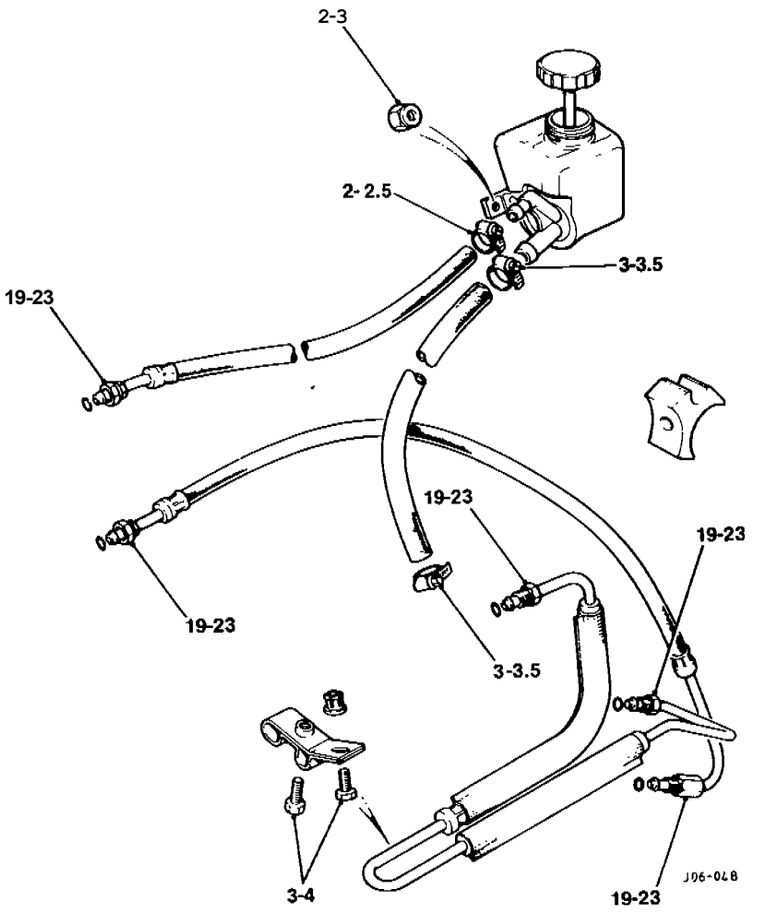


Fig. 4 Power Steering Reservoir and Hoses

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FRONT SUSPENSION

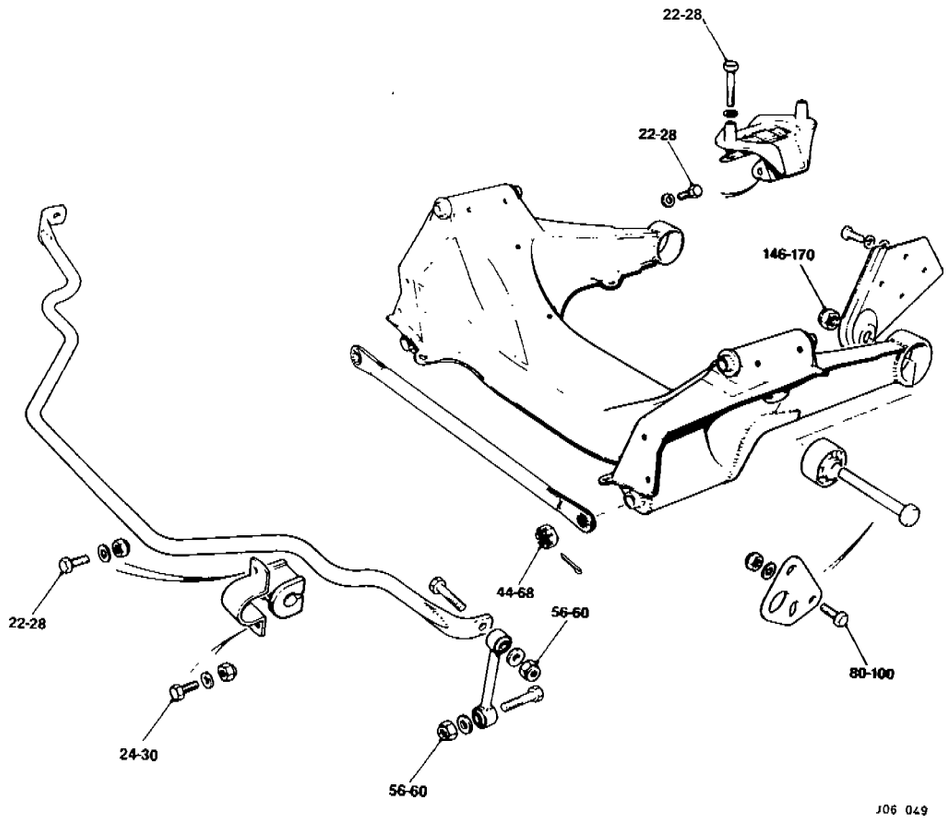


Fig. 1 **Front Crossmember and Anti-Roll Bar**

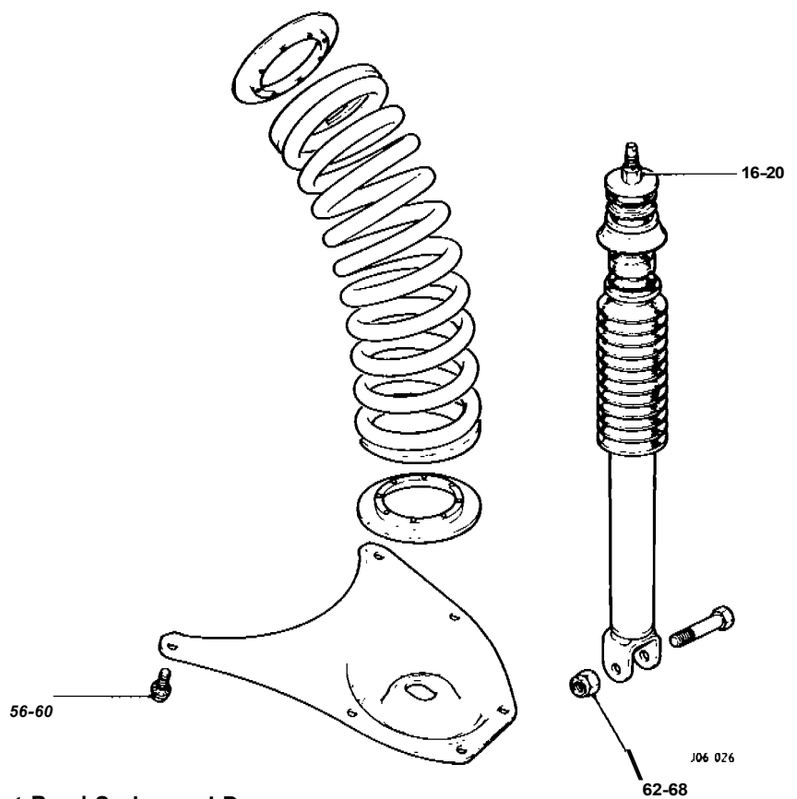


Fig. 2 Front Road Spring and Damper

FRONT SUSPENSION

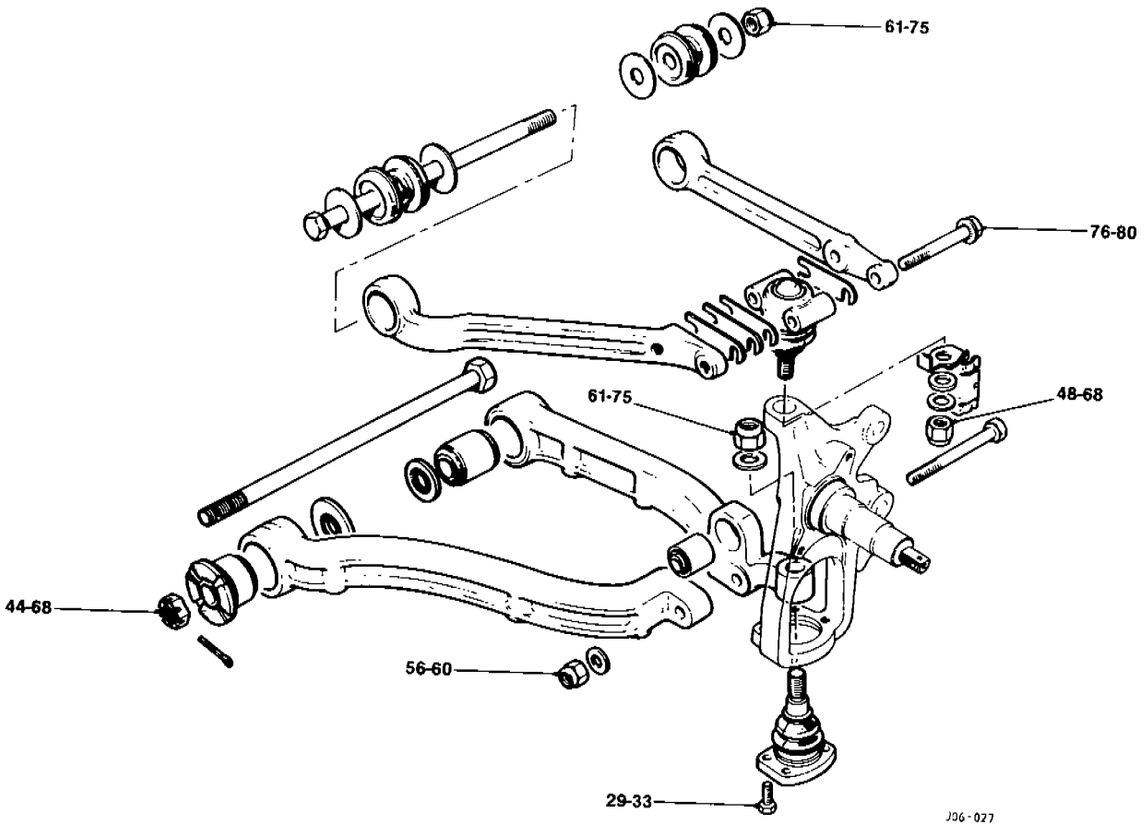


Fig. 3 **Upper** and **Lower Wishbones**

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REAR SUSPENSION

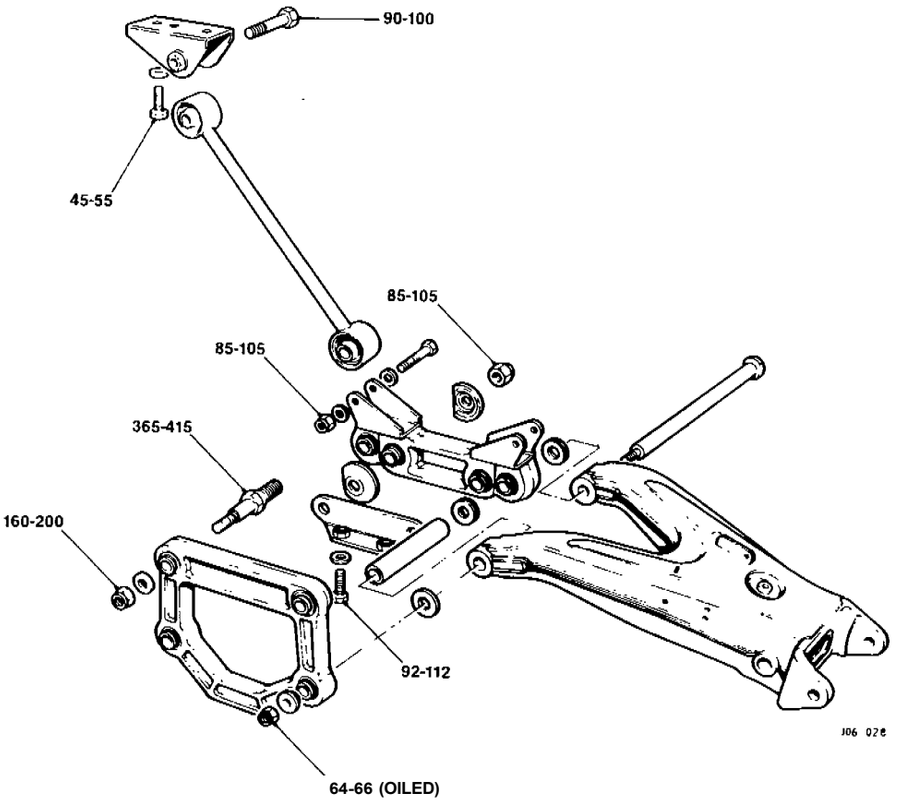


Fig. 1 Differential Mounting and Swing Arm

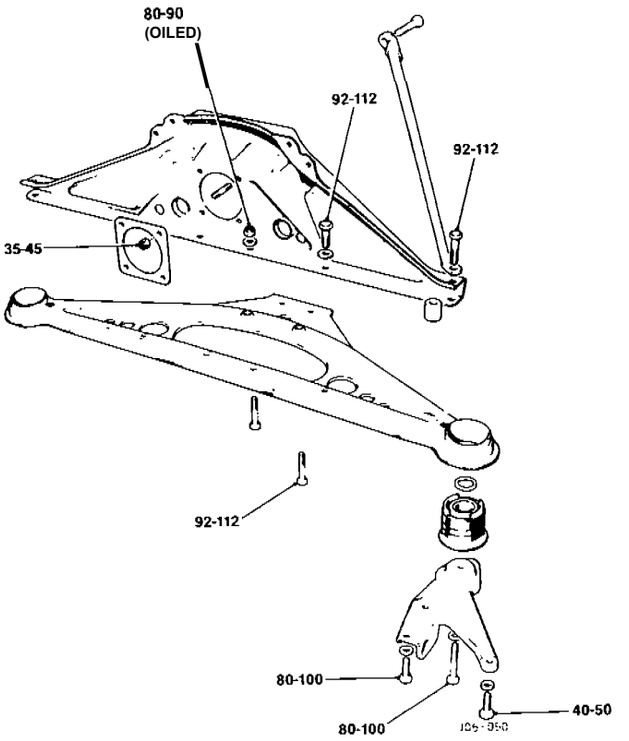


Fig. 2 Rear Frame

REAR SUSPENSION

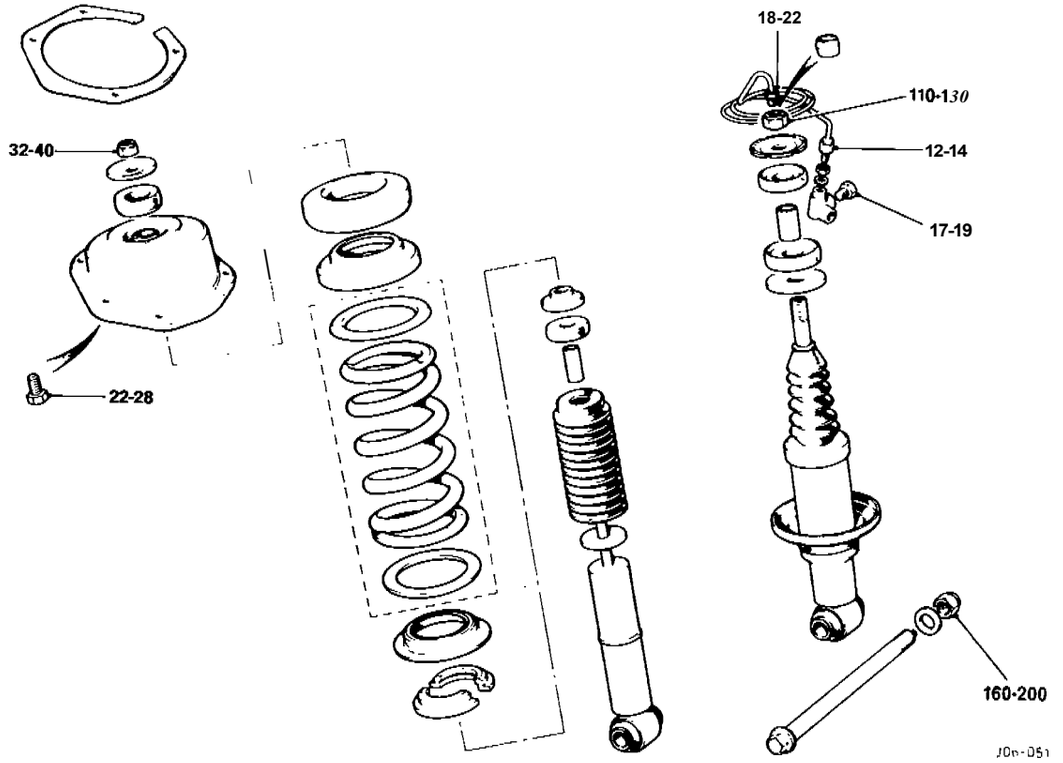


Fig. 3 Rear **Road Spring and Dampers**

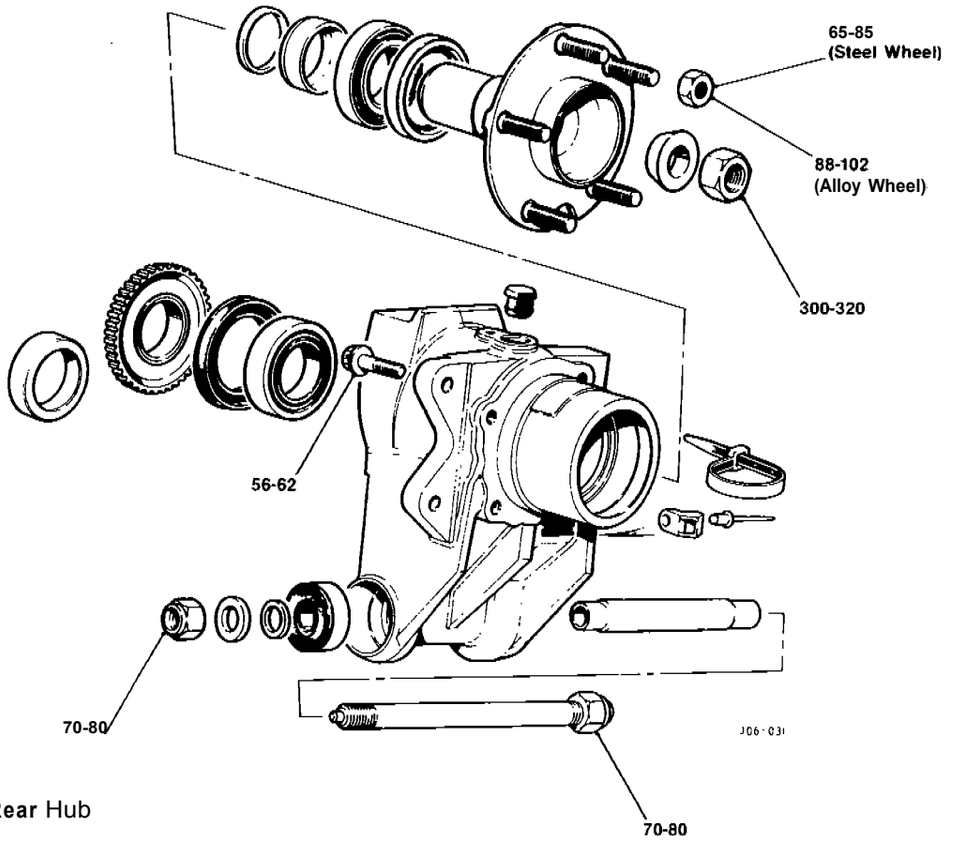


Fig. 4 **Rear** Hub

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BRAKES

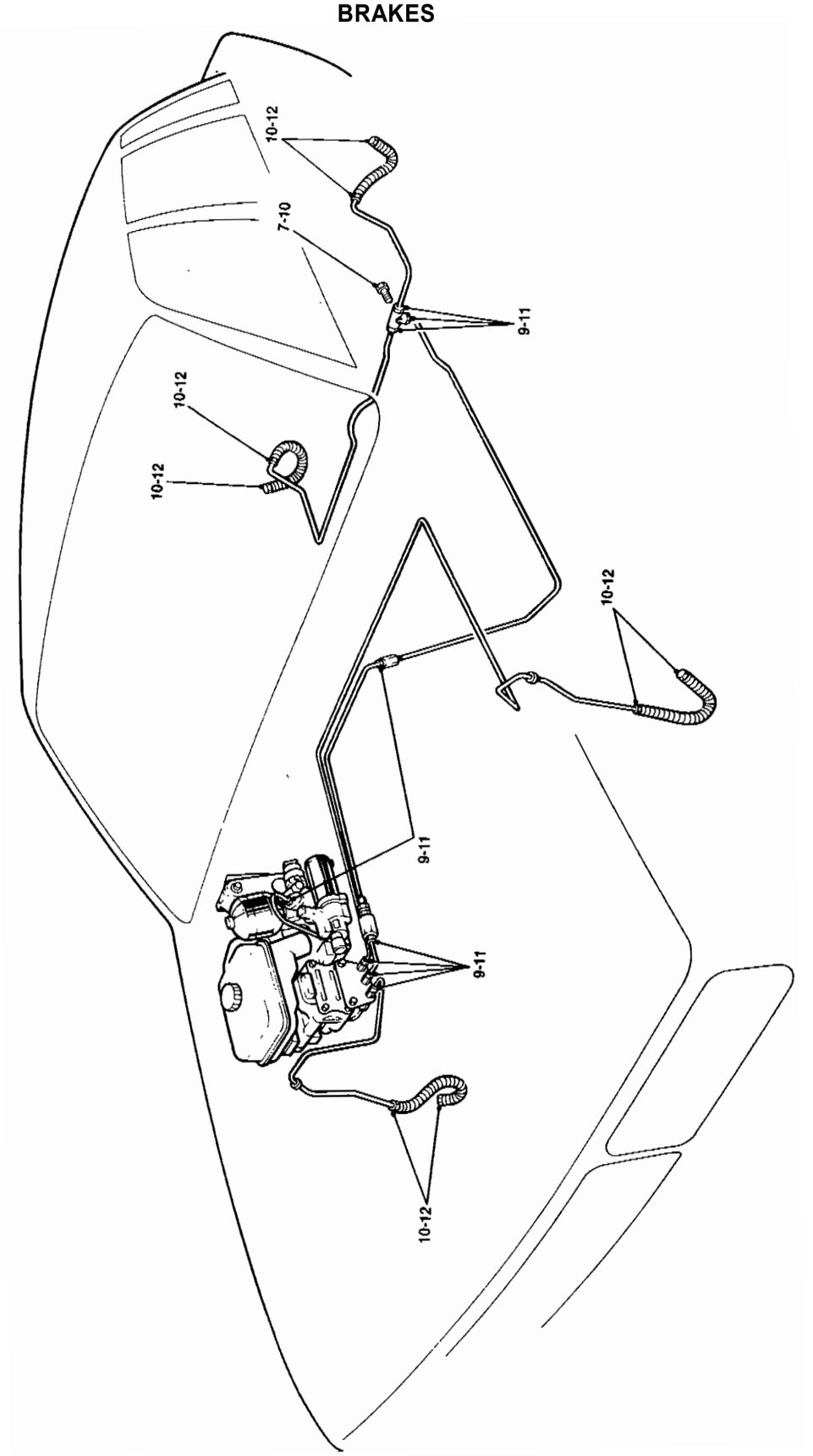


Fig 1 Brake Pipes and Hoses

BRAKES

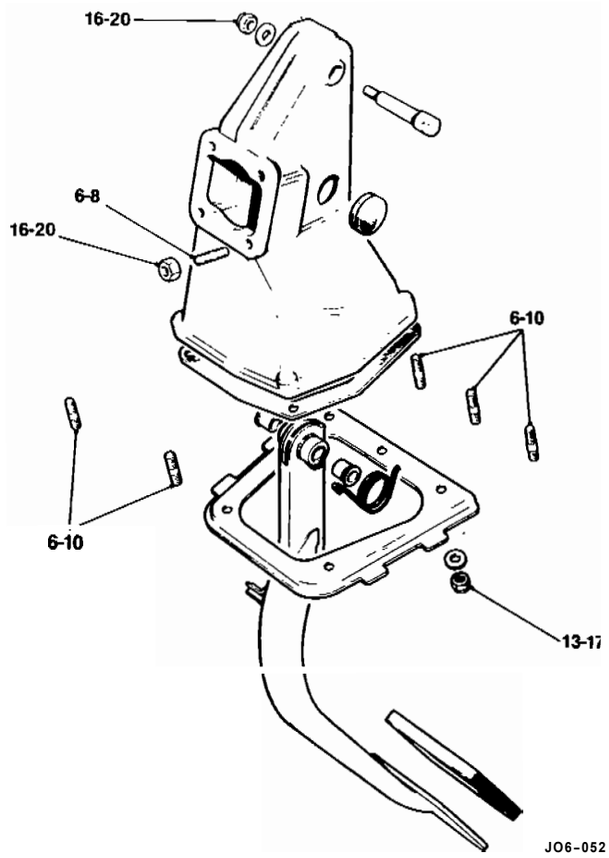


Fig. *2* **Brake Pedal**

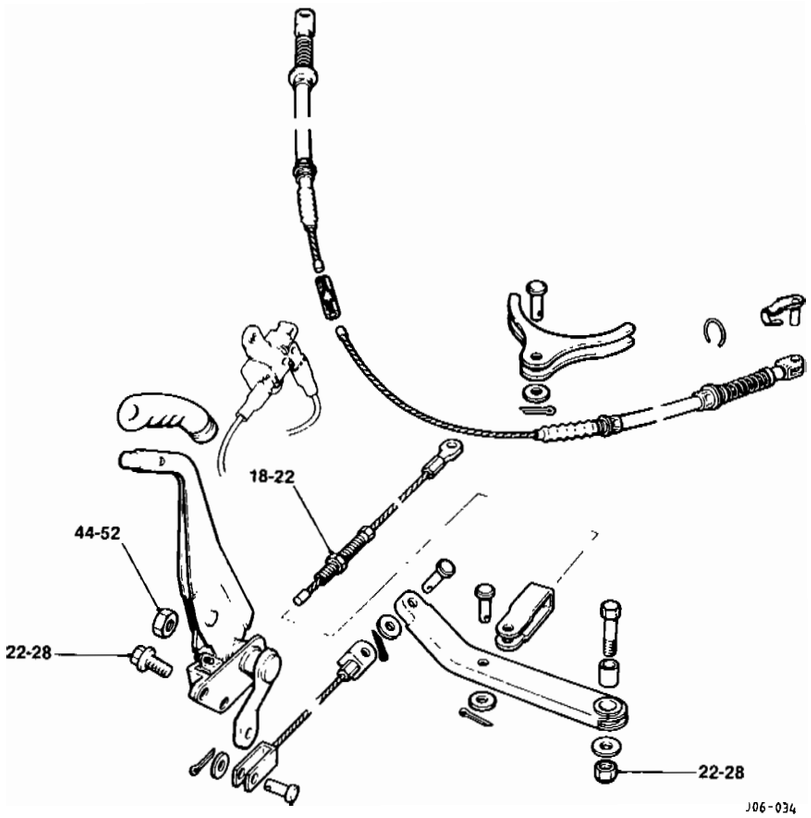
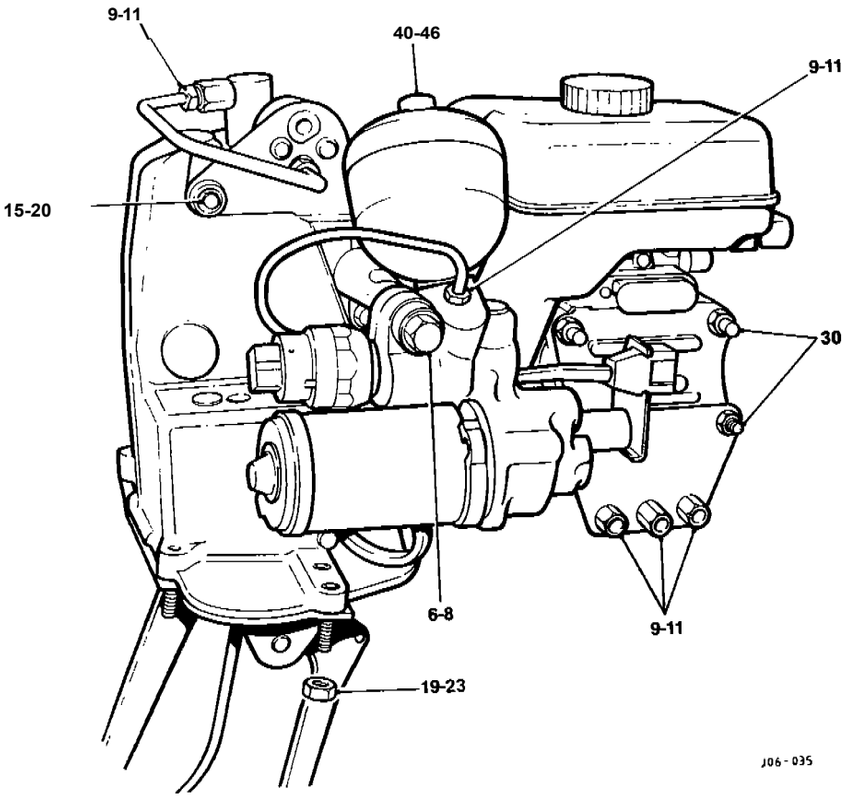


Fig. 3 Handbrake Control

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BRAKES



Fig, **4** **Brake** Reservoir/Pump/Accumulator **Assembly**

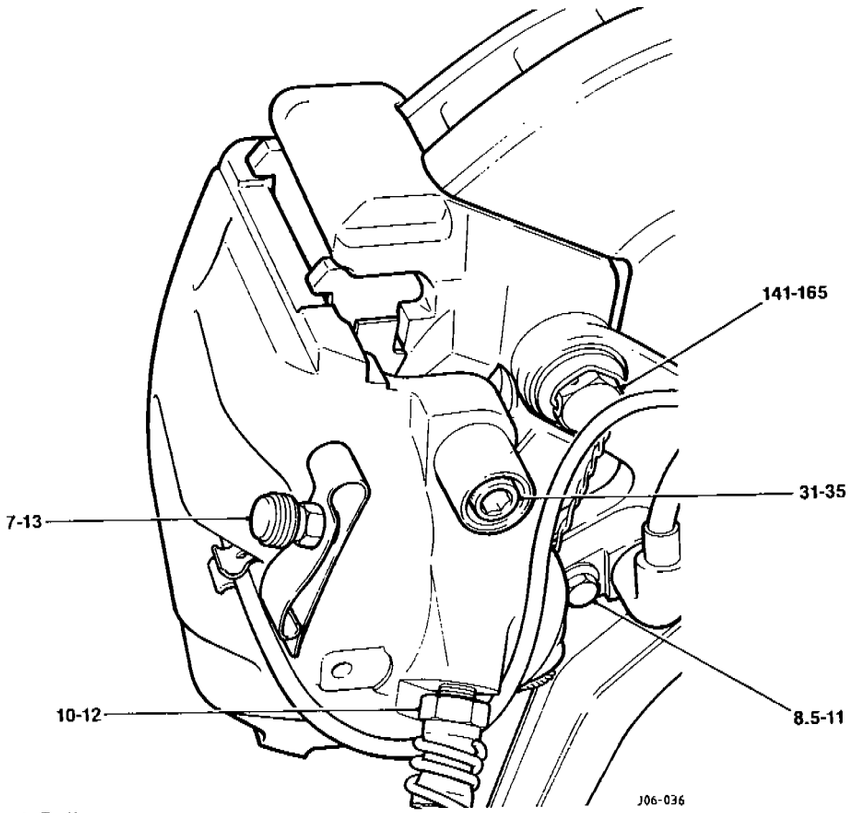


Fig. 5 Front Caliper

BRAKES

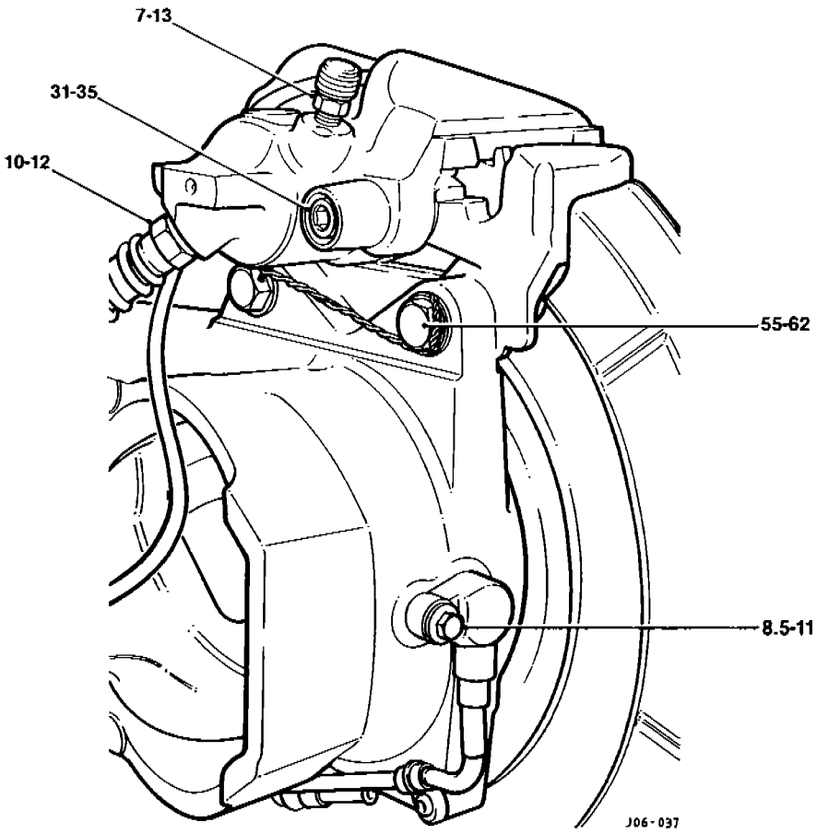


Fig. *6* **Rear Caliper**

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BODY

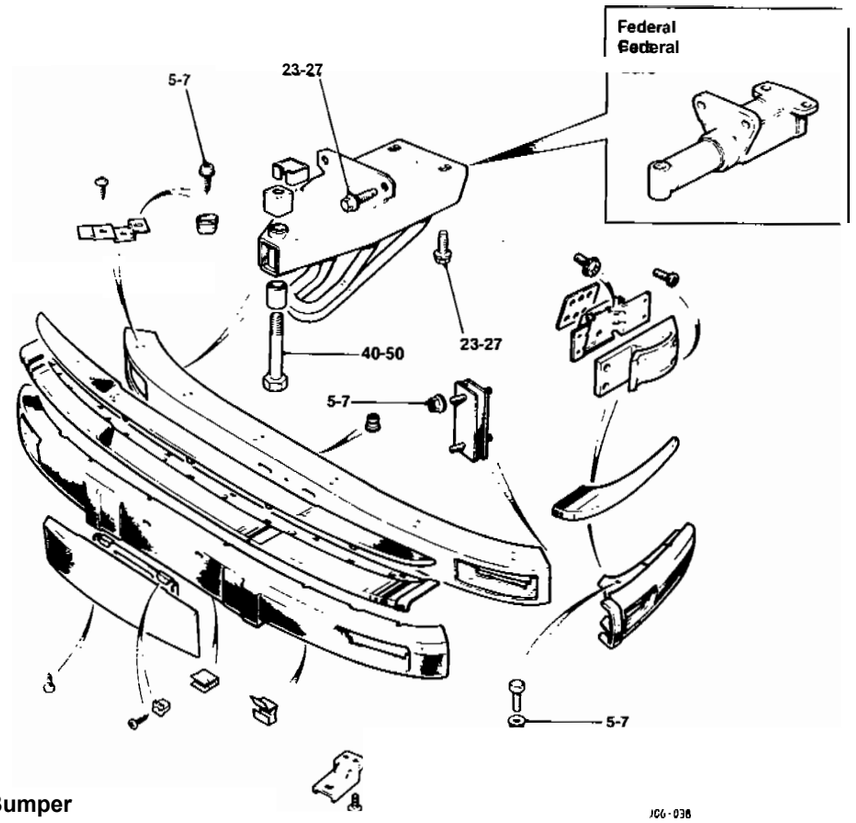


Fig. 1 Front **Bumper**

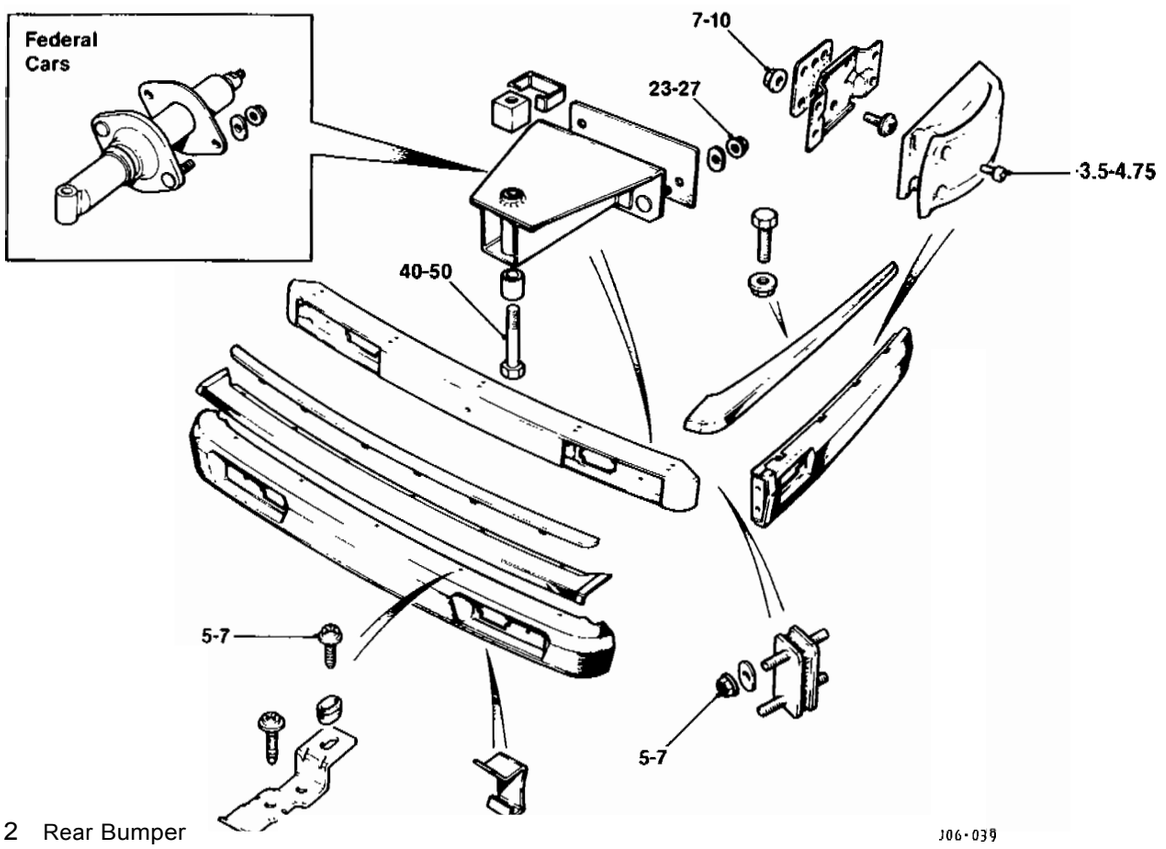


Fig. 2 Rear Bumper

ELECTRICAL

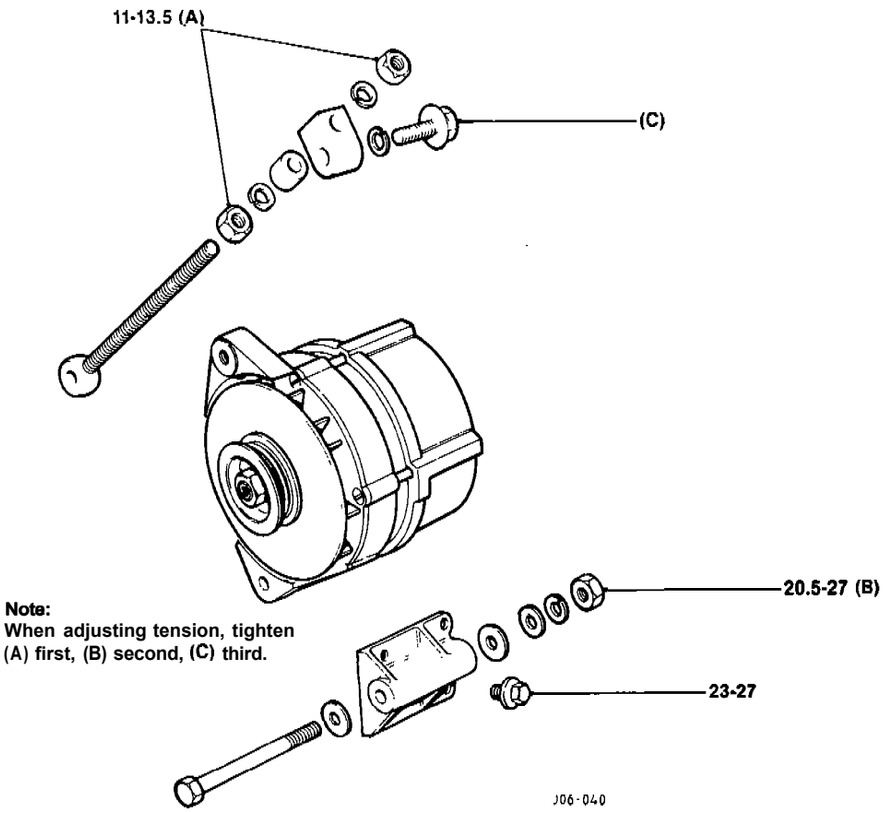


Fig. 1 Alternator

0010N

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TORQUE FIGURE CONVERSION CHART

NEWTON METRES TO POUND FORCE FEET

Nm	0	1	2	3	4	5	6	7	8	9
	pounds force feet									
0		0.7376	1.4751	2.2127	2.9502	3.6878	4.4254	5.1629	5.9005	6.6381
10	7.3756	8.1132	8.8507	9.5883	10.3259	11.0634	11.8010	12.5386	13.2761	14.0137
20	14.7512	15.4888	16.2264	16.9639	17.7015	18.4391	19.1766	19.9142	20.6517	21.3893
30	22.1269	22.8644	23.6020	24.3396	25.0771	25.8147	26.5522	27.2898	28.0274	28.7649
40	29.5025	30,2400	30.9776	31.7152	32.4527	33.1903	33.9279	34.6654	35.4030	36.1405
50	36.8781	37.6157	38.3532	39.0908	39.8284	40.5659	41.3035	42.0410	42.7786	43.5162
60	44.2537	44.9913	45.7289	46.4664	47.2040	47.9415	48.6791	49.4167	50.1542	50.8918
70	51.6294	52.3669	53.1045	53.8420	54.5796	55.3172	56.0547	56.7923	57.5299	58.2674
80	59.0050	59.7425	60.4801	61.2177	61.9552	62.6928	63.4303	64.1679	64.9055	65.6430
90	66.3806	67.1182	67.8557	68.5933	69.3308	70.0684	70.8060	71.5435	72.2811	73.0187
100	73.7562	74.4938	75.2313	75.9689	76.7065	77.4440	78.1816	78.9192	79.6567	80.3943
110	81.1318	81.8694	82.6070	83.3445	84.0821	84.8197	85.5572	86.2948	87.0323	87.7699
120	88.5075	89.2450	89.9826	90.7201	91.4577	92.1953	92.9328	93.6704	94.4080	95.1455
130	95.8831	96.6206	97.3582	98.0958	98.8333	99.5709	100.308	101.046	101.784	102.521
140	103.259	103.996	104.734	105.471	106.209	106.947	107.684	108.422	109.159	109.897
150	110.634	11.372	112.109	112.847	113.585	14.332	115.060	115.797	116.535	17.272
160	118.010	18.748	119.485	120.223	120.960	21.698	122.435	123.173	123.910	24.648
170	125.386	26.123	126.861	127.598	128.336	29.073	129.811	130.549	131.286	32.024
180	132.761	33.499	134.236	134.974	135.711	36.449	137.187	137.924	138.662	39.399
190	140.137	40.874	141.612	142.350	143.087	43.825	144.562	145.300	146.037	46.775
200	147.512	48.250	148.988	149.725	150.463	51.200	151.938	152.675	153.413	54.150
210	154.888	55.626	156.363	157.101	157.838	58.576	159.313	160.051	160.789	61.526
220	162.264	63.001	163.739	164.476	165.214	65.951	166.689	167.427	168.164	68.902
230	169.639	170.377	171.114	171.852	172.590	173.327	174.065	174.802	175.540	176.277
240	177.015	177.752	178.490	179.228	179.965	180.703	181.440	182.178	182.915	183.653
250	184.391	185.128	185.866	186.603	187.341	188.078	188.816	189.553	193.291	191.029
260	191.766	192.504	193.241	193.979	194.716	195.454	196.192	196.929	197.667	198.404
270	199.142	199.879	200.617	201.354	202.092	202.830	203.567	204.305	205.042	205.780
280	206.517	207.255	207.993	208.730	209.468	210.205	210.943	211.680	212.418	213.155
290	213.893	214.631	215.368	216.106	216.843	217.581	218.318	219.056	219.794	220.531
300	221.269	222.006	222.744	223.481	224.219	224.956	225.694	226.432	227.169	227.907
310	228.644	229.382	230.119	230.857	231.595	232.332	233.070	233.807	234.545	235.282
320	236.020	236.757	237.495	238.233	238.970	239.708	240.445	241.183	241.920	242.658
330	243.396	244.133	244.871	245.608	246.346	247.083	247.821	248.558	249.296	250.034
340	250.771	251.509	252.246	252.984	253.721	254.459	255.197	255.934	256.672	257.409
350	258.147	258.884	259.622	260.359	261.097	261.835	262.572	263.310	264.047	264.785
360	265.522	266.260	266.998	267.735	268.473	269.210	269.948	270.685	271.423	272.160
370	272.898	273.636	274.373	275.111	275.848	276.586	277.323	278.061	278.799	279.536
380	280.274	281.011	281.749	282.486	283.224	283.961	284.699	285.437	286.174	286.912
390	287.649	288.387	289.124	289.862	290.599	291.337	292.075	292.812	293.550	294.287
400	295.025	295.762	296.500	297.238	297.975	298.713	299.450	300.188	300.925	301.663
410	302.400	303.138	303.876	304.613	305.351	306.088	306.826	307.563	308.301	309.039
420	309.776	310.514	311.251	311.989	312.726	313.464	314.201	314.939	315.677	316.414
430	317.152	317.889	318.627	319.364	320.102	320.840	321.577	322.315	323.052	323.790
440	324.527	523.265	326.002	326.740	327.478	328.215	328.953	329.690	330.428	331.165
450	331.903	332.641	333.378	334.116	334.853	335.591	336.328	337.066	337.803	338.541
460	339.279	340.016	340.754	341.491	342.229	342.966	343.704	344.442	345.179	345.917
470	346.654	347.392	348.129	348.867	349.604	350.342	351.080	351.817	352.555	353.292
480	354.030	354.767	355.505	356.243	356.980	357.718	358.455	359.193	359.930	360.668
490	361.405	362.143	362.881	363.618	364.356	365.093	365.131	366.568	367.306	368.044

TORQUE FIGURE CONVERSION CHART

Nm	0	1	2	3	4	5	6	7	8	9
50C										
51C										
52C										
53c										
54c										
55c	405.659	406.397	407.134	407.872	408.609	409.347	410.085	410.822	411.560	412.297
56C	413.035	413.772	414.510	415.248	415.985	416.723	417.460	418.198	418.935	419.673
57c	420.410	421.148	421.886	422.623	423.361	424.098	424.836	425.573	426.311	427.049
58C	427.786	428.524	429.261	429.999	430.736	431.474	432.211	432.949	433.687	434.424
59c	435.162	435.899	436.637	437.374	438.112	438.849	439.587	440.325	441.062	441.800
60C	442.537	443.275	444.012	444.750	445.488	446.225	446.963	447.700	448.438	449.175
61C	449.913	450.650	451.388	452.126	452.863	453.601	454.338	455.076	455.813	456.551
620	457.289	458.026	458.764	459.501	460.239	460.976	461.714	462.451	463.189	463.927
63C	464.664	465.402	466.139	466.877	467.614	468.352	469.090	469.827	470.565	471.302
640	472.040	472.777	473.515	474.252	474.990	475.728	476.465	477.203	477.940	478.678
65C	479.415	480.153	480.891	481.628	482.366	483.103	483.841	484.578	485.316	486.053
66C	486.791	487.529	488.266	489.004	489.741	490.479	491.216	491.954	492.692	493.429
67C	494.167	494.904	495.642	496.379	497.117	497.854	498.592	499.330	500.067	500.805
68C	501.542	502.280	503.017	503.755	504.493	505.230	505.968	506.705	507.443	508.180
69C	508.918	509.655	510.393	511.131	511.868	512.606	513.343	514.081	514.818	515.556
70C	516.294	517.031	517.769	518.506	519.244	519.981	520.719	521.456	522.194	522.932
710	523.669	524.407	525.144	525.382	526.619	527.357	528.095	528.832	529.570	530.307
720	531.045	531.782	532.520	533.257	533.995	534.733	535.470	536.208	536.945	537.683
730	538.420	539.158	539.896	540.633	541.371	542.108	542.846	543.583	544.321	545.058
740	545.796	546.534	547.271	548.009	548.746	549.484	550.221	550.959	551.697	552.434
750	553.172	553.909	554.647	555.384	556.122	556.859	557.597	558.335	559.072	559.810
760	560.547	561.285	562.022	562.760	563.498	564.235	564.973	565.710	566.448	567.185
770	567.923	568.660	569.398	570.136	570.873	571.611	572.348	573.086	573.823	574.561
780	575.299	576.036	576.774	577.511	578.249	578.986	579.724	580.461	581.199	581.937
790	582.674	583.412	584.149	584.887	585.624	586.362	587.099	587.837	588.575	589.312
800	590.050	590.787	591.525	592.262	593.000	593.738	594.475	595.213	595.950	696.688
810	597.425	598.163	598.900	599.638	600.376	601.113	601.851	602.588	603.326	604.063
820	604.801	605.539	606.276	607.014	607.751	608.489	609.226	609.964	610.701	611.439
830	612.177	612.914	613.652	614.389	615.127	615.864	616.602	617.340	618.077	618.815
840	619.552	620.290	621.027	621.765	622.502	623.240	623.978	624.715	625.453	626.190
850	626.928	627.665	628.403	629.141	629.878	630.616	631.353	632.091	632.828	633.566
860	634.303	635.041	635.779	636.516	637.254	637.991	638.729	639.466	640.204	640.942
870	641.679	642.417	643.154	643.892	644.629	645.367	646.104	646.842	647.580	648.317
880	649.055	649.792	650.530	651.267	652.005	652.743	653.480	654.218	654.955	655.693
890	656.430	657.168	657.905	658.643	659.381	660.118	660.856	661.593	662.331	663,068
900	663.806	664.544	665.281	666.019	666.756	667.494	668.231	668.969	669.706	670.444
910	671.182	671.919	672.657	673.394	674.132	674.869	675.607	676.345	677.082	677.820
920	678.557	679.295	680.032	680.770	681.507	682.245	682.983	683.720	684.458	685.195
930	685.933	686.670	687.408	688.146	688.883	689.621	690.358	691.096	691.833	692.571
940	693.308	694.046	694.784	695.521	696.259	696.996	697.734	698.471	699.209	699.947
950	700.684	701.422	702.159	702.897	703.634	704.372	705.109	705.847	706.585	707.322
960	708.060	708.797	709.535	710.272	711.010	711.748	712.485	713.223	713.960	714.698
970	715.435	716.173	716.910	717.648	718.386	719.123	719.861	720.598	721.336	722.073
980	722.811	723.548	724.286	725.024	725.761	726.499	727.236	727.974	728.711	729.449
990	730.187	730.924	731.662	732.399	733.137	733.874	734.612	735.349	736.087	736.825
000	737.562									

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TORQUE FIGURE CONVERSION CHART

POUNDS FORCE FEET TO NEWTON METRES

lbf ft	0	1	2	3	4	5	6	7	8	9
	Newton metres (Nm)									
0		1.3558	2.7116	4.0675	5.4233	6.7791	8.1349	9.4907	10.8462	12.2024
10	13.5582	14.9140	16.2698	17.6256	18.9815	20.3373	21.6931	23.0489	24.4047	25.7605
20	27.1164	28.4722	29.8280	31.1838	32.5396	33.8954	35.2513	36.6071	37.9629	39.3187
30	10.6745	42.0304	43.3862	44.7420	46.0978	47.4536	48.8094	50.1653	51.5211	52.8769
40	54.2327	55.5885	56.9444	58.3002	59.6560	61.0118	62.3676	63.7234	65.0793	66.4351
50	57.7909	69.1467	70.5025	71.8583	73.2142	74.5700	75.9258	77.2816	78.6374	79.9933
60	31.3491	82.7049	84.0607	85.4165	86.7723	88.1282	89.4840	90.8398	92.1956	93.5514
70	94.9073	96.2631	7.6189	98.9747	100.331	101.686	103.042	104.398	105.754	107.110
80	108.465	109.821	1.1.117	112.533	113.889	115.245	116.600	117.956	199.312	120.668
90	122.024	123.379	24.735	126.091	127.447	128.803	130.159	131.514	132.870	134.226
100	135.582	136.938	38.293	139.649	141.005	142.361	143.717	145.073	146.428	147.784
110	149.140	150.496	51.852	153.207	154.563	155.919	157.275	158.631	159.987	161.342
120	162.698	164.054	65.410	166.766	168.121	169.477	170.833	172.189	173.545	174.901
130	176.256	177.612	178.968	180.324	181.680	183.035	184.391	185.747	187.103	188.459
140	189.815	191.170	192.526	193.882	195.238	196.594	197.949	199.305	200.661	202.017
150	203.373	204.729	206.084	207.440	208.796	210.152	21 1,508	21 2.863	214.219	21 5.575
160	216.931	21 8.287	219.642	220.998	222.354	223.710	225.066	226.422	227.777	229.1 33
170	230.489	231.845	233.201	234.556	235.912	237.268	238.624	239.980	241.336	242.691
180	244.047	245.403	246.759	248.115	249.470	250.826	252,182	253.538	254.894	256.250
190	257.605	258.961	260.317	261.673	263.029	264.384	265.740	267.096	268.452	269.808
200	271.164	272.519	273.875	275.231	276.587	277.943	279.298	280.654	282.010	283.366
210	284.722	286.078	287.433	288.789	290.145	291.501	292.857	294.212	295.568	296.924
220	298.280	299.636	300.992	302.347	303.703	305.059	306.415	307.771	309.126	310.482
230	311.838	313.194	314.550	315.906	317.261	318.617	319.973	321.329	322.685	324.040
240	325.396	326.752	328.108	329.464	330.820	332.175	333.531	334.887	336,243	337.599
250	338.954	340.310	341.666	343.022	344.378	345.734	347.089	348.445	349.801	351 157
260	352.513	353.868	355.224	356.580	357.936	359.292	360.648	362.003	363.359	364.715
270	366.071	367.427	368.782	370.138	371.494	372.850	374.206	375.562	376.917	378.273
280	379.629	380.985	382.341	383.696	385.052	386.408	387.764	389.120	390.476	391.831
290	393.187	394.543	395.899	397.255	398.610	399.966	401.322	402.678	404.034	405.390
300	406.745	408.101	409.457	410.813	412.169	413.524	414.880	416.236	417.592	418.948
310	420,304	421.659	423.015	424.371	425.727	427.083	428.438	429.794	431.150	432.506
320	433.862	435.218	436.573	437.929	439.285	440.641	441.997	443.352	444.708	446.064
330	447.420	448.776	450.132	451.487	452.843	454.199	455.555	456.911	458.266	459.622
340	460.978	462.334	463.690	465.046	466.401	467.757	469.113	470.469	471.825	473.180
350	474.536	475.892	477.248	478.604	479.960	481.315	482.671	484.027	485.383	486.739
360	488.094	489.450	490.806	492.162	493.518	494.874	496.229	497.585	498.941	500.297
370	501.653	503.008	504.364	505.720	507.076	508.432	509.788	51 1.143	512.499	513.855
380	515.211	516.567	517.922	519.278	520.634	521.990	523.346	524.702	526.057	527.413
390	528.769	530.125	531.481	532.836	534.192	535.548	536.904	538.260	539.616	540.971
400	542.327	543.683	545.039	546.395	547.750	549.106	550.462	551.818	553.174	554.530
41 0	555.885	557.241	558.597	559.953	561.309	562.664	564.020	565.376	566.732	568.088
420	569.444	570.799	572.155	573.511	574.867	576.223	577.578	578.934	580.290	581.646
430	583.002	584.358	585.713	587.069	588.425	589.781	591,137	592.492	593.848	595.204
440	596.560	597.916	599.272	600.627	601.983	603.339	604.695	606.051	607.406	608.762
450	610.118	61 1.474	612.830	614.186	615.541	616.897	618.253	619.609	620.965	622.320
460	623.676	625.032	626.385	627.744	629.100	630.455	631.811	633.167	634.523	635.879
470	637.234	638.590	639.946	641.302	642.658	644.014	645.369	646.725	648.081	649.437
480	650.793	652.148	653.504	654.860	656.216	657.572	658.927	660.639	661.639	662.995
490	664.351	665.707	667.062	668.418	669.774	671.130	672.486	673.841	675.197	676.553

TORQUE FIGURE CONVERSION CHART

bf ft	0	1	2	3	4	5	6	7	8	9
500										
510										
520										
530										
540										
550	745.700	747.056	748.411	749.767	751.123	752.479	753.835	755.191	756.546	757.902
560	759.258	760.614	761.970	763.325	764.681	766.037	767.393	768.749	770.105	771.460
570	772.816	774.172	775.528	776.884	778.239	779.595	780.951	782.307	783.663	785.019
580	786.374	787.730	789.086	790.442	791.798	793.153	794.509	795.865	797.221	798.577
590	799.933	801.288	802.644	804.000	805.356	806.712	808.067	809.423	810.779	812.135
600	813.491	814.847	816.202	817.558	818.914	820.270	821.626	822.981	824.337	825.693
610	827.049	828.405	829.761	831.116	832.472	833.828	835.184	836.540	837.895	839.251
620	840.607	841.963	843.319	844.675	846.030	847.386	848.742	850.098	851.454	852.809
630	854.165	855.521	856.877	858.233	859.589	860.944	862.300	863.656	865.012	866.368
640	867.723	869.079	870.534	871.791	873.147	874.503	875.858	877.214	878.570	879.926
650	881.282	882.637	883.993	885.349	886.705	888.061	889.417	890.772	892.128	893.484
660	894.840	896.196	897.551	898.907	900.263	901.619	902.975	904.331	905.686	907.042
670	908.398	909.754	911.110	912.465	913.821	915.177	916.553	917.889	919.245	920.600
680	921.956	923.312	924.668	926.024	927.379	928.735	930.091	931.447	932.803	934.159
690	935.514	936.870	938.226	939.582	940.938	942.293	943.649	945.005	946.361	947.717
700	949.073	950.428	951.784	953.140	954.496	955.852	957.207	958.563	959.919	961.275
710	962.631	963.987	965.342	966.698	968.054	969.410	970.766	972.121	973.477	974.833
720	976.189	977.545	978.901	980.256	981.612	982.968	984.324	985.680	987.035	988.391
730	989.747	911.103	992.459	993.815	995.170	996.526	997.882	999.238	1000.59	1001.95
740	1003.31	1004.66	1006.02	1007.37	1008.73	1010.08	1011.44	1012.80	1014.15	1015.51
750	1016.86	1018.22	1019.58	1020.93	1022.29	1023.64	1025.00	1026.35	1027.71	1029.07
760	1030.42	1031.78	1033.13	1034.49	1035.84	1037.20	1038.56	1039.91	1041.27	1042.62
770	1043.98	1045.34	1046.69	1048.05	1049.40	1050.76	1052.11	1053.47	1054.83	1056.18
780	1057.54	1058.89	1060.25	1061.61	1062.96	1064.32	1065.67	1067.03	1068.38	1069.74
790	1071.10	1072.45	1073.81	1075.16	1076.52	1077.88	1079.23	1080.59	1081.94	1083.33
800	1084.65	1086.01	1087.37	1088.72	1090.08	1091.43	1092.79	1094.15	1095.50	1096.86
810	1098.21	1099.57	1100.92	1102.28	1103.64	1104.99	1106.35	1107.70	1109.06	1110.41
820	1111.77	1113.13	1114.48	1115.84	1117.19	1118.55	1119.91	1121.26	1122.62	1123.97
830	1125.33	1126.68	1128.04	1129.40	1130.75	1132.11	1133.46	1134.82	1136.18	1137.53
840	1138.89	1140.24	1141.60	1142.95	1144.31	1145.67	1147.02	1148.38	1149.73	1151.09
850	1152.45	1153.80	1155.16	1156.51	1157.87	1159.22	1160.58	1161.94	1163.29	1164.65
860	1166.00	1167.36	1168.72	1170.07	1171.43	1172.78	1174.14	1175.49	1176.85	1178.21
870	1179.56	1180.92	1182.27	1183.63	1184.98	1186.34	1187.70	1189.05	1190.41	1191.76
880	1193.12	1194.48	1195.83	1197.19	1198.54	199.90	1201.25	1202.61	1203.97	1205.32
890	1206.68	1208.03	1209.39	1210.75	1212.10	213.46	1214.81	1216.17	1217.52	1218.88
900	1220.24	1221.59	1222.95	1224.30	1225.66	227.02	1228.37	1229.73	1231.08	1232.44
910	1233.79	1235.15	1236.51	1237.86	1239.22	240.57	1241.93	1243.29	1244.64	1246.00
920	1247.35	1248.71	1250.06	1251.42	1252.78	254.13	1255.49	1256.84	1258.20	1259.55
930	1260.91	1262.27	1263.62	1264.98	1266.33	267.69	1269.05	1270.40	1271.76	1273.11
940	1274.47	1275.82	1277.18	1278.54	1279.89	281.25	1282.60	1283.96	1285.32	1286.67
950	1288.03	1289.38	1290.74	1292.09	1293.45	294.81	1296.16	1297.52	1298.87	1300.23
960	1301.59	1302.94	1304.30	1305.65	1307.01	1308.36	1309.72	1311.08	1312.43	1313.79
970	1315.14	1316.50	1317.85	1319.21	1320.57	1321.92	1323.28	1324.63	1325.99	1327.35
980	1328.70	1330.06	1331.41	1332.77	1334.12	1335.48	1336.84	1338.19	1339.55	1340.90
990	1342.26	1343.62	1344.97	1346.33	1347.68	1349.04	1350.39	1351.75	1353.11	1354.46
000	1355.82									

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GENERAL FITTING

Precautions against damage.

Always fit covers to protect the wings before commencing work in the engine compartment. Cover the Seats and carpets, wear clean overalls and wash hands or wear gloves before working inside the car. Avoid spilling hydraulic fluid or battery acid on paintwork. In the event of spillage, wash *off* with water immediately. Use polythene sheets in the boot to protect carpets. Always use a recommended service tool, or a satisfactory equivalent, where specified.
Protect temporarily exposed screw threads by replacing nuts or fitting plastic caps.

Safety precautions.

Whenever possible use a ramp or pit whilst working beneath a car, in preference to jacking. Chock the wheels as well as applying the handbrake.
Never rely on a jack alone to support a car. Use axle stands or blocks carefully placed at the jacking points to provide a rigid location. Ensure that a suitable form of fire extinguisher is conveniently located.
Check that any lifting equipment used has adequate capacity and is fully serviceable.
Inspect power leads of any mains electrical equipment for damage, and check that it is properly earthed.
Disconnect the earth (grounded) terminal of a car battery.
Do not disconnect any pipes in the air conditioning refrigeration system (where fitted) unless trained and instructed to do so. A refrigerant is used which can cause blindness if allowed to contact eyes.
Ensure that adequate ventilation is provided when volatile de-greasing agents are being used.

CAUTION: Fume extraction equipment must be in operation when trichloroethane, carbon tetrachloride, methylene chloride, chloroform, or perchlorethylene are used for cleaning purposes.

Do not apply heat in an attempt to free stiff nuts or fittings; as well as causing damage to protective coatings, there is a risk of damage to electronic equipment and brake lines from stray heat.
Do not leave tools, equipment, spilt oil, etc. around or on work area.
Wear protective overalls and use barrier creams when necessary.

Used engine oils.

Prolonged and **repeated** contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities should be provided.

Health protection precautions.

1. Avoid prolonged, repeated contact with oils, particularly used engine oils.
2. Wear protective clothing, including impervious gloves where practicable.
3. Do not put oily rags in pockets.
4. Avoid contaminating clothes, particularly underpants, with oil.
5. Overalls must be cleaned regularly. Discard unwashable clothing and oil impregnated footwear.
6. First Aid treatment should be obtained immediately for open cuts or wounds.
7. Use barrier creams, applying before each work period, to help the removal of oil from the skin.
8. Wash with soap and water to ensure all oil is removed (skin cleaners and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
9. Do not use petrol, kerosene, diesel fuel, gas oil, thinners or solvents for washing skin.
10. If skin disorders develop, obtain medical advice.
11. Where practicable, degrease components prior to handling.
12. Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields. An eye wash facility should be provided.

Environmental protection precautions.

It is illegal to pour used oil on to the ground, down sewers or drains, or into water courses.
The burning of used engine oil in small space heaters or boilers is not recommended unless emmission control equipment is fitted. In cases of doubt, check with the Local Authority.
Dispose of used oil through authorised waste disposal contractors, or licensed waste disposal sites or to the waste oil reclamation trade. If in doubt, contact the Local Authority for advice on disposal facilities.

Preparation.

Before removing a component, clean it and its surrounding area as thoroughly as possible.
Blank off any openings exposed by component removal using greaseproof paper and masking tape.
Immediately seal fuel, oil or hydraulic lines when separated, using plastic caps or plugs, to prevent loss of fluid and entry of dirt.
Close the open ends of oilways, exposed by component removal, with tapered hardwood plugs or readily visible plastic plugs.
Immediately a component is removed, place it in a suitable container: use a separate container for each component and its associated parts.
Before dismantling a component clean it thoroughly with a recommended cleaning agent; check that the agent is suitable for all materials of component.
Clean the bench and provide marking materials, labels, containers and locking wire before dismantling a component.

Dismantling.

Observe scrupulous cleanliness when dismantling components, particularly when brake, fuel or hydraulic system parts are being worked on.
A particle of dirt or a cloth fragment could cause a dangerous malfunction if trapped in these systems.
Blow out all tapped holes, crevices, oilways and fluid passages with an air line. Ensure that any 'O' rings used for sealing are correctly replaced or renewed if disturbed. Mark mating parts to ensure that they are replaced as dismantled. Whenever possible use marking ink, which avoids possibilities of distortion or initiation of cracks, liable if centrepunch or scriber are used.
Wire together mating parts where necessary to prevent accidental interchange (e.g. roller bearing components).
Wire labels onto all parts to be renewed, and to parts requiring further inspection before being passed for reassembly; place labelled parts and other parts for rebuild in separate containers.
Do not discard a part due for renewal until it has been compared with a new part, to ensure that its correct replacement has been obtained.

Inspection - **General.**

Never inspect a component for wear or dimensional check unless it is absolutely clean; a slight smear of grease can conceal an incipient failure. When a component is to be checked dimensionally against figures quoted for it, use correct equipment (surface plates, micrometers, dial gauges, etc.) in serviceable condition.
Makeshift checking equipment can be dangerous. Reject a component if its dimensions are outside the limits quoted, or if damage is apparent. A part may however, be refitted it its critical dimension is exactly limit size, and is otherwise satisfactory.
Use Plastigauge 12 Type PG-1 for checking bearing surface clearances.
Directions for its use, and a scale giving bearing clearances in 0,0025mm (0.0001in) steps are provided with it.

Ball and roller bearings.

NEVER REPLACE A BALL OR ROLLER BEARING WITHOUT FIRST ENSURING THAT IT IS IN AS-NEW CONDITION.

Remove all traces of lubricant from a bearing under inspection by washing it in petrol or a suitable degreaser; maintain absolute cleanliness throughout the operations.
Inspect visually for markings of any form on rolling elements, raceways, outer surface of outer rings or inner surface of inner rings. Reject any bearings found to be marked, since any markings in these areas indicates onset of wear.
Holding the inner race between fingers and thumb of one hand, spin the outer race and check that it revolves absolutely smoothly. Repeat, holding the outer race and spinning the inner race.
Rotate the outer ring with a reciprocating motion, while holding the inner ring; feel for any check or obstruction to rotation, and reject the bearing if action is not perfectly smooth.
Lubricate the bearing generously with lubricant appropriate to installation. Inspect shaft and bearing housing for discolouration or other marking suggesting that movement has taken place between bearing and seatings.
If markings are found use Loctite in installation of replacement bearing.
Ensure that the shaft and housing are clean and free from burrs before fitting the bearing. If one bearing of a pair shows an imperfection it is generally advisable to renew both bearings; an exception could be

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made only if the faulty bearing had covered a low mileage, and it could be established that damage was confined to it. When fitting bearing to shaft, apply force only to inner ring of bearing, and only to outer ring when fitting into housing (Fig. 1).
In the case of grease-lubricated bearings (e.g. hub bearings) fill the space between the bearing and outer seal with a recommended grade of grease before filling the seal.
Always mark components of separable bearings (e.g. taper-roller bearings) in dismantling to ensure correct reassembly. never fit new rollers in a used cup.

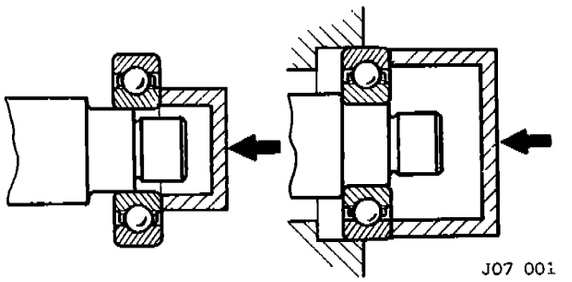


Fig 1

Oil seals.

Always fit new oil seals when rebuilding an assembly. It is not physically possible to replace a seal exactly as it had bedded down.
Carefully examine the seal before fitting to ensure that it is clean and undamaged.
Smear sealing lips with clean grease, pack dust excluder seals with grease, and heavily grease duplex seals in the cavity between sealing lips.
Ensure that seal spring, if provided, is correctly fitted.
Place lip of seal towards fluid to be sealed and slide into position on shaft, using fitting sleeve (Fig. 2) when possible to protect sealing lip from damage by sharp corners, threads of splines. If fitting sleeve is not available, use plastic tube or adhesive tape to prevent damage to sealing lip.
Grease outside diameter of the seal, place it square to the housing recess and press it into position, using great care and if possible a 'bell piece' (Fig 3) to ensure that seal is not tilted. In other cases it may be preferable to fit the seal to the housing before fitting to the shaft. Never let the weight of an unsupported shaft rest in a seal.

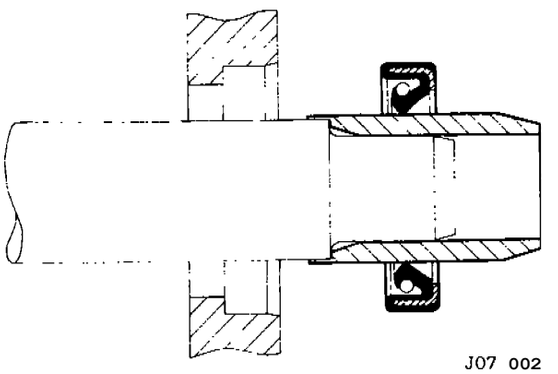


Fig 2

If the correct service tool is not available, use a suitable drift approximately 0,4mm (0.015 in) smaller than the outside diameter of the seal. Use a hammer VERY GENTLY on the drift if a press is not suitable.

Press or drift a seal into the depth of housing if the housing is shouldered, or flush with the face of the housing where no shoulder is provided.

Note: Most cases of failure or leakage of oil seals are due to careless fitting, and resulting damage to both seals and sealing surfaces. Care in fitting is essential if good results are to be achieved.

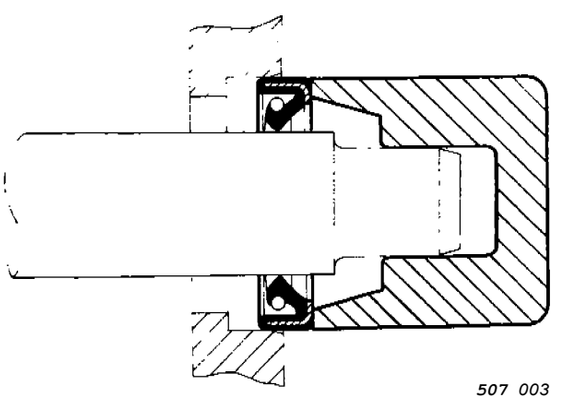


Fig 3

Joints and joint faces.

Always use the correct gaskets where they are specified.
Use jointing compound only when recommended. Otherwise fit joints dry.
When jointing compound is used, apply in a thin uniform film to metal surfaces; take great care to prevent it from entering oilways, pipes or blind tapped holes.
Remove all traces of old jointing materials prior to reassembly. Do not use a tool which could damage joint faces.

Inspect joint faces for scratches **or** burrs and remove with a fine file or oil-stone; do not allow swarf or dirt to enter tapped holes or enclosed parts. Blow out any pipes, channels or crevices with compressed air, renewing any **'O'** rings or **seals** displaced by air blast.

Flexible hydraulic pipes and hoses.

Before removing any brake or power steering hose, clean end fittings and area surrounding them as thoroughly as possible. Obtain appropriate blanking caps before detaching hose end fittings, so that ports can be immediately covered to exclude dirt. Clean hose externally and blow through with airline. Examine carefully for cracks, separation of plies, security of end fittings and external damage. Reject any hose found faulty.

When refitting hoses, ensure that no unnecessary bends are introduced, and that the hose is not twisted before or during tightening of union nuts.
Containers for hydraulic fluid must be kept absolutely clean.
Do not store hydraulic fluid in an unsealed container. **It** will absorb water, and fluid in this condition would be dangerous to use due to a lowering *of* its boiling point. Do not allow hydraulic fluid to be contaminated with mineral oil, **or** use a container which has previously contained mineral oil.

Do not re-use fluid bled from system. Always use clean brake fluid, or a recommended alternative, to clean hydraulic components.
Fit a blanking cap to a hydraulic union and a plug to its socket after removal to prevent ingress of dirt.
Absolute cleanliness must be observed with hydraulic components at all times.
After any work on hydraulic systems, inspect carefully for leaks underneath the vehicle while a second operator applies maximum pressure to the brakes (engine running) and operates the steering.

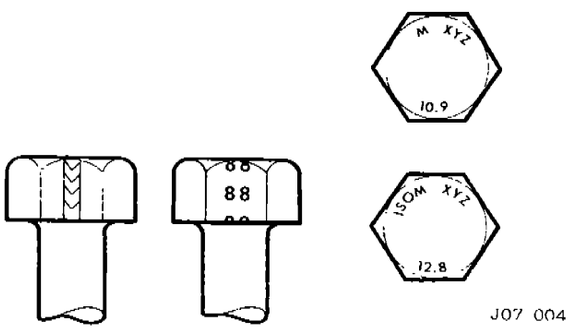


Fig **1**

Metric bolt identification.

An ISO metric bolt or screw, made of steel and larger than 6mm in diameter can be identified by either of the symbols ISO M or M embossed or indented on top of the head (Fig. **1**).

In addition to marks to identify the manufacture, the head is also marked with symbols to indicate the strength grade e.g. 8.8, 10.9, 14.9, where the first figure gives the minimum tensile strength of the bolt material in tens of kgf/mm^2.
Zinc plated ISO metric bolts and nuts are chromate passivated, a greenish-khaki to gold-bronze colour.

Metric nut identification.

A nut with an ISO metric thread is marked on one face (1, Fig 2) or on one of the flats (2, Fig 2) of the hexagon with the strength grade symbol 8, 12 or 14. Some nuts with strength 4, 5 or 6 are also marked and some have the metric symbol M on the flat opposite the strength grade marking.

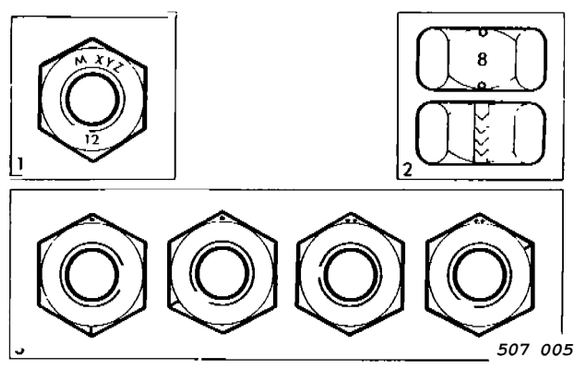


Fig 2

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A clock face system (3, Fig 2 page 07-04) is used as an alternative method of indicating the strength grade. The external chamfers on a face of the nut is marked in a position relative to the appropriate hour mark on a clock face to indicate the strength grade.
A dot is used to locate the 12 o'clock position and a dash to indicate the strength grade. If the grade is above 12, two dots identify the 12 o'clock position.

Hydraulic fittings - Metrification

WARNING: METRIC AND UNIFIED THREADED HYDRAULIC PARTS. ALTHOUGH PIPE CONNECTIONS TO BRAKE SYSTEM UNITS INCORPORATED THREADS OF METRIC FORM, THOSE FOR POWER ASSISTED STEERING ARE OF UNF TYPE. IT IS VITAL THAT THESE TWO THREAD FORMS ARE NOT CONFUSED, AND CAREFUL STUDY SHOULD BE MADE OF THE FOLLOWING NOTES.

Metric threads and metric sizes are being introduced into motor vehicle manufacture and some duplication of parts must be expected. Although standardization must in the long run be good, it would be wrong not to give warning of the dangers that exist while UNF and metric threaded hydraulic parts continue together in service.
Fitting UNF pipe nuts in to metric ports and vice-versa should not happen, but experience of the change from BSF to UNF indicated that there is not certainty in relying upon the difference in thread size when safety is involved.
To provide permanent identification of metric parts is not easy but recognition has been assisted by the following means.
All metric pipe nuts, hose ends, unions and bleed screws are coloured black.
The hexagon area of pipe nuts is indented with the letter 'M'.
Metric and UNF pipe nuts are slightly different in shape.

Note: In the following four Figs, **'A'** indicates the metric and 'B' the UNF type.

The metric female nut is **ALWAYS** used with a trumpet flared pipe and the metric male nut is **ALWAYS** used with a convex flared pipe (Fig 1.).

All metric ports in cylinders and calipers have no counterbores, but unfortunately a few cylinders with UNF threads also have no counterbore. The situation is, all ports with counterbores are UNF, but ports not counterbored are most likely to be metric. (Fig 2).

The colour of the protective plugs in hydraulic ports indicates the size and the type of the threads, but the function of the plugs is protective and not designed as positive identification. In production it is difficult to use the wrong plug but human error must be taken into account.
The plug colours and thread sizes are:

	UNF
RED	3/8 in x 24 UNF
GREEN	7/16 in x 20 UNF
YELLOW	112 in x 20 UNF
PINK	5/8 in x 18 UNF

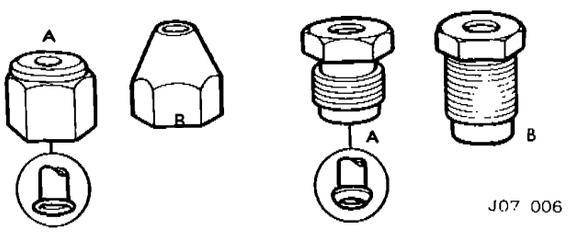


Fig 1

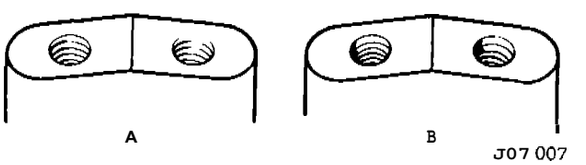


Fig 2

	METRIC
BLACK	10 x Imm
GREY	12 x 1mm
BROWN	14 x 1,5mm

Hose ends differ slightly between metric and UNF (Fig 1).

Gaskets are not used with metric hoses. The UNF hose is sealed on the cylinder or caliper face by a copper gasket but the metric hose seals against the bottom of the port and there is a gap between faces of the hose end and cylinder (Fig 2).

Pipe sizes for UNF are 3/16in, 1/4in, and 5/16in outside diameter.
Metric pipe sizes are 4,75mm, 6mm and 8mm.
4,75mm pipe is exactly the same as 3/16in pipe.
6mm pipe is 0.014in smaller than 1/4in pipe.
8mm pipe is 0.002in larger than 5/16in pipe. Convex pipe flares are shaped differently for metric sizes and when making pipes for metric equipment, metric pipe flaring tools must be used.
The greatest danger lies with the confusion of 10mm and ⅜in UNF pipe nuts used for 3/16in (or 4,75mm) pipe. The %in UNF pipe nut or hose can be screwed into a 10mm port but is very slack and easily stripped. The thread engagement is too weak and cannot provide an adequate seal. The opposite condition, a 10mm nut in a ⅜in port, is difficult and unlikely to cause trouble. The 10mm nut will screw in 1 1/2 or two turns and seize. It has a crossed thread 'feel' and it is impossible to force the nut far enough to seal the pipe. With female pipe nuts the position is of course reversed.
The other combinations are so different that there is no danger of confusion.

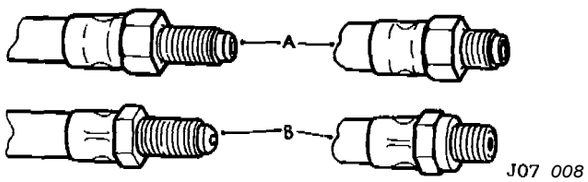


Fig 1

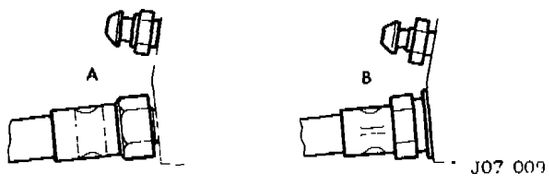


Fig 2

Keys and keyways.

Remove burrs from edges of keyways with a fine file and clean thoroughly before attempting to refit key. Clean and inspect key closely; keys are suitable for refitting only if indistinguishable from new, as any indication may indicate the onset of wear.

Split pins.

Fit new split pins throughout when replacing any unit. Always fit split pins where split pins were originally used. Do not substitute spring washers; there is always a good reason for the use of a split pin.
All split pins should be fitted as shown in Fig.3 unless otherwise stated.

Tabwashers.

Fit new tab washers in all places where they are used. Never replace a used tab washer. Ensure that the new tab washer is of the same design as that replaced.

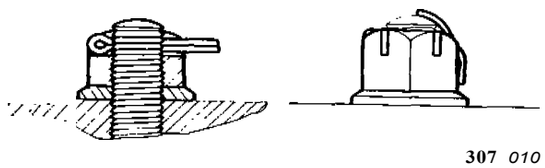


Fig 3

Special fixings.

Bolts are used in various areas of the vehicle with a blue coating applied to the thread. Should any of these bolts be moved or removed they MUST be replaced with a NEW bolt.

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Bolts are used in various areas of the vehicle with a nylon insert. If removed these MUST be renewed.
Nyloc nuts are used in various areas of the vehicle. If removed these MUST be renewed.

Nuts.

When tightening a slotted or castellated nut **NEVER** SLACKEN IT to insert split pin or locking wire except in those recommended cases where this forms part of an adjustment. If difficulty is experienced, alternative washers or nuts should be selected, or washer thickness reduced. Where self-locking nuts have been removed it is advisable to replace them with new ones of the same type.

Note: Where bearing pre-load is involved nuts should be tightened in accordance with special instructions.

Locking wire.

Use new locking wire of the correct type for all assemblies incorporating it.
Arrange wire so that its tension tends to tighten the bolt heads, or nuts, to which it is fitted.

Screw threads.

Both UNF and Metric threads to ISO standards are used. See below for thread identification.

Damaged threads must always be discarded.
Cleaning up threads with a die or tap impairs the strength and closeness of fit of the threads and is not recommended.

Always ensure that replacement bolts are at least equal in strength to those replaced. Do not **allow** oil, grease or jointing compound to enter blind threaded holes. The hydraulic action on screwing in the **bolt** or stud could split the housing.
Always tighten a nut or bolt to the recommended torque figure. Damaged or corroded threads can affect the torque reading.
To check or re-tighten a bolt or screw to a specified torque figure, first slacken a quarter of a turn, then re-tighten to the correct figure. Always oil thread lightly before tightening to ensure a free running thread, except in the case of self-locking nuts.

Unified thread bolt identification.

A circular recess is stamped in the upper surface of the bolt head (1, Fig 1).

Unified thread nut identification.

A continuous line of circles is indented on one **of** the flats of the hexagon, parallel to the axis of the nut (2, Fig 1).

Studs, **brake** rods, etc.

The component is reduced to the core diameter for a short length at its extremity (3, Fig 1).

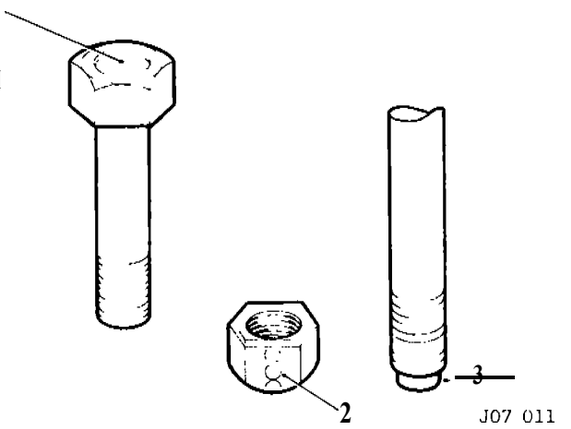


Fig 1

TAPER ROLLER BEARING-FAULT DIAGNOSIS

CONDITION OF BEARING

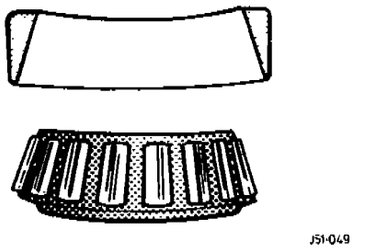


Fig **1**
Good Bearing

CAUSE
Improper handling or **tool** usage.

REMEDY
Replace the bearing.

CONDITION OF BEARING

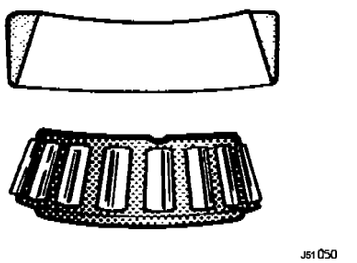


Fig 2
Bent cage

CAUSE
Improper handling or tool usage.

REMEDY
Replace the bearing.

CONDITION OF BEARING

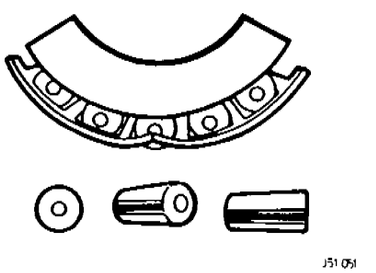


Fig 3
Bent Cage

CAUSE
Marks on roller ends due to overheating.
Lubricant failure or overloading.

REMEDY
Replace the bearing. Check the seals **and** ensure that the bearing is properly lubricated.

CONDITION OF BEARING

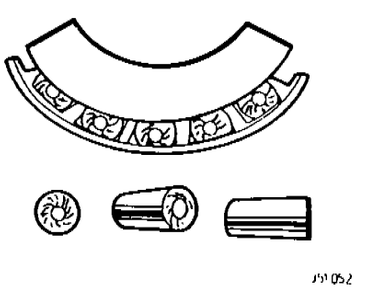


Fig 4
Galling

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TAPER ROLLER BEARING-FAULT DIAGNOSIS

CAUSE
Wear on the roller ends caused **by** fine abrasives.

REMEDY
Clean all components and housing. Check the seals and bearings and replace **if** leaking, rough or noisy.

CONDITION OF BEARING

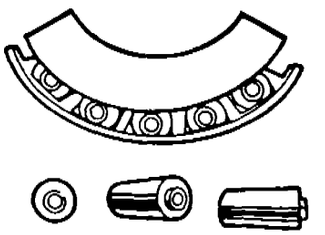


Fig 1
Step wear

CAUSE
The bearing surfaces are grey or greyish black in colour, with the rollers and track material being etched away usually related to roller spacing.

REMEDY
Replace the bearings, check the seals and also ensure there **is** adequate lubrication.

CONDITION OF BEARING

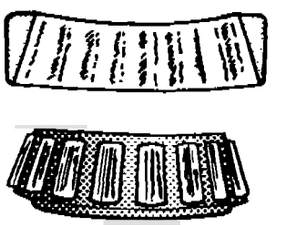


Fig 2
Etching

CAUSE
Outer track misalignment usually **due** to **a** foreign body under the track.

REMEDY
Clean **all** components and replace the bearing and ensure that the new track is correctly seated.

CONDITION OF BEARING

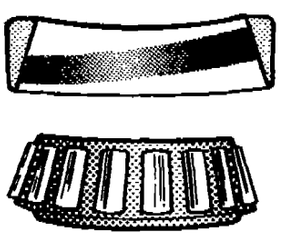


Fig 3
Misalignment

CAUSE
Surfaces are depressed on the race and the track caused **by** hard particles ***of*** foreign material.

REMEDY
Clean all parts and housings, check the Seals and replace if rough or noisy.

CONDITION OF BEARING

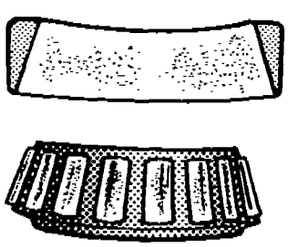


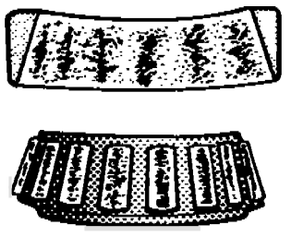
Fig 4
Indentations

TAPER ROLLER BEARING-FAULT DIAGNOSIS

CAUSE
Flaking on the surface material due to fatigue.

REMEDY
Renew the bearing and clean all related components.

CONDITION OF BEARING



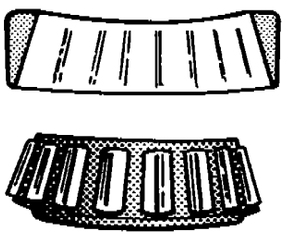
J51-057

Fig 1
Flaking

CAUSE
Surface indentations in track caused by rollers either vibrating or impact loading while the bearing is not rotating.

REMEDY
Replace the bearing if rough or noisy.

CONDITION OF BEARING



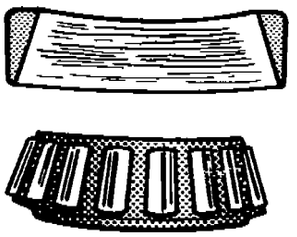
J51-058

Fig 2
Indentations

CAUSE
Wear around the outside diameter of the cage and roller pockets caused by poor lubrication and abrasive material.

REMEDY
Replace the bearings and check the conditions of the seals.

CONDITION OF BEARING



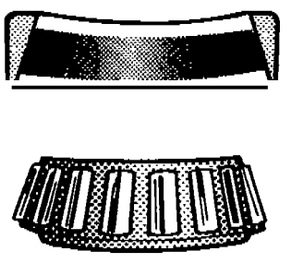
J51-059

Fig 3
Cage wear

CAUSE
Marks on track and rollers caused by fine abrasives.

REMEDY
Clean all components and housings. Check the seal and bearing conditions and renew if leaking or noisy.

CONDITION OF BEARING



J51 060

Fig 4
Roller wear

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TAPER ROLLER BEARING-FAULT DIAGNOSIS

CAUSE
Discolouration ranges from black to light brown caused by moisture or incorrect use of lubricants.

REMEDY
Re-use bearings if stains can be removed by light polishing or if no evidence of overheating is apparent. Check the seal and other component part condition.

CONDITION OF BEARING

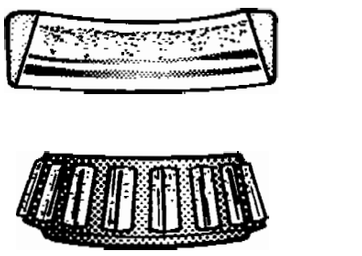


Fig 1
Discolouration

CAUSE
Heat discolouration ranges from blue to faint **yellow** resulting from overload **or** incorrect lubricant. **As** excessive heat can cause softening of tracks and rollers, check **by** drawing a fine file over a softened area. If faulty, file with grab and cut metal; if it remains hard the file will skid over the surface without removing any material.

REMEDY
Renew the bearings and seals if any heat damage is evident.

CONDITION OF BEARING

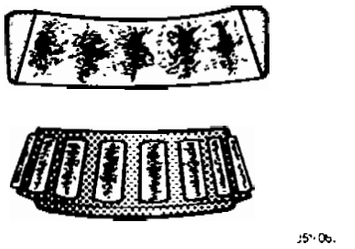


Fig 2
Heat discolouration

CAUSE
Race cracked due to incorrect fitment to shaft, tipping or poor seating.

REMEDY
Renew the bearing and check the condition **of** the seals.

CONDITION OF BEARING

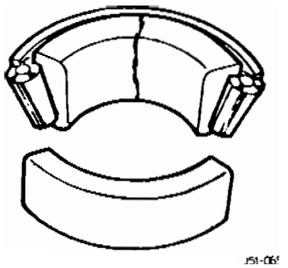


Fig 3
Cracked race

CAUSE
Removal of material **due** to slippage. This can be caused **by** poor fits, incorrect lubrication, overheating, overloading and poor assembly.

REMEDY
Renew bearings and clean **all** related parts, check the fit and ensure the replacement bearings are the correct type. Renew the shaft or housing if damaged.

CONDITION OF BEARING

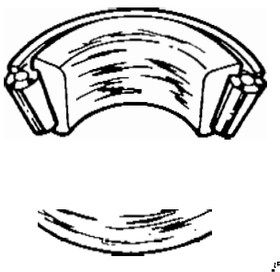


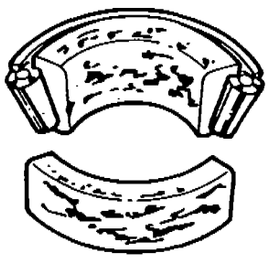
Fig 4
Rotating track and inner race

TAPER ROLLER BEARING-FAULT DIAGNOSIS

CAUSE
Corrosion caused by small movement of components with.nu lubrication.

REMEDY
Renew the bearing, check the seals for leakage and ensure there is adequate lubrication.

CONDITION OF BEARING



/5H-063

Fig 1
Fretting

CAUSE
Caused by lack of lubrication, excessive **loads** or the ingress of foreign matter.

REMEDY
Change the bearings. Check the seals for wear and ensure there is adequate lubrication.

CONDITION OF BEARING

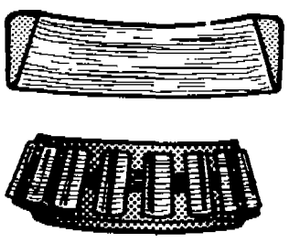


Fig 2
Seizure

0011N

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JACKING AND LIFTING

Wheel-free lift

Use of a wheel-free lift is recommended for maintenance operations. Support the vehicle using lifting pads at the four jacking points.

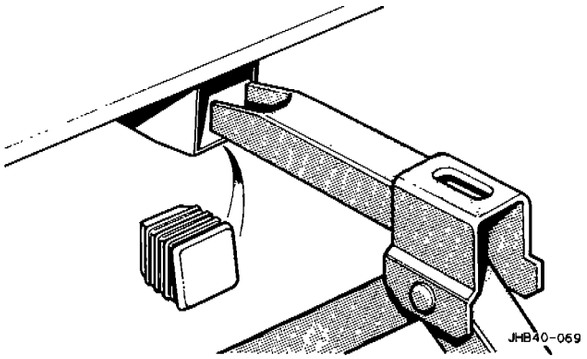


Fig 1

Workshop Jacks

Front - one wheel (Fig 1)

Jack under the lower spring support pan, using a suitable wooden block on the jack head. Place a stand in position at the adjacent jacking point when the wheel is raised.

Rear - one wheel (Fig 2)

Jack under the outer fork of the wishbone to be raised, using a suitable wooden block on the jack head. Place a stand in position at the adjacent jacking point when the wheel is raised.

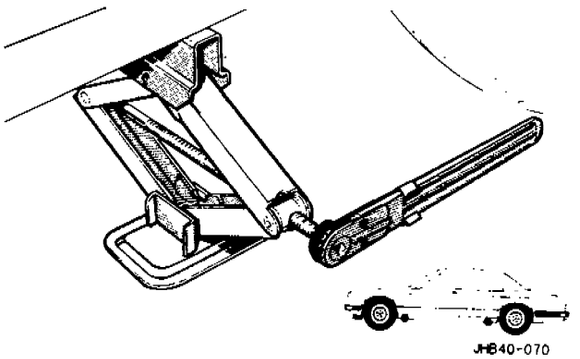


Fig 2

Front - both wheels (Fig 3)

Jack centrally under the front crossmember using a suitable wooden block under the jack head. Place stands under both front jacking points when the vehicle is raised.

Rear - both wheels (Fig 4)

Jack centrally under the rear crossmember using a suitable wooden block under the jack head. Place stands under both rear jacking points when the vehicle is raised.

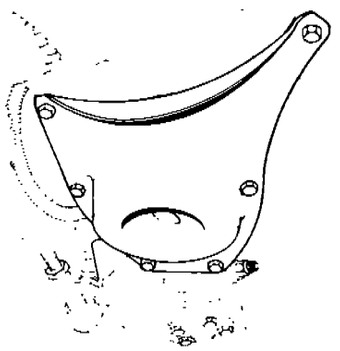


Fig 3

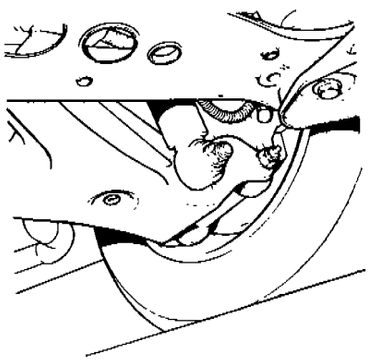


Fig 4

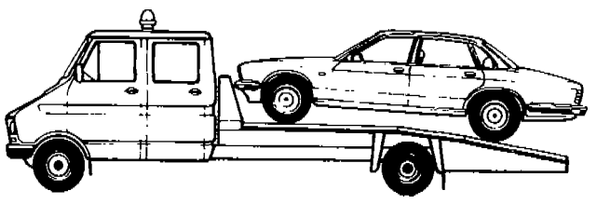
General

The preferred method of vehicle recovery is by suspended tow or flat bed transporter. The front and rear towing loops are primarily for emergency use when towing for SHORT DISTANCES, e.g. removing the vehicle if it is causing an obstruction or winching the vehicle onto a recovery transporter.
When being towed, the vehicle's gear lever must be in neutral with the ignition key turned to position 'II' to release the steering lock and render the indicators, horn and brake lights operational.

Note: Certain vehicles fitted with energy absorbing bumpers do not have a front tow loop. In this instance the vehicle can be towed SHORT DISTANCES using a rope or chain wrapped around the lower front wishbone rear arm (to run inboard of the road spring). The rope or chain must NOT be wrapped around the front suspension beam. Care must be taken to avoid damaging the front air spoiler.

Transporting (Fig 1)

If the vehicle is being transported on a trailer or vehicle flatbed transporter, the handbrake must be applied, the wheels chocked and (if fitted with automatic gearbox) the gear selector lever moved to 'N' or 'D' but NEVER to **'P'.**
There are four transporter tie down brackets on the vehicle underbody. Do not attach tie down hooks to the towing loops.



JH8 40 206

Fig 1

Towing Recovery

Adhere to towing regulations: in certain countries the registration number of the towing vehicle and an 'ON TOW' sign or warning triangle must be displayed in a prominent position at the rear of the vehicle being towed.

WARNING: WHEN THE ENGINE IS NOT RUNNING, THE STEERING AND BRAKES WILL NO LONGER BE POWER-ASSISTED. APPLICATIONS OF THE BRAKE PEDAL WILL GRADUALLY DEPRESSURIZE THE ACCUMULATOR. THEREFORE BE PREPARED FOR RELATIVELY HEAVY STEERING AND THE NEED FOR GREATLY INCREASED BRAKE PEDAL PRESSURE.

The vehicle may be towed by another for SHORT DISTANCES with the gear lever in neutral ('N') provided a speed of 48 km/h (30 mph) is not exceeded.

Vehicles with Defective Automatic Transmission:

The vehicle must be towed with the rear wheels clear of the ground (see suspended towing) or the propeller shaft. disconnected at the final drive input flange. If

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the propeller shaft is disconnected it must be firmly secured away from the final drive flange.

Suspended Towing

Ensure that the recovery team follow these instructions:

DO NOT tow with sling-type equipment since damage to the bodywork may result.

Front suspended (Fig 1)

1. Remove the ignition key from the ignition/steering lock.

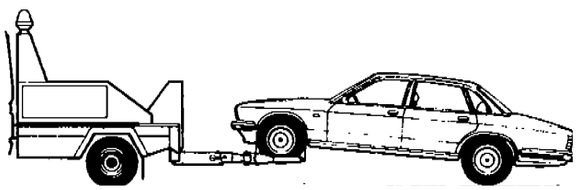
2. Vehicles with automatic transmission: Disconnect the propeller shaft at the final drive input flange. Ensure the propeller shaft is firmly secured away from the final drive input flange.

   or alternatively:

   Providing a distance of **48 km** (30 miles) is not to be exceeded, add an extra 1.7 litres (3 pints) of the recommended fluid to the gearbox through the filler tube.

   Note: Before the vehicle is driven again the excess fluid must be drained and the level checked.

3. Raise the vehicle using a 'spectacle frame' type lifting device where a cradle is positioned under each front wheel as indicated.



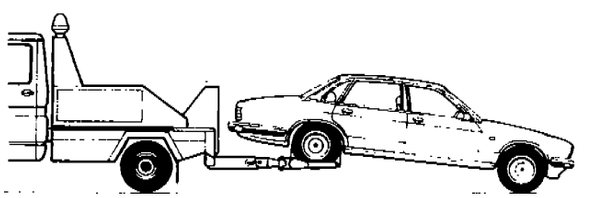
JHB40 207

Fig 1

Rear suspended (Fig 2)

1. Remove the ignition key from the ignition/steering lock.

2. Raise the vehicle using a 'spectacle frame' type lifting device where a cradle is positioned under each rear wheel as indicated.



JHB40 208

Fig 2

0012N

OILS AND GREASE (UNITED KINGDOM AND R.O.W.)

Component	Specification	SAE Viscosity Rating	Preferred Brands
Engine Oil Can	BLS.22.OL.02 BLS.22.OL.07 or CCMC G3. If above are not available, use API SF minimum		Castrol Syntron Castrol Syntron X Castrol Formula RS Castrol TXT Castrol TXT Softec
Manual Gearbox - 2.9 litre Manual Gearbox - 3.2 litre and 4.0 litre	API GL4 Dexron IID	EP80	Castrol EP80 Castrol Hypoy Light Castrol Transrnax M Castrol Dexron II
Automatic Transmission	Dexron IID		Castrol Transrnax M Castrol TQ Dexron II
Differential - Refill Top up only if above oil is not available	API GL5 API GL5	90 EP 90	Shell Spirax Super 90 Castrol EPX 80W/90
Power Assisted Steering/Rear Ride Levelling System (where fitted)			Castrol Hydraulic System Mineral Oil (HSMO) Jaguar Hydraulic System Mineral Oil
Grease Points	Multipurpose Lithium Grease NLGI No 2	Castrol LM	
Braking System"	DOT 4		Jaguar Brake Fluid or Castrol Girling Universal/Disc
Clutch System*	DOT 4		Jaguar Brake Fluid or Castrol Girling Universal/Disc

"CAUTION: These fluids must not be mixed with or added to any other oil/fluid.

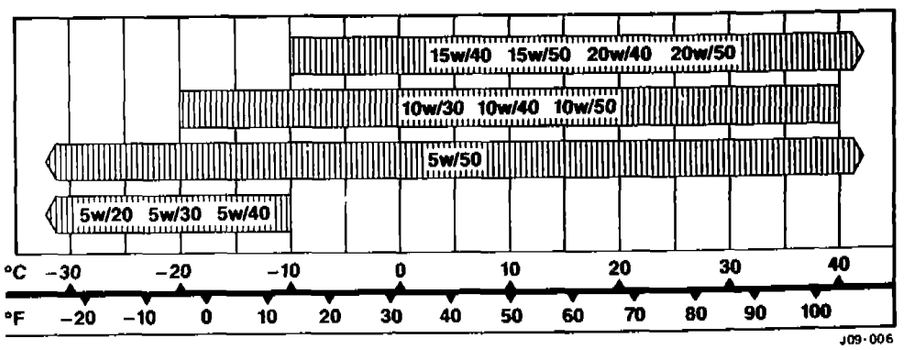
SYNTHETIC OILS

If synthetic oils are used, they must conform to BLS 22.OL.07 standards. The ambient temperature chart applies equally to mineral and synthetic oils.
Synthetic and mineral oils are completely miscible and may be used separately or mixed.

USED ENGINE OIL

WARNING: PROLONGED EXPOSURE TO USED ENGINE OIL CAN CAUSE SERIOUS SKIN DISORDERS, AVOID EXCESSIVE CONTACT. WASH WELL AFTER CONTACT.

Engine Oil - Recommended SAE Viscosity Range/Ambient Temperature Scale



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OILS AND GREASE (UNITED STATES)

Component	Specification	SAE Viscosity Rating	Preferred Brands
Engine Oil Can	BLS.22.OL.02 BLS.22.0L.07 or CCMC G3. If above are not available, use API SF minimum		Castrol GTX
Automatic Transmission	Dexron IID		Castrol Dexron II/Mercon
Differential - Refill Top up only if above oil is not available	API GL5 API GL5	90 80W - 90	Shell Spirax Super 90 Castrol Hypoy C80W - 90
Power Assisted Steering/ Rear Ride Levelling System (where fitted)			Castrol Hydraulic System Mineral Oil (HSMO). Jaguar Hydraulic System Mineral Oil
Grease Points	Multipurpose Lithium Grease NLGI No 2		Castrol MP Grease
Braking System"	DOT 4		Jaguar Brake Fluid or Castrol GT LMA

*CAUTION: These fluids must not be mixed with or added to any other oil/fluid.

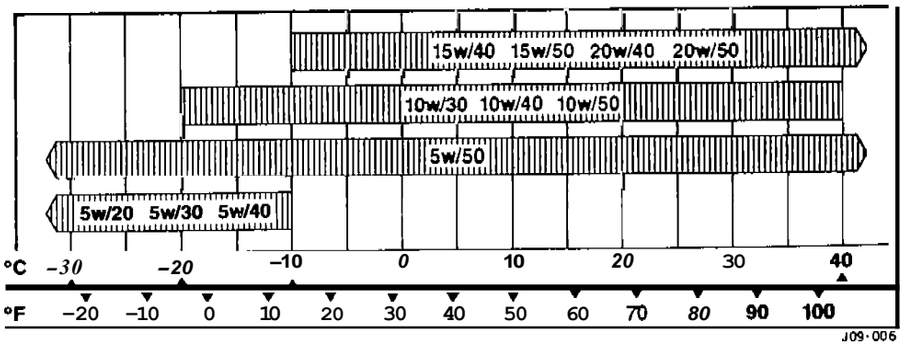
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USED ENGINE OIL

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Engine Oil - Recommended SAE Viscosity Range/Ambient Temperature Scale



OILS AND GREASE (AUSTRALIA)

Component	Specification	SAE Viscosity Rating	Preferred Brands
Engine Oil Can	BLS.22.OL.02 BLS.22.OL.07 or CCMC G3. If above are not available, use API SF minimum		Castrol Syntron Castrol FMX
Automatic Transmission	Dexron IID		Castrol TQ Dexron II
Differential - Top up only if above oil is not available	API GL5 API GL5	90 EP90	Shell Spirax Super 90 Castrol EPX 90
Power Assisted Steering			Castrol Hydraulic System Mineral Oil (HSMO). Jaguar Hydraulic System Mineral Oil
Grease Points	Multipurpose Lithium Grease NLGI No 2		Castrol LM Grease
Braking System*	DOT 4		Jaguar Brake Fluid or Castrol Ultra Stop

***CAUTION:** **These fluids must not be mixed with or added to any other oil/fluid.**

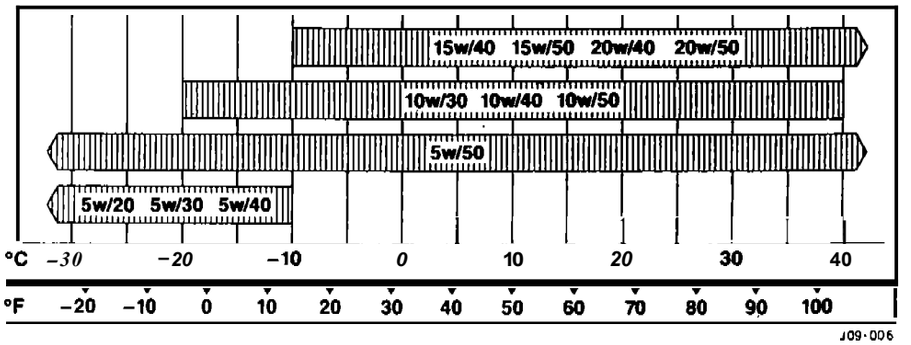
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USED ENGINE OIL

WARNING: **PROLONGED EXPOSURE TO USED ENGINE OIL CAN CAUSE SERIOUS SKIN DISORDERS. AVOID EXCESSIVE CONTACT. WASH WELL AFTER CONTACT.**

Engine Oil - Recommended SAE Viscosity Range/Ambient Temperature Scale



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OILS AND GREASE (CANADA)

Component	Specification	SA€ Viscosity Rating	Preferred Brands
Engine Oil Can	BLS.22.0L.02 BLS.22.0L.07 or CCMC G3. If above are not available, use **API** SF minimum		Castrol **XLR**
Automatic Transmission Powr-lok Differential Top up only if above oil is not available	Dexron IID **API** GL5 **API** GL5	 90 EP90	Castrol Dexron II/ Mercon Shell **Spirax** Super 90 **Castrol Hypoy** *c* 80W/90
Power Assisted Steering/ Rear Ride Levelling System			Castrol Hydraulic System Mineral Oil (HSMO). Jaguar Hydraulic System Mineral Oil
Grease Points	Multipurpose Lithium Grease NLGI No 2		Castrol LM Grease
Braking System*	DOT 4		Jaguar Brake Fluid **or** Castrol GT

***CAUTION:** **These fluids must riot be mixed with or added to any other oillfluid.**

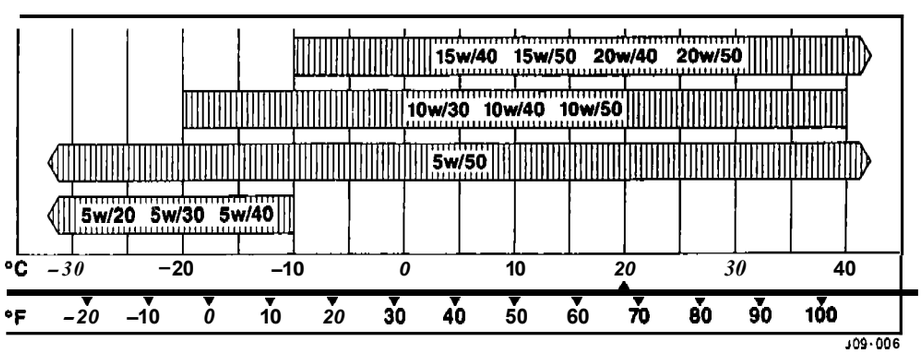
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Synthetic and mineral oils are completely miscible and may be used separately or mixed.

USED ENGINE OIL

WARNING: **PROLONGED EXPOSURE TO USED ENGINE OIL CAN CAUSE SERIOUS SKIN DISORDERS. AVOID EXCESSIVE CONTACT, WASH WELL AFTER CONTACT.**

Engine Oil - Recommended SAE Viscosity Range/Ambient Temperature Scale



0013N

COOLING SYSTEM ADDITIVES/COOLANT (UNITED KINGDOM)

Additive

Jaguar 'Radiator Leak Sealer' or 'Barrs Leaks'. One 135ml bottle per vehicle.

Coolant

Jaguar Anti-freeze. If this is not available, use phosphate free anti-freeze conforming to specification **BS** 6580.

Concentration

50% with a Specific Gravity ***of*** 1.079 (taken from the radiator header tank). This mixture is suitable for -36°C (-33°F).
Should protection to -40°C (-40°F) be required, the coolant concentration must be increased to 55% with a Specific Gravity of 1.086.

COOLING SYSTEM ADDITIVES/COOLANT (UNITED STATES & CANADA)

Additive

Jaguar 'Radiator Leak Sealer' or 'Barrs Leaks'. One 135ml bottle per vehicle.

Coolant

Jaguar Anti-freeze and Summer Coolant. If this is **not** available, use phosphate free anti-freeze conforming to specification BS 6580.

Concentration

50% with a Specific Gravity of 1.079 (taken from the radiator header tank). This mixture is suitable for -36°C (-33°F).
Should protection to -40°C (-40°F) be required, the coolant concentraticn **must** be increased to 55% with a Specific Gravity of 1.086.

COOLING SYSTEM ADDITIVES/COOLANT (AUSTRALIA)

Additive

Jaguar 'Radiator Leak Sealer' or 'Barrs Leaks'. One 135ml bottle per vehicle.

Coolant

JRA Limited Year Round Coolant. If this is not available, use phosphate free anti-freeze conforming **to** specification BS 6580.

Concentration

33% with a Specific Gravity of 1.050 (taken from the radiator header tank). This mixture is suitable for -1**9°C.**
Should protection to -34°C be required, the coolant concentration must be increased to 50% with a Specific Gravity of 1.074.

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CAPACITIES

	Litres	Imperial Pints	U.S. Quarts
Engine refill (including filter)	8.0	14.1	8.5
(excluding filter)	7.45	13.1	7.9
Automatic transmission unit			
From dry - 2.9 litre	7.4	13.0	7.8
From dry - 3.2 litre	10.2	17.9	10.8
From dry - 4.0 litre	10.2	17.9	10.8
- Drain and refill - 2.9 litre	3.0	5.3	3.2
3.2 litre	4.28	7.5	4.5
4.0 litre	4.28	7.5	4.5
- Top up rnin-rnax - 2.9 litre	0.25	0.4	0.26
3.2 litre	0.60	1.0	0.60
4.0 litre	0.60	1.0	0.60
Manual gearbox, drain & refill	1.4	2.5	1.5
Final drive unit	2.1	3.7	2.2
Cooling system, including reservoir and air conditioning:			
Initial fill from dry	12.3	21.7	13.0
Drain and refill	9.2	16.2	9.7
Washer reservoir (Headlamp power wash vehicles)	6.2	10.9	6.6
(non-headlamp power wash vehicles)	3.5	6.2	3.7
Clutch fluid capacity	0.15	0.28	0.17
Brake fluid capacity:			
RHD non-ABS	0.46	0.81	0.487
LHD non-ABS	0.45	0.80	0.476
RHD with ABS	0.465	0.82	0.492
LHD with ABS	0.485	0.85	0.513
Fuel tank	86.6	19.0 gal	22.8 U.S. gal

Dimensions

	mm	inches
Wheelbase	2870	113
Track: Front	1500	59.1
Track: Rear	1498	59.0
Overall length	4988	196.4
Overall width (without mirrors)	1798	70.8
(with mirrors)	2015	79.3
Overall height		
with self-levelling suspension	1358	53.5
without self-levelling suspension	1380	54.3
USA/Canada	1349	53.1
Turning circle: wall to wall (ROW)	12.9 m	508
Turning circle: kerb to kerb	12.4 m	488
Turning circle: wall to wall (N. America)	12.3 m	483.6
Turning circle: kerb to kerb	11.6 m	456
Ground clearance: kerb condition	175	6.9

WEIGHTS

ALL MODELS EXCEPT NORTH AMERICA

	2.9 litre models		3.2 litre models		4.0 litre models	
	kg	(lb)	kg	(lb)	kg	(lb)
Kerb weight	1750	(3859)	1800	(3696)	1800	(3969)
Front axle kerb weight	910	(2006)	951	(2096)	945	(2084)
Rear axle kerb weight	840	(1852)	849	(1872)	855	(1885)
Gross vehicle weight (G.V.W.)	2170	(4785)	2220	(4895)	2220	(4895)
Gross front axle weight !Maximum)	1030	(2271)	1065	(2348)	1070	(2359)
Gross rear axle weight (Maximum)	1160	(2558)	1200	(2646)	1180	(2602)
*Gross vehicle combination weight	3670	(8092)	3720	(8202)	3745	(8257)

NORTH AMERICAN MODELS

	XJ6		Sovereign	
	kg	(lb)	kg	(lb)
Kerb weight	1770	(3903)	1796	(3960)
Front axle kerb weight	939	(2071)	946	(2086)
Rear axle kerb weight	831	(1832)	850	(1874)
Gross vehicle weight (G.V.W.)	2180	(4807)	2206	(4864)
Gross front axle weight	1032	(2276)	1039	(2291)
Gross rear axle weight	1148	(2531)	1167	(2573)
"Gross vehicle combination weight:	3680	(8114)	3706	(8171)

*Gross combination weight is the gross vehicle weight plus maximum recommended trailer weight.

ALL MARKETS

	kg	(lb)
Roof rack capacity including weight of rack	100	(220)
Maximum permitted luggage compartment load with 5 passengers	70	(154.3)
Maximum loading - including people and luggage (deduct roof rack capacity if fitted)	420	(924)

Trailer weight maximum

	2.9 MANUAL MODELS		ALL MODELS EXCEPT MANUAL	
	kg	(lb)	kg	(lb)
-Braked	1300	(2680)	1500	(3300)
-Unbraked	650	(1430)	750	(1650)

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FUEL REQUIREMENTS (1990 MY)

Key to system legend

L - Leaded.
U - Unleaded.
S - Standard compression.
H - High compression.

MARKET	Down Pipe Catalyst	Under Floor Catalyst	Compression Ratio	Fuel Evaporative Loss Control System	Fuel Octane
Australia:					
4.0	X	X	H	X	91 U
Austria:					
4.0	X	X	H	X	95 U
Belgium:					
2.9		X	S		95 U
4.0	X	X	H		95 U
Canada:					
4.0	X	X	H	X	95 U
Denmark:					
2.9		X	S		95 U
4.0	X	X	H		95 U
Eire:					
2.9 Standard			S		97 L/95 U
2.9 Optional		X	S		95 U
4.0 Standard			H		97 L/95 U
4.0 Optional	X	X	H		95 U
Europe (Excluding countries shown individually):					
2.9			H		97 L
4.0			H		97 L/95 U
France:					
2.9		X	S		95 U
4.0	X	X	H		95 U
Germany:					
4.0	X	X	H		95 U
Italy:					
2.9		X	S		95 U
4.0	X	X	H		95 U
Japan:					
4.0	X	X	H	X	95 U
Korea:					
4.0	X	X	H	X	91 U
Luxembourg:					
2.9		X	S		95 U
4.0	X	X	H		95 U
Middle East:					
2.9			S	X	91 L
4.0			H	X	91 L

FUEL REQUIREMENTS (1990 MY) (CONTINUED)

MARKET	Down Pipe Catalyst	Under Floor Catalyst	Compression Ratio	Fuel Evaporative Loss Control System	Fuel Octane
Netherlands:					
2.9		X	S		95 U
4.0	X	X	H		95 U
Norway:					
4.0	X	X	H	X	95 U
Spain (including Canaries):					
4.0 Standard			H		97 L/95 U
4.0 Optional	X	X	H		95 U
Sweden:					
4.0	X	X	H	X	95 U
Switzerland:					
4.0	X	X	H	X	95 U
Taiwan:					
2.9			S	X	95 U
4.0			H	X	95 U
United Kingdom:					
2.9 Standard			S		97 L/95 U
2.9 Optional		X	S		95 U
4.0 Standard			H		97 L/95 U
4.0 Optional	X	X	H		95 U
USA:*					
4.0	X	X	H	X	95 U
Rest of World:					
2.9			S		91 L
2.9			H		97 L
4.0			H		97 L/95 U

*Note that **USA** models **are also fitted** with **air** injection and **EGR** systems **as** standard.

FUEL REQUIREMENTS (1991 MY)

MARKET	Down Pipe Catalyst	Under Floor Catalyst	Compression Ratio	Fuel Evaporative Loss Control System	Fuel Octane
Australia:					
4.0	X	X	H	X	91 U
Austria:					
3.2	X	X	H	X	95 U
4.0	X	X	H	X	95 U
Belgium:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Canada:					
4.0	X	X	H	X	95 U

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FUEL REQUIREMENTS (1991 MY) (CONTINUED)

MARKET	Down Pipe Catalyst	Under Floor Catalyst	Compression Ratio	Fuel Evaporative Loss Control System	Fuel Octane
Denmark:					
3.2	X	X	H	X	95 U
4.0	X	X	H	X	95 U
Eire:					
3.2	X	X	H		95 U
4.0 Standard	X	X	H		95 U
4.0 Optional			H		95 L/U
France:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Finland:					
3.2	X	X	H	X	95 U
4.0 Standard	X	X	H	X	95 U
4.0 Optional			H		95 L/U
Germany:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Greece:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Hong Kong:					
3.2	X	X	H		95 U
4.0			H		95 U/L
Italy:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Japan:					
3.2	X	X	H	X	95 U
4.0	X	X	H	X	95 U
Korea:					
4.0	X	X	H	X	91 U
Luxembourg:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Malta:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Middle East:					
4.0			H	X	91 L
Netherlands:					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Norway:					
3.2	X	X	H	X	95 U
4.0	X	X	H	X	95 U

FUEL REQUIREMENTS (1991 MY) (CONTINUED)

MARKET	Down Pipe Catalyst	Under Floor Catalyst	Compression Ratio	Fuel Evaporative Loss Control System	Fuel Octane
Portugal:					
3.2	X	X	H		95 U
4.0 Standard	X	X	H		95 U
4.0 Optional			H		95 L/U
Singapore:					
3.2	X	X	H		95 U
4.0			H		95 U/L
Spain (including Canaries):					
3.2	X	X	H		95 U
4.0	X	X	H		95 U
Sweden:					
3.2	X	X	H	X	95 U
4.0	X	X	H	X	95 U
Switzerland:					
3.2	X	X	H	X	95 U
4.0	X	X	H	X	95 U
Taiwan:					
3.2	X	X	H	X	95 U
4.0	X	X	H	X	95 U
United Kingdom:					
3.2	X	X	H		95 U
4.0 Standard	X	X	H		95 U
4.0 Optional			H		95 U/L
USA:*					
4.0	X	X	H	X	95 U
Rest of World:					
4.0			H		95 U/L

"Note that **USA** models are also fitted **with** air injection and **EGR systems** as standard.

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SERVICE INTERVALS

The Maintenance Schedules list all the maintenance operations and the frequency at which they are required.

Maintenance after the First Free Service must be carried out at 12 000 kilometres (7 500 miles) or 6 months from date of delivery, whichever comes first. Subsequent maintenance must be carried out at intervals not exceeding 12 000 kilometres (7 500 miles) or 6 months, whichever comes first.

Vehicles that cover a low annual distance (mileage), a high proportion of short journeys, or operate in severe conditions, may require more frequent servicing or particular attention to specific items.

The Maintenance Schedules may be revised from time to time. Jaguar Dealers will be notified of revisions by Service Policy Letters or Technical Bulletins.

The Maintenance Schedule lists on pages 10-02 and 10-03 are for vehicles supplied to all markets except for North America.

The Maintenance Schedule lists on pages 10-04 and 10-05 are for vehicles supplied to North America only.

The Maintenance Procedures are detailed from page 10-06 onwards.

VEHICLE PROTECTION KIT

Cover the seats, carpets and steering wheel with protective covers and polythene sheets. Wear clean overalls and wash hands or wear gloves before working inside the vehicle. Always fit covers to protect the wings before commencing work in the engine compartment.

WHEEL-FREE LIFT

The use of a wheel-free lift is recommended for maintenance operations. Follow the operating instructions given by the manufacturer of the lift and support the vehicle using lifting pads at the four jacking points.

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MAINTENANCE SCHEDULE
EXCEPT NORTH AMERICA

Note: The period between services should not exceed 6 months **or** 12000 kilometres *(7* 500 miles), whichever comes first.

	MAINTENANCE INTERVALS								
Kilometres X 1000	1.5	12	**24**	36	48	60	72	**84**	96
Miles X 1000	1	***7.5***	**15**	22.5	30	37.5	45	**52.5**	*60*
Operation Description									
FLUIDS, FILTERS AND LEAKS CHECK									
1. Renew engine oil and filter canister.	X	X	X	X	X	X	X	X	X
2. Check engine for oil leaks.	X	X	X	X	X	X	X	X	X
3. Renew air cleaner element.			X		X		X		X
4. Clean crankcase breather gauze - 2.9 only.					X				X
5. Renew automatic transmission fluid and filter.					X				X
6. Check/top up automatic transmission fluid.	X	X	X	X	X	X	X	X	X
7. Check automatic transmission for fluid leaks.		X	X	X	X	X	X	X	X
8. Renew manual gearbox oil.	X				X				X
9. Check manual gearbox for oil leaks - top up if necessary.		X	X	X	X	X	X	X	X
10. Renew rear axle oil - Middle East only.			X		X		X		X
11. Check/top up rear axle oil.	X								
12. Check **rear axle** for oil leaks - top up if necessary.		X	X	X	X	X	X	X	X
13. Renew coolant - assure specific gravity.					X				X
14. Check/top up cooling system		X	X	X	X	X	X	X	X
15. Check cooling/heating system for leaks.	X	X	X	X	X	X	X	X	X
16. Renew fuel filter.									X
17. Check for fuel leaks.	X	X	X	X	X	X	X	X	X
18. Check/top up brake fluid reservoir.	X	X	X	X	X	X	X	X	X
19. Renew brake fluid.				EVERY *2* **YEARS.**					
20. Check/top up power steering fluid/rear ride levelling system reservoir*.	X	X	X	X	X	X	X	X	X
Renew power steering/rear ride levelling system fluid*.				EVERY **5 YEARS.**					
***CAUTION: Use H.S.M.O. oils only.**									
21. Check suspension dampers for fluid leaks.			X		X		X		
22. Check hydraulic pipes, **hoses** and unions for leaks.	X	X	X	X	X	X	X	X	X
23. Check/top up clutch fluid reservoir.	X	X	X	X	X	X	X	X	X
24. Check/top up windscreen and headlamp washer reservoir.	X	X	X	X	X	X	X	X	X
25. Check exhaust system for leaks.	X		X		X		X		X
26. Check power steering/rear ride levelling system for leaks.	X	X	X	X	X	X	X	X	X
27. Check air conditioning sight glass.			X		X		X		X
28. Check air conditioning system for leaks.	X								
MECHANICAL FUNCTION CHECK									
29. Grease door check mechanisms.		X	X	X	X	X	X	X	X
30. Grease drive shaft universal joints.			X		X		X		X
31. Check/adjust drive belt tension. Renew if necessary	X				X				X
32. Check and reset front hub clearance			X		X		X		X
33. Adjust handbrake.			X		X		X		X
34. Check handbrake shoes - replace if necessary.									X
35. Inspect brake pads for wear (disc condition on pad change).		X	X	X	X	X	X	X	X
36. Renew windscreen wiper blade.		X	X	X	X	X	X	X	X
37. Clean out radiator matrix and condenser to remove dirt accumulation, etc.					X				X

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MAINTENANCE SUMMARY

Operation Description	MAINTENANCE INTERVALS								
Kilometres X 1000	1.5	12	24	36	48	60	72	84	96
Miles X 1000	1	7.5	15	22.5	30	37.5	45	52.5	60
MECHANICAL FUNCTION CHECK (Continued)									
38. Check condition/operation of all seat belts.			X		X		X		X
39. Check exhaust system for security.	X		X		X		X		X
40. Visually check hoses, pipes and unions for chafing, cracks and corrosion including levelling units.	X	X	X	X	X	X	X	X	X
41. Check power steering hydraulic pipes and unions for chafing and security.	X	X	X	X	X	X	X	X	X
42. Check security and condition of fuel hoses.			X		X		X		X
43. Check speed (cruise) control system vacuum hoses for security and condition.	X	X	X	X	X	X	X	X	X
44. Check cooling/heating system hoses for security and condition.	X	X	X	X	X	X	X	X	X
45. Check air conditioning hoses for security and condition.	X								
46. Check condition of steering unit joint covers.			X		X		X		X
47. Check tightness of steering rack securing bolts.	X								
48. Check the general condition of the underbody anti-corrosion protection.			X		X		X		X
ELECTRICAL FUNCTION CHECK									
49. Renew spark plugs (Except Sweden).			X		X		X		X
Renew spark plugs (Sweden only).					X				X
50. Clean and adjust spark plugs (Except Sweden)		X		X		X		X	
51. Push high tension (H.T.) leads firmly home.	i	r	X	X	X	X	X	X	X	X
52. Check CO level	X		X		X		X		X
53. Check/top up battery electrolyte			X		X		X		X
54. Clean and grease battery connections.	X	X	X	X	X	X	X	X	X
55. Check/adjust headlamp alignment.	X								
56. Check operation of warning systems.	X		X		X		X		X
57. Check audible warnings.	X	X		X		X		X	
58. Check operation of horns.	X		X		X		X		X
59. Check operation of windscreen wiper.	X								
60. Check operation of windscreen/headlamp washers for delivery spray pattern.	X	X	X	X	X	X	X	X	X
61. Clean radio aerial mast.	X	X	X	X	X	X	X	X	X
WHEELS AND TYRES CHECK									
62. Check that tyres are correct size snd type.		X	X	X	X	X	X	X	X
63. Check tyre tread depth.	X	X	X	X	X	X	X	X	X
64. Check tyres for uneven and excessive wear and damage including sidewalls.	X	X	X	X	X	X	X	X	X
65. Check/adjust tyre pressures including spare.	X	X	X	X	X	X	X	X	X
66. Check tightness of road wheel nuts.	X	X	X	X	X	X	X	X	X
GENERAL									
67. Clean exterior of windscreen with Jaguar Screen Clean Paste.		X	X	X	X	X	X	X	X
ROAD TEST CHECK									
68. Carry out road/roller test	X	X	X	X	X	X	X	X	X

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MAINTENANCE SCHEDULE
NORTH AMERICA ONLY

	MAINTENANCE INTERVALS								
Kilometres X 1000	1.5	12	24	36	48	60	72	84	96
Miles X 1000	1	7.5	15	22.5	30	37.5	45	52.5	60
Operation **Description**									
FLUIDS, FILTERS AND LEAKS CHECK									
Renew engine oil and filter canister.	X	X	X	X	X	X	X	X	X
Check engine for oil leaks.	X	X	X	X	X	X	X	X	X
Clean air cleaner element.			X				X		
Renew air cleaner element.					X				X
Renew automatic transmission fluid and filter.					X				X
Check/top up automatic transmission fluid.	X	X	X	X	X	X	X	X	X
Check automatic transmission for fluid leaks.	X	X	X	X	X	X	X	X	X
Check/top up rear axle oil.	X								
Check rear axle for oil leaks - top up if necessary.		X	X	X	X	X	X	X	X
Renew coolant - assure specific gravity.					X				X
Check/top up cooling system		X	X	X	X	X	X	X	X
Check cooling and air conditioning system for leaks.	X	X	X	X	X	X	X	X	X
Renew fuel filter.									X
Check for fuel leaks.	X	X	X	X	X	X	X	X	X
Check/top up brake fluid reservoir.	X	X	X	X	X	X	X	X	X
Renew brake fluid.				EVERY 2 **YEARS.**					
Check/top up power steering fluid/rear ride levelling system reservoir*	X	X	X	X	X	X	X	X	X
Renew power steering/rear ride levelling system fluid*				EVERY 5 YEARS.					
***CAUTION: Use H.S.M.O. oils only.**									
Check suspension dampers for fluid leaks.			X		X		X		X
Check hydraulic pipes, hoses and unions for leaks.	X	X	X	X	X	X	X	X	X
Check/top up windscreen and headlamp washer reservoir.	X	X	X	X	X	X	X	X	X
Check exhaust system for leaks.	X		X		X		X		X
Check power steering/rear ride levelling system for leaks.	X	X	X	X	X	X	X	X	X
Check air conditioning sight glass.			X		X		X		X
Check air conditioning system for leaks.	X								
MECHANICAL FUNCTION CHECK									
Grease door check mechanisms.	X	X	X	X	X	X	X	X	X
Grease drive shaft universal joints.			X		X		X		X
Check/adjust drive belt tension. Renew if necessary.	X				X				X
Check and reset front hub clearance			X		X		X		X
Adjust handbrake.			X		X		X		X
Check handbrake shoes - replace if necessary.									X
Inspect brake pads for wear (disc condition on pad change).		X	X	X	X	X	X	X	X
Renew windscreen wiper blade.		X	X	X	X	X	X	X	X
Clean out radiator matrix and condenser to remove dirt accumulation, etc.					X				X
Check condition/operation of all seat belts.			X		X		X		X
Check exhaust system for security.	X		X		X		X		X
Visually check hoses, pipes and unions for chafing, cracks and corrosion including levelling units.	X	X	X	X	X	X	X	X	X
Check power steering hydraulic pipes and unions for chafing and security.	X	X	X	X	X	X	X	X	X
Check security and condition of fuel hoses.			X		X		X		X

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NORTH AMERICA ONLY (Continued)

Operation Description	MAINTENANCE INTERVALS								
Kilometres X 1000	1.5	12	24	36	48	60	72	84	96
Miles X 1000	1	7.5	15	22.5	30	37.5	45	52.5	60
MECHANICAL FUNCTION CHECK (Continued)									
Check speed (cruise) control system vacuum hoses for security and condition.	X	X	X	X	X	X	X	X	X
Check cooling and air conditioning system hoses for security and condition.	X	X	X	X	X	X	X	X	X
Check condition of steering unit joint covers.			X		X		X		X
Check tightness of steering rack securing bolts.	X								
Check the general condition of the underbody anti-corrosion protection.			X		X		X		X
ELECTRICAL FUNCTION CHECK									
Renew spark plugs					X				X
Push high tension (H.T.) leads firmly home.	X	X	X	X	X	X	X	X	X
Check/top up battery electrolyte			X		X		X		X
Clean and grease battery connections.	X	X	X	X	X	X	X	X	X
Check/adjust headlamp alignment.	X								
Check operation of lamps.	X	X	X	X	X	X	X	X	X
Check audible warnings.	X	X		X		X		X	
Check operation of horns.	X		X		X		X		X
Check operation of windscreen wiper.	X								
Check operation of windscreen/headlamp washers for delivery spray pattern.	X	X	X	X	X	X	X	X	X
Check operation of inertia switch.		X	X	X	X	X	X	X	X
Clean radio aerial mast.	X	X	X	X	X	X	X	X	X
WHEELS AND TYRES CHECK									
Check that tyres are correct size and type.		X	X	X	X	X	X	X	X
Check tyre tread depth.	X	X	X	X	X	X	X	X	X
Check tyres for uneven and excessive wear and damage including sidewalls.	X	X	X	X	X	X	X	X	X
Check/adjust tyre pressures including spare.	X	X	X	X	X	X	X	X	X
Check tightness of road wheel nuts.	X	X	X	X	X	X	X	X	X
GENERAL									
Clean exterior of windscreen with Jaguar Screen Clean Paste.	X	X	X	X	X	X	X	X	X
ROAD TEST CHECK									
Carry out road/roller test.	X	X	X	X	X	X	X	X	X

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MAINTENANCE PROCEDURE

The maintenance schedule lists on pages 10-02 to 10-06 give details of mile and kilometre intervals for the following operations. The figure to the left *of* each heading refers to the item number on the maintenance schedule.

FLUIDS, FILTERS AND LEAKS CHECK

1. Renew engine oil and filter canister

Drain engine oil

Preferably this should be done when the engine oil is warm and therefore the oil drains more readily.
Place an open container with a capacity **of** at least 10 litres (17.6 pints) under the sump drain plug.
Before removing the drain plug wipe clean the area *of* the sump surrounding the plug.
Using a 30 mm ring spanner or socket, remove the sump drain plug, discard the copper washer and collect the oil in the container.
Clean the sump drain plug and fit a new copper washer. Fit the drain plug into position on the sump and using a 30 mm socket and torque wrench, torque tighten the plug to a torque of **41** - 47 Nm (30 - 34 lbf.ft).

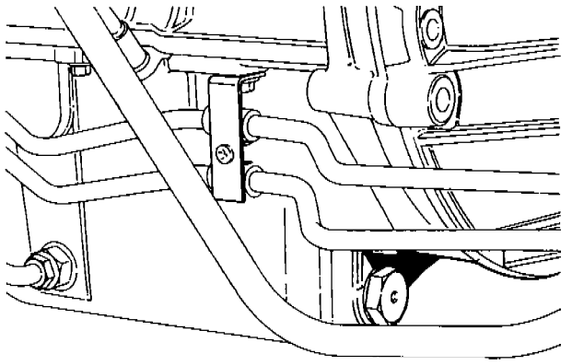
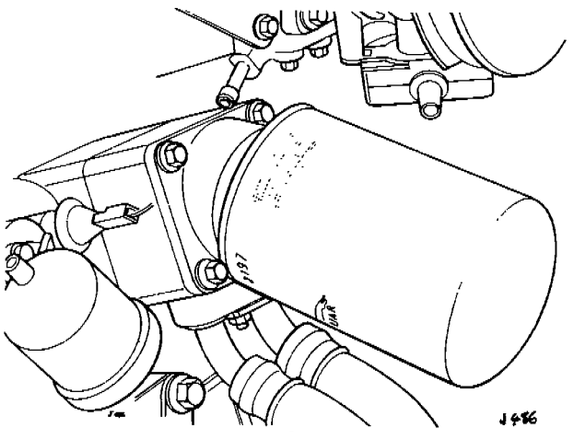


Fig 1


Fig 2

Replace engine oil filter canister
Place an open container under the filter and remove the filter canister using a suitable oil filter removal tool, catch the oil in the container.
Clean the oil filter mounting face and lubricate the rubber seal on the new filter with clean engine oil.
Fit and tighten the filter canister using only **hand** pressure and on no account use an oil filter removal tool.

Note: Normal tightening torque of the oil filter is ⅜ to ½ turn after initial contact.

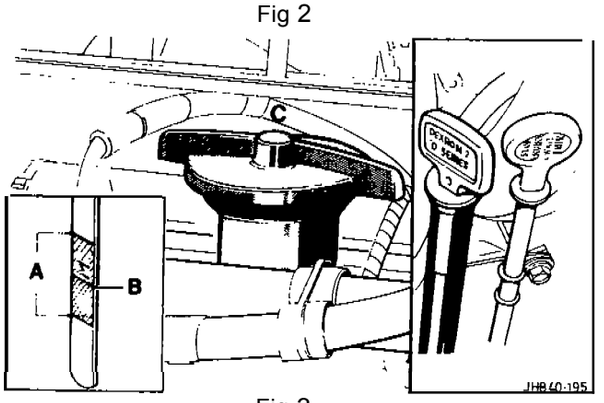


Fig 3

Fill the engine to the correct level with oil (Fig 3, 3.2 and 4.0 Litre: Fig 4, 2.9 Litre)

Remove the oil filler cap adjacent to the left-hand cam cover.
If the oil filter has been replaced add 8.0 litres (14.1 pints) of approved engine oil (refer to Recommended Lubricants and Fluids in Section 09).
Refit the oil filler cap.

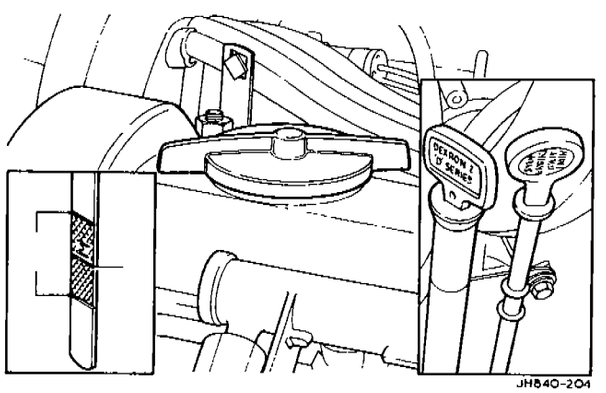


Fig **4**

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2. **Check** engine for oil leaks

Start the engine. Allow it to run at idling speed and check below the vehicle for signs of any oil leakage at the new oil filter. Stop the engine.
If the oil filter is leaking, wipe clean and tighten (use hand pressure only).

3. Renew air cleaner element

Release the four spring clips (1 Fig 1) holding the air cleaner cover and remove the cover/element assembly (2 Fig 1).
Remove the air cleaner element and discard. Clean the cover and the mating faces.

Position a new element in the cover. Refit the cover/element assembly by pushing the air intake pipe (3 Fig 1) into its location hole and then positioning the cover/element assembly in the air cleaner box.
Locate the four clips and snap into position.

4. Clean crankcase breather gauze - 2.9 Litre engines only

Slacken the hose clip (1 Fig 2) and remove the breather pipe (2 Fig 2).
Remove the crankcase breather (3 Fig 2) from the front of the engine cam cover.
Wash the breather in clean fuel and blow dry using a low pressure air blast.
Refit the breather to the engine cam cover ensuring that the sealing ring (4 Fig 2) is correctly located.
Refit the breather pipe and tighten the hose clip.

5. **Renew** automatic transmission fluid and renew automatic transmission filter

Drain automatic transmission fluid

Preferably this should be done when the transmission fluid is warm, allowing the fluid to drain more readily.
Place an open container with a capacity of at least 5 litres (8.8 pints) under the transmission drain plug (1 Fig 3).
Before removing the drain plug wipe clean the area of the transmission surrounding the plug.
Remove the drain plug and collect the fluid in the container.
Fit and torque tighten the drain plug to 15 Nm (11 lbf.ft).
Reposition the container under the dipstick tube union nut (2 Fig 3).
Disconnect the dipstick tube union nut and the tube from the transmission sump.
Drain the remaining fluid into the container.
Allow the transmission to drain for at least 15 minutes.

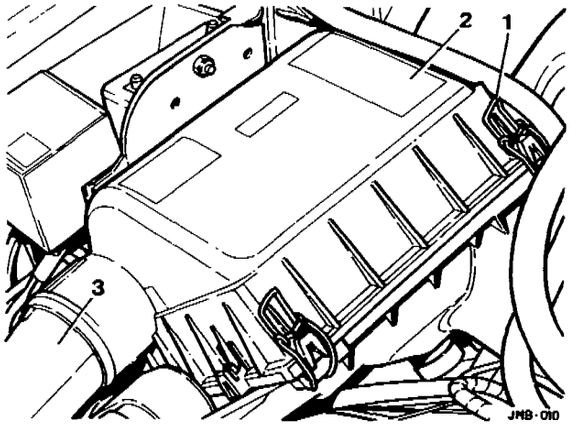


Fig 1

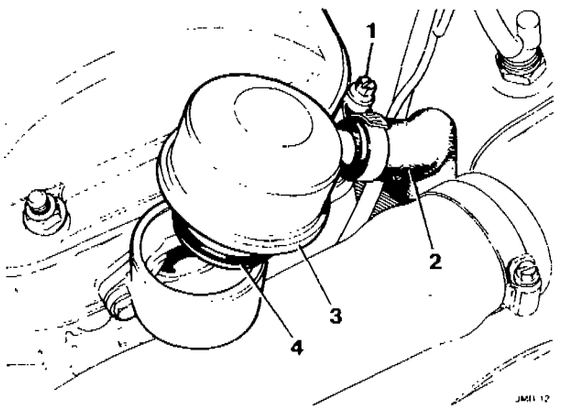


Fig 2

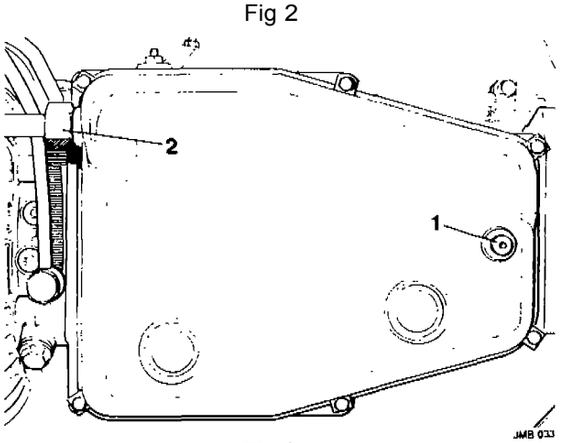


Fig 3

Approximate Drainage Quantities:

2.9 Litre car: 3 litre (5.3 pint)
3.2 Litre car: 3 litre (5.3 pint)
4.0 Litre car: 4,28 litre (7.5 pint)

Clean the tube unions and fit the dipstick tube to the transmission sump, torque tighten the union nut to 20 Nm (15 lbf.ft).

Renew automatic transmission filter

Drain the automatic transmission fluid as detailed above, but do not fit the dipstick tube.
Remove the sump pan securing bolts (1 Fig 1) and clamps.
Displace and remove the sump pan (2 Fig 1) and drain off any remaining fluid.
Remove and discard the gasket, clean the sump pan, magnets and mating faces.
Remove the filter securing screws (3 Fig 1), remove the filter (4 Fig 1) and discard the 'O' ring (5 Fig 1).
Clean the filter mating faces, fit a new 'O' ring to the new filter and secure with the screws.
Fit a replacement gasket to the sump pan, lift into position and secure with the clamps and bolts, torque tighten the bolts to 8 Nm. Clean the tube unions and fit the dipstick tube to the transmission sump. Torque tighten the union nut to 20 Nm.

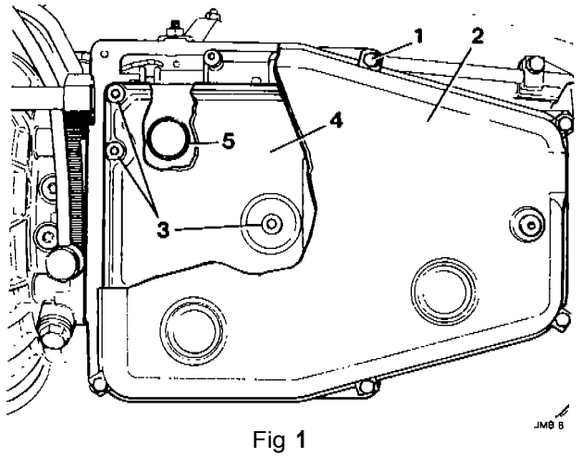


Fig 1

6. Check/top up automatic transmission fluid (Fig 2, 4.0 Litre; Fig 3, 2.9 Litre and 3.2 Litre)

A combined filler tube and dipstick is located on the rear left-hand side of the engine. Before checking the fluid level the transmission must be at normal operating temperature, e.g. after completing a run of at least 24 kilometres.
With the transmission fluid at normal operating temperature, park the vehicle on level ground, firmly apply the handbrake and position the selector lever in 'P' (Park) and allow the engine to run at idling speed for a few minutes. Apply the footbrake and pass the selector lever through the entire range to ensure that the transmission system is primed. Return the selector lever to 'P' (Park) and allow the engine to idle; withdraw the dipstick. Using a lint free cloth, wipe the dipstick clean and immediately check the fluid level by replacing the dipstick and withdrawing it.
If necessary, add the correct specification fluid to bring the level to between the 'MIN and 'MAX' marks on the 'HOT' side of the dipstick (refer to Recommended Lubricants and Fluids in Section 09).

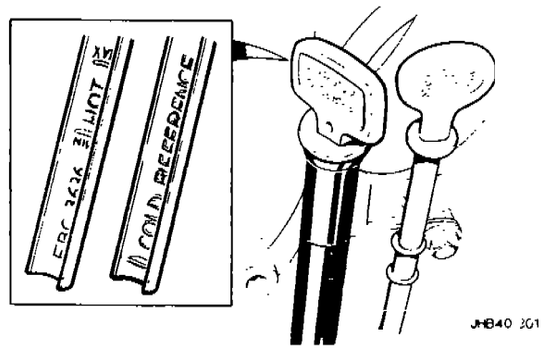


Fig 2

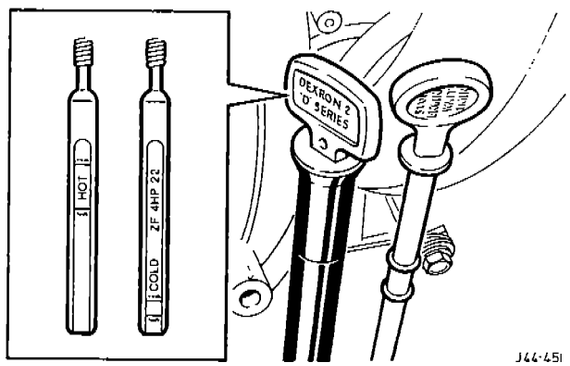


Fig 3

Note: The 'COLD' side of the dipstick is for Jaguar Dealer reference only.

After topping-up (if required), repeat the above procedure. Be careful not to overfill.

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7. Check automatic transmission for fluid leaks

Check the automatic transmission for any signs of oil leakage.
Report if any leaks are evident.

8. Renew manual gearbox oil

Preferably this should be done when the gearbox oil is warm, allowing the oil to drain more readily.
Place an open container with a capacity of at least 2 litres (3.5 pints) under the gearbox drain plug.
Before removing the drain and filler plugs wipe clean the area of the gearbox surrounding the plugs.
Remove the gearbox filler plug (1 Fig 1), then remove the drain plug (2 Fig 1) and collect the oil in the container.
Refit and tighten the drain plug.
Fill the gearbox with a recommended **SAE** 80 oil (refer to Recommended Lubricants and Fluids in Section 09) up to the bottom of the thread in the filler plug hole.
Gearbox capacity is 1.4 litres (2.5 pints).
Fit and tighten the filler plug.

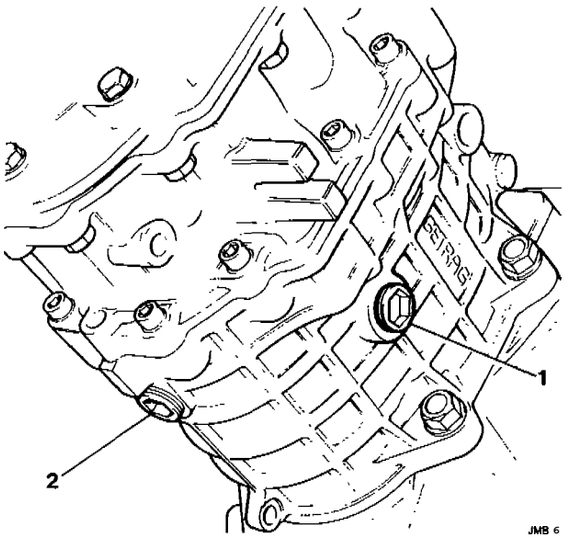


Fig 1

9. Check manual gearbox for *oil* leaks - top up if necessary

Check the gearbox for any signs **of** oil leakage.
Report if any leaks are evident.

If necessary, wipe clean the area of the gearbox surrounding the filler plug (1 Fig 1) and remove the plug.
Top up the gearbox with a recommended **SAE** 80 oil (refer to Recommended Lubricants and Fluids in Section 09) up to the bottom of the thread in the filler plug hole.
Fit and tighten the filler plug.

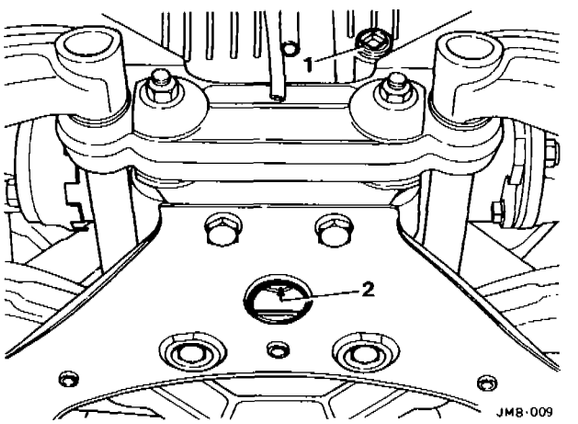


Fig 2

10. Renew rear axle oil - Middle East only

Preferably this should be done when the axle oil is warm, allowing the oil to drain more readily.
Place an open container with a capacity of at least 3 litres (5.3 pints) under the axle drain plug.
Before removing the drain and filler plugs wipe clean the area of the axle surrounding the plugs.
Remove the axle filler plug (1 Fig 2), then remove the drain plug (2 Fig 2) and collect the oil in the container.
Refit and tighten the drain plug.
Fill the axle with a recommended SAE 90 oil (refer to Recommended Lubricants and Fluids in Section 09) up to the bottom of the thread in the filler plug hole.
Axle capacity is approximately 2,1 litres (3.7 pints).
Fit and tighten the filler plug.

11. Check/top up rear axle oil

Wipe clean the area of the axle surrounding the filler plug (1 Fig 2) and remove the plug.

Top up the axle with a recommended SAE 90 oil (refer to Recommended Lubricants and Fluids in Section 09) up to the bottom of the thread in the filler plug hole.
Fit and tighten the filler plug.

12. Check rear axle for oil leaks - top up if necessary

Check the axle for any signs of oil leakage.
Report if any leaks are evident.
If necessary, top up the oil **as** detailed in operation 11.

13. Renew coolant - check specific gravity

Use the recommended phosphate free antifreeze (refer to Recommended Lubricants and Fluids in Section 09).
The correct concentration is 50 per cent with a Specific Gravity of 1.079.
One 135 ml bottle of 'Jaguar Radiator Leak Sealer' or 'Barrs Leaks' must also be **mixed** with fresh anti-freeze.

WARNING: DO **NOT REMOVE THE COOLANT HEADER TANK FILLER CAP WHILST THE ENGINE IS HOT. IF THE CAP MUST BE REMOVED PROTECT THE HANDS AGAINST ESCAPING STEAM, AND SLOWLY TURN THE CAP SLIGHTLY ANTI-CLOCKWISE TO ALLOW EXCESS PRESSURE TO ESCAPE, THEN REMOVE COMPLETELY.**

CAUTION: **Anti-freeze will** damage **paintwork. Avoid spillage.**

Drain **and Refill**

The cooling system refill capacity is 9,2 litres (16.2 pints).

Place a drain tray in position under the radiator drain plug (Fig.1).
Remove the header tank filler/pressure cap, remove the radiator drain plug.
Drain the coolant and flush the radiator with water. Refit the radiator drain plug.
Reposition the drain tray and remove the cylinder block drain plug (Fig.2).
Allow the remaining coolant to drain, flush the system with water and refit the cylinder block drain plug.
Fill the cooling system with the correct solution of anti-freeze and water, and one 135 ml bottle of 'Jaguar Radiator Leak Sealer' or 'Barrs Leaks'.
Move the heater valve control to the 'HOT' position, refit header tank filler/pressure cap and run the engine until the thermostat is open.
Switch OFF the engine, carefully remove the header tank filler/pressure cap and top up with anti-freeze solution, if necessary.
Check for water leaks from drain plugs and retighten if necessary.

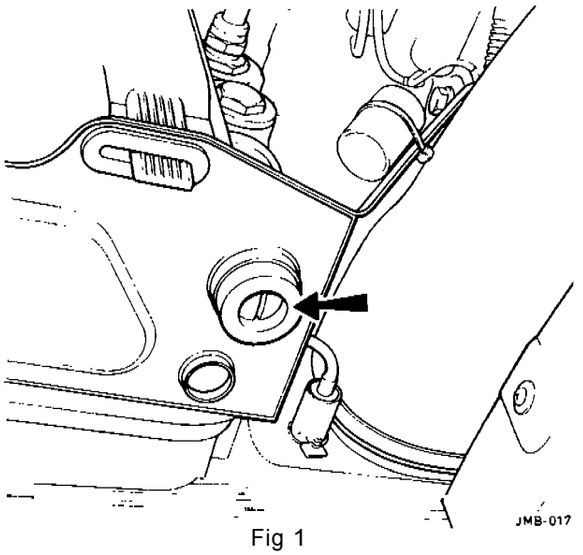


Fig 1

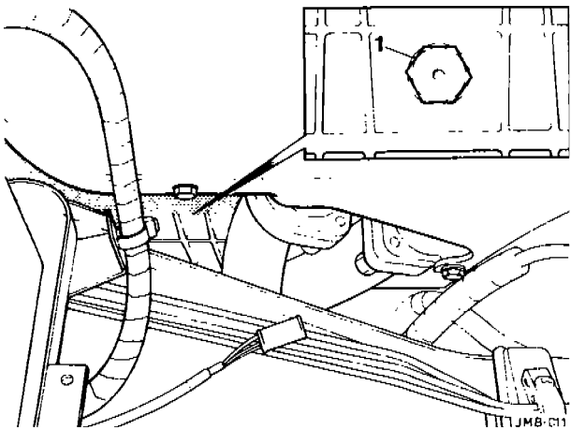


Fig 2

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14. **Check/top** up cooling system

The coolant level must only be checked when the engine is COLD.

WARNING: **DO NOT** REMOVE THE COOLANT HEADER TANK FILLER CAP WHILST THE ENGINE **IS** HOT. IF **THE** CAP MUST **BE** REMOVED PROTECT **THE** HANDS AGAINST ESCAPING STEAM, AND SLOWLY TURN THE CAP SLIGHTLY ANTI-CLOCKWISE **TO** ALLOW EXCESS **PRESSURE TO ESCAPE,** THEN **REMOVE** COMPLETELY .

Topping-up

CAUTION: Anti-freeze **will damage** paintwork. Avoid **spillage.**

Replenishment of the coolant should be carried out using only the correct concentration of coolant solution (anti-freeze) previously mixed in a separate container (refer to Recommended Lubricants and Fluids in Section 09).
The coolant level in the engine header tank should reach the base of the filler neck. If persistent coolant loss is evident then an immediate investigation must be carried out.

Check specific gravity (Fig 1)

The correct concentration of anti-freeze is 50 per cent with a Specific Gravity of 1.079.

Remove the header tank filler/pressure cap.
Use an approved coolant hydrometer to check the Specific Gravity **as** follows:
Insert the rubber tube of the hydrometer below the coolant level, squeeze the bulb and release to draw a sample of coolant into the instrument. Repeat this procedure three times to warm the instrument. With the coolant sample drawn into the hydrometer so that the liquid level is between the two lines on the glass, check the coolant temperature on the thermometer in the upper section of the instrument.

Note: It is not recommended that anti-freeze tests are carried out in coolant temperatures below 15,5°C (60°F). Warm up the engine *for* a few minutes if necessary.

Hold the instrument vertically and at eye level, then note the Specific Gravity reading on the float stem at liquid level.

Note: It is advisable to fold over the rubber tube and grip it between the fingers. This prevents air ingress which causes the float to bounce, and makes a steady reading difficult to obtain.

(Continued overleaf)

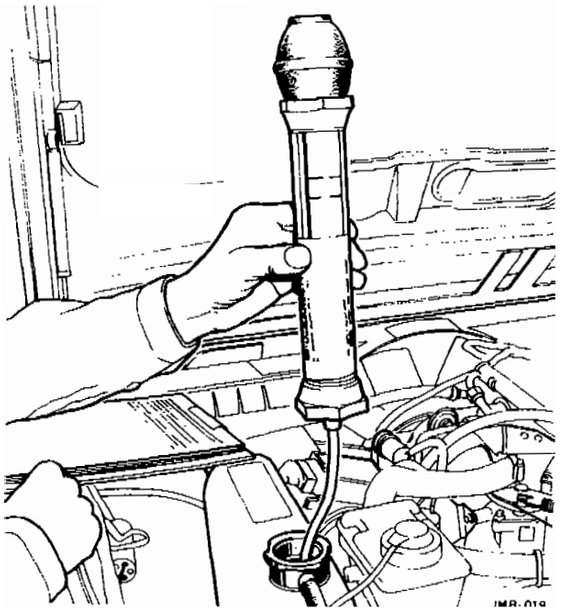


Fig 1

If necessary, add the correct quantity of antifreeze.
Replace the header tank filler/pressure cap.

15, Check cooling/heating system for leaks

Check all hose connections for leaks and tighten the hose clips, if necessary. Check the condition of all hoses for cracks, chafing, damage, etc. Report if any faults are evident.

16. Renew fuel filter (91MY Fig 1, 90MY Fig 2)

WARNING: THIS OPERATION MAY RESULT IN EXTREMELY FLAMMABLE FUEL AND FUEL VAPOUR BEING RELEASED. GREAT CARE MUST BE TAKEN WHEN WORK IS BEING CARRIED OUT ON THE FUEL SYSTEM AND THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO.
NO SMOKING MUST BE ALLOWED NEAR THE AREA AND WARNING SIGNS MUST BE ERECTED TO THIS EFFECT.
A C02 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
DRY SAND MUST BE AVAILABLE TO SOAK UP ANY SPILLAGE.
THE WORKING AREA MUST BE WELL VENTILATED.
ENSURE THE FUEL IS EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.

Depressurize the fuel system as follows:
Open the left-hand side door.
Remove the left hand side dash liner.
Disconnect the black PM4 9 way block connector (LS3).
Start and run the engine until it stops.
Switch OFF the ignition.
Reconnect the PM4 block connector.
Refit the dash liner
Disconnect the battery earth lead.
Drain the fuel from the tank using approved equipment.
Raise the car on a four-post ramp.
Slacken and remove the fuel pipe to filter union nuts (1 Fig 1) or remove the banjo bolt and copper washer (2 Fig 2) and withdraw the pipes from the filter, taking care to catch any fuel spillage.
Remove the filter securing nut (2 Fig 1) or slacken the screw (1 Fig 2), and remove the filter.
(91MY) Discard the sealing rings from the pipes and replace with new rings.
(90MY) Remove the fuel pump hose to filter adaptor piece, remove the plastic cover (3 Fig 2) and remove the foam pad from the filter.
Fitting a new filter is the reversal of the removal procedure, utilizing new copper washers on the 90MY filter's banjo bolt.
Check for leakage from the filter unions after pressurizing the fuel system.

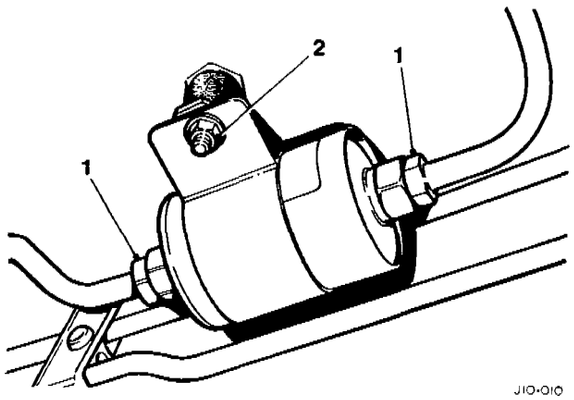


Fig 1

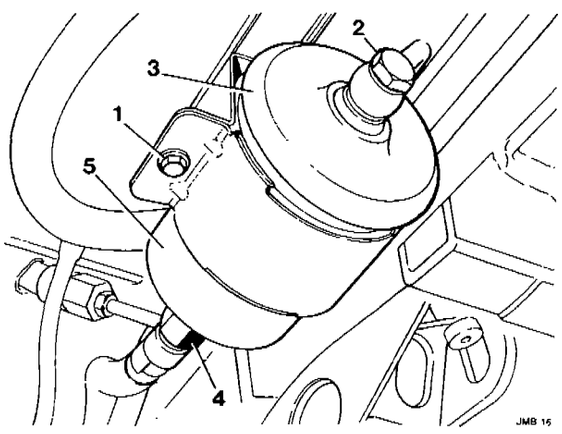


Fig 2

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17. Check for fuel leaks

Visually check all fuel pipes, joints and unions for leaks, tighten if necessary.
Check fuel rail and injectors for leaks.
Report if any leaks are evident.

18. Check/top up brake fluid reservoir (Fig 1)

CAUTION: Whilst handling brake fluid, extreme care must be observed and brake fluid must not be allowed to contact the vehicle paintwork. DO NOT 'top up' the reservoir with fluid which has been bled through the system, as it will have become aerated. Always use fresh, clean fluid from a new tin,

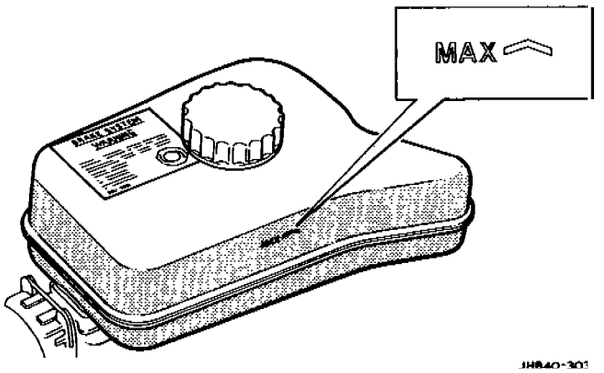


Fig 1

The fluid is visible through the translucent casing *of* the reservoir and must be maintained at the **'MAX'** mark on the reservoir.
In some cases the brake fluid may be above the **'MAX'** mark, this is dependent upon the charged state of the hydraulic unit. Therefore the following procedure for checking or topping up the brake fluid level must be followed:

Ensure the vehicle is parked on level ground before checking the brake fluid level.
Pump the brake pedal at least 20 times (ignition OFF), or until pedal travel becomes restricted.
Switch ignition ON (position 'I' or 'II'). Wait until the Anti-lock Braking System pump stops running.
Check that brake fluid level **is** on the 'Max' mark.
If necessary, top up as follows:

Before removing the cap, clean the reservoir and cap thoroughly with a lint-free cloth to ensure that no dirt enters the reservoir.
Unscrew the filler cap and top up to the 'Max' level using new, unused approved brake fluid (refer to Recommended Lubricants and Fluids in Section 09). Refit the filler cap.
Should any brake fluid be spilt replace the **cap** on the reservoir before rinsing it away, to avoid contamination.

19. Renew brake fluid

CAUTION: During operations which necessitate the handling of brake fluid, extreme care must be taken to ensure that fluid is not permitted to contact paintwork
Do not 'top up' the fluid reservoir with fluid which has been bled through the system, as it will have become aerated. Always use fresh, clean fluid from a new tin.
It is vital that absolute cleanliness is maintained throughout the entire bleeding operation. Always use lint free cloths and ensure that dirt or grit does not enter the system.

19. (Continued)

Use only new, unused approved brake fluid (refer to Recommended Lubricants and Fluids in Section 09).

Renew the brake fluid and bleed the braking system as detailed in Section 70.

20. Check/top up power steering/rear ride levelling system reservoir (Fig 1)

CAUTION: This system is filled with Jaguar/Castrol Hydraulic System Mineral Oil (HSMO). If any other specification fluid is used the system will become contaminated and the system will have to be purged.

This reservoir contains the fluid for the power steering and rear ride levelling system (where fitted). The fluid level must only be checked when the engine is COLD and the vehicle is in an unladen condition, i.e. no passengers or luggage.

Wipe clean and remove the combined filler cap and dipstick from the fluid reservoir; take great care to prevent any foreign matter from entering. Using a lint free cloth, wipe the dipstick clean, refit the filler cap then remove and inspect the oil level shown on the dipstick, which must be between the 'Max' and 'Min' (or 'H' and 'ADO') marks. (Disregard the 'C' mark, where present.)

If necessary, top up with correct specification fluid, DO NOT OVERFILL (refer to Recommended Lubricants and Fluids in Section 09).

Replace the cap and ensure that it is fully tightened .

Should the level be very low, investigate for possible leak(s).

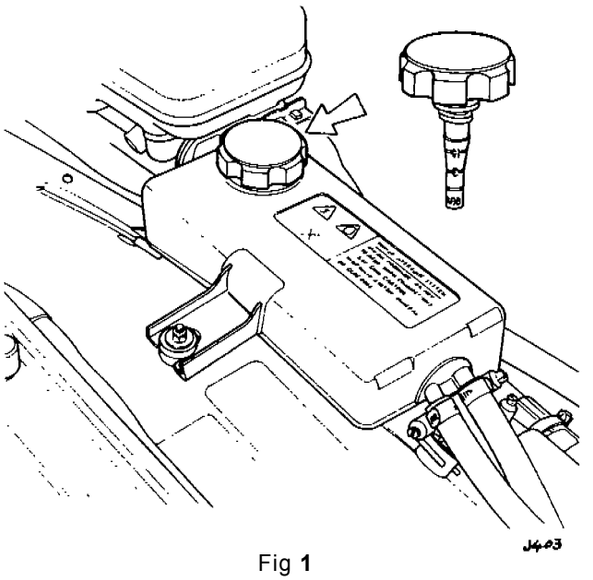


Fig 1

21. Check suspension dampers for fluid leaks

Visually check and report if any leaks are evident.

22. Check hydraulic pipes, hoses and unions for leaks

Visually check all hydraulic pipes, hoses and unions and report if any leaks are evident.

23. Check/top up clutch fluid reservoir (Fig 2)

CAUTION: During the handling of brake/clutch fluid, extreme care must be observed, and brake fluid must not be allowed to contact the vehicle paintwork.

Do not 'top up' the reservoir with fluid which has been bled through the system, as it will have become aerated. Always use fresh, clean fluid from a new tin.

Before removing the cap, clean the reservoir and cap thoroughly with a lint free cloth to ensure that no dirt enters the reservoir.

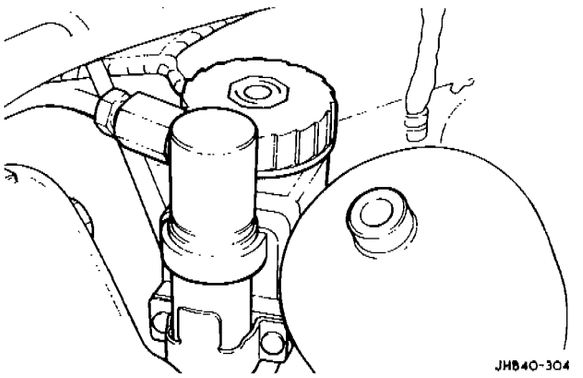


Fig 2

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23. (Continued)

Unscrew the filler cap and top up to the 'Max' level using new, unused approved brake/clutch fluid (refer to Recommended Lubricants and Fluids in Section 09). Refit the filler cap.
Should any brake/clutch fluid be spilt replace the cap on the reservoir before rinsing it away, to avoid contamination.

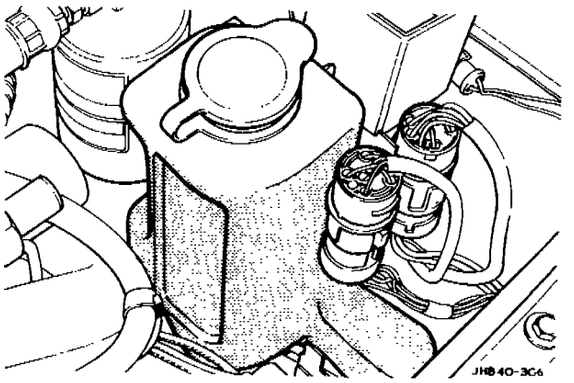


Fig 1

24. Check/top up windscreen and headlamp washer reservoir (Fig 1)

Fluid is visible through the walls of the container.
If necessary, remove the cap and top up with clean, preferably soft water to which Jaguar Windscreen Washer fluid has been added. The reservoir should be filled to just below the neck.
Refit the cap.
In winter add a screen wash anti-freeze fluid to prevent possible damage to the pump under freezing conditions.
UNDER NO CIRCUMSTANCES must cooling system anti-freeze be used, since this will damage paintwork.
After adding screen washer anti-freeze to the reservoir, operate the pump until untreated water is purged from the pipes and jets.

25. Check exhaust system for leaks

Check exhaust system and joints for leaks.
Report if any leaks are evident.

26. Check power steeringlrear ride levelling system for leaks

Check power steeringlrear ride levelling system for leaks.
Report if any leaks are evident.

27. Check air conditioning sight glass (Fig 2)

Check that the compressor drive belt is correctly adjusted as detailed in operation 31.
Start the engine and switch the air conditioning system to full cooling and allow the system to stabilise.
Observe the sight glass on the receiver-drier and check for frothing or bubbles with the engine running at 1000 rpm.
Slowly increase engine speed and repeat check at 1800 rpm.

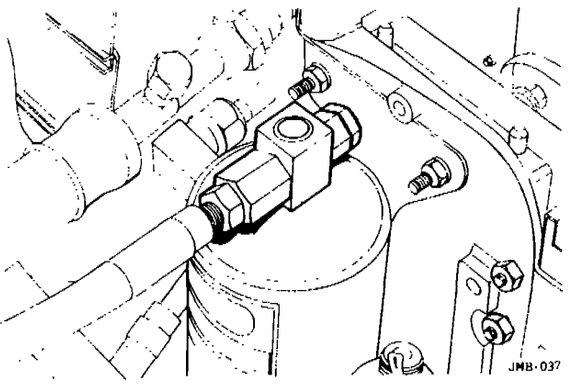


Fig 2

Note: It is normal for there to be slight foaming if ambient air temperature is below 21°C (70°F).

If the sight glass is not clear of bubbles, report the fault for investigation.

28. Check air conditioning system for leaks

Visually check the hoses for signs of leakage or damage. Check for frosting on the connector union housing; the region around the suction

part is normally cold, and slight frosting is permissible.
Check by feel along pipe lines for sudden temperature changes that would indicate a blockage at that point.
Report if any faults are evident.

MECHANICAL FUNCTION CHECK

29. Grease door check mechanism

CAUTION: Do not grease the door striker plates or attempt to lubricate the door lock barrels (this will avoid lubricants contaminating the electrical circuits).

Open all the doors and clean the door check mechanism, then lightly lubricate using a multipurpose lithium base grease (refer to Recommended Lubricants and Fluids in Section 09).

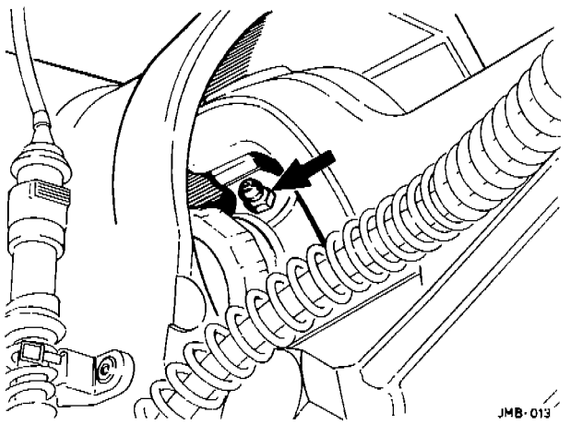


Fig 1

30. Grease drive shaft universal joints (Fig 1)

Four grease nipples are provided, one for each universal joint on the drive shafts.
Rotate each drive shaft in turn to expose its grease nipple, wipe the nipples clean and using a grease gun, apply a multipurpose lithium base grease (refer to Recommended Lubricants and Fluids in Section 09) to each grease nipple.

31 Check/adjust drive belts tension. Renew if necessary

Inspect the drive belts for general condition before checking the tension. If the belt shows signs of 'shredding' - the local separation of strands of material from the body - it must be renewed.

To check the tension apply a known pressure at right angles to the belt in its longest straight run between pulleys, and measure the deflection caused in the belt.

Data for each belt is as follows:

Driving belt for:	Deflecting force kg	lb	Deflection mm	in
Compressor	2,9	6.4	4,4	0.17
Alternator	1,5	3.3	4,4	0.17
Air pump (where fitted)	1,5	3.3	4,6	0.18

If a belt requires to be adjusted observe the following procedures given for each drive belt.

Report if a belt is found to be faulty and requires renewal.

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Compressor drive **belt** - Adjust (Fig 1)

Slacken the compressor pivot bolts (1) and the mounting bracket nut and bolt (2).
Raise the front of the vehicle and position on two axle stands.
From below the vehicle, slacken the drive belt lower adjusting nut (6), adjusting rod securing nut and bolt (3), trunnion block securing nut and bolt (5) and the sliding link nuts and bolts (7).
Tighten the upper adjuster nut (4) to obtain the correct belt tension.
Tighten the lower nut (6), trunnion nut and bolt (5), adjusting rod nut and bolt (3), sliding link nuts and bolts (7), pivot bolts (1) and mounting bracket nut and bolt (2).
Re-check the belt tension.
Lower the vehicle.

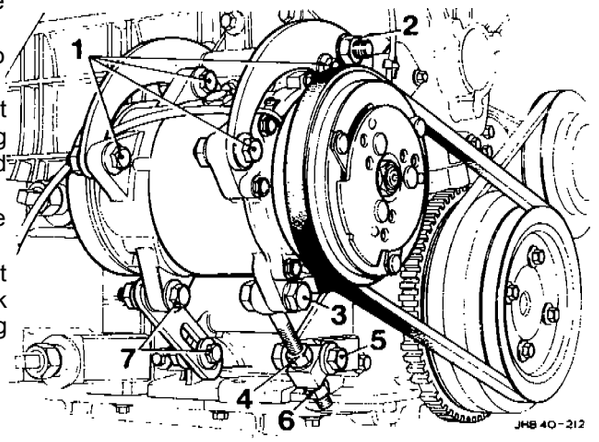


Fig 1

Alternator drive belt - Adjust (Fig 2)

Slacken the alternator pivot bolt locknut (3), trunnion block securing bolt (2), alternator upper adjusting nut (1) and adjusting rod to water pump securing nut (4)
Tighten lower adjusting nut (5) to obtain the correct belt tension.
Tighten upper adjusting nut (1), trunnion securing bolt (2), adjusting rod to water pump securing nut (4) and pivot bolt locknut (3).
Re-check the belt tension.

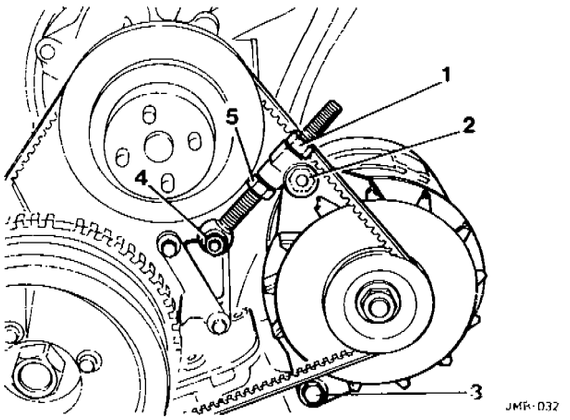


Fig 2

Air pump drive **belt** - Adjust (Where fitted) (Fig 3)

Slacken the link arm trunnion bolt (4), link arm pivot bolt, air pump pivot nut/bolt (6) and link arm adjuster locknut.
Tighten lower adjusting nut (3) to obtain the correct belt tension.
Tighten upper adjusting nut, link arm trunnion bolt, link arm pivot bolt and air pump pivot nut/bolt.
Re-check the belt tension.

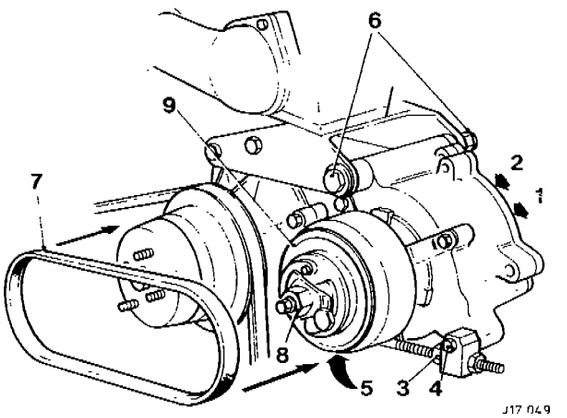


Fig 3

32. Check and reset front **hub** clearance (Fig 1).

Note: With the road wheel and tyre assembly removed the condition of the front brake pads can be examined.

Carefully remove the wheel nut cover (if fitted).
Slacken the road wheel nuts a quarter of a turn each.
Remove one road wheel securing nut, **mark** the road wheel relative to a stud and remove the remaining nuts.
Remove the road wheel and tyre assembly.
Using a dial indicator positioned on the hub flange measure and record the end float.
If the recorded end float is 0,127 mm or more reset the clearance.

To adjust, remove the front hub grease cap (1).
Remove the split pin (2) **from** the hub (6) and remove the nut cover (4).
Using a dial indicator positioned on the hub flange (Fig 2), tighten the nut to obtain **an** end float of 0,0762 - 0,0254 mm.
Align the hub nut cover and secure with a new split pin.
Clean the hub grease cap and refit to the hub.
Lift the road wheel and tyre assembly up to the hub, align the wheel with the marked stud and secure with the nuts.

Repeat the procedure for the opposite side.

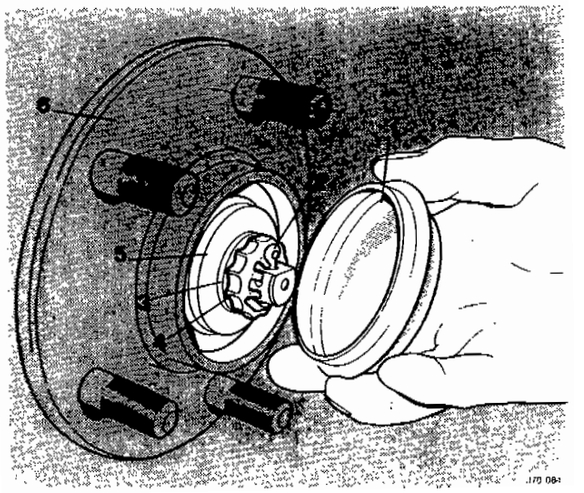


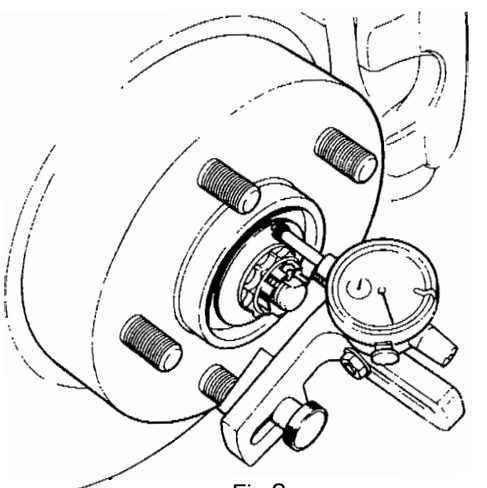
fig 1

33. Adjust handbrake (Fig **3)**

Slacken the adjuster locknut, and tighten the adjuster until 3 to 5 'clicks' on the handbrake lever ratchet can be attained. Tighten the locknut.

Note: When tightening the locknut, hold the fork end to prevent it twisting.

Ensure that the rear wheels can be rotated without excessive drag. Light running contact is permissible.
Lightly apply a multipurpose lithium grease (refer to Recommended Lubricants and Fluids in Section 09) to the cables and lever pivots.

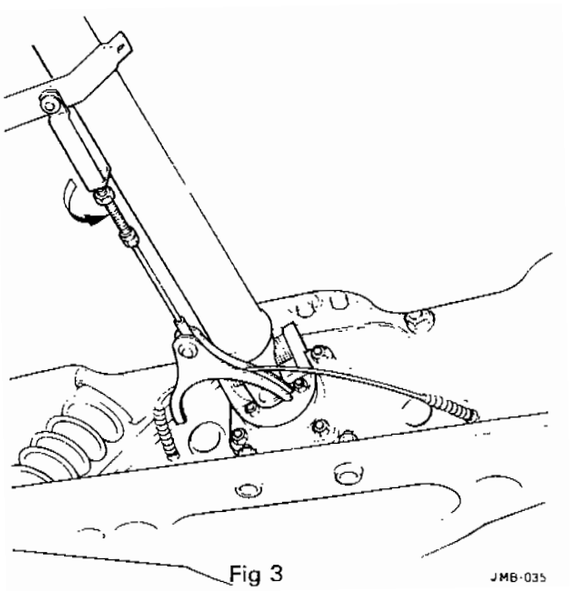

Fig 2

34. Check handbrake **shoes** - renew **if necessary**

WARNING: BRAKE LINING DUST **CAN CONTAIN ASBESTOS** WHICH **IF INHALED, CAN DAMAGE** YOUR HEALTH. **ALWAYS USE A** VACUUM **BRUSH TO REMOVE DRY BRAKE LINING** DUST. **NEVER USE** AN **AIR LINE.**

Note: With the rear road wheel and tyro assembly removed, the condition of the rear brake pads can be examined.

Remove a roadwheel and tyre assembly.
Visually inspect the brake lining thickness through the hole in the drum front face (arrowed in Fig 1, page 10-19).


Fig 3 JMB-035

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Rotate the drum to permit inspection of both shoes, and take note of any apparent damage, and for the lining approaching its serviceable wear limit. (See 'Note' below.) If in any doubt whatsoever as to the condition of the shoes, proceed as follows:
Remove the locking wire from the two caliper securing bolts.
Remove the caliper securing bolts (1 Fig 1) and lift the caliper away for access to the brake pads. Support the caliper **so** that it is not hanging on its hose.
Taking all necessary safety precautions remove the brake dust from around the caliper area.

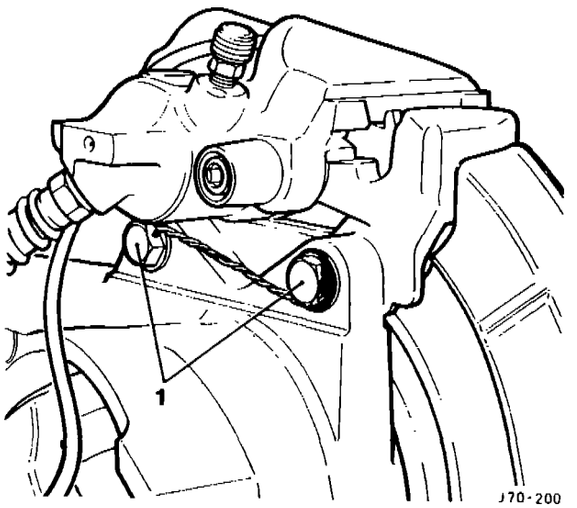


Fig **1**

Release the handbrake adjustment.
Remove the disc/drum securing screw (1 Fig 2) and remove the disc/drum (2 Fig 2).

Taking all necessary safety precautions, remove the brake dust from the handbrake shoe area.
Visually examine the brake linings for cracking, glazing, contamination and thickness, report if necessary.

Note: Minimum permissible thickness is 1 mm at any point. Only renew brake shoes in 'axle' sets.

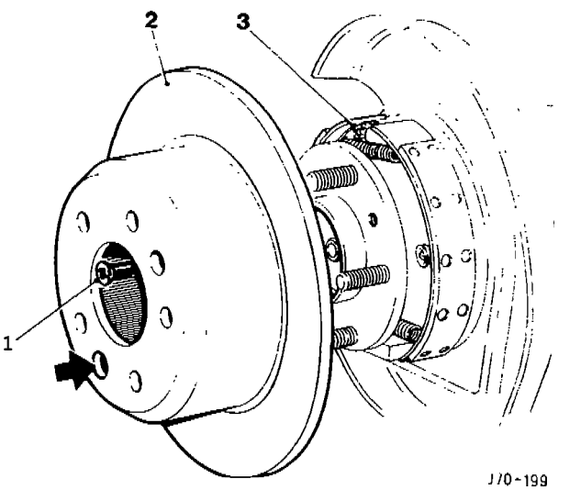


Fig 2

Centralize the brake shoes and wind out the adjuster (3 Fig 2) until the disc/drum can just be fitted.
Fit the disc/drum to the hub, fit and tighten the securing screw. Torque tighten the screw to 11 - 16 Nm (15 - 21 lbf.ft).
Ensure that the handbrake lever in the vehicle is fully off and adjust the handbrake shoes until they lock the disc/drum. Slacken the adjuster until the disc/drum can be rotated without excessive drag. Light running contact is permissible.
Refit the caliper and secure with the bolts. Torque tighten the bolts to 55 - 62 Nm
Lockwire the bolts together, as in Fig **1** (ie *so* that the wire is tending to tighten the bolts).
Lift the road wheel and tyre assembly up **to** the hub, align the wheel with the marked stud and secure with the nuts.

Repeat the procedure for the opposite side.

Adjust the handbrake as detailed in operation 33.

35. Inspect brake pads **for** wear (disc condition **on** pad change)

Remove each roadwheel in turn to inspect the disc pad linings.

Use a pair of inside calipers to check the dimension between the pad backing and the face of the brake disc. (Ensure that the pad material

is in full contact with the disc).
The minimum permissible dimension, ie pad thickness, is 3 mm. Always renew pads in sets.

36. Renew windscreen wiper blade (Fig 1)

Lift the blade clear of the windscreen.
Depress the retaining clip and withdraw the wiper blade .

Fit the new blade and check that it is held firmly in the wiper arm. Return the arm and blade to the windscreen.

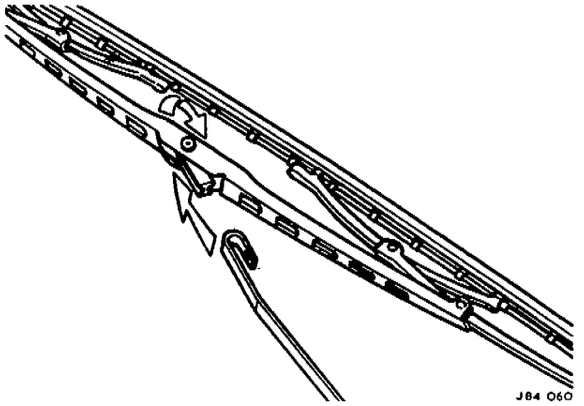


Fig 1

37. Clean out radiator matrix and condenser to remove dirt accumulation, etc.

Using a low pressure air blast on the engine side of the radiator, remove any accumulated mud, road dirt, leaves or insects.

38. Check condition/operation of all seat belts

Check the webbing on the seat belt for imperfections, cuts, fraying or damage.

The inertia mechanism of the front (except passive restraint belts) and rear seat belts can be checked as follows:

Sit in the driving position, fasten the seat belt and grip the shoulder belt at approximately shoulder level with the opposite hand. Pull the belt sharply in a downwards direction, the belt should lock.
Repeat the above procedure for all the other seat belts.

If any seat belt is found to be damaged or the inertia mechanism is not working correctly, the seat belt must be replaced.
Report if necessary.

39. Check exhaust system for security

Check security of exhaust system and mountings.
Report if any faults are evident.

40. Visually check hoses, pipes and unions for chafing, cracks and corrosion including levelling units

Visually check all hydraulic hoses, pipes, unions and levelling units for signs of chafing, cracks, leaks and corrosion.
Hoses should be flexed by hand to ascertain their condition and checked for cracks and cuts particularly at junction ends. Metallic pipes should be checked for corrosion especially where they have been covered by water/mud, etc.
Report if any faults are evident.

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41. Check power steering hydraulic pipes and unions for chafing and security

Visually check and report if any faults are evident.

42. Check security and condition of fuel hoses

Visually check and report if any **faults** are evident.
Hoses should be flexed by hand to ascertain their condition and checked for cracks and cuts particularly at junction ends.

43. Check speed (cruise) control system vacuum hoses for security and condition (Fig 1)

Visually examine the hoses and connections for signs of damage, cracking, chafing, etc. Ensure the connections are secure.
Report if any faults are evident.

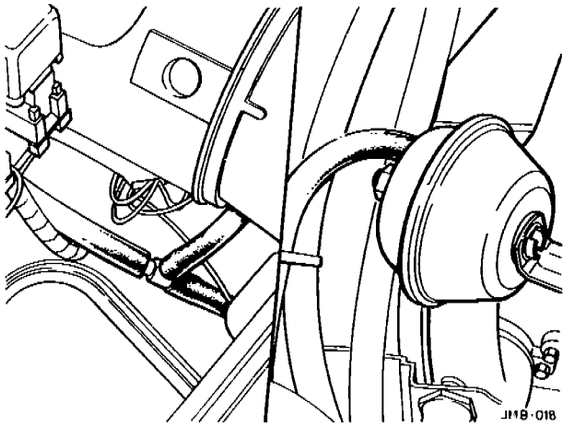


Fig 1

44. Check coolinglheating system hoses for security and condition

Visually examine the hoses and connections for signs of damage, cracking, chafing, etc. Ensure the connections are secure.
Report if any faults are evident.

45. Check air conditioning hoses *for* security and condition

Visually check the hoses for signs of damage. Check for frosting on the connector union housing; the region around the suction part is normally cold, and slight frosting is permissible. Check by feel along pipe lines for sudden temperature changes that would indicate a blockage at that point.
Report if any faults are evident.

46. Check condition of steering unit joint covers

Visually check ball joint covers/gaiters and steering rack bellows to ensure that they are seated and sealing correctly.
Report if any faults or leaks are evident.

47. Check tightness of steering rack securing bolts

Torque tighten the securing bolts to 45 - 55 Nm (61 - 75 lbf.ft).

48. **Check the** general condition **of the** underbody anti-corrosion protection

Visually check and report on the general condition of the underbody anti-corrosion protection.
If any areas are damaged or flaking then new anti-corrosion sealant will have to be applied.

ELECTRICAL FUNCTION CHECK

49. Renew **spark plugs**

Ensure that all H.T. leads are clearly identified by cylinder number (No.1 at front **of** engine) before detaching them.
Clean the area around the spark plugs.

On 2.9L engines:
Remove the spark plugs using a 14 mm spark plug socket.

On 3.2L and 4.0L engines:
Remove the spark plugs using a special, long 10 mm spark plug socket spanner.

It is important that only the correct type of spark plug is used as replacement, otherwise the engine running and exhaust emission levels could be adversely affected.
Set the gap between the two electrodes (by bending the side electrode) as follows:

2.9L engines: 0,64 mm (0.025 in).
3.2L and 4.0L engines: 0,89 rnm (0.035 in).

Before fitting the new spark plugs, wipe clean the seatings in the cylinder head and check the sealing washers.
Screw in all plugs 'finger tight' (2.9L engines, on the 3.2L and 4.0L engines use the special plug socket spanner), and then, using the plug socket spanner torque tighten each plug **as** follows:

2.9L engines: 23 - 27 Nm (31 - 36 lbf.ft).
3.2L and 4.0L engines: 23 - 28.5 Nm (31 - 38 lbf.ft)

Replace the H.T. leads as identified, ensuring that each lead is securely connected to the spark plug.

50. Clean **and adjust spark plugs**

Remove and replace the spark plugs as detailed on operation 49.
Clean and test the spark plugs on a spark plug cleaning machine.
Set the gap between the two electrodes (by bending the side electrode) as follows:

2.9L engines: 0,64 mm (0.025 in).
3.2L and 4.0L engines: 0,89 mm (0.035 in).

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51. Push high tension (H.T.) leads firmly home

Ensure that each H.T. lead is securely connected to the relevant spark plug.
Check that the leads are correctly secured at the distributor cap and coil and that the rubber covers are holding the H.T. leads correctly.

52. **Check C.O.** level

Using an approved C.O. meter, insert the gas analyser probe as far as possible into the exhaust pipe.

Start and run the engine and ensure the engine is at normal operating temperature (90°C).
Check the C.O. reading on the **gas** analyser.

Non-catalyst specification only.

This should read between
1.0 to 1.5 C.O. level
If the readings on the **gas** analyser **do** not conform to the figures specified above, adjust the mixture adjustment screw on the airflow meter until the specified figures are achieved.
Withdraw the gas analyser probe and switch 'OFF' the ignition.

Catalyst specification only.

This should read between 0% and 0.2% C.O. level
Report if the readings on the gas analyser do not conform to the figures specified above.
Withdraw the gas analyser probe and switch 'OFF' the ignition.

53. **Check/top up** battery electrolyte

Remove the battery retaining bracket securing bolts (A and B) and **lift** the bracket (C) clear.
Gently prise off the vent covers taking care not to strain the rubber vent pipe.
Inspect the electrolyte level. This should be between 4 to 9 mm (0.15 to 0.35 in) above the top of the plates. If necessary, top up with distilled water.
Replace the vent cover.
Refit the retaining bracket and secure with the two bolts.

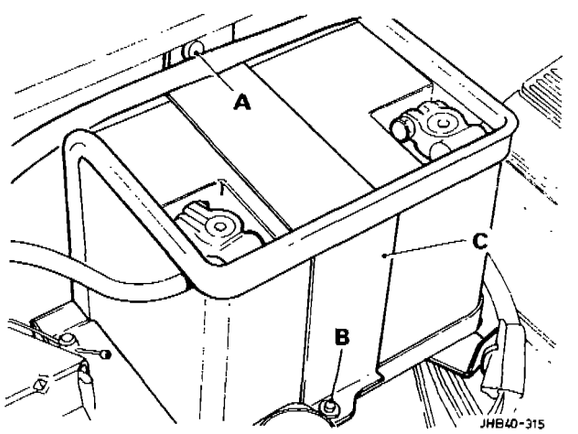


Fig 1

54. Clean and grease battery connections

Ease back battery terminal covers, slacken pinch bolts (13 rnm spanner required) and disconnect battery leads.

CAUTION: Disconnect the negative **lead** (earth terminal) first.

Clean battery posts and coat with petroleum jelly.
Reconnect the positive lead, tighten the pinch bolt and fit the terminal cover.
Reconnect the negative lead, tighten the pinch bolt and fit the terminal cover.

55. **Check/adjust** headlamp alignment

Headlight beam setting should only be carried out with approved beam setting apparatus.

All versions with rectangular headlamps (Fig.**1)**

Check tyre pressures, see operation 66.
Position the beamsetter to front of right-hand headlamp.
Switch lights on to dipped beam.
Locate adjusters at rear of headlamp (three knurled screws, two at top and one at bottom) and adjust horizontal and vertical settings to obtain the correct beam pattern.
Repeat the procedure for the left-hand headlamp.
Switch OFF lights.

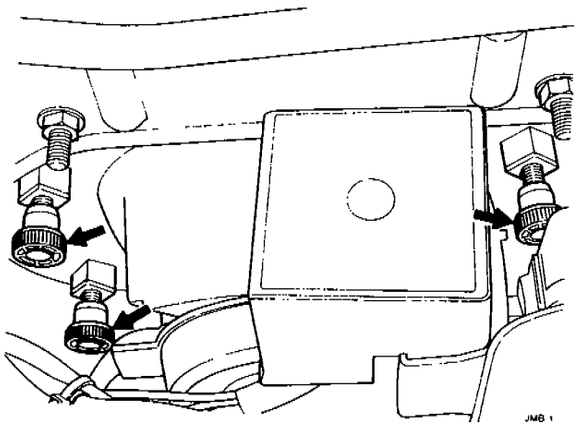


Fig 1

All versions with four headlamps

Outboard headlamp (Fig.2).

Check tyre pressures, **see** operation 66.
Position the beamsetter to front of right-hand outboard headlamp.
Switch lights on to dipped beam.
Locate adjusters at rear of headlamp (two knurled screws (1 and 2), **one** at top and one **at** bottom)and adjust horizontal and vertical settings to obtain the correct beam pattern.
Repeat the procedure for the left-hand outboard headlamp.

Inboard headlamps (Fig.2)

Note: Ensure the outboard headlamps have been correctly adjusted.

Position the beamsetter to front of right-hand inboard headlamp.
Switch lights on to main beam.
Locate adjusters at rear *of* headlamp (two knurled screws (3 and 4), one at top and one at bottom)and adjust horizontal and vertical settings to obtain the correct beam pattern
Repeat the procedure for the left-hand inboard headlamp.
Switch OFF lights.

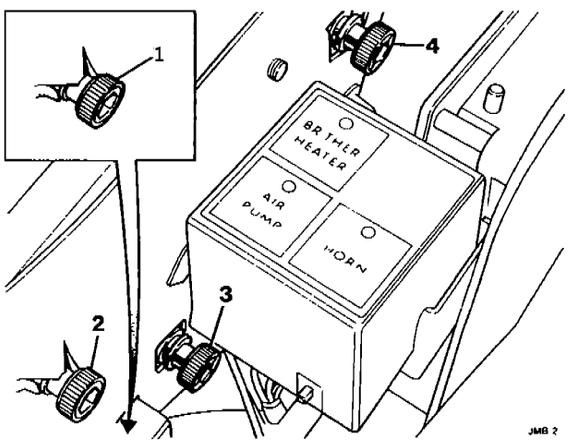


Fig 2

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56. Check operation of warning **systems** (90MY Fig.1, 91MY Fig.2.)

Twenty two warning lights are provided for warning and tell-tale purposes. These are arranged in four groups, two groups of seven at the left and right side of the instrument panel and two groups of four at the bottom **of** the instrument panel.

The seven right-hand side lamps are for primary warnings and **will** illuminate RED.

The seven left-hand side lamps are for secondary warnings and will illuminate **AMBER.**

The eight lower lamps are a mixture of status and warning **lamps.**

A lamp check cycle is initiated when the ignition switch is turned from **OFF** to ON (position 'II'), lasting about five seconds. If any lamp remains **lit** after this period, investigate the cause.

Exhaust Temperature (Japan **only)**

Illuminates if the exhaust temperature becomes excessive.

Low Oil Pressure

Illuminates when the ignition is switched ON (position 'II') and should extinguish when the engine is running. If the warning light remains ON when the engine is running, loss of oil pressure is indicated. Stop the engine immediately and investigate the cause. Begin by checking the engine oil level. **Do** not restart the engine until the fault has been rectified.

Seat Belt

Illuminates when the ignition is switched **ON** (position 'II') and the driver's or front seat passenger's seat belt is not fastened (Inertia reel seat belts) and with passive restraint **belts** is illuminated until the belt is located in the 'restraining' position.

Boot Open

Illuminates if the luggage compartment (boot) is not closed.

Door **Open**

Illuminates if a door is not closed. Check each door to ensure that they are all closed.

High Coolant Temperature

Illuminates if the engine coolant temperature becomes excessive. This warning light is additional to the coolant temperature gauge. **DO NOT RUN THE ENGINE IN AN OVER-HEATED CONDITION.**

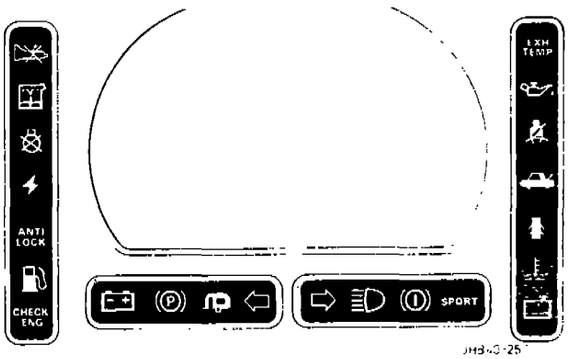


Fig 1

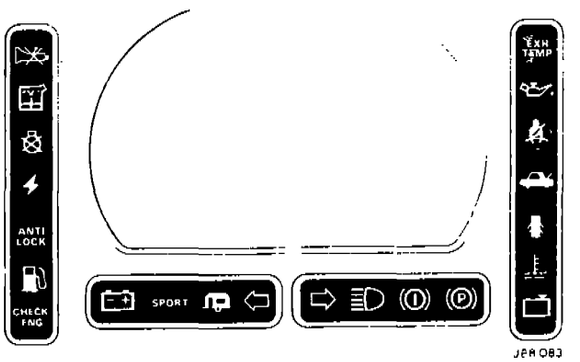


Fig 2

56. Continued

Low **Coolant** Level

Illuminates when the coolant level in the radiator is too low.

Sport Mode (4.0 litre automatic transmission only)

Illuminates when the engine is running and the sport mode switch is depressed. The warning light located on the switch surround will also be illuminated.

Brake System Fault

When the warning light is illuminated, it indicates one of three fault conditions:

1. Low brake fluid level.

2. Low brake boost pressure.

If the warning light comes on and stays on, it warns of very low brake fluid level or low boost pressure. In these cases loss of braking assistance (or complete loss of the braking system fluid) may be imminent.

Press the Vehicle Condition Monitor (VCM) button to display the fault message.

3. Brake Pad Low.

If the warning light goes ON and OFF as the brakes are applied and released, this warns of low brake pads. This can be confirmed by pressing the Vehicle Condition Monitor (VCM) button to display the fault message.

Headlamp Main Beam (High Beam)

Illuminates when the headlamps are on main beam.

Direction Indicator Monitors (left and right)

The appropriate direction indicator tell-tale will flash when the steering column combination switch is moved either up or down to signal a right-hand or a left-hand turn.

If one of the direction indicator lamps has failed, the bulb failure warning light will be illuminated and the direction indicator tell-tale will flash at twice the normal rate when the failed indicator is selected.

Caravan - This will only illuminate if the vehicle is equipped for towing and a caravan or trailer electrical cable is connected to the vehicle.

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56. Continued

Park Brake (Handbrake)

Illuminates when the handbrake is applied and the ignition is switched ON (position 'II').

Ignition

Illuminates when the ignition is switched ON (position 'II') and should extinguish when the engine is running. If the warning light remains ON when the engine is running it indicates either excessive battery voltage or that the alternator is not working, **stop** the engine and investigate the cause.

Check Engine

This illuminates when an engine management fault is indicated. Additional information can **be** displayed when the vehicle **is** stationary by pressing the Vehicle Condition Monitor (VCM) button.

Low Fuel Level

Illuminates to indicate low fuel level in the fuel tank. This warning light is additional **to** the fuel level gauge. The warning light will illuminate when the remaining fuel has fallen to approximately 10 litres (2 gallons).

Anti-lock **Braking System (ABS)**

Should the light illuminate alone, whilst driving, **it** indicates that the anti-lock braking system function has been fully or partially restricted. This will have been carried out automatically as **a** result of an irregularity monitored by the **ABS** electronics. The brake system will continue to function without anti-lock, with fully boosted (assisted) braking to all road wheels being maintained.

The ABS electronics monitor the entire anti-lock electrical system from ignition switch ON to ignition switch OFF.

Should the ABS warning light fail to go out on start-up, or illuminate while the vehicle is being driven; stop the vehicle at the first opportunity, turn the ignition OFF (position 'O') and then restart the engine. If the light continues to stay on, or comes on again, investigate the cause.

56. Continued

Circuit Failure

Illuminates when a fuse has failed, additional detail of which circuit has failed can be obtained by pressing the Vehicle Condition Monitor (VCM) button.

Bulb Failure

Illuminates to indicate that a bulb has **failed.** The bulb warning system monitors two seperate circuits:

1. Failure of direction indicators, also indicated when the direction indicator warning light flashes at twice the normal rate when the failed indicator is selected.

2. Failure of any external light bulbs.

Check which bulb has failed.

Low Windscreen Washer Reservoir Level

Illuminates to indicate low fluid level in the windscreen washer reservoir. Check and if necessary top up the level of the windscreen and headlamp washer fluid. If the level is correct investigate the cause.

Automatic Transmission Failure (4.0 litre only)

Illuminates when the ignition is switched ON (position 'II') and should extinguish when the engine is running.

If the warning light remains ON when the engine is running an electronics failure in the automatic transmission circuit is indicated.

When the transmission is in the 'limp home' mode the gearbox automatically selects third gear and will remain in this gear until the fault is rectified. During this condition the kickdown facility will not operate.

57. **Check audible warnings**

Note: If any of the audible warnings do not operate, report the fault for investigation.

PARK

Firmly apply the handbrake and position the automatic transmission selector lever in 'P' (Park).

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57. **Continued**

Ensure ignition is switched OFF. Move the selector lever from position 'P' and listen for a rapid intermittent low pitched tone.
Move the selector lever back to position 'P' to stop the audible warning.

DOOR OPEN

Sit in the driving position and close the door.
Insert the ignition key into the ignition switch and leave at position 'O'.
Open the door and listen for a continuous high pitched tone.
Close the door to stop the audible warning.

SEAT BELT (Inertia reel seat belts)

Sit in the driving position and ensure that the seat belt tongue is disconnected from the buckle unit.
Turn the ignition key to position 'II' and listen for a continuous low pitched tone which will operate for approximately six seconds.
Push the seat belt tongue into the buckle unit, the audible warning should not operate.
Switch the ignition OFF and release the seat belt harness.

SEAT BELT (Passive restraint seat belts)

Close the driver's door and turn the ignition key to position 'II'. Listen for a continuous low pitched tone which will operate for approximately six seconds if the driver's automatic diagonal seat belt is not in the 'restraining' position.

DIRECTION INDICATORS

Turn ignition key to position 'II'.
Move the lever up or down and listen for an intermittent tone.
Cancel the indicators to stop the audible warning. Switch the ignition OFF.

Operate the hazard warning switch and listen for an intermittent tone. Switch the hazard warning OFF.

SIDE LIGHTS ON

Sit in the driving position and close the door.
Move the master lighting switch to the second position to illuminate the front parking and tail lamps.
Remove the ignition key from the ignition switch and open the door, listen for an intermittent high pitched tone.

57. Continued

Close the door to stop the audible warning.
Move the master lighting switch to the OFF position.

DOOR OPEN (North America only)

Sit in the driving position and close the door.
Insert the ignition key into the ignition switch and leave at position '0'.
Open the door and listen for a continuous high pitched tone.
Close the door to stop the audible warning.

58. Check operation of horns

Press the end *of* the combination switch lever to sound the horns.

59. Check operation of windscreen wiper

Note: If any of the windscreen wiper switch positions do not operate, report the fault for investigation.

Turn ignition **key** to position 'II'.
Push the wiper switch lever to position '1' for normal speed operation.
Push the wiper switch lever to position '2' for high speed operation.
Push the wiper switch lever to position '0' to cancel the function and park the wiper blade.

For intermittent operation, push the wiper switch lever down against spring pressure and release.
The blade will perform a single sweep then there will be a delay period **of** approximately five seconds before the **blade** sweeps the windscreen again.
Push the lever down against spring pressure to cancel the function.

To obtain a single sweep **of** the wiper blade, pull the wiper switch lever towards the steering wheel and release.
Switch ignition 'OFF'.

60. Check operation of windscreen/headlamp washers for delivery spray pattern

Switch lights to headlamp position (if headlamp washers fitted).
Turn ignition key to position 'II'.
Push the wiper switch lever to position '1'.
Press the end of the wiper switch lever to operate the washer switch.
Observe the wash/wipe cycle on the windscreen and the headlamps (when fitted).
Switch wiper blade, ignition and lights OFF.

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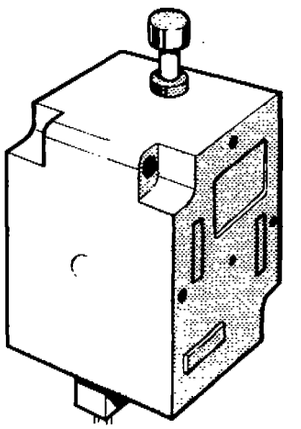
If the windscreen washer jets are obsructed they can be cleared using a suitable implement.

Note: The headlamp washer jets are not adjustable.

Reposition the windscreen washer jets if necessary by inserting a suitable implement into the jet orifice and moving the jet to the required position.

61. Clean radio aerial mast

Turn ignition key to position 'II'.
Switch radio ON and allow the aerial to extend.
Clean the aerial by wiping the mast with a clean cloth in an upwards direction.
Switch radio OFF, and allow the aerial to retract.
Switch ignition OFF.



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Fig 1

* **Check operation *of* the** inertia **switch** (United States of America only)

The inertia switch is located in the driver's footwell.
Ensure all doors except for the driver's door are closed.
Sit in the driving position. Ensure the gear selector lever is not in the reverse ('R') position.
Close and lock the driver's door by pressing the door locking button down, this will also lock the other doors.
Switch the ignition ON (position 'II'), the automatic diagonal seat belts should move to the 'restraining' position.
Raise the test/reset button, which protrudes through the top of the inertia switch cover.
Observe that the doors unlock, the automatic diagonal seat belts remain in the 'restraining' position and the instrument display **is** switched OFF.
Open the front doors, the automatic diagonal seat belts should not move from the 'restraining' position.
Leave the front doors open and reset the inertia switch by depressing the button. Observe that the instrument display is illuminated and that the automatic diagonal seat belts move to the 'parked' (unrestraining) position.
Lock and un-lock the doors to ensure the central locking system still functions. Switch the ignition OFF.
If the inertia switch fails to unlock the doors, switch the instrument display OFF or if the automatic diagonal seat belts move from the 'restraining' position, report the fault for investigation.

* **Check operation of seat belt** warning **light** (United States of America only)

Sit in the driving position, close the driver's door, ensure the automatic transmission selector lever is in position 'P' (Park) and turn the ignition key

to position 'II', the automatic diagonal seat belt should move to the 'restraining' position.
The seat belt warning should be illuminated until the automatic diagonal seat belt is located in the 'restraining' position.
Release the seat belt buckle from the travelling mechanism by operating the red 'Press' button. The seat belt warning light should illuminate.
Re-attach the seat belt buckle to the runner/tongue assembly with the red 'Press' button facing inboard.
Switch the ignition OFF to release the seat belt.

Note: The continuous low pitched tone will operate for approximately six seconds if the driver's automatic diagonal seat belt is not in the 'restraining' position.

If the warning light does not operate correctly, report the fault for investigation.

* **Check operation of reverse gear inhibit switch** (United States of America only)

Sit in the driving position, close the driver's door, ensure the automatic transmission selector lever is in position 'P' (Park)and turn the ignition key to position 'II', the automatic diagonal seat belt should move to the 'restraining' position and the seat belt warning light should not be illuminated.
Select reverse gear (position 'R') and open the driver's door. The automatic diagonal seat belt should remain in the 'restraining' position.
Ensure that body or limbs are not in the path of the deploying seat belt, then disengage reverse gear. The automatic diagonal seat belt should travel to the 'parked' (unrestraining) position.
If the automatic diagonal seat belt fails to comply with the above procedure, report the fault for investigation.

WHEELS AND TYRES CHECK

62. Check that tyres are correct size and type

Check all tyres including the *spare.*

U.K., Europe and Rest *of* World

1990 MY; Dunlop or Michelin 220/65 VR 390 TD
1991 MY; Pirelli 225/65 VR 15

1991 MY Optional Fits (not Canada)

Dunlop or Michelin 220/65 VR 390 TD
Pirelli 225/55 ZR 16

North America only

Pirelli 205/70 VR15.

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63. Check tyre tread depth - Note on service sheet

Visually check the tyre tread depth indicators on all tyres including the spare.
The minimum depth allowed is 1mm over three quarters of the tread width around the entire circumference.

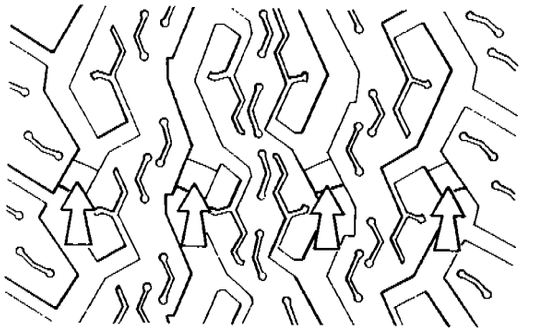


Fig 1

64. Check tyres for uneven and excessive wear and damage (including sidewalls)

Check each tyre for wear and damage including the spare.
Visually inspect sidewalls and tread for **signs** of damage, uneven and excessive wear, exposure of ply or cord sructure and for sharp objects embedded in the tread.
Remove any objects found in the tread with a small **blunt** tool.

The following information details some of the causes of irregular wear and tyre damage:

Incorrect Tyre Pressures (Fig.2).

Under-inflation (a Fig 2) is a frequent cause **of** severe tyre damage, resulting from the excessive flexing of the tyre. Under-inflation builds up internal heat which eventually weakens the casing. It also causes rapid and irregular tread wear.

Over-inflation (c Fig 2) leads to shortened tyre life with tread wear concentrated on the centre section in contact with the road. The cushioning effect of the tyre is impaired, resulting in a hard and uncomfortable ride. The tyre is also susceptible to impact fracture and casing damage.

Correct inflation (b Fig 2).

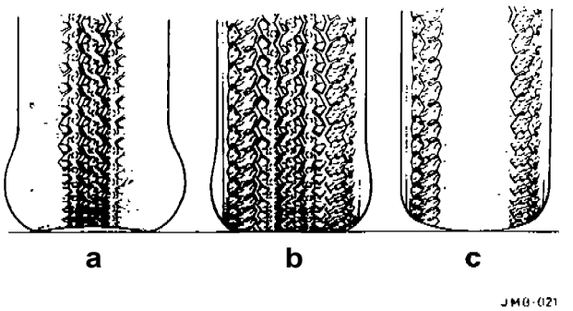


Fig 2

Misalignment Wear (Fig.3).

Rasped and feathered tread condition is caused by wheel misalignment and results in very rapid tread wear.

'Fins' on the inside edges of the pattern ribs, particularly on the nearside tyre, indicate toe-in. 'Fins' on the outside edges, particularly on the offside tyre, indicate toe-out.

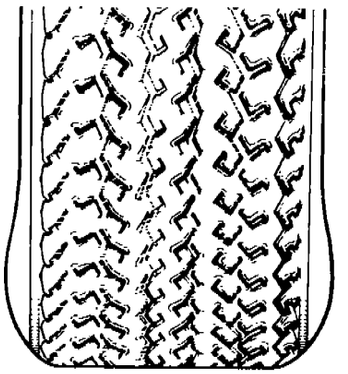


Fig 3

Camber Wear (Fig.4).

One shoulder more severely worn than the other. This type of wear is accentuated by mechanical irregularities of steering or suspension, or by high speed cornering.

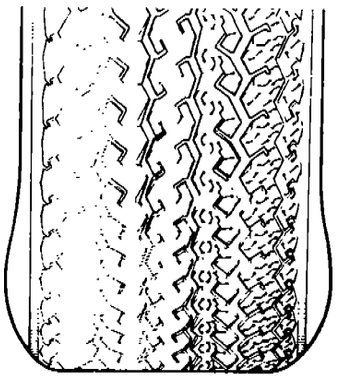
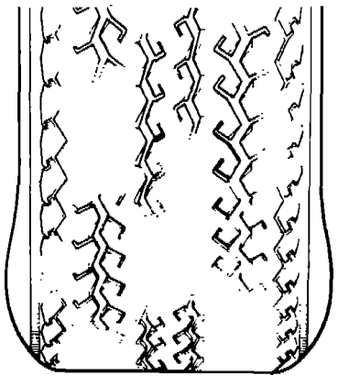


Fig 4

64. Continued

Irregular Wear (Fig. 1).

Caused by mechanical irregularity of the vehicle as, for example, worn bearings, steering joints or badly adjusted brakes.

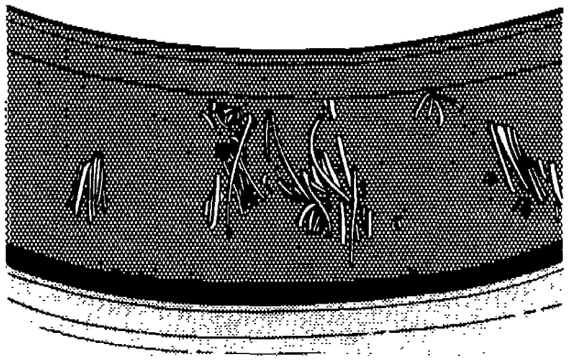


JMB·025

Fig 1

Deflation Damage (Fig. 2).

Breakdown of the tyre casing structure which can arise from under-inflation, overloading or running on a flat tyre.



JMB 023

Fig 2

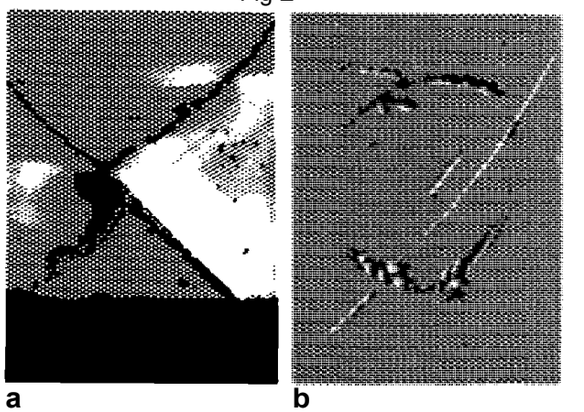
Impact Fractures (Fig. 3).

Resultant damage from impact fractures is not always visible externally and, therefore, as a safety precaution the tyre should be removed and examined.

(a) Casing fracture caused by severe localised impact through driving over kerbs, hitting pot-holes and/or objects in the roadway.

(b) A double fracture is caused by crushing the sidewall of the tyre between an object and the rim flange.

Note: In both instances such damage can lead to sudden and dangerous tyre deflation some time after the impact occurred.



a b

JMB·024

Fig 3

Age Deterioration

Cracking and crazing of the tread and sidewall rubber, sometimes accompanied by carcase deformation. An indication that tyres have been in service for an extremely long time.

Neglected Cut

Damage through accidental cuts or penetrations will extend in use due to continued flexing and/or ingress of moisture and road matter.

65. **Check/adjust** tyre pressures including spare

Unscrew the dust cap from the valve of the tyre to be tested and check the pressure using an accurate tyre pressure gauge. Refit the dust cap.

U.K., Europe and Rest of World (**non** TD tyres, cold **)**

Front **(90MY)**	**Rear (90&91MY)**
2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar)	2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar)

Front **(91MY)**

2,24 kgf/cm^2 (32 lbf/in^2, 2.21 **bar)**

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The pressures quoted for U.K., Europe and Rest of World non TD tyres may be reduced by (90MY) 0,56 kgf/cm^2, 8 lbf/in^2, 0,55 bar (91MY reduce by 0,42kgf/cm^2, 6 lbf/in^2, 0,41 bar) on the front, and 0,42 kgf/cm^2, 6 lbf/in, 0,41 bar (both 90MY and 91MY) on the rear tyres to obtain maximum comfort provided the speed does not exceed 160 km/h (100 mph)

U.K.,Europe and Rest of World (TD tyres, cold)

Front	Rear
2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar)	2,38 kgf/cm^2 (34 lbf/in^2, 2.34 bar)

The above pressures may be reduced by 0,56 kgf/cm^2, 8 lbf/in^2, 0,55 bar on the front, and by 0,42 kgf/cm^2, 6 lbf/in^2, 0,41 bar on the rear tyres to obtain maximum comfort provided the speed does not exceed 160 km/h (100 mph)

North America Only (cold tyres)

Front	Rear
228 kPa (33 lbf/in^2)	248 kPa (36 lbf/in^2)

The above pressures may be reduced by 41 kPa (6 lbf/in^2) on the front and rear tyres to obtain maximum comfort provided the speed does not exceed 160 km/h (100 mph)

66. Check tightness of road wheel nuts

Carefully remove the wheel nut cover (if fitted). Torque tighten all road wheel nuts **as follows:**
Wheel nut to wheel stud (steel wheel) - 65 to 85 Nm (48 to 63 lbf.ft).
Wheel nut to wheel stud (alloy wheel) - 88 to 102 Nm (65 to 75 lbf.ft).

CAUTION: Do not exceed a torque of 85 Nm (63 lbf.ft) where steel wheels are fitted or 102 Nm (75 lbf.ft) where alloy wheels are fitted.

Fit the moulded wheel nut cover (if applicable) to the road wheel.

ROAD TEST CHECK

68. Carry out road/roller test

Road test procedure

Before driving the vehicle check the following:

(1) Car meets current roadworthiness legislation.

Road test procedure (continued)

(2) On automatic transmission models; check that the vehicle will only start in Park (P) or Neutral (N).

(3) The starter motor operates smoothly.

(4) Engine starts easily.

(5) Low oil pressure and ignition warning lights extinguish on starting.

(6) Oil pressure gauge and battery condition indicator register.

(7) Tachometer operates.

(8) Engine runs smoothly and quietly without undue noise levels.

(9) Footbrake and handbrake operate.

(10) On automatic transmission models; check parking pawl for engagement.

When driving the vehicle on the road check the following:

(1) Automatic drive selection and noise levels throughout the range.

(2) Manual gearbox selection and noise levels throughout the range.

(3) Engine drive performance is normal, without excessive noise levels.

(4) The throttle operates smoothly.

(5) Speedometer for steady operation, and that the distance recorder operates.

(6) Indicators for self cancelling.

(7) Steering for noise, effort required, free play, wander and castor action.

(8) Check suspension for noise, irregularity in ride and road wheel imbalance.

(9) Footbrake pedal for effort, travel, braking efficiency, pulling and binding.

(10) Operation of all instruments and optional equipment.

(11) Abnormal body and wind noise.

(12) Operation of speed control.

(13) Webbing and operation of seat belts including inertia reels.

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Road test procedure (continued)

(14) Handbrake ratchet and hold.

On completion of road test procedure:

Report on road test findings.

Remove vehicle protection kit.

Ensure cleanliness of controls, door handles, etc.

Roller test procedure

Before running the vehicle on the roller equipment, check the following:

(1) Check that the vehicle will only start in Park (P) or Neutral (N).

(2) The starter motor operates smoothly.

(3) Engine starts easily.

(4) Low oil pressure and ignition warning **lights** extinguish on starting.

(5) Oil pressure gauge and battery condition indicator register.

(6) Tachometer operates.

(7) Engine runs smoothly and quietly without undue noise **levels.**

(8) Footbrake and handbrake operate.

(9) Check parking pawl for engagement.

When running the vehicle on the roller equipment, check the following:

(1) Automatic drive selection and noise levels throughout the range.

(2) Manual gearbox selection and noise levels throughout the range.

(3) Engine drive performance is normal, check power output.

(4) The throttle operates smoothly.

(5) Speedometer for steady operation, and that the distance recorder operates.

(6) Footbrake pedal for effort, travel and braking efficiency.

(7) Operation *of* all instruments and optional equipment.

Roller test procedure (continued)

(8) Handbraks ratchet and hold.

On completion of roller test:

Report on roller test findings.

Remove vehicle protection kit.

Ensure cleanliness of controls, door handles, etc.

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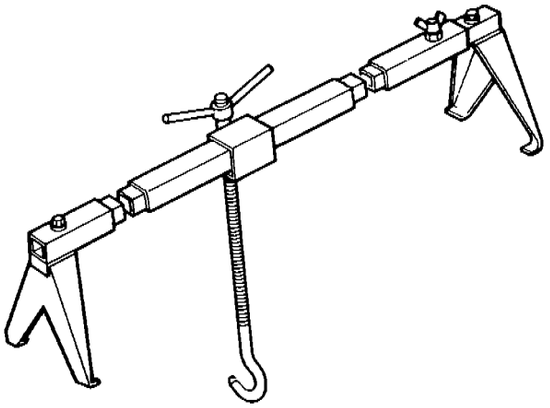
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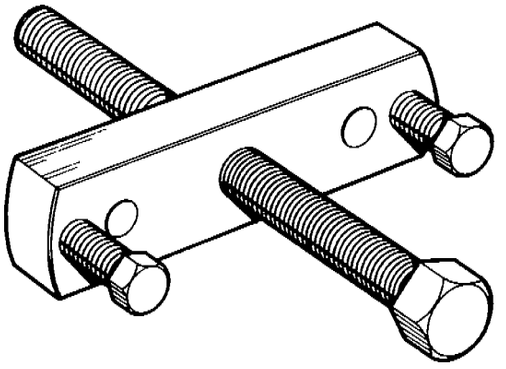
ENGINE

MS 538
ENGINE **SUPPORT BRACKET**



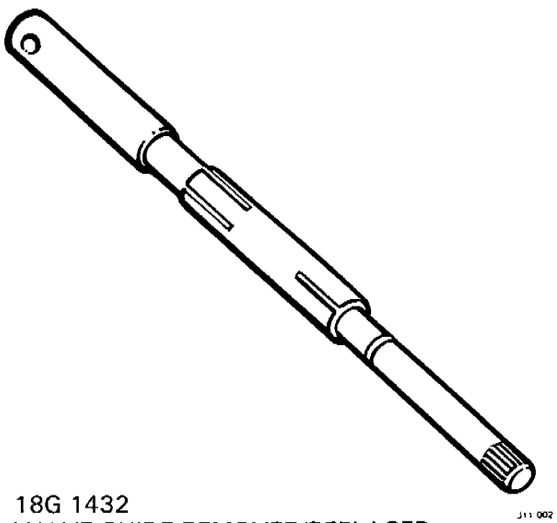
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TIMING **DAMPER** OIL **PRESSURE SIMULATOR**
TOOL **AND CRANK PULLEY REMOVER**



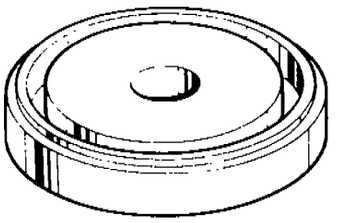
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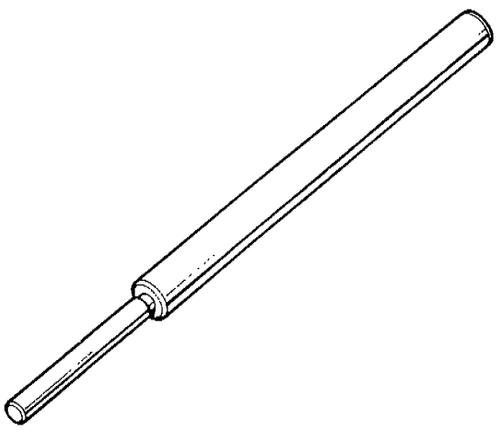
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JD 550-3
CRANKSHAFT REAR OIL SEAL
REPLACER ADAPTOR



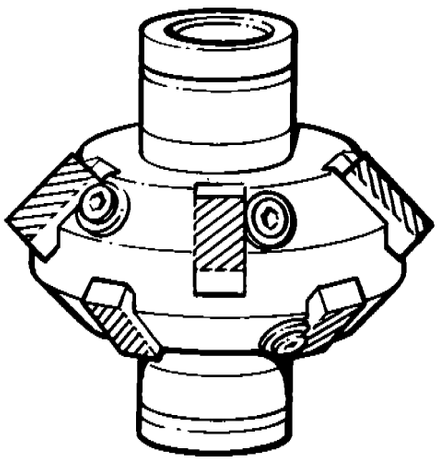
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ADJUSTABLE VALVE SEAT CUTTER

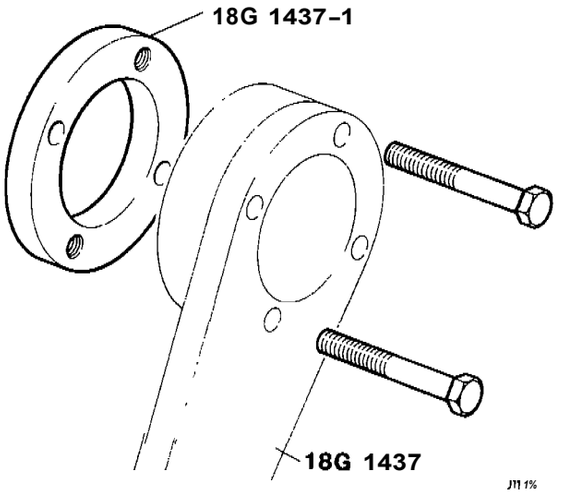


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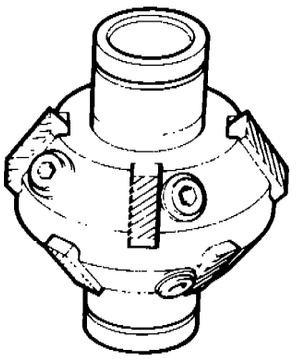
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ENGINE

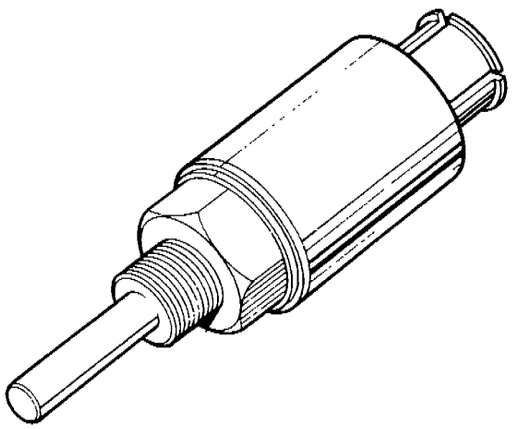
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FRONT PULLEY LOCK



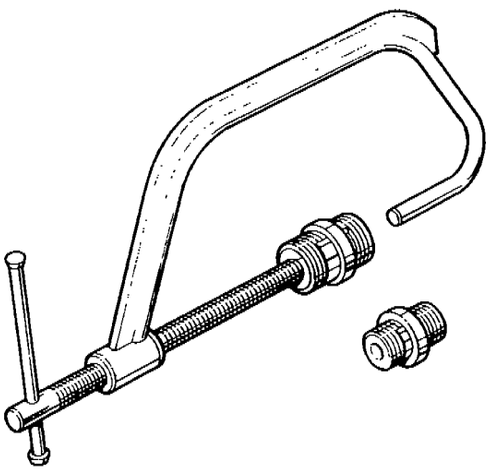
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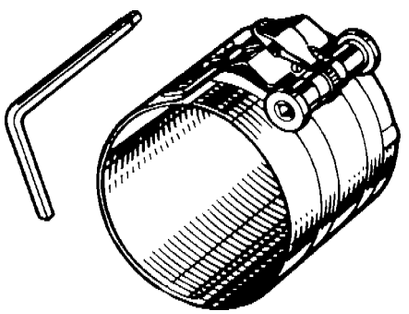
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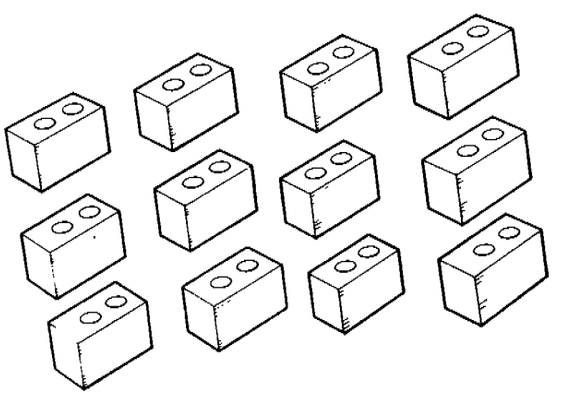
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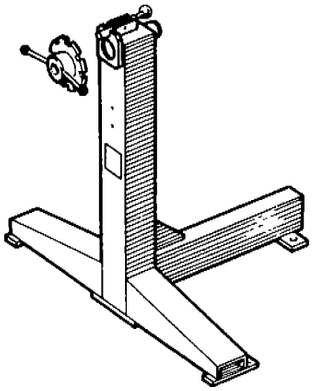


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DUMMY CAMSHAFT CAPS



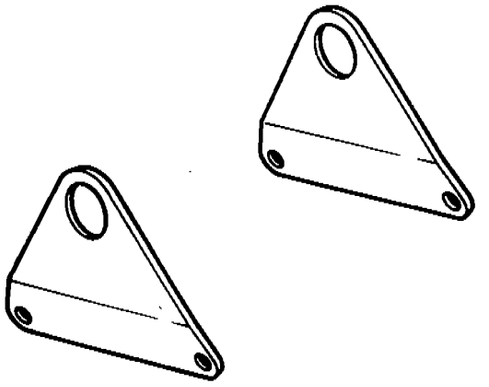
ENGINE

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ENGINE STAND



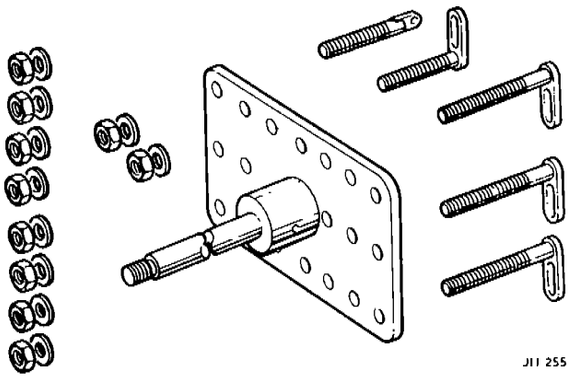
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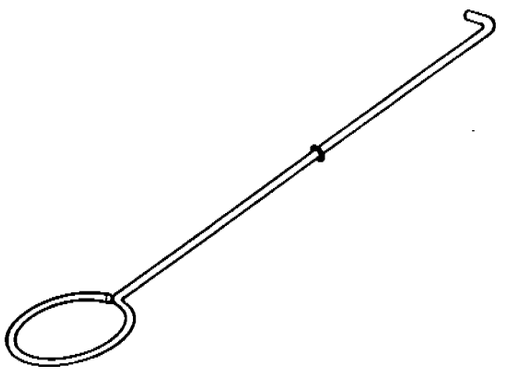
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MS 1520-2
ENGINE STAND ADAPTOR



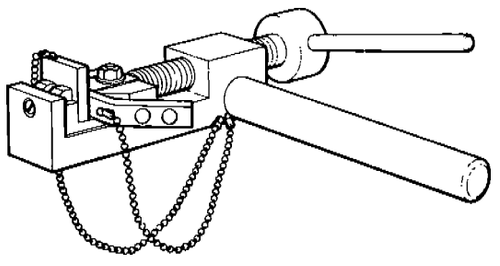
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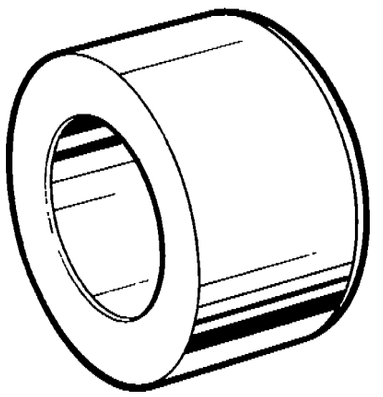
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JD 130
CHAIN LINK REMOVER/REPLACER



J11 015

JD **129**
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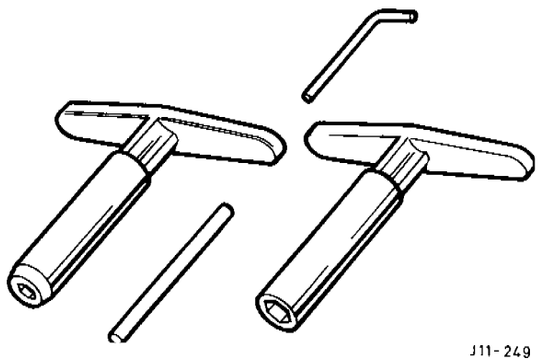


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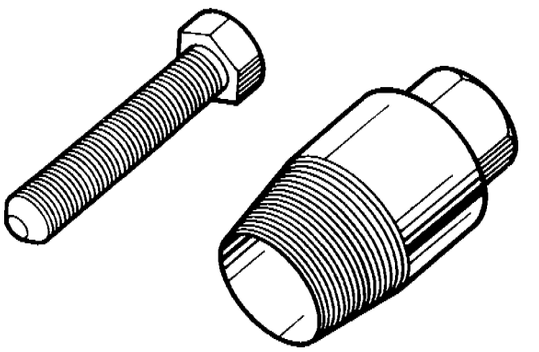
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ENGINE

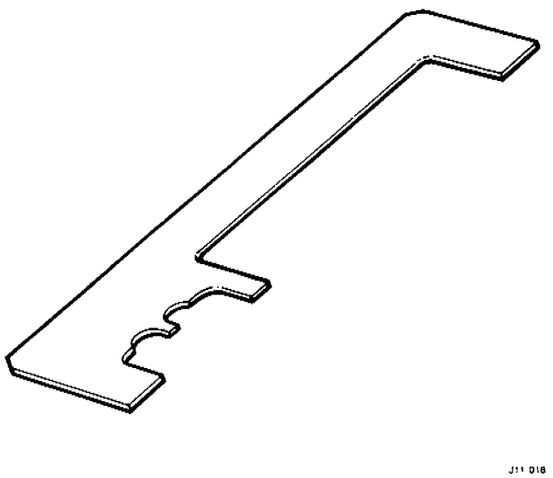
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BASIC HANDLE SET



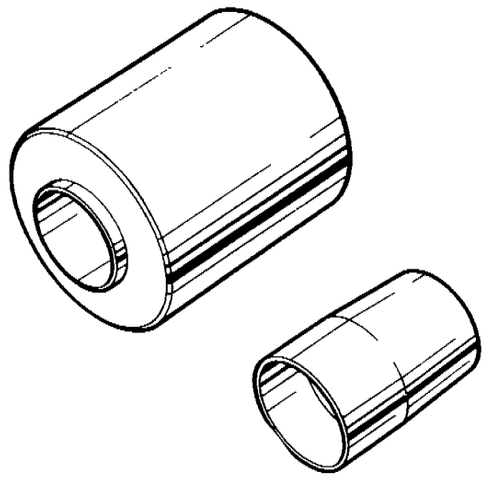
JD 118
AUXILIARY DRIVES OIL SEAL REMOVER



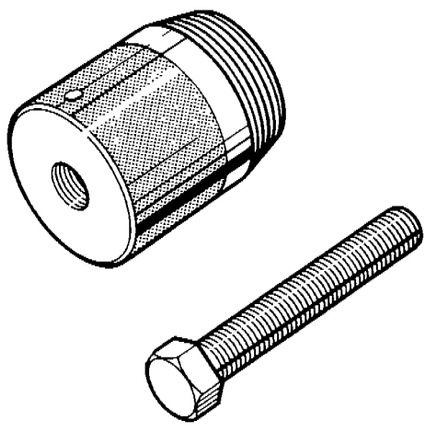
18G 1433
CAMSHAFT TIMING TOOL



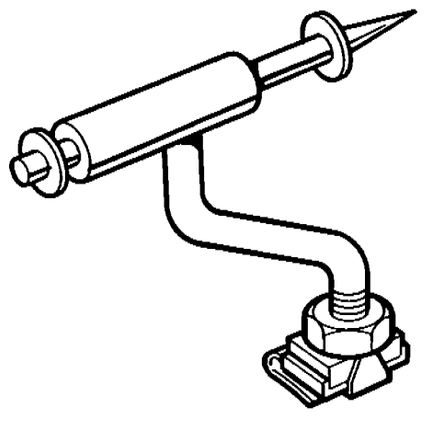
18G 1469
AUXILIARY DRIVES OIL SEAL REPLACER



JD 128
CRANKSHAFT FRONT OIL SEAL REMOVER

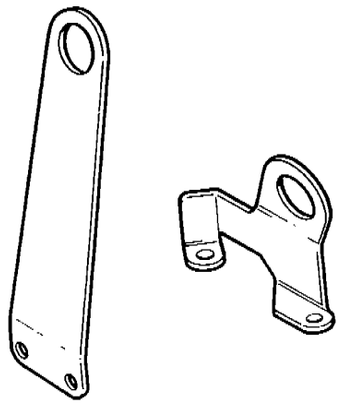


JD 131
THROTTLE LINKAGE SETTING POST



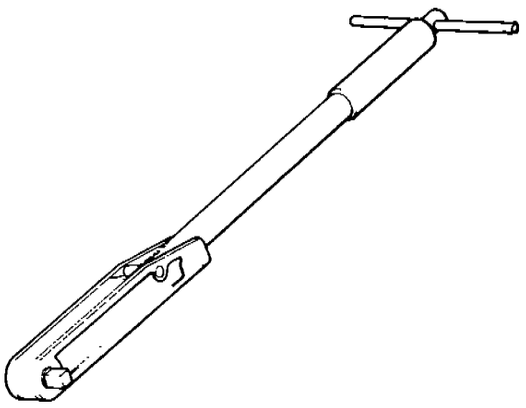
ENGINE

JD 123
ENGINE LIFTING BRACKET FRONT 2.9



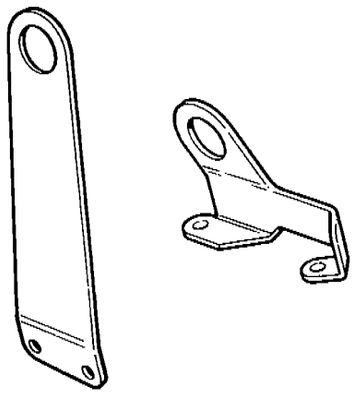
J11 021

18G 592
TORQUE WRENCH



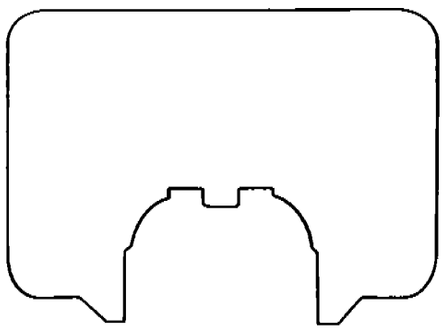
J11 024

JD 124
ENGINE LIFTING BRACKET REAR 2.9



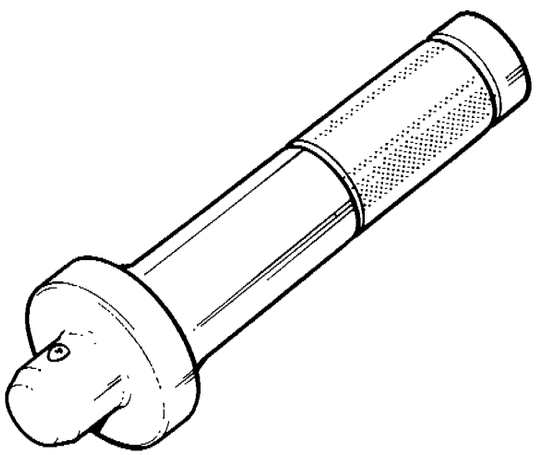
J11 022

C3993
CAMSHAFT TIMING TOOL



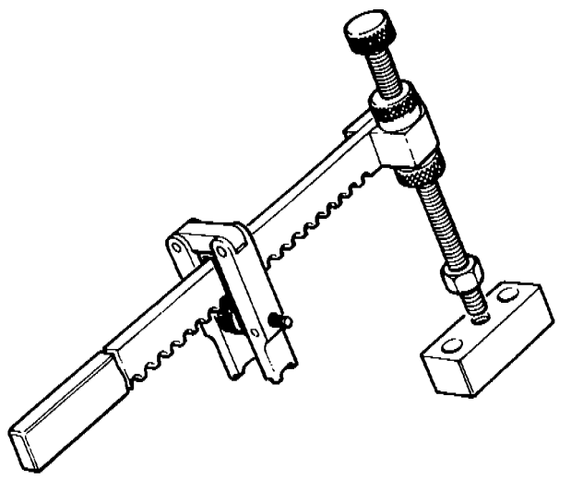
J11 025

18G 134
DRIVER HANDLE



J11 023

JD 6118C
VALVE SPRING COMPRESSOR 2.9

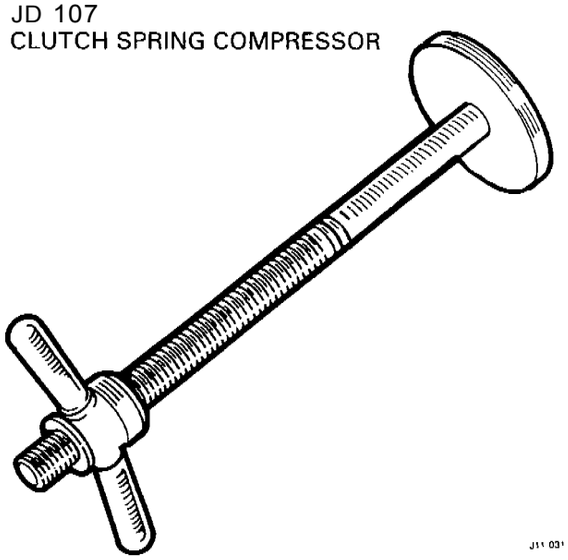


J11 026

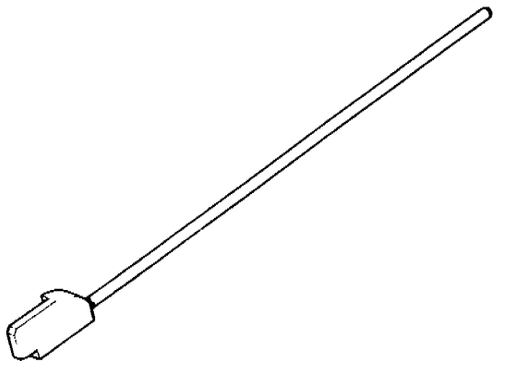
www.JagDocs.com

AUTOMATIC TRANSMISSION

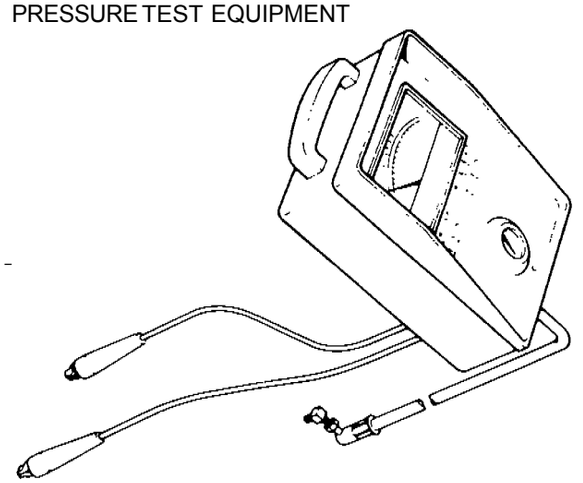
JD 107
CLUTCH SPRING COMPRESSOR



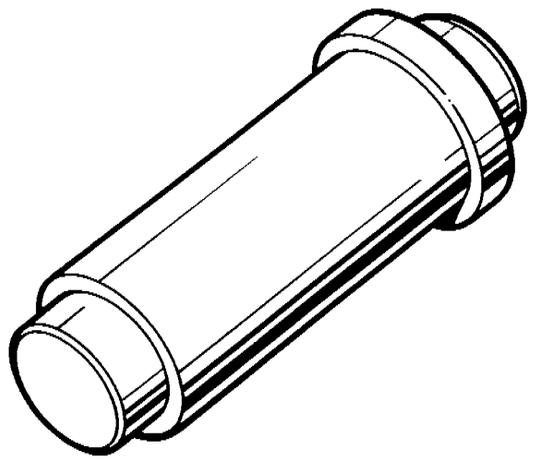
JD 103
SELECTOR LINKAGE GAUGE



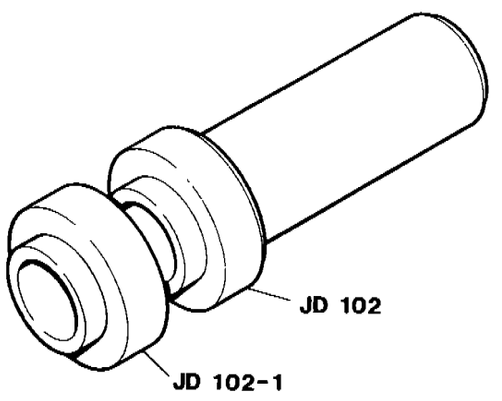
18G 677ZC
PRESSURE TEST EQUIPMENT



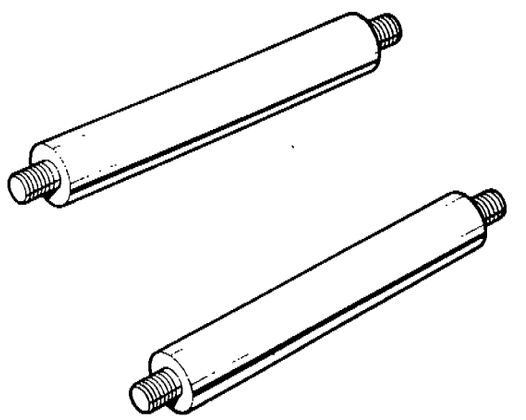
JD 104
EXTENSION HOUSING NEEDLE ROLLER
BEARING REMOVER/REPLACER



JD 102
FRONT/REAR OIL **SEAL** REPLACER

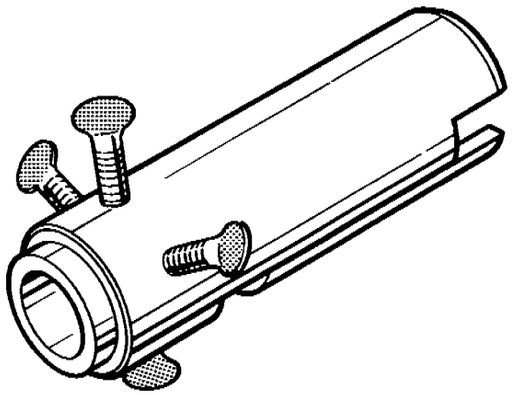


JD 105
CONVERTER LIFTING HANDLES



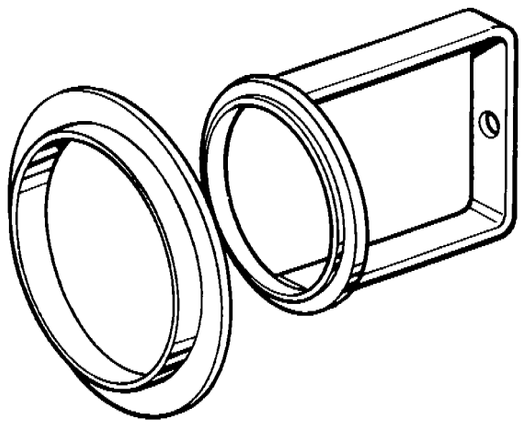
AUTOMATIC TRANSMISSION

JD 106
OIL PUMP ROTATION SLEEVE AND END FLOAT GAUGE



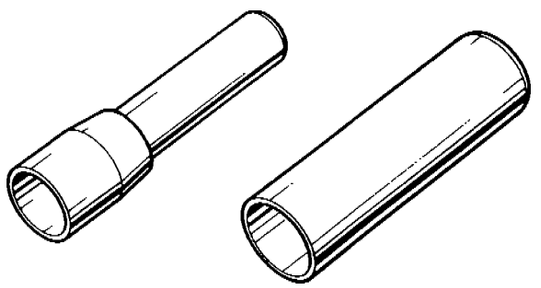
J11 037

JD 107-1
ADAPTOR CLUTCH **SPRING COMPRESSOR**



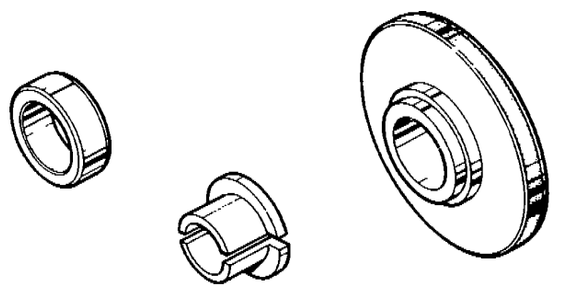
J11 040

JD 108
'0' RING AND SNAP RING REPLACER



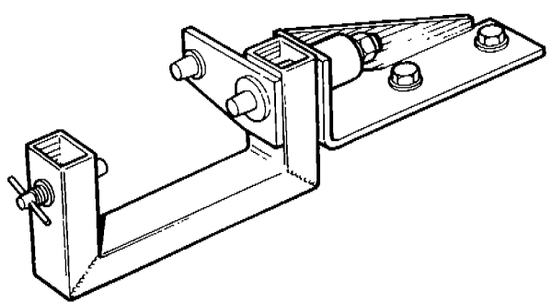
J11 038

JD 109
GEAR TRAIN REMOVER



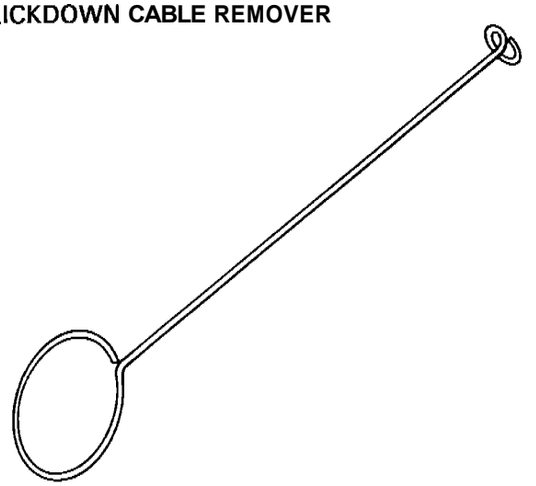
J11 041

JD 111
TRANSMISSION HOLDING FIXTURE



J11 039

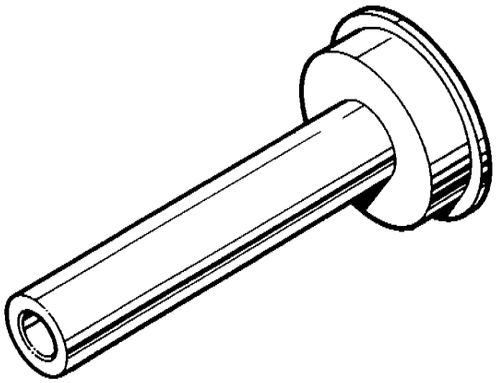
JD 110
KICKDOWN CABLE REMOVER



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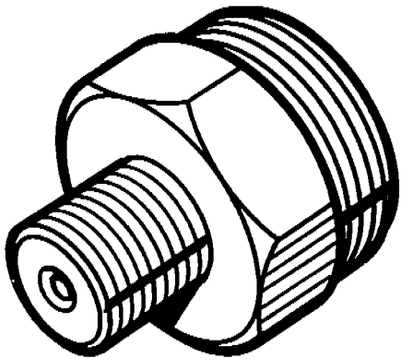
AUTOMATIC TRANSMISSION

JD 107-2
ADAPTOR GREARBOX MOUNTING CENTRALIZER

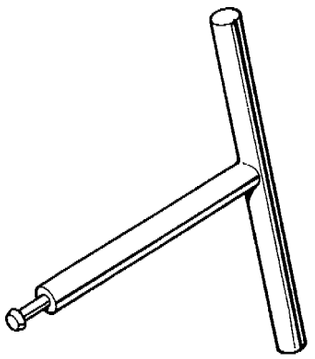


JD 677-3

ADAPTOR PRESSURE TEST

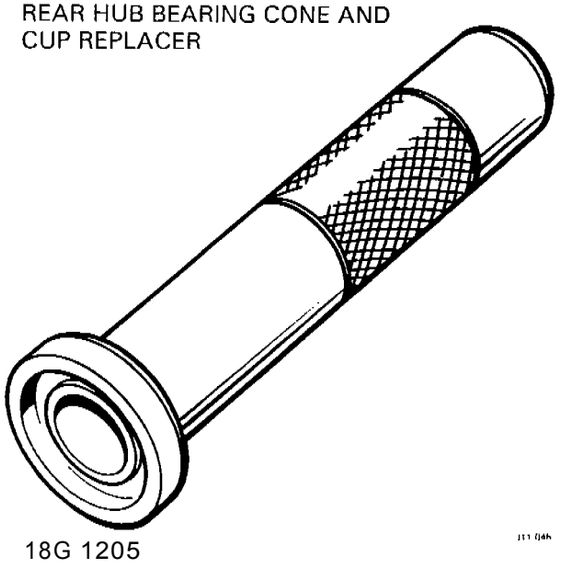


JD 126
CONTROL UNIT INLET OIL **SEALS** REMOVER/REPLACER



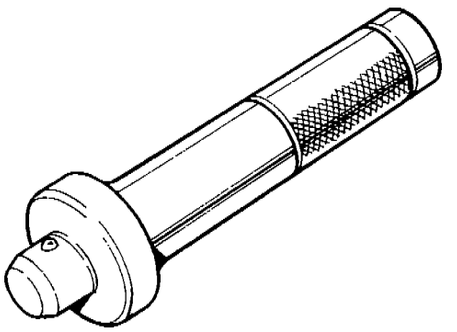
REAR AXLE

SL7
REAR HUB BEARING CONE AND CUP REPLACER



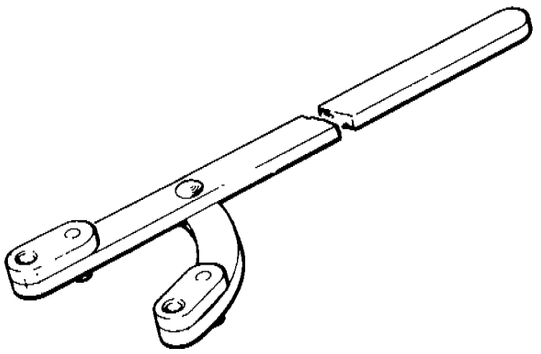
J11 046

18G 134
DRIVER HANDLE



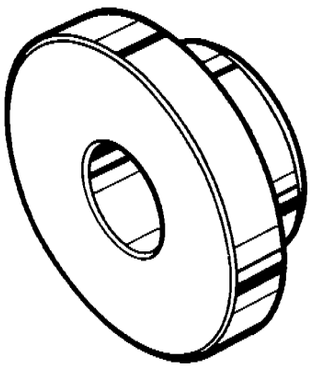
J11 049

18G 1205
PROPELLOR SHAFT FLANGE WRENCH



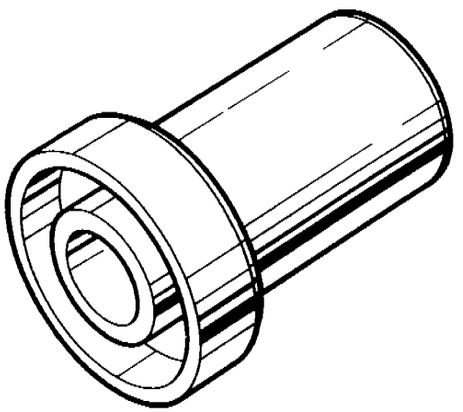
J11 047

JD 550-1
DRIVE **SHAFT** OIL **SEAL** REMOVER/REPLACER ADAPTOR



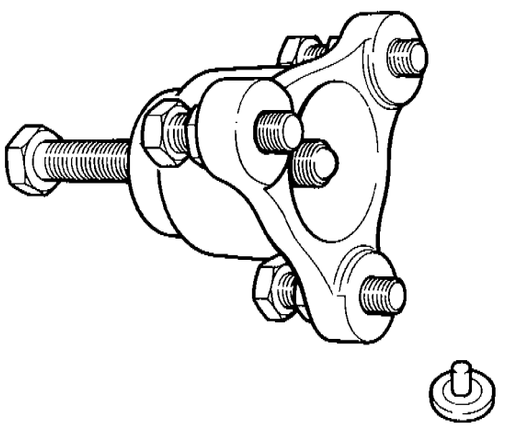
J11 050

18G 1428A
PINION OIL SEAL INSTALLER



J11 048

JD 156
DRIVE COUPLING AND **SPIGOT** REMOVER

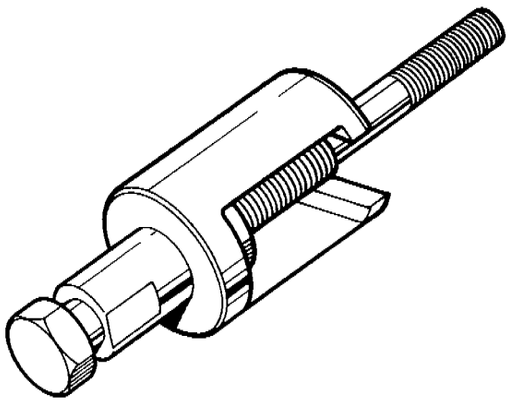


JII-199

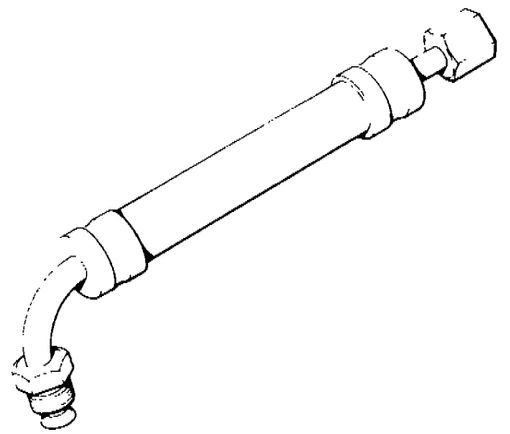
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POWER STEERING

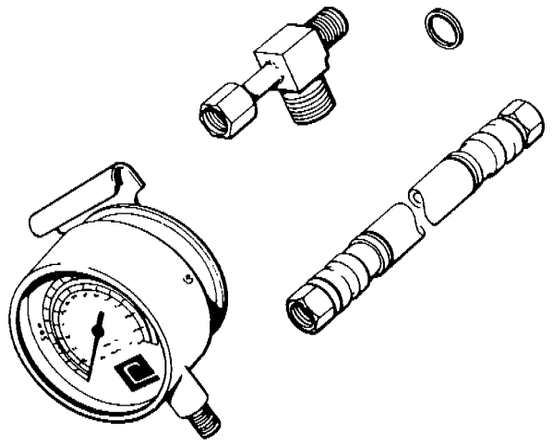
18G 1445
POWER STEERING PUMP
DRIVE DOG REMOVER/REPLACER



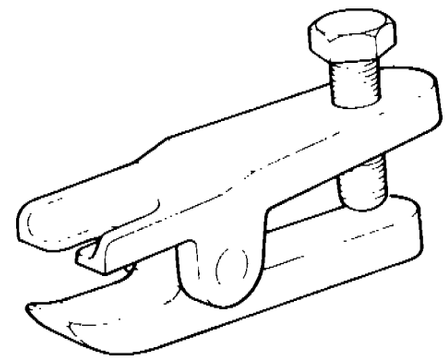
JD 10/3A
POWER STEERING ADAPTOR



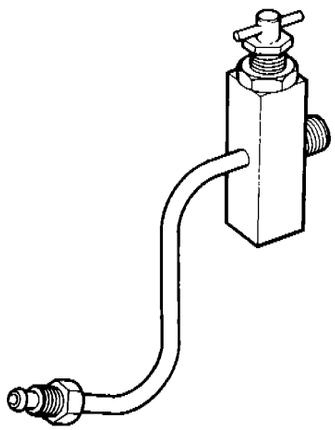
JD 10
POWER STEERING TEST **SET**



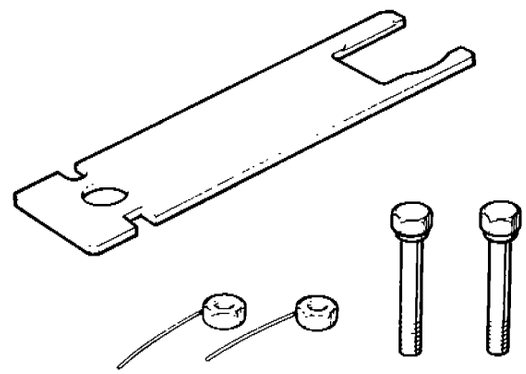
JD 100
STEERING ARM AND SWIVEL
HUB BALL PINS REMOVER



JD 10/2
HYDRAULIC PRESSURE TEST ADAPTOR

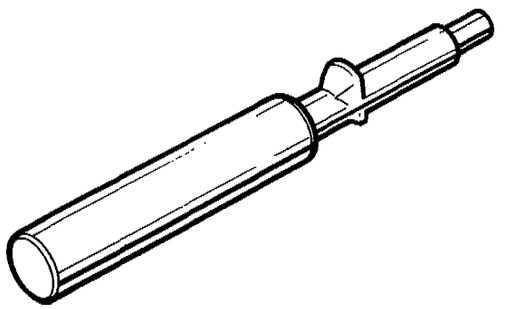


JD 119
POWER STEERING PUMP DRIVE DOG
REMOVER/ADAPTOR



POWER STEERING

JD 120
STEERING RACK CENTRALIZING PIN

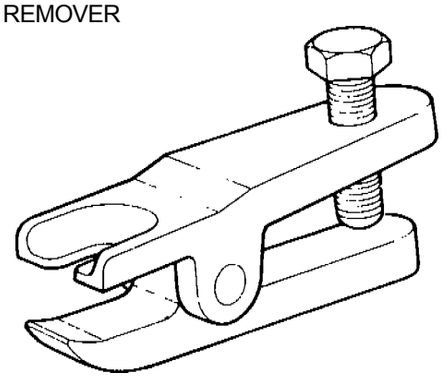


J11 054

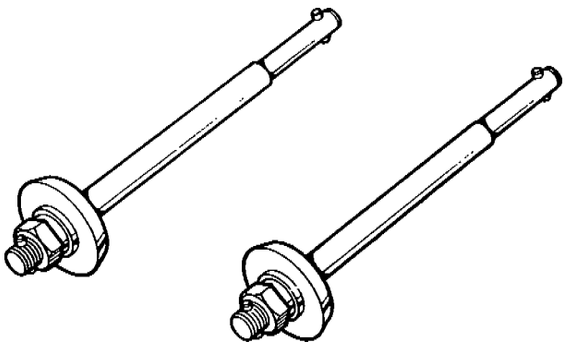
www.JagDocs.com

FRONT SUSPENSION

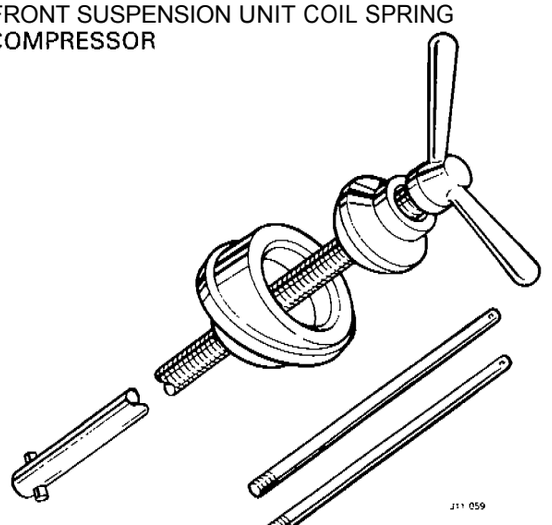
JD 100
STEERING ARM AND SWIVEL HUB BALL PIN REMOVER



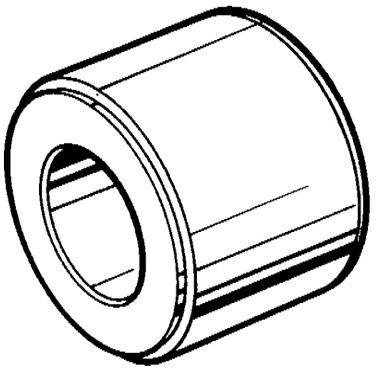
JD 133
CAMBER TIE DOWN LINK FRONT



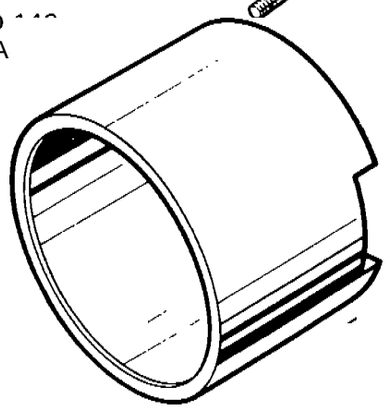
JD 115
FRONT SUSPENSION UNIT COIL SPRING COMPRESSOR



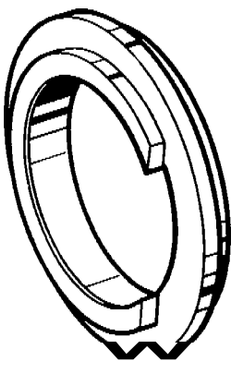
JD 143-5
ADAPTOR BUSH REMOVER/REPLACER



JD
BA

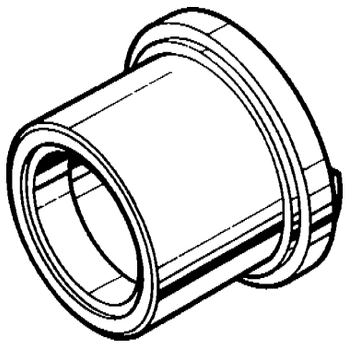


JD 143-1
ADAPTOR RING



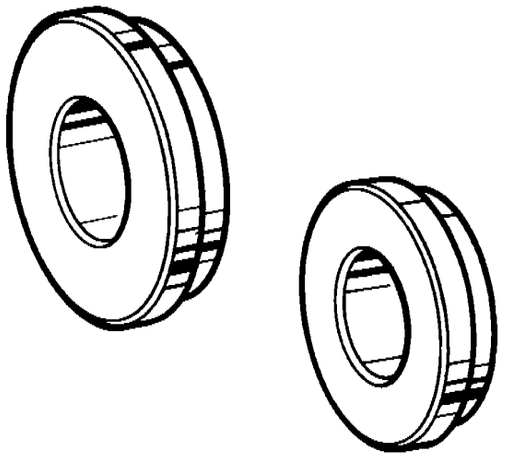
FRONT SUSPENSION

JD 143-2
ANVIL ADAPTOR



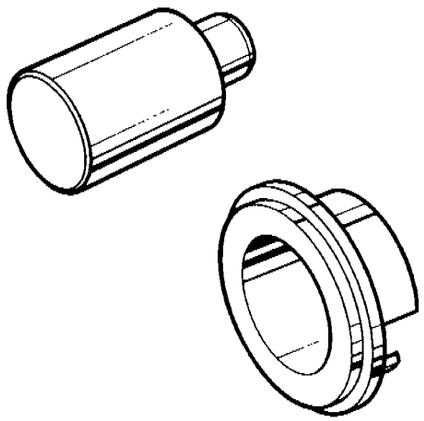
J11 064

JD 550-5
ADAPTOR REPLACER FRONT HUB BEARING
CUP INNER **AND OUTER**



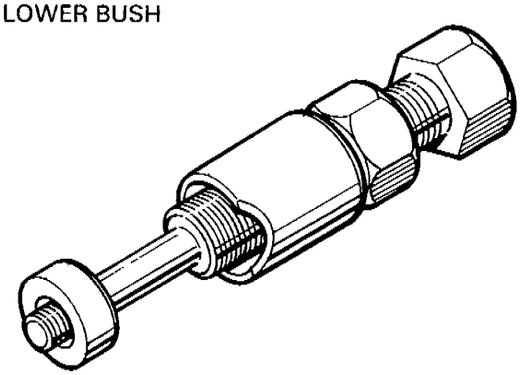
J11 067

JD 143-3
ADAPTOR BUSH REMOVER/REPLACER



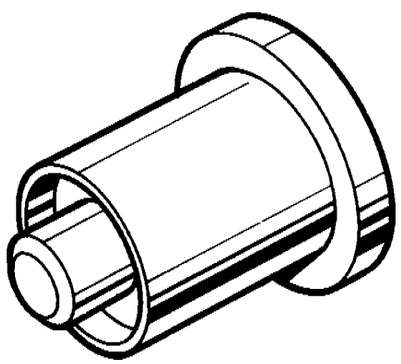
J11 065

JD 135
REMOVER REPLACER F.S.U. DAMPER
LOWER BUSH



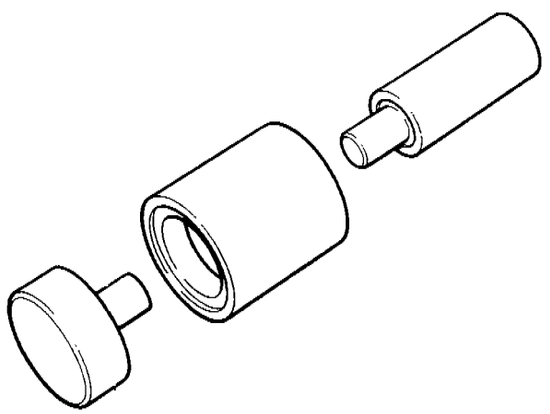
J11 068

JD 143-4
ADAPTOR BUSH **REMOVER/REPLACER**



J11 066

JD 160
UPPER **WISHBONE** BUSH **REMOVER/REPLACER**

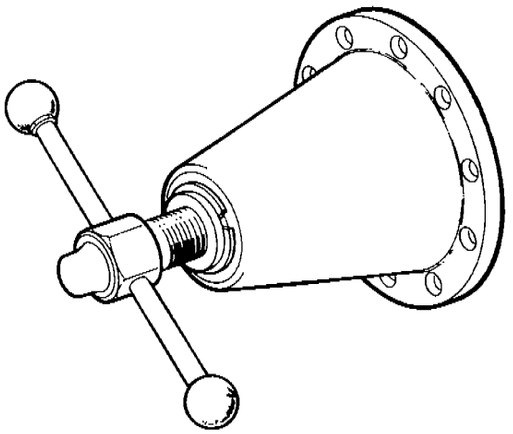


J11-198

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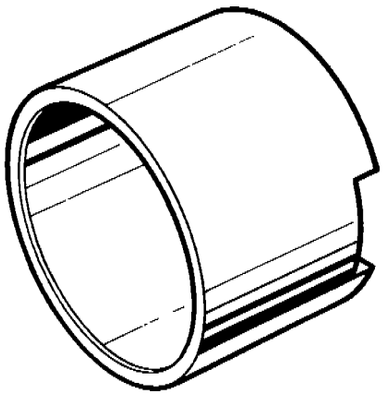
REAR SUSPENSION

JD 1D
HUB REMOVER



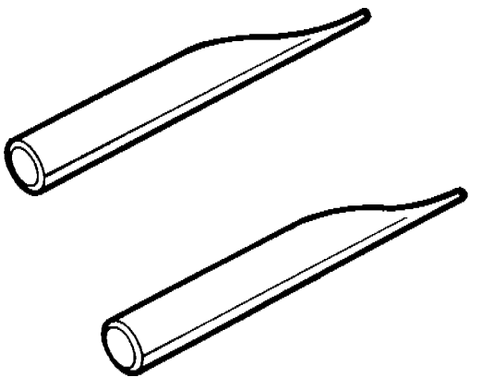
J11 069

JD 143
BASIC TOOL



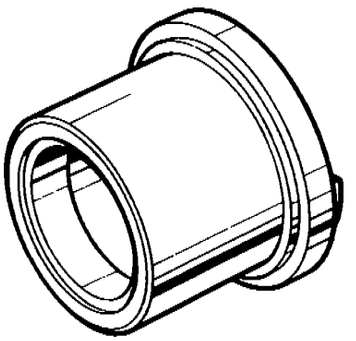
J11 072

JD 153
SELF-LEVELLING ADAPTOR/REMOVER



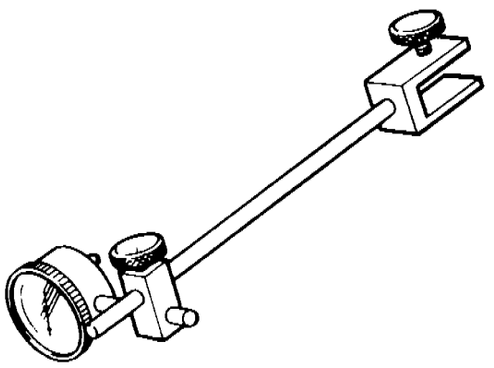
J11 090

JD 143-3
ANVIL ADAPTOR



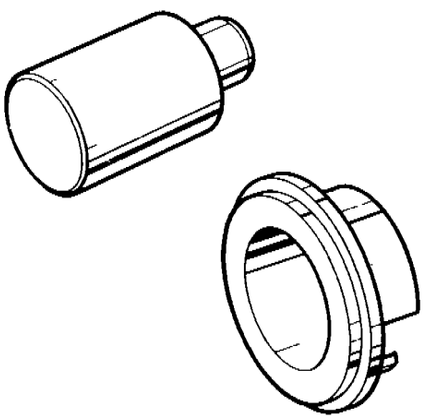
J11 073

JD 13B
REAR HUB END FLOAT GAUGE



J11 071

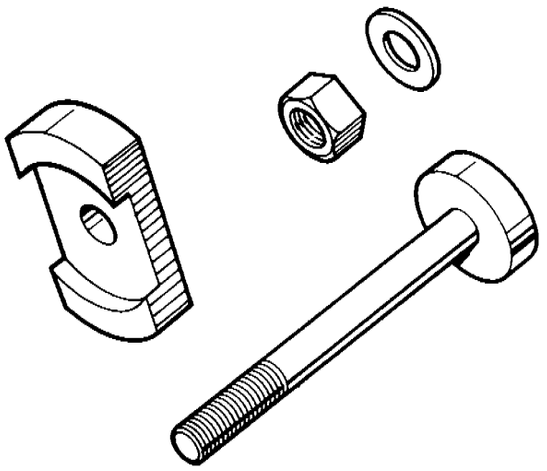
JD 143-3
ADAPTOR BUSH REMOVER/REPLACER



J11 074

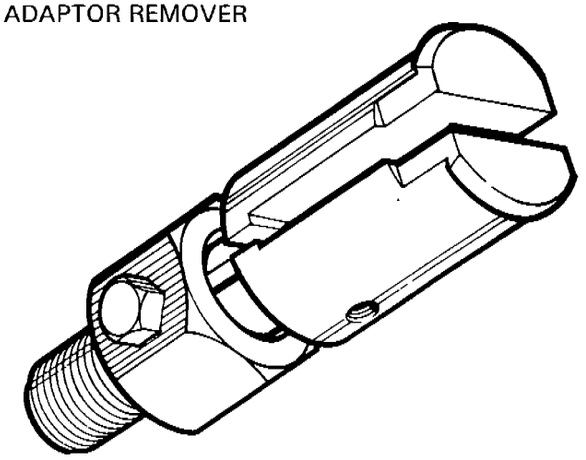
REAR SUSPENSION

JD 143-6
ADAPTOR BUSH REMOVER/REPLACER



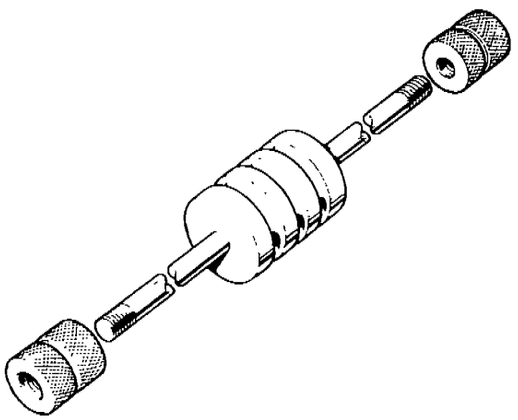
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18G 284 **AAH**
MAINSHAFT PILOT BEARING OUTER TRACK ADAPTOR REMOVER



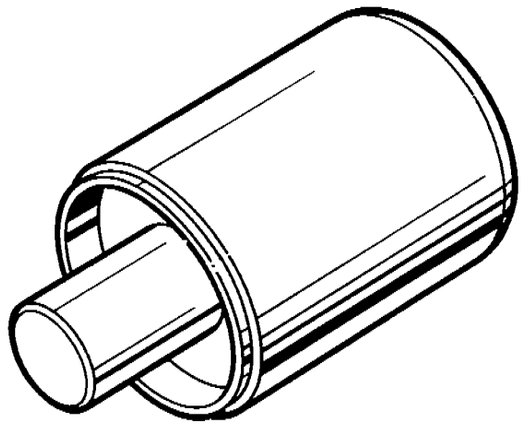
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18G 284
IMPULSE EXTRACTOR



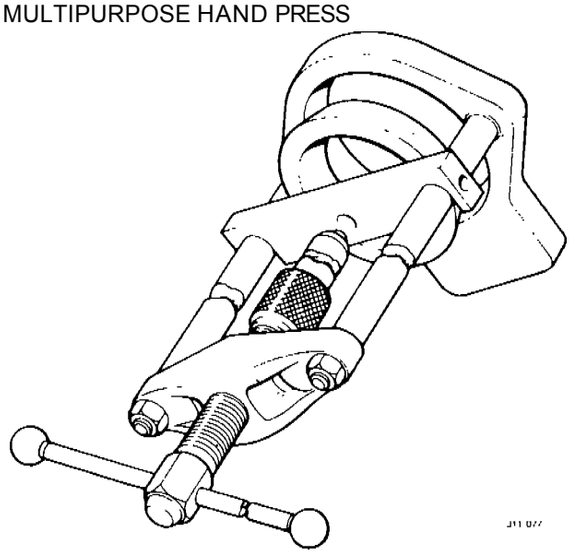
J11 076

JD 143-7
ADAPTOR BUSH REMOVER/REPLACER



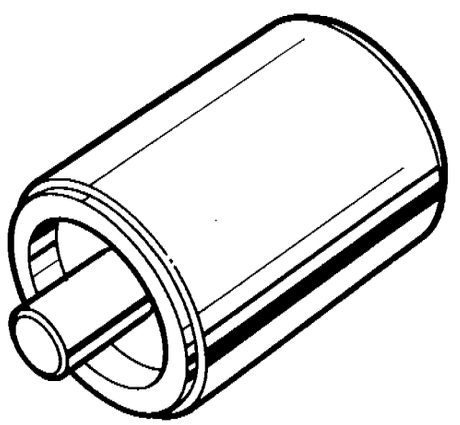
J11 079

47
MULTIPURPOSE HAND PRESS



J11 077

JD 143-8
ADAPTOR BUSH REMOVER/REPLACER

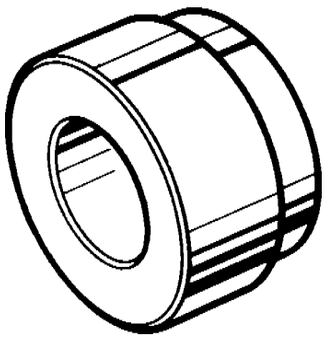


J11 080

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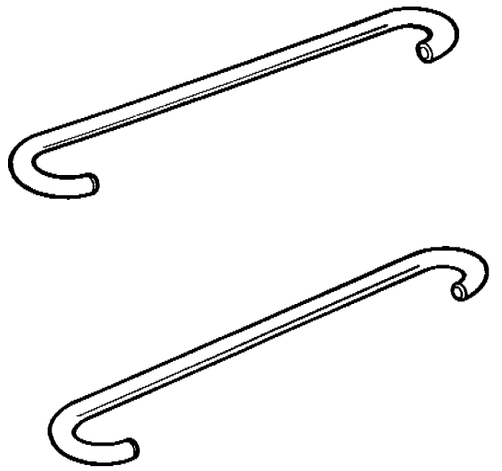
REAR SUSPENSION

JD 550-6
ADAPTOR REPLACER REAR HUB PIVOT **BEARING CUP**



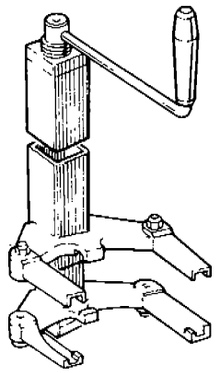
J11 081

JD **145**
REAR CAMBER CHECKING TIE DOWN LINK



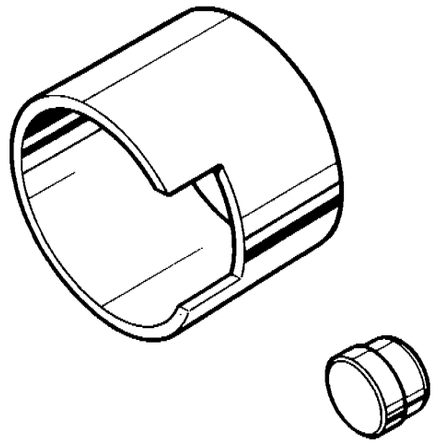
J11 084

JD 125
COIL **SPRING COMPRESSOR**



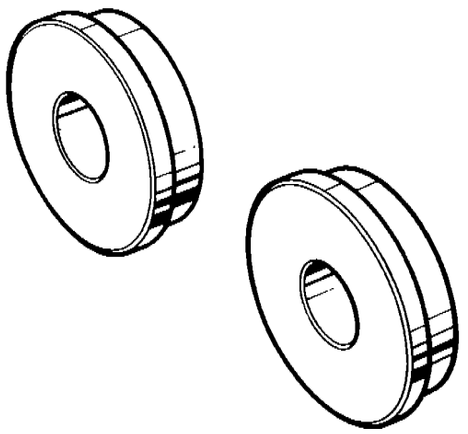
J11 082

JD 132
REAR HUB REMOVER



J11 085

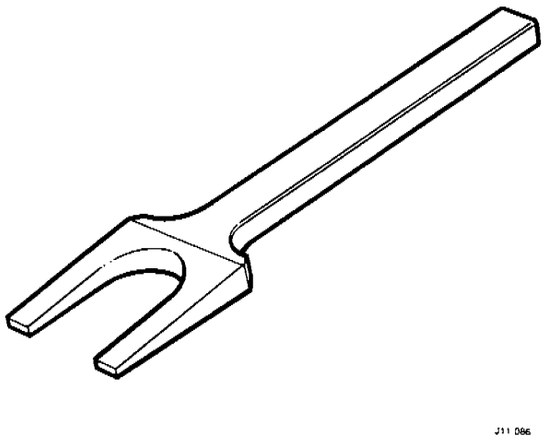
JD 550-4
ADAPTOR REPLACER REAR HUB **BEARING CUP AND SEAL INNER AND OUTER**



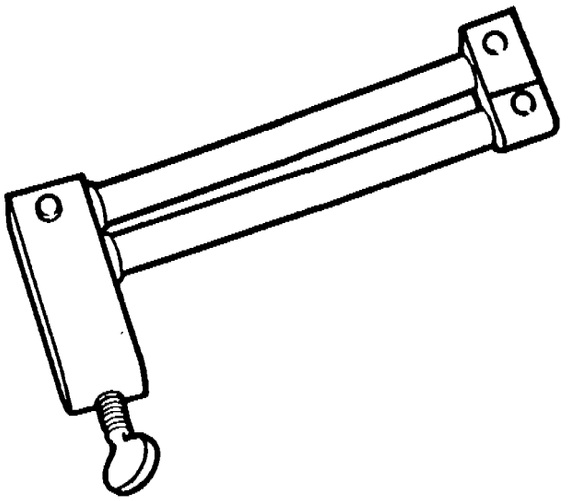
J11 083

BRAKES

JD 142
HANDBRAKE CABLE REMOVER



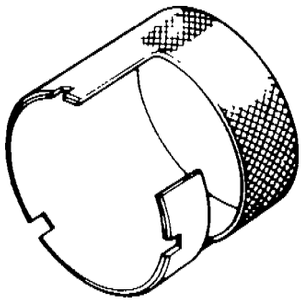
6947017 (GIRLING)
BRAKE PIPE CLAMP



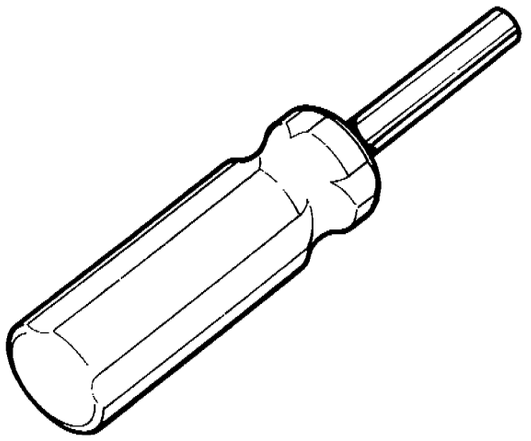
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ELECTRICAL

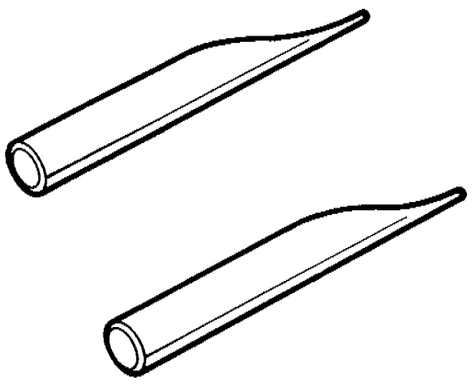
18G 1001
FUEL TANK SENDER UNIT SPANNER



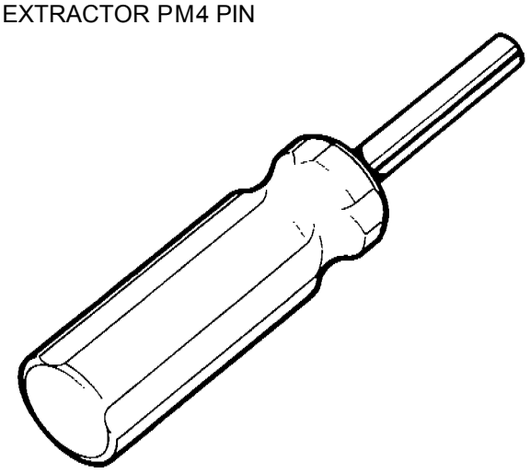
JD 138
EXTRACTOR PM4 **SOCKET**



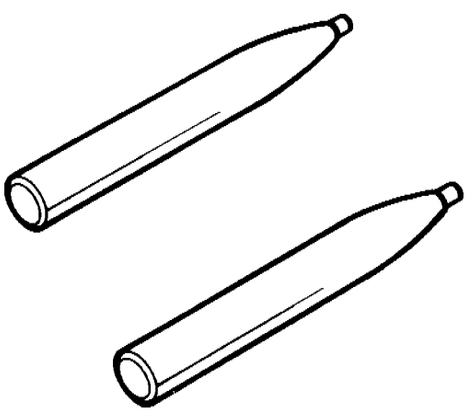
JD 139
EXTRACTOR TERMINAL FROM SEAL, PM4



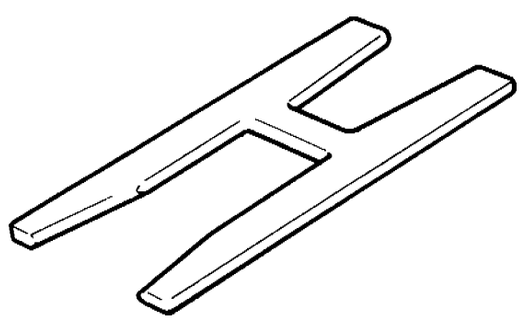
JD 137
EXTRACTOR PM4 PIN



JD 140
INSTALLER TERMINAL INTO SEAL, PM4

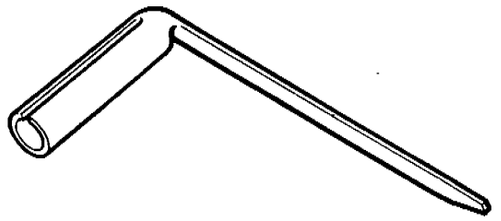


JD 121
P.M.H.D. CONNECTOR SEPARATOR



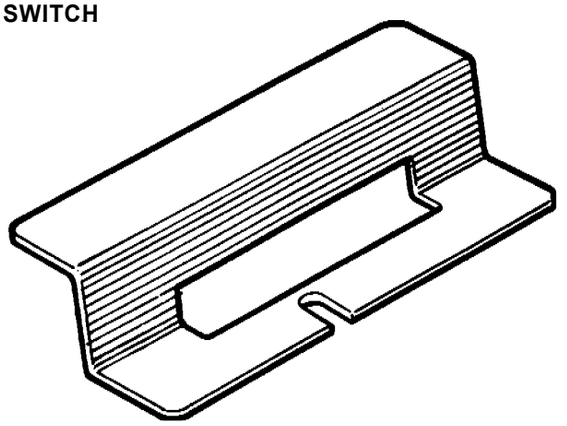
ELECTRICAL

JD 122
AIR CONDITIONING UNIT SENSOR INSTALLER



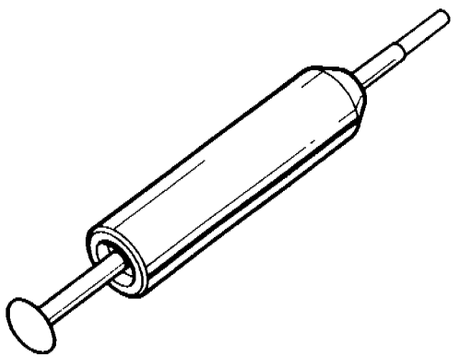
J11 095

JD 127
SETTING GAUGE AUTO GEARBOX LINEAR SWITCH



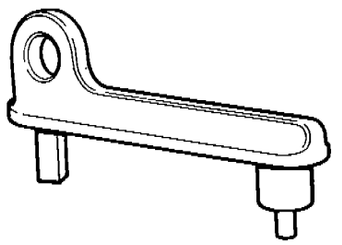
J11 097

JD 141
EXTRACTOR P.M.H.D. SOCKET AND PIN



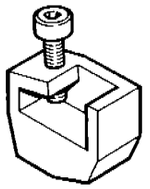
J11 096

JD 161
GEARBOX ROTARY SWITCH SETTING TOOL (4.0 LITRE ONLY)



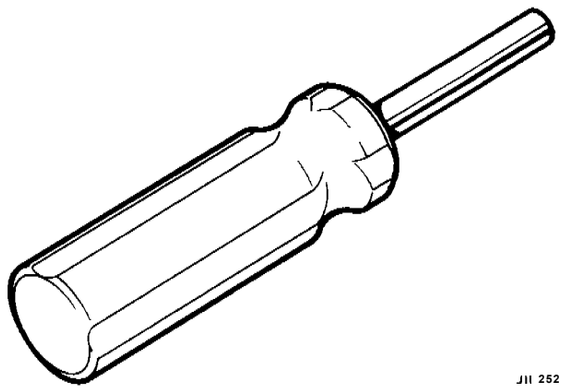
J11194

JD 162
KICKDOWN SWITCH THROTTLE STOP SETTING GAUGE (4.0 LITRE ONLY)



J11-195

MS 1533
MALE TERMINAL EXTRACTION TOOL

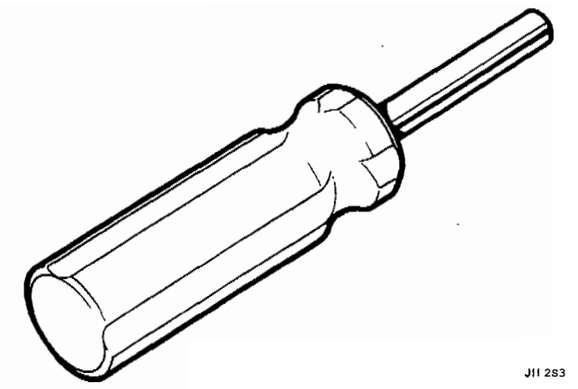


J11 252

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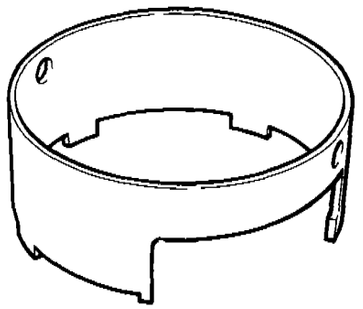
ELECTRICAL

JD 173
FEMALE TERMINAL EXTRACTION TOOL



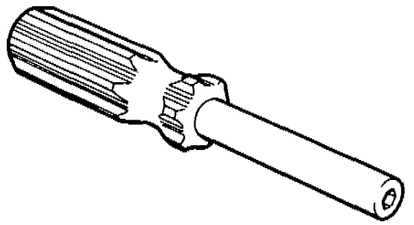
FUEL SYSTEM

JD 174
FUEL **TANK** FLANGE LOCK RING WRENCH



JH 250

JD 175
FUEL TANK **INTERNAL HOSE CLIP** TOOL



JH 251

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SERVICE TOOL CROSS REFERENCE CHART

Some of the tool identification numbers have been updated. To help in identification of older tools this cross reference chart has been compiled.

NUMBERS	DESCRIPTION
JD 1D	Hub remover
18G 2	Universal two legged puller
JD 13B (JD 13A)	Rear hub end float gauge
47 (MS 47 SL 14)	Multipurpose hand press
MS 53B (MS 53A)	Engine support bracket
18G 55A (38U3 JD 55A)	Piston ring compressor
MS 68	Torx screw wrench
MS 76B	Basic handle set
JD 100 (18G 1063, JD 24)	Remover - steering arm and swivel hub ball pins
JD 101	Timing chain tensioner release hook
JD 102 (LST 108)	Front and rear oil seal replacer
JD 103 (LST 109)	Selector linkage gauge
JD 104	Extension housing roller bearing remover/ replacer
JD 105 (18G 1501)	Torque convertor lifting handles
JD 106 (LST 111)	Oil pump rotation sleeve and end float gauge
JD 107 (18G 1016)	Clutch spring compressor
JD 107-1 (LST 106.1)	Clutch spring compressor adaptor
JD 107-2	Gearbox mounting centralizer
JD 108 (LST 116)	'O' ring and snap ring replacer
JD 109 (LST 117)	Gear train removerheplacer
JD 110 (LST 112)	Kickdown cable remover
JD 111 (LST 118)	Transmission holding fixture
JD 115	Coil spring compressor front suspension
JD 118 (18G 1468)	Auxiliary drive oil seal remover
JD 119	Steering pump drive dog remover
JD 120	Rack centralizing pin
JD 121	P.M.H.D. connector separator
JD 122	Air con. unit sensor installer
JD 123	Engine support bracket (front)
JD 124	Engine support bracket (rear)
JD 125 (MS1516A)	Coil spring compressor rear suspension
JD 126 LST 113)	Control unit oil seal remover/replacer
JD 127	Linear switch setting jig
JD 128	Crankshaft front oil seal remover
JD 129	Crankshaft front oil seal installer
JD 130 (18G 1151)	Chain link removerheplacer
JD 131	Throttle linkage setting gauge
JD 132	Rear hub remover
JD 133	Camber tie down link front
18G 134 (MS 550)	Driver handle
JD 135	Remover replacer F.S.U. damper lower bush
JD 137	Extractor PM4 pin
JD 138	Extractor PM4 socket
JD 139	Extractor terminal from seal PM4
JD 140	Installer terminal into seal PM4
JD 141	Extractor P.M.H.D. socket and pin
JD 142	Handbrake cable remover
JD 143	Remover/replacer suspension bushes (basic tool)
JD 143-1	Adaptor ring
JD 143-2	Anvil adaptor
JD 143-3	Adaptor, suspension bush removerheplacer
JD 143-4	Adaptor, suspension bush removerheplacer
JD 143-5	Adaptor, front subframe suspension bush remover/replacer
JD 143-6	Adaptor, suspension bush replacer

NUMBERS	DESCRIPTION
JD 143-7	Adaptor, suspension bush replacer
JD 143-8	Adaptor, suspension bush replacer
JD 145	Camber tie down link (rear)
MS 150-8	Expandable pilot
JD 153	Self-levelling adaptor/remover
JD 156	Drive coupling and spigot remover
JD 160	Upper Wishbone bush remover/replacer
JD 161	Gearbox rotary switch setting tool (4.0 litre)
JD 162	Kickdown switch throttle stop setting gauge (4.0 litre)
JD 173	Female terminal extraction tool
JD 174	Fuel tank flange lock ring wrench
JD 175	Fuel tank internal hose clip wrench
MS 204	Adjustable valve seat cutter
18G 284 (MS 284)	Impulse extractor, UNF (basic tool)
JD 550-1	Driveshaft oil seal remover/replacer adaptor
JD 550-3	Crankshaft rear oil seal replacer adaptor
JD 550-4	Adaptor replacer rear hub bearing cups and seals inner and outer
JD 550-5	Aaaptor replacer front hub bearing cups and seals inner and outer
JD 550-6	Adaptor replacer rear hub pivot bearing cup
MS 621	Adjustable valve seat cutter
CBW 1C	Pressure test equipment
JD 677-3	Pressure test adaptor
18G 1001	Fuel tank sender unit wrench
18G 1004 (7066)	Circlip pliers
18G 1004H (7066H)	Circlip plier points
18G 1205	Propellor shaft flange wrench
18G 1433	Camshaft timing tool
18G 1434	Jackshaft power steering and timing cover bush removerheplacer
18G 1435	Dummy camshaft caps
18G 1436	Timing damper oil pressure simulator and crank pulley remover
18G 1437	Front pulley lock
18G 1445	Power steering pump drive dog remover/replacer
18G 1465	Engine lifting bracket
18G 1469	Auxiliary drive shaft seal replacer
MS 1519A (18G 106A) (18G 106)	Valve spring compressor
MS 1520	Engine stand
MS 1520-2	Engine stand adapter
MS 1533	Male terminal extraction tool
DBC 3085	Fuse Extractor
C3993	Camshaft timing jig
JD 6118C	Valve spring compressor

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XJ6

SERVICE MANUAL

VOLUME 2

Contains Sections

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12. ENGINE 4.0
17. EMISSION CONTROL
18. ENGINE MANAGEMENT 2.9
18. ENGINE MANAGEMENT 4.0
19. FUEL SYSTEM
26. COOLING SYSTEM 2.9
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WATER PUMP GXSKET	RENEW	26.50.02	26-26
WATER PUMP HOUSING	RENEW	26.50.07	26-27

0207G

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RESERVED FOR ILLUSTRATED **INDEX**

RESERVED FOR ILLUSTRATED INDEX **KEY**

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COOLING SYSTEM

FAULT DIAGNOSIS

26.00.00

Sympton	Reason	Remedy
Overheating	Insufficient water in cooling system	Top up radiator
	Fan belt slipping	Tighten fan belt to recommended tension or replace if worn.
	Radiator core blocked or radiator grille obstructed	Reverse flush the radiator, remove obstruction from grille.
	Thermostat not opening properly	Remove & fit new thermostat.
	Ignition advance and retard incorrect	Check ignition timing
	Incorrect fuel/air mixture	Check CO/HC level.
	Exhaust system partially blocked	Check exhaust pipe for obstruction.
	Oil level in sump too low	Top up to correct level.
	Blown cylinder head gasket (water/ steam being forced down the radiator overflow pipe under pressure)	Remove cylinder head and fit new gasket.
	Engine not yet 'run-in'	Run-in slowly and carefully.
	Brakes binding	Check brake calipers for sticking pistons and seized brake pad pins
Engine running "cold"	Thermostat jammed open	Remove and renew thermostat
	Incorrect grade of thermostat fitted	Remove and replace with correct type of thermostat.
	Theremostat missing	Check and fit correct thermostat.
Leaks in system	Loose clips on water hoses	Check and tighten clips.
	Top or bottom water hoses perished	Check and replace any faulty hoses.
	Radiator leaking	Remove radiator & repair
	Thermostat gasket leaking	Inspect and renew gasket
	Pressure cap spring worn or seal ineffective.	Renew pressure cap.
	Cylinder wall or head cracked	Replace either cylinder block or cylinder head.

0171b

COOLING SYSTEM

DESCRIPTION 26.00.00

The cooling system consists of a cross flow radiator matrix, a water pump, belt driven by the engine crankshaft, a header tank and an expansion tank located in the near side wing, and a thermostatic valve to ensure rapid warm up. The radiator is cooled by a viscous coupled fan and also an electric driven fan, this fan is thermostatically controlled and it is possible under very hot conditions for it to operate after the engine is switched off. The fan will switch off automaticallywhen the coolant drops below 90°C.

Under cold start condition coolant is forced by the water pump through the cylinder block and cylinder head to the thermostat housing. The valve is closed and the coolant is therefore returned to the water pump suction inlet.

Cars fitted with automatic transmission have a cooling tube included in the centre section of the radiator matrix.

We use and recommend BP Type H21 or Union Carbide UTI84 or Unipart Universal anti-freeze which should be used at the specified concentration whenever the cooling system is refilled. For topping up purposes, only reputable brands of anti-freeze, formulated and approved for 'mixed metal' engines should be used.

IMPORTANT **NOTE:** THE CONCENTRATION OF ANTI-FREEZE MUST NOT BE ALLOWED TO FALL BELOW THE RECOMMENDED STRENGTH, AS SEDIMENT MAY BE FORMED IN THE COOLING SYSTEM BY CERTAIN TYPES LOW CONCENTRATES.

A 40% solution by volume in the U.K. (55% U.S.A/Canada and all other countries) must be used at all times, either by topping-up or replenishingthe cooling system.

For maximum corrosion protection, the concentration should never be allowed to fall below 25%.

Always top-up with recommended strength of anti-freeze. NEVER WITH WATER ONLY.

In countries where it is unnecessary to use anti-freeze, Marston SQ 36 Corrosion Inhibitor must be used in the cooling system in the proportion of 1 part SQ 36 to 24 parts water. CHANGE COOLANT EVERY TWO YEARS. The system should be drained, flushed and refilled with fresh anti-freeze (or Corrosion Inhibitor) mixed with a satchet of "Barrs Leaks".

An alternative coolant known as CARBUROL FORLIFE is recommened where temperatures below 10°C (14°F) are not encountered.

Before Carburol Forlife is used, the coolant already present in the system must be drained out and the system flushed before filling with Carburol Forlife.

Once in use, the system should be topped up with Carburol Forlife only, and a label giving this information should be affixed in an appropriate and prominent position.

0168b

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THERMOSTAT CLOSED

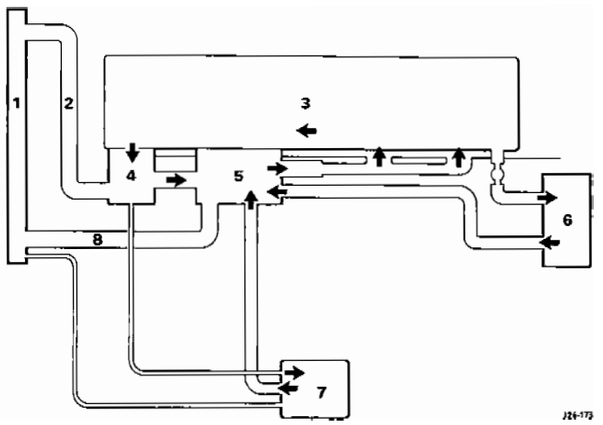


Fig 1

THERMOSTATOPEN

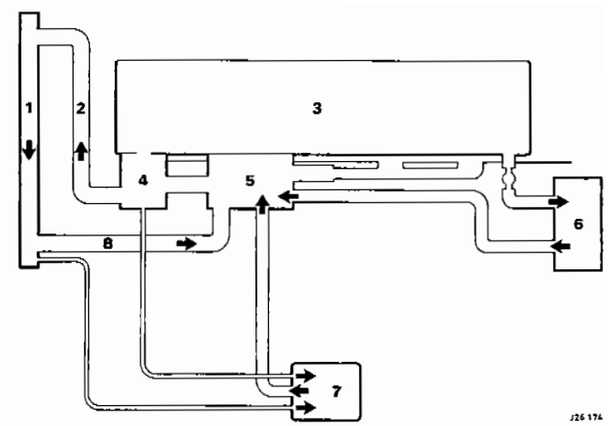


Fig 2

KEY

1. Radiator
2. Top Hose
3. Engine
4. Thermostat Housing
5. Water Pump
6. Heater
7. Header Tank
8. Bottom Hose

COOLING SYSTEM FLOW

COOLING SYSTEM

PRESSURE TEST 26.10.07

Ensure that the engine is warm from recent operation.
Carefully remove the pressure cap from the expansion tank and check that it is the correct type for the vehicle.
Select the correct adpators for the neck of the header tank (1 Fig.1) and the tester (2 Fig.1) and fit it to the header tank.
Pump up the pressure to a pressure equal to the pressure cap poundage.
Watch the gauge for ten seconds and if the pressure drops check the water pump and external connections for leaks.
If the pressure remains constant for ten seconds, maintain the pressure and visually check for pin point leaks.
Tighten all connections and replace worn or leaky hoses, internal leaks may be cured by torqueing the cylinder head bolts.
A more severe test may be carried out by using the above procedure with the engine running.
Absence of external leaks accompanied by fluctuations in pressure usually indicates a 'blown' cylinder head gasket, however under no circumstances should the pressure be allowed to exceed the upper limit of the cap.

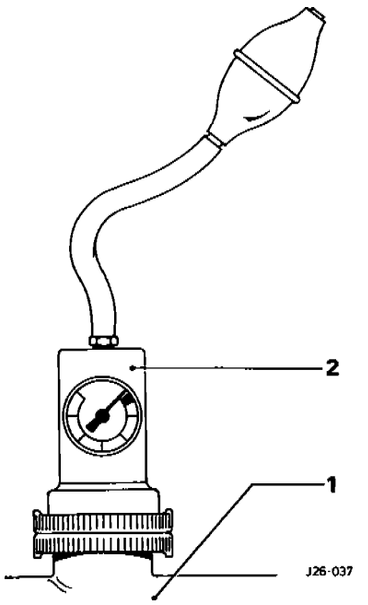


Fig 1

0172b

PRESSURE CAP

TEST 26.40.13

Ensure that the cooling system is cold before removing the cap.
Determine the correct adaptors for the cap to be checked and attach the adpators to the tester, check and examine the rubbers for cracks and wear, (1 Fig 2).
Rinse the cap in water to remove any sediment and apply the cap to the tester in the wet condition. (2 Fig 2).
Pump up the tester until the gauge pointer stops rising. This pressure should read between 0,859-1,094 Bars. 0,949-1,23 kg/cm^2. 93,15 – 120,75kPa. 13.5-17.5 lb/in^2.
Reject the cap if it does not reach or exceed this pressure.
Reject the cap which will not hold the rated pressure for 10 seconds without additional pumping.
NOTE: When renewing a defetive pressure cap with a new unit, never fit a cap of a higher pressure than of the original fitment.

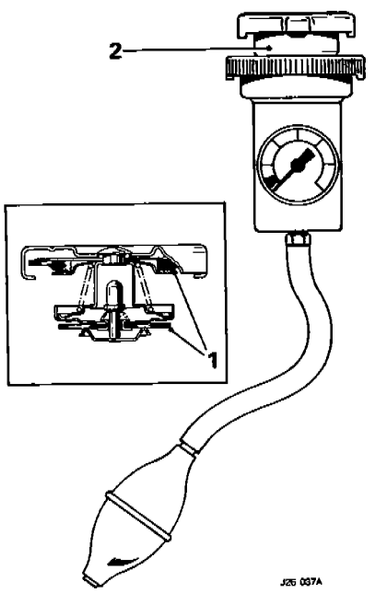


fig 2

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DATA

Pressure cap pressure 0,859-1,094 Bars. 0,949-1,23 kg/cm^2. 93,15 – 120,75kPa. 13.5-17.5 lb/in^2.

0170b

THERMOSTAT

TEST 26.45.09

The thermostat may be checked by suspending it with the thermostat heat control unit facing down in a small pan or dish (1 Fig.1) containing a solution of ethylene glycol coolant and a thermometer (2 Fig.1).
Neither the thermostat or the thermometer should rest on the bottom of the pan because of the uneven concentration of heat at this point when the pan is heated.
The thermostat (3 Fig.1) should open when a temperature of 82°C is attained.
When the coolant reaches 97°C the valve should be fully open.

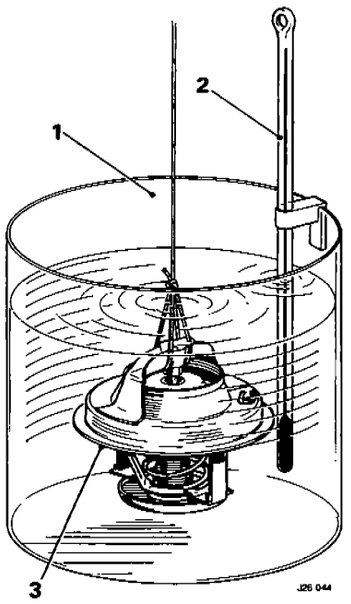


Fig 1

0169b

COOLING SYSTEM

DRAIN AND REFILL 26.10.01

Place a drain tray in position under the radiator drain plug (1 Fig.2).
Remove the expansion tank filler cap, remove the radiator drain plug (2 Fig.2) and drain the coolant.
Remove the power steering and transmission cooler pipes (where fitted) from the radiator.
Remove the rear drain block plug and drain the coolant.
Refit the cylinder block drain plug and fit the radiator drain plug.
Refit the power steering and transmission cooler pipes to the radiator (where fitted).
Fill the cooling system with a solution of anti-freeze and water, move the heater valve control lever to the hot position, refit the expansion tank cap and run the engine until the thermostat is open.
Switch off engine, remove expansion tank cap and refill with water.

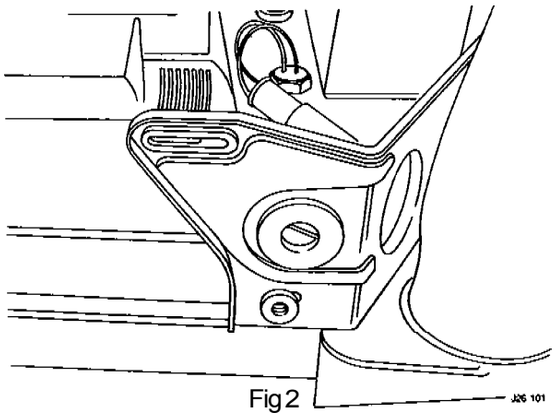


Fig 2

0173b

COOLANT RADIATOR ONLY

DRAIN AND REFILL 26.10.01/1

Open the bonnet and place a drain tin in position below the radiator drain plug to the offside of the radiator.

Remove the radiator pressure cap, remove the drain plug (1 Fig 1) and allow the radiator to drain.
Refit and tighten the drain plug, refill the cooling system with the correct solution of anti-freeze and water, run the engine up to normal running temperature, top up the cooling system, refit the pressure cap and close the bonnet.

0174b

PRESSURE CAP

RENEW **26.40.03**

Open the bonnet.
Ensure that the cooling system is cold before removing the cap.
Remove the cap.
Top up the cooling system if required with the correct water/anti-freeze solution, refit the replacement pressure cap, close the bonnet.

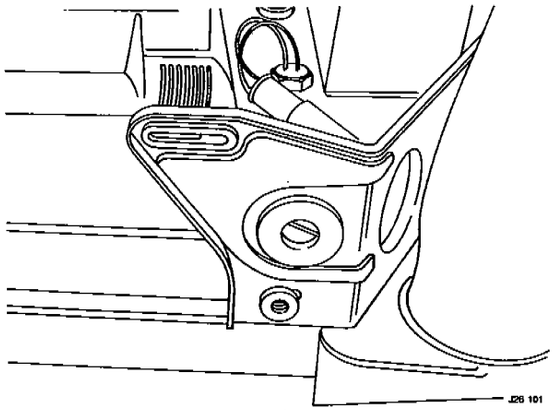


Fig 1

0196b

WATER PIPE

RENEW **26.30.74**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug (1 Fig 1) and allow the radiator to drain.
Depressurise the fuel system 19.50.02
Remove the bolt securing the heater feed pipe to the rear of the manifold.
Reposition the vacuum valve from the heater feed pipe.
Remove the bolt securing the dipstick tube, slacken the clips securing the breather hose to the oil trap turret and disconnect the hose from the trap.
Slacken the clip securing the induction elbow hose and reposition the hose from the elbow.
Disconnect the air flow meter multi plug, cut the ratchet strap securing the harness to the cylinder head front securing bolt.
Disconnect the crank sensor multi plug and the spark plug leads.
Remove the nuts and bolts securing the manifold and reposition the earth leads away from the studs.
Carefully lift the manifold from the cylinder head ensuring that any harnesses/hoses are not stressed.
Support the manifold using a suitable chock, remove and discard the gaskets.

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Slacken the hose clip (1 Fig 1) and remove the bolts (2 Fig 1) securing the water pipe (3 Fig 1) to the cylinder block (4 Fig 1).
Reposition the oil feed pipe clip, oil trap and the heater return pipe from the water pipe.
Remove the water pipe and clean the gasket faces.
Apply 'Hylosil 102 to the gasket faces and reverse the removal procedure to fit the water pipe and induction manifold.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

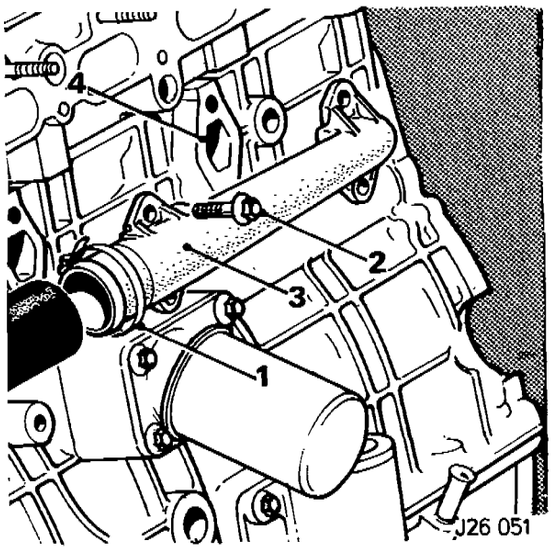


Fig 1

DATA

TORQUE FIGURES

Clip hose to water rail 2.4Nm
Dipstick to bracket 5-8Nm
Inlet manifold to cylinder head 23-27Nm
Water pipe to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Water pipe to cylinder block 'Hylosil 102'

SPANNER SIZES

6mm
8mm
10mm
13mm

3/8AF

0192b

WATER PIPE GASKETS

RENEW 26.30.75

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug (1 Fig 2) and allow the radiator to drain.
Depressurise the fuel system 19.50.02
Remove the bolt securing the heater feed pipe to the rear of the manifold.
Reposition the vacuum valve from the heater feed pipe.
Remove the bolt securing the dipstick tube, slacken the clips securing the breather hose to the oil trap turret and disconnect the hose from the trap.
Slacken the clip securing the induction elbow hose and reposition the hose from the elbow.

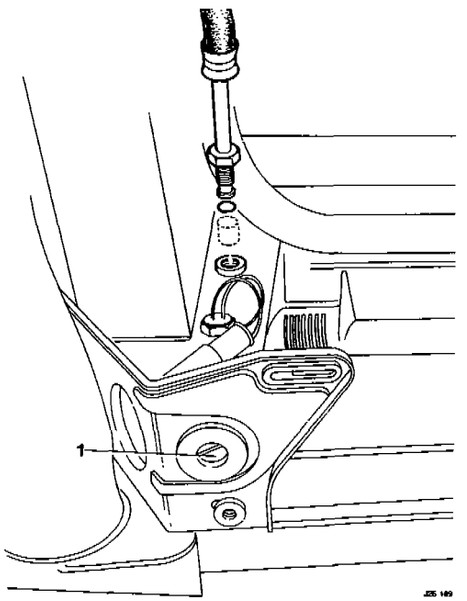


Fig 2

Disconnect the air flow meter multi plug, cut the ratchet strap securing the harness to the cylinder head front securing bolt.
Disconnect the crank sensor multi plug and the spark plug leads.
Remove the nuts and bolts securing the manifold and reposition the earth leads away from the studs.
Carefully lift the manifold from the cylinder head ensuring that any harnesses/hoses are not stressed.
Support the manifold using a suitable chock, remove and discard the gaskets.
Slacken the hose clip (1 Fig 1) and remove the bolts (2 Fig 1) securing the water pipe (3 Fig 1) to the cylinder block (4 Fig 1).
Reposition the oil feed pipe clip, oil trap and the heater return pipe from the water pipe.
Remove the water pipe and clean the gasket faces.
Apply 'Hylosil 102 to the gasket faces and reverse the removal procedure to fit the water pipe and induction manifold.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

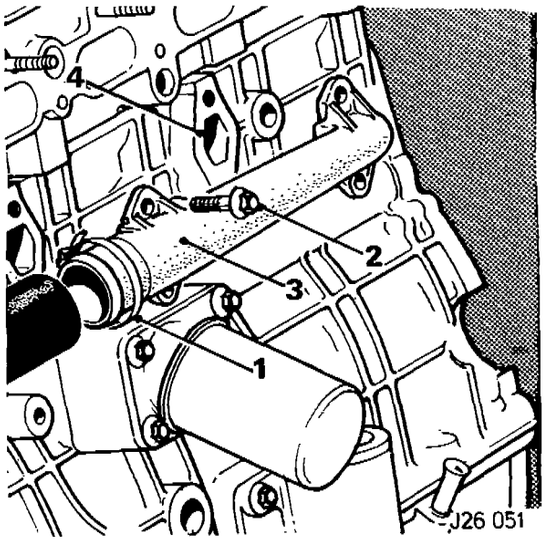


Fig 1

DATA

TORQUE FIGURES

Clip hose to water rail 2.4Nm
Dipstick to bracket 5-8Nm
Inlet manifold to cylinder head 23-27Nm
Water pipe to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Water pipe to cylinder block 'Hylosil 102'

SPANNER SIZES

6mm
8mm
10mm
13mm

3/8AF

0193b

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COOLANT LEVEL PROBE SEAL

RENEW **26.40.12**

Open the bonnet and remove the pressure cap, detatch the coolant level probe harness securing clip from the expansion tank. Rotate the probe (1 Fig 1) anti-clockwise to release the unit from its seating.
Remove the coolant level probe and seal.
Discard the seal.
Refit the replacement seal to the expansion tank and reverse the remaning removal procedure.

Top up the expansion tank with coolant, ensure this is of the correct solution of water and anti-freeze.
Refit the pressure cap and close the bonnet.

0200b

COOLANT LEVEL PROBE

RENEW **26.40.11**

Open the bonnet and remove the pressure cap, detatch the coolant level probe harness securing clip from the expansion tank.
Disconnect the coolant level probe block connector.
Rotate the probe (1 Fig 1) anti-clockwise to release the unit from its seating.
Remove the coolant level probe and seal.
Discard the seal.
Refit the replacement seal to the expansion tank and reverse the rernaning removal procedure.
Top up the expansion tank with coolant, ensure this is of the correct solution of water and anti-freeze.
Refit the pressure cap and close the bonnet.

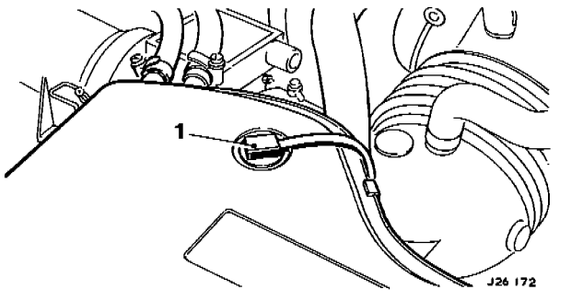


Fig 1

COOLANT LEVEL INDICATOR

RENEW **26.15.04**

Open the bonnet.
Remove the pressure cap from the expansion tank.
Remove the level indicator (1 Fig 2) from the filler neck (using two screw drivers to depress the tangs).
Discard the level indicator.
Reverse the removal procedure to refit the replacement level indicator.

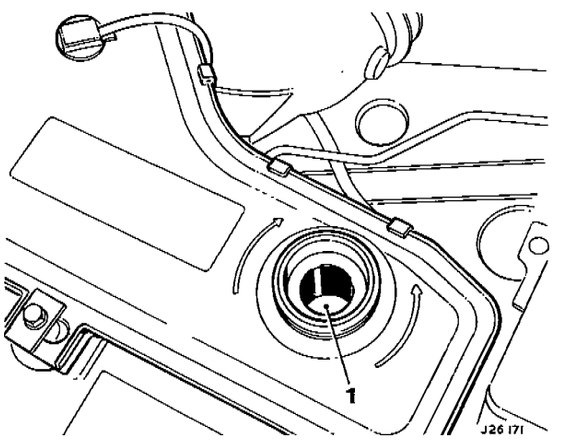


Fig 2

19498

EXPANSION TANK

RENEW 26.15.01

Open the bonnet, and remove the tank securing nut (1 fig 1).
Disconnect the coolant probe block connector. Displace the tank from the rear mounting grommet followed by the front.
Place a suitable receptacle below the tank, slacken the expansion tank hose to thermostat tee piece securing clip disconnect the hose from the tee piece and position the outlet hose over the suitable container.
Fit a suitable blanking plug to the tee piece.
Remove the pressure cap and drain the coolant into the suitable container.
Slacken the expansion tank hose clips and disconnect the hoses from the expansion tank.
Discard the tank.
Reverse the removal procedure to refit the tank.
Top up the expansion tank with coolant, ensure this is the correct solution of water and anti-freeze.
Refit the pressure cap and close the bonnet.

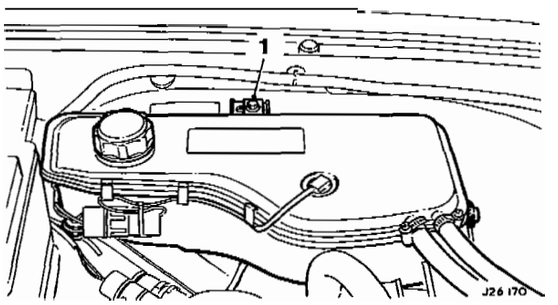


Fig 1

DATA

TORQUE FIGURES

Header tank to body 8-11Nm
Hose header tank 2.5-3.5Nm

0175b

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RADIATOR COWL

RENEW **26.40.07**

Open the bonnet and remove the air cleaner element, remove the nuts securing the torquatrol unit to the water pump.
Remove the fan cowl securing clips (1 Fig 1), two off, and lift out the fan cowl (2 Fig 1) and torquatrol unit complete.
Reverse the removal procedure to refit the replacement fan cowl.

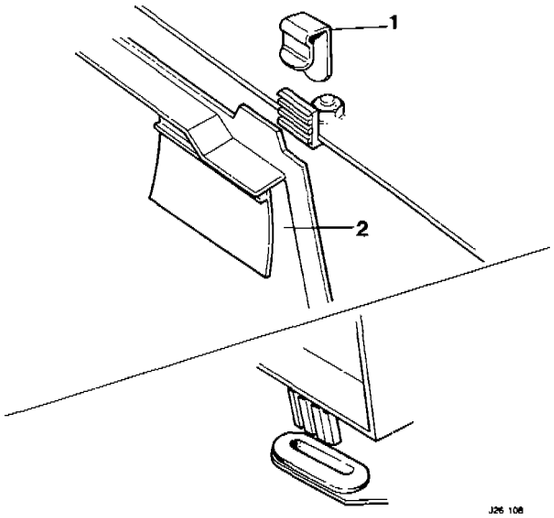


Fig 1

DATA

TORQUE FIGURES

Fan ***to torquatrol unit 13.5Nm***
Torquatrol unit to water pump 23-27Nm

SPANNER SIZES

1/2AF

0198b

RADIATOR BLOCK

RENEW **26.40.04**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug (1 Fig 1) and allow the radiator to drain.
Release the top hose from the radiator and pull clear.
Remove the power assisted steering and gearbox (where fitted) cooling pipe unions (1 Fig 1).
Remove the pipes from the radiator and discard the 'O' rings.
Plug the apertures in the pipes and the radiator.
Disconnect the expansion tank hose from the radiator.
Slacken the clip securing the bottom hose to the radiator and pull the pipe clear of the radiator.
Remove the clip.
Remove the radiator cowl upper securing clips (1 Fig 2) and remove the cowl.
Remove the top rail securing bolts and remove the top rail and lift out the radiator assembly.
Remove the radiator mounting rubbers.
Reverse the removal procedure to refit the replacement radiator and hoses.
Tighten the clips, fit a drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

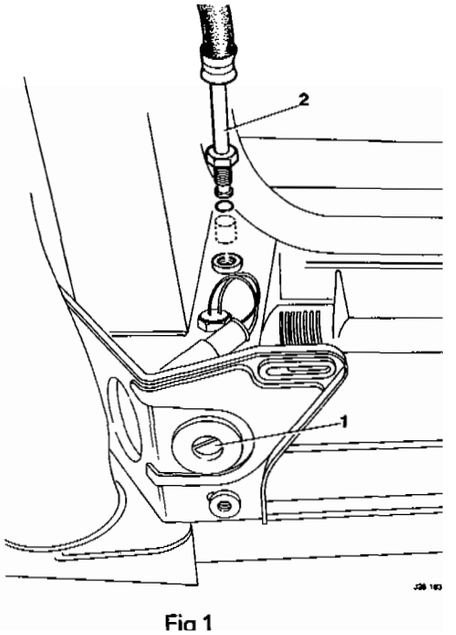


Fig 1

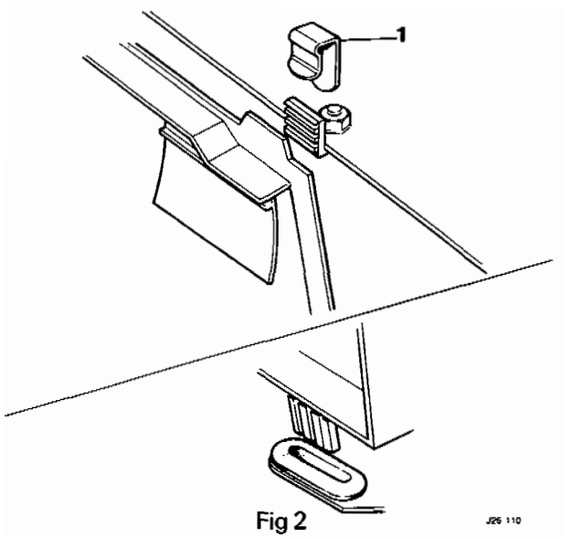


Fig 2

DATA

TORQUE FIGURES

Bottom water hose to radiator ***3.8-4.3Nm.***
Steering cooler hoses to radiator ***19-23Nm.***
Top panel-radiator ***assembly to*** *body* ***22-28Nm.***
Top water hose io radiator ***3.8-4.3Nm.***

SPANNER SIZES

6mm
8mm
10mm
13mm
19mm

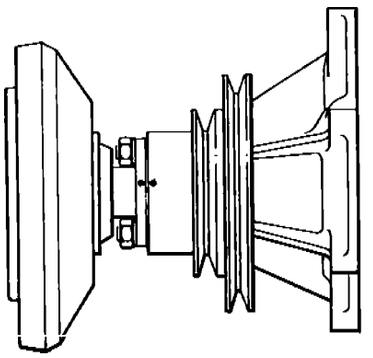
0197b

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FAN BLADES

RENEW **26.25.06**

Open the bonnet and remove the air cleaner 19.10.08, remove the nuts securing the torquatrol unit to the water pump (Fig 1).
Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete, remove the bolts securing the fan to the torquatrol unit and separate the two.
Replace the fan blades ensure that the two paint spots (one on fan and one on the torquatrol unit) are positioned together and secure with the bolts.
Reverse the removal procedure to refit the torquatrol unit and the air cleaner element, close the bonnet.



J26 112

Fig 1

DATA

TORQUE FIGURES

Fan to torquatrol unit 13.5Nm
Torquatrol unit to water pump 23-27Nm

SPANNER SIZES

13mm

1/2in AF

0177b

THERMOSTAT COVER ENGINE SET

RENEW **26.45.22**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the top hose to the thermostat cover and pull the pipe clear.
Remove the bolts (1 Fig 2) securing the thermostat cover (2 Fig 2) and remove the cover.
Remove the thermostat (3 Fig 2).
Remove and discard the 'O' ring (4 Fig 2).
Fit a new 'O' ring to the thermostat housing.

Fit the thermostat to the housing, ensuring that the 'jiggle pin' is to the top.
Reposition the thermostat cover and secure with the bolts.
Fit the top hose to the thermostat cover and secure with the clip.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

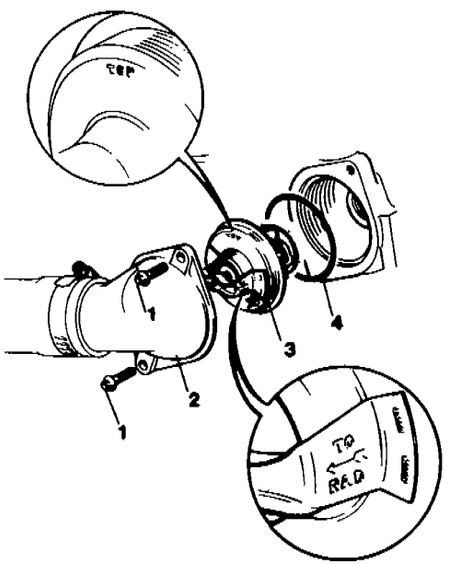


Fig 2

J26 113

DATA

TORQUE FIGURES

Thermostat cover to thermostat housing 23-27Nm.

SPANNER SIZES

6mm
13mm

0209b

THERMOSTAT COVER GASKET ENGINE SET

RENEW **26.45.23**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the **offside** of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the bolts securing the thermostat cover (1 Fig 1) and remove the cover (2 Fig 1).
Remove the thermostat.
Remove and discard the 'O' ring.
Fit a new 'O' ring to the thermostat housing.
Fit the thermostat to the housing, ensuring that the 'jiggle pin' is to the top.
Reposition the thermostat cover and secure with the bolts.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

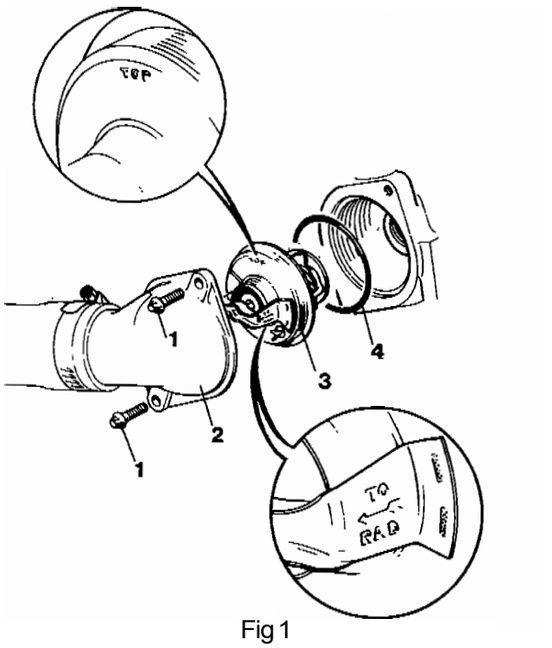


Fig 1

DATA

TORQUE FIGURES

Thermostat cover to thermostat housing 23-27Nm.

SPANNER SIZES

6mm
13mm

0208b

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THERMOSTAT ENGINE SET

RENEW **26.45.07**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the thermostat cover securing bolts (1 Fig 1) and remove the thermostat (2 Fig 1) and 'O' ring (3 Fig 1).
Fit a new 'O' ring to the thermostat and fit the thermostat to the housing, coat the housing with 'Hylosil 102, fit the housing in positon and secure with the bolts.
Refill the cooling system with the correct solution and anti-freeze and water, refit the pressure cap and close the bonnet.

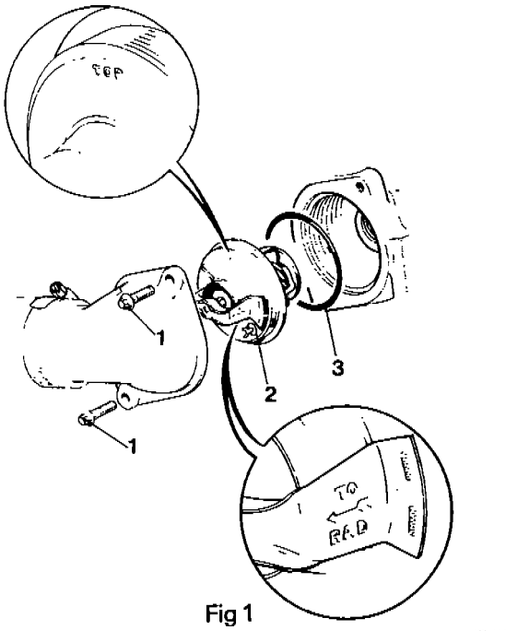


Fig 1

J26 115

DATA

TORQUE FIGURES

Thermostat cover to thermostat housing 23-27Nm.

SPANNER SIZES

6mm
13mm

0201b

THERMOSTAT HOUSING ENGINE SET

RENEW **26.45.21**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Disconnect the water temperature sensor, transmitter (1 Fig 2) and vacuum advance temperature sensor (2 Fig 2) feed wires.
Slacken the clips securing the top hose and expansion hoses to the thermostat housing.
Remove the hoses from the housing.
Slacken the clip securing the water pump to thermostat housing hose (3 Fig 2) remove the bolts (4 Fig 2) and remove the pipe from the rear outlet.
Remove the bolts (5 Fig 2) securing the thermostat housing (6 Fig 2) and remove.
Slacken the clips securing the breather hose to the extension piece and disconnect the hose.
Remove the extension piece from the remaining breather hose.

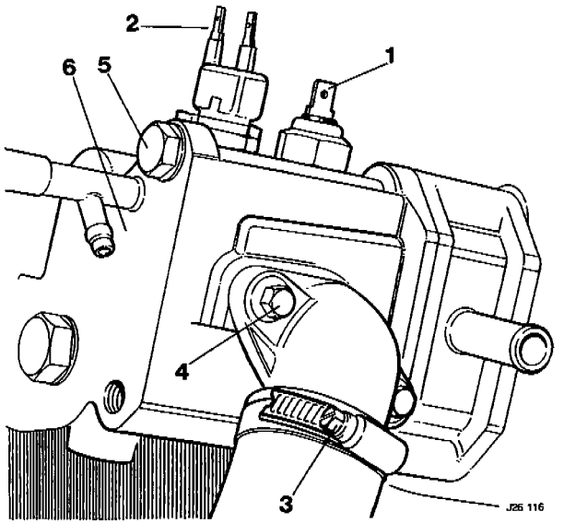


Fig 2

J26 116

Remove the water temperature sensor, transmitter and vacuum advance temperature sensor.
Remove and discard the sealing washers.
Discard the housing.
Fit new washers to the water temperature sensor, transmitter and vacuum advance temperature sensor and fit to the housing.
Apply 'Hylosil 102 to the rear outlet gasket faces, fit outlet to the housing and secure with the bolts.
Fit the extension piece to the breather hose, connect the remaining breather hose to the extension piece, position and tighten the clip securing the hose.
Apply 'Hylosil 102' to the housing and extension piece gasket faces, align and fit the thermostat housing to the extension piece.
Position the extension piece/thermostat housing to the cylinder head and secure with the bolts.
Refit the hoses to the thermostat housing and secure with the clips.
Refit the water temperature sensor, transmitter and vacuum advance tempreature sensor feed wires.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing ***9.5-12.2Nm***
Thermostat cover to thermostat housing ***23-27Nm.***
Thermostat housing to cylinder head ***23-27Nm.***
Water temperature switch ***49-54Nm***

OILS/GREASES/SEALANTS

Thermostat housing to cylinder head ***'Hylosil 102'***

SPANNER SIZES

6mm
13mm
19mm
20mm
22mm

0207b

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THERMOSTAT HOUSING GASKET ENGINE SET

RENEW **26.45.20**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator (Fig 1).
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain, disconnect the water temperature sensor, transmitter and vacuum advance tempreature sensor feed wires (1,2 Fig 2).
Slacken the clips securing the top hose and expansion hoses to the thermostat housing.
Remove the hoses from the housing.
Slacken the clip securing the water pump to thermostat housing pipe and remove the pipe from the rear outlet, remove the bolts (5 Fig 2) securing the thermostat-housing (6 Fig 2) and remove.
Slacken the clips securing the breather hose to the extension piece and disconnect the hose.
Remove the extension piece from the remaining breather hose.
Clean the gasket faces.
Fit the extension piece to the breather hose, connect the remaining breather hose to the extension piece, position and tighten the clip securing the hose.
Apply 'Hylosil 102' to the housing and extension piece gasket faces, align and fit the thermostat housing to the extension piece.
Position the extension piece/thermostat housing to the cylinder head and secure with the bolts.
Refit the hoses to the thermostat housing and secure with the clips.
Refit the water temperature sensor, transmitter and vacuum advance tempreature sensor feed wires.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

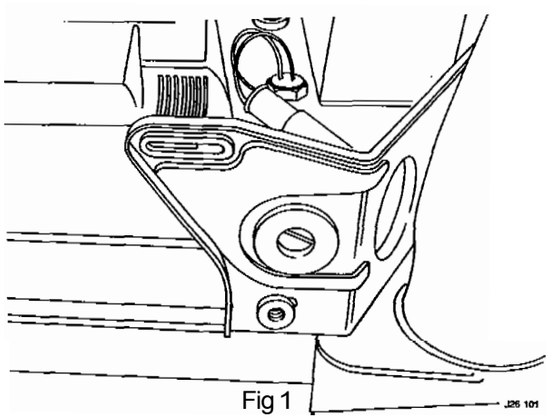


Fig 1

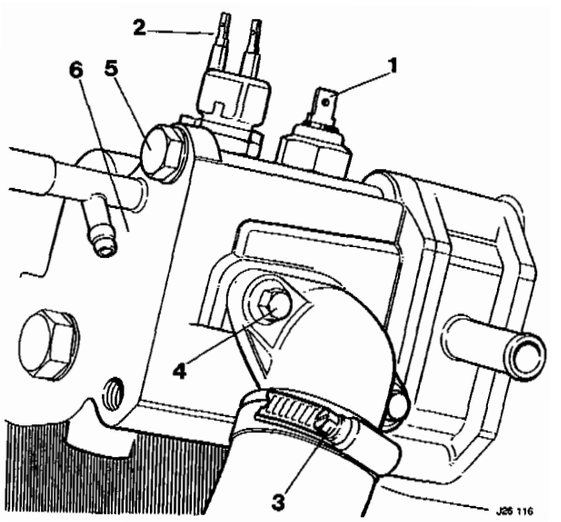


Fig 2

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing 9.5-12.2Nm
Thermostat cover to thermostat housing 23-27Nm.
Thermostat housing to cylinder head 23-27Nm.
Water temperature switch 49-54Nm

OILS/GREASES/SEALANTS

Thermostat housing to cylinder head 'Hylosil 102'

SPANNER SIZES

6mm
13mm
79mm
20mm
22mm

0206b

THERMOSTAT HOUSING REAR OUTLET

RENEW **26.45.17**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the thermostat housing.
Slacken the clip securing the hose to the water pump.
Remove the hose assembly, remove the securing clips.
Remove the rear outlet securing bolts (1 Fig 1) and remove the outlet (2 Fig 1) and discard.
Clean the gasket faces.
Apply 'Hylosil 102 to the cleaned thermostat and replacement outlet mounting faces, fit the securing bolts to the outlet as guides and fit the rear outlet.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

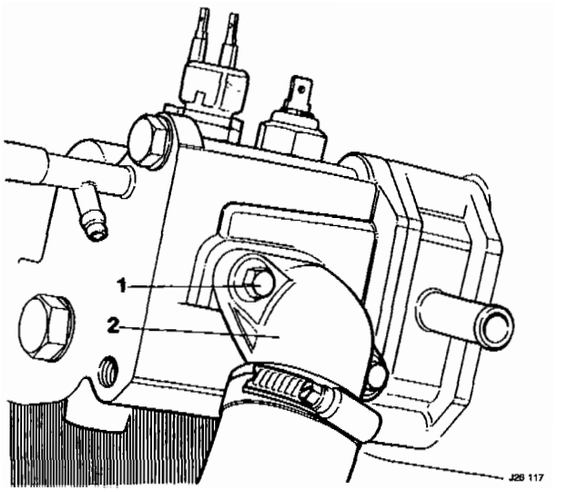


Fig1

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing ***9.5-12.2Nm***

OILS/GREASES/SEALANTS

Thermostat housing to rear outlet ***'Hylosil 102'***

SPANNER SIZES

6mm
8mm

0203b

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THERMOSTAT HOUSING SPACER BLOCK

RENEW **26.45.18**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Disconnect the water temperature sensor, transmitter and vacuum advance tempreature sensor feed wires.
Slacken the clips securing the top hose and expansion hoses to the thermostat housing.
Remove the hoses from the housing.
Slacken the clip securing the water pump to thermostat housing pipe and remove the pipe from the rear outlet.
Remove the bolts (1 Fig 1) securing the thermostat housing (2 Fig 1) and remove.
Slacken the clips securing the breather hose to the spacer block and disconnect the hose.
Remove the extension piece (3 Fig 1) from the remaining breather hose.
Clean the gasket faces.
Fit thew replacement extension piece to the breather hose, connect the remaining breather hose to the extension piece, position and tighten the hose clip.
Apply 'Hylosil 102 to the housing and extension piece gasket faces, align and fit the thermostat housing to the extension piece.
Position the extension piece/thermostat housing to the cylinder head and secure with the bolts.
Refit the hoses to the thermostat housing and secure with the clips.
Refit the water temperature sensor, transmitter and vacuum advance ternpreature sensor feed wires.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

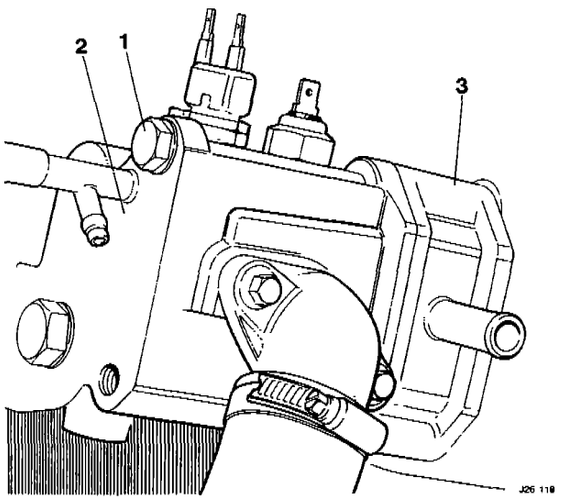


Fig 1

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing 9.5-12.2Nm
Thermostat cover to thermostat housing 23-27Nm.
Thermostat housing to cylinder head 23-27Nm.
Water temperature switch 49-54Nm

OILS/GREASES/SEALANTS

Thermostat housing to spacer block 'Hylosil 102'

SPANNER SIZES

6mm
13mm
19mm
20mm
22mm

0204b

THERMOSTAT HOUSING SPACER BLOCK GASKET

RENEW **26.45.19**

Open the bonnet.
Remove the air cleaner element 19.10.08

Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Disconnect the water temperature sensor, transmitter and vacuum advance tempreature sensor feed wires.
Slacken the clips securing the top hose and expansion hoses to the thermostat housing.
Remove the hoses from the housing.
Slacken the clip securing the water pump to thermostat housing pipe and remove the pipe from the rear outlet.
Remove the bolts (1 Fig 1) securing the thermostat housing (2 Fig 1) and remove.
Slacken the clips securing the breather hose to the spacer block (3 Fig 1) and disconnect the hose.
Remove the extension piece from the remaining breather hose.
Clean the gasket faces.
Fit the extension piece to the breather hose, connect the remaining breather hose to the extension piece, position and tighten the clip securing the hose.
Apply 'Hylosil 102' to the housing and extension piece gasket faces, align and fit the thermostat housing to the extension piece.
Position the extension piece/thermostat housing to the cylinder head and secure with the bolts.
Refit the hoses to the thermostat housing and secure with the clips.
Refit the water temperature sensor, transmitter and vacuum advance tempreature sensor feed wires.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

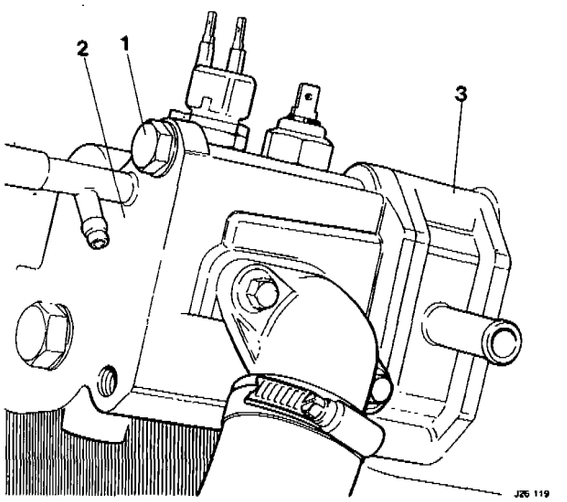


Fig 1

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing 9.5-12.2Nm
Thermostat cover to thermostat housing 23-27Nm.
Thermostat housing to cylinder head 23-27Nm.
Water temperature switch 49-54Nm

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OILS/GREASES/SEALANTS

Thermostat housing to spacer block 'Hylosil 102'

SPANNER SIZES

6mm
13mm
19mm
20mm
22mm

0205b

THERMOSTAT REAR OUTLET GASKET

RENEW **26.45.16**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the thermostat housing.
Slacken the clip securing the hose to the water pump.
Remove the hose assembly, remove the securing clips.
Remove the rear outlet securing bolts (1 Fig 1) and remove the outlet (2 Fig 1).
Clean the gasket faces.
Apply 'Hylosil 102' to the cleaned faces, fit the securing bolts to the outlet as guides and fit the rear outlet.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

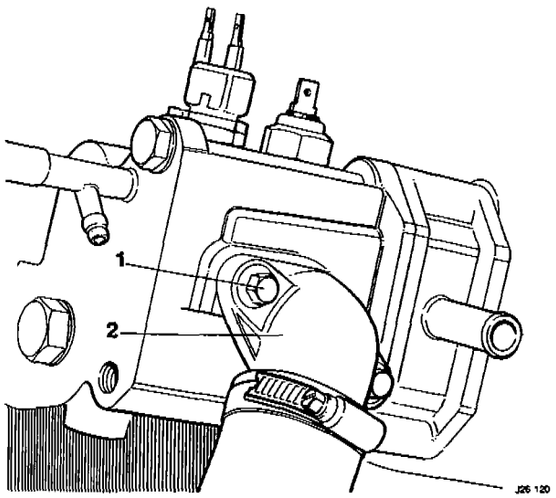


Fig 1

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing ***9.5-12.2Nm***

OILS/GREASES/SEALANTS

Thermostat housing to spacer block 'Hylosil 102'

SPANNER SIZES

6mm
8mm

0202b

TORQUATROL UNIT

RENEW **26.25.19**

Open the bonnet and remove the air cleaner element, remove the nuts (1 Fig 1) securing the torquatrol unit (2 Fig 1) to the water pump.
Remove the fan cowl securing clips (1 Fig 1), two off, and lift out the fan cowl and torquatrol unit complete, remove the bolts securing the fan to the torquatrol unit and separate the two.
Replace the torquatrol unit and reverse the assembly procedure to refit ensuring that the two paint spots (3 Fig 1) (balance marks) are lined up.

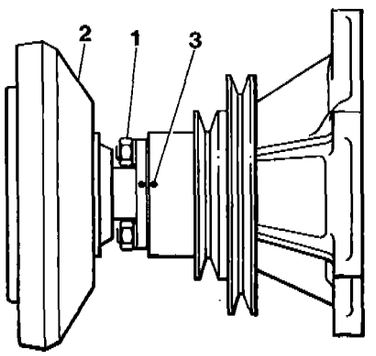


Fig 1

DATA

TORQUE FIGURES

Fan to torquatrol unit 13.5Nm
Torquatrol unit to water pump pulley 23-27Nm

SPANNER SIZES

13mm
1/2in AF

0178b

WATER PUMP

RENEW **26.50.01**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the nuts (1 Fig 2) securing the torquatrol unit (2 Fig 2) to the water pump.
Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete.
Slacken the alternator link arm:
Adjusting nut.
Pivot nut.
Trunnion bolt.
and pivot nut/bolt.
Pivot the alternator into the engine and remove the drive belt.
Remove the water pump to housing securing bolts, place a protective board against the radiator and remove the pump assembly.
Clean the gasket face.
Apply 'Hylosil 102' to the replacement water pump, fit and seat the pump taking care not to disturb the sealant.
Fit and tighten the securing bolts.

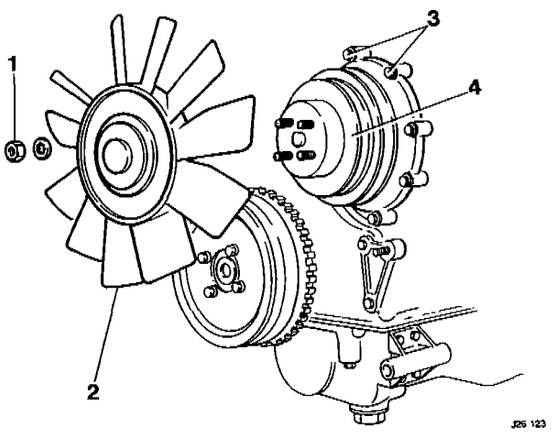


Fig 2

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Remove the protective board from the radiator, refit the drive belt and retension.
Refit the fan cowl and torquatrol unit ensuring that the paint marks align (Fig 1).
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Hose clip - water pump to rail 2.4Nm
Water pump to timing cover 23-27Nm
Water pump and timing cover to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Water pump to housing 'Hylosil 102'

SPANNER SIZES

6mm
8mm
10mm
13mm

9/16in AF

02 10b

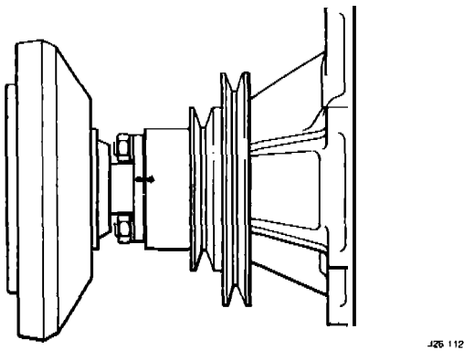


Fig 1

WATER PUMP GASKET

RENEW **26.50.02**

Open the bonnet.
Remove the air cleaner element **19.1**0.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the nuts (1 Fig 2) securing the torquatrol unit (2 Fig 2) to the water pump.
Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete.
Slacken the alternator link arm:
Adjusting nut.
Pivot nut.
Trunnion bolt.
and pivot nut/bolt.
Pivot the alternator into the engine and remove the drive belt.
Remove the water pump to housing securing bolts (3 Fig 1), place a protective board against the radiator and remove the pump assembly (4 Fig 2).
Clean the gasket face.
Apply 'Hylosil 102' to the replacement water pump, fit and seat the pump taking care not to disturb the sealant.
Fit and tighten the securing bolts.

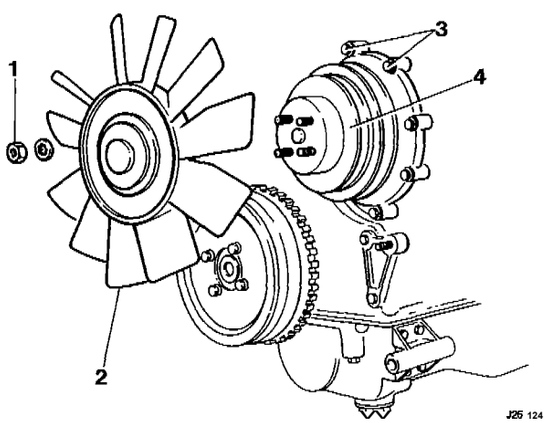


Fig 2

Remove the protective board from the radiator, refit the drive belt and retension.
Refit the fan cowl and torquatrol unit ensure that the paint marks align (Fig 1).
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Hose clip - water pump to rail ***2.4Nm***
Water pump to timing cover 23-27Nm
Water pump and timing cover to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Water pump to housing 'Hylosil 102'

SPANNER SIZES

6mm
8mm
10mm
13mm

9/16in AF

0211b

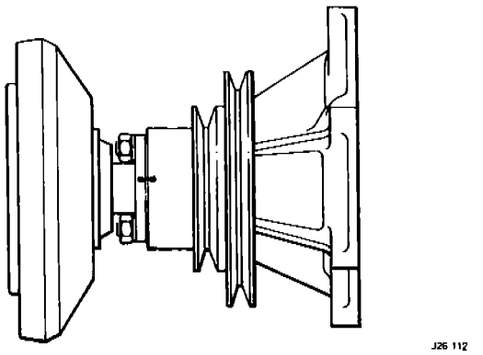


Fig 1

WATER PUMP HOUSING

RENEW **26.50.07**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the nuts (1 Fig 2) securing the torquatrol unit (2 Fig 2) to the water pump.
Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete.
Slacken the alternator link arm:
Adjusting nut.
Pivot nut.
Trunnion bolt.
and pivot nut/bolt.
Pivot the alternator into the engine and remove the drive belt.
Remove the water pump to housing securing bolts, place a protective board against the radiator and remove the pump assembly.
Clean the gasket face.
Apply 'Hylosil 102' to the replacement water pump, fit and seat the pump taking care not to disturb the sealant.
Fit and tighten the securing bolts.

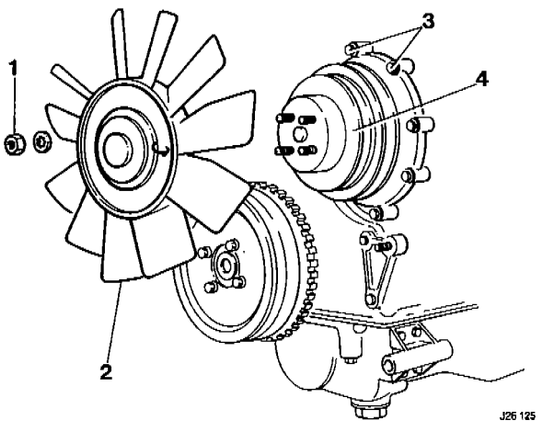


Fig 2

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Remove the protective board from the radiator, refit the drive belt and retension.
Refit the fan cowl and torquatrol unit.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Hose clip-water pump ***to rail 2.4Nm***
Waterpump to timing cover 23-27Nm
Water pump and timing cover to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Waterpump to housing 'Hylosil 102'

SPANNER SIZES

6mm
8mm
10mm
13mm

9/16in AF

0212b

RADIATOR BOTTOM HOSE

RENEW **26.30.07**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the radiator.
Slacken the clip/s (1 Fig 1/2) securing the hose (2 Fig 1/2) to the water pump.
Remove the bottom hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the radiator and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

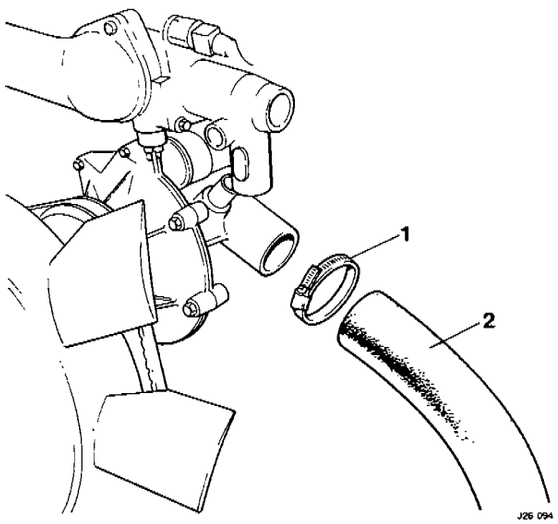


Fig 1

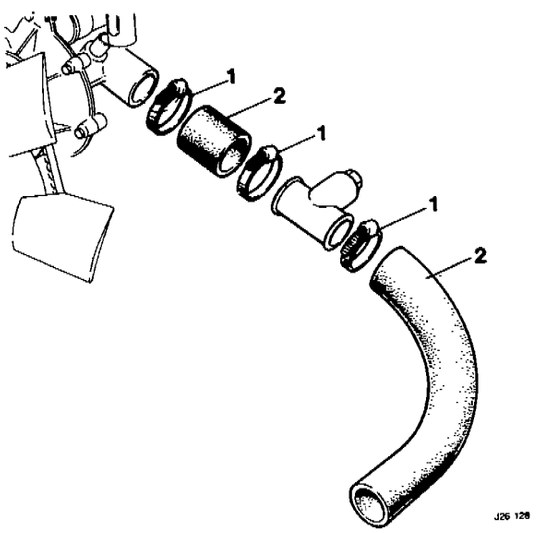


Fig 2

DATA

TORQUE FIGURES

Hose ***clip 3.8-4.3Nm***

SPANNER SIZES

8mm

0180b

RADIATOR TOP HOSE

RENEW **26.30.01**

Open the bonnet and drain the coolant from the radiator. Slacken the top hose securing clips (1 Fig 1) on either end of the pipe and remove the hose (2 Fig 1) assembly, remove the clips from the hose, replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the radiator and the thermostat housing.
Tighten the clips, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

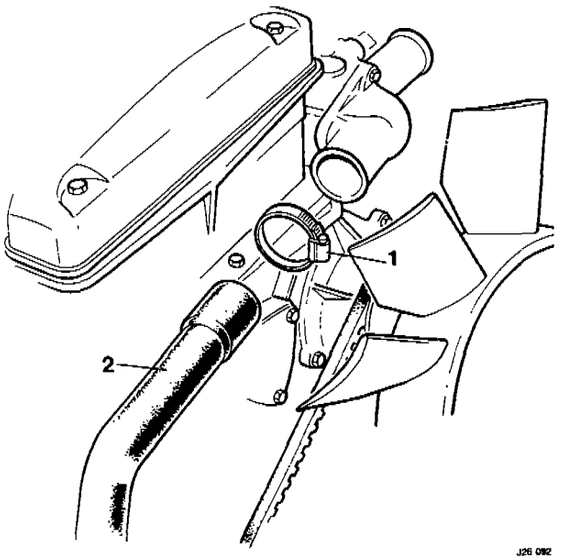


Fig 1

DATA

TORQUE FIGURES

Hose clip 3.8-4.3Nm

SPANNER SIZES

8mm

0179b

HOSE WATER PIPE TO WATER PUMP

RENEW **26.30.73**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the water pump/ thermostat housing, thermostat housing end.
Slacken the clip (1 Fig 2) securing the water pump/ thermostat housing hose water pump end.
Remove the hose assembly (2 Fig 2), remove the securing clips.
Slacken the clips securing the hose to the water pipe and the water pump.
Remove the hose assembly, remove the securing clips.
Replace the hoses, fit the clips to the replacement hoses, lubricate the inside of the hose ends with soap solution, and fit the hoses to the water pipe, water pump and thermostat housing.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

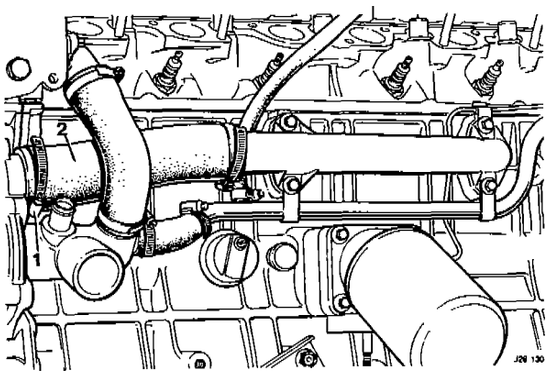


Fig 2

DATA

TORQUE FIGURES

Hose ***clip 2.5-3.5Nm***

SPANNER SIZES

6mm

0191b

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HOSE-CYLINDER HEAD TO HEATER VALVE

RENEW **26.30.39**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the water valve.
Slacken the clip (1 Fig 1) securing the hose (2 Fig 1) to the cylinder head.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the cylinder head and the water valve.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

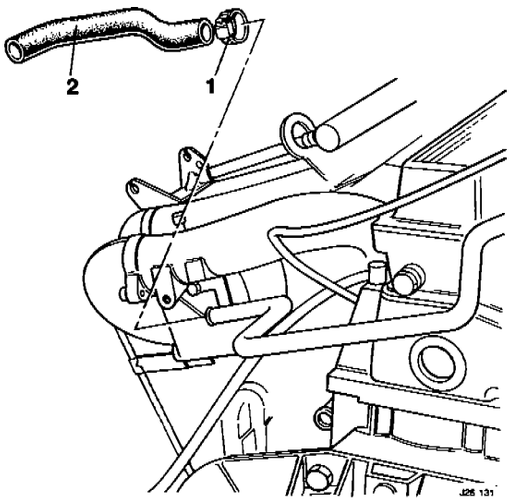


Fig 1

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0183b

HOSE-EXPANSION TANK TO RADIATOR

RENEW **26.30.54**

Open the bonnet.
Cut the ratchet strap securing the hose.
Slacken the clip securing the hose to the radiator.
Slacken the clip securing the hose to the expansion tank, remove the hose assembly and the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the radiator and the expansion tank.
Tighten the clips, position the expansion hoses together and secure with a suitable ratchet strap.
Remove the pressure cap, top up the cooling system with the correct water/anti-freeze solution, fir the pressure cap and close the bonnet.

DATA

TORQUE FIGURES

*Hose **clip 2.5-3.5Nm***

SPANNER SIZES

6mm

0188b

HOSE-EXPANSION TANK TO WATER PUMP

RENEW **26.30.72**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the water pump.
Slacken the clip securing the hose to the expansion tank.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the expansion tank and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Hose clip ***2.5-3.5Nm***

SPANNER SIZES

6mm

0190b

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HOSE-HEATER RETURN PIPE TO WATER PUMP

RENEW **26.30.43**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
emove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the heater return pipe.
Slacken the clip (1 Fig 1) securing the hose (2 Fig 1) to the water pump.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the heater return pipe and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner and close the bonnet.

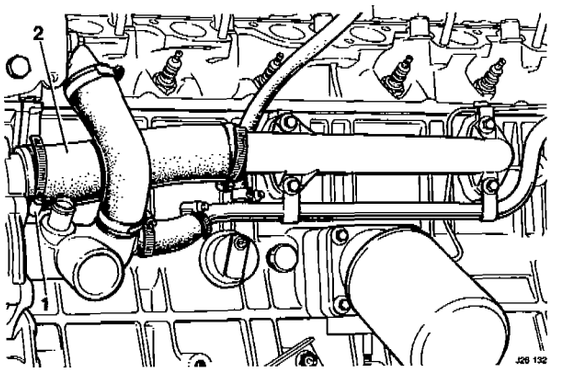


Fig 1

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0186b

HOSE-HEATER TO RETURN PIPE

RENEW **26.30.44**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the water valve hose to the heater.
Disconnect the hose from the heater for access.
Slacken the clip securing the hose to the heater.
Slacken the clip (1 Fig 2) securing the hose (2 Fig 2) to the heater return pipe.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the heater return pipe and the heater.
Reconnect the water valve hose to the heater.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

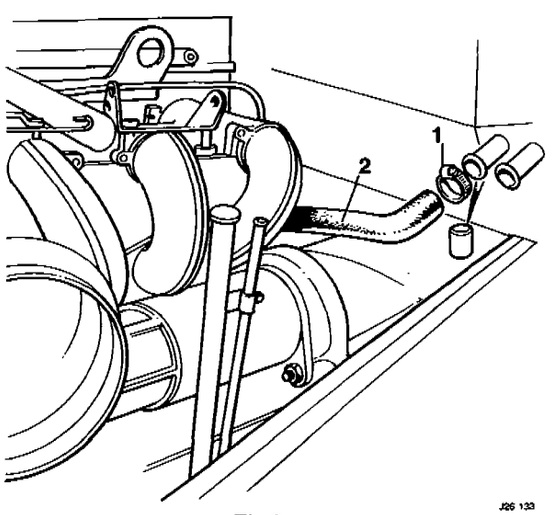


Fig 2

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0187b

HOSE-HEATER VALVE TO HEATER

RENEW **26.30.40**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Disconnect the water vacuum hose (I Fig 1).
Slacken the clip securing the hose to the water valve.
Slacken the clip securing the hose to the heater (2 Fig 1).
Remove the hose (3 Fig 1) assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the heater and the water valve.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap, reconnect the vacuum hose to the water valve and close the bonnet.

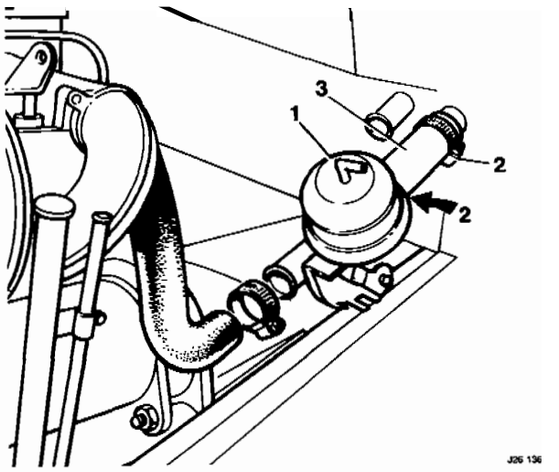


Fig 1

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0184b

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HOSE-PARTTHROTTLE CONTROL HOUSING TO HEATER RETURN PIPE

RENEW **26.30.84**

Open the bonnet.
Remove the air cleaner element 19.10.08

Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the expansion tank to thermostat housing hose.
Remove the hose from the housing.
Slacken the clip securing the hose to the part throttle control orifice housing.
Remove the hose assembly, remove the securing clip.
Slacken the clip (1 Fig 1) securing the hose (2 Fig 1) to the return pipe.
Remove the hose assembly, remove the securing clip.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the return pipe and the part throttle control orifice housing.
Refit the remaining hose to the thermostat housing and tighten the clips.
Fit the drain plug to the radiator, top up the cooling system with the correct waterlanti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

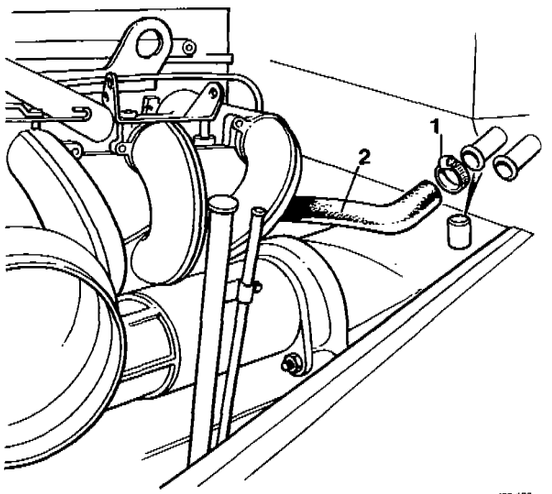


Fig 1

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0195b

HOSE-THERMOSTAT HOUSING TO EXPANSIONTANK

RENEW **26.30.36**

Open the bonnet.
Cut the ratchet strap securing the hose.
Slacken the clip securing the hose to the thermostat housing.
Slacken the clip securing the hose to the expansion tank.
Remove the hose assembly, remove the securing clips.

Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the expansion tank.
Tighten the clips, position the expansion hoses together and secure with a suitable ratchet strap.
Remove the pressure cap, top up the cooling system with the correct water/anti-freeze solution, fit the pressure cap and close the bonnet.

DATA

TORQUE FIGURES

Hose clip ***2.5-3.5Nm***

SPANNER SIZES

6mm

0182b

HOSE-THERMOSTAT HOUSING TO PART THROTTLE CONTROL HOUSING

RENEW **26.30.78**

Open the bonnet.
Remove the air cleaner element 19.10.08
Slacken the clip securing the hose to the thermostat housing stub pipe, fit a suitable plug to the housing stub pipe.
Remove the hose assembly
remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, remove the plug from the thermostat housing stub pipe and fit the hose.
Tighten the clips, remove the pressure cap, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0194b

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HOSE-WATER PUMPTOTHERMOSTAT HOUSING

RENEW **26.30.20**

Open the bonnet.
Remove the air cleaner element 19.10.08
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip (1 Fig 1) securing the hose (2 Fig 1) to the thermostat housing.
Slacken the clip securing the hose to the water pump.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

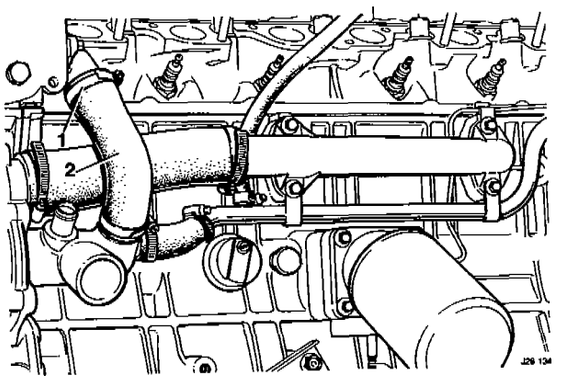


Fig 1

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0181b

HOSE ENGINE SET

RENEW **26.30.41**

Drain the cooling system, slacken hose clips as required and carefully remove the hoses.
To ease assembly of the hoses to attachment points, a liberal application of soft soap may be applied to the inside of the hoses.
Position and tighten the securing clips and refill the system with coolant.

DATA

TORQUE FIGURES

Hose clip (Not top and bottom radiator hoses) 2.5-3.5Nm
Hose clip (Top and bottom radiator hoses) 3.8-4.3Nm

SPANNER SIZES

6mm
8mm

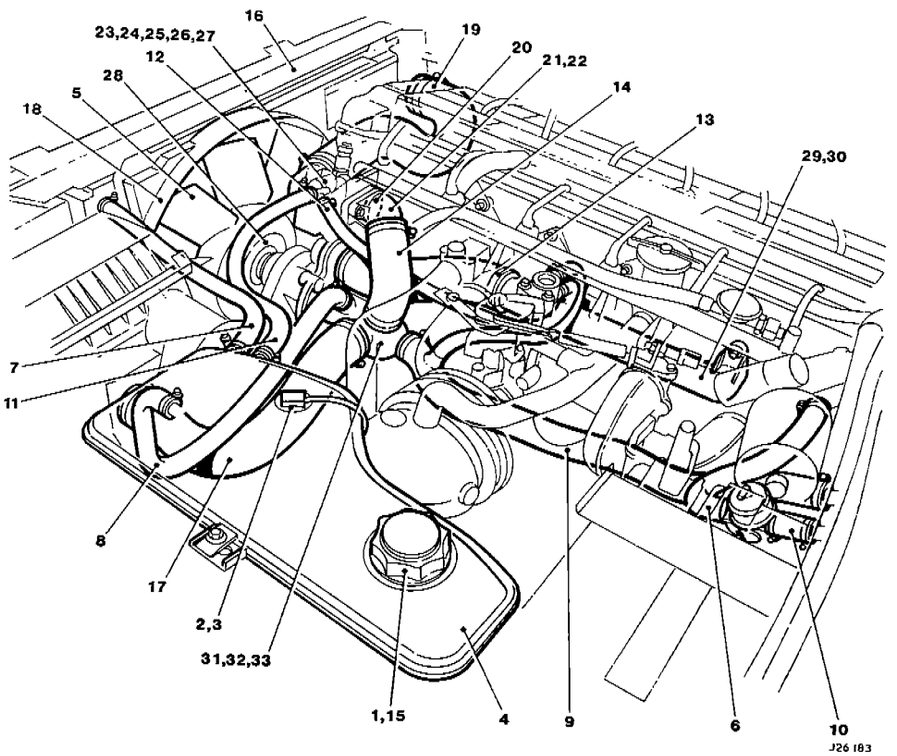
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FAULT DIAGNOSIS

26.00.00

Symptom	Reason	Remedy
Overheating	Insufficient water in cooling system	Top up radiator
	Fan belt slipping	Tighten fan belt to recommended tension or replace if worn.
	Radiator core blocked or radiator grille obstructed	Reverse flush the radiator, remove obstruction from grille.
	Thermostat not opening properly	Remove & fit new thermostat.
	Ignition advance and retard incorrect	Check ignition timing
	Incorrect fuel/air mixture Exhaust system partially blocked	Check CO/HC level. Check exhaust pipe for obstruction.
	Oil level in sump too low	Top up to correct level.
	Blown cylinder head gasket (water/steam being forced down the radiator overflow pipe under pressure)	Remove cylinder head and fit new gasket.
	Engine not yet 'run-in' Brakes binding	Run-in slowly and carefully. Check brake calipers for sticking pistons and seized brake pad pins
Engine running 'cold'	Thermostat jammed open	Remove and renew thermostat
	Incorrect grade of thermostat fitted	Remove and replace with correct type of thermostat.
	Thermostat missing	Check and fit correct thermostat.
Leaks in system	Loose clips on water hoses	Check and tighten clips.
	Top or bottom water hoses perished	Check and replace any faulty hoses.
	Radiator leaking	Remove radiator & repair
	Thermostat gasket leaking	Inspect and renew gasket
	Pressure cap ineffective	Renew pressure cap.
	Cylinder wall or head cracked	Replace either cylinder block or cylinder head.

0171b

COOLING SYSTEM

DESCRIPTION *26.00.00*

The cooling system consists of a cross flow radiator matrix, a water pump, belt driven by the engine crankshaft, an expansion tank and a thermostatic valve to ensure rapid warm up. The radiator is cooled by a viscous coupled fan and also an electric driven fan, this fan is thermostatically controlled and it is possible under very hot conditions for it to operate after the engine is switched off. The fan will switch off automatically when the coolant drops below 90°C.
Under cold start conditions, coolant is forced by the water pump through the cylinder block and cylinder head to the thermostat housing. The valve is closed and the coolant is therefore returned to the water pump suction inlet.
Cars fitted with automatic transmission have a cooling tube included in the centre section of the radiator matrix.
We use and recommend BP Type H21 or Union Carbide UT184 or Unipart Universal anti-freeze which should be used at the specified concentration whenever the cooling system is refilled. For topping up purposes, only reputable brands of anti-freeze, formulated and approved for 'mixed metal' engines should be used.

IMPORTANT NOTE: THE CONCENTRATION OF ANTI-FREEZE MUST NOT BE ALLOWED TO FALL BELOW THE RECOMMENDED STRENGTH, AS SEDIMENT MAY BE FORMED IN THE COOLING SYSTEM BY CERTAIN TYPES OF ANTI-FREEZE AT LOW CONCENTRATES.

A 40% solution by volume in the U.K. (55% U.S.A/Canada and all other countries) must be used at all times, either by topping-up or replenishing the cooling system.
For maximum corrosion protection, the concentration should never be allowed to fall below 25%.
Always top-up with recommended strength of anti-freeze. NEVER WITH WATER ONLY.
In countries where it is unnecessary to use anti-freeze, Marston SQ 36 Corrosion Inhibitor must be used in the cooling system in the proportion of 1 part SQ 36 to 24 parts water. CHANGE COOLANT EVERY TWO YEARS. The system should be drained, flushed and refilled with fresh anti-freeze (or Corrosion Inhibitor) mixed with a satchet of 'Barrs Leaks'.
An alternative coolant known as CARBUROL FORLIFE is recommened where temperatures below 10°C (14°F) are not encountered.
Before Carburol Forlife is used, the coolant already present in the system must be drained out and the system flushed before filling with Carburol Forlife.
Once in use, the system should be topped up with Carburol Forlife only, and a label giving this information should be affixed in an appropriate and prominent position.

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THERMOSTAT CLOSED

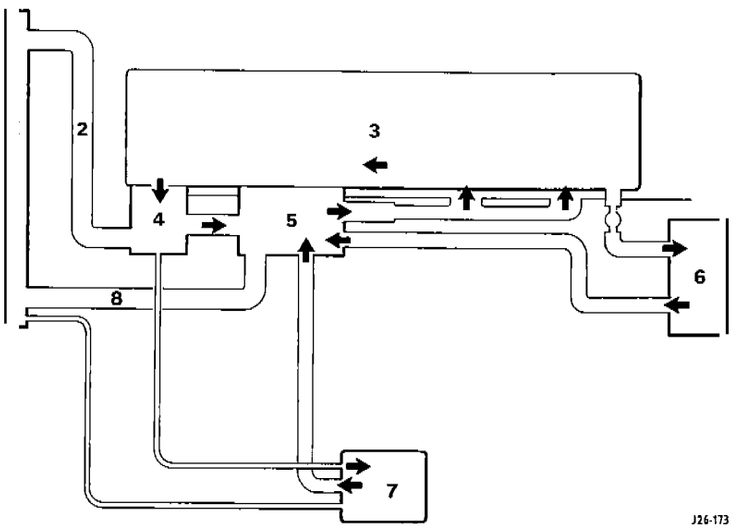


Fig 1

THERMOSTAT OPEN

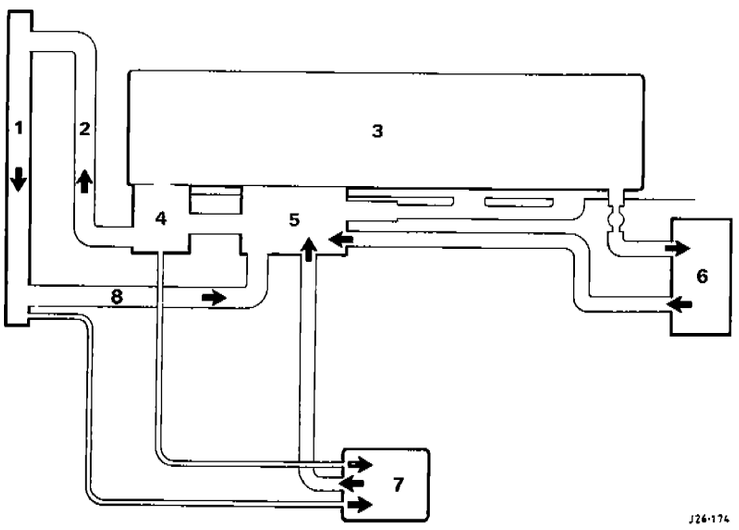


Fig 2

KEY

1. **Radiator**
2. **Top Hose**
3. **Engine**
4. Thermostat Housing
5. Water **Pump**
6. Heater
7. **Expansion Tank**
8. **Bottom Hose**

COOLING SYSTEM

PRESSURE TEST 26.10.07

Ensure that the engine is warm from recent operation.
Carefully remove the pressure cap from the expansion tank.
Select suitable adaptors and assemble to the neck of the expansion tank (1 Fig. 1) and the tester (2 Fig. 1).
Pump up the pressure to a pressure equal to the pressure cap poundage.
Watch the gauge for ten seconds and if the pressure drops check the water pump and external connections for leaks.
If the pressure remains constant for ten seconds, maintain the pressure and visually check for pin point leaks.
Tighten all connections and replace worn or leaky hoses, internal leaks may be cured by torqueing the cylinder head bolts.
A more severe test may be carried out by using the above procedure with the engine running. Absence of external leaks accompanied by fluctuations in pressure usually indicates a 'blown' cylinder head gasket, however under no circumstances should the pressure be allowed to exceed the upper limit of the cap.

0172b

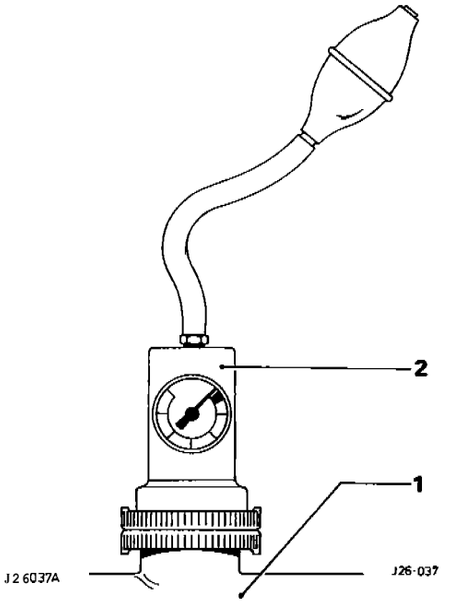


Fig 1

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THERMOSTAT

TEST 26.45.09

The thermostat may be checked by suspending it with the thermostat heat control unit facing down in a small pan or dish (1 Fig.1) containing a solution of ethylene glycol coolant and a thermometer (2 Fig. 1). Neither the thermostat nor the thermometer should rest on the bottom of the pan because of the uneven concentration of heat at this point when the pan is heated.
The thermostat (3 Fig.1) should open when a temperature of 82°C is attained.
When the coolant reaches 97°C the valve should be fully open.

0169b

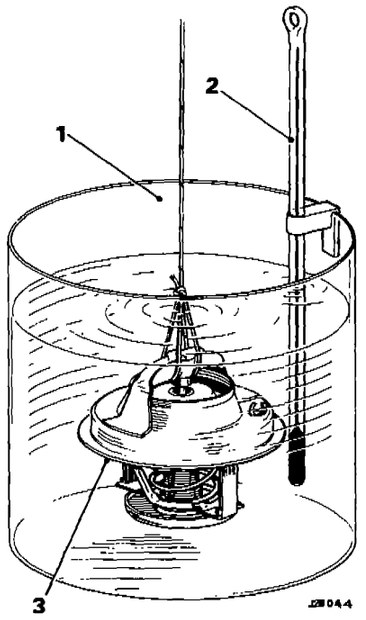


Fig 1

COOLING SYSTEM

DRAIN AND REFILL 26.10.01

Place a drain tray in position under the radiator drain plug (1 Fig.2).
Remove the expansion tank filler cap, remove the radiator drain plug and drain the coolant.
Remove the power steering and transmission cooler pipes (where fitted) from the radiator.
Remove the rear drain block plug and drain the coolant.
Refit the cylinder block drain plug and fit the radiator drain plug.
Refit the power steering and transmission cooler pipes to the radiator (where fitted).
Fill the cooling system with a solution of anti-freeze and water, move the heater valve control lever to the hot position, refit the expansion tank cap and run the engine until the thermostat is open.
Switch off engine, remove expansion tank cap and refill with water.

0173b

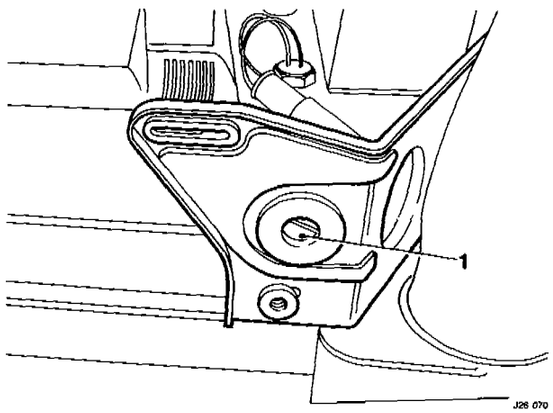


Fig 2

COOLANT RADIATOR ONLY

DRAIN AND REFILL

Open the bonnet and place a drain tin in position below the radiator drain plug to the offside of the radiator.

Remove the radiator pressure cap, remove the drain plug (1 Fig 2) and allow the radiator to drain.
Refit and tighten the drain plug, refill the cooling system with the correct solution of anti-freeze and water, run the engine up to normal running temperature, top up the cooling system, refit the pressure cap and close the bonnet.

PRESSURE CAP

RENEW **26.40.03**

Open the bonnet.
Ensure that the cooling system is cold before removing the cap.
Remove the cap.
Top up the cooling system if required with the correct water/anti-freeze solution, refit the replacement pressure cap, close the bonnet.

0196b

WATER PIPE

RENEW **26.30.74**

Open the bonnet, remove the air cleaner element and depressurise the fuel system.
Disconnect the engine breather heater element multi-plug (Federal only).
Disconnect injector plugs.
Disconnect the idle speed actuator multi-plug and the air condition vacuum hose from manifold.
Remove the engine and gearbox dipstick tube to manifold securing bolt.
Remove the cruise control to throttle linkage securing nut.
Reposition the cruise control operating rod/trunnion from throttle linkage.
Disconnect the cruise control, vaccum hose and position aside.
Disconnect the kick-down cable from the throttle linkage, undo the cable to matching bracket lock nut and reposition the cable away from the bracket.
Disconnect the throttle cable from the linkage and undo the cable to matching bracket locknut and reposition the cable away from the mounting bracket.
Slacken the breather hose to part throttle orifice control valve housing and oil filter tube securing clips.
Disconnect the hose from the part throttle housing and oil filter tube.
Slacken the intake elbow hose to throttle housing securing clip.
Disconnect the hose from the throttle housing.
Disconnect the air flow meter multi-plug, undo and remove the air flow meter earth lead securing nut.
Reposition the earth lead from the air flow meter stud and remove the air flow meter mounting securing nut.
Unclip the air flow meter to air box retaining clips.
Replace and remove the air flow meter/intake elbow assembly from the vehicle.
Undo the fuel return hose to pressure'regulator union nut.

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Disconnect the hose from regulator.
Fit plugs to hose and regulator.
Unclip the fuel feed hose to fuel rail retaining clips undo the feed hose to the fuel rail union nut and reposition the hose from the rail.
Release the fuel hose to manifold retaining clips and reposition the hoses from the manifold.
Slacken the coolant to part throttle control orifice housing hose clips.
Disconect the coolant hoses from the housing and fit plugs to prevent coolant loss.
Slacken the engine and breather hose to cam cover securing clip and disconnect the hose from the cover.
Disconnect the throttle potentiometer multi-plug and the supplementary air valve multi-plugs (Federal only).
Disconnect the two way solenoid vacuum valve multi-plug (Federal only).
Disconnect the vacuum hose from the two-way solenoid vacuum valve to air pump diverter valve (Federal only).
Disconnect the vacuum hose from the vacuum temperature switch on the thermostat housing (Federal only).
Undo and remove the water pipe to front inlet manifold securing bolt (Federal only).
Slacken the induction manifold purge valve hose clip (Federal only).
Disconnect the hose from purge valve pipe (Federal only).
Undo and remove the oil filler tube to mounting bracket securing bolt.
Displace the filler tube from the lower housing and remove the induction manifold *to* cylinder head securing nuts/bolts.
Reposition the earth lead from the manifold front securing stud and reposition the engine harness mounting brackets from the manifold studs.
Displace and remove the oil filler tube to manifold mounting brackets.
Undo the remaining manifold securing bolt and remove the manifold assembly from the vehicle.
Remove and discard manifold gaskets, clean the cylinder head gasket's face.
Slacken the hose clip (1 Fig 1) and remove the bolts (2 Fig 1) securing the water pipe (3 Fig 1) to the cylinder block (4 Fig 1).
Reposition the oil feed pipe clip and oil trap from the water pipe.
Remove the water pipe and clean the gasket faces.
Apply 'Hylosil 102' to the gasket faces and reverse the removal procedure to fit the water pipe and induction manifold.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

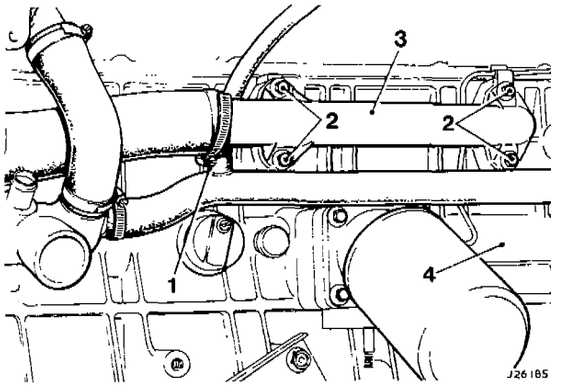


Fig 1

DATA

TORQUE FIGURES

Adaptor to manifold **9.5-12.2Nm**
Clip hose to water rail **2.4Nm**
Dipstick to bracket **5-8Nm**
Elbow to induction manifold 12.2Nm
Inlet manifold to cylinder head **23-27Nm**
Manifold to cylinder head (bolt) **23-27Nm**
Manifold to cylinder head (nut) **12-16Nm**
Pressure regulator connecting **nut 12.5-15Nm**
Water pipe to cylinder block **23-27Nm**

SPANNER SIZES

6mm
7rnm
8mm
1Omm
13mm
19mm

OILS/GREASES/SEALANTS

Water pipe to cylinder block 'Hylosil 102'

0192b

WATER PIPE GASKETS

RENEW 26.30.75

Open the bonnet, remove the air cleaner element and depressurise the fuel system.
Disconnect the engine breather heater element multi-plug (Federal only).
Disconnect injector plugs.
Disconnect the idle speed actuator multi-plug **and** the air condition vacuum hose from manifold.
Remove the engine and gearbox dipstick tube to manifold securing bolt.
Remove the cruise control to throttle linkage securing nut.
Reposition the cruise control operating rod/trunnion from throttle linkage.
Disconnect the cruise control, vacuum **hose** and position aside.
Disconnect the kick-down cable from the throttle linkage, undo the cable to matching bracket lock nut and reposition the cable away from the bracket.
Disconnect the throttle cable from the linkage and undo the cable to matching bracket locknut and reposition the cable away from the mounting bracket.
Slacken the breather hose to part throttle orifice control valve housing and oil filter tube securing clips.
Disconnect the hose from the part throttle housing and oil filter tube.
Slacken the intake elbow hose to throttle housing securing clip.
Disconnect the hose from the throttle housing.

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Disconnect the air flow meter multi-plug, undo and remove the air flow meter earth lead securing nut.
Reposition the earth lead from the AFM stud and remove the air flow meter mounting securing nut.
Unclip the air flow meter to air box retaining clips.
Replace and remove the air flow meter/intake elbow assembly from the vehicle.
Undo the fuel return hose to pressure regulator union nut.
Disconnect the hose from regulator.
Fit plugs to hose and regulator.
Unclip the fuel feed hose to fuel rail retaining clips, undo the feed hose to the fuel rail union nut and reposition the hose from the rail.
Release the fuel hose to manifold retaining clips and reposition the hoses from the manifold.
Slacken the coolant to part throttle control orifice housing hose clips.
Disconnect the coolant hoses from the housing and fit plugs to prevent coolant loss.
Slacken the engine and breather hose to cam cover securing clip and disconnect the hose from the cover.
Disconnect the throttle potentiometer multi-plug and the supplementary air valve multi-plugs (Federal only).
Disconnect the two way solenoid vacuum valve multi-plug (Federal only).
Disconnect the vacuum hose from the two-way solenoid vacuum valve to air bump diverter valve (Federal only).
Disconnect the vacuum hose from the vacuum temperature switch on the thermostat housing (Federal only).
Undo and remove the water pipe to front inlet manifold securing bolt (Federal only).
Slacken the induction manifold purge valve hose clip (Federal only).
Disconnect the hose from purge valve pipe (Federal only).
Undo and remove the oil filler tube to mounting bracket securing bolt.
Displace the filler tube from the lower housing and remove the induction manifold to cylinder head securing nuts/bolts.
Reposition the earth lead from the manifold front securing stud and reposition the engine harness mounting brackets from the manifold studs.
Displace and remove the oil filler tube to manifold mounting brackets.
Undo the remaining manifold securing bolt and remove the manifold assembly from the vehicle.
Remove and discard manifold gaskets, clean the cylinder head gaskets face.

Slacken the hose clip (1 Fig 1) and remove the bolts (2 Fig 1) securing the water pipe (3 Fig 1) to the cylinder block (4 Fig 1).
Reposition the oil feed pipe clip and oil trap from the water pipe.
Remove the water pipe and clean the gasket faces-, Apply 'Hylosil 102' to the gasket faces and reverse the removal procedure to fit the water pipe and induction manifold.
Fit the drain plug to the radiator, top up the cooling system with the correct waterlanti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

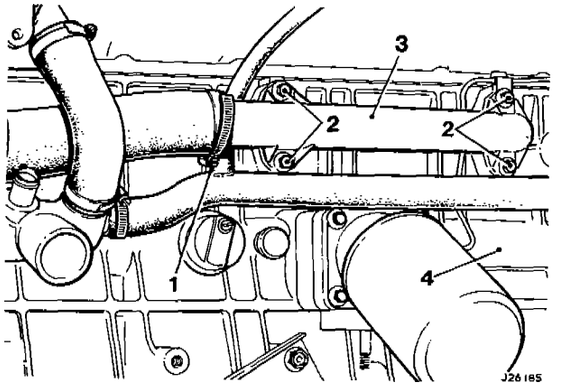


Fig 1

DATA

TORQUE FIGURES

Adaptor to manifold ***9.5-12.2Nm***
Clip hose to water rail ***2.4Nm***
Dipstick to bracket ***5-8Nm***
Elbow *to induction manifold* ***12.2Nm***
Inlet manifold ***to*** *cylinder head* ***23-27Nm***
Manifold to cylinder head (bolt) ***23-27Nm***
Manifold to cylinder head (nut) ***12-16Nm***
Pressure regulator connecting nut ***12.5-15Nm***
Water pipe to cylinder block ***23-27Nm***

SPANNER SIZES

6mm
7mm
8mm
10mm
13mm
19mm

⅜" AF

OILS/GREASES/SEALANTS

Water pipe to cylinder block 'Hylosil 102'

0193b

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COOLANT LEVEL PROBE SEAL

RENEW **26.40.12**

Open the bonnet and remove the pressure cap, detatch the coolant level probe harness securing clip from the expansion tank.
Rotate the probe (1 Fig 1) anti-clockwise to release the unit from its seating.
Remove the coolant level probe and seal.
Discard the seal.
Refit the replacement seal to the expansion tank and reverse the remaining removal procedure.

Top up the expansion tank with coolant, ensure this is of the correct solution of water and anti-freeze.
Refit the pressure cap and close the bonnet.

0200b

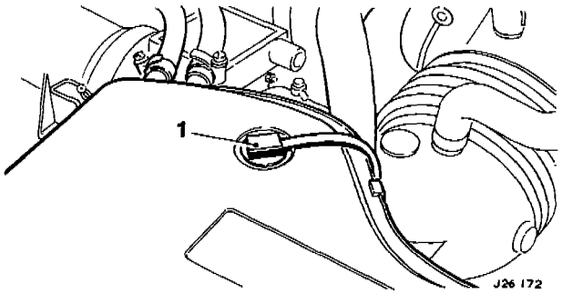


Fig 1

COOLANT LEVEL PROBE

RENEW **26.40.11**

Open the bonnet and remove the pressure cap, detatch the coolant level probe harness securing clip from the expansion tank.
Disconnect the coolant level probe block connector.
Rotate the probe (1 Fig 1) anti-clockwise to release the unit from its seating.
Remove the coolant level probe and seal.
Discard the seal.
Refit the replacement seal to the expansion tank and reverse the remaining removal procedure.

Top up the expansion tank with coolant, ensure this is of the correct solution of water and anti-freeze.
Refit the pressure cap and close the bonnet.

COOLANT LEVEL INDICATOR

RENEW **26.15.04**

Open the bonnet.
Remove the pressure cap from the expansion tank.
Remove the level indicator (1 Fig 1) from the filler neck (using two screw drivers to depress the tangs).
Discard the level indicator.
Reverse the removal procedure to refit the replacement level indicator.

19498

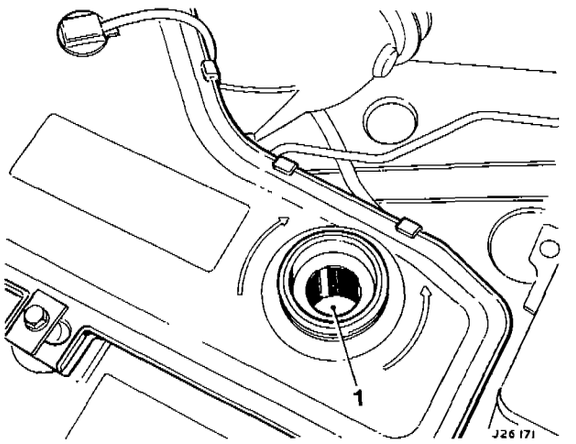


Fig 1

EXPANSION TANK

RENEW **26.15.01**

Open the bonnet, and remove the tank securing nut (2 Fig 2).
Disconnect the coolant probe block connector.
Displace the tank from the rear mounting grommet followed by the front.
Place a suitable receptacle below the tank, slacken the expansion tank hose to thermostat tee piece securing clip.
Disconnect the hose from the tee piece and position the outlet hose over the suitable container.
Fit a suitable blanking plug to the tee piece.
Remove the pressure cap (1 Fig 2) and drain the coolant into the suitable container.
Slacken the expansion tank hose clips and disconnect the hoses from the expansion tank.
Discard the tank.
Reverse the removal procedure to refit the tank.
Top up the expansion tank with coolant, ensure this is the correct solution of water and anti-freeze.
Refit the pressure cap and close the bonnet.

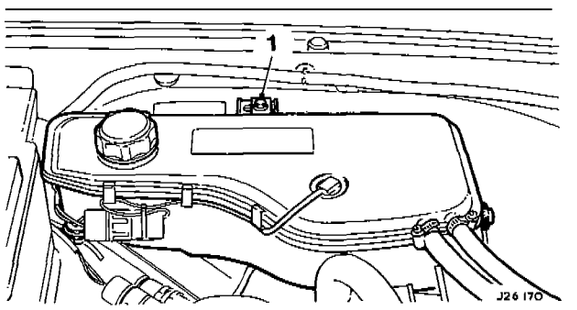


Fig 2

DATA

TORQUE FIGURES

Header tank to body 8-11Nm
Hose header tank 2.5-3.5Nm

0175b

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RADIATOR COWL

RENEW 26.40.07

Open the bonnet and remove the air cleaner element, remove the nuts securing the torquatrol unit to the water pump.

Remove the fan cowl securing clips (1 Fig 1), two off, and lift out the fan cowl (2 Fig 1) and torquatrol unit complete.
Reverse the removal procedure to refit the replacement fan cowl.

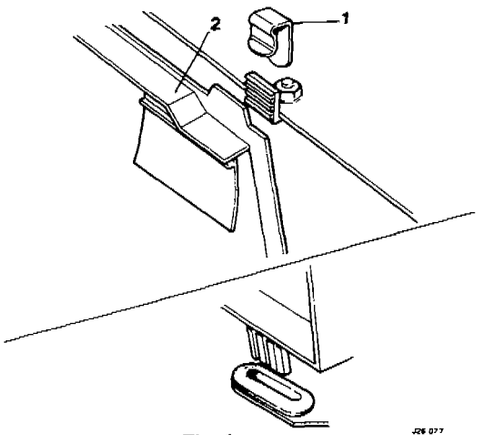


Fig 1

DATA

TORQUE FIGURES

Fan to torquatrol unit ***13.5Nm***
Torquatrol unit ***to*** *water* ***pump 23-27Nm***

SPANNER SIZES

1/2AF

0198b

RADIATOR BLOCK

RENEW 26.40.04

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug (1 Fig 2) and **allow** the radiator to drain.
Release the top hose from the radiator and **pull** clear.
Remove the power assisted steering and gearbox (where fitted) cooling pipe unions (2 Fig 1).
Remove the pipes from the radiator and discard the 'O' rings.
Plug the apertures in the pipes and the radiator.
Disconnect the expansion tank hose from the radiator,
Slacken the clip securing the bottom **hose** to the radiator and pull the pipe clear **of** the radiator.
Remove the clip.
Remove the radiator cowl upper securing clips (1 Fig 1) and remove the cowl.
Remove the top rail securing bolts (1 Fig *3)* and remove the top rail and lift out the radiator assembly.
Remove the radiator mounting rubbers.
Reverse the removal procedure to refit the replacement radiator and hoses.
Tighten the clips, fit a drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

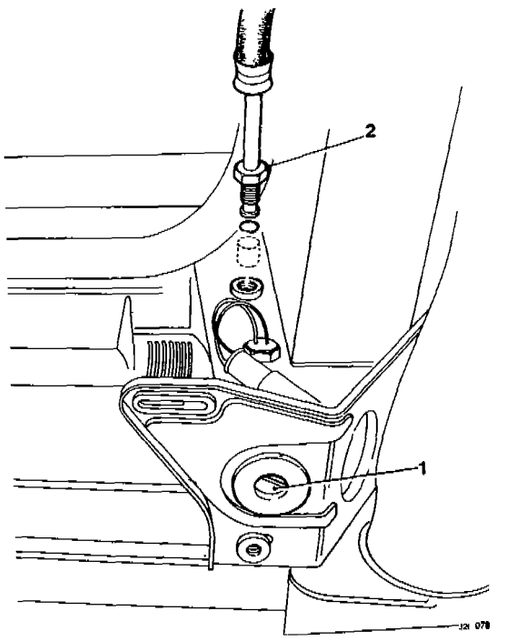


Fig 2

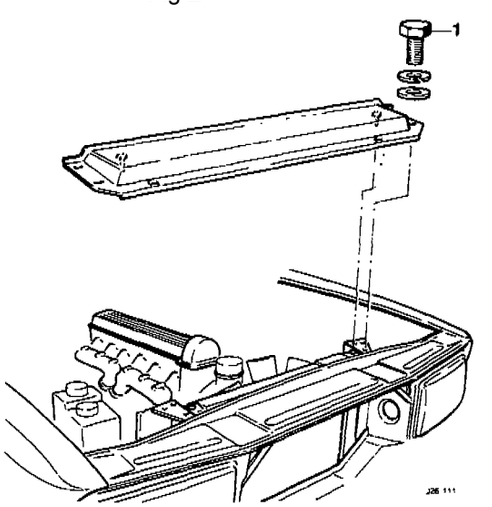


Fig 3

DATA

TORQUE FIGURES

Bottom water hose to radiator 3.8-4.3Nm.
Steering cooler hoses to radiator 19-23Nm.
Top panel-radiator assembly to body 22-28Nm.
Top water hose to radiator 3.8-4.3Nm.

SPANNER SIZES

6mm
8mrn
1Ornrn
13mrn
19mm

0197b

FAN BLADES

RENEW **26.25.06**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Remove the nuts (1 Fig 1) securing the torquatrol unit to the water pump.
Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete, remove the bolts (2 Fig 1) securing the fan to the torquatrol unit and separate the two.
Replace the fan blades ensuring that the two paint spots (one on fan and one on the torquatrol unit) are positioned together and secure with the bolts.
Reverse the removal procedure to refit the torquatrol unit and the air cleaner element, close the bonnet.

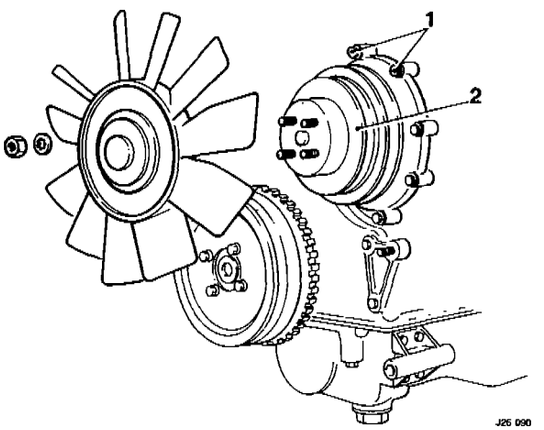


Fig 1

DATA

TORQUE **FIGURES**

Fan to torquatrol unit 13.5Nm
Torquatrol unit to water pump 23-27Nm

SPANNER SIZES

13mm

1/2in AF

0177b

THERMOSTAT COVER ENGINE SET

RENEW **26.45.22**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.

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Slacken the clip securing the top hose to the thermostat cover and pull the pipe clear.
Remove the bolts (1 Fig 1) securing the thermostat cover (2 Fig 1) and remove the cover.
Remove the thermostat (3 Fig 1).
Remove and discard the 'O' ring (4 Fig 1).
Fit a new 'O' ring to the thermostat housing.
Fit the thermostat to the housing, ensuring that the 'jiggle pin' is to the top.
Reposition the thermostat cover and secure with the bolts.
Fit the top hose to the thermostat cover and secure with the clip.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

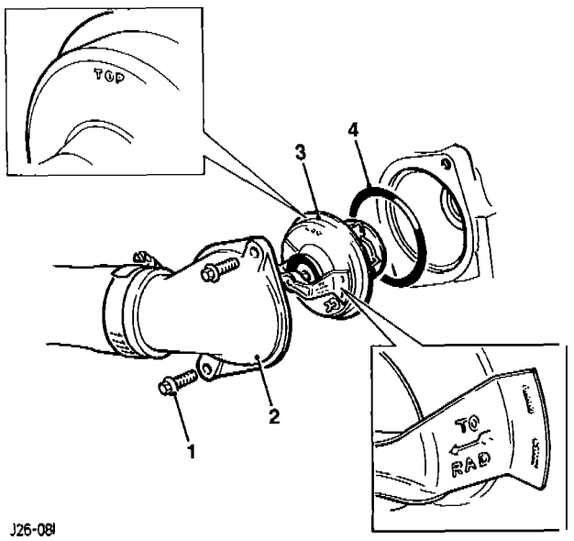


Fig 1

DATA

TORQUE FIGURES

Thermostat ***cover to thermostat housing 23-27Nm.***

SPANNER SIZES

6mm
13mm

0209b

THERMOSTAT COVER GASKET ENGINE SET

RENEW 26.45.23

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the bolts securing the thermostat cover (1 Fig 1) and remove the cover (2 Fig 1).
Remove the thermostat.
Remove and discard the 'O' ring.
Fit a new 'O' ring to the thermostat **housing.**
Fit the thermostat to the housing, ensuring that the 'jiggle pin' is to the top.
Reposition the thermostat cover and secure with the bolts.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

DATA

TORQUE FIGURES

Thermostat cover to thermostat housing 23-27Nm.

SPANNER SIZES

6mm
13mm

0208b

THERMOSTAT ENGINE SET

RENEW 26.45.07

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the thermostat cover securing bolts (1 Fig 1) and remove the thermostat (2 Fig 1) and 'O' ring (3 Fig 1).
Fit a new 'O' ring to the thermostat and fit the thermostat to the housing, coat the housing with 'Hylosil 102', fit the housing in positon and secure with the bolts.
Refill the cooling system with the correct solution of anti-freeze and water, refit the pressure cap and close the bonnet.

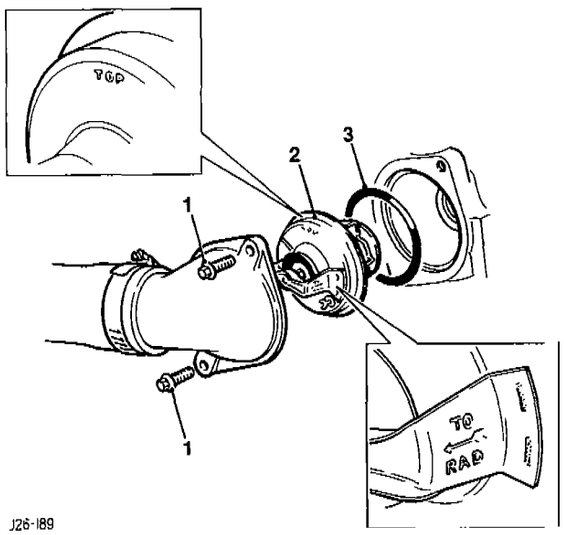


Fig 1

DATA

TORQUE FIGURES

Thermostat cover to thermostat housing 23-27Nm.

SPANNER SIZES

6mm
13mm

0201b

THERMOSTAT HOUSING ENGINE SET

RENEW 26.45.21

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the pressure cap, remove the drain plug and allow the radiator to drain.

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Disconnect the water temperature sensor, transmitter and vacuum advance temperature sensor feed wires.
Slacken the clips securing the top hose and expansion hoses to the thermostat housing.
Remove the hoses from the housing.
Slacken the clip securing the water pump to thermostat housing pipe and remove the pipe from the rear outlet.
Remove the bolts securing the thermostat housing and remove.
Slacken the clips securing the breather hose to the extension piece and disconnect the hose.
Remove the extension piece from the remaining breather hose.
Remove the bolts securing the rear outlet to the housing and remove the outlet.
Remove the water temperature sensor, transmitter and vacuum advance temperature sensor.
Remove and discard the sealing washers.
Discard the housing.
Fit new washers to the water temperature sensor, transmitter and vacuum advance temperature sensor and fit to the housing.
Apply 'Hylosil 102' to the rear outlet gasket faces, fit outlet to the housing and secure with the bolts.
Fit the extension piece to the breather hose, connect the remaining breather hose to the extension piece, position and tighten the clip securing the hose.
Apply 'Hylosil 102' to the housing and extension piece gasket faces, align and fit the thermostat housing to the extension piece.
Position the extension piece/thermostat housing to the cylinder head and secure with the bolts.
Refit the hoses to the thermostat housing and secure with the clips.
Refit the water temperature sensor, transmitter and vacuum advance tempreature sensor feed wires.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing ***9.5-12.2Nm***
Thermostat cover to thermostat housing ***23-27Nm.***
Thermostat housing to cylinder head ***23-27Nm.***
Water temperature switch ***49-54Nm***

OILS/GREASES/SEALANTS

Thermostat housing to cylinder head 'Hylosil 102'

SPANNER SIZES

6mm
13mm
19mm
20mm
22mm

0207b

THERMOSTAT HOUSING GASKET ENGINE SET

RENEW **26.45.20**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator (Fig 1).
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Disconnect the water temperature sensor, transmitter and vacuum advance ternpreature sensor feed wires.
Slacken the clips securing the top hose and expansion hoses to the thermostat housing.

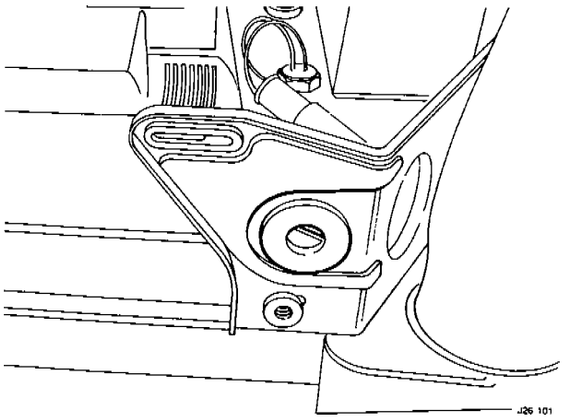


Fig 1

Remove the hoses from the housing.
Slacken the clip securing the water pump to thermostat housing pipe and remove the pipe from the rear outlet, remove the bolts securing the thermostat housing and remove.
Slacken the clips securing the breather hose to the extension piece and disconnect the hose.
Remove the extension piece from the remaining breather hose.
Clean the gasket faces.
Fit the extension piece to the breather hose, connect the remaining breather hose to the extension piece, position and tighten the clip securing the hose.
Apply 'Hylosil 102' to the housing and extension piece gasket faces, align and fit the thermostat housing to the extension piece.
Position the extension piece/thermostat housing to the cylinder head and secure with the bolts.
Refit the hoses to the thermostat housing and secure with the clips.
Refit the water temperature sensor, transmitter and vacuum advance temperature sensor feed wires.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

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DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing **9.5-12.2Nm**
Thermostat cover to thermostat housing **23-27Nm.**
Thermostat housing to cylinder head **23-27Nm.**
Water temperature switch **49-54Nm**

OILS/GREASES/SEALANTS

Thermostat housing to cylinder head **'Hylosil** *102'*

SPANNER SIZES

6mm
13mm
19mm
20mm
22mm

0206b

THERMOSTAT HOUSING REAR OUTLET

RENEW **26.45.17**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the thermostat housing.
Slacken the clip securing the hose to the water pump.
Remove the hose assembly, remove the securing clips.
Remove the rear outlet securing bolts (1 Fig 1) and remove the outlet (2 Fig 1) and discard.
Clean the gasket faces.
Apply 'Hylosil 102' to the cleaned thermostat and replacement outlet mounting faces, fit the securing bolts to the outlet as guides and fit the rear outlet.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

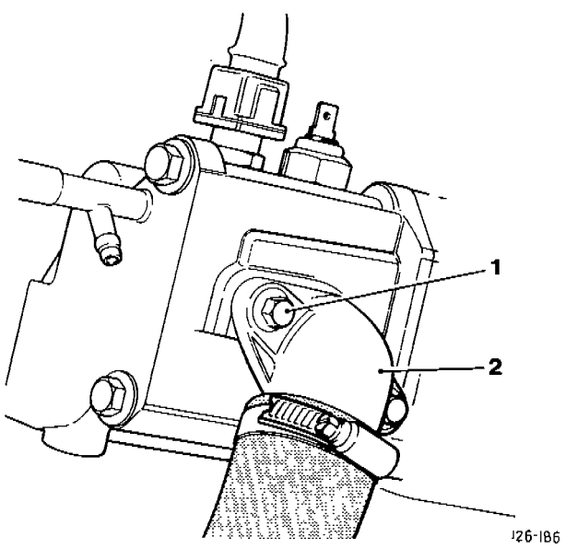


Fig 1

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing 9.5-12.2Nm

OILS/GREASES/SEALANTS

Thermostat housing to rear outlet 'Hylosil 102'

SPANNER SIZES

6mm
8mm

0203b

THERMOSTAT REAR OUTLET GASKET

RENEW 26.45.16

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the thermostat housing.
Slacken the clip securing the hose to the water pump.
Remove the hose assembly, remove the securing clips.
Remove the rear outlet securing bolts (1 Fig 1) and remove the outlet (2 Fig 1).
Clean the gasket faces.
Apply 'Hylosil 102' to the cleaned faces, fit the securing bolts to the outlet as guides and fit the rear outlet.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

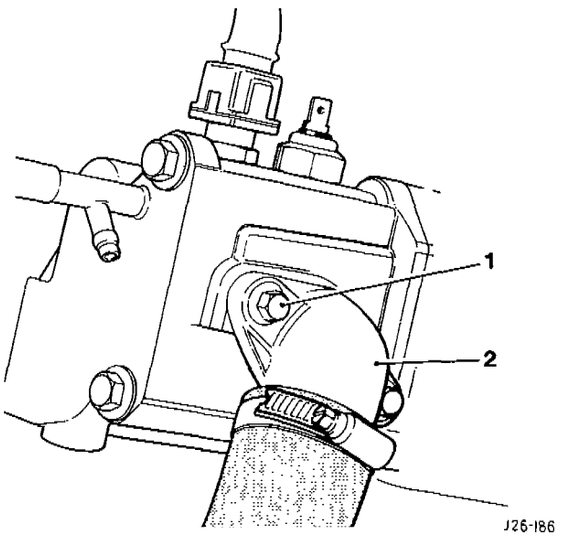


Fig 1

DATA

TORQUE FIGURES

Rear outlet pipe to thermostat housing 9.5-12.2Nm

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OILS/GREASES/SEALANTS

*Thermostat housing **to** spacer block 'Hylosil 102'*

SPANNER SIZES

6mm
8mm

0202b

TORQUATROL UNIT

RENEW 26.25.19

Open the bonnet and remove **the** air cleaner element, remove the nuts (1 Fig 1) securing the torquatrol unit (2 Fig 1) to the water pump.
Remove the fan cowl securing clips (1 Fig 2), two off, and lift out the fan cowl and torquatrol unit complete.
Remove the bolts securing the fan to the torquatrol unit and separate the two.
Replace the torquatrol unit and reverse the assembly procedure to refit, ensuring that the two paint spots (balance **marks) are** lined up.

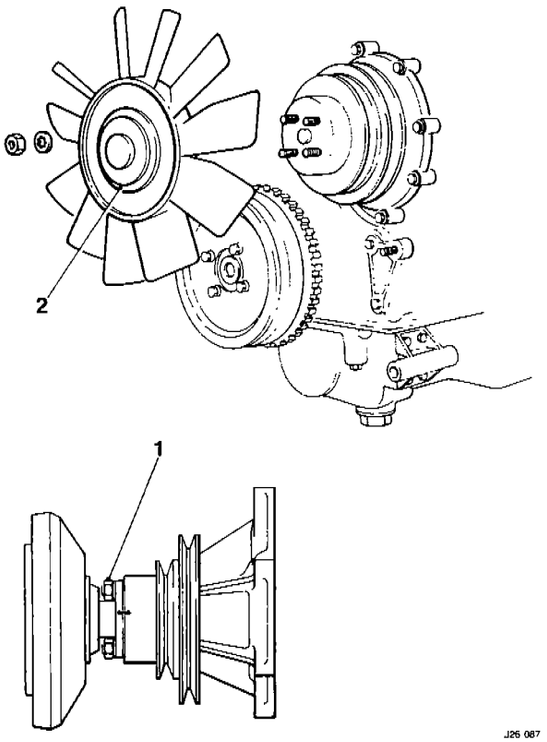


Fig 1

DATA

TORQUE FIGURES

*Fan to torquatrol unit **13.5Nm***
*Torquatrol unit to water pump pulley **23-27Nm***

SPANNER SIZES

13mm
1/2in AF

0178b

WATER PUMP

RENEW 26.50.01

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place **a** drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the nuts securing the torquatrol unit to the water pump.
Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete.

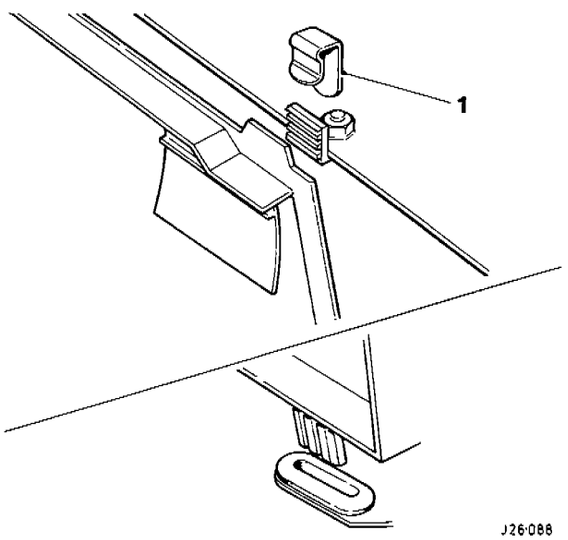


Fig 2

Slacken the alternator link arm:
Adjusting nut.
Pivot nut.
Trunnion bolt.
and pivot nut/bolt.
Pivot the alternator into the engine and remove the drive belt.
Remove the water pump to housing securing bolts (1 Fig 1), place a protective board against the radiator and remove the pump assembly (2 Fig 1).
Clean the gasket face.
Apply 'Hylosil 102' to the replacement water pump, fit and seat the pump taking care not to disturb the sealant.
Fit and tighten the securing bolts.
Remove the protective board from the radiator, refit the drive belt and retension.
Refit the fan cowl and torquatrol unit.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner.
Close the bonnet.

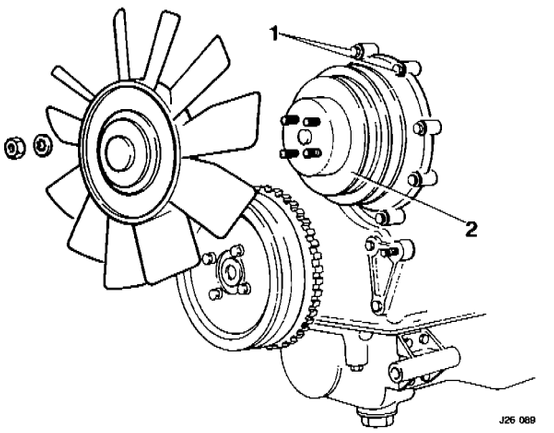


Fig 1

DATA

TORQUE FIGURES

Hose clip-water pump to rail 2.4Nm
Water pump to timing cover 23-27Nm
Water pump and timing cover to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Water pump to housing 'Hylosil 102'

SPANNER SIZES

6mm
8mm
10mm
13mm

9/16in AF

0210b

WATER PUMP GASKET

RENEW **26.50.02**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the nuts securing the torquatrol unit to the water pump.
Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete.

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Slacken the alternator link arm:
Adjusting nut.
Pivot nut.
Trunnion bolt.
and pivot nut/bolt.
Pivot the alternator into the engine and remove the drive belt.
Remove the water pump to housing securing bolts (1 Fig 1), place a protective board against the radiator and remove the pump assembly (2 Fig 1).
Clean the gasket face.
Apply 'Hylosil 102' to the replacement water pump, fit and seat the pump taking care not **to** disturb the sealant.
Fit and tighten the securing bolts.
Remove the protective board from the radiator, refit the drive belt and retension.
Refit the fan cowl and torquatrol unit.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

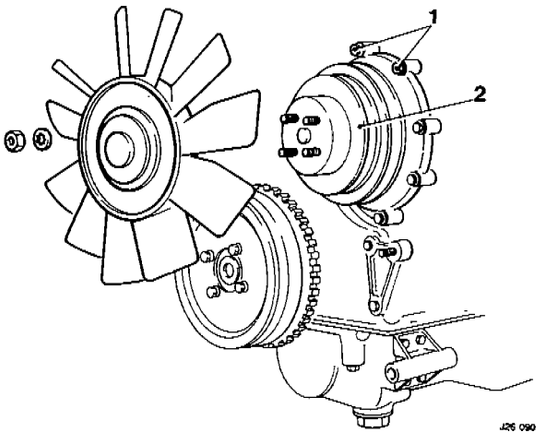


Fig 1

DATA

TORQUE FIGURES

Hose clip-water pump to rail ***2.4Nm***
Water pump to timing cover ***23-27Nm***
Water pump and timing cover to cylinder ***block 23-27Nm***

OILS/GREASES/SEALANTS

Water pump to housing 'Hylosil 102'

SPANNER SIZES

6mm
8mm
10mm
13mm

9/16in AF

0211b

WATER PUMP HOUSING

RENEW **26.50.07**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Remove the nuts securing the torquatrol unit to the water pump.

Remove the fan cowl securing clips, two off, and lift out the fan cowl and torquatrol unit complete.
Slacken the alternator link arm:
Adjusting nut.
Pivot nut.
Trunnion bolt.
and pivot nut/bolt.
Pivot the alternator into the engine and remove the drive belt.
Remove the water pump to housing securing bolts (1 Fig 1), place a protective board against the radiator and remove the pump assembly (2 Fig 1).
Clean the gasket face.
Apply 'Hylosil 102' to the replacement water pump, fit and seat the pump taking care not to disturb the sealant.
Fit and tighten the securing bolts.
Remove the protective board from the radiator, refit the drive belt and retension.
Refit the fan cowl and torquatrol unit.
Fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

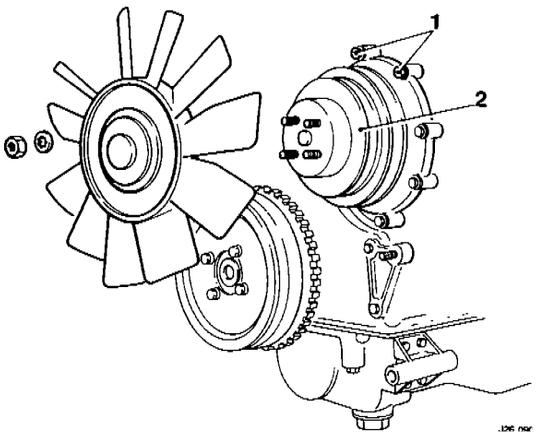


Fig 1

DATA

TORQUE FIGURES

Hose ***clip-water pump to rail 2.4Nm***
Water pump to timing cover 23-27Nm
Water pump and timing cover to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Water pump to housing 'Hylosil *102'*

SPANNER SIZES

6mm
8mm
10mm
13mm

9/16in ***AF***

0212b

RADIATOR BOTTOM HOSE

RENEW **26.30.07**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the radiator.

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Slacken the clip/s (1 **Fig** 1/2) securing the hose (2 Fig 1/2) to the water pump.
Remove the bottom hose assembly, remove the securing **clips.**
Replace the hose, **fit** the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the radiator and the water pump.

Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and **close** the bonnet.

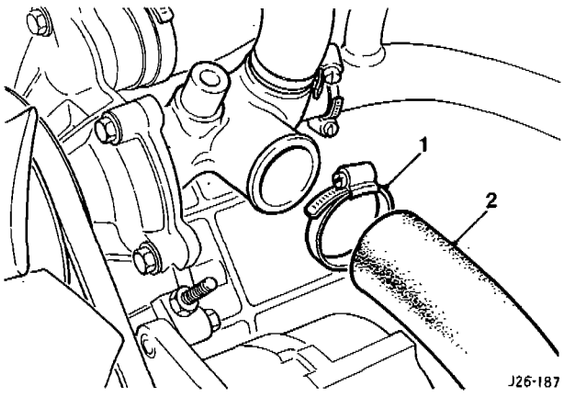


Fig 1

DATA

TORQUE FIGURES

Hose clip 3.8-4.3Nm

SPANNER SIZES

8mm

0180b

RADIATOR TOP HOSE

RENEW **26.30.01**

Open the bonnet and drain the coolant from the radiator.
Slacken the top hose securing clips (1 Fig 3) on either end of the pipe and remove the hose (2 Fig 3) assembly, remove the clips from the hose, replace the **hose,** fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the radiator **and** the thermostat housing.
Tighten the clips, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

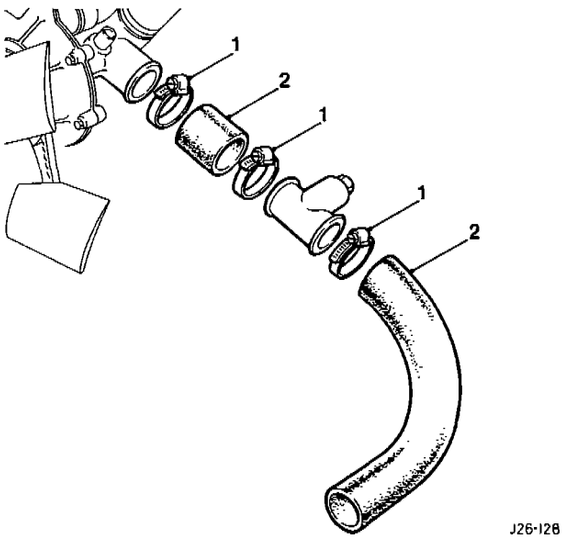


Fig 2

DATA

TORQUE FIGURES

Hose clip 3.8-4.3Nm

SPANNER SIZES

8mm

0179b

HOSE WATER PIPE TO WATER PUMP

RENEW **26.30.73**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.

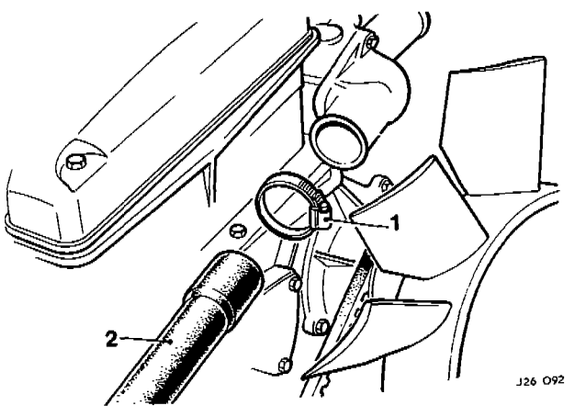


Fig 3

Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip (1 Fig 1) securing the hose to the water pump housing outlet.
Slacken the clip securing the hose to the engine water pipe.
Remove the hose assembly (2 **Fig** 1), remove the securing clips.
Slacken the clips securing the hose to the water pipe and the water pump.
Remove the hose assembly, remove the securing clips.
Replace the hoses, fit the clips **to** the replacement **hoses,** lubricate the inside of the hose ends with soap solution, and fit the hoses to the water pipe, water pump and thermostat housing.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

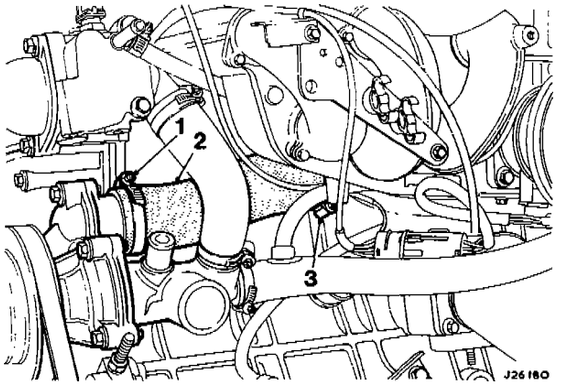


Fig **1**

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0191b

HOSE-CYLINDER HEAD TO HEATER VALVE

RENEW **26.30.39**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside **of** the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the hose to the water valve.
Slacken the clip (1 Fig 2) securing the hose (1 Fig 2) to the cylinder head.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the cylinder head and the water valve.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and close the bonnet.

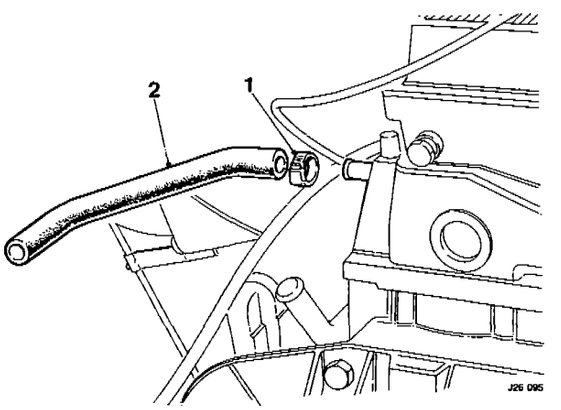


Fig 2

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DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0183b

HOSE-EXPANSION TANK TO RADIATOR

RENEW **26.30.54**

Open the bonnet.
Cut the ratchet strap securing the hose.

Slacken the clip securing the hose to the radiator.
Slacken the clip securing the hose to the expansion tank, remove the hose assembly and the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the radiator and the expansion tank.
Tighten the clips, position the expansion hoses together and secure with a suitable ratchet strap.
Remove the pressure cap, top up the cooling system with the correct water/anti-freeze solution, fit the pressure cap and close the bonnet.

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0188b

HOSE-EXPANSION TANK TO WATER PUMP

RENEW **26.30.72**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.

Slacken the clip securing the hose to the water pump.
Slacken the clip securing the hose to the expansion tank.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the expansion tank and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Hose clip ***2.5-3.5Nm***

SPANNER SIZES

6mm

0190b

HOSE - HEATER RETURN TO WATER PUMP/PART THROTTLE CONTROL HOUSING

RENEW **26.30.43**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clip securing the water valve hose to the heater.
Disconnect the hose from the heater for access.
Slacken the clip securing the heater return hose *to* the heater.
Slacken the clip (1 Fig 1) securing the heater return hose (2 Fig 1) to the water pump.
Slacken the clip (3 Fig 1) securing the hose to the **part** throttle control housing.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the heater pipe, the water pump and the part throttle control housing.
Tighten the clips, fit the drain plug to the radiator, ***top*** up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner and **close** the bonnet.

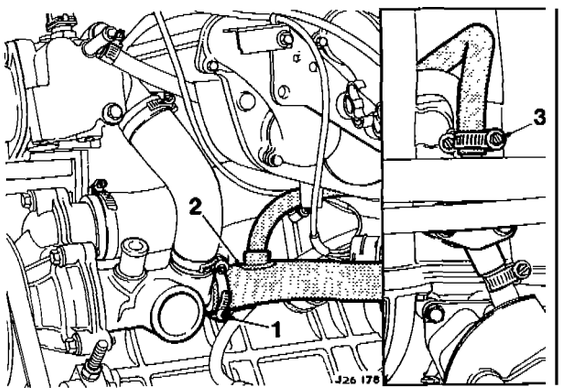


Fig 1

DATA

TORQUE FIGURES

Hose clip ***2.5-3.5Nm***

SPANNER SIZES

6mm

0186b

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HOSE - HEATER VALVE TO HEATER

RENEW **26.30.40**

Open the bonnet.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the pressure cap, remove the drain plug and allow the radiator to drain.
Disconnect the water vacuum hose.
Slacken the clip securing the hose (2 Fig 1) to the water valve (1 Fig 1).
Slacken the clip securing the hose to the heater.
Remove the hose (3 Fig 1) assembly, remove the securing clips.

Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the heater and the water valve.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap, reconnect the vacuum hose to the water valve and **close** the bonnet.

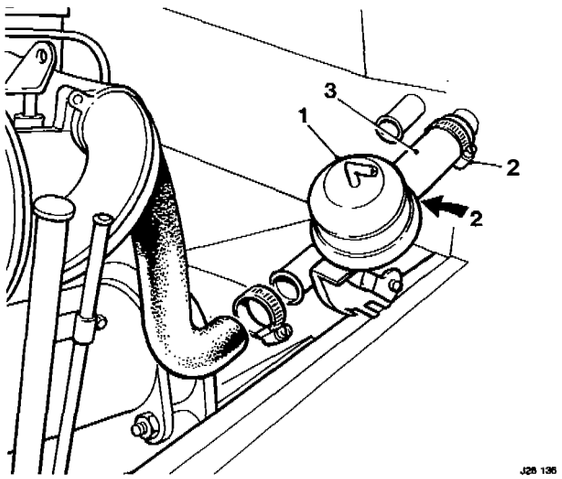


Fig 1

DATA

TORQUE FIGURES

*Hose **clip 2.5-3.5Nm***

SPANNER SIZES

6mm

0184b

HOSE - THERMOSTAT HOUSING TO EXPANSION TANK

RENEW **26.30.36**

Open the bonnet.
Cut the ratchet strap securing the hose.
Slacken the clip securing the hose to the thermostat housing.
Slacken the clip securing the hose to the expansion tank.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the expansion tank.
Tighten the ***clips,*** position the expansion hoses together and secure with a suitable ratchet strap.
Remove the pressure cap, top up the cooling system with the correct water/anti-freeze solution, fit the pressure cap and close the bonnet.

DATA

TORQUE FIGURES

Hose clip ***2.5-3.5Nm***

SPANNER SIZES

6mm

0182b

HOSE - THERMOSTAT HOUSING TO PART THROTTLE CONTROL HOUSING

RENEW **26.30.78**

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Slacken the clip securing the hose to the thermostat housing stub pipe, fit a suitable plug to the housing stub pipe.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside *of* the hose ends with soap solution, remove the plug **from** the thermostat housing stub pipe and fit the hose.
Tighten the clips, remove the pressure cap, top up the cooling system with the correct water/anti-freeze solution, refit the pressure cap and air cleaner, close the bonnet.

DATA

TORQUE FIGURES

Hose clip ***2.5-3.5Nm***

SPANNER SIZES

6mm

0194b

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HOSE - WATER PUMP TO THERMOSTAT HOUSING

RENEW 26.30.20

Open the bonnet.
Unclip the air cleaner cover and remove the cover/element assembly.
Place a drain tin in position below the radiator drain plug to the offside of the radiator.
Remove the radiator pressure cap, remove the drain plug and allow the radiator to drain.
Slacken the clips (1 Fig 1) securing the hose (2 Fig 1) to the thermostat housing and water pump.
Remove the hose assembly, remove the securing clips.
Replace the hose, fit the clips to the replacement hose, lubricate the inside of the hose ends with soap solution, and fit the hose to the thermostat housing and the water pump.
Tighten the clips, fit the drain plug to the radiator, top up the cooling system with the correct water/anti-*freeze* solution, refit the pressure cap and air cleaner, close the bonnet.

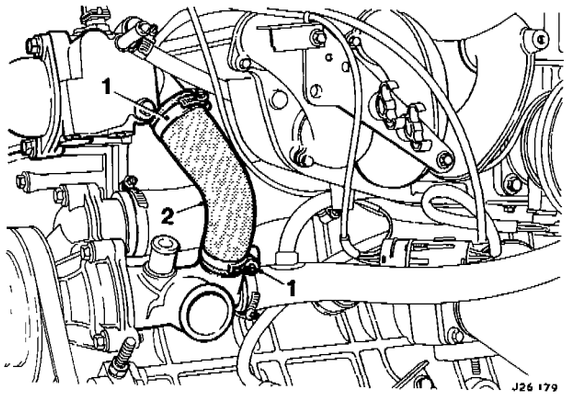


Fig 1

DATA

TORQUE FIGURES

Hose clip 2.5-3.5Nm

SPANNER SIZES

6mm

0181b

HOSE ENGINE SET

RENEW **26.30.41**

Drain the cooling system, slacken hose clips as required and carefully remove the hoses.
To ease assembly of the hoses to attachment points, a liberal application of soft soap **may** be applied to the inside of the hoses.
Position and tighten the seduring clips and refill the system with coolant.

DATA

TORQUE FIGURES

*Hose **clip** (Not **top** and bottom **radiator hoses)*** ***2.5-3.5Nm***
*Hose **clip** (Top and bottom **radiator hoses)*** ***3.8-4.3Nm***

SPANNER SIZES

6mm
8rnm

01**85b**

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3.2 litre **models** utilize the same cooling system as 4.0 litre models. The operation and components of the **system are** identical.

Refer to Section 26.2 for details of components, service procedures, requirements **and** operations.

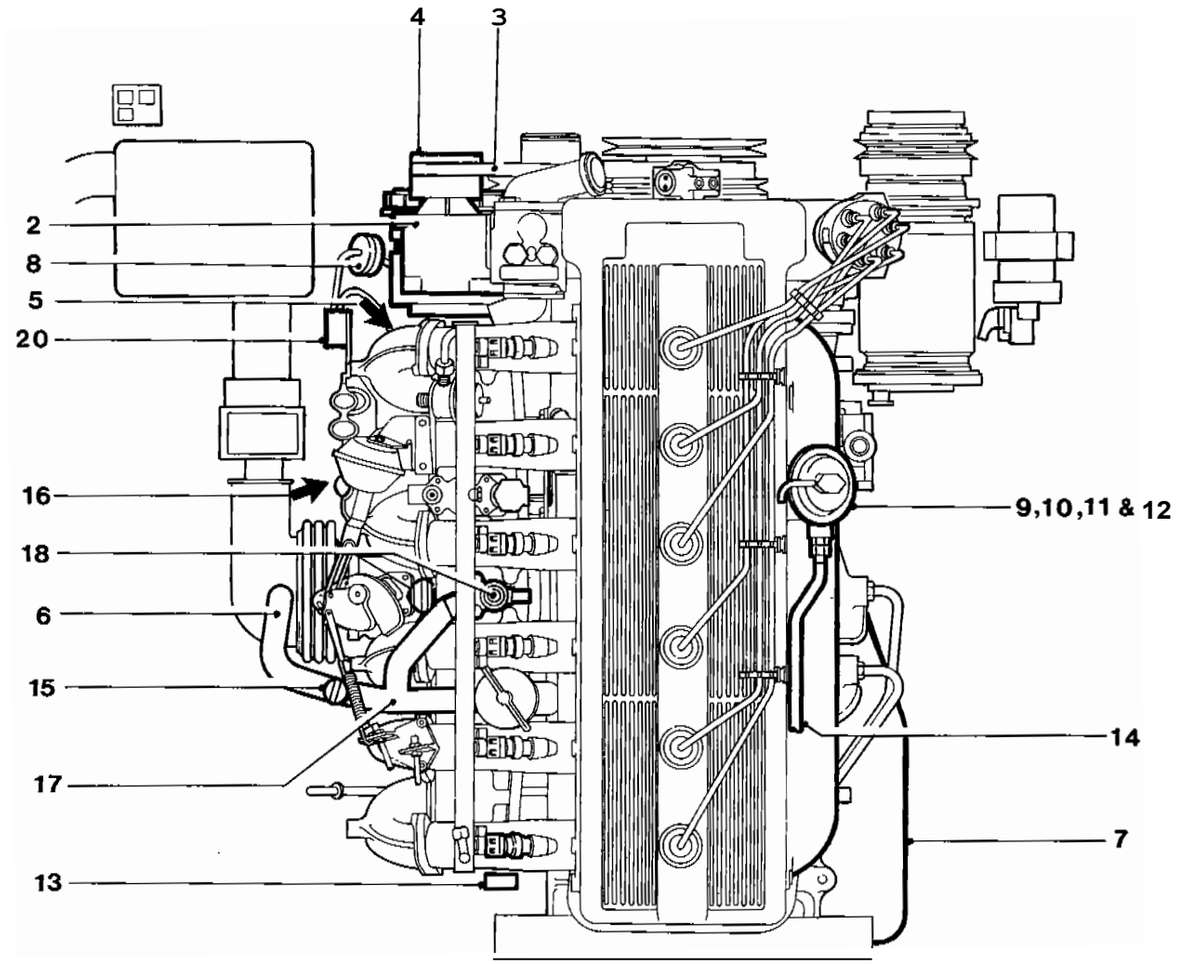
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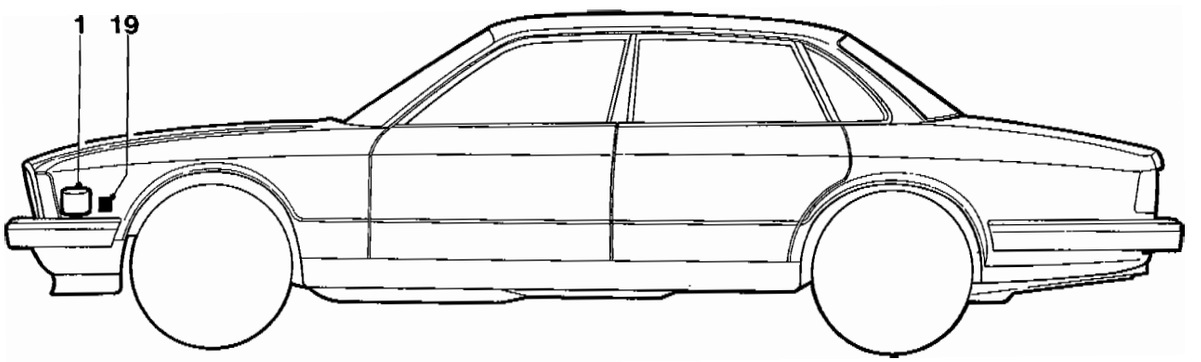
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FUEL & EVAPORATIVE EMISSION CONTROL SYSTEM

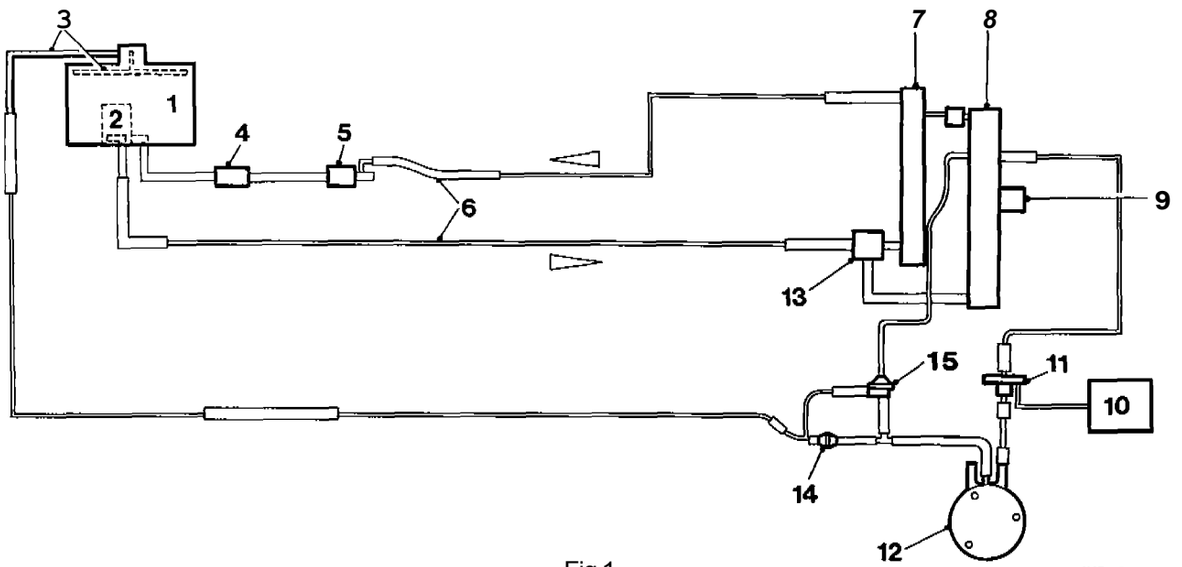


Fig 1

Key to Fig 1

1 Fuel tank
2 Swirl pot
3 Vapour pipes
4 Fuel pump
5 Fuel filter
6 Fuel pipes
7 Fuel rail
8 Inlet manifold
9 Throttle housing
10 ECU
11 Purge control valve
12 Charcoal canister
13 Fuel pressure regulator
14 Pressure/vacuum relief valve
15 Purge valve

EVAPORATIVE EMISSION CONTROL

DESCRIPTION *17.15.00*

In order to accommodate up to 10% fuel expansion, the maximum fuel level is limited by the inclusion of an expansion tank located within the fuel tank.
The fuel tank is vented through a system of vapour pipes and a liquid/vapour separator to a charcoal canister located in the engine compartment.
The flow of vapour to the cannister is controlled by a pressure/vacuum relief valve. The vapour absorbed in the cannister is purged by the engine via an electronic operated valve the operation of which is controlled by the ECU. The rate of purge flow is dependent upon engine speed, load and temperature.
Cannister purging does not occur until the engine coolant exeeds 43°C. This function is controlled by a thermal vacuum valve.

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CATALYTIC CONTROL

DESCRIPTION 17.50.00

Catalytic convertors are fitted into the exhaust system to reduce carbon monoxide and hydrocarbon emissions. On the 4.0 four ceramic monolith convertors are mounted in the exhaust system, one pair in the down pipe close to the engine and the second pair in an underbody location. On the 2.9 a single underfloor catalyst is used.
In order for the device to function correctly it is necessary to control very closely the oxygen concentration in the exhaust gas entering the catalyst. This is achieved by the engine management system which continuously monitors the oxygen content of the exhaust gas by means of an oxygen sensor and adjusts the fuelling level to obtain the required oxygen content.
Unleaded fuel must be used on catalyst equipped vehicles and labels are displayed to indicate this. The filler cap is designed to accommodate unleaded fuel pump nozzles only.

CRANKCASE CONTROL SYSTEM

DESCRIPTION 17.10.00

To ensure that piston blow by gasses do not escape from the engine crankcase, a depression is maintained in the crankcase under all operating conditions.
This is achieved by scavenging from the crankcase and the camshaft case via the oil sump filler tube.
The crankcase and cam shaft case emissions collected are then fed into the engine intake manifold through a part throttle control orifice and the engine air intake elbow.
To pevent possible icing up of the control orifice during cold weather the orifice is heated in a water heated housing and a breather heater element located in the hose connected from the oil filler tube and the air intake elbow.
The heater element is controlled by, via a relay, the power wash jet heater sensor.

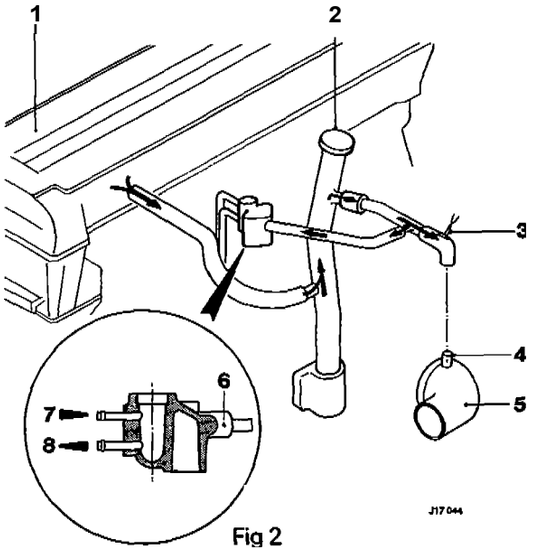


Fig 2

Key to Fig 2

1	Camshaft cover	5	Air intake elbow
2	Oil filler	6	Inlet
3	Heater element	7	From thermostat
4	Hose connection	8	To coolant hose

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AIR INJECTION SYSTEM

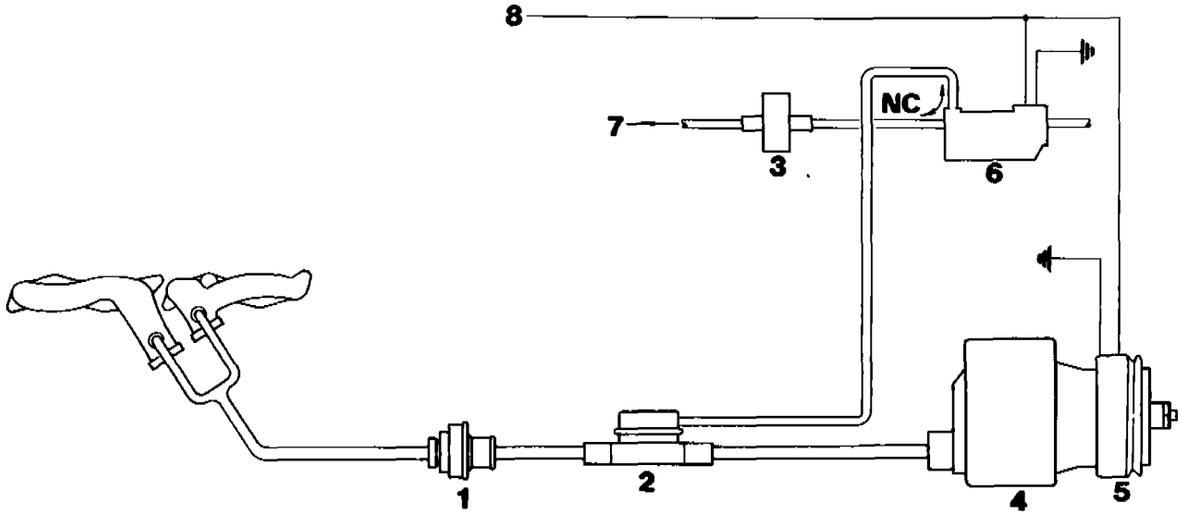


Fig 1 J17-040

Key to Fig 1
1 Non-return valve
2 Air switching valve
3 Vacuum delay valve
4 Air purnp
5 Magnetic clutch
6 Solenoid vacuum valve
7 Vacuum delay valve

AIR INJECTION SYSTEM

DESCRIPTION 17.25.00

To assist in the reduction of the high emissions of carbon monoxide and hydrocarbons encountered during the engine warm-up period, secondary air is delivered to the exhaust manifolds in order to aid oxidation.
The air is delivered by means of an engine driven pump (4 Fig 1). The air pump is a rotary vane positive displacement device, belt driven from the engine crankshaft. The air pump is driven via an electrically operated clutch (5 Fig 1), which, is controlled by the engine management system such that when the engine coolant temperature (35°C) and/or the engine speed (2500 rev/min) have been exceeded enables the pump drive to be disengaged.

To prevent back flow of exhaust gas damaging the pump a check valve (1 Fig 1) and a vacuum operated switching valve (2 Fig 1) are located in the air delivery line.
The operating vacuum to the vacuum switching valve is switched by a solenoid operated valve (6 Fig 1) simultaneously with the air pump clutch. A vacuum delay valve (3 Fig 1) in the vacuum supply line prevents loss of vacuum to the switching valve during wide open throttle operation of the engine.

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EXHAUST GAS RECIRCULATION (EGR) SYSTEM

DESCRIPTION 17.45.00

During combustion, certain trace elements, i.e. oxygen and nitrogen, are emitted via the exhaust into the atmosphere.
If the temperature in the combustion chamber rises above a certain level, the elements combine to form 'oxides of nitrogen'.

The Exhaust Gas Recirculation (EGR) System controls the output of oxides of nitrogen by reducing the temperature in the combustion chamber.
This is achieved by feeding an'inert gas, i.e. exhaust gas, into the combustion chamber and effectively reducing the volume of mixture to be burnt, thus lowering the temperature in the chamber.

The system is controlled by the ECU which receives information from various sensors – coolant temperature, load/back pressure, engine speed, etc.
The ECU energizes a solenoid which opens and closes the EGR valve.
The EGR valve controls the flow of exhaust gases between the exhaust and inlet manifolds. Flow through the valve is proportional to back pressure in the exhaust, which is itself proportional to engine load.

Key to Fig 1
1 Exhaust manifold
2 EGR valve
3 ECU
4 Solenoid (vented)
5 EGR adaptor and temperature sensor
6 Inlet manifold

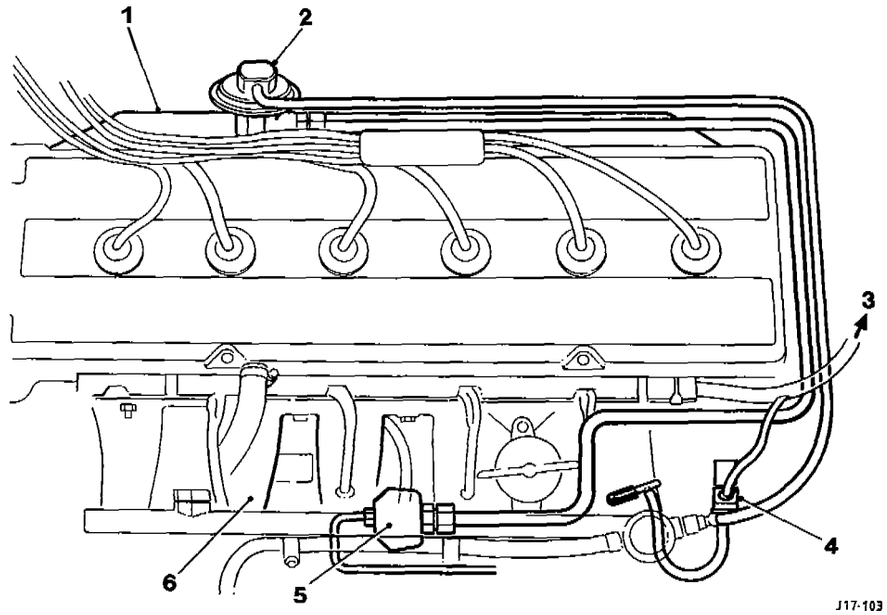


Fig 1

FAULT DIAGNOSIS

There are three instances when the **ECU** will flag a 'Check Engine' warning.

1 Temperature too high in the EGR system. The ECU will shut down the system and flag the fault.
2 EGR system not operating in correct speed/load range. The ECU will flag the fault.
3 EGR system operating at too low temperature. **ECU** will shut down the system and flag the fault.
4 NOTE: The 'Check Engine' fault codes applicable to the **EGR** system are **37** and 39. Fault code 37 looks for ECU output. Fault code 39 looks at system operation, i.e. flowing/not flowing when it should be.

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FAULT DIAGNOSIS (CONTINUED)

Rough Idle Check:

1 Ensure that the engine is at normal operating temperature, drive is selected, and the handbrake is applied.

2 Remove the vacuum pipe from the EGR valve.

3 Raise the engine speed to 1100 rev/min.

4 Feel for vacuum effect at the pipe.

5 If the vacuum works BELOW 1100 rev/min, then the solenoid pipes have been fitted the wrong way round.

EGR Valve Diaphragm Check:

NOTE: A split or porous diaphragm is the usual cause of EGR valve failure.

1 Remove the vacuum pipe from the EGR valve.

2 From underneath the valve, push up and hold the diaphragm in position. Block off the vacuum pipe outlet. Release the diaphragm, it should remain where it is. If it doesn't, air is escaping through the diaphragm. Renew the EGR valve.

PART THROTTLE ORIFICE CONTROL HOUSING

RENEW **17.10.12**

CAUTION: THIS OPERATION MUST ONLY BE CARRIED OUT ON A COLD OR COOL ENGINE.

Open the bonnet.
Carefully remove and refit the pressure cap from the remote header tank to release coolant system pressure.

Slacken the housing to breather pipe hose clip (1 Fig 1) and disconnect breather hose from the housing.
Remove the bolts securing the housing (2 Fig 1) and displace the housing above engine level for access.
Remove and discard the housing gasket.
Slacken the hose clips and disconnect the hoses from the housing.
Position the hoses above engine level to prevent spillage.
Remove the housing (3 Fig 1) and clean the housing and gasket faces.

Fitting a new housing is the reversal of the removal procedure ensuring the coolant is topped up to the correct level.

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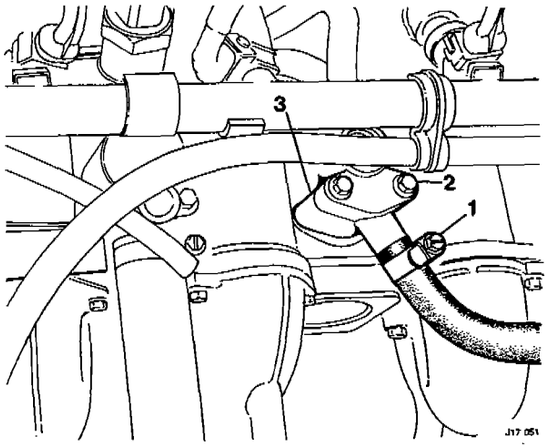


Fig 1

ENGINE BREATHER HEATER ELEMENT

RENEW **17.10.13**

Open the bonnet and disconnect the heater element cable harness block connector.
Slacken the breather hose to element securing clip and disconnect the hose from the element.
Slacken the intake elbow to heater element securing clip.
Disconnect the hose and remove the heater element (Fig 2).

Fitting a new element is the reversal of the removal procedure.

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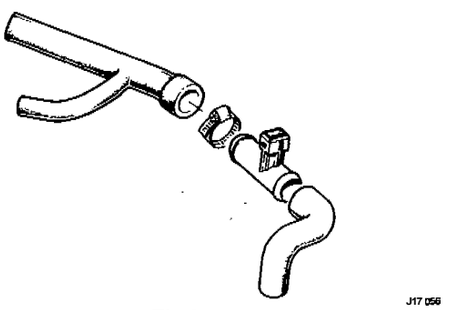


Fig 2

BREATHER HEATER ELEMENT TO INTAKE ELBOW HOSE

RENEW **17.10.14**

Open the bonnet.
Slacken the clip securing the hose to the breather element and disconnect the hose from the element.
Slacken the clip securing the hose to the intake elbow and remove the hose from the elbow.
Remove the clips from the hose.

Fitting a new hose is the reversal of the removal procedure.

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OIL FILLER TO HEATER ELEMENT HOSE

RENEW **17.10.15**

Open the bonnet.
Slacken the clip securing the hose to the oil filler tube and disconnect the tube from the tube.
Slacken the clip securing the hose to the part throttle control orifice housing and disconnect the hose from the housing.
Slacken the clip securing the hose to the heater element.
Disconnect and remove the hose from the element.
Remove the clips from the hose.

Fitting a new hose is the reversal of the removal procedure

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ADSORPTION CANISTER

RENEW **17.15.13**

Jack up and place the front of the vehicle on stands.
Open the car door and turn the steering wheel clock wise for access to canister cover securing screws located under the front left hand wheel arch.
Remove the screws securing the canister cover and remove the cover.
Remove the bolts securing the canister.
Disconnect the hoses from the canister.
Remove the canister (Fig 1).

Fitting a new canister is the reversal of the removal procedure.

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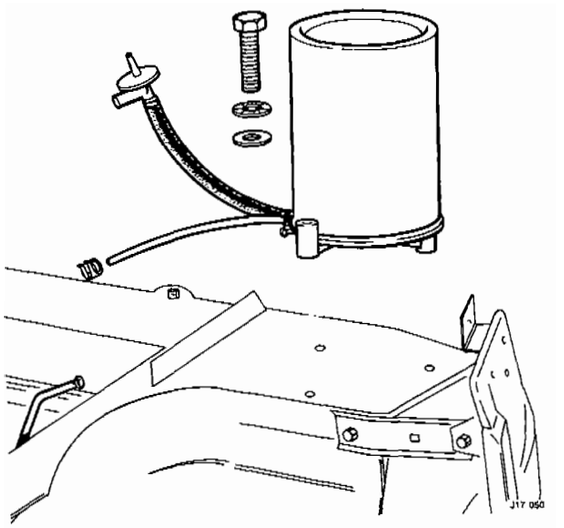


Fig 1

PURGE CONTROL VALVE

RENEW **17.15.30**

Open the bonnet.
Remove the air cleaner element.
Disconnect the vacuum hose from the purge valve.
Disconnect the manifold hose from the valve.
Disconnect and remove the valve from the cannister hose (Fig 2).

Fitting a new valve **is** the reversal of the removal procedure

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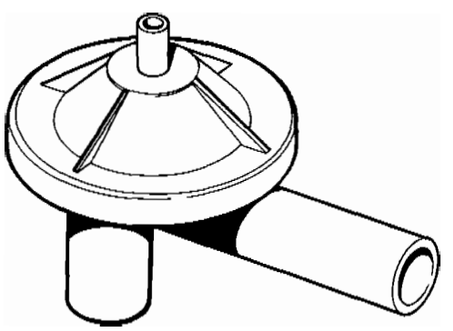


fig 2

AIR PUMP

RENEW **17.25.07**

Open the bonnet and disconnect the battery earth lead.
Disconnect the air pump cable harness block connector.
Slacken the clip securing the inlet hose and disconnect the hose from the pump (1 Fig 1).
Slacken the clip securing the outlet hose and disconnect the hose from the pump (2 Fig 1).
Undo the link arm adjuster nut (3 Fig 1).
Undo but do not remove the link arm trunnion bolt (4 Fig 1).
Slacken the link arm pivot bolt (5 Fig 1).
Undo but do not remove the air pump pivot nut/bolt (6 Fig 1).
Pivot the pump towards the engine.
Remove the drive belt from the air pump pulley (7 Fig 1).
Remove the link arm trunnion bolt and reposition the link arm.
Remove the pump pivot nut/bolt.
Remove the front spacer and the rear cone.
Remove the pump assembly.
Remove the nut securing the clutch pulley (8 Fig 1).
Remove the clutch plate (9 Fig 1), remove the pulley retaining clip and remove the pulley/bearing assembly.
Remove the clutch housing retaining circlip and remove the housing.
Clean the mating faces.

Fitting a new pump is the reversal of the removal procedure.

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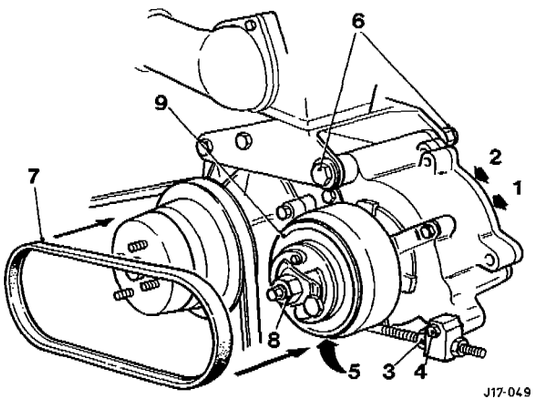


Fig 1

AIR PUMP CLUTCH

RENEW **17.25.08**

Open the bonnet and disconnect the battery earth lead.
Undo the link arm adjuster nut.
Undo but do not remove the link arm trunnion bolt.
Slacken the link arm pivot bolt.
Undo but do not remove the air pump pivot nut/bolt.
Pivot the pump towards the engine.
Remove the drive belt from the air pump pulley.
By retaining the air pump shaft, slacken off and remove the clutch plate securing nut, and remove the plate.
Remove the pulley retaining circlip and withdraw the pulley.
Disconnect the clutch coil multi plug.
Remove the clutch coil housing retaining circlip and withdraw the housing.

Fitting a new pump clutch is the reversal of the removal procedure

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AIR PUMP DRIVE BELT

ADJUST 17.25.13

Open the bonnet.
Slacken the link arm trunnion bolt.
Slacken the link arm pivot bolt.
Slacken the air pump pivot bolt.
Slacken the link arm adjuster locknut.
Adjust the link arm adjusting to obtain the correct belt tension.
A load of 2.9 kgf (6.4 lbf) must give the belt a deflection of 5.6 mm (0.22 in) when applied on the longest stretch of the belt.
Tighten the link arm adjuster locknut.
Tighten the remaining air pump securing nuts/bolts.

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AIR PUMP DRIVE BELT

RENEW 17.25.15

Open the bonnet.
Slacken the link arm adjusting nut.
Slacken the link arm trunnion nut.
Slacken the link arm pivot bolt.
Slacken the air pump pivot bolt.
Pivot the air pump towards the engine.
Remove the nuts securing the torquatrol unit to water pump pulley.
Turn the pulley for access to the nuts.
Reposition the fan/torquatrol unit from the pulley.
Displace and remove the air pump drive belt.

Fitting a new drive belt is the reversal of the removal procedure
Adjust the link arm adjusting to obtain the correct belt tension.
A load of 2.9 kgf (6.4 lbf) must give the belt a deflection of 5.6 mm (0.22 in) when applied on the longest stretch of the belt.

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NON RETURN VALVE

RENEW 17.25.21

Open the bonnet.
Remove the air pump 17.25.07 page 11.
Slacken the clip securing the hose to the non return valve and disconnect the hose from the valve.
Undo and remove the non return valve.

Fitting a new non return valve is the reversal of the removal procedure

0195G

AIR SWITCHING VALVE

RENEW **17.25.38**

Open the bonnet.
Disconnect the vacuum hose from the switching valve.
Slacken the hose to valve securing clips.
Disconnect the air pump to valve hose.
Remove the air switching valve.

Fitting a new switching valve is the reversal of the removal procedure

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DELAY VALVE

RENEW **17.25.39**

Open the bonnet
Disconnect the vacuum hose from the valve.
Note the direction of the valve.
Remove the valve (Fig 1).

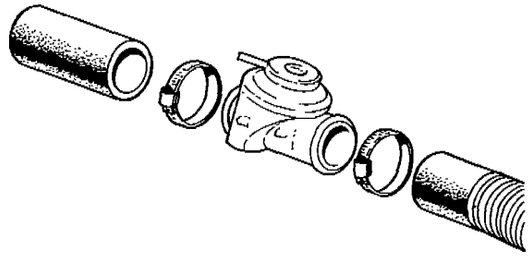


Fig 1

Fitting a new delay valve is the reversal of the removal procedure

0195G

SOLENOID VACUUM VALVE

RENEW **17.25.47**

Open the bonnet.
Note and disconnect the vacuum hoses.
Disconnect the solenoid vacuum valve cable harness block connector.
Remove the screw (2 Fig 2) securing the valve and remove the valve (3 Fig 2).

Fitting a new solenoid vacuum valve is the reversal of the removal procedure

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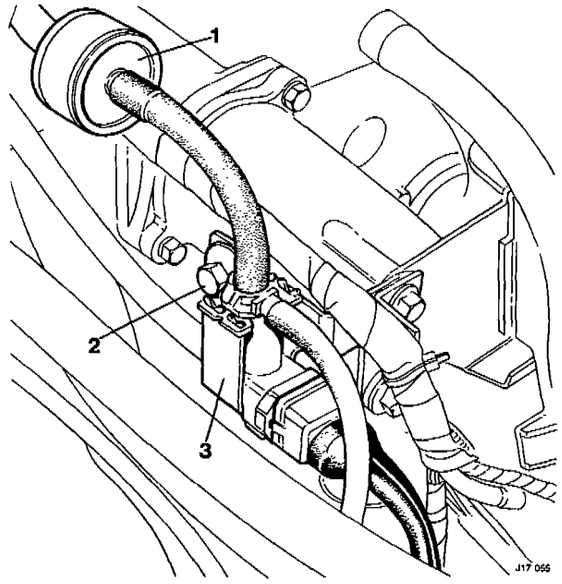


Fig 2

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EXHAUST GAS RECIRCULATION VALVE

RENEW **17.45.01**

Open the bonnet.
Disconnect the vacuum hose **(1 Fig** 1) from the E.G.R valve stub **pipe,** remove the nuts (2 Fig 1) securing the E.G.R valve, remove the valve.
Discard the **gasket.**
Fit a new gasket, fit and align the E.G.R valve fit and tighten the securing nuts.
Reconnect the vacuum pipe.
Close the bonnet.

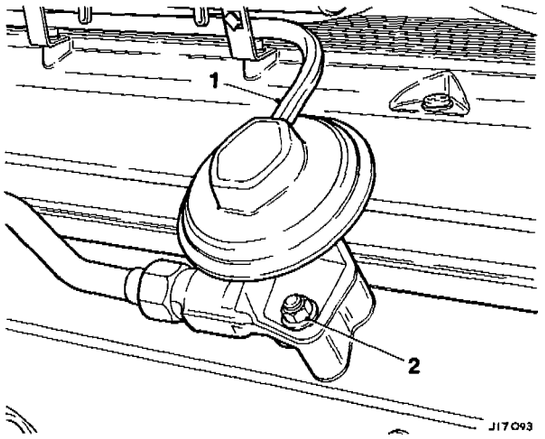


Fig 1

DATA

TORQUE FIGURES

E.G.R. valve ***to*** *housing* ***23-27Nm***

SPANNER SIZES

13mm

0195G

EXHAUST GAS RECIRCULATION VALVE GASKET

RENEW **17.45.02**

Open the bonnet.
Disconnect the vacuum hose **(1 Fig 1)** from the E.G.R valve stub pipe, remove the nuts (2 Fig 1) securing the E.G.R valve, remove the valve.
Discard **the** gasket.
Clean the mating faces.
Fit a new gasket, fit and align the E.G.R valve fit and tighten the securing nuts.
Reconnect the vacuum **pipe.**
Close the bonnet.

DATA

TORQUE FIGURES

E.G.R. valve to housing 23-27Nm

SPANNER SIZES

13mm

0195G

EXHAUST GAS RECIRCULATION VALVE HOUSING

RENEW **17.45.03**

Slacken the E.G.R valve housing union nut.
Disconnect the vacuum hose (1 Fig 1) from the E.G.R valve stub pipe, remove the nuts (2 Fig 1) securing the E.G.R valve, remove the valve.
Discard the gasket.
Remove the E.G.R valve housing and discard the gasket.
Remove the transfer pipe union gland and discard the housing.
Reverse the removal procedure to refit the replacement housing.

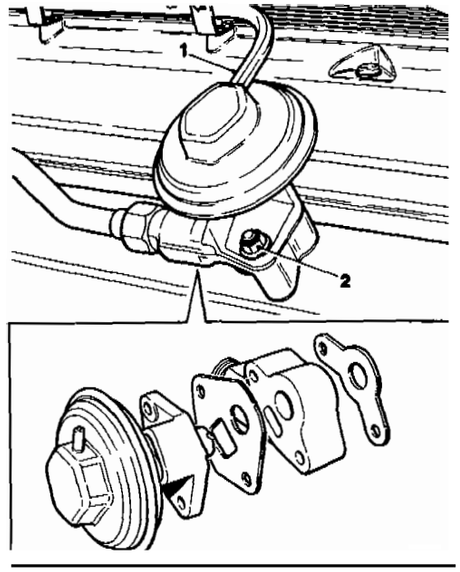


Fig 1

DATA

TORQUE FIGURES

E.G.R. valve to housing 23-27 Nm
Union gland to housing 38-42 Nm
Transfer pipe to gland 38-42 Nm

SPANNER SIZES

13mm
25mm

0195G

E.G.R. VALVE HOUSING HEAT SHIELD TO MANIFOLD GASKET

RENEW **17.45.05**

Raise the vehicle and support on two stands.
From below slacken the E.G.R. valve transfer pipe to inlet manifold housing securing nut and reposition the pipe from the housing.
From within the engine bay slacken the transfer pipe to E.G.R. valve housing union nut.
Reposition the transfer pipe onto the cam cover for access to the exhaust manifold heat shield.
Slacken and remove the nuts securing the E.G.R valve, remove the valve from the studs and the E.G.R. valve to housing gasket.
Remove the housing and discard the gasket.
Remove the heat shield securing bolts and remove the heat shield.
Remove and discard the heat shield to manifold E.G.R. valve gasket.
Reverse the removal procedure to replace the gasket.

DATA

TORQUE FIGURES

E.G.R valve heat shield to manifold 23-27 Nm
E.G.R. valve to housing 23-27 Nm
Transfer pipe to union gland 38-42 Nm
Union gland to housing 38-42 Nm

SPANNER SIZES

13mm
25mm

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E.G.R. VACUUM SOLENOID VALVE

RENEW **17.45.06**

Open the bonnet.
Disconnect the solenoid valve switch harness multi plug.
Disconnect the vacuum hoses from the solenoid valve and remove the bolt (1 Fig 1) securing the valve to the manifold.
Remove the valve.
Reverse the removal procedure to refit the replacement valve.

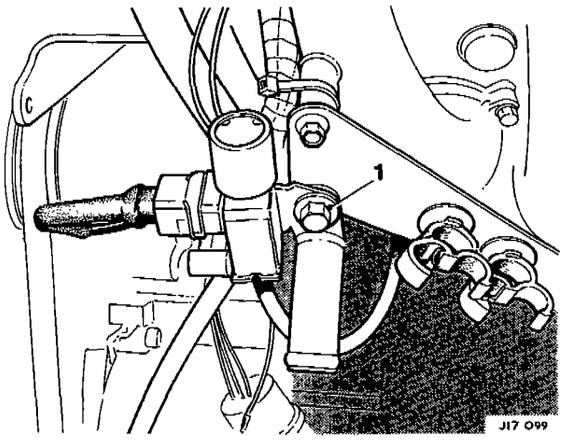


Fig 1

DATA

TORQUE FIGURES

E.G.R vacuum solenoid valve to manifold 16-22Nm

SPANNER SIZES

10mm

0195G

E.G.R. TRANSFER PIPE

RENEW **17.45.11**

Open the bonnet.
Disconnect nos 3,4,5&6 spark plug leads, remove the rear plug lead bracket securing bolt and remove the bracket.
Slacken the union nut securing the transfer pipe to the E.G.R. housing union nut.
Remove the bolt securing the starter motor harness mounting bracket to the to the inlet manifold.
Disconnect the E.G.R. control solenoid mulit plug.
Release the ratchet strap securing the injection harness to the manifold channel.
Raise the front of the vehicle and place on stands.
From below disconnect the Lambda sensor harness multi plugs.
Cut the ratchet straps securing the harness to the gearbox oil cooler pipes and remove the starter solenoid terminal nut.
Slacken the transfer pipe to manifold union nut.
Jack up the rear of the engine to gain access to and reposition the starter motor and the Lambda sensor harnesses from the rear of the engine.
Carefully remove the transfer pipe (1 Fig 2).
Reverse the removal procedure to refit the **replacement** transfer pipe.

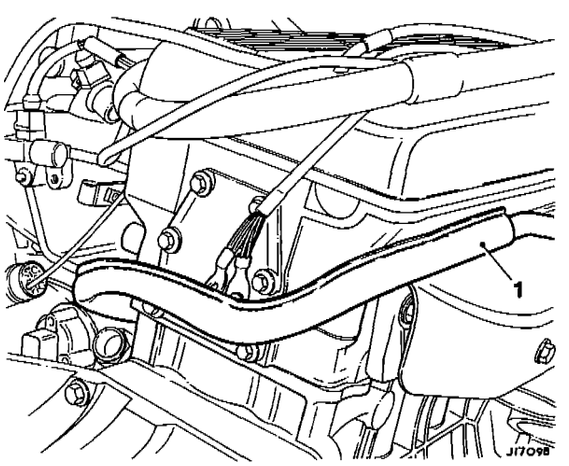


Fig 2

DATA

TORQUE FIGURES

Transfer pipe to union gland 38-42 Nm

SPANNER SIZES

25mm

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CATALYTIC CONVERTOR

RENEW **17.50.01**

Open the bonnet.
Remove the oxygen sensor 18.50.01
Raise the vehicle on a ramp.
Remove the strap to catalyst securing nut/bolt.
Slacken the bolt securing the strap to the bell housing.
Reposition the strap.
Remove the nut and bolt securing the catalyst to the intermediate pipe.
Displace the clamp rearwards.
Disconnect the exhaust system from the catalyst.
Remove the nuts securing the catalyst to the manifold.
Remove the catalyst assembly.
Remove and discard the sealing rings.
Remove the sealing olive from the intermediate pipe.
Clean all of the sealing faces and the olives.
Fitting a new catalyst assembly and sealing rings is the reversal of the removal procedure.

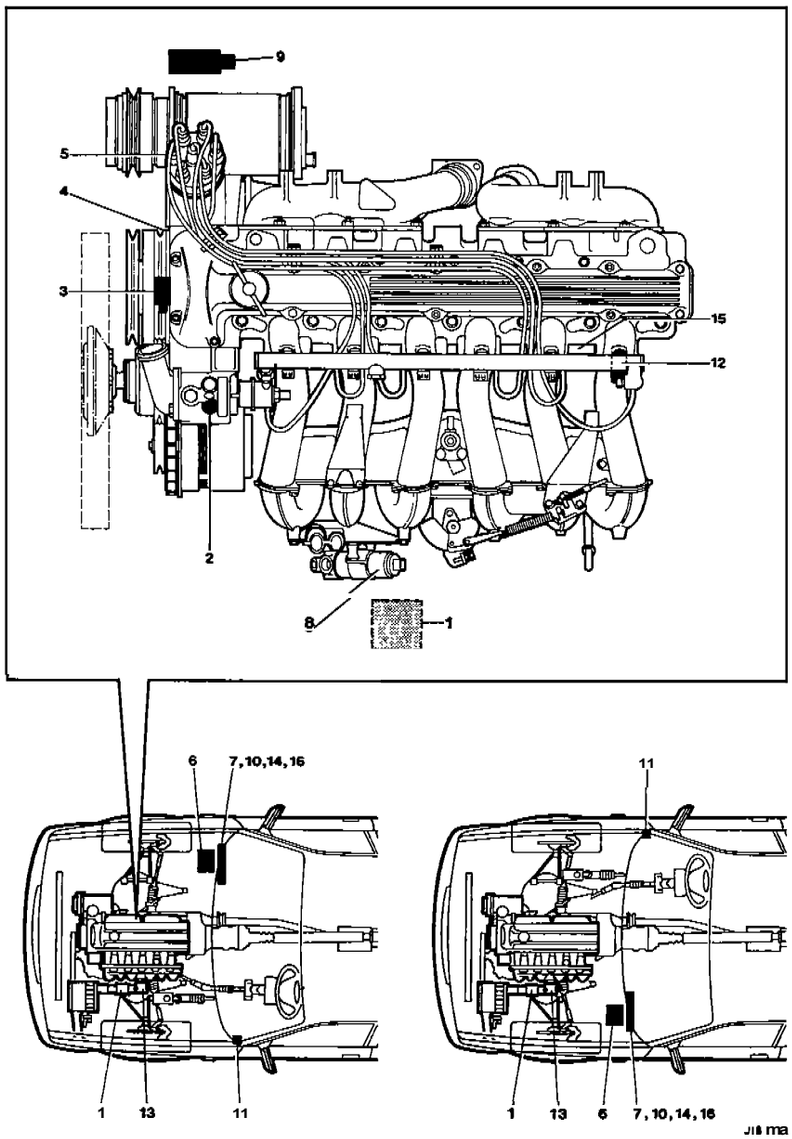
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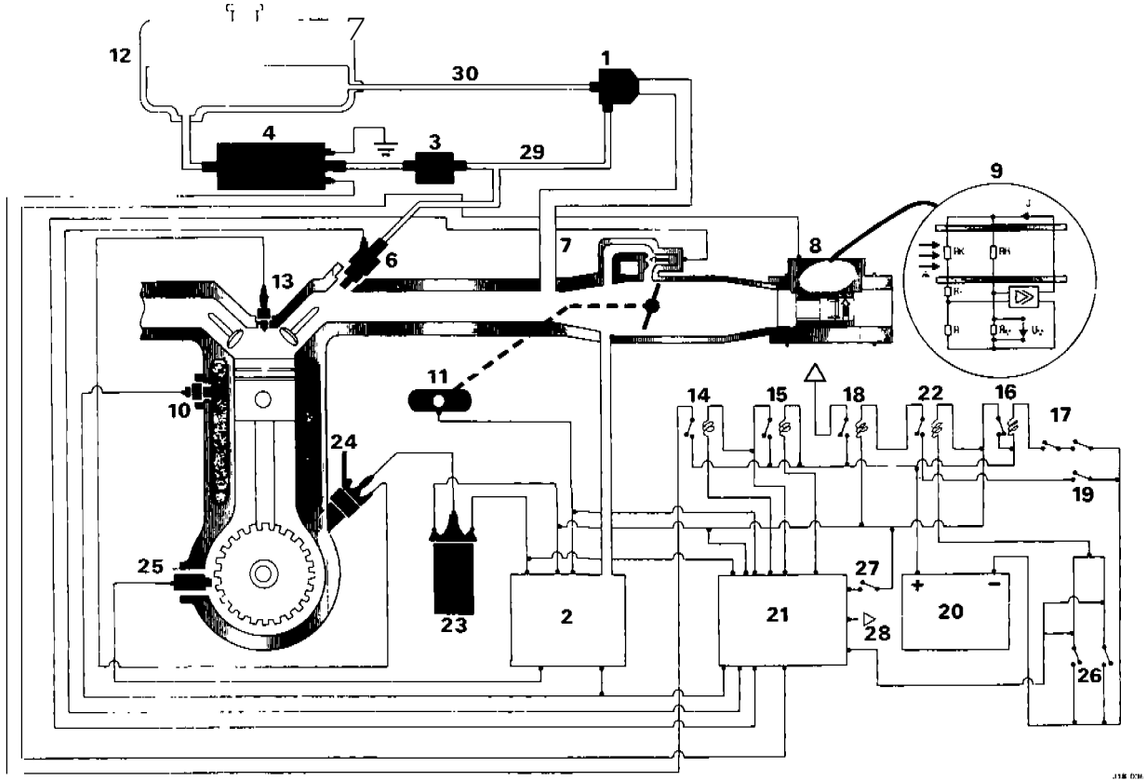
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ENGINE MANAGEMENT

INTRODUCTION

18.00.00



Key to diagram

1 Pressure regulator
2 Injection ECU
3 Filter
4 Pump
5 Lambda sensor
6 Injector
7 Idle speed actuator
8 **Air** flowmeter
9 Hot wire sensing device
10 Coolant temperature sensor
11 Throttle switch
12 Fuel tank
13 Spark plug
14 Fuel pump relay
15 Main relay
16 Ignition 'on' relay
17 Inertia switch
18 Start **relay**
19 Start switch
20 Battery
21 Ignition ECU
22 **Start** inhibit relay
23 Ignition coil
24 HT distributor
25 Crankshaft sensor
26 Gearbox sensor
27 Air conditioning clutch sensor
28 **To** VCM
29 Fuel rail
30 Fuel return

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COMPONENT LOCATION DETAILS

COMPONENT	LOCATION	FIXING
Air flowmeter	Air filter outlet	Retaining clips
Battery	Battery tray	Bolt
Coolant temperature sensor	Thermostat housing	Body union
Crankshaft sensor	Timing cover	Allen screw
Crankshaft toothed gear	Crankshaft pulley	Bolts
Distributor	Engine RH front	Bolt
ECU	Passenger footwell	Screws
Fuel Filter	Underside rear footwell LH	Nuts and bolts
Fuel pump	Underside rear footwell LH	Nuts and bolts
Fuel pump relay	Passenger footwell	Securing tab
Fuel rail	Inlet manifold	Bolts
Ignition coil	Engine RH front	Bolts
Ignition 'on' relay	Passenger footwell	Securing tab
Inertia switch	Driver footwell	Screws
Injectors	Inlet manifold	Retaining clips
Lambda sensor	Exhaust downpipe	Body union
Main relay	Passenger footwell	Securing tab
Pressure regulator	Fuel rail	Union nuts
Start relay	Passenger footwell	Securing tab
Start switch	Column switch assembly	
Throttle switch	Underside inlet manifold	Bolts

CABLE COLOUR CODES

N - Brown	B - Black	W - White	K - Pink	G - Green
R - Red	Y - Yellow	O - Orange	S - Slate	U - Blue

L in front of any of the above code letters denotes a 'light' colour.

The Bosch engine management system maintains optimum engine performance over its entire operating range by metering the fuel into each cylinders' inlet tract, and adjusting the ignition timing angle at the sparking plugs. These functions are performed by two Electronic Control Units (ECUs) which, from data received from sensors located on and around the engine, evaluate optimum ignition timing and fuel metering parameters relative to engine load and speed. Functions of the system are as follows:

FUEL PUMP CONTROL

To prevent fuel flooding and/or spillage when the engine is stationary with the ignition switch set to ON.

COLD START CONTROL

To ensure that there is sufficient fuel in the inlet manifold to create a combustible air/fuel mixture in the combustion chamber.

IDLE SPEED CONTROL

To Compensate for varying engine temperature and loads, e.g. the engaging or disengaging of the air Conditioning clutch.

FUEL CUT-OFF

During engine overrun conditions to improve fuel economy by minimising the quantity of unburnt fuel dicharged into the exhaust system.

ENGINE OVERSPEED CONTROL

To impose a maximum engine speed limit of 6250 rev/min.

AIR POLLUTION CONTROL

To reduce exhaust contamination levels to those which comply with different country exhaust regulations.

FUEL MONITORING

To provide precise fuelling information to the trip computer

'LIMP HOME' FEATURE

The system also incorporates a 'limp home' feature which permits continued engine operation on certain sensor failure, the sensor failure being indicated on the instrument pack. .

FUEL METERING

Fuel is delivered to solenoid operated injectors, via a variable pressure regulator, by an electrically driven pump operating at a virtual constant pressure. Actual injector pressure, however, fluctuates between 36-45 lbf/in2 depending on the absolute manifold pressure acting on the regulator at the time. The quantity of fuel injected for a given duration of 'injector on' (open) time is thus maintained constant, irrespective of the back pressure on the injector nozzles, and accurate fuel metering is achieved.

Injector operation is by means of an electrical pulse which actuates a solenoid valve within the injector body. The duration of the pulse, and hence the quantity of fuel injected, is determined by the injection **ECU** on a basis of intake air (engine load) and engine speed information. This information is used to access mapped data stored in 256 memory locations containing basic injector pulse durations pertaining to 16 engine loads at **16** different speeds.

Correction factors are imposed on the basic injector pulses to compensate for varying conditions. The resultant pulses are then normally applied to the injectors twice per engine cycle, i.e. once per crankshaft revolution, with only half the amount of fuel being injected at each 'injector on' time.

Injector pulse adjustments are necessary to provide:

Cranking enrichment during starting.
Temperature enrichment during starting and warm-up.
Demand corrections during idle, full power and acceleration.
Voltage corrections for variations in the electrical system voltage.
Contamination corrections for exhaust emission control.

CRANKING ENRICHMENT

Cranking enrichment is provided, irrespective of temperature conditions, when the injection **ECU** receives the first ignition timing signal generated by the ignition ECU. Enrichment is achieved by increasing the injector operating frequency from one pulse to three pulses per crankshaft revolution and is maintained up to an engine speed of approximately 500 rev/min.

TEMPERATURE ENRICHMENT

Temperature enrichment is provided during starting and warm-up. This is achieved by increasing the injector 'on' time above that of basic requirements and is implemented in response to an input from a coolant temperature sensor.

DEMAND CORRECTIONS

Corrections are provided for full power demands. This is achieved by increasing the injector 'on' time above that of basic reqirements and is implemented in response to an input from a throttle switch.

VOLTAGE CORRECTIONS

Corrections for the electrical system voltage, i.e. the state of the battery and electrical load, are provided because the time taken for an injector to open is affected by voltage and results in a corresponding change in the quantity of fuel delivered.

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CONTAMINATION CORRECTIONS

On certain vehicles exhaust pollution is reduced to levels which comply with Legislation. This is achieved by adjusting the injector 'on' time in response to a Lambda sensor which monitors the oxygen content of the gases emitted through the exhaust system. Further contamination control measures retard the ignition timing during cold starting, retarding being achieved by the action of a temperature switched vacuum advance timer operating on a solenoid valve installed in a vacuum feed to the ignition ECU.

IGNITION TIMING

Ignition pulses are applied to the ignition coil which generates high energy pulses for the sparking plugs via the distributor. Unlike conventional ignition systems, the distributor has no centrifugal or vacuum advance mechanisms; however, centrifugal weights are fitted to ensure that the rotor is aligned with the correct pole at the moment an ignition pulse is generated.

Ignition timing is controlled by the ignition ECU from engine load and speed information supplied by a crankshaft sensor and an integral pressure sensor connected, via a solenoid valve (if fitted) and capillary tube, to the inlet manifold, This information is used to access mapped data stored in 240 memory locations containing ignition timing angles pertaining to 15 engine loads at 16 different speeds.

Depending upon the monitored engine speed and supply voltage, the dwell-period (dwell angle) is determined and the ignition energy is adapted to that required at any instant in time. Unnecessary energy consumption in the ignition coil is thus prevented. In addition, a peak coil current cut-off facility also prevents current flowing through the ignition coil below a specific engine speed and, therefore, prevents the battery being discharged and the ignition coil overheating.

ENGINE MANAGEMENT

DESCRIPTION 18.00.00

Each ECU contains a microprocessor and discreet electronic component circuits that provide interfacing to peripheral input/output devices. The processors perform either ignition or injection control and have non-volatile memories pre-loaded with system parameters that are accessed under software control. System response times are, therefore, reduced to a minimum and the system is rendered operational immediately the ignition switch is set to ON. System perhipherals, some of which are ECU shared, are as follows:

FUEL INJECTORS

Solenoid actuated devices which spray metered quantities of fuel into the inlet ports.

AIR FLOWMETER

A hot wire sensing device which monitors inlet manifold air flow for optimum fuelling control.

IDLE SPEED ACTUATOR

A motor driven device which controls the volume of air entering the engine to provide idle, cold start and warm-up speed control.

CRANKSHAFT SENSOR

A device which generates engine speed and crankshaft position information for precise ignition timing control.

THROTTLE SWITCH

A device which interprets throttle position to identify idle and full power demands. The switch is mechanically coupled to the throttle butterfly spindle and provides a reference voltage to the ECUs dependent on throttle position. As the throttle is opened, demand enrichment circuits are triggered which cause the engine to accelerate.

GEARBOX SENSOR (MANUAL TRANSMISSION)

A gear selector actuated switch which inhibits fuel cut-off at the injectors during overrun conditions in first and second gears.

FUEL PUMP RELAY

A device which implements controlled fuel pump switching.

COOLANT TEMPERATURE SENSOR

A device which monitors the coolant temperature to induce cold starting and warm-up fuel enrichment.

LAMBDA SENSOR

A device which monitors the oxygen content of the exhaust to induce contamination corrections on vehicles exported to specified countries.

AIR CONDITIONING SENSOR

An air conditioning compressor clutch actuated switch that induces idle speed corrections which compensate for engine load changes that occur when the clutch is engaged **or** disengaged. The sensor provides trigger information to the **ECU** when the air conditioning clutch is engaged or disengaged.

IDLE MIXTURE POTENTIOMETER

A device which provides fine adjustment of engine idle fuel. The device is set during vehicle manufacture and only requires adjustment when the air flowmeter assembly, of which **it** forms an integral part, is renewed.

SOLENOID VALVE

A device which reduces the vacuum fed to the ignition ECU under the control of a vacuum advance timer.

VACUUM ADVANCE TIMER

A device triggered by a temperature switch to actuate the solenoid valve for a period of **15** minutes after **a** cold start.

TEMPERATURE SWITCH

A device which triggers the vacuum advance timer at a coolant temperature below 45oC.

Other system devices and communications are as follows:

IGNITION 'ON' SENSING

An input taken from contact 87 of the ignition 'on' relay which connects battery power to the ignition coil and both the main and fuel pump relays.

BATTERY VOLTAGE SENSING

An input taken from contact 87 of the main relay which, in addition to applying power to the air flowmeter and the fuel pump relay, induces fuelling corrections that compensate for battery voltage fluctuations.

IGNITION SENSING

A signal taken from the ignition ECU which, in addition to generating high energy electical pulses for distribution to the sparking plugs, provides precise ignition timing information for the injection ECU.

VCM

An output applied to the instrumentation system to provide precise fuelling information for the **trip** computer.

IGNITION ON

Power is applied to the various devices through contacts Bl4-87/30 of the main relay which is ene'rgised, via contacts B17-87/30 of the ignition 'on' relay, when the vehicle ignition switch is set to ON, i.e. when O Volts is applied to B17-85 of the ignition on relay. Application of power to the ECUs at Bl3-18 and Bl2-25 generates system resets which cause the microprocessors to perform initialization routines (sofware programmes stored in memory) and condition input circuits for sensor scanning.

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IGNITION ON (CONTINUED)

On completion of the initialization routines, sensor scanning commences and analogue information from the sensors is converted into digital data for storage. The data thus stored is then evaluated to determine prevailing engine conditions and memory locations are accessed to obtain appropriate ignition timing and fuel metering parameters. In addition, the following functions are performed.

The motor of the idle speed actuator is driven, via BI3-10 and B13-23, to set the valve at a position suitable for engine starting. Rapid valve positioning is achieved for all cranking conditions by applying a 100 Hz squarewave to the motor drive circuit, the symetry of the squarewave being such that the valve is driven either open or closed.
The solenoid valve (if fitted) in the vacuum feed to the ignition ECU is actuated, via the vacuum advance timer and temperature switch, at a coolant temperature below 45°C.

ENGINE CRANKING

Fuel pump operation is instated when the engine is cranked provided that the injection ECU detects ignition pulses at BI3-1. In addition, fuel is injected into the air flow of the inlet manifold by the injectors which are actuated by pulses output from the injection ECU at BI3-13. Injector triggering occurs three times per crankshaft revolution with appropriate correction factors imposed.

ENGINE RUNNING

When the engine starts, cranking enrichment is terminated, i.e. injector pulses occur once per crankshaft revolution, at approximately 500 rev/min and warm-up enrichment is gradually reduced by the injection ECU. In addition, the engine idle speed is controlled by the injection ECU which varies the symetry of the squarewave applied to the idle speed actuator to maintain cold and hot idle speeds of 920 rev/min and 650 rev/min respectively. Compensation is also provided for engine load fluctuations attributed to the air conditioning clutch input at BI3-15.

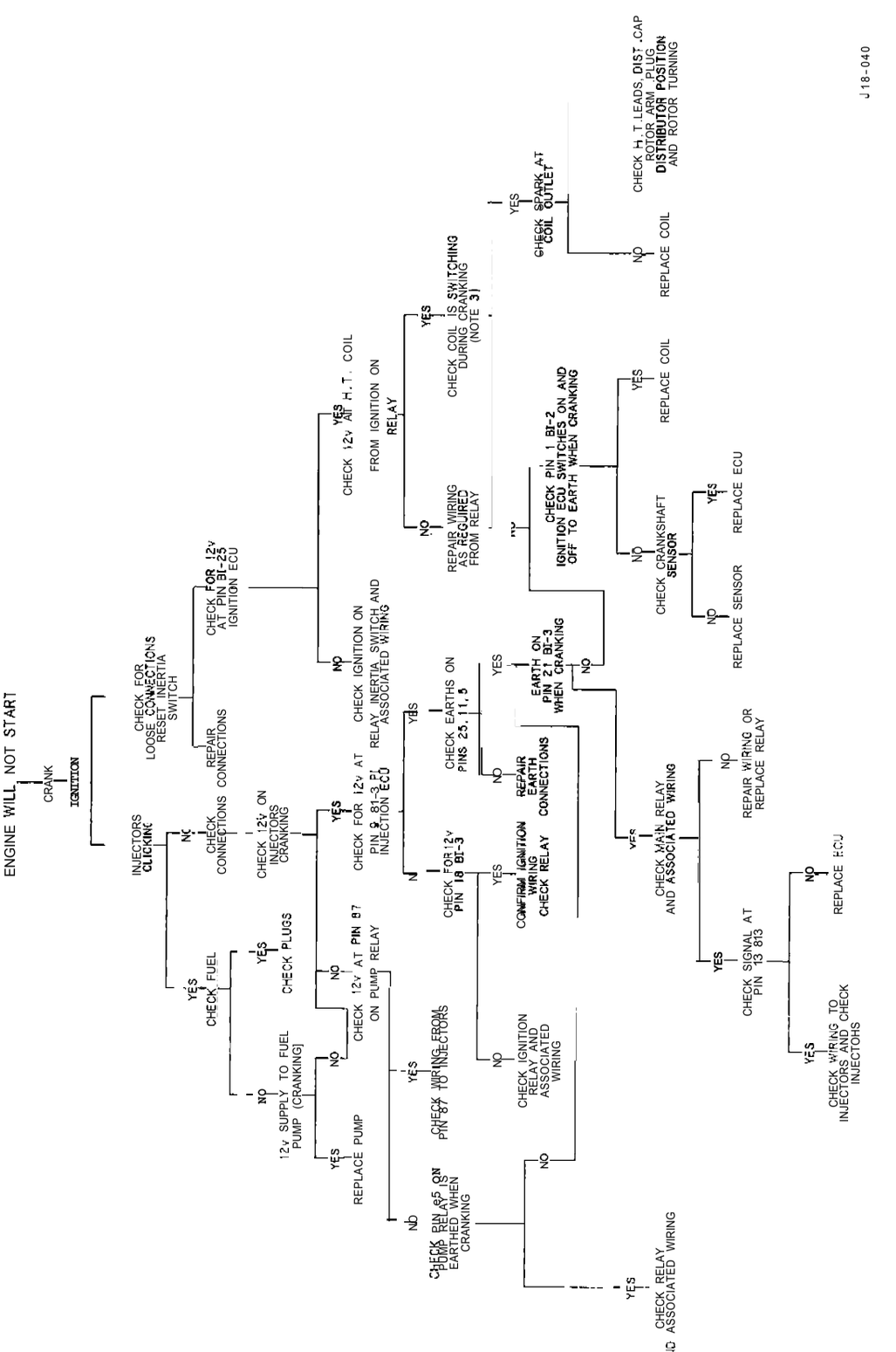
Fuel and ignition requirements are calculated at each sensor scanning to maintain optimum engine efficiency over its entire range, including full power demands.

Exhaust emission control is implemented by the Lambda sensor (if fitted) which monitors the oxygen content of the exhaust system and provides a corresponding signal to the injection ECU at B13-20. This signal imposes corrections on the basic injector 'on' times to reduce exhaust emissions to a minimum. Power to a heater of the Lambda sensor is supplied from contact BI5-87 *of* the fuel pump relay. Exhaust emission control is, therefore, only operational during periods that fuel pump operation is permitted.

ENGINE MANAGEMENT

FAULT TREE

18.00.00



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INJECTORS

RENEW 18.10.01

Each fuel injector (Fig 1) contains a needle valve rigidly attached to the plunger of a solenoid which, when energised by an electrical pulse, moves the needle away from its seat against a helical pressure spring. This action permits a metered quantity of pressurised fuel to enter the inlet manifold, via an integral filter and nozzle, each time an injector pulse is applied.
Valve lift is approximately 0.15mm (0.006in.) for the fully open position which is reached in a response time of approximately 1 millisecond. The amount of fuel delivered is dependent only on the period of time the injector is open, the precise open time being determined by the ECU and is typically 2.7 milliseconds at engine idle speed.

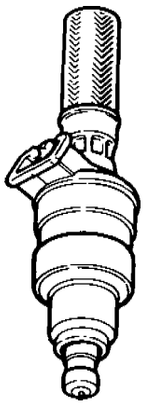


Fig 1

Remove the screws securing the passenger dash liner and remove the liner.
Remove the relay from the fuel pump relay connector (yellow).
Open the drivers door and crank the engine for 10 seconds to depressurise the fuel system,
Close the drivers door, refit the relay and dash liner.
Open the bonnet.
Note the position and disconnect the injector connectors.
Remove the fuel rail securing bolts and release the fuel feed hose union nut (Fig 2).
Disconnect the fuel feed hose.
Fit protective plugs to the fuel rail and hose.
Release the fuel rail to pressure regulator union nut.
Disconnect the fuel rail from the induction manifold and pressure regulator.
Place the fuel rail on a work bench.
Remove the injector retaining clip and withdraw the injector from the fuel rail.
Clean the fuel rail aperture and remove the injector protective caps.
Insert the new injector into the fuel rail aperture and fit the injector retaining clip.
Fit the fuel rail assembly to the induction manifold ensuring that the injectors are fully seated.
Connect the fuel rail to the pressure regulator and tighten the union nut.
Remove the protective caps from the fuel rail and hose.
Connect the fuel hose to the rail and tighten the union nut.
Fit the injector connectors to the injectors as noted.
Close the bonnet.

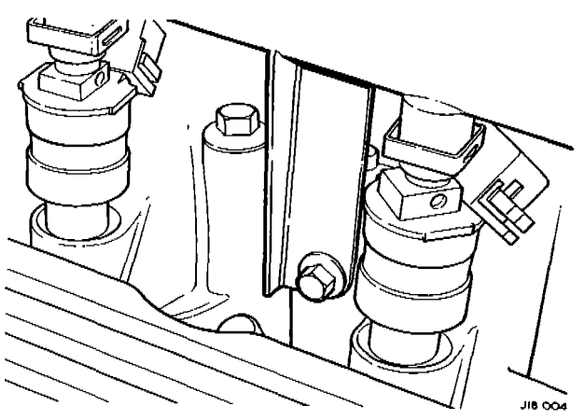


Fig 2

DATA

TORQUE FIGURES

Injector ***rail to manifold 9.5-12.5Nm***
Injector *union* ***nut 12.5-15Nm***
Guide bracket to manifold 6-7Nm

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SPARK PLUGS

RENEW 18.20.02

Open the bonnet.
Disconnect the plug leads from the spark plugs.
Ensure the engine is clean around the plugs then release and remove the plugs using a suitable spark plug spanner.
With the plugs removed ensure the plug apertures are clean.

Set the electrode gap to 0.025in. (0.64mm).
Fit the new plugs to the engine and tighten to the correct torque (see **DATA).**
Connect the plug leads to the spark **plugs.**
Close the bonnet.

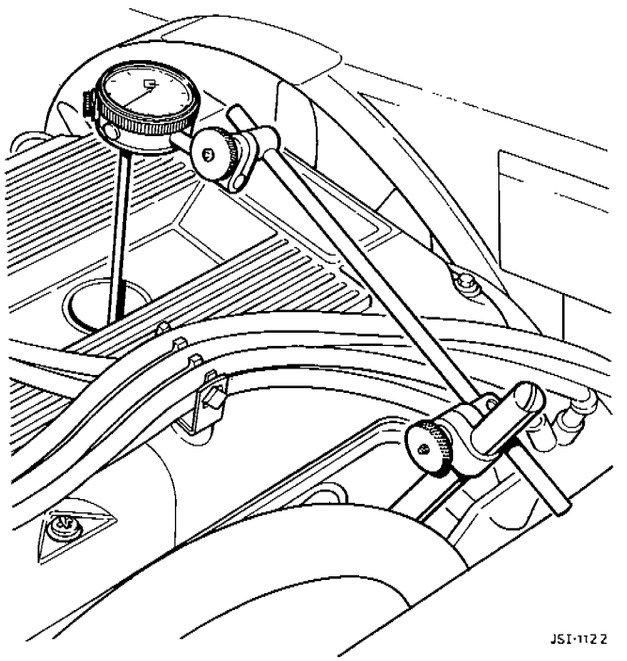


Fig 1

DATA

SERVICE TOOLS

***Torque** wrench*

TORQUE FIGURES

*Spark-plugs **23-27Nm***

0199G

DISTRIBUTOR

RENEW 18.20.20

Open the bonnet.
Remove the nuts securing the air cleaner to the inner wing valance.
Release the clips securing the air cleaner to the air flowmeter and remove the air cleaner for access to the engine TDC. indicator.
Release the distributor cap retaining clips and reposition the cap.
Jack up and place the vehicle on two stands.

Using a suitable dial gauge (Fig 1), set the engine to TDC. on number one cylinder.
Remove the distributor clamp bolt.
NOTE THE POSITION OF THE **ROTOR ARM** and remove the distributor.
Note the position of the plug leads in the distributor cap and disconnect the leads from the cap.

Examine the cap, leads, rotor arm and carbon brush for excessive wear and damage. Renew parts as necessary.
Ensure that number one cylinder is set at TDC firing stroke.
Fit the distributor into the timing cover with the rotor arm positioned as shown in **Fig** 2.
Slacken off the clamp bolt (1 Fig 2) and if necessary reset the position of the fixing plate *so* that the screw (2 Fig 2) **is** in the centre of the kidney slot.

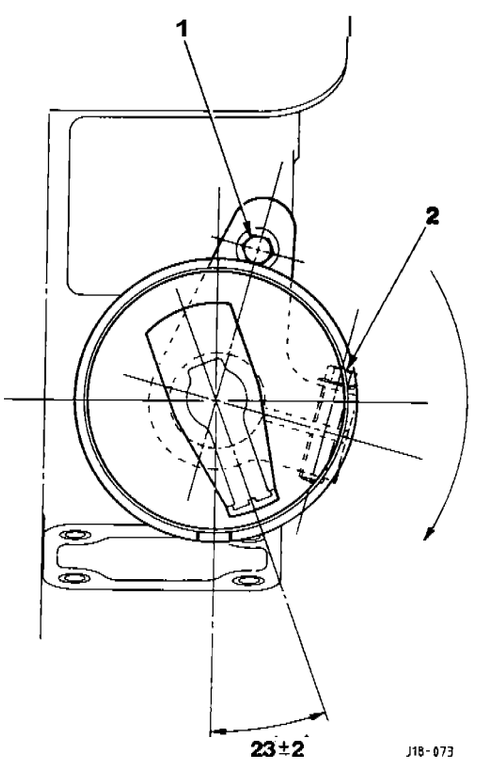


Fig 2

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Tighten the screw.
The keyway cutout should be at the 6 o'clock position.
The centre of the rotor arm should be 23° before the centre line of the distributor cap retaining slot.
This is achieved as follows:

1 Measure back from the distributor cap retaining slot in an anti-clockwise direction 12mm and scribe a line on the distributor body (Fig 1).

2 Mark (using a pencil NOT a scribe) the centre of the rotor arm (A Fig 1).

3 Using a straight edge (1 Fig 2), align the mark on the rotor arm (2 Fig 2) with the mark on the distributor body (3 Fig 2). This may require slight rotation of the distributor body.

4 Tighten the clamp bolt and fixing plate screw, ensure that the setting is not disturbed.

5 Re-check the alignment, re-adjust as necessary.

fit the distributor cap to the distributor and engage the retaining clips.
Fit the air cleaner to the air flowmeter and engage the securing clips.
Secure the air cleaner to the inner wing valance and tighten the securing nuts.
Close the bonnet.

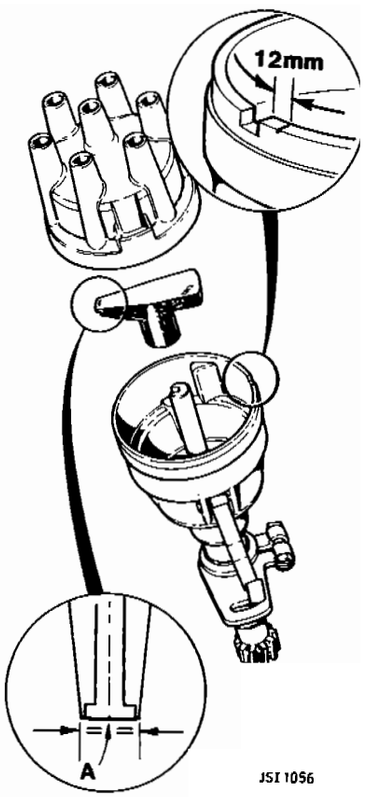


Fig 1

DATA

TORQUE FIGURES

Fixing plate screw ***9.5-12.5Nm***
Distributor clamp screw ***9.5-12.5Nm***

SPANNER SIZES

11mm
13mm

0199G

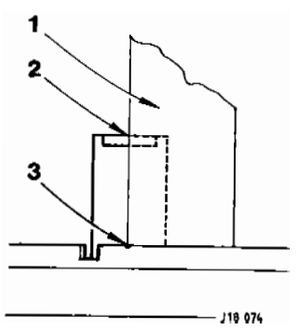


Fig 2

IGNITION COIL

RENEW **18.20.32**

The ignition coil (Fig 1) is a Bosch type TC1 and is secured to the right-hand inner wing valance.

Open the bonnet and disconnect the battery earth lead.
Displace the LT terminal rubber protective covers and disconnect the LT terminal connections from the coil.
Remove the coil retaining bracket inner and outer securing bolts.
Displace the suppression capacitor, disconnect the HT lead and remove the coil assembly.
Remove the bracket from the coil and discard the coil.

Fitting a new coil is the reversal of the removal procedure.

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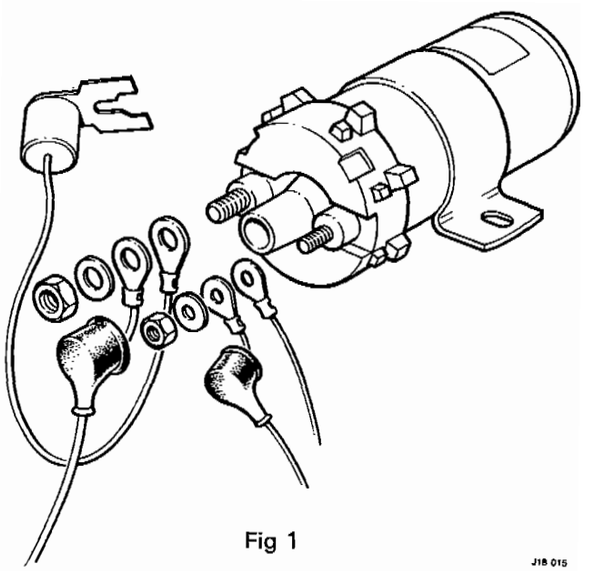


Fig 1

ELECTRONIC CONTROL UNIT

RENEW **18.30.02**

Note: This operation applies to both ignition and injection ECUs.

Open the bonnet and disconnect the battery earth lead.
Remove the passenger side dash liner.
Remove the four securing bolts and displace the ECU (Ignition ECU - 1 fig 2; Injection ECU - 2 Fig 2).
Disconnect the vacuum pipe (Ignition ECU only).
Disconnect the multi-pin cable connector and remove the ECU.

Fitting a new ECU is the reversal of the removal procedure ensuring the cable connection are secure and tight.

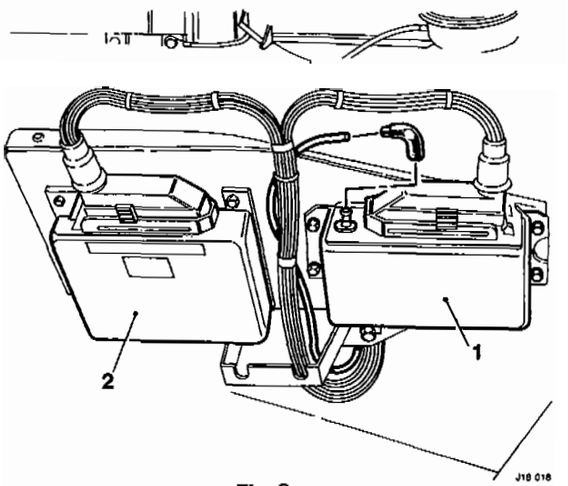


Fig 2

COOLANT TEMPERATURE SENSOR

RENEW **18.30.10**

The coolant temperature sensor (Fig 3) is located at the rear of the thermostat housing and comprises a temperature-sensitive resistor having a negative temperature coefficient, i.e. its electrical resistance decreases conversely with increasing temperature. The sensor provides a temperature parameter to the ECU which triggers temperature enrichment circuits that increase the injector 'on' time during cold starting and warm-up. The coolant temperature sensor, idle speed control valve and supplementary air valve combination form the equivalent to a carburettor automatic choke.

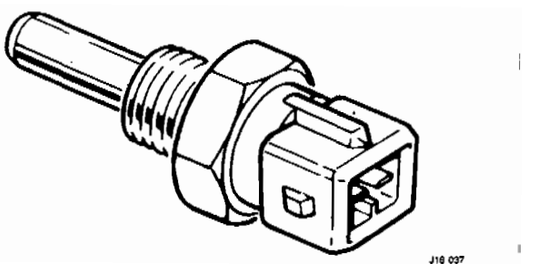


Fig 3

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Note: This procedure must only be performed on a cold **or** cool engine.

Open the bonnet and disconnect the battery earth lead.
Disconnect the coolant temperature connector (brown).
Release and remove the sensor (Fig **1**).
Clean the sensor aperture, fit the new sensor and tighten.
Connect the coolant temperature sensor connector.
Connect the battery earth lead and close the bonnet.

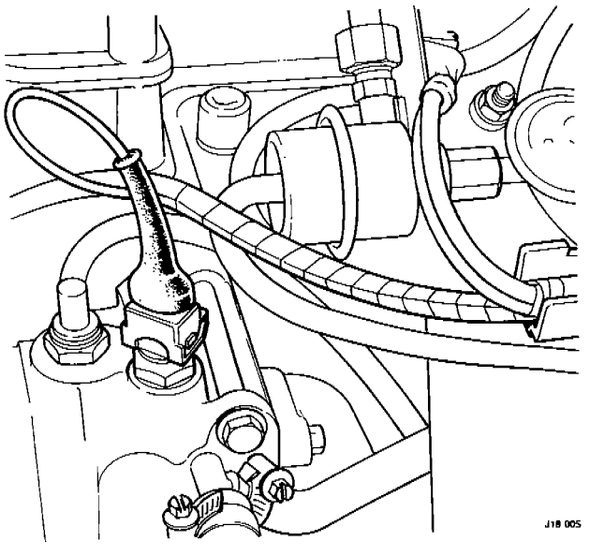


Fig 1

DATA

TORQUE FIGURES

Sensor to block 49-54Nm

0199G

CRANKSHAFT SENSOR

RENEW 18.30.12

The crankshaft sensor (Fig 2) provides both engine speed and crankshaft position information **to** the ECU. It comprises **a** toothed gear and **a** variable reluctance coil.
The toothed gear is attached to the crankshaft and has 59 symmetrically spaced rectangular segments around its periphery. These segments induce a signal in the reluctance coil when the engine is running, the frequency of the signal being proportional to engine speed. An omitted segment, which would give a total segment complement of 60, interrupts the induced signal to provide crankshaft position references.

Remove the hex head securing screws and remove the sensor. Disconnect the harness multi plug.

Fit the new sensor into position, fit and tighten the screws. Reconnect the multi plug.

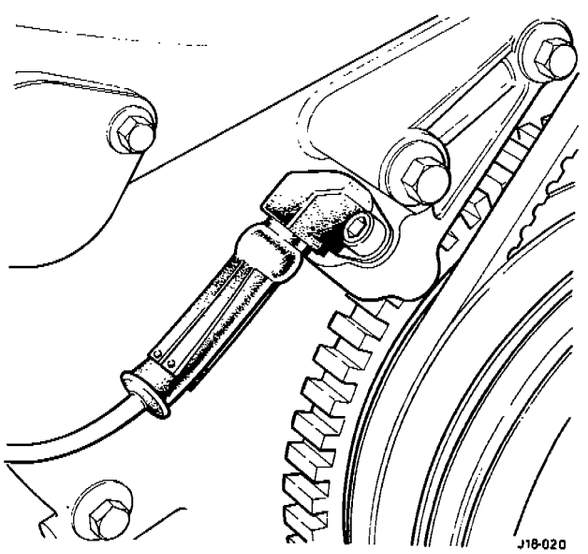


Fig 2

DATA

Sensor screws 23-27Nm

SPANNER SIZES

6mm (Hex key)

0199G

CRANKSHAFT TOOTHED GEAR

RENEW 18.30.14

Unclip the air cleaner cover and remove the cover complete with element from the backplate.
Remove the air conditioning drive pulley, slacken the drive belt adjusting nut, the link arm adjusting nut, and the alternator pivot bolt.
Pivot the alternator, remove the drive belt.
Note the position of the pulley relative to the damper.
Remove the pulley securing bolts.
Remove the damper.
Fit Service Tool 18G 1837 to the front crankshaft damper (1 Fig 1) and tighten the securing bolts.
Wedge the tool and remove the **damper** retaining bolt. Remove Service Tool 18G 1837.
Fit Service Tool 18G 1436 to the damper (1 Fig 2) and tighten the securing bolts. Tighten the centre bolt (2 Fig 2), withdraw the pulley from the crankshaft and remove the tool.
Remove the toothed gear securing bolts, remove the gear from the damper (Fig 3).

Fit a new roll pin to the damper.
Refit the toothed gear to the damper and tighten the securing bolts, fit the damper to the engine, start the damper securing bolt and fit Service Tool 18G 1437.
Wedge the tool, torque up the securing bolt and remove Service Tool 18G 1437.
Reposition the alternator drive belt.
Tension the alternator drive belt and tighten all securing bolts and nuts.
Align and fit the alternator pulley, ensure the balance weights are fitted correctly.
Secure the pulley with the bolts.
Refit the air cleaner element.

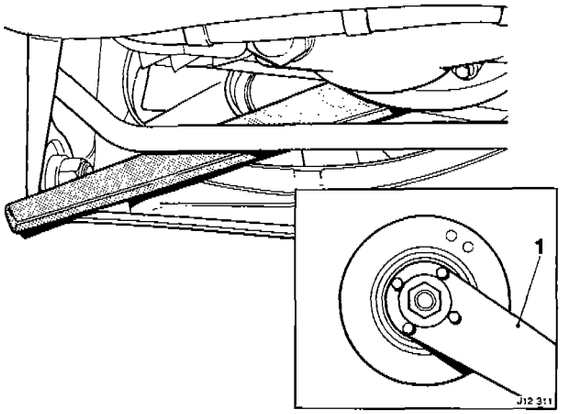


Fig 1

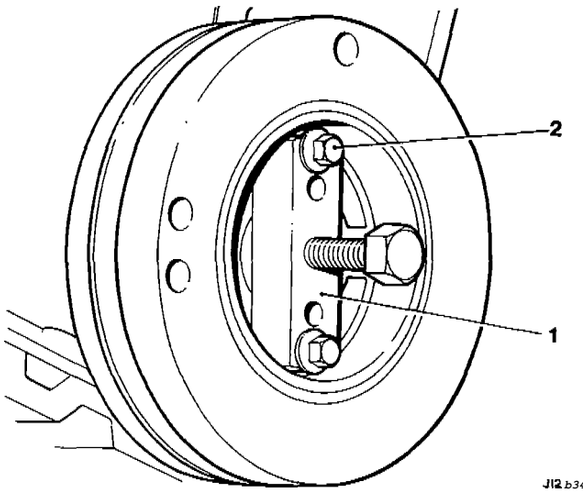


Fig 2

DATA

SERVICE TOOLS

Crankshaft pulley remover 18G 1436
Front pulley lock 18G 1437

TORQUE FIGURES

Alternator to timing cover 23-27Nm
Alternator to trunnion locknuts 12-14Nm
Alternator pivot bolt/nut 23-27Nm
Crankshaft pulley to crankshaft 203.5Nm
Crankshaft pulley to damper 23-27Nm
Timing ring to damper 16-19Nm

NUT/BOLT SIZES

8mm
10mm
13mm
19mm
1/2in AF
9/16in AF
¾ ***WHIT****WORTH*

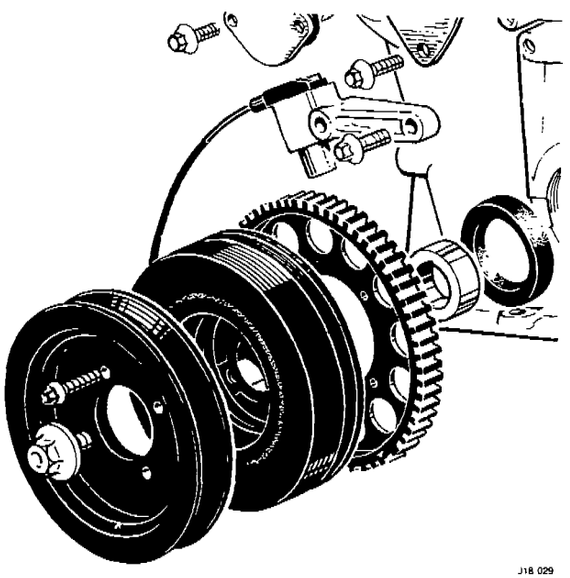


Fig 3

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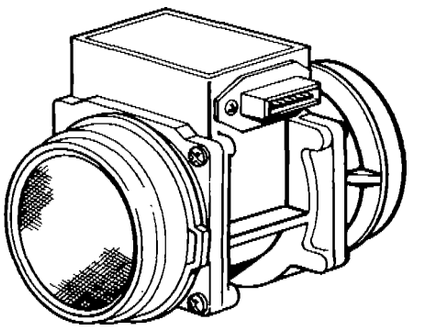
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AIR FLOWMETER

RENEW 18.30.15

The air flowmeter (Fig 1) is situated in the air duct to the inlet manifold and provides indication of the air drawn through the duct by the engine. The unit contains two thermal sensitive elements; one operating at ambient temperature, and the other heated at a constant temperature by an electrical current. Air passing through the flowmeter has a cooling effect on the heated element, the electrical current supplied to the element being adjusted proportional to volume.

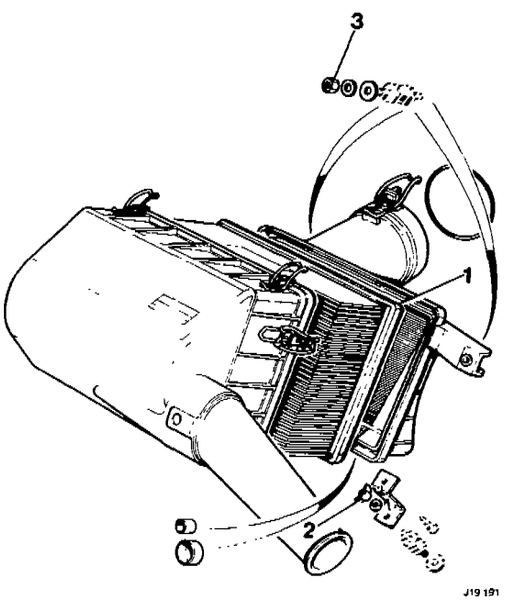
Due to dirt ingress and backfire flows that exist in the duct, unavoidable contamination of the heated element occurs. To remove such contamination, the element temperature is raised to 1000°C for a burn-off period of one second. The burn-off period is implemented if predetermined engine parameters are exceeded and occurs four seconds after the ignition switch is set to 'off'.
A potentiometer is incorporated in the air flowmeter to provide idle fuel adjustment. This potentiometer operates completely independent of the air flowmeter elements, but is incorporated in the flowmeter for ease of access to its adjustment screw.



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Fig 1

Open the bonnet and disconnect the battery earth lead.
Remove the nuts securing the air cleaner assembly (1 Fig 2) to the inner wing valance (2,3 Fig 2).
Release the clips securing the air cleaner to the air flowmeter and reposition the air cleaner for access.
Release the air flowmeter to intake elbow hose clip.
Remove the screw securing the air flowmeter earth lead and disconnect the earth lead.
Disconnect **the** air flowmeter connector (black) and remove the air flowmeter.
Connect the air flowmeter connector (black) to the new air flowmeter.
Connect the air flowmeter earth lead.
Fit the air flowmeter to to intake elbow hose and tighten the hose clip.
Fit the air cleaner to the air flowmeter and engage the securing clips.
Secure the air cleaner to the inner wing valance and tighten the securing nuts.
Connect the battery earth lead and close the bonnet.



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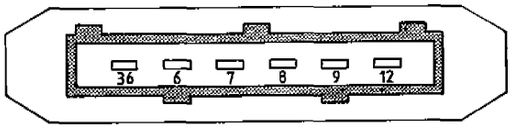
Fig 2

0199G

AIR FLOW METER

DIAGNOSTIC CHECK 18.30.00

Disconnect the airrneter **plug** (Fig 1). Connect **pin** 36 to the negative side of a suitable power supply and pin 9 to the positive side.
Set the power supply to 14v.
Connect pin 6 to the negative side of **a** suitable voltmeter and pin 7 to the positive side, and select a suitable voltage range, say **0-1**Ov.



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Fig 1

TEST 1: (Airmeter stationary, ie no air flowing through it, and preferably with the inlet and outlet ports covered).

VOLTMETER READING	DIAGNOSIS
0.4V + 0.2V	OK
OV	OUTPUT OPEN CIRCUIT
VOLTAGE GREATER THAN 0.7V	OUTPUT DRIFTED, MODULE INOPERATIVE, HOT OR COLD SENSOR HAS BECOME DETACHED FROM GOAL POSTS.

TEST 2: (Carried out **by** blowing one hard blast through the airrneter **(in**the direction *of* air **flow),** thus causing the voltmeter to rise and fall).

VOLTMETER READING	DIAGNOSIS
RISE TO 1.5V, THEN FALL BACK TO TEST 1 VOLTAGE	OK
0V	OUTPUT OPEN CIRCUIT
SAME VOLTAGE AS IN TEST 1	MODULE INOPERATIVE, HOT OR COLD WIRE DETACHED
RISE TO GREATER THAN 5V	MODULE INOPERATIVE, CALIBRATION DRIFTED

Disconnect the voltmeter **and** power supply.
Reconnect the airmeter plug.

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FUEL PUMP RELAY

RENEW **18.30.30**

Open the bonnet and disconnect the battery earth lead.
Open the front passenger door.
Remove the passenger dash liner, locate and remove the relay from the fuel pump relay connector (1 Fig 1 - yellow).
Fit the new relay in fuel pump relay connector (yellow) and fit the passenger dash liner.
Close the front passenger door.
Connect the battery earth lead and close the bonnet.

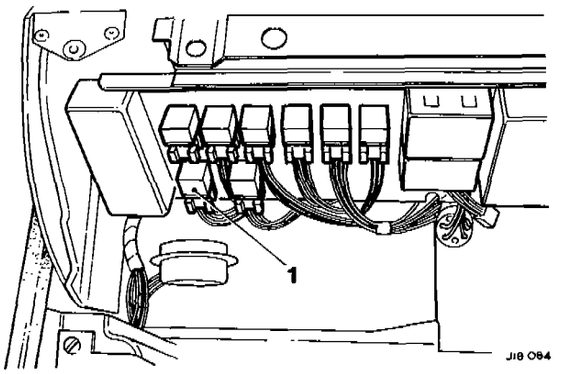


Fig 1

MAIN RELAY

RENEW **18.30.31**

Open the bonnet and disconnect the battery earth lead.
Open the front passenger door.
Remove the passenger dash liner, locate and remove the relay from the main relay connector (1 Fig 2 -red).
Fit the new relay in the main **relay** connector (red) and fit the passenger dash liner.
Close the front passenger door.
Connect the battery earth lead and close the bonnet.

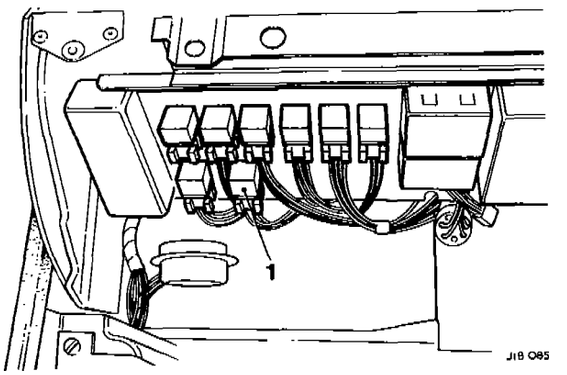


Fig 2

IGNITION 'ON' RELAY

RENEW **18.30.32**

Open **the** bonnet and disconnect the battery earth lead.
Open the front passenger door.
Remove the passenger dash liner, locate and remove the relay from the ignition 'on' relay connector (1 Fig 3 - blue).
Fit the new relay in the ignition 'on' relay connector (blue) and fit the passenger dash liner.
Connect the battery earth lead and close the bonnet.

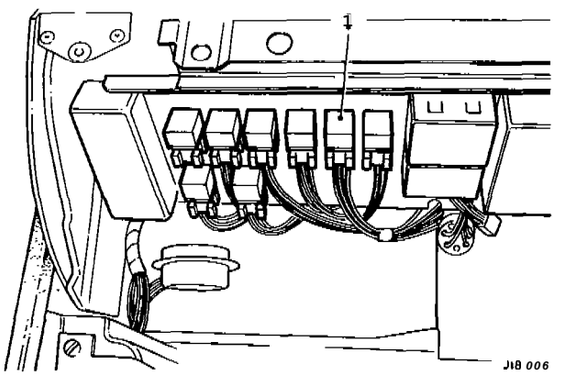


Fig 3

START RELAY

RENEW **18.30.33**

Open the bonnet and disconnect the battery earth lead.
Open the front passenger door.
Remove the passenger dash liner, locate and remove the relay from the start relay connector (1 Fig 4 - white).
Fit the new relay in the start relay connector (white) and fit the passenger dash liner.
Connect the battery earth lead and close the bonnet.

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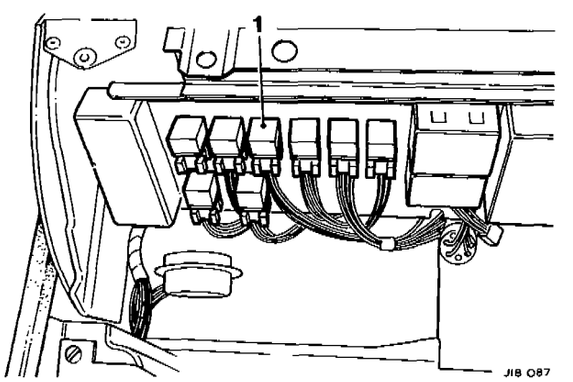


Fig 4

INERTIA SWITCH

RENEW 18.30.35

The inertia switch (Fig 1) is secured to the bulkhead, forward of the **'A'** post fuseblock on the driver side. It is a gravity actuated safety device which de-energises the ignition 'on' relay, inhibits fuel pump operation and activates the central locking system to open all door locks and close both the luggage compartment and fuel filler locks should the vehicle be subjected to heavy impact force.

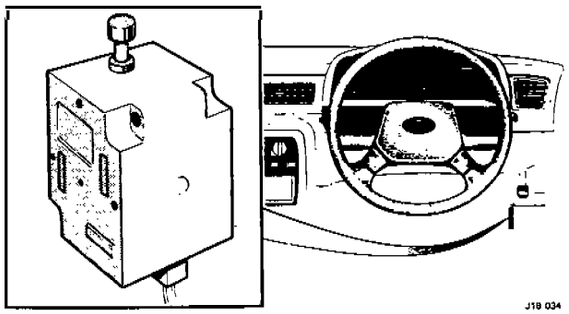


Fig 1

Note: The luggage Compartment will not unlock if it was previously locked in the 'manual position'.

Resetting

Reset the inertia switch by depressing the plunger located on the upper surface of the switch housing.

Open the bonnet and disconnect the battery earth lead.
Open the drivers door.
Remove the screws securing the **'A'** post fuseblock cover and remove the cover.
Disconnect the inertia switch connector (white), remove the inertia switch assembly securing screws and remove the assembly complete with bracket to a work bench.
Remove the screws securing the inertia switch to the bracket and remove the switch from the bracket.

Fit the new inertia switch to the bracket and tighten the screws.
Connect the inertia switch connector (white), fit the inertia switch assembly to the bulkhead and tighten the screws.
Fit the **'A'** post fuseblock cover **and** close the drivers door.
Connect the battery earth lead and close the bonnet.

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IDLE SPEED CONTROL ACTUATOR - NON CRUISE/CRUISE CONTROL VEHICLES

RENEW 18.30.41

The idle speed control actuator (Fig 1) is attached to the inlet manifold and contains a stepper motor driven valve which permits intake air to bypass the throttle butterfly valve. The volume of air passed by the actuator is controlled by the ECU so that correct idle speeds are maintained irrespective of engine temperature and load.

Open the bonnet and disconnect the battery earth lead.
Disconnect the idle speed actuator multi-plug.
Release the hose clip securing the intake elbow to actuator hose and disconnect the hose from the actuator.
Release the hose clip securing the connector pipe to actuator hose and disconnect the hose from the actuator.
Unscrew the nut securing the actuator mounting clamp and remove the actuator and clamp.

Fitting a new control actuator is the reversal of the removal procedure.

Note: After fitting a new actuator, the base idle speed MUST be set.

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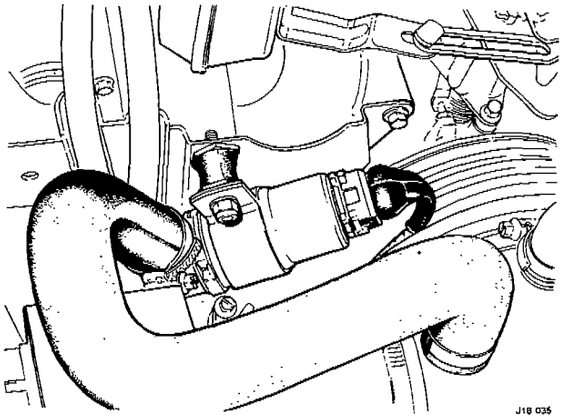


Fig 1

INTAKE ELBOW

RENEW 18.40.13

Open the bonnet and disconnect the battery earth lead.
Unclip the air cleaner cover and remove the cover complete with element from the backplate.
Remove the nuts securing the air cleaner backplate to the inner wing valance.
Release the clips securing the air cleaner backplate to the air flowmeter and reposition the backplate for access (1 Fig 1).
Release the air flowmeter to intake elbow hose clip (2 Fig 1).
Remove the screws securing the air flowmeter earth lead and disconnect the earth lead.
Disconnect the air flowmeter connector (black) and remove the air flowmeter (3 Fig 1).
Release the intake elbow to idle speed control valve hose clip and disconnect the hose from the elbow (4 Fig 1).
Release the intake elbow to filler tube hose clip and disconnect the hose (5 Fig 1).
Release and remove the elbow mounting securing nut (6 Fig 1).
Release the elbow to throttle housing hose clip and remove the elbow from the hose (7 Fig 1).
Release the elbow to air flowmeter hose clip and remove the hose from the elbow

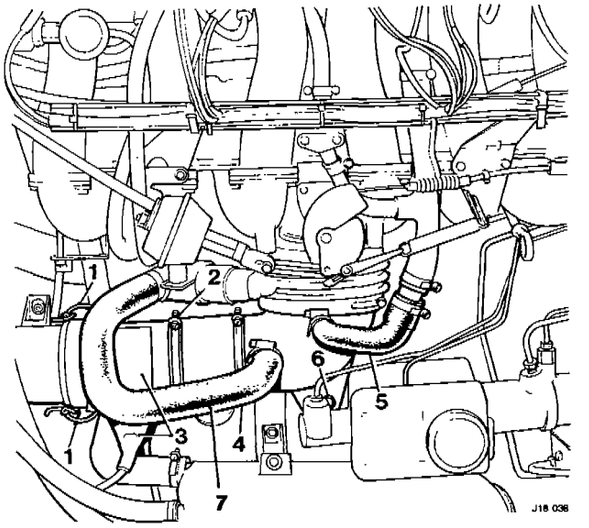


Fig 1

Fit the air flowmeter hose to the new elbow and tighten the hose clip.
Fit the elbow to the throttle housing hose and tighten the hose clip.
Secure the elbow to the inner wing valance and tighten the retaining nut.
Fit the filler tube hose to the elbow and tighten the hose clip.
Fit the throttle housing hose to the elbow **and** tighten the hose clip.
Connect the air flowmeter connector (black) to the air flowmeter.
Connect the air flowmeter earth lead.
Fit the air flowmeter to the intake elbow hose and tighten the hose clip.
Refit the air cleaner assembly.
Connect the battery earth lead and close the bonnet.

DATA

TORQUE FIGURES

Hose clips ***1.5-2.5Nm***
Air cleaner securing ***nuts 15-18Nm***

SPANNER SIZES

6mm
1Imm

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BASE IDLE SPEED

SETTING 18.00.00

Note: This should be set using J.D.S Equipment, however should this not be available then the manual method described below may be used. When using the manual method, ensure the manual instructions are adhered to as the two procedures are not the same.

Run the engine until it reaches normal operating temperature (more than 850C).
Switch the ignition off.
Switch the ignition on, wait 5 seconds and then disconnect connector L156 to the idle speed controller.
Switch the ignition off.
Wait 15 seconds then reconnect the idle speed controller.
Repeat the above operation twice, on the last occassion do not reconnect the idle speed controller.
Start the engine.
Check the base idle speed, this should be between approximately 550 rpm and 600 rpm. If the idle speed is not between these limits then adjust the air bypass screw to bring the idle speed within limits.
Switch the ignition off and reconnect the idle speed controller.
Start the engine and check to ensure that the idle speed is between 650 rpm and 800 rpm.

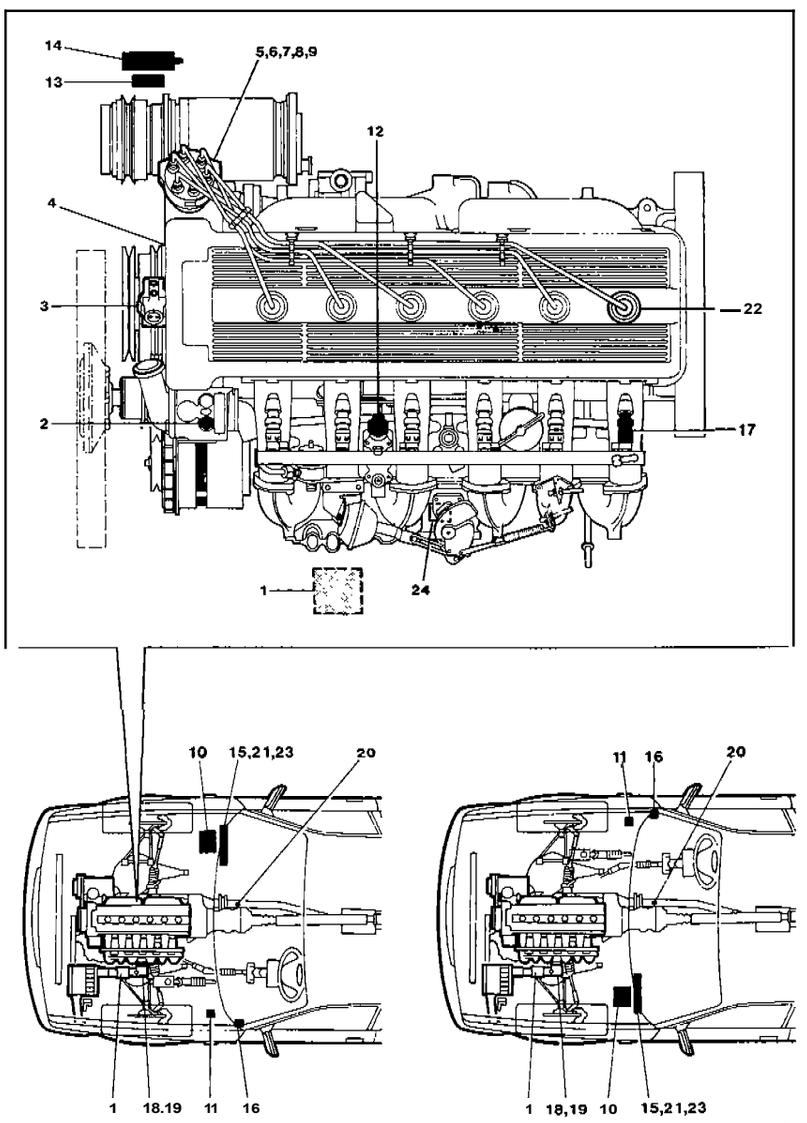
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ENGINE MANAGEMENT 3.2

DESCRIPTION 18.00.00

The components and service procedures of the 3.2L engine management system are similar to the 4.0L system (1991 model year condition).

Refer to Section 18.2 for details of service requirements and operations.

The following areas of the 3.2L system deviate from the 4.0L system and should be considered when performing service operations.

ELECTRONIC CONTROL UNIT (ECU)

DESCRIPTION 18.00.00

The electronic control unit employed by the 3.2L system differs from that of the 4.0L system as the hydraulic automatic gearbox does not communicate with the engine management system. The ECU's have software differences and are therefore not interchangeable.

ENGINE RUNNING

DATA 18.00.00

The engine control idle speeds for the 3.2L are set as follows:

Automatic
1. Fully warm in Neutral - 700 rpm
2. Fully warm in Drive - 650 rpm

Manual
1. Fully warm in Neutral - 800 rpm

Increase in control idle speed with reduced coolant temperature is as follows:

76°C	Fully warm idle speed
40°C	+ 50 rpm
18°C	+ 100 rpm
-2°C	+ 150 rpm
-30°C	+ 200 rpm

The 3.2L system should be treated the same as the 4.0L system in terms of setting up the idle speed and fuelling.

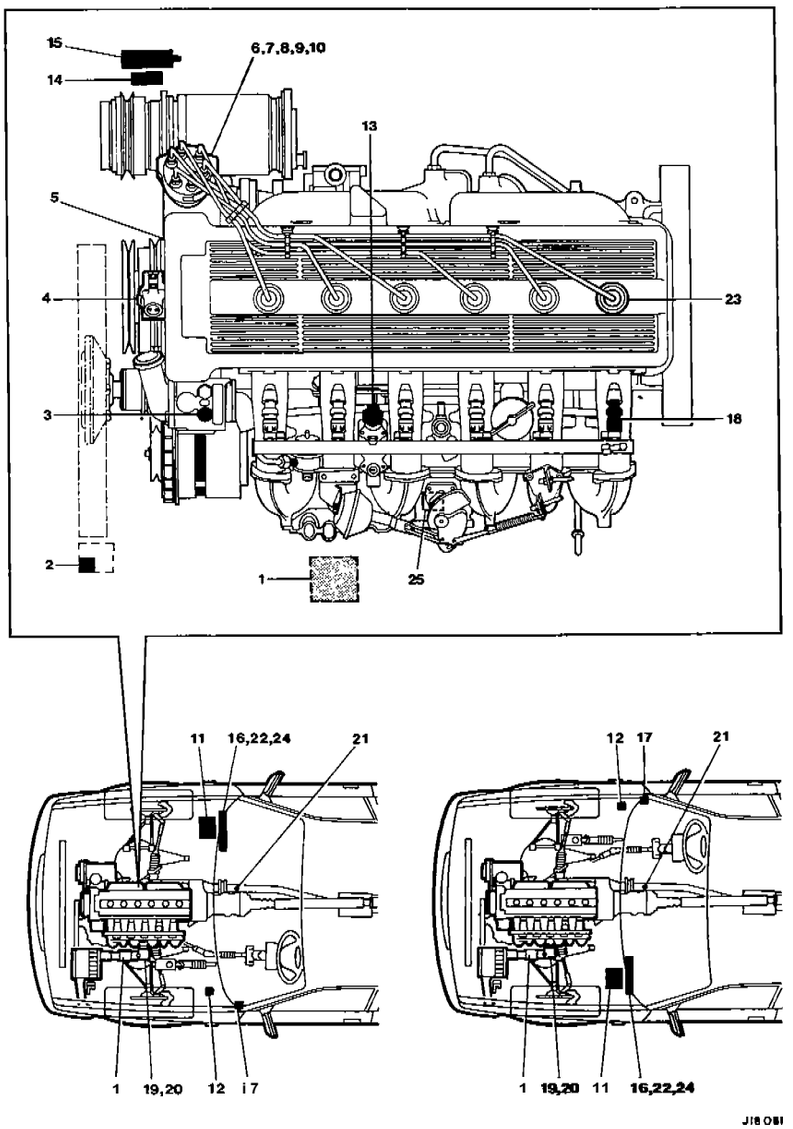
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COMPONENT DETAILS 18.00.00

COMPONENT	LOCATION	FIXING
Air conditioning sensor		
Air flowmeter	Air filter outlet	Retaining clips
Air pump	Engine LH front	Nuts and bolts
Air pump relay	Engine comp't LH front	Securing tab
Battery	Battery tray	Bolt
Coolant temperature sensor	Thermostat housing	Body union
Crankshaft sensor:		
Variable reluctance coil	Timing chain cover	Allen screw
Reference disc	Crankshaft pulley	Bolts
ECU	Passenger footwell	Screws
Fuel Filter	Underside rear footwell LH	Nuts and bolts
Fuel pump	Underside rear footwell LH	Nuts and bolts
Fuel pump relay	Passenger footwell	Securing tab
Fuel rail	Inlet manifold	Bolts
Gearbox sensor (Auto only)		
HT distributor	Engine RH front	Bolt
Idle speed control valve		
Ignition 'on' relay	Passenger footwell	Securing tab
Ignition amplifier	Engine comp't RH front	Screws
Ignition coil	Engine RH front	Bolts
Inertia switch	Driver footwell	Screws
Injectors	Inlet manifold	Retaining clips
Lambda sensor	Exhaust downpipe	Body union
Main relay	Passenger footwell	Securing tab
Pressure regulator	Fuel rail	Union nuts
Start relay	Passenger footwell	Securing tab
Start switch	Column switch assembly	
Throttle potentiometer	Underside inlet manifold	Bolts

CABLE COLOUR CODES

N - Brown	B - Black	W - White	K - Pink	G - Green
R - Red	Y - Yellow	O - Orange	S - Slate	L - Light

ENGINE MANAGEMENT - 4.0

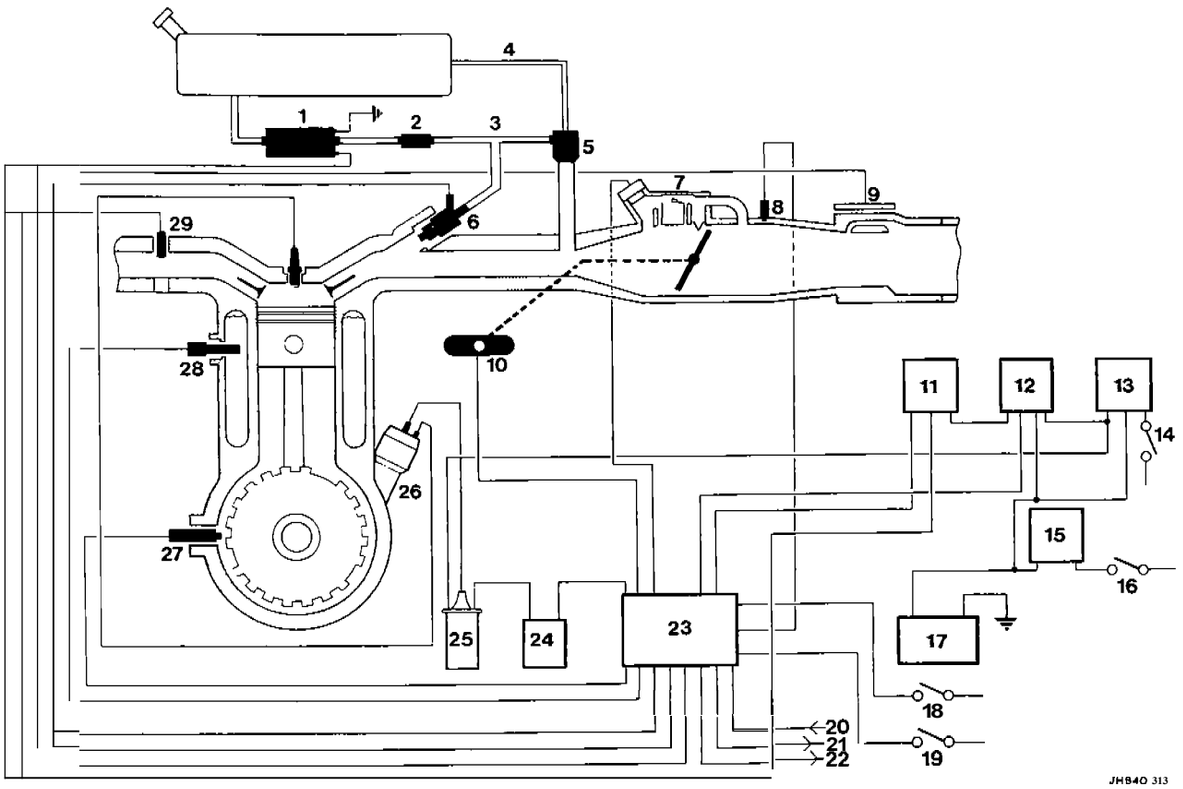


Fig 1 Engine management system

Key to Illustration

1. Pump
2. Filter
3. Fuel rail
4. Fuel return
5. Pressure regulator
6. Injector
7. Idle speed control actuator
8. Air thermistor
9. Airflow meter
10. Throttle potentiometer
11. Fuel pump relay
12. Main relay
13. Ignition 'on' relay
14. Inertia switch
15. Start relay
16. Start switch
17. Battery
18. Gearbox sensor (auto only)
19. Air conditioning clutch sensor
20. Idle override
21. Vehicle condition monitor VCM1
22. Vehicle condition monitor VCM2
23. Electronic control unit **ECU**
24. Ignition amplifier
25. Ignition coil
26. H.T. distributor
27. Crankshaft sensor
28. Coolant temperature sensor
29. Lambda (oxygen) sensor

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ENGINE MANAGEMENT - 4.0 18.00.00

INTRODUCTION

The engine management system maintains optimum engine performance over its entire operating range by metering the fuel into each cylinder's inlet tract and adjusting the ignition timing angle at the sparking plugs. Each of these functions is performed by an Electronic Control Unit (ECU) which, from data received from sensors located on and around the engine (Fig. 1), evaluates optimum ignition timing and fuel metering parameters relative to engine load and speed. Additional functions of the system include:

1 Fuel pump control to prevent fuel flooding and/or spillage when the engine is stationary with the ignition switch in position 'II'.
2 Cold start control to ensure sufficient fuel exits in the inlet manifold to create a combustible air/fuel mixture in the combustion chamber.
3 Idle speed control to compensate for varying engine temperature and load conditions, e.g. the engaging or disengaging of the transmission (4.0L automatic only) and/or the air conditioning clutch.
4 Fuel cut-off during engine overrun conditions to improve fuel economy by minimising the quantity of unburnt fuel discharged into the exhaust system.
5 Engine overspeed control to impose a maximum engine speed limit of 6300 rev/min.
6 Air pollution control to reduce exhaust contamination to levels which comply with different country exhaust regulations.
7 Fuel monitoring to provide precise fuelling information to the trip computer.
8 Fault monitoring to provide data to the instrumentation system for display.

The system also incorporates a 'limp home' feature which permits continued engine operation on certain sensor failure, the sensor failure being indicated on the instrument pack.

Fuel Metering

Fuel is delivered to solenoid operated injectors, via a variable pressure regulator, by an electrically driven pump operating at a virtual constant pressure. Actual injector pressure, however, fluctuates between 35-45 lbf/in2 depending on the absolute manifold pressure acting on the regulator at the time. The quantity of fuel injected for a given duration of injector 'on' (open) time is thus maintained constant, irrespective of the back pressure on the injector nozzles, and accurate fuel monitoring is achieved.

Injector operation is by means of an electrical pulse which actuates a solenoid valve within the injector body. The duration of the pulse, and hence the quantity of fuel injected, is determined by the ECU on a basis of intake air (engine load) and engine speed information derived from air flowmeter and crankshaft sensors. This information is used to access mapped data stored in 128 memory locations containing injector pulse durations pertaining to eight engine loads at 16 different speeds.

Correction factors are imposed on the basic injector pulses to compensate for varying conditions. The resultant pulses are then normally applied to the injectors twice per engine cycle, i.e. once per crankshaft revolution, with only half the amount of fuel being injected at each injector 'on' time.

Injector pulse adjustments are necessary to provide:

1 Cranking enrichment during starting.
2 Temperature enrichment during starting and warm-up.
3 After-start enrichment during warm-up.
4 Demand corrections during idle, full power and acceleration.
5 Voltage corrections for variations in the electrical system voltage.
6 Contamination corrections for emission control.

Cranking enrichment

Cranking enrichment is provided, irrespective of prevailing temperature conditions, when the starter motor is activated. This is achieved by increasing the injector operating frequency frdm one pulse to three pulses per crankshaft revolution and is implemented by the ECU in response to an input from the starter solenoid. Cranking enrichment is terminated at an engine speed of 600 rev/min.

Cranking enrichment terminates at an engine speed of 200 rev/min above a coolant temperature of 75°C (167°F) and at 500 rev/min below a coolant temperature of 75°C (167°F).

Temperature enrichment

Temperature enrichment is provided during starting and warm-up. This is achieved by increasing the injector 'on' time above that of basic requirements and is implemented by the ECU in response to an input from a coolant temperature sensor.

After-start enrichment

After-start enrichment is provided, irrespective of temperature, to supply added fuel during warm-up. This is achieved by the ECU which increases the injector 'on' time above that of basic requirements and then decreases the amount of additional fuel supplied at a fixed rate with time.

Demand corrections

Corrections are provided for idle, acceleration and full power demands. This is achieved by increasing the injector 'on' time above that of basic reqirements and **is** implemented by the ECU in response to an input from a throttle potentiometer.

Voltage corrections

The ECU constantly monitors the electrical system voltage, i.e. the state of the battery and electrical load, because the time taken for an injector to open is affected by voltage and results in a corresponding change in the quantity of fuel delivered. The ECU compensates for any voltage change detected by adjusting the injector 'on' time accordingly.

Contamination corrections

On certain vehicles exhaust pollution is reduced to **a** minimum by monitoring the oxygen content **of** the exhaust and correcting the fuel/air mixture to maintain an intake ratio **of** approximately 14.7:1. This is achieved by the ECU in response to an input from a Lambda sensor.

Additional air is also introduced into the exhaust system by a relay activated air pump and solenoid vacuum valve. The relay is actuated by the ECU at temperatures between 15oC and 45oC with the ignition 'on'.

Ignition timing

Ignition pulses are applied, via a separate ignition amplifier, to the ignition coil which generates high energy pulses for the sparking plugs via the distributor. Unlike conventional ignition systems, however, the distributor has no centrifugal or vacuum advance mechanisms and no LT circuit exists. The distributor is only required, therefore, to distribute the high energy pulses to the plugs.

Ignition timing is controlled by the **ECU** from information supplied by the air flowmeter and crankshaft sensor. This information is used to access mapped data stored in **128** memory locations containing ignition timing angles pertaining to eight engine loads at 16 different speeds.

Depending on the monitored engine speed and supply voltage, the dwell-period (dwell angle) is determined and the ignition energy is adapted to that required at any instant in time. The unnecessary consumption of energy in the ignition coil is thus prevented. In addition, a peak coil current cut-off facility prevents current flowing through the ignition coil below **a** specific engine speed and, therefore, prevents the battery being discharged and the ignition coil overheating.

Description

The ECU contains a microprocessor and discrete electronic component circuits that provide interfacing to peripheral input/output devices, engine locations of which are shown in Figure 1, **Page** 18.2-05.

The microprocessor performs all system control functions and has a memory pre-loaded with system parameters that are accessed under software control. System response times are, therefore, reduced to a minimum and the system is rendered operational immediately the ignition switch is set to position 'II'. System perhipherals are as follows:

1 Fuel injectors: solenoid actuated devices which spray quantities of fuel into the inlet manifold.
2 Ignition amplifer: an electronic device which, through the ignition coil, generates high energy electrical pulses for distribution to the sparking plugs.

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3 Air flowmeter: a hot wire sensing device which monitors inlet manifold air flow for optimum fuelling and ignition control.
4 Idle speed control valve: a stepper motor driven device which controls the volume of air entering the engine to maintain a correct idle speed.
5 Crankshaft sensor: a device which generates engine speed and crankshaft position information for precise ignition timing and fuelling control.
6 Throttle potentiometer: a device which interprets the throttle position to identify idle, acceleration and full power demands.
7 Gearbox sensor: two linear gearbox selector actuated switches that induce idle speed corrections which compensate for engine load changes that occur when 'N' or 'P' is engaged or disengaged. On vehicles fitted with manual transmission units, the switch input to the ECU is connected to logic earth.
8 Fuel pump relay: a device which implements controlled fuel pump switching.
9 Coolant temperature sensor: a thermal device which monitors the coolant temperature to induce cold starting and warm-up enrichment.
10 Lambda sensor: a device which monitors the oxygen content of the exhaust to induce contamination corrections on vehicles exported to specified countries.
11 Air conditioning sensor: an air conditioning compressor clutch actuated switch that induces idle speed corrections which compensate for engine load changes that occur when the clutch is engaged or disengaged.
12 Air pump relay: a device which controls exhaust system air pump and solenoid vacuum valve operation on vehicles fitted with exhaust emmission control.
13 Idle fuel potentiometer: a device which provides fine adjustment of engine idle fuel, This device is set during vehicle manufacture and only requires adjustment when the air flowmeter assembly, of which it forms an integral part, is renewed.

Other system devices and communications are as follows:

1 tcIgnition 'on' sensing: an input taken from contact 87 of the ignition 'on' relay which, in addition to applying power to the ignition coil, energises the main and fuel pump relays through the ECU. A timer is also initiated which, through the fuel pump relay, permits fuel pump operation for approximately 0.5 seconds to ensure the fuel rail is pressurised prior to cranking.
2 Cranking sensing: an input which induces cranking enrichment when the starter solenoid is activated.
3 Battery voltage sensing: an input taken from contact 87 of the main relay which, in adddition to applying power to the air flowmeter, fuel injectors and both fuel and air pump relays, induces fuelling corrections that compensate for battery voltage fluctuations.
4 Idle override: an input derived from the instrumentation system which, in addition to displaying the vehicle road speed on the instrument pack, inhibits engine idle control at road speeds greater than 3 mph (4.8 kph).
5 VCM 1: an output applied to the instrumentation system to provide indication of an engine management system fault on the instrument pack.
6 VCM 2: a dual purpose output applied to the instrumentation system to (1) identify individual engine management system faults when the ignition switch is initially set to to position 'II', and (2) provide precise fuelling conditions to the trip computer when the engine is running.

OPERATION

A circuit diagram of the engine management system detailing interconnections between the ECU end the various input/output pheripheral devices is shown in Figure 1, Page 18.2-5.

Ignition On

Power is applied to the various devices through contacts LI4-87/30 of the main relay which is energised, via contacts B17-87/30 of the ignition 'on' relay, when the vehicle ignition switch is in position 'II', i.e. when O Volts is applied to **B17-85** of the ignition 'on' relay.

Application of power to the ECU at L13-1 and LI2-10 generates a system reset which causes the microprocessor to perform an initialization routine (a sofware program stored in memory), condition input circuits for sensor scanning and initiates fuel pump operation to pressurise the fuel rail prior to cranking. The fuel pump is activated via contacts LI5-87/30 of the fuel pump relay which is energised by an output from the ECU at LI2-7.

On completion of the initialization routine, sensor scanning commences and analogue information from the sensors is converted into digital data for storage. The data thus stored is then evaluated to determine prevailing engine conditions and memory locations are accessed to obtain appropriate ignition timing and fuel metering paramgters. In addition, the following functions are performed:

1 The stepper motor of the idle speed control valve is driven, via LI2-15/16 and LI2-18/19, to set the valve at a position suitable for engine starting. Rapid valve positioning is achieved for all conditions by extending or retracting its stem from a mid-travel position restored each time the ignition switch is set to 'off'.
2 Fuel pump operation is terminated, i.e. the output at L12-7 is removed, after approximately 0.5 seconds to eliminate possible fuel flooding should an injector be stuck in the open position. This feature is also used to eliminate possible fuel spillage creating a hazardous condition at an accident scene if fuel line fracture occurs due to impact damage.
3 The exhaust system air pump and solenoid vacuum valve (if fitted) are activated by the air pump relay which is energised, via L12-2, at temperatures between 15°C and 45°C.
4 A number relating to a fault which may have occurred during the last period that the engine was run is recalled from memory and displayed on the instrument pack fascia.
5 A breather pipe heater is actuated, via a breather pipe heater relay, under the control of a screenwash jet heater sensor.

Engine Cranking

Fuel pump operation is reinstated and any fault number displayed on the instrument pack fascia is erased when the engine is cranked, provided that the ECU detects a crankshaft sensor input at LI3-13 and 14. The Lambda sensor heater is also activated to heat the sensor on vehicles fitted with exhaust emission control.

As the engine rotates under the influence of the starter motor, fuel is introduced into the airflow of the inlet manifold by the fuel injectors which are actuated by the ECU under control of the crankshaft sensor input. Injector triggering occurs, through LI2-12, 13 and 25, three times per crankshaft revolution with appropriate correction factors imposed. The ignition amplifier is also actuated at the correct times, through LIZ-1, to fire the sparking plugs.

Engine Running

When the engine starts, cranking enrichment is terminated at 600 rev/min, i.e. injector pulses occur once per crankshaft revolution, and both warm-up and after-start enrichment is imposed.

The engine idle speed is controlled, through L12-15/16 and LI2-18/19, by the ECU which drives the idle speed control valve stepper motor from coolant temperature, throttle position and crankshaft speed information. Compensation is also provided for fluctuating engine load by monitoring air conditioning clutch and gearbox (automatic only) sensor inputs at LI3-21 and 3 respectively. The engine idle speeds are set as follows:

1. Cold in neutral - 800 rev/min.
2. Hot in neutral - 700 rev/min.
3. Cold in drive - 650 rev/min.
4. Hot in drive - 580 rev/min.

Fuel and ignition requirements are calculated at each sensor scanning to .maintain optimum engine efficiency over its entire range, including full power and acceleration demands. Should a sensor failure be detected, an output is applied to the instrument pack to provide indication of the failure on the fascia. The nature of the fault is also stored in ECU memory and is output as a fault number the next time the ignition switch is set to position 'II'.

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Exhaust emission regulation is implemented by the ECU under control of the Lambda sensor (if fitted) which monitors the oxygen content of the exhaust system and provides a corresponding signal to the ECU at L13-17. This signal imposes corrections on the basic injector 'on' times to reduce exhaust emissions to a minimum. Power to the Lambda sensor heater is supplied from contact LI5-87/30 of the fuel pump relay and, therefore, exhaust emission control is only operational during periods that fuel pump operation is permitted.

Additional air is introduced into the exhaust system by a relay actuated air pump and solenoid vacuum valve (if fitted) to reduce the density of the gases emitted, the relay being actuated by an output from the ECU at L12-2.

Note: During periods that the air pump is operating, Lambda sensor operation is inhibited.

Fault identification:

CHECK ENGINE FAULT CODES

In the event of an engine management fault occurring the 'Check Engine' warning light will be illuminated. Additional information can be displayed by pressing the Vehicle Condition Monitor (VCM) button located on the trip computer panel.

When a fault has been signalled the likely area reponsible for the malfunction can be indicated when the vehicle is stationary. Switch off the ignition, wait at least 5 seconds then turn the ignition switch to position 'II' (do not start the engine). Press the VCM button, this'action will cause the VCM/trip computer display to illuminate the applicable fault code.

All fault codes are, when triggered, stored in the ECU memory. In addition, the 'check engine' warning lamp is illuminated, and will remain illuminated (when the ignition is switched on) until the fault is rectified and the ECU memory cleared by **JDS** or by grounding the relevant ECU pin (see notes below for exceptions). The fault codes **are** displayed in order of priority, **one** at a time. The next code **is** only displayed when the preceding one is rectified or cleared.

NOTES:

1 **USA** Specification: Fault codes 26 and **44** will not remain illuminated at each ignition on/off cycle. This is to prevent the check engine lamp remaining on and becoming **a** nuisance if the vehicle runs out of fuel. Codes 26 and 44 and the warning lamp will remain on only until the next ignition on/off cycle.
The code will no longer be available to the driver. However, the code is still in the ECU memory and can be accessed by dealer personnel.

2 Non-USA Catalyst Specification: Only the following fault codes will cause the check engine warning lamp to illuminate - 11, 12, 14, 16, 17, **18, 19, *68,*** 23, 26 and 44. The warning lamp will not remain illuminated after the next ignition on/off cycle.

3 Non-Catalyst Specification: **As** Non-USA Catalyst Specification except that codes 23, 26 and 44 are not active.

Definitions of fault numbers displayed on the instrument pack fascia are as follows:

FAULT CODE	DESCRIPTION	FUNCTION
11	Idle pot or associated wiring	Looks for idle trim pot out of normal operating range
12	Air flow meter or associated wiring	Looks for air flow meter signal out of normal operating range
14	Coolant thermistor or associated wiring	Looks for coolant thermistor resistance out of range or static during engine warm up
16	Air thermistor or associated wiring	Looks for air thermistor resistance out of range
17	Throttle pot or associated wiring	Looks for throttle pot resistance out of range
18	Throttle pot/air flow meter calibration	Looks for low throttle pot signal at high air flow
19	Throttle pot/airflow meter calibration	Looks for high throttle pot signal at low air flow
22	Fuel pump drive	Looks for ECU output to fuel pump relay
23	Fuel supply	Looks for poor feedback control in rich direction
24	Ignition drive	Looks for ECU output to ignition amplifier module
26	Air leak	Looks for poor feedback control in lean direction
29	ECU self check	Checks microprocessor function
33	Injector drive fault	Checks for ECU output to injectors
34	Injector drive and associated wiring	Looks for injector dribble
37	EGR drive	Looks for ECU output to EGR switch valve
39	EGR check sensor	Looks for correct operation of EGR
44	Lambda sensor or associated wiring	Looks for feedback out of control rich or weak
46	Idle speed control coil 1 drive	Looks for ECU output to idle speed control stepper motor
47	Idle speed control coil 2 drive	Looks for ECU output to idle speed control stepper motor
48	Idle speed control motor or valve	Looks for stepper motor being wildly out of position with engine temperature hot and less than 860F (30oC)
66	Air pump drive	Continuity check from pin 2 of ECU
68	Road speed sensor or associated wiring	Looks for road speed indicating less than 5 km/h at high engine air flow
69	Drive/neutral switch or wiring	Looks for cranking in 'D' or high air flow in 'N'
89	Purge valve drive	Looks for ECU output to purge valve

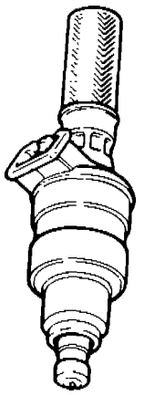
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INJECTORS

DESCRIPTION 18.00.00

Each fuel injector (Fig.1) contains a needle valve rigidly attached to the plunger of a solenoid which, when energised by an electrical pulse, moves the needle away from its seat against a helical pressure spring. This action permits a measured quantity of pressurised fuel to enter the inlet manifold, via an integral filter and nozzle, each time an injector pulse is applied.
Valve lift is approximately 0.15 mm (0.006 in.) for the fully open position which is reached in a response time of approximately 1 millisecond. The amount of fuel delivered is dependent only on the period of time the injector is open, the precise open time being determined by the ECU and is typically 2.75 milliseconds at engine idle.

0200G



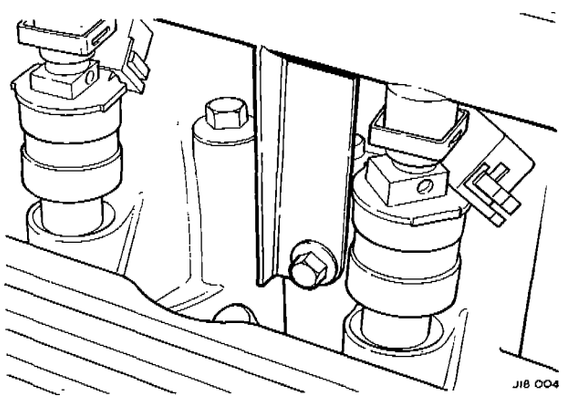
J18 026

Fig 1

INJECTORS

RENEW 18.10.02

Open the passenger door.
Remove the screws securing the passenger dash liner and remove the liner.
Remove the relay from the fuel pump relay connector (red).
Open the drivers door and crank the engine for 10 seconds to depressurise the fuel system.
Close the drivers door, refit the relay and dash liner.
Open the bonnet.
Note the position and disconnect the injector connectors.
Remove the fuel rail securing bolts (Fig 2) and release the fuel feed hose union nut.
Disconnect the fuel feed hose.
Fit protective plugs to the fuel rail and hose.
Release the fuel rail to pressure regulator union nut.
Disconnect the fuel rail from the induction manifold and pressure regulator.
Place the fuel rail on a work bench.
Remove the injector retaining clips and withdraw each injector from the fuel rail.
Clean the fuel rail apertures and remove the injector protective caps.
Insert the new injectors into the fuel rail apertures and fit the injector retaining clips.
Fit the fuel rail assembly to the induction manifold ensuring that the injectors are fully seated.
Connect the fuel rail to the pressure regulator and tighten the union nut.
Remove the protective caps from the fuel rail and hose.
Connect the fuel hose to the rail and tighten the union nut.
Fit the injector connectors to the injectors as noted.
Close the bonnet.



J18 004

Fig 2

SPARK PLUGS

CLEAN AND ADJUST 18.20.01

Open the bonnet.
Disconnect the plug leads from the spark plugs.
Ensure the engine is clean around the plugs then release and remove the plugs using a suitable plug spanner.
With the plugs removed ensure the plug apertures are clean.
Clean the plug electrodes using suitable equipment to remove all carbon deposits.
Set the electrode gap to 0.025 in. (0.64mm).
Refit the plugs to the engine and tighten to the correct torque.
Connect the plug leads to the spark plugs.
Close the bonnet.

DATA

SERVICE TOOLS

Torque wrench.

TORQUE FIGURES

Spark plugs 16.25-28.45N/m

SPANNER SIZES

⅝ AF.

0200G

SPARK PLUGS

RENEW 18.20.02

Open the bonnet.
Disconnect the plug leads from the spark plugs.
Ensure the engine is clean around the plugs then release and remove the **plugs** using a suitable plug spanner.
With the plugs removed ensure the plug apertures are clean.
Fit the new plugs to the engine and tighten to the correct torque.
Connect the plug leads to the spark plugs.
Close the bonnet.
With the plugs removed ensure the plug apertures are clean.
Clean the plug electrodes using suitable equipment to remove all carbon deposits.
Set the electrode gap to 0.025 in. (0.64mm).
Refit the plugs to the engine and tighten to the correct torque.
Connect the plug leads to the spark plugs.
Close the bonnet.

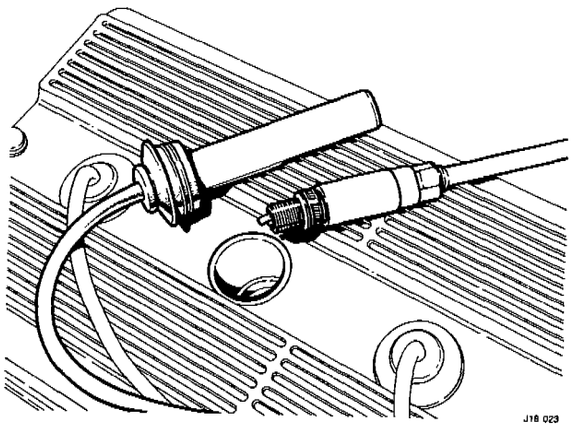


Fig 1

DATA

SERVICE TOOLS

Torque ***wrench.***

TORQUE FIGURES

Spark plugs 16.25-28.45N/m

SPANNER SIZES

⅝ AF.
0200G

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DISTRIBUTOR CAP

RENEW **18.20.10**

Open the bonnet.
Release the distributor cap retaining clips and displace the cap.
Note the positions of the plug leads and remove the leads.
Remove the HT lead from the cap and remove the cap.
Remove the carbon brush from the cap and discard the cap.
Fit the carbon brush to the new cap.
Fit the HT and plug leads to the cap as noted.
Fit the cap to the distributor and engage the retaining clips.
Close the bonnet.

0200G

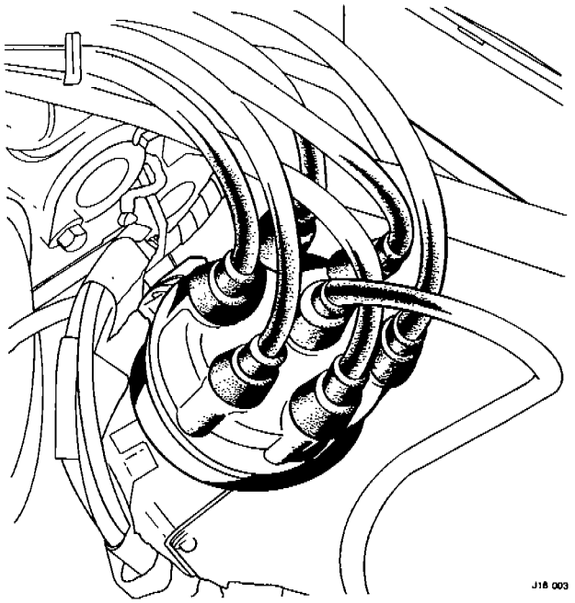


Fig 1

DISTRIBUTOR LEADS

RENEW **18.20.11**

Open the bonnet.
Disconnect the HT lead from the ignition coil.
Release the distributor cap retaining clips and displace the cap.
Detach the lead retaining bracket from the camshaft cover and disconnect the leads from the plugs.
Remove the lead and cap assembly to a work bench.
Note the positions **of** the leads and disconnect the leads from the cap.
Remove the lead retaining brackets from the leads and discard the leads.
Fit the lead retaining brackets to the new leads.
Secure the lead retaining bracket to the camshaft cover and connect the leads to the plugs.
Fit the cap to the distributor and engage the retaining clips.
Connect the HT lead to the ignition coil.
Close the bonnet.

DISTRIBUTOR

RENEW **18.20.20**

Open the bonnet.
Remove the nuts securing the air cleaner to the inner wing valance.
Release the clips securing the air cleaner to the air flowmeter and remove the air cleaner for access to the engine T.D.C. indicator.
Release the distributor cap retaining clips and reposition the cap.
Jack up and place the vehicle on two stands.
Turn the engine to T.D.C. on number one cylinder.
Remove the distributor clamp bolt.

Note the position of the rotor arm and **remove** the distributor.
Note the position of the plug leads in the distributor cap and disconnect the leads from the cap.
Remove the cap of the new distributor and fit the leads to the new cap as noted.
Ensure that number one cylinder of the engine is at T.D.C. (see illustration).
Fit the distributor and position it *so* that the centre *of* the rotor electrode is in line with cylinder number one electrode in the distributor cap.
Fit and tighten the distributor clamp bolt (1 Fig 1) to the correct torque.
Fit the distributor cap (2 Fig 1) to the ditributor and engage the retaining clips.
Fit the air cleaner to the air flowmeter and engage the securing clips (3 Fig 1).
Secure the air cleaner to the inner wing valance and tighten the securing nuts.
Close the bonnet.

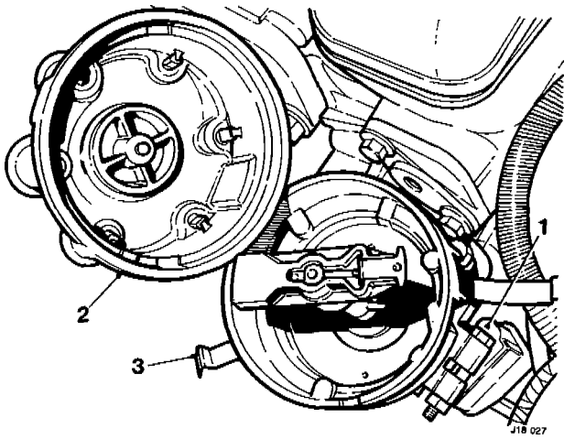


Fig 1

DATA

SERVICE TOOLS

Torque wrench.

TORQUE FIGURES

Distributor clamp bolt ***9.5-12Mn***

0200G

DISTRIBUTOR CAP CARBON BRUSH

RENEW 18.20.22

Open the bonnet.
Release the distributor cap retaining clips and reposition the cap for access to the carbon brush.
Remove the carbon brush from the distributor cap and discard the brush.
Fit the new brush to the distributor cap, fit the cap to the distributor and engage the retaining clips.
Close the bonnet.

0200G

DISTRIBUTOR ROTOR ARM

RENEW 18.20.23

Open the bonnet.
Release the distributor cap retaining clips and displace the cap.
Remove the rotor arm from the distributor and discard the arm.
Fit the new rotor arm to the distributor, fit the cap to the distributor and engage the retaining clips.
Close the bonnet.

0200G

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IGNITION AMPLIFIER

RENEW **18.20.30**

Open the bonnet and disconnect the battery earth lead.
Release and remove the screws **(Fig 1)** securing the amplifier to its mounting plate.
Disconnect the amplifier connector (black) and remove the amplifier.
Connect the amplifier connector (black) and position the amplifier on the mounting plate.
Secure the amplifier to the mounting plate and connect the battery earth lead.
Close the bonnet.

0200G

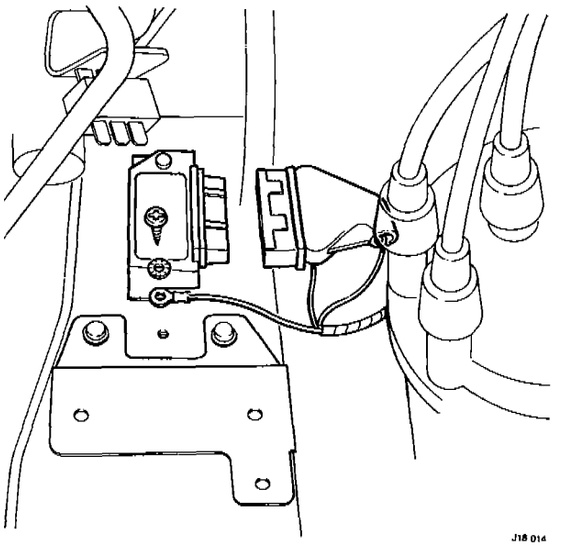


Fig 1

IGNITION COIL

RENEW **18.20.32**

The ignition coil is **a** Bosch type TC1 and is secured to the right-hand inner wing valance.
Open the bonnet and disconnect the battery earth lead.
Displace the LT terminal rubber protective covers and disconnect the LT terminal connections from the coil (Fig 2).
Remove the coil retaining bracket inner and outer securing bolts.
Displace the suppression capacitor, disconnect the HT lead and remove the coil assembly.
Remove the bracket from the coil and discard the **coil.**
Fit the bracket to the new coil, position the coil and fit the bracket inner and outer securing bolts ensuring that the suppression capacitor bracket **is below** the inner bolt and the earth eyelet **of** the LT leads is below the outer bolt.
Tighten the bracket securing bolts to the correct torque **and** connect the LT leads.
Fit the LT terminal rubber protective covers and connect the HT lead.
Connect the battery earth lead and close the bonnet.

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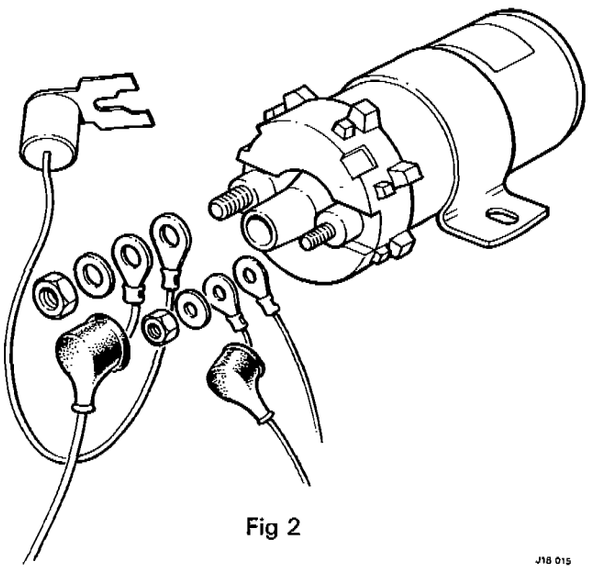


Fig 2

ELECTRONIC CONTROL UNIT

RENEW **18.30.01**

Open the bonnet and disconnect the battery earth lead.
Open the passenger door, remove the screws securing the passenger side dash liner and remove the liner.
Remove the four bolts securing the ECU.
Displace the **ECU** (1 Fig 3) and disconnect the multi-pin connectors.
Remove the ECU.

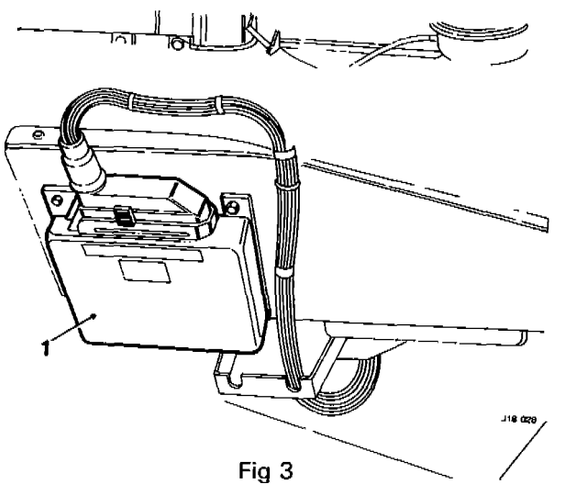


Fig 3

Fitting a new ECU is the reversal of the removal procedure ensuring the connectors are secure, clean and tight.

0200G

COOLANT TEMPERATURE SENSOR

DESCRIPTION 18.00.00

The coolant temperature sensor (Fig.1) is located at the rear of the thermostat housing and comprises a temperature-sensitive resistor having a negative temperature coefficient, i.e. its electrical resistance decreases conversely with increasing temperature.
The sensor provides a temperature parameter to the ECU which triggers temperature enrichment circuits that increase the injector 'on' time during cold starting and warm-up.
The coolant temperature sensor, idle speed control valve and supplementary air valve combination form the equivalent to a carburettor automatic choke.

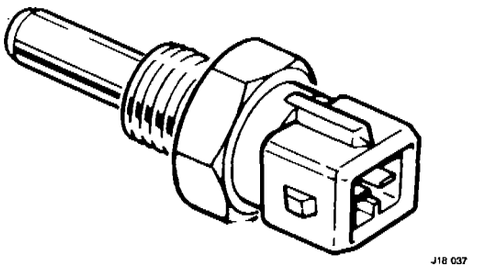


Fig 1

0200G

COOLANT TEMPERATURE SENSOR

RENEW 18.30.10

Note: This procedure must only be performed on a cold or cool engine.

Open the bonnet and disconnect the battery earth lead.
Disconnect the coolant temperature connector (brown).
Undo and remove the sensor (Fig 2).
Clean the sensor aperture, fit the new sensor and tighten to the correct torque.
Connect the coolant temperature sensor connector (brown).
Connect the battery earth lead and close the bonnet.

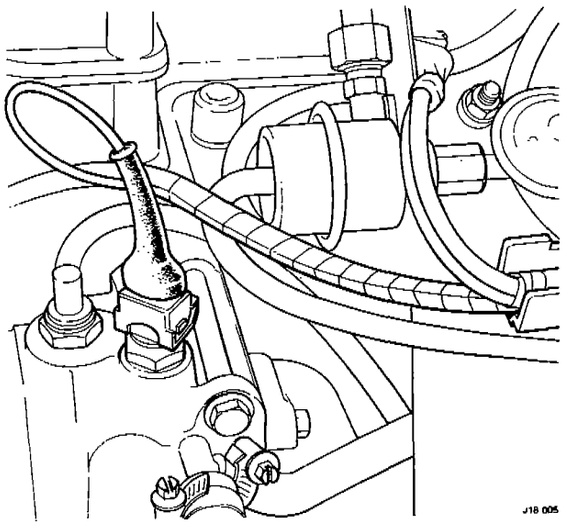


Fig 2

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CRANKSHAFT SENSOR

DESCRIPTION 18.00.00

The crankshaft sensor (Fig.1) provides both engine speed and crankshaft position information to the ECU. It comprises a toothed gear and a variable reluctance coil.

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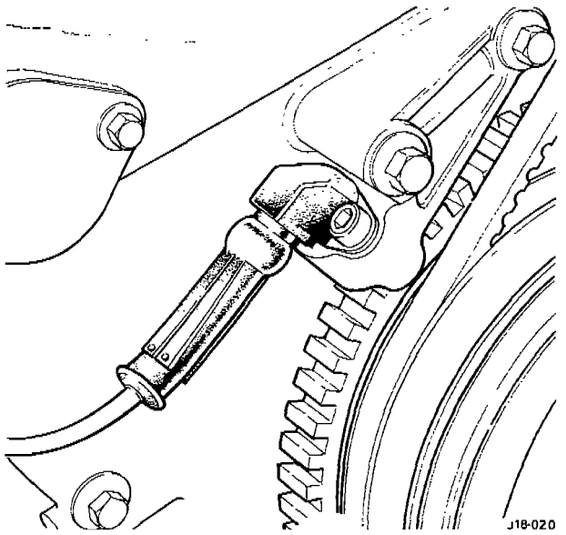


Fig 1

CRANKSHAFT SENSOR

RENEW 18.30.12

Open the bonnet and disconnect the battery earth lead.
Remove the clips securing the sensor cable.
Disconnect the mult-pin cable connector.
Remove the bolts securing the sensor housing and remove the housing complete with the sensor.
With a suitable allen key remove the bolt securing the sensor and remove the sensor from its housing.

Fitting a new sensor is the reversal of the removal procedure ensuring the connector is secure, clean and tight.

0200G

CRANKSHAFT SENSOR TOOTHED GEAR

DESCRIPTION 18.00.00

The toothed gear is attached to the crankshaft and has 57 symmetrically spaced rectangular segments around its periphery. These segments induce a signal in the reluctance coil when the engine is running, the frequency of the signal being proportional to engine speed. Three omitted segments, which would give a total segment complement of 60, interrupt the induced signal to provide crankshaft position references.

0200G

CRANKSHAFT SENSOR TOOTHED GEAR

RENEW 18.30.14

Open the bonnet.
Unclip the air cleaner cover and remove the cover complete with element from the backptate.
Clean the cover, box and mating faces.
Remove the air conditioning drive pulley, slacken the alternator drive belt adjusting nut, the link arm adjusting nut, and the alternator pivot bolt.
Pivot the alternator towards the engine and remove the drive belt.
Note the position of the pulley relative to the damper.
Remove the bolts securing the pulley to the damper.
Note the position of the balance weights and remove from the pulley.
Remove the damper.
Fit Service Tool 18G 1837 to the front crankshaft damper and tighten the securing bolts.
Wedge the tool and remove the damper retaining bolt. Remove Service Tool 18G 1837 from the damper.
Fit Service Tool 18G 1436 to the damper and tighten the securing bolts. Tighten the centre bolt, withdraw the pulley from the crankshaft (Fig 1) and remove the tool.
Remove the bolts securing the toothed gear to the damper and remove the gear from the damper.
Remove the roll pin from the damper and discard the damper.
Fit the roll pin to a new damper.
Refit the toothed gear to the damper and tighten the securing bolts, fit the damper to the engine, start the damper securing bolt and fit Service Tool 18G 1437.
Wedge the tool, torque up the securing bolt and remove Service Tool 18G 1437.
Reposition the alternator drive belt over the pulleys.
Tension the alternator drive belt and tighten all the securing bolts and nuts.
Align and fit the alternator drive belt pulley to the damper ensuring that the balance weights are fitted in their respective positions noted previously.
Secure the pulley with the bolts.
Fit the air cleaner element to the cover and fit the assembly to the backplate.
Secure the cover with the clips.
Close the bonnet.

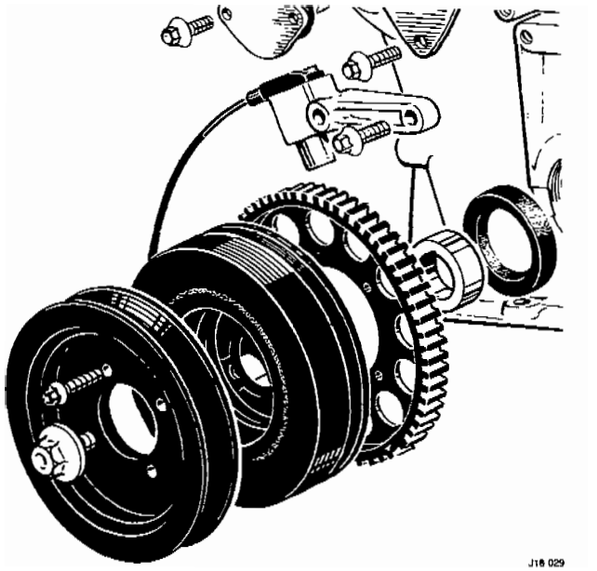


Fig 1

DATA

SERVICE TOOLS

Crank pulley remover 18G 1436
Front pulley lock 18G 1437

TORQUE FIGURES

Trunnion to alternator 23-27Nm
Alternator to timing cover 23-27Nm
Alternator to trunnion locknuts 12-14Nm
Alternator pivot bolt 23-27Nm
Alternator pivot bolt nut 23-27Nm

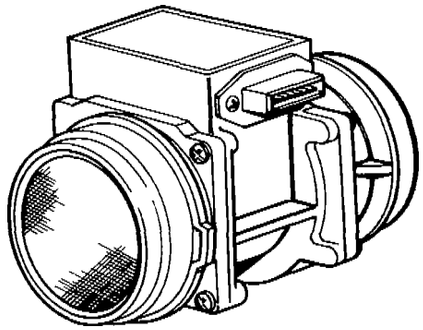
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Crankshaft pulley to crankshaft 203.5Nm
Crankshaft pulley to damper 23-27Nm
Timing ring to damper 16-19Nm

SPANNER SIZES

8mm
10mm
13mm
19mm
1/2in AF
9/16in AF
¾ WHITWORTH

0200G



J16 010

Fig 1

AIR FLOWMETER

DESCRIPTION 18.00.00

The air flowmeter (Fig 1) provides a measurement to the ECU of the air flow in the duct to the inlet manifold. The unit contains two sourcing elements; one at inlet air temperature, and the other which is heated by an electrical current. Both elements are situated in a by-pass, the heated element being subjected to cooling as air is drawn into the engine. The volume of air is thus determined by measuring the electrical current required to maintain the temperature differential of the elements constant.
The by-pass method of air flow measurement has a number of advantages which include:

1. Protection for the delicate sensing elements from shock loads.
2. Reduction in the scale of measurement error due to severe flow pulsations.
3. Minimal contamination of the sensing elements by dirt and backfire flows that exist in the main duct.

A potentiometer is incorporated in the air flowmeter to provide idle fuel adjustment. This potentiometer operates completely independent of the air flowmeter elements, but is incorporated in the flowmeter for ease of access to its adjustment screw which is sealed with a plastic plug.

0200G

AIR FLOWMETER

RENEW 18.30.15

Open the bonnet and disconnect the battery earth lead.
Remove the nuts securing the air cleaner to the inner wing valance.
Release the clips securing the air cleaner to the air flowmeter and reposition the air cleaner for access.
Release the air flowmeter to intake elbow hose clip.
Remove the screw securing the air flowmeter earth lead and disconnect the earth lead.
Disconnect the air flowmeter connector (black) and remove the air flowmeter.
Connect the air flowmeter connector (black) to the new air flowmeter.
Connect the air flowmeter earth lead.
Fit the air flowmeter to to intake elbow hose and tighten the hose clip.
Fit the air cleaner to the air flowmeter and engage the securing clips.
Secure the air cleaner to the inner wing valance and tighten the securing nuts.
Connect the battery earth lead and close the bonnet.

0200G

THROTTLE POTENTIOMETER

DESCRIPTION 18.00.00

The twin track throttle potentioneter (Fig.1) is mechanically coupled to the throttle butterfly spindle and provides a reference voltages both the ECU and electronic gearbox controller dependant on throttle position.
The ECU detects a linear increasing voltage produced by the potentiometer as the throttle is opened and triggers demand enrichment circuits which, due to increased manifold air, causes the engine to accelerate.
The gearbox controller detects a similar signal and will adapt gearshift points to different driving styles as indicated by the throttle input.

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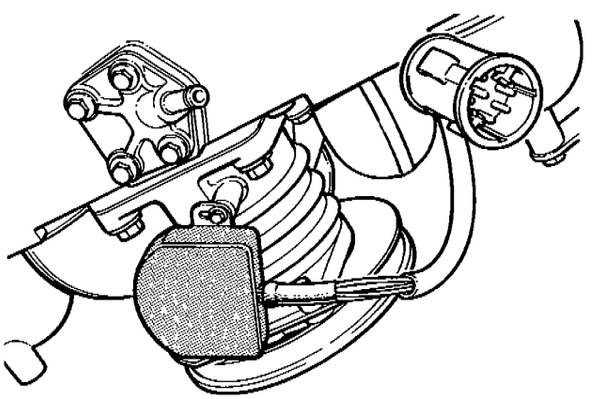


Fig 1

THROTTLE POTENTIOMETER

RENEW 18.30.17

Open the bonnet and disconnect the battery earth lead.
Slacken breather and extra air valve hose clips at intake elbow and displace hoses from elbow.
Slacken throttle housing to elbow hose clip at throttle housing and displace hose.
Slacken air flowmeter to elbow hose clip and displace hose.
Remove intake elbow mounting securing nut and remove elbow for access.
Disconnect throttle potentiometer multi-plug. Displace and remove potentiometer.
Fit and fully seat new throttle potentiometer to throttle housing.
Fit but do not fully tighten potentiometer securing bolts.
Note: The throttle potentiometer must be adjusted and set using JDS equipment.
Following adjustment finally tighten potentiometer securing bolts.
Refit the air intake elbow assemby and tighten hose clips.
Connect the battery earth lead and close the bonnet.

0200G

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LAMBDA SENSOR

DESCRIPTION 18.00.00

The Lambda sensor (1 Fig 1) is installed in the exhaust system downpipe on vehicles exported to specified countries. The purpose of the sensor is to provide an input proportional to the oxygen content of the exhaust gases monitored to the **ECU.**

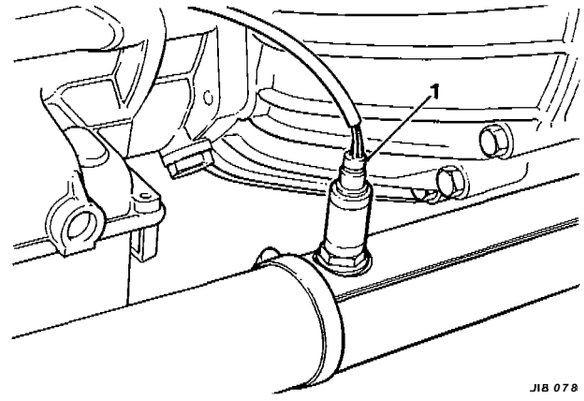


Fig 1

LAMBDA SENSOR

RENEW 18.30.20

Open the bonnet and disconnect the battery earth lead.
Disconnect the lamda sensor harness multi-plugs, engine compartment **RHS.**
Release the harness from the three retaining clips.
Raise the vehicle on a ramp.
Unscrew and remove the sensor from the downpipe catalyst assembly.
Clean the downpipe aperture.
Smear the threads of the new sensor with anti-seize grease, fit the sensor **and** tighten.
Lower the vehicle.
Connect the Lambda sensor multi-plugs and reposition harness to retaining clips.
Connect the battery earth lead and close the bonnet.

0200G

GEARBOX SENSOR

DESCRIPTION 18.00.00

The gearbox sensor is installed on vehicles fitted with automatic transmission units only. The sensor comprises two switches which provide indication to the ECU when the linear gearbox selector is in position 'N' or 'P'.

0200G

AIR CONDITIONING SENSOR

DESCRIPTION 18.00.00

The air conditioning sensor provides indication to the ECU when the air conditioning clutch is engaged and disengaged.

0200G

FUEL PUMP RELAY

RENEW **18.30.30**

Open the bonnet and disconnect the battery earth lead.
Open the front passenger door.
Remove the passenger dash liner, locate and remove the relay from the fuel pump relay connector (yellow) (1 Fig 1).
Fit the new relay in fuel pump relay connector (yellow) and fit the passenger dash liner.
Close the front passenger **door.**
Connect the battery earth lead and close the bonnet.

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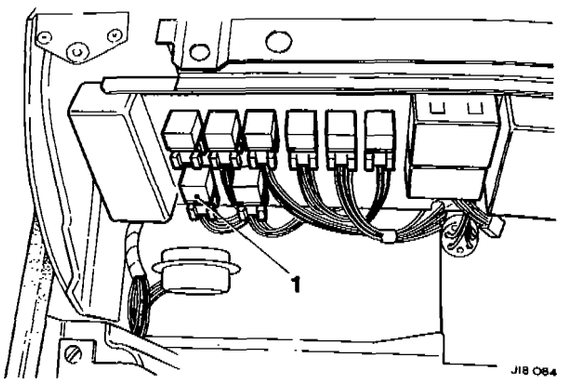


Fig 1

MAIN RELAY

RENEW **18.30.31**

Open the bonnet and disconnect the battery earth lead.
Open the front passenger **door.**
Remove the passenger dash liner, locate and remove the relay from the main relay connector (red) (1 Fig 2).
Fit the new relay in the main relay connector (red) and fit the passenger dash liner.
Close the front passenger door.
Connect the battery earth lead and close the bonnet.

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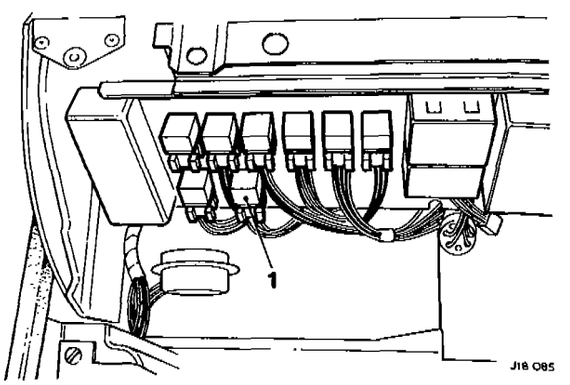


Fig 2

IGNITION 'ON' RELAY

RENEW **18.30.32**

Open the bonnet and disconnect the battery earth lead.
Open the front passenger **door.**
Remove the passenger dash liner, locate and remove the relay from the ignition 'on' relay connector (blue) (1 Fig 3).
Fit the new relay in the ignition 'on' relay connector (blue) and fit the passenger dash liner.
Close the front passenger door.
Connect the battery earth lead and close the bonnet.

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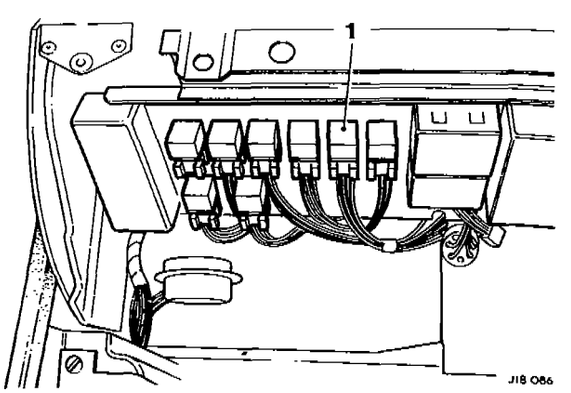


Fig 3

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START RELAY

RENEW **18.30.33**

Open the bonnet and disconnect the battery earth lead.
Open the front passenger door.
Remove the passenger dash liner, locate and remove the relay from the start relay connector (white) (Fig 1).
Fit the new relay in the start relay connector (white) and fit the passenger dash liner.
Close the front passenger door.
Connect the battery earth lead and close the bonnet.

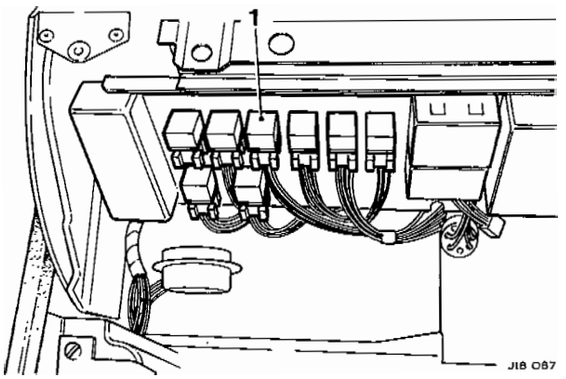


Fig 1

AIR PUMP RELAY

RENEW **18.30.34**

Open the bonnet and disconnect the battery earth lead.
Remove the relay from the air pump relay connector (green) located on the left-hand radiator support bracket.
Fit the new relay in the air pump relay connector (green), connect the battery earth lead and close the bonnet.

0200G

INERTIA SWITCH

RENEW 18.30.35

The inertia switch (Fig 1) is secured to the bulkhead, forward of the **'A'** post fuseblock on the driver side. It is a gravity actuated safety device which de-energises the ignition 'on' relay, inhibits fuel pump operation and activates the central locking system to open all door locks and close both the luggage compartment and fuel filler locks should the vehicle be subjected to heavy impact force.

Note: The luggage compartment will not unlock if it was previously locked in the 'manual position'.

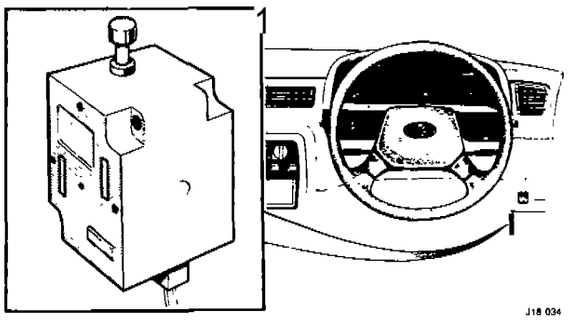


Fig 1

Resetting

Reset the inertia switch by depressing the plunger located on the upper surface of the switch housing.
Open the bonnet and disconnect the battery earth lead.
Open the drivers door.
Remove the screws securing the **'A'** post fuseblock cover and remove the cover.
Disconnect the inertia switch connector (white), remove the inertia switch assembly securing screws and remove the assembly complete with bracket to a work bench.
Remove the screws securing the inertia switch to the bracket and remove the switch from the bracket.
Fit the new inertia switch to the bracket and tighten the screws.
Connect the inertia switch connector (white), fit the inertia switch assembly to the bulkhead and tighten the screws.
Fit the **'A'** post fuseblock cover and close the drivers door.
Connect the battery earth lead and close the bonnet.

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IDLE SPEED CONTROL ACTUATOR - NON CRUISE/CRUISE CONTROL VEHICLES

RENEW **18.30.41**

The idle speed control actuator (Fig 1) is attached to the inlet manifold and contains a stepper motor driven valve which permits intake air to bypass the throttle butterfly valve. The volume of air passed by tha actuator is controlled by the ECU so that correct idle speeds are maintained irrespective of engine temperature and load.

Open the bonnet and disconnect the battery earth lead.
Disconnect the idle speed actuator multi-plug.
Unscrew and remove the two bolts securing the actuator to the actuator housing (1 Fig 1).
Remove the actuator and remove then discard the gasket.

Fitting a new control actuator is the reversal of the removal procedure.
Ensure a new gasket is fitted.

Note: After fitting a new actuator, the base idle speed MUST be set.

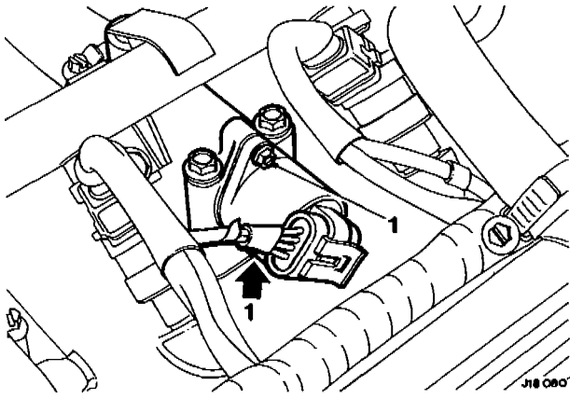


Fig 1

INTAKE ELBOW TO THROTTLE HOSE

RENEW 18.40.14

Open the bonnet and disconnect the battery,, earth lead.
Unclip the air cleaner cover and remove the cover complete with element from the backplate.
Remove the nuts securing the air cleaner backplate to the inner wing valance.
Release the clips securing the air cleaner backplate to the air flowmeter and reposition the backplate for access (1 Fig 1).
Release the air flowmeter to intake elbow hose clip (2 Fig 1).
Remove the screw securing the air flowmeter earth lead and disconnect the earth lead.
Disconnect the air flowmeter connector (black) and remove the air flowmeter (3 Fig 1).
Release the intake elbow to idle speed control valve hose clip and disconnect the hose from the **elbow** (4 Fig 1).
Release the intake elbow to filler tube hose clip and disconnect the hose from the elbow (5 **Fig 1**).
Release and remove the **elbow** mounting securing nut (6 Fig 1).
Release the elbow to throttle housing hose clip and remove the elbow from the hose.
Release the throttle housing hose clip and remove the hose from the housing.
remove the clips from the hose and discard the hose (7 fig 1).
Fit the hose clips to the new elbow to throttle hose, fit the hose to the throttle housing and tighten the hose clip.
Fit the elbow to the throttle housing hose and tighten the hose clip.
Secure the elbow to the inner wing valance and tighten the retaining nut.
Fit the filler tube hose to the elbow and tighten the hose clip,
Fit the throttle housing hose to the elbow and tighten the hose clip.
Connect the air flowmeter connector (black) to the air flowmeter.
Connect the air flowmeter earth lead.
Fit the air flowmeter to the intake elbow hose and tighten the hose clip.
Fit the air cleaner backplate to the air flowmeter and engage the securing clips.
Secure the air cleaner backplate to the inner 'wing valance and tighten the securing nuts.
Fit the air cleaner element to the cover and fit the assembly to the backplate.
Secure the cover with the clips.
Connect the battery earth lead and close the bonnet.

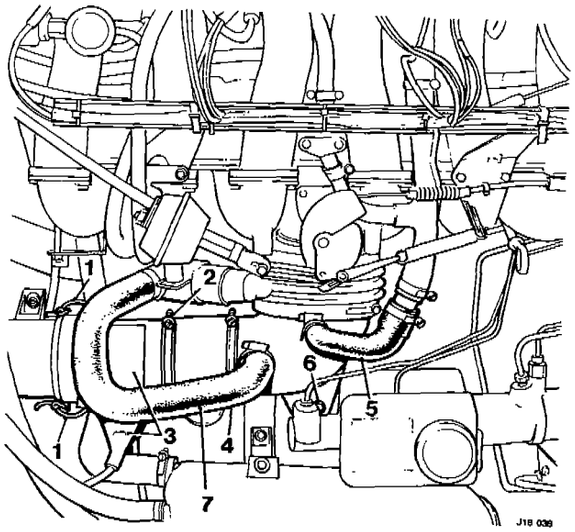


Fig 1

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INTAKE ELBOW

RENEW 18.40.13

Open the bonnet and disconnect the battery earth lead.
Unclip the air cleaner cover and remove the cover complete with element from the backplate.
Remove the nuts securing the air cleaner backplate to the inner wing valance.
Release the clips securing the air cleaner backplate to the air flowmeter and reposition the backplate for access (1 Fig 1).
Release the air flowmeter to intake elbow hose clip (2 Fig 1).
Remove the screw securing the air flowmeter earth lead and disconnect the earth lead.
Disconnect the air flowmeter connector (black) and remove the air flowmeter (3 Fig 1).
Release the intake elbow to idle speed control valve hose clip and disconnect the hose from the elbow (4 Fig 1).
Release the intake elbow to filler tube hose clip and disconnect the hose from the elbow (5 Fig 1).
Release and remove the elbow mounting securing nut (6 Fig 1).
Release the elbow to throttle housing hose clip and remove the elbow from the hose (7 Fig 1).
Release the elbow to air flowmeter hose clip and remove the hose from the elbow.
Fit the air flowmeter hose to the new elbow and tighten the hose clip.
Fit the elbow to the throttle housing hose and tighten the hose clip.
Secure the elbow to the inner wing valance and tighten the retaining nut.
Fit the filler tube hose to the elbow and tighten the hose clip.
Fit the throttle housing hose to the elbow and tighten the hose clip.
Connect the air flowmeter connector (black) to the air flowmeter.
Connect the air flowmeter earth lead.
Fit the air flowmeter to the intake elbow hose and tighten the hose clip.
Fit the air cleaner backplate to the air flowmeter and engage the securing clips.
Secure the air cleaner backplate to the inner wing valance and tighten the securing nuts.
Fit the air cleaner element to the cover and fit the assembly to the backplate.
Secure the cover with the clips.
Connect the battery earth lead and close the bonnet,

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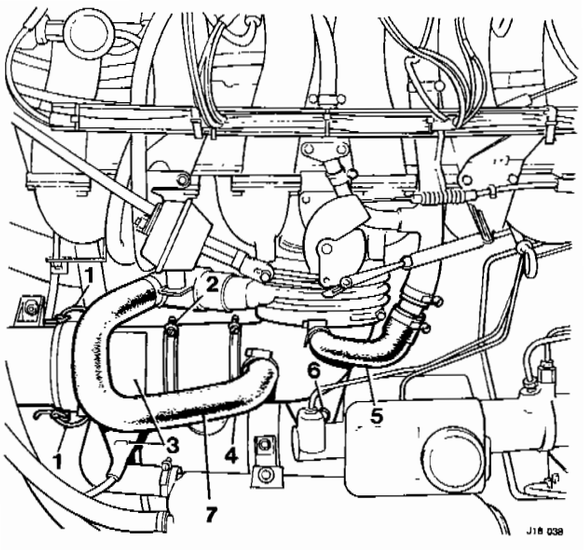
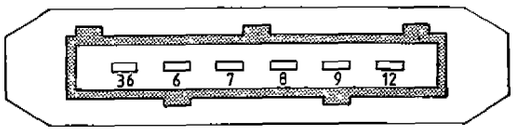


Fig 1

AIR FLOW SENSOR

DIAGNOSTIC CHECK 18.00.00

Disconnect the airmeter plug (Fig 1). Connect pin 36 to the negative side of a suitable power supply and pin 9 to the positive side.
Set the power supply to 14V.
Connect pin 6 to the negative side and select a suitable voltage range, say 0-10V.



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Fig 1

TEST 1: (Airmeter stationary, ie. no air flowing through it, and preferably with the inlet and outlet ports covered).

VOLTMETER READING	DIAGNOSIS
0.4V +- 0.2V	OK
OV	Output open circuit
Voltage greater than 0.7V	Output drifted, module inoperative, hot or cold sensor has become detached from the goal posts.

TEST 2. (Carried out by blowing one hard blast through the air meter [in the direction of air flow] thus causing the volt meter to rise and fall).

VOLTMETER READING	DIAGNOSIS
Raise to 1.5V, then fall back to test 1 voltage	OK
OV	Output open circuit
Same voltage as in Test 1	Module inoperative hot or cold wire detached
Rise to greater than 5V	Module inoperative, caliberation drifted

Disconnect the voltmeter and power supply.
Reconnect the airmeter plug.

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BASE IDLE SPEED

SETTING **18.00.00**

Note: This should be set using J.D.S Equipment, however should this not be available then the manual method described below may be used. When using the manual method, ensure the manual instructions are adhered to as the two procedures are not the same.

Run the engine until it reaches normal operating temperature (more than 85°C).
Switch the ignition off.
Switch the ignition on, wait 5 seconds and then disconnect connector L156 to the idle speed controller.
Switch the ignition off.
Wait 15 seconds then reconnect the idle speed controller.
Repeat the above operations twice, on the last occasion do not reconnect the idle speed controller.
Start the engine.
Check the base idle speed this should be between approximately 550 rpm and 600 rpm. If the idle speed is not within these limits then adjust the air bypass screw to bring the idle speed within limits.
Switch the ignition off and reconnect the idle speed controller.
Start the engine and check to ensure that the idle speed is between 650 rpm and 800 rprn.

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1991 MODEL YEAR MODIFICATIONS

The following are the areas of the engine management system which have received modifications with the introduction of the revised model range for 1991 model year.

Refer throughout Section 18.2 for details of components and service procedures.

IDLE SPEED CONTROL ACTUATOR

Following termination of the ignition from idle speed the stepper motor valve of the idle speed controller references to the closed position before moving to the mid-travel position.
The valve restores to the mid-travel position from an open position in the 1990 MY condition.

DIAGNOSTIC SYSTEM

To prevent the 'Check Engine' warning light illuminating if the vehicle has run out of fuel the fault detection system is inhibited when the fuel level falls below quarter tank full.

ELECTRONIC CONTROL UNIT (ECU)

The electronic control unit fitted to 1991 MY vehicles has software modifications which introduce low fuel sensing and extra fuel on sharp acceleration.

FUEL PUMP RELAY

The fuel pump relay has been relocated to the engine compartment LHS.

RENEW **18.30.30**

Open the bonnet and disconnect the battery earth lead.
Identify the fuel pump relay mounted adjacent to the brake pedal box.
Displace the relay cover and remove the relay from the base connector (yellow).
Fit the new relay to the base connector and replace the relay cover.
Reconnect the battery earth lead and close the bonnet.

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ENGINE MANAGEMENT - 4.0

1991 MODEL YEAR

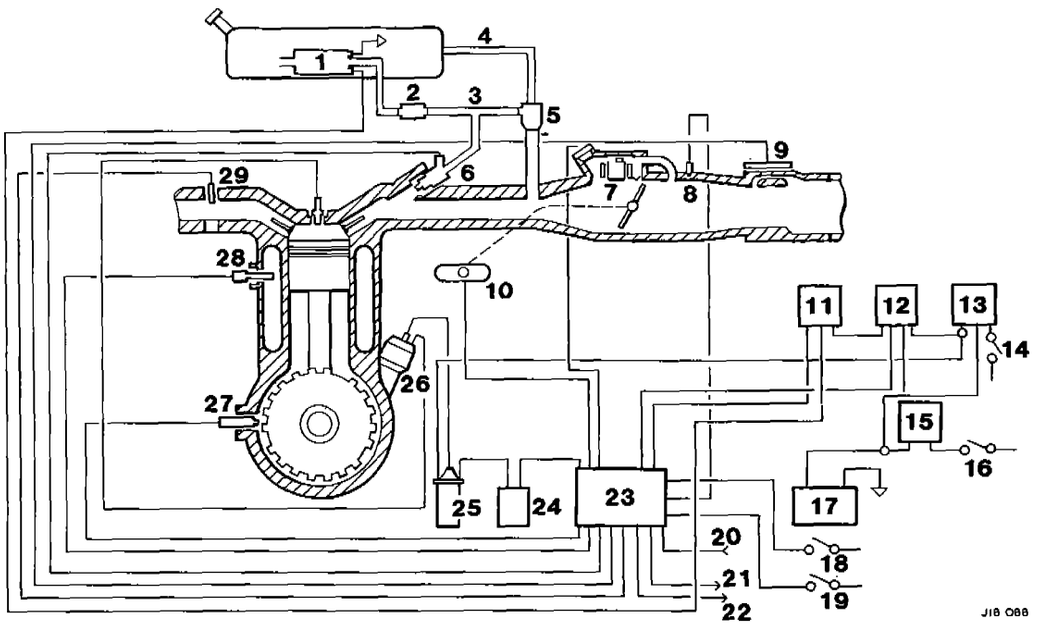


Fig 1 Engine management system

Key to **Illustration**

1. Pump
2. Filter
3. Fuel rail
4. Fuel return
5. Pressure regulator
6. Injector
7. Idle speed control actuator
8. Air thermistor
9. Airflow meter
10. Throttle potentiometer
11. Fuel pump relay
12. Main relay
13. Ignition 'on' relay
14. Inertia switch
15. Start relay
16. Start switch
17. Battery
18. Gearbox sensor (auto only)
19. Air conditioning clutch sensor
20. Idle override
21. Vehicle conditiori monitor VCM1
22. Vehicle condition monitor CM2
23. Electronic control unit ECU
24. Ignition amplifier
25. Ignition coil
26. H.T. distributor
27. Crankshaft sensor
28. Coolant temperature sensor
29. **Lambda** (oxygen) sensor

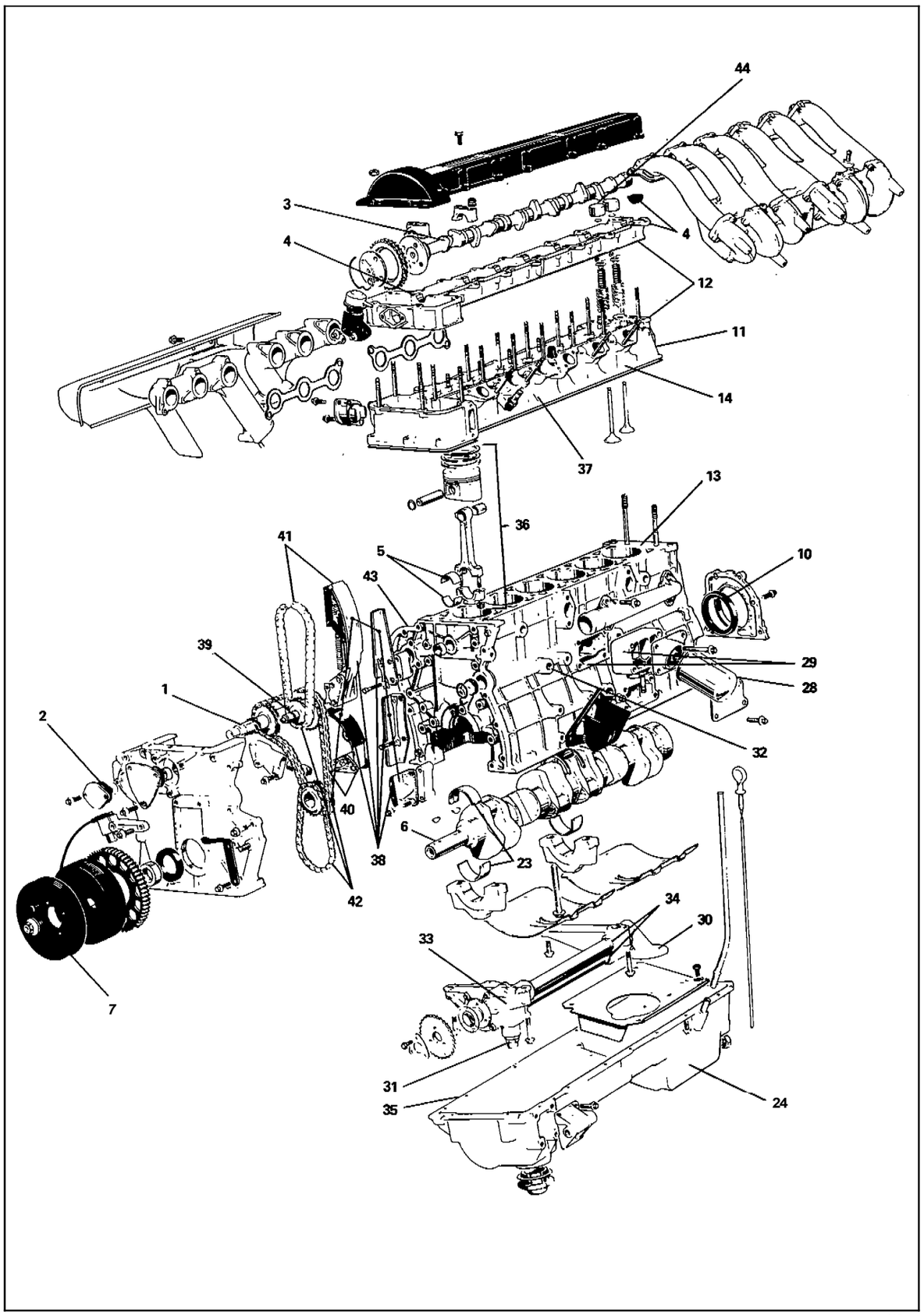
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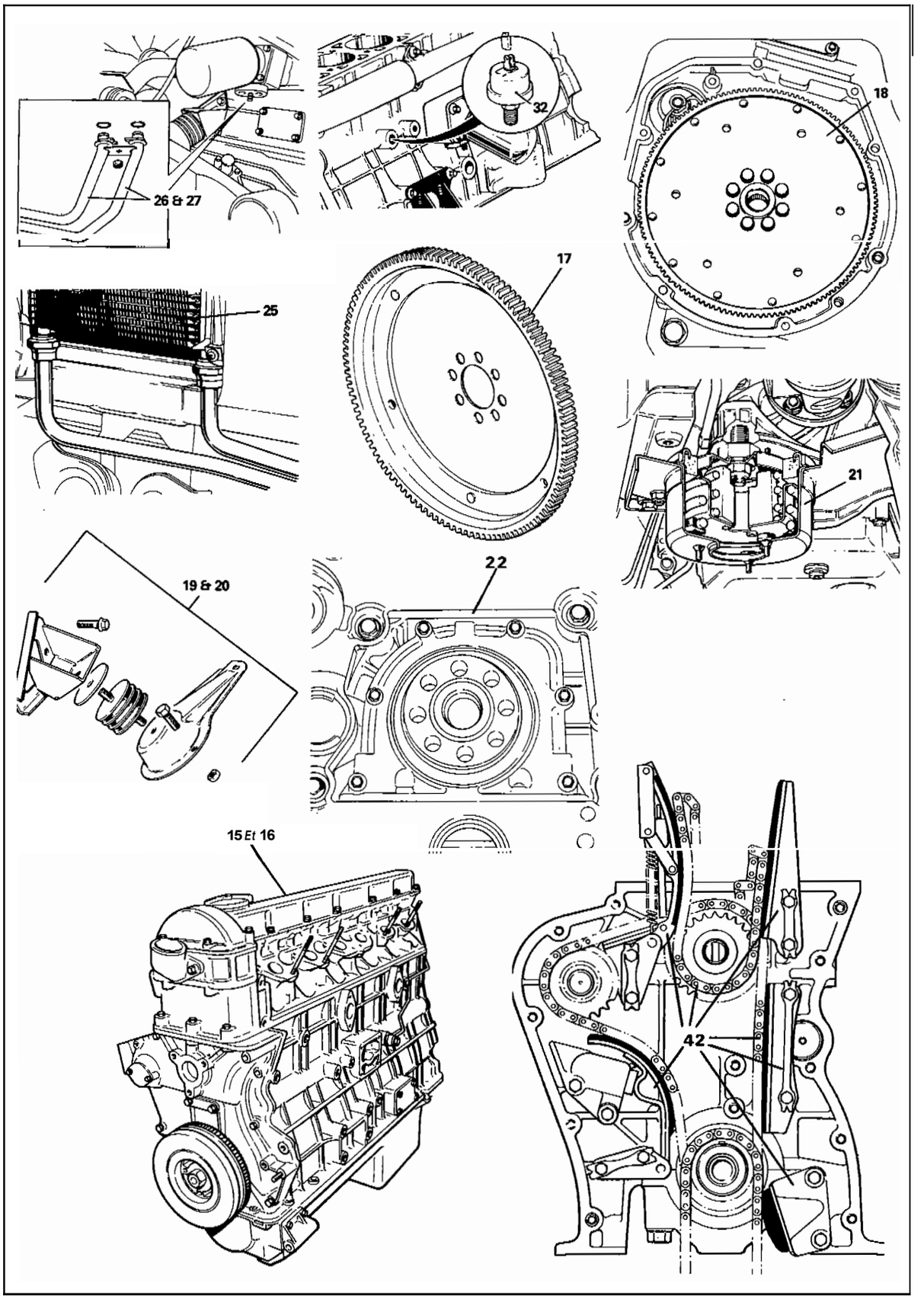
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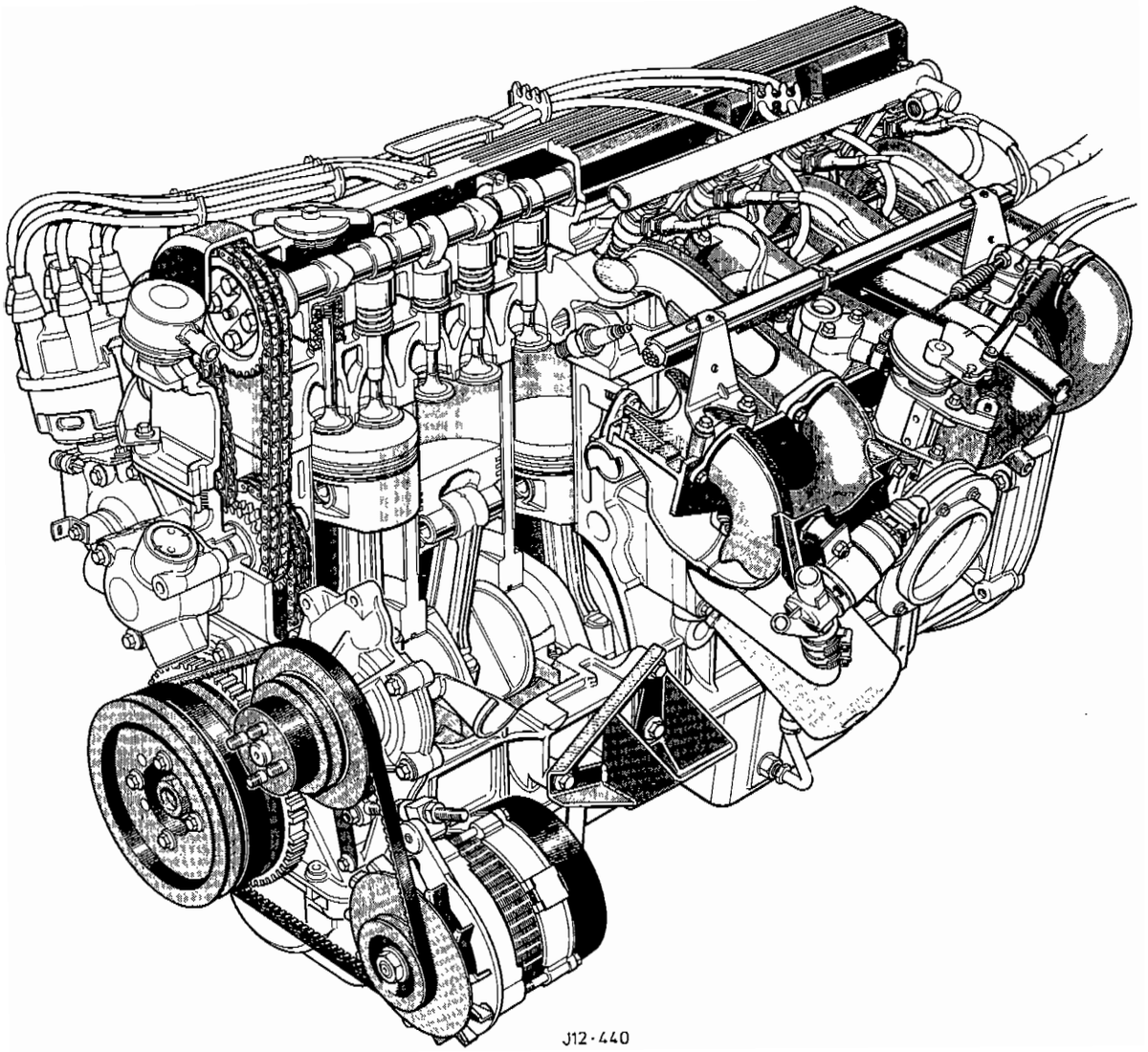
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J12·440

GENERAL DESCRIPTION 12.00.00

CONSTRUCTION

The deep-skirted design crankcase is manufactured in cast aluminium alloy with shrink fit cast iron cylinder liners.
The crankshaft is manufactured from SG cast iron and is nitro-carburise treated to give a very high quality finish on the bearing surfaces and increase the life of the journals. The crankshaft is supported by seven iron main bearing caps. Main bearings are of a lead bronze alloy on split steel-backed shells with a lead indium overlay.

Crankshaft end float is controlled by half thrust washers fitted on each side of the centre main bearing journal.
The connecting rods are manufactured from manganese molybdenum steel, forged in an 'H' section. The small end bushes are lead bronze with steel backing, machined to size after being pressed into the connecting rods.
The big end bearings are of a lead bronze alloy on split steel-backed shells with a lead indium overlay.

The pistons are die-cast aluminium alloy. Each piston has three rings; a barrel-faced chrome plated compression ring, an externally stepped taper-faced secondary ring, and a spring-assisted micro land oil control ring.
The pistons are internally strutted for thermal control and run on hardened steel gudgeon pins offset from the centre line of the piston towards the thrust face.

The cylinder head is cast from aluminium alloy and features May high efficiency combustion chambers.
The cast iron camshaft runs directly in the cylinder head and is retained by machined aluminium caps. The camshaft uses chilled cams to drive two valves per cylinder (one inlet, one exhaust) via chilled cast iron bucket tappets with shim adjustment. Control of each of the valves is provided by double valve springs.

The camshaft is operated by a two stage 'duplex' chain drive from the crankshaft. The primary stage is controlled by a hydraulic tensioner, and the secondary stage by a spring tensioner. Each stage operates through a pivoted rubber-faced curved tensioner blade and a static tubber-faced flat blade damper.
The first stage incorporates a three point drive via the crankshaft, intermediate shaft and auxiliary shaft.

The intermediate shaft is 'live' and provides a 0.75x crankspeed drive through the timing cover, driving the Brake Power Boost hydraulic pump.

The 'live' auxiliary shaft is driven at crankshaft speed and is situated on the RH side of the engine (looking from the rear). In addition to driving the distributor via a set of 2 1 reduction spiral gears, it provides an external drive for the power assisted steering pump
The second stage is a two point drive via the intermediate shaft and the camshaft. The 2:1 reduction ratio from crankspeed is achieved by the combined ratio of the intermediate and camshaft sprockets sizes.

At the rear of the crankshaft is a lip-type oil seal providing a high degree of oil retention, the use of higher engine speed, and easier serviceability.

LUBRICATION SYSTEM

The oil pump is a rotor-type mounted on the underside of the front of the crankcase and driven by a 'simplex' chain from the crankshaft nose. The pump incorporates a built-in pressure relief valve which is accessible via a plug at the front of the sump.

Below the line of the crankcase are two windage trays, which prevent oil being sucked up and thrown into the crankcase causing windage and power loss.
Above the sump oil level is a sump tray and baffle assembly to prevent oil surge.
Oil is drawn from the sump via a gauze filter. Pressurised oil is regulated by a relief valve, then fed via internal galleries on the LH side of the cylinder block,

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An adaptor block is fitted between the cylinder block and the oil filter housing which diverts the full oil flow through the oil cooler prior to filtering.

A balance valve is fitted which bypasses the oil cooler circuit when a pressure differential of 10 to 15 pounds per square inch occurs.
Pressurised and filtered oil is fed into the main gallery. the seven main bearings, and the big end bearings via crankshaft drillings.

The intermediate shaft, auxiliary shaft and camshaft bearings are pressure lubricated by means of internal drillings directly fed from the front of the main oil gallery.

NOTE: Oil coolers are specified on all models to date. If, however, the oil cooler is not required, then the oil cooler adaptor can be removed and the filter housing bolted directly to the cylinder block.

SPS JOINT CONTROL SYSTEM

A feature of the engine is the adoption of the SPS joint control system on the cylinder head bolts. This system ensures that the joints receive maximum clamp loading for a given fixing size and type of material by tightening the fixing to its particular yield point. This greatly helps to prevent premature cylinder head gasket failures.

Apart from the cylinder head, manifolds and throttle body, the engine is gasketless. The use of a rubber sealing material on all other joints ensures a leak-free engine.

NOTE: The SPS system in service requires the fixing to be set to a specific torque initially; it must then be rotated through 90 degrees + 10 degrees.. The accuracy of this cannot be too highly stressed.
To obtain the correct setting, use Special Tool LST 122, or self-manufacture a tool using the dimensions illustrated, right.

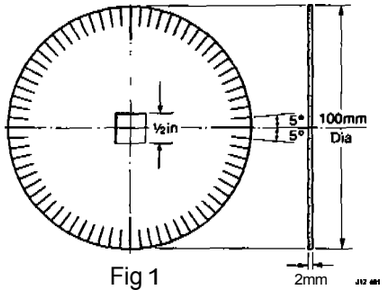


Fig 1

CRANKCASE BREATHER

Blowby gases are recycled via the induction system to maintain a crankcase depression and so prevent their escape to the atmosphere.
The induction system takes the blow-gases from a breather at the front of the camshaft cover to an oil separation tank which feeds to the air intake elbow. Separated oil drains into the sump.
A water heated breather restrictor is connected to the inlet manifold plenum chamber, and controls crankcase depression at closed throttle.

CYLINDER HEAD DESIGN
The central feature of the May high efficiency combustion chamber is its effective use and good control of the fuel/air mixture. The combustion chamber consists of two 'zones:' the first is a small depression beneath the inlet valve, from which a narrow guide channel leads to a second, larger chamber beneath the exhaust valve.

On compression stroke, the mixture is compressed in the inlet valve 'zone' and swirled along the guide channel to the combustion chamber, where it is ignited. The high compression ratio and the swirling action of the mixture as it enters the combustion zone produce a strong turbulence and 'squish' effect; this in turn gives a more thorough fuel/air mixing and controlled, even burning.

COOLANT **SYSTEM**

The engine is liquid-cooled by a mixture of water and anti-freeze circulating around the coolant passages. The coolant **pump** is mounted on the LH side of the cylinder **block** and is driven from the crankshaft nose by a three point belt drive (which includes the alternator).

The pump is **a fully** assembled bolt-on unit. The coolant is fed into the cylinder block at two places via an external delivery **pipe.** The coolant is drawn from the cylinder head via a **self** contained thermostat housing back to the radiator or recirculated according to the thermostat position.

SEALANTS

The sealant used on **all** gasketless joints on this engine must be the Marston compound known as Hylosil 102, a white amine cure system rubber. Should this not be available an amine cure sealant must be used. Under no circumstances should any acidtoxy cure system be used.

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SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Engine does not start (fails to rotate)	Battery leads loose or terminals corroded	Check the condition of the leads and terminals	Clean and tighten as necessary
	Battery discharged	Check condition of battery with hydrometer	Charge or replace as necessary
	Starter motor inoperative	If the lights dim when ignition switch is operated, the starter may be jammed in the starter ring	Remove starter motor, free off pinion and refit
		Check for loose and dirty connections *to* the starter motor	
Engine rotates but will not fire	Starter motor speed too low	Check battery leads and terminals	Tighten and clean leads as necessary
		Check the state of the battery charge	Charge battery or fit replacement
	Faulty ignition system	Using plug lead pliers, hold the plug lead approx. 16 mm from the cylinder head and crank the engine, check that a good blue spark jumps the gap between the end of the plug lead and the cylinder head	If no spark, a yellow or white spark is evident, check the ignition system
		Remove the spark plugs	Clean and re-gap the spark plugs, replace if worn out
	Fuel system defect	Check the injectors are 'clicking'. Check the fuel pressure. Check the voltage at the fuel pump.	Refer to Fuel Injection and Engine Management sections
Overheating	Thermostat stuck closed	Remove thermostat and carry out boiling water check	Change thermostat
	Faulty gauge	Check with equipment	Fit new gauge
	Faulty transmitter	If other equipment in circuit OK fit new transmitter	fit new transmitter
	Radiator blocked	Check for uneven heat in radiator i.e. hot and cold spots plus water emission from overflow pipe	Flush or change radiator
	Too high concentration of anti-freeze	Remove the heater tank cap and check concentration with a hydrometer	Drain coolant and fill with correct concentration
	Fan belt slack	Check tension	Drain coolant and fill with correct concentration
	Fan belt broken	Open bonnet and check visually	Fit new belt
	Water pump seized	Remove drive belt and turn pulley	Change water pump
	Insufficient coolant	Remove header tank cap and check coolant level visually	Top-up coolant

SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Overheating	Incorrect ignition timing	Check ignition timing	See Engine Management
	Fuel/air mixture too weak	Check CO/HC levels	See Engine Management
	Incorrect thermostat	Remove thermostat and visually check temperature reading	Change thermostat
	Collapsed hoses	Start engine, run until normal temperature is attained and visually check the hoses for collapsing	Fit new hoses
	Cylinder head gasket leaking	Remove head tank cap, fill tank with water. Run engine until hot rev engine and return to idle; check for bubbles in water	Change head gasket
	Incorrect valve timing	Check valve timing	Reset valve timing
	Radiator cap spring weak	Fit cap to pressure testing equipment and check spring release pressure	Fit new cap
Overheating at tick-over	Viscous fan free wheeling	Run engine and visually check	Fit new viscous coupling that large fan is turning
Too cold	Thermostat stuck open	Remove thermostat	Fit new thermostat
	Auxiliary fan remains operational	Check relay circuit Check radiator fan thermostat Check diode	Fit new relay Fit new fan thermostat Fit new diode
	Faulty indicator	Check with equipment	Change indicator
	Faulty transmitter	If all other equipment OK, fit new transmitter	Fit new transmitter
	Thermostat missing	Remove thermostat housing	Fit new thermostat
	Wrong temperature rated thermostat	Remove thermostat housing and visually check rate	Fit correct thermostat
Insufficient oil pressure	Oil requires changing	Dip oil, check colour and viscosity	Change oil
	Worn crankshaft journals	Listen for rumble or knock	Change crankshaft
	Excessive crankshaft endfloat	Fit dial gauge and measure	Remove sump and fit oversize thrust washers.
	Worn main bearing shells	Listen for rumble	Check crankshaft journals for wear and fit new shells
	Worn oil pump	Remove oil pump and check the clearances	Fit new oil pump
	Oil pressure relief valve spring too weak	Remove spring and check spring rates	Fit new spring
	Insufficient oil in sump	Dip oil	Top-up required
	Faulty gauge	Check gauge with equipment	Fit new gauge

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SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Insufficient oil pressure	Engine overheating	–	See overheating fault finding
	Wrong specification oil (too thin)	Dip oil and check viscosity	Change oil and filter
	Water in oil	Dip oil and check if oil is a milky white colour	Change oil and check for blown head gasket
	Cracked oil pump housing	Remove sump and check visually	Change the pump
	Blocked oil picked-up pipe strainer	Remove sump and check visually	Remove oil pick-up and clean strainer
	Oil pump pipe 'O' rings	Remove sump and pipes and check	Fit new 'O' rings
	Main oil gallery seals leaking or gallery blocked	Eliminate other possible causes	Fit new 'O' rings or clear oil gallery
Oil pressure too high	Relief valve stuck shut	Remove valve and check for sticking	Clean or replace the valve
	Wrong pressure relief valve	Remove spring and check the rate	Fit new spring
	Incorrect grade engine oil	–	Drain engine oil and fill with correct oil
	Gauge or transmitter fault	Check gauge, if O.K. fit new transmitter	Fit new gauge or transmitter
	Engine temperature too low	Check operation of the thermostat (stuck open) or oil cooler valve stuck open	Fit new thermostat or valve
Burning oil	Worn cylinder bores	Check wear with a comparitor	Rebore cylinders as necessary
	Worn valve guides	Insert valve in guide and check side movement	Change valve guides as necessary
	Worn inlet valve seals	Remove seals and check for splits or wear	Replace in sets
	Worn piston rings	Measure rings in bore	Replace rings in sets and rebore as necessary
	Leaking cylinder head gasket	Check for blue smoke from exhaust	Replace head gasket
	Engine oil wrong specification	–	Drain oil and refill with correct viscosity oil
Losing oil (leaking)	Worn front oil seal	Wipe clean, run engine and visually check	Fit new seal
	Worn rear oil seal	Wipe belt housing clean, run engine and visually clean	Remove gearbox and fit new seal
	Leaking gaskets	Visual	Change gasket or reseal
	Cylinder block cracked	Visual	Change cylinder block

SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Excessive noise from valve gear	Excessive valve clearance	Check valve clearances	Adjust valve clearances
	Broken valve spring(s)	Remove valves and check springs	Replace as necessary
	Broken valve guide	Remove valves and check guides	Replace as necessary
	Broken valve seat insert	Remove valves and check inserts	Replace as necessary
	Lack of lubrication	Check oil pressure	See insufficient oil pressure fault finding
	Valve clash	Check valve timing	Adjust valve timing
	Worn camshafts	Valve clearances and lack of lubrication	Adjust valve clearances – see insufficient oil pressure
	Worn camshaft drive chains/tensioners	Remove front timing cover and check for wear	Replace as necessary
Noisy Chains	Low oil pressure	Take reading from gauge. when engine is hot	See insufficient oil pressure
	Tensioners not released	Remove camcover and check tension of chain (top chain). Remove timing cover to check bottom chain tension	Insert 3 mm Allen key and turn tensioner anti-clockwise, compress tensioner to release bottom chain
	Chains worn	Check visually/remove and check for wear	Replace as necessary
	Sprockets worn	Check visually	Replace as necessary
	Tensioner worn	Check visually	Replace as necessary
Detonation knock (pinking)	Ignition timing too far advanced	Check ignition timing	See Engine Management
	Head gasket blown	Dip engine oil and check for ingress of water. Remove header tank cap, rev engine and check for bubbles in water	Change head gasket
	Thermostat stuck (shut and overheating)	Remove thermostat and carry out boiling water test	Fit new thermostat
	Mixture too weak	Check with CO/HC meter	See Engine Management
	No water in engine/ radiator	Remove header tank cap and check water level	Fill with water
	Engine running too hot	–	See overheating fault finding
	Valve timing incorrect	Check valve timing	Adjust valve timing
	Incorrect octane fuel	If all other checks OK, this could be the cause	Fill with correct octane fuel

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SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Loss of power	Burned valves	Check compressions	Remove cylinder head and change valves
	Sticky valves	Check compressions	Remove cylinder head and replace valves/guides or springs
	Poor engine tune	Check engine tune	Adjust as necessary
	Insufficient valve clearance	Check valve clearance	Adjust as necessary
Loss of power	Fuel injection fault	Refer to fuel injection section	
	Low compression in cylinders	Check compressions	Rebore he-ring as necessary
	Ignition fault	Refer to electrical section	
	Camshaft timing incorrect	Check camshaft timing	Adjust camshaft timing
	Incorrect grade fuel	–	Drain fuel and refill with correct octane
	Partial seizure of engine	Remove spark plugs and rotate	Overhaul engine as necessary
	Worn camshaft	Remove camshaft and check for wear	Replace camshaft
Rough running normal engine speed (less than 6 cylinders)	Sticking valves	Check compressions	Change valve, springs or guides
	Broken valve springs	Check compressions	Change valve springs and check for bent valves
	Piston fault	Check compressions	Change pistons
	Head gasket blown	Check compressions and water level	Change head gasket
	Valve burned out	Check compressions	Renew valve
	Valve seat burned out	Check compressions	Cut or change valve seat
	Ignition fault	Refer to electrical section	
	Fuel injection fault	Refer to fuel injection section	
	Air leaking into inlet manifold	Run engine and listen for whistling, spray 'easy start' around suspect area. If engine speed increases, confirmed	Change gasket or manifold
	Blowing exhaust	Run engine and check for leaks	Repair leak or change exhaust

SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Rough idle	Valve timing incorrect	Check camshaft timing	Adjust camshaft timing
	Incorrect ignition timing	Check ignition timing	See Engine Management
	Valve clearances insufficient	Check valve clearances	Adjust valve clearances
	Valve burned out	Check compressions	Change valve
	Ignition fault	Refer to electrical section	
	Fuel injection fault	Refer to fuel ignition section	
Engine backfires	Air leakage into/from the exhaust system	Check for leaks or blows in the system	Repair leaks or replace system if necessary
	Leakage past valves and guides	Check reading of exhaust gases and also check for crankcase fumes	Remove the cylinder head and overhaul
	Ignition timing retarded	Check ignition timing	See Engine Management
	Incorrect valve timing	Check camshaft timing	Adjust camshaft timing
	Valves sticking open	Check valve clearances	Adjust valve clearances
		Check for wear or gum in valve guides	Replace guides or decarbonise the cylinder head
		Check for poor seating of valves	Overhaul the cylinder head
Engine spits back into air box	Excessively weak mixture	Check CO reading of gases leaving the exhaust pipe	See Engine Management
	Air leaking into induction manifold	Check for leaks/whistling, spray 'easy start' around suspect area, the engine speed will increase should an air leak be present	Renew intake tube or gasket
Engine fails to die	Incorrect ignition timing	Check ignition timing	Adjust ignition timing
	Valve clearances insufficient	Check clearance	Adjust clearances
	Faulty cylinder head gasket	Check for leaks into the oil and water	Replace the gasket
	Exhaust system blocked	Check for restrictions	Remove the restrictions or replace components as necessary

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CAMSHAFT

RENEW 12.13.01

Remove the camshaft cover securing nuts and bolts (1,2 Fig 1), and remove the cover.
Remove and discard the gasket and half moon seal.
Set No. 1 cylinder at TDC using Service Tool C3993 (Fig 2).
Remove the bolts (5 Fig 3) securing the reaction shoe (6 Fig 3) to the cylinder head, remove the shoe and discard the gasket.
Using service tool JD 101 (1 Fig 3) release the upper timing chain tensioner.
Push back the lock tabs from the camshaft sprocket securing bolts (2 Fig 3).
Remove the bolts and tab washers. Remove the sprocket and chain (3 Fig 3).

Gradually remove the nuts (1 Fig 4) securing the camshaft caps.
NOTE: Slacken each nut two turns at a time to gradually release the load on the camshaft.
Note the position of the caps (2 Fig 4) relative to the cylinder head and remove.
Remove the camshaft (3 Fig 4).
Oil the camshaft journals.
Place the replacement camshaft in the cylinder head with the slot for the timing gauge facing upwards.
Re-oil the camshaft journals and fit the bearing caps back in their respective positions.
Fit the nuts and gradually tighten each nut of each camshaft cap two turns at a time until all the caps are fully secured and torqued tightened.

Rotate the engine as necessary to measure the valve clearances between the heel of the camshaft and the cam followers (Fig 1 page 17).
The correct clearance is 0.012 to 0.014 in.
Should the clearances by incorrect, remove the camshaft and cam followers (Fig 2 page 17).
Remove all the shims, or only those requiring adjustment, check the size of the existing shims with a micrometer and note the reading. Calculate the size of the shim required following the examples in DATA.

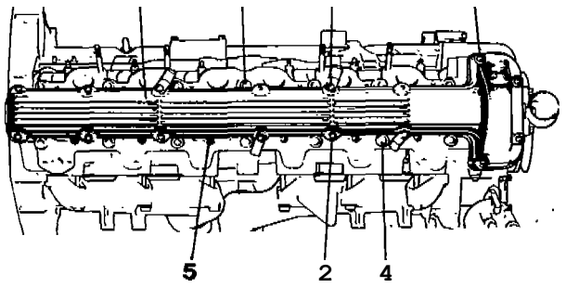


Fig 1

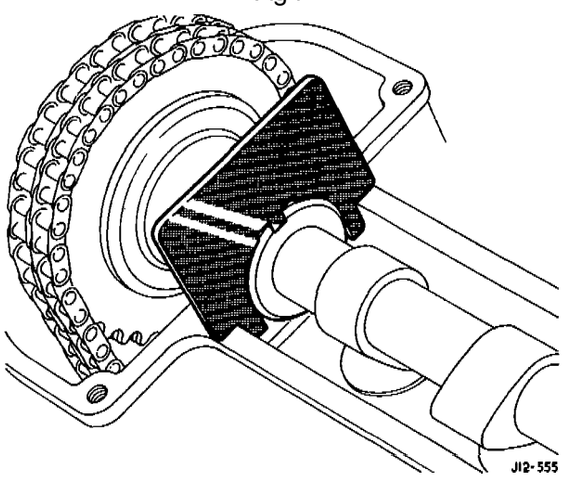


Fig 2

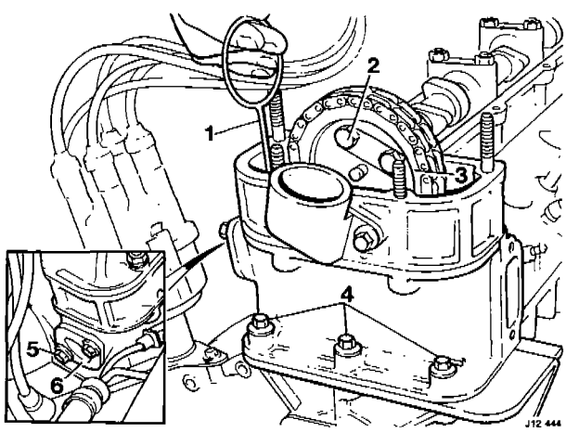


Fig 3

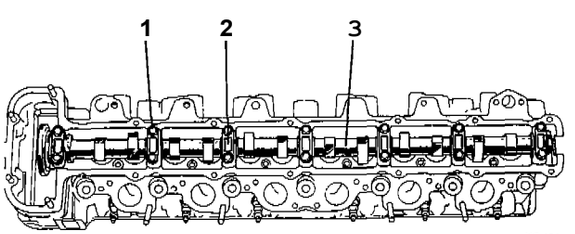


Fig 4

DATA

VALVE CLEARANCES:

Inlet	**0.012-0.01**4in
Exhaust	0.012-0.014in

EXCESSIVE CLEARANCE	INCHES
Size **of** existing shim	0.100
Plus the actual clearance noted	0.019
	= 0.119
Less the specified clearance	0.013
Required shim size	= 0.106

INSUFFICIENT CLEARANCE	**INCHES**
Size of existing shim	0.107
Plus the actual clearance noted	0.010
	= 0.117
Less the specified clearance	0.013
Required shim size =	0.104

AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	0.086 in
C	0.087in
D	0.088 in
F	0.089in
G	0.089 in
H	0.090in
I	0.091 in
J	0.094 in
K	0.095 in
L	0.096 in
M	0.097in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

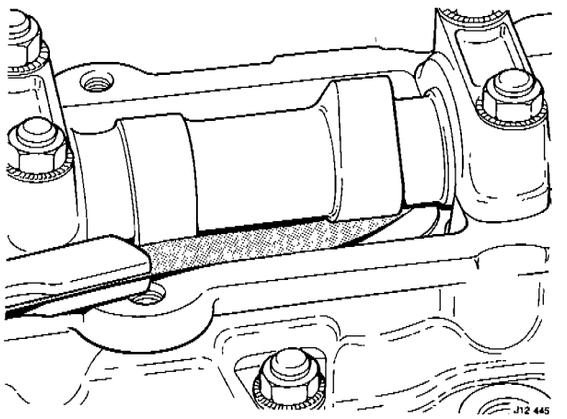


Fig 1

Refit the cam followers and camshaft.
Set the camshaft to TDC.
Position the chain over the sprocket and align the sprocket to the camshaft.
Fit the reaction shoe and release the upper tensioner.
Remove the clip securing the inner wheel and align the securing bolt holes.
Fit and tighten the securing bolts.
Clean the cam cover and cylinder head.
Apply 'Hylosil 102' to a new half moon seal and fit to the aperture in the rear of the cam carrier (Fig 3).
Fit a new gasket to the cam carrier, fit and align the camcover and fit the plug lead brackets.
Fit and tighten the cam cover securing bolts.
Refit the distributor cap and plug lead clips to the brackets. Reconnect the HT lead to the coil.

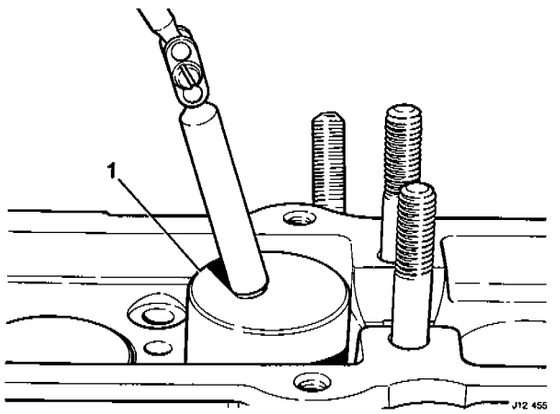


Fig 2

DATA

SERVICE TOOLS

*Camshaft timing tool **C3993***
Timing chain tension release hook JD 101

TORQUE FIGURES

*Bearing caps to camshaft carrier 11-**13.5Nm***
*Camshaft sprocket to camshaft **23-27Nm***
*Reaction shoe to cylinder head **23-27Nm***

SPANNER SIZES

10mm
13mm
9/16in AF

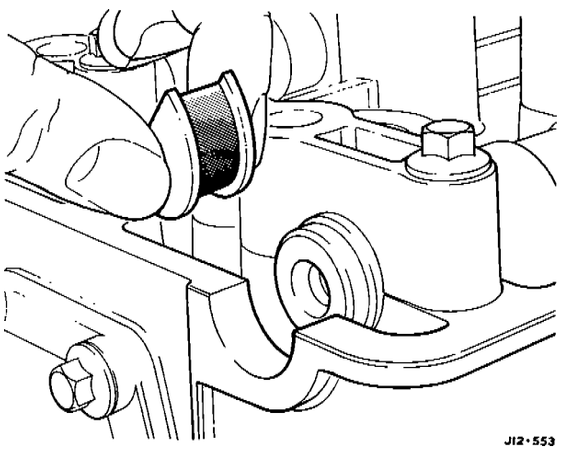


Fig 3

OILS/GREASES/SEALANTS

*Half moon seal to cam carrier **'HYLOSIL 102'***

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CAMSHAFT COVER GASKET

RENEW 12.29.39

Release the plug lead retaining clips from the camcover brackets.
Unclip the distributor cap.
Disconnect the HT lead from the coil and position the plug leads over the inlet manifold.
Remove the nuts (1 Fig 1) and bolts (2 Fig 1) securing the camcover to the cam carrier.
Remove the camcover (3 Fig 1).
Remove and discard the cam cover gasket and the half moon seal from the rear of the cylinder head.
Clean the cam cover and cylinder head.
Apply 'Hylosil 102 to the half moon seal and fit to the aperture in the rear of the cam carrier (Fig 2).
Fit a new gasket to the cam carrier, fit and align the camcover, fit the plug lead brackets and secure the assembly to the cam carrier with the nuts and bolts.
Refit the distributor cap and plug lead clips to the brackets.
Reconnect the HT lead to the coil.

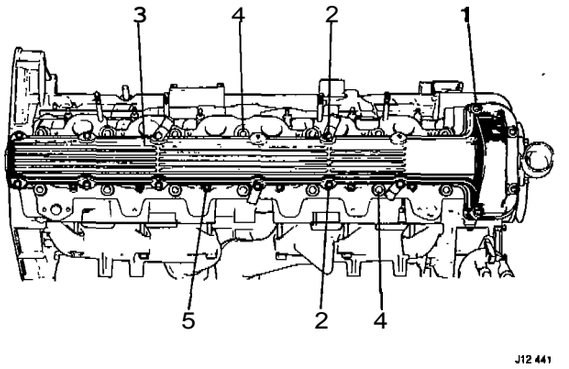


Fig 1

DATA

TORQUE FIGURES

Camshaft cover to cam carrier (nut) 23-27Nm
Camshaft cover to cam carrier (screw) 9.5-12Nm

SPANNER SIZES

8mm
13mm

OILS/GREASES/SEALANTS

Half moon seals to cam carrier 'HYLOSIL 102'

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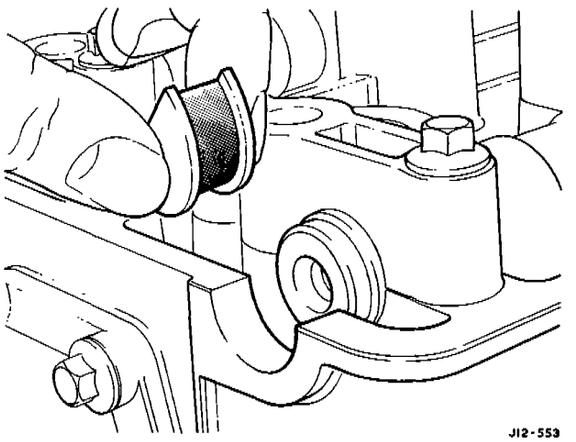


Fig 2

VALVE CLEARANCES

CHECK AND ADJUST 12.29.48

Release the plug lead retaining Clips from the camcover brackets. Unclip the distributor Cap.
Disconnect the HT lead from the coil and position the plug leads over the inlet manifold.
Remove the nuts (1 Fig 1) and bolts (2 Fig 1) securing the camcover to the cam carrier.
Remove the camshaft cover (3 Fig 1).
Rotate the engine as necessary to measure the valve clearances between the heel of the camshaft and the cam followers (Fig 2).
The correct clearance is 0.012 to 0.014 in.
Should the clearances by incorrect:
Set No. 1 cylinder at TDC using Service Tool C3993 (Fig 3).
Remove the bolts (5 Fig 4) securing the reaction shoe (6 Fig 4) to the cylinder head, remove the shoe and discard the gasket.
Using service tool JD 101 (1 Fig 4) release the upper timing chain tensioner.
Push back the lock tabs from the camshaft sprocket securing bolts (2 Fig 4).
Remove the bolts and tab washers. Remove the sprocket and chain (3 Fig 4).

Gradually remove the nuts (1 Fig 1 page 20) securing the camshaft caps.
NOTE: Slacken each nut two turns at a time to gradually release the load on the camshaft.
Note the position of the caps (2 Fig 1 page 20) relative to the cylinder head and remove.
Remove the camshaft (3 Fig 1 page 20).
Remove the cam followers (Fig 2 page 20).
Remove all the shims, or only those requiring adjustment, check the size of the existing shims with a micrometer and note the reading. Calculate the size of the shim required following the examples in DATA.

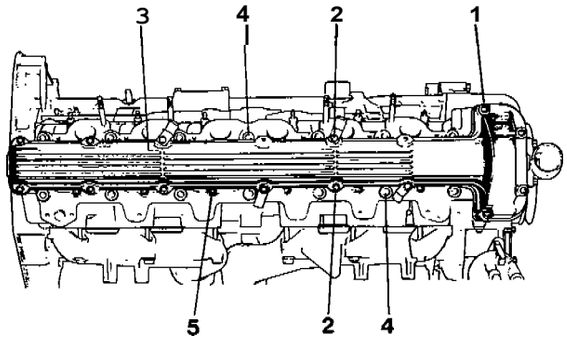


Fig 1

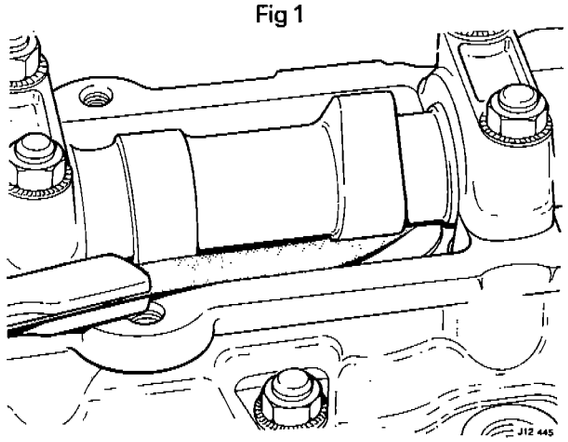


Fig 2

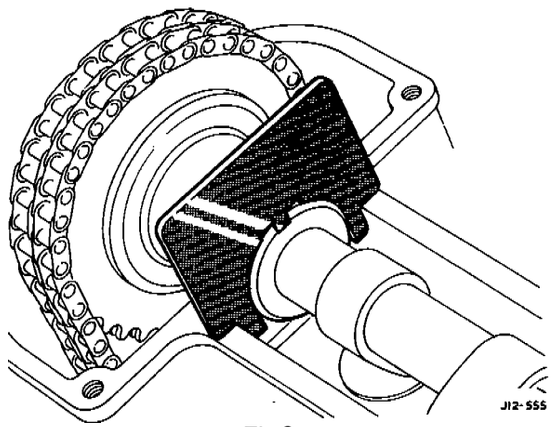
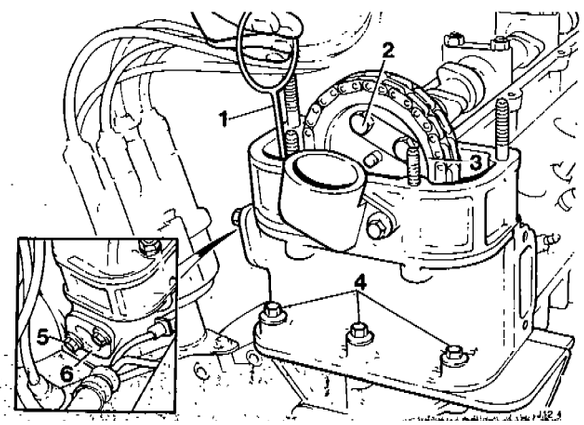


Fig 3



DATA

VALVE CLEARANCES:

Inlet	0.012-0.014in
Exhaust	0.012-0.014in

EXCESSIVE CLEARANCE	INCHES
Size of existing shim	0.100
Plus the actual clearance noted	0.019
	= 0.119
Less the specified clearance	0.013
Required shim size =	0.106

INSUFFICIENT CLEARANCE	INCHES
Size of existing shim	0.107
Plus the actual clearance noted	0.010
	= 0.117
Less the specified clearance	0.013
Required shim size =	0.104

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AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	0.086 in
C	0.087 in
D	0.088 in
F	0.089 in
G	0.089 in
H	0.090 in
I	0.091 in
J	0.094 in
K	0.095 in
L	0.096 in
M	0.097 in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

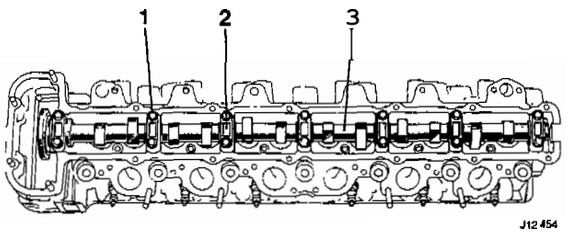


Fig 1

Place the camshaft in the cylinder head with the slot for the timing gauge facing upwards.
Oil the camshaft journals and fit the bearing caps back in their respective positions.
Fit the nuts and gradually tighten each nut of each camshaft cap two turns at a time until all the caps are fully secured and torqued tightened.
Set the camshaft to TDC.
Position the chain over the sprocket and align the sprocket to the camshaft.
Fit the reaction shoe and release the upper tensioner.
Remove the clip securing the inner wheel and align the securing bolt holes.
Fit and tighten the securing bolts.
Clean the cam cover and cylinder head.
Apply 'Hylosil 102' to the half moon seal and fit to the aperture in the rear of the cam carrier (Fig 3).
Fit a new gasket to the cam carrier, fit and align the camcover and fit the plug lead brackets.
Fit and tighten the cam cover securing bolts.
Refit the distributor cap and plug lead clips to the brackets. Reconnect the HT lead to the coil.

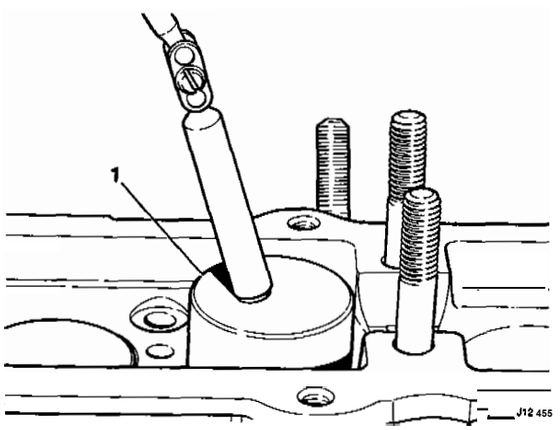


Fig 2

DATA

TORQUE FIGURES

Bearing caps to camshaft carrier 1-13.5Nm
Camshaft cover to carrier (nut) 23-27Nm
Camshaft cover to carrier (screw) 9.5-12Nm
Camshaft sprocket to camshaft 23-27Nm

SPANNER SIZES

10mm
13mm
9/16in AF

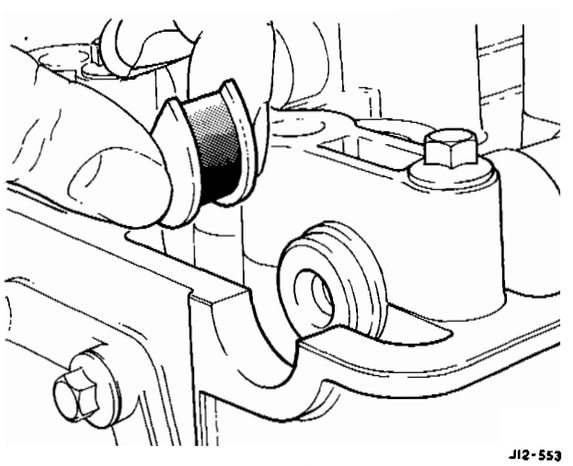


Fig 3

OILS/GREASES/SEALANTS

Half moon seal to cam carrier 'HYLOSIL 102'

CYLINDER PRESSURES

CHECK **12.25.01**

Run the engine until it reaches its normal operating temperature.
Stop the engine.
Disconnect the sparking plug leads from the sparking plugs.
Remove ALL the sparking plugs.
Fit a compression test gauge to No.1 plug hole (cylinders are numbered from the front, ie radiator end, of the engine).
Turn the ignition key to position 3 (start) and crank the engine over with the starter motor for 10 seconds.
NOTE: THE CRANKING SPEED **MUST NOT** DROP **BELOW** 300 **RPM,** AND **THE THROTTLE MUST BE WIDE OPEN.**
Make a note of the test gauge reading (Fig 1).
Remove the compression gauge and release the pressure from the gauge.
Repeat the procedure for the remaining five cylinders.
Check the gap of the sparking plug and refit to the engine.
Refit the plug leads.
Close the bonnet.



Fig 1

DATA

Compression Pressure:	
UK/European	210-230lbf/in^2
Federal	200-220lbf/in^2
Rest of the World	200-220lbf/in^2
Differential between cylinders	10 lb/in^2 **(MAX)**

Firing order 1,5,3,6,2,4.
(No 1 situated at the front of the vehicle).
Sparking plug gap 0.035in

TORQUE FIGURES

Sparking plug to cylinder head 23-28Nm

SPANNER SIZES

13/16in AF

0439G

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CYLINDER HEAD GASKET

RENEW 12.29.01

Open the bonnet.
Remove the bonnet insulation pad. Disconnect the bonnet lamp multi plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround). for paint protection.
Slacken off the bonnet securing bolts (1 Fig 1), disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place a drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.

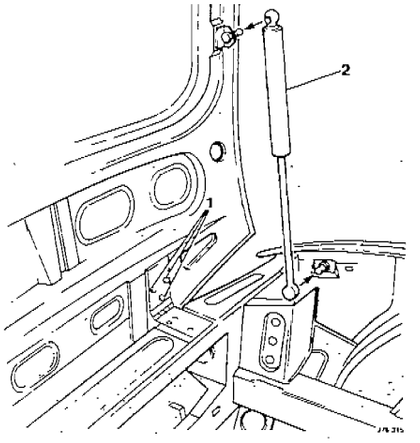


Fig 1

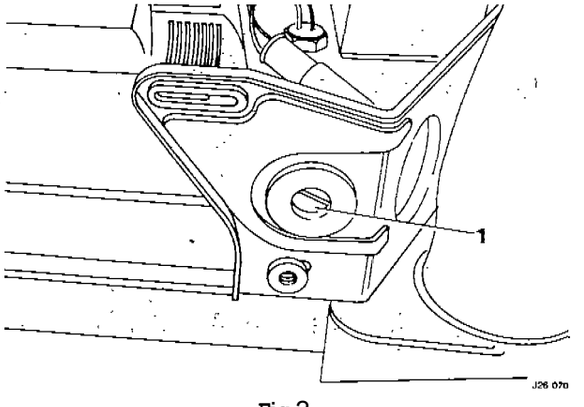


Fig 2

Remove the camshaft cover securing nuts and bolts, and remove the cover.
Remove and discard the gasket and half moon seal.
Remove the bolt securing the heater pipe to the manifold.
Re-position the two-way solenoid valve/heater pipe away from the inlet manifold.
Remove the bolt securing the dipstick tube to the inlet manifold (4 Fig 3).
Disconnect the hose from the intake throttle elbow.
Disconnect the breather hose from the oil trap turret (3 Fig 3).
Disconnect the upper coolant hose from the part throttle orifice control housing.

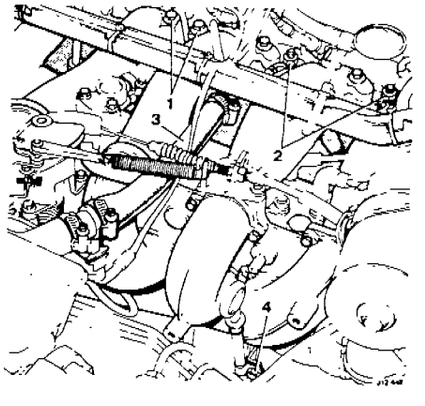


Fig 3

Disconnect the auxiliary air valve block connector.
Remove the harness clip securing bolt.
Disconnect the earth leads (2 Fig 3).
Remove the remaining nuts and bolts (1 Fig 3) and carefully lift the inlet manifold off the cylinder head.
Chock the manifold clear of the cylinder head.
Remove and discard the gasket.
Remove the thermostat housing.

Remove and discard the breather cap 'O' ring seal.
Remove the heatshield (1,2 Fig 4).
Disconnect the oil feed pipe (3 Fig 4) from the rear of the tappet block.
Discard the copper sealing washers from the banjo bolt.
Disconnect the heater feed pipe (4 Fig 4) from the cylinder head and discard the gasket.
Remove the exhaust manifold and re-position the manifold away from the cylinder head.
Remove and discard the manifold gaskets.
Drain the coolant from the engine
Remove the upper timing chain tensioner using Service Tool JD 101 (1 Fig 1 page 23)
Remove the reaction shoe lower securing bolt (5 Fig 2) page 23) remove the shoe (6 Fig 1 page 23) and gasket.

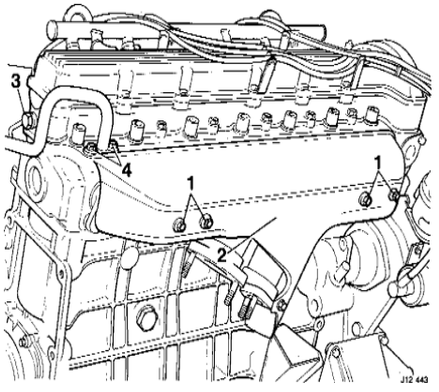


Fig 4

Push back the lock tabs and remove the timing chain wheel securing bolts (2,3 Fig 1). Remove the last two bolts only when the camshaft is at TDC (use Service Tool C 3993 – Fig 2).
Remove the timing chain wheel.

Lower the chain into the cylinder head and secure the tensioner and upper guide with an elastic band.
Remove the cylinder head to timing cover bolts (4 Fig 1).
Remove the remaining cylinder head securing bolts/nuts and remove the cylinder head.
Remove and discard the head gasket.
Clean the cylinder head thoroughly and check the cylinder head and cylinder block for warping, bowing or cracks.
Clean both cylinder head and block to prepare for fitrnent of replacement gasket.

Reverse the removal procedure to refit the cylinder head, using new gaskets, and ensuring that the cylinder head is torque tightened in the correct sequence (as follows).
Following the sequence shown in (Fig 3), tighten the cylinder head bolts *to* 20-23Nm.
NOTE: Ensure that the camshaft is still on TDC using Service Tool C3993 (Fig 2).
Tighten the cylinder head bolts in sequence to 32-35Nm.
Rotate the bolts clockwise in sequence through exactly 90 degrees, using Special Tool LST 122 or a self-manufactured tool of the dimensions given in the 2.9 Engine Description page 12-07.

Ensure that new copper washers are fitted to the oil feed pipe.
Release the upper chain tensioner using JD 101.
Ensure that the engine is filled with the correct anti-freeze/water solution.
Check the engine oil for traces of water. If water has contaminated the oil, change the engine oil and oil filter.

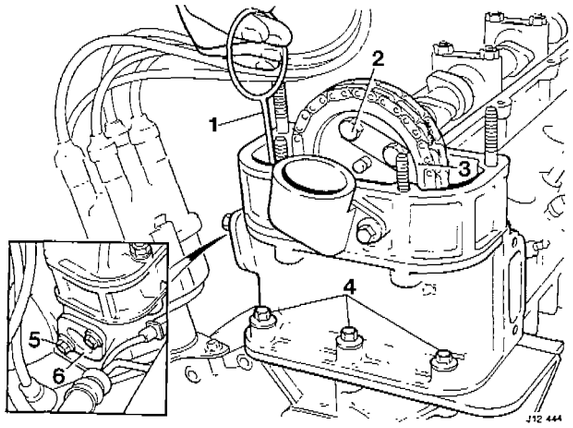


Fig 1

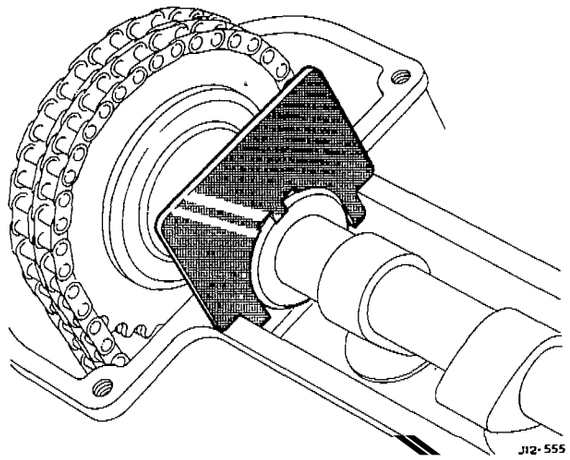


Fig 2

DATA

SERVICE TOOLS

Camshaft timing tool C3993
Timing chain tension release hook JD 101

TORQUE FIGURES

Banjo bolt to cylinder head ***13- 16Nm***
Camshaft cover to cam carrier (nut) ***23-27Nm***
Camshaft cover to cam carrier (screw) ***9.5- 12Nm***
Camshaft sprocket to camshaft ***23-27Nm***
Clip-hose to brearher pipe ***2.4Nm***
Cylinder block drain plug ***68-75Nm***
Cylinder head to cylinder block:
Tighten in sequence to ***20.5-23Nm***
Tighten in sequence to ***32.5-35Nm***
Rotate clockwise through exactly 90"
Exhaust manifold to cylinder head ***23-27Nm***
Inlet manifold to cylinder head ***23-27Nm***
Intake elbow to throttle housing ***2.4Nm***
Reaction shoe to cylinder head ***23-27Nm***

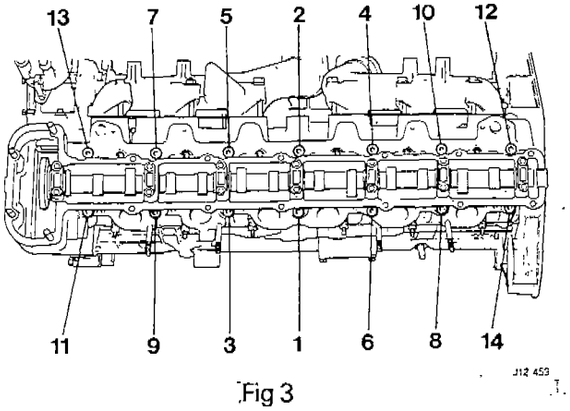


Fig 3

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SPANNER SIZES

6mm
10mm
13mm
30mm
9/16in AF
5/8in AF
10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

Half moon seals to cam carrier ***HYLOSIL 102.***
Thermostat housing to extension ***HYLOSIL 702.***

0439G

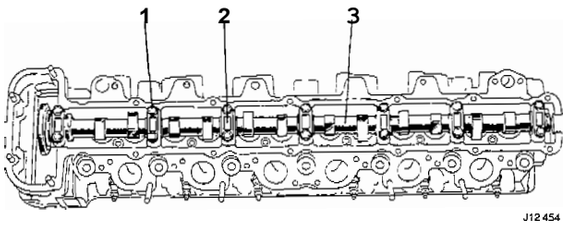


Fig 1

CYLINDER HEAD

OVERHAUL 12.29.19

Remove the cylinder head assembly 12.29.01 page 22.
Remove the sparking plugs and the inlet and exhaust manifolds.
Mark the position of the camshaft caps relative to the head, and remove the caps (1,2 Fig 1).
Remove the camshaft (3 Fig 1).
Using a magnet (Fig 2), lift out the cam followers and remove the cam carrier.
Support the valves using a wooden block.
Remove the valve springs, using Service Tool JD 6118C and adaptor JD 6118C-2 (Fig 3).
Retrieve the collars, cotters, and spring retaining plates.
Remove the valves, noting the relationship between valve and guide to ensure correct pairing during re-assembly.
Remove the seals from the inlet valve guides and remove the cylinder head rear blanking plate.
Clean all component parts.
Check for wear and burning of valves or seats.
Check the cylinder head face for distortion.
If distortion is evident, a maximum of 0.025mm (0.010 in) may be removed by skimming the cylinder head.
Taking care not to damage the inside surface of the combustion chambers, clean the inlet and exhaust ports.
NOTE: When using scrapers or wire brushes for removing carbon deposits, avoid scratching the valve faces and seats. A soft wire brush is the most suitable implement for this purpose.
Clean all carbon and other deposits from the valve guide using a suitable valve guide brush.
Throughly wash the cylinder head to ensure that all loose carbon is removed and dry the head with a high pressure air line.
After cleaning and polishing each valve, examine the stems for straightness and wear, using a suitable dial gauge and V-block arrangement (Fig 4).

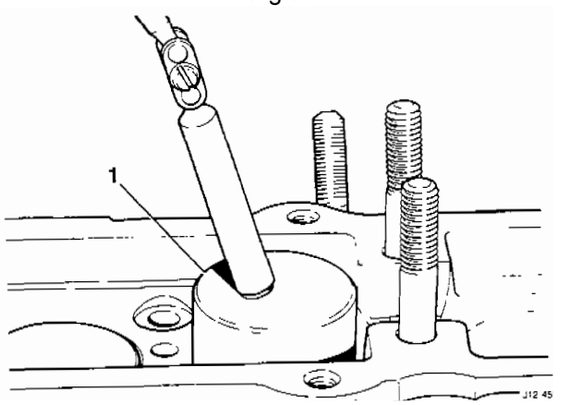


Fig 2

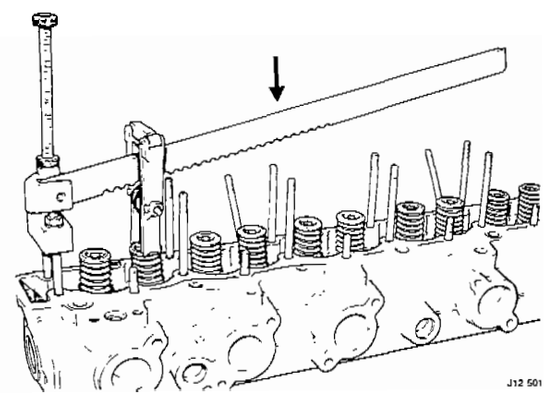


Fig 3

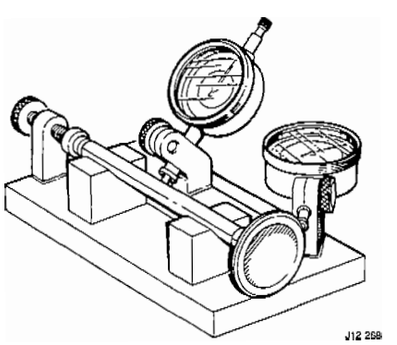


Fig 4

Examine the valve faces for burns, pitting and distortion. Renew any valves that are excessively worn, bent, or too badly pitted to be salvaged by refacing.
NOTE: No attempt should be made to clean up a burnt or badly pitted valve face by extensive 'grinding in' of the valve to the seat.
Lightly lap the valves into the seats with a fine grinding compound. The reseating operation should leave the finished surfaces smooth. Excessive lapping will groove the valve face resulting in a poor seat when the engine is hot.

Fig 1 shows:
'A Correctly seated
'B' Undesirable condition
'C' Method of rectification.

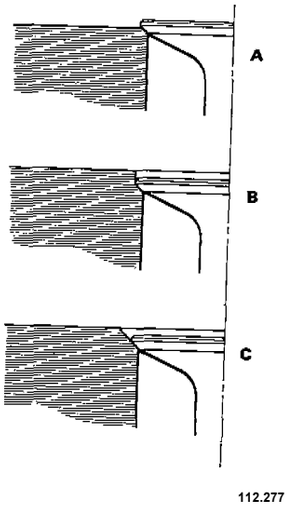


Fig 1

To test the valves for concentricity with their seats, coat the face of the valve with 'Engineers Blue' or similar, and rotate the valve against the seat.
If the valve face is concentric with the valve stem, a mark will be made all around the face. Should a mark be made on only one side of the face, the face is not concentric with the valve stem.
Clean the valve and again coat with 'Engineers Blue' and rotate the valve against the seat.

Check that the valve guide is concentric with the valve seat, if not, the seat must be recut.
Whenever valves are replaced, the seats must be recut prior to lapping of the valves.
Check valve guide wear by inserting a new valve into the guide to be checked, lift it 3 mm (1/4") from its seat and rock it sideways. Movement of the valve across its seat must not exceed 0.5 mm (0.020 in) **(A** Fig 2).
Should the movement exceed this tolerance, the valve guide must be replaced, using Service Tool **18G** 1432 to drift out the old guide (Fig 3). Ensure that the relevant valve guide is selected prior to fitting (see chart below).

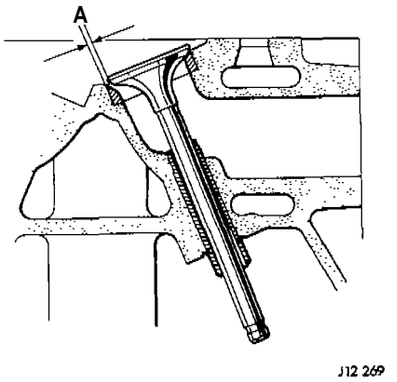


Fig 2

DATA

Replacement guides are available in two sires and have identification grooves machined in the shank. Sizes are as follows:

First o/size 2 grooves	12.88 to 12.85mm (0.507 to 0.506in) diameter
Second o/size 3 grooves	13.00 to 12.98mm (0.512 to 0.61 1in) diameter

When new guides are to be fitted they should always be one size larger than the old guide.
Cylinder head bores will require reaming as follows:

Remove the old valve guide and ream the cylinder head to the relevant dimension (see **DATA).**
Immerse the cylinder head in boiling water for 30 minutes.

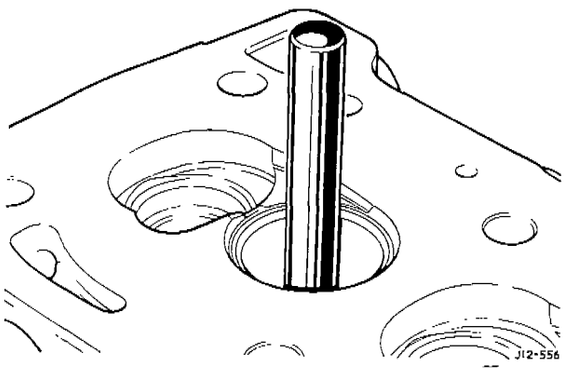


Fig 3

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Coat the guide with graphite grease, and, using Service Tool 18G 1432, drift in the guide from the camshaft side until the circlip is seated in the groove.
NOTE: To fit the guide correctly, the interference should not be sufficient to cause the use of excessive force.
After fitting a valve guide, the valve seat must be recut using Service Tool **MS 204** (Fig 1).
Examine the valve seat inserts for pitting or excess wear.
If renewal is necessary, proceed as follows:
Remove the inserts by machining, leaving approximately 0.25 mm (0.01 in) of metal which can easily be removed by hand without damaging the cylinder head.
Measure the diameter of the insert recess in the cylinder head.

Grind down the outside diameter of the new insert to a dimension 0.08mm (0.003 in) larger than the insert recess.
Heat the cylinder head for 30 minutes from cold to a temperature of 150°C (300°F).
Fit the insert ensuring that it beds evenly in the recess.

Recut when the cylinder head has cooled using Service Tool **MS 204** (Fig 1).

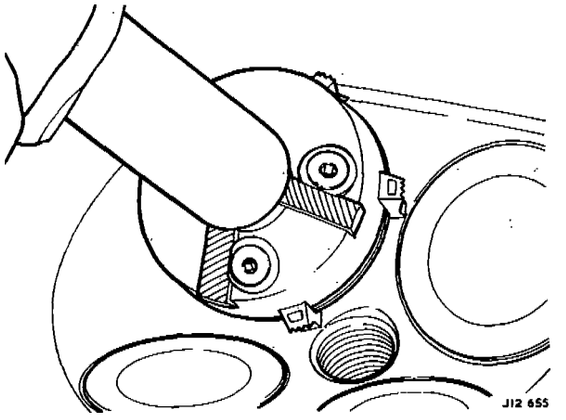


Fig 1

Correct valve seat angles are:

Inlet	Exhaust
44.1/2 degrees	**44.1/2 degrees**

NOTE If new valve inserts have been fitted, the clearance between valve stem and cam must be checked; this should be 8.13mm (0.320 in) plus the valve clearance.
The dimension must be taken between the valve stem and the back of the cam.
Should this dimension not be obtained, metal must be ground from the valve seat of the insert.
NOTE: Use only suitable grinding equipment.
Remove only very small amounts of metal from the valve seat at one time before re-checking the clearance.
Examine the cam followers for wear on the top face, these should be perfectly flat.
Check for any sign of barrelling on the side faces (Fig 2).
Replace all followers that are worn or suspect.
Wash the valves, springs, collets, followers and air dry.
After the valve springs have been thoroughly washed, they must be examined for fatigue and distortion.
Test the valve springs either by comparison with the figures given below, or by comparison with a new valve spring (using a recommended valve spring testing machine).

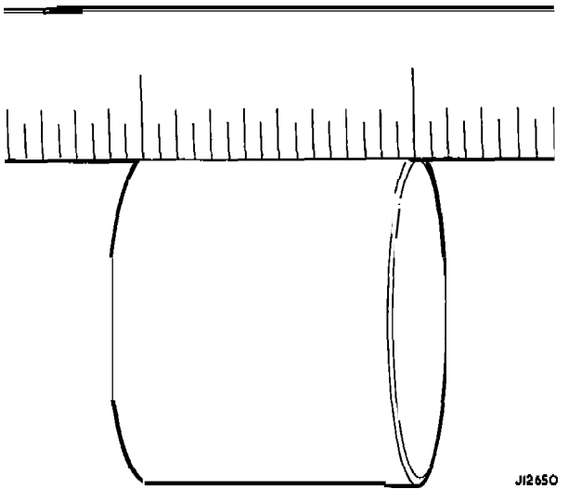


Fig 2

DATA

Valve spring wire diameter:

Inner	12SWG (0.104in)
Outer	10SWG (0.128in)

Inside diameter	0.636in inner
	0.872in outer
Total No. of coils	6 inner: 5 outer
Free length	1.734in inner
	2.103in outer
Rate	69.3lbs/in Def inner
	77.4lbs/in Def outer
Helix	Right hand

To test against a new valve spring, insert both valve springs end to end between the test equipment. Apply a load to partly compress the springs and measure their comparative lengths (Fig 1). NOTE: 'A' is the old spring. If the distance 'A' is smaller than the distance 'B, then 'A' must be replaced.

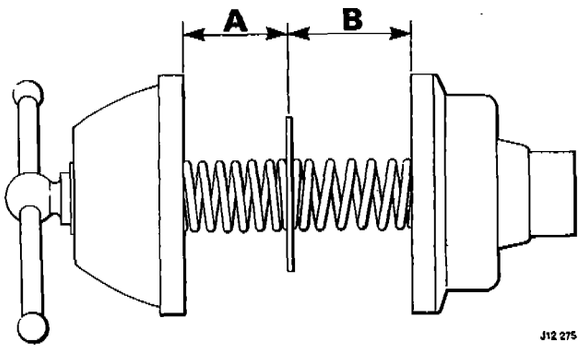


Fig 1

Spring distortion is determined by positioning the spring upright on a surface plate and checking the squareness of each end with a set square (Fig 2).
All valve springs which have diminished in length and/or are not square must be discarded and replacements fitted.
Fit the valves into the guides and place the cylinder head on wooden blocks.
Fit the valve spring seats, inlet valve guide oil seals, springs and collars.
Compress the springs using Service Tool J6118B and Adaptor J6118C-2 and insert the split cotters.
Refit the cam carrier. Refit the original shims in the valve collar recesses (1 Fig 3).
Ensure that the shims are seated correctly (not as shown in Fig 1 page 28).
fit the cam followers.
NOTE: If the cylinder head has been overhauled to the extent of having the valve seats recut, each shim should be 0.010 in. smaller than the original.
Lubricate the camshaft and fit to the cam carrier ensuring that it is fitted with the slot to the top.
Fit the camshaft caps and torque tighten the bolts in the sequence shown in Fig 2 page 28.
Adjust the valve clearances 12.29.48 page 19.

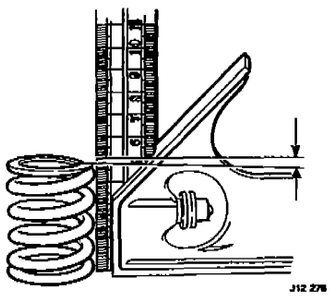


Fig 2

Fit the cam followers, refit the camshaft, the camshaft caps and recheck the valve clearances.
NOTE: A final check of the valve clearances should be done when the cylinder head is fitted and torque tightened to the cylinder block.
Clean the cylinder head thoroughly and check the cylinder head and cylinder block for warping, bowing or cracks.
Clean both cylinder head and block to prepare for fitment of replacement gasket.
Refit the cylinder head 12.29.01 page 22.

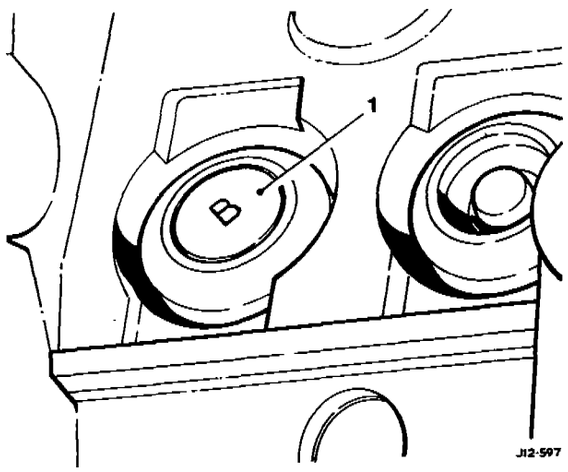


Fig 3

DATA

SERVICE TOOLS

Camshaft timing tool C3993
Valve spring compressor J6118B
Valve spring compressor adaptor J6118C-2

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Replacement guides are available in two sizes and have identification grooves machined in the shank. Sizes are as follows:

First oversize: (2 grooves) 12,88-12,85 mm (0.507-0.506 in) diameter.

Second oversize: (3 grooves) 13,00-12,98 mm (0.512-0.61 1 in) diameter

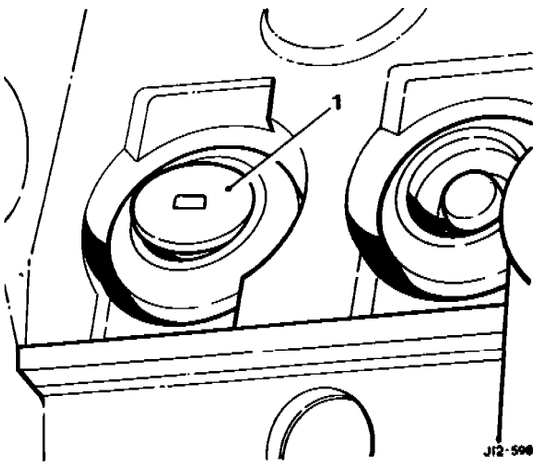


Fig 1

TORQUE FIGURES

Banjo bolt to cylinder head 13-16Nm
Camshaft cover to cam carrier (nut) 23-27Nm
*Camshaft cover to cam carrier (screw) **9.5-12Nm***
*Camshaft sprocket to camshaft **23-27Nm***
*Clip-hose to breather pipe **2.4Nm***
Cylinder block drain plug 68-75Nm
Cylinder head to cylinder block:
Tighten in sequence to 20.5-23Nm
*Tighten in sequence to **32.5-35Nm***
Rotate clockwise through exactly 90°
*Dipstick to bracket **5-8Nm***
*Exhaust manifold to cylinder head **23-27Nm***
*Heat shield to exhaust manifold **23-27Nm***
*Heater p i p to cylinder head **23-27Nm***
Heater pipe to inlet manifold 9.5-12Nm
*Inlet manifold to cylinder head **23-27Nm***
*Intake elbow to throttle housing **2.4Nm***
*Reaction shoe to cylinder head **23-27Nm***

SPANNER SIZES

6mm
10mm
13mm
30mm
9/16in AF
5/8in AF
10mm (ALLEN KEY)

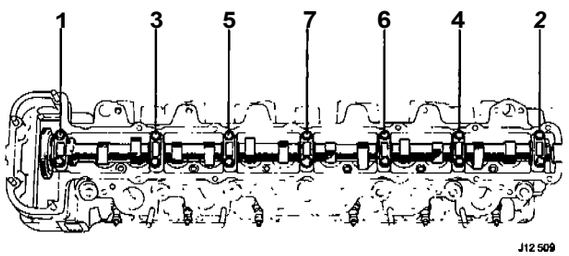


Fig 2

OILS/GREASES/SEALANTS

Half** moon **seals to cam carrier HYLOSIL 102
*Thermostat housing to extension H**YLOSIL 102***

04396

CYLINDER HEAD CASTING

RENEW 12.29.15

Remove the cylinder head 12.29.01 page 22.
Place the cylinder head on suitable blocks on a bench.
Remove the spark plugs.
Remove the breather housing, the spark plugs and the inlet manifold securing studs.

Mark the position of the camshaft caps relative to the head, and remove the caps (1,2 Fig 1).
Remove the camshaft (3 Fig 1).
Using a magnet, lift out the cam followers and remove the cam carrier.
Support the valves using a wooden block.
Remove the valve springs, using Service Tool JD 6118C and adaptor JD 6118C-2 (Fig 2).
Remove the seals from the inlet valve guides and remove the cylinder head rear blanking plate.
Remove all studs from the cylinder head.
Clean all component parts.
Check for wear and burning of valves.
Throughly wash the new cylinder head and dry the head with a high pressure air line.
Lightly lap the valves into the seats with a fine grinding compound.
Fit the valves into the guides and place the cylinder head on wooden blocks.
Fit the valve spring seats, inlet valve guide oil seals, springs and collars.
Compress the springs using Service Tool J6118B and Adaptor J6118C-2 and insert the split cotters.
Refit the cam carrier.

Refit the original shims in the valve collar recesses (1 Fig 3).
Ensure that the shims are seated correctly (not as shown in Fig 1 page 30).
Fit the cam followers.
Lubricate the camshaft and fit to the cam carrier ensuring that it is fitted with the slot to the top.
Fit the camshaft caps and torque tighten the securing bolts in the sequence shown in Fig 2 page 30.
Check/adjust the valve clearances.
NOTE: A final check of the valve clearances should be done when the cylinder head is fitted and torque tightened to the cylinder block.
Refit the cylinder head 12.29.01 page 22.

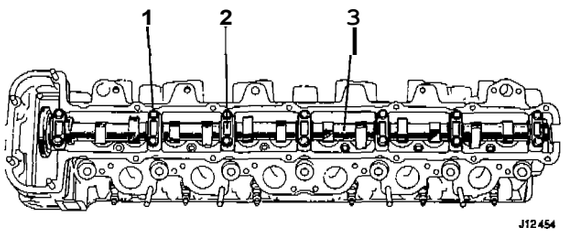


Fig 1

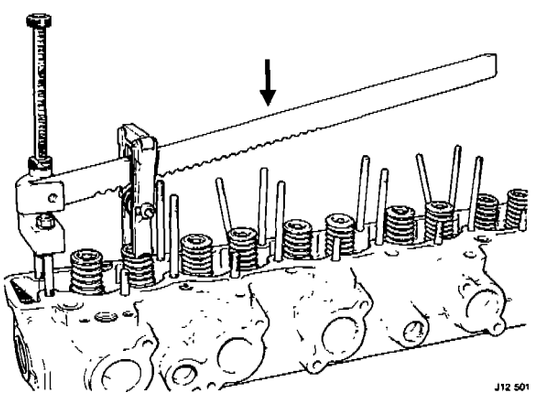


Fig 2

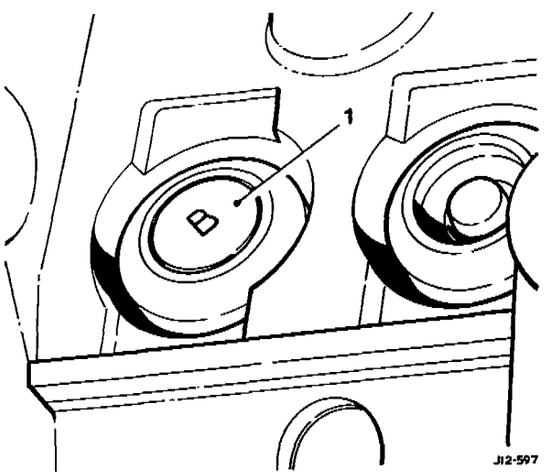


Fig 3

DATA

SERVICE TOOLS

Camshaft timing tool 18G1433
Cylinder head bolt torque tool LST 122
Valve spring compressor MS 1519A

TORQUE FIGURES

Banjo bolt to cylinder head ***13-16Nm***
Breather elbow to cylinder head ***23-27Nm***
Dipstick to bracket ***5-8Nm***
Camshaft cap to cylinder head ***23-27.5Nm***

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TORQUE FIGURES

Camshaft sprocket to camshaft **23-27Nm**
Clip-hose to breather pipe **2.4Nm**
Cylinder block drain plug **68-75Nm**
Cylinder head to cylinder block:
Tighten in sequence to **52-54Nm**
Rotate clockwise through exactly 90"
Exhaust manifold to cylinder head **23-27Nm**
Heat shield to exhaust manifold **23-27Nm**
Heater pipe to cylinder head **23-27Nm**
Heater pipe to inlet manifold **9.5-12Nm**
Inlet manifold to cylinder head **23-27Nm**
Intake elbow to throttle housing **2.4Nm**
Sparking plug to cylinder head **23-27Nm**

SPANNER SIZES

6mm
10mm
13mm
30mm
9/16in AF
5/8in AF
13/16in AF
6mm (ALLEN KEY)
10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

Half moon seals to cylinder head HYLOSIL
Thermostat housing to extension 'HYLOSIL'

0439G

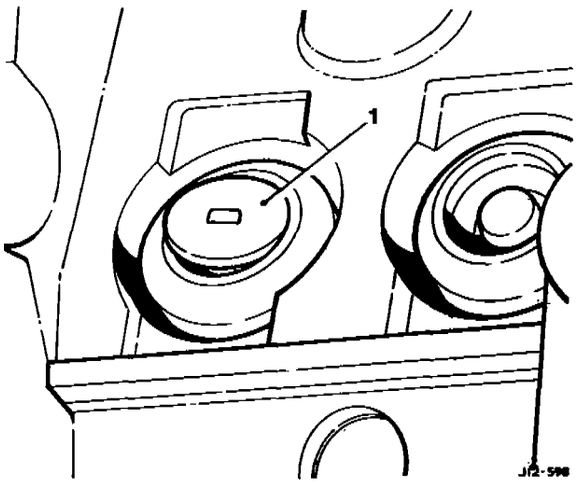


Fig 1

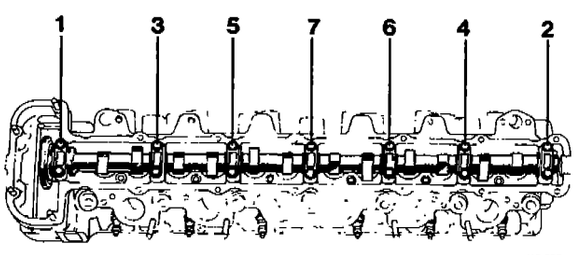


Fig 2

PISTON AND CONNECTING ROD – ENGINE SET

RENEW **12.17.03**

Remove the engine and gearbox/transmission unit from the vehicle 12.41.01/2 page 59.
Detach the gearbox/transmission unit from the engine 12.41.01/2 page 63.
Fit the engine to a stand.
Remove the cylinder head 12.29.01 page 22.
Remove and discard the head gasket.
Remove the sump securing bolts, and remove the sump.
place a suitable drain tray under the oil transfer housing area and remove the transfer housing.
Remove the oil pump sprocket, remove the oil pump securing bolts and remove the pump.
Remove the windage trays securing bolts.
Remove the windage trays.
Remove the big-end connecting rod nuts (1 Fig 1) in connecting rod pairs (1 & 6,2 & 5,3 & 4 cylinders), and remove the con rod caps (2 Fig 1). Note the position of the cap to con rod.
Push the pistons up and through the top of the cylinder block.
Remove the gudgeon pin circlips (1 Fig 2) from each piston, remove the gudgeon pin (2 Fig 2) and separate the piston (3 Fig 2) from the connecting rod (4 Fig 2).

Check the connecting rods for out of balance, twist and bend.
If any connecting rod is bent, twisted or out of balance with the other five, then the complete set must be renewed.
Insert each new piston ring into the cylinder bore (1 Fig 3) ensuring they are square in the cylinders and check the gap using a feeler gauge (2 Fig 3).
If the gap is insufficient, then a **small** flat file can be used on the butting ends of the ring. Ensure that after filing no burrs remain.
Lubricate the small end bush and slide the gudgeon pin through the new piston and connecting rod.
Secure with new circlips. Never re-use old circlips.
Fit the rings to the pistons ensuring that gaps are positioned as in (Fig 1 page 32).
Lubricate and compress the rings using Service Tool 18G 55A (Fig 2 page 32).
Insert the piston skirt into the bore, and using a suitable implement, ie a wooden hammer shaft, gently tap the piston into the cylinder bore.
Ensure that the connecting rod does not foul either the cylinder block or crankshaft.

Lubricate and fit the big end bearing shells to the connecting rod and the connecting rod cap. Pull the connecting rod and bearing carefully onto the crankshaft and fit the connecting rod cap to the rod.
Fit and tighten the connecting rod cap nuts to a torque of 52-55Nm.
Repeat the operation for the remaining five pistons.

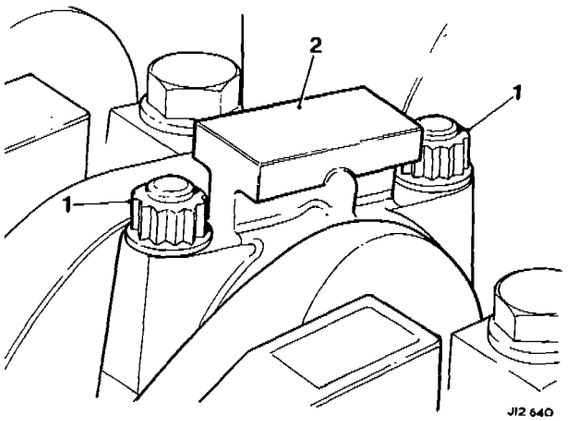


Fig 1

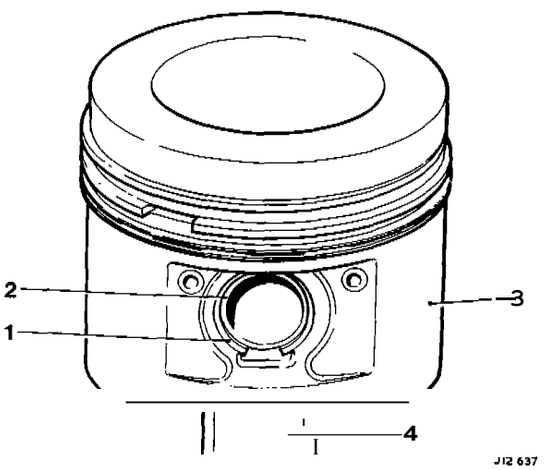


Fig 2

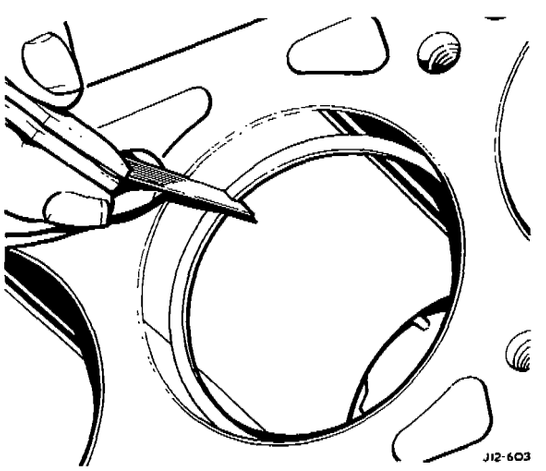


Fig 3

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Clean and fit the crankshaft windage trays and torque tighten the securing bolts. Refit the oil pump.
Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 3).
Lubricate and refit the pipes to the pump.
Smear the oil transfer housing to cylinder block gasket face with 'HYLOSIL 102.
Fit and seat the assembly to the cylinder block.
Clean the sump, smear the mating face with 'HYLOSIL 102, fit and torque tighten the sump securing bolts.
Refit the cylinder head 12.29.01 page 22.
Remove the engine from the stand.
Attach the gearbox/transmission unit to the engine 12.41.01/2 page 63.
Refit the engine to the vehicle 12.41.01/2 page 67.

DATA

SERVICE TOOLS

Piston ring compressor 18G 55A

TORQUE FIGURES

Connecting Rod Nut 52-55Nm
Oil Sump To Cylinder Block 23-27Nm
Oil Sump To Timing Cover 23-27Nm
Windage Tray To Cylinder Block 23-27Nm

SPANNER SIZES

13mm
17mm
1/2in AF
9/16in AF
5/8in AF

OILS/GREASES/SEALANTS

Oil Pipe 'O' Rings PETROLEUM JELLY
Sump To Timing Cover 'HYLOSIL 102'

0439G

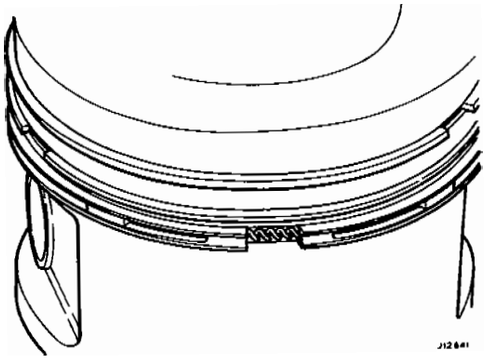


Fig 1

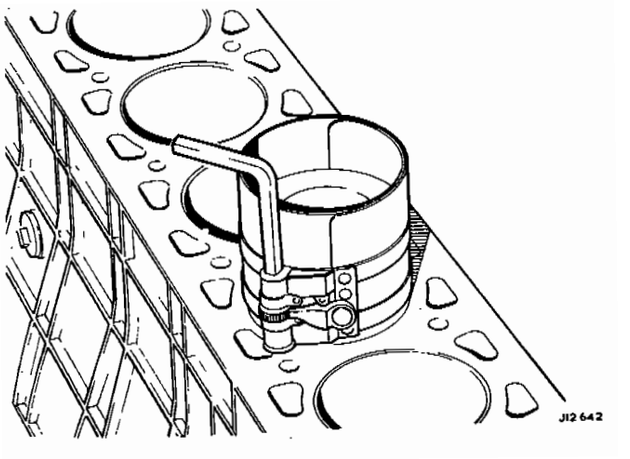


Fig 2

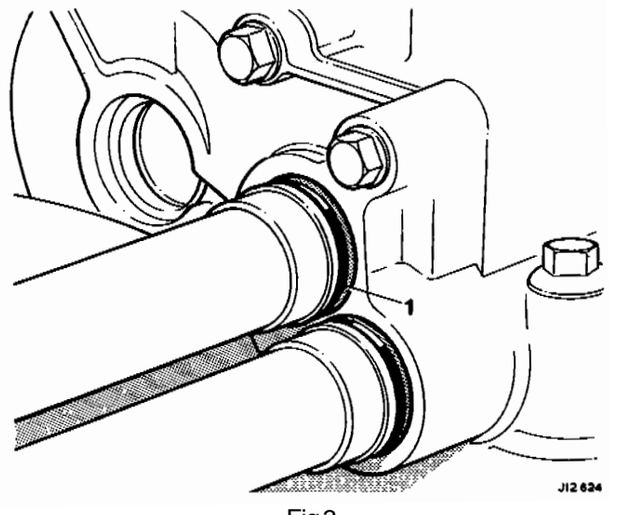


Fig 3

CONNECTING ROD BEARING – ENGINE SET

RENEW **12.17.16**

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD **133** to the road spring pans (Fig 1).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts **1/4** of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper **(1** Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column **(3** Fig 3) to steering rack securing bolt/nut (1.2. Fig 3).

Disengage the splines from the rack pinion (4 **Fig** 3).
NOTE: At this point, the lower column. cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Disconnect Nos. **1** and 2 plug leads.
Attach 18G **1465** rear engine lifting eye, fit and align Service Tool MS 53B engine support bracket (Fig **4).**
Engage the hook to the lifting eye.
Tighten the hook nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.

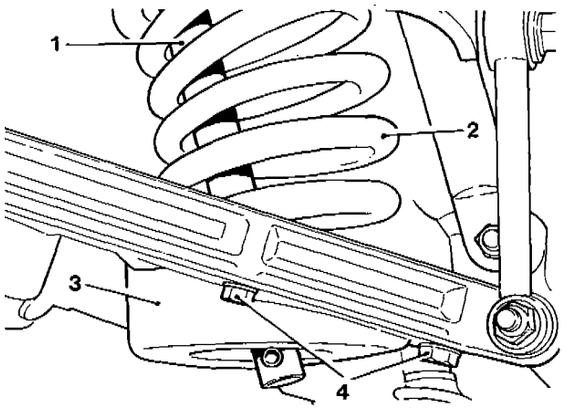


Fig 1

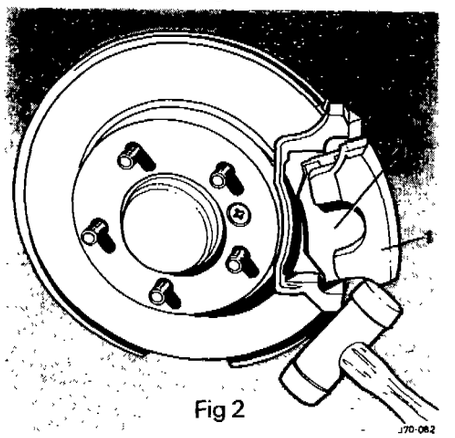


Fig 2

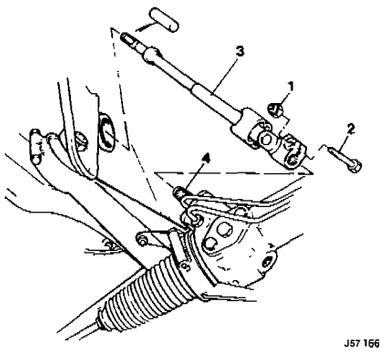


Fig 3

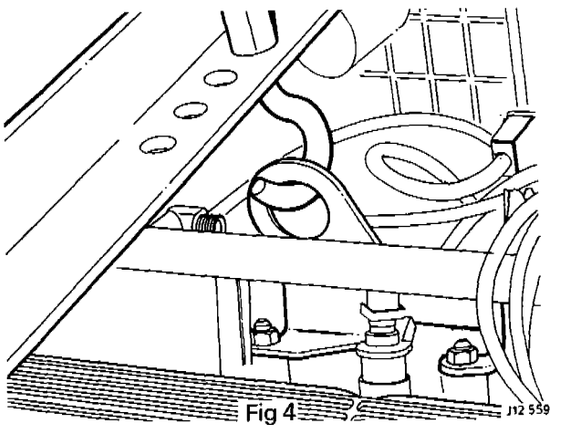


Fig 4

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Remove the nuts. Do not remove the bolts at this stage (Fig 1).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 2).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.

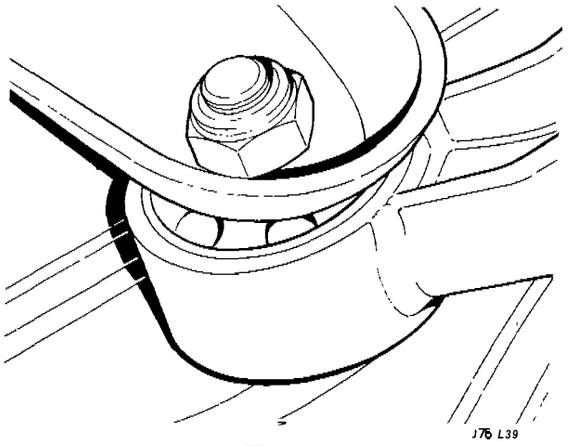
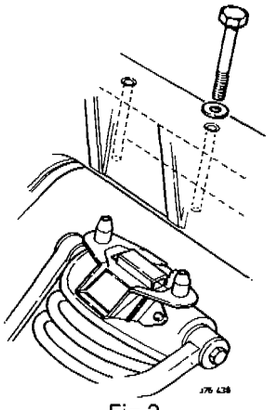


Fig 1


Fig 2

Drain the engine oil.
Remove the air cleaner assembly.
Slacken off the alternator adjusting nuts (4, 5 Fig 3) and pivot nut (3 Fig 3).
Pivot the alternator towards the engine and disconnect the drive belt.
Remove the alternator link arm trunnion bolt (3 Fig 3).
From below the vehicle, disconnect the alternator feed wires, remove the alternator pivot bolt and nut (1 Fig 3), and remove the alternator.
Remove the rear spacers and move the P.A.S. pipes for access.
Slacken the union securing the oil drain back/filler tube to the sump and pull the tube clear of the sump.
Position the steering rack to allow access to the sump securing bolts.
Slacken and remove all the sump bolts except two.
Remove the bell housing to sump securing bolts.
Finally remove the remaining two sump bolts and lower the sump.
Place a suitable drain tin below the oil transfer housing area and remove the housing securing bolts (1 Fig 4), remove the housing assembly (2 Fig 4) and pull the pipes (3 Fig 4) from the housing.
Remove and discard the 'O' rings, clean the housing and oil pipes.
Remove the bolts (1 Fig 4) securing the crankshaft windage trays (6 Fig 4) to the cylinder block and remove the trays.
Rotate the crankshaft for access to the first connecting rod.
Remove the nuts (1 Fig 1 page 35) securing the cap (2 Fig 1 page 35) to the connecting rod and remove the cap and bearing assembly.
Note the position of the cap relative to the connecting rod and also that they are numbered to each other (1 Fig 2 page 35).
Discard the bearing shell (2 Fig 2 page 35), move the connecting rod and piston up the bore and remove the bearing shell from the connecting rod (3 Fig 2 page 35).
Remove the 'paired' bearing cap ie 1-6, 2-5, 3-4. as in the previous description.
Clean and polish the crankshaft journals, oil the new bearings and fit two halves to the connecting rods.
NOTE: Ensure that the 'tag' (4 Fig 2 page 35) on the shell is fully seated in the connecting rod.
Oil the crankshaft journals.

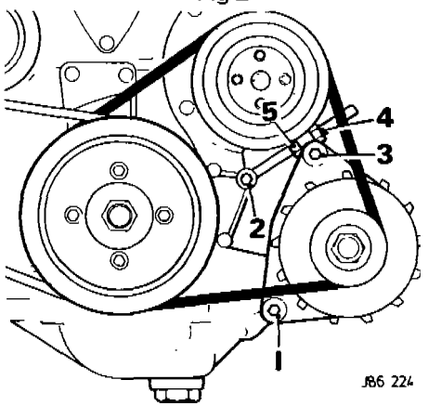


Fig 3

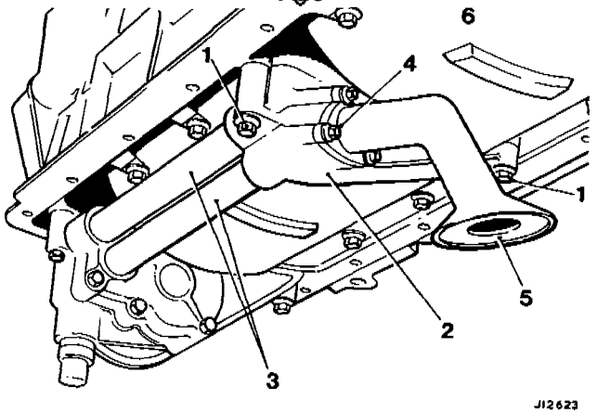


Fig 4

Pull one piston and rod down the bore and guide onto its relative crankshaft journal.
Fit a bearing shell to the 'matched' cap.
NOTE: Ensure that the 'tag' on the shell is fully seated in the connecting rod cap, oil the shell and fit to the crankshaft/connecting rod assembly.
Ensure that the 'numbers' are fitted together.
Fit and tighten the securing nuts.
Repeat the procedure for the second piston and connecting rod assembly.
Rotate the crankshaft for the second matched pair and repeat the procedure.
Repeat the procedure for the third pair.
Clean the windage trays.
Fit to the cylinder block.
Fit and tighten the securing bolts.
Carefully fit new 'O' rings to the oil pipes, (1 Fig 3) lubricate the 'O' rings with petroleum jelly.
Remove the drain tin and fit the pipes to the oil pump.
Apply 'Hylosil 102' to the tranfer housing gasket face and fit the housing to the engine.
Fit and tighten the securing bolts.
Apply 'Hylosil 102' to the sump mating face.
Clean the gasket face on the cylinder block.
Lift the sump into position.
Fit and torque tighten the securing bolts.

Refit the oil filler/drain back tube.
Refit the alternator, ensure all spacers are correctly located.
Tension the alternator drive belt. A load of 1.5kg must give a total deflection of 4.5mm when applied to the rnid-point of the belt.
Refit the air cleaner assembly.
Re-position the steering rack under the sump.
Position the crossmember assembly on the jack under the vehicle.
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, P.A.S. pipes, lower column and rear mountings.
Align the front mounting securing bolt holes.
Fit and tighten the front mounting securing nuts (Fig 1 page 36).
Using a second jack, align the left hand rear mounting (Fig 2 page 36).

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting. Fit the inner spacer.
Push the bolt fully home, fit but do not tighten the nut.
Lower the jack from below the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower the jack from below the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the P.A.S. pipes and rack.

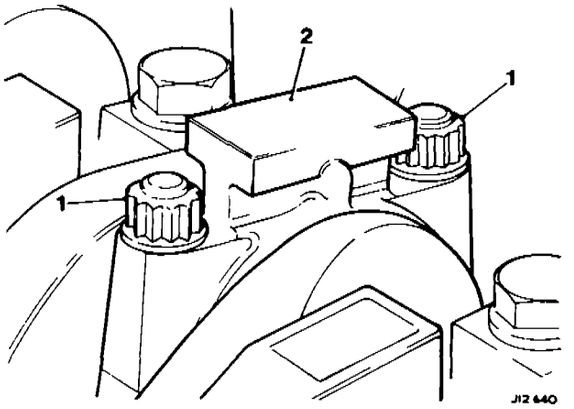


Fig 1

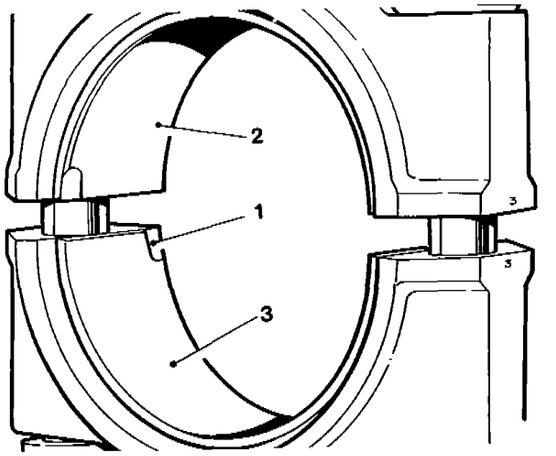


Fig 2

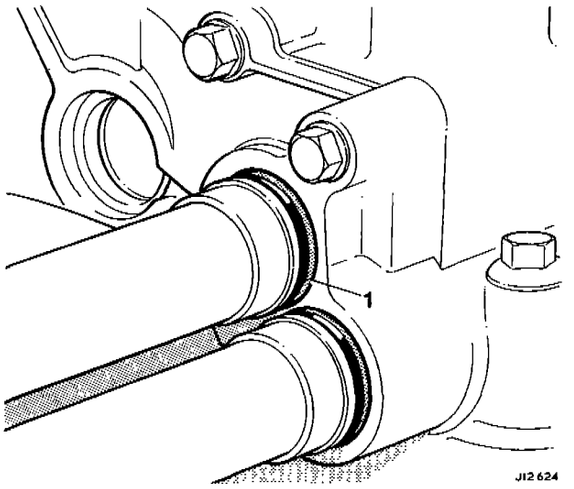


Fig 3

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Fit new 'O' rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the P.A.S. pipe clamps.
Slacken off the MS 53B hook nut. Remove the hook. Remove Service Tool MS 53B.
Remove the lifting eye.
Fit and tighten the engine mounting securing nuts. Refit the calipers. Refit the brake pads.
Refit the road wheels.
Lower the vehicle from the axle stands Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. Lower the vehicle.
Refill the engine with oil to the correct level.
Bleed the P.A.S. system as follows:
Top up the P.A.S. reservoir. Start the engine.
Turn the steering wheel to full left hand lock.
Turn the steering wheel to full right hand lock.
Top up the reservoir. Fit the reservoir cap.
Close the bonnet.

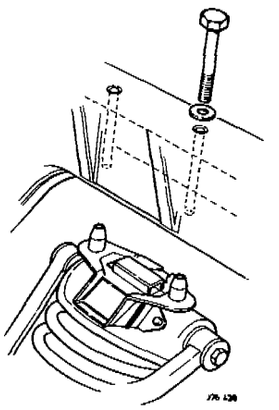


Fig 1

DATA

SERVICE TOOLS

*Tie-down bars JD **133***
*Rear lifting eye 186 **1465***
*Engine **support** bracket **MS 53B***

TORQUE FIGURES

*Adaptor plate to sump **49-54Nm***
*Adjustment trunnion to alternator bolt **23-27Nm***
*Alternator bolt to timing cover nut **23-27Nm***
*Alternator bolt (trunnion lock nuts) **12-14Nm***
*Alternator pivot bolt/nut **23-27Nm***
*Caliper to carrier **31-40Nm***
*Connecting rod nut **52-55Nm***
*Dipstick to bracket **5-8Nm***
*Oil drain back tube to sump adaptor **12.5-15Nm***
*Oil sump plug **41-47Nm***
*Oil sump to cylinder block **23-27Nm***
*Oil sump to timing cover **23-27Nm***
*P.A.S. feed/return pipes to rack **19-23"***
*Shock absorber **to** upper mounting **35-43"***
*Transfer housing to cylinder block **23-27Nm***
*Wheel nut to wheel stud (steel wheel) **65-85Nm***
*Wheel nut to wheel stud (alloy wheel) **88-102Nm***
*Windage tray to cylinder block **23-27Nm***

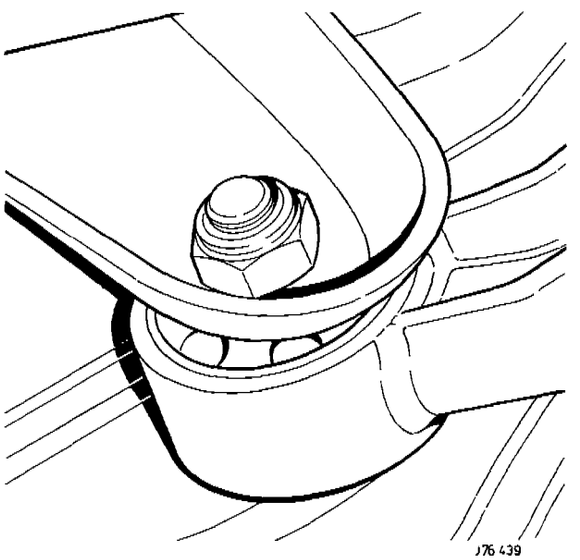


Fig 2

SPANNER SIZES

10mm
13mm
14mm
17mm
19mm
22mm
30mm
15/16AF

OILS/GREASES/SEALANTS

*Oil pipe 'O' rings **PETROLEUM JELLY***
*Sump to cylinder block **HYLUSIL 102***
*Transfer housing to cylinder block **HYLOSIL** 102*

MAIN BEARING – ENGINE SET

RENEW **12.21.39**

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD 133 to the road spring pans (Fig 1).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 3) to steering rack securing bolt/nut (1.2. Fig 3).

Disengage the splines from the rack pinion (4 Fig 3).
NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Disconnect Nos. 1 and 2 plug leads.
Attach 18G 1465 rear engine lifting eye, fit and align Service Tool MS **53B** engine support bracket (Fig **4).**
Engage the hook to the lifting eye.
Tighten the hook nut to take the weight of the engine.
Slacken *off* the crossmember rear mounting bolts/nuts.

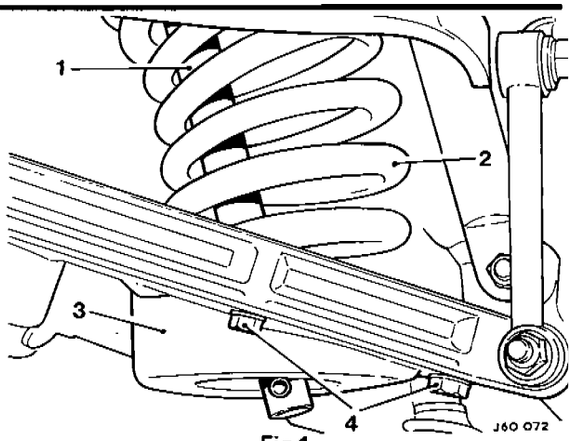
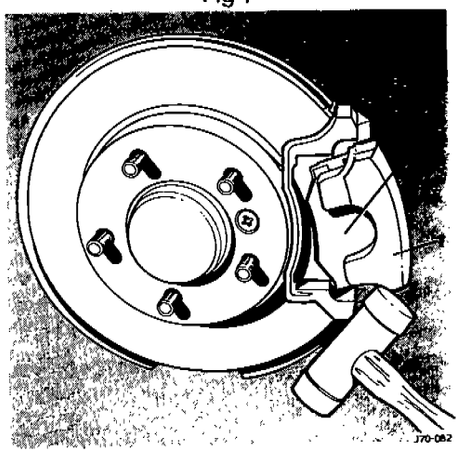


Fig 1


Fig 2

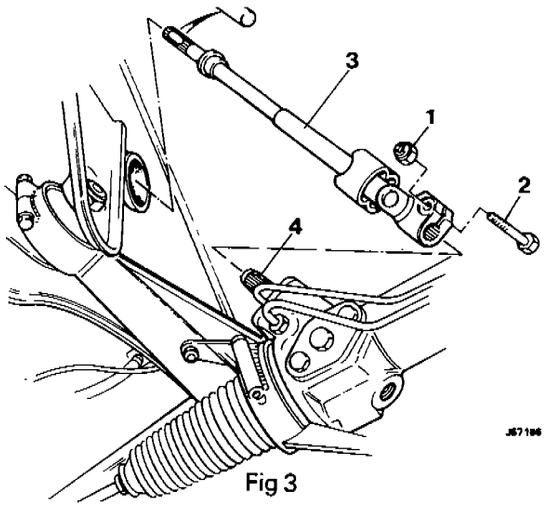
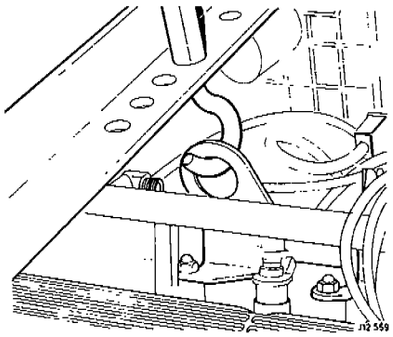
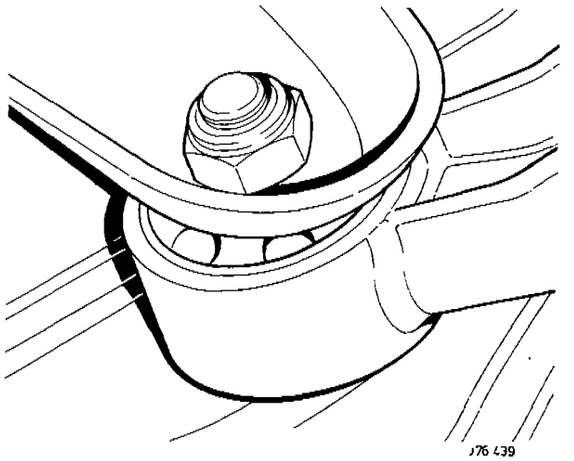


Fig 3

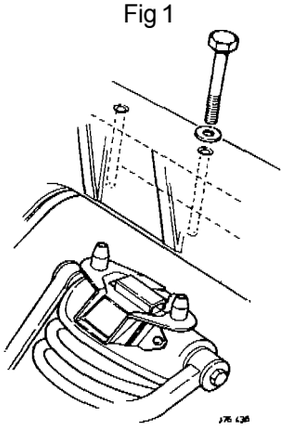

Fig 4

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Remove the nuts. Do not remove the bolts at this stage (Fig 1).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 2).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.


Fig 1

Drain the engine oil.
Remove the bolt securing the dipstick tube to the inlet manifold and remove the dipstick tube/assembly.
Remove the air cleaner assembly.
Remove the alternator.
Remove the rear spacers and move the power assisted steering pipes for access.
Disconnect the exhaust to bell housing mounting bracket.
Slacken off the union securing the oil drain-back/filler tube to the sump, and pull the tube clear of the sump.
Remove the clamp securing the gearbox oil cooler pipes to the sump (AUTO ONLY).
Remove all but two of the sump bolts.


Fig 2

Remove the bell housing to sump securing bolts.
Finally remove the two remaining sump bolts and lower the sump.
Place a suitable drain tray under the oil transfer housing area and remove the transfer housing bolts and housing (1.2 Fig 3).
Remove the oil pump pick-up pipes (3 Fig 3).
Remove the windage trays (6 Fig 3).
Push back the lock tabs (1 Fig 4) on the bolts (2 Fig 4) securing the oil pump sprocket to the oil pump and slacken the bolts.
Remove the bolts, tab washer and sprocket (3 Fig 4) from the chain (5 Fig 4).
Remove the shims.
Remove the oil pump securing bolts and remove the pump.
Remove the oil pressure relief valve cap, spring, tube and valve (1-4 Fig 1 page 39).
Clean the mating face in the cylinder **block,** the relief valve assembly, sprocket and shims.
Remove the bolts securing the crankshaft windage trays to the cylinder block and remove the trays.
Remove the bolts (1 Fig 2 page 39) securing one of the main bearing caps (2 Fig 2 page 39) to the cylinder block and remove the cap.
Remove and discard the bearing shell from the cap and cylinder block.

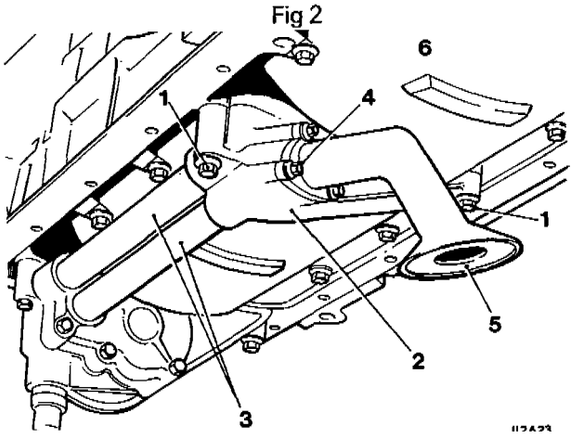


Fig 3

Clean the cylinder block and crankshaft.
Polish the crankshaft journals and liberally coat with oil.
Feed the new bearing shell into the cylinder block and ensure that the tag is fully seated in its location.
Fit the new bearing shell to the bearing cap. Oil the bearing and fit the assembly to the cylinder block.

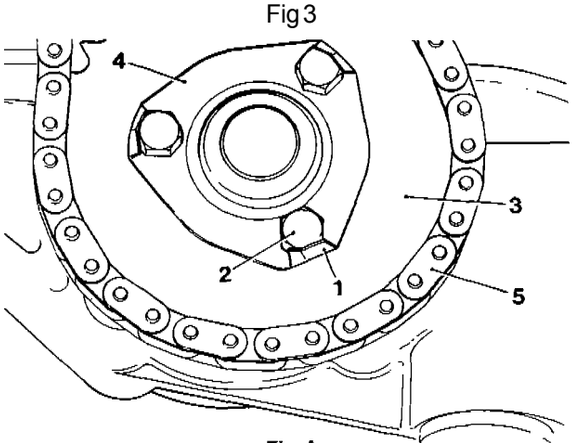


Fig 4

Fit and torque tighten the securing bolts.
NOTE: Ensure that the bearing cap is the correct way round ie. the cap numbers correspond to the numbers stamped on the oil sump mounting face (1 Fig 3).
Rotate the crankshaft to ensure that it is not being 'pinched' and will rotate freely.
Repeat the procedure for the remaining six caps and shells.
Mount a suitable dial gauge to the fan cowl and position the stylus on the crankshaft front pulley.
Zero the dial gauge, and with the use of suitable lever, measure the crankshaft endfloat (Fig 4).
Endfloat should be between 0.004 to 0.010 in.
Should the endfloat be outside the above tolerances, remove the centre main bearing cap, remove the thrust washers and replace with suitable oversized thrust washers (1 Fig 1 page 40).
These are available in 0.005 in. and 0.010 in. Thrust washers can be added to reduce the endfloat by 0.005 to 0.100 in. 0.015 and 0.20 in. (the oversizes are marked on the steel side of the thrust washer).
NOTE: When refitting the thrust washers, ensure that the bearing face (grooved) and not the steel side contacts the crankshaft.
Recheck the end float and if satisfactory, clean the main bearing cap and bearing and lubricate with clean engine oil.

Refit the cap and bearing assembly, remove the dial gauge and torque tighten the main bearing cap securing bolts.
Refit the windage trays to the cylinder block. Fit and tighten the securing bolts.
Lubricate the relief valve assembly, assemble into the pump and tighten the relief valve cap.
Fit the oil pump to the engine and torque tighten the securing bolts.
Move the drive chain fully rearward, fit a shim pack of 0.015 in thickness to the oil pump, align the bolt holes, fit the drive sprocket and two securing bolts.
Using a straight edge (2 Fig 2 page 40), check the alignment of the oil pump drive sprocket (1 Fig 2 page 40), and the crankshaft sprocket (4 Fig 2 page 40).
Remove and refit the pump drive sprocket as required in order to align the sprockets. When the alignment is correct, remove the pump sprocket.
Fit the chain and shims to the sprocket, and fit the assembly to the oil pump.
Fit the tab washer and bolts.
Tighten the bolts and lock over the tabs.
Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 3 page 40).
Lubricate and refit the pipes to the pump.

Apply 'Hylosil" to the transfer housing gasket face and seat the housing.
Fit and torque tighten the securing bolts.
Reverse the remaining removal procedure to fit the replacement sump. Refit the front crossmember. Refit the air cleaner.

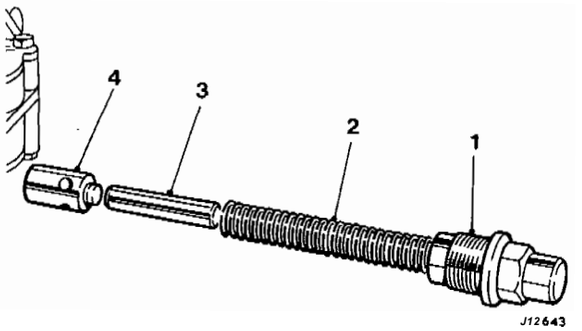


Fig 1

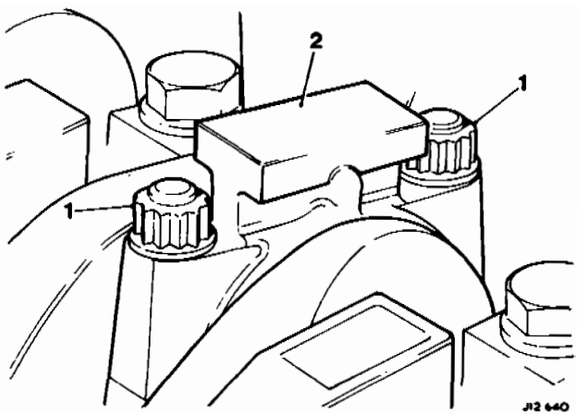


Fig 2

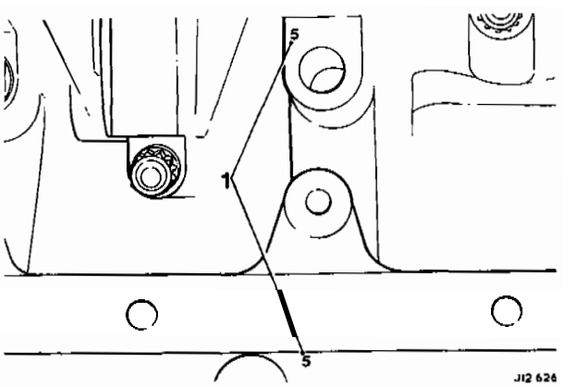


Fig 3

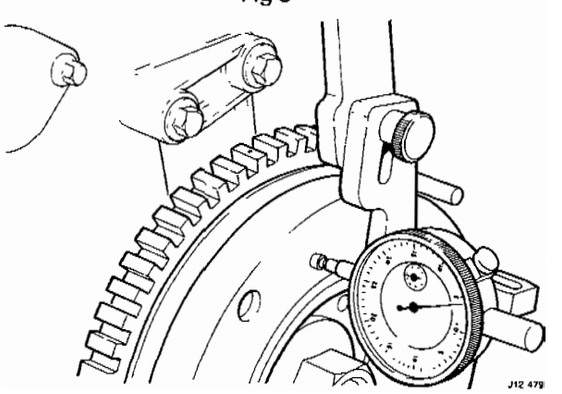


Fig 4

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Fill the engine with oil to the correct level.

DATA

Crankshaft end float:
0.004 to 0.010 **in.**

Oversize thrust washers available in sizes:
0.005 in.
0.010 in.

Oil **pump sprocket shims available sizes:**
0.005in
0.010in
0.020in

TORQUE FIGURES

Adaptor plate to sump ***49-54Nm***
Adjustment trunnion ***to*** *alternator securing* ***bolt 23-27Nm***
Alternator adjustment bolt ***to*** *timing cover nut* ***23-27Nm***
Alternator adjustment bolt-trunnion lock nuts ***12-14Nm***
Alternator pivot ***bolt 23-27Nm***
Alternator pivot bolt nut ***23-27Nm***
Dipstick to bracket ***5-8Nm***
Oil drain back/filler tube to sump adaptor boss ***12.5-15Nm***
Oil *pump drive sprocket to oil pump drive hub* ***9.5-12Nm***
Oil ***pump*** *to cylinder block* ***23-27Nm***
Oil sump plug ***41-47Nm***
Oil sump to cylinder block ***23-27Nm***
Oil sump to timing cover ***23-27Nm***
Main bearing cap to block ***136-142Nm***
Transfer housing to cylinder block ***23-27Nm***
Windage trays to cylinder block ***23-27Nm***

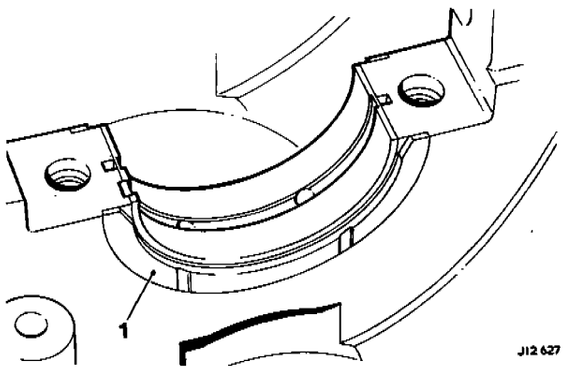


fig 1

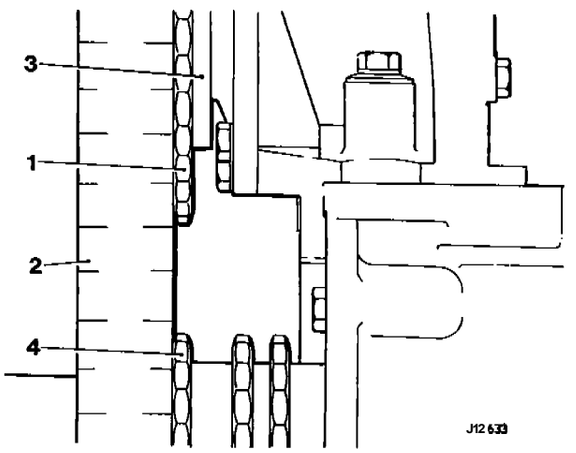


Fig 2

OILS/GREASES/SEALANTS

Oil pipe 'O' rings PETROLEUM ***JELLY***
Sump to cylinder block ***HYLOSIL 102***
Transfer housing to block ***HYLOSIL 102***

SPANNER SIZES

10mm
17mm
19mm
30mm
3/8in AF
9/16in AF

04390

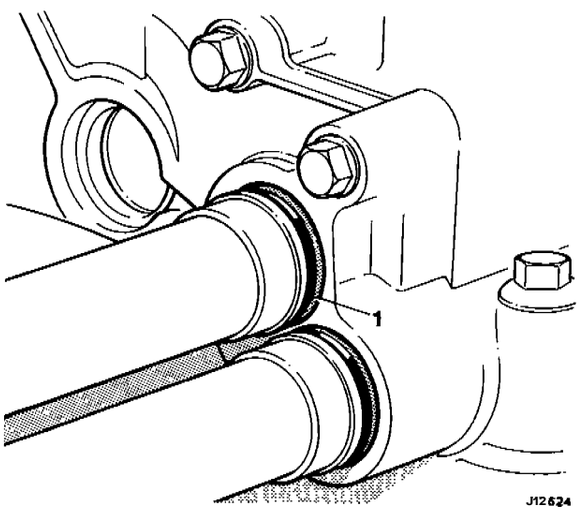


Fig 3

CRANKSHAFT

RENEW 12.21.33

Remove the engine and gearbox/transmission unit 12.41.01/2 page 59.
Detach the gearbox/transmission unit from the engine 12.41.01/2 page 63. Fit the engine to a stand.
Remove the flywheel/drive plate and transmission adaptor plate.
Remove the cylinder head 12.29.01 page 22.
Using Service Tool 18G 1437 to hold the crankshaft pulley, remove the pulley securing bolt.
Fit Service Tool 18G 1436 to the pulley. Fit and tighten the tool securing bolts.
Tighten the tool centre bolt to remove the pulley assembly.
Remove the sump bolts, and remove the sump.
Remove the transfer housing bolts and housing.
Remove the oil pump pick-up pipe assemblies, the crankshaft windage trays (1,2 Fig 1) and the oil pump (3,4 Fig 1).
Remove the engine timing cover securing bolts and remove the cover assembly.
Slacken off the oil pump drive chain damper securing bolts and move the damper clear of the chain.
Remove the oil pump drive chain, remove the elastic band from the upper dampers and remove the upper timing chain.
Remove the lower tensioner bolts and remove the tensioner.
Release the lower chain fixed damper securing bolt lock tabs, remove the bolts and collect the damper and tab washer. Repeat for the remaining fixed and pivot dampers and remove the lower chain and intermediate sprocket.
Remove the seal/crankshaft damper spacer, the woodruff key (1 Fig 2), the crankshaft sprockets (2 Fig 2) and the inner woodruff key.
Remove the rear oil seal housing securing bolts (1 fig 3) and remove the housing (2 Fig 3).
Remove the connecting rod cap securing nuts and remove the bearing caps in pairs (i.e. 1-6, 2-5, 3-4). turning the crankshaft for access as required. As each connecting rod cap is removed, ensure that each rod and cap are identified to each other for re-pairing during assembly.
As each cap is removed, its relative connecting rod and piston assembly should be pushed up the bore, enabling the crankshaft to be rotated to remove the remaining caps. Care should be taken not to push the piston too far up the cylinder bore as this will release the piston rings.
Ensuring that the main bearing caps are marked relative to the cylinder block (1 Fig 4), remove the main bearing cap bolts, the caps and carefully lift out the crankshaft.

Remove and discard the bearing shells and the thrust washers.
Clean the bearing caps and the cylinder block main bearing housings.
Fit the new bearing shell halves to the cylinder block and lubricate with clean engine oil.

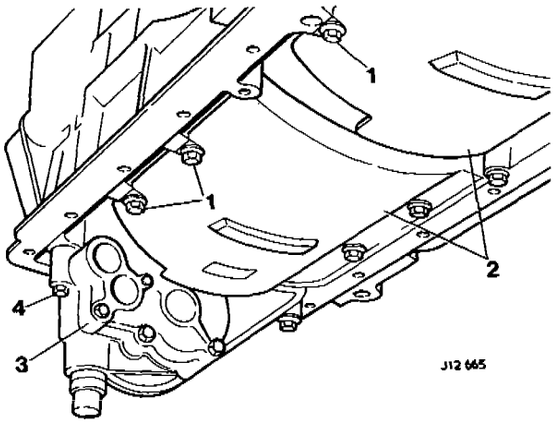


Fig 1

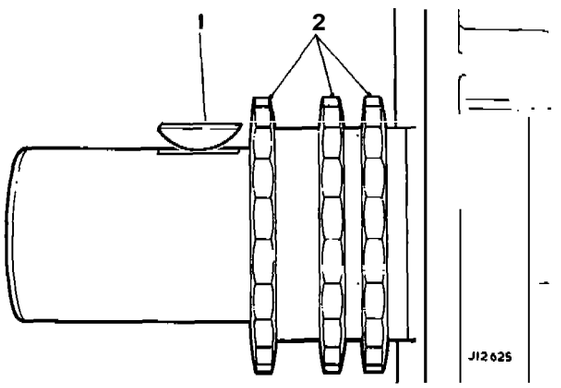


Fig 2

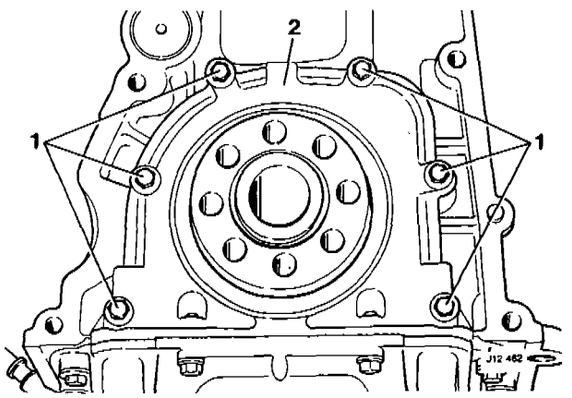


Fig 3

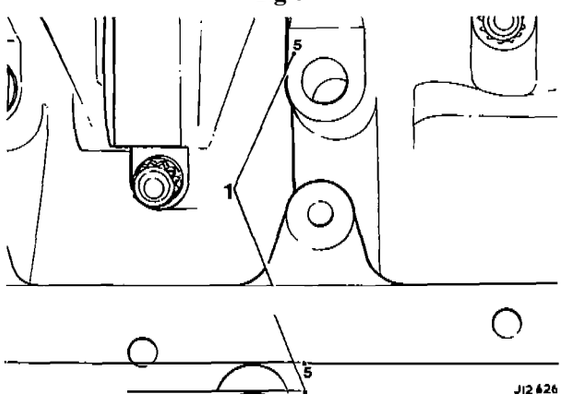


Fig 4

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Clean and polish the crankshaft journals, lubricate and carefully assemble the crankshaft into the cylinder block.
Fit the thrust washers ensuring that the steel side of the washer is mated to the cylinder block (1 Fig 1).
Rotate the crankshaft to ensure that it turns freely.
Fit the main bearing shells into the main bearing caps, lubricate and fit to the cylinder block.
Start the securing bolts and very carefully tap the main bearing caps to ensure they are seated in the cylinder block.
Rotate the crankshaft to ensure that it still turns freely, pull down each bearing cap individually and torque up the bolts.
Rotate the crankshaft between pulling down each bearing cap.
Check the crankshaft end float (1 Fig 2), the permitted tolerance is 0.000 to 0.010 in.
Should the end float exceed this, oversize thrust washers are available in 0.005 in. and 0.010 in. and should be fitted accordingly to ensure that the end float is within these tolerances.

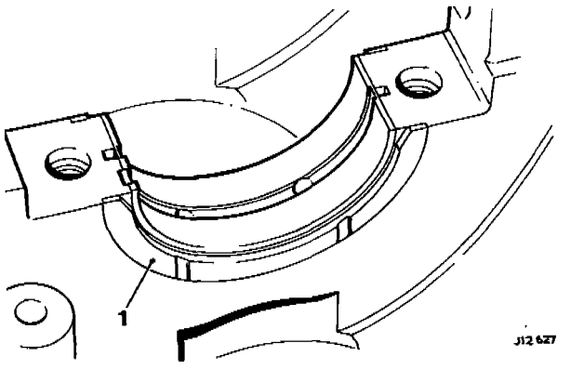


Fig 1

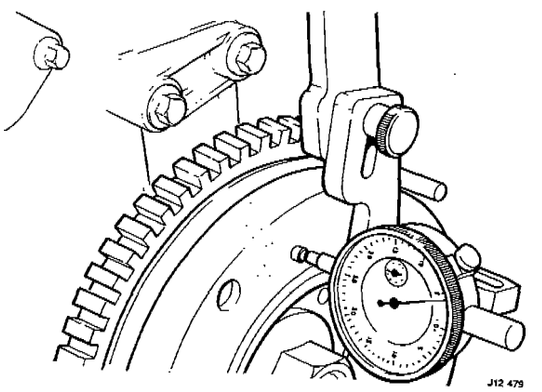


Fig 2

EXCESSIVE END FLOAT

End float measured	(A)	0.023 in.
Oversize thrust washers fitted	(B)	0.000 in. (standard)
End float required	(C)	0.007 in.
A-C = Thrust washer size required		= 0.016 in.
Thrust washer sizes to be fitted		0.010 in. + 0.005 in.
Total		0.015 in.
End float achieved		0.023 in. - 0.015 in.
Total		0.008 in.

INSUFFICIENT END FLOAT

End float measured	(A)	0.003 in.
Oversize thrust washer fitted	(B)	0 010 in.
End float required	(C)	0.007 in.
C-A = Thrust washer size required		= 0.004 in.
Thrust washer size to be fitted		= 0.005 in.
End float achieved		0.003 in. + 0.005 in.
Total		0.008 in.

Carefully remove the old rear oil seal from the rear housing.

Clean the housing and lubricate the seal mounting face. DO NOT REMOVE THE PLASTIC 'O' RING PROTECTOR FROM THE SEAL PRIOR TO FITTING TO THE ENGINE

Using Service Tool 550-3 (1,2 Fig 1), fit the new seal (3 Fig 1) to the housing (4 Fig 1).
Smear the gasket face with 'Hylosil 102'.
Locate the plastic protector 'O' ring (1 Fig 2) onto the end of the crankshaft (2 Fig 2) and push the rear seal housing over the crankshaft and up to the rear cylinder block face.
Fit the bolts, check that the sump face and the cylinder block are flush and tighten the bolts.
Fit a new bearing shell to the connecting rod, lubricate with clean engine oil and fit to the crankshaft.
Fit a bearing shell to the big end cap, lubricate and fit to the connecting rod. Fit and torque tighten the nuts,
Turn the crankshaft over and ensure that there are no 'tight' spots, i.e. the crankshaft rotates freely.
Repeat this procedure for the remaining five cylinders.
Clean and inspect for wear or damage all the timing gears, chains, guides and tensioners.
Should any components be suspect, replace them.
Fit and seat the crankshaft sprocket woodruff key and fit the sprocket to the crankshaft.
Lubricate the lower timing chain. Fit the chain to the intermediate sprocket, fit the chain to the lower sprocket, and then assemble the intermediate sprocket and chain to the cylinder block.

Should the intermediate sprocket be worn or damaged, the assembly must be replaced.
Fit the spacers (1 Fig 3) to the lower pivoting damper and fit the assembly (3 Fig 3) to the cylinder block.
Fit a tab washer (4 fig 3) and securing bolts (5 Fig 3).
Tighten the bolts and lock over the tabs.
Clean the lower tensioner assembly, remove the ball valve (1 Fig 4) and ensure that the bottom of the housing is clean (2 Fig 4).
Check that the ball valve is free by shaking it to ensure it rattles. If it does not, replace the valve assembly. If it does, renew and lubricate the 'O' ring (3 Fig 4) and press the valve back into the housing.
The ball free movement is 0.74 to 0.45mm.
Inspect the housing and hydraulic tensioner (4 Fig 4) for wear or scoring. Also check that the oilhole (5 Fig 4) is clear in the end of the piston.
Lubricate the component parts. Assemble the tensioner by pressing and twisting the snail clockwise until the pawl locks in the 'park position. Insert the tensioner assembly into the housing and fit the housing to the cylinder block. Fit and tighten the securing bolts (6 Fig 4).
Fit the lower static damper, fit the tab washers and bolts, tighten the bolts and knock up the tabs.

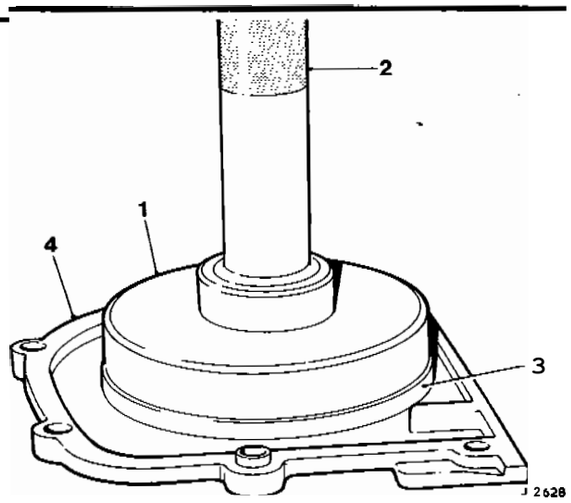


Fig 1

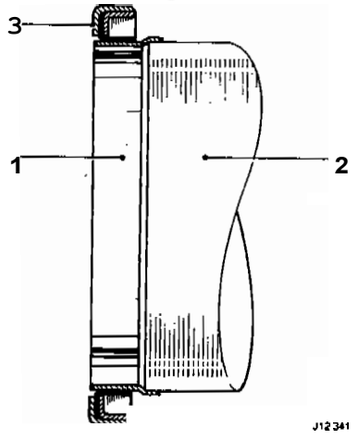


Fig 2

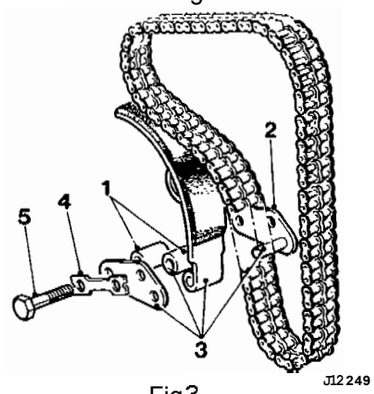


Fig 3

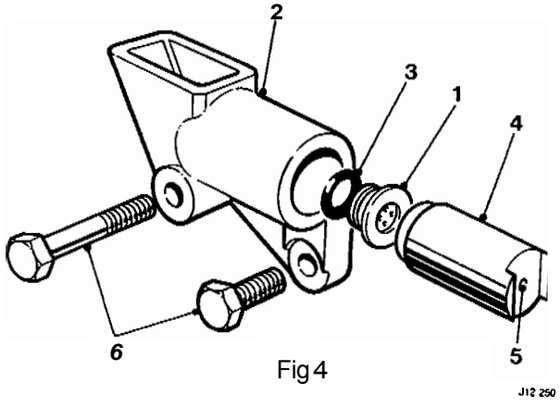


Fig 4

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Release the tensioner by pushing the pivoting damper away from the chain,
thus pushing the tensioner back into the housing which will release the snail, and tension the chain.
Fit the upper static damper pedestal securing bolts, the tab washer and the damper.
Tighten the securing bolts and lock over the tabs.

Fit a dial gauge to the top of the cylinder block, and turn the engine over until No. 1 piston is at TDC (Fig 1).
Lubricate the upper chain and fit it to the intermediate sprocket.
Fit and engage an elastic band around the upper dampers to secure the chain.
Lubricate the oil pump drive chain, fit the chain to the crankshaft sprocket and lodge in the correct position.
Remove the distributor drive gear shaft seal using Service Tool JD 118 (18G 1468).
Lubricate the new distributor drive shaft seal and fit to the cover using Service Tool 18G 1469.
Remove the old timing cover oil seal.

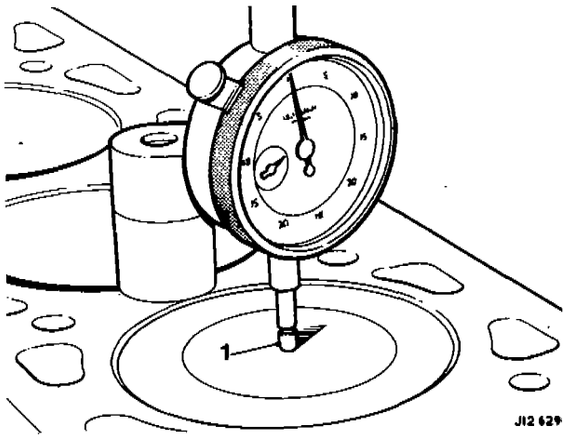


Fig 1

Fit a new seal into the timing cover using Service Tool JD 129 and a suitable press (Fig 2).
Smear the cylinder block timing cover face with 'Hylosil 102', lubricate the bearing shells and carefully fit the timing cover to the angine ensuring that the timing cover/cylinder head mating face is flush with the cylinder block (Fig 3).
Fit and tighten the securing bolts.
Lubricate and fit the oil seal distance piece. Fit and seat the damper woodruff key.
Remove the oil pump pressure relief valve retaining nut, remove the spring, tube and valve, clean and check for wear or scoring. Remove the oil pump body securing bolts and remove the outer rotor.
Remove the oil pump backplate securing bolts, remove the backplate, and remove the bearing shell from the housing.

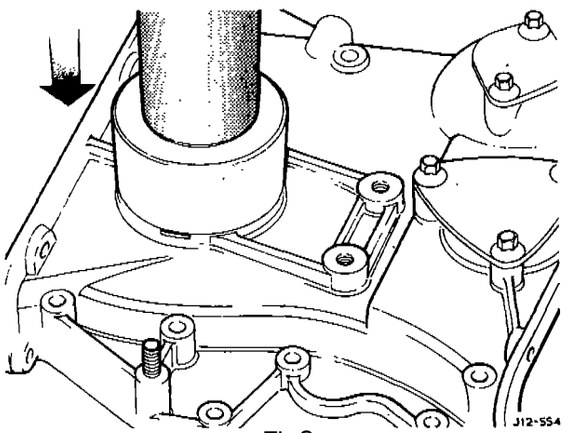


Fig 2

Clean all dismantled parts and check for obvious wear or scoring.
Fit the outer rotor and check the clearance between the rotor and the oil pump housing (Fig 4).
Check the rotor end float (Fig 1 page 45).
Check the measurements given below. Replace any suspect parts.

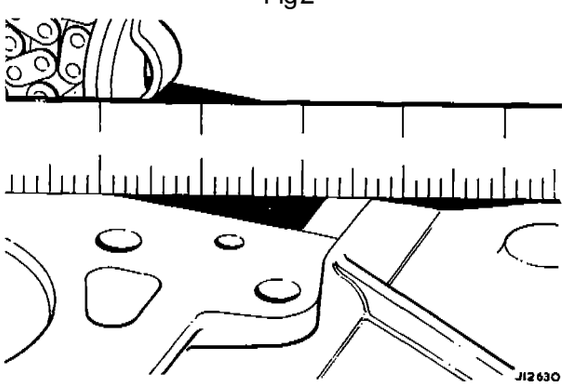


Fig 3

DATA

Material	Cast iron grade 12
End float	0,1 mm
Outer rotor O/D	69,825 to 69,774 mm
Outer rotor width	27,975 to 27,962 mm
Inner rotor width	27,975 to 27,962 mm
Clearance outer rotor to body	0.2 mm
Oil pump body rotor bore	69,951 to 69,926 mm
2 horn clearance	0,2 mm
3 horn clearance	0.2 mm

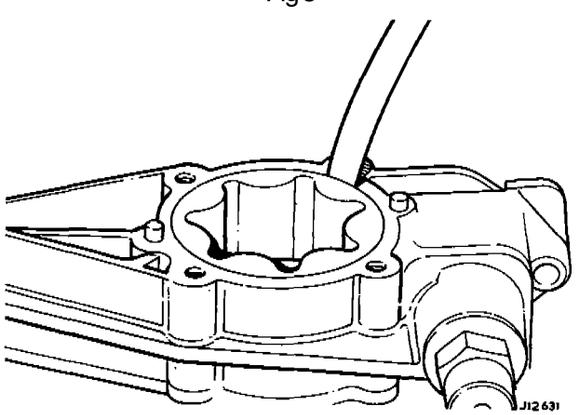


Fig 4

Lubricate the bearing shell and fit to the pump housing.
Smear the backplate gasket face with sealant.
Fit the backplate and tighten the securing bolts.
Lubricate the pump inner and outer rotors, the bearing and the housing.
Fit the outer rotor, smear the gasket face with sealant, fit the seal to the pump body and tighten the securing bolts.
Lubricate and assemble the relief valve, spring and tube to the pump. Fit and tighten the relief valve cap.

Fit the oil pump to the engine and tighten the securing bolts.
Clean oil pump drive sprocket, offer up the sprocket to the oil Dump drive flange (3 Fig 2), place a straight edge (2 Fig 2) between the crankshaft sprocket (4 Fig 2) and the oil pump drive sprocket (1 Fig 2), and shim out the oil pump drive sprocket until the two sprockets are precisely aligned.
Once the necessary shim pack has been selected, fit the shims to the oil pump, engage the sprocket in the drive chain, offer up the sprocket to the pump and align the securing bolt holes.
Fit the tab washers and the securing bolts, tighten the bolts and lock over the tabs.
Position the oil pump chain damper to take the slack out of the chain and tighten the securing bolts.
Clean and fit the crankshaft windage trays and tighten the securing bolts. Clean all oil pick-up pipes and housings. Fit new 'O'rings (1 Fig 3) to the oil pick-up pipes.
Fit the pick-up pipe to the housing and secure with the bolts. Lubricate the '0 rings on the oil pipes and fit the pipes to the housing. Smear the housing to the cylinder block gasket face with 'Hylosil 102 engage the pipes in the rear face of the oil pump, ensure that the '0' rings enter the housing easily. Fit and tighten the housing securing bolts.
Smear the sump gasket face with 'Hylosil 102' and fit the sump to the engine and tighten the securing bolts.
Refit the crankshaft damper, fit Service Tool 18G **1437** to the damper and torque tighten the nut.
Refit the cylinder head 12.29.01 page 22.
Remove the engine from the stand.
Attach the gearbox/transmission unit to the engine 12.41.01/2 page 63.
Refit the engine to the vehicle **12.41.01/2** page **67.**

DATA

Crankshaft end float 0.004 to 0.010in

Oversize thrust washers available in sizes:
0.005in
0.010in

Oil pump sprocket shims available sizes:
0.005in
0.010in
0.020in

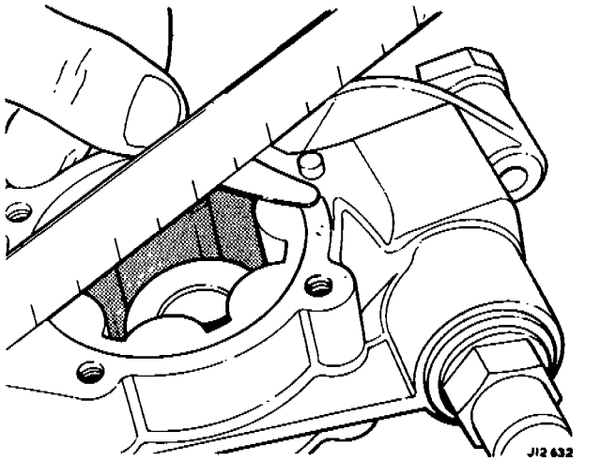


Fig 1

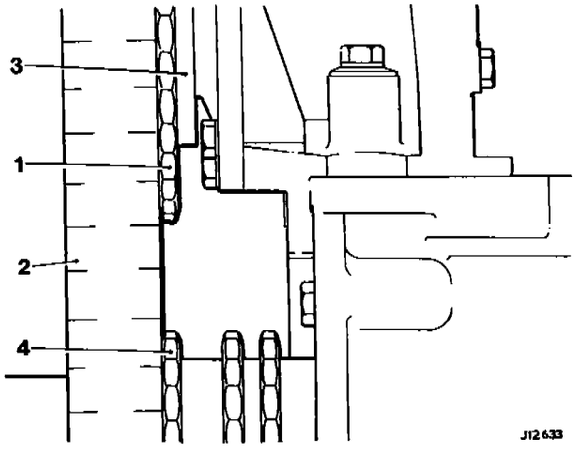


Fig 2

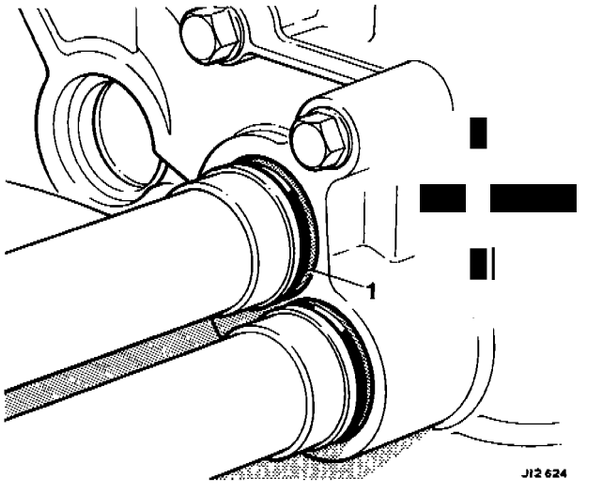


Fig 3

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TORQUE FIGURES

Adaptor plate to sump **49-54Nm**
Adjustmant trunnion to alternator securing bolt **23-27Nm**
Alternator adjustment bolt to timing cover nut **23-27Nm**
Alternator adjustment bolt-trunnion **lock** *nuts* **12-14Nm**
Alternator pivot bolt **23-27Nm**
Alternator pivot bolt nut **23-27Nm**
Dipstick to bracket **5-8Nm**
Oil drain back tube to sump adaptor **boss 12.5-15Nm**
Oil **pump** *drive sprocket to oil pump drive hub* **9.5-12Nm**
Oil pump **to** *cylinder block* **23-27Nm**
Oil sump plug 41 **-47Nm**
Oil sump to cylinder **block 23-27Nm**
Oil sump **to** *timing cover* **23-27Nm**
Main bearing cap to cylinder **block** *136-142Nm*
Transfer housing to cylinder block **23-27Nm**
Windage trays to cylinder block **23-27Nm**

OILS/GREASES/SEALANTS

Oil pipe 'O' rings **PETROLEUM JELLY**
Sump to cylinder block **HYLOSIL 102**
Transfer housing to cylinder block **HYLOSIL 102**

SPANNER SIZES

10mm
17mm
19mm
30mm
3/8in AF
9/16in AF

04390

CRANKSHAFT PULLEY

RENEW **12.21.09**

Remove the spoiler/under tray to inner wheel arch cover.
Remove the spoiler/under tray to inner wheel arch cover.
Remove the nuts securing the torquatrol unit to the water pump **(1,2** Fig **1).**
Remove the fan cowl securing clips (1 Fig 2).
Lift out the cowl and torquatrol unit complete.

Remove the air con drive belt (if fitted).
Remove the air con drive pulley (if fitted).
Slacken the alternator drive belt adjusting nut, the link arm adjusting nut, and the alternator pivot bolt.
Pivot the alternator towards the engine and remove the drive belt.
Fit Service Tool **18G 1437** (1 Fig **3)** to the front crankshaft pulley (3 Fig **3)** and tighten the securing bolts (2 Fig 3).
Wedge the tool against the crossmember **(4** Fig 3).
Remove the pulley retaining bolt **(1** Fig 4).
Remove Service Tool **18G 1437** from the pulley.
Fit Service Tool **18G 1436** to the pulley **(1** Fig 1 page 48) and tighten the securing bolts (2 Fig **1** page **48).**
Tighten the centre bolt, withdraw the pulley from the crankshaft and remove the tool.

Remove the timing plate securing bolts and remove the timing plate.
Fit the timing plate to the new pulley and tighten the securing bolts.
Fit the pulley to the engine, hand tighten the securing bolt and fit Service Tool **18G 1437.**
Wedge the tool against the front crossmember, torque tighten the securing bolt and remove Service Tool **18G 1437.**
Re-position the alternator drive belt over the pulleys and refit the air conditioning belt (if fitted).
Refit the torquatrol unit/fan cowl assembly into position.
Fit the cowl securing clips.
Fit and tighten the torquatrol unit securing nuts.

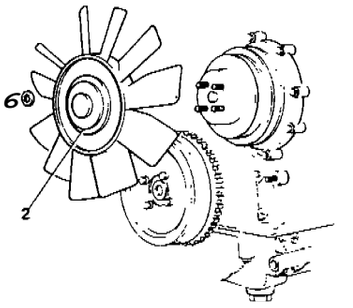
Refit the spoiler/under tray.
Tension the alternator drive belt. A load of 1.5kg must give a total deflection of 4.5mm when applied to the mid-point of the belt.
Tension the air conditioning drive belt and tighten the securing bolts (if fitted).

DATA

Drive belt tension – 1.5kg to give a total deflection of 4.5mm when applied to the mid-point of the belt.

SERVICE TOOLS

Crankshaf pulley remover 18G 1436
Front pulley lock 18G1437/1



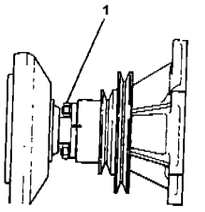


Fig 1

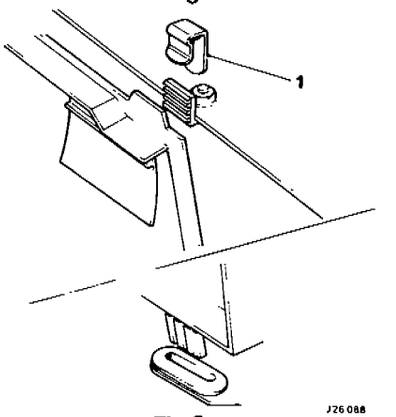


Fig 2

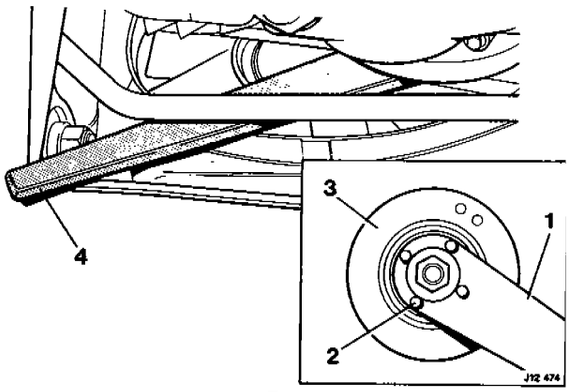


Fig 3

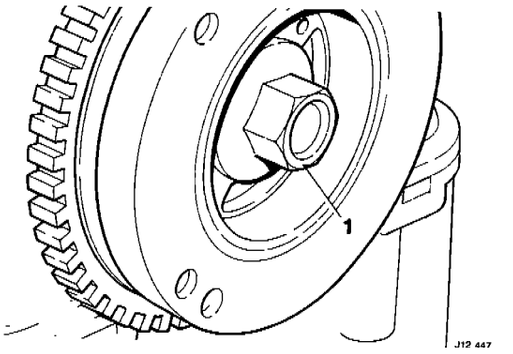


Fig **4**

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TORQUE FIGURES

Adjostment bolt to timing cover nut 23-27Nm
Adjostment bolt trunnion lock nuts 12-14Nm
Adjostment trunnion to alternator bolt 23-27Nm
Alternator pivot bolt 23-27Nm
Alternator pivot bolt nut 23-27Nm
Crankshaft pulley to crankshaft 203.5Nm

SPANNER SIZES

10mm
13mm
19mm
1/2in AF

0439G

CRANKSHAFT END FLOAT

CHECK AND ADJUST **12.21.26**

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD 133 to the road spring pans (Fig 2).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 3) upwards to gain access to the brake pads (2 Fig 3).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 4) to steering rack securing bolt/nut (1,2, Fig 4).

Disengage the splines from the rack pinion (4 Fig 4).

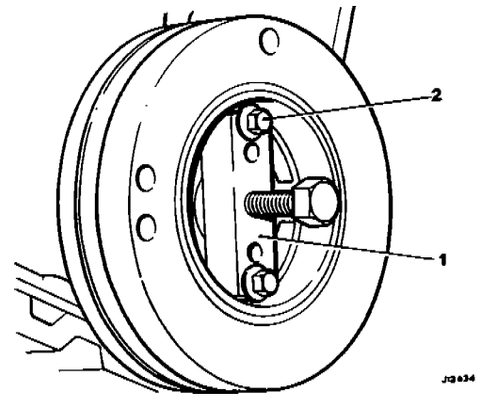


Fig 1

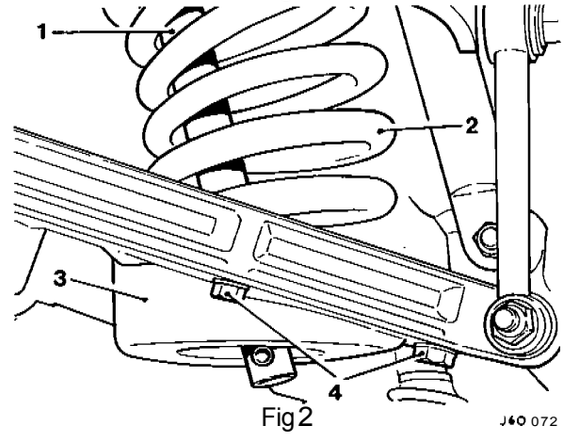


Fig 2 J60 072

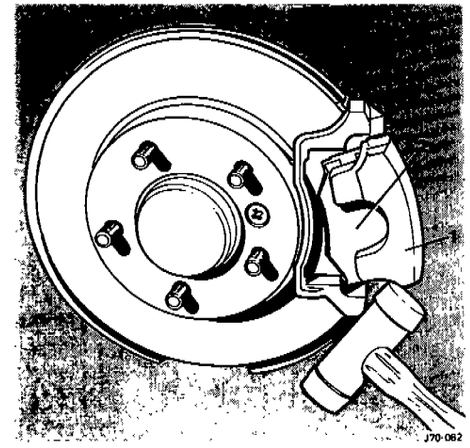


Fig 3

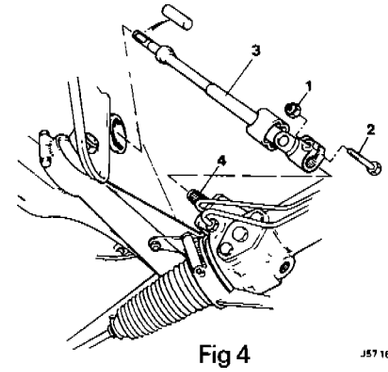


Fig 4 J57 166

NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Disconnect Nos. 1 and 2 plug leads.
Attach **18G 1465** rear engine lifting eye, fit and align Service Tool MS 536 engine support bracket (fig 1).
Engage the hook to the lifting eye.
Tighten the hook nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.
Remove the nuts. Do not remove the bolts at this stage (Fig 2).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 3).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.

Drain the engine oil.
Remove the bolt securing the dipstick tube to the inlet manifold and remove the dipstick tube/assembly.
Remove the air cleaner assembly.
Remove the alternator.
Remove the rear spacers and move the power assisted steering pipes for access.
Disconnect the exhaust to bell housing mounting bracket.
Slacken off the union securing the oil drain-back tube to the sump, and pull the tube clear of the sump.
Remove the clamp securing the gearbox oil cooler pipes to the sump (AUTO ONLY).
Remove all but two of the sump bolts.
Remove the bell housing to sump securing bolts.
Finally remove the two remaining sump bolts and lower the sump.

Place a suitable drain tray under the oil transfer housing area and remove the transfer housing (1.2 Fig 1 page 50).
Remove the oil pump pick-up pipes (3 Fig 1 page 50).
Remove crankshaft windage trays (6 Fig 1 page 50).

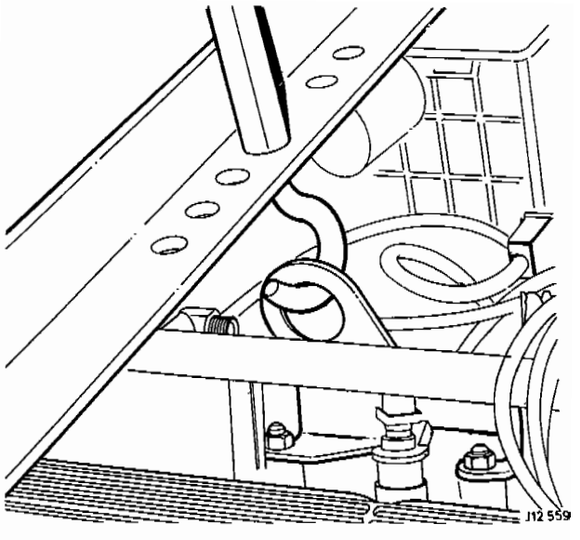


Fig 1

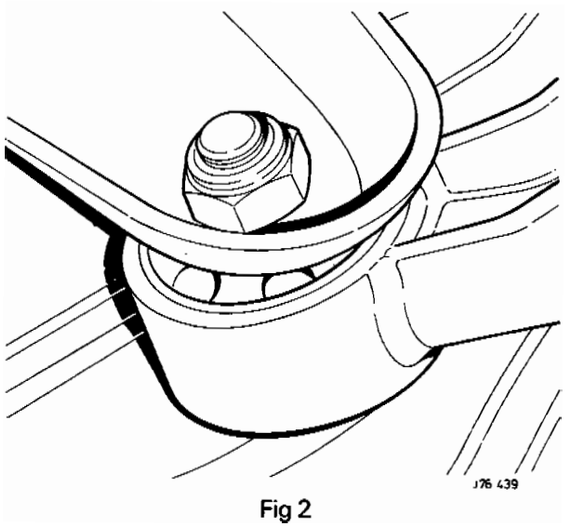
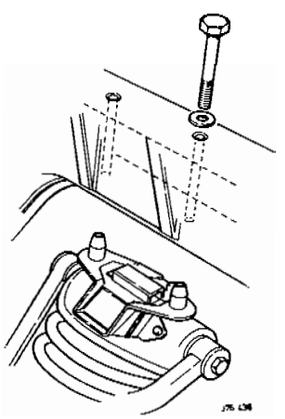


Fig 2


Fig 3

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Mount a suitable dial gauge to the fan cowl and position the stylus on the crankshaft front pulley.
Zero the gauge, and with the use of a suitable lever, measure the crankshaft endfloat (Fig 2).
Correct endfloat should be 0.004 to 0.010in.
Should the endfloat exceed this, remove the centre main bearing cap, remove the thrust washers and replace with suitable oversized thrust washers.
These are available in 0.005in. and 0.010in.
Thrust washers can be added to reduce the endfloat by 0.005in, 0.100 in, 0.015in and 0.20in. (the oversizes are marked on the steel side of the thrust washer).
NOTE: When refitting the thrust washers, ensure that the bearing face (grooved) and not the steel side contacts the crankshaft.
Recheck the end float and if satisfactory, clean the main bearing cap and bearing, lubricate with clean engine oil and fit the cap assembly to the cylinder block.
Fit and torque tighten the securing bolts.
Note: Ensure that the bearing cap is the correct way round, ie the cap numbers correspond to the numbers stamped on the oil sump mounting face.
Rotate the crankshaft to ensure that it is not being 'pinched' and will rotate freely.
Remove the dial gauge and torque tighten the main bearing cap.
Refit the windage trays to the cylinder block and secure with the bolts.
Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 3).
Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102' to the transfer housing gasket face, fit and seat the housing
Fit and tighten the securing bolts.

Apply 'Hylosil 102' to the sump mating face.
Clean the gasket face on the cylinder block.
Lift the sump into position.
Fit and torque tighten the securing bolts.

Refit the oil filler/drain back tube.
Refit the alternator, ensure all spacers are correctly located.
Tension the alternator drive belt. A load of 1.5kg must give a total deflection of 4.5mm when applied to the rnid-point of the belt.
Refit the air cleaner assembly.
Re-position the steering rack under the sump.
Position the crossmember assembly on the jack under the vehicle.
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, P.A.S. pipes, lower column and rear mountings.
Align the front mounting securing bolt holes.
Fit and tighten the front mounting securing nuts (Fig 1 page 51).
Using a second jack, align the left hand rear mounting.

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting. Fit the inner spacer.
Push the bolt fully home, fit but do not tighten the nut.

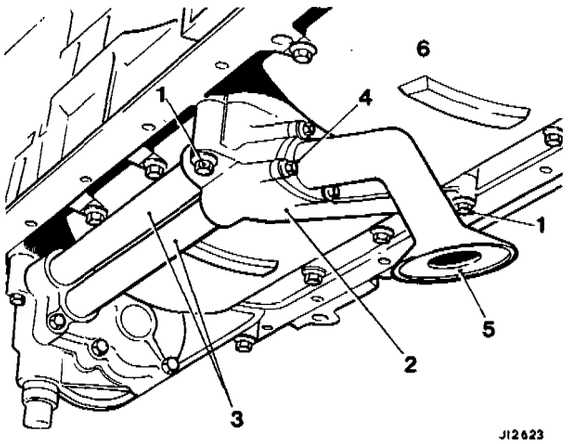


Fig 1

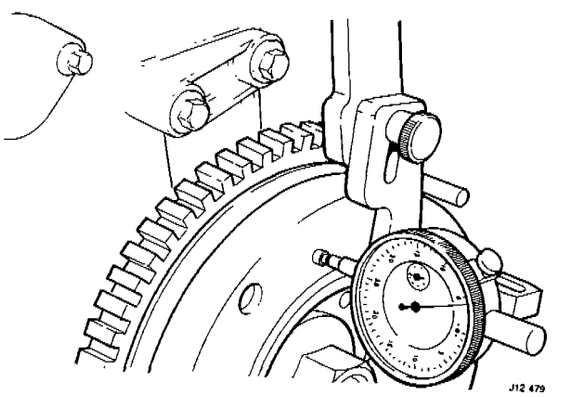


Fig 2

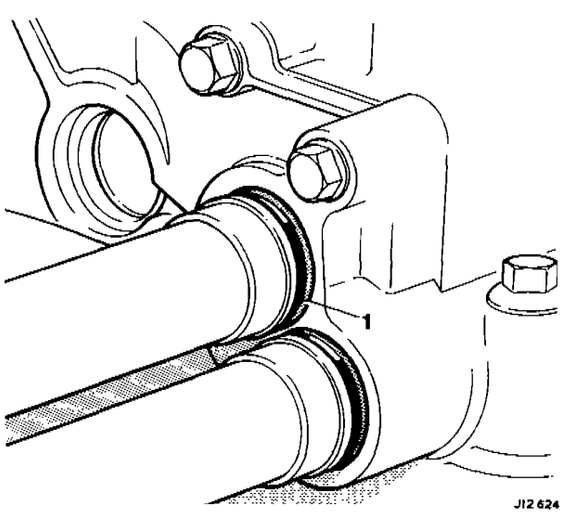


Fig 3

Lower the jack from below the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower the jack from below the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp plate securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the **P.A.S.** pipes and rack
Fit new 'O' rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the **P.A.S.** pipe clamps.
Slacken off the MS 53B hook nut. Remove the hook.
Remove Service Tool MS 53B.
Remove the lifting eye.
Fit and tighten the engine mounting securing nuts. Refit the calipers. Refit the brake pads.
Refit the road wheels.
Lower the vehicle from the axle stands Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. **Lower** the vehicle,
Refill the engine with oil to the correct level,
Bleed the **P.A.S.** system as follows:
Top up the **P.A.S.** reservoir.
Start the engine.
Turn the **steering** wheel to full left hand lock.
Turn the steering wheel to full right hand **lock.**
Top up the reservoir. Fit the reservoir cap.
Close the bonnet.

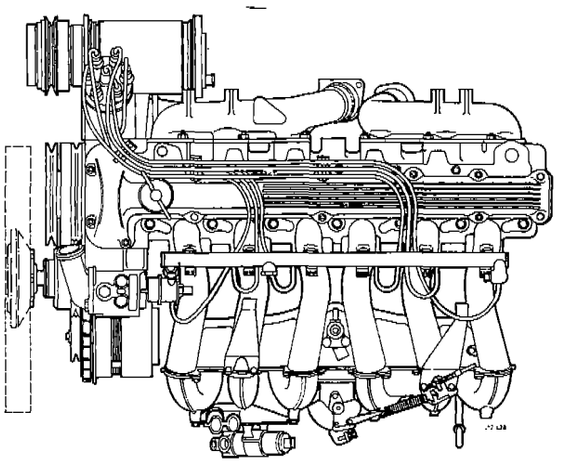


Fig 1

DATA

SERVICE TOOLS

Tie-down bars ***JD 133***
Rear *lifting eye* ***18G1465***
Engine support bracket ***MS 53B***

TORQUE FIGURES

Adaptor plate to sump ***49-54Nm***
Adjustment trunnion to alternator bolt ***23-27Nm***
Alternator bolt to timing cover nut ***23-27Nm***
Alternator bolt (trunnion lock nuts) ***12-14Nm***
Alternator pivot bolt/nut ***23-27Nm***
Caliper to carrier ***31-40Nm***
Connecting rod nut ***52-55Nm***
Dipstick to bracket ***5-8Nm***
Oil drain back tube to sump adaptor ***12.5-15Nm***
Oil sump plug ***41-47Nm***
Oil sump to cylinder block ***23-27Nm***
Oil sump to timing cover ***23-27Nm***
P.A.S. feed/return pipes to rack ***19-23Nm***
Shock absorber to upper mounting ***35-43 ""***
Transfer housing to cylinder block ***23-27Nm***
Wheel nut to wheel stud (steel wheel) ***65-85Nm***
Wheel nut to wheel stud (alloy wheel) ***88-102Nm***
Windage tray ***to*** *cylinder block* ***23-27Nm***

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SPANNER SIZES

10mm
13mm
14mm
17mm
19mm
22mm
30mm
15/16AF

OILS/GREASES/SEALANTS

Oil pipe 'O'rings ***PETROLEUM JELLY***
Sump to cylinderblock ***HYLOSIL 102***
Transferhousing ***to*** *cylinderblock* ***HYLOSIL 102***

04396

CRANKSHAFT FRONTOILSEAL

RENEW **12.21.14**

Removethe air con drive pulley (iffitted) and removethe crankshaft pulley 12.21.09 page47.
Removethe woodruff key and spacer (2 Fig 1).
Remove the old oil seal from the timing cover using Service Tool JD 128 (A Fig 2).
Fit the new oil seal (prior to fitting the crank spacer) using Service Tool JD 129 and the crankshaft pulley bolt (**B** Fig 2).
Inspectthe edges of the spacer for nicks, burrs and wear marks. Replace if necessary.
Refitthe woodruff key and the crankshaft pulley.
Refitthe aircon pulley (if fitted).

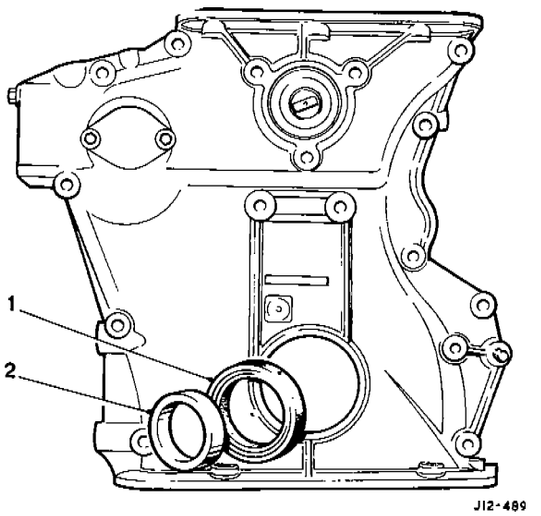


Fig 1

DATA

SERVICE TOOLS

Crankshaftpulley remover ***18G1436***
Frontpulley lock ***18G 1437/1***

TORQUE FIGURES

Adjustment trunnion to alternator bolt ***23-27Nm***
Adjustment bolt to timing ***cover*** *nut* ***23-27Nm***
Adjustment bolt-trunnion lock nuts ***12-14Nm***
Alternator pivot bolt 23-27Mm
Alternator pivot bolt nut ***23-27Nm***
Crankshaft pulley ***to*** *crankshaft* ***203.5Nm***

SPANNER SIZES

8mm
10mm
13mm
19mm

1/2in AF
9/16in AF

04390

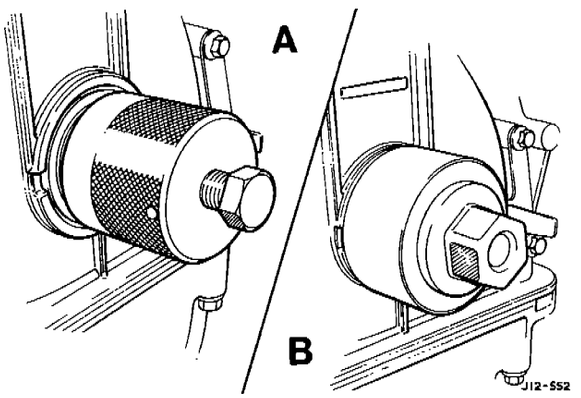


Fig 2

CRANKSHAFT REAR OIL SEAL

RENEW **12.21.20**

Remove the flywheel 12.53.07 (Manual) page 54.
Remove the transmission drive plate 12.53.03 (Auto) page 56.

NOTE: Make a note of the position of any balance weights fitted to the flywheel/drive plate.

Remove the rear oil seal housing securing bolts (1 Fig 1) and remove the housing (2 Fig 1).
Carefully remove the old rear oil seal from the housing, clean the housing and lubricate the seal mounting face.
DO **NOT** REMOVE **THE PLASTIC 'O' RING PROTECTOR** FROM **THE NEW** SEAL **PRIOR TO FITTING TO THE** HOUSING.

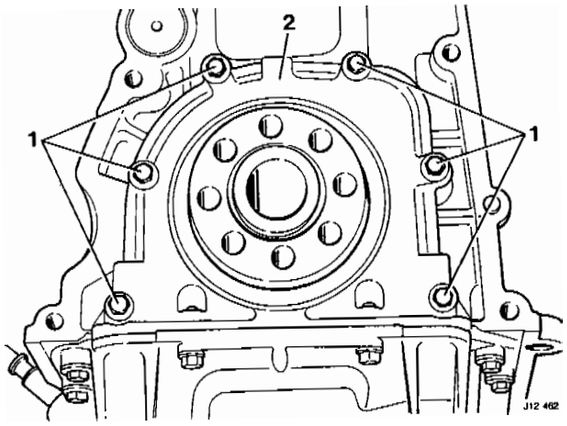


Fig 1

Fit the new seal (3 Fig 2) to the housing (4 Fig 2) using tool JD 550-3 (1 Fig 2) and 18G 134 (2 Fig 2).

Smear the gasket face with 'Hylosil 102', and locate the plastic 'O' ring protector (1 Fig 3) on to the end of the crankshaft (2 Fig 3).
Push the rear seal housing (3 Fig 3) over the crankshaft and up to the rear cylinder block face.
Remove the plastic 'O' ring protector.
Fit and torque tighten the housing securing bolts.
Refit the flywheel 12.53.07 (Manual) page 54.
Refit the transmission drive plate 12.53.03 (Auto) page 56.

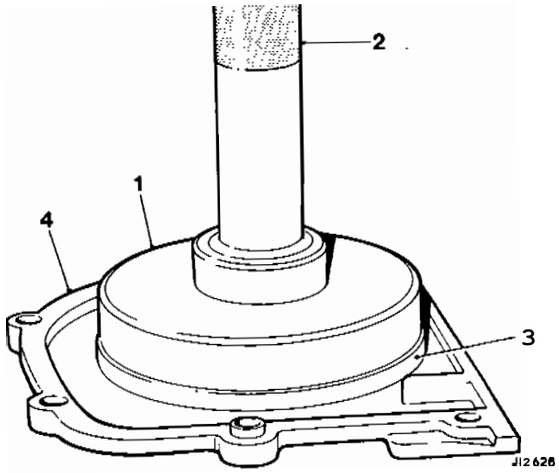


Fig 2

DATA

SERVICE TOOLS

Driver handle 18G 134
Rear main oil seal installer 186134-8

TORQUE FIGURES

Rear crankshaft seal housing to cylinder block 23-27Nm

SPANNER SIZES

17mm

04396

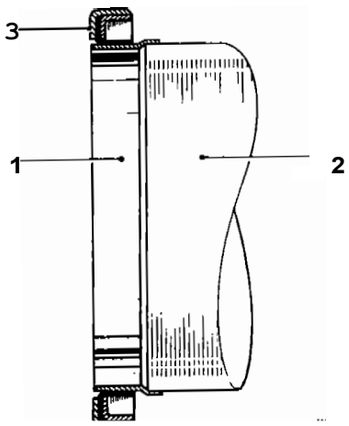


Fig 3

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ENGINE FLYWHEEL

RENEW 12.53.07

Remove the rear inlet manifold securing nuts and pull the earth leads clear of the studs.
Fit lifting eye **18G** 1465 to the rear inlet manifold studs.
Fit Service Tool MS 538 (Fig 1) and take the weight of the engine with the hook.
Remove the fan cowl. Remove the gear knob.
Remove the propeller shaft.
Remove the exhaust down pipe support bracket and the down pipe/intermediate pipe clamp.
Remove the olive and secure the exhaust aside.
Remove the slave cylinder nuts (1 Fig 2) from the bell housing and remove the push rod.
Disconnect the gearbox switch connectors.
Using a jack/support channel, take the weight of the gearbox and remove the bolts securing the rear mounting to the body. Lower the jack and remove the rear mounting assembly.
Using MS 536, lower the gearbox and engine assembly.
Disconnect the gear selector shaft universal joint securing nut/bolt, remove the wavy washer and remove bolts securing the remote control.
Remove the mounting rubbers and washers.
Remove the gearbox switch for access to the upper right hand gearbox/bell housing securing bolt.
Remove the remaining gearbox/bell housing securing bolts and remove the gearbox assembly.
Reposition the clutch slave cylinder from the bell housing.
Remove the gearbox insulation pad.
Remove the bell housing to adaptor plate securing bolts and nuts, reposition the earth leads and remove the bell housing.

Hold the flywheel in one position and remove the bolts securing the clutch cover to the flywheel.
CAUTION: MAKE A NOTE OF **THE POSITION OF** ANY **BALANCE WEIGHTS RELATIVE** TO **THE CLUTCH** COVER. Remove the balance weights.
Remove the clutch assembly.
Remove the eight securing bolts (1 Fig 1 page 55) and remove the flywheel (2 Fig **1** page 55).
Remove the needle roller race and fit to the replacement flywheel.
Refit the flywheel to the crankshaft and torque tighten the securing bolts to the recommended value.
Fit the clutch assembly to the flywheel ensuring that the 'flywheel side' of the drive plate faces the flywheel.
Align the clutch with a dummy input shaft.

Fit the balance weights to the clutch cover and torque tighten the securing bolts.
Remove the dummy shaft.

Fit the housing to the adaptor plate, fit and torque tighten the securing bolts/nuts.
Fit the insulation pad in position, secure with string.
Fit the gearbox, fit and tighten the bolts.
Refit the upper switch.

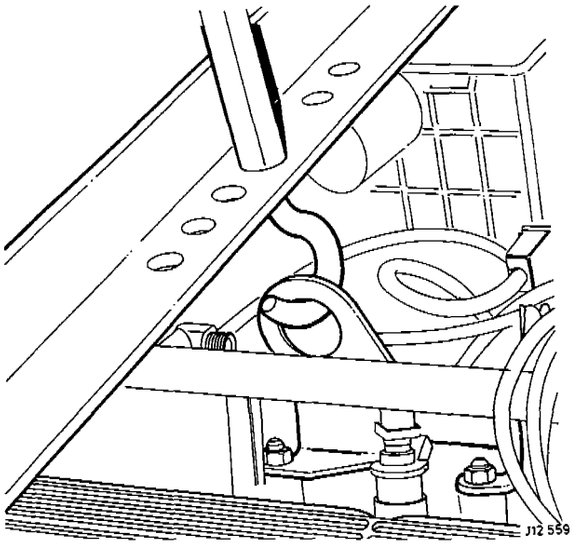


Fig 1

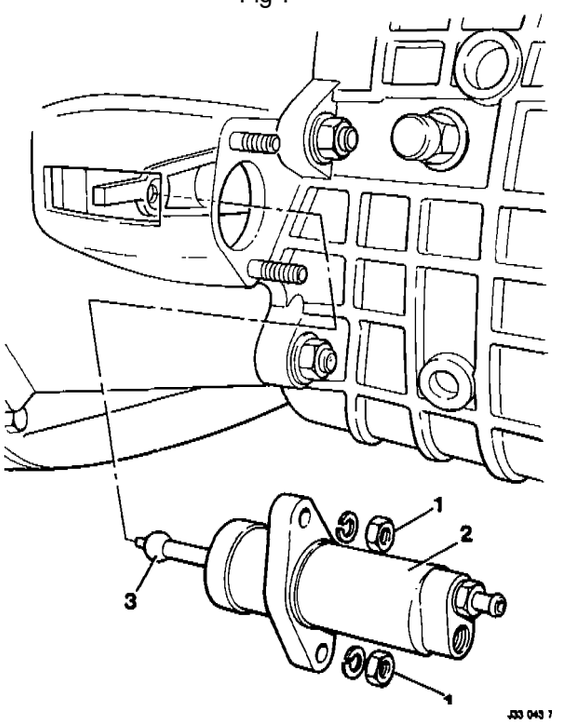


Fig 2

Fit the mounting rubbers and washers, reconnect the selector shaft.
Raise the engine by tightening the hook nut on tool MS 53B and refit the rear mounting.
Refit the slave cylinder. Reconnect the exhaust system.
Refit the propeller shaft.
Lower the ramp. Release and remove tool **MS** 53B.
Refit the fan cowl.
Remove the engine lifting eye.
Fill the gearbox with the recommended grade of oil to the lower threads of the filler plug aperture.

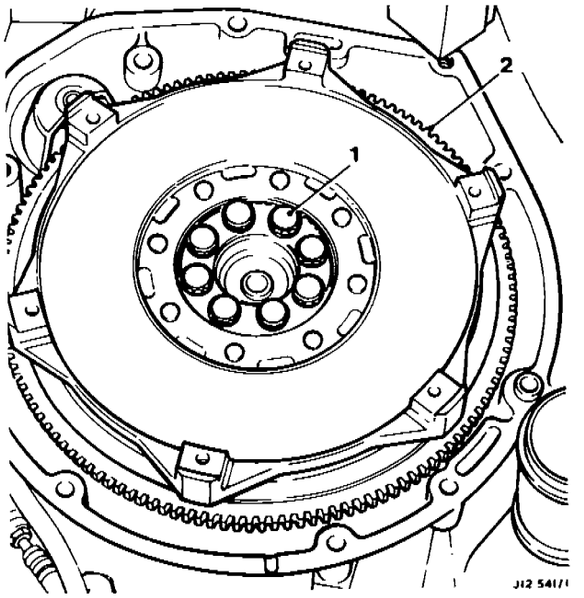


Fig 1

DATA

Maximum material removal allowance to clean up the clutch face 1 mm.

SERVICE TOOLS

***MS** 53B Engine support bracket*
***1861465** Engine lifting bracket*

TORQUE FIGURES

Bell housing to adaptor plate 49-54Nm
Clutch cover to flywheel 23-27Nm
Flywheel to crankshaft 95-105Nm
Propeller shaft to gearbox 95-105Nm
Slave cylinder to bell housing 23-27Nm

SPANNER SIZES

10mm
13mm
17mm
9/16AF

0439G

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ENGINE DRIVE PLATE

RENEW 12.53.13

Disconnectthe kickdown cablefrom the throttle linkage.
Remove the bolt securing the transmission dipstick tube to the inlet manifold.
Fit Service Tool 18G 1465 to the rear of the inlet manifold and take the weight of the engine with MS53B (Fig 1).
Place drain tin below the transmission, drain the fluid.
Disconnectthe exhaustfront pipe.
Taking the weight of the transmission unit, remove the rear mounting to body securing bolts, lower the jack and collet the spacer.
Disconnectthe propeller shaft from the drive flange.
Remove the transmission cable assembly (1,2 Fig 2) complete. Reposition the switch assembly away from the work area.
Remove the selector cable bracket clamp.
Place a drain tin below the dipstick tube (Fig 3), and disconnect the union, drain the remaining fluid and fit a dummy plug to the sump.
Remove the clamp securing the transmission cooling pipes to the transmission, disconnect the pipes and fit a dummy plug to the apertures. Remove the drain tin.
Remove the blanking plug from the torgue converters securing bolt access aperture (1 Fig 4), and remove the crankshaft/drive plate securing bolts, turning the crankshaftfor access to remove each bolt.

Lower the engine/transmission unit using MS53B ensuring that the engine does not foul the steering rack.
Remove the bell housing bolts and remove the transmission (1 Fig 1 page 57).

Remove the drive plate securing bolts (1 Fig 2 page 57).
Remove the drive plate (2 Fig 2 page 57).
Examine all components and check for wear, cracks and distortion.
Check the rear crankshaft oil seal for leaking, replace as necessary.
Fit the replacement drive plate to the crankshaft. Fit and torque tighten the securing bolts.
Lift the transmission unit into position, fit and tighten the bell housing bolts.
Tighten the torque converter bolts as follows:

1 Turn the crankshaft for access to the first converter to drive plate securing bolt (1 Fig 3 page 57).
Align the converter to drive plate bolt hole.
Fit but do not fully tighten the converter to drive plate securing bolt.
2 Turn the crankshaft for access to the second securing bolt hole.
Fit but do not fully tighten the second securing bolt.

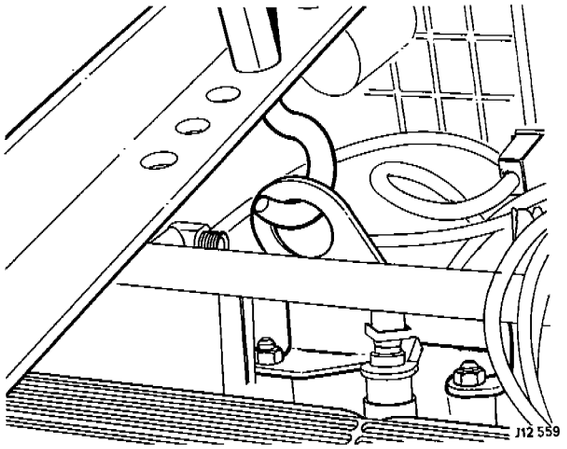


Fig 1

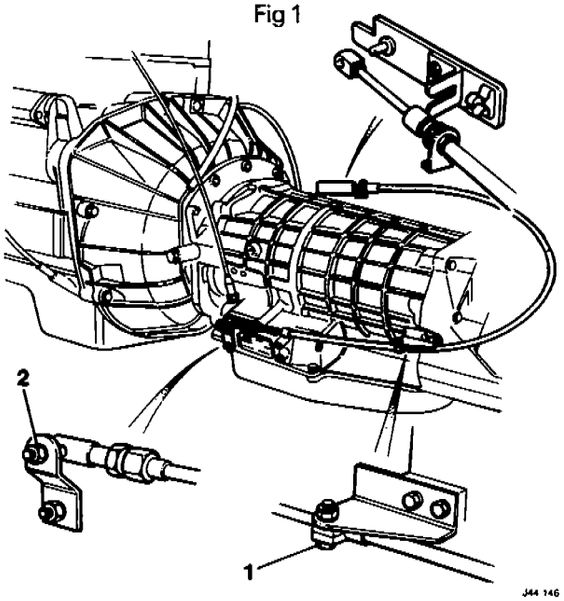
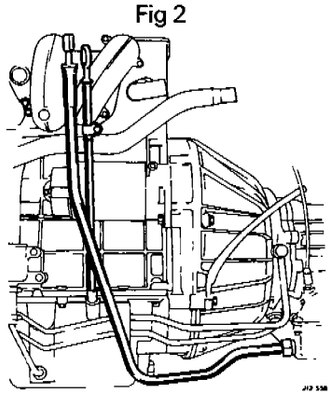


Fig 2


Fig 3

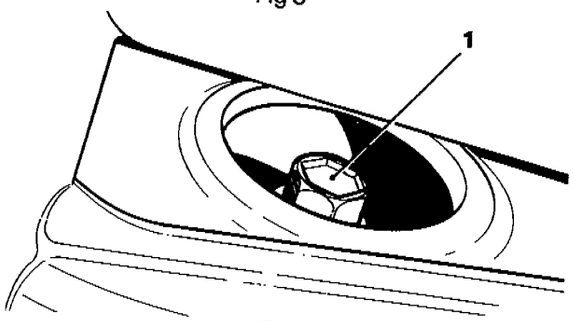


Fig 4

3 Turn the crankshaft for access to the remaining securing bolt hole.
Fit and torque tighten the remaining securing bolt.
4 Torque tighten the remaining two securing bolts.

Refit the blanking plug and stone guard.
Refit the oil cooler pipes to the transmission ensuring new sealing washers are used, secure with the sump bracket.
Reposition the kickdown cable to the bell housing and refit the dipstick tube.
Raise the engine/transmission unit using MS53B.

Refit the transmission cable assembly to the selector shaft. Fit and tighten the securing nuts.
Refit the propeller shaft to the drive flange, raise the rear of the unit into position fit the spacers and secure with the mounting bolts.
Refit the exhaust front pipe to the intermediate pipe and manifold.
Remove Service Tool MS53B align the fan cowl, refit and adjust the kickdown cable.
Remove the engine lifting eye 18G 1465 and replace the manifold securing nuts.
Align and secure the dipstick tubes to the inlet manifold.
Refill with transmission fluid.

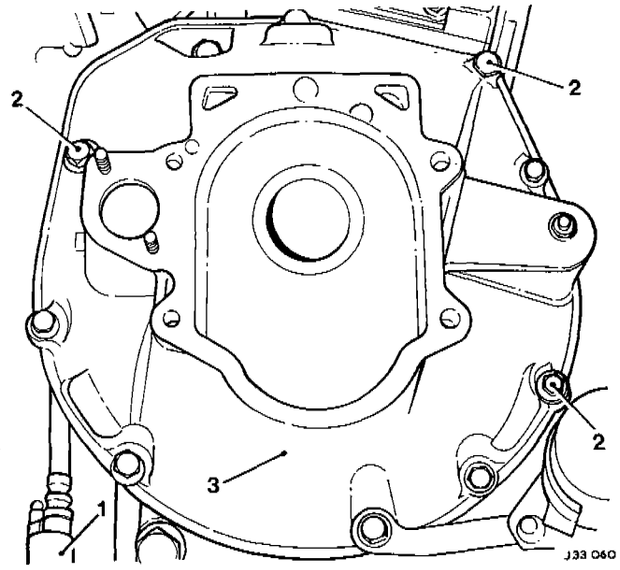


Fig 1

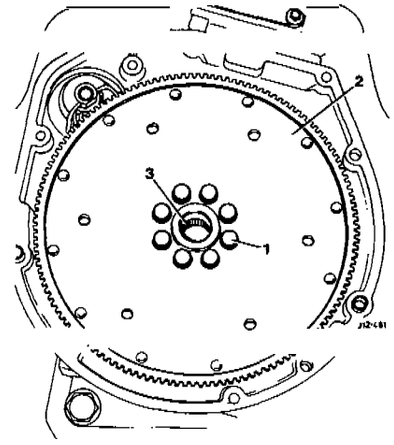


Fig 2

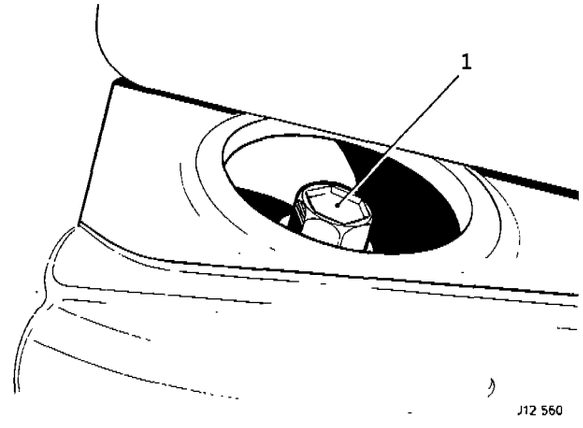


Fig 3

DATA

SERVICE TOOLS

MS 53B Engine support bracket
18G 1465 Engine lifting bracket

TORQUE FIGURES

Base plate assembly to mounting pan ***7-10Nm***
Dipstick tube nut ***20Nm***
Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Drive plate to crankshaft ***95-105Nm***
Drive plate to torque convertor ***49-54Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Intermediate pipe to silencer ***15-18Nm***
Oil cooler pipe banjo bolt ***32-36Nm***
Propeller shaft to gearbox ***95-105Nm***
Rear engine mounting bracket to body ***20-25Nm***
Torque convertor housing to adaptor ***49-54Nm***
Torque convertor housing to block/sump ***49-54Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLIKA YARHESIVES No 5696
Transmission fluid Dexron IID

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16 AF
5mm Allen key

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ENGINE REAR/TRANSMISSION ADAPTOR PLATE

RENEW **12.53.03**

Remove the engine flywheel 12.53.07 (Manual) page 54.
Remove the engine drive plate 12.53.13 (Auto) page 56.

Remove the lower bolt securing the starter motor and reposition the starter motor away from the adaptor plate.
Remove the adaptor plate securing bolts (1 Fig 1) and remove the adaptor assembly.
Remove the dowel pegs and blanking plugs from the adaptor plate.
Discard the adaptor plate.

Fit the blanking plugs and dowel pegs to the new adaptor plate.
Fit the assembly to the rear of the engine and torque tighten the securing bolts.
Re-position the starter motor to the adaptor plate and secure with the lower bolt.

Refit the engine flywheel/gearbox 12.53.07 (Manual) page 54.

Refit the engine drive plate/transmission unit 12.53.13 (Auto) page 56.

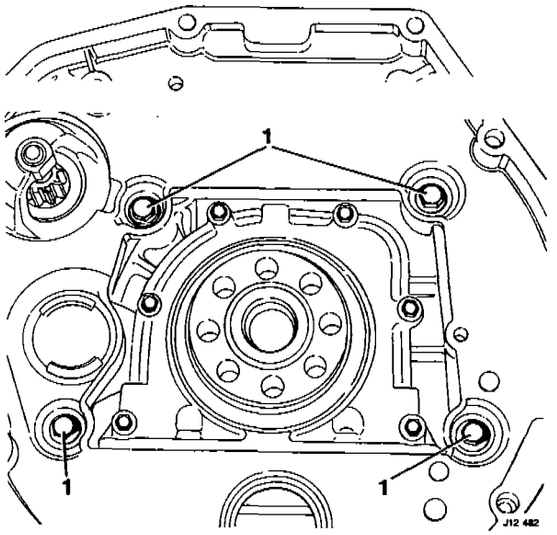


Fig 1

DATA

TORQUE FIGURES

Adaptor plate to cylinder block 49-54Nm
Engine drive plate to crankshaft 95-105Nm
Engine flywheel to crankshaft 95-105Nm
Starter motor to adaptor plate 49-54Nm

SPANNER SIZES

13mm
17mm

04396

ENGINE ASSEMBLY

RENEW **12.41.01/2**

REMOVE ENGINE

MANUAL AND AUTOMATIC:

Remove .the passenger side dash liner. Remove the fuel pump relay from the yellow base connector.
Crank the engine to de-pressurise the fuel system. Switch off the ignition.
Refit the relay.

Open the bonnet.
Disconnect the battery earth lead.
Remove the bonnet insulation pad. Disconnect the bonnet lamp multi plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround) for paint protection.
Slacken off the bonnet securing bolts (1 Fig 1), disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place a drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the spoiler/under tray to inner wheel arch cover.
Remove the nuts securing the torquatrol unit to the water pump.
Remove the fan cowl securing clips (1 Fig 3).
Lift out the cowl and torquatrol unit complete.

Disconnect the expansion tank hose from the radiator.
Disconnect the bottom hose from the water pump.
Disconnect the top hose from the thermostat housing.
Place a drain tray under the front of the vehicle.
Disconnect the P.A.S. cooler pipes from the radiator. Remove and discard the 'O' ring seals. Fit plugs to the pipes and radiator.

AUTOMATIC ONLY:
Disconnect the gearbox cooler pipes from the radiator; remove and discard the 'O' ring seals; fit plugs to the pipes and radiator.

MANUAL AND AUTOMATIC:
Remove the drain tray.
Remove the top radiator rail.
Cut and remove the thermostatic switch multi plug securing strap (AIRCON ONLY).
Disconnect the thermostatic switch rnulti plug (AIRCON ONLY).
Remove the radiator/hose assembly.
Cut and remove the harness to hydraulic pump hose securing straps.
Remove the coil mounting bracket securing bolt.

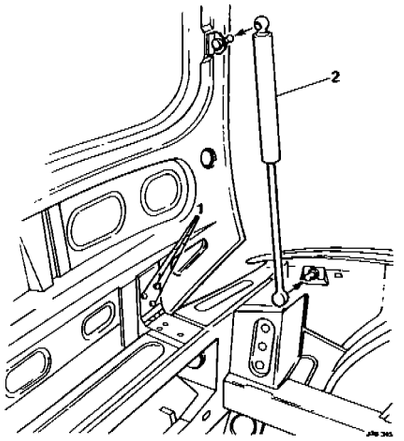


Fig 1

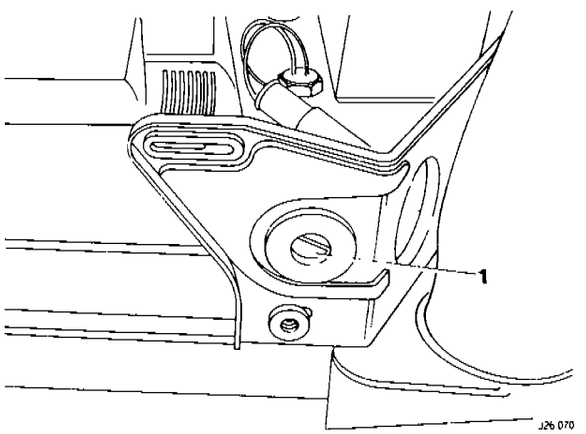


fig 2

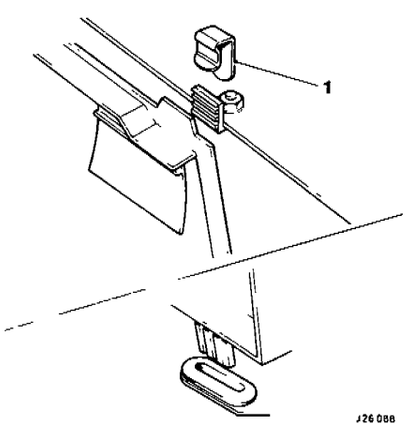


Fig 3

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Reposition the earth lead away from the coil mounting.
Re-position the insulation boots away from the coil L.T. terminals.
Remove the coil LT connection securing nuts and disconnect the feed wires.
Disconnect the super heat switch and multi plug from the compressor (AIRCON ONLY).
Disconnect the engine harness block connectors.
Disconnect the crank sensor block connector.
Cut and remove the harness to cylinder head bracket ratchet strap.
Re-position the harness over the manifold.

Disconnect the coil H.T. lead.
Place a drain tray under the front of the vehicle.
Remove the P.A.S. reservoir to pump hose.
Plug the reservoir and pump.
Disconnect the rack to pump feed pipe.
Remove and discard 'O' ring seal.
Plug the feed pipe and pump.
Remove the drain tray.
Remove the hydraulic pump to timing cover securing bolts. Remove the pump.
Remove the pump drive coupling.
Disconnect the coolant temperature sensor block connectors (Fig 1).

Disconnect the injector block connectors.
Disconnect the throttle potentiometer block connector.
Disconnect the air flow meter and auxilliary air valve multi plugs.
Disconnect the coolant temperature and oil pressure transmitter feed wires.
Remove the inlet manifold front securing nut and re-position the earth leads away from the manifold.
Re-position the harness away from its manifold location.
Remove the inlet manifold rear securing nuts and re-position the earth leads away from the studs.
Re-position the complete harness over the bulkhead, away from the engine.
Remove the fuel feed pipe to injector rail retaining clips.
Disconnect the fuel feed pipe from the injector rail (Fig 2).
Plug the feed pipe and injector rail.
Disconnect the return hose from the pressure regulator (Fig 3).
Plug the hose and regulator.
Reposition the feed and return hoses away from the manifold.
Disconnect the heater vacuum hoses from the manifold.
Disconnect the inner throttle cable from the linkage (Fig 4).
Slacken off the throttle cable adjusting nuts.
Disconnect the cable and re-position away from the bracket.
Disconnect the intake elbow hose from the throttle housing.
Disconnect the intake elbow hose from the breather pipe.
Disconnect the auxilliary air valve hose from the intake elbow.

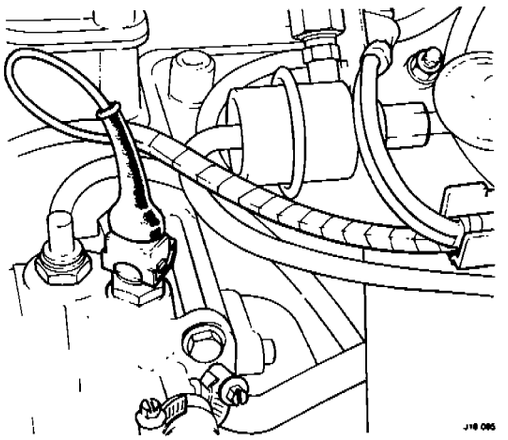
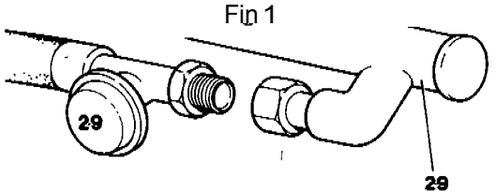


Fig 1



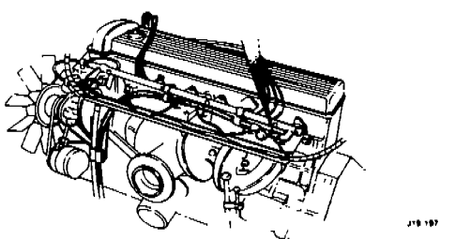


Fig 2

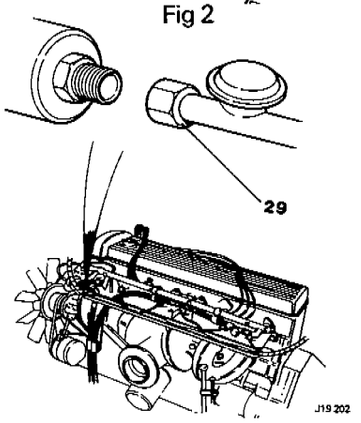


Fig 3

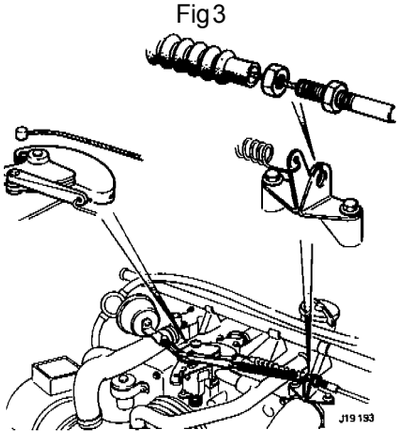


Fig 4

Remove the intake elbow to mounting rubber securing nut.
Unclip the air flow meter from the air cleaner box.
Remove the airflow meter/intake elbow assembly.

Disconnect the expansion tank hose from the thermostat housing.
Disconnect the expansion tank hose from the water pump.
Remove the insulation boots from the alternator terminals.
Remove the alternator terminal securing nuts.
Remove the alternator terminals and re-position away from the alternator.
Disconnect the water valve vacuum hose.
Disconnect the feed hose from the heater.
Disconnect the return hose from the heater return pipe.
Disconnect the starter solenoid feed wire multi plug.
Remove the solenoid main feed connection securing nut.
Remove the starter solenoid/alternator link harness.
Remove the main harness from the starter solenoid terminal and re-position away from the engine.
Remove oil cooler pipes to oil filter head clamp nut.
Disconnect the pipes from the filter head.
Fit the lifting eyes 18G 1465 to the manifold (Fig 1).
Tighten the securing nuts.
Fit the engine retaining tool MS 53B to the wing channels. Align to the rear lifting eye (Fig 1).
Tighten the wing channel stand nuts/bolts. Fit and engage the retaining hook to the rear eye.
Tighten the hook nut to take the engine weight.

MANUAL ONLY:
Jack up the rear of the vehicle. Support with axle stands.
Remove the propshaft.
Lower the vehicle.

MANUAL AND AUTOMATIC:
Jack up the front of the vehicle. Support with axle stands.
Slacken off the compressor adjusting link nut (2 Fig 2) (AIRCON ONLY).
Slacken off the adjusting link trunnion bolt (1 Fig 2) (AIRCON ONLY).
Slacken off the adjusting link to compressor pivot bolt (3 Fig 2) (AIRCON ONLY).
Slacken off the compressor pivot bolts (AIRCON ONLY).
Pivot the compressor towards the engine (AIRCON ONLY).
Remove the drive belt (4 Fig 2) AIRCON ONLY).
Finally remove the adjusting link and compressor pivot bolts (AIRCON ONLY).
Re-position the compressor away from the mounted position and secure to the body (AIRCON ONLY).
Disconnect the exhaust intermediate pipe to gearbox support cable (Fig 3).

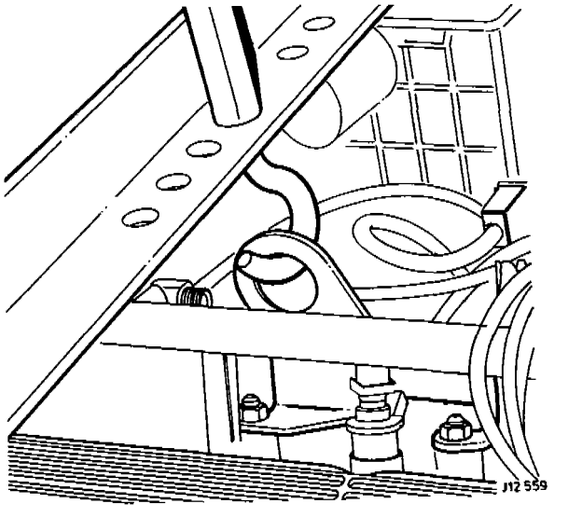


Fig 1

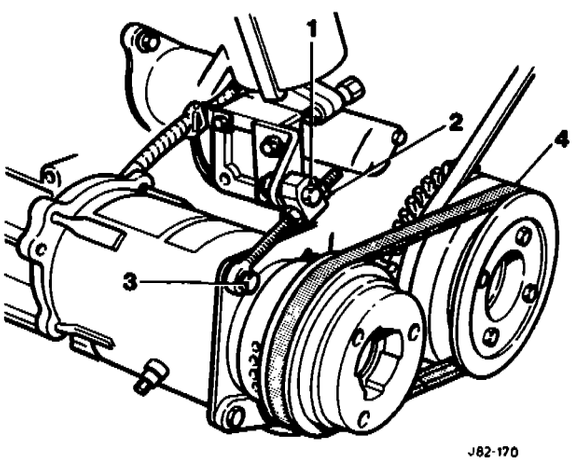


Fig 2

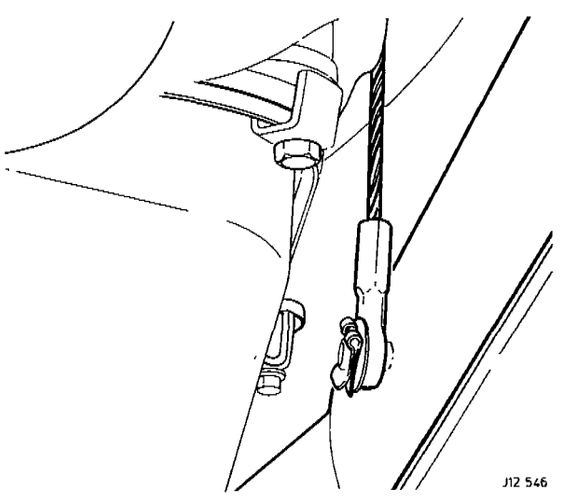


Fig 3

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Remove the clutch housing to front pipe bracket.
Remove the front pipe to manifold securing nuts.
Displace the flanges from the studs and disconnect the exhaust system.
Remove the earth lead to clutch housing securing bolt.
Re-position the earth lead away from the engine.

MANUAL ONLY:
Remove the clutch slave cylinder (1,2 Fig 1) from the bell housing. Remove the push rod (3 Fig 1).
Note and disconnect the gearbox switch multi plugs.
Take the weight of the rear mounting on the jack.
Remove the rear mounting to body securing bolts.
Lower the jack and remove the mounting assembly.
Remove the mounting spring.
Remove the spring to gearbox mounting rubber.
Slacken off tool MS 538 hook nut to lower the rear of the gearbox for access. Ensure the engine does not foul the steering rack from below. Remove the gear lever to selector securing bolt.
Reposition the gear lever away from the selector linkage.
Retrieve the wavy washer.
Remove the remote control mounting to gearbox securing bolts.
Re-position the mounting for access.
Remove the mounting rubbers and washers.
Lower the vehicle from the front axle stands.

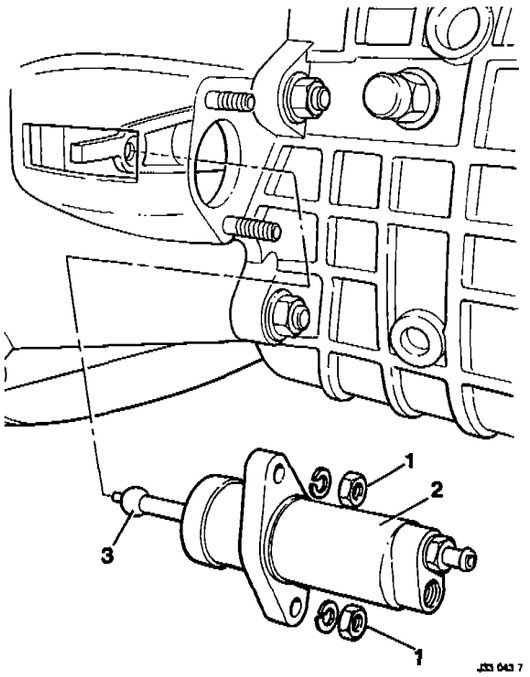


Fig 1

AUTOMATIC ONLY:
Remove the selector cable from the securing clamp
Reposition the switch assembly away from the work area.

Take the weight of the rear mounting on the jack.
Remove the rear mounting to body securing bolts.
Lower the jack and remove the mounting assembly.
Remove the mounting spring. Remove the mounting spring to gearbox rubber. Remove the mounting to body spacers.
Remove the propshaft to gearbox flange securing nuts.
Re-position the propshaft away from the flange.
Slacken off tool MS53B hook nut to lower the rear of the gearbox for access. Ensure the engine does not foul the rack.
Lower the vehicle from the front axle stands.

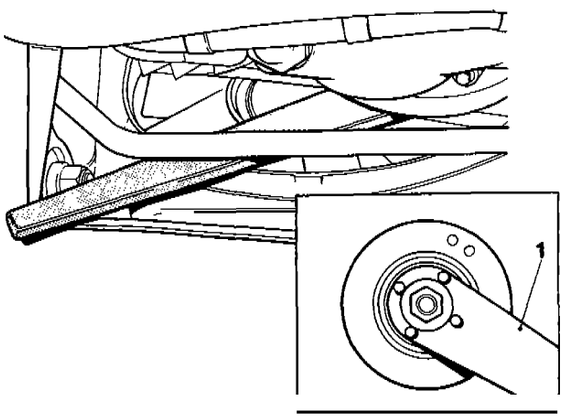


Fig 2

MANUAL AND AUTOMATIC:
Remove the front pulley securing bolt using Service Tool 18G 1437 (1 Fig 2) to hold the pulley.
Remove the front pulley.
Remove the air conditioning drier to rubber mounting securing nuts (AIRCON ONLY).
Carefully remove the condenser from the mounted position and, ensuring that all pipes and hoses are not stressed, re-position the condenser/drier assembly over the wing (AIRCON ONLY).
Place a suitable support under the assembly to take the weight (AIRCON ONLY).
Remove the exhaust manifold heat shield securing bolts.
Remove the heat shield.

Fit and align the remaining lifting eyes to the manifolds.
Fit and tighten the lifting eye securing bolts.
Remove the remaining inlet manifold securing nut/bolt.
Remove the front engine mounting upper securing nuts.
Take the weight of the gearbox on the jack.
Remove the retaining tool MS 53B hook. Remove tool MS **53B.**
Fit an **'H'** frame sling to the engine hoist.
Connect the hooks to the lifting eyes (Fig 1).
Using hoist and jack, remove the engine from the engine bay; taking care not to damage the steering rack.
Raise the engine clear of the vehicle body.
Transport the engine to the bench.
Remove the insulation pad from the gearbox.
Drain the engine oil.
Lower the engine to the bench.

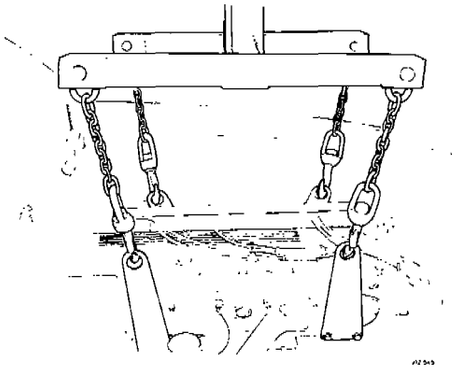


Fig 1

REMOVE/REFIT GEARBOX/CLUTCH (Manual Only)

Remove the gearbox.
Fit a flywheel jamb.
Remove the clutch assembly.
Remove the starter motor.
Remove the flywheel securing bolts (1 Fig 2).
Remove the flywheel jamb.
Remove the flywheel **(2** Fig 2).
Remove the adaptor plate.

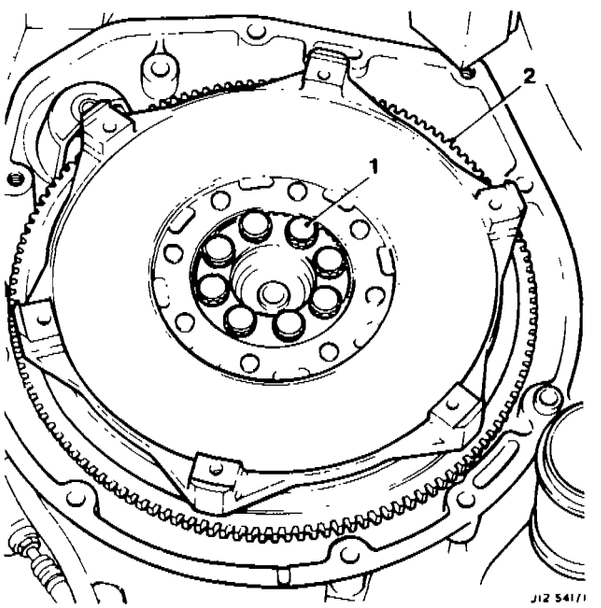


Fig 2

Clean the flywheel, adaptor plate, and all other component parts.
Fit the adaptor plate to the engine. Fit and tighten the securing bolts.
Fit and align the flywheel.
Fit the flywheel jamb.
Fit and tighten the flywheel securing bolts.
Fit and align the clutch assembly to the flywheel.
Fit and tighten the clutch cover securing bolts.
Remove the flywheel jamb.
Fit the starter motor.
Fit and tighten the starter motor lower securing bolt.
Fit the gearbox to the engine.
Fit and tighten the gearbox securing bolts.
Fit the foam insulation pad to the gearbox.
Secure the pad to the gearbox with string.

REMOVE/REFIT TRANSMISSION/CONVERTER (Automatic Only)

Remove the transmission cooler pipes from the mounting bracket.
Remove the starter motor.
Disconnect the dipstick assembly from the mounting bracket (Fig **3).**
Remove the adaptor plate blanking plug.
Turn the crankshaft for access to the first converter bolt.

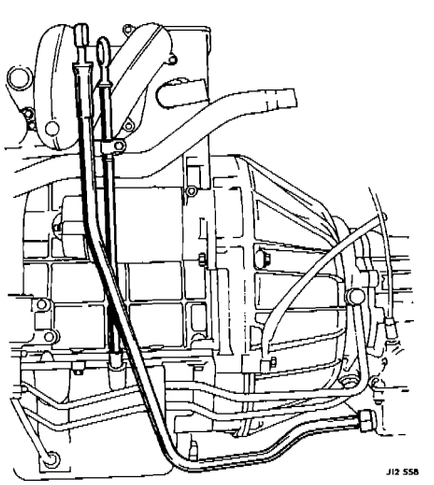


Fig 3

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Remove the bolt (1 Fig 1).
Repeat for the remaining two bolts.
Remove the housing to adaptor plate securing bolts.
Remove the transmission/converter assembly from the engine.

Fit and align the transmission/converter assembly to the engine.
Ensure the cooler pipes seat behind the mounting brackets.
Fit and tighten the housing bolts.
Turn the crankshaft for access to the first converter to drive plate securing bolt.
Align the converter to drive plate bolt hole.
Fit but do not tighten the converter to drive plate securing bolt.
Turn the crankshaft for access to the second securing bolt hole.
Fit but do nat tighten the second securing bolt.
Turn the crankshaft for access to the remaining securing bolt hole.
Fit and tighten the remaining securing bolt.
Tighten the remaining two securing bolts.
Connect the dipstick assembly to the monuting bracket.
Fit the foam insulation pad to the transmission.
Secure the pad with string.

CHANGE ANCILLARY EQUIPMENT

MANUAL ONLY:
Remove the water valve to heater feed pipe hose assembly.
Slacken off the alternator adjuster locknut (5 Fig 2) and adjusting nut (4 Fig 2).
Remove the alternator link arm pivot bolt (2 Fig 2).
Slacken off the alternator link arm trunnion bolt (3 Fig 2).
Remove the alternator pivot bolt nut.
Pivot the alternator towards the engine.
Displace the alternator drive belt.
Remove the alternator pivot bolt.
Remove the alternator assembly.
Collect the alternator spacing washer.
Remove the adaptor plate bolts (1 Fig 3).
Displace the adaptor plate.
Remove the oil filler tube assembly.
Remove the P.A.S. pump.
Remove the pump drive coupling.
Raise the engine from the bench.
Move the engine to one side.
Transfer the lifting eyes, chains, and hoist to the new engine.
Move the new engine to the bench.
Clean the P.A.S. steering pump drive coupling and mating faces (3 Fig 1 page 65).
Fit the coupling to the distributor driveshaft.
Set the P.A.S. pump drive to align with the coupling.
Fit and seat the P.A.S. pump (2 Fig 1 page 65) to the engine.
Fit the oil filler tube assembly.
Fit and tighten the pump bolts (1 Fig 1 page 65).
Fit and align the alternator to the link arm pivot and mounting bracket.

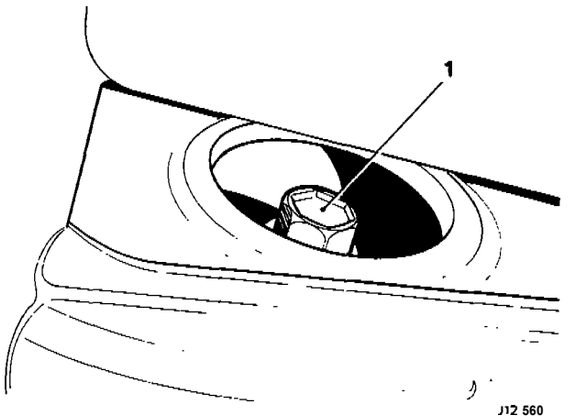


Fig 1

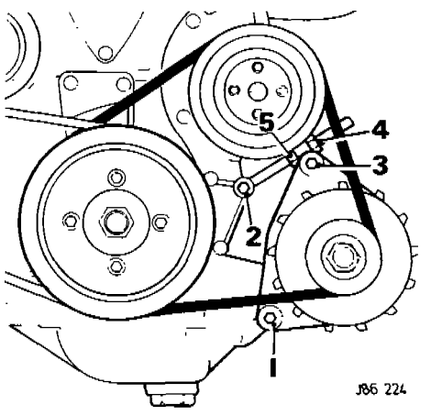


Fig 2

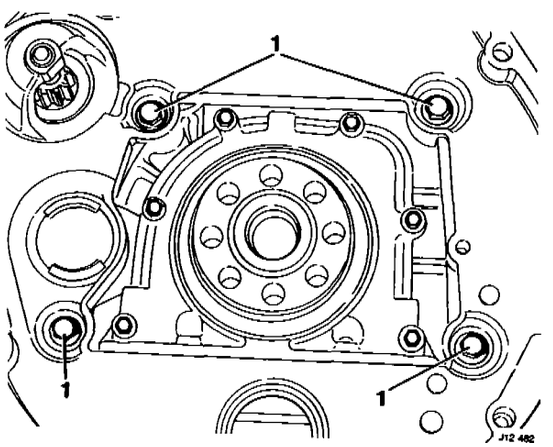


Fig 3

Fit the alternator pivot bolt to pass through the front of the alternator and into the bracket.
Fit the rear spacer.
Push the alternator pivot bolt fully home, but do not tighten the securing nut.
Fit but do not tighten the link pivot nut.
Pivot the alternator towards the engine.
Fit the alternator drive belt.
Tighten the link arm adjusting nut to obtain the correct belt tension.
Tighten the link arm lock nut.
Tighten the link arm trunnion nut.
Tighten the alternator and link arm pivot bolts/nuts.
Fit the water valve/hose assembly.
Tighten the feed pipe hose clip.
Clean the rear adaptor plate.
Fit the adaptor plate to the engine.
Fit and tighten the adaptor plate securing bolts.
Remove and discard the exhaust sealing rings.
Clean the exhaust sealing faces.
Fit new exhaust sealing rings.

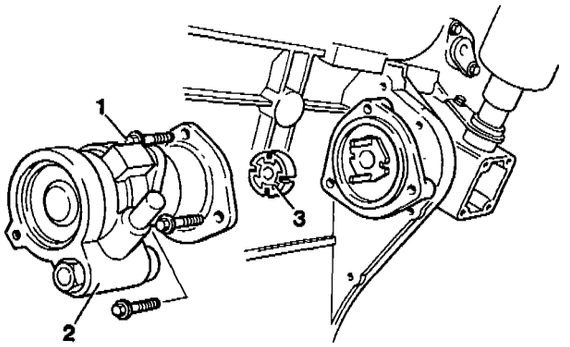


Fig 1

AUTOMATIC ONLY:
Disconnect the down shift cable (Fig 2) from the throttle linkage and mounting bracket.
Re-position the cable away from the bracket.
Remove the dipstick assembly.
Disconnect the oil filler tube assembly.
Remove the pipe to sump assembly.
Fit a jamb to the drive plate.
Remove the drive plate to crankshaft securing **bolts.**
Remove the jamb.
Remove the drive plate. Retrieve the spacer.
Remove the adaptor plate securing bolts.
Remove the adaptor plate.
Remove the water valve to heater feed pipe hose assembly.
Slacken off the alternator adjuster locknut and adjusting nut.
Remove the alternator link arm pivot bolt.
Slacken off the alternator link arm trunnion bolt.
Remove the alternator pivot bolt nut.
Pivot the alternator towards the engine.
Remove the alternator drive bett.
Remove the alternator pivot bolt.
Remove the alternator assembly.
Remove the alternator spacing washer.
Remove the PAS pump.
Remove the pump drive coupling.
Raise the engine from the bench.
Move the engine to one side.
Transfer the lifting eyes, chains, and hoist to the new engine.

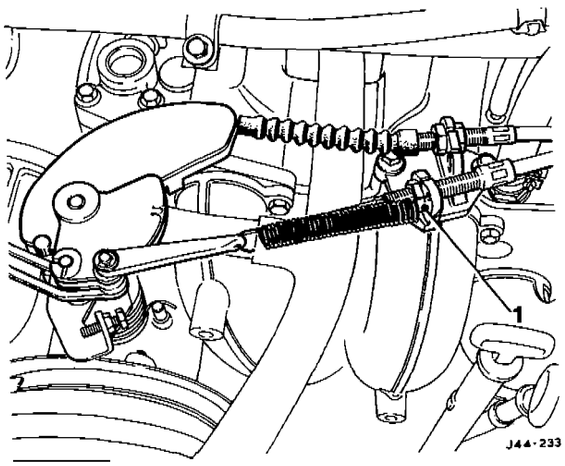


Fig 2

Move the new engine to the bench.
Clean the P.A.S. steering pump drive coupling and mating faces (**3** Fig 1).
Fit the coupling to the distributor driveshaft.
Set the P.A.S. pump drive to align with the coupling.
Fit and seat the P.A.S. pump (2 Fig 1) to the engine.
Fit and tighten the pump securing bolts (1 Fig 1).

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Fit and align the alternator to the link arm pivot and mounting bracket.
Fit the alternator pivot bolt to pass through the front of the alternator and into the bracket.
Fit the rear spacer.
Push the alternator pivot bolt fully home, but do not tighten the securing nut.
Fit but do not tighten the link arm pivot nut.
Pivot the alternator towards the engine
Fit the alternator drive belt.

Tighten the link arm adjusting nut to obtain the correct belt tension.
Tighten the link arm lock nut.
Tighten the link arm trunnion nut.
Tighten the alternator and link arm pivot bolts/nuts.
Fit the water valve/hose assembly.
Tighten the feed pipe hose clip.
Clean the rear adaptor plate.
Fit the adaptor plate to the engine.
Fit and tighten the adaptor plate securing bolts.
Clean the drive plate and spacer.
Fit and align the spacer to the crankshaft.
Fit and align the drive plate.
Fit the jamb.
Fit and tighten the drive plate securing bolts.
Fit the starter motor.
Fit and tighten the starter motor lower securing bolt.

Fit the adaptor plate blanking plug.
Fit and align the gearbox cooler pipe to the mounting bracket sleeves, retaining brackets and spire clips.
Fit and tighten the cooler pipe/mounting bracket securing screws.
Fit and align the oil filler tube assembly.
Connect the drain-back tube hose to the oil filler housing stub pipe.
Position and tighten the hose clips.
Tighten the union nut.
Reposition the down shift cable (Fig 1) towards the throttle linkage.
Connect the inner cable to the linkage.
Adjust the down shift cable to the bracket securing nut.
Tighten the lock nut.
Secure the cable to the bell housing.

Apply HYLOSIL to the engine dipstick tube.
Fit and seat the dipstick assembly to the engine.
Fit the engine and gearbox dipstick tubes to the mounting bracket (Fig 2).
Fit and tighten the securing bolt.
Remove and discard the exhaust sealing rings.
Clean the exhaust sealing faces.
Fit new exhaust sealing rings.

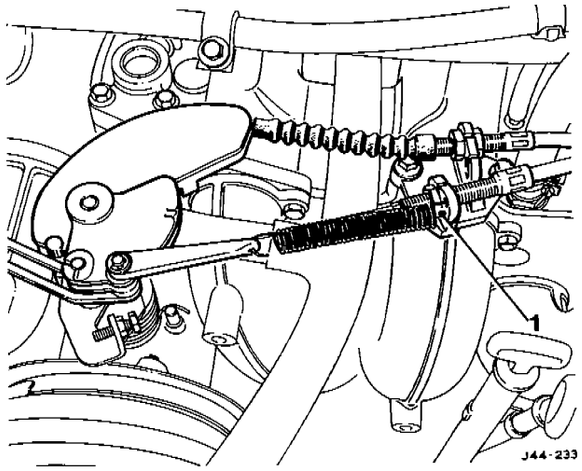


Fig 2

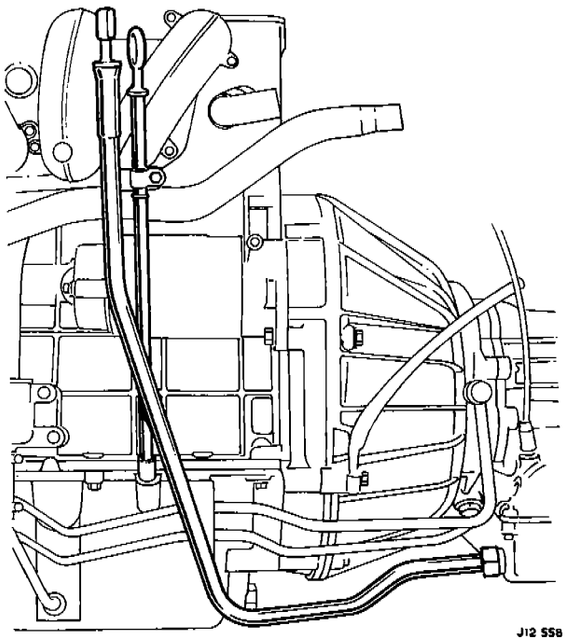


Fig 3

REFIT ENGINE

MANUAL AND AUTOMATIC:

Move the engine assembly to the vehicle.
Lower the engine assembly into the engine bay.
Take the weight of the gearbox on a jack.
Using hoist and jack, lower the engine into the engine bay and engage on the engine mountings. Ensure that the inlet manifold does not foul on the wiper motor.
Unhook the chains. Remove the 'H' frame sling.
Raise the hoist to safety height.
Move the hoist to one side.

Fit engine retaining tool MS53B across the wing channels, align to the rear lifting eye (Fig 1).
Fit and seat the engine retaining hook to the rear eye (Fig 1).
Tighten the hook nut to take the weight of the engine.
Lower and remove the jack from the gearbox.
Fit and tighten the engine mounting securing nuts.
Jack up the front of the vehicle. Support with axle stands.

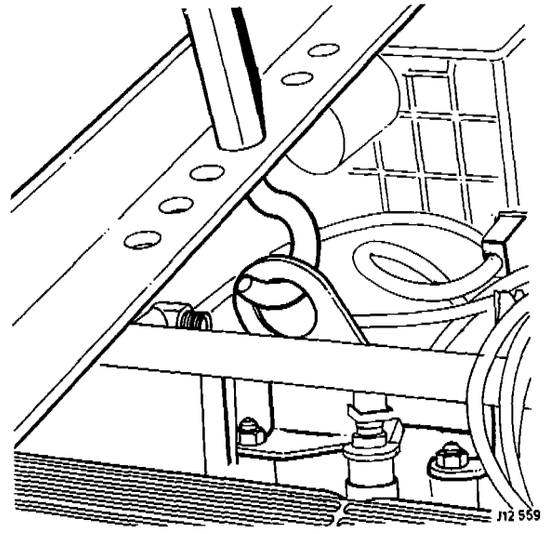


Fig 1

MANUAL ONLY:

Fit the gear selector mounting rubbers/inserts.
Align the assembly to the mounting position.
Fit and align the mounting washers.
Fit and tighten the remote control assembly securing bolts.
Tighten the hook nut to raise the engine into position.
Fit and align the wavy washer/spring assembly to the lower gear lever (4,5,6, Fig 2).
Align the gear lever (1 Fig 2) to the remote control (2 Fig 2).
Fit and tighten the securing nut/bolt (7 Fig 2).

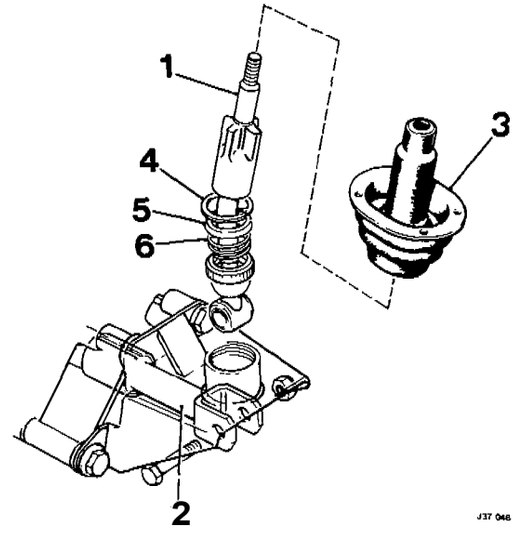


Fig 2

AUTOMATIC ONLY:

Reposition the transmission unit to propshaft flange.
Fit and tighten the propshaft securing nuts.
Tighten the engine retaining tool to raise the engine into position.
Cut/remove the insulation pad securing string.
Refit the transmission cable assembly to the selector shaft.

MANUAL AND AUTOMATIC:

Fit the spring assembly to the rear mounting.
Using a jack, fit and align the mounting assembly to the body/gearbox.
Fit but do not fully tighten the body to mounting securing bolts.
Lower and remove the jack.
Slacken off the hook nut to release the weight of the engine. Remove the hook.
Remove retaining tool MS53B.
Align the mounting to the gearbox.
Fully tighten the mounting to body securing nuts.

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MANUAL ONLY:
Connect the gearbox switch multiplugs.
Locate the multi plugs above the insulation pad.
Fit the push rod (3 Fig 1) to the slave cylinder (2 Fig 1).
Fit the cylinder, connect the push rod to the release arm.
Fit and tighten the securing nuts (1 Fig 1).

MANUAL AND AUTOMATIC:
Reposition the earth lead to the bell housing.
Fit and tighten the earth lead securing bolt.
Connect the exhaust system to the exhaust manifold.
Re-position the flanges over the studs.
Fit and tighten the front pipe securing nuts.
Fit and align the front pipe to clutch housing mounting bracket.
fit and tighten the front pipe to mounting bracket securing nuts and bolts.
Re-position the support cable to the intermediate pipe (Fig 2).
Fit the security clip.

MANUAL ONLY:
Refit the propshaft.

MANUAL AND AUTOMATIC:
Re-position the compressor to the mounting bracket (AIRCON ONLY).
Fit but do not tighten the compressor pivot bolts (AIRCON ONLY).
Lower the vehicle from the axle stands.
Clean the hydraulic pump coupling and mating faces. Fit the drive coupling to the pump.
Align the pump to drive shaft position.
Fit and tighten the pump to front cover bolts.
Clean the front pulley and mating faces.
Fit and tighten the front pulley securing bolt, using Service Tool 18G 1437.
Pivot the compressor towards the engine (AIRCON ONLY).
Fit the compressor drive belt (4 Fig 3) (AIRCON ONLY).
Align the link arm to the compressor (AIRCON ONLY).
Fit but do not tighten the link arm to compressor securing bolt (AIRCON ONLY).
Tighten the link arm adjuster nut to obtain correct tension (2 Fig 3) (AIRCON ONLY).
Tighten the link arm lock nut (AIRCON ONLY).
Tighten the link arm trunnion bolt (1 Fig 3) (AIRCON ONLY).
Finally tighten the compressor and link arm pivot bolts (3 Fig 3) (AIRCON ONLY).
Carefully re-position the condenser/drier assembly from the wing area to the mounted position (AIRCON ONLY).
Fit and tighten the drier to mounting securing bolts (AIRCON ONLY).
Remove the condenser/drier support (AIRCON ONLY).

Remove the blanking plugs from the P.A.S. pump and rack feed pipe.
Fit a new 'O' ring to the pipe.
Connect the rack feed pipe to the P.A.S. pump.
Tighten the union nut.

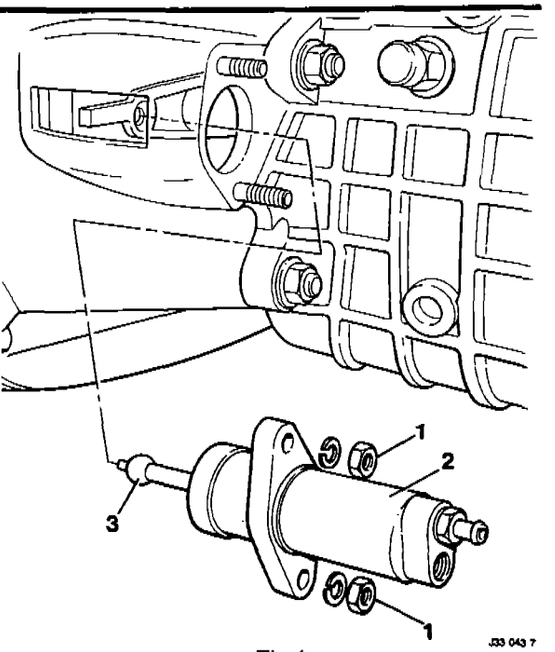


Fig 1

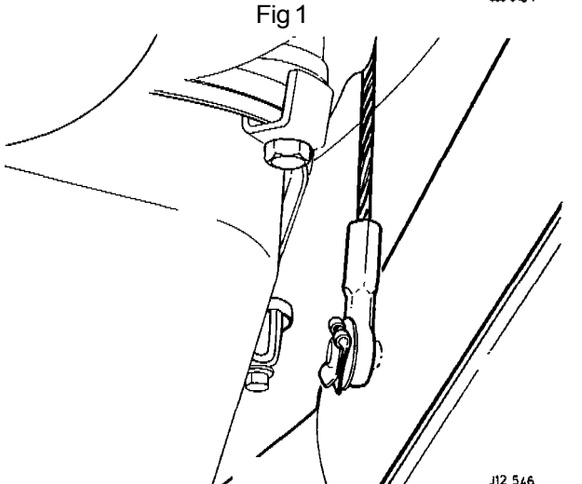


Fig 2

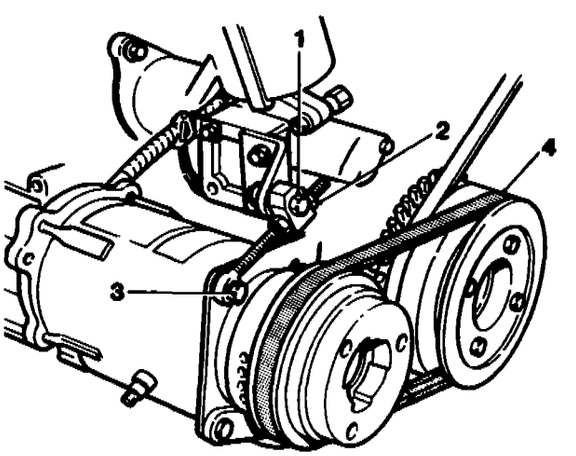


Fig 3

Remove the blanking plugs from the P.A.S. pump and pump feed hose (1 Fig 1).
Connect the hose to the pump (2 Fig 1).
Fit and align the starter solenoid link harness to the alternator terminal.
Connect the remaining wire to the alternator.
Fit and tighten the terminal securing nuts.
Fit insulation boots over the terminals.
Remove and discard the 'O' rings (3 Fig 2) from the engine oil cooler pipes (2 Fig 2).
Fit new 'O' rings to the pipes.
Connect the cooler pipes to the filter head.
fit and tighten the pipe clamp nut (1 Fig 2).
Fit the starter solenoid link harness to the solenoid and connect the main feed wire.
Connect the heater return hose to the heater.
Connect the heater feed hose to the heater.

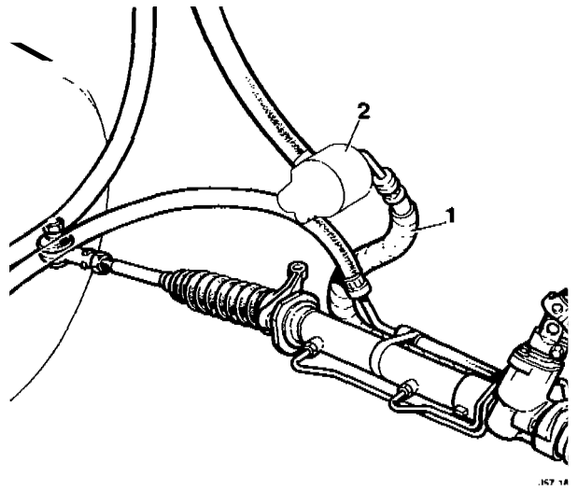


Fig 1

Remove 18G 1465 engine lifting eyes.
Re-position the main harness over the engine.
Fit the earth leads to the manifold rear studs.
Connect the vacuum switch multi plug.
Connect the starter solenoid feed wire multi plug.
Fit the air flow meter/intake elbow assembly to the air cleaner box.
Fit and tighten the intake elbow securing nut.
Connect the auxilliary air valve hose to the intake elbow.
Connect the intake elbow to the throttle housing.
Connect the throttle cable to bracket (Fig 3).
Connect the inner cable to the linkage.
Adjust the cable. Tighten the locknuts.
Connect the water valve and heater vacuum hoses.
Attach the fuel feed hoses to the inlet manifold clamp.
Remove the plugs from the fuel feed hose and the fuel rail.
Connect the feed hose to the fuel rail.
Tighten the hose union nut.
Secure the feed hose to the rail with plastic clips.
Remove the plugs from the return hose and regulator.
Connect the hose to the regulator.
Tighten the hose union nut.

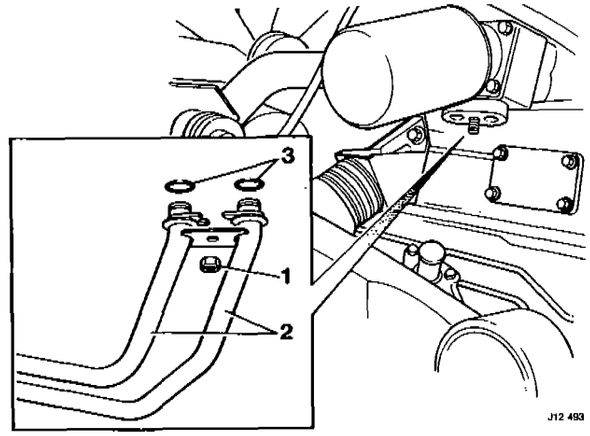


Fig 2

Connect the air flow meter/throttle potentiometer and auxilliary air valve multi plugs.
Connect the injector and coolant sensor multi plugs.
Connect the coolant temperature and oil pressure transmitter feed wires.
Connect the expansion tank to water pump hose.
Secure the harness to the hose with ratchet clips.
Connect the earth lead to the inlet manifold front stud.
Connect the expansion tank to thermostat housing hose.
Connect the harness to the crank sensor multi plug.
Secure the harness to the front of the cylinder head with a ratchet strap.
Connect the coil L.T. connections.
Fit insulation boots over the terminals.
Connect the H.T. lead to the coil.

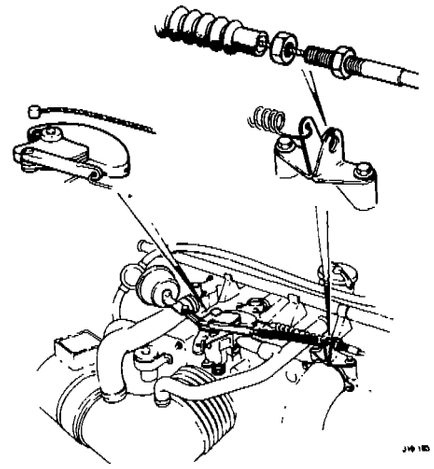


Fig 3

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Connect the super heat switch and clutch multi plug to thecompressor (AIRCON **ONLY)** .
Remove the exhaust lifting eye.
Fit the heat shield.
Fit the radiator assembly.
Fit the top rail.
Connect the thermostatic switch block connector (AIRCON ONLY).
Secure the block connector to the lower panel with a ratchetstrap (AIRCON ONLY).
Connect the bottom hose to the water pump (1.2 Fig 1).
Connect the expansion tank to radiator hose.
Remove the blanking plugs from the P.A.S. cooler pipes.
Fit new 'O' rings to the pipes.
Remove the blanking plugs from the radiator.
Connect the P.A.S. pipes to the radiator.
Tighten the pipe union nuts.

AUTOMATIC ONLY:
Remove the blanking plugs from the transmission unit cooler hoses and radiator.
Fit new 'O' rings to the hoses.
Connect the hoses to the radiator.
Tighten the hose union nuts.

MANUAL AND AUTOMATIC:
Secure the harness to the P.A.S. pipes with plastic clips.
Connect the top hose to the thermostat (1,2 Fig 2).
Fit the fan cowl.
Fit the torquatrol unit.
Fit the air cleaner element.
Replenish the engine with oil.
Replenish the cooling system with coolant.

AUTOMATIC ONLY:
Check/adjust the downshift cable initial setting.

MANUAL AND AUTOMATIC:
fit the bonnet.

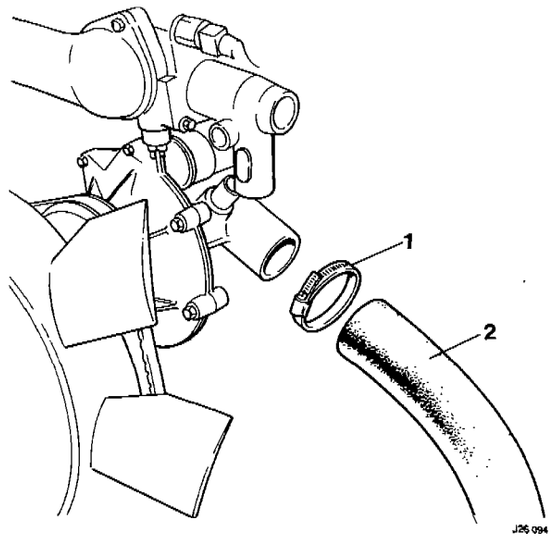


Fig 1

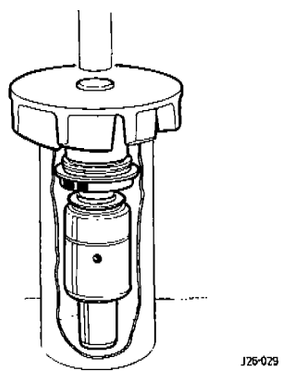


Fig 2

DATA

SERVICE TOOLS

18G 1433 Camshaft timing tool
18G 1436 Crankshaft pulley remove/lock
18G 1465 Engine support brackets
MS53B Engine support bracket

TORQUE FIGURES

Bracket to intermediate pipe 23-27Nm
Centre bearing to body 22-28Nm
Clip-bottom hose 3.8-4.3Nm
Clip-hose to water rail 2.4Nm
Clip-top hose 3.8-4.3Nm
Clutch/torque converter housing to block 49-54Nm
Dipstick to bracket 5-8Nm
Engine mounting bracket bobbin 47-55Nm
Engine mounting bracket LH to block 49-54Nm
Engine mounting bracket RH to block 49-54Nm

DATA (CONTINUED)

TORQUE FIGURES

Engine mounting LH to mounting bracket **22-25Nm**
Engine mounting RH to mounting bracket **22-25Nm**
Fan to torquatrol unit **13.5Nm**
Feed hose to steering rack **10-12Nm.**
Front pipe to intermediate pipe 15-18Nm
Fuel return **hose** *to regulator* **10-12Nm.**
High pressure hose, pump to rack 19-23Nm.
Inlet manifold nuts-lifting eyes 6.5-9Nm
Inlet manifold **to** *cylinder head* **23-27Nm**
Low pressure hose, rack to oil cooler **19-23Nm.**
Propshaft **coupling to axle (Auto only) 95-105Nm**
Rear engine mounting bracket to body **20-25Nm**
Rear mounting to **body 20-25Nm**
Spring cup to mounting **20-25Nm**
Starter motor to adaptor plate **49-54Nm.**
Thermostat cover to housing 23-27Nm
Thermostat housing to cylinder head **23-27Nm**
Torquatrol unit to water pump pulley **23-27Nm**
Water pipe to cylinder block **23-27Nm**
Water pump to timing cover **23-27Nm**
Water temperature switch **49-54Nm**

SPANNER SIZES

8mm
10mm
13mm
17mm
3/8in AF
1/2in AF
9/16in AF
3/4in **AF**

OILS/GREASES/SEALANTS

Exhaust sealer 'TIVOLI KAY ADHESIVES No 5696'
Water pipe to cylinder block 'Hylosil 102'
Water pump housing 'Hylosil 102'

0439G

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ENGINE ASSEMBLY

OVERHAUL 12.41.05

Remove the engine and gearbox/transmission unit from the vehicle 12.41.01/2 page 59.
Detach the gearbox/transmission unit from the engine 12.41.01/2 page 63.
Fit the engine to a stand.

Place a drain tray below the cylinder block drain plug and drain any remaining coolant from the engine.
Remove the camcover.
Push back the lock tabs from the timing chain sprocket securing bolts (1 Fig 1), and remove the bolts (2 Fig 1).
Remove the timing chain sprocket.
Lower the chain (1 Fig 2) into the cylinder head and secure the tensioner (3 Fig 2) and upper guide with an elastic band (2 Fig 2).
Remove the cylinder head securing nuts/bolts and remove the cylinder head.
Remove and discard the head gasket.
Place the cylinder head on suitable blocks on a bench.

Mark the position of the camshaft caps relative to the head, and remove the caps.
Remove the camshaft.
Using a magnet, lift out the cam followers.
Support the valves using a wooden block.
Remove the valve springs, using Service Tool MS 1519A (Fig 3).
Retrieve the collars, cotters, and spring retaining plates.

Remove the valves, noting the relationship between valve and guide to ensure correct pairing during re-assembly.
Remove the seals from the inlet valve guides and remove the cylinder head rear blanking plate.
Clean all component parts.
Check for wear and burning of valves or seats.
Check the cylinder head face for distortion.
If distortion is evident, a maximum of 0.025 mm (0.010 in) may be removed by skimming the cylinder head.
Taking care not to damage the inside surface of the combustion chambers, clean the inlet and exhaust ports.
NOTE: When using scrapers or wire brushes for removing carbon deposits, avoid scratching the valve faces and seats. A soft wire brush is the most suitable implement for this purpose.
Clean all carbon and other deposits from the valve guide using a suitable valve guide brush.
Throughly wash the cylinder head to ensure that all loose carbon is removed and dry the head with a high pressure air line.

After cleaning and polishing each valve, examine the stems for straightness and wear, using a dial gauge and V-block arrangement (Fig 4).
Examine the valve faces for burns, pitting and distortion.
Renew any valves that are excessively worn, bent, or too badly pitted to be salvaged by refacing.

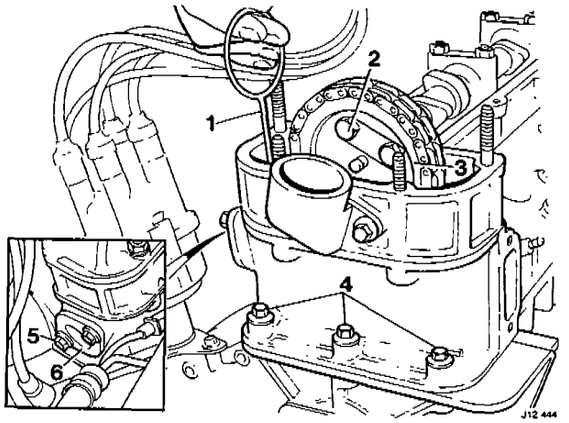


Fig 1

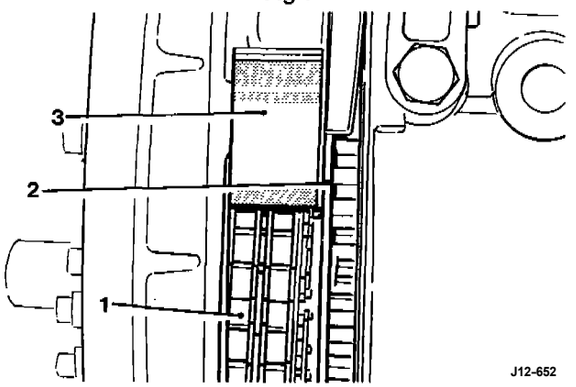


Fig 2

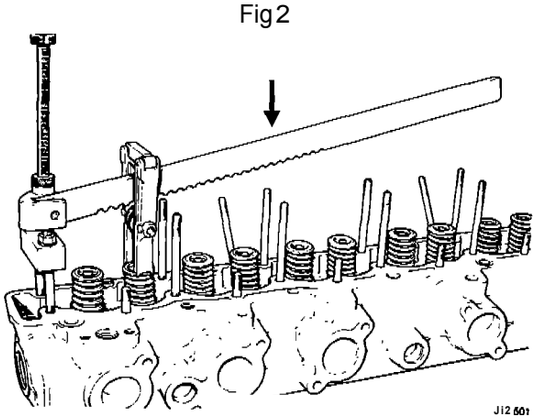


Fig 3

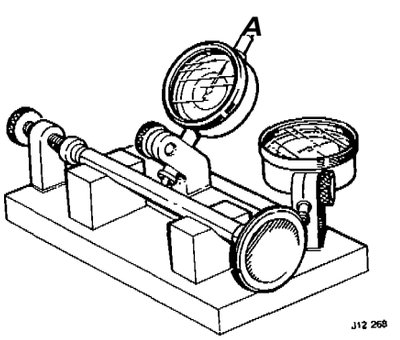


Fig 4

NOTE: No attempt should be made to clean up a burnt or badly pitted valve face by extensive 'grinding in' of the valve to the seat.
Lightly lap the valves into the seats with a fine grinding compound. The reseating operation should leave the finished surfaces smooth. Excessive lapping will groove the valve face resulting in a poor seat when the engine is hot.

Fig 1 shows:
'A' Correctly seated
'B' Undesirable condition
'C Method of rectification.

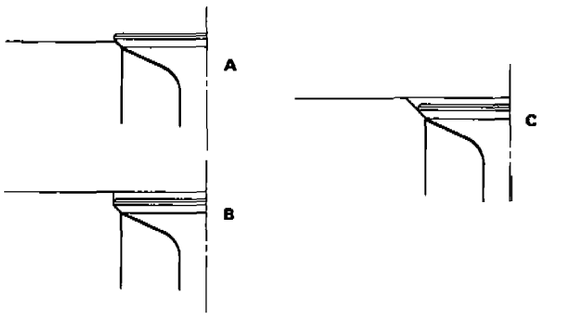


Fig 1

To test the valves for concentricity with their seats, coat the face of the valve with 'Engineers Blue' or similar, and rotate the valve against the seat.
If the valve face is concentric with the valve stem, a mark will be made all around the face. Should a mark be made on only one side of the face, the face is not concentric with the valve stem.

Clean the valve and again coat with 'Engineers Blue' and rotate the valve against the seat.
Check that the valve guide is concentric with the valve seat, if not, the seat must be recut.

Whenever valves are replaced, the seats must be recut prior to lapping of the valves.
Check valve guide wear by inserting a new valve into the guide to be checked, lift it 3 mm (1/4") from its seat and rock it sideways. Movement of the valve across its seat must not exceed 0.5 mm (0.020 in) (A Fig 2).
Should the movement exceed this tolerance, the valve guide must be replaced, using Service Tool 18G 1432 to drift out the old guide (Fig 3). Ensure that the relevant valve guide is selected prior to fitting (see chart below).

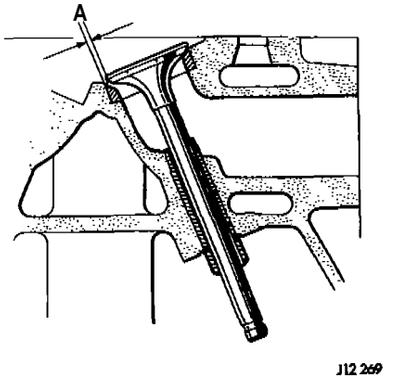


Fig 2

DATA

Replacement guides are available in two sizes and have identification grooves machined in the shank. Sizes are as follows:

First o/size 2 grooves	12.83 to 12.85mm (0.507 to 0.506in) diameter.
Second o/size 3 grooves	13.00 to 12.98mm (0.512 to 0.611in) diameter

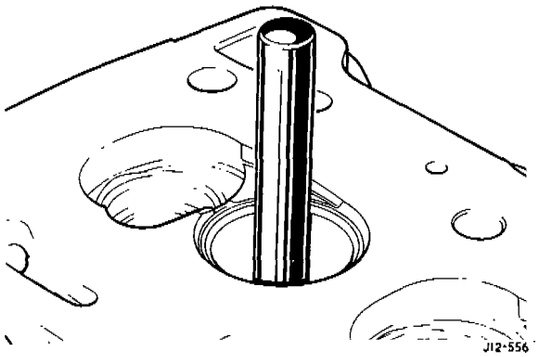


Fig 3

When new guides are to be fitted they should always be one sire larger than the old guide.
Cylinder head bores will require reaming as follows:

Remove the old valve guide and ream the cylinder head to the relevant dimension (see DATA).
Immerse the cylinder head in boiling water for 30 minutes.
Coat the guide with graphite grease, and, using Service Tool 18G 1432, drift in the guide from the camshaft side until the circlip is seated in the groove (1 Fig 4).

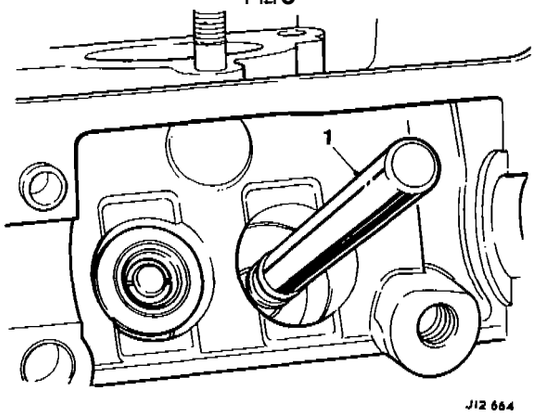


Fig 4

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NOTE: To fit the guide correctly, the interference should not be sufficient to cause the use of excessive force.

Examine the valve seat inserts for pitting or excess wear. If renewal is necessary, proceed as follows:
Remove the inserts by machining, leaving approximately 0.25 mm (0.010in) of metal which can easily be removed by hand without damaging the cylinder head.
Measure the diameter of the insert recess in the cylinder head.
Grind down the outside diameter of the new insert to a dimension 0.08 mm (0.003 in) larger than the insert recess.
Heat the cylinder head for 30 minutes from cold to a temperature of 150°C (300°F).
Fit the insert ensuring that it beds evenly in the recess.

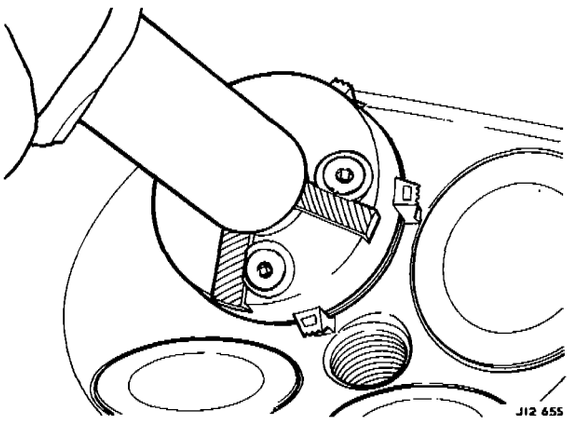


Fig 1

Recut when the cylinder head has cooled using Service Tool MS 204 (Fig 1).
Correct valve seat angles are:
Inlet Exhaust
44 1/2 degrees 44 1/2 degrees

NOTE: If new valve inserts have been fitted, the clearance between valve stem and cam must be checked; this should be 8.13 mm (0.320 in) plus the valve clearance.
The dimension must be taken between the valve stem and the back of the cam.
Should this dimension not be obtained, metal must be ground from the valve seat of the insert.
NOTE: Use only suitable grinding equipment.
Remove only very small amounts of metal from the valve seat at one time before re-checking the clearance.

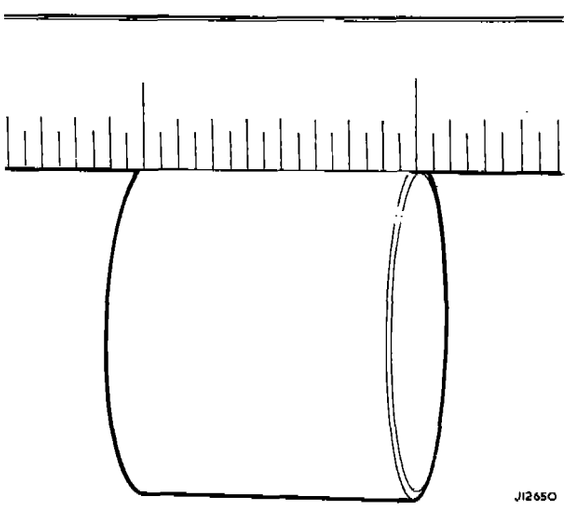


Fig 2

Examine the cam followers for wear on the top face, these should be perfectly flat.
Check for any sign of barrelling on the side faces *(see* Fig 2).
Replace all followers that are worn or suspect.
Wash the valves, springs, collets, followers and air dry.
After the valve springs have been thoroughly washed, they must be examined for fatigue and distortion.
Test the valve springs either by comparison with the figures given, or by comparison with a new valve spring using a recommended valve spring testing machine.

DATA

Valve spring wire diameter:	
Inner	12SWG (0.104in)
Outer	1OSWG (0.128in)
Inside diameter:	
Inner	0.636in
Outer	0.872in
Total No. of coil	
Inner	6
Outer	5
Helix:	Right hand

To test against a new valve spring, insert both valve springs end to end between the test equipment. Apply a load to partly compress the springs and measure their comparative lengths (Fig 1).

NOTE: 'A is the old spring.
If the distance 'A is smaller than the distance 'B', then 'A' must be replaced.

Spring distortion is determined by positioning the spring upright on a surface plate and checking the squareness of each end with a set square (Fig 2).
All valve springs which have diminished in length and/or are not square must be discarded and replacements fitted.
Fit the valves into the guides and place the cylinder head on wooden blocks.
Fit the valve spring seats, inlet valve guide oil seals, springs and collars.
Compress the springs using Service Tool MS 1519A and insert the split cotters.
Refit the original shims in the valve collar recesses (1 Fig 3).
Ensure that the shims are seated correctly.
Fit the cam followers.
NOTE: If the cylinder head has been overhauled to the extent of having the valve seats recut, each shim should be
0.010 in. smaller than the original.

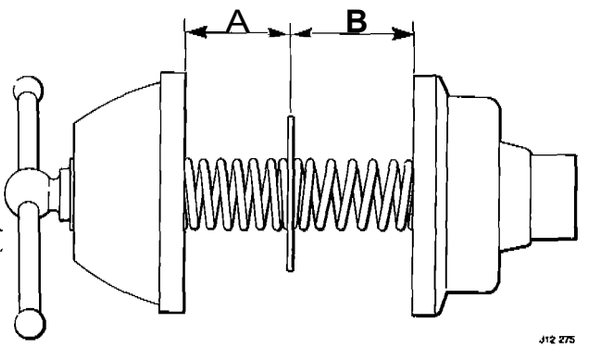


Fig 1

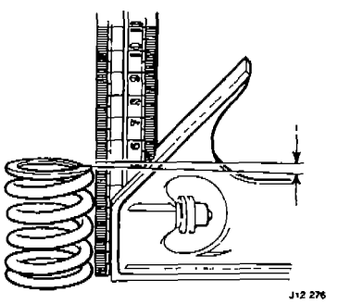


Fig 2

Slacken the sump securing bolts.
Remove all but two of the sump securing bolts.
Remove the clutch housing to sump securing bolts.
Finally remove the remaining bolts and lower the sump.
Place a suitable drain tray under the oil transfer housing and remove the housing.
Remove the oil pump pick-up pipes.
Remove the oil pump securing bolts and remove the oil pump.
Remove the bolts securing the crankshaft windage trays to the cylinder block and remove the trays.

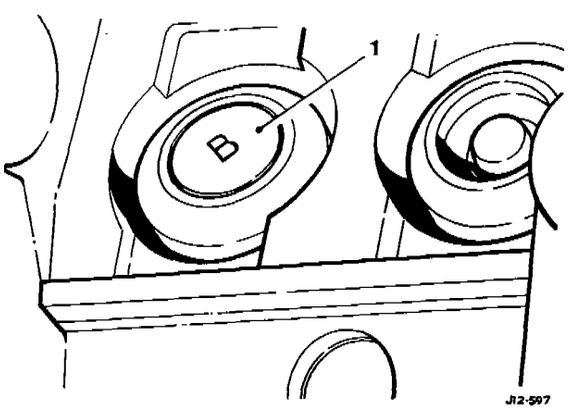


Fig 3

Clean all components and examine for damage and wear.
Remove the rear oil seal housing securing bolts and remove the housing. Remove and discard the oil seal.
Remove the engine timing cover securing bolts, and remove the cover assembly.
Remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and damper.
Slacken off the oil pump drive chain damper securing bolts, and move the damper clear of the chain.
Push back the lock tabs (1 Fig 4 and remove the securing bolts (2 Fig 4) from the oil pump drive sprocket (3 Fig 4).
Remove the drive sprocket and shim pack.
Remove the oil pump drive chain (5 Fig 4), remove the elastic band from the upper dampers and remove the upper timing chain.
Remove the lower tensioner securing bolts and remove the tensioner.
Push back the lower chain fixed damper securing bolt lock tabs and remove the bolts.

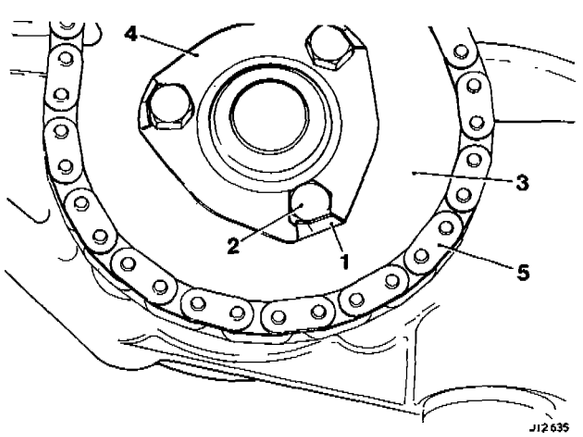


Fig 4

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Remove the damper and tab washer.
Repeat for the remaining fixed and pivot dampers and remove the lower chain and intermediate sprocket.
Remove the crankshaft pulley spacer and the crankshaft pulley woodruff key.
Remove the drive sprockets and woodruff keys from the crankshaft.
Check all drive sprockets for wear, distortion and damaged teeth.

Remove the P.A.S. pump drive coupling, remove and discard the auxilliary shaft rear oil seal using Service Tools 18G 1468 and 18G 1469.
Using right-angled circlip pliers, remove the auxilliary shaft securing circlip, remove the shaft and retrieve the thrust washer.
Remove the oil pump drive chain damper.
Remove the spacers from behind the damper.
Fit Service Tool 18G 1434 to the bearing situated in the front of the cylinder block (2 Fig 1).
Locate the centre peg, tighten the tool nut (1 Fig 1) to withdraw the bearing shell.
Remove the tool and shell assembly.
Slacken the tool nut. Withdraw the centre peg, remove and discard the shell.
Repeat the procedure to remove the remaining bearing shells.

Clean all component parts and check for wear, cracks and distortion. Should any of these conditions prevail then the component must be replaced.
Clean the auxilliary shaft housing.
Check for wear and if necessary change the auxilliary shaft bushes using Service Tool 18G 1434.
Mark the big-end cap to connecting rod relationship for correct pairing during
re-assembly (1 Fig 2).
Remove the big-end connecting rod nuts in piston/ connecting rod pairs (1&6, 2&5, 3&4 cylinders), and push the pistons up and out through the top of the cylinder block.
Remove and discard the bearing shells (2,3 Fig 2).
Mark the piston to connecting rod relationship for correct pairing during re-assembly.
Remove the gudgeon pin circlips (1 Fig 3) from each piston (3 Fig 3), remove the gudgeon pin (2 Fig 3) and separate the piston from the connecting rod (4 Fig 3).
Remove the piston rings and clean the carbon and deposits from the piston crown and skirt. Clean out the ring grooves. Examine the pistons for cracks and excessive wear.
Clean the connecting rods and gudgeon pins.

Refit the big end bearing shells to one connecting rod and cap, and fit the rod to the crankshaft. Torque tighten the nuts and check the side clearance between the end face of the rod and the journal shoulder (Fig 4).
The side clearance must be between 0.132-0.233mm.
Remove the connecting rod from the crankshaft.
Repeat for the remaining five connecting rods.

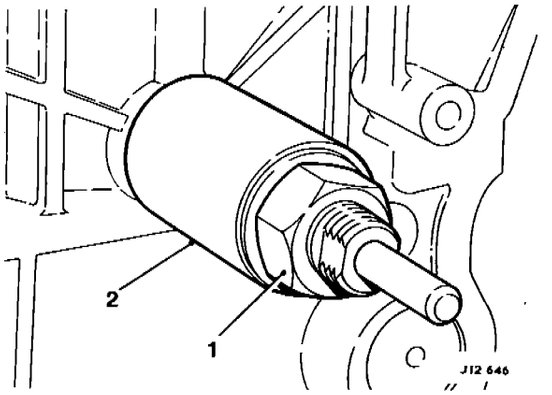


Fig 1

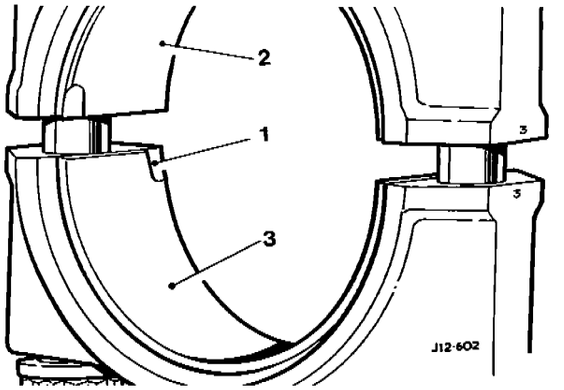


Fig 2

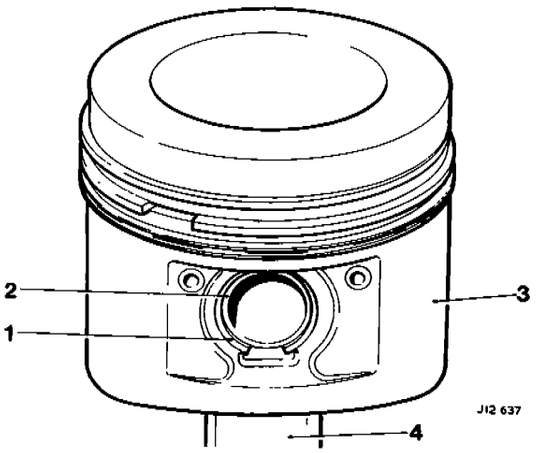


Fig 3

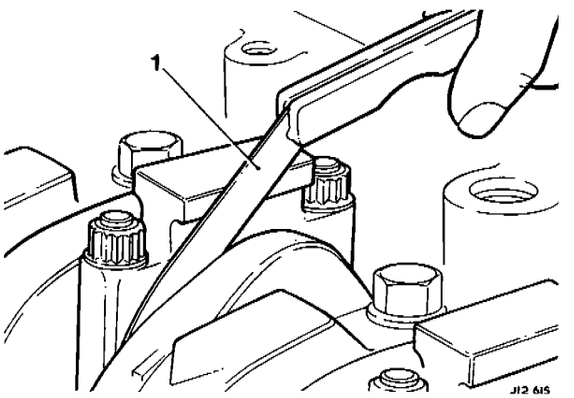


Fig 4

Ensuring that the main bearing caps are marked relative to the cylinder block, remove the main bearing cap bolts and remove the caps.
Carefully lift out the crankshaft.
Place the crankshaft on suitable blocks on a bench.
Remove and discard the bearing shells and the thrust washers.
Clean the cylinder block, crankshaft and bearing caps.

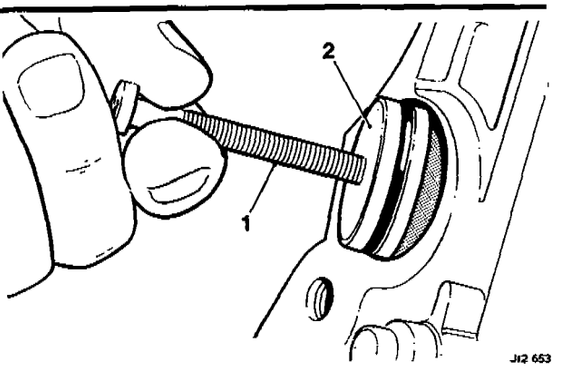


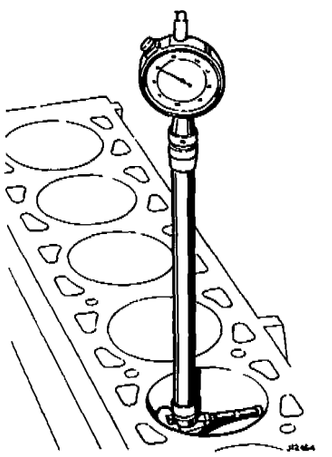
Fig 1

Check the crankshaft journals for wear and ovality, the tolerances are:

Main bearing	76.231 mm (3.0012in)
Thrust width	36.233-36.208mm (1.4265-1.4255in)
Big end tolerance	52.987mm (2.0861in) 52.974mm (2.0856in)
Running clearance	0.041-0.084mm (0.0016-0.0033in)

Should any of the dimensions be outside these tolerances, then the crankshaft must be renewed.

Fit suitable bolts to the oil gallery plugs and pull to remove (Fig 1).
Check all cylinder block oil galleries for cracks and blockages.
Fit new 'O' rings to the oil gallery plugs, lubricate the 'O' rings and fit the plugs to the cylinder block oil galleries.
Check all bearing housings for cracks, distortion, and any signs of bearing movement, ie scoring or overheating.
Check the cylinder block/cylinder head mating surface for warping, bowing and cracks.
Check the bore wear in the cylinder block with a suitable comparator (Fig 2). This must be done in at least six positions in the bore **(Fig 3).**
NOTE: Maximum bore wear normally occurs towards the top of the bore, across its thrust access.
NOTE: If standard size replacement pistons are being fitted, they must be the same grade as the markings on the cylinder block.


Fig 2

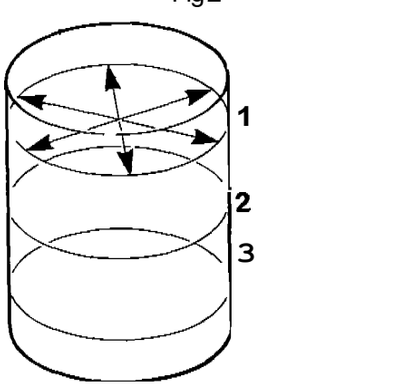


Fig 3

If new piston rings are being fitted without reboring, deglaze the cylinder bores using a hone or glaze buster.
This operation will not increase the size of the bores, and will give the bores a cross-hatched finish.
Insert the new piston rings into the cylinder bores, ensure that they are square in the cylinders and check the gap using a feeler gauge (Fig 4).

DATA:

Top compression ring gap	0.4 – 0.65mm
Second compression ring gap	0.4 – 0.65mm
Oil control ring gap	0.3 – 0.55mm

If the gap is insufficient, then a small flat file or carborundum stone can be used on the butting ends of the ring. Ensure that after filing no burrs remain.

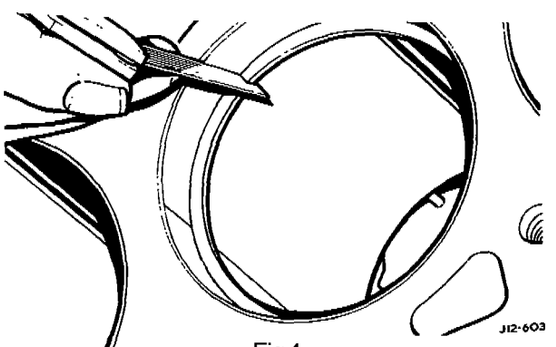


Fig 4

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NOTE: Ensure that the rings are not intermixed after they have been gapped, and that each piston/ring assembly is matched to its respective bore.

Measure the piston skirt clearance using a long feeler gauge. Insert the feeler gauge down the RH side of the cylinder bore, insert the correct piston INVERTED into the bore (with the gudgeon pin parallel to the axis of the crankshaft).
Push the piston down the cylinder until it reaches its tightest point in the bore. At this point, withdraw the feeler gauge; a steady resistance should be felt.
If the tolerances are outside those given below, the pistons must be replaced (as a set).
Piston skirt clearance 0.018mm – 0.042mm

Fit the new main bearing shell halves to the cylinder block and lubricate with clean engine oil.
Clean and polish the crankshaft journals (remove any scratches with lapping tape, polishing in an anti-clockwise direction ONLY, against the crankshaft rotation), lubricate with clean engine oil and carefully assemble the crankshaft into the cylinder block,
Fit the thrust washers ensuring that the grooved bearing face contacts the crankshaft (1 Fig 1).
Check the crankshaft rotates freely.
Fit the remaining new bearing shell halves into the main bearing caps. Lubricate with clean engine oil.
Fit the caps to the cylinder block. Start off the securing bolts (approximately 2 or 3 turns) and very gently tap the main bearing caps to ensure they are seated on the cylinder block.
Check the crankshaft still rotates freely.
Pull down each bearing cap individually and torque tighten the bolts.
Check the crankshaft still rotates freely after pulling down each bearing cap.
Check the crankshaft end float using a dial gauge mounted on the flywheel end of the crankshaft (Fig 2).
The correct tolerance is 0.004 to 0.010 in.
Should the end float exceed this, oversize thrust washers are available in 0.005 in. and 0.010 in.
Calculate the thickness of thrust washers as follows.

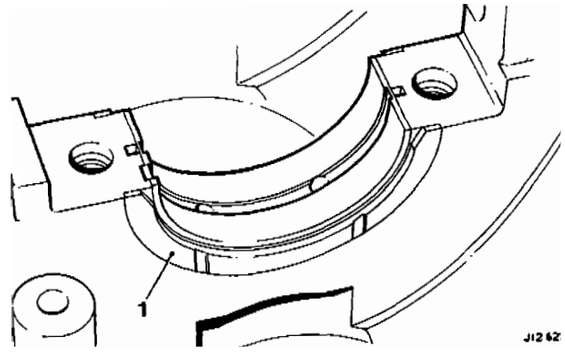
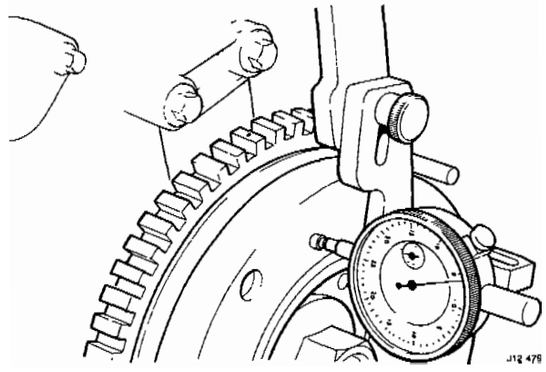


Fig 1


Fig 2

EXCESSIVE END FLOAT

End float measured		(A) 0.023 in.
Oversize thrust washers fitted		(B) 0.000 in. (standard)
End float required		(C) 0.007 in.
A-C = Thrust washer size required		= 0.016 in
Thrust washer sizes to be fitted		0.010 in. + 0.005 in.
	Total	0.015 in.
End float achieved		0.023 in. – 0.015 in.
	Total	0.008 in.

INSUFFICIENT END FLOAT

End float measured	(A) 0.003 in.	
Oversize thrust washer fitted	(B) 0 010 in.	
End float required	(C) 0.007 in.	
C-A = Thrust washer size required	= 0.004 in.	
Thrust washer size to be fitted	= 0.005 in.	
End float achieved	0.003 in. + 0.005 in.	
Total	0.008 in.	

Fit new woodruff keys to the crankshaft, never re-use old ones.
Fit the timing and oil pump sprockets to the crankshaft.
Check the connecting rods for out-of balance, twist and bend, using a suitable measuring jig (Figs 1 and 2).
If any rod is bent, twisted or out of balance with the other five, then the complete set must be renewed.
Lubricate the small end bush, slide the gudgeon pin through the piston and connecting rod.
NOTE: Pistons are marked 'FRONT. Ensure that the marking faces the front of the engine.
Secure with new circlips, never re-use old ones.
Fit the rings to the pistons ensuring that gaps are positioned as shown in Fig 3.

Lubricate and compress the rings using Service Tool 18G 55A (Fig 4).
Insert the piston skirt into the bore, and using a suitable implement, ie a wooden hammer shaft, gently tap the piston into the cylinder bore.
Ensure that the connecting rod does not foul either the cylinder block or camshaft.
Lubricate (using clean engine oil) and fit the big end bearing shells to the connecting rod and the connecting rod cap.
Fit the rod to the crankshaft, and fit the connecting rod cap to the rod.
Fit and tighten the connecting rod cap nuts to a torque of 52-55Nm.
Repeat the operation for the remaining pistons.
Clean and fit the windage trays. Fit and tighten the securing bolts.
Remove the oil pressure relief valve assembly from the oil pump.
Check the valve spring and mandrel for wear, scoring or pitting.
Measure against the specifications below.
Should any of the components be suspect, they must be replaced.

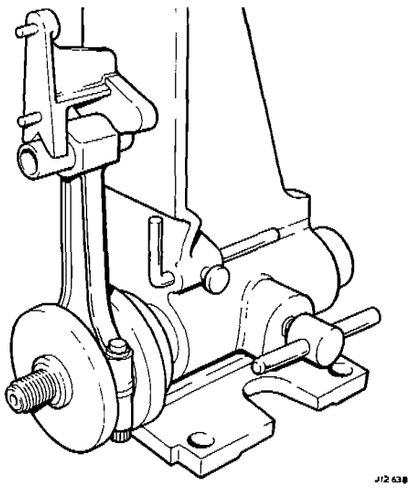


Fig 1

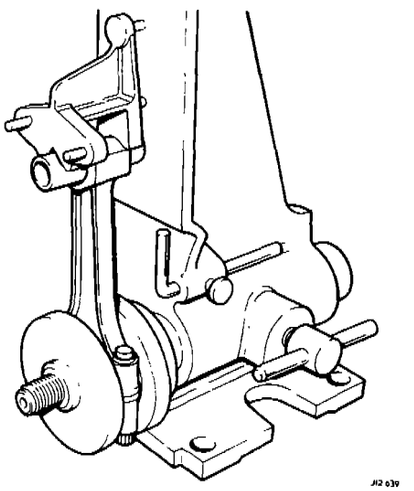


Fig 2

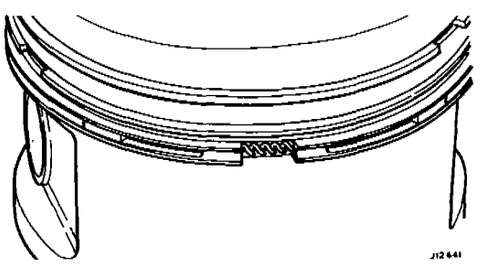


Fig 3

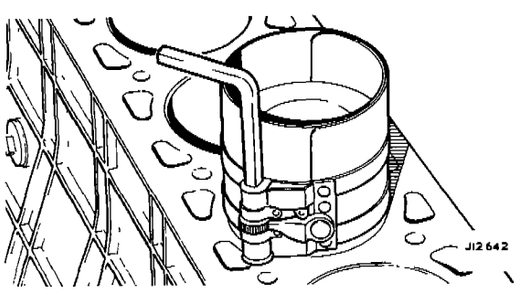


Fig 4

DATA

OIL PRESSURE RELIEF VALVE

O/D	17.98 to 17.95 mm
I/D	15.00 to 14.50 mm
Overall length	35 mm
Working length	30 mm
Bore depth	27 mm
Material	ENIA

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MANDREL

Length	57mm
Diameter	11.11 mm
Material	Steel tube to BS970

SPRING WALL

Thickness	1.63 or 1.22 mm
Free length	106 mm
Outside diameter	16.34 mm

Remove the oil pump body securing bolts and remove the outer rotor. Remove the backplate securing bolts, remove the backplate, and remove the bearing shell from the housing.
Clean all dismantled parts and check for obvious wear or scoring.
Fit the outer rotor and check the clearance between the rotor and the oil pump housing (Fig 1).

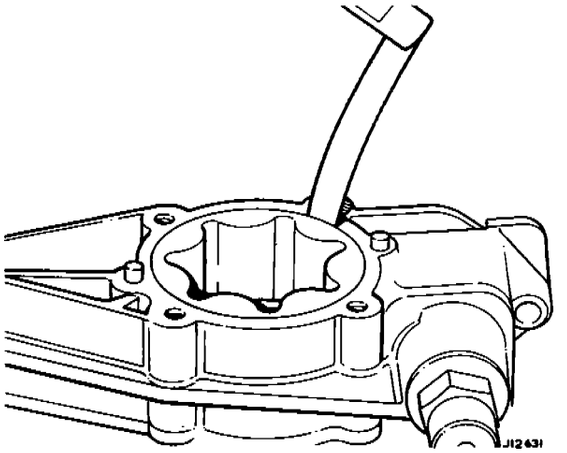


Fig 1

Check the oil pump end float (Fig 2).
Check the measurements given below. If any components are outside the specified tolerances, they must be replaced.

DATA

OIL PUMP

Material	Cast iron grade 12
End float	0.1 mm
Outer rotor clearance	0.2 mm
Outer rotor O/D	69,825 to 69,774 mm
Outer rotor width	27,975 to 27,962 mm
Inner rotor width	27,975 to 27,962 mm
Pump body rotor bore	69,951 to 69,926 mm

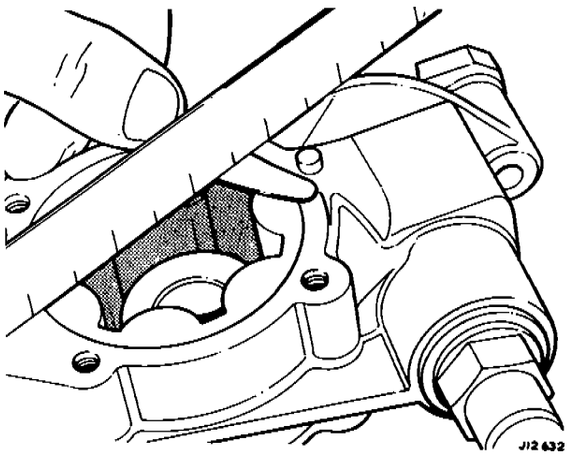


Fig 2

Lubricate the bearing shell with clean engine oil and fit to the pump housing.
Smear the backplate gasket face with sealant. Fit the backplate and tighten the securing bolts.
Lubricate the pump inner and outer rotors, the bearing, and the housing with clean engine oil.
Fit the outer rotor, smear the gasket face with sealant, fit the seal to the pump body and tighten the securing bolts.
Assemble and fit the relief valve assembly to the oil pump.
Fit the oil pump to the engine and torque tighten the securing bolts.
Refit the camshaft sprocket.
Fit the oil pump drive chain over the crankshaft sprocket, and move the drive chain as far rearward as possible.
Fit a shim pack (3 Fig 3) of 0.015in thickness to the oil pump.
Align the bolt holes, fit the drive sprocket and the two securing bolts.
Using a straight edge (2 Fig 3). check the alignment of the oil pump drive sprocket (4 Fig 3) and the crankshaft sprocket (1 Fig 3).

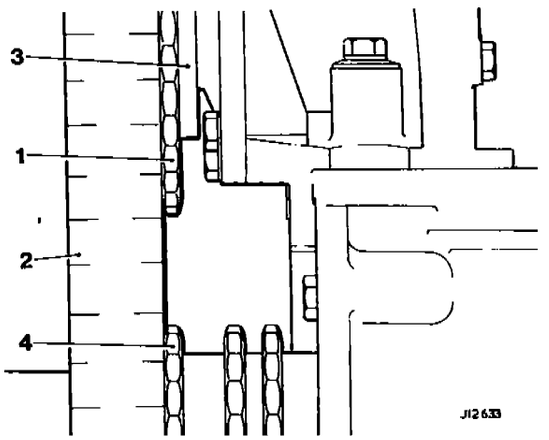


Fig 3

Remove and refit the pump drive sprocket, varying the thickness of the shim pack as required in order to align the sprockets. When the alignment is correct remove the pump sprocket.
Fit the chain and shims to the sprocket (3 Fig **1)** and fit the assembly to the oil pump.
Fit the tab washer (4 Fig **1**) and securing bolts (2 Fig **1**).
Tighten the bolts and lock over the tab washer **(1** Fig 1).
NOTE: Oil pump sprocket shims are available in the following sizes:
0.005in
0.010in
0.020in

Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 2).

Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102' to the transfer housing gasket face, and fit the housing to the block. Fit and torque tighten the securing bolts.

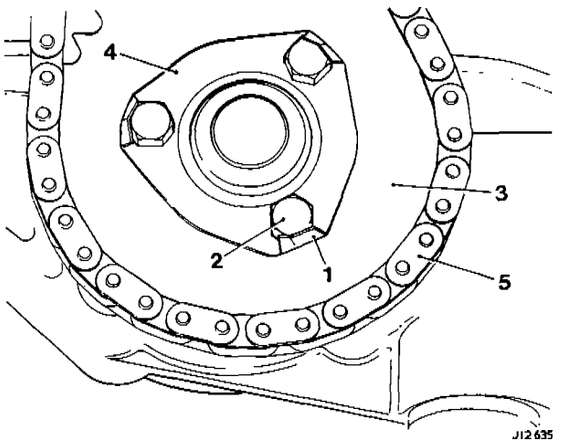


Fig 1

Lubricate the lower timing chain. Fit the chain to the intermediate sprocket, fit the chain to the lower sprocket, and then assemble the intermediate sprocket and chain to the cylinder block.
Should the intermediate sprocket be worn or damaged, the assembly must be replaced.
Fit the spacers to the lower pivoting damper and fit the assembly to the cylinder block.
Fit the tab washer and securing bolts.
Tighten the bolts and lock over the tabs.
Clean the lower tensioner assembly, remove the ball valve **(1** Fig 3), **and** ensure that the base of the housing (2 Fig **3)** is clean.
Check that the ball valve is free by shaking it to ensure it rattles. If it does not, replace the valve assembly. If it does, renew and lubricate the **'O'** ring (3 Fig 3) and press the valve back into the housing. The ball free movement is 0.74 to 0.45 mm.
Inspect the housing and hydraulic tensioner (4 Fig 3) for excessive wear or scoring. Also check that the oil hole (5 Fig **3)** is clear in the end of the piston.
Lubricate the component parts with clean engine oil. Assemble the tensioner by pressing and twisting the snail clockwise until the pawl locks in the 'park' position. Insert the tensioner assembly into the housing and fit the housing to the cylinder block. Fit and tighten the securing bolts (6 Fig 3).

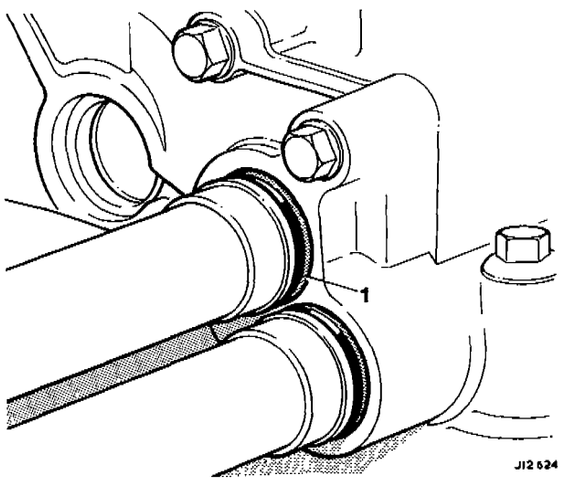


Fig 2

Fit the lower static damper, fit the tab washer and bolts.
Tighten the bolts and lock over the tabs.
Release the tensioner by pushing the pivoting damper away from the chain, thus pushing the tensioner back into the housing.
This will release the snail, and tension the chain.
Fit the upper static damper.
Fit the securing bolts and tab washer.
Tighten the securing bolts and lock over the tabs.

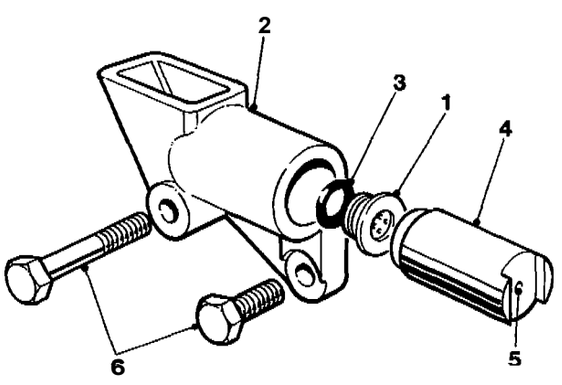


Fig 3

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fit a dial **gauge** to the top of the cylinder block, and turn the engine over until No.1 piston is at TDC (Fig 1).
Lubricate the upper chain with clean engine oil and fit to the intermediate sprocket.
Fit an elastic band around the upper dampers to secure the chain.

Remove the crankshaft front oil seal and distributor drive gear shaft seal using Service Tool **JD** 118 (18G 1468).
Lubricate the new distributor drive shaft seal and fit to the cover using Service Tool 18G 1469.

Fit the crankshaft front oil seal to the timing cover (Fig 2) ensuring that the front edge of the seal is flush with the cover.
Smear the cylinder block timing cover face with 'Hylosil 102', lubricate the bearing shells with clean engine oil and carefully fit the timing cover to the engine ensuring that the timing cover **to** cylinder head mating face is flush with the cylinder block (Fig 3).
Fit and tighten the securing bolts.
Lubricate and fit the oil seal distance spacer. Fit and seat the crankshaft pulley woodruff key.
Remove and discard the old oil seal from the rear housing.
Clean the housing (4 Fig 4), lubricate the seal mounting face (3 Fig 4), and fit the new seal using Service Tools JD 550-3 and 18G134 (1.2 Fig **4).**
Smear the gasket face with Hylosil 102, locate the plastic protector 'O' ring on to the end of the crankshaft, and push the rear seal housing over the crankshaft and up to the rear cylinder block face.
Check that the sump to rear housing mating face and cylinder block are flush (Fig 1 page 83).
Fit and tighten the securing bolts.
Clean and refit the baffle to the **sump.**
Apply Hylosil 102 to the **sump** mating face, **lift** the sump into position, and fit and tighten the securing **bolts.**

Refit the cylinder head using a new gasket.
Ensure that the cylinder head is torque tightened in the correct sequence, as follows:

Tighten the cylinder head bolts in sequence to 52-54Nm.
Rotate the bolts clockwise in sequence through exactly 90 degrees, using Special **Tool** LST 122 or a self-manufactured tool **of** the dimensions given in Fig **2** page 83.

Lubricate the camshafts and fit to the cylinder head, ensuring that they are fitted with the slots to the top.
Fit the camshaft caps and torque tighten the securing bolts.
Measure the valve clearance between the heel of the camshaft and the cam followers, turning the engine over as necessary to measure all the clearances.
The correct clearance should be:

INLET VALVES 0.012 – 0.014in
EXHAUST VALVES 0.012 – 0.014in

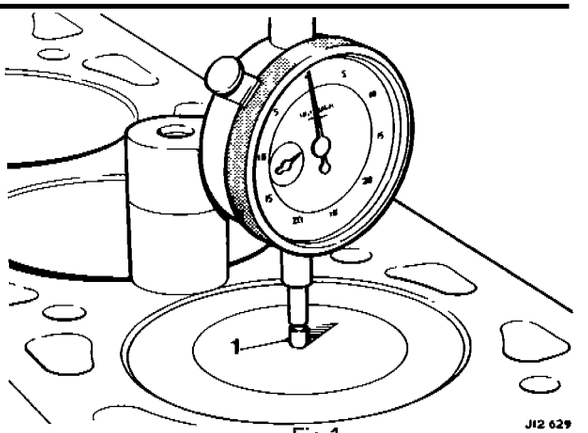


Fig 1

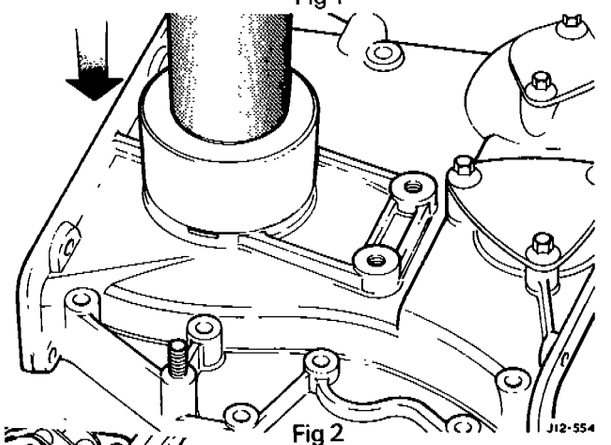


Fig 2

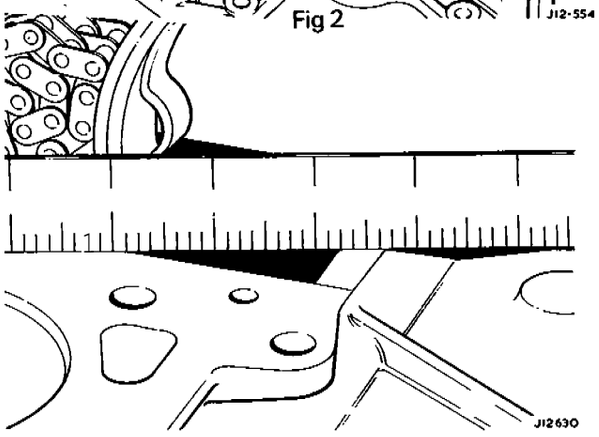
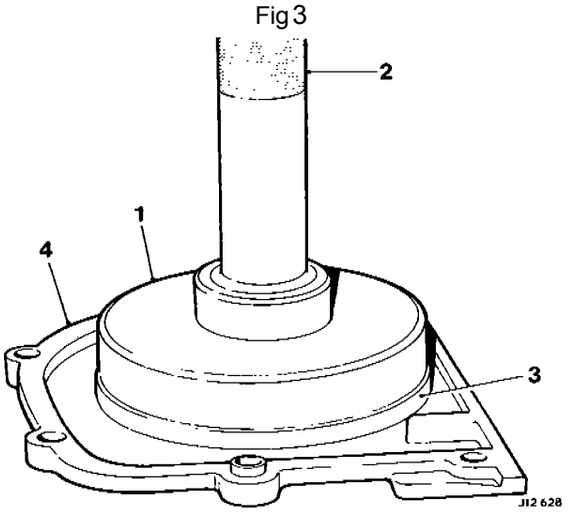


Fig 3



Fia 4

Make note *of* the actual clearances.
Should any of the clearances be incorrect, remove the camshaft caps, the camshaft and the cam followers.
Remove all the shims requiring adjustment, check with a micrometer the size **of** the existing shims and note the reading. Calculate the size **of** the shim required, following the examples in **DATA.**

DATA

EXCESSIVE CLEARANCE	**INCHES**
Size of existing shim	0.1*00*
Plus the actual clearance noted	0.01**9**
	0.11**9**
Less the specified valve clearance	0.01**3**
= required shim size	0.1*06*

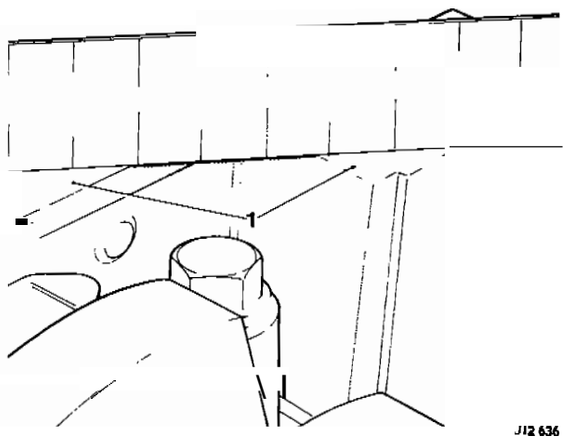


Fig 1

INSUFFICIENT CLEARANCE	**INCHES**
Size *of* existing shim	0.1*07*
Plus the actual clearance noted	0.01*0*
	0.1 17
Less the specified valve clearance	0.01**3**
= required shim size	0.1 **04**

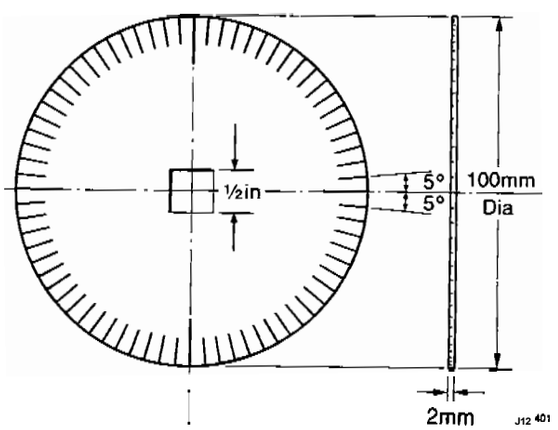


Fig 2

AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	*0.086* in
C	0.087 in
D	*0.088* in
E	0.089 in
F	0.090 in
G	0.091 in
H	0.092 in
I	0.093 in
J	0.094 in
K	0.095 in
L	0.096 in
M	0.097 in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

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Fit the cam followers, refit the camshaft, the camshaft caps and recheck the valve clearances.
NOTE: **A** final check **of** the valve clearances should be done when the cylinder head is fitted and torque tightened to the cylinder block.

Using Service Tool C 3993 camshaft timing tool, set the camshaft to TDC (Fig **1**).
Position the chain over the sprockets and align the sprockets to the camshaft.
Remove the inner sprocket circlips (**1** Fig 2) and remove the inner sprocket (2 Fig 2).
Align the inner sprocket to the bolt holes.
Refit the inner sprocket to the outer sprocket (3 Fig 2).
Refit the circlip.
Fit and tighten the sprocket securing bolts.
Fit new half moon seals and camcover gasket.
Fit the camcover. Fit and torque tighten the securing bolts.

Refit all ancilliaries.
Detach the engine from the stand.
Attach the gearbox/transmission unit to the engine 12.41.01/2 page 63.
Refit the engine **to** the vehicle 12.41.01/2 page 67.

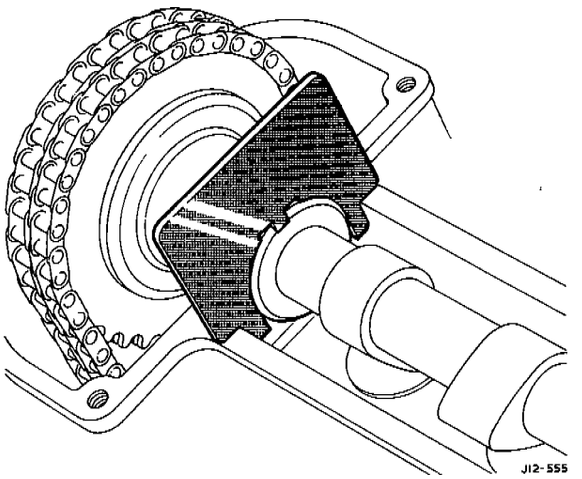


Fig **1**

DATA

SERVICE TOOLS

Auxiliary oilseal remover JD 118 (18G1468)
Auxiliary oilseal replacer 18G1469
Camshaft timing tool C 3993
Crankshaft pulley lock 18G1437
Crankshaft pulley tool 18G 1436
Rear oilseal adaptor JD 550-3
Timing cover bush tool 18G1434
Valvespring compressor MS 1519A

TORQUE FIGURES

piAdaptor plate to sump **49-54Nm**
Adjustment trunnion to alternator securing bolt **23-27Nm**
Alternator adjustment bolt to timing cover nut **23-27Nm**
Alternator adjustment bolt-trunnion lock nuts **12-14Nm**
Alternator pivot bolt **23-27Nm**
Alternator pivot bolt nut **23-27Nm**
Banjo bolt to cylinder head **13-16Nm**
Camcover to cylinder head **9.5-12Nm**
Camshaft sprocket **to** camshaft **23-27Nm**
Clip-hose to breather pipe **2.4Nm**
Connecting rod to big end nut **52-55Nm**
Crankshaft pulley to crankshaft **203.5Nm**
Crankshaft speed sensor housing to timing cover **23-27Nm**
Cylinder block drain plug **68-75Nm**
Cylinder head to cylinder block:
Tighten in sequence to **52-54Nm**
Rotate clockwise through exactly 90°
Dipstick to bracket **5-8Nm**
Distributor clamp plate to timing cover **9.5-12Nm**
Drive plate centre coupling **9.5-12Nm**
Exhaust manifold to cylinder head **23-27Nm**
Fan/torquatrol unit to water pump **23-27Nm**
Heat shield to exhaust manifold **23-27Nm**

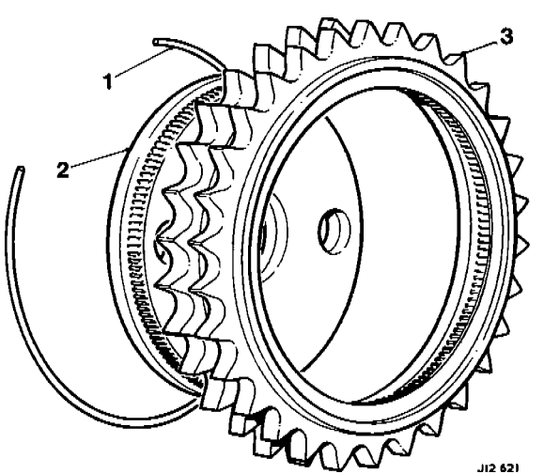


Fig 2

DATA (CONTINUED)

TORQUE FIGURES

Heater pipe to cylinder head ***23-27Nm***
Heater pipe to inlet manifold 9.5- ***12Nm***
Hose-bottom hose to water pump ***3.8-4.3Nm***
Hose-expansion tank to water pump ***2.5-3.5Nm***
Hose-heater return pipe to water pump ***2.5-3.5Nm***
Hose- water pump to thermostat housing ***2.5-3.5Nm***
Hydraulic pump to timing cover ***23-27Nm***
Inlet manifold ***to*** *cylinder head* ***23-27Nm***
Intake elbow to throttle housing ***2.4Nm***
Lower chain tensioner to cylinder block ***23-27Nm***
Oil drain-back tube to sump ***12.5-15Nm***
Oil pump front cover to ***body 9.5-12Nm***
Oil pump to cylinder block ***23-27Nm***
Oil pump rear cover to body ***9.5-12Nm***
Oil sump plug ***41-47Nm***
Oil sump to cylinder block ***23-27Nm***
Oil sump ***to*** *timing cover* ***23-27Nm***
Power steering pump to mounting ***23-27Nm***
Power steering pump to adaptor ***49-54Nm***
Timing cover to cylinder block ***23-27Nm***
Top hose ***to*** *thermostat housing* ***3.8-4.3Nm***
Transfer housing ***to*** *cylinder block* ***23-27Nm***
Upper static ***damper*** *to cylinder block* ***23-27Nm***
Upper timing chain tensioner to cylinder block
23-27Nm
Water pump to timing cover ***23-27Nm***
Windage tray to cylinder block ***23-27Nm***

SPANNER SIZES

8mm
10mm
13mm
17mm
19mm (SERVICE TOOL-18G 1436)
30mm
3/8in AF
1/2in AF (SERVICE TOOL 18G1437/1)
9/16in AF
5/8in AF
13/16in AF
10mm (ALLEN KEY)
3/4 WHITWORTH

OILS/GREASES/SEALANTS

Half moon seals to cylinder head ***'HYLOSIL 102'***
Hydraulic pump drive plate bolt ***'LOCTITE***
'O' Rings ***'PETROLEUM JELLY'***
Sump to timing cover ***'HYLOSIL 102'***
Timing cover to cyl. head ***'HYLOSIL*** *102'*
Thermostat housing to extension ***'HYLOSIL 102'***
Oil pump front cover to body ***'LOCTITE 501'***
Oil pump rear cover to body ***'LOCTITE 501'***

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TIMING COVER GASKET

RENEW 12.65.04

Open the bonnet.
Remove the bonnet insulation pad. Disconnect the bonnet lamp **multi** plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround) for paint protection.
Slacken off the bonnet securing bolts **(1** Fig 1), disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place **a** drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.

Remove the camshaft cover securing nuts and bolts, and remove the cover.
Remove and discard the gasket and half moon seal.
Remove the bolt securing the heater pipe to the manifold.
Re-position the two-way solenoid valve/heater pipe away from the inlet manifold.
Remove the bolt securing the dipstick tube to the inlet manifold (4 Fig 3).
Disconnect the hose from the intake throttle elbow.
Disconnect the breather hose from the oil trap turret **(3 Fig** 3).
Disconnect the upper coolant hose from the part throttle orifice control housing.

Disconnect the auxillary air valve block connector.
Remove the harness clip securing bolt.
Disconnect the earth leads (2 Fig 3).
Remove the remaining nuts and bolts (1 Fig 3) and carefully lift the inlet manifold *off* the cylinder head. Chock the manifold clear of the cylinder head.
Remove and discard the gasket.
Remove the thermostat housing.

Remove and discard the breather cap 'O' ring seal.
Remove the heatshield (1.2 Fig 4).
Disconnect the oil feed pipe (3 Fig **4)** from the rear of the tappet block.
Discard the copper sealing washers from the banjo bolt.
Disconnect the heater feed pipe (4 Fig 4) from the cylinder head and discard the gasket.
Remove the exhaust manifold, and re-position the manifold away from the cylinder head.
Remove and discard the manifold gaskets.
Drain the coolant from the engine.
Release the upper timing chain tensioner using Service **Tool** JD 101 **(1** Fig 1 page 87).
Remove the reaction shoe lower securing bolt (5 Fig **1** page 87), remove the shoe (6 Fig 1 page 87) and gasket.

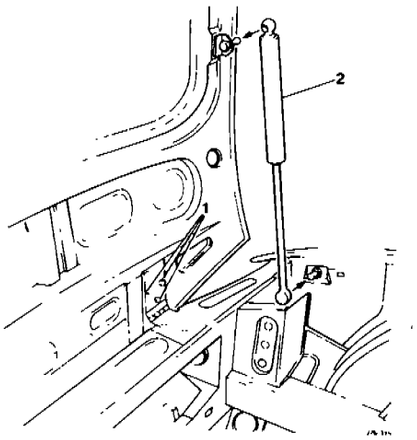


Fig 1

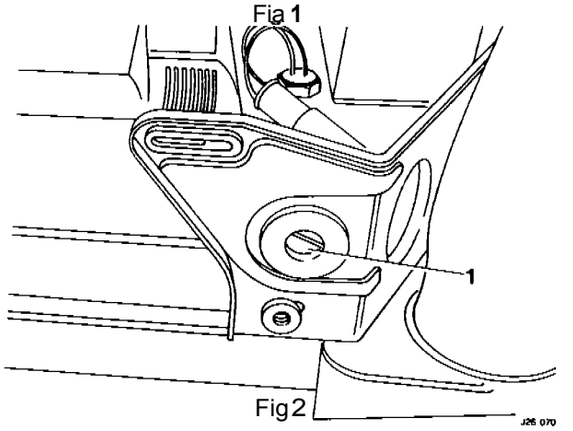


Fig 2

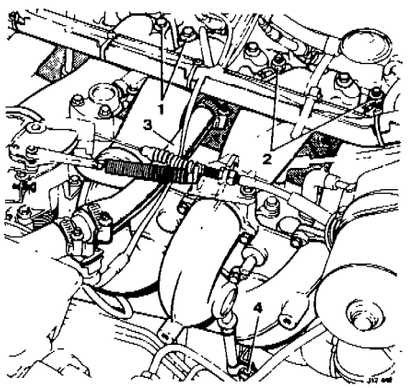


Fig 3

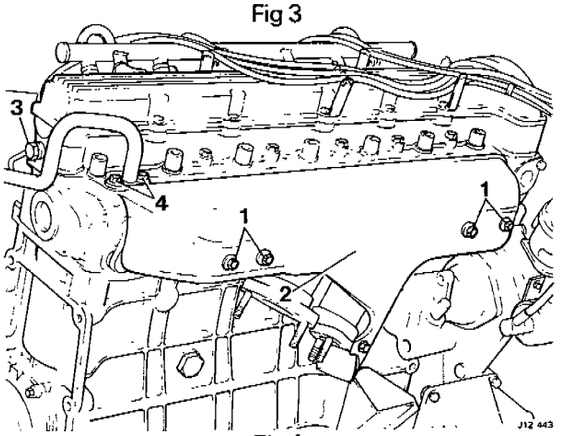


Fig 4

Push back the lock tabs and remove the timing chain wheel securing bolts (2,3 Fig **1).** Remove the last two bolts only when the camshaft is at TDC (use Service Tool C 3993 – Fig 2).
Remove the timing chain wheel.

Lower the chain into the cylinder head and secure the tensioner and upper guide with an elastic band.
Remove the cylinder head to timing cover bolts **(4** Fig **1**).
Remove the remaining cylinder head securing bolts/nuts and remove the cylinder head.
Remove and discard the head gasket.
Clean the cylinder head thoroughly and check the cylinder head and cylinder block for warping, bowing or cracks.

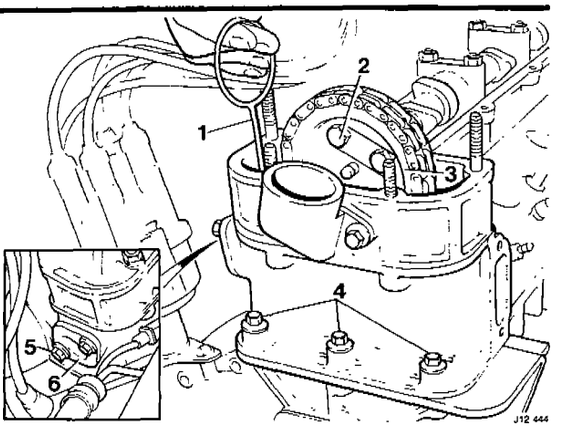


Fig **1**

Remove the bolts securing the surnp to the timing cover.
Disconnect the top hose from the thermostat housing.
Disconnect the harness connections from the thermostat housing.
Disconnect the water pump and expansion hoses from the thermostat housing.

Remove the spoiler/under tray to inner wheel arch cover.
Remove the nuts securing the torquatrol unit **to** the water pump **(1,2** Fig 3).
Remove the fan cowl securing clips **(1** Fig **4).**
Lift out the cowl and torquatrol unit complete.
Remove the hydraulic pump from the timing cover.
Re-position the pump away from the timing cover area.
Remove the pump drive plastic coupling.
Remove the drive plate centre securing bolt.
Using **a** suitable pry bar, remove the drive plate from the shaft.
Remove the distributor.
Remove the alternator drive belt.
Fit Service Tool **18G 1437** (1 Fig 1 page **88)** to the crankshaft pulley (3 Fig 1 page ***88)*** and tighten the Service Tool securing bolts (2 Fig **1** .page **88).**
Slacken off the crankshaft centre securing bolt, remove the Service **Tool** and remove the bolt.
Fit Service **Tool 18G 1436** (1 Fig 2 page ***88)*** through the crankshaft pulley, tighten the securing bolts (2 Fig 2 page 88), tighten the centre **bolt *of*** the tool and remove the pulley and tool assembly.
Remove the crankshaft speed sensor securing bolts (1 Fig 3 page 88), and re-position the sensor ***(6*** Fig 3 page **88)** away from the timing cover area.
Disconnect the expansion tank hose from the water pump.
Disconnect the bottom hose from the water pump.
Disconnect the water and heater return pipe hoses from the water pump.
Remove the water pump assembly from the timing cover.
Remove the alternator link arm assembly.
Remove the timing cover securing bolts (2 Fig **3** page ***88).*** Remove the timing pointer (3 Fig 3 page **88)** and remove the timing cover assembly (5 Fig 3 page **88).**

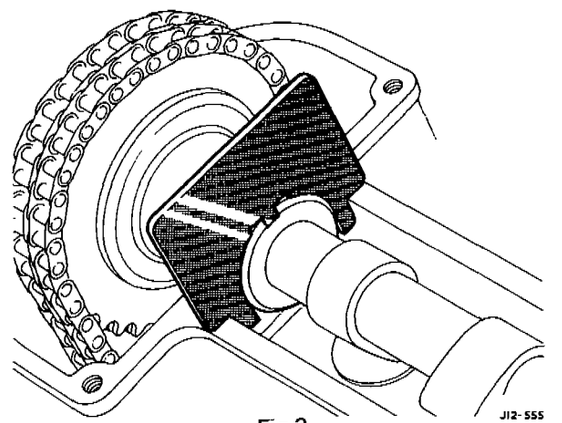


Fig 2

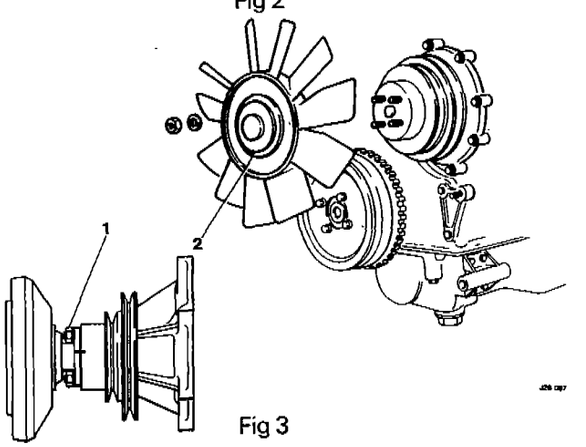


Fig 3

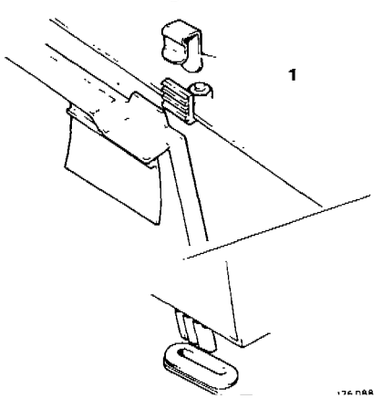


Fig **4**

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Remove the damper woodruff key and oil seal spacer from the crankshaft.
Remove the oil seal from the timing cover using Service Tool JD128.

Clean all gasket surfaces, oil seal spacer, pointer and crankshaft damper.
Using Service Tool JD 129 and a suitable press, fit a new oil seal to the timing cover (Fig 1 page 89).
Ensure that the front of the seal is flush with the front face of the timing cover.
Apply 'Hylosil 102 to the timing cover gasket faces and the outer edge of the sump face.
Lubricate the oil seal and bearing surfaces and fit the timing cover assembly to the cylinder block.
Fit and tighten the timing cover securing bolts.
NOTE: Do not fully tighten the timing pointer bolts at this stage.
Fit and tighten the sump to timing cover securing bolts.
Fit the oil seal spacer to the crankshaft and engage into the oil seal.
Fit the damper woodruff key into the crankshaft, and fit the damper.
Align the timing pointer to TDC and tighten the pointer securing bolts.
Refit the damper. Fit and tighten the securing bolt, using 18G 1437.
Re-position the engine at TDC and remove the Service Tool.
Refit the alternator link arm assembly.
NOTE: Do not tighten the trunnion bolt at this stage.
Refit the water pump.
Reconnect the water and heater return pipe hoses.
Reconnect the bottom hose to the water pump.
Reconnect the expansion tank hose to the water pump.
Refit the crankshaft sensor assembly to the timing cover, and secure the harness with the ' P clip.
Refit and adjust the alternator drive belt.
Finally tighten the alternator trunnion bolt.
Refit the crank pulley and balance weights. Fit and tighten the pulley securing bolts.
Clean the power hydraulic pump drive coupling and mating faces.
Fit the drive plate to the shaft.
Apply loctite to the drive plate securing bolt. Fit and tighten the drive plate securing bolt.
Fit and align the coupling to the pump.
Reconnect the pump to the drive shaft. Fit and tighten the pump securing bolts.
Fit a new 'O' ring to the distributor. Set the rotor arm to the correct position.
Refit the distributor.
NOTE: Do not tighten the distributor securing bolt at this stage.
Refit the torquatrol unit. Ensure the paint spots align together (Fig 2 page 89).

Refit the thermostat housing to water pump hose.
Reconnect the expansion and top hoses to the thermostat housing.
Reconnect the thermostat housing sensor connections.
Refit the cylinder head.

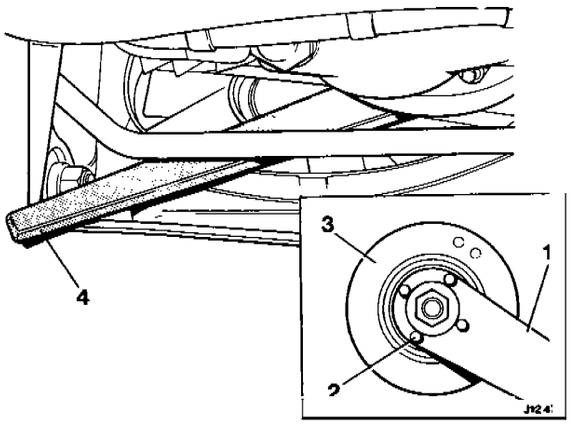


Fig 1

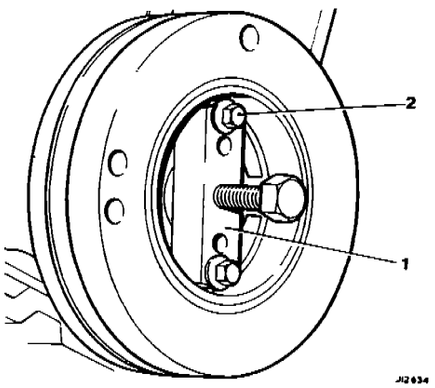


Fig 2

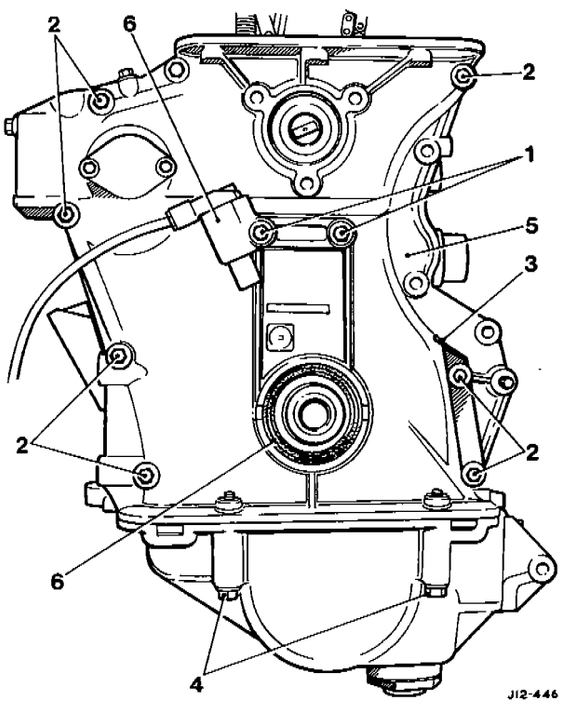


Fig 3

Refit the air cleaner element.
Replenish the engine oil to the correct level (Fig 3).
NOTE: If the engine oil has been contaminated with water, then the oil must be changed.
Replenish the coolant system.
Refit the bonnet.

DATA

SERVICE TOOLS

*Camshaft timing tool C **3993***
*Crankshaft pulley remover **18G1436***
*Front pulley lock **18G** 1437*
*Timing cover seal remover JD **128***
*Timing cover replacer JD **129***

TORQUE FIGURES

*Alternator pivot bolt **23-27Nm***
*Alternator pivot bolt nut **23-27Nm***
*Crankshaft pulley to crankshaft **203.5Nm***
*Crankshaft speed sensor housing to timing cover **23-27Nm***
*Distributor clamp plate to timing cover **9.5-12Nm***
*Fan/torquatrol unit to water pump **23-27Nm***
*Hose-bottom hose to water pump **3.8-4.3Nm***
*Hose-expansion tank to water pump **2.5-3.5Nm***
*Hose-heater return pipe to water pump **2.5-3.5Nm***
*Hose-water pump to thermostat housing **2.5-3.5Nm***
*Hydraulic pump to timing cover **23-27Nm***
*Oil sump **to** timing cover **23-27Nm***
*Timing cover to cylinder block **23-27Nm***
*Top hose to thermostat housing **3.8-4.3Nm***
*Water pump to timing cover **23-27Nm***

SPANNER SIZES

8mm
10mm
13mm
19mm (SERVICE TOOL-18G 1436)
30mm

1/2in AF
9/16in AF
5/8in AF
13/16in AF

10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

Hydraulic pump drive plate securing bolt 'LOCTITE
*'O'rings 'PETROLEUM **JELLY'***
*Sump to timing cover **'HYLOSIL** 102'*
*Timing cover to cylinder head **'HYLOSIL 102'***
*Thermostat housing **to** extension piece **'HYLOSIL 102'***

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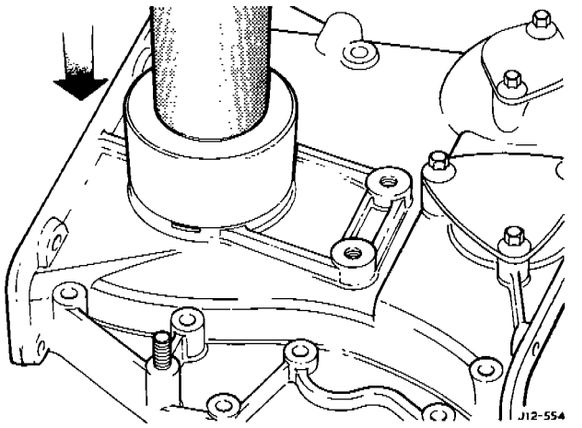
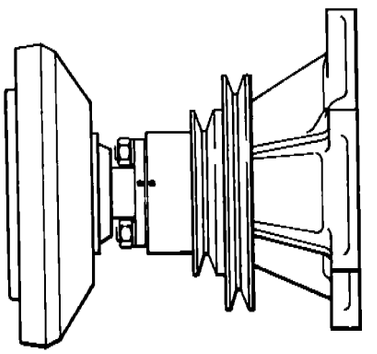


fig 1


fig 2

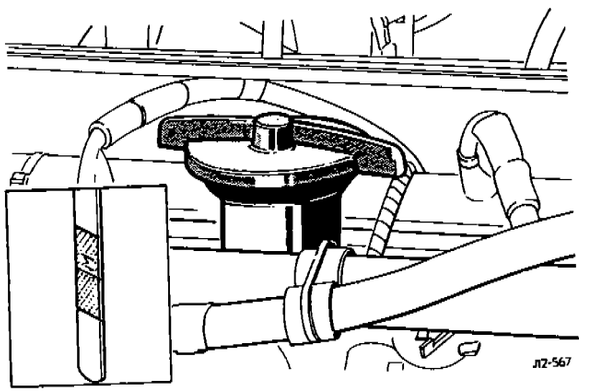


Fig 3

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TIMING CHAIN, GEAR AND TENSIONER – ENGINE SET

RENEW **12.65.13**

Remove the timing cover 12.65.04 page 86.
Remove the elastic band from the upper dampers, push back the lock tabs on the upper tensioner pedestal securing bolts (3 Fig 1), and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Push back the lock tabs on the upper static damper securing bolts (5 Fig 1), and remove the bolts, tab washer and damper (4 Fig 1).
Remove the damper pedestal and the upper timing chain (6 Fig 1).
Remove the lower timing chain tensioner securing bolts (11 Fig 1), and remove the tensioner assembly (10, 12, Fig 1).
Remove the lower timing chain (8 Fig 1) from the intermediate sprocket (9 Fig 1).

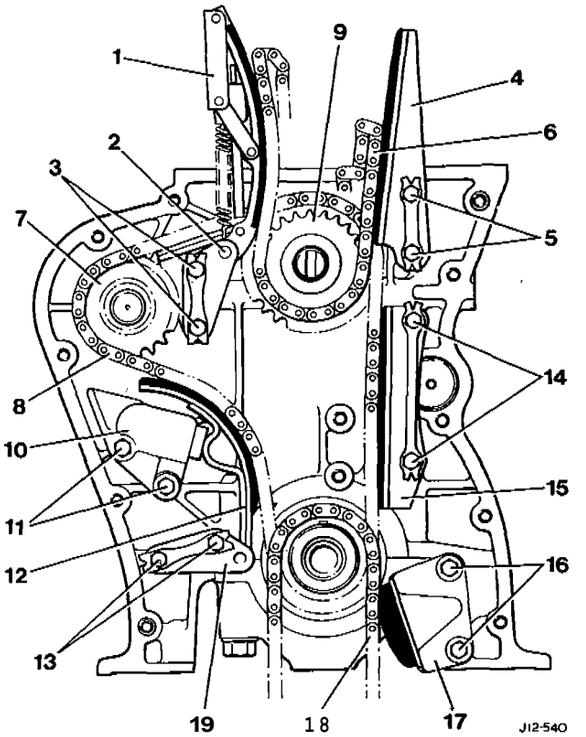


Fig 1

Remove the intermediate sprocket and bearing.
Remove the oil pump drive chain damper securing bolts (16 Fig 1), and remove the damper (17 Fig 1).
Push back the lock tabs on the lower static damper securing bolts (14 Fig 1), remove the bolts, and remove the damper (15 Fig 1).
Fit and tighten the crankshaft pulley securing bolt.
Fit Service Tool JD 130 chain link remover/replacer (1 Fig 2) to the master link (rotate the engine as necessary to align the link).
Ensure the tool aligns to the master link, position the 'E gate (2 Fig 2) to the tool and seat behind the chain (3 Fig 2).
Fit and tighten the tool handle ensuring that the extractor cones (4 Fig 2) line up with the link pins and extract the link.
Slacken the tool carefully ensuring that no components fall into the sump and remove the oil pump chain.
Remove the lower timing chain from the sprockets.
Remove the crankshaft pulley securing bolt.
Using a suitable drift, remove the crankshaft sprocket.
Re-position the hydraulic pump, harness and hose for access.
Remove the P.A.S. pump to engine securing bolts.
Remove the P.A.S. pump.
Remove the pump drive coupling using Service Tool JD 119.
Remove the drive coupling plate securing bolts.
Remove the drive coupling plate.
Remove the auxilliary shaft oil seal, using Service Tool JD 118 as follows.
Slacken off the tool centre bolt.
Fit and tighten the tool to the oil seal.
Tighten the centre bolt to withdraw the oil seal.
Remove the tool/seal assembly.
Remove the seal from the tool.
Using right-angled circlip pliers, displace and remove the drive shaft circlip.
Remove the drive shaft.
Remove the drive shaft rear thrust washer.

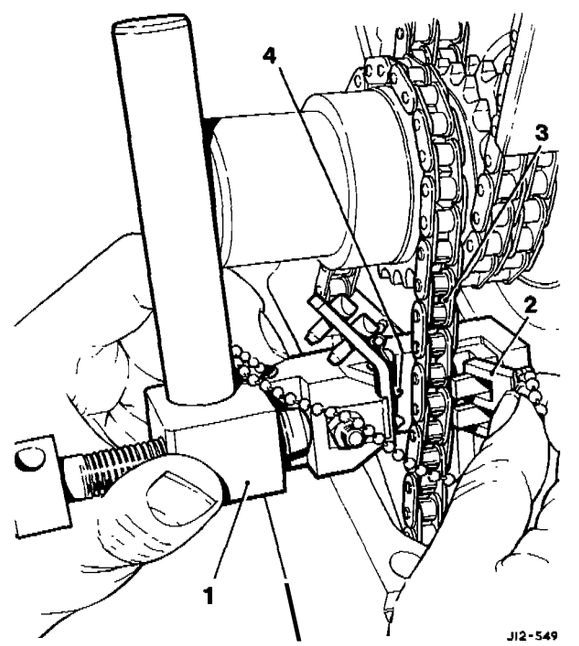


Fig 2

Fit Service Tool 18G.1434 to the bearing situated in the front of the cylinder block (2 Fig 1).
Locate the centre peg.
Tighten the tool nut to withdraw the bearing shell (1 Fig 1).
Remove the tool and shell assembly.
Slacken off the tool nut withdraw the centre peg.
Remove and discard the shell.
Remove the blanking plate from the timing cover.

Repeat the procedure to remove the timing cover and drive shaft housing bearing shells.
Clean all component parts and check for wear or damage, replace worn or damaged components as necessary.
Check for wear and if necessary change the auxilliary shaft bushes (1 Fig 2) using Service Tool 18G 1434 (2 Fig 2).
Lubricate all bearing shells. Refit all shells using 18G 1434.
Ensure that the oil feed holes are lined up with the holes in the bearing shell (1 Fig 3).
The Service tool 18G 1434 has a line scribed on it to assist the alignment of the oil holes.
Coat the timing cover blanking plate with 'Hylosil 102, and fit the plate to the timing cover.
Fit and tighten the securing bolts.
Lubricate and fit the drive shaft to the housing.
Lubricate and fit the thrust washer.
Refit the drive shaft circlip.
Fit a new oil seal to the rear of the shaft, using Service Tool 18G 1469.
Fit and align the drive coupling plate to the drive shaft.
Apply Loctite to the drive plate securing bolts.
Fit and tighten the drive plate securing bolts.
Fit the coupling to the P.A.S. pump.
Align the pump with the drive shaft.
Connect the P.A.S. pump assembly to the drive shaft.
Fit and tighten the pump securing bolts.
Re-position the hose, harness and hydraulic pump.
Fit the replacement sprocket to the crankshaft.
Fit and tighten the crankshaft pulley securing bolt.
Using a straight edge (2 Fig 4), check the alignment of the oil pump drive sprocket (1 Fig 4), and the crankshaft sprocket (4 Fig 4).
If the alignment is incorrect, proceed as follows.
Push back the lock tabs from one oil pump drive sprocket securing bolt. Remove the bolt.
Rotate the sprocket. Push back the lock tabs from the second bolt. Remove the bolt.
Rotate the sprocket, push back the lock tabs and remove the remaining bolt.
Remove the tab washer and drive sprocket.
Remove the shims (3 Fig 4). Calculate the thickness of shim(s) required for correct sprocket alignment.
Fit and tighten a dummy stud to the oil pump drive flange.
Fit and align the shims to the flange.
Fit and align the sprocket.
Fit and align the tab washer.
NOTE: Always fit a new tab washer. Never re-use the old one.

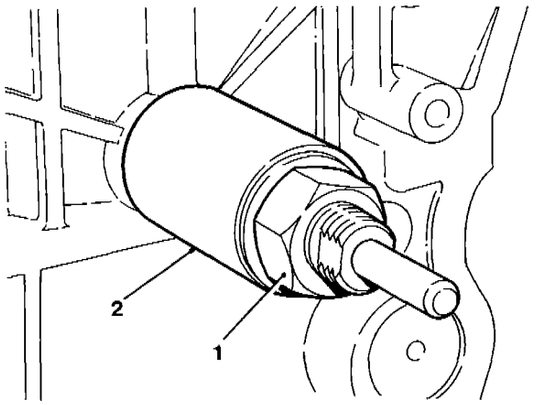


Fig 1

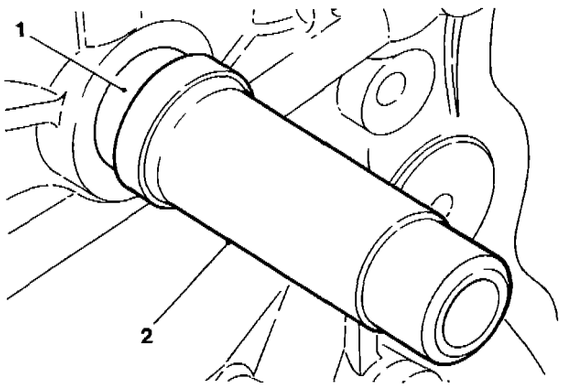


Fig 2

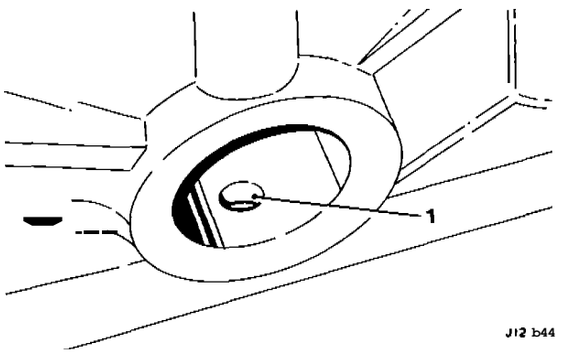


Fig 3

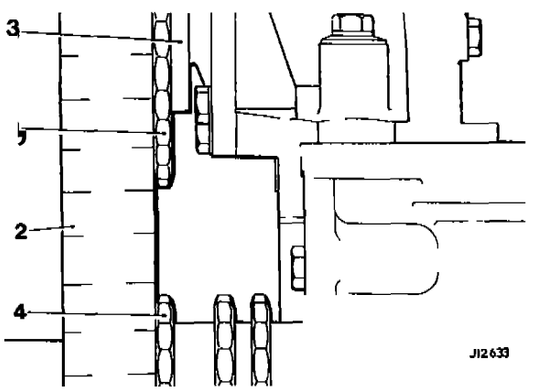


Fig 4

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Fit and tighten the first sprocket securing bolt. Do not lock over the tab washer at this stage.
Rotate the sprocket for access.
Fit and tighten the second sprocket securing bolt. Lock over the tab washer.
Rotate the sprocket for access.
Remove the dummy stud. Fit and tighten the third sprocket securing bolt. Lock over the tab washer.
Rotate the sprocket for access.
Re-tighten the first securing bolt. Lock over the tab washer.
Re-check the sprocket alignment.
Re-adjust as necessary.
Lubricate the new timing chain and position the chain over the auxilliary drive shaft and crankshaft sprocket.
NOTE: Always fit a new oil pump drive chain. Never re-use the old one.
Lubricate the oil pump drive chain.
Fit the drive chain to the oil pump sprocket.
Engage the drive chain to the crank sprocket.
Ensure that the drive chain ends are on the damper side of the sprockets.
Fit a new link to the drive chain (2 Fig 1).
Fit and align a link plate to Service Tool JD 130 (1 Fig 1).
Ensure that the link and tool clamp holes are aligned.
Fit the tool/link plate assembly to the drive chain.
Fit the 'E gate (3 Fig 1) to the tool and chain link. Ensure that the chain is central to the tool.
Tighten the tool centre bolt, fully seating the plate on to the link.
Slacken off the tool centre bolt.
Re-position the tool clamp (4 Fig 1) away from the chain.
Locate the link riveting head on to the clamp.
Tighten the tool centre bolt (finger tight, then further 1/2-3/4 turn).
Slacken off the tool centre bolt.
Remove the tightening bar.
Re-position the clamp away from the chain.
Re-position the 'E gate away from the tool/chain.
Remove the tool retaining handle, and remove the tool.
Fit a magnetic dial gauge to the top of the engine with the stylus resting on a piston, rotate the engine and set at TDC No 1 cylinder (Fig 2).
Refit the lower static damper. Fit and tighten the securing bolts and lock over the tab washer.
Fit the oil pump chain damper in position, do not tighten the securing bolts at this stage.
Take any slack out of the chain using hand pressure to push the damper towards the centre of the engine.
Tighten the damper securing bolts.
Lubricate the intermediate sprocket bearing.
Lift up the chain, engage the sprocket in the chain, and locate the sprocket into the bearing.
Refit the lower tensioner assembly.
Lubricate the upper timing chain.
Refit the upper chain to the intermediate sprocket.

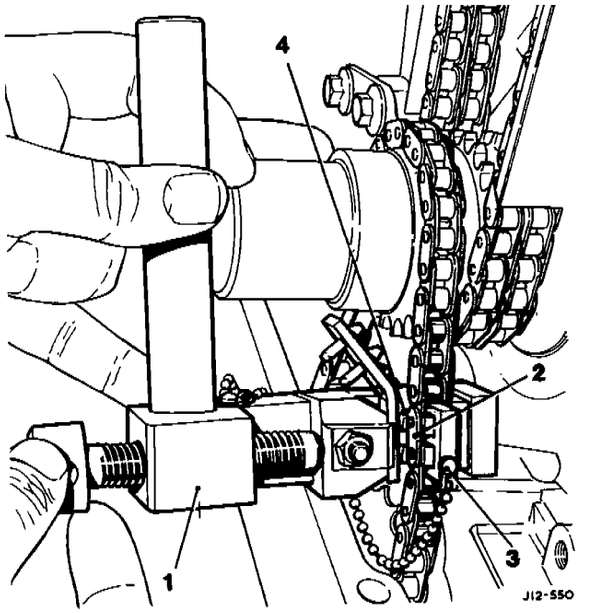


Fig 1

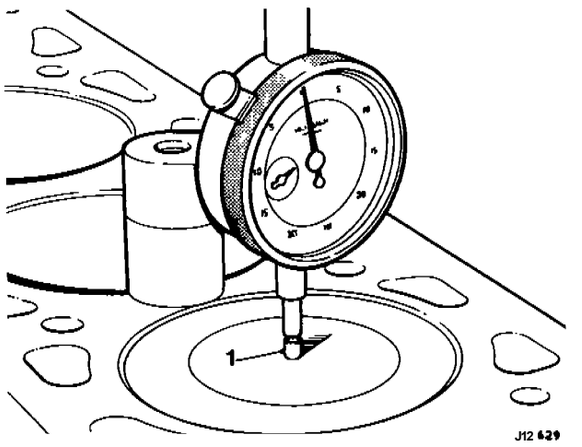


Fig 2

Refit the upper static damper.
Fit and tighten the securing bolts.
Refit the upper tensioner.
Remove the oil seal (1 Fig 1) from the timing cover.
Clean all gasket surfaces, oil seal spacer (2 Fig 1), timing pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 2).
Refit the timing cover 12.65.04 page 86.

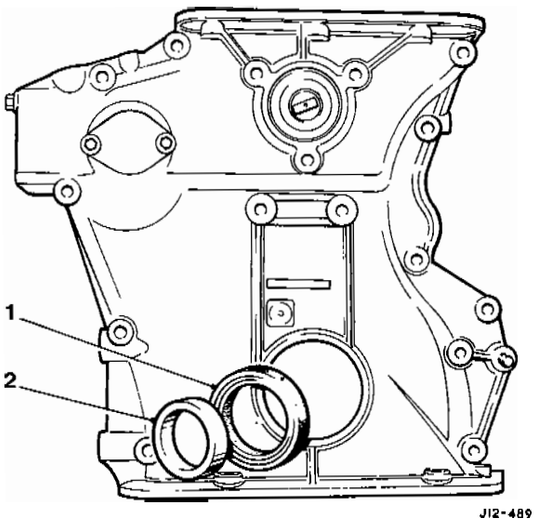


Fig 1

DATA

Oil pump sprocket shims available sizes:
0.005in
0.010in
0.020in

SERVICE TOOLS

*Auxilliary shaft oil seal remover JD **118***
*Auxilliary shaft oil seal replacer **18G 1469***
*Chain link tool JD **130***
*Timing cover bush remover replacer **18G 1434***

TORQUE FIGURES

*Lower chain tensioner **to** cylinder block **23-27Nm***
*Lower static damper to cylinder block **23-37Nm***
*Oil pump drive chain damper to cylinder block **23-27Nm***
*Upper static damper to cylinder block **23-27Nm***
Upper timing chain tensioner to cylinder block 23-27Nm

SPANNER SIZES

6mm
8mm
10mm
13mm
16mm
19mm
30mm

1/2in AF
9/16in AF
5/8in AF
13/16in AF
10mm

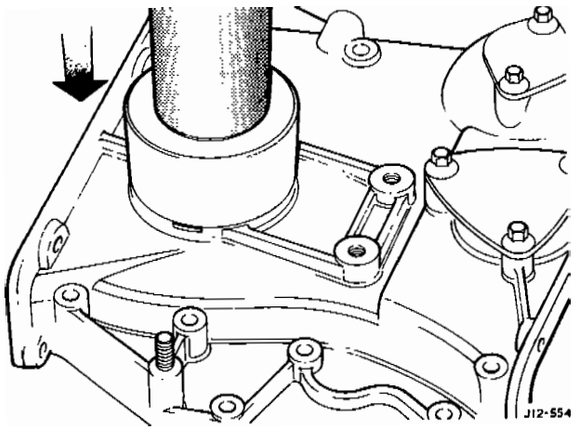


Fig 2

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TIMING CHAIN DAMPERS – VEHICLE SET

RENEW 12.65.48

Remove the timing cover 12.65.04 page 86.
Remove the elastic band from the upper dampers, push back the lock tabs on the upper tensioner pedestal securing bolts (3 Fig 1), and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Push back the lock tabs on the upper static damper securing bolts (5 Fig 1), and remove the bolts, tab washer and damper (4 Fig 1).
Remove the damper pedestal..
Remove the lower timing chain tensioner securing bolts (11 Fig 1), and remove the tensioner assembly (10, 12, Fig 1).
Remove the oil pump drive chain damper securing bolts (1 Fig 1), and remove the damper (2 Fig 1).
Push back the lock tabs on the lower static damper securing bolts (14 Fig 1), remove the bolts, and remove the damper (15 Fig 1).
Clean all component parts and check for wear or damage, replace worn or damaged components as necessary.
Fit the oil pump chain damper (2 Fig 1) in position, do not tighten the securing bolts at this stage.
Take any slack out of the chain using hand pressure to push the damper towards the centre of the engine.
Tighten the damper securing bolts (1 Fig 1).
Refit the lower tensioner assembly.
Refit the upper static damper (4 Fig 1).
Fit and tighten the securing bolts (5 Fig 1).
Refit the upper tensioner (1 Fig 1).
Remove the oil seal (1 Fig 2) from the timing cover.
Clean all gasket surfaces, oil seal spacer (2 Fig 2), timing pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 3).
Refit the timing cover 12.65.04 page 86.

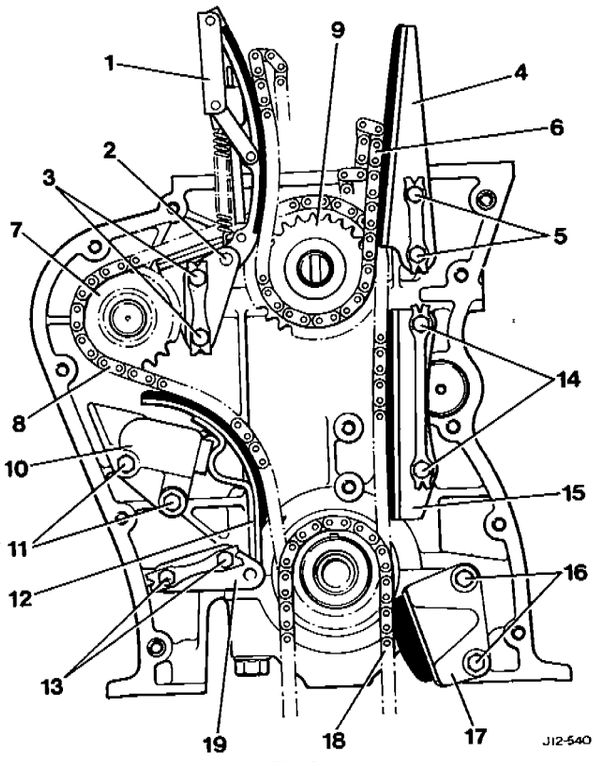


Fig 1

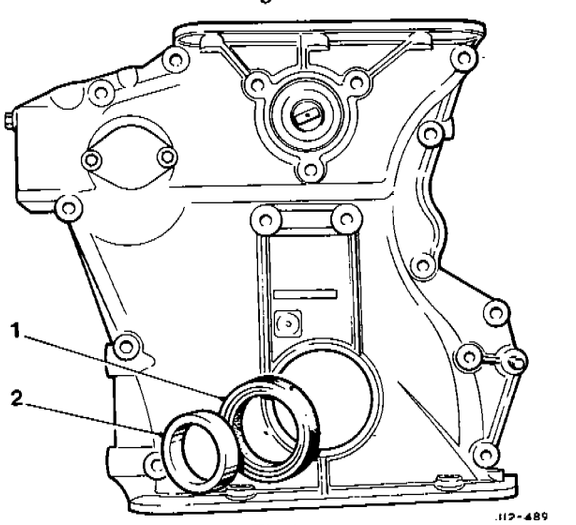


Fig 2

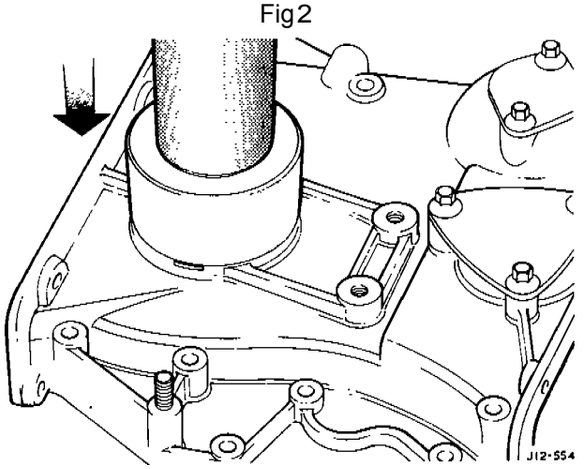


Fig 3

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Lower left hand damper to cylinder block 23-27Nm
Lower right hand damper to cylinder block 23-27Nm
Oil pump drive chain damper to block 3-27Nm
Upper right hand damper to cylinder block 23-27Nm
Upper timing chain tensioner to block 23-27Nm

SPANNER SIZES

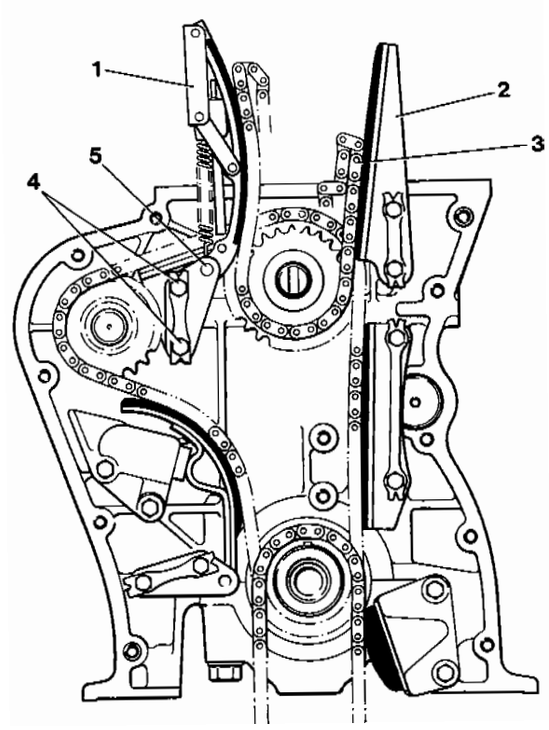
13mm
1/2in AF
9/16in AF

04396

TIMING CHAIN AND TENSIONER – UPPER

RENEW **12.65.29**

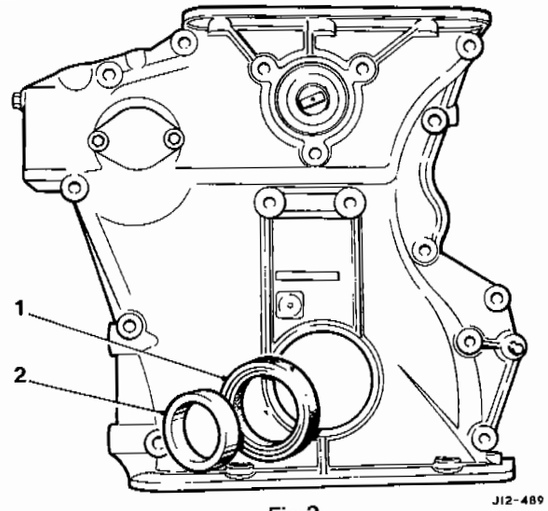
Remove the timing cover 12.65.04 page 86.
Remove the elastic band from the upper dampers (1,4 fig 1), and remove the upper timing chain (6 Fig 1).
Push back the lock tabs on the tensioner pedestal securing bolts (3 Fig 1). and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Clean the pivot pin.
Fit a new tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing bolts.
Align the damper to the tensioner and fit the damper/ tensioner assembly to the engine.
Ensure that the damper does not foul the the distributor drive shaft sprocket.
Finally tighten the securing bolts and lock over the tabs.
Fit the new timing chain.
Re-position the upper tensioner and secure to the upper dampers with an elastic band.



J12 159

Fig 1

Remove the oil seal (1 Fig 2) and spacer (2 Fig 2) from the timing cover.
Clean all gasket surfaces, oil seal spacer, pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 3).
Refit the timing cover 12.65.04 page 86.



J12-489

Fig 2

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Upper timing chain tensioner to cylinder block 23-27Nm

SPANNER SIZES

13mm
1/2in AF

0439G

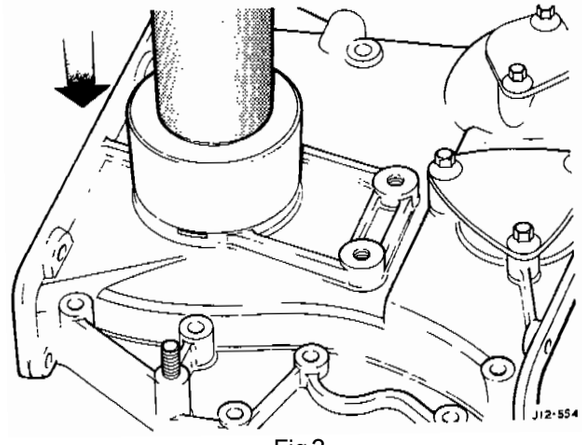

J12-554

Fig 3

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TIMING CHAIN AND TENSIONER – LOWER

RENEW **12.65.30**

Remove the timing cover 12.65.04 page 86.
Remove the elastic band from the upper dampers (1,4 Fig 1), and remove the upper timing chain (6 Fig 1).
Push back the lock tabs on the tensioner pedestal securing bolts (3 Fig 1). and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Remove the lower timing chain tensioner securing bolts (11 Fig 1), and remove the tensioner assembly (10 Fig 1).
Remove the lower timing chain (8 Fig 1).

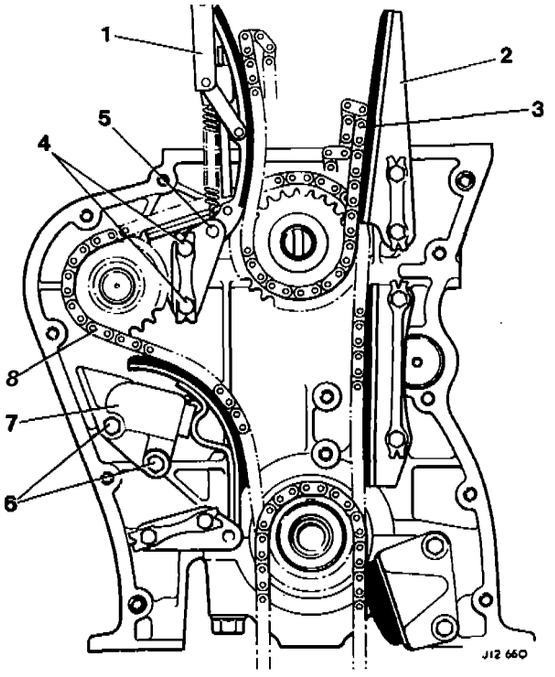


Fig 1

Clean the tensioner components (1-5 Fig 2), and examine them for wear, scoring and damage.
Assemble the plunger, spring and base to the guide, lubricate the assembly.
Fit the new lower timing chain.
Fit the guide assembly, valve and 'O' ring to the tensioner housing.
Re-position the chain damper for access.
Fit the tensioner assembly to the cylinder block with the guide facing downwards.
Fit but do not tighten the tensioner upper securing bolt, push the guide into the housing to release the base and align with the damper.
Align the damper with the lower bolt hole, fit and tighten the lower bolt.
Finally tighten the upper bolt, fill the tensioner oil reservoir with oil and work the tensioner to prime with oil.
Fit the upper tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing bolts.
Align the damper to the tensioner and fit the damper/ tensianer assembly to the engine.
Finally tighten the securing bolts and lock over the tabs.
Refit the upper timing chain.
Re-position the upper tensioner and secure to the upper dampers with an elastic band.
Refit the timing cover 12.65.04 page 86.

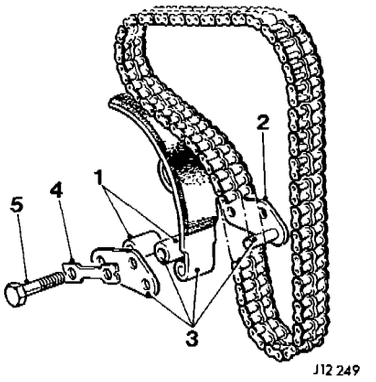


Fig 2

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Lower chain tensioner to block 23-27Nm
Upper timing chain tensioner to block 23-27Nm

SPANNER SIZES

13mm
1/2in AF

0439G

TIMING SPROCKET–INTERMEDIATE

RENEW **12.65.26**

Remove the timing cover 12.65.04 page 86.
Remove the elastic band from the upper dampers (1,4 Fig 1), and remove the upper timing chain (6 Fig 1).
Push back the lock tabs on the tensioner pedestal securing bolts (3 Fig 1), and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Remove the lower timing chain tensioner securing bolts (11 Fig 1), and remove the tensioner assembly (10 Fig 1).
Remove the lower timing chain.
Remove the intermediate sprocket.

Examine all components for wear or damage. Replace worn or damaged parts as necessary.
Fit the new intermediate sprocket.
fit the lower timing chain.
Fit the guide assembly, valve and 'O' ring to the tensionsr housing.
Re-position the chain damper for access.
Fit the tensioner assembly to the cylinder block with the guide facing downwards.
Fit but do not tighten the tensioner upper securing bolt, push the guide into the housing to release the base and align with the damper.
Align the damper with the lower bolt hole, fit and tighten the lower bolt.
Finally tighten the upper bolt, fill the tensioner oil reservoir with oil and work the tensioner to prime with oil.
Fit the upper tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing bolts.
Align the damper to the tensioner and fit the damper/tensioner assembly to the engine.
Finally tighten the securing bolts and lock over the tabs.
Refit the upper timing chain.
Re-position the upper tensioner and secure to the upper dampers with an elastic band.
Refit the timing cover 12.65.04 page 86.

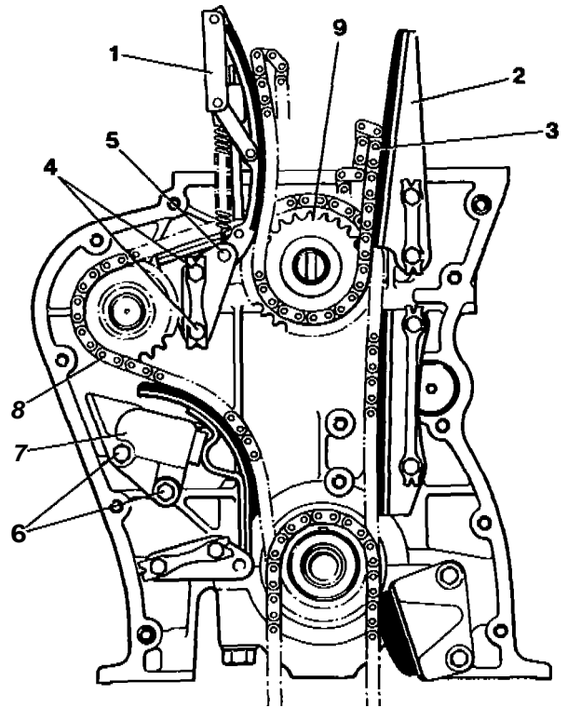


Fig 1

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Lower chain tensioner to block 23-27Nm
Upper timing chain tensioner to block 23-27Nm

SPANNER SIZES

73mm
1/2in AF

04396

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AUXILIARY SHAFT

RENEW **12.10.22**

Remove the timing cover 12.65.04 page 86.
Remove the pulley woodruff key and remove the oil seal spacer from the crankshaft.
Remove the elastic band from the upper dampers (1,4 Fig 1), and push back the lock tabs on the tensioner pedestal securing bolts.
Remove the pedestal bolts and tab washer (3 Fig 1).
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal. Clean the pivot pin.
Push back the lock tabs on the upper static damper securing bolts (5 Fig 1).
Remove the bolts (5 Fig 1), tab washer, upper damper, damper pedestal (4 Fig 1) and upper timing chain (6 Fig 1).
Remove the bolts (10 Fig 1) securing the chain tensioner and remove the assembly.
Remove the intermediate sprocket (9 Fig 1) and chain (8 Fig 1) from the block.
Remove the power assisted steering pump housing to auxiliary shaft housing securing bolts (1 Fig 2).
Remove the power-assisted steering pump drive coupling.
Remove the auxiliary shaft rear oil seal using Service Tool JD 118 (18G 1468).
Using right-angled circlip pliers remove the drive shaft securing circlip (1 Fig 3).
Lift the timing chain (8 Fig 1) from the sprocket (7 Fig 1), remove the shaft (2 Fig 2), and retrieve the thrust washer (3 Fig 2).
Clean all component parts and check for wear or damage.
Replace worn or damaged parts as necessary.
Clean the auxiliary bearing housing.
Check for wear and if necessary change the auxilliary shaft bushes (5 Fig 2) using Service Tool 18G 1434.
Refit the housing (4 Fig 2) with new gasket (6 Fig 2).
Fit and tighten the securing bolts (1 Fig 2).
Lubricate the shaft and refit the shaft into the housing, engaging the chain with the gear as it is fitted.
Lubricate and fit the thrust washer (3 Fig 2) and secure with the circlip (1 Fig 3).
Lubricate new oil seal and using Service Tool 18G 1469, fit and seat the shaft rear oil seal (2 Fig 3).
NOTE: Under no circumstances must the plastic seal insert be removed prior to fitting the seal.

Fit the drive coupling to the power assisted steering pump.
Align the pump shaft with the auxiliary shaft and connect the pump shaft to the drive shaft.
Fit and tighten the pump housing securing bolts.
Lubricate the intermediate sprocket bearing, attach the chain to the sprocket, and fit the assembly into the bearing.

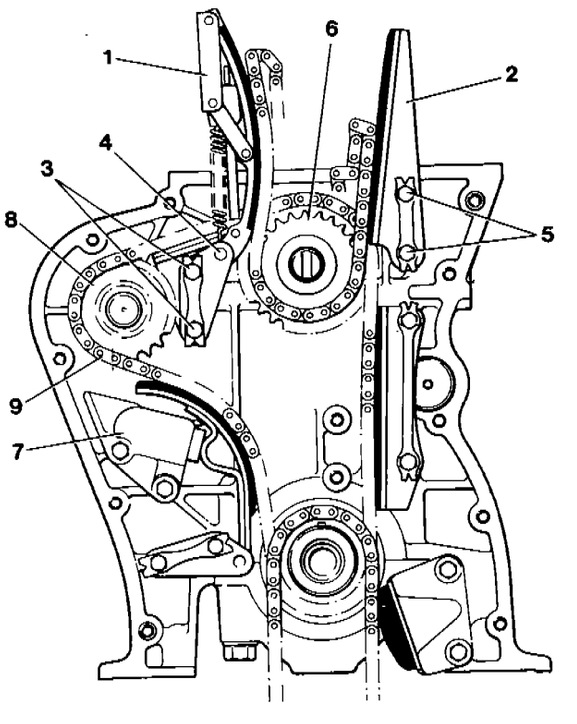


Fig 1

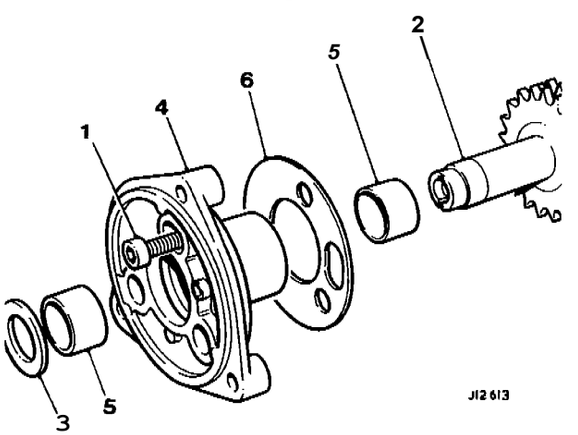


Fig 2

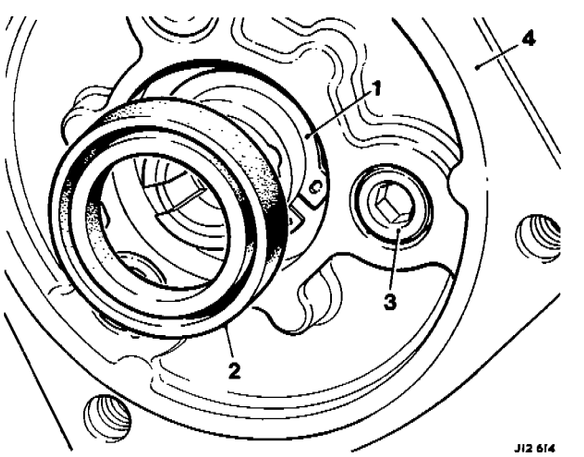


Fig 3

Assemble the plunger, spring and base to the guide, lubricate the assembly.
fit the guide assembly to the tensioner housing.
Re-position the chain damper for access ensuring that no loose links are left below the crankshaft and fit the tensioner assembly to the cylinder block with the guide facing downwards.
Fit but do not tighten the upper tensioner securing bolt, push the guide into the housing to release the base and align with the damper.
Align the damper with the lower bolt hole, fit and tighten the lower bolt.
Finally tighten the upper bolt, fill the tensioner oil reservoir with oil and work the tensioner to prime with oil.
Refill the reservoir with oil and ensure that the tensioner is fully primed.

Lubricate the upper timing chain and fit to the intermediate sprocket.
Fit the upper static damper, fit the tab washer, secure with the bolts and lock over the tab washer.
Fit a new tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing bolts.
Align the damper to the tensioner and fit the damper/ tensioner assembly to the engine.
Ensure that the damper does not foul the the distributor drive shaft sprocket.
Finally tighten the securing bolts and lock over the tab washer,

Re-position the upper tensioner and secure to the upper dampers with an elastic band.
Remove the oil seal (1 Fig 1) and spacer (2 Fig 1) from the timing cover.
Clean all gasket surfaces, oil seal spacer, pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 2).
Refit the timing cover 12.65.04 page 86.

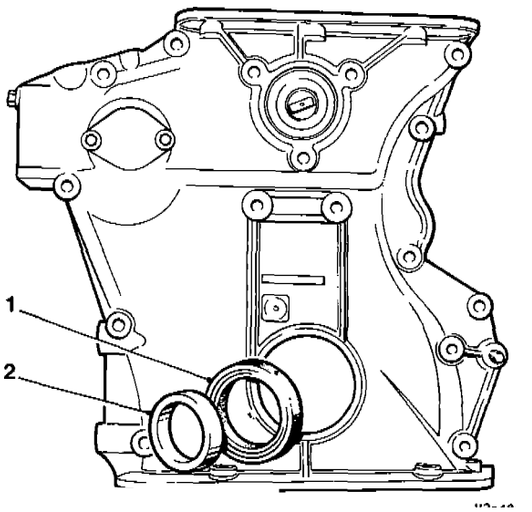


Fig 1

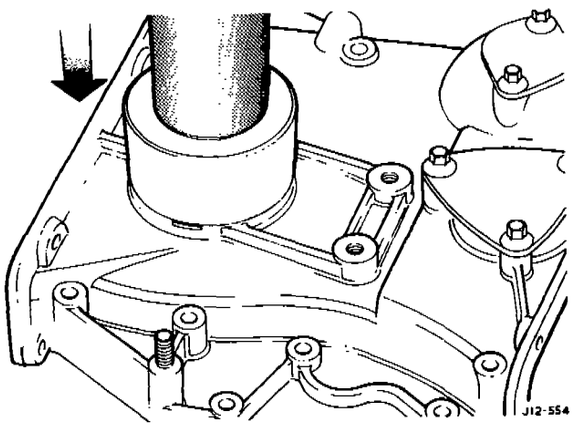


Fig 2

DATA

SERVICE TOOLS

Auxillary shaft oil seal replacer 18G 1469
Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Hydraulic pump to timing cover 23-27Nm
Upper timing chain tensioner to cylinder block 23-27Nm

SPANNER SIZES

13mm
19mm
1/2in AF

0439G

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AUXILIARY SHAFT REAR SEAL

RENEW 12.10.32

Place a suitable drain tray in position and slacken the clip securing the reservoir hose to the pump.
Disconnect the hose from the pump.
Fit a plug to the hose.
Slacken the union (1 Fig 1) securing the rack feed hose (2 Fig 1) to the pump and disconnect the hose.
Allow the pump and hose to drain.
Discard the 'O' ring and fit a suitable plug to the hose.
Remove the bolts (1 Fig 2) securing the pump assembly to the engine and remove the pump assembly.
Remove the drive coupling (2 Fig 2) from the pump.

Remove the power steering pump drive coupling.
Remove the auxiliary shaft oil seal using Service Tool JD 118.
Lubricate the new seal and mating faces.
NOTE: Under no circumstances must the plastic insert be removed prior to fitting of the seal.

Using Service Tool 18G 1469 fit and fully seat the auxiliary shaft seal (2 Fig 3).
Refit the power steering pump drive coupling.
Refit the power steering pump. Fit and tighten the securing bolts.
Fit a new 'O' ring to the rack feed hose. Fit the hose to the pump. Tighten the union.
Reconnect the reservoir hose. Tighten the clip.
Replenish the reservoir. Start the engine. Rotate the steering wheel left and right to bleed the system.
Stop the engine. Re-check the reservoir fluid level.

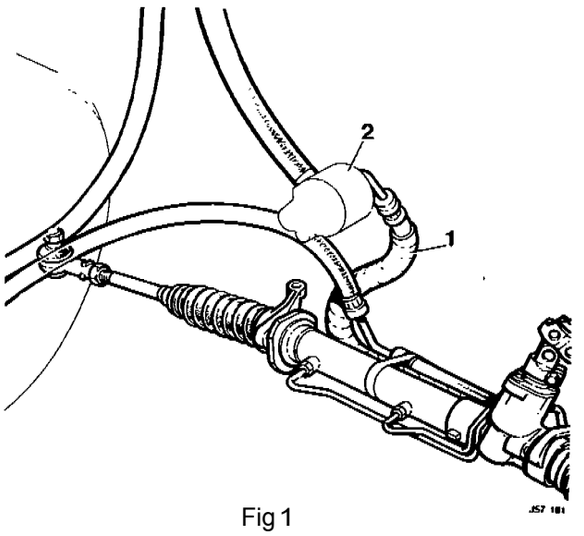


Fig 1

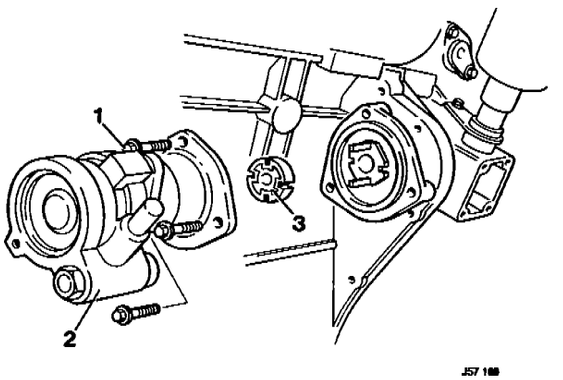


Fig 2

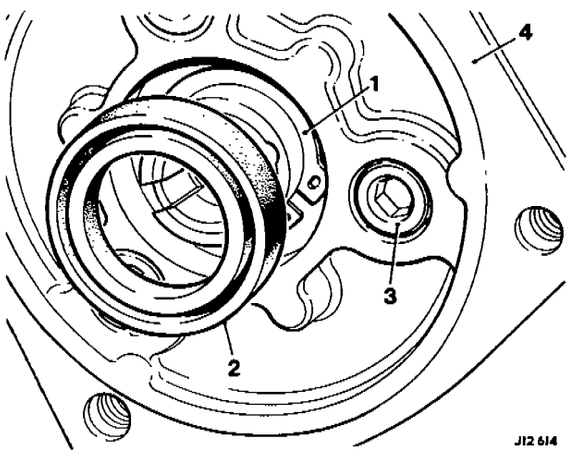


Fig 3

DATA

SERVICE TOOLS

Auxiliary shaft oil seal remover JD 118
Auxiliary shaft oil seal replacer 18G 1469

TORQUE FIGURES

Steering pump to adaptor 49-54Nm

SPANNER SIZES

13mm
19mm

0439G

OIL COOLER

RENEW 12.60.68

Remove the screws securing the LH radiator grille to the surround, and remove the grille.
Place a drain tray below the oil cooler.
Remove the feed and return hoses from the cooler (Fig 1). Discard the 'O' rings.
Fit plugs to the hoses and cooler, and remove the drain tray.
Remove the cooler mounting securing nuts (1 Fig 2), and remove the cooler assembly (2 Fig 2) from the vehicle.

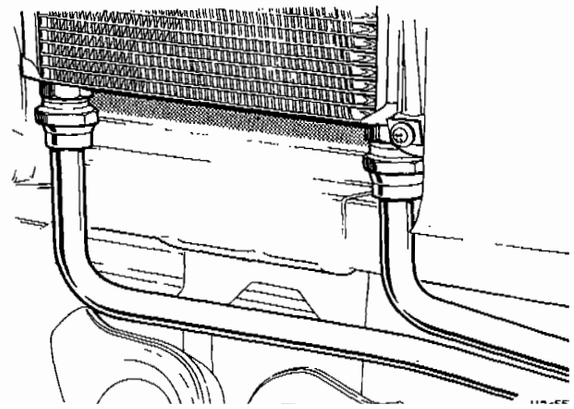


Fig 1

Transfer the mountings to the new cooler.
Fit the assembly to the vehicle.
Fit and tighten the securing nuts and remove the blanking plugs from the cooler and hoses.
Fit new 'O' rings to the hoses and refit the hoses to the cooler.
Tighten the unions, fit the inner grille to the surround and secure with the screws.
Check and top up the engine oil.
Start the engine and check for oil leaks.
Re-check the oil to the correct level.

DATA

TORQUE FIGURES

Oil cooler mounting bracket to body 6-8Nm
Oil pipe feed hose to oil cooler 41-48Nm
Oil pipe return hose to oil cooler 41-48Nm

SPANNER SIZES

10mm
32mm

04396

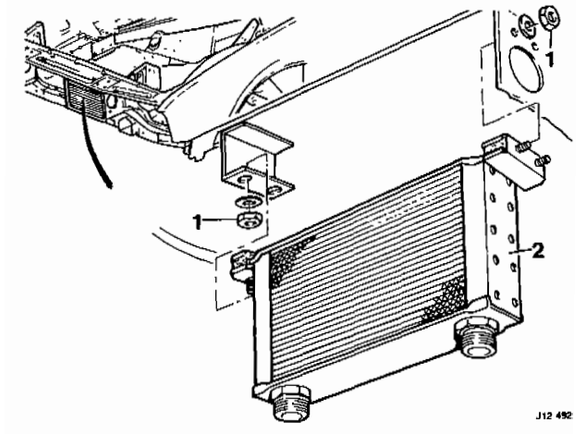


Fig 2

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OIL COOLER RETURN HOSE

RENEW **12.60.76**

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 1).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig 1) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

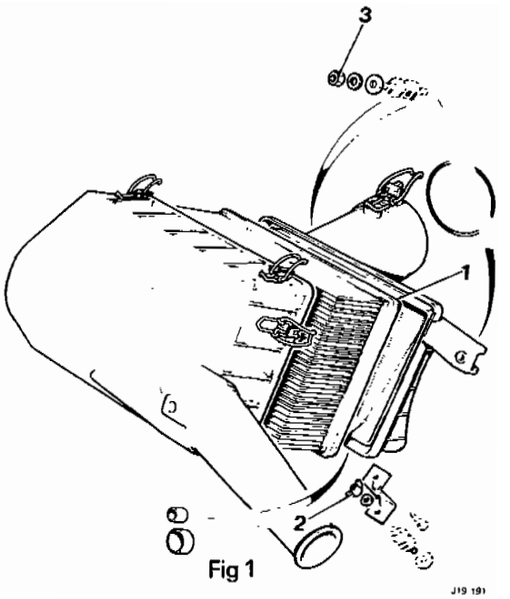


Fig 1

Place a drain tray under the oil filter area.
Remove the oil cooler hose to filter head clamp nut (1 Fig 2).
Remove the cooler hoses (2 Fig 2) from the filter head.
Remove and discard the 'O' rings (3 Fig 2).
Fit blanking plugs to the hoses and filter head.
Remove the screw securing the hoses to the body side crossmember.
Remove the mounting bracket and hoses.
Remove the screws securing the left hand radiator grille to the surround, remove the grille.
Place a drain tray below the cooler.
Remove the return hose from the cooler.
Discard the 'O' ring.
Fit plugs to the hose and cooler, and remove the drain tray.
Re-position the hose from behind the engine mounting and remove via the front grille.
Reverse the removal procedure to refit the replacement hose ensuring that new 'O' rings are fitted to the hose prior to fitting.

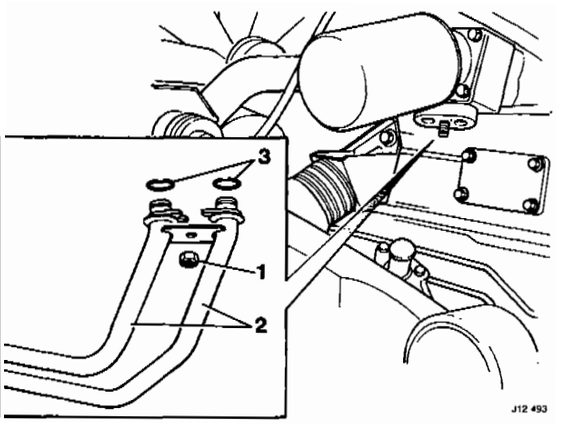


Fig 2

Tighten the unions, fit the inner grille to the surround and secure with the screws.
Refit the air cleaner.
Check and top up the engine oil.
Start the engine and check for oil leaks.
Re-check and top up the engine oil to the correct level (Fig 3).

DATA

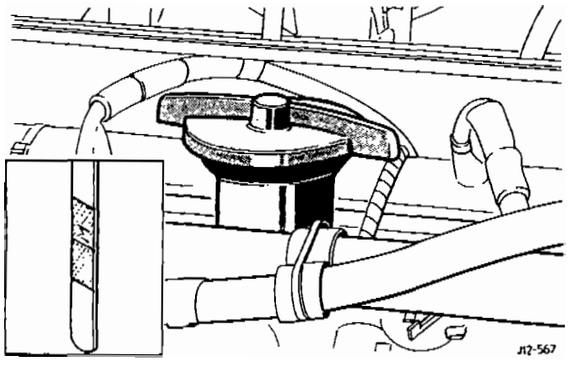
TORQUE FIGURES

Oil filter head to cylinder block and cooler adaptor 23-27Nm
Oil pipe return hose to oil filter head 41-48Nm
Oil pipe return hose to oil cooler 41-48Nm

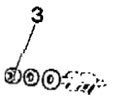
SPANNER SIZES

10mm
13mm
32mm

04396


Fig 3

OIL COOLER SUPPLY HOSE



RENEW **12.60.74**

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 1).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig 1) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

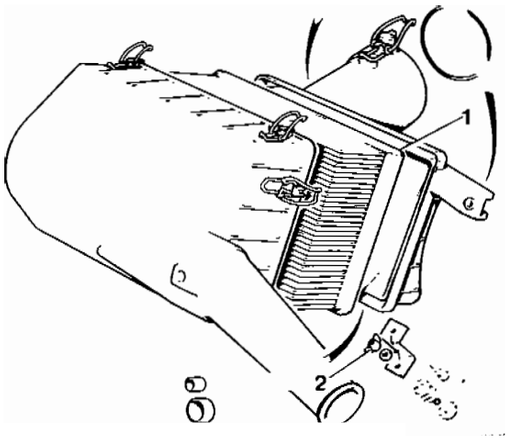


Fig 1

Place a drain tray under the oil filter area.
Remove the oil cooler hose to filter head clamp nut (1 Fig 2).
Remove the cooler hoses (2 Fig 2) from the filter head.
Remove and discard the 'O' rings (3 Fig 2).
Fit blanking plugs to the hoses and filter head.
Remove the screw securing the hoses to the body side crossmember.
Remove the mounting bracket and hoses.
Remove the screws securing the left hand radiator grille to the surround, remove the grille.
Place a drain tray below the cooler.
Remove the supply hose from the cooler.
Discard the 'O' ring.
Fit plugs to the hose and cooler, and remove the drain tray.
Re-position the hose from behind the engine mounting and remove via the front grille.

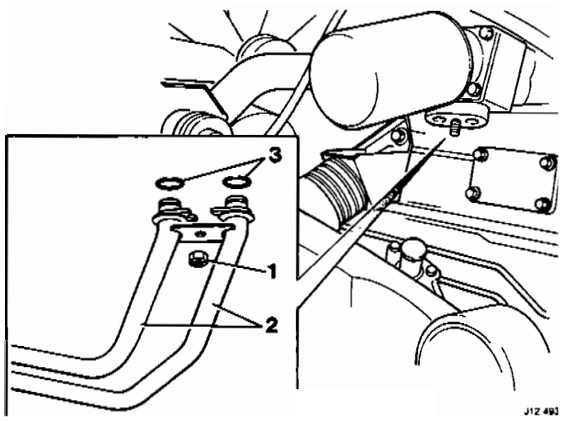


Fig 2

Reverse the removal procedure to refit the replacement hose ensuring that new 'O' rings are fitted to the hose prior to fitting.
Tighten the unions, fit the inner grille to the surround and secure with the screws.
Refit the air cleaner.
Check and top up the engine oil.
Start the engine and check for oil leaks.
Re-check and top up the engine oil to the correct level (Fig 3).

DATA

TORQUE FIGURES

Oil filter head to cylinder block and cooler adaptor 23-27Nm
Oil pipe supply hose to oil filter head 41-48Nm
Oil pipe supply hose to oil cooler 41-48Nm

SPANNER SIZES

10mm
13mm
32mm

0439G

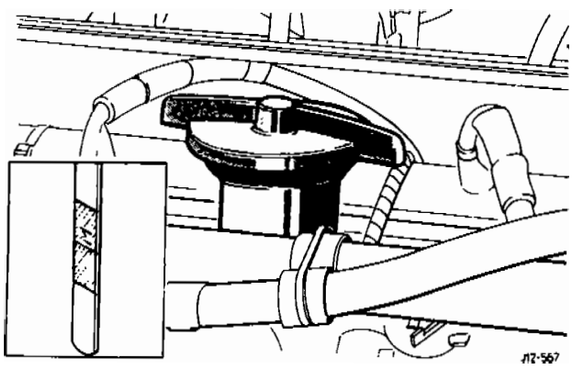


Fig 3

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OIL

DRAIN AND REFILL 12.60.00

Place a suitable container under the sump rear drain plug, remove the plug and drain the oil.
Clean and refit the sump plug.
Remove the container and torque tighten the sump plug.
Remove the engine filler cap and refill the engine with oil to the correct level (Fig 1).
Engine oil capacity excluding fitter is 7.45 litres (13.1 Imp pints).
Refit the oil filler cap.
Remove the dipstick, wipe clean, check the oil level and adjust accordingly.

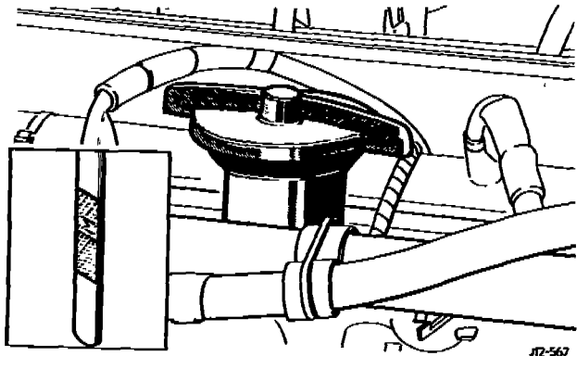


Fig 1

DATA

TORQUE FIGURES

Oil sump plug 41-47Nm

SPANNER SIZES

30mm

OIL FILTER CANISTER

RENEW 12.60.04

Place a drain tray under the filter and remove the filter canister (Fig 2).
Clean the oil filter mounting face, lubricate the rubber seal on the new filter with clean engine oil.
Fit and tighten the filter canister using only hand pressure, and on no account use an oil filter strap designed for removal of canisters.
Start the engine, wait for the oil light to extinguish, switch off the engine and wait for 30 seconds.
Check the oil level and top-up as necesssary.
NOTE: Normal tightening torque of oil filter is 3/8 to 1/2 turn after initial contact.

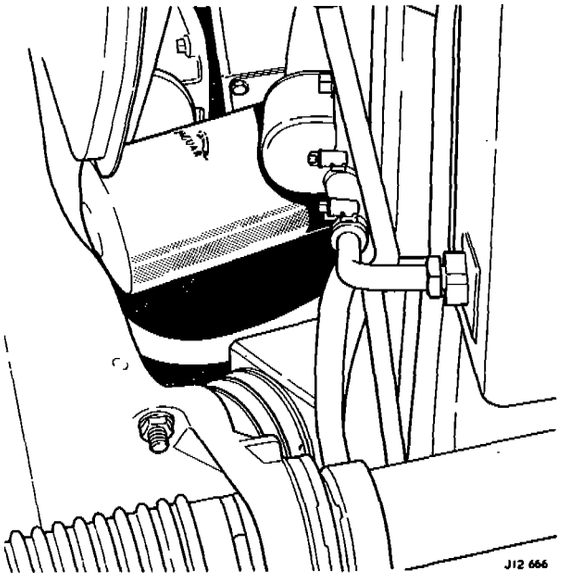


Fig 2

DATA

TORQUE FIGURES

Oil filter canister – 8.1 Nm or 3/8 to 1/2 turn after initial contact.

CANISTER SPECIFICATION

Maximum working pressure	*100 lb/in²*
Relief valve setting	*0,9 – 1,1 kgf/cm²*
Canister to withstand	*17.60 kgf/cm²*
Element filtration area	*3555cm²*
Canister diameter	*95.70 mm*
Canister length	*148.00 – 145.50 mm*
Canister metal thickness	*24 SWG*
Adaptor thread	*1 in 12UNF – 2B*

OILS/GREASES/SEALANTS

Mounting face rubber seal – Clean engine oil

OIL FILTER HEAD GASKET

RENEW **12.60.03**

Place a drain tray under the oil filter.
Remove the oil filter cartridge (1 Fig 1).
Remove the oil cooler pipe clamp nut and clamp, note the position of and disconnect the pipes from the oil supply housing.
Remove and discard the 'O' rings. Remove the filter head securing bolts (2 Fig 1).
Remove the inner (3 Fig 1) and outer (4 Fig 1) housings.
Thoroughly clean the housings, the oil cooler pipes and the cylinder block face.
Apply 'Hylosil 102' to the outer housing, align the inner housing with the outer housing, and fit the securing bolts to the housing assembly.
Apply 'Hylosil 102' to the inner housing, align the assembly to the aperture in the cylinder block and tighten the securing bolts.
Fit new 'O' rings to the oil cooler pipes, lubricate and connect the pipes to the housing, fit the clamp plate and fit a new oil filter.
Start the engine, wait for the oil pressure light to extinguish, switch off the engine and let stand for 30 seconds.
Check the engine oil level and top-up as necessary (Fig 2).

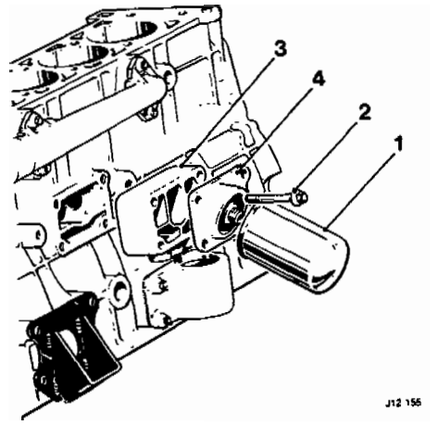


Fig 1

DATA

TORQUE FIGURES

Housing to cylinder block 23-27Nm
Oil filter canister – 8.1Nm or 3/8 to 1/2 turn after initial contact.
Clamp plate and hose assembly to engine 22-28 "

OILS/GREASES/SEALANTS

Filter rubber seal – Clean engine oil
Outer housing HYLOSIL 102
Inner housing HYLOSIL 102

SPANNER SIZES

10mm
17mm

04396

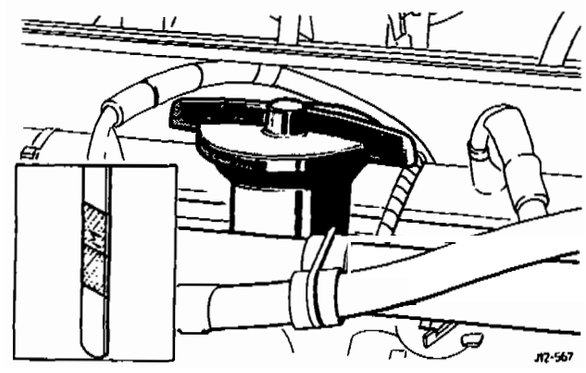


Fig 2

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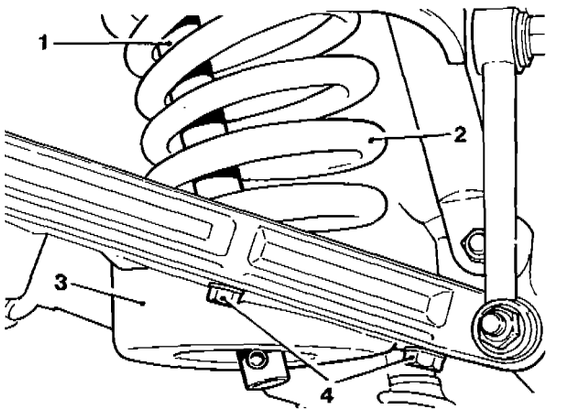
OILSUMPGASKET

RENEW **12.60.38**

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD 133 to the road spring pans (Fig 1).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 3) to steering rack securing bolt/nut (1,2, Fig 3).

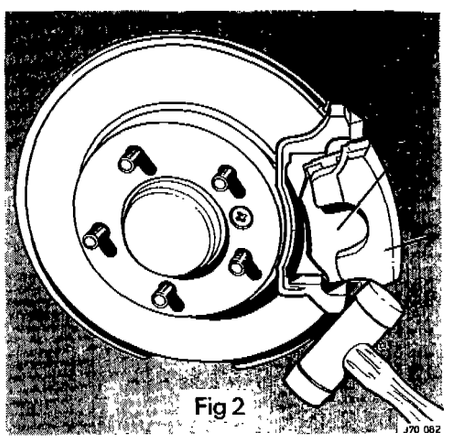
Disengage the splines from the rack pinion (4 Fig 3).
NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

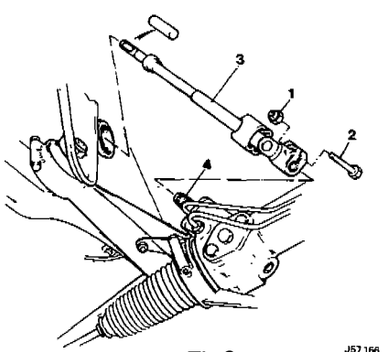
Disconnect Nos. 1 and 2 plug leads.
Attach **18G 1465** rear engine lifting eye, fit and align Service Tool **MS 53B** engine support bracket (Fig 4).
Engage the hook to the lifting eye.
Tighten the hook-nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.



J60 a12

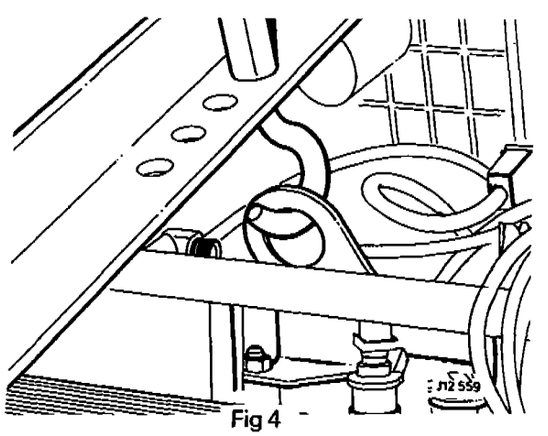
Fig 1


Fig 2
J70 082



J57 166

Fig 3


Fig 4

Remove the nuts. Do not remove the bolts at this stage (Fig **1**).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 2).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.

Drain the engine oil.
Remove the bolt securing the dipstick tube to the inlet manifold and remove the dipstick tube/assembly.

Unclip the air cleaner cover and remove the cover/element assembly.
Remove the air cleaner element (1 Fig **3**).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig **3**) from the lower mounting and the nuts (3 Fig 3) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

Slacken off the alternator link arm lock nut (4 Fig **1** page 108) and trunnion bolt (**3** Fig 1 page **108**).
Slacken off the link arm pivot bolt (2 Fig **1** page **108**), wind down the adjuster nut (5 Fig 1 page **108**) and pivot the alternator towards the engine.
Remove the drive belt. Disconnect the alternator connectors.
Remove the trunnion bolt (3 Fig **1** page **108**).
Remove the pivot bolt and nut (1 Fig **1** page **108**).
From above lift and remove the alternator, retrieve the spacer/washers.
Remove the rear spacers and move the power assisted steering pipes for access.

Disconnect the exhaust to bell housing mounting bracket.
Slacken off the union securing the oil drain-back tube to the sump, and pull the tube clear of the sump.
Remove the clamp securing the gearbox oil cooler pipes to the sump (AUTO **ONLY**).
Remove **all** but two sump **bolts** (1 Fig 2 page 108).
Remove the bell housing to sump bolts.
Finally remove the **two** remaining **sump** bolts and lower the sump (2 Fig 2 page 108).
Clean all components and examine for damage and wear.
NOTE: If renewing the sump, transfer all components to the new sump.
Apply 'Hylosil 102' to the sump mating face.
Clean the gasket face on the cylinder block.
Lift the sump into position.
Fit and torque tighten the securing bolts.

Refit the clamp securing the gearbox oil cooler pipes to the sump (AUTO **ONLY**).

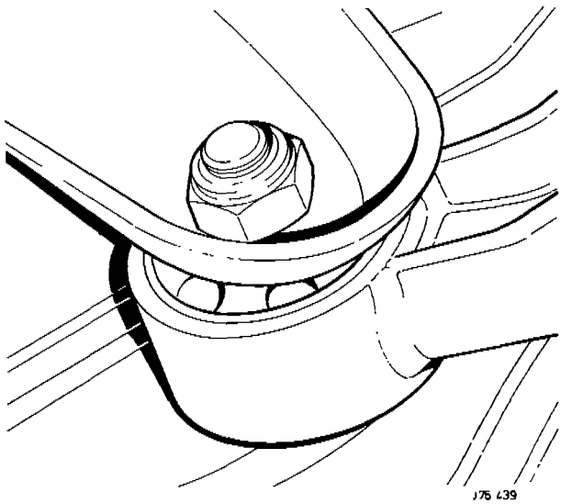


Fig 1

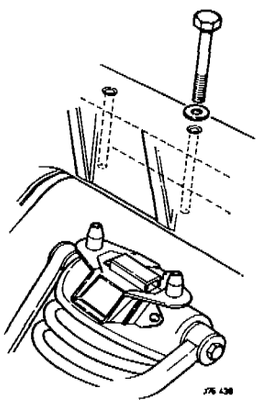


Fig 2

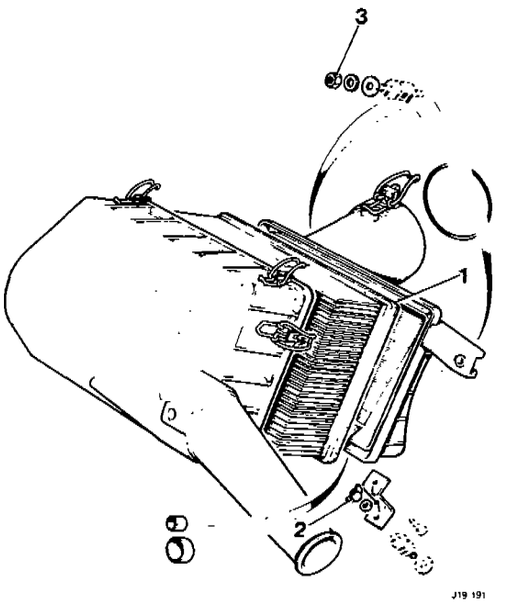


Fig 3

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Refit the oil drain back tube.
Connect the bell housing to exhaust bracket.
Refit the alternator. Tension the drive belt to give a total belt deflection of 4.5mm when a load of 1.5kg is applied at the mid-point of the belt.
Refit the air cleaner assembly.
Fit and tighten the dipstick tube to manifold securing bolt.

Position the crossmember assembly on the jack under the vehicle.
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, **P.A.S.** pipes, lower column and rear mountings.
Align the front mounting securing bolt holes.
Fit and tighten the front mounting securing nuts (Fig 3).
Using a second jack, align the left hand rear mounting (Fig 1 page 109).

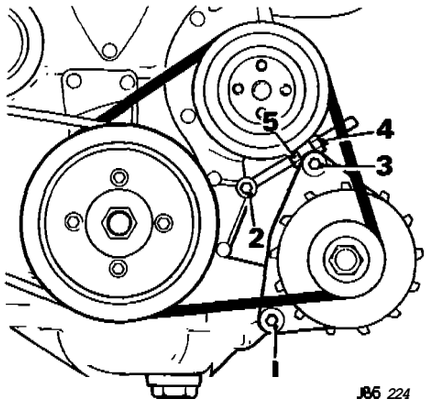


Fig 1

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting. Fit the inner spacer.
Push the bolt fully home, fit but do not tighten the nut.
Lower the jack from below the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower the jack from below the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp plate securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the P.A.S. pipes and rack.
Fit new 'O' rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the P.A.S. pipe clamps.

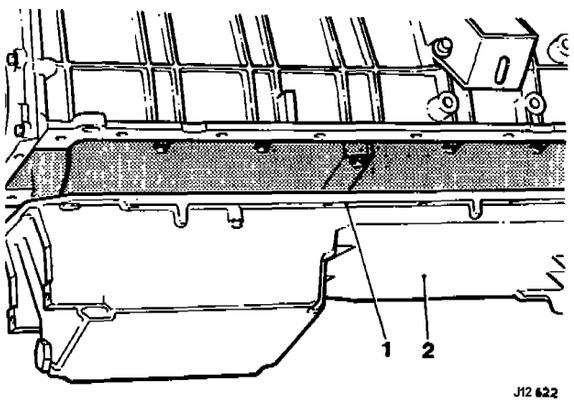
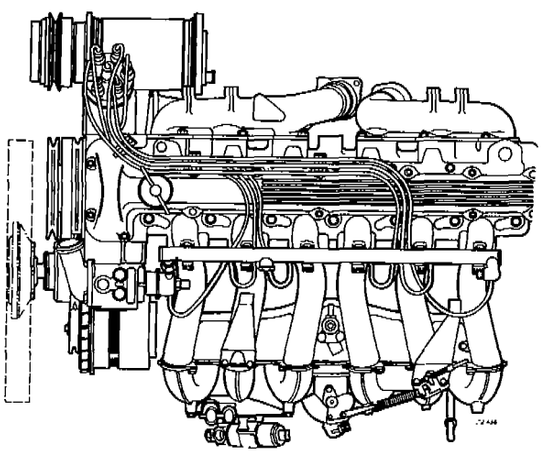


Fig 2

Slacken off the MS 53B hook nut. Remove the hook.
Remove Service Tool MS53B.
Remove the lifting eye.
Fit and tighten the engine mounting securing nuts. Refit the calipers. Refit the brake pads.
Refit the road wheels.
Lower the vehicle from the axle stands Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. Lower the vehicle.
Refill the engine with oil to the correct level.
Bleed the P.A.S. system as follows:
Top up the **P.A.S.** reservoir.
Start the engine.
Turn the steering wheel to full left hand lock.
Turn the steering wheel to full right hand lock.
Top up the reservoir. Fit the reservoir cap.
Close the bonnet.


Fig 3

DATA

SERVICE TOOLS

Tie-down bars JD 133
Rear lifting eye 18G1465
Engine support bracket MS 53B

TORQUE FIGURES

Adaptor plate to sump 49-54Nm
Adjustment trunnion to alternator bolt 23-27Nm
Alternator bolt to timing cover nut 23-27Nm
Alternator bolt (trunnion lock nuts) 12-14Nm
Alternator pivot bolt/nut 23-27Nm
Caliper to carrier 31-40Nm
Connecting rod nut 52-55Nm
Dipstick to bracket 5-8Nm
Oil drain back tube to sump adaptor 12.5-15Nm
Oil sump plug 41-47Nm
Oil sump to cylinder block 23-27Nm
Oil sump to timing cover 23-27Nm
P.A.S. feed/return pipes to rack 19-23Nm
Shock absorber to upper mounting 35-43 Nm
Transfer housing to cylinder block 23-27Nm
Wheel nut to wheel stud (steel wheel) 65-85Nm
Wheel nut to wheel stud (alloy wheel) 88-102Nm
Windage tray to cylinder block 23-27Nm

SPANNER SIZES

10mm
13mm
14mm
17mm
19mm
22mm
30mm
3/8 AF
9/16 in AF
15/16 AF

OILS/GREASES/SEALANTS

Oil pipe 'O' rings PETROLEUM JELLY
Sump to cylinder block 'HYLOSIL 102'
Transfer housing to cylinder block 'HYLOSIL 102'

04720

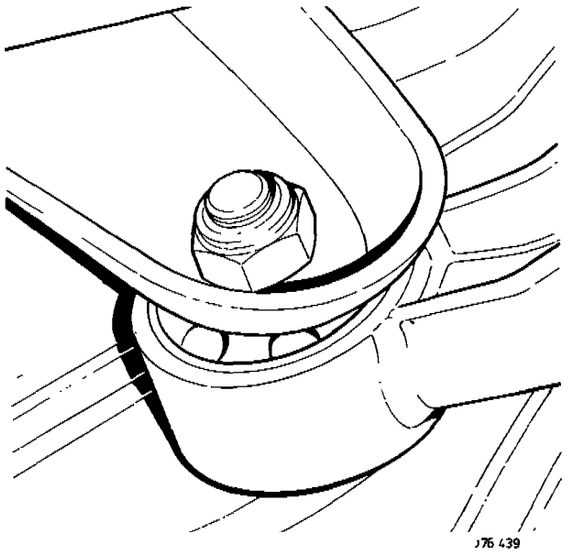


Fig 1

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OIL PUMP PIPE 'O' RINGS

RENEW **12.60.27**

Remove the sump 12.60.38 page 106.
Place a suitable drain tray under the oil transfer housing area and remove the transfer housing (1,2 Fig 1).
Remove the oil pump pick-up pipes (3 Fig 1).
Remove and discard the 'O' rings.
Clean the transfer housing and oil pipes.
Carefully fit new 'O' rings to the oil pipes (1 Fig 2), lubricate the 'O' rings with petroleum jelly.
Refit the pipes to the oil pump.

Apply 'Hylosil 102 to the tranfer housing gasket face and refit the housing to the engine.
Fit and tighten the securing bolts.
Refit the sump 12.60.38 page 106.
Replenish the engine oil to the correct level (Fig 3).

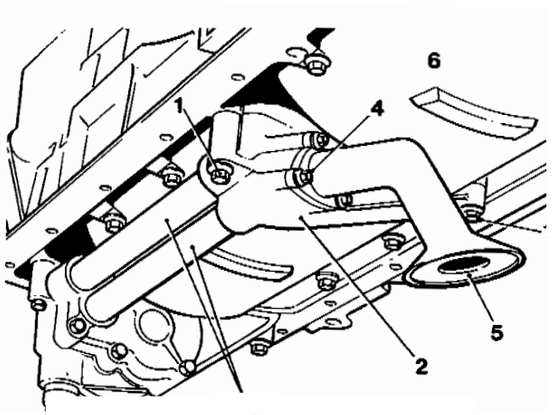


Fig 1

DATA

TORQUE FIGURES

Transfer housing to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Oil pipe 'O' rings Petroleum Jelly

SPANNER SIZES

17mm
9/16in AF

04726

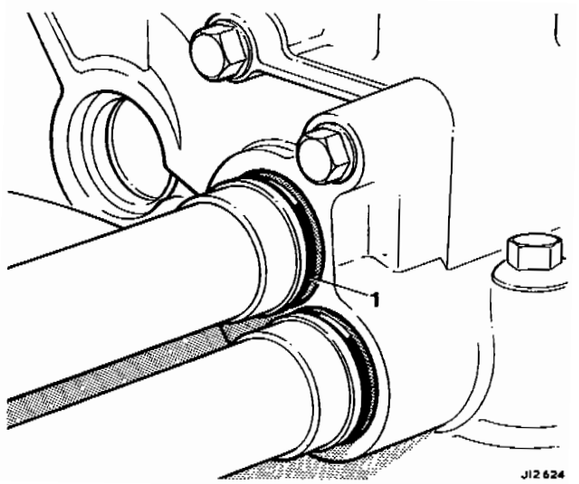


fig 2

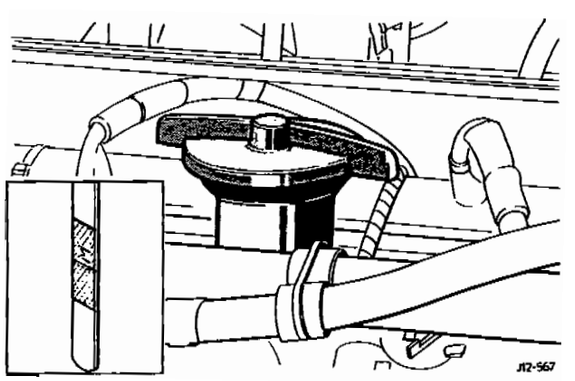


Fig 3

OIL PICK UP STRAINER

RENEW **12.60.20**

Remove the sump 12.60.38 page 106.
Remove the **bolts** securing the rear windage tray (6 Fig 1) to the cylinder block and remove the tray.
Remove the three bolts (4 Fig 1) securing the strainer and remove the strainer (5 Fig 1).
Clean all components and examine for damage and wear.
Apply 'Hylosil 102' to the replacement strainer, fit and secure to the housing with the bolts.
Refit the rear windage tray to the cylinder block and secure with the bolts.
Refit the sump 12.60.38 page 106.
Fill the engine with oil to the correct level (Fig 2).

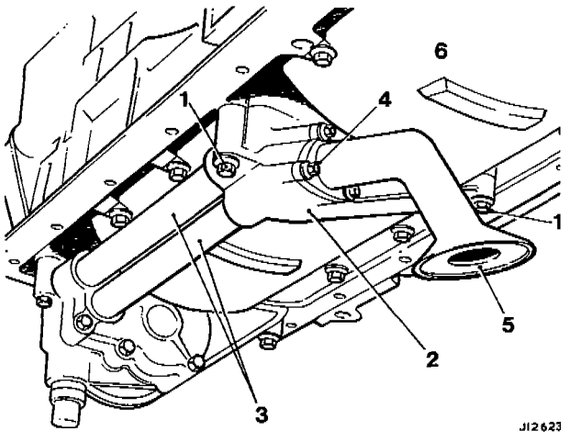


Fig 1

DATA

TORQUE FIGURES

Oil pick up strainer 9.5-12Nm
Windage tray-rear to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Sump to cylinder block HYLOSIL 102

SPANNER SIZES

10mm
17mm
3/8in AF

04726

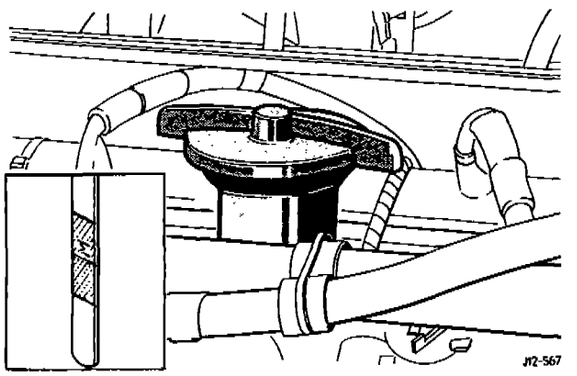


Fig 2

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OIL PRESSURE RELIEF VALVE ASSEMBLY

RENEW 12.60.56

Jack up the front of the vehicle and place on two stands, and partially drain the engine oil.
Remove the oil pressure relief valve plug (1 Fig 1) and collect the spring (2 Fig 1), valve (3 Fig 1), and mandrel (4 Fig 1).
Check the valve spring and mandrel for wear, scoring or pitting.
Measure the components against the specifications below.
Should any of the components be suspect, they must be replaced.
Lubricate and assemble the mandrel, spring and valve.
Fit and tighten the relief valve plug.
Refit and tighten the sump plug.
Lower the vehicle, open the bonnet and top-up the engine with oil to the correct level (Fig 2).

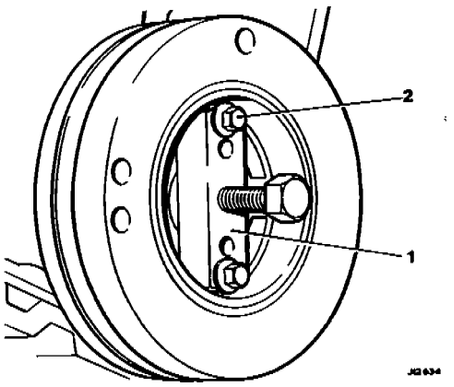


Fig 1

DATA

RELIEF VALVE

O/D	17.98 to 17.95 mm
I/D	15.00 to 14.50 mm
Overall length	35 mm
Working length	30 mm
Bore depth	27 mm
Material	ENIA

MANDREL

Length	57mm
Diameter	11.11 mm
Material	Steel tube to BS970 (CDS2 or ERW1)

SPRING SPECIFICATION

Wire diameter	2.34 mm
Mean diameter coils	14.0 mm
Total No. of coils	26
Material	BS970/735/A50 (EN 47) Spring steel wire.

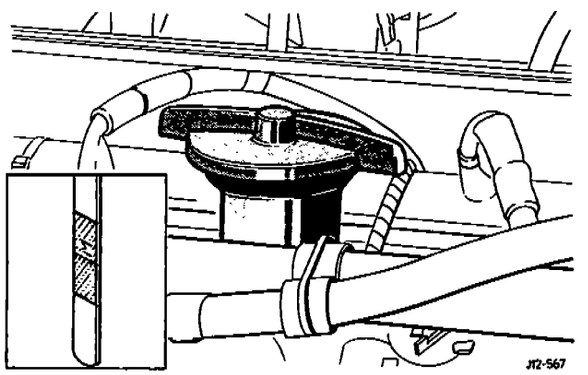


Fig 2

TORQUE FIGURES

Drain plug to sump 68-75Nm
Relief valve plug to pump body 37—45''

SPANNER SIZES

42mm
24mm

04726

OIL PUMP

RENEW 12.60.22

Remove the sump 12.60.38 page 106.
Place a drain tray under the transfer housing, remove the housing (1,2 Fig 1).
Remove the pick-up pipes (3 Fig 1), push back the lock tabs (1 Fig 2) and remove the pump sprocket bolts (2 Fig 2).
Remove the oil pump drive sprocket (3 Fig 2), tab washers (4 Fig 2) and shims.
Remove the oil pump securing bolts and remove the pump.

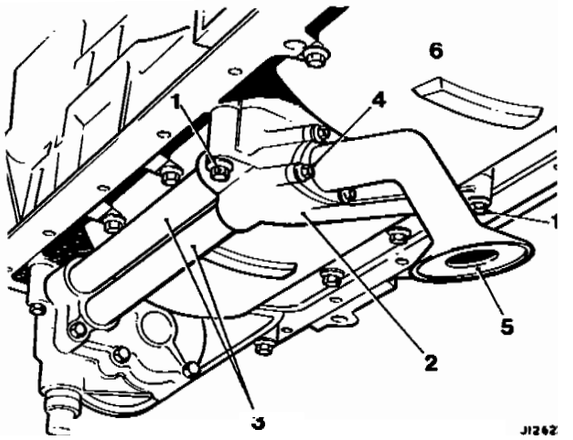


Fig 1

Remove the pressure relief valve cap, spring, tube and valve (1-4 Fig 3).
Clean the mating face in the cylinder block, the relief valve assembly, sprocket and shims.
Lubricate the relief valve assembly, assemble into the pump, tighten the cap.

Fit the new oil pump to the engine and tighten the securing bolts.
Move the drive chain as far rearward as possible, fit a shim pack of 0.015 in thickness to the oil pump flange (3 Fig 4), align the bolt holes, fit the drive sprocket and two securing bolts.
Using a straight edge (2 Fig 4), check the alignment of the oil pump drive sprocket (1 Fig 4) and crankshaft sprocket (4 Fig 4).
Remove and refit the pump drive sprocket as required in order to align the sprockets.
When the alignment is satisfactory, remove the pump sprocket. Fit the chain and shims to the sprocket, fit to the oil pump.
Fit the tab washer and securing bolts.
Tighten the bolts and lock over the tabs,
Fit new 'O' rings to the oil pump pick-up pipes.
Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102' to the transfer housing gasket face.
Fit and seat the housing, fit and tighten the securing bolts.
Refit the sump 12.60.38 page 106.

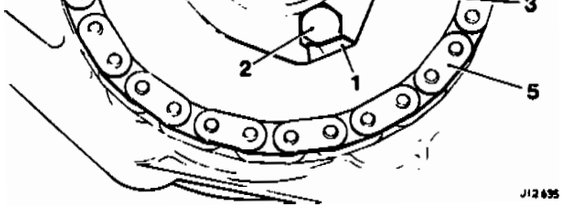


Fig 2

DATA

Oil pump sprocket shims available sizes
0.005 in
0.010 in
0.020 in

TORQUE FIGURES

Oil pump to cylinder block 23-27 Nm
Transfer housing to cylinder block 23-27 Nm

OILS/GREASES/SEALANTS

Transfer housing to block HYLOSIL 102

SPANNER SIZES

10 mm
13 mm

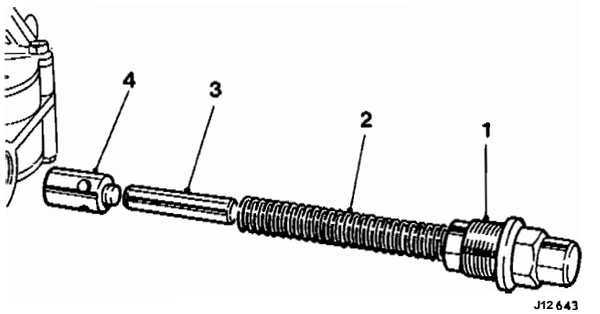


Fig 3

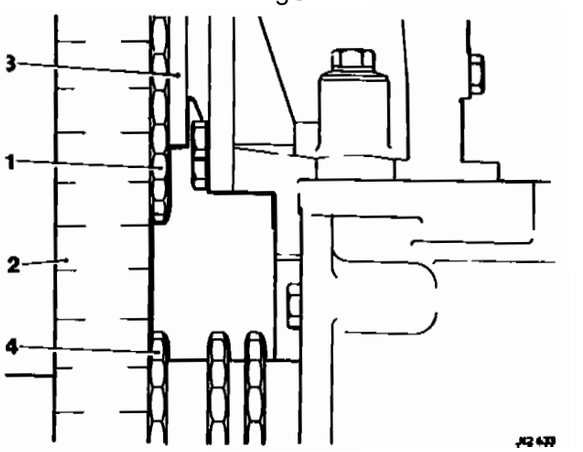


Fig 4

0472G

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OIL PUMP

OVERHAUL 12.60.32

Remove the oil pump 12.60.26 page 113.
Remove the oil pressure relief valve cap (1 Fig 1), spring (2 Fig 1), tube (3 Fig 1) and valve (4 Fig 1).
Clean the mating face in the cylinder block, the relief valve assembly, sprocket and shims.
Remove the body securing bolts.
Remove the pump body, the pump outer rotor, the backplate securing bolts, the backplate and the bearing shell, clean all the component parts of the pump.

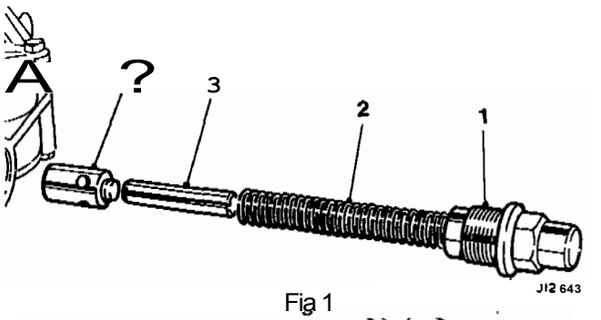
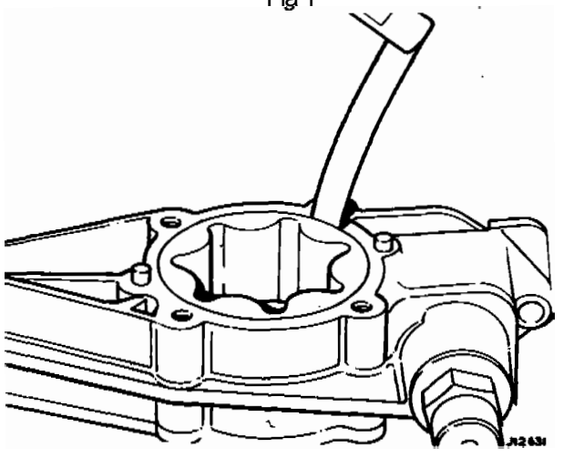


Fig 1

Check all the clearance and components for undue wear (Figs 2 & 3, check tolerances in DATA).
Clean and lubricate all the component parts.
Fit the bearing shell to the housing.
Apply sealant to the backplate gasket face, fit the backplate and securing **bolts.**
Fit the outer rotor.
Lubricate the relief valve assembly and assemble into the pump.
Tighten the relief valve cap.
Fit the oil pump to the engine and tighten the securing bolts.


Fig 2

Move the drive chain as far rearward as possible, fit a shim pack of 0.015 in thickness to the oil pump flange (3 Fig 4), align the bolt holes, fit the drive sprocket and two securing bolts.
Using a straight edge (2 Fig 4), check the alignment of the oil pump drive sprocket (1 Fig 4) and the crank sprocket (4 Fig 4).
Remove and refit the pump drive sprocket as required in order to align the sprockets. When the alignment is satisfactory remove the pump sprocket, fit the chain and shims to the sprocket and fit the assembly to the oil pump.
Fit the tab washer and bolts.
Tighten the bolts and lock over the tabs.
Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 1 page 115).
Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102 to the transfer housing gasket face, fit and seat the housing.
Fit and tighten the securing **bolts.**

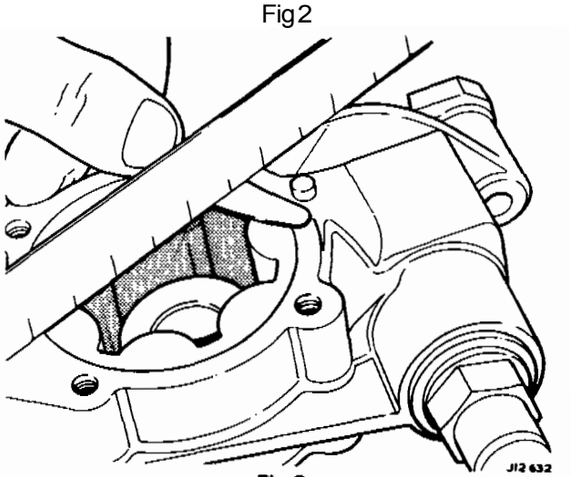


Fig 3

Refit the sump 12.60.26 page 106.
Refill the engine with oil to the correct level (Fig 2 page 115).

DATA

Outer rotor O/D	69,825 to 69,774 mm
Outer rotor width	27,975 to 27,962 mm
Inner rotor width	27,975 to 27,962 mm
Clearance outer rotor to body	0,2 mm
Material	Cast iron grade 12
Oil pump body rotor bore	69,951 to 69,926 mm
End float	0.1 mm

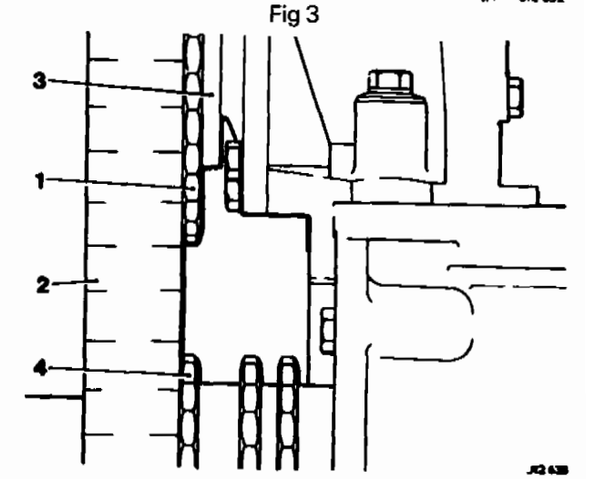


Fig 4

TORQUE FIGURES

Oil Pump to cylinder block ***23-27Nm***
Oil pump front cover to body ***9.5-12Nm***
Oil pump rear cover to body 9.5-12Nm
Transfer housing to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Oil pipe '0' rings ***PETROLEUM*** *JELLY*
Oil ***pump*** *front cover to body* ***LOCTITE*** *501*
Oil pump rear cover to body ***LOCTITE 502***
Transfer housing to block ***HYLOSIL*** *102*

SPANNER SIZES

10mm
17mm
30mm

3/8in AF

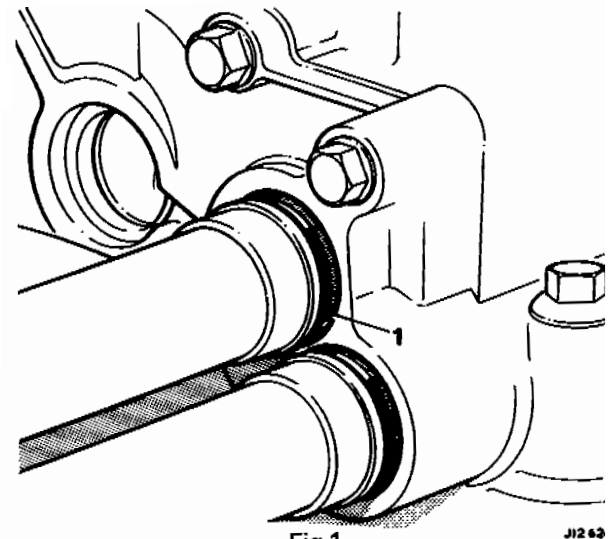


Fig 1

0472G

OIL PRESSURE TRANSMITTER

RENEW **12.60.50**

Remove the oil filter canister 12.60.04 page 15.
Disconnect the feed wire (1 Fig 3), remove the transmitter (2 Fig 3). and retrieve the copper washer.
Fit a new copper washer to the replacement transmitter, and fit the new transmitter to the cylinder block.
Reconnect the feed wire.
Refit the oil filter canister.
Start the engine and ensure that there are no oil leaks and that the oil pressure gauge is operating.
Switch the engine off, wait for 30 seconds, check the oil level, and top up as necessary.

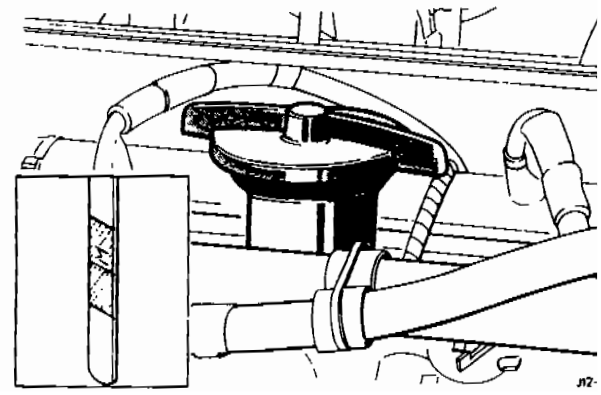


Fig 2

DATA

TORQUE FIGURES

Transmitter to cylinder block ***20-27Nm***

SPANNER SIZES

18mm

0472G

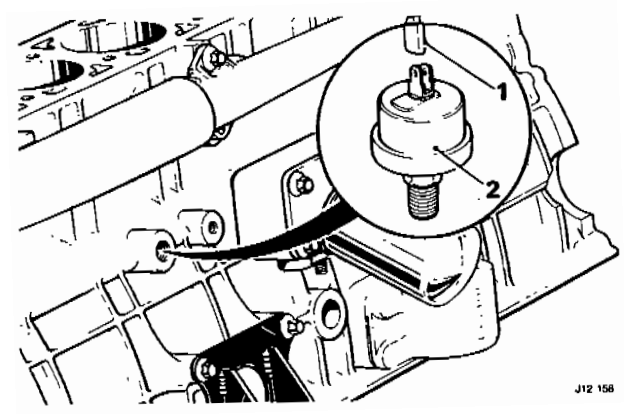


Fig 3

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ENGINE MOUNTING AND BRACKET – FRONT RH

RENEW **12.45.03**

Remove the the engine mounting to mounting bracket securing nut (Fig 1).
Take the weight of the engine on a jack.
Remove the engine mounting lower bracket to crossmember securing nuts and bolts.
Remove the mounting/bracket assembly from the vehicle (Fig 2).
Change the spacer and bracket over to the new mounting.
Refit the mounting/bracket assembly to the crossmember. Fit and tighten the bolts.
Lower the engine onto the mounting.
Fit and tighten the securing nut.
Refit the air cleaner.

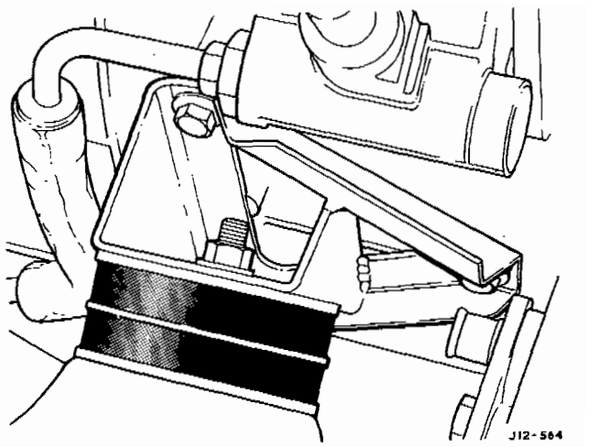


Fig 1

DATA

TORQUE FIGURES

Engine mounting to mounting bracket 47-55Nm
Lower bracket to crossmember 22-28Nm

SPANNER SIZES

73mm
9/16in AF

0472G

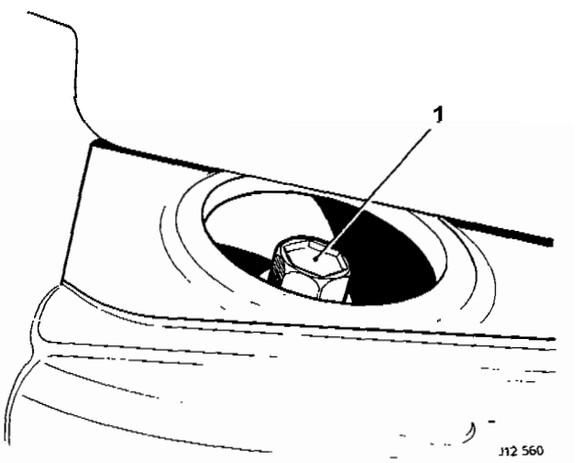


Fig 2

ENGINE MOUNTING AND BRACKET – FRONT LH

RENEW **12.45.01**

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 1).
Unclip the air cleaner box from the airflow meter.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig 1) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

Remove the the engine mounting to mounting bracket securing nut (Fig 2).
Take the weight of the engine on a jack, ensuring that the fan does not foul the fan cowl.
Remove the engine mounting lower bracket to crossmember securing nuts and bolts.
Remove the mounting/bracket assembly from the vehicle (Fig 3).
Change the spacer and bracket over to the new mounting.
Refit the mounting/bracket assembly to the crossmember. Fit and tighten the securing bolts.
Lower the engine onto the mounting.
Fit and tighten the securing nut.
Refit the air cleaner.

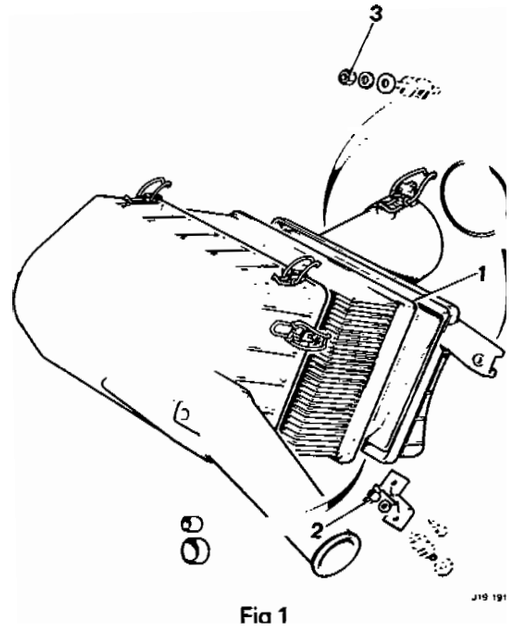


Fig 1

DATA

TORQUE FIGURES

Engine mounting to mounting bracket	*47-55Nm*
Engine mounting bracket to cylinder block	*49-54Nm*
Lower bracket to crossmember	*22-28 ""*

SPANNER SIZES

13mm

9/16in AF

04726

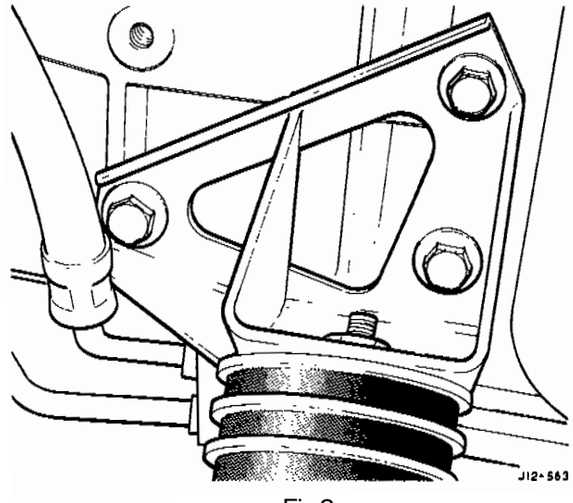


Fig 2

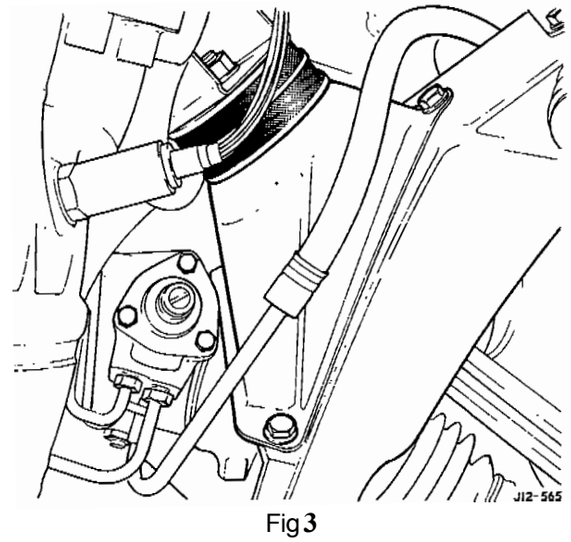
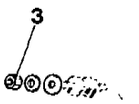


Fig 3

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ENGINE MOUNTING – REAR



RENEW 12.45.04

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig **1**).
Unclip the air cleaner box.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig **1**) from the upper mountings. Displace and remove the air cleaner.
Fit Tool **18G 1465** to the manifold **(Fig 2).**
Fit **Tool MS** 53B across the wing channels.
Fit the hook to the lifting eye and tighten the hook nut to take the weight **of** the engine.
Jack up the vehicle and support with axle stands.
Remove the gearbox to intermediate pipe bracket.
Re-position the mounting bracket away from the exhaust pipe. Remove the intermediate exhaust pipe clamp securing nut and bolt.
Re-position the clamp away from the union.
Disconnect the exhaust pipe and remove the sealing olive.
Take the weight of the rear mounting with a jack and remove the bolts securing the mounting.
Lower the jack and remove the mounting (Fig 3).
Remove the restraining cable **(NAS AUTO ONLY).**
Remove the upper spring rubber **and** spring.
Using Service Tool JD 107 and mounting sleeve JD 107-2, fit the mounting to the tool, ensure that the shoulder locates in the lower mounting.
Align the collar to the mounting/tool, compress the lower mounting spring, thus removing tension **from** the micron retaining ring.
Remove the central mounting plate, and remove the micron ring and retainer plate.
Slacken off the wing nut and remove the tool **assembly** from the mounting.
Remove the lower spring **cup** and bump **stops.**
Remove the lower spring rubber and spring.
Remove the upper spring mounting cup.
Remove the screw securing the balance weight, remove the upper weight and upper spring cup.
Clean all components and check **for** wear **or** damage, replace components as necessary.
Reverse the removal procedure to refit the replacement rear mounting.

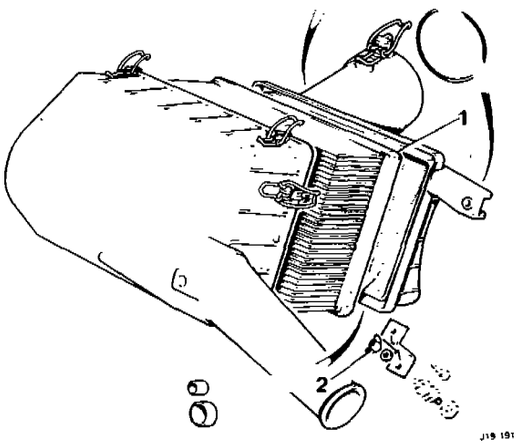


Fig 1

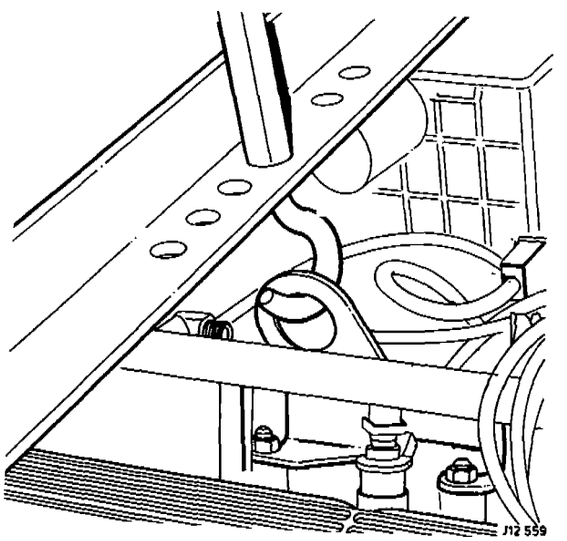


Fig 2

DATA

SERVICE TOOLS

JD 107 Spring compressor
JD 107-2 Adaptor-mounting centraliser
MS 538 Engine support bracket
18G 1465 Lifting eye

TORQUE FIGURES

Balance weight to spring cradle 3-4Nm
Inlet manifold securing nuts-lifting eyes 6.5-9Nm
Rear mounting to body 20-25Nm
Spring cup to mounting 20-25Nm
Bracket to intermediate pipe 23-27Nm

SPANNER SIZES

10mm
13mm
17mm

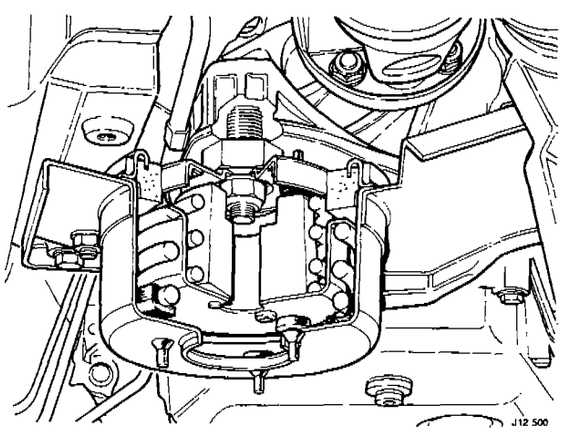


Fig 3

SPARKING PLUG INSERTS

FITTING 12.29.78

Remove the inlet and exhaust valves – Cylinder Head Overhaul 12.29.19 page 24.
Bore out the stripped thread to 19.05 mm (0.750 in) diameter and tap out to 0.5in, BSP.
Referring to Fig 1:
Counter bore to 22.62mm (0.890in)
Dimension 'A' = 22.62mm (0.890in)
Dimension 'B' = 14.28mm (0.562in)
Dimension 'C' = 12.70mm (0.500in) B.S.P.
Dimension 'D' = 11.1 mm + 0.13mm
– 0.15mm
(0.437in + 0.005in
– 0.01Oin)

Fit the screwed insert ensuring that it sits firmly at the bottom of the thread.

Referring to Fig 2:
Drill and ream a 3.17mm (0.125in) diameter hole between the side of the insert and the head.

Drive in a locking pin and secure by peening the edge of the insert and the locking pin.

Dimension 'A' = 11.1 mm (0.437in).
Refit the valves and cylinder head 12.29.19 page 24.

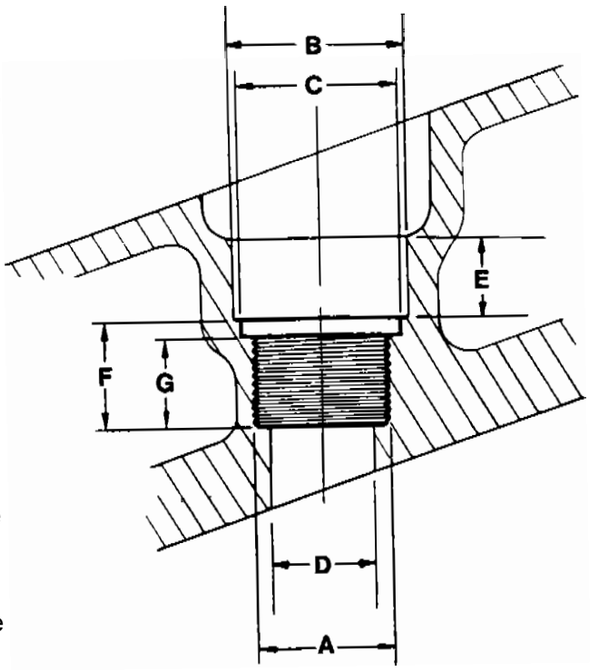


Fig 1

DATA

TORQUE FIGURES

Cylinder head to cylinder block:
Tighten in sequence to ***20.5-23Nm***
Tighten ***in*** *sequence* ***to 32.5-35Nm***
Rotate clockwise through exactly 90°
Sparking *plug* to *cylinder head* ***23-27Nm***

SPANNER SIZES

6mm
1Omm
13mm
30mm

9/16in AF
5/8in AF

10mm (ALLEN KEY)

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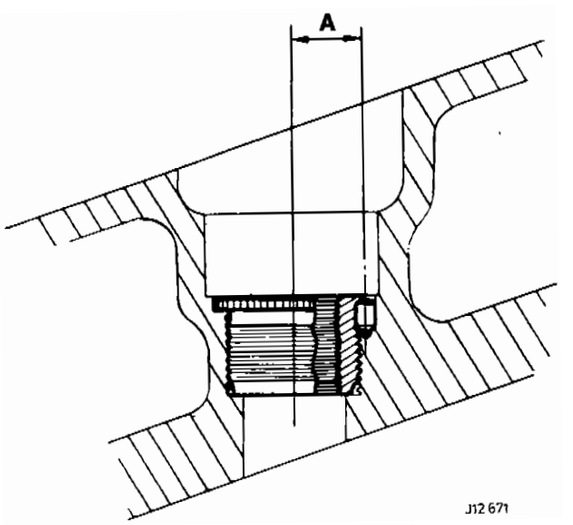


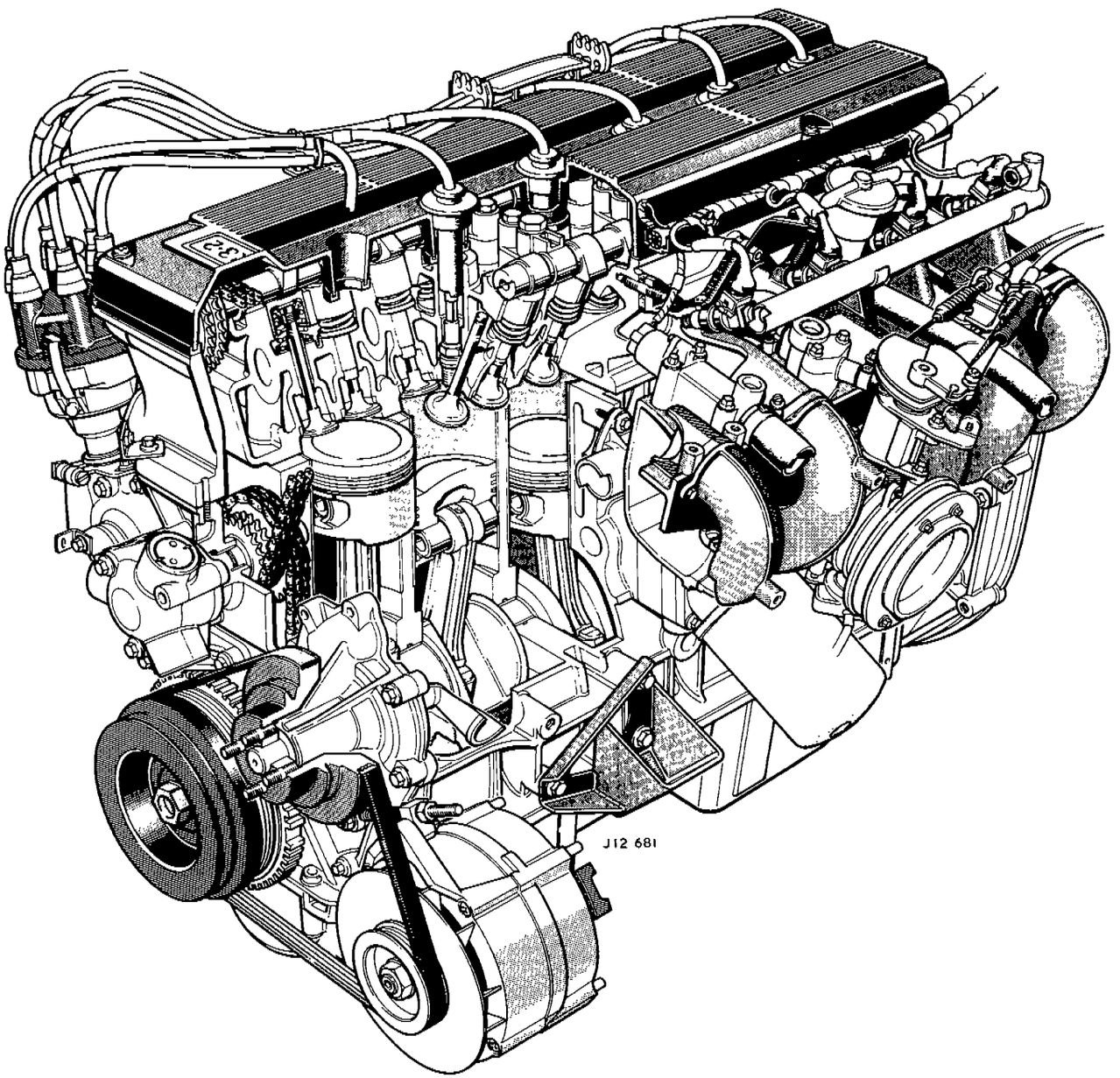
Fig 2

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0050K



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DESCRIPTION 12.00.00

The 3.2 litre engine is basically the same as the 4.0 litre unit.
Refer to Section 12 ''4.0L Engine" for details of components, service procedures, requirements and operations.

The following aspects of the 3.2 litre engine deviate from the 4.0 litre unit and must be considered when performing service operations.

The crankshaft is manufactured from SG cast iron and is nitro carbonise treated to increase the life of the bearing journals. The crankshaft has a shorter-stroke than that of the 4.0 litre unit.

The connecting rods are a different length from the rods of the 4.0 litre, the rods are slightly longer in order to attain the correct compression height for the piston.

The pistons are taller than those of the 4.0 litre unit and can be recognised by their raised piston crown (Fig 1). The piston skirt is slightly deeper to provide improved support.
The piston and gudgeon pin are assembled as a matched pair, the pin being positioned offset.
Arrows cast inside the piston skirt indicate the thrust side of the piston whilst an arrow marked on the piston crown indicates the front,

The pistons have a spring assisted micro land oil control ring the same as used on 4.0 litre pistons.
The top compression ring is manufactured from steel and is of thinner section thus requiring smaller chamfers on the mating faces.
The secondary ring is a tapered cast iron ring, 1,5mm thickness.

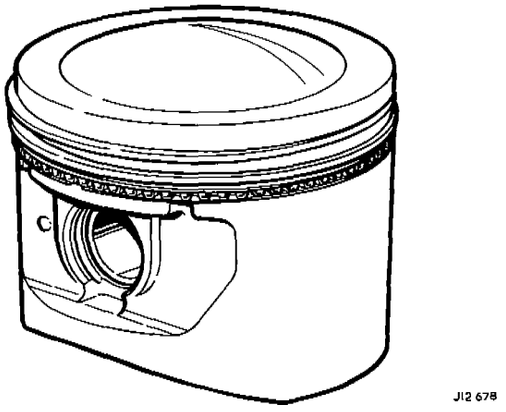


Fig 1

0050K

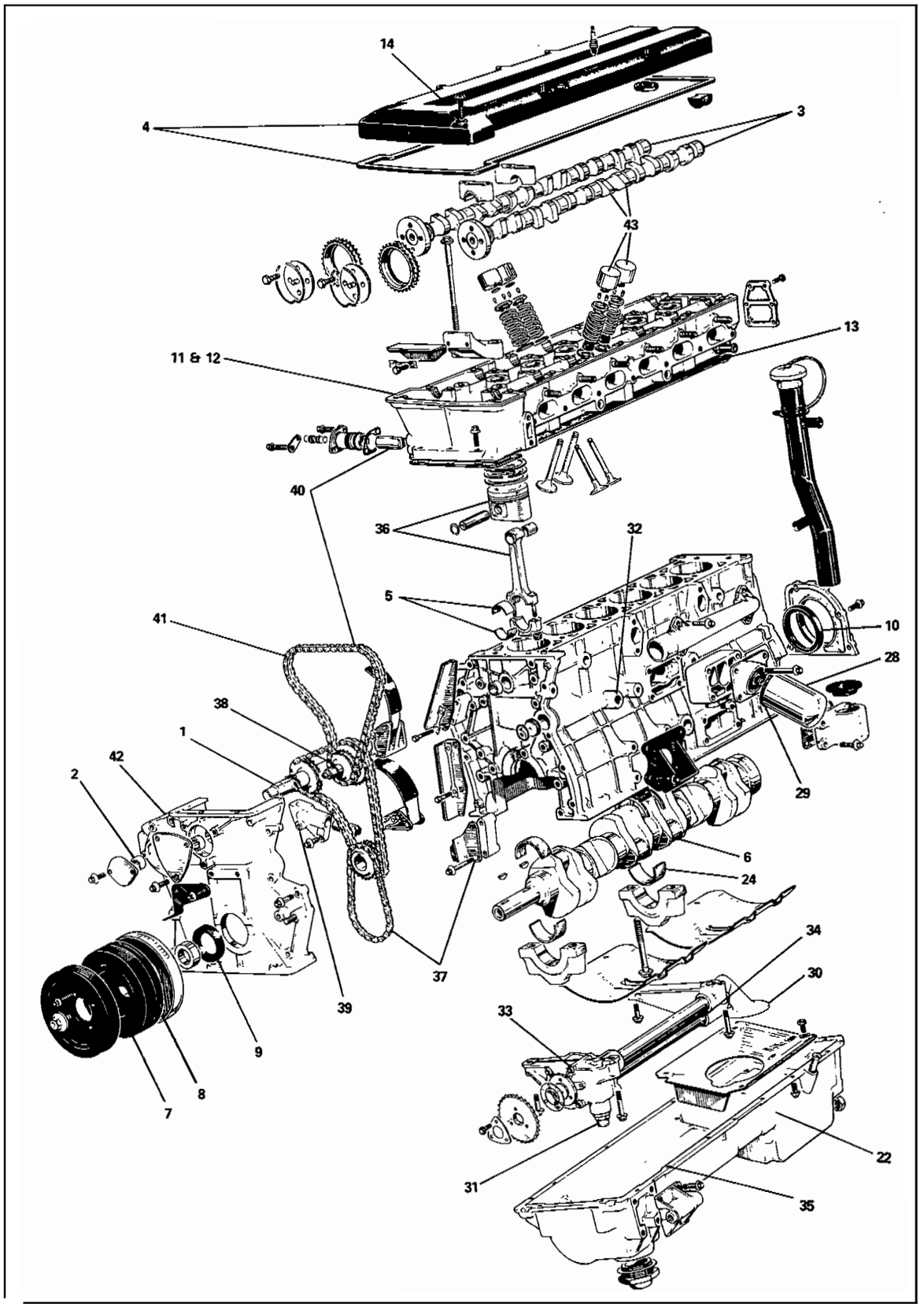
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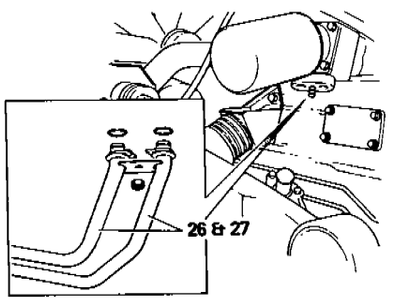
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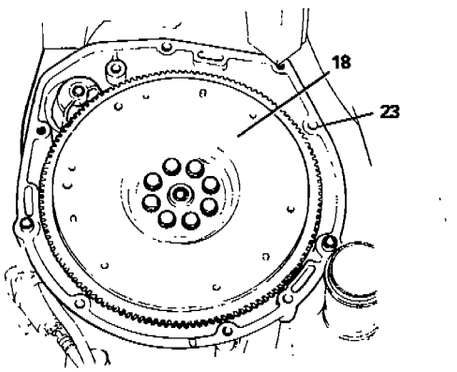
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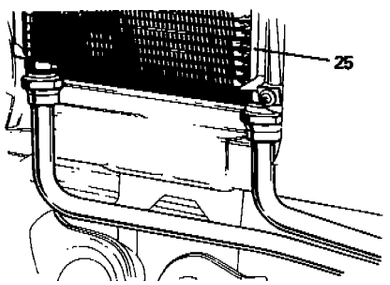
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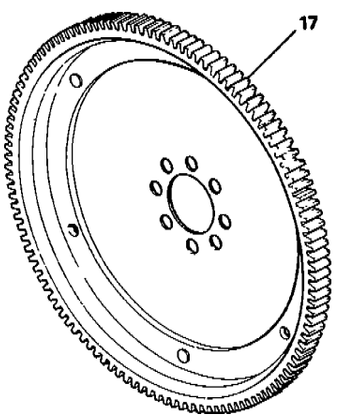
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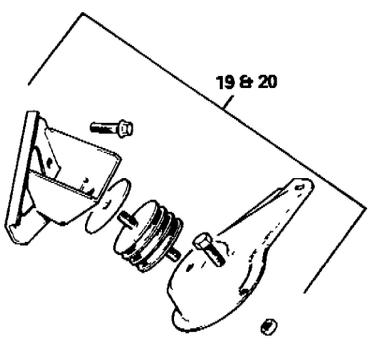
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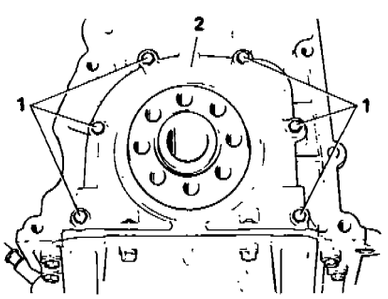


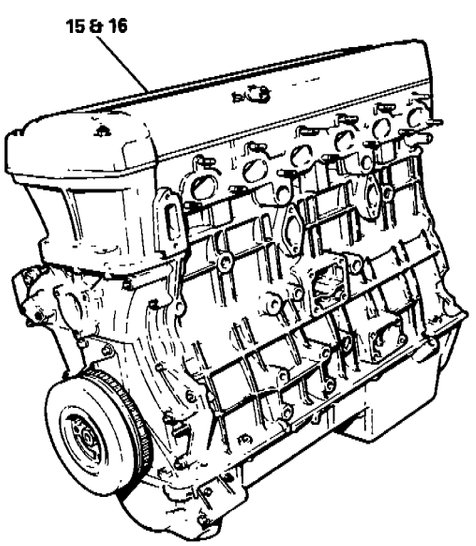


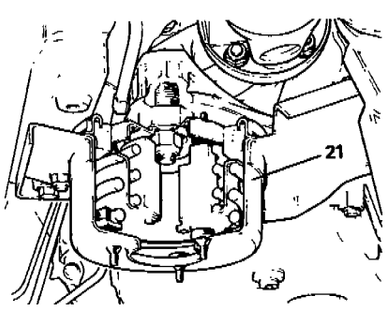












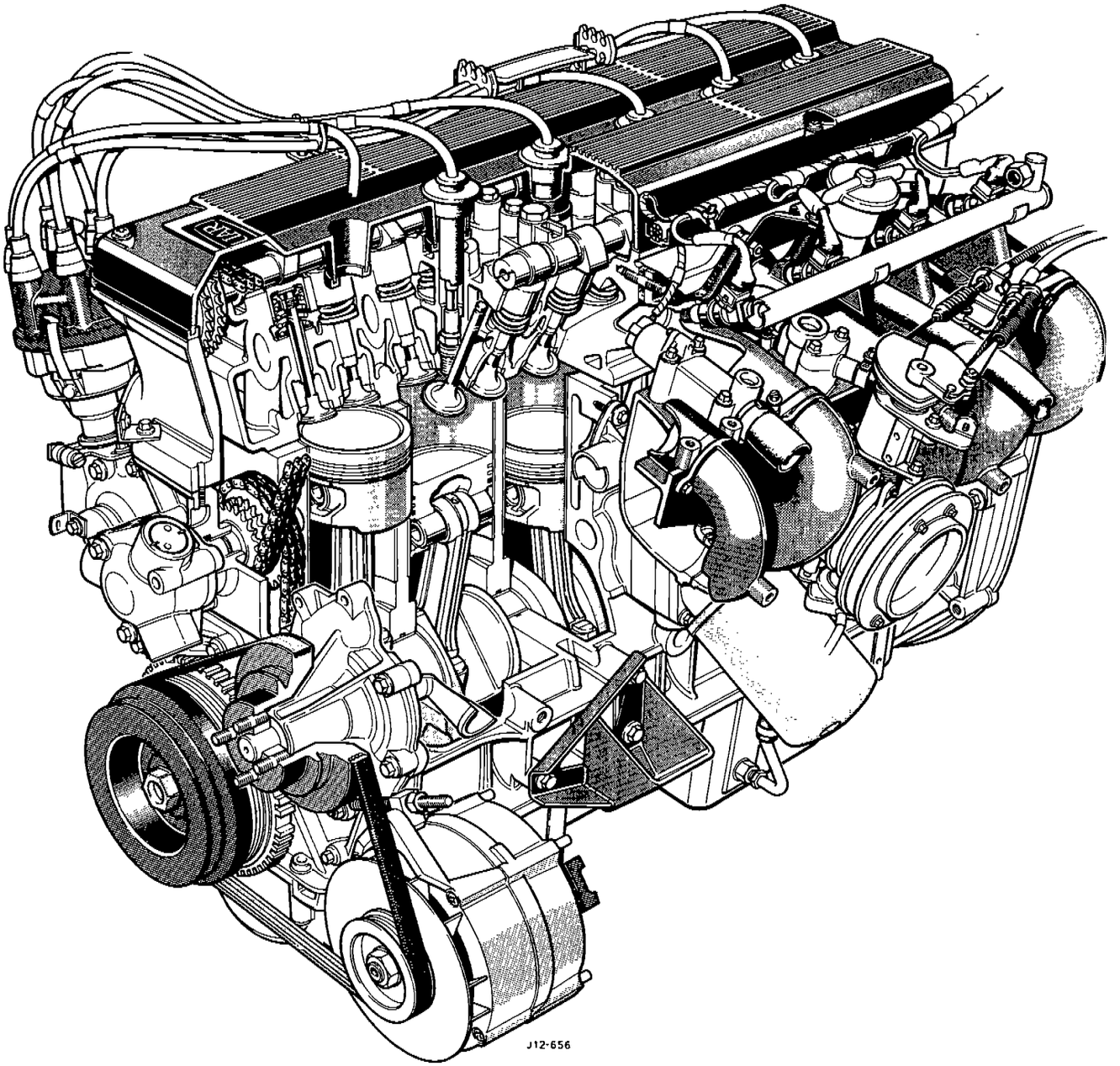
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GENERAL DESCRIPTION 12.00.00

CONSTRUCTION

The skirted design crankcase is manufactured in cast aluminium alloy with shrink fit dry cast iron cylinder liners.
The crankshaft is manufactured from forged steel and is nitro-carburise treated to enable a very high quality finish on the bearing surfaces and increase the life of the journals.
The crankshaft is supported by seven iron bearing caps having bearings, which are lead bronze on split steel backed shells with a lead indium overlay.

Crankshaft end float is controlled by half thrust washers fitted on each side of the centre main bearing journal.
The connecting rods are manufactured from manganese molybdenum steel, forged in an 'H' section.
The small end bushes are lead bronze with steel backing, machined to size after being pressed into the connecting rods.
The big end bearings are of a lead bronze alloy on split steel backed shells and with lead indium overlay.

The pistons are manufactured from aluminium alloy and have a spring assisted micro land oil control ring situated below a barrel-faced internally tapered chrome plated compression ring and an externally stepped taper-faced secondary ring.
The pistons are internally strutted for thermal control and run on hardened steel gudgeon pins offset from the centre line of the piston towards the thrust face.

The cylinder head is cast from aluminium alloy with pent-roof shaped combustion chambers with crossflow valve porting.
Running directly in the cylinder head are two cast iron camshafts retained by machined aluminium caps.
Each camshaft uses chilled cams to drive two valves per cylinder via chilled cast iron bucket tappets with shim adjustment.
Control of each of the four valves per cylinder is maintained by single valve springs.

The camshafts are operated by a two stage 'duplex' chain drive from the crankshaft. Each stage is controlled by a hydraulic tensioner operating through a pivoted rubber-faced curved tensioner blade.
The first stage incorporates a three point drive via the crankshaft, intermediate shaft and auxiliary shaft.
The intermediate shaft is live and provides a 0.75 x crankspeed drive through the timing cover. This drive access is blanked off.

The 'live' auxiliary shaft is driven at crankshaft speed and is situated on the RH side of the engine (looking from rear).
In addition to driving the distributor via a set of 2:1 reduction spiral gears, it provides an external drive for the power assisted steering pump at the rear.

The second stage is a three point drive via the intermediate shaft and two camshafts.
The 2:1 reduction ratio from crankspeed is achieved by the combined ratio of the intermediate and camshaft sprockets sizes.
The oil pump is a rotor-type mounted on the underside of the front of the crankcase and driven by a 'simplex' chain from the crankshaft nose. The pump incorporates a built-in pressure relief valve.
Below the line of the crankcase are two windage trays; these prevent oil being sucked up and thrown into the crankcase thereby alleviating windage and power losses.
Above the sump oil level is a sump tray and baffle assembly to prevent oil surge.

At the rear of the crankshaft is a new design of lip-type oil seal which provides a high degree of oil retention. It also allows the use of higher engine speed and easier serviceability as opposed to conventional asbestos rope seal.

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LUBRICATION SYSTEM

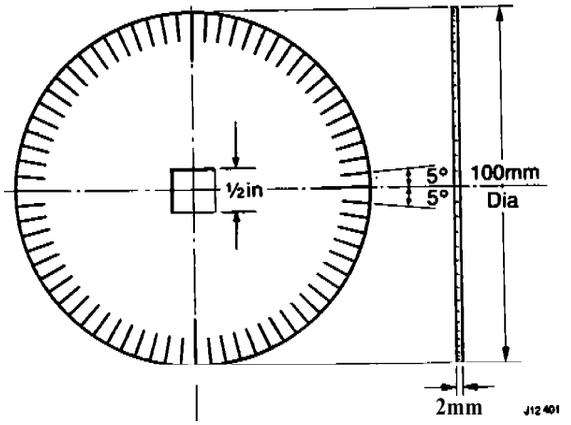
Oil is drawn from the sump via a gauze filter. Pressurised oil, having been regulated by a relief valve, is then fed via internal galleries on the LH side of the cylinder block. An adaptor block is fitted between the cylinder block and the oil filter housing which diverts the full oil flow through the oil cooler prior to filtering. A balance valve is fitted which bypasses the oil cooler circuit when a pressure differential of 10 to 15lb/in^2 occurs.
Pressurised and filtered oil is fed into the main oil gallery, the seven main bearings are fed and thence via crankshaft drillings to the big end bearings.
The intermediate shaft, auxiliary shaft and camshaft bearings are pressure lubricated by means of internal drillings directly fed from the front of the main oil gallery.

NOTE: Oil coolers are specified on all models to date, but if at any time a cooler is not required, then the oil filter housing can be bolted directly to the cylinder block through omitting the oil cooler adaptor.

SPS JOINT CONTROL SYSTEM

A feature of the engine is the adoption of the SPS system on the cylinder head bolts. This system ensures that the joints receive maximum clamp load for a given fixing size and type of material by tightening the fixing to its particular yield point. This greatly helps to prevent any premature cylinder head gasket failures.
Apart from the cylinder head, manifolds and auxiliary housing, the engine is gasketless. The use of a rubber sealing material on all other joints ensures a leak-free engine.

NOTE: The SPS system in service requires the nut or bolt to be set to a specified torque initially, the fastening then has to be rotated clockwise through exactly 90°. The accuracy of this cannot be too highly stressed.
It is therefore recommended that a tool is manufactured to aid the turning of the fixing through exactly 90°. A suggested tool is illustrated right.



CRANKCASE BREATHER

Blowby gases are recycled via the induction system to maintain a crankcase depression and so prevent their escape to the atmosphere.
A dual system is employed by means of:
(a) An oil filler stack pipe which vents into the crankcase
(b) A baffled vent from the cam box cover, the pipe from which connects the air cleaner casing (clean side) with a feed branch via a water heated restrictor into the plenium chamber.

In this way, a crankcase depression is maintained under both closed and open throttle workload conditions.

CYLINDER HEAD DESIGN

The advantage of four valves per cylinder are although the valves are smaller in diameter than on a conventional engine they have a greater combined effective area and, also being lighter apply less stress to the operating gear.
The design increases the power at high engine revs and allows an efficient combustion of the fuel.
It also allows the sparking plug to be situated in its ideal central position which creates efficient combustion and consequently enhances fuel economy.

COOLANT SYSTEM

The engine is liquid cooled by a mixture of water and anti-freeze circulating around the coolant passages. The coolant pump is mounted on the LH side of the cylinder block and is driven from the crankshaft nose by a three point belt drive (which includes the alternator). The pump is a fully assembled bolt-on unit. The coolant is fed into the cylinder block at two places via an external delivery pipe. The coolant is drawn from the cylinder head via a self-contained thermostat housing back to the radiator or recirculated according to the thermostat position.

SEALANTS

The sealant used on all gasketless joints on this engine must be the Marston compound known as Hylosii 102, a white amine cure system rubber. Should this not be available an amine cure sealant must be used.
Under no circumstances should any acid/oxy cure system be used.

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SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Engine does not start (fails to rotate)	Battery leads loose or terminals corroded	Check the condition of the leads and terminals	Clean and tighten as necessary
	Battery discharged	Check condition of battery with hydrometer	Charge or replace as necessary
	Starter motor inoperative	If the lights dim when ignition switch is operated, the starter may be jammed in the starter ring	Remove starter motor, free off pinion and refit
		Check for loose and ditty connections to the starter motor	
Engine rotates but will not fire	Starter motor speed too low	Check battery leads and terminals	Tighten and clean leads as necessary
		Check the state of the battery charge	Charge battery or fit replacement
	Faulty ignition system	Using plug lead pliers, hold the plug lead approx. 16 mm from the cylinder head and crank the engine, check that a good blue spark jumps the gap between the end of the plug lead and the cylinder head	If no spark, a yellow or white spark is evident, check the ignition system
		Remove the spark plugs	Clean and re-gap the spark plugs, replace if worn out
	Fuel system defect	Check the injectors are 'clicking'. Check the fuel pressure. Check the voltage at the fuel pump.	Refer to Fuel Injection and Engine Management sections
Overheating	Thermostat stuck closed	Remove thermostat and carry out boiling water check	Change thermostat
	Faulty gauge	Check with equipment	Fit new gauge
	Faulty transmitter	If other equipment in circuit OK fit new transmitter	fit new transmitter
	Radiator blocked	Check for uneven heat in radiator i.e. hot and cold spots plus water emission from overflow pipe	Flush or change radiator
	Too high concentration of anti-freeze	Remove the heater tank cap and check concentration with a hydrometer	Drain coolant and fill with correct concentration
	Fan belt slack	Check tension	Drain coolant and fill with correct concentration
	Fan belt broken	Open bonnet and check visually	Fit new belt
	Water pump seized	Remove drive belt and turn pulley	Change water pump
	Insufficient coolant	Remove header tank cap and check coolant level visually	Top-up coolant

SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Overheating	Incorrect ignition timing	Check ignition timing	See Engine Management
	Fuel/air mixture too weak	Check CO/HC levels	See Engine Management
	Incorrect thermostat	Remove thermostat and visually check temperature reading	Change thermostat
	Collapsed hoses	Start engine, run until normal temperature is attained and visually check the hoses for collapsing	Fit new hoses
	Cylinder head gasket leaking	Remove head tank cap, fill tank with water. Run engine until hot rev engine and return to idle; check for bubbles in water	Change head gasket
	Incorrect valve timing	Check valve timing	Reset valve timing
	Radiator cap spring weak	Fit cap to pressure testing equipment and check spring release pressure	Fit new cap
Overheating at tick-over	Viscous fan free wheeling	Run engine and visually check	Fit new viscous coupling that large fan is turning
Too cold	Thermostat stuck open	Remove thermostat	Fit new thermostat
	Auxiliary fan remains operational	Check relay circuit Check radiator fan thermostat Check diode	Fit new relay Fit new fan thermostat Fit new diode
	Faulty indicator	Check with equipment	Change indicator
	Faulty transmitter	If all other equipment OK, fit new transmitter	Fit new transmitter
	Thermostat missing	Remove thermostat housing	Fit new thermostat
	Wrong temperature rated thermostat	Remove thermostat housing and visually check rate	Fit correct thermostat
Insufficient oil pressure	Oil requires changing	Dip oil, check colour and viscosity	Change oil
	Worn crankshaft journals	Listen for rumble or knock	Change crankshaft
	Excessive crankshaft endfloat	Fit dial gauge and measure	Remove sump and fit oversize thrust washers.
	Worn main bearing shells	Listen for rumble	Check crankshaft journals for wear and fit new shells
	Worn oil pump	Remove oil pump and check the clearances	Fit new oil pump
	Oil pressure relief valve spring too weak	Remove spring and check spring rates	Fit new spring
	Insufficient oil in sump	Dip oil	Top-up required
	Faulty gauge	Check gauge with equipment	Fit new gauge

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SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Insufficient oil pressure	Engine overheating	–	See overheating fault finding
	Wrong specification oil (too thin)	Dip oil and check viscosity	Change oil and filter
	Water in oil	Dip oil and check if oil is a milky white colour	Change oil and check for blown head gasket
	Cracked oil pump housing	Remove sump and check visually	Change the pump
	Blocked oil picked-up pipe strainer	Remove sump and check visually	Remove oil pick-up and clean strainer
	Oil pump pipe 'O' rings	Remove sump and pipes and check	Fit new 'O' rings
	Main oil gallery seals leaking or gallery blocked	Eliminate other possible causes	Fit new 'O' rings or clear oil gallery
Oil pressure too high	Relief valve stuck shut	Remove valve and check for sticking	Clean or replace the valve
	Wrong pressure relief valve	Remove spring and check the rate	Fit new spring
	Incorrect grade engine oil	–	Drain engine oil and fill with correct oil
	Gauge or transmitter fault	Check gauge, if O.K. fit new transmitter	Fit new gauge or transmitter
	Engine temperature too low	Check operation of the thermostat (stuck open) or oil cooler valve stuck open	Fit new thermostat or valve
Burning oil	Worn cylinder bores	Check wear with a comparitor	Rebore cylinders as necessary
	Worn valve guides	Insert valve in guide and check side movement	Change valve guides as necessary
	Worn inlet valve seals	Remove seals and check for splits or wear	Replace in sets
	Worn piston rings	Measure rings in bore	Replace rings in sets and rebore as necessary
	Leaking cylinder head gasket	Check for blue smoke from exhaust	Replace head gasket
	Engine oil wrong specification	–	Drain oil and refull with correct viscosity oil
Losing oil (leaking)	Worn front oil seal	Wipe clean, run engine and visually check	Fit new seal
	Worn rear oil seal	Wipe belt housing clean, run engine and visually clean	Remove gearbox and fit new seal
	Leaking gaskets	Visual	Change gasket or reseal
	Cylinder block cracked	Visual	Change cylinder block

SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Excessive noise from valve gear	Excessive valve clearance	Check valve clearances	Adjust valve clearances
	Broken valve spring (s)	Remove valves and check springs	Replace as necessary
	Broken valve guide	Remove valves and check guides	Replace as necessary
	Broken valve seat insert	Remove valves and check inserts	Replace as necessary
	Lack of lubrication	Check oil pressure	See insufficient oil pressure fault finding
	Valve clash	Check valve timing	Adjust valve timing
	Worn camshafts	Valve clearances and lack of lubrication	Adjust valve clearances – see insufficient oil pressure
	Worn camshaft drive chains/tensioners	Remove front timing cover and check for wear	Replace as necessary
Noisy Chains	Low oil pressure	Take reading from gauge when engine is hot	See insufficient oil pressure
	Tensioners not released	Remove camcover and check tension of chain (top chain). Remove timing cover to check bottom chain tension	Insert 3 mm Allen key and turn tensioner anti-clockwise, compress tensioner to release bottom chain
	Chains worn	Check visually/remove and check for wear	Replace as necessary
	Sprockets worn	Check visually	Replace as necessary
	Tensioner worn	Check visually	Replace as necessary
Detonation knock (pinking)	Ignition timing too far advanced	Check ignition timing	See Engine Management
	Head gasket blown	Dip engine oil and check for ingress of water. Remove header tank cap, rev engine and check for bubbles in water	Change head gasket
	Thermostat stuck (shut and overheating)	Remove thermostat and carry out boiling water test	Fit new thermostat
	Mixture too weak	Check with CO/HC meter	See Engine Management
	No water in engine/ radiator	Remove header tank cap and check water level	Fill with water
	Engine running too hot	–	See overheating fault finding
	Valve timing incorrect	Check valve timing	Adjust valve timing
	Incorrect octane fuel	If all other checks OK, this could be the cause	Fill with correct octane fuel

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SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Loss of power	Burned valves	Check compressions	Remove cylinder head and change valves
	Sticky valves	Check compressions	Remove cylinder head and replace valves/guides or springs
	Poor engine tune	Check engine tune	Adjust as necessary
	Insufficient valve clearance	Check valve clearance	Adjust as necessary
Loss of power	Fuel injection fault	Refer to fuel injection section	
	Low compression in cylinders	Check compressions	Rebore/re-ring as necessary
	Ignition fault	Refer to electrical section	
	Camshaft timing incorrect	Check camshaft timing	Adjust camshaft timing
	Incorrect grade fuel	–	Drain fuel and refill with correct octane
	Partial seizure of engine	Remove spark plugs and rotate	Overhaul engine as necessary
	Worn camshaft	Remove camshaft and check for wear	Replace camshaft
Rough running normal engine speed (less than 6 cylinders)	Sticking valves	Check compressions	Change valve, springs or guides
	Broken valve springs	Check cornpressions	Change valve springs and check for bent valves
	Piston fault	Check compressions	Change pistons
	Head gasket blown	Check compressions and water level	Change head gasket
	Valve burned out	Check compressions	Renew valve
	Valve seat burned out	Check compressions	Cut or change valve seat
	Ignition fault	Refer to electrical section	
	Fuel injection fault	Refer to fuel injection section	
	Air leaking into inlet manifold	Run engine and listen for whistling, spray 'easy start' around suspect area. If engine speed increases, confirmed	Change gasket or manifold
	Blowing exhaust	Run engine and check for leaks	Repair leak or change exhaust

SYMPTOM	POSSIBLE CAUSE	CHECK	REMEDY
Rough idle	Valve timing incorrect	Check camshaft timing	Adjust camshaft timing
	Incorrect ignition timing	Check ignition timing	See Engine Management
	Valve clearances insufficient	Check valve clearances	Adjust valve clearances
	Valve burned out	Check compressions	Change valve
	Ignition fault	Refer to electrical section	
	Fuel injection fault	Refer to fuel ignition section	
Engine backfires	Air leakage into/from the exhaust system	Check for leaks or blows in the system	Repair leaks or replace system if necessary
	Leakage past valves and guides	Check reading of exhaust gases and also check for crankcase fumes	Remove the cylinder head and overhaul
	Ignition timing retarded	Check ignition timing	See Engine Management
	Incorrect valve timing	Check camshaft timing	Adjust camshaft timing
	Valves sticking open	Check valve clearances	Adjust valve clearances
		Check for wear or gum in valve guides	Replace guides or decarbonise the cylinder head
		Check for poor seating of valves	Overhaul the cylinder head
Engine spits back into air box	Excessively weak mixture	Check CO reading of gases leaving the exhaust pipe	See Engine Management
	Air leaking into induction manifold	Check for leaks/whistling, spray 'easy start' around suspect area, the engine speed will increase should an air leak be present	Renew intake tube or gasket
Engine fails to die	Incorrect ignition timing	Check ignition timing	Adjust ignition timing
	Valve clearances insufficient	Check clearance	Adjust clearances
	Faulty cylinder head gasket	Check for leaks into the oil and water	Replace the gasket
	Exhaust system blocked	Check for restrictions	Remove the restrictions or replace components as necessary

0472G

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CAMSHAFTS

RENEW **12.13.01**

Open the bonnet.
Remove the distributor cap and leads assembly.
Disconnect the camcover breather hose.
Remove the camcover to cylinder head securing screws (1 Fig 1).
Remove the camcover (2 Fig 1).
Remove and discard the camcover gasket (3 Fig 1), and half moon seals (4 Fig 1).
Rotate the engine and set number 1 cylinder at TDC using Service Tool 18G 1433 (Fig 2).
Remove the distributor and block off the aperture to prevent ingress of dirt and dust.
Push back the lock tabs (1 Fig 3) from the camshaft sprocket securing bolts (2 Fig 3).
Slacken off the bolts and tab washers.
Remove the upper chain tensioner valve clamp bolt (1 Fig 4), remove the clamp (2 Fig 4), and remove the valve (3 Fig 4).
Using a 3mm Allen key, wind back the tensioner (turn clockwise) until the snail engages in the park position.
Remove the tensioner housing securing bolt (4 Fig 4) and withdraw the tensioner assembly (2,3 Fig 1 page 17).
Remove and discard the 'O' ring (1 Fig 1 page 17) and gasket.

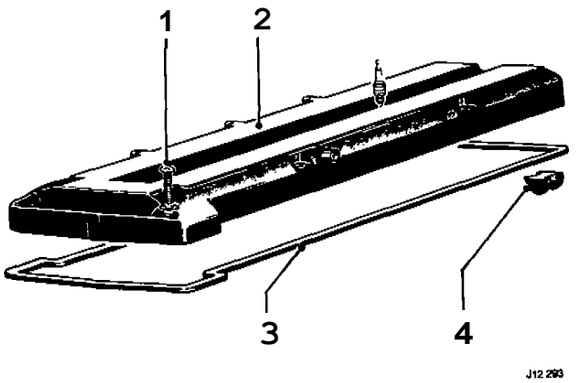


Fig 1

Remove the camshaft sprocket securing bolts/tab washers and remove the sprockets.
Remove the cylinder head bolt from No 2 cap, LH camshaft (1 Fig 2 page 17).
Remove the cap securing bolts from No 2 cap, LH camshaft.
Remove No 2 cap from the LH camshaft.
Fit spacer tool 18G 1435 (2 Fig 2 page 17) to the head.
Fit and torque tighten the cylinder head bolt.
Repeat the procedure for Nos 3, 4, 5 and 6 caps, LH camshaft (3 Fig 2 page 17).
Remove the cylinder head bolt from No 7 cap, LH camshaft.
Remove alternately the securing bolts from Nos 1 and 7 caps, until the LH camshaft is free. Lift the camshaft from the cylinder head, and fit spacer tool 18G 1435 to No 7 cylinder head bolt position (5 Fig 2 page 17). Fit and torque tighten the bolt.
Repeat the procedure for the RH camshaft.
Clean all components and examine for wear and damage. Replace all worn or damaged components.

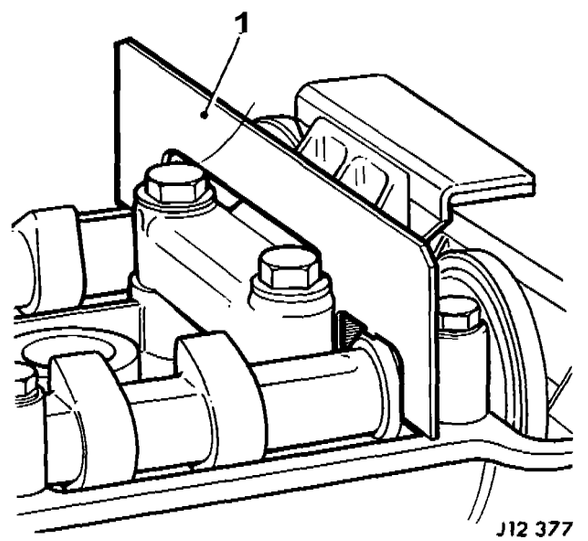


Fig 2

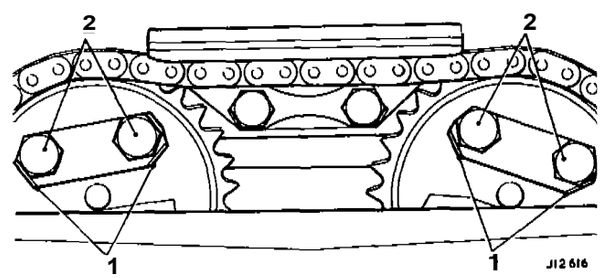


Fig 3

Lubricate the new LH camshaft.
Fit the camshaft at approximately TDC.
Lubricate Nos 1 and 7 caps.
Fit No 1 cap. Fit but do not tighten the cap securing bolts.
Remove No 7 cap cylinder head bolt.
Remove the spacer tool.
Fit No 7 cap. Fit but do not tighten the cap securing bolts.
Finally tighten Nos 1 and 7 cap securing bolts in sequence.
Remove No 4 cap cylinder head bolt and remove the spacer tool.
Lubricate and fit No 4 cap.

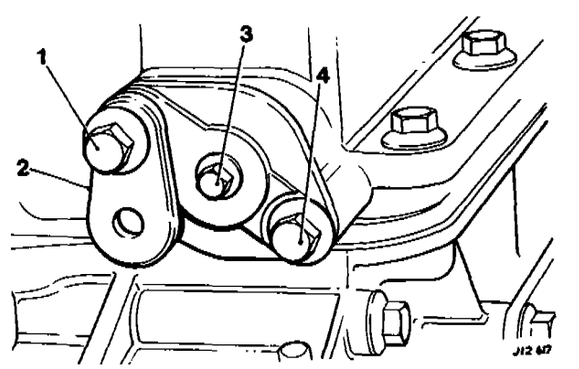


Fig 4

Fit and tighten No 4 cap securing bolts.
Fit and tighten No 4 cap cylinder head bolt.
Repeat the procedure for Nos 2, 3, 5 and 6 caps, LH camshaft.
Set the LH camshaft to TDC.
Repeat the procedure for the RH camshaft.

Rotate the engine as necessary to measure the valve clearances between the heel of the camshaft and the cam followers.
The correct clearance is 0.012 to 0.014 in.
Make note of each clearance measurement.
Should the clearances be incorrect, proceed as follows:
Rotate the engine and set number 1 cylinder at T.D.C. using Service Tool 18G 1433 (Fig 3).
Remove the cylinder head bolt from No 2 cap, LH camshaft (1 Fig 2).
Remove the cap securing bolts from No 2 cap, LH camshaft.
Remove No 2 cap from the LH camshaft.
Fit spacer tool 18G 1435 (2 Fig 2) to the head.
Fit and torque tighten the cylinder head bolt.
Repeat the procedure for Nos 3, 4, 5 and 6 caps, LH camshaft (3 Fig 2).
Remove the cylinder head bolt from No 7 cap, LH camshaft.
Remove alternately the securing bolts from Nos 1 and 7 caps, until the LH camshaft is free. Lift the camshaft from the cylinder head, and fit spacer tool 18G 1435 to No 7 cylinder head bolt position (5 Fig 2). Fit and torque tighten the bolt.
Repeat the procedure for the RH camshaft.

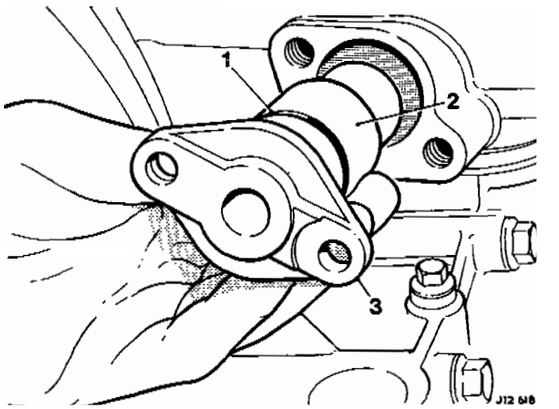


Fig 1

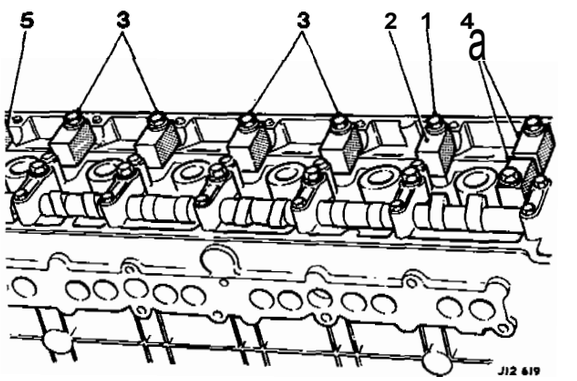


Fig 2

Remove all the shims, or only those requiring adjustment, check the size of the existing shims with a micrometer and note the reading. Calculate the size of the shim required following the examples in DATA.

DATA

VALVE CLEARANCES

Inlet	0.012-0.014 in
Exhaust	0.012-0.014 in

EXCESSIVE CLEARANCE	**INCHES**
Size of existing shim	0.100
Plus the actual clearance noted	0.019
	0.119
Less the specified valve clearance	0.013
= required shim size	0.106

INSUFFICIENT CLEARANCE	**INCHES**
Sire of existing shim	0.107
Plus the actual clearance noted	0.010
	0.117
Less the specified valve clearance	0.013
= required shim size	0.104

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AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	0.086 in
C	0.087 in
D	0.088 in
F	0.089 in
G	0.089 in
H	0.090 in
I	0.091 in
J	0.094 in
K	0.095 in
L	0,096 in
M	0.097 in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

Fit the relevent shims to the cylinder head.
Fit the LH camshaft at approximately TDC.
Lubricate Nos 1 and 7 caps.
Fit No 1 cap. Fit but do not tighten the cap securing bolts.
Remove No 7 cap cylinder head bolt.
Remove the spacer tool.
Fit No 7 cap. Fit but do not tighten the cap securing bolts.
Finally tighten Nos 1 and 7 cap securing bolts in sequence.
Remove No 4 cap cylinder head bolt and remove the spacer tool.
Lubricate and fit No 4 cap.
Fit and tighten No 4 cap securing bolts.
Fit and tighten No 4 cap cylinder head bolt.
Repeat the procedure for Nos 2, 3, 5 and 6 caps, LH camshaft.
Set the LH camshaft to TDC.
Repeat the procedure for the RH camshaft.

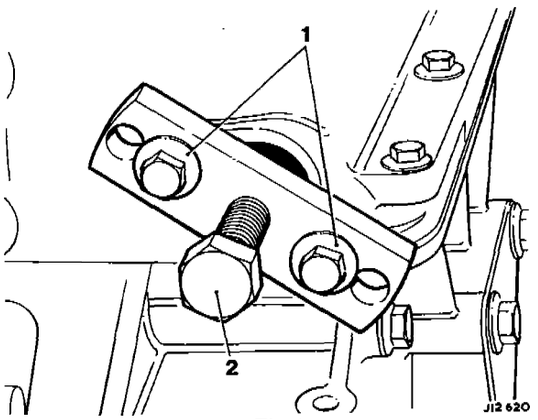


Fig 1

Fit and align the camshaft sprockets to the chain and the camshafts.
Move all the slack to the tensioner side.
Fit upper chain tensioner tool 18G **1436** (2 Fig 1). Fit and tighten the bolts (1 Fig 1).
Tension the cam chain.
Remove the inner sprocket spring clip (I Fig 2).
Remove the inner sprocket (2 Fig 2) from the outer sprocket (3 Fig 2) and align the securing bolt holes.
Fit the tab washers. Fit and tighten the securing bolts.
Lock over the tabs.
Refit the inner sprocket securing clip.
Repeat the procedure for the other sprocket.
Slacken off the chain tensioner tool bolts.
Remove the tensioner tool.

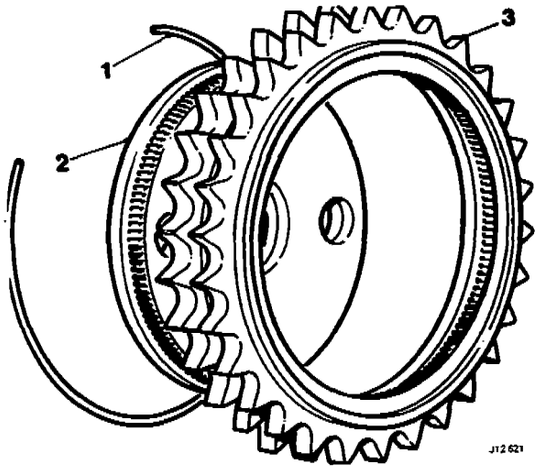


Fig 2

Clean the tensioner assembly and gasket faces.
Fit a new housing gasket. Fit a new 'O' ring. Lubricate the 'O' ring.
Fit the tensioner assembly to the cylinder head.
Fit and tighten the tensioner securing bolt.
Fit but do not tighten the valve clamp bolt.
Clean the valve assembly and fit new 'O' rings.
Lubricate the tensioner valve.
Using an Allen key, release the tensioner, ie turn the Allen key anti-clockwise.
Fit the tensioner valve. Position the clamp over the valve.
Tighten the clamp bolt.
Refit the camcover using a new gasket and half moon seals (Fig 1).
Refit the distributor, cap and leads.
Reconnect the breather hose.
Close the bonnet.

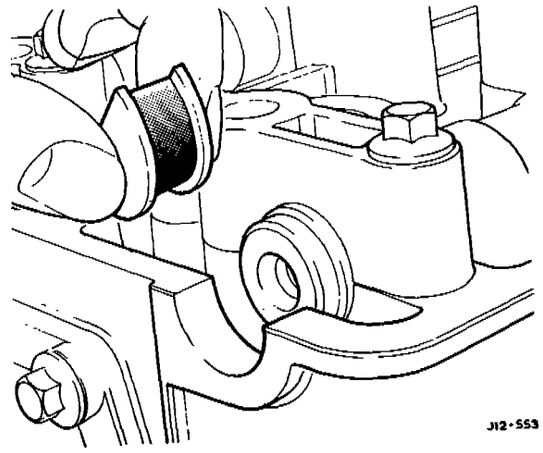


Fig 1

DATA

SERVICE TOOLS

Camshaft timing tool ***18G 1433***
Tensioner/pressure simulator ***18G 1436***
Dummy camshaft caps/spacer tool ***18G 1435***

TORQUE FIGURES

Camshaft sprocket to camshaft ***23-27Nm***
Cylinder head to cylinder block:
Tighten to ***52-54Nm***
Rotate the bolts clockwise through ***90*** *degrees*

Distributor clamp plate to timing cover ***9.5-12Nm***
Upper chain tensioner to cylinder block ***23-27Nm***

SPANNER SIZES

6mm
8mm
10mm
13mm
17mm
19mm (SERVICE TOOL-18G 1436)
3/8in AF
10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

'O' Rings 'PETROLEUM JELLY'
Half moon seals ***Hylosil 102***

04286

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CAMSHAFT COVER GASKET

RENEW 12.29.39

Open the bonnet.
Remove the distributor cap and leads assembly.
Disconnect the camcover breather hose.
Remove the camcover to cylinder head securing screws (1 Fig 1).
Remove the camcover (2 Fig 1).
Remove and discard the cam cover gasket (3 Fig 1), and half moon seals (4 Fig 1).
Clean the cam cover and cylinder head.
Fit new half moon seals to the cylinder head (Fig 2).
Fit a new gasket to the cylinder head.
Refit the camcover.
fit and tighten the camcover securing screws.
Reconnect the breather hose.
Refit the distributor cap and leads.
Close the bonnet.

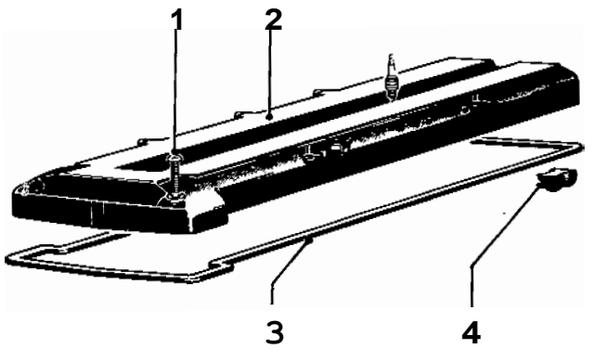


Fig 1

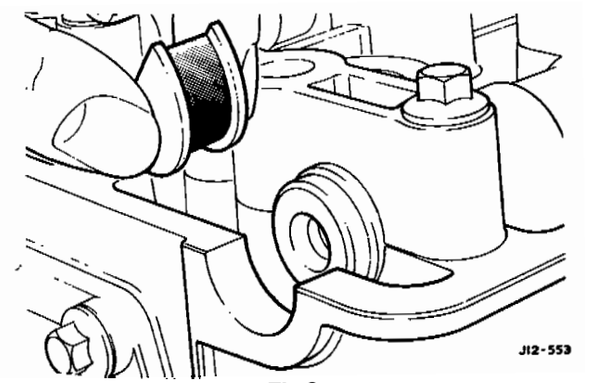


Fig 2

DATA

TORQUE FIGURES

Camshaft cover to cylinder head **1.5Nm**

SPANNER SIZES

No 4 Posi

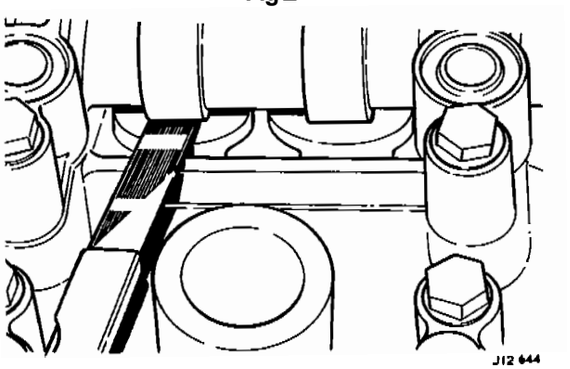


Fig 3

VALVE CLEARANCES

CHECK AND ADJUST 12.29.48

Open the bonnet.
Remove the distributor cap and leads assembly.
Disconnect the camcover breather hose.
Remove the camcover to cylinder head securing screws (1 Fig 1).
Remove the camcover (2 Fig 1).
Remove and discard the cam cover gasket (3 Fig 1), and half moon seals (4 Fig 1).
Clean the cam cover and cylinder head.
Rotate the engine as necessary to measure the valve clearances between the heel of the camshaft and the cam followers (Fig 3).
The correct clearance is 0.012 to 0.014 in.
Make note of each clearance measurement.
Should the clearances be incorrect, proceed as follows:
Rotate the engine and set number 1 cylinder at T.D.C. using Service Tool 18G 1433 (Fig 4).
Remove the distributor and block off the aperture to prevent ingress of dirt and dust.
Push back the lock tabs (1 Fig 1 page 21) from the camshaft sprocket securing bolts (2 Fig 1 page 21).
Slacken off the bolts and tab washers.

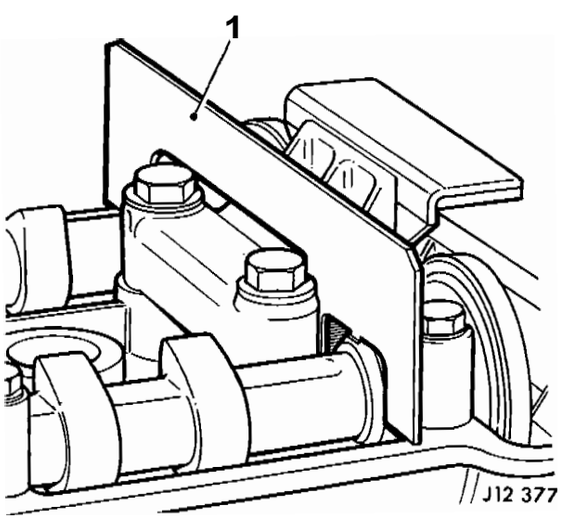


Fig 4

Remove the upper chain tensioner valve clamp bolt (1 Fig 2), remove the clamp (2 Fig 2), and remove the valve (3 Fig 2).
Using a 3mm Allen key, wind back the tensioner (turn clockwise) until the snail engages in the park position.
Remove the tensioner housing securing bolt (4 Fig 2) and remove the tensioner assembly.
Remove and discard the 'O' ring and gasket.
Remove the camshaft sprocket securing bolts/tab washers and remove the sprockets.

Remove the cylinder head bolt from No 2 cap, LH camshaft (1 Fig 3).
Remove the cap securing bolts from No 2 cap, LH camshaft.
Remove No 2 cap from the LH camshaft.
Fit spacer tool 18G **1435** (2 Fig 3) to the head.
Fit and torque tighten the cylinder head bolt.
Repeat the procedure for Nos 3, 4, 5 and 6 caps, LH camshaft (3 Fig 3).
Remove the cylinder head bolt from No 7 cap, LH camshaft.
Remove alternately the securing bolts from Nos 1 and 7 caps, until the LH camshaft is free. Lift the camshaft from the cylinder head, and fit spacer tool 18G **1435** to No 7 cylinder head bolt position (5 Fig 3). Fit and torque tighten the bolt.
Repeat the procedure for the RH camshaft.

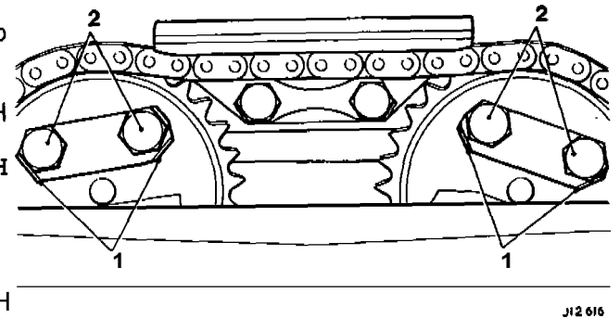


Fig 1

Remove all the shims, or only those requiring adjustment check the site of the existing shims with a micrometer and note the reading. Calculate the size of the shim required following the examples in DATA.

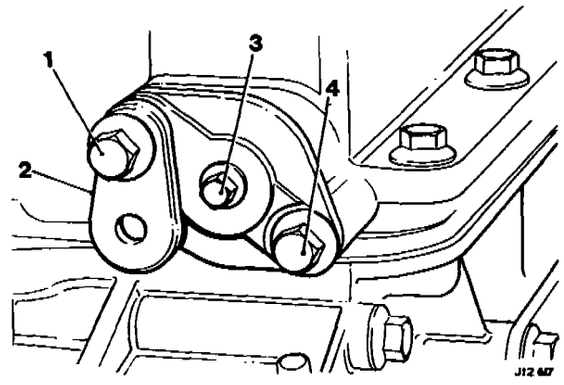


Fig 2

DATA

VALVE CLEARANCES

Inlet	0.012-0.014in
Exhaust	0.012-0.014in

EXCESSIVE CLEARANCE	**INCHES**
Size of existing shim	**0.100**
Plus the actual clearance noted	**0.019**
	0.119
Less the specified valve clearance	**0.013**
= required shim size	**0.106**

INSUFFICIENT CLEARANCE	**INCHES**
Site of existing shim	0.107
Plus the actual clearance noted	0.010
	0.117
Less the specified valve clearance	**0.013**
= required shim size	**0.104**

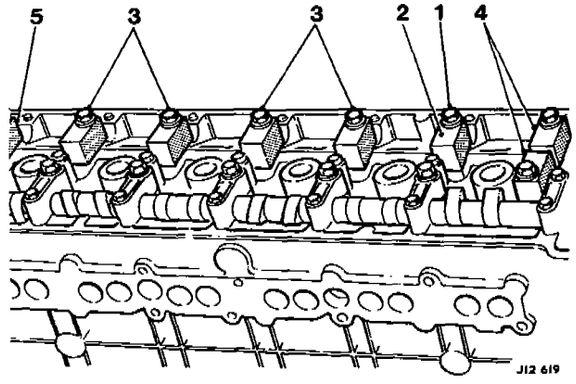


Fig 3

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AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	0.086 in
C	0.087 in
D	0.088 in
F	0.089 in
G	0.089 in
H	0.090 in
I	0.091 in
J	0.094 in
K	0.095 in
L	0.096 in
M	0.097 in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

Fit the relevant shims to the cylinder head.
Fit the LH camshaft at approximately TDC.
Lubricate Nos 1 and 7 caps.
Fit No 1 cap. Fit but do not tighten the cap securing bolts.
Remove No 7 cap cylinder head bolt.
Remove the spacer tool.
Fit No 7 cap. Fit but do not tighten the cap securing bolts.
Finally tighten Nos 1 and 7 cap securing bolts in sequence.
Remove No 4 cap cylinder head bolt and remove the spacer tool.
Lubricate and fit No 4 cap.
Fit and tighten No 4 cap securing bolts.
Fit and tighten No 4 cap cylinder head bolt.
Repeat the procedure for Nos 2, 3, 5 and 6 caps, LH camshaft.
Set the LH camshaft to TDC.
Repeat the procedure for the RH camshaft.
Fit and align the camshaft sprockets to the chain and the camshafts
Move all the slack in the chain to the tensioner side.
Fit upper chain tensioner tool 18G 1436 (2 Fig 1). Fit and tighten the tool securing bolts (1 Fig 1).
Tension the cam chain.
Remove the inner sprocket securing clip (1 Fig 2).
Remove the inner sprocket (2 Fig 2) from the outer sprocket (3 Fig 2) and align the securing bolt holes.
Fit the tab washers. Fit and tighten the securing bolts. Lock over the tabs.
Refit the inner sprocket securing clip.
Repeat the procedure for the other sprocket.
Slacken off the chain tensioner tool securing bolts.

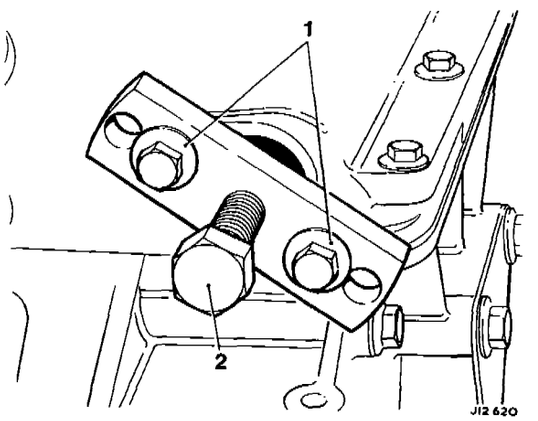


Fig 1

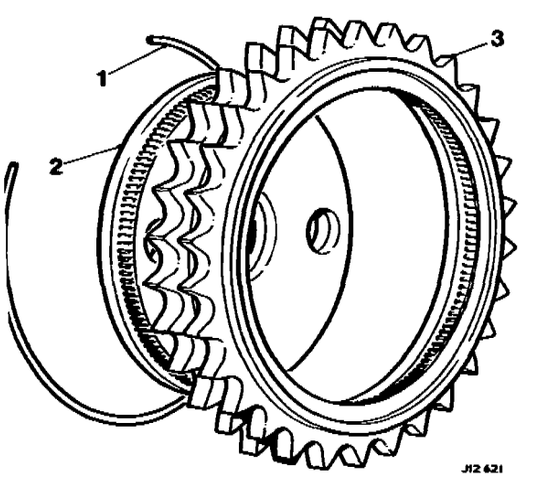


Fig 2

Remove the tensioner tool.
Clean the tensioner assembly and gasket faces.
Fit a new housing gasket. Fit a new 'O' ring. Lubricate the 'O' ring.
Fit the tensioner assembly to the cylinder head.
Fit and tighten the tensioner assembly securing bolt (4 Fig 1).
Fit but do not tighten the valve clamp bolt.
Clean the valve assembly and fit new 'O' rings.
Lubricate the tensioner valve.
Using an Allen key, release the tensioner, ie turn the Allen key anti-clockwise.
Fit the tensioner valve (3 Fig 1). Position the clamp (2 Fig 1) over the valve.
Tighten the clamp bolt (1 Fig 1).
Refit the camcover using a new gasket and half moon seals (Fig 2).
Refit the distributor, cap and leads.
Reconnect the breather hose.
Close the bonnet.

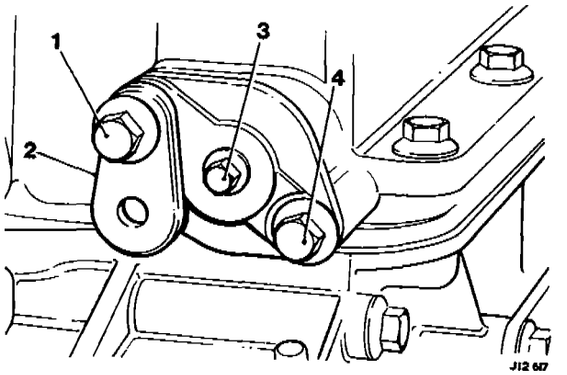


Fig 1

DATA

SERVICE TOOLS

Camshaft timing tool ***18G 1433***
Tensioner/pressure simulator ***18G 1436***
Dummy camshaft caps/spacer tool 18G ***1435***

TORQUE FIGURES

Camshaft sprocket to camshaft ***23-27Nm***
Cylinder head to cylinder block:
Tighten to 52-54Nm
Rotate clockwise through exactly 90 degrees
Distributor clamp plate to timing cover ***9.5-12Nm***
Upper chain tensioner to cylinder block ***23-27Nm***

SPANNER SIZES

6mm
8mm
10mm
13mm
17mm
19mm (SERVICE TOOL-18G 1436)

3/8in AF

10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

'O' Rings ***'PETROLEUM JELLY***
Half moon ***seals Hylosil 102***

04280

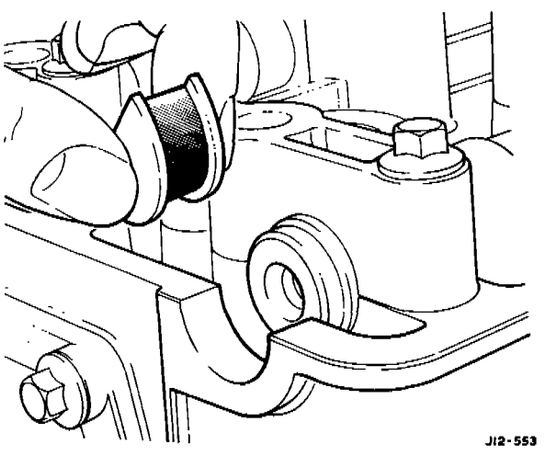


Fig 2

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CYLINDER PRESSURES

CHECK 12.25.01

Run the engine until it reaches its normal operating temperature.
Stop the engine.
Open the bonnet.
Disconnect the sparking plug leads from the sparking plugs.
Remove ALL the sparking plugs.
Fit a compression test gauge to No.1 plug hole (cylinders are numbered from the front, ie radiator end, of the engine).
Turn the ignition key to position 3 (start) and crank the engine over with the starter motor for 10 seconds.
NOTE: THE CRANKING SPEED MUST NOT DROP BELOW 300 RPM, AND THE THROTTLE MUST BE WIDE OPEN.
Make a note of the test gauge reading (Fig 1).
Remove the compression gauge and release the pressure from the gauge.
Repeat the procedure for the remaining five cylinders.
Check the gap of the sparking plug and refit to the engine.
Refit the plug leads.
Close the bonnet.

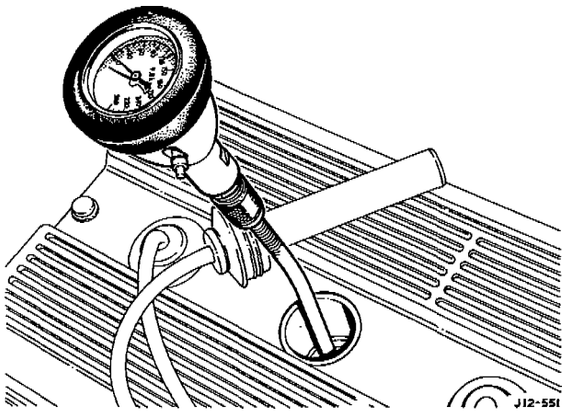


Fig 1

DATA

Compression Pressure:	
UK/European	210-230 lbf/in^2
Federal	200-220 lbf/in^2
Rest of the World	200-220 lbf/in^2
Differential between cylinders	10 lb/in^2 (MAX)

Firing order 1,5,3,6,2,4.
(No 1 situated at the front of the vehicle).
Sparking plug gap 0.035 in

TORQUE FIGURES

Sparkplug to cylinder head ***23-28 Nm***

SPANNER SIZES

13/16 in AF

04286

CYLINDER HEAD GASKET

RENEW **12.29.01**

Open the bonnet.
Remove the bonnet insulation pad. Disconnect the bonnet lamp multi plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround) for paint protection.
Slacken off the bonnet securing bolts (1 Fig 1), disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place a drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.

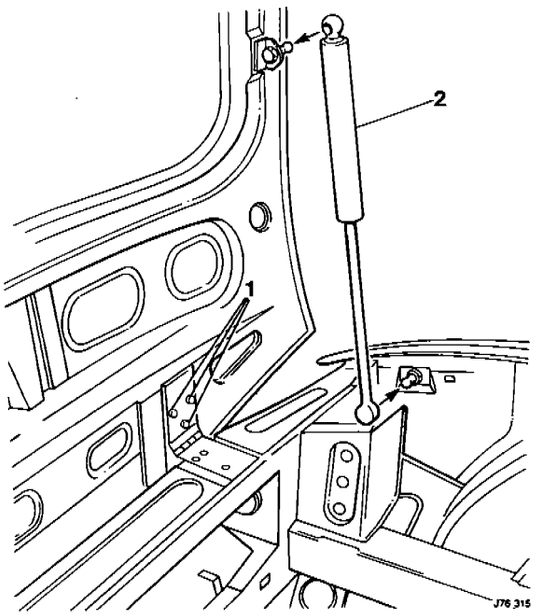


fig 1

Disconnect the hose from the intake throttle elbow.
Disconnect the breather hose from the intake elbow.
Disconnect the intake elbow hose from the throttle orifice control housing.
Remove the bolt securing the dipstick tube(s) to the inlet manifold (4 Fig 3).
Remove the oil filler tube upper mounting bracket securing bolt.
Displace the oil filler tube from the lower housing.
Disconnect the engine breather hose from the cam cover.
Disconnect the heater feed hose from the cylinder head (3 fig 3).
Remove the inlet manifold securing nuts and bolts (1,2 Fig 3).
NOTE: The securing bolt behind the oil filler tube remains captive.

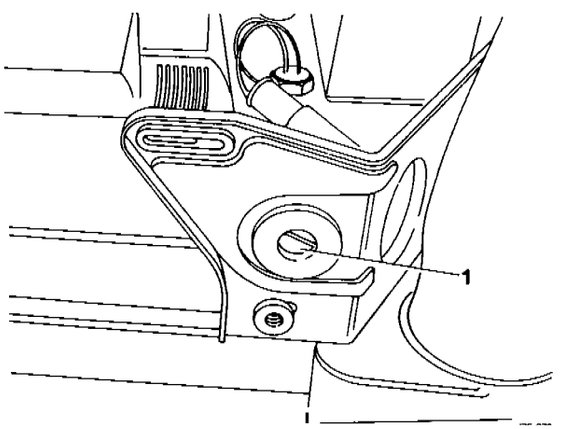


Fig 2

Remove the earth leads from the front stud.
Displace the engine harness channel mounting brackets from the studs.
Remove the oil filler tube upper mounting bracket.
Carefully lift the inlet manifold off the cylinder head.
Chock the manifold clear of the cylinder head.
Remove and discard the gasket.
Remove the thermostat housing.
Displace the distributer cap for access.
Rotate the engine to TDC number 1 cylinder.
Jack up the vehicle and support with axle stands.
Remove the exhaust mounting bracket from the gearbox.
Remove the front pipe to manifold securing nuts.
Displace the flanges from the studs and disconnect the exhaust system.

Remove the axle stands and lower the vehicle.
Disconnect the HT lead from the coil.
Disconnect the spark plug leads.
Remove the cap and leads assembly.

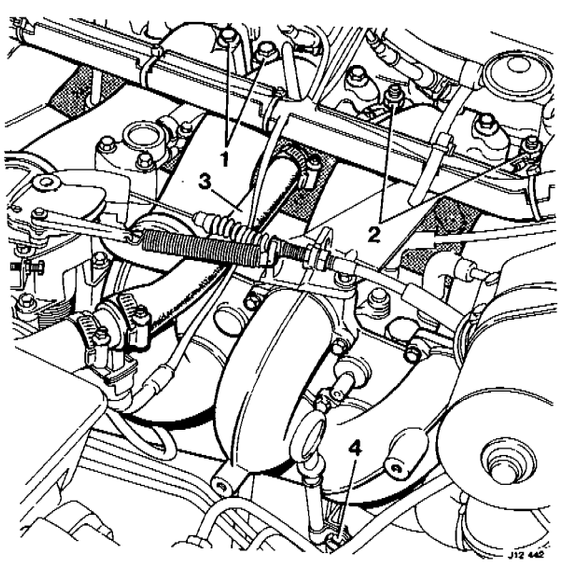


Fig 3

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Remove the camcover securing screws and remove the cover.
Remove and discard the gasket and half moon seals.
Push back the lock tabs and remove the camshaft sprocket securing bolts. Remove the tab washers.
Remove the upper chain tensioner valve clamp bolt (1 Fig 1), remove the clamp (2 Fig 1), and remove the valve (3 Fig 1).
Using a 3mm Allen key, wind back the tensioner (turn clockwise) until the snail engages in the park position.
Remove the tensioner housing securing bolt **(4** Fig **1)** and withdraw the tensioner assembly.

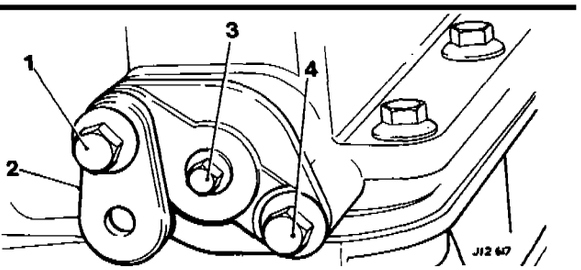


Fig 1

Note the position of the rotor arm, and remove the distributor.
Re-position the timing chain between the upper dampers.
Fit an elastic band to retain the dampers and chain.
Remove the cylinder head front securing bolts.
Re-position the hydraulic pump hose and harness mounting brackets.
Remove the remaining cylinder head securing bolts/ nuts, remove the upper static damper pedestal assembly and remove the cylinder head.
Remove and discard the head gasket.
Remove and discard the exhaust manifold sealing rings.
Place the cylinder head on suitable blocks on a bench.

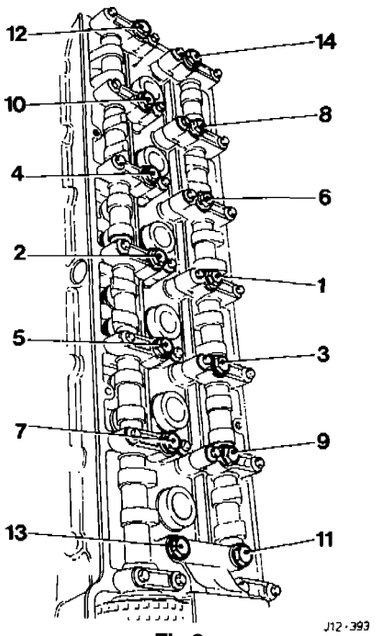


Fig 2

Clean the cylinder head thoroughly and check the cylinder head and cylinder block for warping, bowing or cracks.
Fit new exhaust down pipe sealing rings.
Fit a new cylinder head gasket.
Fit the cylinder head assembly to the engine, ensure no hoses or cables are trapped.
Refit the upper static damper assembly.

The cylinder head must be torque tightened as follows:
Following the sequence shown in (Fig 2), tighten the cylinder head bolts to 52-54Nm.
NOTE: Ensure that the camshaft is still on TDC using Service Tool 18G 1433 (Fig 3).
Rotate the bolts clockwise in sequence through exactly 90 degrees, using Special Tool LST 122 or a self-manufactured tool of the dimensions given in Fig **4.**

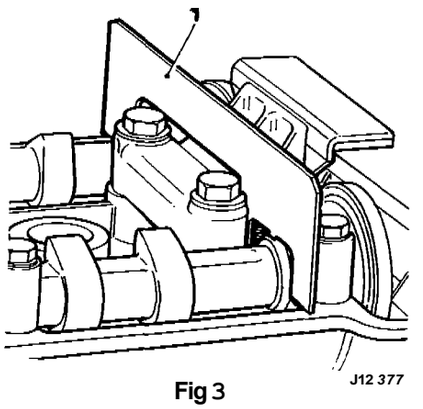


Fig 3

Fit the harness clip and hose bracket to the cylinder head front securing bolts.
Fit and tighten the front securing bolts.
Check the camshafts are set at TDC using Service Tool **18G 1433** (Fig **3).**
Raise the timing chain from between the upper dampers.
Remove the elastic band.
Re-position the chain over the camshafts.
Fit and engage the sprockets to the chain and camshafts.
Move all the chain free play to the tensioner side.

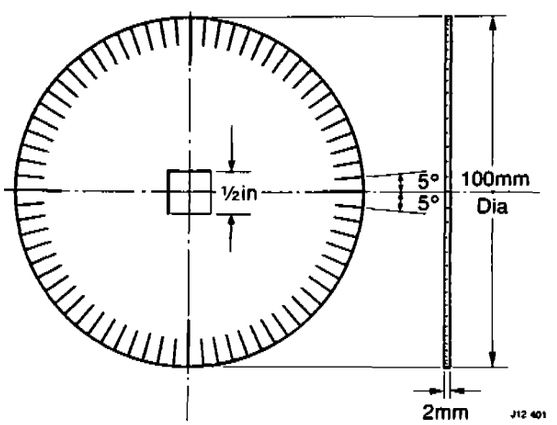


Fig 4

Fit upper chain tensioner tool **18G 1436** (2 Fig **1).** Fit and tighten the tool securing bolts **(1** Fig 1).
Tension the timing chain.

Remove the inner sprocket securing clip (1 Fig 2).
Remove the inner sprocket (2 Fig 2) from the outer sprocket (3 Fig 2) and align the securing bolt hole.
Fit the tab washers. Fit and tighten the securing bolts. Lock over the tabs.
Refit the inner sprocket securing clip.
Repeat the procedure for the other sprocket.
Release the tension on the timing chain.
Slacken off the upper chain tensioner tool securing bolts.
Remove the upper chain tensioner tool **18G 1436.**
Clean the tensioner assembly and gasket faces.
Fit a new housing gasket. Fit a new **'O'** ring. Lubricate the 'O' ring.
Fit the tensioner to the cylinder head.
Fit and tighten the tensioner assembly securing bolt (4 Fig 3).
Clean the valve assembly and fit new **'O'** rings.
Lubricate the tensioner valve.
Using an Allen key, release the tensioner, ie turn the Allen key anti-clockwise.
Fit the tensioner valve **(3** Fig 3). Position the clamp (2 Fig **3)** over the valve.
Tighten the clamp bolt **(1** Fig **3).**
Fit a new **'O'** ring to the distributor. Lubricate the **'O'** ring and driven gear.
Align the rotor arm and fit the distributor (Fig 1 page **28).**
Fit the distributor securing bolt. Do not tighten at this stage.

Apply sealant to the half moon seals (Fig 2 page 24) and fit to the cylinder head.
Fit new plug well seals and camcover gasket.
Fit and align the camcover. Fit and tighten the securing bolts.
Fit the distributor cap and leads. Connect the plug leads.
Refit the thermostat housing to the cylinder head.
Fit new inlet manifold gaskets.
Fit a new seal to the oil filler tube housing.
Re-position the manifold assembly over the studs.
Tighten the manifold captive bolt behind the oil filler tube.
Fit the oil filler tube and upper mounting bracket.
Re-position the engine harness channel mounting brackets to the inlet manifold studs.
Re-position the earth leads over the front stud.
Re-position the starter solenoid harness bracket to the rear bolt hole.
Fit and tighten the manifold securing bolts/nuts.
Reconnect the heater hose to the cylinder head.
Reconnect the breather hose to the cam cover.

Fit and tighten the oil filler tube upper mounting bracket securing bolt.
Fit **and** tighten the dipstick tube(s) mounting bracket securing bolt.

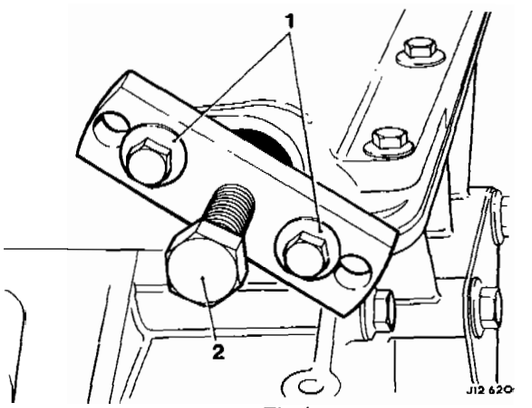


Fig 1

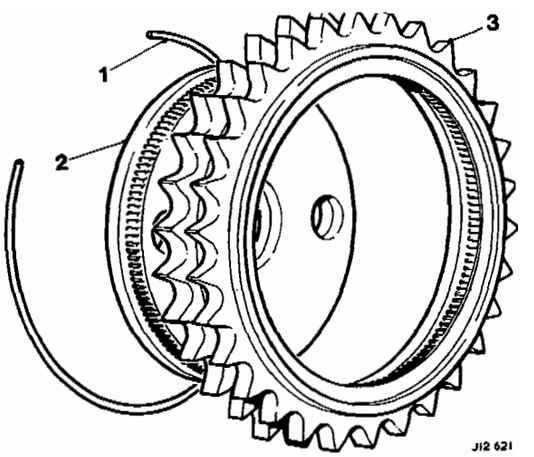


Fig 2

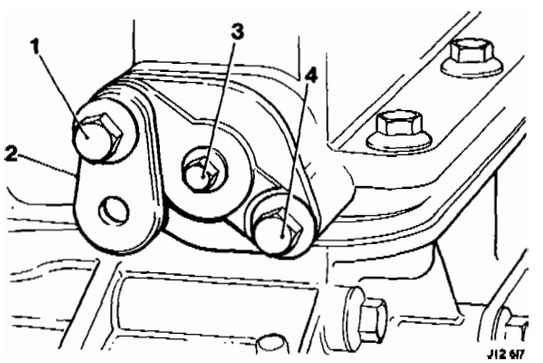


Fig 3

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Reconnect the throttle housing hose to the intake elbow.
Reconnect the breather hose to the breather pipe.
Reconnect the air valve hose to the intake elbow.
Jack up the vehicle. Support with axle stands.
Reconnect the exhaust system to the manifolds. Fit and tighten the securing nuts.
Refit the exhaust pipe to gearbox bracket. Fit and tighten the securing bolts.
Remove the stands and lower the vehicle.
Refit the air cleaner element.
Ensure that the engine is filled with the correct anti-freeze/water solution.
Refit the bonnet. Close the bonnet.

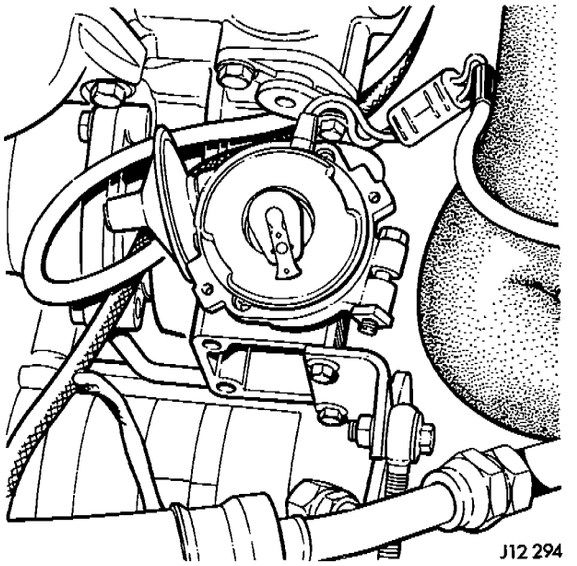


Fig 1

DATA

SERVICE TOOLS

Camshaft timing tool 18G1433
Cylinder head bolt torque tool LST122
Tensioner valve adaptor 18G1436

TORQUE FIGURES

Banjo bolt to cylinder head 13-16Nm
Camshaft cover to cylinder head (screw) 9.5-12Nm
Camshaft sprocket to camshaft 23-27Nm
Clip-hose to breather pipe 2.4Nm
Cylinder block drain plug 68-75Nm
Cylinder head to cylinder block:
Tighten in sequence to 52-54Nm
Rotate clockwise through exactly 90°
Dipstick to bracket 5-8Nm
Exhaust manifold to cylinder head 23-27Nm
Heat shield to exhaust manifold 23-27Nm
Heater pipe to cylinder head 23-27Nm
Heater pipe to inlet manifold 9.5-12Nm
Inlet manifold to cylinder head 23-27Nm
Intake elbow to throttle housing 2.4Nm

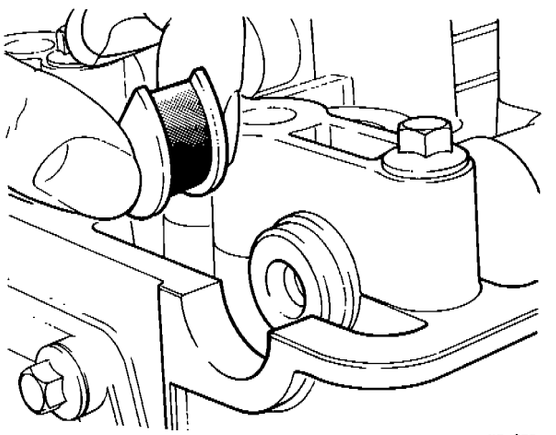


Fig 2

SPANNER SIZES

6mm
10mm
13mm
30mm
9/16in AF
5/8in AF
10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

Half moon seals to cam carrier HYLOSIL 102
Thermostat housing to extension HYLOSIL 102

04286

CYLINDER HEAD

OVERHAUL 12.29.19

Open the bonnet.
Remove the bonnet insulation pad. Disconnect the bonnet lamp multi plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround) for paint protection.
Slacken off the bonnet securing bolts (1 Fig 1), disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place a drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.

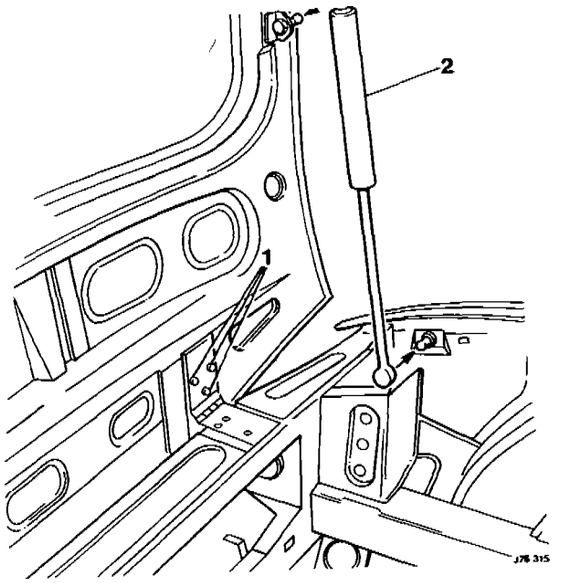


Fig 1

Disconnect the hose from the intake throttle elbow.
Disconnect the breather hose from the intake elbow.
Disconnect the intake elbow hose from the throttle orifice control housing.
Remove the bolt securing the dipstick tube(s) to the inlet manifold (4 Fig 3).
Remove the oil filler tube upper mounting bracket securing bolt.
Displace the oil filler tube from the lower housing.
Disconnect the engine breather hose from the cam cover.
Disconnect the heater feed hose from the cylinder head (3 Fig 3).
Remove the inlet manifold securing nuts and bolts (1,2 Fig 3).
NOTE: The securing bolt behind the oil filler tube remains captive.

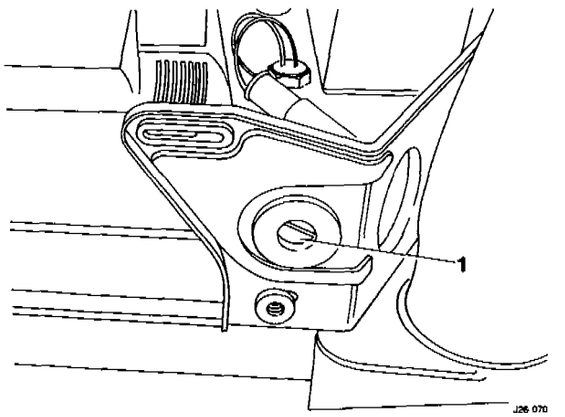


Fig 2

Remove the earth leads from the front stud.
Displace the engine harness channel mounting brackets from the studs.
Remove the oil filler tube upper mounting bracket.
Carefully lift the inlet manifold off the cylinder head.
Chock the manifold clear of the cylinder head.
Remove and discard the gasket.
Remove the thermostat housing.
Displace the distributer cap for access.
Rotate the engine to TDC number 1 cylinder.
Jack up the vehicle and support with axle stands.
Remove the exhaust mounting bracket from the gearbox.
Remove the front pipe to manifold securing nuts.
Displace the flanges from the studs and disconnect the exhaust system.

Remove the axle stands and lower the vehicle.
Disconnect the HT lead from the coil.
Disconnect the spark plug leads.
Remove the cap and leads assembly.

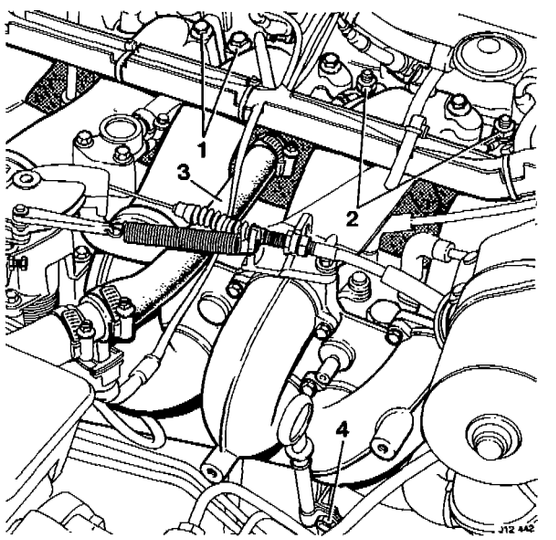


Fig 3

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Remove the camcover securing screws (1 Fig 1) and remove the cover (2 Fig 1).
Remove and discard the gasket (3 Fig 1) and half moon seals (4 Fig 1).
Push back the lock tabs and remove the camshaft sprocket securing bolts (2 Fig 2). Remove the tab washers (1 Fig 2).
Remove the upper chain tensioner valve clamp bolt (1 Fig 3), remove the clamp (2 Fig 3), and remove the valve (3 Fig 3).
Using a 3mm Allen key, wind back the tensioner (turn clockwise) until the snail engages in the park position.
Remove the tensioner housing securing bolt (4 Fig 3) and withdraw the tensioner assembly.

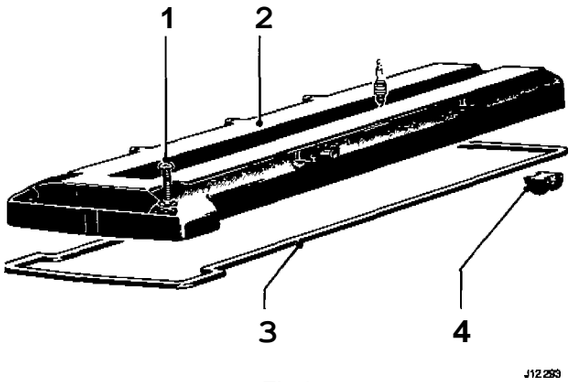


Fig 1

Note the position of the rotor arm, and remove the distributor.
Re-position the timing chain between the upper dampers.
Fit an elastic band to retain the dampers and chain.
Remove the cylinder head front securing bolts.
Re-position the hydraulic pump hose and harness mounting brackets.
Remove the remaining cylinder head securing bolts/ nuts, remove the upper static damper pedestal assembly and remove the cylinder head.
Remove and discard the head gasket.
Remove and discard the exhaust manifold sealing rings.
Place the cylinder head on suitable blocks on a bench.

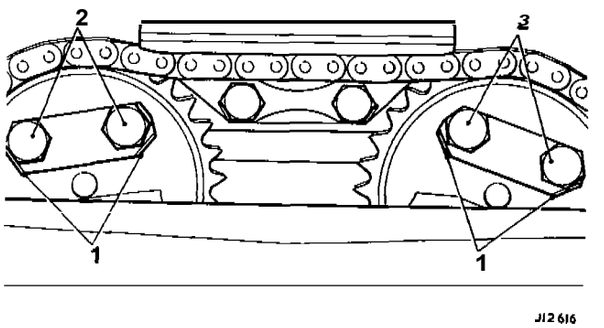


Fig 2

Remove the sparking plugs and the inlet and exhaust manifolds.
Mark the position of the camshaft caps relative to the head, remove the cap securing bolts and remove the caps (1 Fig 4).
Remove the camshafts.
Using a magnet, lift out the cam followers (Fig 1 page 31).
Support the valves using a wooden block.
Remove the valve springs, using Service Tool MS 1519A valve spring compressor.
Retrieve the collars, cotters, and spring retaining plates.
Remove the valves, noting the relationship between valve and guide to ensure correct pairing during re-assembly.

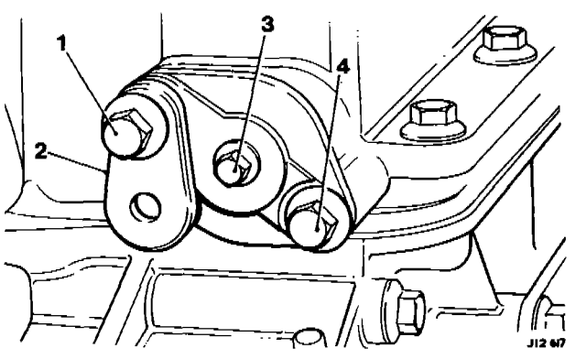


Fig 3

Remove the seals from the inlet valve guides and remove the cylinder head rear blanking plate.
Clean all component parts.
Check for wear and burning of valves or seats.
Check the cylinder head face for distortion.
If distortion is evident, a maximum of 0.025 mm (0.010 in) may be removed by skimming the cylinder head.
Taking care not to damage the inside surface of the combustion chambers, clean the inlet and exhaust ports.
NOTE: When using scrapers or wire brushes for removing carbon deposits, avoid scratching the valve faces and seats. A soft wire brush is the most suitable implement for this purpose.

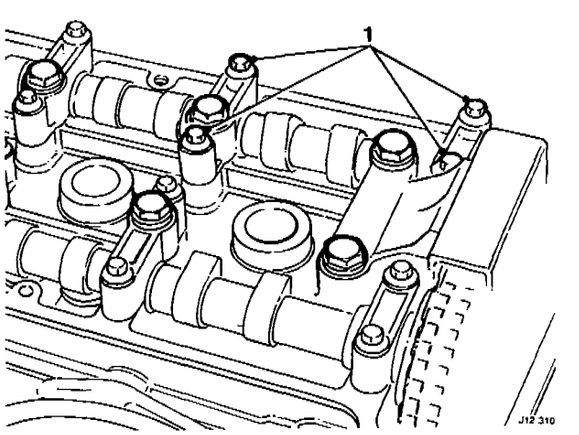


Fig 4

Clean all carbon and other deposits from the valve guide using a suitable valve guide brush.
Throughly wash the cylinder head to ensure that all loose carbon is removed and dry the head with a high pressure air line.

After cleaning and polishing each valve, examine the stems for straightness and wear, using a suitable dial gauge and V-block (Fig 2).
Examine the valve faces for burns, pitting and distortion.
Renew any valves that are excessively worn, bent, or too badly pitted to be salvaged by refacing.
NOTE: No attempt should be made to clean up a burnt or badly pitted valve face by extensive 'grinding in' of the valve to the seat.
Lightly lap the valves into the seats with a fine grinding compound. The reseating operation should leave the finished surfaces smooth.
Excessive lapping will groove the valve face resulting in a poor seat when the engine is hot.

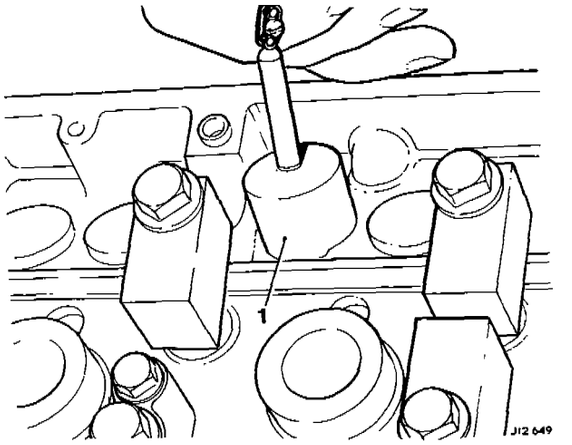


Fig 1

Fig 3 shows:
'A Correctly seated
'B' Undesirable condition
'C' Method of rectification.

To test the valves for concentricity with their seats, coat the face of the valve with 'Engineers Blue' or similar, and rotate the valve against the seat.
If the valve face is concentric with the valve stem, a mark will be made all around the face. Should a mark be made on only one side of the face, the face is not concentric with the valve stem.
Clean the valve and again coat with 'Engineers Blue' and rotate the valve against the seat.
Check that the valve guide is concentric with the valve seat, if not, the seat must be recut.
Whenever valves are replaced, the seats must be recut prior to lapping of the valves.
Check valve guide wear by inserting a new valve into the guide to be checked, lift it 3 mm (1/4) from its seat and rock it sideways.
Movement of the valve across its seat must not exceed 0.0015-0.0030 in) (A Fig 4).
Should the movement exceed this tolerance, the valve guide must be replaced, using Service Tool 18G 1432 to drift out the old guide (Fig 1 page 32).
Ensure that the relevant valve guide is selected prior to fitting (see DATA).

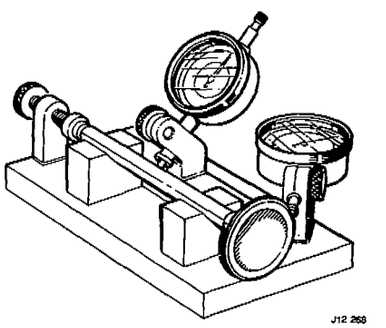


Fig 2

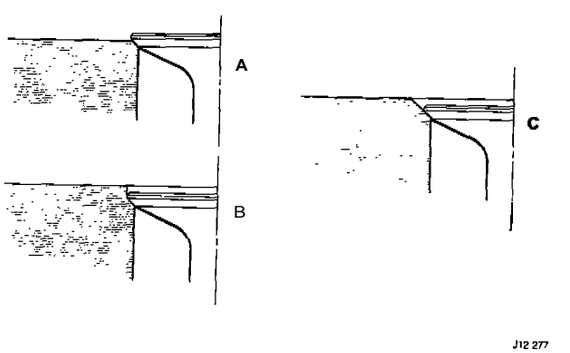


Fig 3

DATA

Replacement guides are available in two sizes and have identificat'ion grooves machined in the shank. Sizes are as follows:

First o/size 2 grooves	12.88 to 12.85 mm (0.507 to 0.506 in) diameter
Second o/size 3 grooves	13.00 to 12.98 mm (0.512 to 0.611 in) diameter

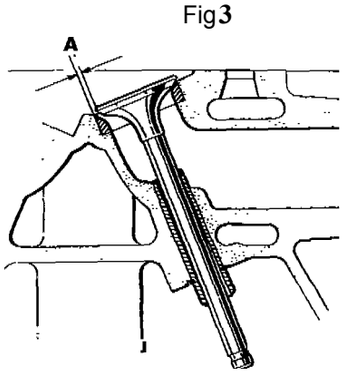


Fig 4

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When new guides are to be fitted they should always be one size larger than the old guide.
Cylinder head bores will require reaming as follows:

Remove the old valve guide and ream the cylinder head to the relevant dimension.
Immerse the cylinder head in boiling water for 30 minutes.
Coat the guide with graphite grease, and, using Service Tool 18G 1432, drift in the guide from the camshaft side until the circlip is seated in the groove (1 Fig 2).
NOTE: To fit the guide correctly, the interference should not be sufficient to cause the use of excessive force.
After fitting a valve guide, the valve seat must be recut using Service Tool MS 204 (Fig 3).
Examine the valve seat inserts for pitting or excess wear.
If renewal is necessary, proceed as follows:
Remove the inserts by machining, leaving approximately 0.25 mm (0.01in) of metal which can easily be removed by hand without damaging the cylinder head.
Measure the diameter of the insert recess in the cylinder head.
Grind down the outside diameter of the new insert to a dimension 0.08 mm (0.003 in) larger than the insert recess.
Heat the cylinder head for 30 minutes from cold to a temperature of 150°C (300°F).
Fit the insert ensuring that it beds evenly in the recess.

Recut when the cylinder head has cooled using Service **Tool** MS 204.

Correct valve seat angles are:

Inlet	Exhaust
44.1/2 degrees	44.1/2 degrees

NOTE: If new valve inserts have been fitted, the clearance between valve stem and cam must be checked; this should be 8.13 mm (0.320in) plus the valve clearance.

The dimension must be taken between the valve stem and the back of the cam.
Should this dimension not be obtained, metal must be ground from the valve seat of the insert.
NOTE: Use only suitable grinding equipment.
Remove only very small amounts of metal from the valve seat at one time before re-checking the clearance.

Examine the cam followers for wear on the top face. Check for any sign of barrelling on the side faces (Fig 1 page 33). Replace all followers that are worn or suspect.
Wash the valves, springs, collets, followers and air dry.
After the valve springs have been thoroughly washed, they must be examined for fatigue and distortion.

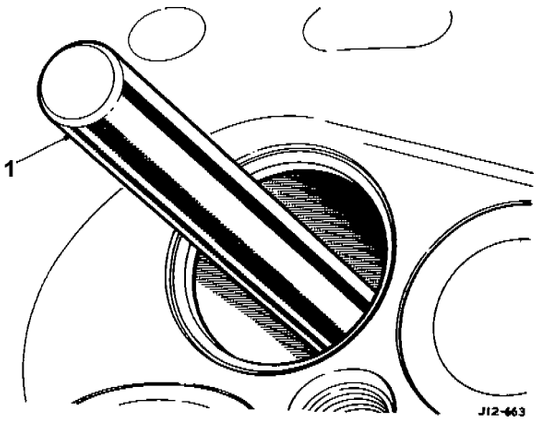


Fig 1

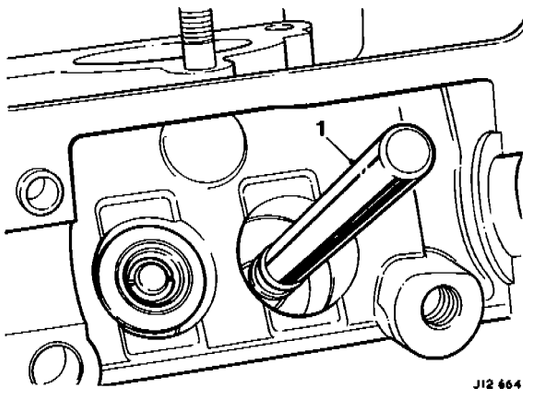


Fig 2

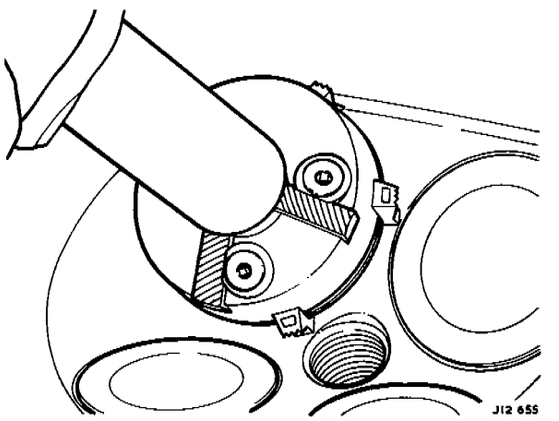


Fig 3

Test the valve springs either by comparison with the figures given below, or by comparison with a new valve spring (using a recommended valve spring testing machine).

DATA

Valve spring wire diameter:	
Inner	**12SWG (0.104in)**
Outer	**10SWG** (0.128in)
Inside diameter	0.636in inner
	0.872in outer
Total No. of coils	6 inner. 5 outer
Free length	1.734in inner
	2.103in outer
Rate	69.3lbs/in Def inner
	77.4lbs/in Def outer
Helix	Right hand

To test against a new valve spring, insert both valve springs end to end between the test equipment. Apply a load to partly compress the springs and measure their comparative lengths (Fig 2).
NOTE: 'A' is the old spring.
If the distance 'A is smaller than the distance 'B', then 'A' must be replaced.
Spring distortion is determined by positioning the spring upright on a surface plate and checking the squareness of each end with a set square (Fig 3).
All valve springs which have diminished in length and/or are not square must be discarded and replacements fitted.
Fit the valves into the guides and place the cylinder head on wooden blocks.
Fit the valve spring seats, inlet valve guide oil seals, springs and collars.
Compress the springs using Service Tool MS **1519A** and insert the split cotters.

Refit the original shims in the valve collar recesses (**1** Fig **1** page 34).
Ensure that the shims are seated correctly.
Fit the cam followers (Fig **2** page 34).
NOTE: If the cylinder head has been overhauled to the extent of having the valve seats recut, each shim should be **0.010** in. smaller than the original.
Lubricate the camshafts and fit to the cylinder head, ensuring that they are fitted with the slots to the top.
Fit the camshaft caps and torque tighten the securing bolts.
Measure the valve clearance between the heel of the camshaft and the cam followers, turning the camshaft as necessary to measure all the clearances.
The correct clearance should be:

INLET VALVES	**0.012 – 0.014**in
EXHAUST VALVES	**0.012 – 0.014**in

Make note of the actual clearances.

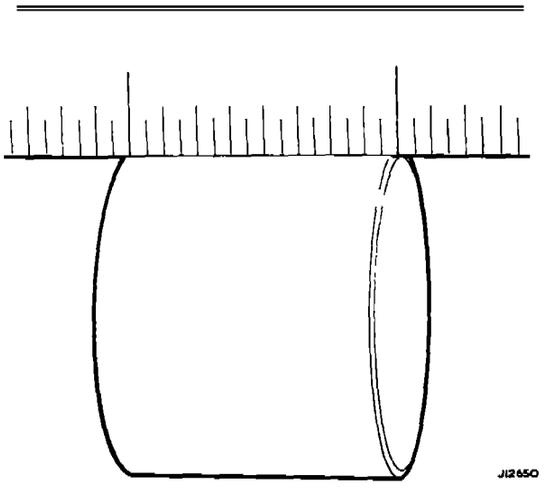


Fig **1**

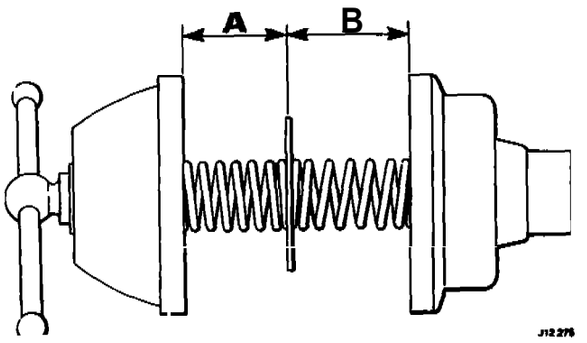


Fig 2

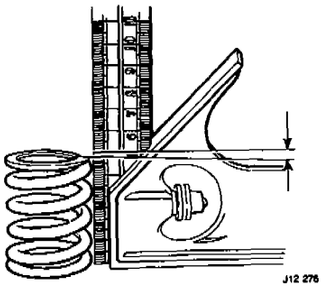


Fig **3**

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Should any of the clearances be incorrect, remove the camshaft caps, the camshaft and the cam followers.
Remove all the shims requiring adjustment, check with a micrometer the size of the existing shims and note the reading. Calculate the size of the shim required, following the examples below.

EXCESSIVE CLEARANCE	INCHES
Size of existing shim	0.100
Plus the actual clearance noted	0.019
	0.119
Less the specified valve clearance	0.013
= required shim size	0.106

INSUFFICIENT CLEARANCE	**INCHES**
Size of existing shim	0.107
Plus the actual clearance noted	0.010
	0.117
Less the specified valve clearance	0.013
= required shim size	**0.104**

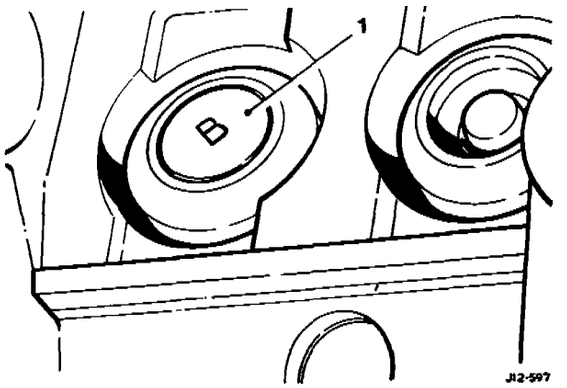


Fig 1

AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	0.086 in
C	0.087 in
D	0.088 in
E	0.089 in
F	0.090 in
G	0.091 in
H	0.092 in
I	0.093 in
J	0.094 in
K	0.095 in
L	0.096 in
M	0.097 in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

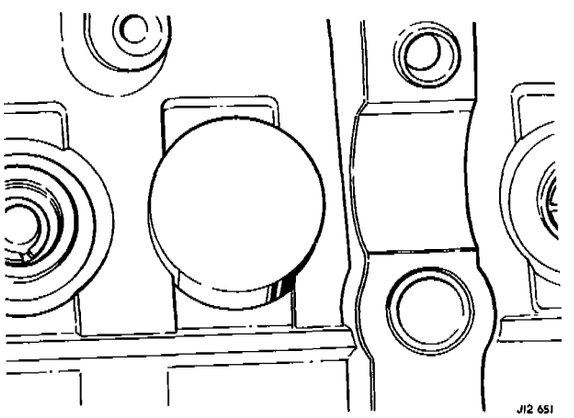


Fig 2

Fit the cam followers, refit the camshaft, the camshaft caps and recheck the valve clearances.
NOTE: A final check of the valve clearances should be done when the cylinder head is fitted and torque tightened to the cylinder block.

Clean the cylinder head thoroughly and check the cylinder head and cylinder block *for* warping, bowing or cracks.

Fit new exhaust down pipe sealing rings.
Fit a new cylinder head gasket.
Fit the cylinder head assembly to the engine, ensure no hoses or cables are trapped.
Refit the upper static damper assembly.

The cylinder head must be torque tightened as follows:
Following the sequence shown in (Fig 1). tighten the cylinder head bolts to 52-54Nm.
NOTE: Ensure that the camshaft is still on TDC using Service Tool 18G 1433 (Fig 2).
Then rotate the bolts clockwise in sequence through exactly 90 degrees, using Special Tool LST 122 or a self-manufactured tool of the dimensions given in Fig 3.

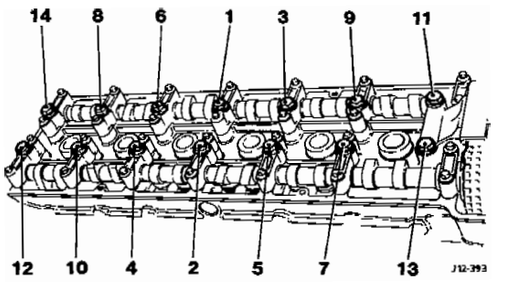


Fig 1

fit the harness clip and hose bracket to the cylinder head front securing bolts.
Fit and tighten the front securing bolts.
Check the camshafts are set at TDC using Service Tool 18G 1433 (Fig 2).
Raise the timing chain from between the upper dampers.
Remove the elastic band.
Re-position the chain over the camshafts.
Fit and engage the sprockets to the chain and camshafts.
Move all the chain free play to the tensioner side.

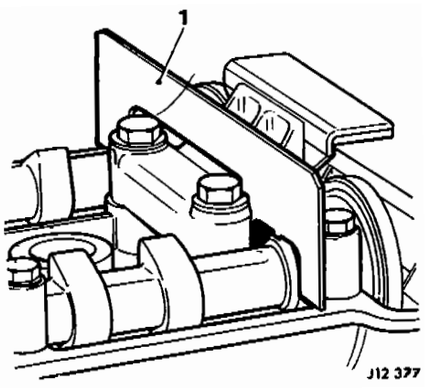


Fig 2

Fit upper chain tensioner tool 18G 1436 (2 Fig 4). Fit and tighten the tool securing bolts (1 Fig 4).
Tension the timing chain.

Remove the inner sprocket securing clip (1 Fig 1 page 36).
Remove the inner sprocket (2 Fig 1 page 36) from the outer sprocket (3 Fig 1 page 36) and align the securing bolt holes.
Fit the tab washers. Fit and tighten the securing bolts. Lock over the tabs.
Refit the inner sprocket securing clip.
Repeat the procedure for the other sprocket.
Release the tension on the timing chain.
Slacken off the upper chain tensioner tool securing bolts.
Remove the upper chain tensioner tool 18G 1436.
Clean the tensioner assembly and gasket faces.
Fit a new housing gasket. Fit a new 'O' ring. Lubricate the 'O' ring.
Fit the tensioner to the cylinder head.
Fit and tighten the tensioner assembly securing bolt (4 Fig 2 page 36).
Clean the valve assembly and fit new 'O' rings.
Lubricate the tensioner valve.
Using an Allen key, release the tensioner, ie turn the Allen key anti-clockwise.
Fit the tensioner valve (3 Fig 2 page 36). Position the clamp (2 Fig 2 page 36) over the valve.
Tighten the clamp bolt (1 Fig 2 page 36).
Fit a new 'O' ring to the distributor. Lubricate the 'O' ring and driven gear.

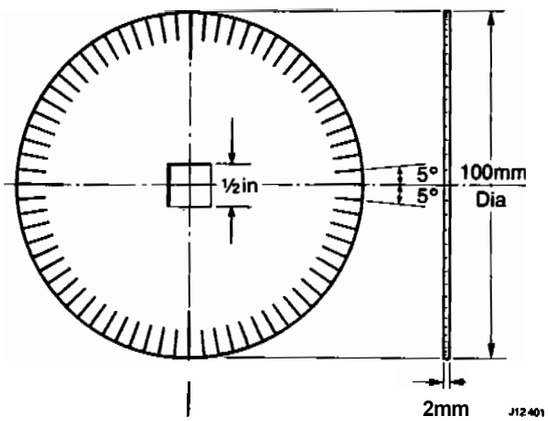


Fig 3

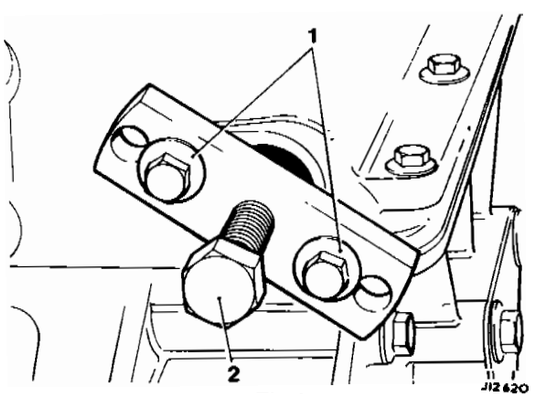


Fig 4

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Align the rotor arm and fit the distributor (Fig 3).
Fit the distributor securing bolt. Do not fully tighten at this stage.

Apply sealant to the half moon seals (Fig 1 page 33) and fit to the cylinder head.
Fit new plug well seals and camcover gasket.
Fit and align the camcover. Fit and tighten the securing bolts.
Fit the distributor cap and leads. Connect the plug leads.
Refit the thermostat housing to the cylinder head.
Fit new inlet manifold gaskets.
Fit a new seal to the oil filler tube housing.
Re-position the manifold assembly over the studs.
Tighten the manifold captive bolt behind the oil filler tube.
Fit the oil filler tube and upper mounting bracket.
Re-position the engine harness channel mounting brackets to the inlet manifold studs.
Re-position the earth leads over the front stud.
Re-position the starter solenoid harness bracket to the rear bolt hole.
Fit and tighten the manifold securing bolts/nuts.
Reconnect the heater hose to the cylinder head.
Reconnect the breather hose to the cam cover.

Fit and tighten the oil filler tube upper mounting bracket securing bolt.
Fit and tighten the dipstick tube(s) mounting bracket securing bolt.

Reconnect the throttle housing hose to the intake elbow.
Reconnect the breather hose to the breather pipe.
Reconnect the air valve hose to the intake elbow.
Jack up the vehicle. Support with axle stands.
Reconnect the exhaust system to the manifolds. Fit and tighten the securing nuts.
Refit the exhaust pipe to gearbox bracket. Fit and tighten the securing bolts.
Remove the stands and lower the vehicle.
Refit the air cleaner element.
Ensure that the engine is filled with the correct anti-freeze/water solution.
Refit the bonnet.
Close the bonnet.

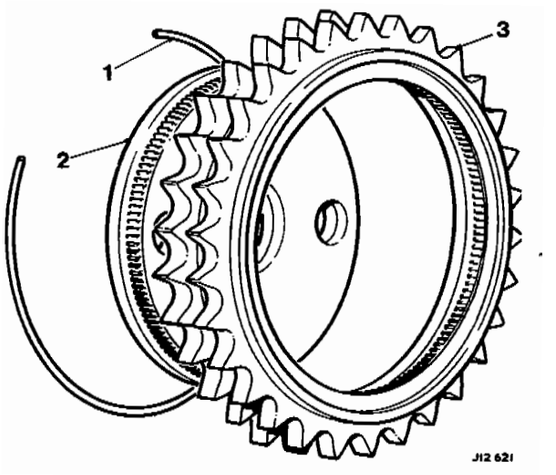


Fig 1

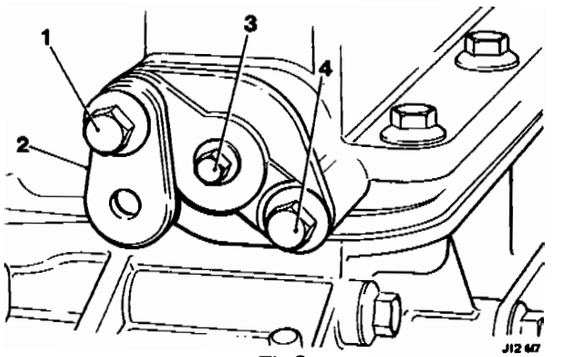


Fig 2

DATA

SERVICE TOOLS

18G 1432 Valve guide remover/replacer
18 61433 Camshaft timing tool
18G 1436 Tensioner valve adaptor
LST122 Cylinder head bolt torque tool
MS 1519A Valve spring compressor
MS 204 Valve seat cutter

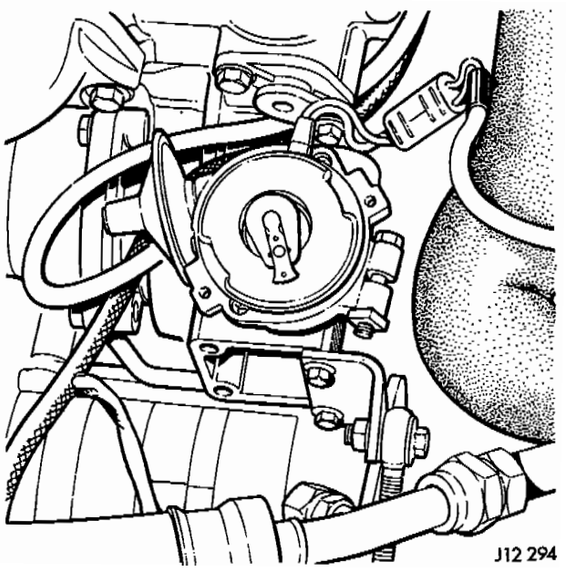


Fig 3

TORQUE FIGURES

Banjo bolt to cylinder head 13- 16Nm
Camshaft cover to cylinder head (screw) 9.5-12Nm
Camshaft sprocket to camshaft 23-27Nm
Clip-hose to breather pipe 2.4Nm
Cylinder block drain plug to block 68-75Nm
Cylinder head to cylinder block:
Tighten in sequence to 52-54Nm
Rotate clockwise through exactly 90°
Dipstick to bracket 5-8Nm
Exhaust manifold to cylinder head 23-27Nm
Heat shield to exhaust manifold 23-27Nm
Heater pipe to cylinder head 23-27Nm
Heater pipe to inlet manifold 9.5-12Nm
Inlet manifold to cylinder head 23-27Nm
Intake elbow to throttle housing 2.4Nm

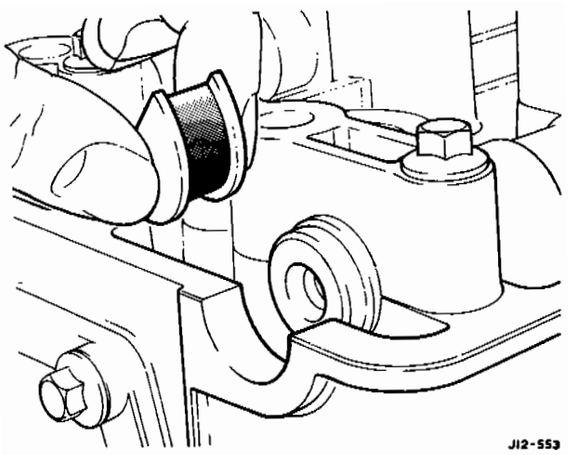


Fig 1

SPANNER SIZES

6mm
10mm
13mm
30mm
9/16in AF
5/8in AF
10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

Half moon seals to cam carrier 'HYLOSIL 102'
Thermostat housing to extension 'HYLOSIL 102'

04286

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CYLINDER HEAD CASTING

RENEW **12.29.15**

Open the bonnet.
Remove the bonnet insulation pad. Disconnect the bonnet lamp multi plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround) for paint protection.
Slacken off the bonnet securing bolts (**1** Fig 1), disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place a drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.

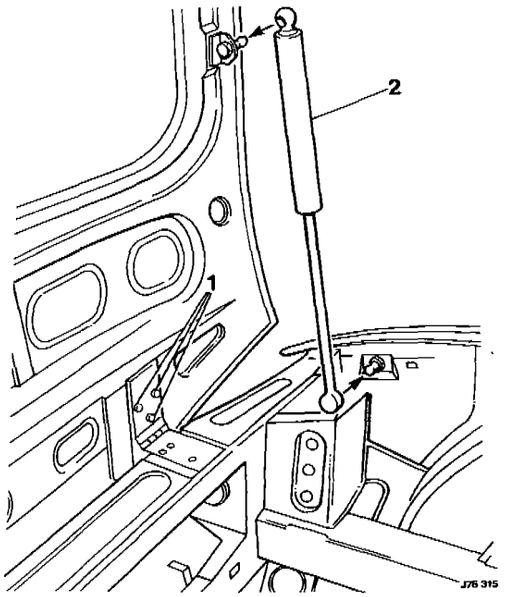


Fig 1

Disconnect the hose from the intake throttle elbow.
Disconnect the breather hose from the intake elbow.
Disconnect the intake elbow hose from the throttle orifice control housing.
Remove the bolt securing the dipstick tube(s) to the inlet manifold (4 Fig 3).
Remove the oil filler tube upper mounting bracket securing bolt.
Displace the oil filler tube from the lower housing.
Disconnect the engine breather hose from the cam cover.
Disconnect the heater feed hose from the cylinder head (3 Fig **3**).
Remove the inlet manifold securing nuts and bolts (1,2 Fig 3).
NOTE: The securing bolt behind the oil filler tube remains captive.

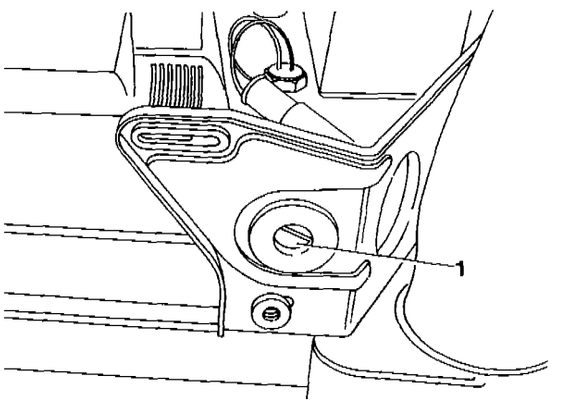


Fig 2

Remove the earth leads from the front stud.
Displace the engine harness channel mounting brackets from the studs.
Remove the oil filler tube upper mounting bracket.
Carefully lift the inlet manifold off the cylinder head.
Chock the manifold clear of the cylinder head.
Remove and discard the gasket.
Remove the thermostat housing.
Displace the distributer cap for access.
Rotate the engine to TDC number 1 cylinder.
Jack up the vehicle and support with axle stands.
Remove the exhaust mounting bracket from the gearbox.
Remove the front pipe to manifold securing nuts.
Displace the flanges from the studs and disconnect the exhaust system.

Remove the axle stands and lower the vehicle.
Disconnect the HT lead from the coil.
Disconnect the spark plug leads.
Remove the cap and leads assembly.

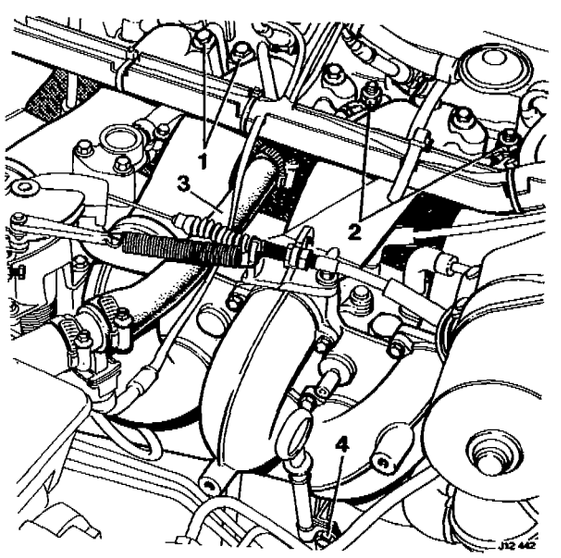


Fig 3

Remove the camcover securing screws (1 Fig 1) and remove the cover (2 Fig 1).
Remove and discard the gasket (3 Fig 1) and half moon seals (4 Fig 1).
Push back the lock tabs and remove the camshaft sprocket securing bolts (2 Fig 2). Remove the tab washers (1 Fig 2).
Remove the upper chain tensioner valve clamp bolt (1 Fig 3), remove the clamp (2 Fig 3), and remove the valve (3 Fig 3).
Using a 3mm Allen key, wind back the tensioner (turn clockwise) until the snail engages in the park position.
Remove the tensioner housing securing bolt (4 Fig 3) and withdraw the tensioner assembly.

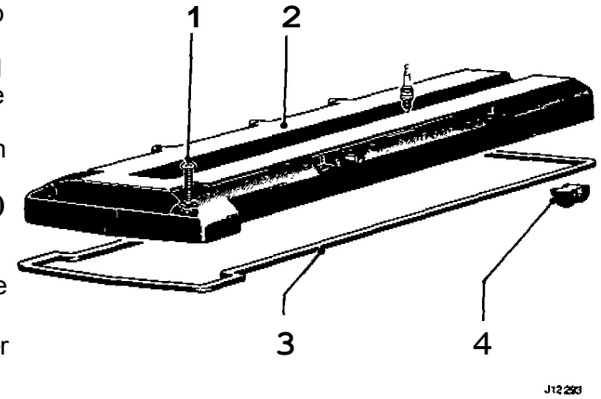


Fig 1

Note the position of the rotor arm, and remove the distributor.
Re-position the timing chain between the upper dampers.
Fit an elastic band to retain the dampers and chain.
Remove the cylinder head front securing bolts.
Re-position the hydraulic pump hose and harness mounting brackets.
Remove the remaining cylinder head securing bolts/ nuts, remove the upper static damper pedestal assembly and remove the cylinder head.
Remove and discard the head gasket.
Remove and discard the exhaust manifold sealing rings.
Place the cylinder head on suitable blocks on a bench.

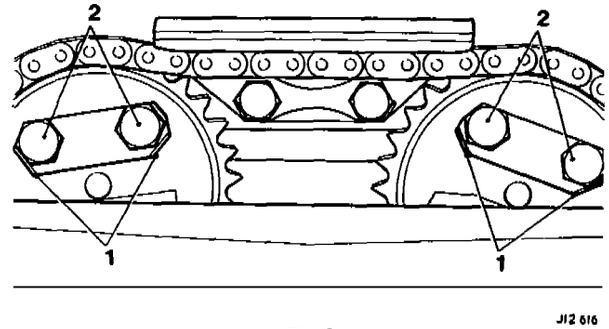


Fig 2

Remove the spark plugs.
Remove the inlet camshaft cap securing bolts.
Remove the camshaft caps.
Remove the camshaft.
Repeat the procedure for the exhaust camshaft.
Remove the cam followers and shims, noting the positions for re-assembly.
Remove the valves using Service Tool MS 1519A valve spring compressor.
Remove the seals from the inlet valve guides.
Remove the rear blanking plate.
Clean all components and examine for wear and damage.
Replace any worn or damaged parts as necessary.
Clean thoroughly the new cylinder head casting.
Refit the rear blanking plate to the new cylinder head.
Smear fine grinding compound on to the face of one valve.
Oil the valve stem.
Fit the valve to the head.
Lightly lap the valves into the seats, leaving a smooth finish to both surfaces.

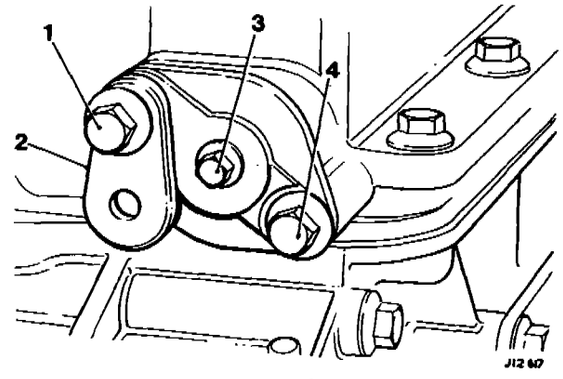


Fig 3

NOTE: Excessive lapping will groove the valve face, resulting in poor seating when hot.
Clean the valve and seat.
Repeat the procedure for the remaining valves.
Fit a new seal to the inlet valve guide.
Lubricate the valve stem.
Fit the valve to the guide.
Fit the spring seat, spring and collar.

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Fit Service Tool MS 1519A spring compressor to the valve.
Compress the valve spring, fit and seat the collets, and release the clamp.
Repeat the procedure for the remaining valves.
Refit the shims.
Ensure that the shims are fitted correctly, not as shown in Fig 1.

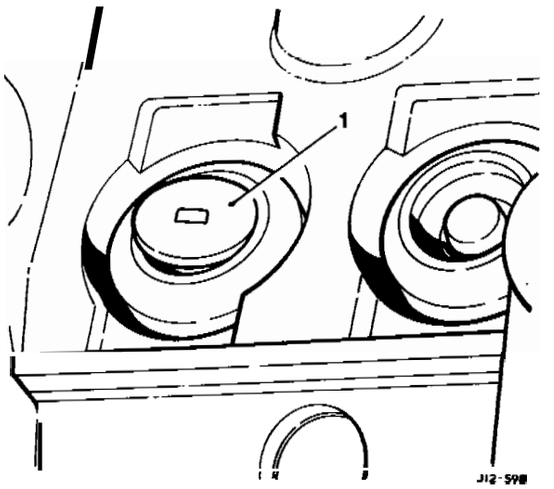


Fig 1

Lubricate and fit the cam followers (Fig 2).
Lubricate the camshafts and bearings.
Fit the camshafts.
Fit the camshaft caps.
Fit and torque tighten the camshaft cap securing bolts.
Measure the valve clearance between the heel of the camshaft and the cam followers (Fig 3), turning the camshaft as necessary to measure all the clearances.

The correct clearance should be:

INLET VALVES	0.012 – 0.014in
EXHAUST VALVES	0.012 – 0.014in

Make note of the actual clearances.
Should any of the clearances be incorrect, remove the camshaft caps, the camshaft and the cam followers.
Remove all the shims requiring adjustment, check with a micrometer the sire of the existing shims and note the reading.
Calculate the size of the shim required, following the examples below.

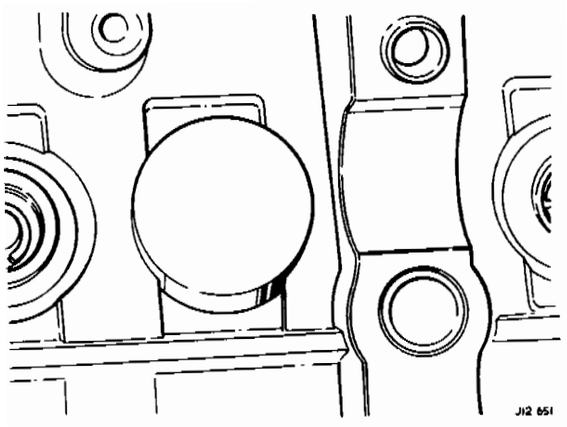


Fig 2

EXCESSIVE CLEARANCE	**INCHES**
Size of existing shim	0.100
Plus the actual clearance noted	0.019
	0.119
Less the specified valve clearance	0.013
= required shim sire	**0.106**

INSUFFICIENT CLEARANCE	**INCHES**
Sine of existing shim	0.107
Plus the actual clearance noted	0.010
	0.117
Less the specified valve clearance	0.013
= required shim size	0.104

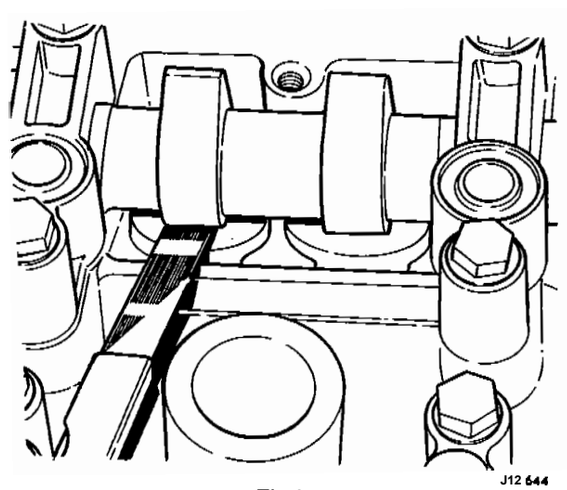


Fig 3

AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	0.086 in
C	0.087 in
D	0.088 in
E	0.089 in
F	0.090 in
G	0.091 in
H	0.092 in
I	0.093 in
J	0.094 in
K	0.095 in
L	0.096 in
M	0.097 in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

NOTE: A final check of the valve clearances should be done when the cylinder head is fitted and torque tightened to the cylinder block.

Clean the cylinder head thoroughly and check the cylinder head and cylinder block for warping, bowing or cracks.
Fit new exhaust down pipe sealing rings.
Fit a new cylinder head gasket.
Fit the cylinder head assembly to the engine, ensure no hoses or cables are trapped.
Refit the upper static damper assembly.

The cylinder head must be torque tightened as follows:
Following the sequence shown in (Fig 1). tighten the cylinder head bolts to 52-54Nm.
NOTE: Ensure that the camshaft is still on TDC using Service Tool 18G 1433 (Fig 2).
Rotate the bolts clockwise in sequence through exactly 90 degrees, using Special Tool LST 122 or a self-manufactured tool of the dimensions given in Fig 3.

Fit the harness clip and hose bracket to the cylinder head front securing bolts.
Fit and tighten the front securing bolts.
Check the camshafts are set at TDC using Service Tool 18G 1433 (Fig 2).
Raise the timing chain from between the upper dampers.
Remove the elastic band.
Re-position the chain over the camshafts.
Fit and engage the sprockets to the chain and camshafts.
Move all the chain free play to the tensioner side.

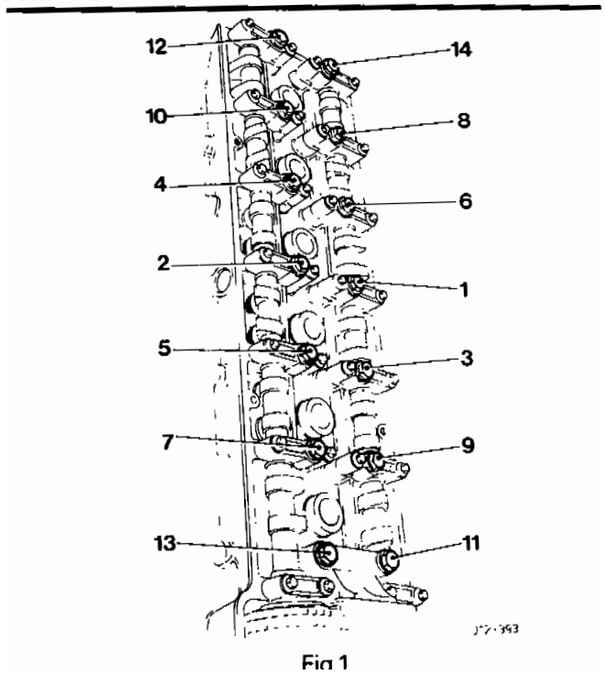


Fig 1

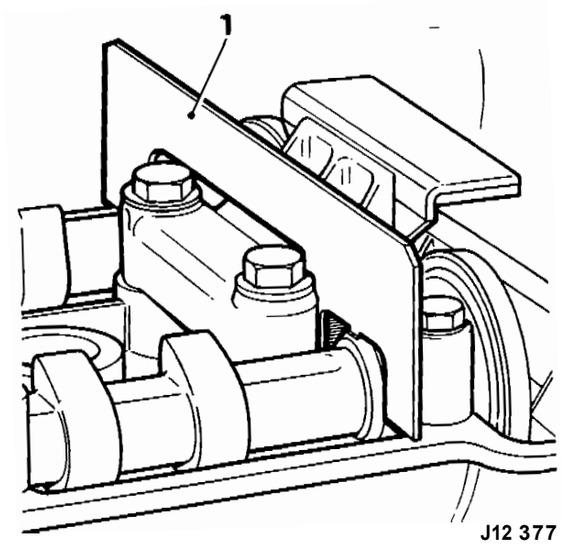


Fig 2

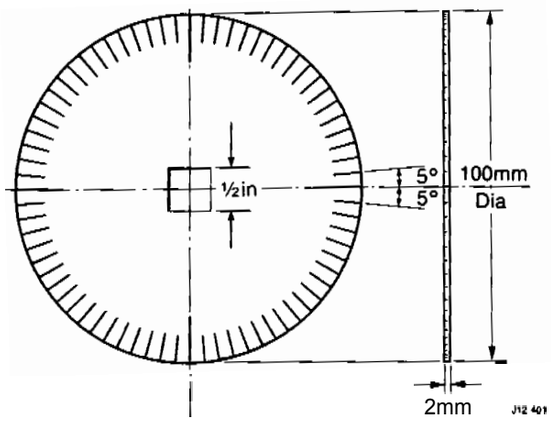


Fig 3

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Fit upper chain tensioner tool **18G** 1436 (2 Fig 1). Fit and tighten the tool securing bolts (1 Fig 1).
Tension the timing chain.

Remove the inner sprocket securing clip (1 **Fig** 2).
Remove the inner sprocket (2 Fig 2) from the outer sprocket (3 Fig **2)** and align the securing bolt holes.
Fit the tab washers. Fit and tighten the securing bolts.
Lock over the tabs.
Refit the inner sprocket securing clip.
Repeat the procedure for the other sprocket.
Release the tension on the timing chain.
Slacken off the upper chain tensioner tool securing bolts.
Remove the upper chain tensionsr tool 18G 1436.
Clean the tensioner assembly and gasket faces.
Fit a new housing gasket. Fit a new **'O'** ring. Lubricate the 'O' ring.
Fit the tensioner to the cylinder head.
Fit and tighten the tensioner assembly securing bolt (4 Fig 3).
Clean the valve assembly and fit new **'O'** rings.
Lubricate the tensioner valve.
Using an Allen key, release the tensioner, ie turn the Allen key anti-clockwise.
Fit the tensioner valve (3 Fig 3). Position the clamp (2 Fig 3) over the valve.
Tighten the clamp bolt (1 Fig 3).
Fit a new **'O'** ring to the distributor. Lubricate the **'O'** ring and driven gear.

Align the rotor arm and fit the distributor (Fig I page 39).
Fit the distributor securing bolt. Do not tighten at this stage.

Apply sealant to the half moon seals (Fig 2 page 39) and fit to the cylinder head.
Fit new plug well seals and camcover gasket.
Fit and align the camcover. Fit and tighten the securing bolts.
Fit the distributor cap and leads. Connect the plug leads.
Refit the thermostat housing to the cylinder head.
Fit new inlet manifold **gaskets.**
Fit a new seal to the oil filler tube housing.
Re-position the manifold assembly over the studs.
Tighten the manifold captive bolt behind the oil filler tube.
Fit the oil filler tube and upper mounting bracket.
Re-position the engine harness channel mounting brackets to the inlet manifold studs.
Re-position the earth leads over the front stud.
Re-position the starter solenoid harness bracket **to** the rear bolt hole.
Fit and tighten the manifold securing bolts/nuts.
Reconnect the heater hose to the cylinder head.
Reconnect the breather hose to the cam cover.

Fit and tighten the oil filler tube upper mounting bracket securing bolt.
Fit and tighten the dipstick tube(s) mounting bracket securing bolt.

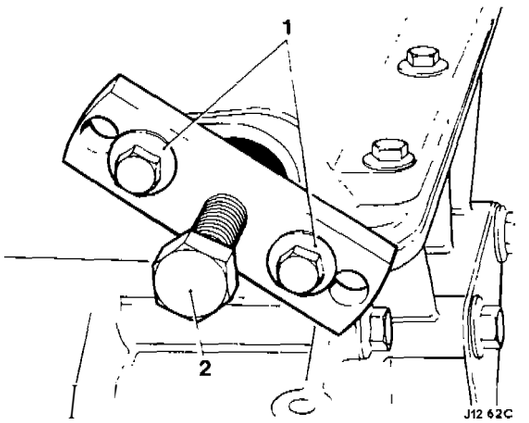


Fig 1

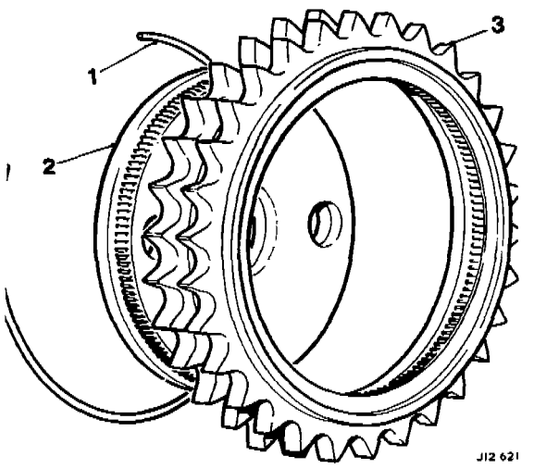


Fig 2

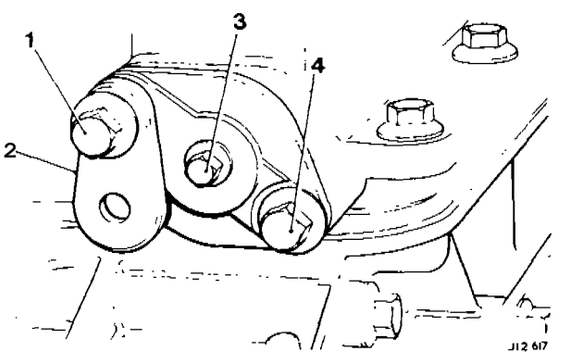


Fig 3

Reconnect the throttle housing hose to the intake elbow.
Reconnect the breather hose to the breather pipe.
Reconnect the air valve hose to the intake elbow.
Jack up the vehicle. Support with axle stands.
Reconnect the exhaust system to the manifolds. Fit and tighten the securing nuts.
Refit the exhaust pipe to gearbox bracket. Fit and tighten the securing bolts.
Remove the stands and lower the vehicle.
Refit the air cleaner element.
Ensure that the engine is filled with the correct anti-freeze/water solution.
Refit the bonnet. Close the bonnet.

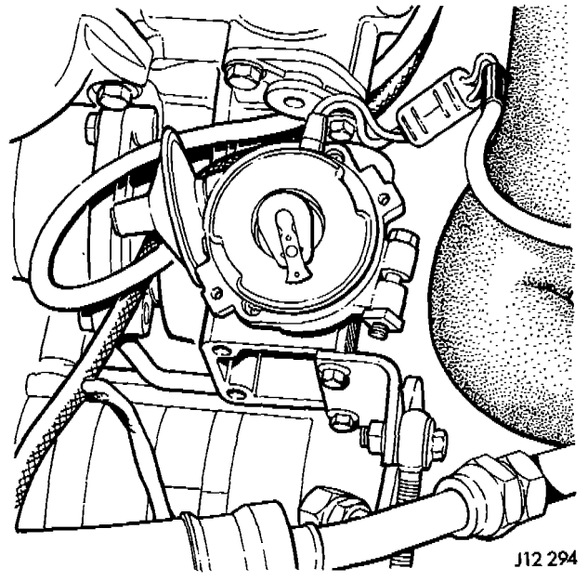


Fig 1

DATA

SERVICE TOOLS

Camshaft timing tool **18G1433**
Cylinder head bolt torque tool **LST 122**
Tensioner valve adaptor **18G 1436**
Valve guide remover/replacer **1861432**
Valve seat cutter **MS 204**
Valve spring Compressor **MS 1519A**

TORQUE FIGURES

Banjo bolt to cylinder **head 13-16Nm**
Camshaft cover to cylinder head (screw) **9.5-12Nm**
Camshaft sprocket to camshaft **23-27Nm**
Clip-hose to breather pipe **2.4Nm**
Cylinder block drain plug **to** *cylinder block* **68-75Nm**
Cylinder head to cylinder **block:**
Tighten in sequence to **52-54Nm**
Rotate clockwise through exactly 90°
Dipstick to bracket **5-8Nm**
Exhaust manifold to cylinder head **23-27Nm**
Heat shield to exhaust manifold **23-27Nm**
Heater *pipe to cylinder head* **23-27Nm**
Heater pipe to inlet manifold **9.5-12Nm**
Inlet manifold **to** *cylinder head* **23-27Nm**
Intake elbow to throttle housing **2.4Nm**

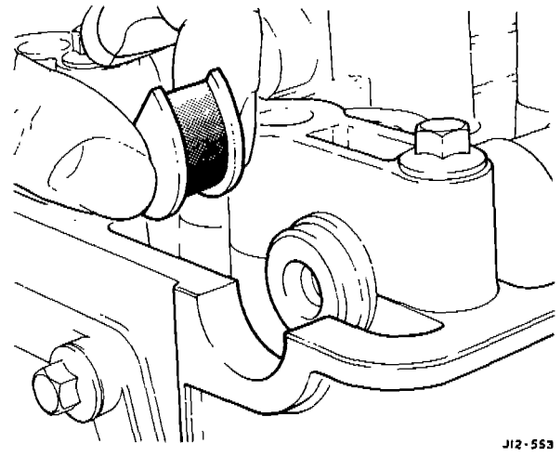


Fig 2

SPANNER SIZES

6mm
10mm
13mm
30mm
9/16in AF
5/8in AF
10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

Half moon seals to cam carrier **HYLOSIL 102**
Thermostat housing to extension piece **HYLOSIL 102**

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PISTONS AND CONNECTING ROD ENGINE SET

RENEW 12.17.03

Remove the engine and gearbox/transmission unit from the vehicle 12.41.01/2 page 77.
Detach the gearbox/transmission unit from the engine.
Fit the engine to a stand.
Remove the cylinder head 12.29.02 page 25.
Remove and discard the head gasket.
Remove the sump securing bolts, and remove the sump.
Place a drain tray under the transfer housing, remove the housing/filter assembly (1,2,5 Fig 1).
Remove the pick-up pipes (3 Fig 1), push back the lock tabs (1 Fig 2) and remove the oil pump sprocket bolts (2 Fig 2).
Remove the oil pump drive sprocket (3 Fig 2), tab washers (4 Fig 2) and shims.
Remove the oil pump securing bolts and remove the pump.
Remove the windage trays securing bolts.
Remove the windage trays.
Remove the big-end connecting rod nuts (1 Fig 3) in connecting rod pairs (1 & 6,2 & 5,3 & 4 cylinders), and remove the con rod caps (2 Fig 3). Note the position of the cap to con rod.
Push the pistons up and through the top of the cylinder block.
Remove the gudgeon pin circlips (1 Fig 4) from each piston, remove the gudgeon pin (2 Fig 4) and separate the piston (3 Fig 4) from the connecting rod (4 Fig 4).

Check the connecting rods for out of balance, twist and bend.
If any connecting rod is bent, twisted or out of balance with the other five, then the complete set must be. renewed.
Insert each new piston ring into the cylinder bore (1 Fig 1 page 45) ensuring they are square in the cylinders and check the gap using a feeler gauge (2 Fig 1 page 45).
If the gap is insufficient, then a small flat file can be used on the butting ends of the ring. Ensure that after filing no burrs remain.
Lubricate the small end bush and slide the gudgeon pin through the new piston and connecting rod.
Secure with new circlips. Never re-use old circlips.
Fit the rings to the' pistons ensuring that gaps are positioned as in (Fig 2 page 45).
Lubricate and compress the rings using Service Tool 18G 55A (Fig 3 page 45).
Insert the piston skirt into the bore, and using a suitable implement, ie a wooden hammer shaft, gently tap the piston into the cylinder bore.
Ensure that the connecting rod does not foul either the cylinder block or crankshaft.

Lubricate and fit the big end bearing shells to the connecting rod and the connecting rod cap. Pull the connecting rod and bearing carefully onto the crankshaft and fit the connecting rod cap to the rod.

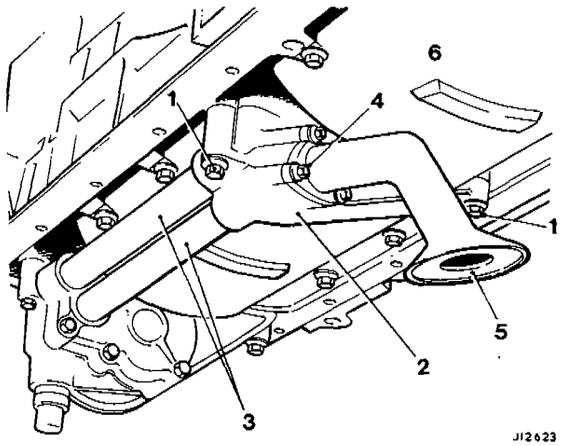


Fig 1

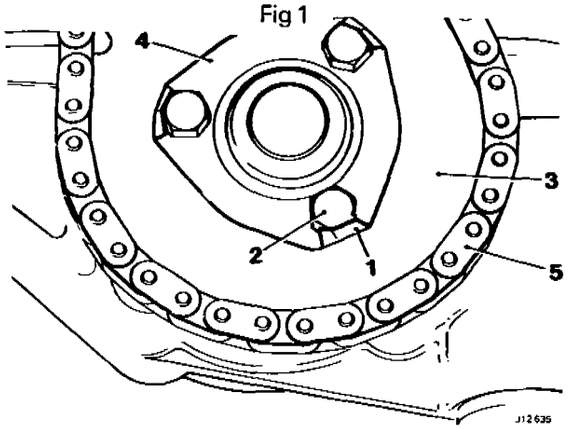


Fig 2

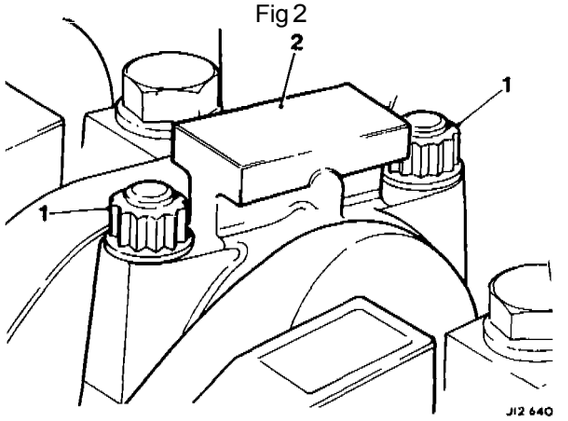


Fig 3

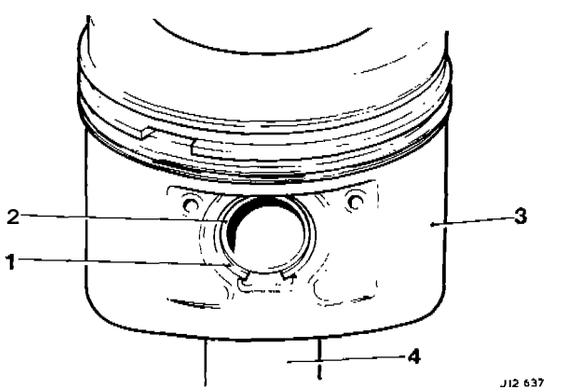
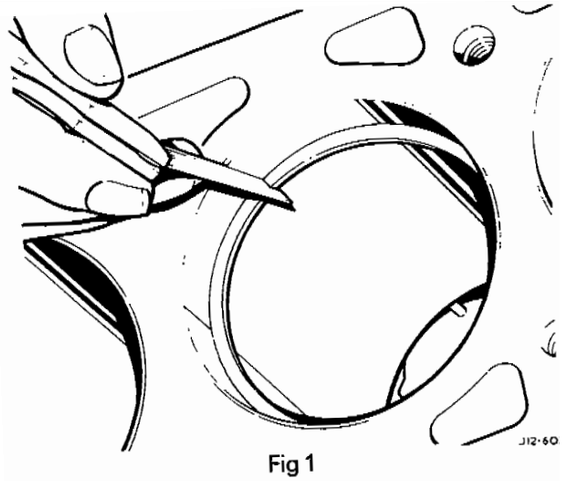
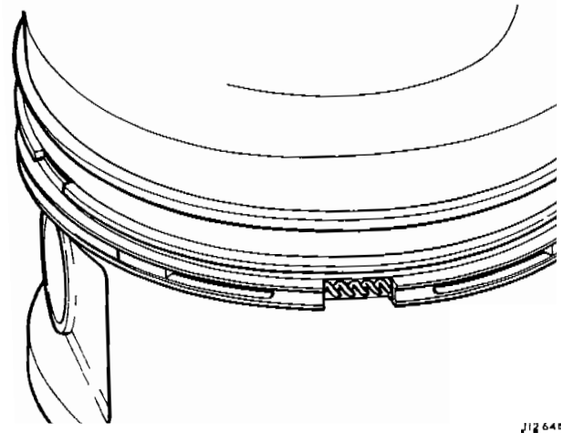


Fig 4

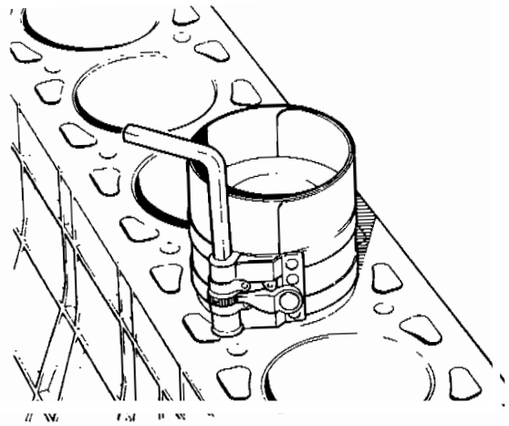
Fit and tighten the connecting rod cap nuts to a torque of 52-55Nm.
Repeat the operation for the remaining five pistons.
Clean and fit the crankshaft windage trays and torque tighten the securing bolts.
Remove the pressure relief valve cap, spring, tube and valve (1-4 Fig 4).
Clean the mating face in the cylinder block, the relief valve assembly, sprocket and shims.
Lubricate the relief valve assembly, assemble into the pump, tighten the cap.


Fig 1

Fit the oil pump to the engine and tighten the securing bolts.
Move the drive chain as far rearward as possible, fit a shim pack of 0.015 in thickness to the oil pump flange (3 Fig 1 page 46), align the bolt holes, fit the drive sprocket and two securing bolts.
Using a straight edge (2 Fig 1 page 46), check the alignment of the oil pump drive sprocket (1 Fig 1 page 46) and crankshaft sprocket (4 Fig 1 page 46).
Remove and refit the pump drive sprocket as required in order to align the sprockets.
When the alignment is satisfactory, remove the pump sprocket. Fit the chain and shims to the sprocket, fit to the oil pump.
Fit the tab washer and securing bolts.
Tighten the bolts and lock over the tabs.
Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 2 page 46).
Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102' to the transfer housing gasket face.
Fit and seat the housing, fit and tighten the securing bolts.


Fig 2

Apply 'Hylosil 102' to the sump mating face.
Clean the gasket face on the cylinder block.
Lift the sump into position.
Fit and torque tighten the securing bolts.
Refit the cylinder head 12.29.02 page 25.
Remove the engine from the stand.
Attach the gearbox/transmission unit to the engine.
Fit the engine assembly to the vehicle 12.41.01/2 page 77.


Fig 3

DATA

SERVICE TOOLS

Auxilliary oil seal remover **JD 118 (18G 1468)**
Auxilliary oil seal replacer **18G 1469**
Camshaft timing tool **18G 1433**
Crankshaft pulley lock **18G 1437**
Crankshaft pulley tool **18G 1436**
Piston ring compressor **18G 55A**
Rear oil seal adaptor **JD 550-3**
Timing cover bush tool **18G 1434**

TORQUE FIGURES

Adaptor plate to sump **49-54Nm**
Adjustment trunnion to alternator bolt **23-27Nm**
Alternator bolt to timing cover nut **23-27Nm**

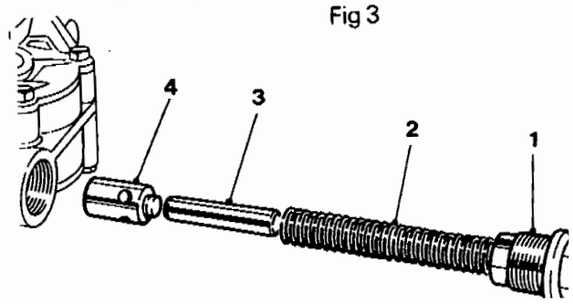


Fig 4

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DATA

TORQUE FIGURES

Alternator bolt-trunnion lock nuts **12- 14Nm**
Alternator pivot bolt **23-27Nm**
Alternator pivot bolt nut **23-27Nm**
Banjo bolt **to** *cylinder head* **13-16Nm**
Camcover to cylinder head **9.5-12Nm**
Camshaft sprocket to camshaft **23-27Nm**
Clip-hose to breather pipe **2.4Nm**
Connecting rod to big end nut **52-55Nm**
Cylinder block drain plug **68-75Nm**
Cylinder head to cylinder block:
Tighten in sequence **to 52-54Nm**
Rotate clockwise through exactly 90°
Dipstick to bracket **5-8Nm**
Distributor clamp plate to timing cover **9.5-12Nm**
Exhaust manifold to cylinder head **23-27Nm**
Heat shield to exhaust manifold **23-27Nm**
Heater pipe to cylinder head **23-27Nm**
Heater pipe to inlet manifold **9.5-12Nm**
Hose-bottom hose **to** *water pump* **3.8-4.3Nm**
Hose-expansion tank to water pump **2.5-3.5Nm**
Hose-heater return pipe to water pump **2.5-3.5Nm**
Hose- water pump to thermostat housing **2.5-3.5Nm**
Inlet manifold to cylinder head **23-27Nm**
Intake elbow to throttle housing **2.4Nm**
Oil pump front cover to body **9.5-12Nm**
Oil pump to cylinder block **23-27Nm**
Oil pump rear cover to body **9.5- 12Nm**
Oil sump plug **41-47Nm**
Oil sump to cylinder block **23-27Nm**
Oil sump to timing cover **23-27Nm**
Power steering pump to mounting **23-27Nm**
Power steering pump to adaptor **49-54Nm**
Top *hose to thermostat housing* **3.8-4.3Nm**
Transfer housing to cylinder block **23-27Nm**
Windage tray to cylinder block **23-27Nm**

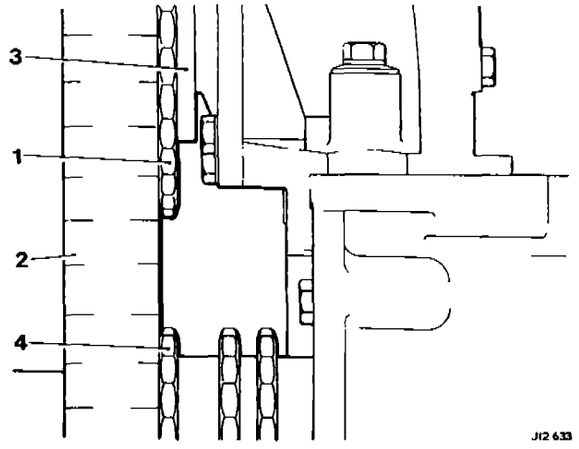


Fig 1

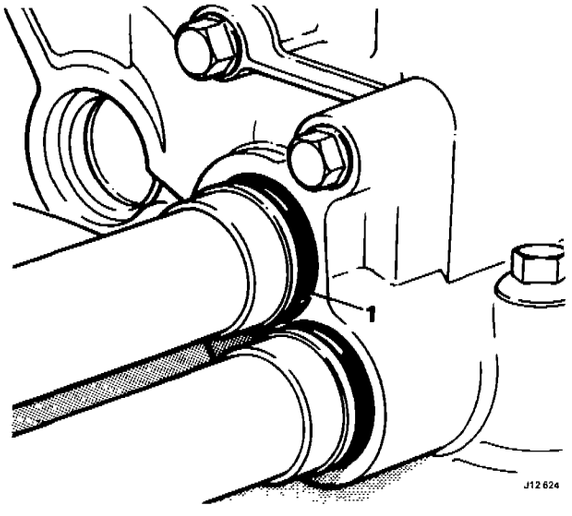


Fig 2

SPANNER SIZES

8mm
10mm
13mm
I 7mm
19mm (SERVICE TOOL-18G 1436)
30mm
3/8in **AF**
9/16in **AF**
5/8in **AF**
13/16in **AF**
10mm **(ALLEN** *KEY)*

OILS/GREASES/SEALANTS

Half moon seals to cylinder head **'HYLOSIL 102'**
'O' Rings **'PETROLEUM JELLY'**
Sump to timing cover **'HYLOSIL 102'**
Timing cover to cylinder head **'HYLOSIL 102'**
Thermostat housing to extension **'HYLOSIL 102'**
Oil pump front **cover** *to body* **'LOCTITE 501'**
Oil pump rear cover to body **'LOCTITE 501'**

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CONNECTING ROD BEARING - ENGINE SET

RENEW **12.17.16**

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD 133 to the road spring pans (Fig 1).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector,
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 3) to steering rack securing bolt/nut (1,2, Fig 3).

Disengage the splines from the rack pinion **(4** Fig 3).
NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the **P.A.S.** pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front *of* the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, **and** drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Disconnect Nos. 1 and 2 plug leads.
Attach **18G** 1465 rear engine lifting **eye,** fit and align Service Tool **MS** 53B engine support bracket (Fig 4).
Engage the hook to the lifting eye.
Tighten the hook nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.

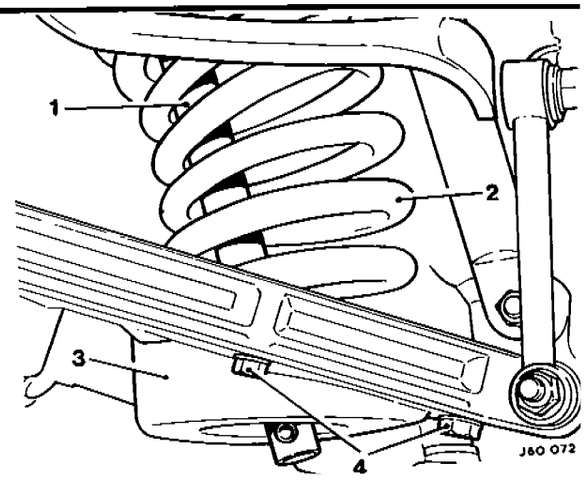


Fig 1

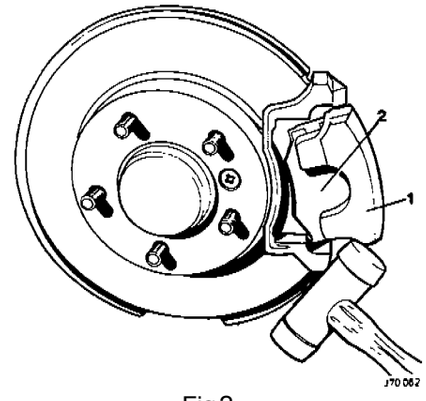


Fig 2

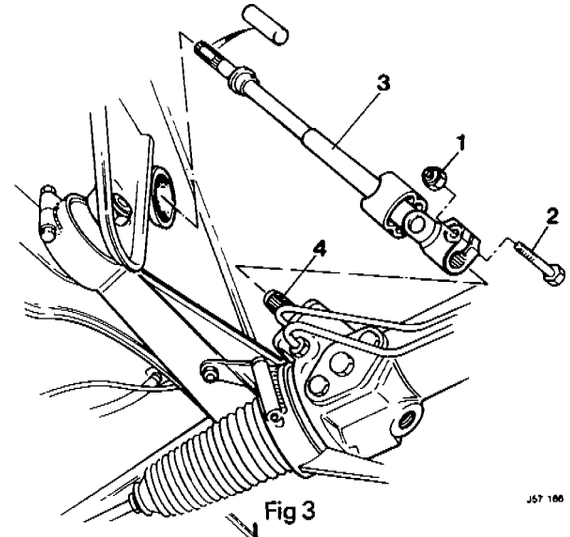


Fig 3

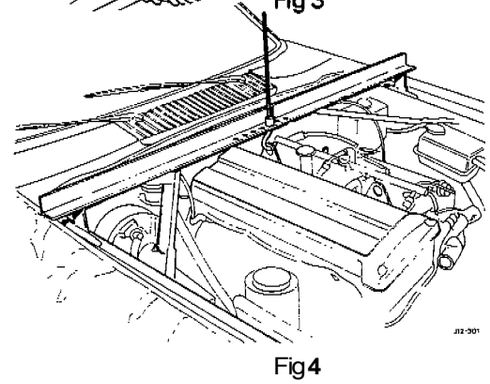


Fig 4

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Remove the nuts. Do not remove the bolts at this stage (Fig 1).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 2).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.

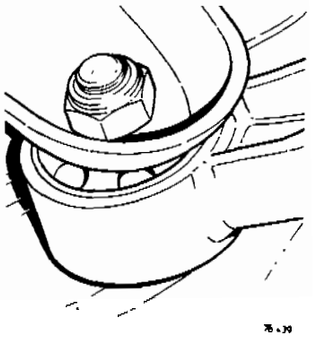


Fig 1

Drain the engine oil.
Remove the air cleaner assembly.
Slacken off the alternator adjusting nuts (4.5 Fig 3) and pivot nut (2 Fig 3).
Pivot the alternator towards the engine and disconnect the drive belt.
Remove the alternator link arm bolt (3 Fig 3).
From below the vehicle, disconnect the alternator feed wires, remove the alternator pivot bolt and nut (1 Fig 3), and remove the alternator. Remove the rear spacers.
Slacken the union securing the oil drain back/filler tube to the sump and pull the tube clear of the sump.
Position the steering rack to allow access to the sump securing bolts.
Slacken and remove all the sump bolts except two.
Remove the bell housing to sump securing bolts.
Finally remove the remaining two sump bolts and lower the sump.
Place a suitable drain tin below the oil transfer housing area and remove the housing securing bolts (1 Fig 4), remove the housing assembly (2 Fig 4) and pull the pipes (3 Fig 4) from the housing.
Remove and discard the 'O' rings, clean the housing and oil pipes.
Remove the bolts securing the crankshaft windage trays (6 Fig 4) to the cylinder block and remove the trays.
Rotate the crankshaft for access to the first connecting rod.
Remove the nuts (1 Fig 1 page 49) securing the cap (2 Fig 1 page 49) to the connecting rod and remove the cap and bearing assembly.
Note the position of the cap relative to the connecting rod and also that they are numbered to each other (Fig 2 page 49).
Discard the bearing shell (3 Fig 2 page 49). move the connecting rod and piston up the bore and remove the bearing shell from the connecting rod (2 Fig 2 page 49).
Remove the 'paired' bearing cap ie 1-6, 2-5, 3-4. as in the previous description.
Clean and polish the crankshaft journals, oil the new bearings and fit two halves to the connecting rods.
NOTE: Ensure that the 'tag' (1 Fig 2 page 49) on the shell is fully seated in the connecting rod.
Oil the crankshaft journals.
Pull one piston and rod down the bore and guide onto its relative crankshaft journal.
Fit a bearing shell to the 'matched' connecting rod cap.

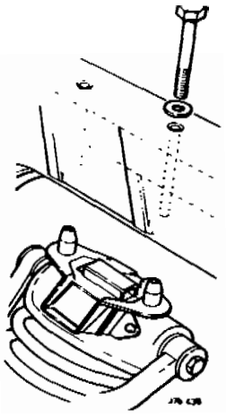


Fig 2

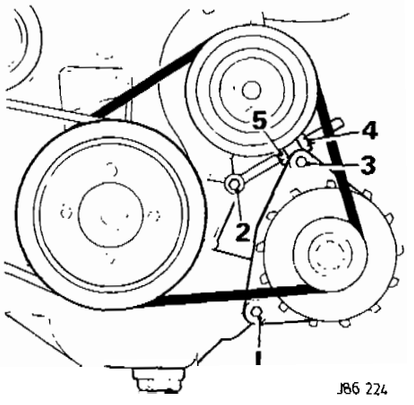


Fig 3

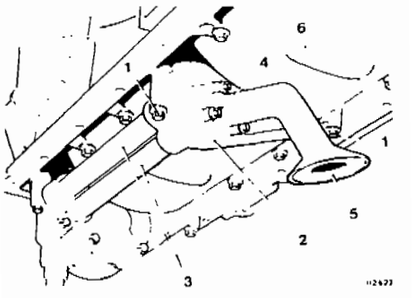


Fig 4

NOTE: Ensure that the 'tag' on the shell is fully seated in the connecting rod cap, oil the shell and fit to the crankshaft/connecting rod assembly.
Ensure that the 'numbers' are fitted together.
Fit and torque tighten the securing nuts.
Repeat the procedure for the second piston and connecting rod assembly.
Rotate the crankshaft for the second matched pair and repeat the procedure.
Repeat the procedure for the third pair.

Clean the windage trays.
Fit to the cylinder block.
Fit and tighten the securing bolts.
Fit new 'O' rings to the oil pipes, (1 Fig 3) lubricate the 'O' rings with petroleum jelly.
Fit the pipes to the oil pump.
Apply 'Hylosil 102' to the tranfer housing gasket face and fit the housing to the engine.
Fit and tighten the securing bolts.
Apply 'Hylosil 102' to the sump mating face.
Clean the gasket face on the cylinder block.
Lift the sump into position.
Fit and torque tighten the securing bolts.

Refit the oil filler/drain back tube.
Refit the alternator, ensure all spacers are correctly located.
Tension the alternator drive belt. A load of 1.5kg must give a total deflection of 4.5mm when applied to the mid-point of the belt.
Refit the air cleaner assembly.
Re-position the steering rack under the sump.
Position the crossmember assembly on the jack under the vehicle.
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, P.A.S. pipes, lower column and rear mountings.
Align the front mounting securing bolt holes.
Fit and tighten the front mounting securing nuts (Fig 1 page 50).
Using a second jack, align the left hand rear mounting (Fig 2 page 50).

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting. Fit the inner spacer.
Push the bolt fully home, fit but do not tighten the nut.
Lower the jack from below the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower the jack from below the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp plate securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the P.A.S. pipes and rack.
Fit new 'O' rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the P.A.S. pipe clamps.

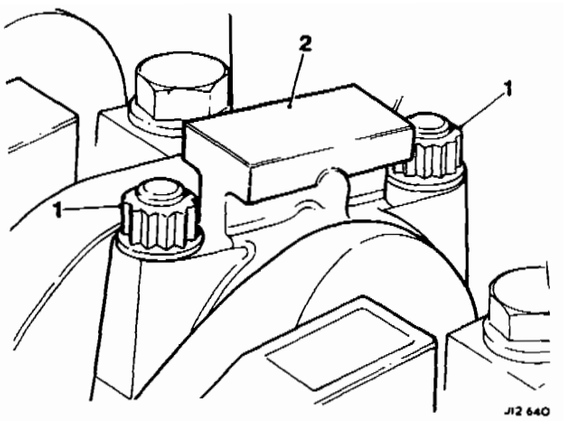


Fig 1

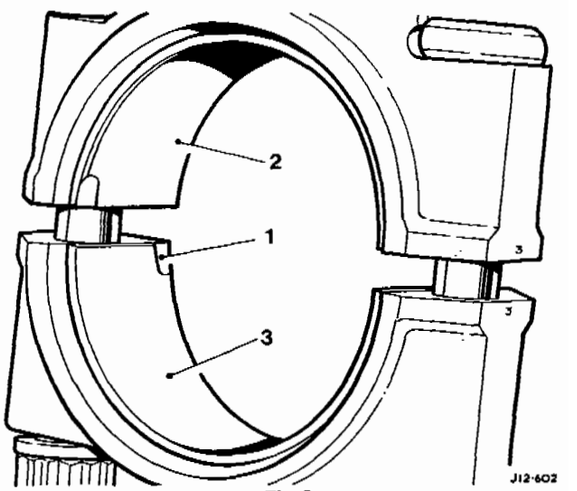


Fig 2

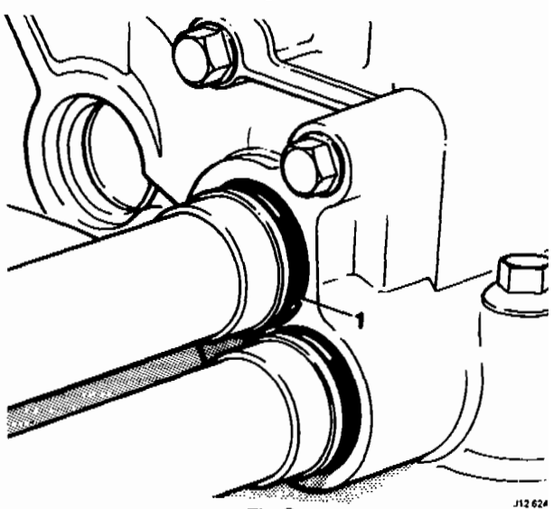


Fig 3

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Slacken off the **MS** 53B hook nut. Remove the hook. Remove Service Tool MS 53B.
Remove the lifting eye.
Fit and tighten the engine mounting securing nuts. Refit the calipers. Refit the brake pads.
Refit the road wheels.
Lower the vehicle from the axle stands Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. Lower the vehicle.
Refill the engine with oil to the correct level.
Bleed the **P.A.S.** system as follows:
Top up the **P.A.S.** reservoir.
Start the engine.
Turn the steering wheel to full left hand lock.
Turn the steering wheel to full right hand **lock.**
Top up the reservoir. Fit the reservoir **cap.**
Close the bonnet.

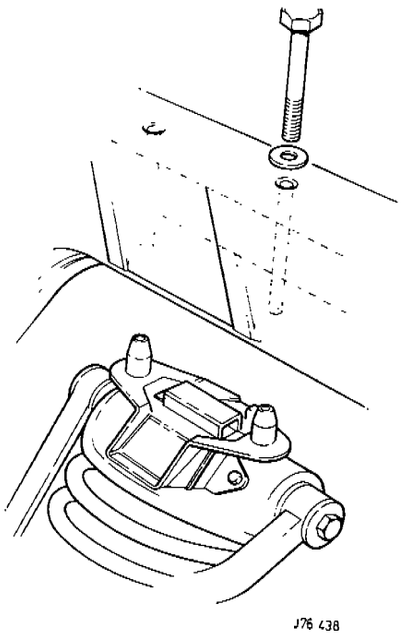


Fig **1**

DATA

SERVICE TOOLS

Tie-down bars ***JD 133***
Rear lifting eye ***18G 1465***
Engine ***support*** *bracket* ***MS 53B***

TORQUE FIGURES

Adaptor plate to sump ***49-54Nm***
Adjustment trunnion to alternator bolt ***23-27Nm***
Alternator bolt to timing cover nut ***23-27Nm***
Alternator bolt (trunnion lock nuts) ***12-14Nm***
Alternator pivot bolt/nut ***23-27Nm***
Caliper to carrier ***31-40Nm***
Connecting rod nut ***52-55Nm***
Dipstick to bracket ***5-8Nm***
Oil drain back tube to sump adaptor ***12.5-15Nm***
Oil sump plug ***41-47Nm***
Oil sump to cylinder block ***23-27Nm***
Oil sump to timing cover ***23-27Nm***
P.A.S. feed/return pipes to rack ***19-23Nm***
Shock absorber to ***upper*** *mounting* ***35-43Nm***
Transfer housing to cylinder block ***23-27Nm***
Wheel nut to wheel stud (steel wheel) ***65-85Nm***
Wheel nut to wheel stud (alloy wheel) ***88-102Nm***
Windage tray to cylinder block ***23-27Nm***

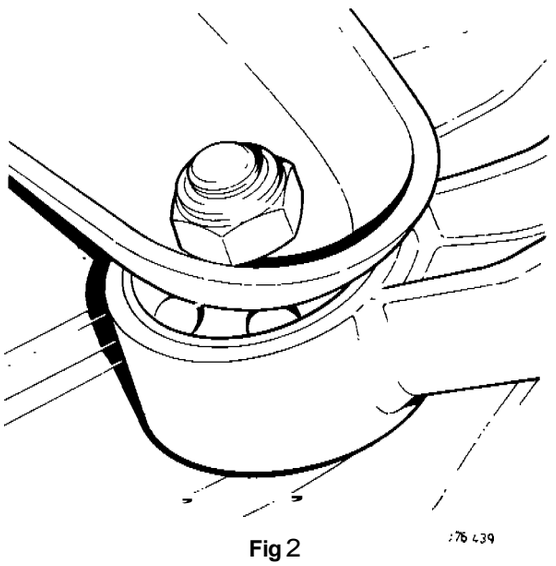


Fig 2

SPANNER SIZES

10mm
13mm
14mm
17mm
19mm
22mm
30mm
15/16AF

OILS/GREASES/SEALANTS

Oil pipe 'O' rings ***PETROLEUM JELLY***
Sump ***to*** *cylinder block* ***HYLOSIL 102***
Transfer housing to cylinder block ***HYLOSIL 102***

0428G

MAIN BEARING-ENGINE SET

RENEW **12.21.39**

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD 133 to the road spring pans (Fig 1).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin **bolt,** remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 3) to steering rack securing bolt/nut (1.2, Fig 3).

Disengage the splines from the rack pinion (4 Fig 3).
NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps **and** spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Disconnect Nos. 1 and 2 plug leads.
Attach 18G 1465 rear engine lifting eye, fit and align Service Tool MS 53B engine support bracket (Fig 4).
Engage the hook to the lifting eye.
Tighten the hook nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.

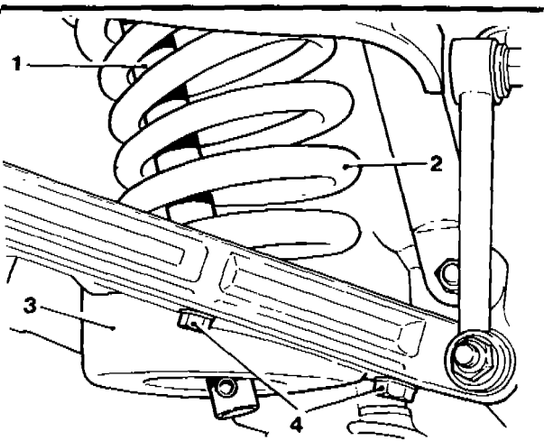


Fig 1

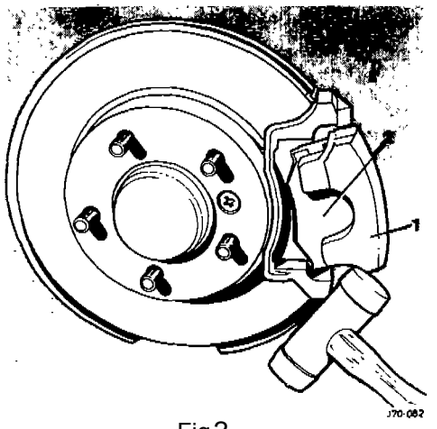
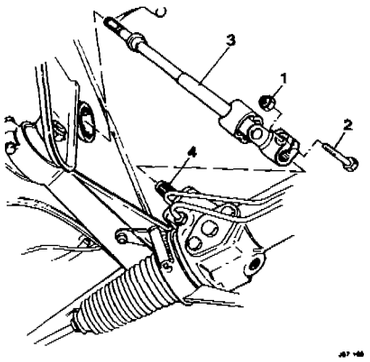
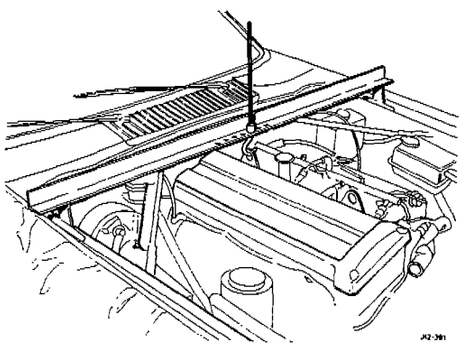


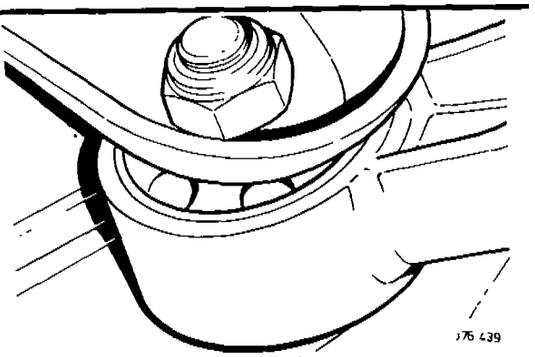
Fig 2



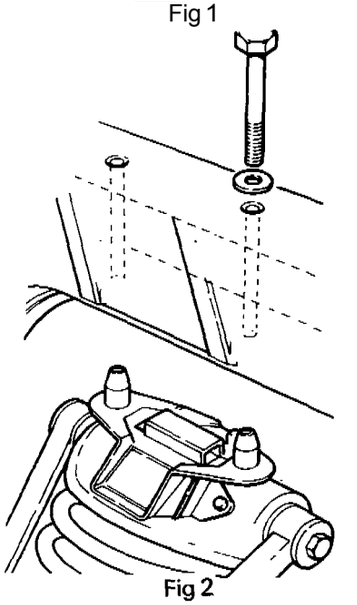

Fig 4

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Remove the nuts. Do not remove the bolts at this stage (Fig 1).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 2).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.


Fig 1

Drain the engine oil.
Remove the air cleaner assembly.
Slacken off the alternator adjusting nuts (4.5 Fig 3) and pivot nut (2 Fig 3).
Pivot the alternator towards the engine and disconnect the drive belt.
Remove the alternator link arm bolt (3 Fig 3).
From below the vehicle, disconnect the alternator feed wires, remove the alternator pivot bolt and nut (1 Fig 3). and remove the alternator. Remove the rear spacers.
Slacken the union securing the oil drain back/filler tube to the sump and pull the tube clear of the sump.
Position the steering rack to allow access to the sump securing bolts.
Slacken and remove all the sump bolts except two.
Remove the bell housing to sump securing bolts.
Finally remove the remaining two sump bolts and lower the sump.
Place a suitable drain tin below the oil transfer housing area and remove the housing securing bolts (1 Fig 4), remove the housing assembly (2 Fig 4) and pull the pipes (3 Fig 4) from the housing.
Remove and discard the 'O' rings, clean the housing and oil pipes.
Remove the bolts securing the crankshaft windage trays (6 Fig 4) to the cylinder block and remove the trays.


Fig 2

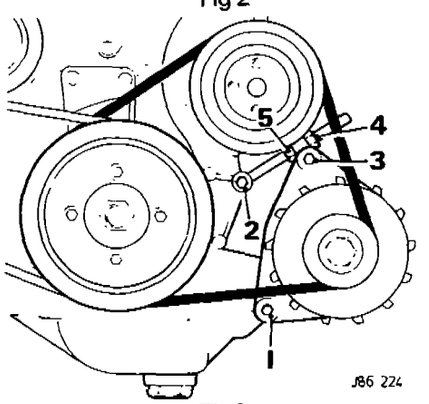


Fig 3

Push back the lock tabs (1 Fig 1 page 53) on the bolts (2 Fig 1 page 53) securing the oil pump sprocket to the oil pump and slacken the bolts.
Remove the bolts, tab washer (4 Fig 1 page 53) and sprocket (3 Fig 1 page 53) from the chain (5 Fig 1 page 53). Remove the shims.
Remove the oil pump securing bolts and remove the pump.
Remove the oil pressure relief valve cap, spring, tube and valve (1-4 Fig 2 page 53).
Clean the mating face in the cylinder block, the relief valve assembly, sprocket and shims.
Remove the bolts securing the crankshaft windage trays to the cylinder block and remove the trays.
Remove the bolts securing one of the main bearing caps to the cylinder block and remove the cap.
Remove and discard the bearing shell from the cap and cylinder block.

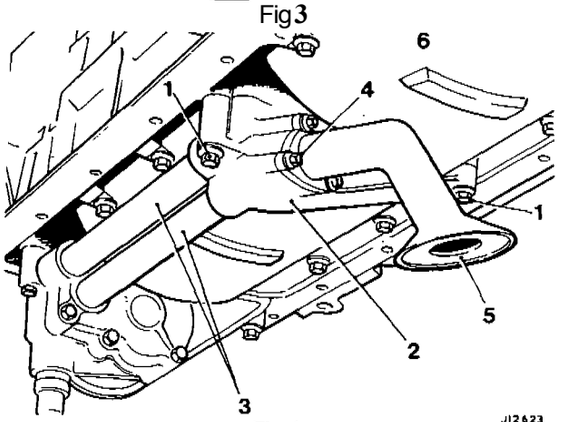


Fig 4

Clean the cylinder block and crankshaft.
Polish the crankshaft journals and liberally coat with oil.

Feed the new bearing shell into the cylinder block and ensure that the tag is fully seated in its location.
Fit the new bearing shell to the bearing cap. Oil the bearing and fit the assembly to the cylinder block.
Fit and torque tighten the securing bolts.
NOTE: Ensure that the bearing cap is the correct way round ie. the cap numbers correspond to the numbers stamped on the oil sump mounting face (1 Fig 3).
Rotate the crankshaft to ensure that it is not being 'pinched' and will rotate freely.
Repeat the procedure for the remaining six caps and shells.

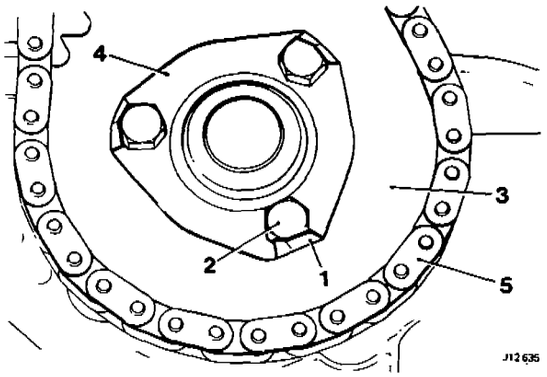


Fig 1

Mount a suitable dial gauge to the fan cowl and position the stylus on the crankshaft front pulley.
Zero the dial gauge, and with the use of suitable lever, measure the crankshaft endfloat (Fig 4).
Endfloat should be between 0.004 to 0.010 in.
Should the endfloat be outside the above tolerances, remove the centre main bearing cap, remove the thrust washers and replace with suitable oversized thrust washers (1 Fig 1 page 54).
These are available in 0.005 in. and 0.010 in. Thrust washers can be added to reduce the endfloat by 0.005 to 0.100 in. 0.015 and 0.20 in. (the oversizes are marked on the steel side of the thrust washer).
NOTE: When refitting the thrust washers, ensure that the bearing face (grooved) and not the steel side contacts the crankshaft.
Recheck the end float and if satisfactory, clean the main bearing cap and bearing and lubricate with clean engine oil.

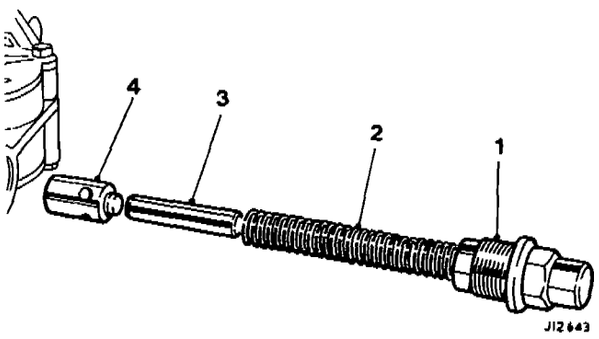


Fig 2

Refit the cap and bearing assembly, remove the dial gauge and torque tighten the main bearing cap securing bolts.
Refit the windage trays to the cylinder block. Fit and tighten the securing bolts.
Lubricate the relief valve assembly, assemble into the pump and tighten the relief valve cap.
Fit the oil pump to the engine and torque tighten the securing bolts.
Move the drive chain fully rearward, fit a shim pack (3 Fig 2 page 54) of 0.015in thickness to the oil pump, align the bolt holes, fit the drive sprocket and two securing bolts.
Using a straight edge (2 Fig 2 page 54), check the alignment of the oil pump drive sprocket (1 Fig 2 page 54), and the crankshaft sprocket (4 Fig 2 page 54).
Remove and refit the pump drive sprocket, altering the thickness of the shim pack as required in order to align the sprockets. When the alignment is correct, remove the pump sprocket.
Fit the chain and shims to the sprocket, and fit the assembly to the oil pump.
Fit the tab washer and bolts.
Tighten the bolts and lock over the tabs.

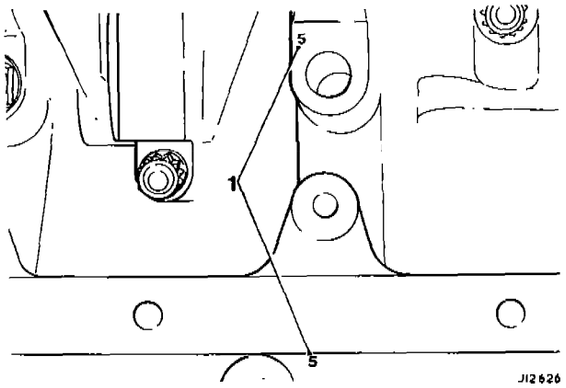


Fig 3

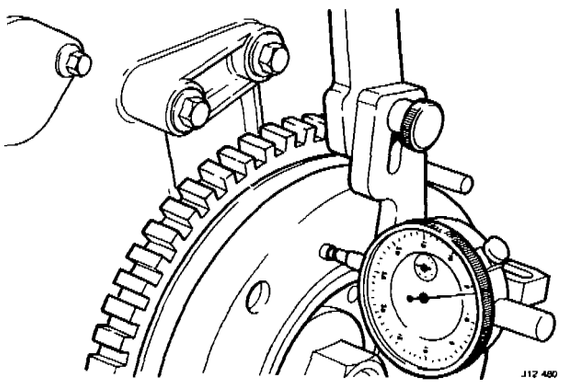


Fig 4

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Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 3).
Lubricate and refit the pipes to the pump.
Apply 'Hylosil' to the transfer housing gasket face and seat the housing.
Fit and torque tighten the securing bolts.
Apply 'Hylosil' to the sump and block gasket faces and fit the sump into position.
Fit and torque tighten the securing bolts.

Refit the oil filler/drain back tube.
Refit the alternator, ensure all spacers are correctly located.
Tension the alternator drive belt. A load of 1.5kg must give a total deflection of 4.5mm when applied to the mid-point of the belt.
Refit the air cleaner assembly.
Re-position the steering rack under the sump.
Position the crossmember assembly on the jack under the vehicle.
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, **P.A.S.** pipes, lower column and rear mountings.
Align the front mounting securing bolt holes.
Fit and tighten the front mounting securing nuts (Fig **4).**
Using a second jack, align the left hand rear mounting (Fig 1 page 55).

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting. Fit the inner spacer.
Push the bolt fully home, fit but do not tighten the nut.
Lower the jack from below the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower the jack from below the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp plate securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the **P.A.S.** pipes and rack.
Fit new 'O' rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the P.A.S. pipe clamps.

Slacken off the MS 53B hook nut. Remove the hook.
Remove Service Tool MS 53B.
Remove the lifting eye.
Fit and tighten the engine mounting securing nuts. Refit the calipers. Refit the brake **pads.**
Refit the road wheels.
Lower the vehicle from the axle stands Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. Lower the vehicle.
Refill the engine with oil to the correct level.

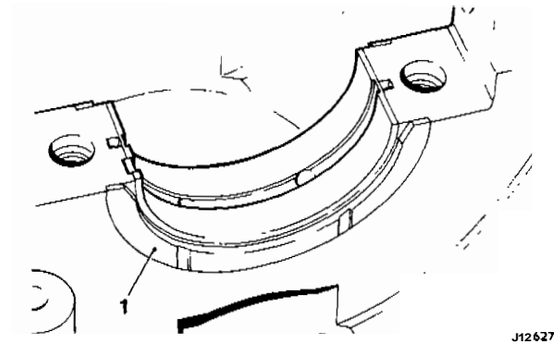


Fig 1

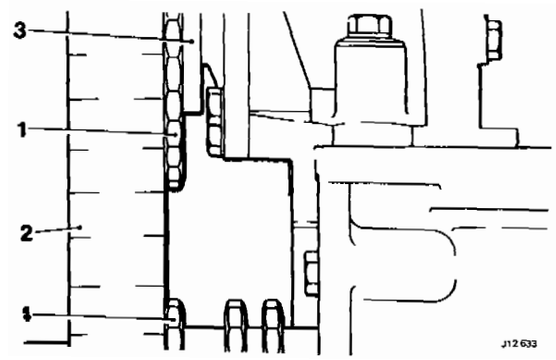


Fig 2

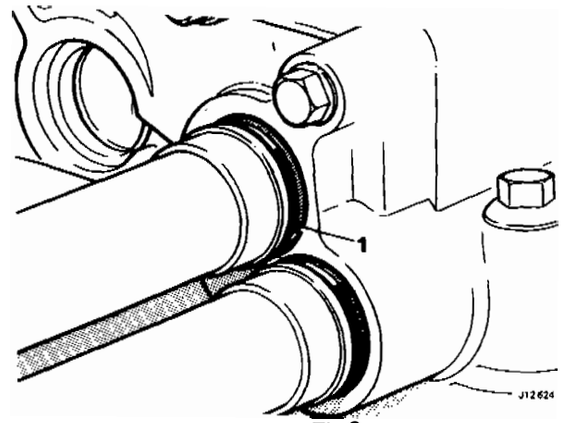


Fig 3

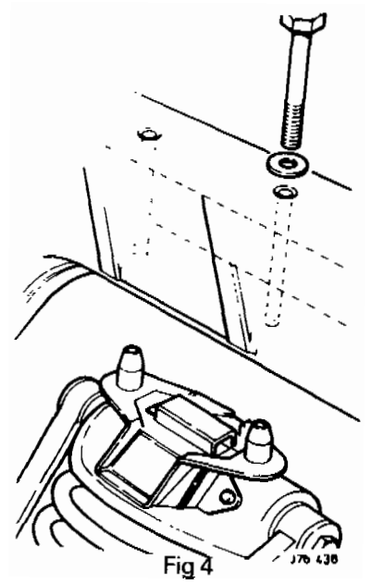


Fig 4

Bleed the **P.A.S.** system as follows:
Top up the **P.A.S.** reservoir.
Start the engine.
Turn the steering wheel to full left hand **lock.**
Turn the steering wheel to full right hand **lock.**
Top up the reservoir. Fit the reservoir cap.
Close the bonnet.

DATA

Crankshaft end float:
0.004 to 0.010 in.

Oversize thrust washers available in sizes:
0.005 in.
0.010 in.

Oil pump sprocket shims available sizes:
0.005in
0.010in
0.020in

SERVICE TOOLS

Tie-down bars ***JD 133***
Rear lifting eye ***18G 1465***
Engine support bracket ***MS 536***

TORQUE FIGURES

Adaptor plate to ***sump 49-54Nm***
Adjustment trunnion ***to*** *alternator bolt* ***23-27Nm***
Alternator bolt to timing cover nut ***23-27Nm***
Alternator bolt (trunnion lock nuts) ***12-14Nm***
Alternator pivot bolt/nut ***23-27Nm***
Caliper to carrier ***31-40Nm***
Dipstick to bracket ***5-8Nm***
Main bearing cap to block ***136-142Nm***
Oil drain back tube to sump adaptor ***12.5-15Nm***
Oil pump sprocket to oil pump ***drive*** *hub* ***9.5-12Nm***
Oil pump to cylinder block ***23-27Nm***
Oil sump plug ***41-47Nm***
Oil sump to cylinder block ***23-27Nm***
Oil sump to timing cover ***23-27Nm***
P.A.S. *feed pipe to rack* ***19-23Nm***
P.A.S. *return pipe* ***to*** *rack* ***19-23Nm***
Shock absorber ***to upper*** *mounting* ***35-43Nm***
Transfer housing ***to*** *cylinder block* ***23-27Nm***
Wheel nut to wheel stud (steel wheel) ***65-85Nm***
Wheel nut ***to*** *wheel stud (alloy wheel)* ***88-102Nm***
Windage tray to cylinder block ***23-27Nm***

SPANNER SIZES

10mm
13mm
17mm
19mm
30mm
3/8in AF
9/16in ***AF***

OILS/GREASES/SEALANTS

Oil pipe 'O' rings ***PETROLEUM JELLY***
Sump to cylinder block ***HYLOSIL 102***
Transfer housing to block ***HYLOSIL 102***

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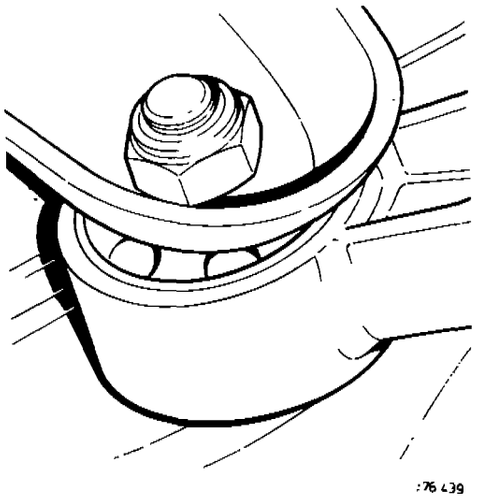


Fig 1

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CRANKSHAFT

RENEW **12.21.33**

Remove the engine and gearbox/transmission unit from the vehicle **12.41.01/2** page 77.
Detach the gearbox/transmission unit from the engine.
Fit the engine to a stand.
Remove the cylinder head **12.29.02** page 25.
Remove and discard the head gasket.

Manual only:
Hold the flywheel in one position and remove the bolts securing the clutch cover to the flywheel.
CAUTION: MAKE A NOTE OF THE **POSITION** OF **ANY BALANCE WEIGHTS RELATIVE TO THE CLUTCH COVER.** Remove the balance weights.
Remove the clutch assembly.
WARNING: THE TWIN-MASS FLYWHEEL IS EXTREMELY HEAVY. ASSISTANCE WILL BE REQUIRED **DURING REMOVAL.**
Remove the eight securing bolts **(1** Fig 1) and remove the flywheel (2 Fig **1).**

Auto only:
Remove the drive plate securing bolts **(1** Fig 2).
Remove the drive plate **(2** Fig **2).**

Using Service Tool **18G** 1437 to hold the crankshaft pulley, remove the pulley securing bolt.
Fit Service **Tool 18G 1436** to the pulley. Fit and tighten the tool securing bolts.
Tighten the tool centre **bolt** to remove the pulley assembly.
Remove the sump bolts, and remove the sump.
Remove the transfer housing bolts and housing.
Remove the oil pump pick-up pipe assemblies, the crankshaft windage trays **(1.2** Fig 3) and the oil pump (3,4 Fig 3).
Remove the engine timing cover securing bolts and remove the cover assembly.
Slacken off the oil pump drive chain damper securing bolts and move the damper clear of the chain.
Remove the oil pump drive chain, remove the elastic band from the upper dampers and remove the upper timing chain.
Remove the lower tensioner bolts and remove the tensioner.
Release the lower chain fixed damper securing bolt lock tabs, remove the bolts and collect the damper and tab washer. Repeat for the remaining fixed and pivot dampers and remove the lower chain and intermediate sprocket.
Remove the seal/crankshaft damper spacer, the woodruff key **(1** Fig 4), the crankshaft sprockets (2 Fig 4) and the inner woodruff key.
Remove the rear oil seal housing securing bolts (1 Fig 1 page 57) and remove the housing **(2** Fig 1 page 57).
Remove the connecting rod cap securing nuts and remove the bearing caps in pairs (i.e. **1-6, 2-5,** 3-4), turning the crankshaft for access as required. As each connecting rod cap is removed, ensure that each rod and cap are identified to each other for re-pairing during **assembly.**

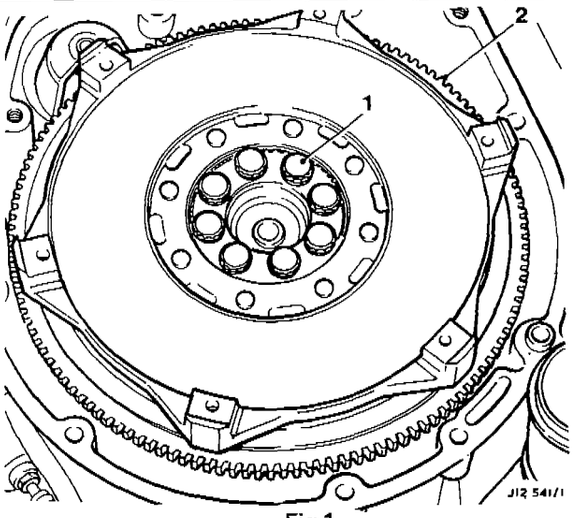


Fig 1

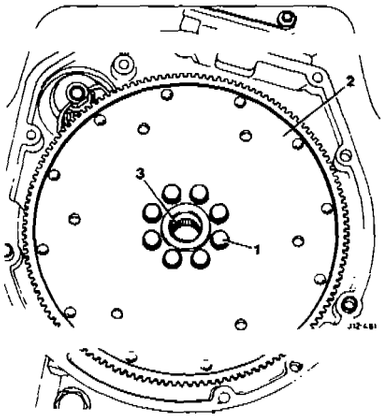


Fig 2

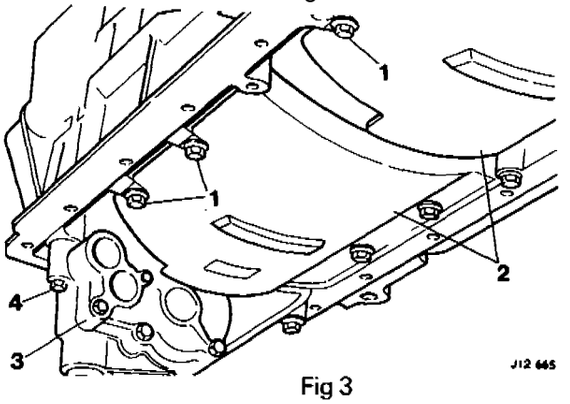


Fig 3

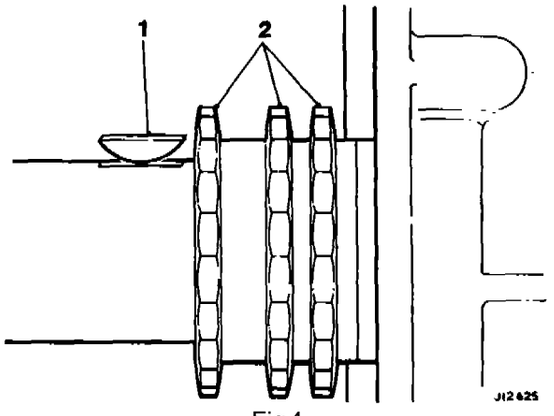


Fig 4

As each cap is removed, its relative connecting rod and piston assembly should be pushed up the bore, enabling the crankshaft to be rotated to remove the remaining caps. Care should be taken not to push the piston too far up the cylinder bore as this will release the piston rings.
Ensuring that the main bearing caps are marked relative to the cylinder block (1 Fig 2). remove the main bearing cap bolts, the caps and carefully lift out the crankshaft.

Remove and discard the bearing shells and the thrust washers.
Clean the bearing caps and the cylinder block main bearing housings.
Fit the new bearing shell halves to the cylinder block and lubricate with clean engine oil.
Clean and polish the crankshaft journals, lubricate and carefully assemble the crankshaft into the cylinder block, fit the thrust washers ensuring that the steel side of the washer is mated to the cylinder block (1 Fig 3).
Rotate the crankshaft to ensure that it turns freely.
Fit the main bearing shells into the main bearing caps, lubricate and fit to the cylinder block.
Start the securing bolts and very carefully tap the main bearing caps to ensure they are seated in the cylinder block.

Rotate the crankshaft to ensure that it still turns freely, pull down each bearing cap individually and torque up the bolts.
Rotate the crankshaft between pulling down each bearing cap.
Check the crankshaft end float (Fig 4), the permitted tolerance is 0.000 to 0.010 in.
Should the end float exceed this, oversize thrust washers are available in 0.005 in. and 0.010 in. and should be fitted accordingly to ensure that the end float is within these tolerances.

EXCESSIVE END FLOAT

End float measured	(A)	0.023 in.
Oversize thrust washers fitted	(B)	0.000 in. (standard)
End float required	(C)	0.007 in.
A-C = Thrust washer size required		= 0.016 in.
Thrust washer sires to be fitted		0.010 in. + 0.005 in.
	Total	0.015 in.
End float achieved		0.023 in. - 0.015 in.
	Total	0.008 in.

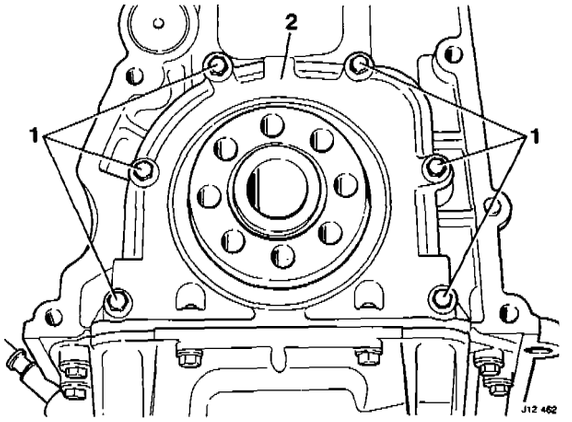


Fig 1

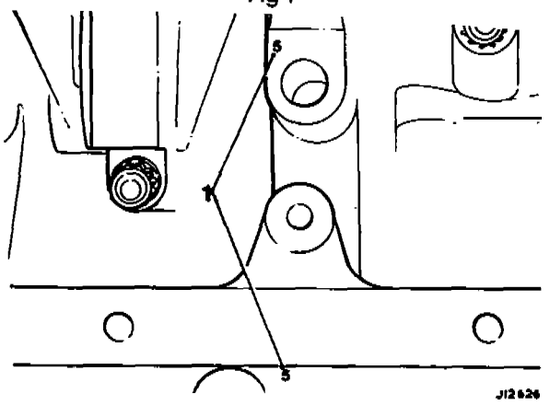


Fig 2

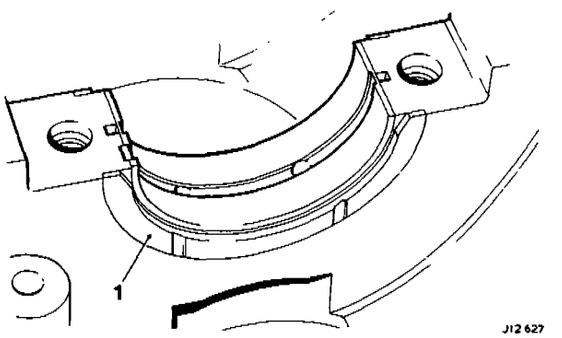


Fig 3

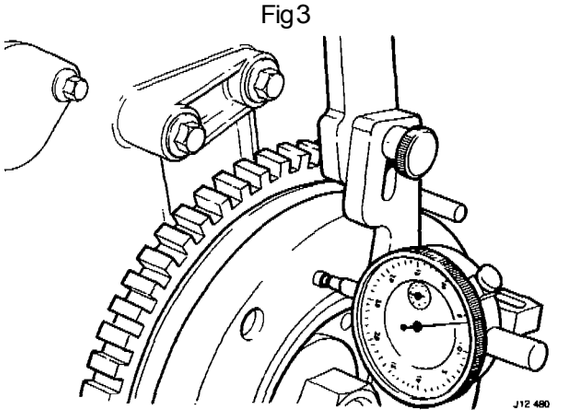


Fig 4

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INSUFFICIENT END FLOAT

Endfloat measured	(A)	0.003 in.
Oversizethrust washerfitted	(B)	0 010 in.
Endfloat required	(C)	0.007 in.
C-A = Thrust washer size required		=0.004 in.
Thrust washer size to befitted		=0.005 in.
Endfloat achieved		0.003 in. + 0.005 in.
Total		0.008 in.

Carefully remove the old rear oil seal from the rear housing.
Clean the housing and lubricate the seal mounting face.

DO NOT REMOVE THE PLASTIC 'O' RING **PROTECTOR FROM THE SEAL** PRIOR TO FITTING TO THE ENGINE

Using Service Tool 550-3 (1.2 Fig 1), fit the new seal (3 Fig 1) to the housing (4 Fig 1).
Smear the gasket face with 'Hylosil 102'.
Locate the plastic protector 'O' ring (1 Fig 2) onto the end of the crankshaft (2 Fig 2) and push the rear seal housing over the crankshaft and up to the rear cylinder block face.
Fit the bolts, check that the sump face and the cylinder block are flush and tighten the bolts.
Fit a new bearing shell to the connecting rod, lubricate with clean engine oil and fit to the crankshaft.
Fit a bearing shell to the big end cap, lubricate and fit to the connecting rod. Fit and torque tighten the nuts.
Turn the crankshaft over and ensure that there are no 'tight' spots, i.e. the crankshaft rotates freely.
Repeat this procedure for the remaining five cylinders.
Clean and inspect for wear or damage all the timing gears, chains, guides and tensioners.
Should any components be suspect, replace them.
Fit and seat the crankshaft sprocket woodruff key and fit the sprocket to the crankshaft.
Lubricate the lower timing chain. Fit the chain to the intermediate sprocket, fit the chain to the lower sprocket, and then assemble the intermediate sprocket and chain to the cylinder block.

Should the intermediate sprocket be worn or damaged, the assembly must be replaced.
Fit the spacers (1 Fig 3) to the lower pivoting damper and fit the assembly (3 Fig 3) to the cylinder block.
Fit a tab washer (4 Fig 3) and securing bolts (5 Fig 3).
Tighten the bolts and lock over the tabs.

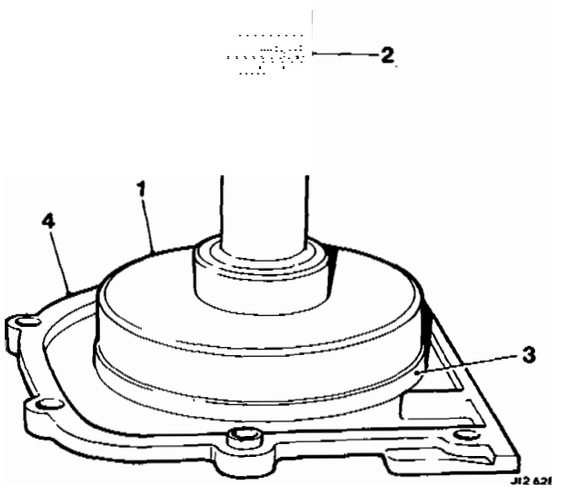


Fig 1

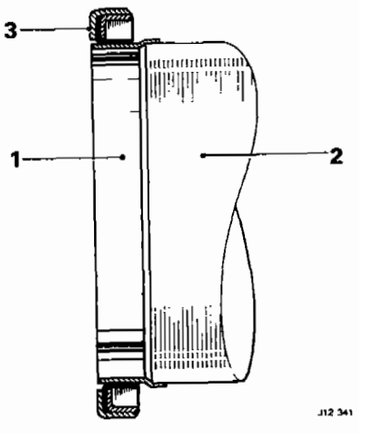


Fig 2

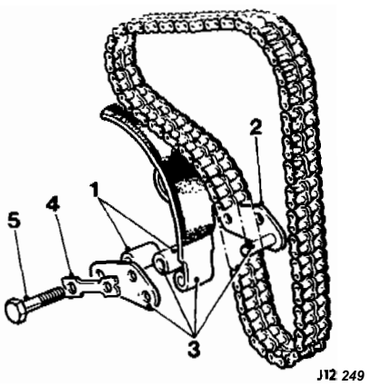


Fig 3

Clean the lower tensioner assembly, remove the ball valve (1 Fig 1) and ensure that the bottom of the housing is clean (2 Fig 1).
Check that the ball valve is free by shaking it to ensure it rattles. If it does not, replace the valve assembly. If it does, renew and lubricate the 'O' ring (3 Fig 1) and press the valve back into the housing.
The ball free movement is 0.74 to 0.45mm.
Inspect the housing and hydraulic tensioner (4 Fig 1) for wear or scoring. Also check that the oil hole (5 Fig 1) is clear in the end of the piston.
Lubricate the component parts. Assemble the tensioner by pressing and twisting the snail clockwise until the pawl locks in the 'park position. Insert the tensioner assembly into the housing and fit the housing to the cylinder block. Fit and tighten the securing bolts (6 Fig 1).
Fit the lower static damper, fit the tab washers and bolts, tighten the bolts and knock up the tabs.
Release the tensioner by pushing the pivoting damper away from the chain,
thus pushing the tensioner back into the housing which will release the snail, and tension the chain.

Fit the upper static damper pedestal securing bolts, the tab washer and the damper.
Tighten the securing bolts and lock over the tabs.
Fit a dial gauge to the top of the cylinder block, and turn the engine over until No.1 on 6 pistons are at TDC (Fig 2
Lubricate the upper chain and fit it to the intermediate sprocket.
Fit and engage an elastic band around the upper dampers to secure the chain.
Lubricate the oil pump drive chain, fit the chain to the crankshaft sprocket and lodge in the correct position.
Remove the old timing cover oil seal.

Fit a new seal into the timing cover using Service Tool JD 129 and a suitable press (Fig 3).
Smear the cylinder block timing cover face with 'Hylosil 102', lubricate the bearing shells and carefully fit the timing cover to the engine ensuring that the timing cover/cylinder head mating face is flush with the cylinder block (Fig 4).
Fit and tighten the securing bolts.
Lubricate and fit the oil seal distance piece. Fit and seat the damper woodruff key.
Remove the oil pump pressure relief valve retaining nut, remove the spring, tube and valve, clean and check for wear or scoring. Remove the oil pump body securing bolts and remove the outer rotor.
Remove the oil pump backplate securing bolts, remove the backplate, and remove the bearing shell from the housing.
Clean all dismantled parts and check for obvious wear or scoring.

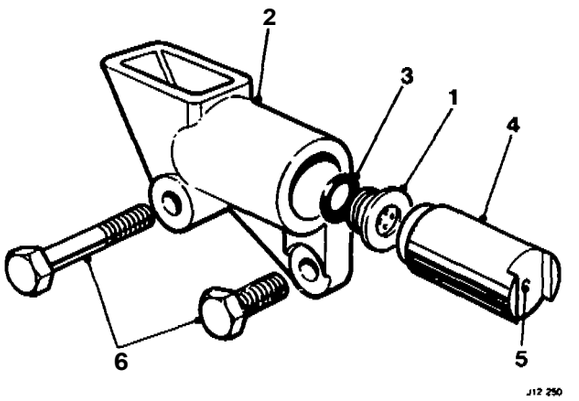


Fig 1

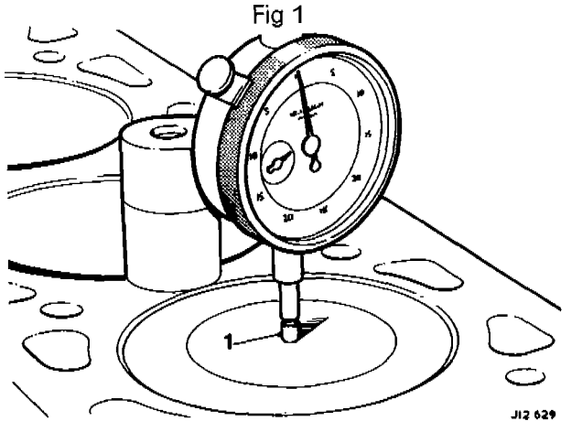


Fig 2

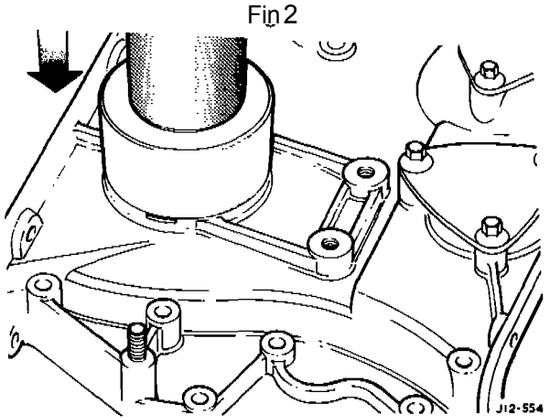


Fig 3

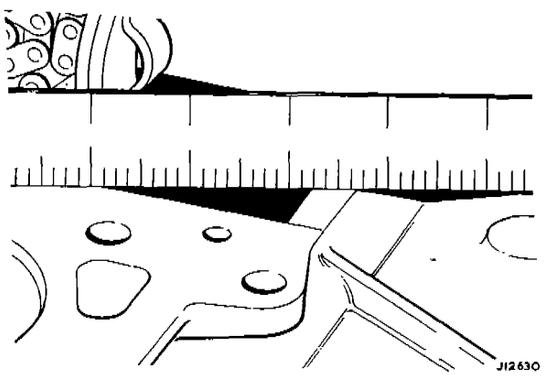


Fig 4

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Fit the outer rotor and check the clearance between the rotor and the oil pump housing (Fig 1).
Check the rotor end float (Fig 2).
Check the measurements given below. Replace any suspect parts.

DATA

Material	Cast iron grade 12
End float	0,1 mm
Outer rotor O/D	69,825 to 69,774 mm
Outer rotor width	27,975 to 27,962 mm
Inner rotor width	27,975 to 27,962 mm
Clearance outer rotor to body	0.2 mm
Oil pump body rotor bore	69,951 to 69,926 mm

Lubricate the bearing shell and fit to the pump housing.
Smear the backplate gasket face with sealant.
Fit the backplate and tighten the securing bolts.
Lubricate the pump inner and outer rotors, the bearing and the housing.

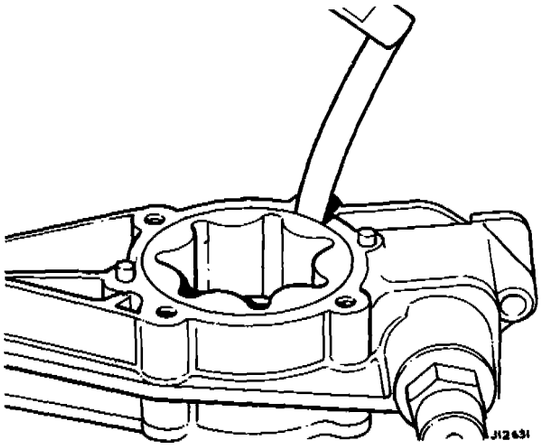


Fig 1

Fit the outer rotor, smear the gasket face with sealant, fit the seal to the pump body and tighten the securing bolts.
Lubricate and assemble the relief valve, spring and tube to the pump. Fit and tighten the relief valve cap.

Fit the oil pump to the engine and tighten the securing bolts.
Clean oil pump drive sprocket, offer up the sprocket to the oil pump drive flange (3 Fig 3), place a straight edge (2 Fig 3) between the crankshaft sprocket (4 Fig 3) and the oil pump drive sprocket (1 Fig 3). and shim out the oil pump drive sprocket until the two sprockets are precisely aligned.
Once the necessary shim pack has been selected, fit the shims to the oil pump, engage the sprocket in the drive chain, offer up the sprocket to the pump and align the securing bolt holes.
Fit the tab washers and the securing bolts, tighten the bolts and lock over the tabs.
Position the oil pump chain damper to take the slack out of the chain and tighten the securing bolts.
Clean and fit the crankshaft windage trays and tighten the securing bolts. Clean all oil pick-up pipes and housings. Fit new 'O' rings (1 Fig 1 page 61) to the oil pick-up pipes.
Fit the pick-up pipe to the housing and secure with the bolts. Lubricate the 'O' rings on the oil pipes and fit the pipes to the housing. Smear the housing to the cylinder block gasket face with 'Hylosil 102 engage the pipes in the rear face of the oil pump, ensure that the 'O rings enter the housing easily. Fit and tighten the housing securing bolts.
Smear the sump gasket face with 'Hylosil 102' and fit the sump to the engine and tighten the securing bolts.

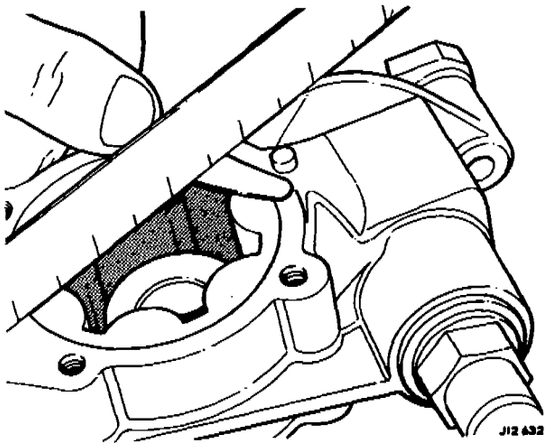


Fig 2

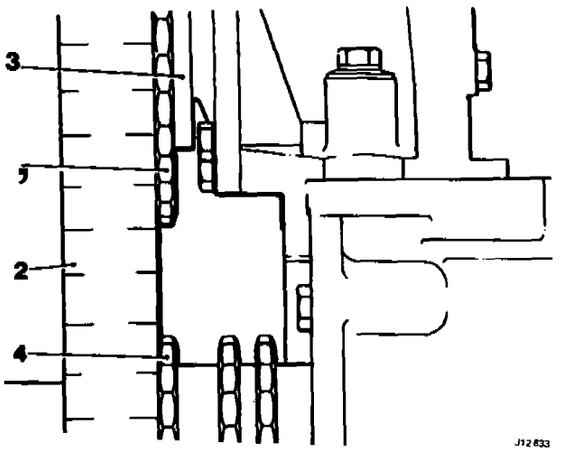


Fig 3

Refit the crankshaft pulley, fit Service Tool 18G 1437 (1 Fig 2) to the pulley and torque tighten the nut.
Refit the cylinder head 12.29.02 page 25.
Remove the engine from the stand and refit to the vehicle 12.41.01/2 page 77.

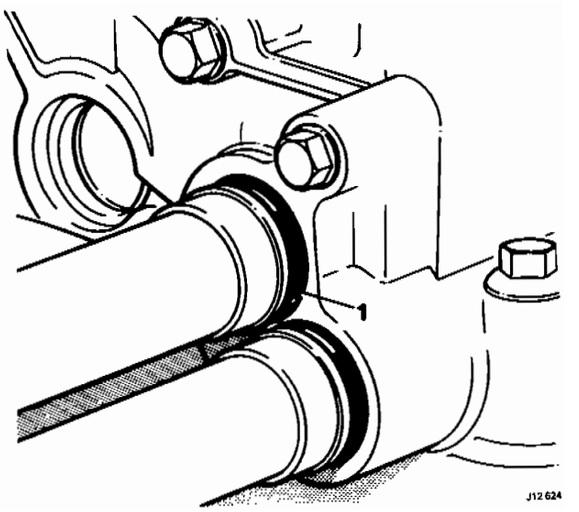


Fig 1

DATA

Crankshaft end float:
0.004–0.01 0in

Oversize thrust washers available in sizes:
0.005in
0.01 0in

Oil pump sprocket shims available sizes:
0.005in
0.01 0in
0.020in

SERVICE TOOLS

Auxilliary oil seal remover JD 118
Auxilliary oil seal replacer 18G 1469
Camshaft timing tool 18G 1433
Crankshaft pulley lock 18G 1437
Crankshaft pulley tool 18G 1436
Rear oil seal adaptor JD 550-3
Timing cover bush tool 18G 1434

TORQUE FIGURES

Adaptor plate to sump 49-54Nm
Adjustment trunnion to alternator bolt 23-27Nm
Alternator bolt to timing cover nut 23-27Nm
Alternator bolt-trunnion lock nuts 12-14Nm
Alternator pivot bolt 23-27Nm
Alternator pivot bolt nut 23-27Nm
Banjo bolt to cylinder head 13-16Nm
Camcover to cylinder head 9.5-12Nm
Camshaft sprocket to camshaft 23-27Nm
Clip-hose to breather pipe 2.4Nm
Connecting rod to big end nut 52-55Nm
Cylinder block drain plug 68-75Nm
Cylinder head to cylinder block:
Tighten in sequence to 52-54Nm
Rotate clockwise through exactly 90"
Dipstick to bracket 5-8Nm
Distributor clamp plate to timing cover 9.5-12Nm
Exhaust manifold to cylinder head 23-27Nm
Heat shield to exhaust manifold 23-27Nm
Heater pipe to cylinder head 23-27Nm
Heater pipe to inlet manifold 9.5-12Nm
Hose-bottom hose to water pump 3.8-4.3Nm
Hose-expansion tank to water pump 2.5-3.5Nm
Hose-heater return pipe to water pump 2.5-3.5Nm
Hose-water pump to thermostat housing 2.5-3.5Nm
Inlet manifold to cylinder head 23-27Nm
Intake elbow to throttle housing 2.4Nm
Oil pump front cover to body 9.5-12Nm
Oil pump to cylinder block 23-27Nm

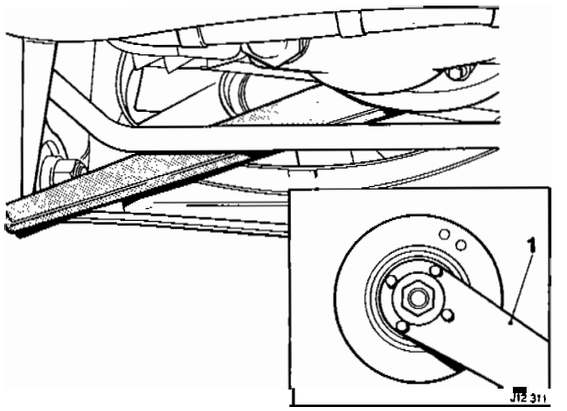


Fig 2

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TORQUE FIGURES (CONTINUED)

Oil pump rear cover to body 9.5-12Nm
Oil sump plug 41-47Nm
Oil sump to cylinder block 23-27Nm
Oil sump to timing cover 23-27Nm
Power steering pump to mounting 23-27Nm
Power steering pump to adaptor 49-54Nm
Top hose to thermostat housing 3.8-4.3Nm
Transfer housing to cylinder block 23-27Nm
Windage tray to cylinder block 23-27Nm

SPANNER SIZES

8mm
10mm
13mm
17mm
19mm (SERVICE TOOL-18G1436)
30mm

3/8in A F
9/16in A F
5/8in A F
13/16in A F

10mm (ALLENKEY)

OILS/GREASES/SEALANTS

Half moon seals to head 'HYLOSIL 102'
'O' Rings 'PETROLEUM JELLY'
Oil pump front cover to body 'LOCTITE 501'
Oil pump rear cover to body 'LOCTITE 501'
Sump to timing cover 'HYLOSIL 102'
Timing cover to head 'HYLOSIL 102'

0428G

CRANKSHAFT PULLEY

RENEW 12.21.09

Remove the spoiler/under tray to inner wheel arch cover.
Remove the nuts securing the torquatrol unit to the water pump (1.2 Fig 1).
Remove the fan cowl securing clips (1 Fig 2).
Lift out the cowl and torquatrol unit complete.

Remove the air con drive belt (if fitted).
Remove the air con drive pulley (if fitted).
Slacken the alternator drive belt adjusting nut, the link arm adjusting nut, and the alternator pivot bolt.
Pivot the alternator towards the engine and remove the drive belt.
Fit Service Tool 18G 1437 (1 Fig 3) to the crankshaft pulley (3 Fig 3) and tighten the securing bolts (2 Fig 3).
Wedge the tool against the crossmember (4 Fig 3).
Remove the pulley retaining bolt (1 Fig 1 page 64).
Remove Service Tool 18G 1437 from the pulley.
Fit Service Tool 18G 1436 to the pulley (1 Fig 2 page 64) and tighten the securing bolts (2 Fig 2 page 64).
Tighten the centre bolt, withdraw the pulley from the crankshaft and remove the tool.

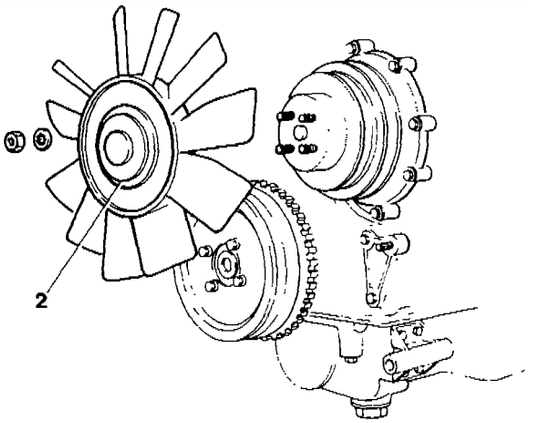
Remove the timing plate securing bolts and remove the timing plate.
Fit the timing plate to the new pulley and tighten the securing bolts.
Fit the pulley to the engine, hand tighten the securing bolt and fit Service Tool 18G 1437.
Wedge the tool against the front crossmember, torque tighten the securing bolt and remove Service Tool 18G 1437.
Re-position the alternator drive belt over the pulleys and refit the air conditioning belt (if fitted).
Refit the torquatrol unit/fan cowl assembly into position.
Fit the cowl securing clips.
Fit and tighten the torquatrol unit securing nuts.

Refit the spoiler/under tray.
Tension the alternator drive belt. A load of 1.5kg must give a total deflection of 4.5mm when applied to the mid-point of the belt.
Tension the air conditioning drive belt and tighten the securing bolts (if fitted).

DATA

SERVICE TOOLS

Crankshaft pulley remover 18G 1436
Front pulley lock 18G 1437/1



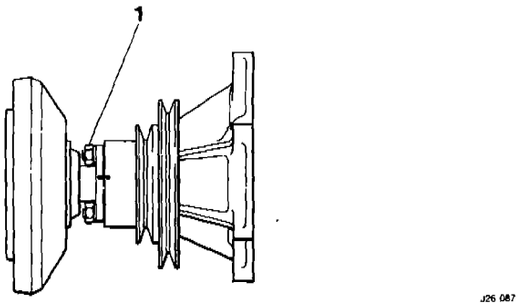


Fig 1

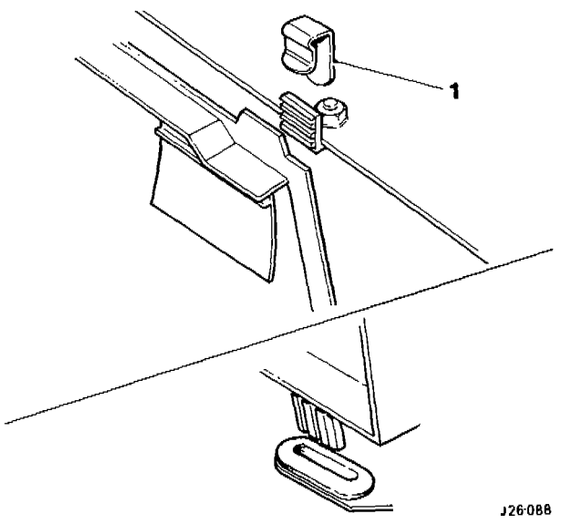


Fig 2

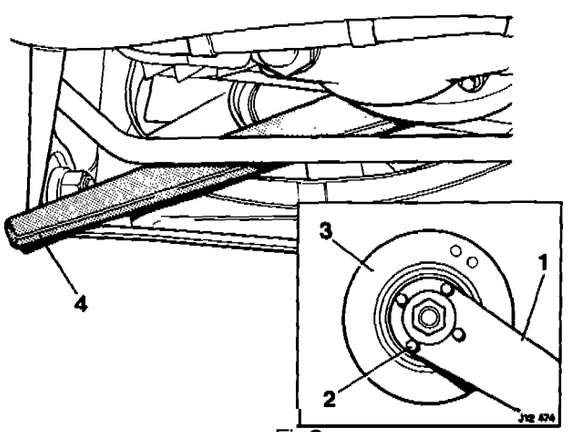


Fig 3

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DATA

TORQUE FIGURES

Adjustment bolt to timing cover nut 23-27Nm
Adjustment bolt trunnion lock nuts 12-14Nm
Adjustment trunnion to alternator bolt 23-27Nm
Alternator pivot bolt 23-27Nm
Alternator pivot bolt nut 23-27Nm
Crankshaft pulley to crankshaft 203.5Nm
Torquatrol unit to water pump pulley 23-27Nm

SPANNER SIZES

10mm
13mm
19mm
1/2in AF

0428G

CRANKSHAFT END FLOAT

CHECK AND ADJUST 12.21.26

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD 133 to the road spring pans (Fig 3).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 4) upwards to gain access to the brake pads (2 Fig 4).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 1 page 65) to steering rack securing bolt/nut (1,2, Fig 1 page 65).
Disengage the splines from the rack pinion (4 Fig 1 page 65).

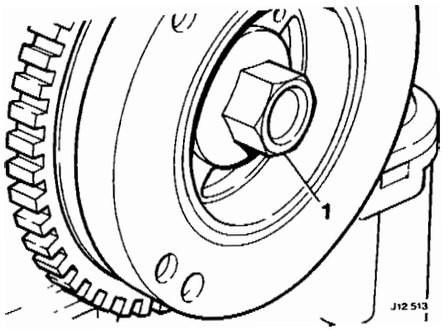


Fig 1

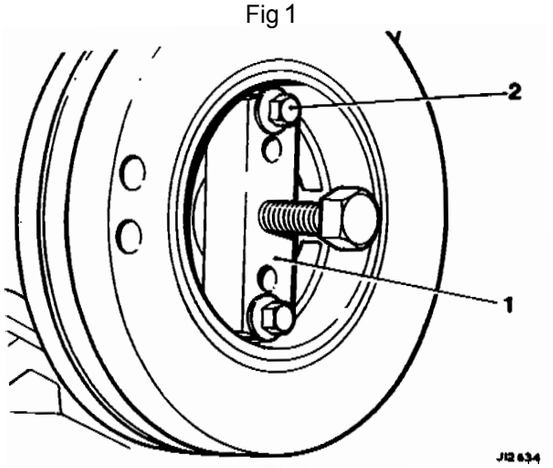


Fig 2

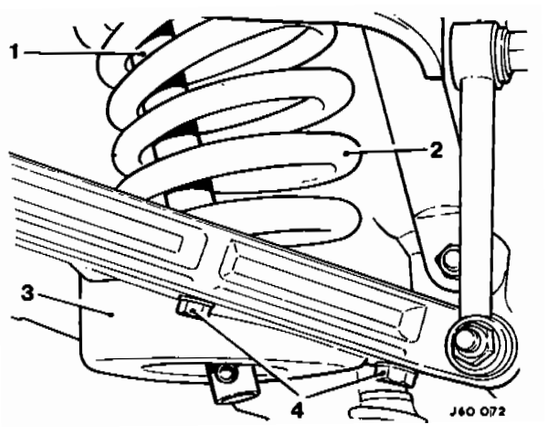


Fig 3

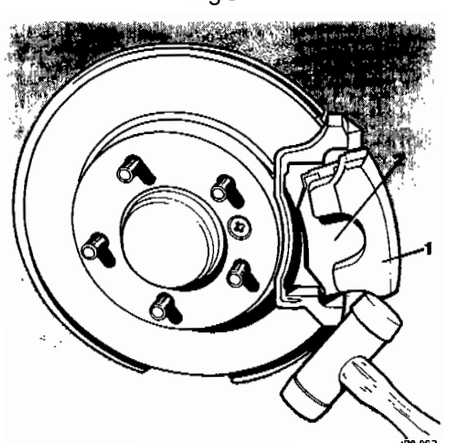


Fig 4

NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Disconnect Nos. 1 and 2 plug leads.
Attach 18G 1465 rear engine lifting eye, fit and align Service Tool MS 53B engine support bracket (Fig 2).
Engage the hook to the lifting eye.
Tighten the hook nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.

Remove the nuts. Do not remove the bolts at this stage (Fig 3).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 4).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.

Drain the engine oil.
Remove the bolt securing the dipstick tube to the inlet manifold and remove the dipstick tube/assembly.
Remove the air cleaner assembly.
Remove the alternator.
Remove the rear spacers and move the power assisted steering pipes for access.
Disconnect the exhaust to bell housing mounting bracket.
Slacken off the union securing the oil drain-back tube to the sump, and pull the tube clear of the sump.
Remove the clamp securing the gearbox oil cooler pipes to the sump (AUTO ONLY).
Remove all but two of the sump bolts.
Remove the bell housing to sump securing bolts.
Finally remove the two remaining sump bolts and lower the sump.

Place a suitable drain tray under the oil transfer housing area and remove the transfer housing (1.2 Fig 1 page 66).
Remove the oil pump pick-up pipes (3 Fig 1 page 66).
Remove crankshaft windage trays (6 Fig 1 page 66).

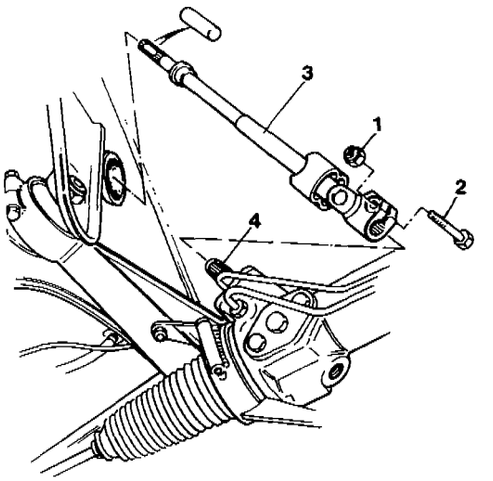
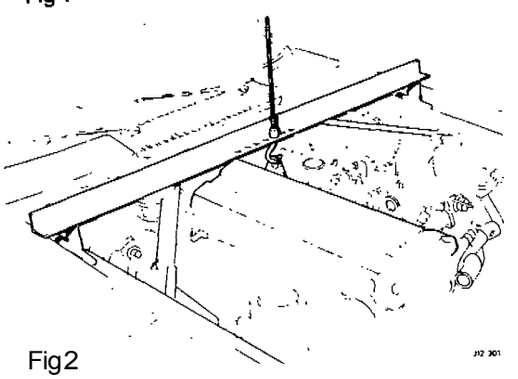
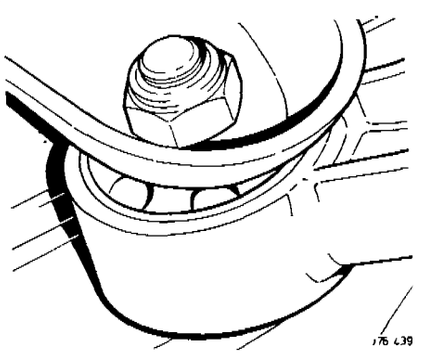
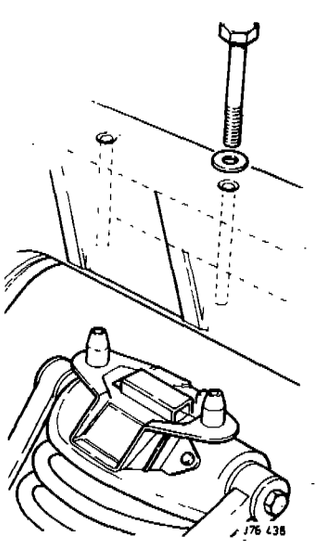


Fig 1


Fig 2


Fig 3


fig 4

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Mount a suitable dial gauge to the fan cowl and position the stylus on the crankshaft front pulley.
Zero the gauge, and with the use of a suitable lever, measure the crankshaft endfloat (Fig 2).
Correct endfloat should be 0.004 to 0.010in.
Should the endfloat exceed this, remove the centre main bearing cap, remove the thrust washers and replace with suitable oversized thrust washers.
These are available in 0.005in and 0.010in.
Thrust washers can be added to reduce the endfloat by 0.005in, 0.100in, 0.015in and 0.20in. (the oversizes are marked on the steel side of the thrust washer).
NOTE When refitting the thrust washers, ensure that the bearing face (grooved) and not the steel side contacts the crankshaft.
Recheck the end float and if satisfactory, clean the main bearing cap and bearing, lubricate with clean engine oil and fit the cap assembly to the cylinder block.
Fit and torque tighten the securing bolts.
Note: Ensure that the bearing cap is the correct way round, ie the cap numbers correspond to the numbers stamped on the oil sump mounting face.
Rotate the crankshaft to ensure that it is not being 'pinched' and will rotate freely.
Remove the dial gauge and torque tighten the main bearing cap.
Refit the windage trays to the cylinder block and secure with the bolts.
Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 3).
Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102' to the transfer housing gasket face, fit and seat the housing
Fit and tighten the securing bolts.

Apply 'Hylosil' to the sump and block gasket faces and fit the sump into position.
Fit and torque tighten the securing bolts.

Refit the oil filler/drain back tube.
Refit the alternator, ensure all spacers are correctly located.
Tension the alternator drive belt. A load of 1.5kg must give a total deflection of 4.5mm when applied to the mid-point of the belt.
Refit the air cleaner assembly.
Re-position the steering rack under the sump.
Position the crossmember assembly on the jack under the vehicle.
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, P.A.S. pipes, lower column and rear mountings.
Align the front mounting securing bolt holes.
Fit and tighten the front mounting securing nuts (Fig 1 page 67).
Using a second jack, align the left hand rear mounting (Fig 2 page 67).

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting. Fit the inner spacer.
Push the bolt fully home, fit but do not tighten the nut.

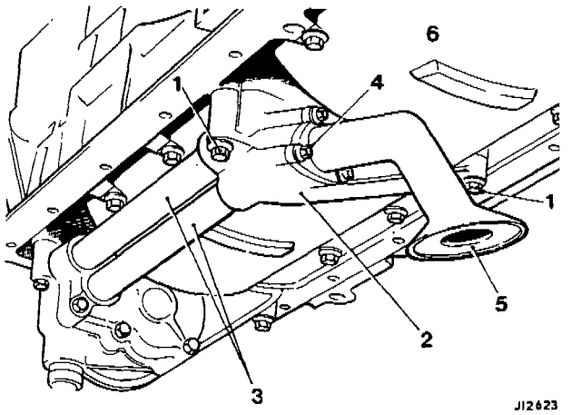


Fig 1

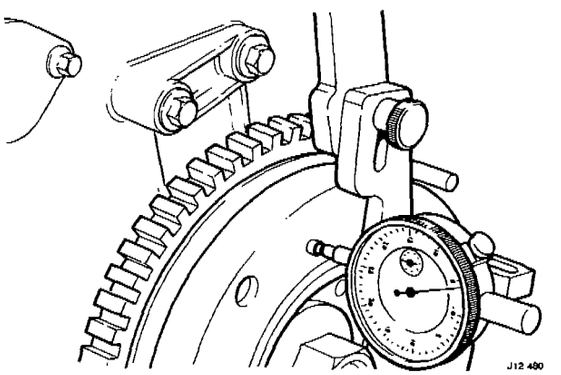


Fig 2

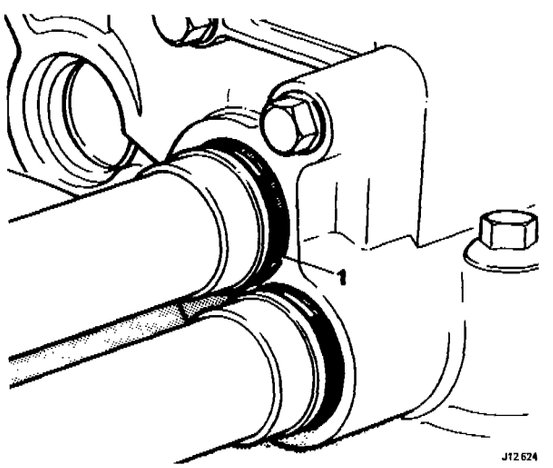


Fig 3

Lower the jack from below the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower the jack from below the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp plate securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the P.A.S. pipes and rack.
Fit new 'O' rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the P.A.S. pipe clamps.

Slacken off the MS 53B hook nut. Remove the hook.
Remove Service Tool **MS 53B.**
Remove the lifting eye.
fit and tighten the engine mounting securing nuts. Refit the calipers. Refit the brake pads.
Refit the road wheels.
Lower the vehicle from the axle stands Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. Lower the vehicle.
Refill the engine with oil to the correct level.

Bleed the P.A.S. system as follows:
Top up the P.A.S. reservoir.
Start the engine.
Turn the steering wheel to full left hand lock.
Turn the steering wheel to full right hand lock.
Top up the reservoir. Fit the reservoir cap.
Close the bonnet.

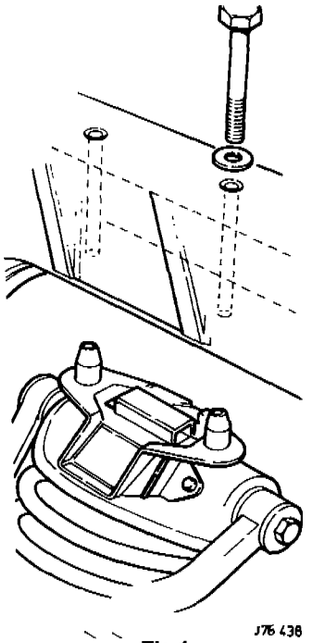


Fig 1

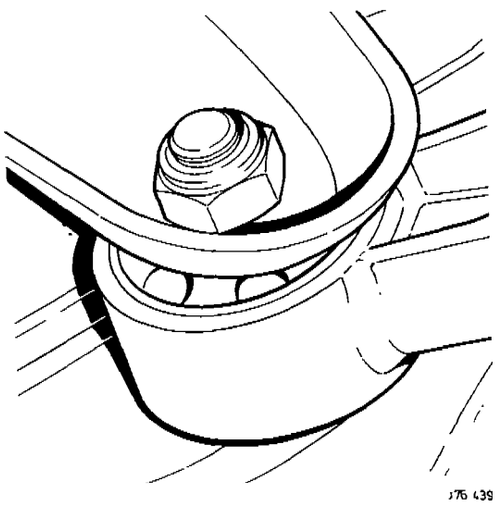


Fig 2

DATA

Crankshaft end float:
0.004 to 0.010 in.

Oversize thrust washers available in sizes:
0.005 in.
0.010 in.

Oil pump sprocket shims available sizes:
0.005in
0.010in
0.020in

SERVICE TOOLS

*Tie-down bars **JD 133***
*Rear lifting eye **18G 1465***
*Engine support bracket **MS 536***

TORQUE FIGURES

*Adaptor plate to sump **49-54Nm***
*Adjustment trunnion to alternator bolt **23-27Nm***
*Alternator bolt to timing cover nut **23-27Nm***
*Alternator bolt (trunnion lock nuts) **12-14Nm***

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TORQUE FIGURES

Alternator pivot bolt/nut 23-27Nm
Caliper to carrier 31-40Nm
Dipstick to bracket 5-8Nm
Main bearing cap to block 136-142Nm
Oil drain back tube to sump adaptor 12.5-15Nm
Oil pump sprocket to oil pump drive hub 9.5-12Nm
Oil pump to cylinder block 23-27Nm
Oil sump plug 41-47Nm
Oil sump to cylinder block 23-27Nm
Oil sump to timing cover 23-27Nm
P.A.S. feed pipe to rack 19-23Nm
P A S. return pipe to rack 19-23Nm
Shock absorber to upper mounting 35-43Nm
Transfer housing to cylinder block 23-27Nm
Wheel nut to wheel stud (steel wheel) 65-85Nm
Wheel nut to wheel stud (alloy wheel) 88-102Nm
Windage tray to cylinder block 23-27Nm

SPANNER SIZES

10mm
13mm
17mm
19mm
30mm
3/8in AF
9/16in AF

OILS/GREASES/SEALANTS

Oil pipe 'O' rings PETROLEUM JELLY
Sump to cylinder block 'H YLOSIL 102'
Transfer housing to block 'HYLOSIL 102

0428G

CRANKSHAFT FRONTOILSEAL

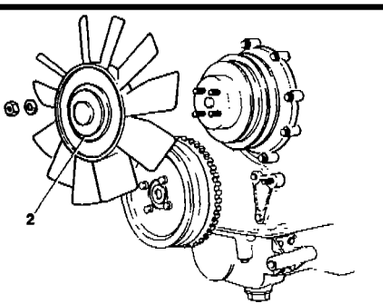
RENEW 12.21.14

Remove the spoiler/under tray to inner wheel arch cover.
Remove the nuts securing the torquatrol unit to the water pump (1,2 Fig 1).
Remove the fan cowl securing clips (1 Fig 2)
Lift out the cowl and torquatrol unit complete.

Remove the air con drive belt (if fitted).
Remove the air con drive pulley (if fitted).
Slacken the alternator drive belt adjusting nut, the link arm adjusting nut, and the alternator pivot bolt.
Pivot the alternator towards the engine and remove the drive belt.
Fit Service Tool 18G 1437 (1 Fig 3) to the crankshaft pulley (3 Fig 3) and tighten the securing bolts (2 Fig 3).
Wedge the tool against the crossmember (4 Fig 3).
Remove the pulley retaining bolt (1 Fig 4).
Remove Service Tool 18G 1437 from the pulley.
Fit Service Tool 18G 1436 to the pulley (1 Fig 1 page 70) and tighten the securing bolts (2 Fig 1 page 70).
Tighten the centre bolt, withdraw the pulley from the crankshaft and remove the tool.

Remove the woodruff key and spacer.
Remove the old oil seal from the timing cover using Service Tool JD 128 (A Fig 2 page 70).
Fit the new oil seal (ptior to fitting the crank spacer) using Service Tool JD 129 and the crankshaft pulley bolt (B Fig 2 page 70).
Inspect the edges of the spacer for nicks, burrs and wear marks. Replace if necessary.
Refit the woodruff key.
Fit the pulley to the engine, hand tighten the securing bolt and fit Service Tool 18G 1437.
Wedge the tool against the front crossmember, torque tighten the securing bolt and remove Service Tool 18G 1437.
Re-position the alternator drive belt over the pulleys and refit the air conditioning belt (if fitted).
Refit the torquatrol unit/fan cowl assembly into position.
Fit the cowl securing clips.
Fit and tighten the torquatrol unit securing nuts.

Refit the spoiler/under tray.
Tension the alternator drive belt.
A load of 1.5kg must give a total deflection of 4.5mm when applied to the mid-point of the belt.
Tension the air conditioning drive belt and tighten the securing bolts (if fitted).



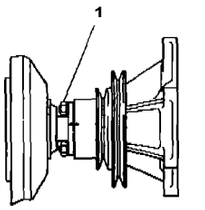


Fig 1

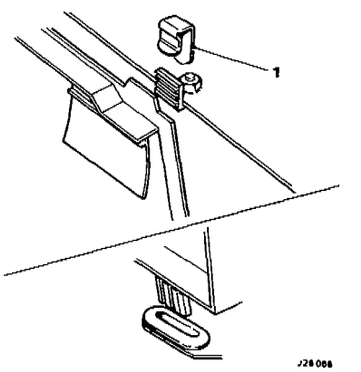


Fig 2

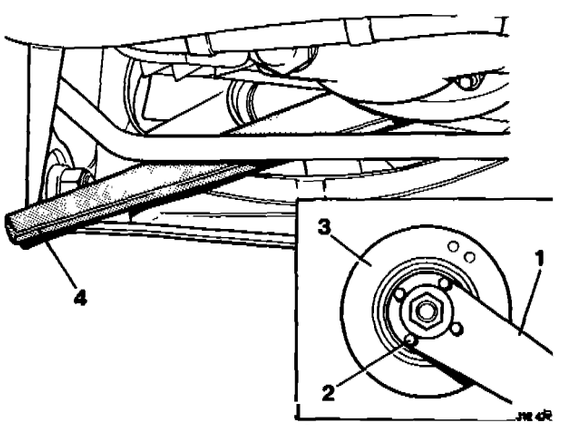


Fig 3

DATA

SERVICE TOOLS

Crankshaft pulley remover ***18G 1436***
Front *pulley* ***lock 18G 1437***

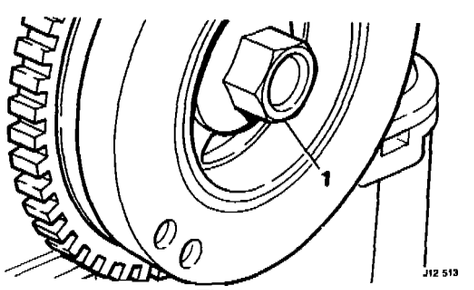


Fig 4

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TORQUE FIGURES

Adjustment bolt to timing cover nut 23-27Nm
Adjustment bolt trunnion lock nuts 12-14Nm
Adjustment trunnion to alternator bolt 23-27Nm
Alternator pivot bolt 23-27Nm
Alternator pivot bolt nut 23-27Nm
Crankshaft pulley to crankshaft 203.5Nm
Torquatrol unit to water pump pulley 23-27Nm

SPANNER SIZES

8mm
10mm
13mm
19mm

1/2in AF
9/16in AF

04286

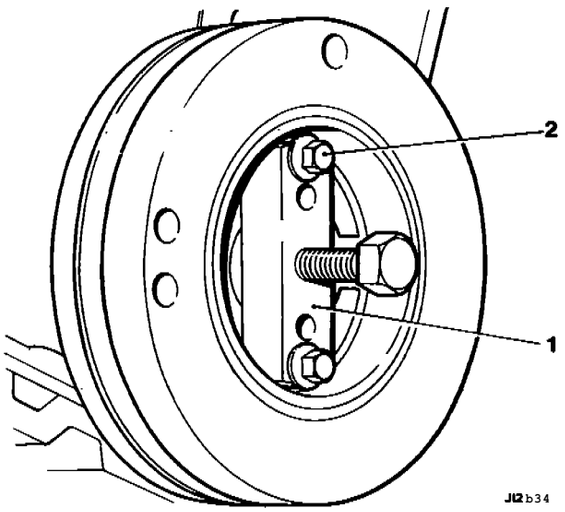


Fig 1

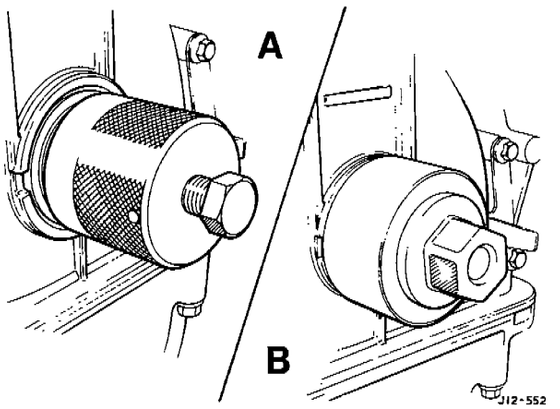


Fig 2

CRANKSHAFT REAR OIL SEAL

RENEW **12.21.20**

Remove the flywheel 12.53.07 (Manual) page 72.
Remove the drive plate 12.53.03 (Auto) page 74.

NOTE: Make a note of the position of any balance weights fitted to the flywheel/drive plate.

Remove the rear oil seal housing securing bolts (1 Fig 1) and remove the housing (2 Fig 1).
Carefully remove the old rear oil seal from the housing, clean the housing and lubricate the seal mounting face.
DO NOT REMOVE THE PLASTIC 'O' RING PROTECTOR FROM THE NEW SEAL PRIOR TO FITTING TO THE HOUSING.

Fit the new seal (3 Fig 2) to the housing (4 Fig 2) using tool JD 550-3 (1 Fig 2) and 18G 134 (2 Fig 2).

Smear the gasket face with 'Hylosil 102', and locate the plastic 'O' ring protector (1 Fig 3) on to the end of the crankshaft (2 Fig 3).
Push the rear seal housing (3 Fig 3) over the crankshaft and up to the rear cylinder block face.
Remove the plastic 'O' ring protector.
Fit and torque tighten the housing securing bolts.

Refit the flywheel 12.53.07 (Manual) page 72.
Refit the drive plate 12.53.03 (Auto) page 74.

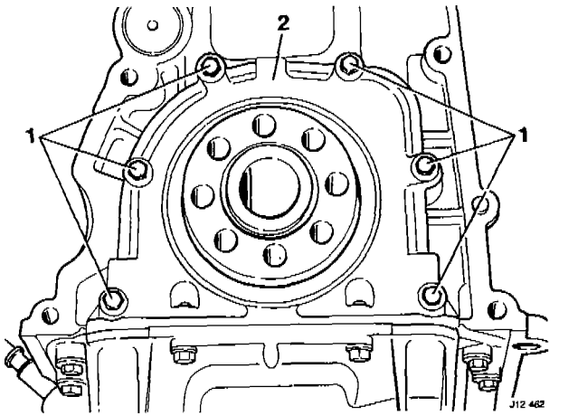


Fig 1

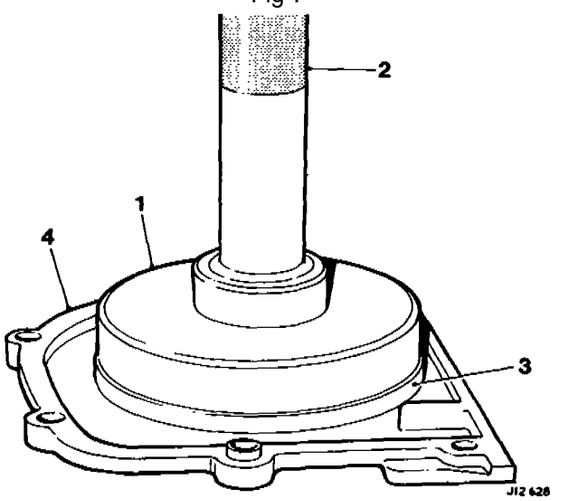


Fig 2

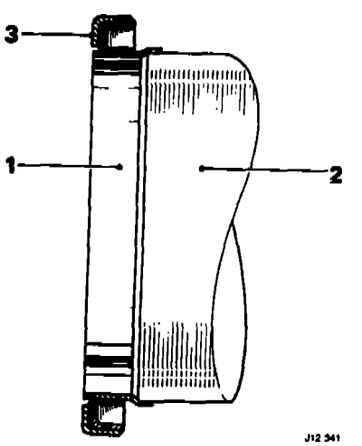


Fig 3

DATA

SERVICE TOOLS

Driver handle 18G 134
Rear main oil seal installer JD 550-3

TORQUE FIGURES

Rear seal housing to cylinder block 23-27Nm

SPANNER SIZES

17mm

04286

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ENGINE FLYWHEEL

RENEW **12.53.07**

Remove the rear inlet manifold securing nuts and pull the earth leads clear of the studs.
Fit lifting eye 18G 1465 to the rear inlet manifold studs.
Fit Service Tool MS 53B (Fig 1) and take the weight of the engine with the hook.
Remove the fan cowl. Remove the gear knob.
Remove the propeller shaft.
Remove the exhaust down pipe support bracket and the down pipe/intermediate pipe clamp.
Remove the olive and secure the exhaust aside.
Remove the slave cylinder nuts (1 Fig 2) from the bell housing and remove the push rod.
Disconnect the gearbox switch connectors.
Using a jack/support channel, take the weight of the gearbox and remove the bolts securing the rear mounting to the body. Lower the jack and remove the rear mounting assembly.
Using MS53B, lower the gearbox and engine assembly.
Disconnect the gear selector shaft universal joint securing nut/bolt, remove the wavy washer and remove bolts securing the remote control.
Remove the mounting rubbers and washers.
Remove the gearbox switch for access to the upper right hand gearbox/bell housing securing bolt.
Remove the remaining gearbox/bell housing securing bolts and remove the gearbox assembly.
Reposition the clutch slave cylinder (1 Fig 3) from the bell housing.
Remove the gearbox insulation pad.
Remove the bell housing to adaptor plate securing bolts (2 Fig 3) and nuts, reposition the earth leads and remove the bell housing (3 Fig 3).

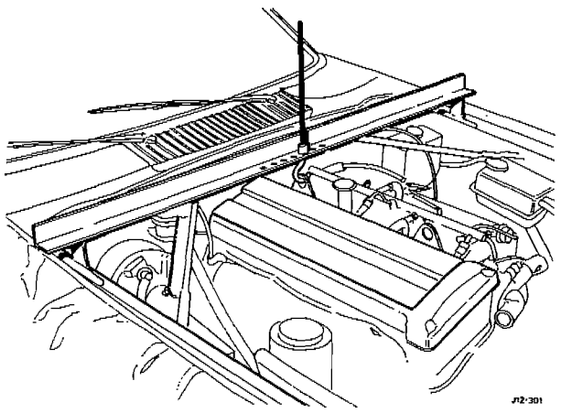


Fig 1

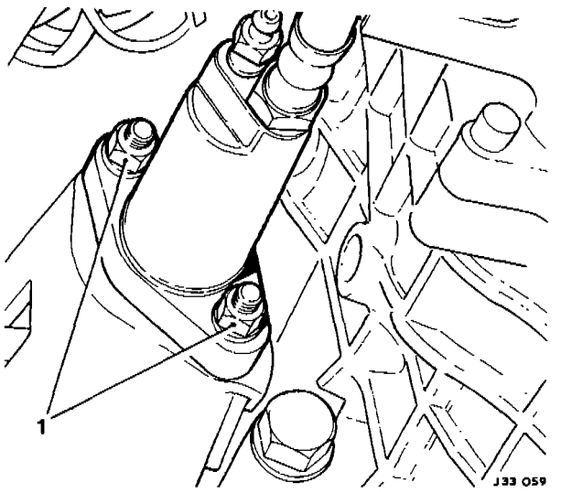


Fig 2

Hold the flywheel in one position and remove the bolts securing the clutch cover to the flywheel.
CAUTION: MAKE A NOTE OF THE POSITION OF ANY BALANCE WEIGHTS RELATIVE TO THE CLUTCH COVER. Remove the balance weights.
Remove the clutch assembly.
WARNING: THE TWIN-MASS FLYWHEEL IS EXTREMELY HEAVY. ASSISTANCE WILL BE REQUIRED DURING REMOVAL.
Remove the eight securing bolts (1 Fig 1 page 73) and remove the flywheel (2 Fig 1 page 73).
Remove the needle roller race and fit to the replacement flywheel.
Refit the flywheel to the crankshaft and torque tighten the securing bolts to the recommended value.
Fit the clutch assembly to the flywheel ensuring that the 'flywheel side' of the drive plate faces the flywheel.
Align the clutch with a dummy input shaft.

Fit the balance weights to the clutch cover and torque tighten the securing bolts.
Remove the dummy shaft.

Fit the housing to the adaptor plate, fit and torque tighten the securing bolts/nuts.

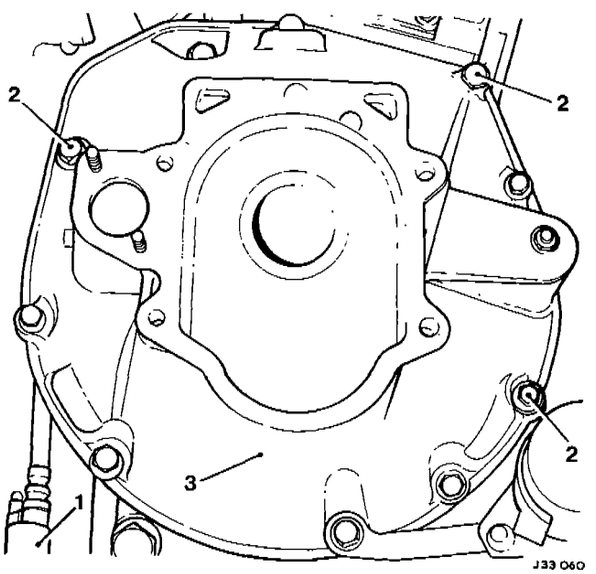


Fig 3

fit the insulation pad in position, secure with string.
Fit the gearbox, fit and tighten the bolts.
Refit the upper switch.
Fit the mounting rubbers and washers, reconnect the selector shaft.
Raise the engine by tightening the hook nut on tool MS 538 and refit the rear mounting.
Refit the slave cylinder. Reconnect the exhaust system.
Refit the propeller shaft.
Lower the ramp. Release and remove tool MS 53B.
Refit the fan cowl.
Remove the engine lifting eye.
Fill the gearbox with the recommended grade of oil to the lower threads of the filler plug aperture.

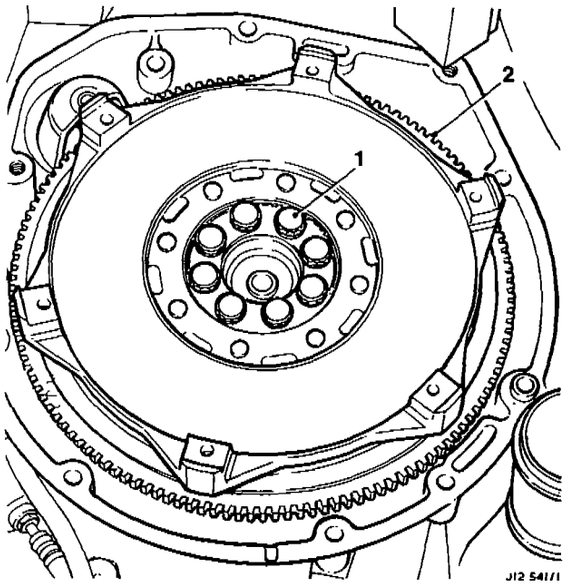


Fig 1

DATA

Maximum material removal allowance to clean up the clutchface 1 mm.

SERVICE TOOLS

***MS 53B** Engine support bracket*
***18G 1465** Engine lifting bracket*

TORQUE FIGURES

*Bell housing to adaptor plate **49-54Nm***
*Clutch cover to flywheel **23-27Nm***
*Flywheel to crankshaft **95-105Nm***
*Propeller shaft to gearbox **95-105Nm***
*Slave cylinder to bell housing **23-27Nm***

SPANNER SIZES

10mm
13mm
17mm
9/16AF

0428G

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ENGINE DRIVE PLATE

RENEW 12.53.13

Disconnectthe kickdown cable from the throttle linkage.
Removethe bolt securing tho transmission dipstick tube to the inlet manifold.
Fit Service Tool **18G 1465** to the rear of the inlet manifold and take the weight of the engine with MS53B (Fig **1).**
Place drain tin below the transmission, drain the fluid.
Disconnectthe exhaust front pipe.
Taking the weight of the transmission unit, remove the rear mounting to body securing bolts, lower the jack and collet the spacer.
Disconnectthe propeller shaft from the drive flange.
Removethe rotary transmission switch/cable assembly/ harness **(1**,**2** Fig **2)** complete. Reposition the switch assembly away from the work area.
Removethe selector cable bracket clamp.
Place a drain tin below the dipstick tube (Fig 3), and disconnect the union, drain the remaining fluid and fit a dummy plug to the sump.
Remove the clamp securing the transmission cooling pipes to the transmission, disconnect the pipes and fit a dummy plug to the apertures. Remove the drain tin.
Remove the blanking plug from the torgue converters securing bolt access aperture **(1** Fig 4), and remove the crankshaft/drive plate securing bolts, turning the crankshaft for access to remove each bolt.

Lower the engine/transmission unit using MS53B ensuring that the engine does not foul the steering rack
Remove the bell housing bolts and remove the transmission **(1** Fig 1 page 75).
Remove the drive plate securing bolts **(1** Fig 2 page 75).
Remove the drive plate **(2** Fig 2 page 75).
Check the crankshaft rear oil seal for leaking, replace as necessary **12.21.20** page 71.
Fit the replacement drive plate to the crankshaft. Fit and tighten the securing bolts.
Lift the transmission unit into position, fit and tighten the bell housing bolts.
Tighten the torque converter bolts as follows:

1 Turn the crankshaft for access to the first converter to drive plate securing bolt **(1** Fig 4).
Align the converter to drive plate bolt hole.
Fit but do not fully tighten the converter to drive plate securing bolt.
2 Turn the crankshaft for access to the second securing bolt hole.
Fit but do not fully tighten the second securing bolt.
3 Turn the crankshaft for access to the remaining securing bolt hole.
Fit and torque tighten the remaining securing bolt.
4 Torque tighten the remaining two securing bolts,

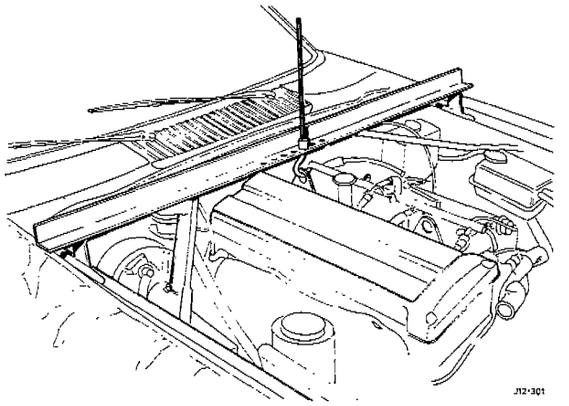


Fig 1

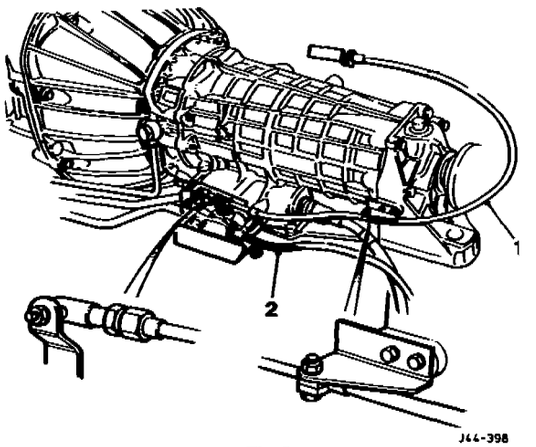


Fig 2

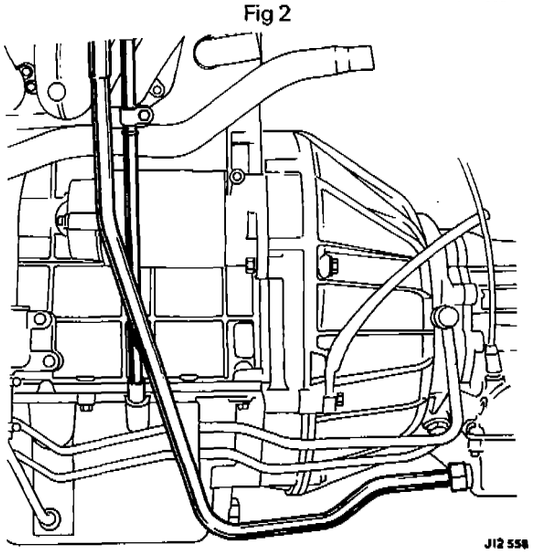


Fig 3

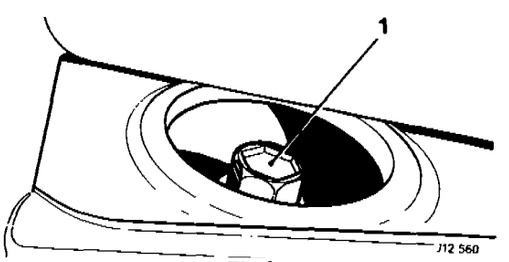


Fig 4

Refit the blanking plug and stone guard.
Refit the oil cooler pipes to the transmission ensuring new sealing washers are used, secure with the sump bracket.
Reposition the kickdown cable to the bell housing and refit the dipstick tube.
Raise the engine/transmission unit using MS53B.

Refit the rotary transmission switch/cable/harness assembly to the selector shaft. Fit but do not tighten the securing nuts.
Ensure that the selector lever is in neutral.
Adjust the switch to enable Service Tool JD 161 to be fitted (Fig 3), thus aligning the selector shaft and switch.
Torque tighten the switch securing bolts.
Remove the tool.
Refit the propeller shaft to the drive flange, raise the rear of the unit into position fit the spacers and secure with the mounting bolts.
Refit the exhaust front pipe to the intermediate pipe and manifold.
Remove Service Tool MS53B align the fan cowl, refit and adjust the kickdown cable.
Remove the engine lifting eye 18G 1465 and replace the manifold securing nuts.
Align and secure the dipstick tubes to the inlet manifold.
Refill with transmission fluid.

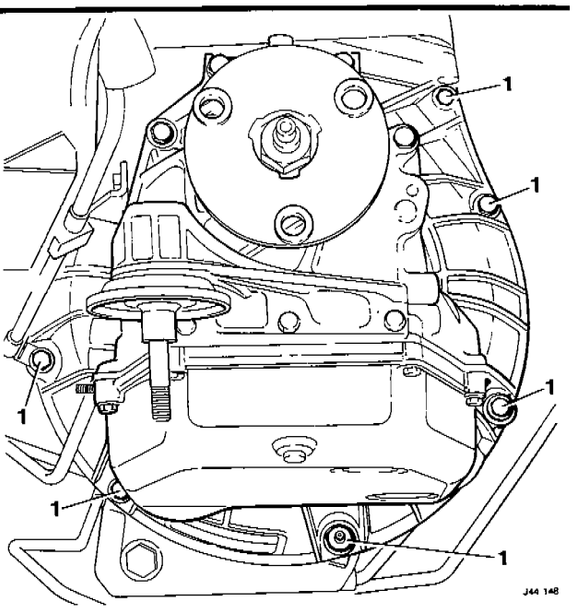


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
***18G 1465** Engine lifting bracket*

TORQUE FIGURES

*Base plate assembly to mounting pan **7-10Nm***
*Dipstick tube nut **20Nm***
*Down pipe to intermediate pipe **15-18Nm***
*Drain plug **15Nm***
*Drive plate to crankshaft **95-105Nm***
*Drive plate to torque convertor **49-54Nm***
*Exhaust tie nut/stud **9.5-12.5Nm***
*Intermediate pipe to silencer **15-18Nm***
*Oil cooler pipe banjo bolt **32-36Nm***
*Propeller shaft to gearbox **95-105Nm***
*Rear engine mounting bracket to body **20-25Nm***
*Torque convertor housing **to** adaptor **49-54Nm***
*Torque convertor housing to block/sump **49-54Nm***

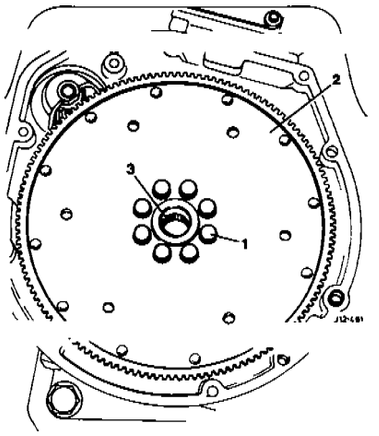


Fig 2

OILS/SEALANTS/LUBRICANTS

*Exhaust sealer **TIVOLI KAYADHESIVES No 5696***
*Transmission fluid **Dexron IID***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16 AF
5mm Allen key

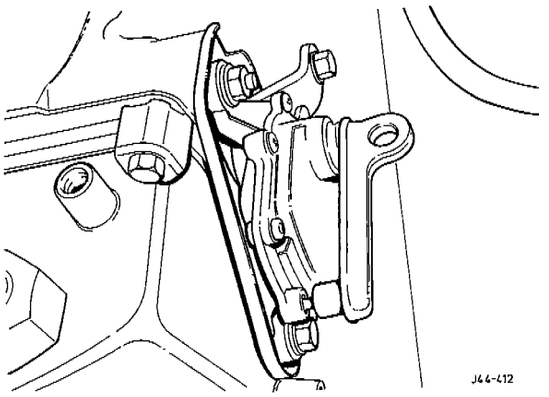


Fig 3

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ENGINE REAR/TRANSMISSION ADAPTOR PLATE

RENEW **12.53.03**

Remove the engine flywheel 12.53.07 (Manual) page 72.
Remove the engine drive plate 12.53.13 (Auto) page 74.

Remove the lower bolt securing the starter motor and reposition the starter motor away from the adaptor plate.
Remove the adaptor plate securing bolts (1 Fig 1) and remove the adaptor plate.
Remove the dowel pegs and blanking plugs from the adaptor plate.
Discard the adaptor plate.

Fit the blanking plugs and dowel pegs to the new adaptor plate.
Fit the assembly to the rear of the engine and torque tighten the securing bolts.
Re-position the starter motor to the adaptor plate and secure with the lower bolt.

Refit the engine flywheel 12.53.07 (Manual) page 72.

Refit the engine drive plate 12.53.13 (Auto) page 74.

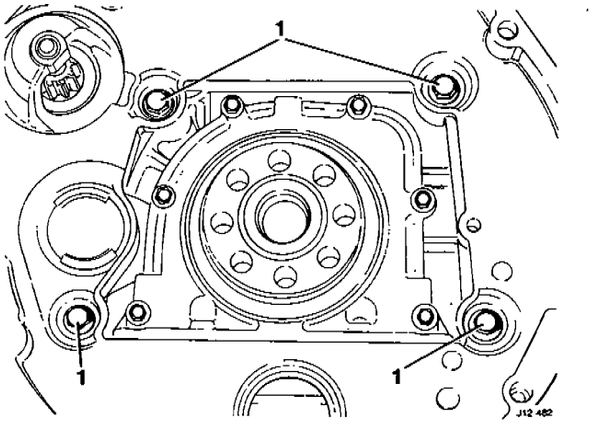


Fig 1

DATA

TORQUE FIGURES

Adaptor plate to cylinder block 49-54Nm
Engine drive plate to crankshaft 95-105Nm
Engine flywheel to crankshaft 95-105Nm
Starter motor to adaptor plate 49-54Nm

SPANNER SIZES

13mm
17mm

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ENGINE ASSEMBLY

RENEW **12.41.01/2**

REMOVE ENGINE

MANUAL AND AUTOMATIC.
Remove the passenger side dash liner. Remove the fuel pump relay from the yellow base connector.
Crank the engine to de-pressurise the fuel system.
Switch off the ignition.
Refit the relay.

Open the bonnet.
Disconnect the battery earth lead.
Remove the bonnet insulation pad. Disconnect the bonnet lamp multi plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround) for paint protection.
Slacken off the bonnet securing bolts (1 Fig 1), disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place a drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the spoiler/under tray to inner wheel arch cover.
Remove the nuts securing the torquatrol unit to the water pump.
Remove the fan cowl securing clips (1 Fig 3).
Lift out the cowl and torquatrol unit complete.

Disconnect the expansion tank hose from the radiator.
Disconnect the bottom hose from the water pump.
Disconnect the top hose from the thermostat housing.
Place a drain tray under the front of the vehicle.
Disconnect the P.A.S. cooler pipes from the radiator. Remove and discard the 'O' ring seals. Fit plugs to the pipes and radiator.

AUTOMATIC ONLY
Disconnect the gearbox cooler pipes from the radiator; remove and discard the 'O' ring seals; fit plugs to the pipes and radiator.

MANUAL AND AUTOMATIC:
Remove the drain tray.
Remove the top radiator rail.
Cut and remove the thermostatic switch multi plug securing strap (AIRCON ONLY).
Disconnect the thermostatic switch multi plug (AIRCON ONLY).
Remove the radiator/hose assembly.
Cut and remove the harness to hydraulic pump hose securing straps.
Remove the coil mounting bracket securing bolt.

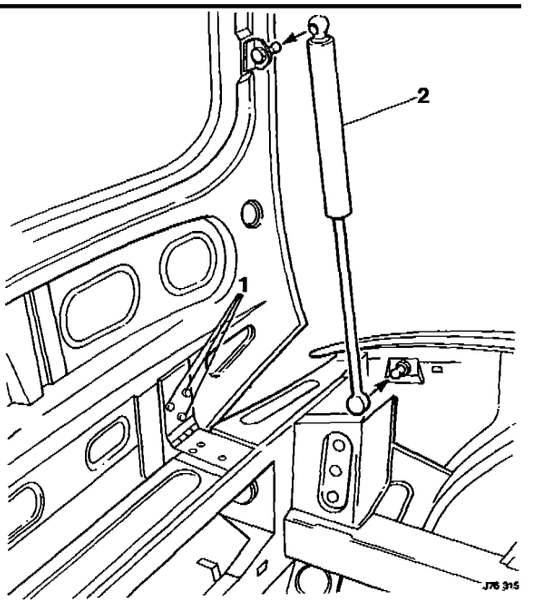


Fig 1

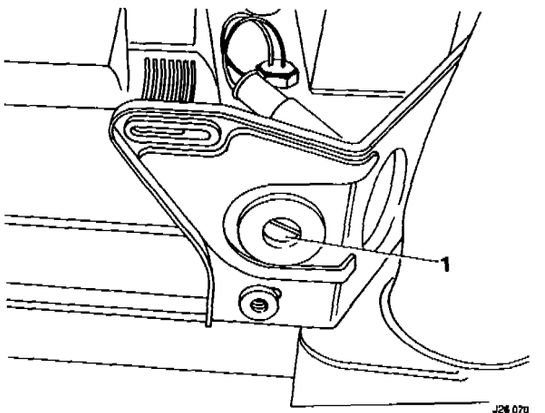


Fig 2

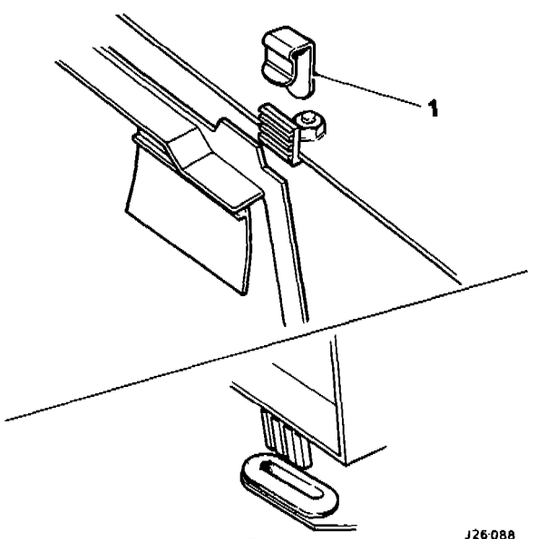
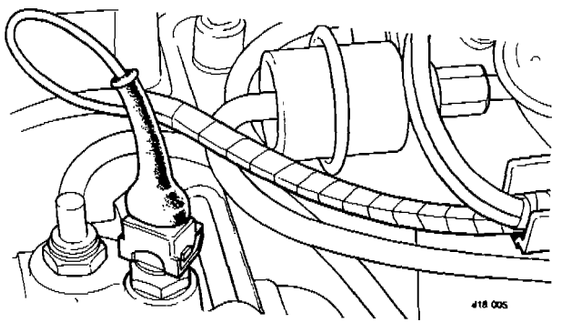


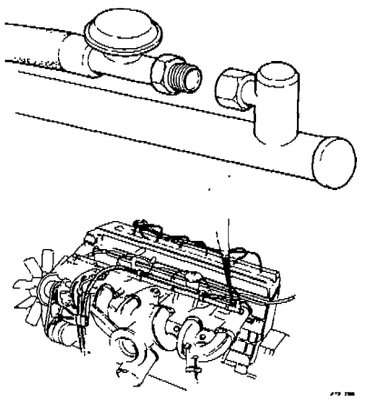
Fig 3

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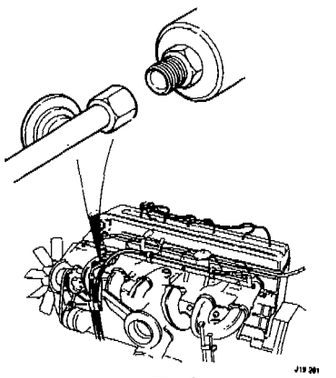
Re-position the earth lead away from the coil mounting.
Re-position the insulation boots away from the coil L.T. terminals.
Remove the coil LT connection securing nuts and disconnect the feed wires.
Disconnect the super heat switch and multi plug from the compressor (AIRCON ONLY).
Disconnect the engine harness block connectors.
Disconnect the crank sensor block connector.
Cut and remove the harness to cylinder head bracket ratchet strap.
Re-position the harness over the manifold.

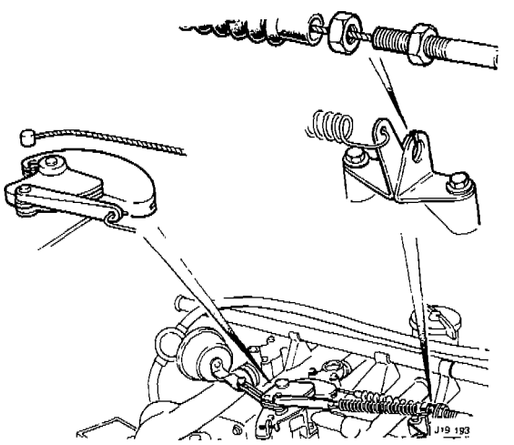

Fig 1

Disconnect the coil H.T. lead.
Place a drain tray under the front of the vehicle.
Remove the P.A.S. reservoir to pump hose.
Plug the reservoir and pump.
Disconnect the rack to pump feed pipe.
Remove and discard 'O' ring seal.
Plug the feed pipe and pump.
Remove the drain tray.
Remove the hydraulic pump to timing cover securing bolts. Remove the pump.
Remove the pump drive coupling.
Disconnect the coolant temperature sensor block connectors (Fig 1).


Fig 2

Disconnect the injector block connectors.
Disconnect the throttle potentiometer block connector.
Disconnect the air flow meter and auxilliary air valve multi plugs.
Disconnect the coolant temperature and oil pressure transmitter feed wires.
Remove the inlet manifold front securing nut and re-position the earth leads away from the manifold.
Re-position the harness away from its manifold location.
Remove the inlet manifold rear securing nuts and re-position the earth leads away from the studs.
Re-position the complete harness over the bulkhead, away from the engine.
Remove the fuel feed pipe to injector rail retaining clips.
Disconnect the fuel feed pipe from the injector rail (Fig 2).
Plug the feed pipe and injector rail.
Disconnect the return hose from the pressure regulator (Fig 3).
Plug the hose and regulator.
Reposition the feed and return hoses away from the manifold.
Disconnect the heater vacuum hoses from the manifold.
Disconnect the inner throttle cable from the linkage (Fig 4).
Slacken off the throttle cable adjusting nuts.
Disconnect the cable and re-position away from the bracket.
Disconnect the intake elbow hose from the throttle housing.
Disconnect the intake elbow hose from the breather pipe.
Disconnect the auxilliary air valve hose from the intake elbow.


Fig 3


Fig 4

Remove the intake elbow to mounting rubber securing nut.
Unclip the air flow meter from the air cleaner box.
Remove the airflow meter/intake elbow assembly.

Disconnect the expansion tank hose from the thermostat housing.
Disconnect the expansion tank hose from the water pump.
Remove the insulation boots from the alternator terminals.
Remove the alternator terminal securing nuts.
Remove the alternator terminals and re-position away from the alternator.
Disconnect the water valve vacuum hose.
Disconnect the feed hose from the heater.
Disconnect the return hose from the heater return pipe.
Disconnect the starter solenoid feed wire multi plug.
Remove the solenoid main feed connection securing nut.
Remove the starter solenoid/alternator link harness.
Remove the main harness from the starter solenoid terminal and re-position away from the engine.
Remove oil cooler pipes to oil filter head clamp nut.
Disconnect the pipes from the filter head.
Fit the lifting eyes 18G 1465 to the manifold (Fig 1).
Tighten the securing nuts.
Fit the engine retaining tool MS 53B to the wing channels. Align to the rear lifting eye (Fig 1).
Tighten the wing channel stand nuts/bolts. Fit and engage the retaining hook to the rear eye.
Tighten the hook nut to take the engine weight.

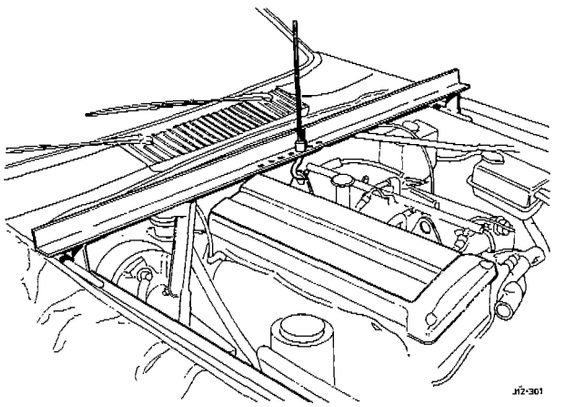


Fig 1

MANUAL ONLY:
Jack up the rear of the vehicle. Support with axle stands.
Remove the propshaft.
Lower the vehicle.

MANUAL AND AUTOMATIC:

Jack up the front of the vehicle. Support with axle stands.
Slacken off the compressor adjusting link nut (2 Fig 2) (AIRCON ONLY).
Slacken off the adjusting link trunnion bolt (1 Fig 2) (AIRCON ONLY).
Slacken off the adjusting link to compressor pivot bolt (3 Fig 2) (AIRCON ONLY).
Slacken qff the compressor pivot bolts (AIRCON ONLY).
Pivot the compressor towards the engine (AIRCON ONLY).
Remove the drive belt (4 Fig 2) AIRCON ONLY).
Finally remove the adjusting link and compressor pivot bolts (AIRCON ONLY).
Re-position the compressor away from the mounted position and secure to the body (AIRCON ONLY).
Disconnect the exhaust intermediate pipe to gearbox Support cable (Fig 3).

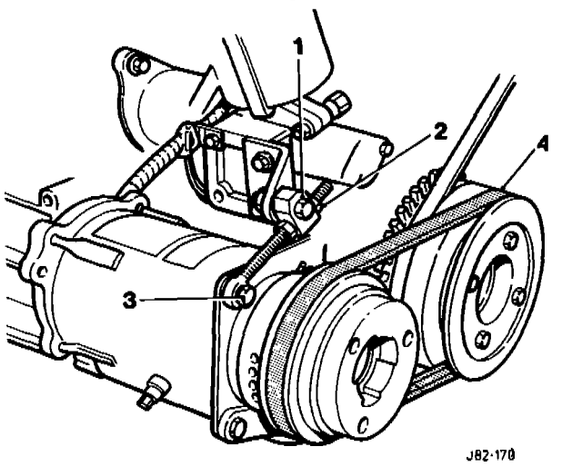


Fig 2

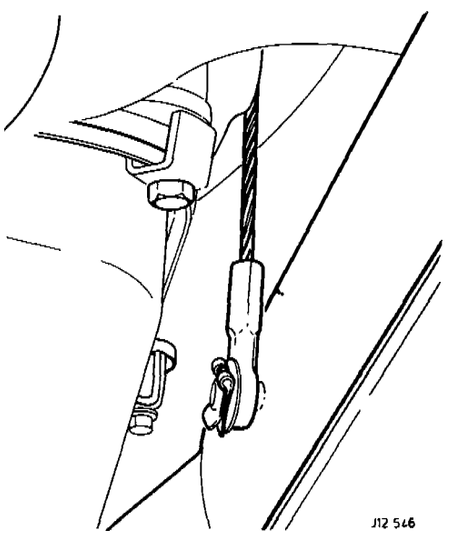


Fig 3

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Remove the clutch housing tn front pipe bracket.
Remove the front pipe to manifold securing nuts.
Displace the flanges from the studs and disconnect the exhaust system.
Remove the earth lead to clutch housing securing bolt.
Re-position the earth lead away from the engine.

MANUAL ONLY
Remove the clutch slave cylinder (1,2 Fig 1) from the bell housing. Remove the push rod (3 Fig 1).
Note and disconnect the gearbox switch multi plugs.
Take the weight of the rear mounting on the jack.
Remove the rear mounting to body securing **bolts.**
Lower the jack and remove the mounting assembly.
Remove the mounting spring.
Remove the spring to gearbox mounting rubber.
Slacken off tool MS **53B** hook nut to lower the rear of the gearbox for access. Ensure the engine does not foul the steering rack from below. Remove the gear lever to selector securing bolt.
Reposition the gear lever away from the selector linkage.
Retrieve the wavy washer.
Remove the remote control mounting *to* gearbox securing bolts.
Re-position the mounting for access.
Remove the mounting rubbers and washers.
Lower the vehicle from the front axle stands.

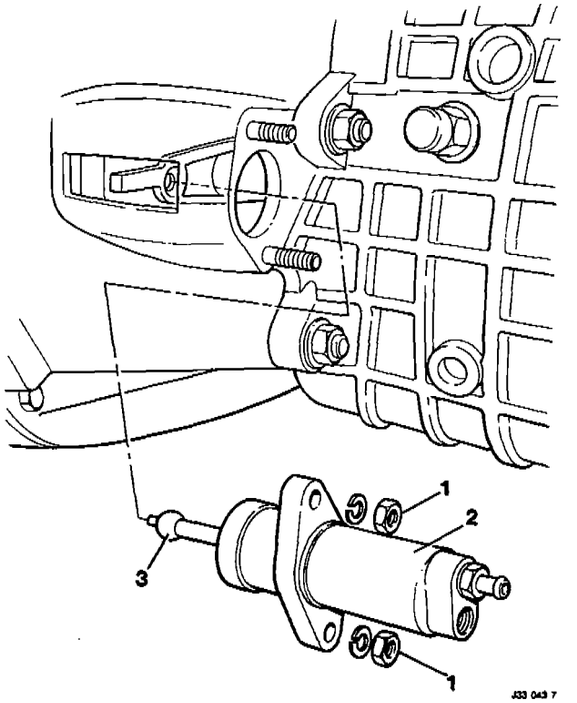


Fig 1

AUTOMATIC ONLY:
Remove the selector cable from the securing clamp and remove the rotary transmission switch/cable assembly/ harness (1,2 Fig 2) complete. Reposition the switch assembly away from the work area.

Take the weight of the rear mounting on the jack.
Remove the rear mounting to body securing bolts.
Lower the jack and remove the mounting assembly.
Remove the mounting spring. Remove the mounting spring to gearbox rubber. Remove the mounting to body spacers.
Remove the propshaft to gearbox flange securing nuts.
Re-position the propshaft away from the flange.
Slacken off tool MS53B hook nut to lower the rear of the gearbox for access. Ensure the engine does not foul the rack.
Lower the vehicle from the front axle stands.

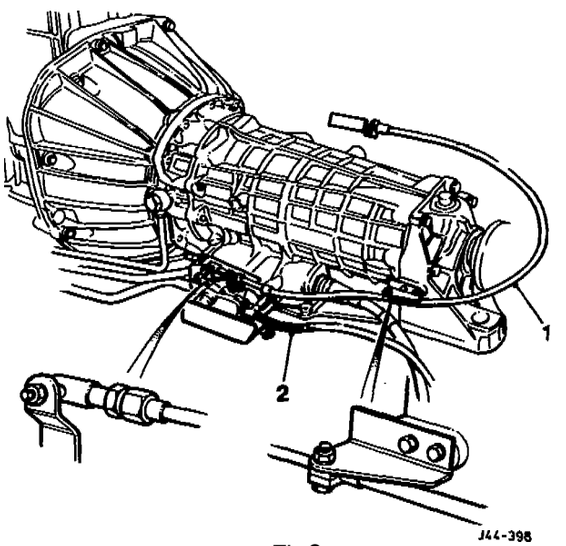
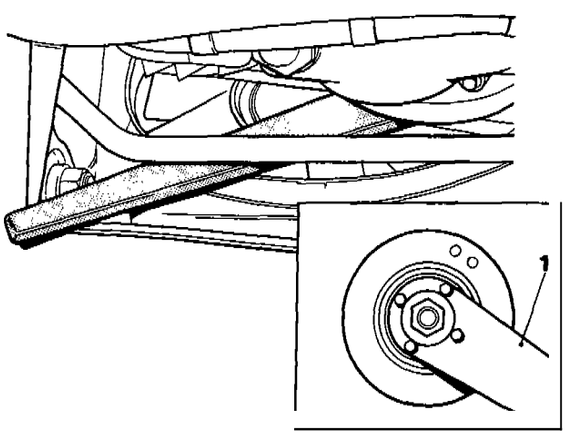


Fig 2

MANUAL AND AUTOMATIC:
Remove the front pulley securing bolt using Service Tool 18G 1437 (1 Fig 3) to hold the pulley.
Remove the front pulley.
Remove the air conditioning drier to rubber mounting securing nuts (AIRCON ONLY).
Carefully remove the condenser from the mounted position and, ensuring that all pipes and hoses are not stressed, re-position the condenser/drier assembly over the wing (AIRCON ONLY).
Place a suitable support under the assembly to take the weight (AIRCON ONLY).
Remove the exhaust manifold heat shield securing bolts.
Remove the heat shield.



Fia 3

Fit and align the remaining lifting eyes to the manifolds.
Fit and tighten the lifting eye securing bolts.
Remove the remaining inlet manifold securing nut/bolt.
Remove the front engine mounting upper securing nuts.
Take the weight of the gearbox on the jack.
Remove the retaining tool MS 53B hook. Remove tool MS 53B.
Fit an 'H' frame sling to the engine hoist.
Connect the hooks to the lifting eyes (Fig 1).
Using hoist and jack, remove the engine from the engine bay, taking care not to damage the steering rack.
Raise the engine clear of the vehicle body.
Transport the engine to the bench.
Remove the insulation pad from the gearbox.
Drain the engine oil.
Lower the engine to the bench.

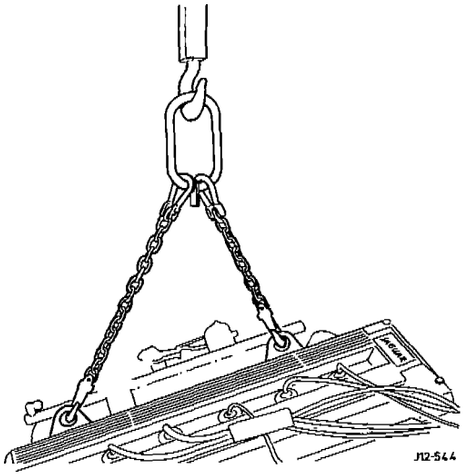


Fig 1

REMOVE/REFIT GEARBOX/CLUTCH
(Manual Only)

Remove the gearbox.
Fit a flywheel jamb.
Remove the clutch assembly.
Remove the starter motor.
Remove the flywheel securing bolts (1 Fig 2).
WARNING: THE TWIN-MASS FLYWHEEL IS EXTREMELY HEAVY. ASSISTANCE WILL BE REQUIRED DURING REMOVAL.
Remove the flywheel jamb.
Remove the flywheel (2 Fig 2).
Remove the adaptor plate.

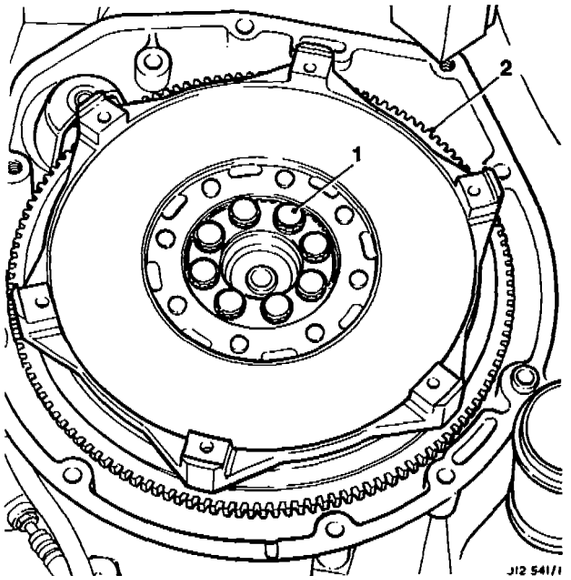


Fig 2

Clean the flywheel, adaptor plate, and all other component parts.
Fit the adaptor plate to the engine. Fit and tighten the securing bolts.
Fit and align the flywheel.
Fit the flywheel jamb.
Fit and tighten the flywheel securing bolts.
Fit and align the clutch assembly to the flywheel.
Fit and tighten the clutch cover securing bolts.
Remove the flywheel jamb.
Fit the starter motor.
Fit and tighten the starter motor lower securing bolt.
Fit the gearbox to the engine.
Fit and tighten the gearbox securing bolts.
Fit the foam insulation pad to the gearbox.
Secure the pad to the gearbox with string.

REMOVE/REFIT TRANSMISSION/CONVERTER
(Automatic Only)

Remove the transmission cooler pipes from the mounting bracket.
Remove the starter motor.
Disconnect the dipstick assembly from the mounting bracket (Fig 3).
Remove the adaptor plate blanking plug.
Turn the crankshaft for access to the first convertor bolt.

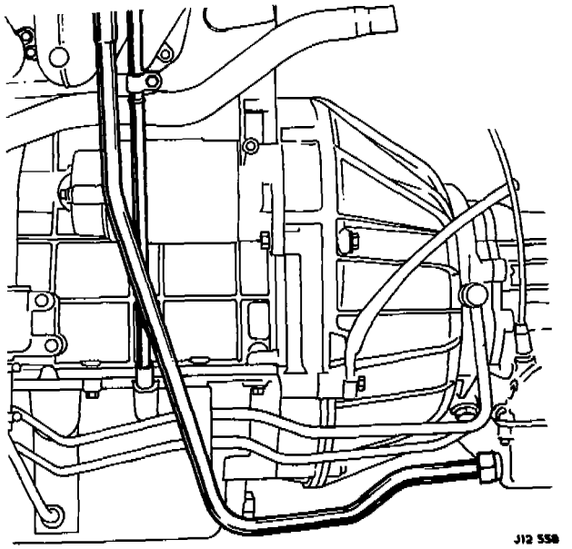


Fig 3

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Remove the bolt (1 Fig 1).
Repeat for the remaining five bolts.
Remove the housing to adaptor plate securing bolts.
Remove the transmission/converter assembly from the engine.

Fit and align the transmission/converter assembly to the engine.
Ensure the cooler pipes seat behind the mounting brackets.
Fit and tighten the housing bolts.
Turn the crankshaft for access to the first converter to drive plate securing bolt.
Align the converter to drive plate bolt hole.
Fit but do not tighten the converter to drive plate securing bolt.
Turn the crankshaft for access to the second securing bolt hole.
Fit but do not tighten the **second** securing bolt.
Turn the crankshaft for access to the remaining securing bolt hole.
Fit and tighten the remaining securing bolt.
Tighten the remaining two securing bolts,
Connect the dipstick assembly to the monuting bracket.
Fit the foam insulation pad to the transmission.
Secure the pad with string.

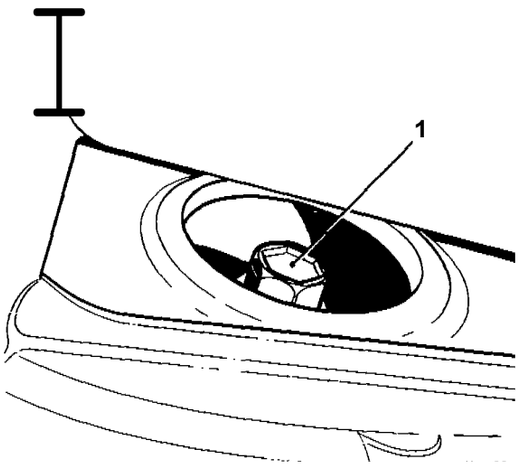


Fig 1

CHANGE ANCILLIARY EQUIP MENT

MANUAL ONLY:
Remove the water valve to heater feed pipe hose assembly.
Slacken off the alternator adjuster locknut (5 Fig 2) and adjusting nut (4 Fig 2).
Remove the alternator link arm pivot bolt (2 Fig 2).
Slacken off the alternator link arm trunnion bolt (3 Fig 2).
Remove the alternator pivot bolt nut.
Pivot the alternator towards the engine.
Remove the alternator drive belt.
Remove the alternator pivot bolt.
Remove the alternator assembly.
Remove the alternator spacing washer.
Remove the adaptor plate bolts (1 Fig 3).
Remove the adaptor plate.
Remove the oil filler tube assembly.
Remove the P.A.S. pump.
Remove the pump drive coupling.
Raise the engine from the bench.
Move the engine to one side.
Transfer the lifting eyes, chains, and hoist to the new engine.'
Move the new engine to the bench.
Clean the P.A.S. steering pump drive coupling and mating faces (3 Fig 1 page 83).
Fit the coupling to the distributor driveshaft.
Set the P.A.S. pump drive to align with the coupling.
Fit and seat the P.A.S. pump (2 Fig 1 page **83**) to the engine.
Fit the oil filler tube assembly.
Fit and tighten the pump bolts (1 Fig 1 page **83**).
Fit and align the alternator to the link arm pivot and mounting bracket.

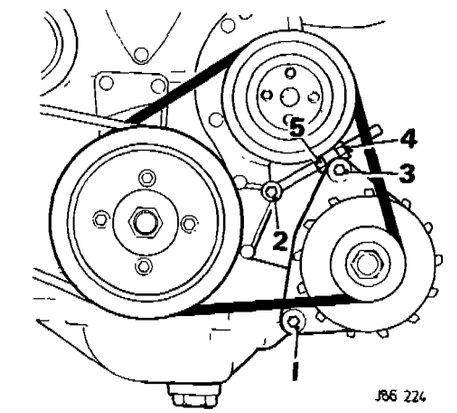


Fig 2

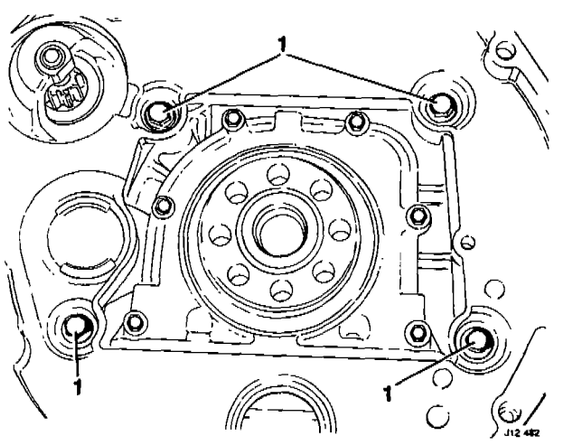


Fig 3

Fit the alternator pivot bolt to pass through the front of the alternator and into the bracket.
Fit the rear spacer.
Push the alternator pivot bolt fully home, but do not tighten the securing nut.
Fit but do not tighten the link pivot nut.
Pivot the alternator towards the engine.
Fit the alternator drive belt.
Tighten the link arm adjusting nut to obtain the correct belt tension.
Tighten the link arm lock nut.
Tighten the link arm trunnion nut.
Tighten the alternator and link arm pivot bolts/nuts.
Fit the water valve/hose assembly.
Tighten the feed pipe hose clip.
Clean the rear adaptor plate.
Fit the adaptor plate to the engine.
Fit and tighten the adaptor plate securing bolts.
Remove and discard the exhaust sealing rings.
Clean the exhaust sealing faces.
Fit new exhaust sealing rings.

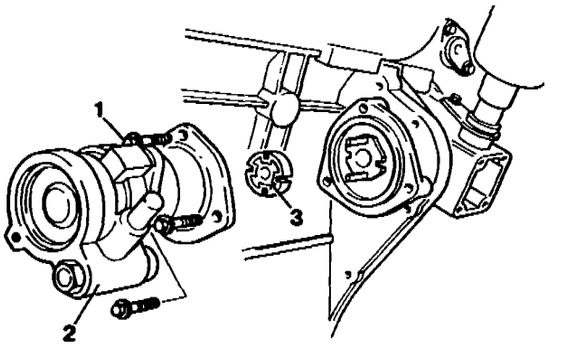


Fig 1

AUTOMATIC ONLY:
Disconnect the down shift cable (Fig 2) from the throttle linkage and mounting bracket.
Re-position the cable away from the bracket.
Remove the dipstick assembly.
Disconnect the oil filler tube assembly.
Remove the pipe to sump assembly.
Fit a jamb to the drive plate.
Remove the drive plate to crankshaft securing bolts.
Remove the jamb.
Remove the drive plate. Retrieve the spacer.
Remove the adaptor plate securing bolts.
Remove the adaptor plate.
Remove the water valve to heater feed pipe hose assembly.
Slacken off the alternator adjuster locknut and adjusting nut.
Remove the alternator link arm pivot bolt.
Slacken off the alternator link arm trunnion bolt.
Remove the alternator pivot bolt nut.
Pivot the alternator towards the engine.
Remove the alternator drive belt.
Remove the alternator pivot bolt.
Remove the alternator assembly.
Remove the alternator spacing washer.
Remove the PAS pump.
Remove the pump drive coupling.
Raise the engine from the bench.
Move the engine to one side.
Transfer the lifting eyes, chains, and hoist to the new engine.

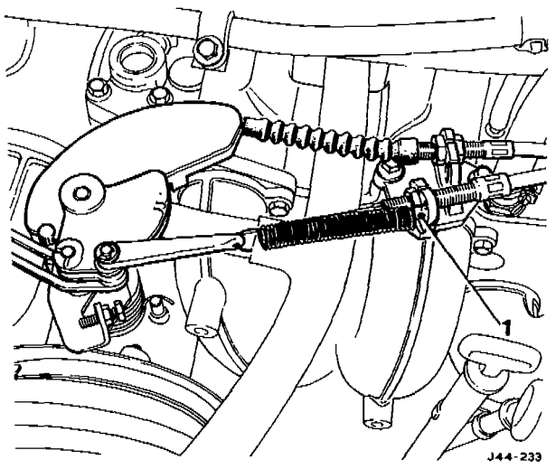


Fig 2

Move the new engine to the bench.
Clean the P.A.S. steering pump drive coupling and mating faces (3 Fig 1).
Fit the coupling to the distributor driveshaft.
Set the P.A.S. pump drive to align with the coupling.
Fit and seat the P.A.S. pump (2 Fig 1) to the engine.
Fit and tighten the pump securing bolts (1 Fig 1).

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Fit and align the alternator to the link arm pivot and mounting bracket.
Fit the alternator pivot bolt to pass through the front of the alternator and into the bracket.
Fit the rear spacer.
Push the alternator pivot bolt fully home, but do not tighten the securing nut.
Fit but do not tighten the link arm pivot nut.
Pivot the alternator towards the engine.
Fit the alternator drive belt.

Tighten the link arm adjusting nut to obtain the correct belt tension.
Tighten the link arm lock nut.
lighten the link arm trunnion nut.
Tighten the alternator and link arm pivot bolts/nuts.
Fit the water valve/hose assembly.
Tighten the feed pipe hose clip.
Clean the rear adaptor plate.
Fit the adaptor plate to the engine.
Fit and tighten the adaptor plate securing bolts.
Clean the drive plate and spacer.
Fit and align the spacer to the crankshaft
Fit and align the drive plate.
Fit the jamb.
Fit and tighten the drive plate securing bolts.
Fit the starter motor.
Fit and tighten the starter motor lower securing bolt.

Fit the adaptor plate blanking plug.
Fit and align the gearbox cooler pipe to the mounting bracket sleeves, retaining brackets and spire clips.
Fit and tighten the cooler pipe/mounting bracket securing screws.
Fit and align the oil filler tube assembly.
Connect the drain-back tube hose to the oil filler housing stub pipe.
Position and tighten the hose clips.
Tighten the union nut.
Re-position the down shift cable (Fig 1) towards the throttle linkage.
Connect the inner cable to the linkage.
Adjust the down shift cable to the bracket securing nut.
Tighten the lock nut.
Secure the cable to the bell housing.

Apply HYLOSIL to the engine dipstick tube.
Fit and seat the dipstick assembly to the engine.
Fit the engine and gearbox dipstick tubes to the mounting bracket (Fig 2).
Fit and tighten the securing bolt.
Remove and discard the exhaust sealing rings.
Clean the exhaust sealing faces.
Fit new exhaust sealing rings.

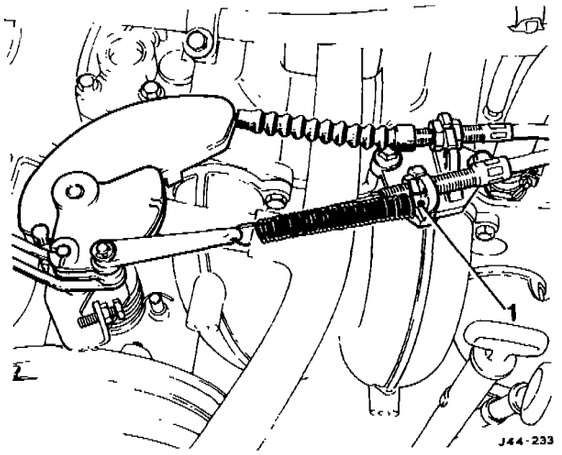


Fig 1

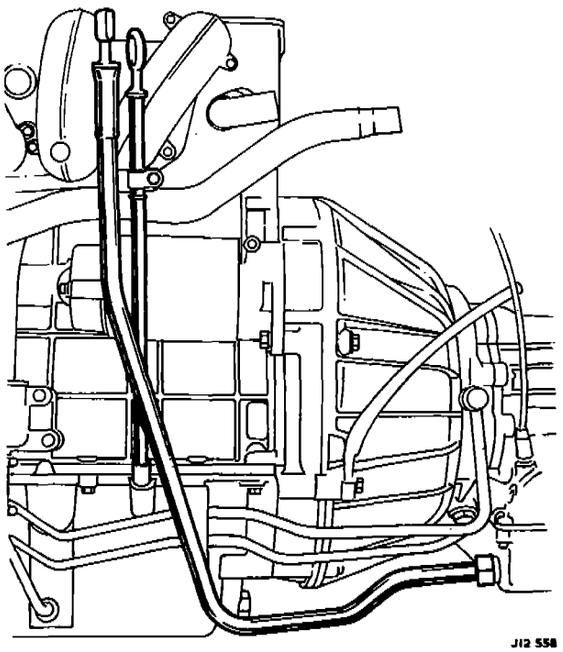


Fig 2

REFIT ENGINE

MANUAL AND AUTOMATIC:

Move the engine assembly to the vehicle.
Lower the engine assembly into the engine bay.
Take the weight of the gearbox on a jack.
Using hoist and jack, lower the engine into the engine bay and engage on the engine mountings. Ensure that the inlet manifold does not foul on the wiper motor.
Unhook the chains. Remove the 'H' frame sling.
Raise the hoist to safety height.
Move the hoist to one side.
Fit engine retaining tool MS53B across the wing channels, align to the rear lifting eye (Fig 1).
Fit and seat the engine retaining hook to the rear eye (Fig 1).
Tighten the hook nut to take the weight of the engine.
Lower and remove the jack from the gearbox.
Fit and tighten the engine mounting securing nuts.
Jack up the front of the vehicle. Support with axle stands.

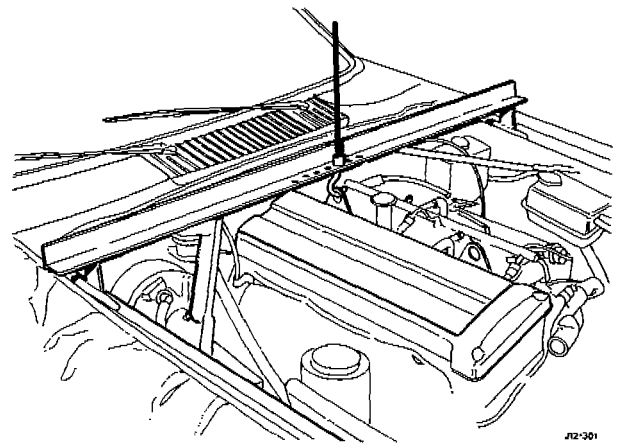


Fig 1

MANUAL ONLY:

Fit the gear selector mounting rubbers/inserts.
Align the assembly to the mounting position.
Fit and align the mounting washers.
Fit and tighten the remote control assembly securing bolts.
Tighten the hook nut to raise the engine into position.
Fit and align the wavy washer/spring assembly to the lower gear lever (4,5,6, Fig 2).
Align the gear lever (1 Fig 2) to the remote control (2 Fig 2).
Fit and tighten the securing nut/bolt (7 Fig 2).

AUTOMATIC ONLY:

Reposition the transmission unit to propshaft flange.
Fit and tighten the propshaft securing nuts.
Tighten the engine retaining tool to raise the engine into position.
Cut/remove the insulation pad securing string.
Refit the rotary transmission switch/cable/harness assembly to the selector shaft. Fit but do not tighten the securing nuts.
Ensure that the selector lever is in neutral.
Adjust the switch to enable Service Tool JD 161 to be fitted, thus aligning the selector shaft and switch.
Torque tighten the switch securing bolts.
Remove the tool.

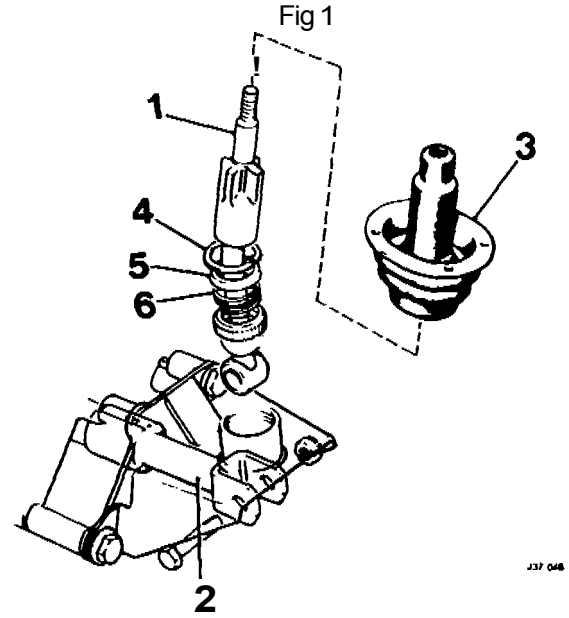


Fig 2

MANUAL AND AUTOMATIC:

Fit the spring assembly to the rear mounting.
Using a jack, fit and align the mounting assembly to the body/gearbox.
Fit but do not fully tighten the body to mounting securing bolts.
Lower and remove the jack.
Slacken off the hook nut to release the weight of the engine. Remove the hook.
Remove retaining tool MS53B.
Align the mounting to the gearbox.
Fully tighten the mounting to body securing nuts.

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MANUAL ONLY:
Connect the gearbox switch multiplugs.
Locate the multi plugs above the insulation pad.
Fit the push rod (3 Fig 1) to the slave cylinder (2 Fig 1).
Fit the cylinder, connect the push rod to the release arm.
Fit and tighten the securing nuts (1 Fig 1).

MANUAL AND AUTOMATIC:
Re-position the earth lead to the bell housing.
Fit and tighten the earth lead securing bolt.
Connect the exhaust system to the exhaust manifold.
Re-position the flanges over the studs.
Fit and tighten the front pipe securing nuts.
Fit and align the front pipe to clutch housing mounting bracket.
Fit and tighten the front pipe to mounting bracket securing nuts and bolts.
Re-position the support cable to the intermediate pipe (Fig 2).
Fit the security clip.

MANUAL ONLY:
Refit the propshaft.

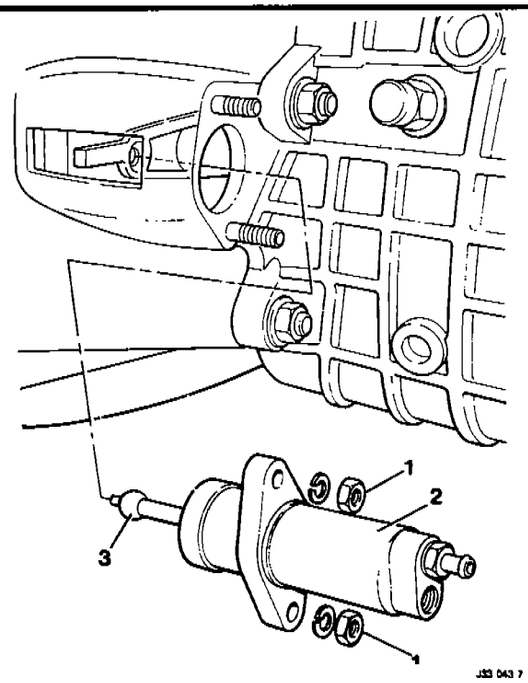


Fig 1

MANUAL AND AUTOMATIC:
Re-position the compressor to the mounting bracket (AIRCON ONLY).
Fit but do not tighten the compressor pivot bolts (AIRCON ONLY).
Lower the vehicle from the axle stands.
Clean the hydraulic pump coupling and mating faces. Fit the drive coupling to the pump.
Align the pump to drive shaft position.
Fit and tighten the pump to front cover bolts.
Clean the front pulley and mating faces.
Fit and tighten the front pulley securing bolt, using Service Tool 18G 1437.
Pivot the compressor towards the engine (AIRCON ONLY).
Fit the compressor drive belt (4 Fig 3) (AIRCON ONLY).
Align the link arm to the compressor (AIRCON ONLY).
Fit but do not tighten the link arm to compressor securing bolt (AIRCON ONLY).
Tighten the link arm adjuster nut to obtain correct tension (2 Fig 3) (AIRCON ONLY).
Tighten the link arm lock nut (AIRCON ONLY).
Tighten the link arm trunnion bolt (1 Fig 3) (AIRCON ONLY).
Finally tighten the compressor and link arm pivot bolts (3 Fig 3) (AIRCON ONLY).
Carefully re-position the condenser/drier assembly from the wing area to the mounted position (AIRCON ONLY).
Fit and tighten the drier to mounting securing bolts (AIRCON ONLY).
Remove the condenser/drier support (AIRCON ONLY).

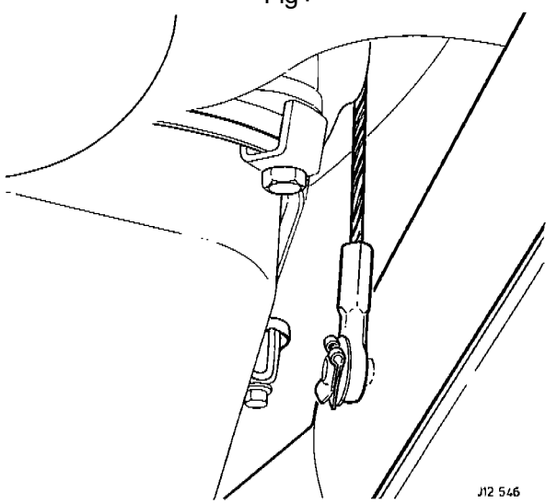


Fig 2

Remove the blanking plugs from the P.A.S. pump and rack feed pipe.
Fit a new 'O' ring to the pipe.
Connect the rack feed pipe to the P.A.S. pump.
Tighten the union nut.

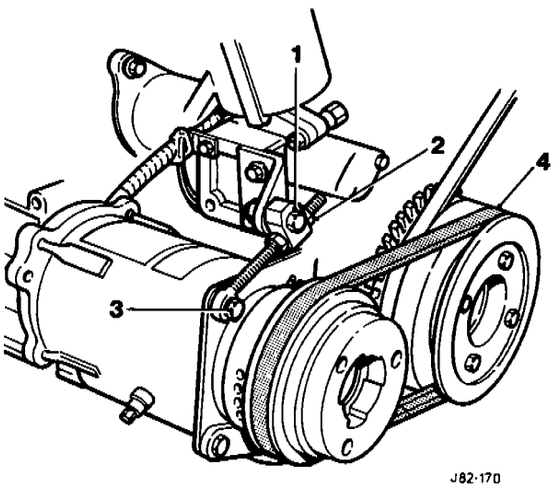


Fig 3

Remove the blanking plugs from the P.A.S. pump and pump feed hose (1 Fig 1).
Connect the hose to the pump (2 Fig 1).
Fit and align the starter solenoid link harness to the alternator terminal.
Connect the remaining wire to the alternator.
Fit and tighten the terminal securing nuts.
fit insulation boots over the terminals.
Remove and discard the 'O' rings (3 Fig 2) from the engine oil cooler pipes (2 Fig 2).
Fit new 'O' rings to the pipes.
Connect the cooler pipes to the filter head.
Fit and tighten the pipe clamp nut (1 Fig 2).
Fit the starter solenoid link harness to the solenoid and connect the main feed wire.
Connect the heater return hose to the heater.
Connect the heater feed hose to the heater.

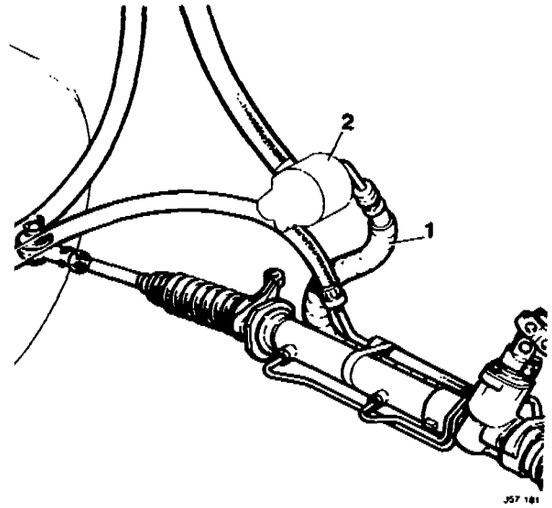


Fig 1

Remove 18G 1465 engine lifting eyes.
Re-position the main harness over the engine.
Fit the earth leads to the manifold rear studs.
Connect the vacuum switch multi plug.
Connect the starter solenoid feed wire multi plug.
Fit the air flow meter/intake elbow assembly to the air cleaner box.
Fit and tighten the intake elbow securing nut.
Connect the auxilliary air valve hose to the intake elbow.
Connect the intake elbow to the throttle housing.
Connect the throttle cable to bracket (Fig 3).
Connect the inner cable to the linkage.
Adjust the cable. Tighten the locknuts.
Connect the water valve and heater vacuum hoses.
Attach the fuel feed hoses to the inlet manifold clamp.
Remove the plugs from the fuel feed hose and the fuel rail.
Connect the feed hose to the fuel rail.
Tighten the hose union nut.
Secure the feed hose to the rail with plastic clips.
Remove the plugs from the return hose and regulator.
Connect the hose to the regulator.
Tighten the hose union nut.

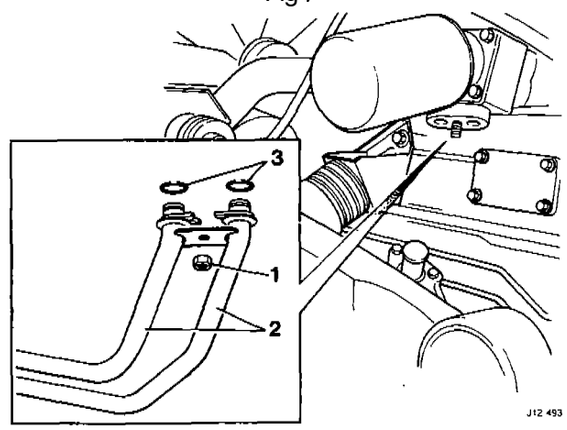
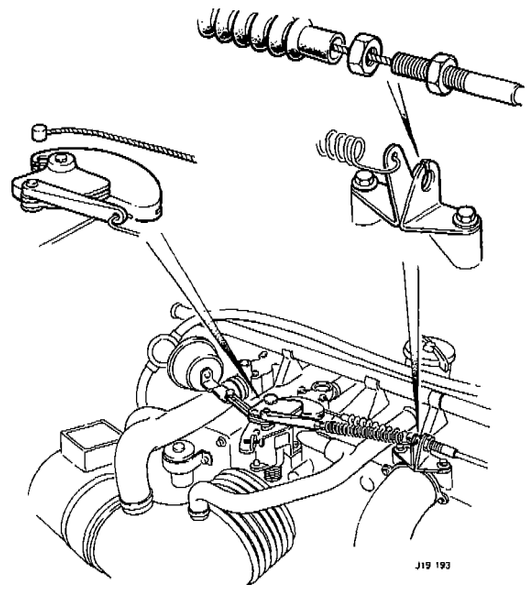


Fig 2

Connect the air flow meter/throttle potentiometer and auxiliary air valve multi plugs.
Connect the injector and coolant sensor multi plugs.
Connect the coolant temperature and oil pressure transmitter feed wires.
Connect the expansion tank to water pump hose.
Secure the harness to the hose with ratchet clips.
Connect the earth lead to the inlet manifold front stud.
Connect the expansion tank to thermostat housing hose.
Connect the harness to the crank sensor rnulti plug.
Secure the harness to the front of the cylinder head with a ratchet strap.
Connect the coil L.T. connections.
Fit insulation boots over the terminals.
Connect the H.T. lead to the coil.


Fig 3

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Connect the super heat switch and clutch multi plug to the compressor (AIRCON ONLY).
Remove the exhaust lifting eye.
Fit the heat shield.
Fit the radiator assembly.
Fit the top rail.
Connect the thermostatic switch block connector (AIRCON ONLY).
Secure the block connector to the lower panel with a ratchetsttap (AIRCON ONLY).
Connect the bottom hose to the water pump (1.2 Fig 1).
Connect the expansion tank to radiator hose.
Remove the blanking plugs from the P.A.S. cooler pipes.
Fit new 'O' rings to the pipes.
Remove the blanking plugs from the radiator.
Connect the P.A.S. pipes to the radiator.
Tighten the pipe union nuts.

AUTOMATIC ONLY:
Remove the blanking plugs from the transmission unit cooler hoses and radiator.
Fit new 'O' rings to the hoses.
Connect the hoses to the radiator.
Tighten the hose union nuts.

MANUAL AND AUTOMATIC:
Secure the harness to the P.A.S. pipes with plastic clips.
Connect the top hose to the thermostat (1.2 Fig 2).
Fit the fan cowl.
Fit the torquatrol unit.
Fit the air cleaner element.
Replenish the engine with oil.
Replenish the cooling system with coolant.

AUTOMATIC ONLY:
Check/adjust the downshift cable initial setting.

MANUAL AND AUTOMATIC:
Fit the bonnet.

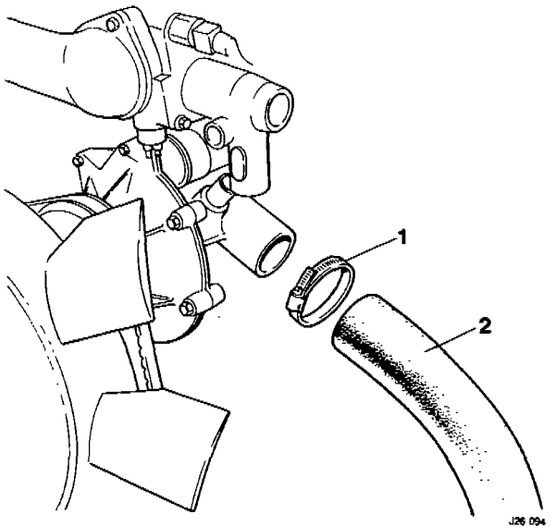


Fig 1

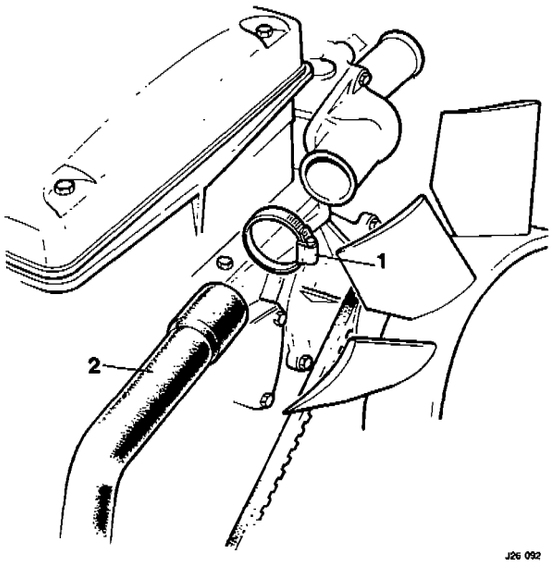


Fig 2

DATA

SERVICE TOOLS

18G 1433 Camshaft timing tool
18G 1436 Crankshaft pulley remove/lock.
18G 1465 Engine support brackets
MS53B Engine support bracket

TORQUE FIGURES

Bracket to intermediate pipe 23-27Nm
Centre bearing to body 22-28Nm
Clip-bottom hose 3.8-4.3Nm
Clip-hose to water rail 2.4Nm
Clip-top hose 3.8-4.3Nm
Clutch/torque converter housing to block 49-54Nm
Dipstick to bracket 5-8Nm
Engine mounting bracket bobbin 47-55Nm
Engine mounting bracket LH to block 49-54Nm
Engine mounting bracket RH to block 49-54Nm

TORQUE FIGURES

Engine mounting LH to mounting bracket 22-25Nm
Engine mounting RH to mounting bracket 22-25Nm
Fan to torquatrol unit 13.5Nm
Feed hose to steering rack 10-12Nm.
Front pipe to intermediate pipe 15-18Nm
Fuel return hose to regulator 10-12Nm.
High pressure hose, pump to rack 19-23Nm.
Inlet manifold nuts-lifting eyes 6.5-9Nm
Inlet manifold to cylinder head 23-27Nm
Low pressure hose, rack to oil cooler 19-23Nm.
Propshaft coupling to axle (Auto only) 95-105Nm
Rear engine mounting bracket to body 20-25Nm
Rear mounting to body 20-25Nm
Rotary transmission switch (Auto only) 9.5-12Nm
Spring cup to mounting 20-25Nm
Starter motor to adaptor plate 49-54Nm.
Thermostat cover to housing 23-27Nm
Thermostat housing to cylinder head 23-27Nm
Torquatrol unit to water pump pulley 23-27Nm
Water pipe to cylinder block 23-27Nm
Water pump to timing cover 23-27Nm
Water temperature switch 49-54Nm

SPANNER SIZES

8mm
10mm
73mm
17mm
3/8in AF
1/2in AF
9/16in AF
3/4in AF

OILS/GREASES/SEALANTS

Exhaust sealer 'TIVOLI KAYADHESIVES No 5696'
Water pipe to cylinder block 'Hylosil 102'
Water pump housing 'Hylosil 102'

0428G

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ENGINE ASSEMBLY

OVERHAUL 12.41.05

Remove the engine and gearbox/transmission unit 12.41.01/2 page 77.
Detach the gearbox from the engine.
Fit the engine to a stand.
Remove all ancilliary equipment.

Place a drain tray below the cylinder block drain plug and drain any remaining coolant from the engine.
Remove the camcover. Discard the gasket, plug well seals and half moon seals.
Push back the lock tabs from the timing chain sprocket securing bolts (1 Fig 1), and remove the bolts (2 Fig 1).
Remove the timing chain sprockets.
Lower the chain (1 Fig 2) into the cylinder head and secure the tensioner (3 Fig 2) and upper guide with an elastic band (2 Fig 2).
Remove the cylinder head securing nuts/bolts and remove the cylinder head.
Remove and discard the head gasket.
Place the cylinder head on suitable blocks on a bench.

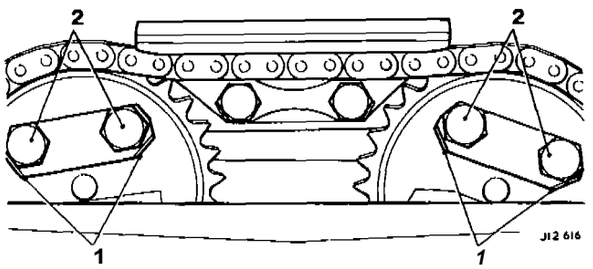


Fig 1

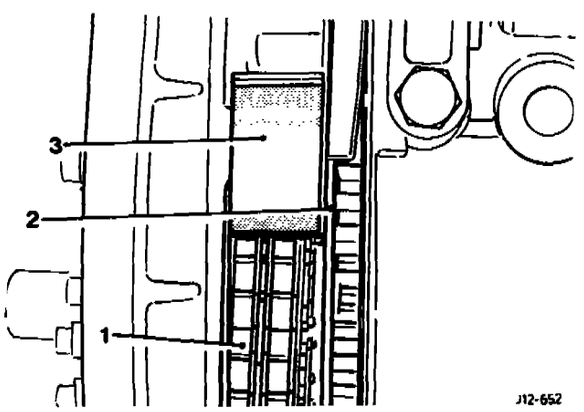


Fig 2

Mark the position of the camshaft caps relative to the head, and remove the caps.
Remove the camshafts.
Using a magnet, lift out the cam followers.
Support the valves using a wooden block.
Remove the valve springs, using Service Tool MS 1519A valve spring compressor.
Retrieve the collars, cotters, and spring retaining plates.
Remove the valves, noting the relationship between valve and guide to ensure correct pairing during re-assembly.
Remove the seals from the inlet valve guides and remove the cylinder head rear blanking plate.
Clean all component parts.
Check for wear and burning of valves or seats.
Check the cylinder head face for distortion.
If distortion is evident, a maximum of 0.025 mm (0.010 in) may be removed by skimming the cylinder head,
Taking care not to damage the inside surface of the combustion chambers, clean the inlet and exhaust ports.
NOTE: When using scrapers or wire brushes for removing carbon deposits, avoid scratching the valve faces and seats. A soft wire brush is the most suitable implement for this purpose.
Clean all carbon and other deposits from the valve guide using a suitable valve guide brush.
Throughly wash the cylinder head to ensure that all loose carbon is removed and dry the head with a high pressure air line.

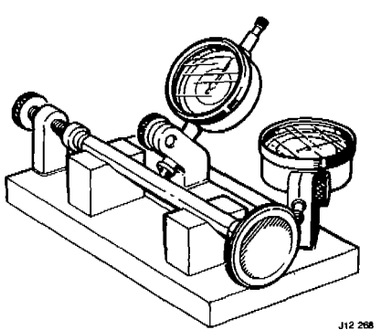
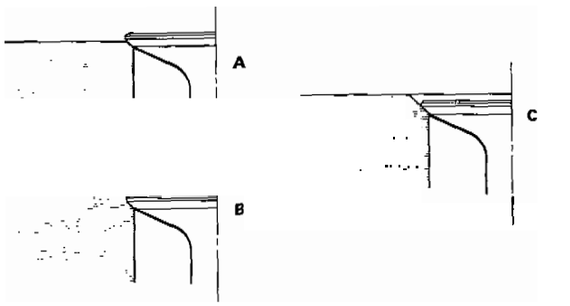


Fig 3

After cleaning and polishing each valve, examine the stems for straightness and wear, using a suitable dial gauge/V-block arrangement (Fig 3).
Examine the valve faces for burns, pitting and distortion.
Renew any valves that are excessively worn, bent, or too badly pitted to be salvaged by refacing.

NOTE: No attempt should be made to clean up a burnt or badly pitted valve face by extensive 'grinding in' of the valve to the seat.
Lightly lap the valves into the seats with a fine grinding compound. The reseating operation should leave the finished surfaces smooth. Excessive lapping will groove the valve face resulting in a poor seat when the engine is hot.

Fig 1 shows:
'A' Correctly seated
'B' Undesirable condition
'C' Method of rectification.



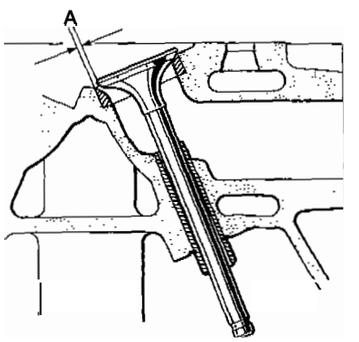
J12 277

Fig 1

To test the valves for concentricity with their seats, coat the face of the valve with 'Engineers Blue' or similar, and rotate the valve against the seat.
If the valve face is concentric with the valve stem, a mark will be made all around the face. Should a mark be made on only one side of the face, the face is not concentric with the valve stem.

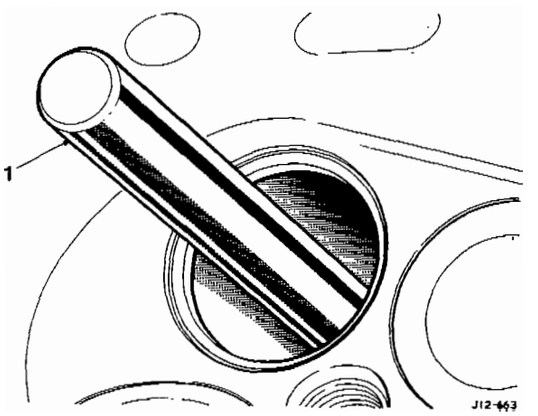
Clean the valve and again coat with 'Engineers Blue' and rotate the valve against the seat.
Check that the valve guide is concentric with the valve seat, if not, the seat must be recut.

Whenever valves are replaced, the seats must be recut prior to lapping of the valves.
Check valve guide wear by inserting a new valve into the guide to be checked, lift it 3mm (1/4in) from its seat and rock it sideways. Movement of the valve across its seat must not exceed 0.0015-0.0030in) (A Fig 2).
Should the movement exceed this tolerance, the valve guide must be replaced, using Service Tool 18G 1432 to drift out the old guide (Fig 3). Ensure that the relevant valve guide is selected prior to fitting (see chart below).



J12 269

Fig 2



J12 663

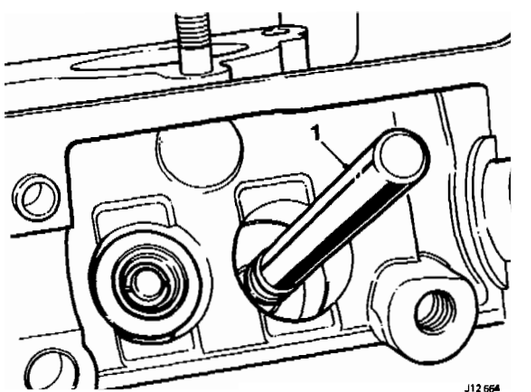
Fig 3

DATA

Replacement guides are available in two sizes and have identification grooves machined in the shank. Sizes are as follows:

First o/size 2 grooves	12.88 to 12.85mm (0.507 to 0.506in) diameter.
Second o/size 3 groove	13.00 to 12.98mm (0.512 to 0.61 1in) diameter.

When new guides are to be fitted they should always be one size larger than the old guide.
Cylinder head bores will require reaming as follows:
Remove the old valve guide and ream the cylinder head to the relevant dimension (see DATA).
Immerse the cylinder head in boiling water for 30 minutes.
Coat the guide with graphite grease, and, using Service Tool 18G 1432, drift in the guide from the camshaft side until the circlip is seated in the groove (1 Fig 4).



J12 664

Fig 4

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NOTE: To fit the guide correctly, the interference should not be sufficient to cause the use of excessive force.
After fitting a valve guide, the valve seat must be recut using Service Tool MS 204 (Fig 1).

Examine the valve seat inserts for pitting or excess wear.
If renewal is necessary, proceed as follows:
Remove the inserts by machining, leaving approximately 0.25 mm (0.010in) of metal which can easily be removed by hand without damaging the cylinder head.
Measure the diameter of the insert recess in the cylinder head.
Grind down the outside diameter of the new insert to a dimension 0.08 mm (0.003 in) larger than the insert recess.
Heat the cylinder head for 30 minutes from cold to a temperature of 150°C (300°F).
Fit the insert ensuring that it beds evenly in the recess.

Recut when the cylinder head has cooled using Service Tool MS 204.
Correct valve seat angles are:

Inlet	Exhaust
44½ degrees	44½ degrees

NOTE: If new valve inserts have been fitted, the clearance between valve stem and cam must be checked; this should be 8.13 mm (0.320 in) plus the valve clearance.
The dimension must be taken between the valve stem and the back of the cam.
Should this dimension not be obtained, metal must be ground from the valve seat of the insert.
NOTE: Use only suitable grinding equipment.
Remove only very small amounts of metal from the valve seat at one time before re-checking the clearance.

Examine the cam followers for wear on the top face, these should be perfectly flat.
Check for any sign of barrelling on the side faces (Fig 2).
Replace all followers that are worn or suspect.
Wash the valves, springs, collets, followers and air dry.
After the valve springs have been thoroughly washed, they must be examined for fatigue and distortion.
Test the valve springs either by comparison with the figures given, or by comparison with a new valve spring (using a recommended valve spring testing machine).

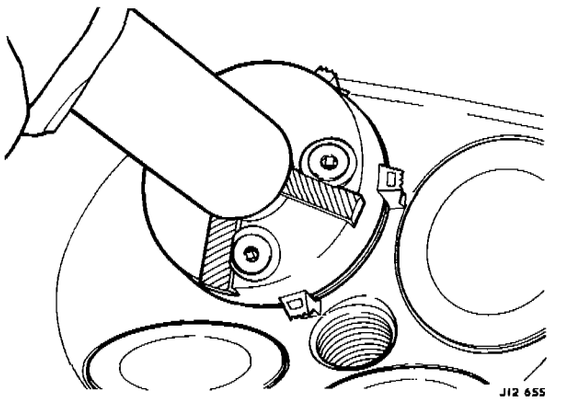


Fig 1

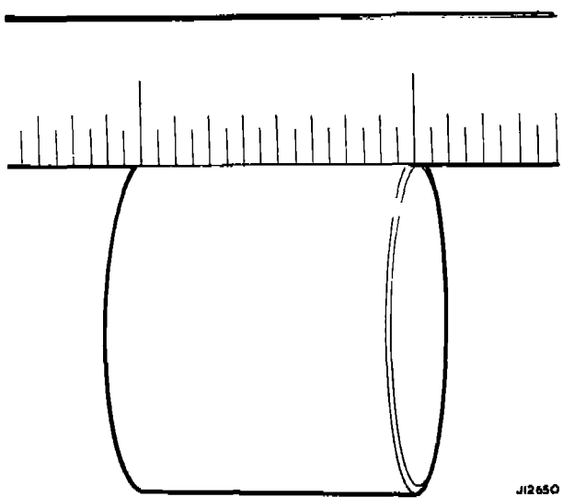


Fig 2

DATA

Valve spring wire diameter:

Inner	12SWG (0.104in)
Outer	10SWG (0.128in)
Inside diameter:	
Inner	0.636in
Outer	0.872in
Total No. of coils:	
Inner	6
Outer	5
Helix:	Right hand

To test against a new valve spring, insert both valve springs end to end between the test equipment. Apply a load to partly compress the springs and measure their comparative lengths (Fig 1).

NOTE: 'A is the old spring.
If the distance 'A is smaller than the distance 'B', then 'A must be replaced.

Spring distortion is determined by positioning the spring upright on a surface plate and checking the squareness of each end with a set square (Fig 2).
All valve springs which have diminished in length and/or are not square must be discarded and replacements fitted.
Fit the valves into the guides and place the cylinder head on wooden blocks.
Fit the valve spring seats, inlet valve guide oil seals, springs and collars.
Compress the springs using Service Tool MS 1519A and insert the split cotters.
Refit the original shims in the valve collar recesses (1 Fig 3).
Ensure that the shims are seated correctly.
Fit the cam followers.
NOTE: If the cylinder head has been overhauled to the extent of having the valve seats recut, each shim should be 0.010in smaller than the original.

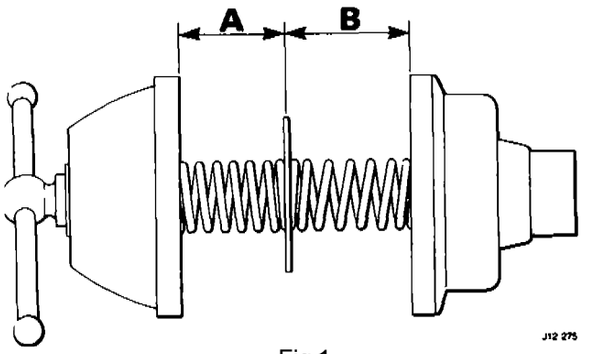


Fig 1

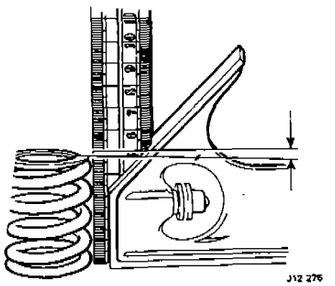


Fig 2

Slacken the sump securing bolts.
Remove all but two of the sump securing bolts.
Remove the clutch housing to sump securing bolts.
Finally remove the remaining bolts and lower the sump.
Place a suitable drain tray under the oil transfer housing and remove the housing.
Remove the oil pump pick-up pipes.
Remove the oil pump securing bolts and remove the oil pump.
Remove the bolts securing the crankshaft windage trays to the cylinder block and remove the trays.

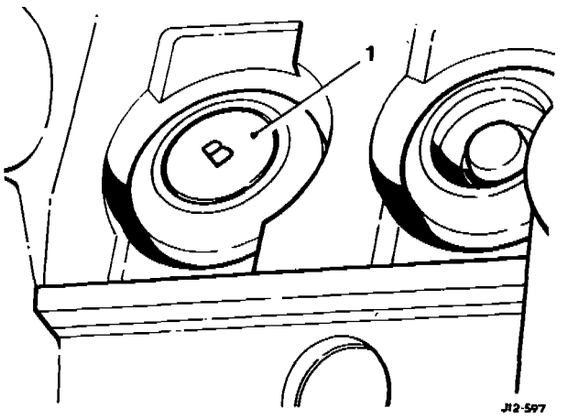


Fig 3

Clean all components, check for damage and wear.
Remove the rear oil seal housing securing bolts and remove the housing. Remove and discard the oil seal.
Remove the engine timing cover securing bolts, and remove the cover assembly.
Remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and damper.
Slacken off the oil pump drive chain damper securing bolts, and move the damper clear of the chain.
Push back the lock tabs (1 Fig 4) and remove the securing bolts (2 Fig 4) from the oil pump drive sprocket (3 Fig 4).
Remove the drive sprocket and shim pack.
Remove the oil pump drive chain (5 Fig 4), remove the elastic band from the upper dampers and remove the upper timing chain.
Remove the lower tensioner securing bolts and remove the tensioner.
Push back the lower chain fixed damper securing bolt lock tabs and remove the bolts.

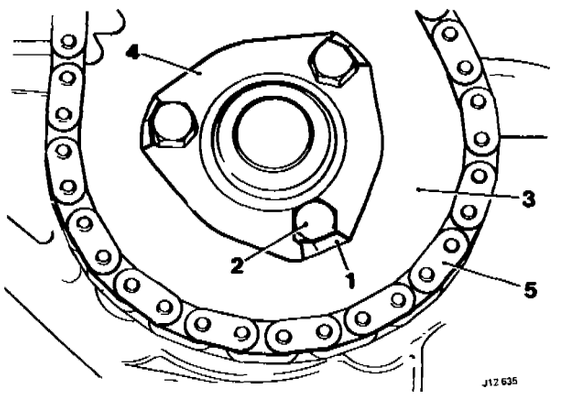


Fig 4

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Remove the damper and tab washer.
Repeat for the remaining fixed and pivot dampers and remove the lower chain and intermediate sprocket.
Remove the crankshaft pulley spacer and the crankshaft pulley woodruff key.
Remove the drive sprockets and woodruff keys from the crankshaft.
Check all drive sprockets for wear, distortion and damaged teeth.

Remove the P.A.S. pump drive coupling, remove and discard the auxiliary shaft rear oil seal.
Using right-angled circlip pliers, remove the auxiliary shaft securing circlip, remove the shaft and retrieve the thrust washer.
Remove the oil pump drive chain damper.
Remove the spacers from behind the damper.
Fit Service Tool 18G 1434 to the bearing situated in the front of the cylinder block (2 Fig 1).
Locate the centre peg, tighten the tool nut (1 Fig 1) to withdraw the bearing shell.
Remove the tool and shell assembly.
Slacken the tool nut. Withdraw the centre peg, remove and discard the shell.
Repeat the procedure *to* remove the remaining bearing shells.

Clean all component parts and check for wear, cracks and distortion. Should any of these conditions prevail then the component must be replaced.
Clean the auxiliary shaft housing.
Check for wear and if necessary change the auxiliary shaft bushes using Service Tool 18G 1434 (1,2 Fig 2).
Mark the big-end cap to connecting rod relationship for correct pairing during
re-assembly.
Remove the big-end connecting rod nuts in piston/ connecting rod pairs (1&6, 285, 3&4 cylinders), and push the pistons up and out through the top of the cylinder block.
Remove and discard the bearing shells.

Mark the piston to connecting rod relationship for correct pairing during re-assembly.
Remove the gudgeon pin circlips (1 Fig 3) from each piston (3 Fig 3), remove the gudgeon pin (2 Fig 3) and separate the piston from the connecting rod (4 Fig 3).
Remove the piston rings and clean the carbon and deposits from the piston crown and skirt. Clean out the ring grooves. Examine the pistons for cracks and excessive wear.
Clean the connecting rods and gudgeon pins.

Refit the big end bearing shells to one connecting rod and cap, and fit the rod to the crankshaft. Torque tighten the nuts and check the side clearance between the end face of the rod and the journal shoulder (Fig 4).
The side clearance must be between 0.132-0.233mm.
Remove the connecting rod from the crankshaft.
Repeat for the remaining five connecting rods.

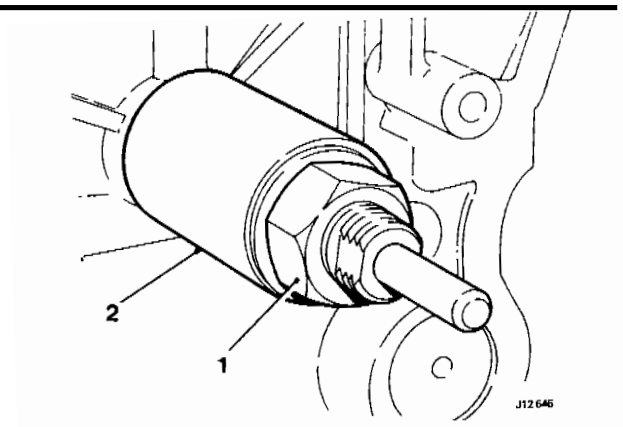


Fig 1

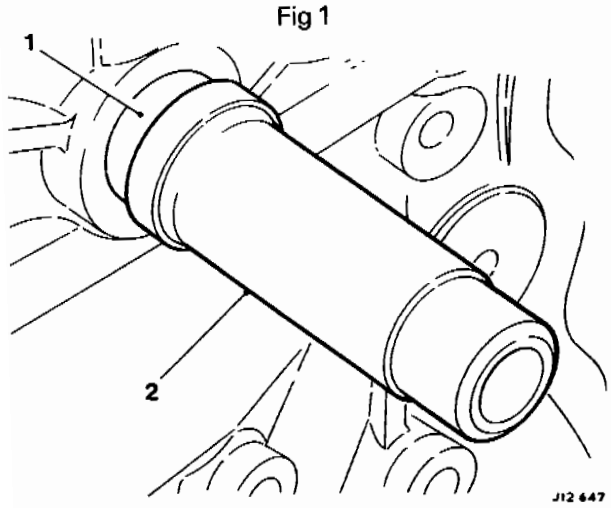


Fig 2

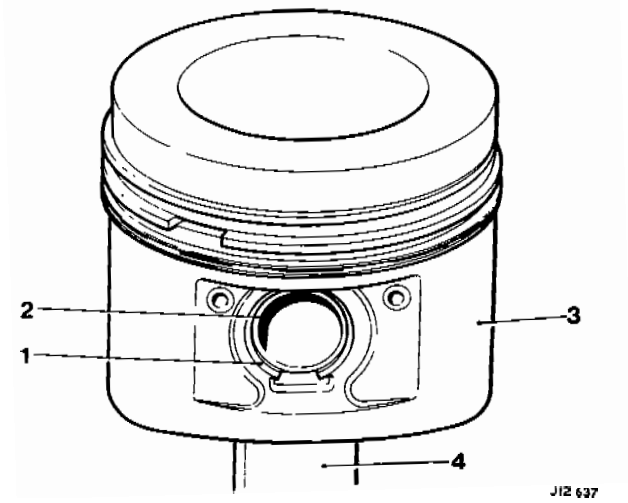


Fig 3

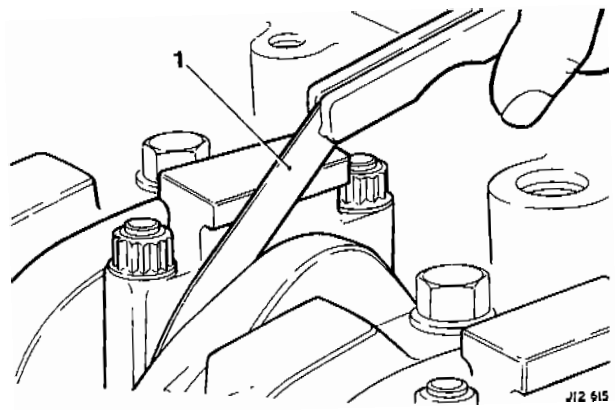


Fig 4

Ensuring that the main bearing caps are marked relative to the cylinder block, remove the main bearing cap bolts and remove the caps.
Carefully lift out the crankshaft.
Place the crankshaft on suitable blocks on a bench.
Remove and discard the bearing shells and the thrust washers.
Clean the cylinder block, crankshaft and bearing caps

Check the crankshaft journals for wear and ovality, the tolerances are:

Main bearing	76.231 mm (3.0012in)
Thrust width	36.233-36.208mm (1.4265-1.4255in)
Big end tolerance	52.987mm (2.0861 in) 52.974mm (2.0856in)
Running clearance	0.041-0.084mm (0.0016-0.0033in)

Should any of the dimensions be outside these tolerances, then the crankshaft must be renewed.

Fit suitable bolts to the oil gallery plugs and pull to remove (Fig 1).
Check all cylinder block oil galleries for cracks and blockages.
Fit new 'O' rings to the oil gallery plugs, lubricate the 'O' rings and fit the plugs to the cylinder block oil galleries.
Check all bearing housings for cracks, distortion, and any signs of bearing movement, ie scoring or overheating.

Check the cylinder block/cylinder head mating surface for warping, bowing and cracks.
Check the bore wear in the cylinder block with a suitable comparator (Fig 2). This must be done in at least six positions in the bore (Fig 3).
NOTE: Maximum bore wear normally occurs towards the top of the bore, across its thrust access.
NOTE: If standard size replacement pistons are being fitted, they must be the same grade as the markings on the cylinder block.

If new piston rings are being fitted without reboring, deglaze the cylinder bores using a hone or glaze buster.
This operation will not increase the size of the bores, and will give the bores a cross-hatched finish.
Insert the new piston rings into the cylinder bores, ensure that they are square in the cylinders and check the gap using a feeler gauge (Fig 4).

DATA:

Top compression ring gap	0.4 – 0.65mm
Second compression ring gap	0.4 – 0.65mm
Oil control ring gap	0.3 – 0.55mm

If the gap is insufficient, then a small flat file or carborundum stone can be used on the butting ends of the ring. Ensure that after filing no burrs remain.

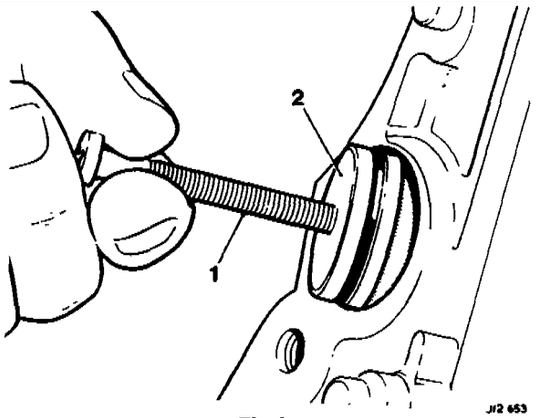
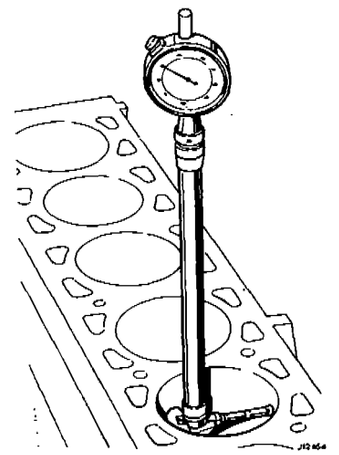


Fig 1


Fig 2

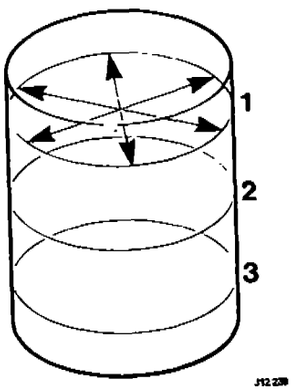
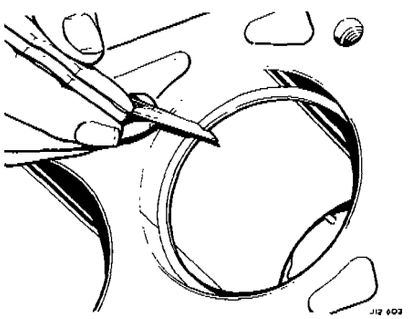


Fig 3


Fig 4

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NOTE: Ensure that the rings are not intermixed after they have been gapped, and that each piston/ring assembly is matched to its respective bore.

Measure the piston skirt clearance using a long feeler gauge. Insert the feeler gauge down the RH side of the cylinder bore, insert the correct piston INVERTED into the bore (with the gudgeon pin parallel to the axis of the crankshaft).
Push the piston down the cylinder until it reaches its tightest point in the bore. At this point, withdraw the feeler gauge; a steady resistance should be felt.
If the tolerances are outside those given below, the pistons must be replaced (as a set).
Piston skirt clearance 0.018-0.042mm.

Fit the new main bearing shell halves to the cylinder block and lubricate with clean engine oil.
Clean and polish the crankshaft journals (remove any scratches with lapping tape, polishing in an anti-clockwise direction ONLY, against the crankshaft rotation), lubricate with clean engine oil and carefully assemble the crankshaft into the cylinder block,
Fit the thrust washers ensuring that the grooved bearing face contacts the crankshaft (1 Fig 1).
Check the crankshaft rotates freely.
Fit the remaining new bearing shell halves into the main bearing caps. Lubricate with clean engine oil.
Fit the caps to the cylinder block. Start off the securing bolts (approximately 2 or 3 turns) and very gently tap the main bearing caps to ensure they are seated on the cylinder block.
Check the crankshaft still rotates freely.
Pull down each bearing cap individually and torque tighten the bolts.
Check the crankshaft still rotates freely after pulling down each bearing cap.
Check the crankshaft end float using a dial gauge mounted on the flywheel end of the Crankshaft (Fig 2).
The correct tolerance is 0.004 to 0.010 in.
Should the end float exceed this, oversize thrust washers are available in 0.005in and 0.010in.
Calculate the thickness of thrust washers as follows.

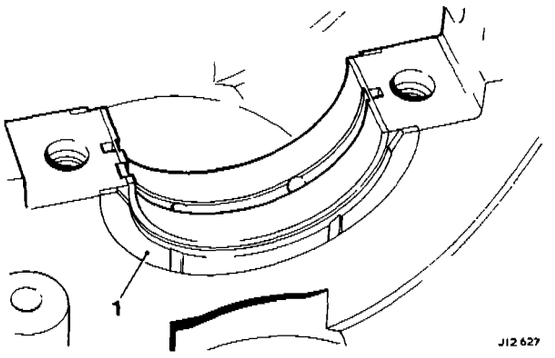


Fig 1

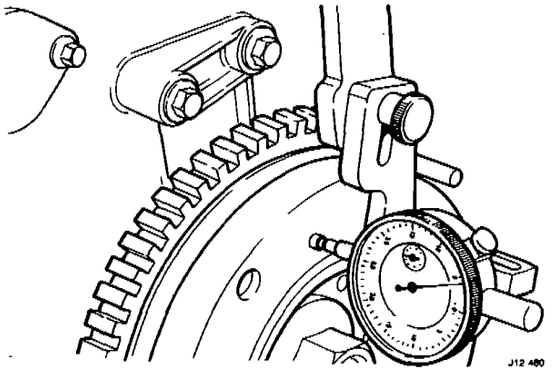


Fig 2

EXCESSIVE END FLOAT

End float measured	(A)	0.023 in.
Oversize thrust washers fitted	(B)	0.000 in. (standard)
End float required	(C)	0.007 in.
A-C = Thrust washer size required		= 0.016 in.
Thrust washer sizes to be fitted		0.010 in. + 0.005 in.
Total		0.015 in.
End float achieved		0.023 in. - 0.015 in.
Total		0.008 in.

INSUFFICIENT END FLOAT

End float measured	(A) 0.003 in.
Oversize thrust washer fitted	(B) 0 010 in.
End float required	(C) 0.007 in.
C-A = Thrust washer size required	=0.004 in.
Thrust washer size to be fitted	=0.005 in.
End float achieved	0.003 in. + 0.005 in.
Total	0.008 in.

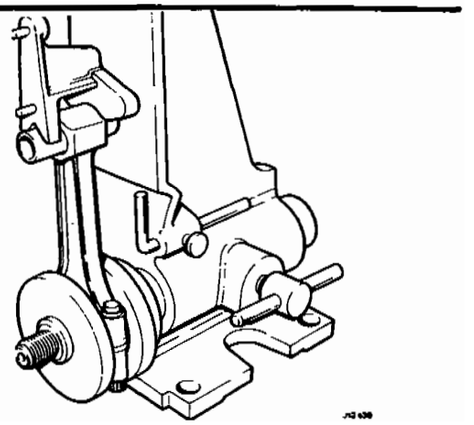


Fig 1

fit new woodruff keys to the crankshaft, never re-use old ones.
Fit the timing and oil pump sprockets to the crankshaft.
Check the connecting rods for out-of balance, twist and bend, using a suitable measuring jig (Figs 1 and 2).
If any rod is bent, twisted or out of balance with the other five, then the complete set must be renewed.
Lubricate the small end bush, slide the gudgeon pin through the piston and connecting rod.
NOTE: Pistons are marked 'FRONT'. Ensure that the marking faces the front of the engine.
Secure with new circlips, never re-use old ones.
Fit the rings to the pistons ensuring that gaps are positioned as shown in Fig 3.

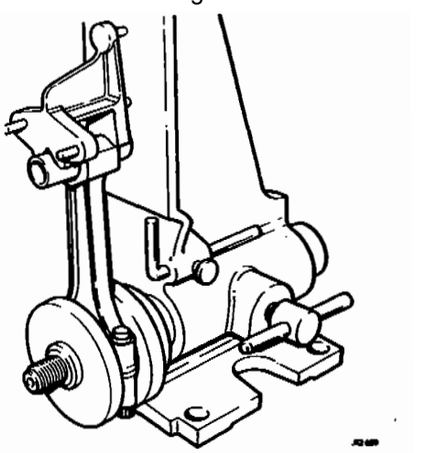


Fig 2

Lubricate and compress the rings using Service Tool 18G 55A (Fig 4).
Insert the piston skirt into the bore, and using a suitable implement, ie a wooden hammer shaft, gently tap the piston into the cylinder bore.
Ensure that the connecting rod does not foul either the cylinder block or camshaft.
Lubricate (using clean engine oil) and fit the big end bearing shells to the connecting rod and the connecting rod cap.
Fit the rod to the crankshaft, and fit the connecting rod cap to the rod.
Fit and tighten the connecting rod cap nuts to a torque of 52-55Nm.
Repeat the operation for the remaining pistons.
Clean and fit the windage trays. Fit and tighten the securing bolts.
Remove the oil pressure relief valve assembly from the oil pump.
Check the valve spring and mandrel for wear, scoring or pitting.
Measure against the specifications below.
Should any of the components be suspect, they must be replaced.

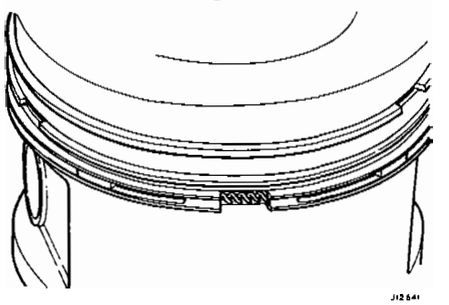


Fig 3

DATA

OIL PRESSURE RELIEF VALVE

O/D	17.98 to 17.95 mm
I/D	15.00 to 14.50 mm
Overall length	35 mm
Working length	30 mm
Bore depth	27 mm
Material	ENIA

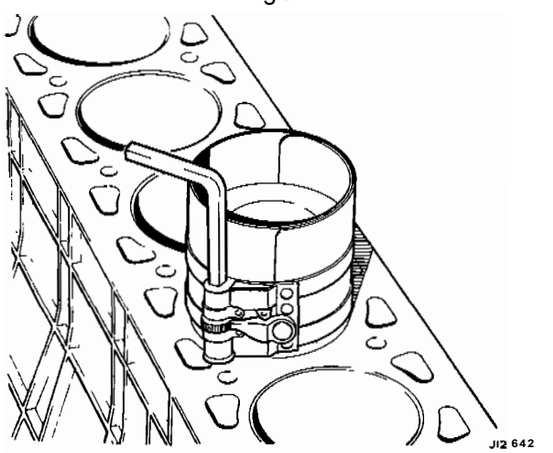


Fig 4

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MANDREL

Length	57mm
Diameter	11.11 mm
Material	Steel tube to BS970

SPRING WALL

Thickness	1.63 or 1.22mm
Free length	106 mm
Outside diameter	16.34 mm

Remove the oil pump body securing bolts and remove the outer rotor. Remove the backplate securing bolts, remove the backplate, and remove the bearing shell from the housing.,

Clean all dismantled parts and check for obvious wear or scoring.

Fit the outer rotor and check the clearance between the rotor and the oil pump housing (Fig 1).

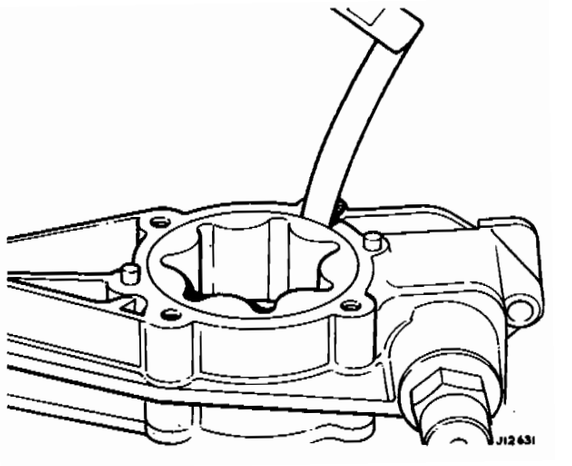


Fig 1

Check the oil pump end float (Fig 2).

Check the measurements given below. If any components are outside the specified tolerances, they must be replaced.

DATA

OIL PUMP

Material	Cast iron grade 12
End float	0,1 mm
Outer rotor clearance	0,2mm
Outer rotor O/D	69,825 to 69,774mm
Outer rotor width	27,975 to 27,962mm
Inner rotor width	27,975 to 27,962mm
Pump body rotor bore	69,951 to 69,926mm

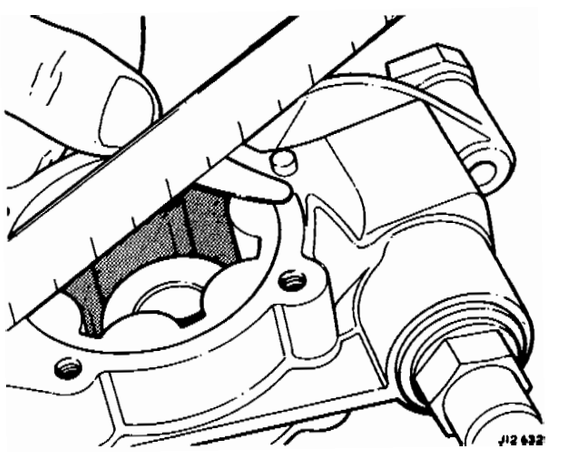


Fig 2

Lubricate the bearing shell with clean engine oil and fit to the pump housing.

Smear the backplate gasket face with sealant. Fit the backplate and tighten the securing bolts.

Lubricate the pump inner and outer rotors, the bearing, and the housing with clean engine oil.

Fit the outer rotor, smear the gasket face with sealant, fit the seal to the pump body and tighten the securing bolts.

Assemble and fit the relief valve assembly to the oil pump.

Fit the oil pump to the engine and torque tighten the securing bolts.

Refit the camshaft sprocket.

Fit the oil pump drive chain over the crankshaft sprocket, and move the drive chain as far rearward as possible.

Fit a shim pack (3 Fig 3) of 0.015in thickness to the oil pump.

Align the bolt holes, fit the drive sprocket and the two securing bolts.

Using a straight edge (2 Fig 3), check the alignment of the oil pump drive sprocket (4 Fig 3) and the crankshaft sprocket (1 Fig 3).

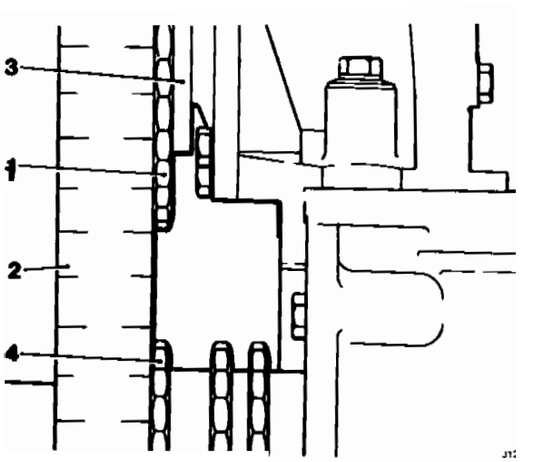


Fig 3

Remove and refit the pump drive sprocket, varying the thickness of the shim pack as required in order to align the sprockets. When the alignment is correct remove the pump sprocket.
Fit the chain and shims to the sprocket (3 Fig 1) and fit the assembly to the oil pump.
Fit the tab washer (4 Fig 1) and securing bolts (2 Fig 1).
Tighten the bolts and lock over the tab washer (1 Fig 1).
NOTE: .Oil pump sprocket shims are available in the following sires:
0.005in
0.01 Oin
0.020in

Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 2).

Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102' to the transfer housing gasket face, and fit the housing to the block. Fit and torque tighten the securing bolts.

Lubricate the lower timing chain. Fit the chain to the intermediate sprocket, fit the chain to the lower sprocket, and then assemble the intermediate sprocket and chain to the cylinder block.
Should the intermediate sprocket be worn or damaged, the assembly must be replaced.
Fit the spacers to the lower pivoting damper and fit the assembly to the cylinder block.
Fit the tab washer and securing bolts.
Tighten the bolts and lock over the tabs.
Clean the lower tensioner assembly, remove the ball valve (1 Fig 3), and ensure that the base of the housing (2 Fig 3) is clean.
Check that the ball valve is free by shaking it to ensure it rattles. If it does not, replace the valve assembly. If it does, renew and lubricate the 'O' ring (3 Fig 3) and press the valve back into the housing. The ball free movement is 0.45-0.74mm.
Inspect the housing and hydraulic tensioner (4 Fig 3) for excessive wear or scoring. Also check that the oil hole (5 Fig 3) is clear in the end of the piston.
Lubricate the component parts with clean engine oil. Assemble the tensioner by pressing and twisting the snail clockwise until the pawl locks in the 'park' position. Insert the tensioner assembly into the housing and fit the housing to the cylinder block. Fit and tighten the securing bolts (6 Fig 3).

Fit the lower static damper, fit the tab washer and bolts.
Tighten the bolts and lock over the tabs.
Release the tensioner by pushing the pivoting damper away from the chain, thus pushing the tensioner back into the housing.
This will release the snail, and tension the chain.
Fit the upper static damper.
Fit the securing bolts and tab washer.
Tighten the securing bolts and lock over the tabs.

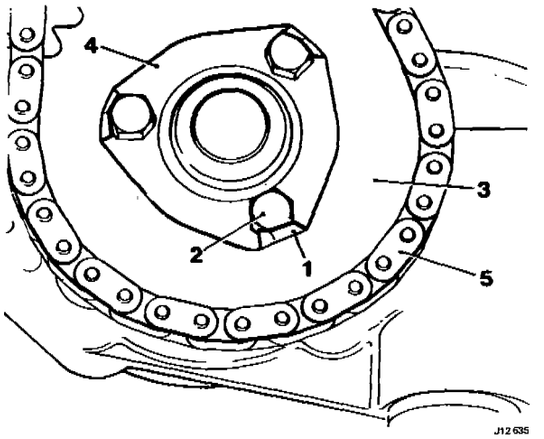


Fig 1

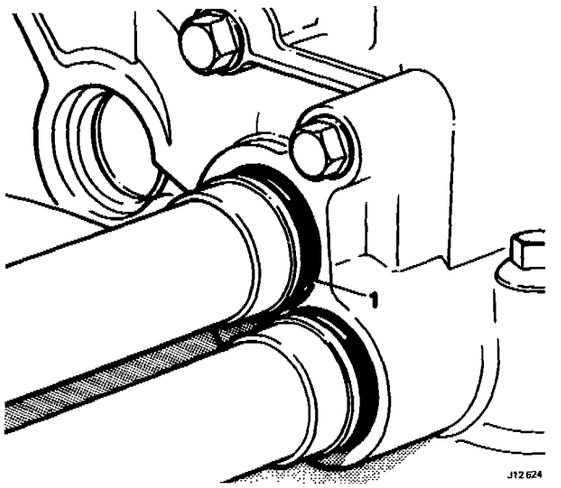


Fig 2

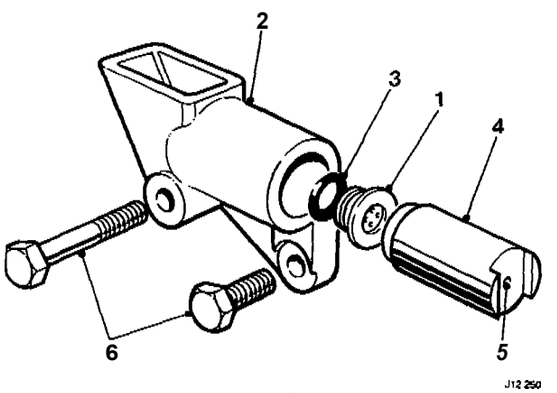


Fig 3

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Fit a dial gauge to the top of the cylinder block, and turn the engine over until No.1 piston is at TDC (Fig 1).
Lubricate the upper chain with clean engine oil and fit to the intermediate sprocket.
Fit an elastic band around the upper dampers to secure the chain.

Remove the crankshaft front oil seal.
Fit a new seal using JD 129 (Fig 2) ensuring that the front edge of the seal is flush with the cover.

Remove the distributor drive gear shaft seal.
Lubricate the new distributor drive shaft seal and fit to the cover using Service Tool 18G 1469 in the same way as JD 129.

Smear the cylinder block timing cover face with 'Hylosil 102, lubricate the bearing shells with clean engine oil and carefully fit the timing cover to the engine ensuring that the timing cover to cylinder head mating face is flush with the cylinder block (Fig 3).
Fit and tighten the securing bolts.
Lubricate and fit the oil seal distance spacer. Fit and seat the crankshaft pulley woodruff key.
Remove and discard the old oil seal from the rear housing.
Clean the housing (4 Fig 4), lubricate the seal mounting face (3 Fig 4), and fit the new seal using Service Tools **JD 550-3 and 18G134 (1,2 Fig 4).**
Smear the gasket face with Hylosil 102, locate the plastic protector 'O' ring on to the end of the crankshaft, and push the rear seal housing over the crankshaft and up to the rear cylinder block face.
Check that the sump to rear housing mating face and cylinder block are flush (Fig 1 page 101).
Fit and tighten the securing **bolts.**
Clean and refit the baffle to the sump.
Apply Hylosil 102 to the sump mating face, lift the sump into position, and fit and tighten the securing bolts.

Refit the cylinder head using a new gasket.
Ensure that the cylinder head is torque tightened in the correct sequence, as **follows:**

Tighten the cylinder head bolts in sequence to 52-54Nm.
Rotate the bolts clockwise in sequence through exactly 90 degrees, using Special Tool LST 122 or a self-manufactured tool of the dimensions given in Fig 2 page 101.
Lubricate the camshafts and fit to the cylinder head, ensuring that they are fitted with the slots to the top.
Fit the camshaft caps and torque tighten the securing bolts.
Measure the valve clearance between the heel of the camshaft and the cam followers, turning the engine over as necessary to measure all the clearances.
The correct clearance should be:

INLET VALVES 0.012 – 0.014in
EXHAUST VALVES 0.012 – 0.014in

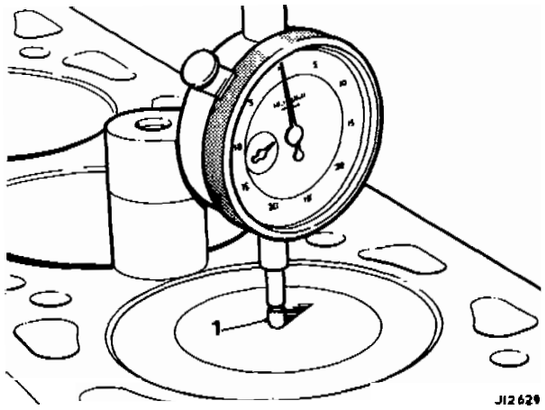


Fig 1

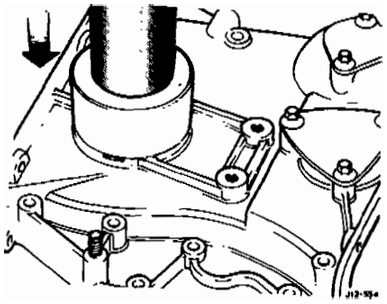


Fig 2

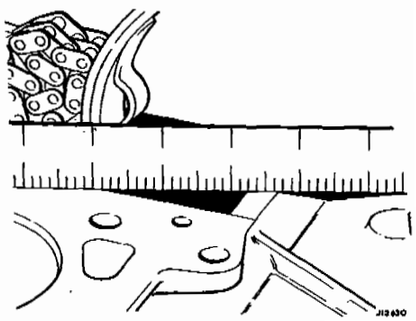


Fig 3

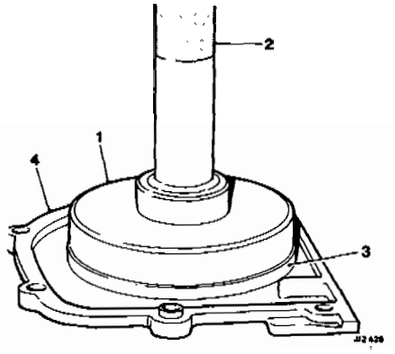


Fig 4

Make note of the actual clearances.
Should any of the clearances be incorrect, remove the camshaft caps, the camshaft and the cam followers.
Remove all the shims requiring adjustment, check with a micrometer the size of the existing shims and note the reading. Calculate the size of the shim required, following the examples in DATA.

DATA

EXCESSIVE CLEARANCE	**INCHES**
Size of existing shim	0.1**00**
Plus the actual clearance noted	0.01**9**
	0.119
Less the specified valve clearance	0.013
= required shim size	**0.106**

INSUFFICIENT CLEARANCE	**INCHES**
Size of existing shim	0.107
Plus the actual clearance noted	**0.010**
	0.117
Less the specified valve clearance	**0.013**
= required shim size	0.1**04**

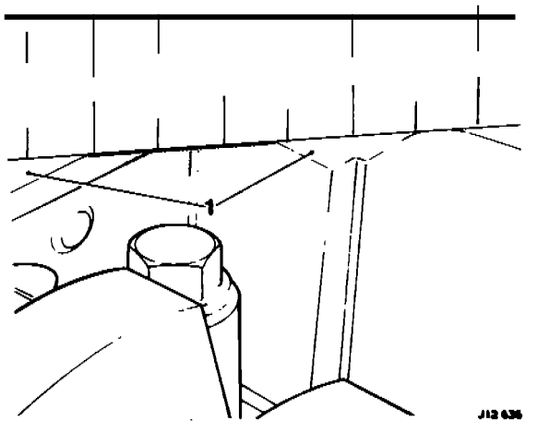


Fig 1

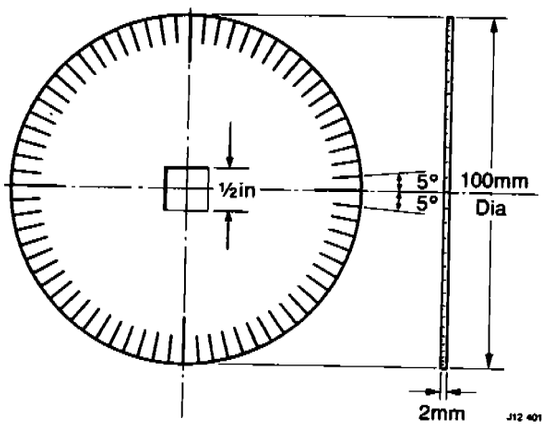


Fig 2

AVAILABLE SHIM SIZES

Letter	Thickness
A	0.085 in
B	0.086 in
C	0.087 in
D	0.088 in
E	0.089 in
F	0.090 in
G	0.091 in
H	0.092 in
I	0.093 in
J	0.094 in
K	0.095 in
L	0.096 in
M	0.097 in
N	0.098 in
O	0.099 in
P	0.100 in
Q	0.101 in
R	0.102 in
S	0.103 in
T	0.104 in
U	0.105 in
V	0.106 in
W	0.107 in
X	0.108 in

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Fit the cam followers, refit the camshafts, the camshaft caps and recheck the valve clearances.
NOTE A final check of the valve clearances should be done when the cylinder head is fitted and torque tightened to the cylinder block.

Using Service Tool 18G 1433 camshaft timing tool, set the camshaft to T.D.C. (Fig 1).
Position the chain over the sprockets and align the sprockets to the camshaft.
Remove the inner sprocket circlips (1 Fig 2) and remove the inner sprockets (2 Fig 2).
Align the inner sprockets to the bolt holes.
Refit the inner sprockets to the outer sprockets (3 Fig 2).
Refit the circlips.
Fit and tighten the sprocket securing bolts.
Fit new half moon seals and camcover gasket.
Fit the camcover. Fit and torque tighten the securing bolts.

Detach the engine from the stand.
Refit all ancilliaries.
Refit the gearbox/transmission unit to the engine.
Refit the engine and gearbox/transmission unit 12.41.01/2 page 77.

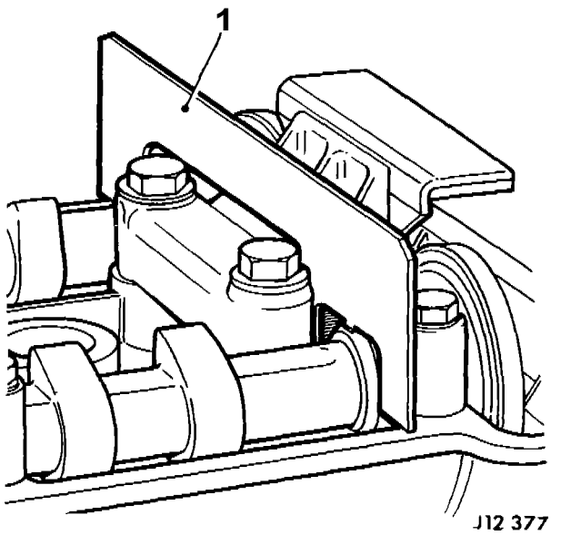


Fig 1

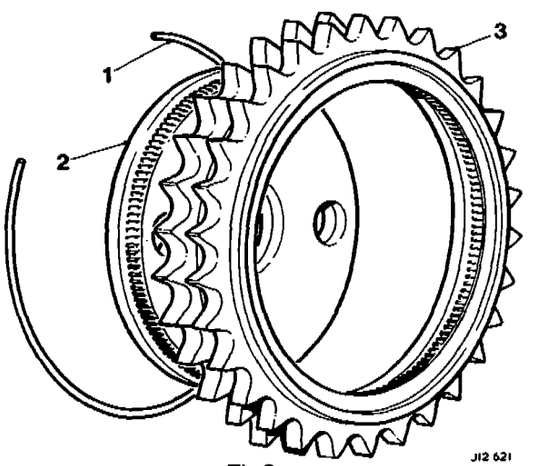


Fig 2

DATA

SERVICE TOOLS

JD 129 *Crankshaft oil seal replacer*
JD ***550-3*** *Rear oil seal adaptor*
18G 1433 *Camshaft timing tool*
18G1434 *Timing cover bush tool*
18G ***1436*** *Crankshaft pulley tool*
18G1437 *Crankshaft* ***pulley lock***
18G 1465 *Engine support brackets*
18G1469 *Auxilliary oil seal replacer*
MS53B *Engine support bracket*
MS 1519A *Valvespring compressor*

TORQUE FIGURES

Adaptor plate to sump ***49-54Nm***
Adjustment trunnion to alternator bolt ***23-27Nm***
Alternator adjustment bolt to cover nut ***23-27Nm***
Alternator adjustment bolt lock nuts ***12-14Nm***
Alternator pivot ***bolt 23-27Nm***
Alternator pivot bolt nut ***23-27Nm***
Banjo bolt to cylinder head ***13-16Nm***
Camcover to cylinder head ***9.5-12Nm***
Camshaft sprocket to camshaft ***23-27Nm***
Clip-hose to breather pipe ***2.4Nm***
Connecting rod to big end nut ***52-55Nm***
Crankshaft pulley to crankshaft ***203.5Nm***
Crankshaft speed sensor to timing cover ***23-27Nm***
Cylinder block drain plug to block ***68-75Nm***
Cylinder head to cylinder block:
Tighten in sequence to ***52-54Nm***
Rotate clockwise through exactly 90"
Dipstick to bracket ***5-8Nm***
Distributor clamp plate to timing cover ***9.5-12Nm***
Drive plate centre coupling ***9.5-12Nm***
Exhaust manifold to cylinder head ***23-27Nm***
Fan/torquatrol unit to water pump ***23-27Nm***
Heat shield to exhaust manifold ***23-27Nm***
Heater pipe to cylinder head ***23-27Nm***

TORQUE FIGURES

Heater pipe to inlet manifold 9.5-12Nm
Hose-bottom hose to water pump 3.8-4.3Nm
Hac-expansion tank to water pump 2.5-3.5Nm
Hose-heater return pipe to water pump 2.5-3.5Nm
Hose- water pump to thermostat housing 2.5-3.5Nm
Hydraulic pump to timing cover 23-27Nm
Inlet manifold to cylinder head 23-27Nm
Intake elbow to throttle housing 2.4Nm
Lower chain tensioner to cylinder block 23-27Nm
Oil drain-back tube to sump 12.5-15Nm
Oil pump front cover to body 9.5-12Nm
Oil pump to cylinder block 23-27Nm
Oil pump rear cover to body 9.5-12Nm
Oil sump plug 41-47Nm
Oil sump to cylinder block 23-27Nm
Oil sump to timing cover 23-27Nm
Power steering pump to mounting 23-27Nm
Power steering pump to adaptor 49-54Nm
Timing cover to cylinder block 23-27Nm
Top hose to thermostat housing 3.8-4.3Nm
Transfer housing to cylinder block 23-27Nm
Upper static damper to cylinder block 23-27Nm
Upper timing chain tensioner to block 23-27Nm
Water pump to timing cover 23-27Nm
Windage tray to cylinder block 23-27Nm

SPANNER SIZES

8mm
10mm
13mm
17mm
19mm (SERVICE TOOL 18G 1436)
30mm
3/8in AF
1/2in AF (SERVICE TOOL 18G 1437)
9/16in AF
5/8in AF
13/16in AF
10mm (ALLEN KEY)
3/4 WHITWORTH

OILS/GREASES/SEALANTS

Half moon seals to cylinder head 'HYLOSIL 102'
Hydraulic pump driveplate bolt 'LOCTITE'
Oil pump front cover to body 'LOCTITE 501'
Oil pump rear cover to body 'LOCTITE 501'
'O' Rings 'PETROLEUM JELLY'
Sump to timing cover 'HYLOSIL 102'
Timing cover to cylinder head 'HYLOSIL 102'
Thermostat housing to extension 'HYLOSIL 102'

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TIMING COVER GASKET

RENEW **12.65.04**

Open the bonnet.
Remove the bonnet insulation pad. Disconnect the bonnet lamp multi plugs.
Apply adhesive tape (or similar) to the forward edge of the bonnet (behind the grille surround) for paint protection.
Slacken off the bonnet securing bolts (1 Fig 1). disconnect the support struts (2 Fig 1).
Remove the bonnet securing bolts and remove the bonnet.
Place a drain tray in position below the radiator drain plug (1 Fig 2).
Remove the expansion tank filler cap.
Remove the radiator and rear cylinder block drain plugs, and drain the coolant.
Refit both drain plugs.
Unclip the air cleaner cover and remove the cover/ element assembly.

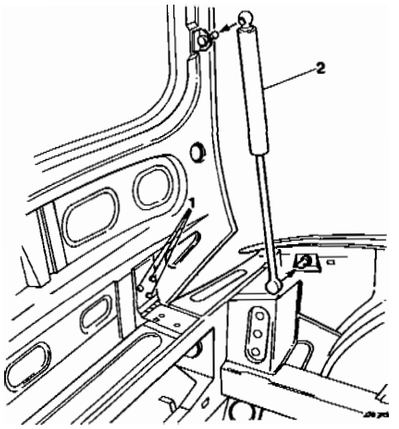


Fig 1

Disconnect the hose from the intake throttle elbow.
Disconnect the breather hose from the intake elbow.
Disconnect the intake elbow hose from the throttle orifice control housing.
Remove the bolt securing the dipstick tube(s) to the inlet manifold (4 Fig 3).
Remove the oil filler tube upper mounting bracket securing bolt.
Displace the oil filler tube from the lower housing.
Disconnect the engine breather hose from the cam cover.
Disconnect the heater feed hose from the cylinder head (3 Fig 3).
Remove the inlet manifold securing nuts and bolts (1,2 Fig 3).
NOTE: The securing bolt behind the oil filler tube remains captive.

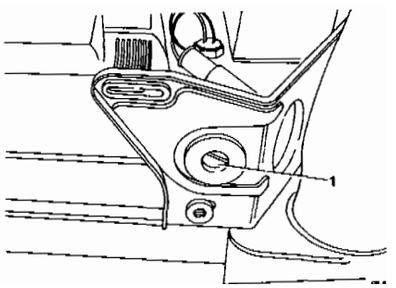


Fig 2

Remove the earth leads from the front stud.
Displace the engine harness channel mounting brackets from the studs.
Remove the oil filler tube upper mounting bracket.
Carefully lift the inlet manifold off the cylinder head.
Chock the manifold clear of the cylinder head.
Remove and discard the gasket.
Remove the thermostat housing.
Displace the distributer cap for access,
Rotate the engine to TDC number 1 cylinder.
Jack up the vehicle and support with axle stands.
Remove the exhaust mounting bracket from the gearbox.
Remove the front pipe to manifold securing nuts.
Displace the flanges from the studs and disconnect the exhaust system.

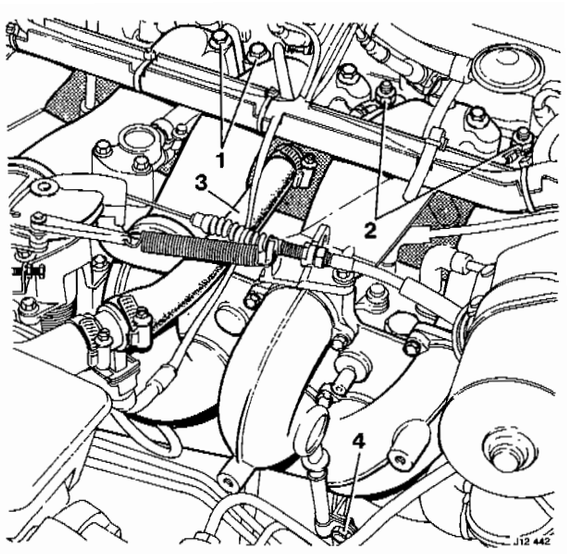


Fig 3

Remove the axle stands and lower the vehicle.
Disconnect the HT lead from the coil.
Disconnect the spark plug leads.
Remove the cap and leads assembly.

Remove the camcover securing screws and remove the cover.
Remove and discard the gasket and half moon seals.
Push back the lock tabs and remove the camshaft sprocket securing bolts. Remove the tab washers.
Remove the upper chain tensionet valve clamp bolt (1 Fig 1), remove the clamp (2 Fig 1), and remove the valve (3 Fig 1).
Using a 3mm Allen key, wind back the tensioner (turn clockwise) until the snail engages in the park position.
Remove the tensioner housing securing bolt (4 Fig 1) and withdraw the tensioner assembly.

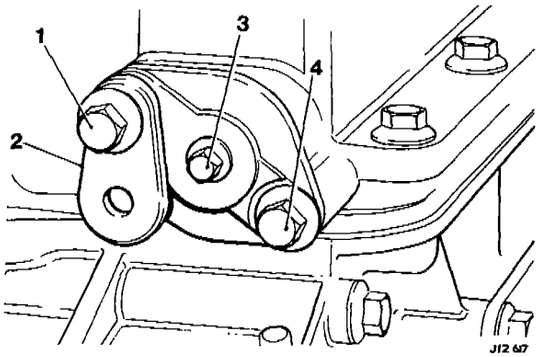


Fig 1

Note the position of the rotor arm, and remove the distributor.
Re-position the timing chain between the upper dampers.
Fit an elastic band to retain the dampers and chain.
Remove the cylinder head front securing bolts.
Re-position the hydraulic pump hose and harness mounting brackets.
Remove the remaining cylinder head securing bolts/ nuts, remove the upper static damper pedestal assembly and remove the cylinder head.
Remove and discard the head gasket.
Remove and discard the exhaust manifold sealing rings.

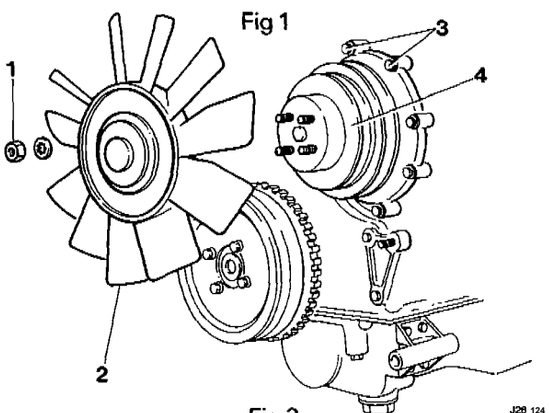


Fig 2

Remove the bolts securing the sump to the timing cover.
Disconnect the top hose from the thermostat housing.
Disconnect the harness connections from the thermostat housing.
Disconnect the water pump and expansion hoses from the thermostat housing.

Remove the spoiler/under tray to inner wheel arch cover.
Remove the nuts securing the torquatrol unit to the water pump (1.2 Fig 2).
Remove the fan cowl securing clips (1 Fig 3).
Lift out the cowl and torquatrol unit complete.

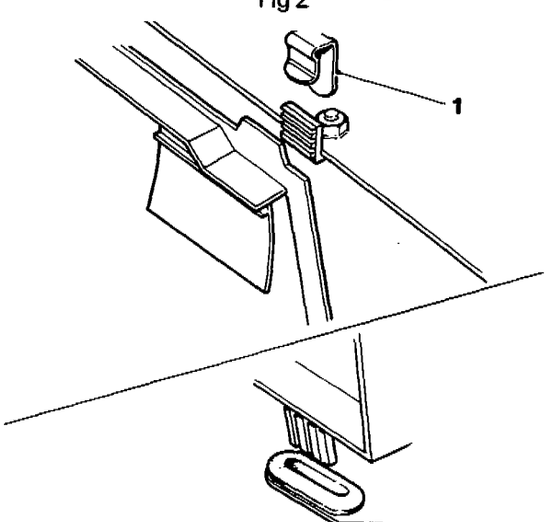


Fig 3

Remove the hydraulic pump from the timing cover.
Re-position the pump away from the timing cover area.
Remove the pump drive plastic coupling.
Remove the drive plate centre securing bolt.
Using a suitable pry bar, remove the drive plate from the shaft.
Remove the distributor.
Remove the alternator drive belt.
Fit Service Tool 18G 1437 (1 Fig 4) to the crankshaft pulley (3 Fig 4) and tighten the Service Tool securing bolts (2 Fig 4).
Slacken off the crankshaft centre securing bolt, remove the Service Tool and remove the bolt.
Fit Service Tool 18G 1436 (1 Fig 1 page 106) through the crankshaft pulley, tighten the securing bolts (2 Fig 1 page 106), tighten the centre bolt of the tool and remove the pulley and tool assembly.

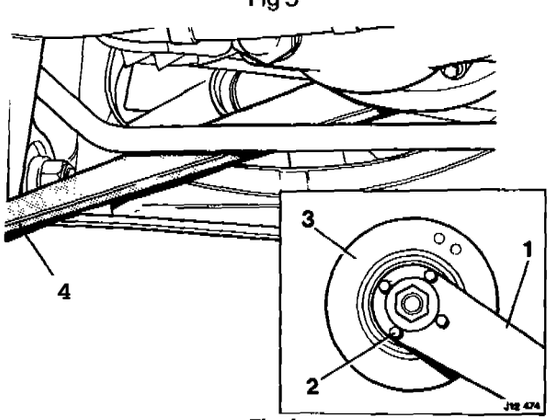


Fig 4

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Remove the crankshaft speed sensor securing bolts (1 Fig 2), and re-position the sensor (6 Fig 2) away from the timing cover area.
Disconnect the expansion tank hose from the water pump.
Disconnect the bottom hose from the water pump.
Disconnect the water and heater return pipe hoses from the water pump.
Remove the water pump assembly from the timing cover.
Remove the alternator link arm assembly.
Remove the timing cover securing bolts (2 Fig 2).
Remove the timing pointer (3 Fig 2) and remove the timing cover assembly (5 Fig 2).
Remove the damper woodruff key and oil seal spacer from the crankshaft.
Remove the oil seal from the timing cover.

Clean all gasket surfaces, oil seal spacer, pointer and crankshaft damper.
Using Service Tool JD 129 and a suitable press, fit a new oil seal to the timing cover (Fig 3).
Ensure that the front of the seal is flush with the front face of the timing cover.
Apply 'Hylosil 102 to the timing cover gasket faces and the outer edge of the sump face.
Lubricate the oil seal and bearing surfaces and fit the timing cover assembly to the cylinder block.
Fit and tighten the timing cover securing bolts.
NOTE: Do not fully tighten the timing pointer bolts at this stage.
Fit and tighten the sump to riming cover securing bolts.
Fit the oil seal spacer to the crankshaft and engage into the oil seal.
Fit the damper woodruff key into the crankshaft, and fit the damper.
Align the timing pointer to T.D.C. and tighten the pointer securing bolts.
Refit the damper. Fit and tighten the securing bolt, using 18G 1437.
Re-position the engine at T.D.C. and remove the Service Tool.
Refit the alternator link arm assembly.
NOTE: Do not tighten the trunnion bolt at this stage.
Refit the water pump.
Reconnect the water and heater return pipe hoses.
Reconnect the bottom hose to the water pump.
Reconnect the expansion tank hose to the water pump.
Refit the crankshaft sensor assembly to the timing cover, and secure the harness with the 'P' clip.
Refit and adjust the alternator drive belt.
Finally tighten the alternator trunnion bolt.
Refit the crank pulley and balance weights. Fit and tighten the pulley securing bolts.
Clean the power hydraulic pump drive coupling and mating faces.
Fit the drive plate to the shaft.
Apply loctite to the drive plate securing bolt. Fit and tighten the drive plate securing bolt.
Fit and align the coupling to the pump.
Reconnect the pump to the drive shaft. Fit and tighten the pump securing bolts.

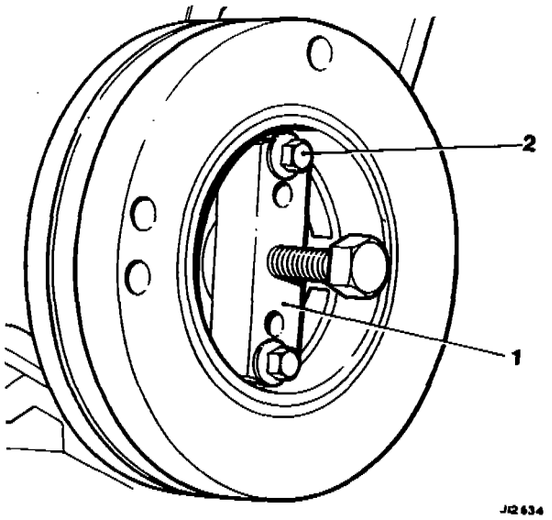


Fig 1

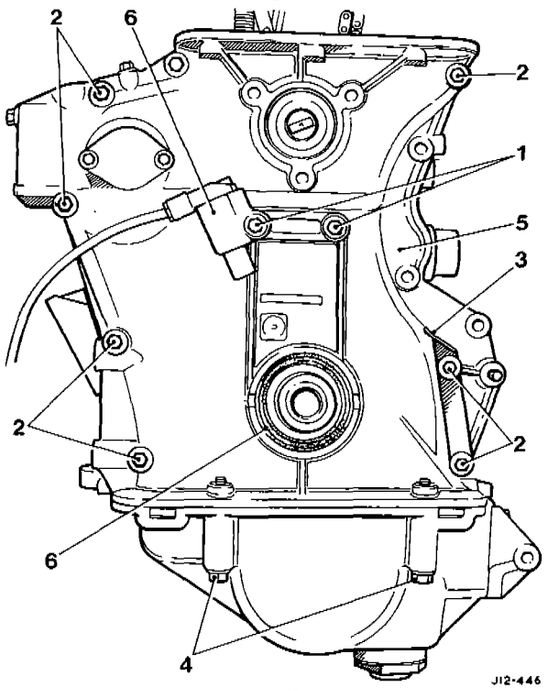


Fig 2

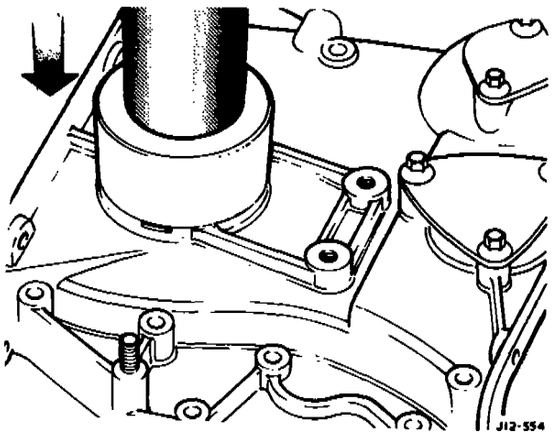


Fig 3

Fit a new 'O' ring to the distributor. Set the rotor arm to the correct position.
Refit the distributor.
NOTE Do not tighten the distributor securing bolt at this stage.
Refit the torquatrol unit. Ensure the paint spots align together (Fig 1).

Refit the thermostat housing to water pump hose.
Reconnect the expansion and top hoses to the thermostat housing.
Reconnect the thermostat housing sensor connections.

Clean the cylinder head thoroughly and check the cylinder head and cylinder block for warping, bowing or cracks.
Fit new exhaust down pipe sealing rings.
Fit a new cylinder head gasket.
Fit the cylinder head assembly to the engine, ensure no hoses or cables are trapped.
Refit the upper static damper assembly.

The cylinder head must be torque tightened as follows:
Following the sequence shown in (Fig 2). tighten the cylinder head bolts to **52-54Nm.**
NOTE: Ensure that the camshaft is still on TDC using Service Tool **18G 1433** (Fig **3).**
Then rotate the bolts clockwise in sequence through exactly 90 degrees, using Special Tool LST 122 or a self-manufactured tool of the dimensions given in Fig 4.

Fit the harness clip and hose bracket to the cylinder head front securing bolts.
Fit and tighten the front securing bolts.
Check the camshafts are set at TDC using Service Tool **18G 1433** (Fig 3).
Raise the timing chain from between the upper dampers.
Remove the elastic band.
Re-position the chain over the camshafts.
Fit and engage the sprockets to the chain and camshafts.
Move all the chain free play to the tensioner side.

Fit upper chain tensioner tool **18G 1436** (2 Fig **1** page **108).** Fit and tighten the tool securing bolts **(1** Fig **1** page **108).**
Tension the timing chain.

Remove the inner sprocket securing clip **(1** Fig 2 page 108).
Remove the inner sprocket (2 Fig **2** page **108) from** the outer sprocket **(3** Fig 2 page **108)** and align the securing bolt holes.
Fit the tab washers. Fit and tighten the securing bolts. Lock over the tabs.
Refit the inner sprocket securing clip.
Repeat the procedure for the other sprocket.
Release the tension on the timing chain.
Slacken off the upper chain tensioner tool securing bolts.
Remove the upper chain tensioner tool 18G 1436.
Clean the tensioner assembly and gasket faces.

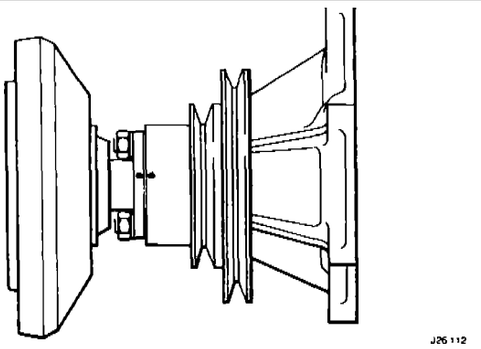


Fig 1

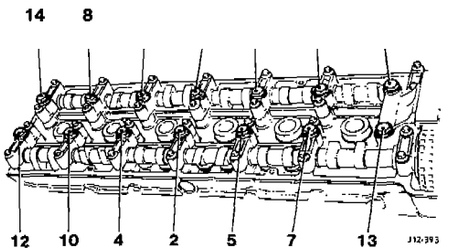


Fig 2

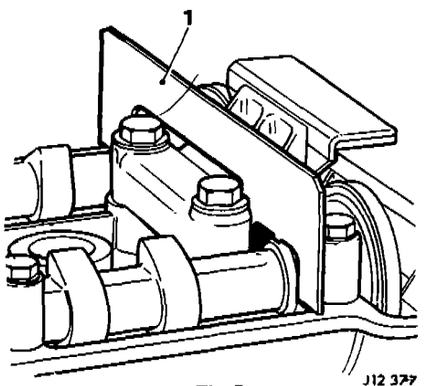


Fig 3

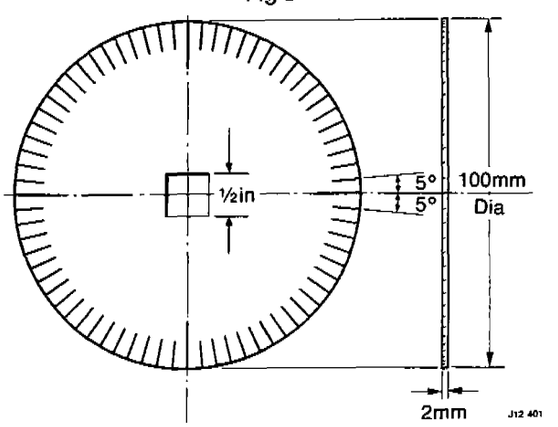


Fig 4

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Fit a new housing gasket. Fit a new 'O' ring. Lubricate the 'O' ring.
Fit the tensioner to the cylinder head.
Fit and tighten the tensioner assembly securing bolt (4 Fig 3).
Clean the valve assembly and fit new 'O' rings.
Lubricate the tensioner valve.
Using an Allen key, release the tensioner, ie turn the Allen key anti-clockwise.
Fit the tensioner valve (3 Fig 3). Position the clamp (2 Fig 3) over the valve.
Tighten the clamp bolt (1 Fig 3).
Fit the distributor.

Apply sealant to the half moon seals (Fig 1 page 109) and fit to the cylinder head.
Fit new plug well seals and camcover gasket.
Fit and align the camcover. Fit and tighten the securing bolts.
Fit the distributor cap and leads. Connect the plug leads.
Refit the thermostat housing to the cylinder head.
Fit new inlet manifold gaskets.
Fit a new seal to the oil filler tube housing.
Re-position the manifold assembly over the studs.
Tighten the manifold captive bolt behind the oil filler tube.
Fit the oil filler tube and upper mounting bracket.
Re-position the engine harness channel mounting brackets to the inlet manifold studs.
Re-position the earth leads over the front stud.
Re-position the starter solenoid harness bracket to the rear bolt hole.
Fit and tighten the manifold securing bolts/nuts.
Reconnect the heater hose to the cylinder head.
Reconnect the breather hose to the cam cover.

Fit and tighten the oil filler tube upper mounting bracket securing bolt.
Fit and tighten the dipstick tube(s) mounting bracket securing bolt.

Reconnect the throttle housing hose to the intake elbow.
Reconnect the breather hose to the breather pipe.
Reconnect the air valve hose to the intake elbow.
Jack up the vehicle. Support with axle stands.
Reconnect the exhaust system to the manifolds. Fit and tighten the securing nuts.
Refit the exhaust pipe to gearbox bracket. Fit and tighten the securing bolts.
Remove the stands and lower the vehicle.
Refit the air cleaner element.
Ensure that the engine is filled with the correct anti-freeze/water solution.
Refit the bonnet. Close the bonnet.

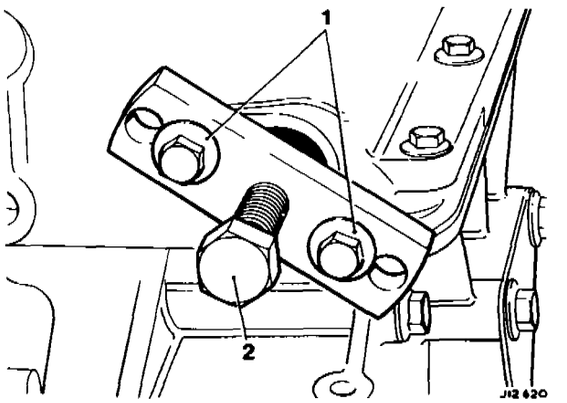


Fig 1

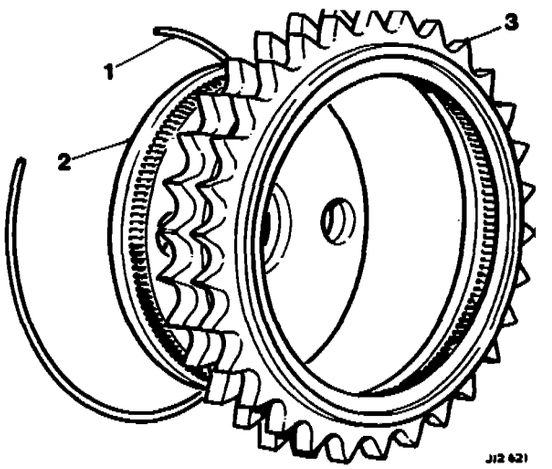


Fig 2

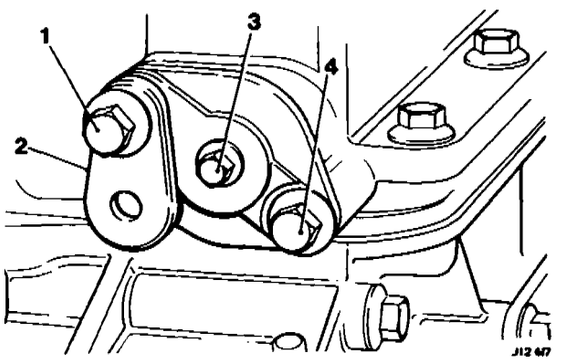


Fig 3

DATA

SERVICE TOOLS

***18G 1433** Camshaft timing tool*
***18G 1436** Tensioner valve adaptor*
***18G 1437** Crankshaft pulley remover*
***LST 122** Cylinder head bolt torque tool*
***JD 129** riming cover oil seal replacer*

TORQUE FIGURES

Alternator pivot bolt 23-27Nm
Alternator pivot bolt nut **23-27Nm**
Banjo bolt to cylinder head **13-16Nm**
Camshaft cover to cylinder head (screw) **9.5-12Nm**
Camshaft sprocket to camshaft **23-27Nm**
Clip-hose to breather pipe **2.4Nm**
Crankshaft pulley to crankshaft **203.5Nm**
Crankshaft sensor housing to timing cover **23-27Nm**
Cylinder block drain plug **68-75Nm**
Cylinder head to cylinder block:
Tighten in sequence to **52-54Nm**
Rotate clockwise through exactly 90°
Dipstick to bracket **5-8Nm**
Distributor clamp plate to timing cover **9.5-** *12Nm*
Exhaust manifold to cylinder head 23-27Nm
Fan/torquatrol unit to water pump **23-27Nm**
Heat shield to exhaust manifold 23-27Nm
Heater pipe to cylinder head 23 **27Nm**
Heater pipe to inlet manifold **9.5-** *12Nm*
Hose-bottom hose to water pump **3.8-4.3Nm**
Hose-expansion tank to water pump **2.5-3.5Nm**
Hose-heater return pipe to water pump **2.5-3.5Nm**
Hose-water pump to thermostat housing **2.5-3.5Nm**
Hydraulic pump to timing cover **23-27Nm**
Inlet manifold to cylinder head **23-27Nm**
Intake elbow to throttle housing **2.4Nm**
Oil *sump to timing* ***cover*** **23-27Nm**
Timing cover ***to*** *cylinder block 23-27Nm*
Top hose to thermostat housing **3.8-4.3Nm**
Water pump to timing cover **23-27Nm**

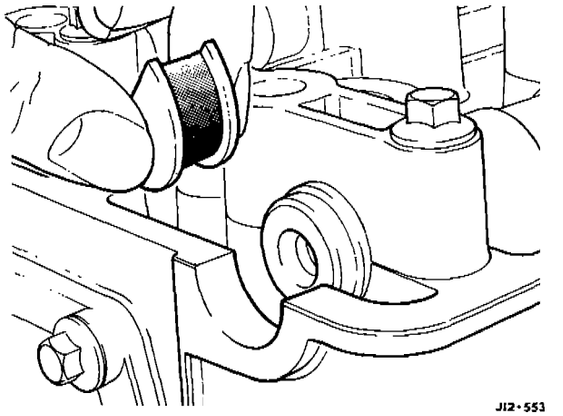


Fig 1

SPANNER SIZES

6mm
8mm
10mm
13mm
19mm *(SERVICE* ***TOOL*** *- 18G* ***1436)***
30mm
1/2in AF
9/16in AF
5/8in AF
13/16in AF
10mm (ALLEN KEY)

OILS/GREASES/SEALANTS

Half moon seals ***to*** *cam carrier* ***'H*** *YLOSIL* ***102'***
Hydraulic pump drive plate bolt ***'LOCTITE'***
'O' rings ***'PETROLEUM JELLY***
Sump to timing cover ***'H*** *YL* ***OSIL*** *102'*
Thermostat housing to extension ***'HYLOSIL 102'***
Timing cover to cylinder head ***'HYLOSIL*** *102'*

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TIMING CHAIN, GEAR AND TENSIONER – ENGINE SET

RENEW **12.65.13**

Remove the timing cover 12.65.04 page 104.
Remove the elastic band from the upper dampers, push back the lock tabs on the upper tensioner pedestal securing bolts (3 Fig 1), and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Push back the lock tabs on the upper static damper securing bolts (5 Fig 1), and remove the bolts, tab washer and damper (4 Fig 1).
Remove the damper pedestal and the upper timing chain (6 Fig 1).
Remove the lower timing chain tensioner securing bolts (11 Fig 1), and remove the tensioner assembly (10, 12, Fig 1).
Remove the lower timing chain (8 Fig 1) from the intermediate sprocket (9 Fig 1).

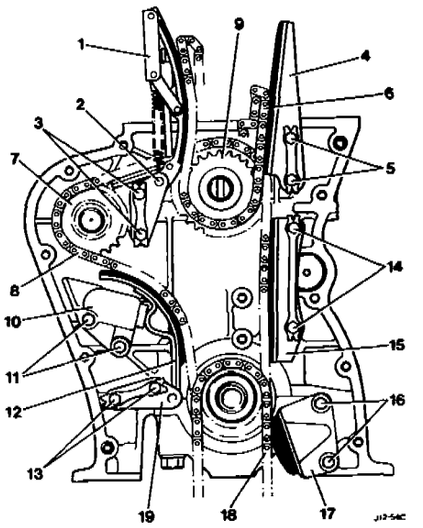


Fig 1

Remove the intermediate sprocket and bearing.
Remove the oil pump drive chain damper securing bolts, and remove the damper (16,17,18 Fig 1).
Push back the lock tabs on the lower static damper securing bolts (14 Fig 1), remove the bolts, and remove the damper (15 Fig 1).
Fit and tighten the crankshaft pulley securing bolt.
Fit Service Tool JD 130 chain link remover/replacer (1 Fig 2) to the master link (rotate the engine as necessary to align the link).
Ensure the tool aligns to the master link, position the 'E' gate (2 Fig 2) to the tool and seat behind the chain (3 Fig 2).
Fit and tighten the tool handle ensuring that the extractor cones (4 Fig 2) line up with the link pins and extract the link.
Slacken the tool carefully ensuring that no components fall into the sump and remove the oil pump chain.

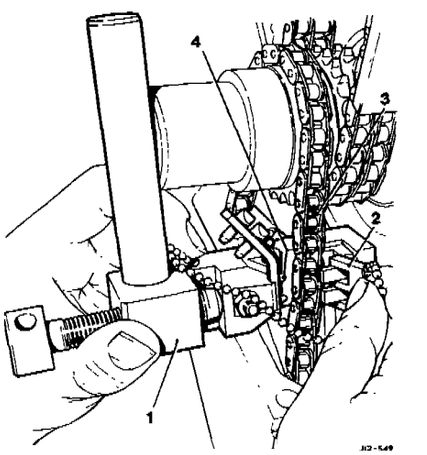


Fig 2

Remove the lower timing chain from the sprockets.
Using a suitable drift, remove the crankshaft sprocket.
Remove the P.A.S. pump to timing cover securing bolts (1 Fig 3).
Remove the P.A.S. pump assembly.
Remove the pump drive coupling (2 Fig 3).
Remove the drive coupling plate securing bolts.
Remove the drive coupling plate.

Remove the auxilliary shaft oil seal, using Service Tool JD 118 as follows:
Slacken off the tool centre bolt.
Fit the tool to the oil seal.
Tighten the centre bolt to withdraw the oil seal.
Remove the tool/seal assembly.
Remove the seal from the tool.
Using right-angled circlip pliers, displace and remove the drive shaft circlip.
Remove the drive shaft.
Remove the drive shaft rear thrust washer.

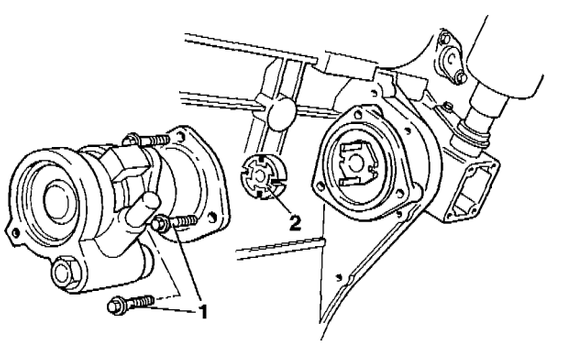


Fig 3

Fit Service Tool 18G 1434 to the bearing situated in the front of the cylinder block (2 Fig 1).
Locate the centre peg.
Tighten the tool nut to withdraw the bearing shell (1 Fig 1).
Remove the tool and shell assembly.
Slacken off the tool nut withdraw the centre peg.
Remove and discard the shell.
Remove the blanking plate from the timing cover.

Repeat the procedure to remove the timing cover and drive shaft housing bearing shells.
Clean all component parts and check for wear or damage, replace worn or damaged components as necessary.
Check for wear and renew the auxilliary shaft bushes (1 Fig 2) using Service Tool 18G 1434 (2 Fig 2).
Lubricate all bearing shells. Refit all shells using 18G 1434.
CAUTION: Ensure that the oil feed holes are lined up with the holes in the bearing shell (1 Fig 3). Service tool 18G 1434 has a line scribed on it to assist the alignment of the oil holes.

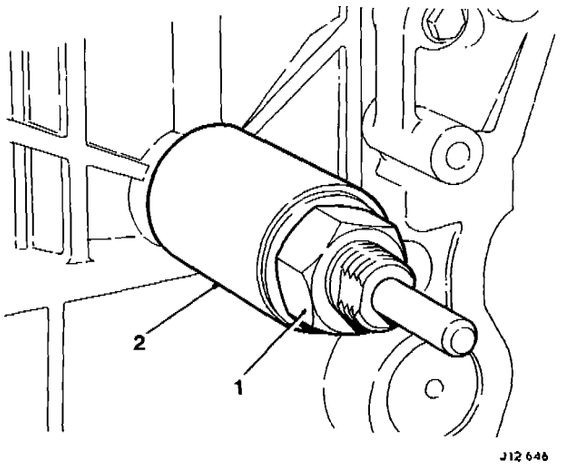


Fig 1

Coat the timing cover blanking plate with 'Hylosil 102, and fit the plate to the timing cover.
Fit and tighten the securing bolts.
Lubricate and fit the drive shaft to the housing.
Lubricate and fit the thrust washer.
Refit the drive shaft circlip.
Fit a new oil seal to the rear of the shaft.
Fit and align the drive coupling plate to the drive shaft.
Apply Loctite to the drive plate securing bolts.
Fit and tighten the drive plate securing bolts.
Fit the coupling to the P.A.S. pump.
Align the pump with the drive shaft.
Connect the P.A.S. pump assembly to the drive shaft.
Fit and tighten the pump securing bolts.
Re-position the hose, harness and hydraulic pump.
Fit the replacement sprocket to the crankshaft.
Using a straight edge (2 Fig 1 page 112), check the alignment of the oil pump drive sprocket (1 Fig 1 page 112), and the crankshaft sprocket (4 Fig 1 page 112).
If the alignment is incorrect, proceed as follows.
Push back the lock tabs from one oil pump drive sprocket securing bolt. Remove the bolt.
Rotate the sprocket. Push back the lock tabs from the second bolt. Remove the bolt.
Rotate the sprocket, push back the lock tabs and remove the remaining bolt.
Remove the tab washer and drive sprocket.
Remove the shims (3 Fig 1 page 112). Calculate the thickness of shim(s) required for correct sprocket alignment.
Fit and tighten a dummy stud to the oil pump drive flange.
Fit and align the shims to the flange.
Fit and align the sprocket.
Fit and align the tab washer.
NOTE: Always fit a new tab washer. Never re-use the old one.

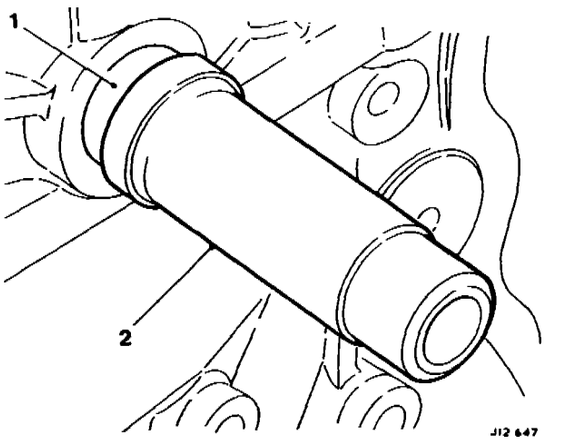


Fig 2

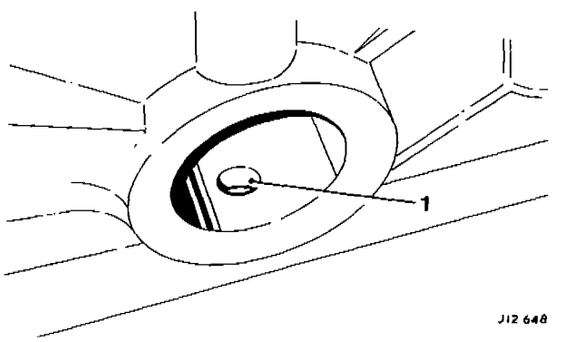


Fig 3

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Fit and tighten the first sprocket securing bolt. Do **not** lock over the tab washer at this stage.
Rotate the sprocket for access.
Fit and tighten the second sprocket securing bolt. Lock over the tab washer.
Rotate the sprocket for access.
Remove the dummy stud. fit and tighten the third sprocket securing bolt. Lock over the tab washer.
Rotate the sprocket for access.
Re-tighten the first securing bolt. Lock over the tab washer.
Re-check the sprocket alignment.
Re-adjust as necessary.
Lubricate the new timing chain and position the chain over the auxilliary drive shaft and crankshaft sprocket.
NOTE: Always fit a new oil pump drive chain. Never re-use the old one.
Lubricate the oil pump drive chain.
Fit the drive chain to the oil **pump sprocket.**
Engage the drive chain to the crank sprocket.
Ensure that the drive chain ends are on the damper side of the sprockets.
Fit a new link to the drive chain (2 Fig 2).
Fit and align a link plate to Service Tool JD 130 (1 Fig 2).
Ensure that the link and tool clamp holes are aligned.
Fit the tool/link plate assembly to the drive chain.
Fit the 'E gate (3 Fig 2) to the tool and chain link. Ensure that the chain is central to the tool.
Tighten the tool centre bolt, fully seating the plate on to the link.
Slacken off the tool centre bolt.
Re-position the tool clamp (4 Fig 2) away **from** the chain.
Locate the link riveting head on to the clamp.
Tighten the tool centre bolt (finger tight, then further 1/2-3/4 turn).
Slacken off the tool centre bolt.
Remove the tightening bar.
Re-position the clamp away from the chain.
Re-position the 'E gate away from the tool/chain.
Remove the tool retaining handle, and remove the tool.
Fit a magnetic dial gauge to the top of the engine with the stylus resting on a piston, rotate the engine and set at TDC No 1 cylinder (Fig 3).
Refit the lower static damper. Fit and tighten the securing bolts and lock over the tab washer.

Fit the oil pump chain damper in position, do not tighten the securing bolts at this stage.
Take any slack out of the chain using hand pressure to push the damper towards the centre of the engine.
Tighten the damper securing bolts.
Lubricate the intermediate sprocket bearing.
Lift up the chain, engage the sprocket in the chain, and locate the sprocket into the bearing.
Refit the lower tensioner assembly.
Lubricate the upper timing chain.

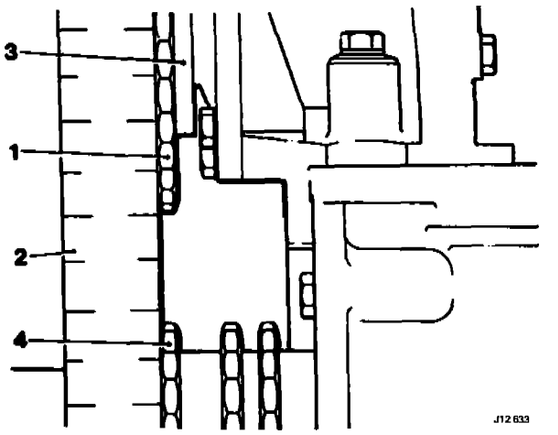


Fig 1

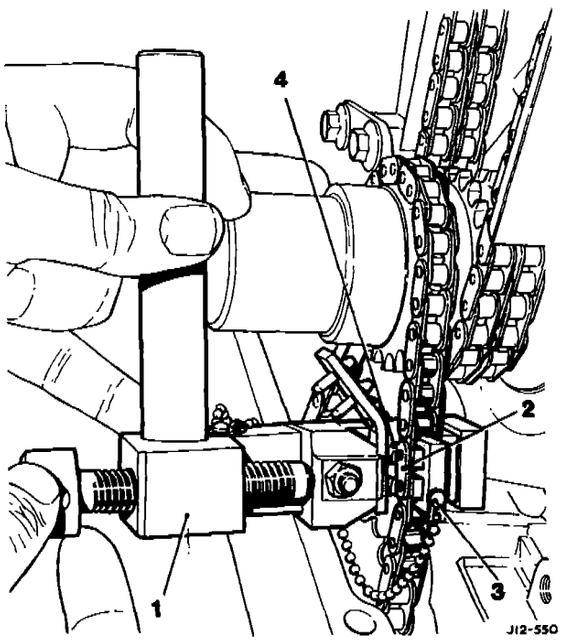


Fig 2

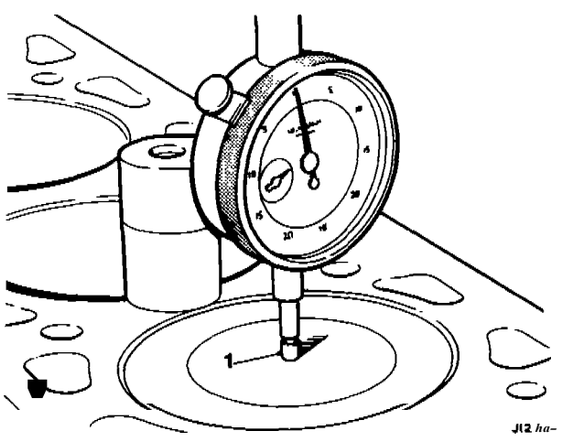


Fig 3

Refit the upper chain to the intermediate sprocket.
Refit the upper static damper.
Fit and tighten the securing bolts.
Refit the upper tensioner.
Remove the oil seal (1 Fig 1) from the timing cover.
Clean all gasket surfaces, oil seal spacer (2 Fig 1), timing pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 2).
Refit the timing cover 12.65.04 page 104.

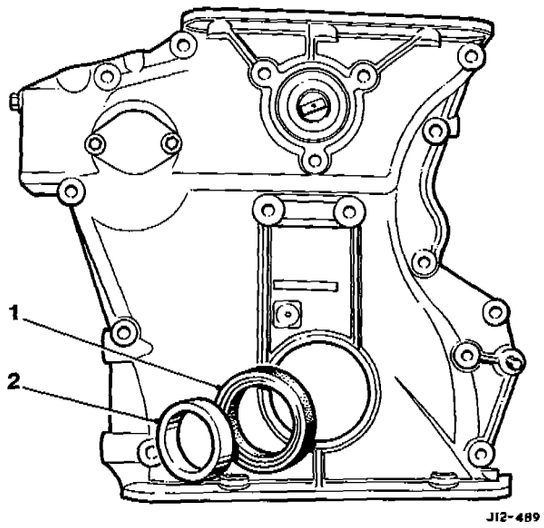


Fig 1

DATA

Oil pump sprocket shims available sizes:
0.005in
0.010in
0.020in

SERVICE TOOLS

JD 718 Auxilliary shaft oil seal remover
JD 129 Crankshaft oil seal replacer
JD 730 Chain link tool
18G 1469 Auxilliary shaft oil seal replacer
18G 1434 Timing cover bush remover replacer

TORQUE FIGURES

Lower chain tensioner to cylinder block 23-27Nm
Lower static damper to cylinder block 23-37Nm
Oil pump drive chain damper to block 23-27Nm
Upper static damper to cylinder block 23-27Nm
Upper timing chain tensioner to block 23-27Nm

SPANNER SIZES

6mm
8mm
10mm
13mm
16mm
19mm
30mm

1/2in AF
9/16in AF
5/8in AF
13/16in AF
10mm

0448G

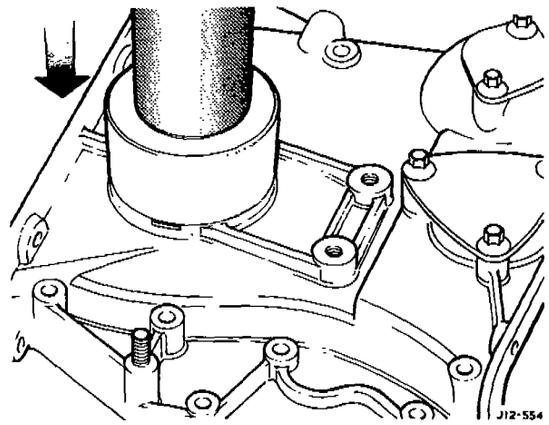


Fig 2

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TIMING CHAIN DAMPERS – VEHICLE SET

RENEW 12.65.48

Remove the timing cover 12.65.04 page 104.
Remove the elastic band from the upper dampers, push back the lock tabs on the upper tensioner pedestal securing bolts (3 Fig 1), and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Push back the lock tabs on the upper static damper securing bolts (5 Fig 1), and remove the bolts, tab washer and damper (4 Fig 1).
Remove the damper pedestal.
Remove the lower timing chain tensioner securing bolts (11 Fig 1), and remove the tensioner assembly (10, 12, Fig 1).
Remove the oil pump drive chain damper securing bolts, and remove the damper (16,17,18 Fig 1).
Push back the lock tabs on the lower static damper securing bolts (14 Fig 1), remove the bolts, and remove the damper (15 Fig 1).
Clean all component parts and check for wear or damage, replace worn or damaged components as necessary.
Fit the oil pump chain damper in position, do not tighten the securing bolts at this stage.
Take any slack out of the chain using hand pressure to push the damper towards the centre of the engine.
Tighten the damper securing bolts.
Refit the lower tensioner assembly.
Refit the upper static damper.
Fit and tighten the securing bolts.
Refit the upper tensioner.
Remove the oil seal (1 Fig 2) from the timing cover.
Clean all gasket surfaces, oil seal spacer (2 Fig 2), timing pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 3).
Refit the timing cover 12.65.04 page 104.

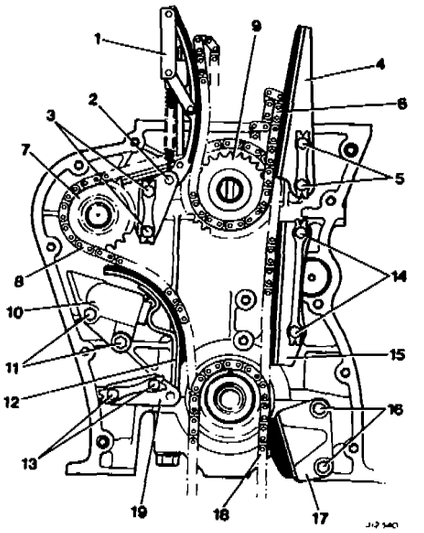


Fig 1

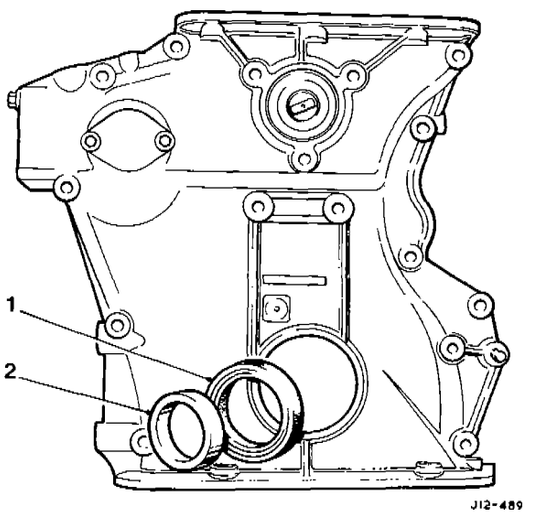


Fig 2

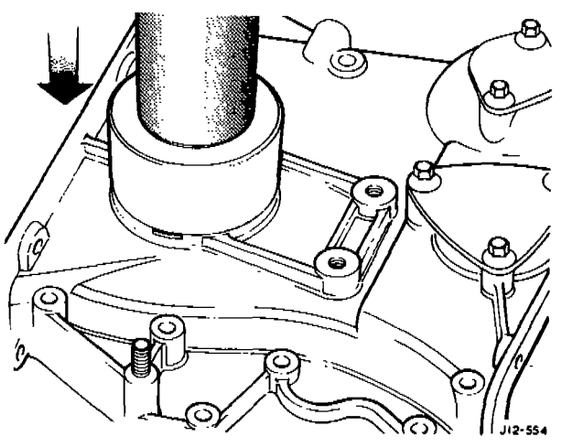


Fig 3

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Lower left hand damper to cylinder block 23-27Nm
Lower right hand damper to cylinder block 23-27Nm
Oil pump drive chain damper to block 3-27Nm
Upper right hand damper to cylinder block 23-27Nm
Upper timing chain tensioner to block 23-27Nm

SPANNER SIZES

13mm
1/2in AF
9/16in AF

0448G

TIMING CHAIN AND TENSIONER – UPPER

RENEW **12.65.29**

Remove the timing cover 12.65.04 page 104.
Remove the elastic band from the upper dampers (1,2 Fig 1), and remove the upper timing chain (3 Fig 1).
Push back the lock tabs on the tensioner pedestal securing bolts (4 Fig 1), and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (5 Fig 1) and remove the tensioner from the pedestal.
Clean the pivot pin.
Fit a new tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing bolts.
Align the damper to the tensioner and fit the damper/tensioner assembly to the engine.
Ensure that the damper does not foul the the distributor drive shaft sprocket.
Finally tighten the securing bolts and lock over the tabs.
Fit the new timing chain.
Re-position the upper tensioner and secure to the upper dampers with an elastic band.

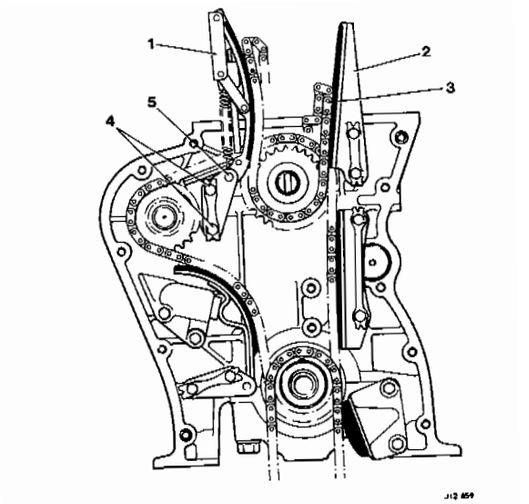


Fig 1

Remove the oil seal (1 Fig 2) and spacer (2 Fig 2) from the timing cover.
Clean all gasket surfaces, oil seal spacer, pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 3).
Refit the timing cover 12.65.04 page 104.

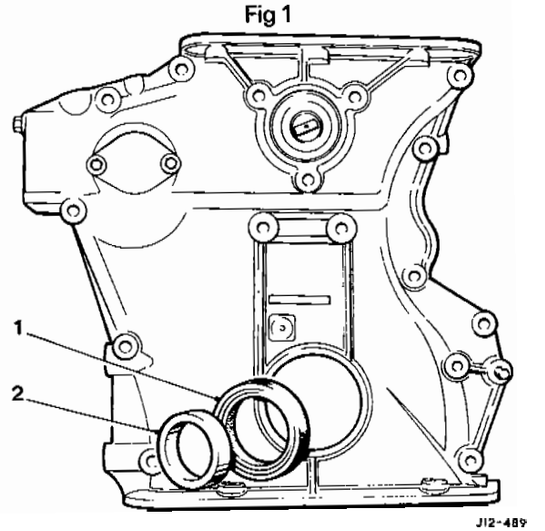


Fig 2

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Upper timing chain tensioner to block 23-27 Nm

SPANNER SIZES

13mm
1/2in AF

0448G

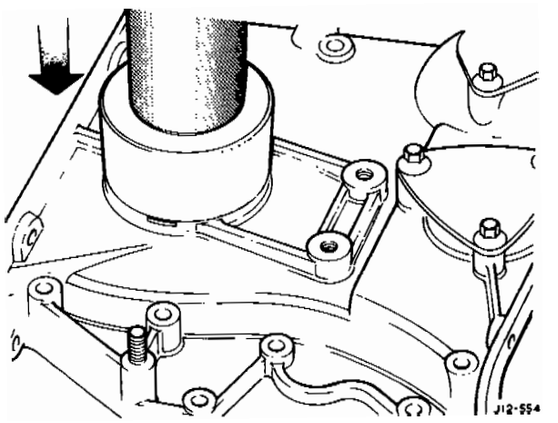


Fig 3

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TIMING CHAIN AND TENSIONER – LOWER

RENEW **12.65.30**

Remove the timing cover **12.65.04** page **104**.
Remove the elastic band from the upper dampers **(1,2** Fig 1), and remove the upper timing chain **(3** Fig **1)**.
Push back the lock tabs on the tensioner pedestal securing bolts **(4** Fig 1), and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig **1).**
Remove the tensioner pivot pin (2 Fig 1) and remove the tensioner from the pedestal.
Remove the lower timing chain tensioner securing bolts (6 Fig **1**), and remove the tensioner assembly (7 Fig **1).**
Remove the lower timing chain (8 Fig **1**).

Clean the tensioner components **(1-6** Fig 2), and examine them for wear, scoring and damage.
Assemble the plunger, spring and base to the guide, lubricate the assembly.
Fit the new lower timing chain.
Fit the guide assembly, valve and 'O' ring to the tensioner housing.
Re-position the chain damper for access.
Fit the tensioner assembly to the cylinder block with the guide facing downwards.
Fit but do not tighten the tensioner upper securing bolt, push the guide into the housing to release the base and align with the damper.
Align the damper with the lower bolt hole, fit and tighten the lower bolt.
Finally tighten the upper bolt, fill the tensioner oil reservoir with oil and work the tensioner to prime with oil.
Fit the upper tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing bolts.
Align the damper to the tensioner and fit the damper/ tensioner assembly to the engine.
Finally tighten the securing bolts and lock over the tabs.
Refit the upper timing chain.
Re-position the upper tensioner and secure to the upper dampers with an elastic band.
Remove the oil seal from the timing cover.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig **3).**
Refit the timing cover **12.65.04** page **104**.

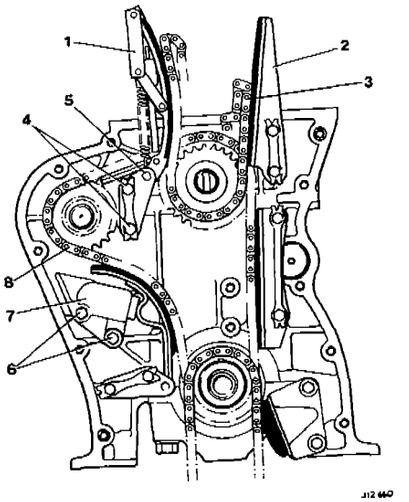


Fig **1**

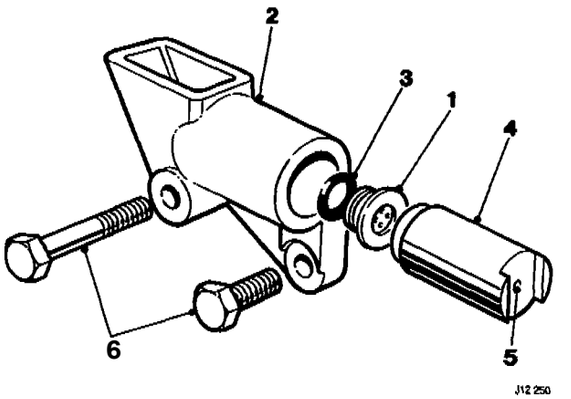


Fig 2

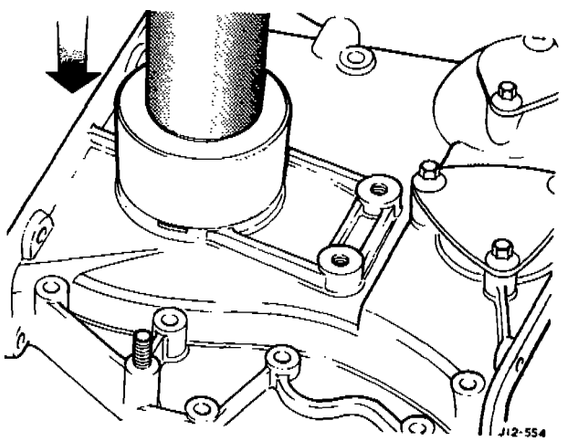


Fig 3

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Lower chain tensioner to block 23-27Nm
Upper timing chain tensioner to block 23-27Nm

SPANNER SIZES

13mm
1/2in A F

TIMING SPROCKET – INTERMEDIATE

RENEW **12.65.26**

Remove the timing cover 12.65.04 page 104.
Remove the elastic band from the upper dampers (1,2 Fig 1), and remove the upper timing chain (3 Fig 1).
Push back the lock tabs on the tensioner pedestal securing bolts (4 Fig 1). and remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (5 Fig 1) and remove the tensioner from the pedestal.
Remove the lower timing chain tensioner securing bolts (6 Fig 1), and remove the tensioner assembly (7 Fig 1).
Remove the lower timing chain (8 Fig 1).
Remove the intermediate sprocket (9 Fig 1).

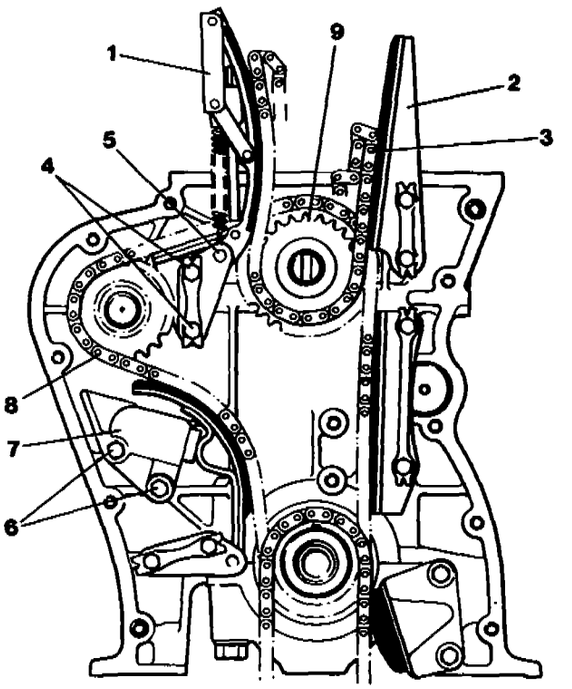


Fig 1

Examine all components for wear or damage. Replace worn or damaged parts as necessary.
Fit the new intermediate sprocket.
Fit the lower timing chain.
Fit the guide assembly, valve and 'O' ring to the tensioner housing.
Re-position the chain damper for access.
Fit the tensioner assembly to the cylinder block with the guide facing downwards.
Fit but do not tighten the tensioner upper securing bolt, push the guide into the housing to release the base and align with the damper.
Align the damper with the lower bolt hole, fit and tighten the lower bolt.
Finally tighten the upper bolt, fill the tensioner oil reservoir with oil and work the tensioner to prime with oil.
Fit the upper tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing bolts.
Align the damper to the tensioner and fit the damper/ tensioner assembly to the engine.
Finally tighten the securing bolts and lock over the tabs.
Refit the upper timing chain.
Re-position the upper tensioner and secure to the upper dampers with an elastic band.
Remove the oil seal from the timing cover.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 2).
Refit the timing cover 12.65.04 page 104.

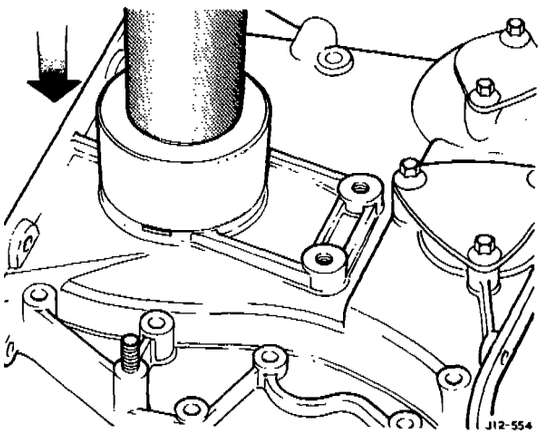


Fig 2

DATA

SERVICE TOOLS

Crankshaft oil seal **replacer JD 129**

TORQUE FIGURES

***Lower** chain tensioner to block* **23-27Nm**
***Upper** timing chain tensioner to* **block 23-27Nm**

SPANNER SIZES

13mm
1/2in AF

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AUXILIARY SHAFT

RENEW 12.10.22

Remove the timing cover 12.65.04 page 104.
Remove the pulley woodruff key and remove the oil seal spacer from the crankshaft.
Remove the elastic band from the upper dampers (1,2 Fig 1), and push back the lock tabs on the tensioner pedestal securing bolts (3 Fig 1).
Remove the pedestal bolts and tab washer.
Remove the pedestal/tensioner assembly and chain damper (1 Fig 1).
Remove the tensioner pivot pin (4 Fig 1) and remove the tensioner from the pedestal. Clean the pivot pin.
Push back the lock tabs on the upper static damper securing bolts (5 Fig 1).
Remove the bolts, tab washer, upper damper, damper pedestal (2 Fig 1) and upper timing chain (6 Fig 1).
Remove the bolts (7 Fig 1) securing the chain tensioner and remove the assembly.
Remove the P.A.S. pump securing bolts (1 Fig 2).
Remove the pump.
Remove the pump drive coupling (2 Fig 2).
Remove the auxilliary shaft rear oil seal (2 Fig 3) from the pump adaptor (4 Fig 3).
Using right-angled circlip pliers remove the drive shaft securing circlip (1 Fig 3).
Lift the timing chain (9 Fig 1) from the sprocket (8 Fig 1), remove the shaft/sprocket assembly, and retrieve the thrust washer.

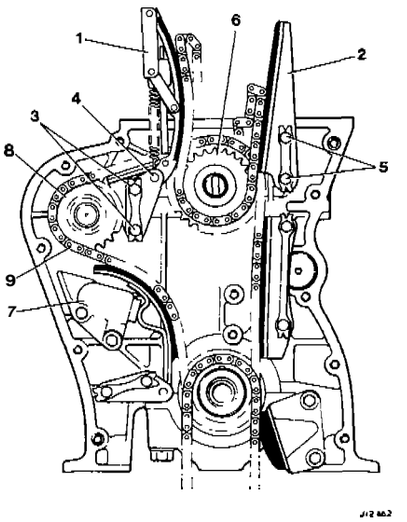
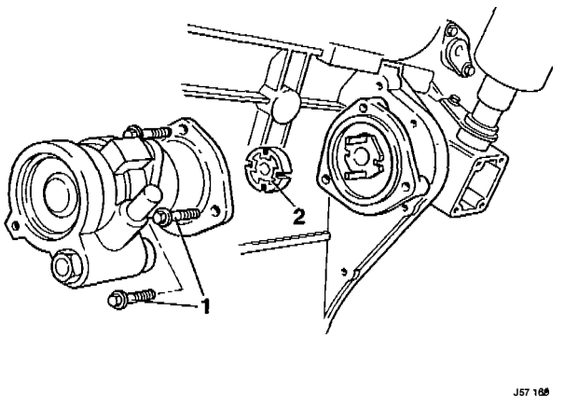


Fig 1

Clean all component parts and check for wear or damage.
Replace worn or damaged parts as necessary.
Clean the auxilliary bearing housing.
Check for wear and if necessary change the auxilliary shaft bushes.
Refit the housing with new gasket.
Fit and tighten the securing bolts.
Lubricate the shaft and refit the shaft into the housing, engaging the chain with the gear as it is fitted.
Lubricate and fit the thrust washer and secure with the circlip.
Lubricate new oil seal, fit and seat the shaft rear oil seal.
NOTE: Under no circumstances must the plastic seal insert be removed prior to fitting the seal.

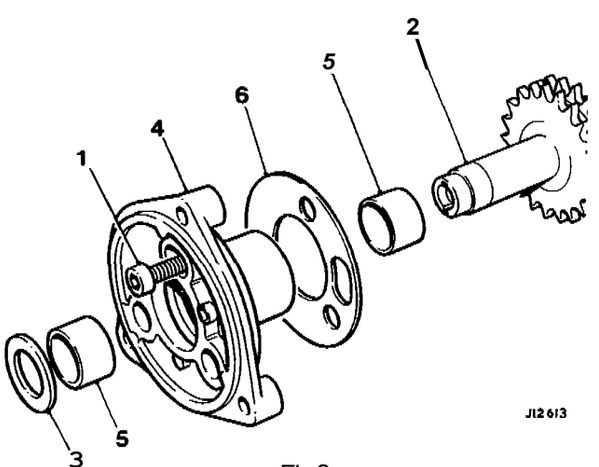


J57 168

Fig 2

Fit the drive coupling to the P.A.S. pump.
Align the pump shaft with the auxilliary shaft, connect the pump shaft to the drive coupling.
Fit and tighten the pump housing securing bolts.
Lubricate the intermediate sprocket bearing, attach the chain to the sprocket, and fit the assembly into the bearing.

Assemble the plunger, spring and base to the guide, lubricate the assembly.
Fit the guide assembly to the tensioner housing.
Re-position the chain damper for access ensuring that no loose links are left below the crankshaft and fit the tensioner assembly to the cylinder block with the guide facing downwards.



J12 613

Fig 3

Fit but do not tighten the upper tensioner securing bolt, push the guide into the housing to release the base and align with the damper.
Align the damper with the lower bolt hole, fit and tighten the lower bolt.
Finally tighten the upper bolt, fill the tensioner oil reservoir with oil and work the tensioner to prime with oil.
Refill the reservoir with oil and ensure that the tensioner is fully primed.
Lubricate the upper timing chain and fit to the intermediate sprocket.
Fit the upper static damper, fit the tab washer, secure with the bolts and lock over the tab washer.
Fit a new tensioner to the pedestal and fit the tensioner pivot pin.
Align a new tab washer to the tensioner and fit the securing botts.
Align the damper to the tensioner and fit the damper/ tensioner assembly to the engine.
Ensure that the damper does not foul the the distributor drive shaft sprocket.
Finally tighten the securing bolts and lock over the tab washer.
Re-position the upper tensioner and secure to the upper dampers with an elastic band.
Remove the oil seal (1 Fig 1) and spacer (2 Fig 1) from the timing cover.
Clean all gasket surfaces, oil seal spacer, pointer and crankshaft damper.
Using Service Tool JD 129 fit a new oil seal to the timing cover (Fig 2).
Refit the timing cover 12.65.04 page 104.

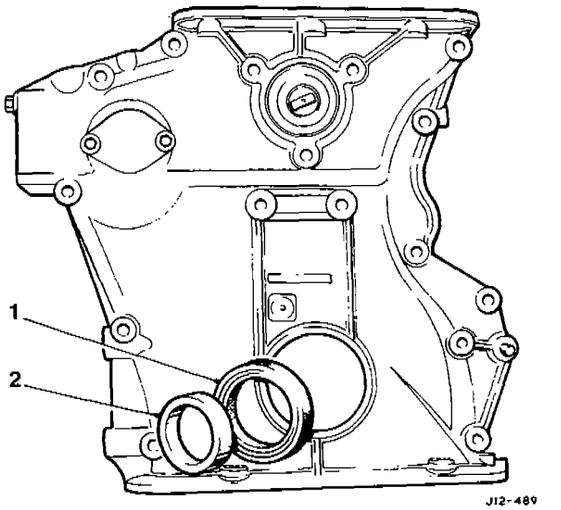


Fig 1

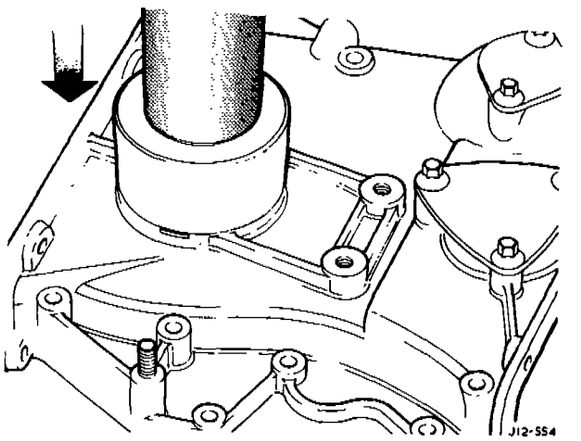


Fig 2

DATA

SERVICE TOOLS

Crankshaft oil seal replacer JD 129

TORQUE FIGURES

Hydraulic pump to timing cover 23-27Nm
Upper timing chain tensioner to block 23-27Nm

SPANNER SIZES

13mm
19mm
1/2in AF

0448G

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AUXILIARY SHAFT REAR SEAL

RENEW **12.10.32**

Place a suitable drain tray in position and slacken the clip securing the reservoir hose to the pump.
Disconnect the hose from the pump.
Fit a plug to the hose.
Slacken the union (1 Fig 1) securing the rack feed hose (2 Fig 1) to the pump and disconnect the hose.
Allow the pump and hose to drain.
Discard the 'O' ring and fit a suitable plug to the hose.
Remove the bolts (1 Fig 2) securing the pump assembly to the engine and remove the pump assembly.
Remove the drive coupling (2 Fig 2) from the pump.

Remove the auxilliary shaft oil seal.
Lubricate the new seal and mating faces.
NOTE: Under no circumstances must the plastic insert be removed prior to fitting of the seal.
Using Service Tool 18G 1469 fit and fully seat the auxilliary shaft seal.
Refit the power steering pump drive coupling.
Refit the power steering pump. Fit and tighten the securing bolts.
Fit a new 'O' ring to the rack feed hose. Fit the hose to the pump. Tighten the union.
Reconnect the reservoir hose. Tighten the clip.
Replenish the reservoir. Start the engine. Rotate the steering wheel left and right to bleed the system.
Stop the engine. Re-check the reservoir fluid level.

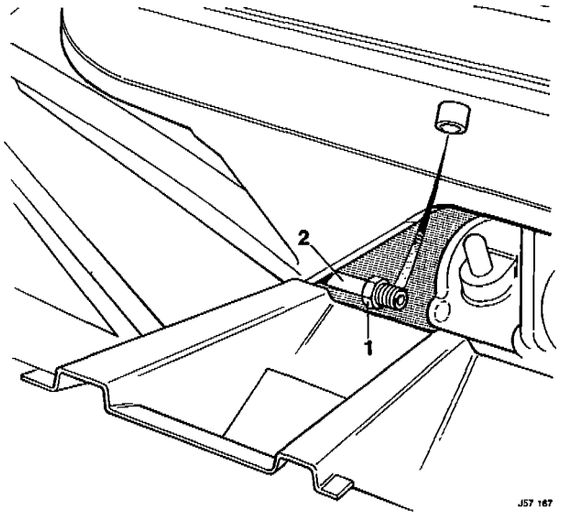


Fig 1

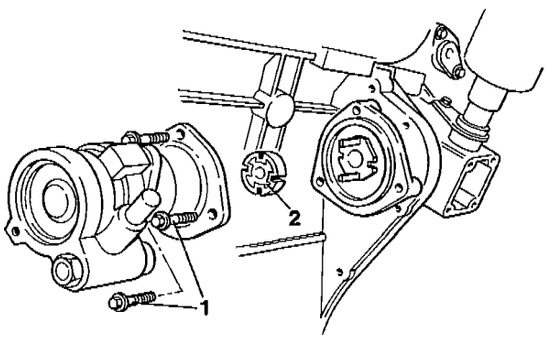


Fig 2

DATA

TORQUE FIGURES

Rack feed hose union 19-23Nm
Reservoir hose clip 2.5-3.5Nm
Steering pump to adaptor 49-54Nm

SERVICE TOOLS

Auxilliary shaft oil seal replacer 18G 1469

SPANNER SIZES

13mm
19mm

0448G

OIL COOLER

RENEW 12.60.68

Remove the screws securing the LH radiator grille to the surround, and remove the grille.
Place a drain tray below the oil cooler.
Remove the feed and return hoses from the cooler (Fig 1). Discard the 'O' rings.
Fit plugs to the hoses and cooler, and remove the drain tray.
Remove the cooler mounting securing nuts (1 Fig 2), and remove the cooler assembly (2 Fig 2) from the vehicle.

Transfer the mountings to the new cooler.
Fit the assembly to the vehicle.
Fit and tighten the securing nuts and remove the blanking plugs from the cooler and hoses.
Fit new 'O' rings to the hoses and refit the hoses to the cooler.
Tighten the unions, fit the inner grille to the surround and secure with the screws.
Check and top up the engine oil.
Start the engine and check for oil leaks.
Re-check the oil to the correct level.

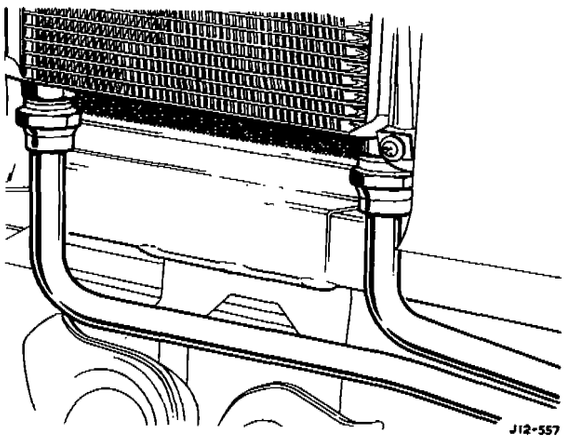


Fig 1

DATA

TORQUE FIGURES

Oil cooler mounting bracket to body	*6-8Nm*
Oil pipe feed hose to oil cooler	*41-48Nm*
Oil pipe return hose to oil cooler	*41-48Nm*

SPANNER SIZES

10mm
32mm

04486

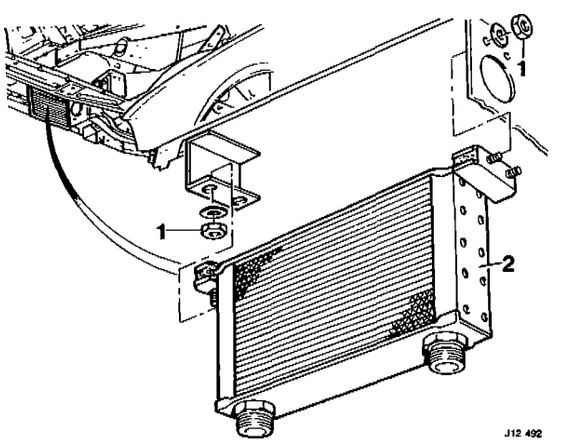


Fig 2

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OILCOOLER RETURN HOSE

RENEW **12.60.76**

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 1).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig 1) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

Place a drain tray under the oil filter area.
Remove the oil cooler hose to filter head clamp nut (1 Fig 2).
Remove the cooler hoses (2 Fig 2) from the filter head.
Remove and discard the 'O' rings (3 Fig 2).
Fit blanking plugs to the hoses and filter head.
Remove the screw securing the hoses to the body side crossmember.
Remove the mounting bracket and hoses.
Remove the screws securing the left hand radiator grille to the surround, remove the grille.
Place a drain tray below the cooler.
Remove the return hose from the cooler (Fig 3).
Discard the 'O' ring.
Fit plugs to the hose and cooler, and remove the drain tray.
Re-position the hose from behind the engine mounting and remove via the front grille.
Fit a new 'O' ring to the new hose. Fit the new hose into position. Tighten the oil cooler union.
Refit the radiator grille.
Fit new 'O' rings to the hoses.
Fit the hose assembly to the filter head.
Fit and tighten the securing nut.

Secure the hoses to the crossmember.
Refit the air cleaner assembly.
Check and top up the engine oil.
Start the engine and check for oil leaks.
Re-check and top up the engine oil to the correct level.

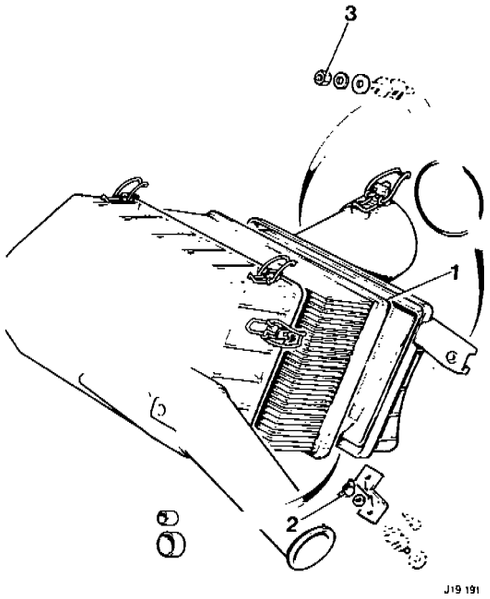


Fig 1

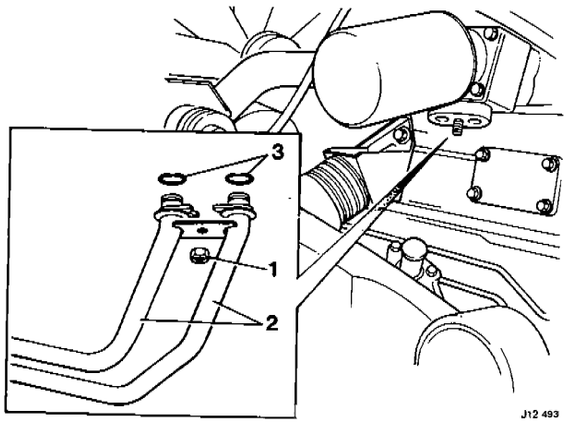


Fig 2

DATA

TORQUE FIGURES

Oil filter head to cylinder block 23-27Nm
Oil pipe return hose to oil cooler 41-48Nm

SPANNER SIZES

10mm
13mm
32mm

0448G

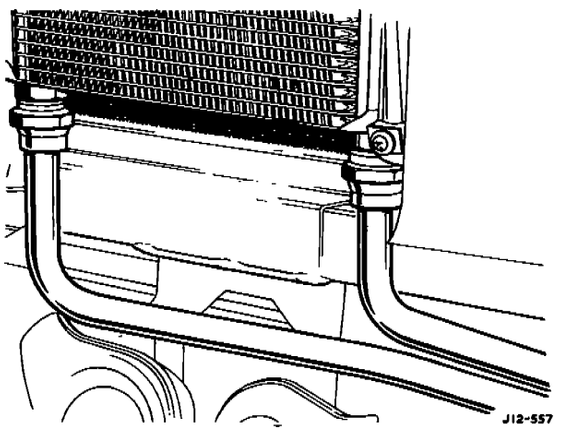


Fig 3

OIL COOLER SUPPLY HOSE

RENEW **12.60.74**

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 1).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig 1) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

Place a drain tray under the oil filter area.
Remove the oil cooler hose to filter head clamp nut (1 Fig 2).
Remove the cooler hoses (2 Fig 2) from the filter head.
Remove and discard the 'O' rings (3 Fig 2).
Fit blanking plugs to the hoses and filter head.
Remove the screw securing the hoses to the body side crossmember.
Remove the mounting bracket and hoses.
Remove the screws securing the left hand radiator grille to the surround, remove the grille.
Place a drain tray below the cooler.
Remove the supply hose from the cooler (Fig 3).
Discard the 'O' ring.
Fit plugs to the hose and cooler, and remove the drain tray.
Re-position the hose from behind the engine mounting and remove via the front grille.
Fit a new 'O' ring to the new hose, Fit the new hose into position. Tighten the oil cooler union.
Refit the radiator grille.
Fit new 'O' rings to the hoses.
Fit the hose assembly to the filter head.
Fit and tighten the securing nut.

Refit the air cleaner assembly.
Check and top up the engine oil.
Start the engine and check for oil leaks.
Re-check and top up the engine oil to the correct level.

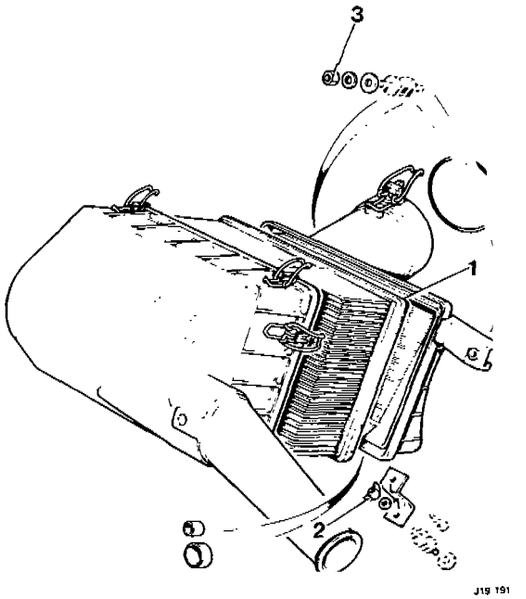


Fig 1

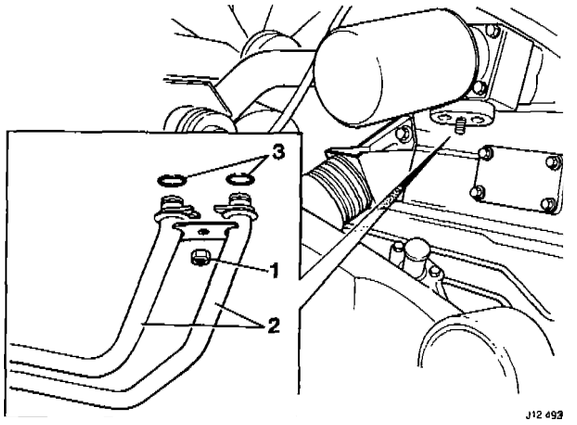


Fig 2

DATA

TORQUE FIGURES

Oil filter head to cylinder block 23-27Nm
Oil pipe supply hose to oil cooler 41-48Nm

SPANNER SIZES

10mm
13mm
32mm

04486

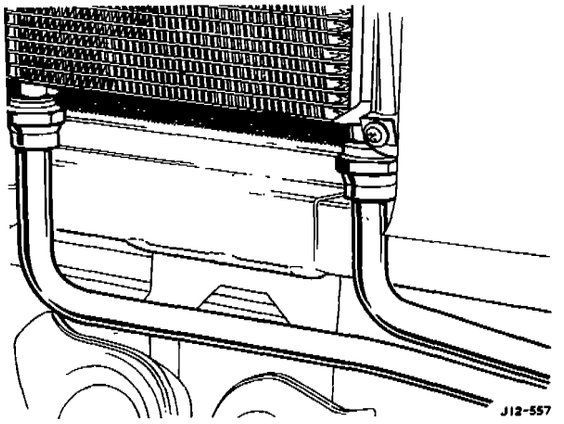


Fig 3

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ENGINE OIL

DRAIN AND REFILL 12.60.00

Place a suitable container under the sump rear drain plug, remove the plug and drain the oil.
Clean and refit the sump plug.
Remove the container and torque tighten the sump plug.
Remove the engine filler cap and refill the engine with oil to the correct level (Fig 1).
Engine oil capacity excluding filter is 7.45 litres (13.1 Imp pints).
Refit the oil filler cap.
Remove the dipstick, wipe clean, check the oil level and adjust accordingly.

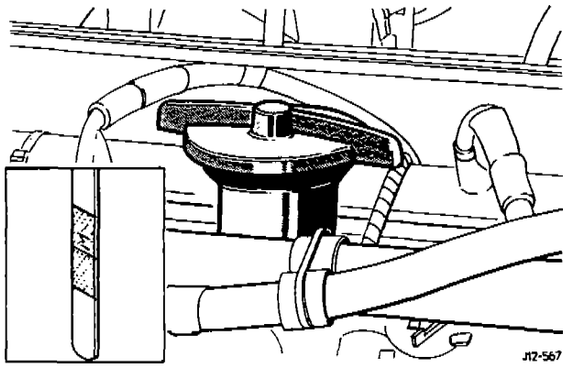


Fig 1

DATA

TORQUE FIGURES

Oil sump plug 41-47Nm

SPANNER SIZES

30mm

OIL FILTER CANISTER

RENEW 12.60.04

Place a drain tray under the filter and remove the filter canister (Fig2).
Clean the oil filter mounting face, lubricate the rubber seal on the new filter with clean engine oil.
Fit and tighten the filter canister using only hand pressure, and ON NO ACCOUNT use an oil filter strap designed for removal of canisters.
NOTE: Normal tightening torque of oil filter is 3/8 to 1/2 turn after initial contact.
Start the engine, wait for the oil light to extinguish, switch off the engine and wait for 30 seconds.
Check the oil level and top-up as necesssary.

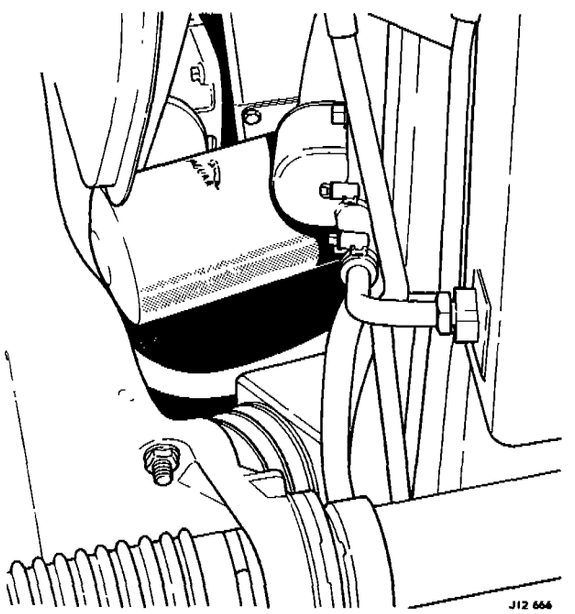


Fig 2

DATA

TORQUE FIGURES

Oil filter canister – 8.1Nm or 3/8 to 1/2 turn after initial contact.

CANISTER SPECIFICATION

Maximum working pressure	***100 lb/in²***
Relief valve setting	***0,9 – 1,1 kgf/cm²***
Canister to withstand	***17.60kgf/cm²***
Element filtration area	***3555cm²***
Canister metal thickness	***24 SWG***
Adaptor thread	***1 in 12 UNF – 2B***

OILS/GREASES/SEALANTS

Mounting face rubber seal – Clean engine oil

04480

OIL FILTER HEAD GASKET

RENEW **12.60.03**

Place a drain tray under the oil filter.
Remove the oil filter cartridge (1 Fig 1).
Remove the oil cooler pipe clamp nut and clamp, note the position of and disconnect the pipes from the oil supply housing.
Remove and discard the 'O' rings. Remove the filter head securing bolts (2 Fig 1).
Remove the inner (3 Fig 1) and outer (4 Fig 1) housings.
Thoroughly clean the housings, the oil cooler pipes and the cylinder block face.
Apply 'Hylosil 102' to the outer housing, align the inner housing with the outer housing, and fit the securing bolts to the housing assembly.
Apply 'Hylosil 102' to the inner housing, align the assembly to the aperture in the cylinder block, fit and tighten the securing bolts.
Fit new 'O' rings to the oil cooler pipes, lubricate and connect the pipes to the housing, fit the clamp plate and fit a new oil filter.
Start the engine, wait for the oil pressure light to extinguish, switch off the engine and let stand for 30 seconds.
Check the engine oil level and top-up as necessary (Fig 2).

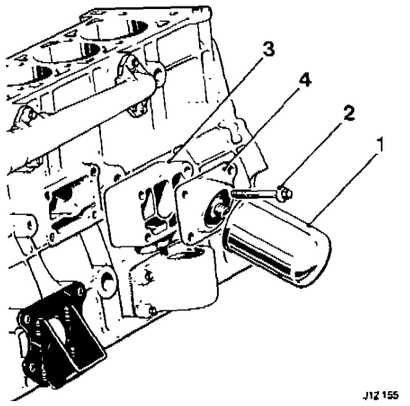


fig 1

DATA

TORQUE FIGURES

Housing to cylinder block 23-27Nm
Oil filter canister – 8.1Nm or 3/8 to 1/2 turn after initial contact
Clampplate and hose assembly to engine ***22-28Nm***

OILS/GREASES/SEALANTS

Filter rubber seal – Clean engine ***oil***
Outer housing ***'HYLOSIL*** *102'*
Inner housing ***'HYLOSIL102'***

SPANNER SIZES

10mm
17mm

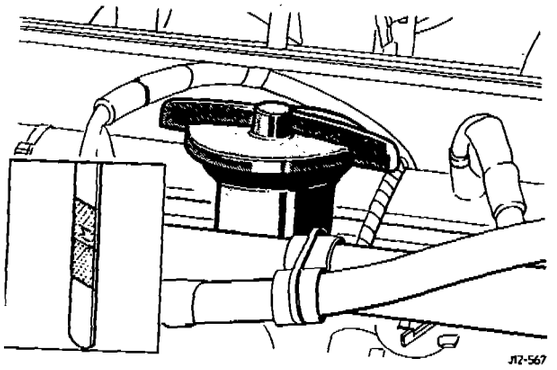


Fig 2

0448G

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OIL SUMP GASKET

RENEW **12.60.38**

Jack up the front of the vehicle.
Fit camber tie-down bars Service Tool JD 133 to the road spring pans (Fig 1).
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers.
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 3) to steering rack securing bolt/nut (1,2, Fig 3).

Disengage the splines from the rack pinion (4 Fig 3).
NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Disconnect Nos. 1 and 2 plug leads.
Attach 18G 1465 rear engine lifting eye, fit and align Service Tool MS 53B engine support bracket (Fig 4).
Engage the hook to the lifting eye.
Tighten the hook nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.

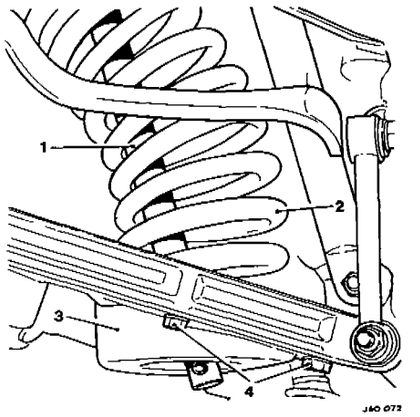


Fig 1

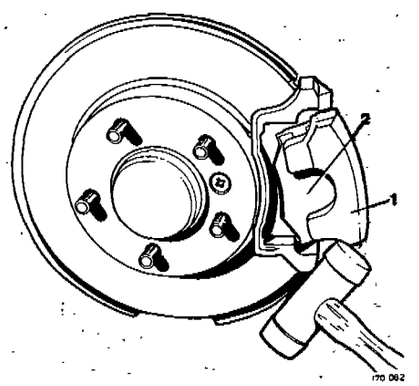


Fig 2

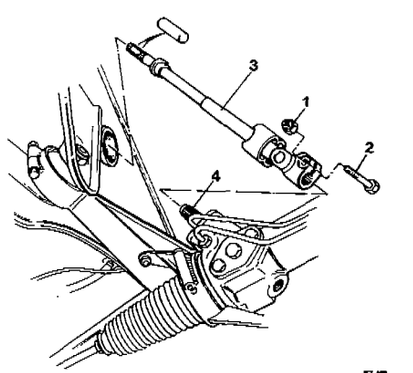
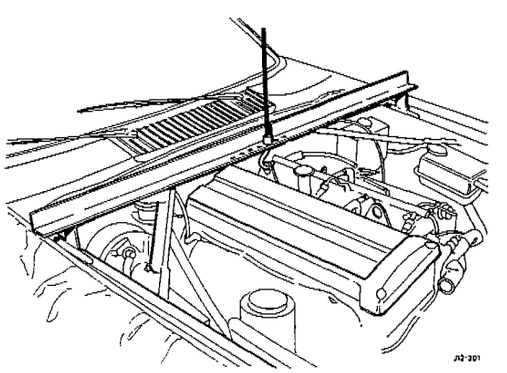


Fig 3


Fig 4

Remove the nuts. Do not remove the bolts at this stage (Fig 1).
Slacken off the mounting clamp plate securing bolts.
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 2).
NOTE: The bolts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.

Drain the engine oil.
Remove the bolt securing the dipstick tube to the inlet manifold and remove the dipstick tube/assembly.

Unclip the air cleaner cover and remove the cover/element assembly.
Remove the air cleaner element (1 Fig 3).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 3) from the lower mounting and the nuts (3 Fig 3) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

Slacken off the alternator link arm lock nut (4 Fig 1 page 128) and trunnion bolt (3 Fig 1 page 128).
Slacken off the link arm pivot bolt (2 Fig 1 page 128), wind down the adjuster nut (5 Fig 1 page 128) and pivot the alternator towards the engine.
Remove the drive belt. Disconnect the alternator connectors.
Remove the trunnion bolt (3 Fig 1 page 128).
Remove the pivot bolt and nut (1 Fig 1 page 128).
From above lift and remove the alternator, retrieve the spacer/washers.
Remove the rear spacers and move the power assisted steering pipes for access.

Disconnect the exhaust to bell housing mounting bracket.
Slacken off the union securing the oil drain-back tube to the sump, and pull the tube clear of the sump.
Remove the clamp securing the gearbox oil cooler pipes to the sump (AUTO ONLY).
Remove all but two sump bolts (1 Fig 2 page 128).
Remove the bell housing to sump bolts.
Finally remove the two remaining sump bolts and lower the sump (2 Fig 2 page 128).
Clean all components and examine for damage and wear.
NOTE: If renewing the sump, transfer all components to the new sump.
Apply 'Hylosil 102' to the sump mating face.
Clean the gasket face on the cylinder block.
Lift the sump into position.
Fit and torque tighten the securing bolts.

Refit the clamp securing the gearbox oil cooler pipes to the sump (AUTO ONLY).

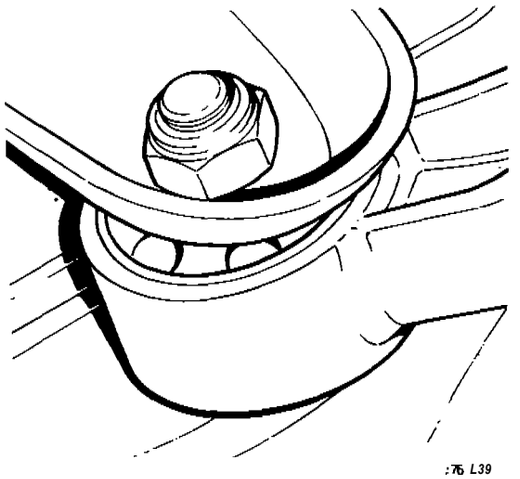


Fig 1

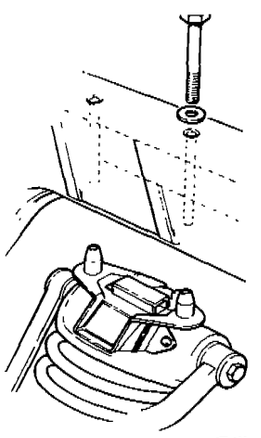


Fig 2

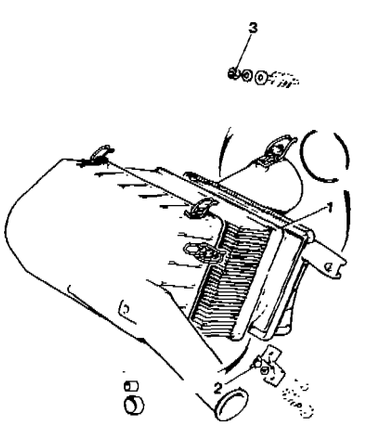


Fig 3

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Refit the oil drain back tube.
Connect the bell housing to exhaust bracket.
Refit the alternator. Tension the drive belt to give a total belt deflection of 4.5mm when a load of 1.5kg is applied at the mid-point of the belt.
Refit the air cleaner assembly.
Fit and tighten the dipstick tube to manifold securing bolt.

Position the crossmember assembly on the jack under the vehicle.
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, P.A.S. pipes, lower column and rear mountings.
Align the front mounting securing bolt holes.
Fit and tighten the front mounting securing nuts (Fig 3).
Using a second jack, align the left hand rear mounting (Fig 1 page 129).

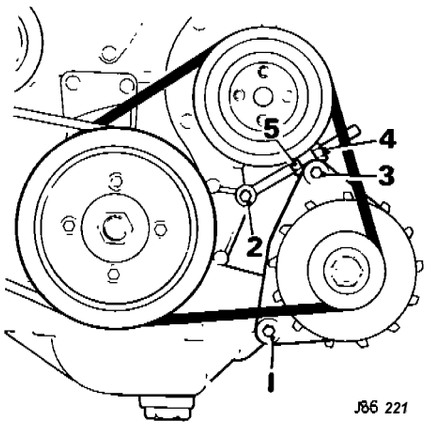


Fig 1

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting. Fit the inner spacer.
Push the bolt fully home, fit **but** do not tighten the nut.
Lower the jack from below the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower the jack from below the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp plate securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the P.A.S. pipes and rack.
Fit new 'O' rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the P.A.S. pipe clamps.

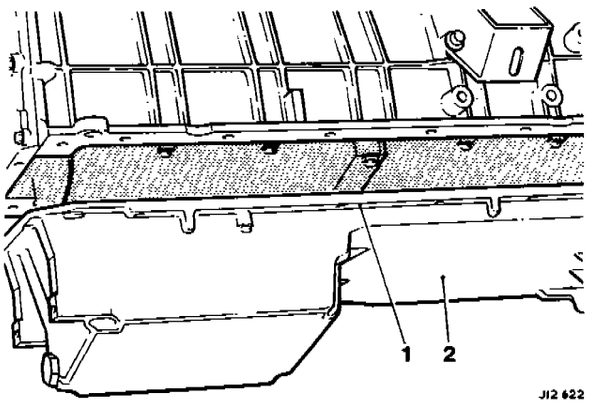


Fig 2

Slacken off the **MS** 53B hook nut. Remove the hook. Remove Service Tool MS 53B.
Remove the lifting eye.
Fit and tighten the engine mounting securing nuts. Refit the calipers. Refit the brake pads.
Refit the road wheels.
Lower the vehicle from the axle stands Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. Lower the vehicle.
Refill the engine with oil to the correct level.
Bleed the P.A.S. system as follows:
Top **up** the P.A.S. reservoir.
Start the engine.
Turn the steering wheel to full left hand lock.
Turn the steering wheel to full right hand lock.
Top up the reservoir. Fit the reservoir cap.
Close the bonnet.

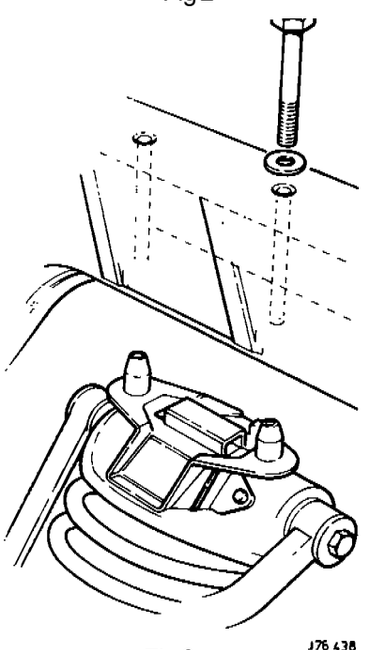


Fig 3

DATA

SERVICE TOOLS

Tie-down bars JD 133
Rear lifting eye 1861465
Engine support bracket MS 53B

TORQUE FIGURES

Adaptor plate to sump 49-54Nm
Adjustment trunnion to alternator bolt 23-27Nm
Alternator bolt to timing cover nut 23-27Nm
Alternator bolt (trunnion lock nuts) 12-14Nm
Alternator pivot bolt/nut 23-27Nm
Caliper to carrier 37-40Nm
Connecting rod nut 52-55Nm
Dipstick to bracket 5-8Nm
Oil drain back tube to sump adaptor 12.5-15Nm
Oil sump plug 41-47Nm
Oil sump to cylinder block 23-27Nm
Oil sump to timing cover 23-27Nm
P.A.S. feed/return pipes to rack 19-23Nm
Shock absorber to upper mounting 35-43Nm
Transfer housing to cylinder block 23-27Nm
Wheel nut to wheel stud (steel wheel) 65-85Nm
Wheel nut to wheel stud (alloy wheel) 88-102Nm
Windage tray to cylinder block 23-27Nm

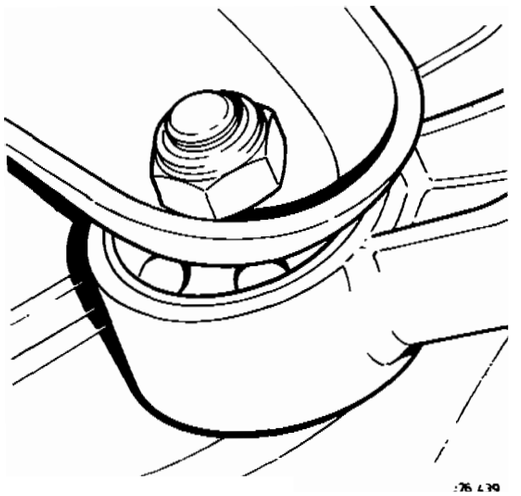


Fig 1

SPANNER SIZES

10mm
13mm
14mm
17mm
19mm
22mm
30mm
3/8 AF
9/16in AF
15/16 AF

OILS/GREASES/SEALANTS

Oil pipe 'O' rings PETROLEUM JELLY
Sump to cylinder block 'HYLOSIL 102'
Transfer housing to cylinder block 'HYLOSIL 102

04480

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OIL PUMP PIPE 'O' RINGS.

RENEW **12.60.27**

Remove the sump 12.60.38 page 126.
Place a suitable drain tray under the oil transfer housing area and remove the transfer housing/pick-up pipe (1.2.4.5 Fig 1).
Remove the oil pump pick-up pipes (3 Fig 1).
Remove and discard the 'O' rings.
Clean the transfer housing and oil pipes.
Carefully fit new 'O' rings to the oil pipes (1 Fig 2).
lubricate the 'O' rings with petroleum jelly.
Refit the pipes to the oil pump.

Apply 'Hylosil 102' to the transfer housing gasket face and refit the housing to the engine.
Fit and tighten the securing bolts.
Refit the sump 12.60.38 page 126.
Replenish the engine oil to the correct level.

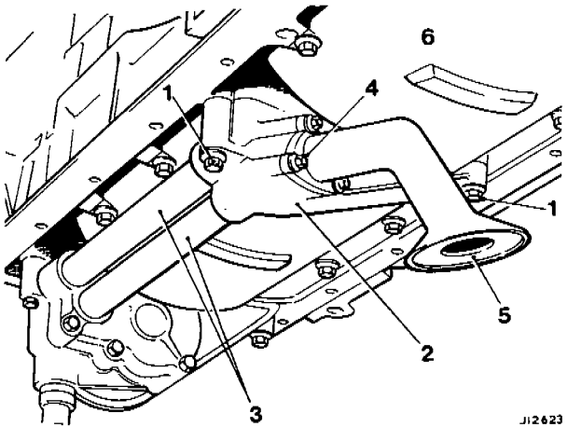


Fig 1

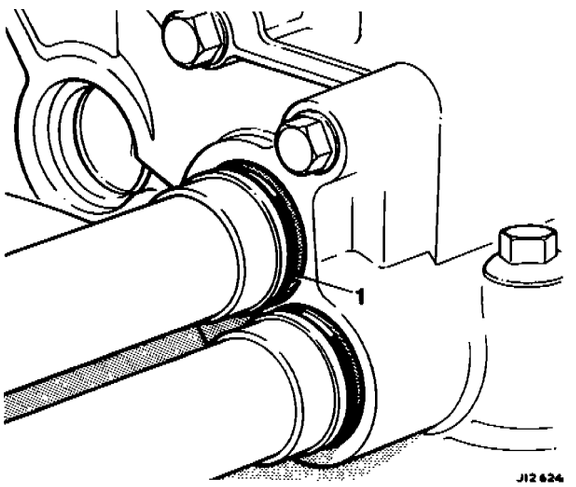


Fig 2

DATA

TORQUE FIGURES

Transfer housing to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Oil pipe 'O' rings Petroleum Jelly

SPANNER SIZES

17mm
9/16in AF

0448G

OIL PICK UP STRAINER

RENEW 12.60.20

Remove the sump 12.60.38 page 126.
Remove the **bolts** securing the rear windage tray (1 Fig 1) to the cylinder block and remove the tray.
Remove the three **bolts** (2 Fig 1) securing the strainer and remove the strainer (3 Fig 1).
Clean all components and examine for damage and wear.
Apply 'Hylosil 102' to the replacement strainer, fit and secure to the housing with the bolts.
Refit the rear windage tray to the cylinder block and secure with the **bolts.**
Refit the sump 12.60.38 page 126.
Fill the engine with oil to the correct level (Fig 2).

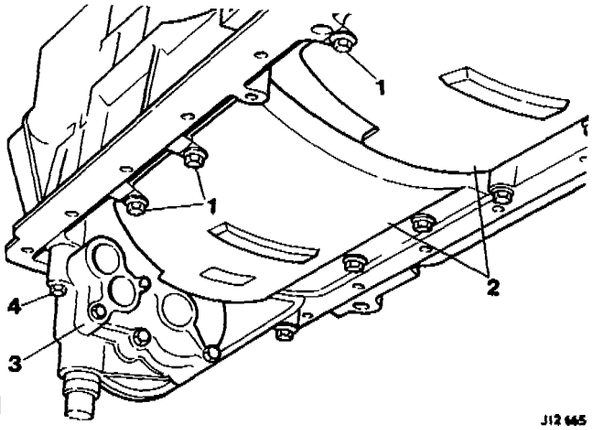


Fig 1

DATA

TORQUE FIGURES

Oil pick up strainer **9.5-72Nm**
Windage tray-rear to cylinder block **23-27Nm**

OILS/GREASES/SEALANTS

Sump to cylinder block **HYLOSIL 102**

SPANNER SIZES

10mm
17mm
3/8in AF

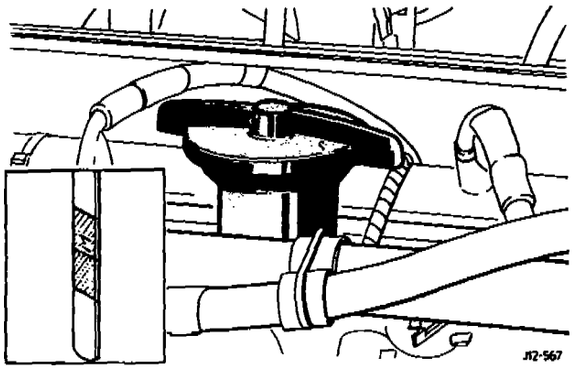


Fig 2

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OIL PRESSURE RELIEFVALVE ASSEMBLY

RENEW 12.60.56

Jack up the front of the vehicle and place on two stands, and partially drain the engine oil.
Remove the oil pressure relief valve plug (1 Fig 1) and collect the spring (2 Fig 1), valve (3 Fig 1), and mandrel (4 Fig 1).
Check the valve spring and mandrel for wear, scoring or pitting.
Measure the components against the specifications below.
Should any of the components be suspect, they must be replaced.
Lubricate and assemble the mandrel, spring and valve.
Fit and tighten the relief valve plug.
Refit and tighten the sump plug.
Lower the vehicle, open the bonnet and top-up the engine with oil to the correct level (Fig 2).

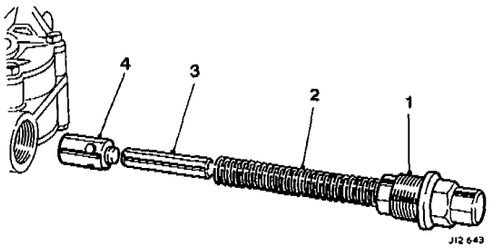


Fig 1

DATA

RELIEFVALVE

O/D	17.98to17.95 mm
I/D	15.00 to 14.50 mm
Overall length	35 mm
Working length	30 mm
Bore depth	27 mm
Material	ENIA

MANDREL

Length	57mm
Diameter	11.11 mm
Material	Steel tube to BS970 (CDS2 or ERW1)

SPRING SPECIFICATION

Wire diameter	2.34 mm
Mean diameter coils	14.0 mm
Total No. of coils	26
Material	BS970/735/A50 (EN 47) Spring steel wire.

TORQUE FIGURES

Drain plug to sump 68-75Nm
Relief valve plug to pump body 37-45Nm

SPANNER SIZES

42mm
24mm

04486

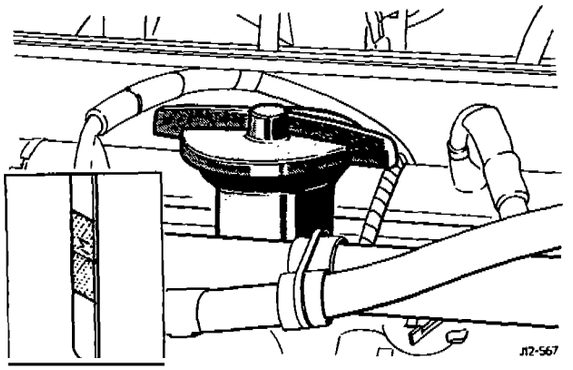


Fig 2

OIL PUMP

RENEW 12.60.22

Remove the sump 12.60.38 page 126.
Place a drain tray under the transfer housing, remove the housing bolts and housing (1.2 Fig 1).
Remove the pick-up pipes (3 Fig 1), push back the lock tabs (1 Fig 2) and remove the pump sprocket bolts (2 Fig 2).
Remove the oil pump drive sprocket (3 Fig 2), tab washers (4 Fig 2) and shims.
Remove the oil pump securing bolts and remove the pump.

Remove the pressure relief valve cap, spring, tube and valve (1-4 Fig 3).
Clean the mating face in the cylinder block, the relief valve assembly, sprocket and shims.
Lubricate the relief valve assembly, assemble into the pump, tighten the cap.

Fit the new oil pump to the engine and tighten the securing bolts.
Move the drive chain as far rearward as possible, fit a shim pack of 0.015 in thickness to the oil pump flange (3 Fig 4), align the bolt holes, fit the drive sprocket and two securing bolts.
Using a straight edge (2 Fig 4), check the alignment of the oil pump drive sprocket (1 Fig 4) and crankshaft sprocket (4 Fig 4).
Remove and refit the pump drive sprocket as required in order to align the sprockets.
When the alignment is satisfactory, remove the pump sprocket. Fit the chain and shims to the sprocket, fit to the oil pump.
Fit the tab washer and securing bolts.
Tighten the bolts and lock over the tabs.
Fit new 'O' rings to the oil pump pick-up pipes.
Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102' to the transfer housing gasket face.
Fit and seat the housing, fit and tighten the securing bolts.
Refit the sump 12.60.38 page 126.

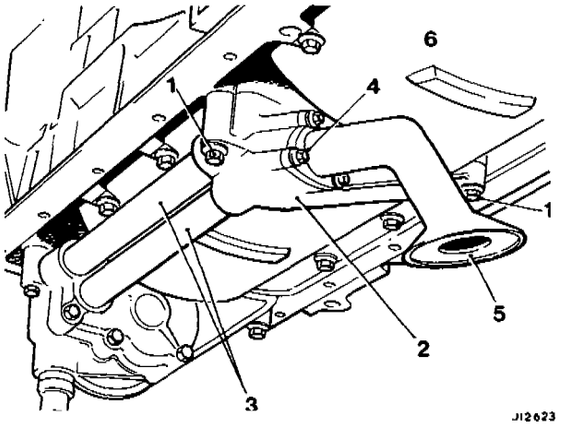


Fig 1

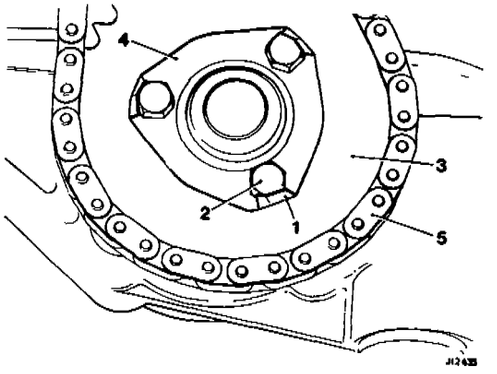


Fig 2

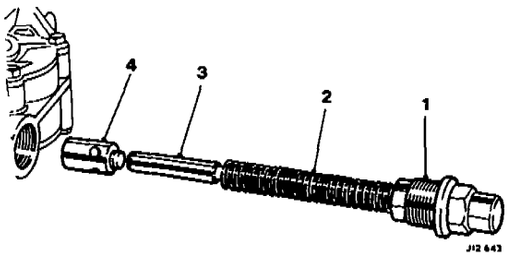


Fig 3

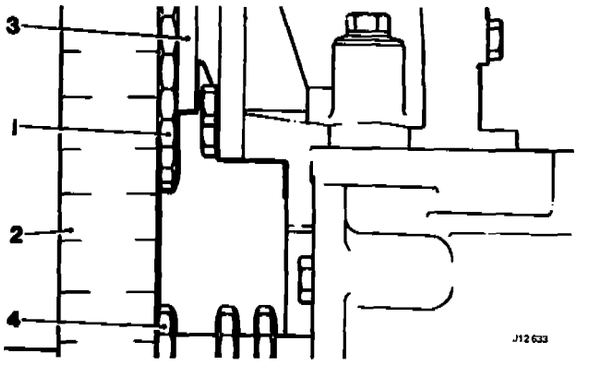


Fig 4

DATA

Oil pump sprocket shims available sizes
0.005in
0.010in
0.020in

TORQUE FIGURES

Oil pump to cylinder block 23-27Nm
Transfer housing to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Transfer housing to block HYLOSIL 102

SPANNER SIZES

10mm
13mm

04486

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OIL PUMP

OVERHAUL 12.60.32

Remove the oil sump 12.60.38 page 122.
Place a drain tray under the transfer housing, remove the housing bolts and housing (1,2 Fig 1).
Remove the pick-up pipes (3 Fig 1), push back the lock tabs (1 Fig 2) and remove the pump sprocket bolts (2 Fig 2).
Remove the oil pump drive sprocket (3 Fig 2), tab washers (4 Fig 2) and shims.
Remove the oil pump securing bolts and remove the pump.

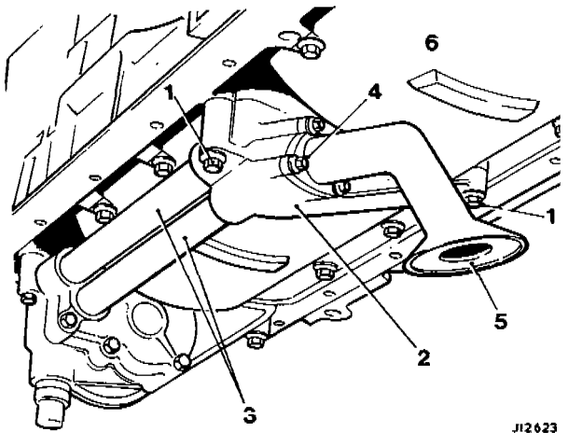


Fig 1

Remove the pressure relief valve cap, spring, tube and valve (1-4 Fig 3).
Clean the mating face in the cylinder block, the relief valve assembly, sprocket and shims.
Remove the body securing bolts.
Remove the pump body, the pump outer rotor, the backplate securing bolts, the backplate and the bearing shell, clean all the component parts of the pump.
Check all the clearance and components for undue wear (Fig 4) & (Fig 1 page 135), check tolerances in DATA).

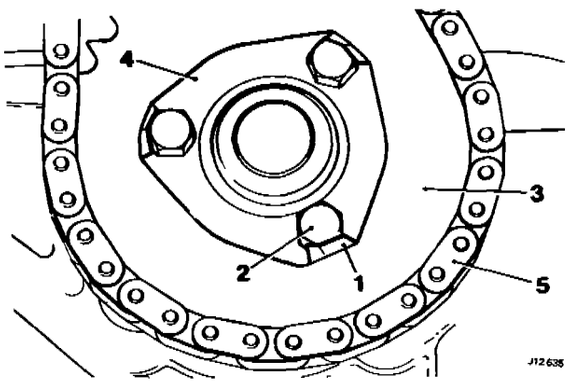


Fig 2

Clean and lubricate all the component parts.
Fit the bearing shell to the housing.
Apply sealant to the backplate gasket face, fit the backplate and securing bolts.
Fit the outer rotor.
Lubricate the relief valve assembly and assemble into the pump.
Tighten the relief valve cap.
Fit the oil pump to the engine and tighten the securing bolts.

Move the drive chain as far rearward as possible, fit a shim pack of 0.015 in thickness to the oil pump flange (3 Fig 2 page 135), align the bolt holes, fit the drive sprocket and two securing bolts.
Using a straight edge (2 Fig 2 page 135). check the alignment of the oil pump drive sprocket (1 Fig 2 page 135) and the crank sprocket (4 Fig 2 page 135).
Remove and refit the pump drive sprocket as required in order to align the sprockets.
When the alignment is satisfactory remove the pump sprocket, fit the chain and shims to the sprocket and fit the assembly to the oil pump.
Fit the tab washer and bolts.
Tighten the bolts and lock over the tabs.

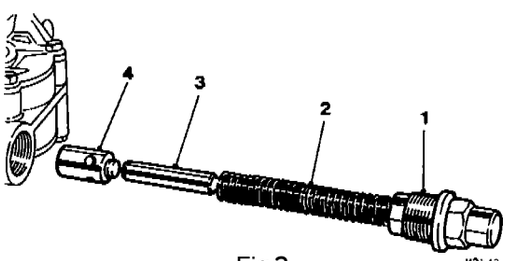


Fig 3

Fit new 'O' rings to the oil pump pick-up pipes (1 Fig 3 page 135).
Lubricate and refit the pipes to the pump.
Apply 'Hylosil 102 to the transfer housing gasket face, fit and seat the housing.
Fit and tighten the securing bolts.

Refit the sump 12.60.38 page 126.
Refill the engine with oil to the correct level.

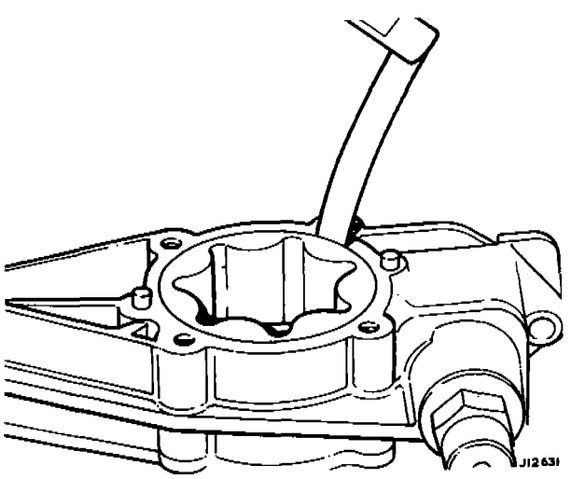


Fig 4

DATA

Oil Pump:	
Outer rotor O/D	69,825 to 69,774 mm
Outer rotor width	27,975 to 27,962 mm
Inner rotor width	27,975 to 27,962 mm
Clearance outer rotor to body	0,2 mm
Material	Cast iron grade 1 2
Oil pump body rotorbore	69,951 to 69,926 mm
End float	0,1 mm

TORQUE FIGURES

Oil pump to cylinder block 23-27Nm
Oil pump front cover to body 9.5-12Nm
Oil pump rear cover to body 9.5-12Nm
Transfer housing to cylinder block 23-27Nm

OILS/GREASES/SEALANTS

Oil pipe '0' rings PETROLEUM JELLY
Oil pump front cover to body 'LOCTITE 501'
Oil pump rear cover to body 'LOCTITE 501'
Transfer housing to block 'HYLOSIL 102'

SPANNER SIZES

10mm
17mm
30mm

3/8in AF
9/16in AF

0448G

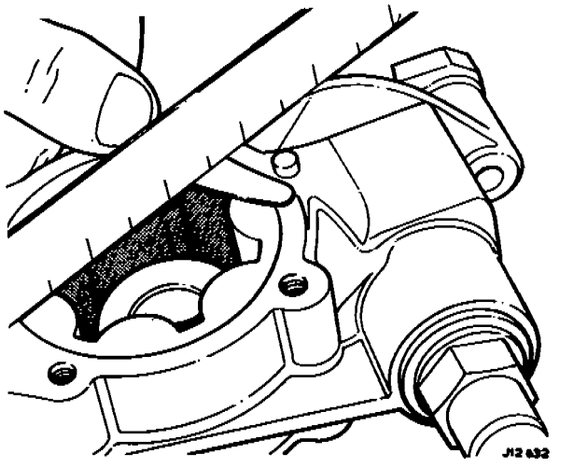


Fig 1

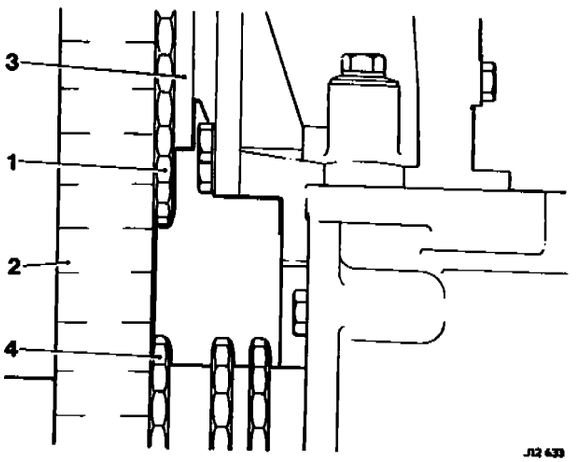


Fig 2

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OIL PRESSURE TRANSMITTER

RENEW **12.60.50**

Place a drain tray under the filter and remove the oil filter canister (Fig 1).
Clean the oil filter mounting face.

Disconnect the feed wire (1 Fig 2), remove the transmitter (2 Fig 2), and retrieve the copper washer.
Fit a new copper washer to the replacement transmitter, and fit the new transmitter to the cylinder block.
Reconnect the feed wire.
Fit and tighten the filter canister using only hand pressure, and ON NO ACCOUNT use an oil filter strap designed for removal of canisters.
NOTE: Normal tightening torque of oil filter is 3/8 to 1/2 turn after initial contact.

Start the engine and ensure that there are no oil leaks and that the oil pressure gauge is operating.
Switch the engine off, wait for 30 seconds, check the oil level, and top up as necessary.

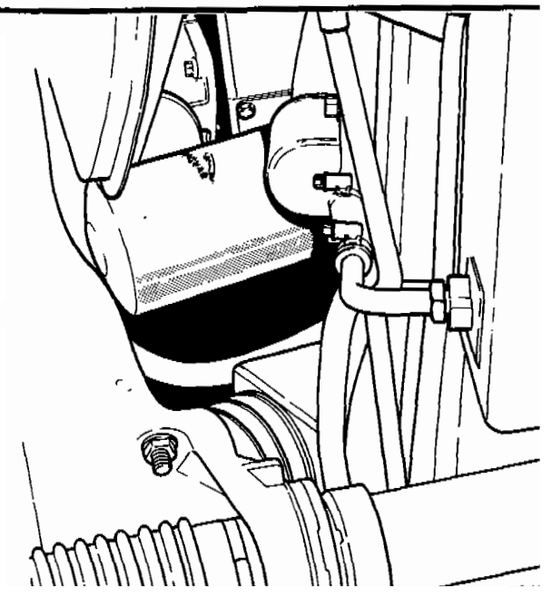


Fig 1

DATA

TORQUE FIGURES

Oil filter canister – 8.1Nm or 3/8 to 1/2 turn after initial contact.
Transmitter to cylinder block 20-27Nm

SPANNER SIZES

18mm

0448G

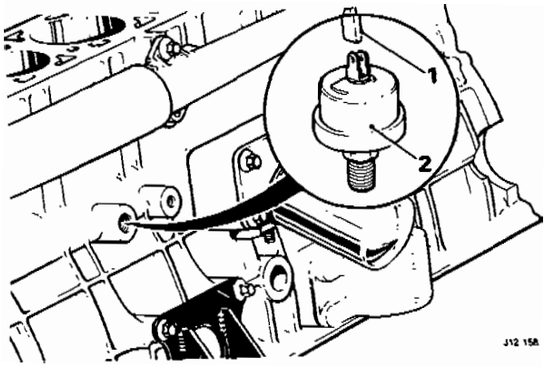


Fig 2

ENGINE MOUNTING AND BRACKET – FRONT LH

RENEW **12.45.01**

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 1).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig 1) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

Remove the the engine mounting to mounting bracket securing nut (Fig 2).
Take the weight of the engine on a jack, ensuring that the fan does not foul the fan cowl.
Remove the engine mounting lower bracket to crossmember securing nuts and bolts.
Remove the mounting/bracket assembly from the vehicle (Fig 3).
Change the spacer and bracket over to the new mounting.
Refit the mounting/bracket assembly to the crossmember. Fit and tighten the securing bolts.
Lower the engine onto the mounting.
Fit and tighten the securing nut.
Refit the air cleaner assembly.

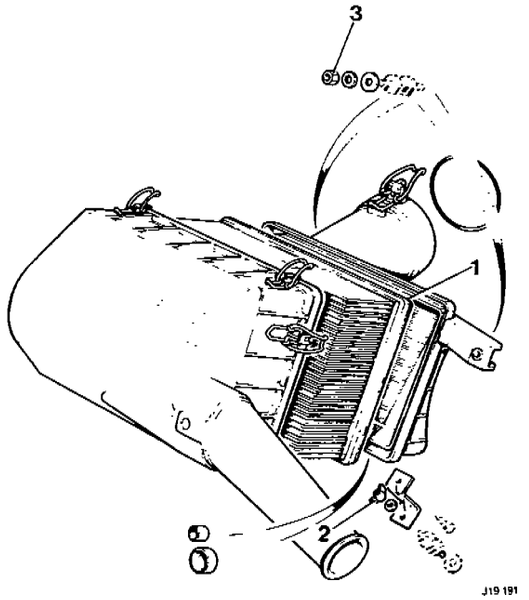


Fig 1

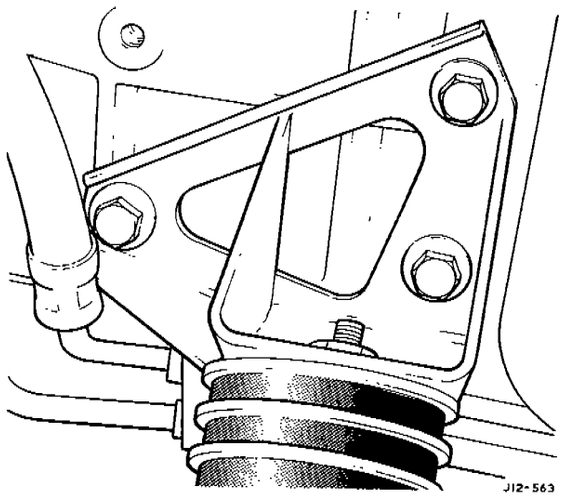


Fig 2

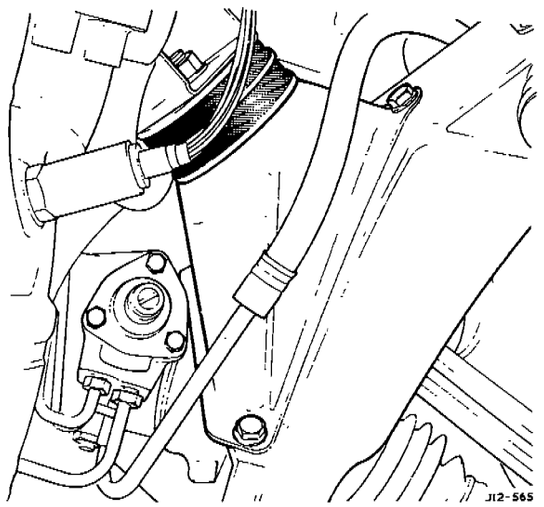


Fig 3

DATA

TORQUE FIGURES

Engine mounting to mounting bracket	***47-55Nm***
Engine mounting bracket to cylinder block	***49-54Nm***
Lower bracket to crossmember	***22-28Nm***

SPANNER SIZES

13mm

9/16in AF

0448G

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ENGINE MOUNTING AND BRACKET – FRONT RH

RENEW **12.45.03**

Remove the the engine mounting to mounting bracket securing nut (Fig 1).
Take the weight of the engine on a jack.
Remove the engine mounting lower bracket to crossmember securing nuts and bolts.
Remove the mounting/bracket assembly from the vehicle (Fig 2).
Change the spacer and bracket over to the new mounting.
Refit the mounting/bracket assembly to the crossmember. Fit and tighten the bolts.
Lower the engine onto the mounting.
Fit and tighten the securing nut.

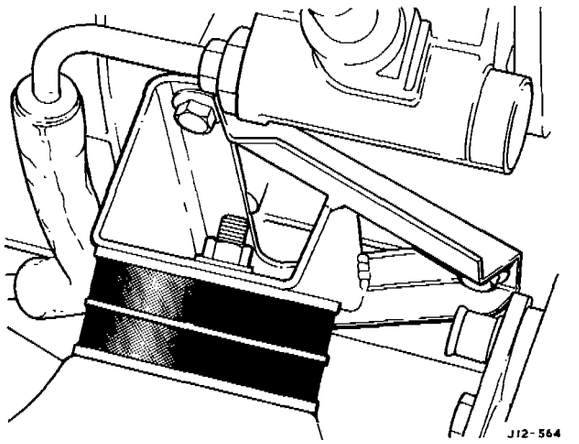


Fig 1

DATA

TORQUE FIGURES

Engine mounting to mounting bracket 47-55Nm
Lower bracket to crossmember 22-28Nm

SPANNER SIZES

73mm
9/16in AF

04486

REAR ENGINE MOUNTING

RENEW **12.45.04**

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 3).
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 3) from the lower mounting and the nuts (3 Fig 3) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.

Fit Service Tool 18G 1465 to the manifold (Fig 1 page 139).
Fit Service Tool MS53B across the wing channels.
Fit the hook to the lifting eye and tighten the hook nut to take the weight of the engine.
Jack up the vehicle and support with axle stands.
Remove the gearbox to intermediate pipe bracket.
Re-position the mounting bracket away from the exhaust pipe.
Remove the intermediate exhaust pipe clamp securing nut and bolt.
Re-position the clamp away from the union.
Disconnect the exhaust pipe and remove the sealing olive.
Take the weight of the rear mounting with a jack and remove the bolts securing the mounting.
Lower the jack and remove the mounting (Fig 2 page 139).
Remove the restraining cable (NAS AUTO ONLY).

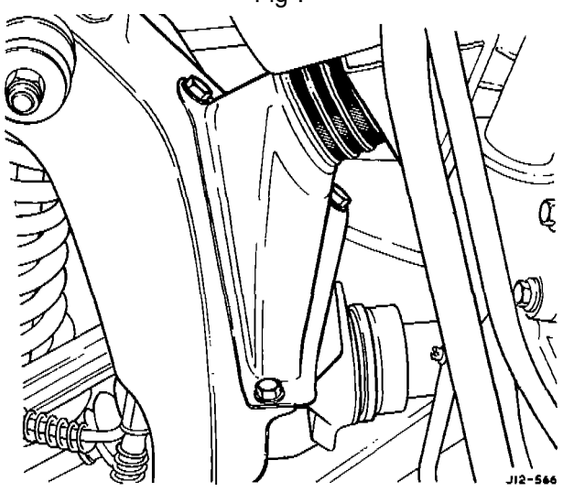


Fig 2

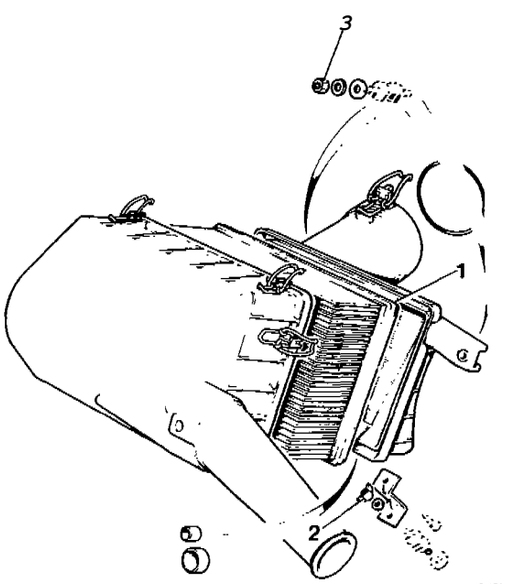


Fig 3

Remove the upper spring rubber and spring.
Using Service Tool JD 107 and mounting sleeve JD 107-2, fit the mounting to the tool, ensure that the shoulder locates in the lower mounting.
Align the collar to the mounting/tool, compress the lower mounting spring, thus removing tension from the micron retaining ring.
Remove the central mounting plate, and remove the micron ring and retainer plate.
Slacken off the wing nut and remove the tool assembly from the mounting.
Remove the lower spring cup and bump stops.
Remove the lower spring rubber and spring.
Remove the upper spring mounting cup.
Remove the screw securing the balance weight, remove the upper weight and upper spring cup.
Clean all components and check for wear or damage, replace components as necessary.

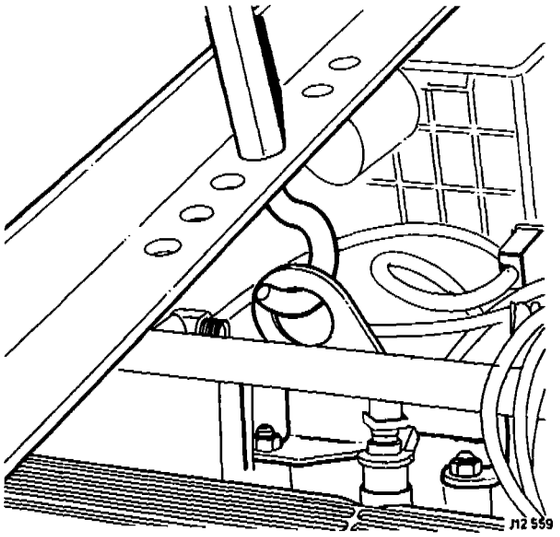


Fig 1

Re-assemble the mounting components in reverse order of removal.
Fit the mounting to the vehicle. Jack the mounting into position. Fit and tighten the securing bolts.
Reconnect the exhaust system.
Raise the engine into position using MS 53B.
Fit and tighten the mounting to body securing bolts.
Remove Service Tools MS 53B and 18G 1465.
Refit the air cleaner assembly.

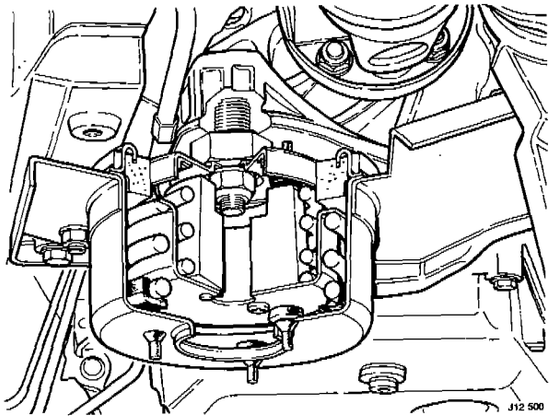


Fig 2

DATA

SERVICE TOOLS

JD 107/2 Spring compressor and adaptor
MS 53B Engine support bracket
18G 1465 Lifting eye

TORQUE FIGURES

Balance weight to spring cradle 3-4Nm
Inlet manifold securing nuts-lifting eyes 6.5-9Nm
Rear mounting to body 20-25Nm
Spring cup to mounting 20-25Nm
Bracket to intermediate pipe 23-27Nm

SPANNER SIZES

13mm

OILS/GREASES/SEALANTS

Front pipe to intermediate pipe olive exhaust sealer TIVOLI KAY ADHESIVES No 5696.

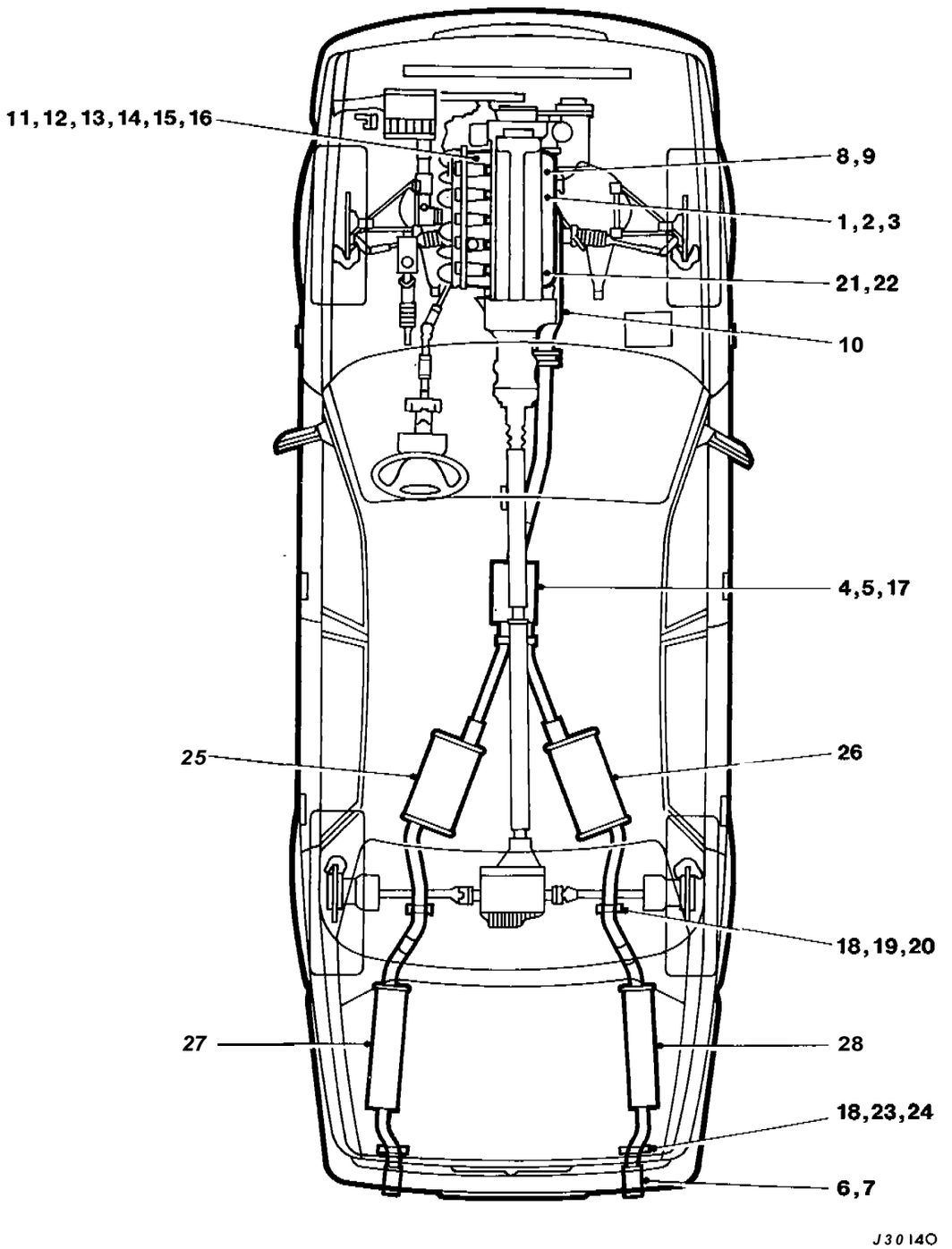
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0032K

EXHAUST MANIFOLD ENGINE SET

RENEW **30.15.38**

Jack up the vehicle and place on two stands.
Remove the nuts (1 Fig 1) securing the front pipe (2 Fig 1) to the manifold (3 Fig 1), release the securing rings and lower the exhaust system from the manifold.
Open the bonnet.
Remove the **bolts** securing the heat shield to the manifolds and remove the shield.
Remove the nuts securing the front manifold to the cylinder head and remove the front manifold assembly.
Discard the manifold gaskets.
Remove the nuts securing the rear exhaust manifold to the cylinder head, remove the manifold and discard the gaskets.
Remove and discard the front pipe sealing rings, clean the cylinder head and front pipe sealing faces.
Reverse the removal procedure *to* refit the replacement manifolds, ensuring that prior *to* assembly **all** the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody **and** chassis.

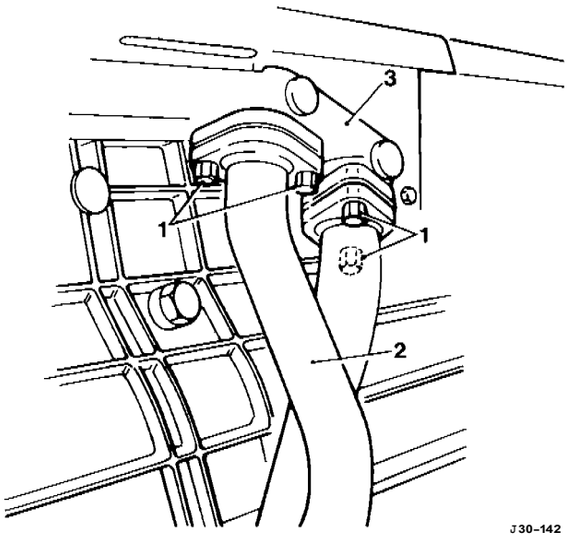


Fig 1

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head ***23-27Nm***
Front pipe ***to*** *manifold* ***30-35Nm***
Heat shield to manifold ***23-27Nm***

SPANNER SIZES

10mm
17mm

9/16" AF

OILSILUBRICANTSISEALANTS

Exhaust sealer TIVOLI ***KAY ADHESIVES No 5696.***

30048

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EXHAUST MANIFOLD GASKET ENGINE SET

RENEW 30.15.12

Jack up the vehicle and place on two stands.
Remove the nuts (1 Fig 1) securing the front pipe (2 Fig 1) to the manifold (3 Fig 1), release the securing rings **and** lower the exhaust system from the manifold.
Open the bonnet.
Remove the bolts securing the heat shield to the manifolds and remove the shield.
Remove the *nuts* securing the front manifold to the cylinder head and remove the front manifold assembly.
Discard the manifold gaskets.
Remove the nuts securing the rear exhaust manifold **to** the cylinder head, remove the manifold and discard the gaskets.
Remove and discard the front pipe sealing rings, clean the cylinder head **and** front pipe sealing faces.
Reverse the removal procedure to refit the replacement manifolds, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear *of* the underbody and chassis.

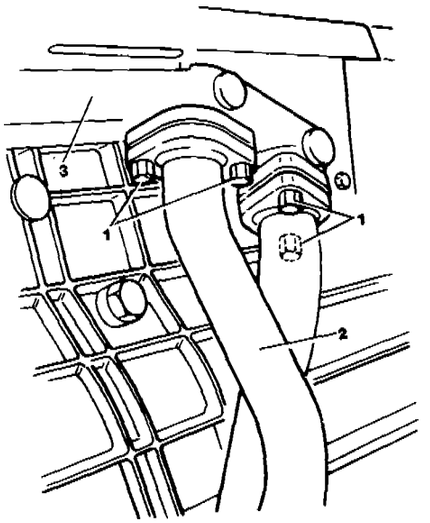


Fig 1

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 23-27Nm
Front pipe to manifold 30-35Nm
Heat shield to manifold 23-27Nm

SPANNER SIZES

I Omm
17mm

9/16" AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

3004B

EXHAUST MANIFOLD HEAT SHIELD

RENEW 30.15.09

Open the bonnet.
Remove the bolts securing the heat shield to the manifold and remove the heat shield.
Reverse the removal procedure to refit.

DATA

TORQUE FIGURES

Heat shield ***to*** *manifold* ***23-27Nm***

SPANNER SIZES

10mm

3004B

EXHAUST SYSTEM

ALIGN 30.10.04

Raise the vehicle on a ramp.
Remove the bolt securing the clamp, front pipe/intermediate pipe.
Align the intermediate pipe to the vehicle, smear the olive with sealer, fit and tighten the clamp.
Slacken the clamps securing the intermediate pipe to the silencers, align the silencers to the vehicle, smear with exhaust sealant, realign the clamps and tighten.
Slacken the **clamps** (1 Fig 1) securing the silencers to the tail pipe assemblies, align the tail pipes to the vehicle, **smear** the joints with sealant and tighten the clamps.
Lower the vehicle.

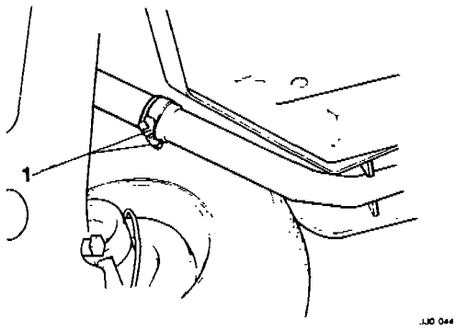


Fig 1

DATA

TORQUE FIGURES

Intermediate pipe to silencer ***15-18Nm***
Front pipe to intermediate pipe ***15-18Nm***
Front pipe ***to*** *manifold* ***30-35Nm***

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI ***KAY ADHESIVES No*** *5696.*

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EXHAUST SYSTEM

RENEW

30.10.01

Using a suitable drift, tap off the exhaust trim.
Remove the nuts securing the left hand tail lamp cover and remove the cover.
Lift the boot carpet to gain access to the nuts securing the rear mounting.
Remove the nuts and bolt (1 Fig 1), from below remove the mounting from the body/tail pipe.
Repeat the procedure for the opposite side.
Remove the nuts (2 Fig 1) securing the plate to the mounting bracket and remove the bracket.
Repeat the procedure for the opposite side.

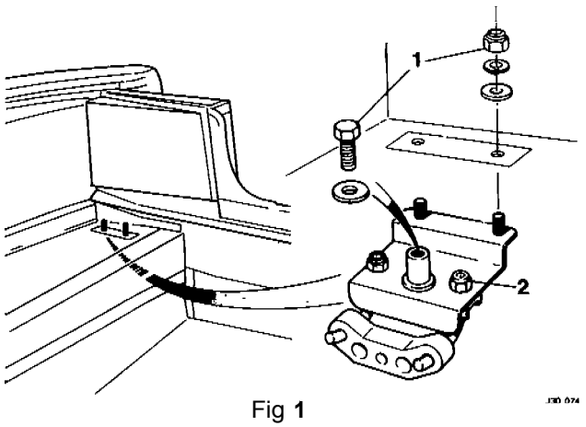


Fig 1

Slacken the tail pipe and silencer to main silencer clamp, nut and bolt (1 Fig 2).
Reposition the clamp from the joint.
Remove the tail pipe and silencer assembly from the main silencer, remove the clamp from the tail pipe.
Repeat the procedure for the remaining tail pipe assembly.
Slacken the clamps securing the silencers to the intermediate pipe.

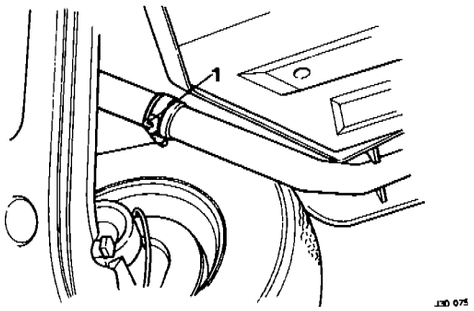


Fig 2

Remove the bolts (1 Fig 3) securing the over axle mounting (2 Fig 3) to the axle carrier (3 Fig 3).
Remove the mounting from the axle carrier, pivot the mounting on the exhaust pin and withdraw.
Repeat the procedure for the opposite side.

Split the silencers from the intermediate pipe and remove the silencers from the axle carrier.
Remove the nut securing the silencer mounting pin.
Remove the pin and insulation bushes.
Place a suitable support across the ramp to retain the intermediate pipe.

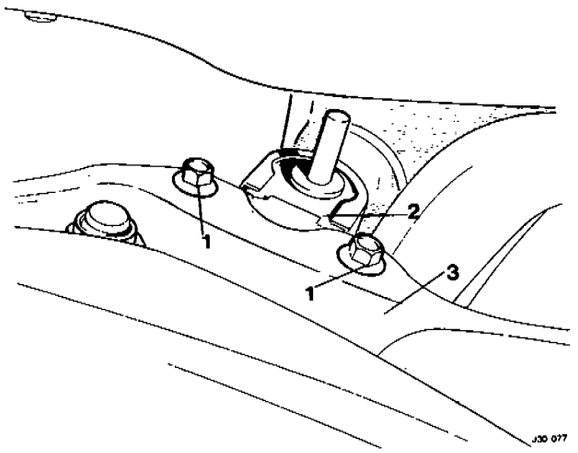


Fig 3

Remove the clamp (1 Fig 1) securing the intermediate pipe (2 Fig 1) to the front pipe (3 Fig 1).
Reposition the clamp and remove the intermediate pipe and front pipe sealing ring.

Remove the nuts (1 Fig 2) securing the front pipe assembly (2 Fig 2) to the manifold assembly (3 Fig 2) and withdraw the pipe assembly from the vehicle.
Remove and discard the manifold sealing rings.

Reverse the removal procedure to refit the replacement exhaust system and mountings, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer, new sealing rings are fitted and that all the component parts when fitted are clear of the underbody and chassis.

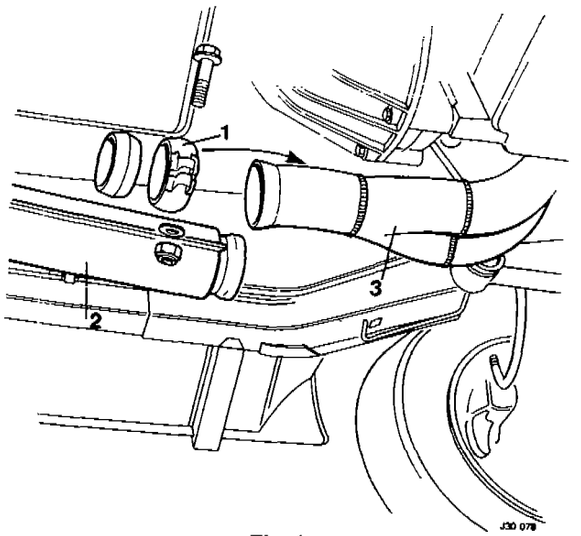


Fig 1

DATA

TORQUE FIGURES

Intermediate pipe to silencer **75-18Nm**
Over axle mounting to axle carrier **22-28Nm**
Front pipe to intermediate pipe **15-18Nm**
Front pipe to manifold **30-35Nm**
Mounting pin to over axle pipe 14-17Nm
Rear silencer mounting to floor **8-10Nm**

SPANNER SIZES

10mm
11mm
13mm

9/16"AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES **No 5696.**

3004B

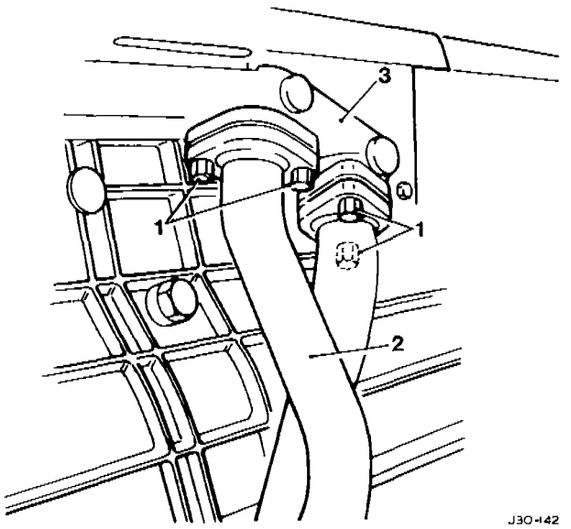


Fig 2

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EXHAUST SYSTEMS AND MOUNTINGS

RENEW **30.10.08**

Remove the complete exhaust system and mountings in accordance with the method detailed in operation 30.10.01 on pages 30.1-07 and 30.1-08.

When refitting the replacement system and mountings ensure that prior to assembly all the joints are coated with the recommended exhaust **sealer,** new sealing rings are fitted and that all the component parts when fitted are clear *of* the underbody and chassis.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***

30048

EXHAUST TRIM

RENEW **30.10.23**

Using a suitable drift, tap **off** the exhaust trim.
Clean the tail pipe.
Fit and seat the replacement trim to the tail pipe.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer* ***TIVOLI KAY ADHESIVES No 5696.***

3004B

EXHAUST TRIM VEHICLE SET

RENEW **30.10.40**

Using a suitable drift, tap off the exhaust **trims.**
Clean the tail pipes.
Fit and seat the replacement trims to the tail pipes.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer* ***TIVOLI KAY ADHESIVES No 5696.***

30048

FRONT EXHAUST MANIFOLD

RENEW 30.15.36

Jack up the vehicle and place on two stands.
Remove the nuts (1 **Fig** I) securing the front pipe (2 Fig 1) to the manifold (3 Fig 1), release the securing rings and lower the exhaust system from the manifold.
Open the bonnet;
Remove the bolts securing the heat shield to the manifolds and remove the shield.
Remove the nuts securing the front manifold to the cylinder head and remove the front manifold assembly.
Discard the manifold gaskets.
Remove and discard the front pipe sealing rings, clean the cylinder head and front pipe sealing faces.
Reverse the removal procedure to refit the replacement manifolds, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

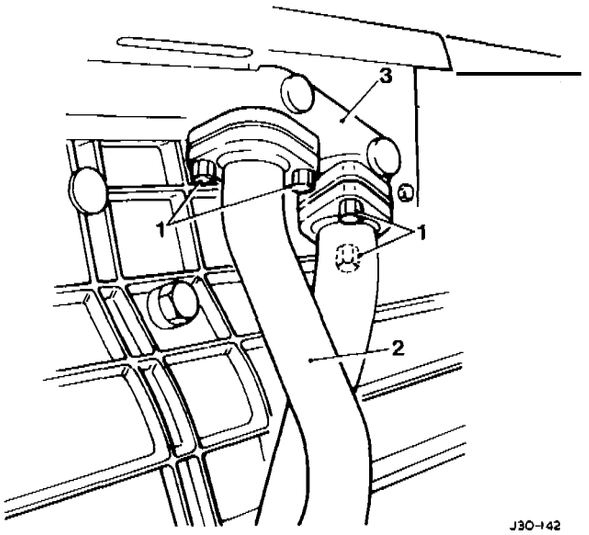


Fig 1

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 23-27Nm
Front pipe to manifold 30-35Nm
Heat ***shield to manifold 23-27Nm***

SPANNER SIZES

1Omm
17mm

9/16"AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30048

FRONT EXHAUST MANIFOLD GASKET - ENGINE SET

RENEW 30.15.12

Remove the front exhaust manifold in accordance with the method detailed in 30.15.36.
Discard the exhaust manifold gasket and downpipe sealing rings.
Reverse the procedure to fit the replacement gasket and sealing rings.
Ensure that prior ***to*** assembly all ***joints are*** coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer* ***TIVOLI KAY ADHESIVES No 5696.***

30048

www.JagDocs.com

OVER AXLE MOUNTING RUBBER

RENEW **30.20.16**

Jack up the rear **of** the vehicle and place on two stands.
Remove the bolts (1 Fig 1) securing the mounting (2 **Fig** 1) to the axle carrier (3 Fig 1).
Remove the mounting from the axle carrier, pivot the mounting on the exhaust pin and withdraw.
Remove the insulation bush from the mounting and the rubber from the bracket.

Apply soft soap to the replacement rubber and seat the rubber in the mounting bracket.
Reverse the removal procedure to refit the replacement mounting.
Check to ensure that no part of the exhaust system fouls the body/chassis.

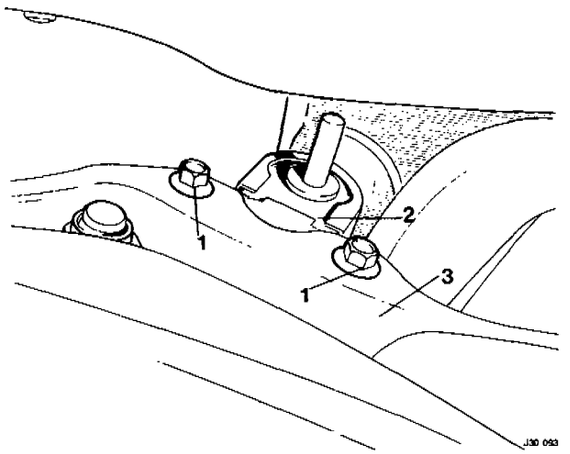


Fig 1

DATA

TORQUE FIGURES

Over axle mounting to axle** carrier **22-28Nm
*Mounting **pin to over axle pipe 15-17Nm***

SPANNER SIZES

1Ornrn
13mm

3004B

OVER AXLE MOUNTING R JBBER VEHICLE SET

RENEW **30.20.17**

Remove the over axle mounting rubber in accordance with the method detailed in 30.20.16.

Repeat the procedure for the opposite side.
Check to ensure that no part of the exhaust system fouls the chassis.

30048

FRONT PIPE VEHICLE SET

RENEW **30.10.56**

Jack up the vehicle and place on two stands.
Remove the front pipe to intermediate pipe securing nut (1 Fig 1) and bolt (2 Fig 1).
Reposition the exhaust system rearwards to remove the sealing ring (Fig 1).

Remove the nuts (1 Fig 2) securing the front pipe (2 Fig 2) to the manifold (3 **Fig** 2) **assembly** and remove the manifold from the vehicle.
Remove and discard the manifold sealing rings.
Reverse the removal procedure **to** refit the replacement front pipe ensuring that prior to assembly **all** the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

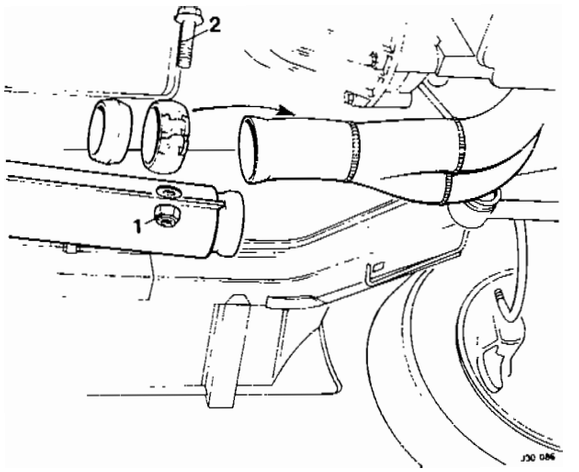


Fig 1

DATA

TORQUE FIGURES

Front pipe to intermediate pipe ***15-18Nm***
Front pipe to manifold ***30-35Nm***

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer* *TIVOLI* ***KAY ADHESIVES No 5696.***

SPANNER SIZES

10mm
13mm

9/16"AF

3004B

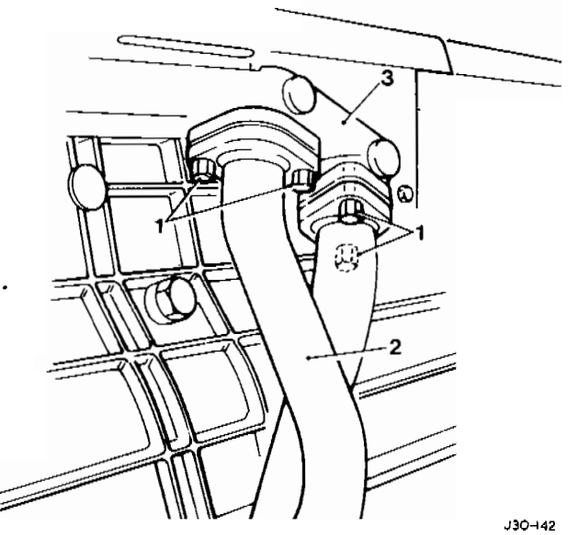


Fig 2

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INDUCTION MANIFOLD ENGINE SET

RENEW **30.15.01**

Depressurise the fuel system 19.50.02
Slacken the clip securing the intake elbow to the breather pipe and disconnect.
Slacken the clip securing the intake elbow to the air by-pass valve hose and remove the clips and disconnect the hose from the elbow.
Slacken the clip securing the intake elbow to the throttle housing, disconnect the hose and the advance and retard vacuum hose.
Disconnect the air flow meter, air by-pass valve and throttle potentiometer block connectors, reposition the harness from its mounted position and onto the manifold.
Remove the bolt securing the dipstick tube, release the throttle cable from the retaining clip.
Disconnect the throttle cable from the linkage, slacken the cable lock nut (1 Fig 1) and position the cable (2 Fig 1) aside.
Remove the bolt securing the heater feed pipe to the manifold, reposition the vacuum valve away from the heater feed pipe and disconnect the vacuum **hoses** from the manifold.
Disconnect the sparking plug leads and position away from the manifold.
Disconnect the injector block connectors and the pressure regulator vacuum hose.
Slacken the clips securing the part throttle control orifice coolant hoses and disconnect from the housing and collect the clips.

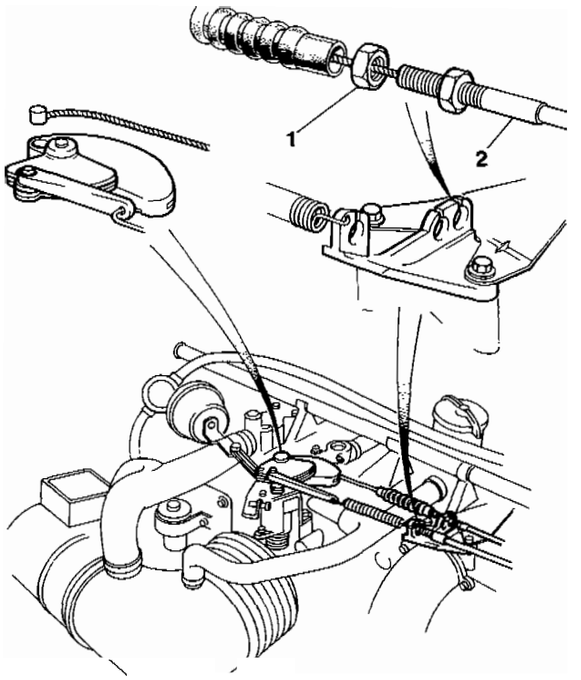


Fig 1

Fit plugs to the hoses to prevent coolant **loss** and reposition through the manifold.
Slacken the clips securing the breather hose to the oil trap turret and disconnect the hose from the trap.
Slacken the fuel return to pressure regulator hose union nut and disconnect the hose from the regulator.
Fit plugs to the regulator and hose.
Remove the fuel feed hose **to** fuel rail securing clips.
Slacken the fuel feed to fuel rail union nut and disconnect the hose from the rail.
Reposition the hose through the manifold.
Remove the manifold securing nuts and bolts, displace the earth leads from the front and rear studs and remove the manifold assembly.
Remove and discard the manifold gaskets.
Slacken the clip securing the by-pass valve to the lower housing and disconnect.
Remove the screws securing the air by-pass valve to the manifold.
Remove the air valve assembly and unhook and remove the throttle return springs.
Remove the throttle housing to manifold securing bolts and remove the throttle housing assembly.
Remove and discard the throttle housing gasket.

Remove the lower housing securing bolts and remove the lower housing/hose assembly.
Remove and discard the housing gasket.
Remove the dipstick bracket securing bolt and remove the bracket.
Remove the nut securing the breather pipe to the cable bracket.
Displace the clip from the cable bracket, remove the bracket securing bolts and remove the bracket.
Remove the part throttle control orifice housing securing bolts and remove the housing **and** breather pipe assembly.
Remove and discard the housing gasket.
Remove the bolts securing the throttle return spring anchor bracket and remove the bracket.
Remove the pressure regulator vacuum hose.
Remove the bolts securing the fuel rail and remove the rail assembly.
Remove the screws securing the intake tubes and remove the tubes.
Remove the manifold aand vacuum blanking plugs.
Clean the manifold mating face and reverse the removal procedure to refit the replacement manifold ensure that prior to fitting of the intake tubes they are coated with Hylosil 102 and **also** that new **'O'** rings are fitted to the injectors prior to fitting.

DATA

TORQUE FIGURES

Throttle body to manifold ***23-27Nm***
Cruise control bracket to cylinder head ***9.5-12Nm***
Elbow to manifold ***12.2Nm***
Fuel rail ***to*** *manifold* ***9.5-12Nm***
Idle air and E.G.R. with purge adaptor to manifold ***9.5-12Nm***
Idle air and E.G.R. without ***purge adaptor to*** *manifold* ***9.5-12Nm***
Idle air and ***purge*** *adaptor to manifold* ***9.5-12Nm***
Inlet manifold ***to*** *cylinder head (nuts)* ***23-27Nm***
Inlet manifold to cylinder head (bolts) ***23-27Nm***
Throttle body to manifold ***23-27Nm***

SPANNER SIZES

8mm
1Omm
13mm

OILS/LUBRICANTS/SEALANTS

Intake tubes to inlet manifold Hylosil 102

30048

www.JagDocs.com

INDUCTION MANIFOLD GASKET ENGINE SET

RENEW **30.15.08**

Open the bonnet.
Remove the bolt securing the heater feed pipe to the rear of the manifold.
Reposition the vacuum valve from the heater feed pipe.
Remove the bolt securing the dipstick tube (4 Fig 1), slacken the clips securing the breather hose to the oil trap turret and disconnect the hose from the trap.
Slacken the clip securing the induction elbow hose and reposition the hose from the elbow.
Disconnect the air flow meter multi-plug, cut the ratchet strap securing the harness to the cylinder head front securing bolt.
Disconnect the crank sensor multi-plug and the spark plug leads.
Remove the nuts and bolts (1,2 Fig 1) securing the manifold and reposition the earth leads away from the studs.
Carefully lift the manifold from the cylinder head ensuring that any harnesses/hoses are not stressed.
Support the manifold using a suitable chock, remove and discard the gaskets.
Clean the mating **faces,** fit and align the gaskets and reverse the removal procedure to refit the replacement gaskets.

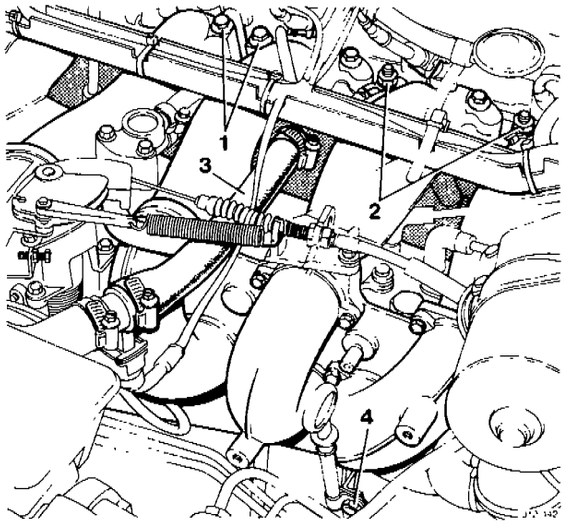


Fig 1

DATA

TORQUE FIGURES

Inlet manifold to cylinder head ***(nuts) 23-27Nm***
Inlet manifold to cylinder head ***(bolts) 23-27Nm***

SPANNER SIZES

8mm
10mm
13mm

30048

INTAKE TUBE

RENEW **30.15.30**

Open the bonnet.
Remove the nuts securing the air by-pass valve to the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Reposition the fuel hose from the retaining bracket and the by-pass valve for access to the lower securing bolt.

Remove the bolt securing the lower mounting bracket followed by the remaining securing bolts.
Remove the by-pass valve/fuel hose mounting from the manifold.
Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and reposition the turret from the throttle housing (Fig 1).
Remove the intake tube to manifold securing bolts and remove the intake tube.
Clean the gasket faces and reverse the removal procedure to refit the replacement intake tube ensuring that 'Hylosil 102' is applied to the gasket faces prior to reassembly.

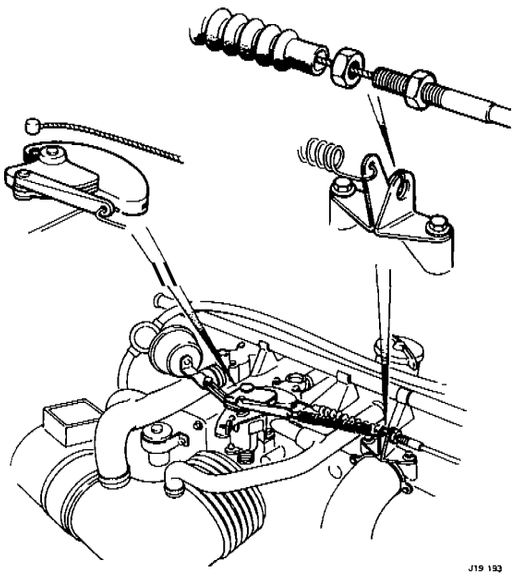


fig 1

DATA

TORQUE FIGURES

Throttle body to manifold ***23-27Nm***

SPANNER SIZES

6mm
8mm

LUBRICANTS/SEALANTS

intake tube ***to*** *cylinder head Hylosil 102*

30048

INTAKE TUBE GASKET

RENEW 30.15.31

Open the bonnet.
Remove the nuts securing the air by-pass valve **to** the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Reposition the fuel hose from the retaining bracket and the by-pass valve **for** access to the lower securing bolt.
Remove the bolt securing the lower mounting bracket followed by the remaining securing bolts.
Remove the by-pass valve/fuel hose mounting from the manifold.
Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and reposition the turret from the throttle housing.
Remove the intake tube to manifold securing bolts and remove the intake tube.
Clean the gasket faces and reverse the removal procedure to refit the intake tube ensuring that 'Hylosil 102' is applied to the gasket faces prior to reassembly.

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DATA

TORQUE FIGURES

Throttle body to manifold ***23-27Nm***

SPANNER SIZES

6mm
8mm

LUBRICANTS/SEALANTS

Intake tube to cylinder head Hylosil 102

0105b

INTAKE TUBE GASKET VEHICLE SET

RENEW **30.15.33**

Open the bonnet.
Remove the nuts securing the air by-pass valve to the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Reposition the fuel **hose** from **the** retaining bracket and the by-pass valve for access to the lower securing bolt.
Remove the bolt securing the lower mounting bracket followed by the remaining securing bolts.
Remove the by-pass valve/fuel **hose** mounting from the manifold.
Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and reposition the turret from the throttle housing (Fig 1).
Remove the intake tube to manifold securing bolts and remove the intake tube.
Repeat the procedure for the remaining tubes to remove.
Clean the gasket **faces** and reverse the removal procedure to refit the intake tubes ensuring that 'Hylosil 102' is applied to the gasket faces prior to reassembly.

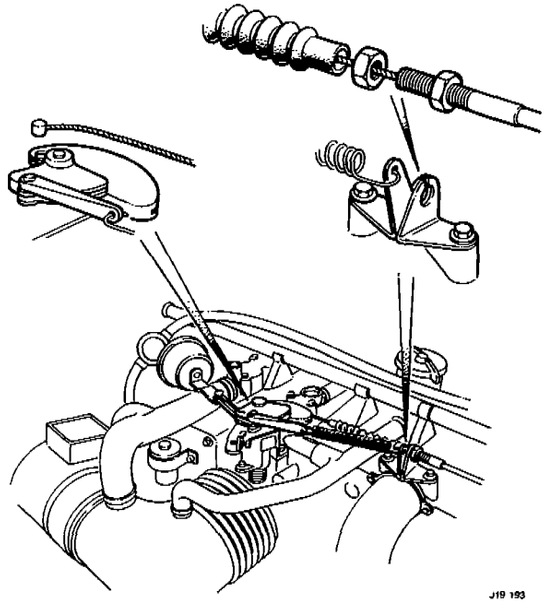


Fig 1

DATA

TORQUE FIGURES

Throttle body to manifold ***23-27Nm***

SPANNER SIZES

6mm
8mm

LUBRICANTS/SEALANTS

Intake tube to cylinder head Hylosil 102

30048

INTAKE TUBE VEHICLE SET

RENEW **30.15.32**

Open the bonnet.
Remove the nuts securing the air by-pass valve to the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Reposition the fuel hose from the retaining bracket and the by-pass valve for access to the lower securing bolt.
Remove the bolt securing the lower mounting bracket followed by the remaining securing bolts.
Remove the by-pass valve/fuel hose mounting from the manifold.
Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and reposition the turret from the throttle housing.
Remove the intake tube to manifold securing bolts and remove the intake tube.
Repeat the procedure for the remaining tubes.
Clean the gasket faces and reverse the removal procedure to refit the replacement intake tube ensuring that 'Hylosil 102' is applied to the gasket faces prior to reassembly.

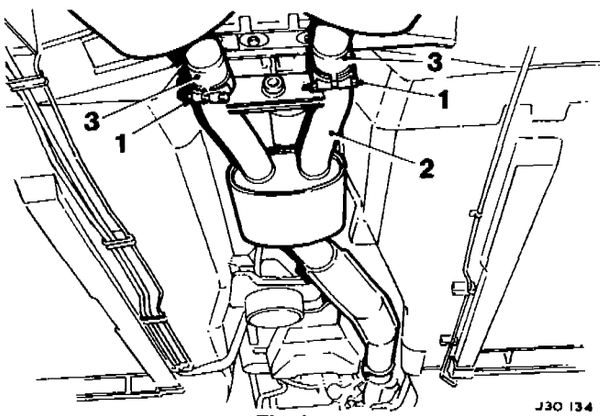


Fig 1

DATA

TORQUE FIGURES

Throttle body to manifold ***23-27Nm***

SPANNER SIZES

6mm
8mm

LUBRICANTS/SEALANTS

Intake** tube to **cylinder head Hylosil 102

30048

INTERMEDIATE PIPE AND SILENCER

RENEW **30.10.19**

Raise the vehicle on a ramp.
Slacken the clamps (1 **Fig** 1) securing the intermediate pipe (2 Fig 1) to the main silencers (3 Fig 1).
Move both main silencers rearwards from the intermediate pipe.
Remove the clamp nut and bolt (1 Fig 2) securing the intermediate pipe (2 Fig 2) to the front pipe (3 Fig 2).

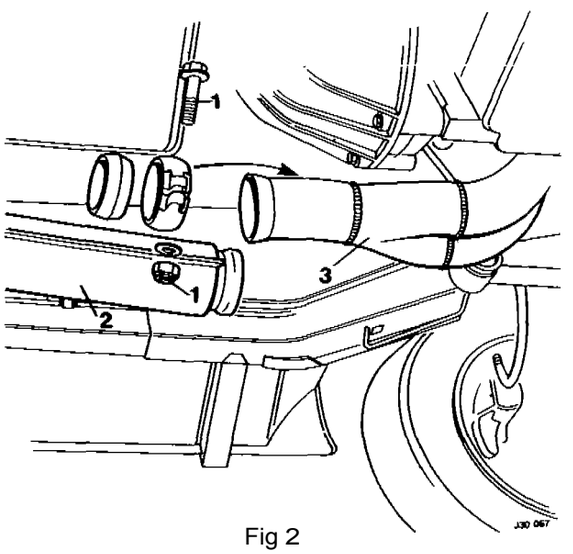


Fig 2

www.JagDocs.com

Split the intermediate pipe from the front pipe and main silencers,
Retrieve the front pipe sealing ring.

Clean all relevent joints renew all sealing rings and reverse the removal procedure to refit the replacement intermediate pipe and silencer, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis,

DATA

TORQUE FIGURES

Intermediate pipe ***to*** *silencer* ***15-18Nm***
Front pipe tu intermediate pipe ***15-18Nm***

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer* ***TIVOLI KAY ADHESIVES No 5696.***

3004B

MOUNTING RUBBER VEHICLE SET

RENEW ***30.20.06***

Jack up the rear of the vehicle and place on two stands.
Remove the nuts securing the tail lamp cover and remove the cover.
Lift the boot carpet to gain access to the nuts securing the rear mounting.
Remove the nuts and bolt (1 Fig 1), from below remove the mounting from the body/tail pipe.
Remove the nuts (2 Fig 1) securing the plate to the mounting bracket and remove the bracket.

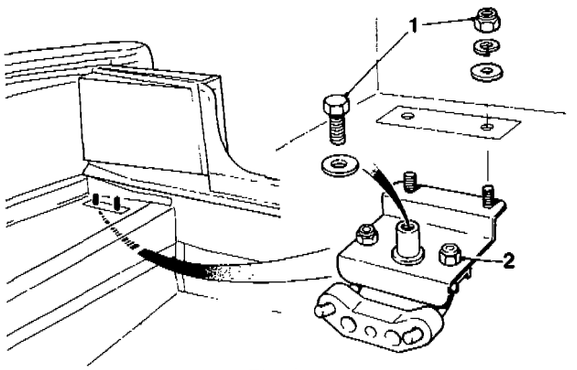
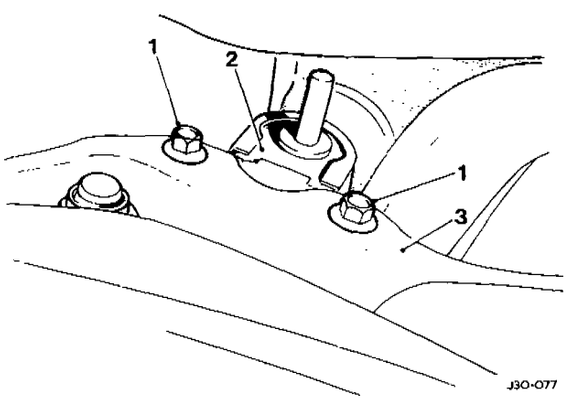


Fig 1 J30-074

Repeat the procedure for **the** opposite side.
Remove the bolts (1 Fig 2) securing the over axle mounting (2 Fig 2) to the axle carrier (3 Fig 2).

Remove the mounting from the axle carrier, pivot the mounting on the exhaust pin and withdraw.
Repeat the procedure for the opposite side.
Remove the insulation bush from the mounting and the rubber from the bracket.
Repeat the procedure for the opposite side.
Apply soft soap to the replacement rubbers and seat the rubbers in the mounting brackets.



J30-077

Fig 2

Reverse the removal procedure to refit the replacement mountings.
Check to ensure that no part of the exhaust system fouls the body/chassis.

DATA

TORQUE FIGURES

Front mounting to axle carrier 22-28Nm
Mounting pin to over axle pipe 14-17Nm
Rear silencer mounting to floor 8-10Nm

SPANNER SIZES

10mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.
Mounting rubbers Soft soap

3004B

REAR EXHAUST MANIFOLD

RENEW 30.15.37

Jack up the vehicle and place on two stands.
Remove the nuts securing the front pipe to the manifold, release the securing rings and lower the exhaust system from the manifold.
Open the bonnet.
Remove the bolts securing the heat shield to the manifolds and remove the shield.
Remove the nuts (1 Fig 1) securing the rear exhaust manifold (2 fig 1) to the cylinder head, remove the manifold and discard the gaskets.
Remove and discard the front pipe sealing rings, clean the cylinder head and front pipe sealing faces.
Reverse the removal procedure to refit the replacement manifolds, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear *of* the underbody and chassis.

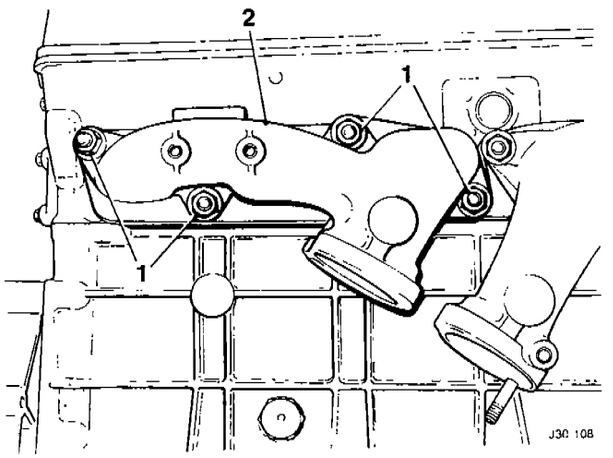


Fig 1

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 23-27Nm
Front pipe to manifold 30-35Nm
Heat shield to manifold 23-27Nm

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SPANNER SIZES

1Omm
17mm

9/16" AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

3004B

REAR EXHAUST MANIFOLD GASKET

RENEW 30.15.21

Jack up the vehicle and place on two stands.
Remove the nuts securing the front pipe to the manifold, **release** the securing rings and lower the exhaust system from the manifold.
Open the bonnet.
Remove the bolts securing the heat shield to the manifolds and remove the shield.
Remove the nuts (1 Fig 1) securing the rear exhaust manifold (2 Fig 1) to the cylinder head, remove the manifold and discard the gaskets.
Remove and discard the front pipe sealing rings, clean the cylinder head and front pipe sealing faces.

Reverse the removal procedure to refit the replacement manifolds, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all **the** component parts are clear of the underbody and chassis.

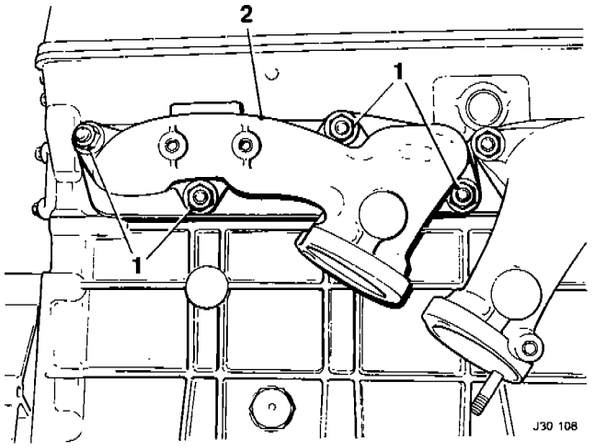


Fig 1

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 23-27Nm
Front pipe to manifold 30-35Nm
Heat shield to manifold 23-27Nm

SPANNER SIZES

1Omm
17mm

9/16" AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30048

REAR MOUNTING RUBBER

RENEW **30.20.04**

Open the boot.
Remove the nuts securing the tail lamp cover and remove the cover.
Lift the boot carpet to gain access to the nuts securing the rear mounting.
Remove the nuts and bolt (1 Fig 1), from below remove the mounting from the body/tail pipe.
Remove the nuts (2 Fig 1) securing the plate to the mounting bracket and remove the bracket.
Reverse the removal procedure to refit the mounting rubber and check to ensure that no part of the exhaust system fouls the body/chassis.

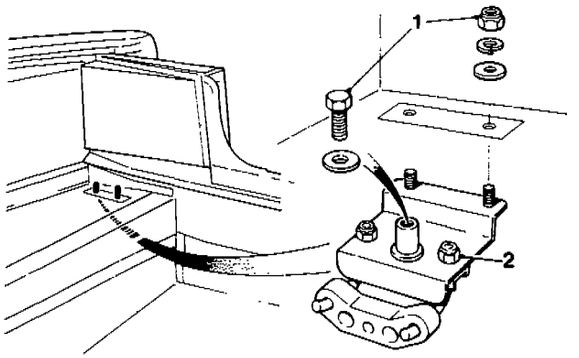


Fig 1

DATA

TORQUE FIGURES

Rear silencer mounting to floor 8-10Nm

SPANNER SIZES

13mm

OILS/LUBRICANTS/SEALANTS

Rear mounting rubber Soft soap

3004B

REAR MOUNTING RUBBER VEHICLE SET

RENEW **30.20.14**

Replace the rear mounting rubber in accordance with the method detailed in operation 30.20.04.

Repeat the procedure for the opposite side.

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SILENCER ASSEMBLY LEFT HAND

RENEW **30.10.15**

Raise the vehicle on a ramp.
Slacken the tail pipe to silencer clamp nut and bolt.
Disconnect the tailpipe assembly from the main silencer.
Remove the intermediate pipe and silencer 30.10.19
Remove the silencer from the axle carrier and front mounting.
Remove the nut securing the silencer mounting pin .
Remove the pin and insulation bushes.
Clean the relevent exhaust joints.
Reverse the removal procedure to refit the replacement silencer ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

DATA

TORQUE FIGURES

Intermediate pipe to silencer 15-18Nm
Mounting pin to over axle pipe 14-17Nm

SPANNER SIZES

10mm
11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30048

SILENCER ASSEMBLY RIGHT HAND

RENEW **30.10.16**

Remove the right hand silencer assembly following the method detailed **for** replacement of the left hand silencer asssernbly 30.10.15.

Clean the relevent exhaust joints.
Reverse the removal procedure to refit the replacement silencer ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

3004B

TAIL PIPE AND SILENCER LEFT HAND

RENEW **30.10.22**

Jack up the rear of the vehicle and place on two stands.
Remove the exhaust trim in accordance with the method detailed in operation 30.20.23.
Remove the rear mounting rubber in accordance with the method detailed in operation 30.20.04.
Slacken the tail pipe and silencer to main silencer clamp, nut and bolt.
Reposition the clamp from the union to the tail pipe assembly.
Remove the tail pipe and silencer assembly from the main silencer, remove the clamp from the tail pipe and clean all the relevent exhaust joints.

Reverse the removal procedure **to** refit the replacement tail pipe and silencer ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

DATA

TORQUE FIGURES

Intermediate pipe to silencer 15-18Nm
Mounting pin to over ***axle pipe 14-17Nm***
Rear silencer mounting to floor 8-10Nm

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust ***sealer TIVOLI KAY ADHESIVES No 5696.***

30048

TAIL PIPE AND SILENCER RIGHT HAND

RENEW **30.10.52**

Remove the right hand tail pipe and silencer assembly following the method detailed for replacement of the left hand assembly 30.10.22.

Reverse the removal procedure to refit the replacement tail pipe and silencer ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

30048

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CONTENTS

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3005B

DESCRIPTION 30.00.00

3.2 litre models are equipped with a twin catalyst exhaust system. **A** downpipe catalytic convertor assembly is connected to an underfloor catalytic convertor assembly supported by **a** front rubber mounting.
Two main silencers are supported by **over** axle rubber mountings and connected to tail pipe assemblies supported by rear rubber mountings.
A Lambda oxygen sensor is fitted towards the rear of the downpipe convertor assembly.

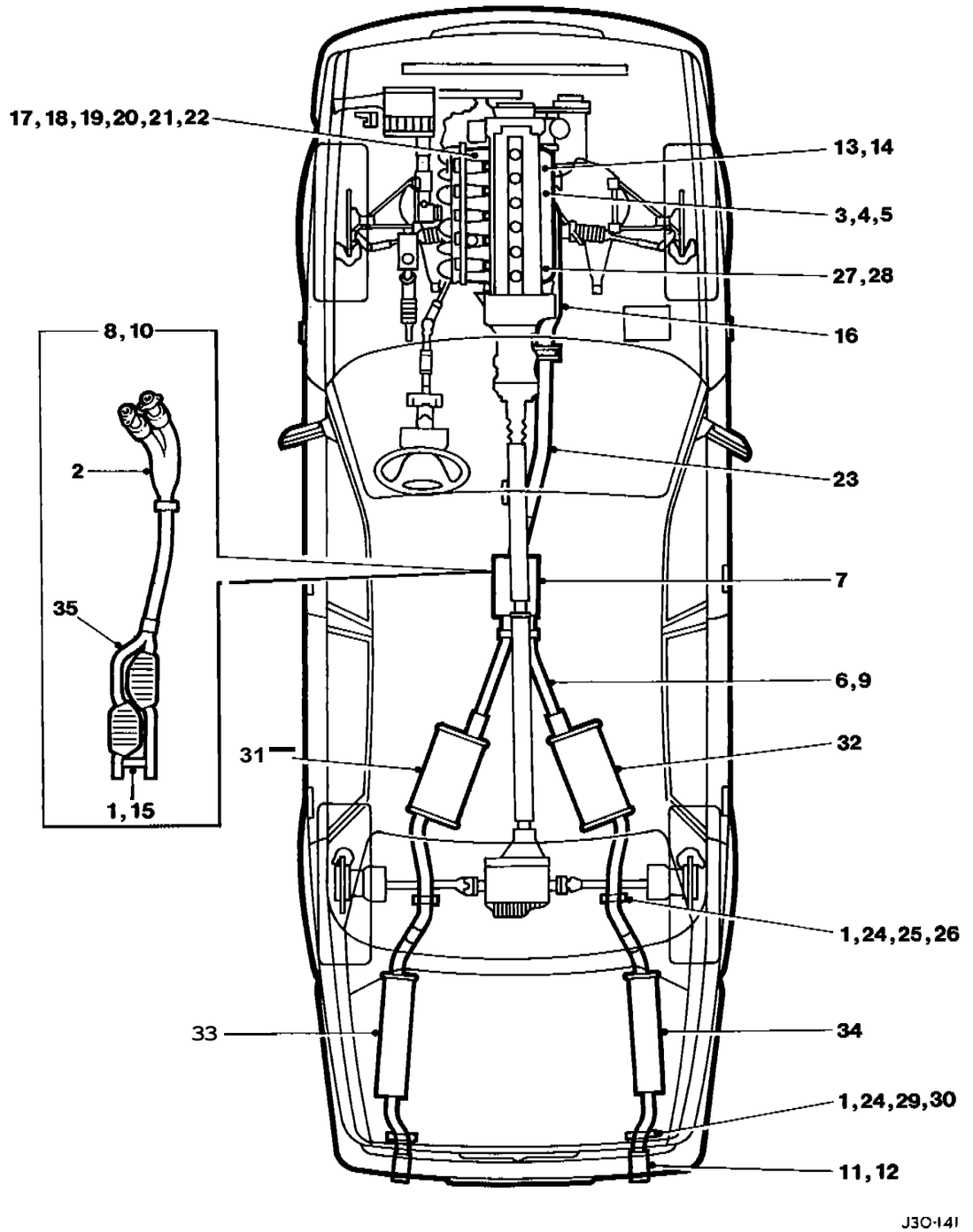
The system is the same as the **twin** catalyst system fitted to 4.0 litre models.
Refer to Section 30.2 **for** details of components, service procedures. requirements and operations.

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0032K

EXHAUST SYSTEM - NON CATALYST

RENEW **30.10.01**

Using a suitable drift, tap off the exhaust trim.
Remove the nuts securing the left hand tail lamp cover and remove the cover.
Lift the boot carpet to gain access to the nuts securing the rear mounting.
Remove the nuts and bolt (1 Fig 1) and from below remove the mounting from the body/tail pipe.

Repeat the procedure for the opposite side.
Remove the nuts (2 Fig 1) securing the plate to the mounting bracket and remove the bracket.
Repeat the procedure for the opposite side.

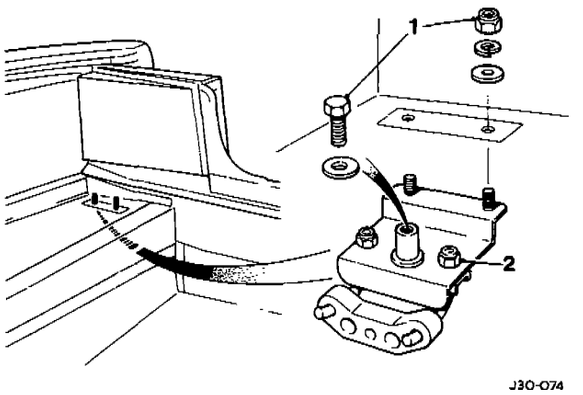


Fig 1

Slacken the tail pipe and silencer to main silencer clamp, nut and bolt (1 Fig 2).
Reposition the clamp from the joint.
Remove the tail pipe and silencer assembly from the main silencer, remove the clamp from the tail pipe.
Repeat the procedure for the remaining tail pipe assembly.

Slacken the clamps securing the main silencers to the intermediate pipe.
Remove the bolts (1 Fig 3) securing the over axle mounting (2 Fig 3) to the axle carrier (3 Fig 3).
Displace the over axle mounting, remove the nut securing the mounting pin and withdraw,
Repeat the procedure for the opposite side.

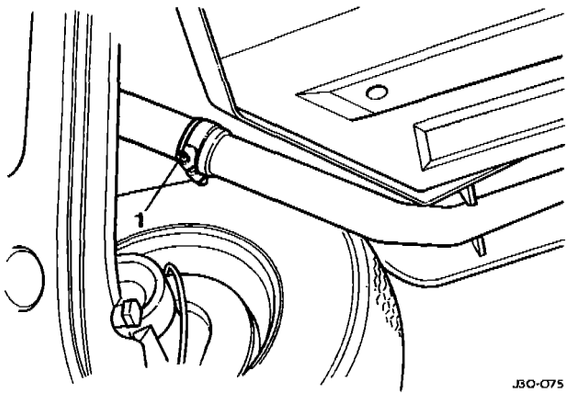


Fig 2

Split the silencers from the intermediate pipe and remove the silencers from the axle carrier.

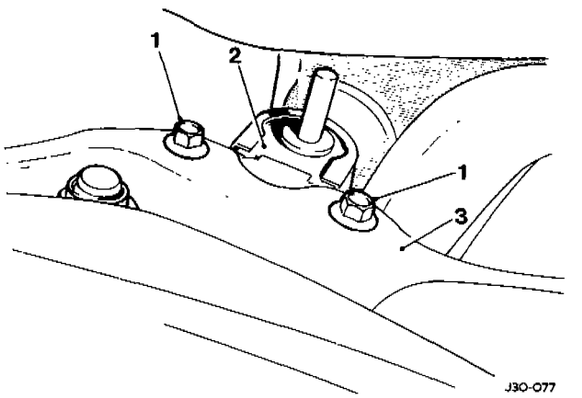


Fig 3

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Place a suitable support **across** the ramp to retain the intermediate pipe.
Remove the clamp (1 Fig 1) securing the intermediate pipe (2 Fig 1) to the front pipe (3 Fig 1).
Reposition the clamp and remove the intermediate pipe and front pipe sealing ring.

Remove the nuts (1 Fig 2) securing the front pipe assembly (2 Fig 2) to the manifold assembly (3 Fig 2) and withdraw the pipe assembly from the vehicle.
Remove and discard the manifold sealing rings.

Reverse the removal procedure to refit the replacement exhaust **system** and mountings, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer, new sealing rings are fitted and that all the component parts when fitted are clear of the underbody and chassis.

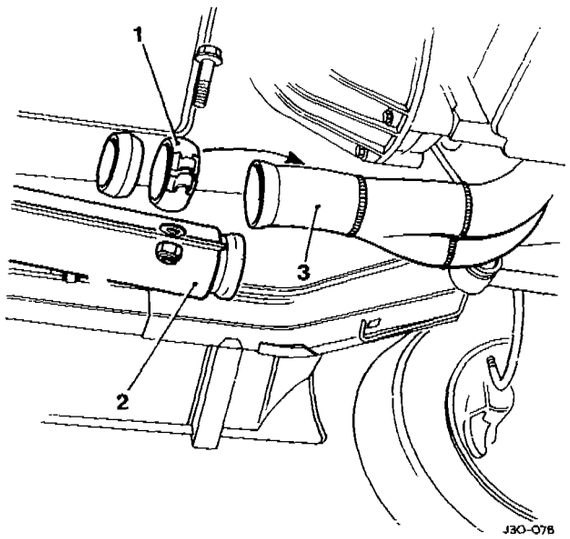


Fig 1

DATA

TORQUE FIGURES

*Intermediate pipe to silencer 15-**18Nm***
*Over axle mounting to axle carrier **22-28Nm***
*Front pipe **to** intermediate pipe **15-18Nm***
*Front pipe to manifold **30-35Nm***
*Mounting pin **to** over axle pipe **14-17Nm***
*Rear silencer mounting to floor 8-**10Nm***

SPANNER SIZES

10mm
11mm
13mm

9/16" AF

OILS/LUBRICANTS/SEALANTS

*Exhaust sealer TIVOLI KAY ADHESIVES **No 5696.***

30058

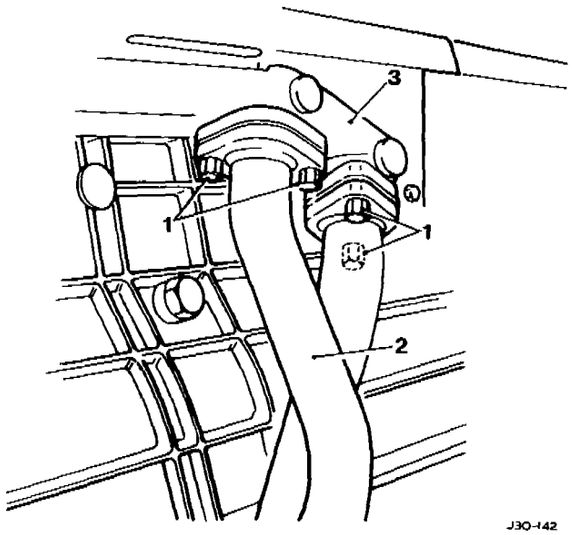


Fig 2

EXHAUST SYSTEM AND CATALYTIC CONVERTOR

RENEW **30.10.02**

Using a suitable drift, tap off the exhaust trim. Remove the nuts securing the left hand tail lamp cover and remove the cover.
Lift the boot carpet to gain access to the nuts securing the rear mounting.
Remove the nuts and bolt (1 Fig 1) and from below remove the mounting from the body/tail pipe.

Remove the nuts (2 Fig 1) securing the plate to the mounting bracket and remove the bracket.
Repeat the procedure for the opposite side.

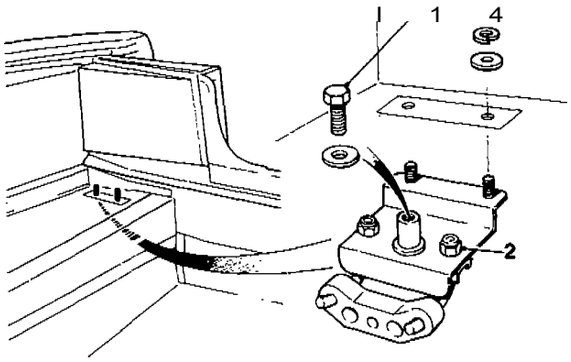


Fig 1

Slacken the tail pipe and silencer to main silencer clamp, nut and bolt (1 Fig 2).
Reposition the clamp from the joint.
Remove the tail pipe and silencer assembly from the main silencer, remove the clamp from the tail pipe.
Repeat the procedure for the remaining tail pipe assembly.

Slacken the clamps securing the main silencers to the underfloor catalyst assembly.
Remove the bolts (1 Fig 3) securing the over axle mounting (2 Fig 3) to the axle carrier (3 Fig 3).
Displace the over axle mounting, remove the nut securing the mounting pin and withdraw.
Repeat the procedure for the opposite side.

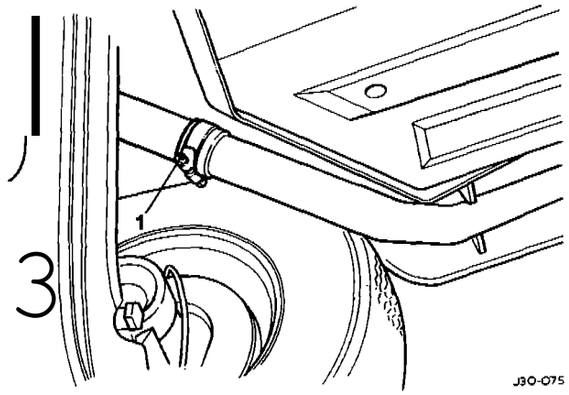


Fig 2

Split the silencers from the underfloor catalyst assembly and remove the silencers from the axle carrier.

Disconnect the two lambda sensor electrical connectors in the engine compartment and release the three harness retaining clips.
Undo and remove the lambda sensor from the downpipe assembly.

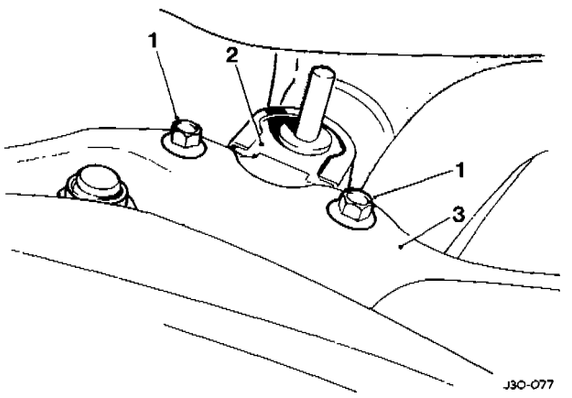


Fig 3

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Place a suitable support across the ramp to retain the underfloor catalyst assembly.
Displace the mounting rubber (1 Fig 1) from its location and withdraw from the support pin.

Remove the clamp (1 Fig 2) securing the underfloor catalyst assembly (5 Fig 2) to the downpipe catalyst assembly (4 Fig 2).
Reposition the clamp and remove the underfloor catalyst assembly and downpipe sealing ring.

Remove the nuts securing the downpipe catalyst assembly to the manifold assembly and withdraw the assembly from the vehicle.
Remove and discard the manifold sealing rings.

Remove the six nuts and bolts securing the underfloor catalyst assembly to the heatshield (6 Fig 2) and remove the heatshield.

Reverse the removal procedure to refit the replacement exhaust system and mountings, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer, new sealing rings are fitted and that all the component parts when fitted are clear of the underbody and chassis.

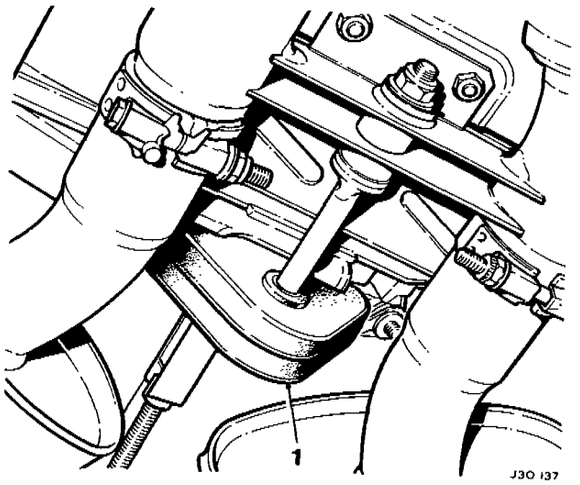


Fig 1

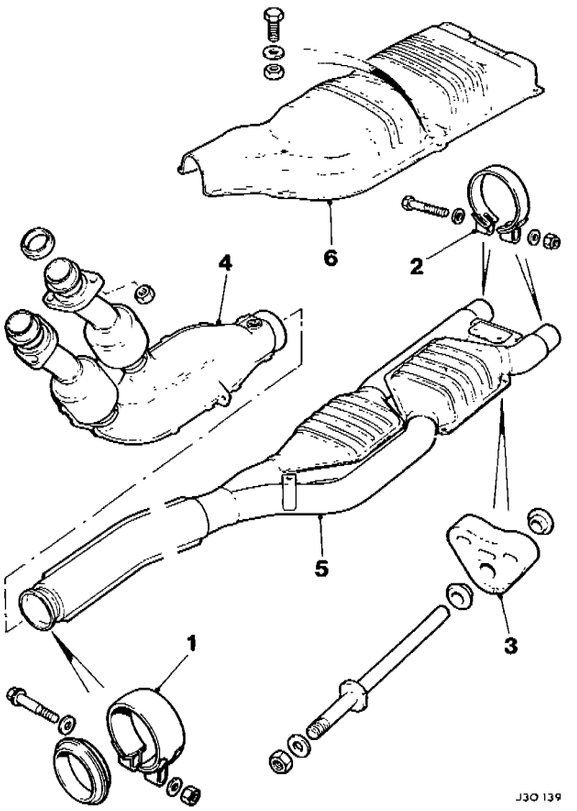


Fig 2

DATA

TORQUE FIGURES

Underfloor catalyst to silencer ***15-18Nm***
Over axle mounting to axle carrier ***22-28Nm***
Downpipe to underfloor catalyst ***15-18Nm***
Downpipe to manifold ***30-35Nm***
Front mounting support pin ***15-17Nm***
Mounting pin to over axle pipe ***15-17Nm***
Rear silencer mounting to floor ***8-10Nm***
Heatshield to underfloor catalyst ***7-9Nm***

SPANNER SIZES

10mm
11mm
13mm

9/16" AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI ***KAY ADHESIVES No 5696.***

3005B

EXHAUST SYSTEM AND MOUNTINGS - NON CATALYST

RENEW **30.10.08**

Remove the complete exhaust system and mountings in accordance with the method detailed in operation 30.10.01 on pages 30.2-04 and 30.2-05.

When refitting the replacement system and mountings ensure that prior to assembly **all** the joints are coated with the recommended exhaust sealer, new sealing rings are fitted and that all the component parts when fitted are clear ***of*** the underbody and chassis.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer TIVOLI KAY* ***ADHESIVES No 5696.***

EXHAUST SYSTEM AND MOUNTINGS - CATALYST

RENEW **30.10.08**

Remove the complete exhaust system and mountings in accordance with **the** method detailed in operation **30.1**0.02 on pages 30.2-06 and 30.2-07.

When refitting the replacement system and mountings ensure that prior **to** assembly all the joints are coated with the recommended exhaust sealer, new sealing rings are fitted and that **all** the component parts when fitted are clear of the underbody and chassis.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust sealer *TIVOLI* ***KAY ADHESIVES No 5696.***

3005B

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FRONT PIPE VEHICLE SET - NON CATALYST

RENEW **30.10.56**

Jack up the vehicle and place on two stands.
Remove the front pipe to intermediate pipe securing nut (1 Fig 1) and bolt (2 Fig 1).
Reposition the exhaust system rearwards to remove the sealing ring.

Remove the nuts (1 Fig 2) securing the front pipe (2 Fig 2) to the manifold (3 Fig 2) assembly and remove the manifold **from** the vehicle.
Remove and discard the manifold sealing rings.
Reverse the removal procedure to refit the replacement front pipe ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

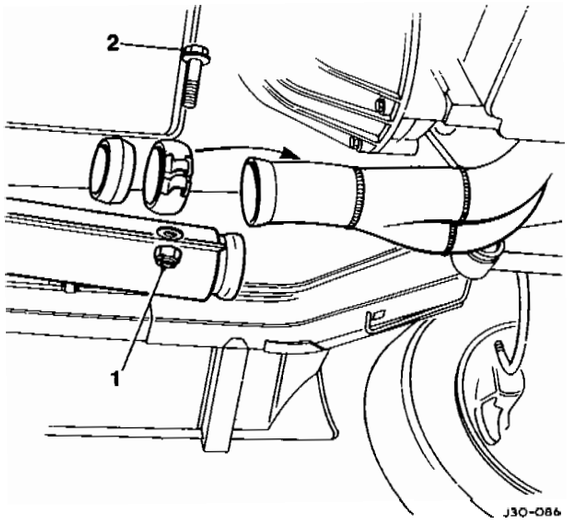


Fig 1

DATA

TORQUE FIGURES

Front pipe to intermediate pipe 15-18Nm
Front pipe to manifold 30-35Nm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

SPANNER SIZES

1Omm
13mm

9/16" AF

3005B

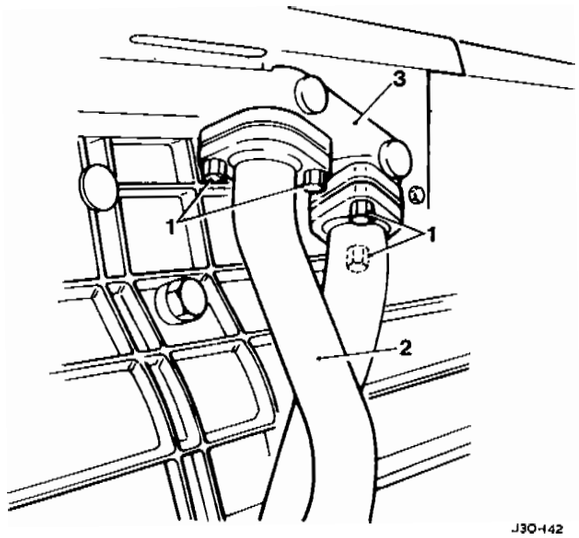


Fig 2

DOWNPIPE CATALYTIC CONVERTOR - VEHICLE SET

RENEW **17.50.08**

Jack up the vehicle and place on two stands.
Disconnect the two lambda sensor electrical connectors in the engine compartment and release the three harness retaining clips.
Undo and remove the lambda sensor from the downpipe assembly.
Remove the nut and bolt securing the joint clamp (1 Fig 1) between the downpipe catalyst assembly and the underfloor catalyst assembly.
Displace the clamp ring forward.
Support the underfloor catalyst assembly and separate the joint.
Remove the nuts (2 **Fig** 1) securing the downpipe catalyst to the exhaust manifold and remove the assembly.
Remove and discard the manifold sealing rings (3 Fig 1).

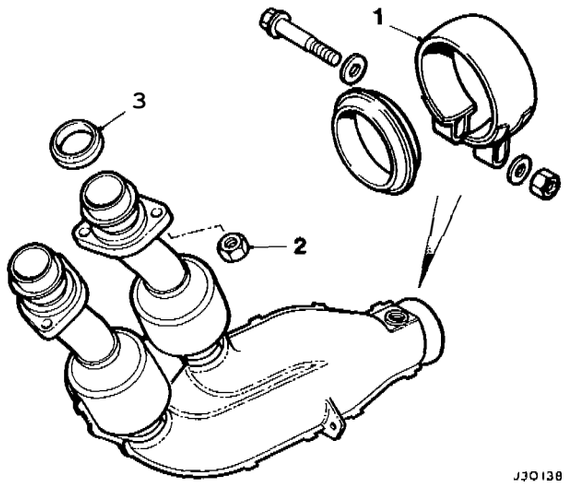


Fig 1

Reverse the removal procedure to fit the replacement assembly.
Ensure that prior to assembly all joints are coated with the recommended exhaust sealer and that all component parts are **clear** of the underbody and chassis.

DATA

TORQUE FIGURES

Downpipe catalyst to underfloor catalyst 15-18Nm
Downpipe catalyst to manifold 30-35Nm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

SPANNER SIZES

10mm
13mm

9/16" AF

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EXHAUST MANIFOLD ENGINE SET

RENEW 30.15.38

Jack up the vehicle and place on two stands.
Remove the nuts (1 Fig **1**) securing the downpipe assembly (2 Fig 1) to the manifold (3 Fig 2), release the securing rings and lower the exhaust system from the manifold.
On vehicles fitted with a lambda sensor release the electrical connections and harness retaining clips.
Open the bonnet.
Remove the **bolts** securing the heat shield to the manifolds and remove the shield.

Remove the nuts (1 Fig 2) securing the front manifold (2 Fig 2) to the cylinder head and remove the front manifold assembly.
Discard the manifold gaskets.

Remove the nuts securing the rear exhaust manifold to the cylinder head, remove the manifold and discard the gaskets.
Remove and discard the downpipe sealing rings, clean the cylinder head and front pipe sealing faces.
Reverse the removal procedure to refit the replacement manifolds, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

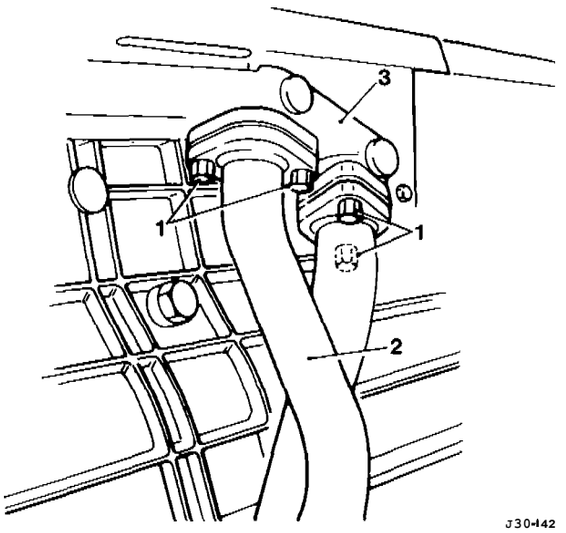


Fig 1

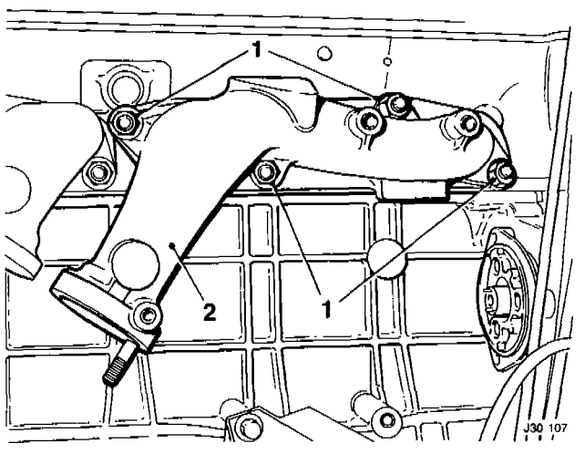


Fig 2

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 49-54Nm
Downpipe to manifold 30-35Nm
Heat shield to manifold 23-27Nm

SPANNER SIZES

10mm
17mm

***9/16"** AF*

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

3005B

EXHAUST MANIFOLD GASKET - ENGINE SET

RENEW **30.15.12**

Remove the front and rear exhaust manifolds in accordance with the method detailed in 30.15.38 on page 30.2-11.

Discard the exhaust manifold gaskets and downpipe sealing rings.

Reverse the procedure to fit the replacement gaskets and sealing rings.
Ensure that prior to assembly all joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

DATA

OILSILUBRICANTSISEALANTS

Exhaust** sealer TIVOLI KAY **ADHESIVES No 5696.

30058

EXHAUST MANIFOLD HEAT SHIELD

RENEW **30.15.09**

Open the bonnet.
Remove the bolts securing the heat shield to the manifold and remove the heat shield.
Reverse the removal procedure to refit.

DATA

TORQUE FIGURES

Heat shield to manifold 23-27Nm

SPANNER SIZES

1Omm

3005B

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EXHAUST SYSTEM

ALIGN 30.10.04

Raise the vehicle on a ramp.
Remove the bolt securing the clamp, downpipe/ intermediate pipe.
Align the intermediate pipe to the vehicle, smear the olive with sealer, fit and tighten the clamp.
Slacken the clamps securing the intermediate pipe to the silencers, align the silencers to the vehicle, smear with exhaust sealant, realign the clamps and tighten.
Slacken the clamps (1 Fig 1) securing the silencers (2 Fig 1) to the tail pipe assemblies (3 Fig 1), align the tail pipes to the vehicle, smear the joints with sealant and tighten the clamps.
Lower the vehicle.

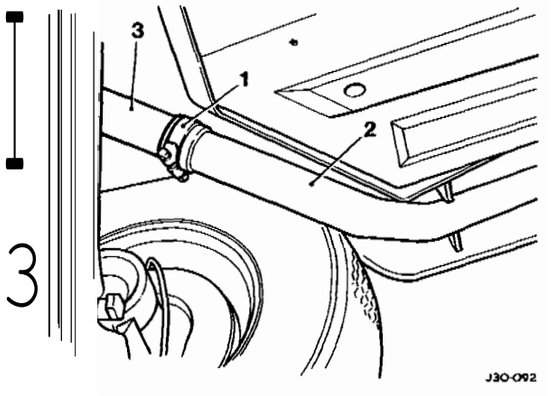


Fig 1

DATA

TORQUE FIGURES

Intermediate pipe to silencer ***15-18Nm***
Downpipe to intermediate pipe ***15-18Nm***
Downpipe to manifold 30-35Nm

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30058

EXHAUST TRIM

RENEW 30.10.23

Using a suitable drift, tap off the exhaust trim.
Clean the tail pipe.
fit and seat the replacement trim to the tail pipe.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30058

EXHAUST TRIM VEHICLE SET

RENEW **30.10.40**

Using a suitable drift, tap **off** the exhaust trims.
Clean the tail pipes.
Fit and seat the replacement trims to the tail pipes.

DATA

OILS/LUBRICANTS/SEALANTS

Exhaust ***sealer TIVOLI KAY ADHESIVES No 5696.***

30058

FRONT MOUNTING RUBBER - CATALYST

RENEW **30.20.02**

Jack up the rear of the vehicle and place on two stands.
Release the mounting rubber (1 Fig 1) from its location hangers.
Withdraw the mounting rubber from the support pin and remove.

Apply soft soap to the replacement rubber and locate onto support pin.
Slide the rubber onto supprt pin and locate onto hangers.
Check to ensure that no part of the exhaust system fouls the body/chassis.

30058

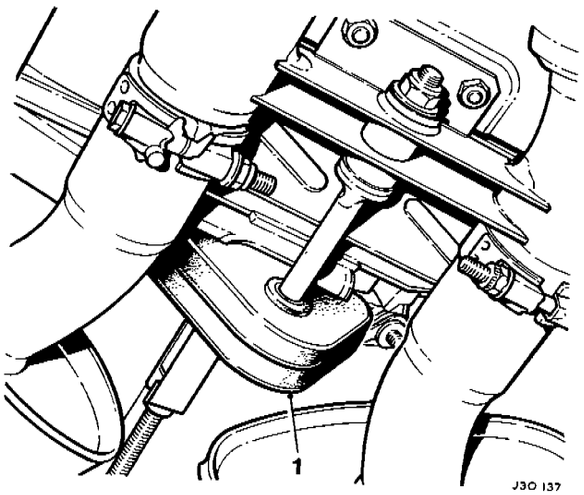


Fig 1

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OVER AXLE MOUNTING RUBBER

RENEW 30.20.16

Jack up the rear of the vehicle and place on two stands.
Remove the bolts (1 Fig 1) securing the mounting (2 Fig 1) to the **axle** carrier (3 Fig 1).
Remove the mounting from the axle carrier, pivot the mounting on the exhaust pin and withdraw.
Remove the insulation bush from the mounting and the rubber from the bracket.

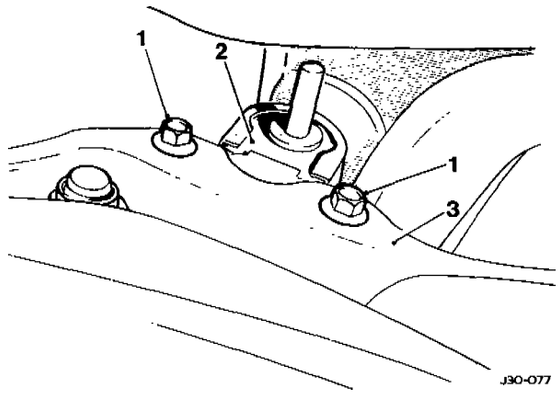


Fig 1

Apply soft **soap** to the replacement rubber and seat **the** rubber in the mounting bracket.
Reverse the removal procedure to refit the replacement mounting.
Check to ensure that no part **of** the exhaust system fouls the body/chassis.

DATA

TORQUE FIGURES

Over** axle **mounting to axle carrier 22-28Nm
Mounting pin to over** axle **pipe 15-17Nm

SPANNER SIZES

10mm
13mm

30058

OVER AXLE MOUNTING RUBBER VEHICLE SET

RENEW 30.20.17

Remove the over axle mounting rubber in accordance with the method detailed in 30.20.16.

Repeat the procedure for the opposite side.
Check **to** ensure that no part **of** the exhaust system fouls the chassis.

INTERMEDIATE PIPE AND SILENCER - NON CATALYST

RENEW **30.10.19**

Raise the vehicle on a ramp.
Slacken the clamps (1 Fig 1) securing the intermediate pipe (2 Fig 1) to the main silencers (3 Fig 1). Move both main silencers rearwards from the intermediate pipe.

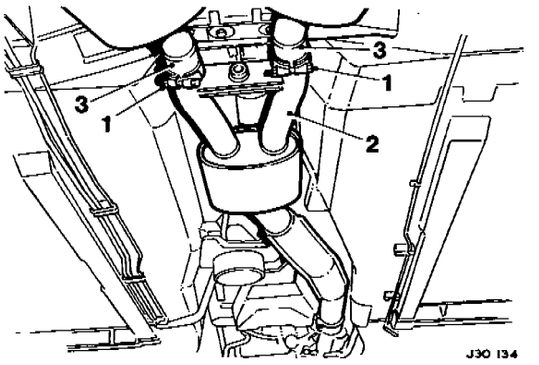


Fig 1

Remove the clamp nut and bolt (1 Fig 2) securing the intermediate pipe (2 Fig 2) to the front pipe.
Split the intermediate pipe from the front pipe and main silencers.
Retrieve the front pipe sealing ring.

Clean all relevent joints renew all sealing rings and reverse the removal procedure to refit the replacement intermediate pipe and silencer, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

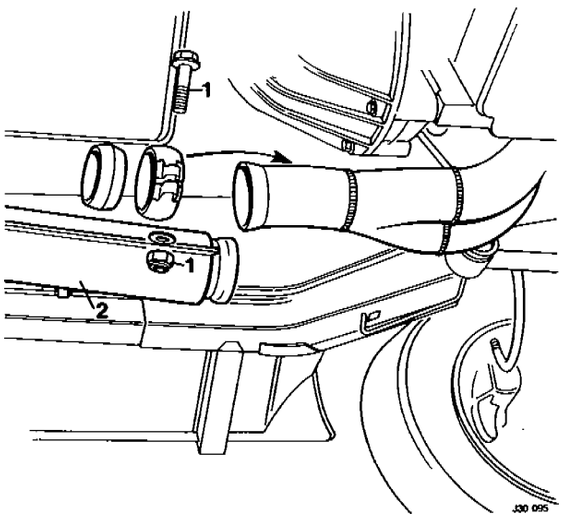


Fig 2

DATA

TORQUE FIGURES

Intermediate pipe to silencer 15-18Nm
Front pipe to intermediate pipe 15-18Nm

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30058

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UNDERFLOOR CATALYTIC CONVERTOR VEHICLE SET

RENEW 17.50.13

Raise the vehicle on a ramp.
Slacken the clamps (2 Fig 1) securing the underfloor catalyst (5 Fig 1) to the main silencers.
Slacken the clamp nut and bolt (1 Fig 1) securing the downpipe catalyst (4 Fig 1) to the underfloor catalyst.
Release the front mounting rubber (3 Fig 1) from the location hangers and withdraw the mounting from the support pin.
Separate the underfloor catalyst assembly from the downpipe assembly and main silencers and remove the assembly from the vehicle.
Retrieve the front pipe sealing ring.

Undo and remove the six nuts and bolts securing the heatshield (6 Fig 1) to the catalyst assembly and remove the heatshield.
Undo and remove the nut securing the mounting support pin to the assembly.
Withdraw the pin complete with washers.

Clean all relevent joints renew all sealing rings and reverse the removal procedure to refit the replacement assembly, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

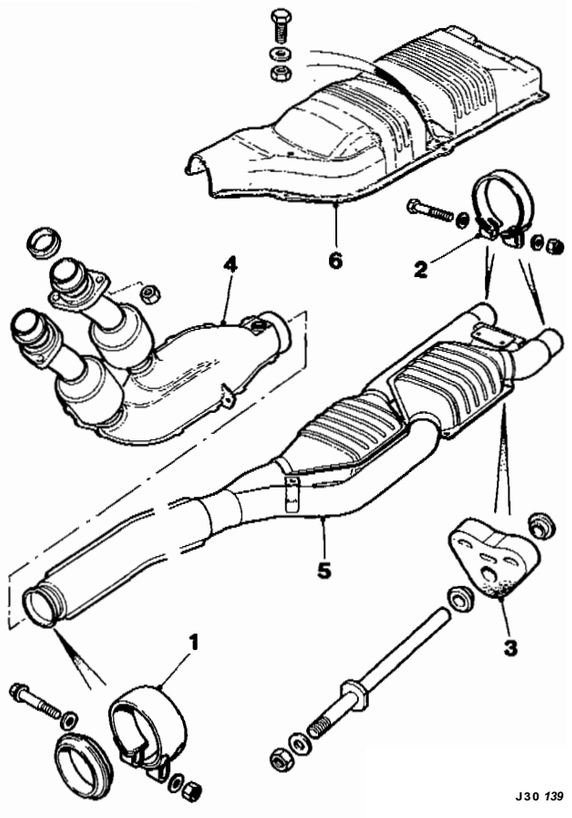


Fig 1

DATA

TORQUE FIGURES

Underfloor catalyst to silencer 15-18Nm
Downpipe to underfloor catalyst 15-18Nm
Heatshield securing bolts 7-9Nm
Support pin securing nut 15-17Nm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30058

REAR MOUNTING RUBBER

RENEW **30.20.04**

Open the boot.
Remove the nuts securing the tail lamp cover and remove the cover.
Lift the boot carpet to gain access to the nuts securing the rear mounting.
Remove the nuts and bolt (1 Fig 1), from **below** remove the mounting from the body/tail pipe.
Remove the nuts (2 Fig **1)** securing the plate to the mounting bracket and remove the bracket.
Reverse the removal procedure to refit the mounting rubber and check to ensure that no part of the exhaust system fouls the body/chassis.

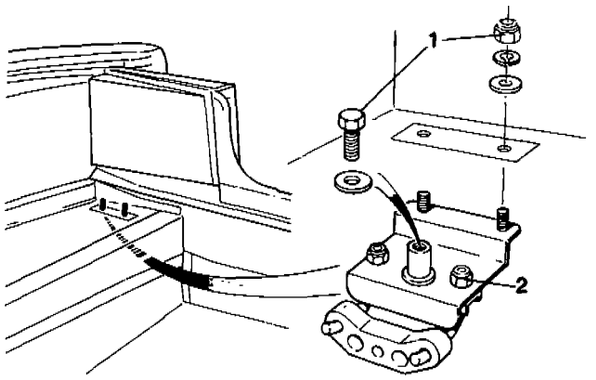


Fig 1

DATA

TORQUE FIGURES

*Rear **silencer mounting to floor 8-10Nm***

SPANNER SIZES

13mm

OILS/LUBRICANTS/SEALANTS

Rear mounting rubber Soft soap

30058

REAR MOUNTING RUBBER VEHICLE SET

RENEW **30.20.14**

Remove the rear mounting rubber in accordance with the method detailed in 30.20.04.

Repeat the procedure for the opposite side.

Reverse the removal procedure to refit the mounting rubbers and check to ensure that no part of the exhaust system fouls the body/chassis.

3005B

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MOUNTING RUBBER VEHICLE SET - NON CATALYST

RENEW **30.20.06**

Replace the rear mounting rubbers in accordance with the method detailed in operation 30.20.14.

Replace the over axle mounting rubbers in accordance with the method detailed in operation 30.20.17

Check to ensure that no part of the exhaust system fouls the body/chassis.

DATA

TORQUE FIGURES

Over axle** mounting **to axle** carrier **22-28Nm
*Mounting **pin to** over **axle pipe 14-17Nm***
Rear** silencer mounting **to floor 8-10Nm

SPANNER SIZES

*1 **Omm***
13mm

OILS/LUBRICANTS/SEALANTS

*Mounting rubbers **Soft soap***

30058

CATALYST SYSTEM MOUNTING RUBBER - VEHICLE SET

RENEW **30.20.18**

Replace the front mounting rubber in accordance with the method detailed in operation 30.20.06

Replace the over axle mounting rubbers in accordance with the method detailed in operation 30.20.17

Replace the rear mounting rubbers in accordance with the method detailed in operation 30.20.14

Check to ensure that no part of the exhaust system fouls the chassis.

SILENCER ASSEMBLY LEFT HAND

RENEW **30.10.15**

Raise the vehicle on a ramp.
Slacken the tail pipe to silencer clamp nut and bolt.
Disconnect the tailpipe assembly from the main silencer.
Remove the intermediate pipe and silencer 30.10.19
Remove the silencer from the axle carrier and front mounting.
Remove the nut securing the silencer mounting pin.
Remove the pin and insulation bushes.
Clean the relevent exhaust joints.
Reverse the removal procedure to refit the replacement silencer ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

DATA

TORQUE FIGURES

Intermediate pipe to silencer 15-18Nm
Mounting pin to over axle pipe 14-17Nm

SPANNER SIZES

10mm
11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

3005B

SILENCER ASSEMBLY RIGHT HAND

RENEW **30.10.16**

Raise the vehicle on a ramp.
Slacken the tail pipe to silencer clamp nut and bolt (1 Fig 1).
Disconnect the tailpipe assembly (3 Fig 1) from the main silencer (2 Fig 1).
Remove the intermediate pipe and silencer 30.10.19
Remove the silencer from the axle carrier and front mounting.
Remove the nut securing the silencer mounting pin.
Remove the pin and insulation bushes.

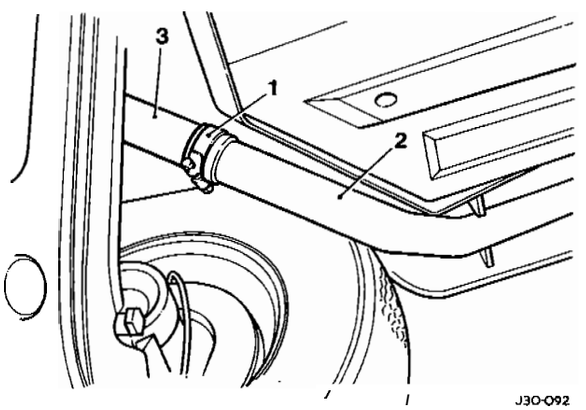


Fig 1

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Clean the relevent exhaust joints.
Reverse the removal procedure to refit the replacement silencer ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

DATA

TORQUE FIGURES

Intermediate pipe to silencer 15-18Nm
Mounting pin to over axle pipe 14-17Nm

SPANNER SIZES

10mm
11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

30058

TAIL PIPE AND SILENCER LEFT HAND

RENEW 30.10.22

Jack up the rear of the vehicle and place on two stands.
Remove the exhaust trim in accordance with the method detailed in operation 30.20.23.
Remove the rear mounting rubber in accordance with the method detailed in operation 30.20.04.
Slacken the tail pipe and silencer to main silencer clamp, nut and bolt.
Reposition the clamp from the union to the tail pipe assembly.
Remove the tail pipe and silencer assembly from the main silencer, remove the clamp from the tail pipe and clean all the relevent exhaust joints.

Reverse the removal procedure to refit the replacement tail pipe and silencer ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer and that all the component parts are clear of the underbody and chassis.

DATA

TORQUE FIGURES

Intermediate pipe to silencer ***15-18Nm***
Mounting ***pin to*** *over axle pipe* ***14-17Nm***
Rear silencer mounting ***to floor 8-10Nm***

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer TIVOLI* ***KAY ADHESIVES No 5696.***

30058

TAIL PIPE AND SILENCER RIGHT HAND

RENEW **30.10.52**

Remove the right hand tail pipe and silencer assembly in accordance with the method detailed in operation 20.10.22.

FRONT EXHAUST MANIFOLD

RENEW **30.15.36**

Jack up the front of vehicle and support with **axle** stands.
Remove the nuts (1 Fig 1) securing the downpipe assembly (2 Fig 1) to the manifold (3 Fig 1).
Release the securing rings and lower the exhaust system from the manifold.

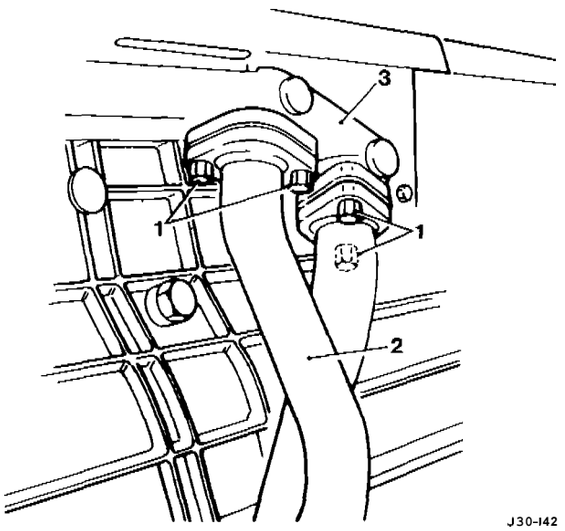


Fig 1

Open the bonnet.
Remove the heat shield to manifold securing **bolts** and remove the shield.
Remove the nuts (1 Fig 2) securing the front manifold (2 Fig 2) to the cylinder head and remove the front manifold assembly.

Discard the manifold gaskets.
Remove and discard the front pipe sealing rings, clean the cylinder head and front pipe sealing faces.
Reverse the removal procedure to refit the replacement manifold, ensuring that prior to assembly all joints are coated with the recommended exhaust sealer, and that all the component parts are clear of the underbody and chassis.

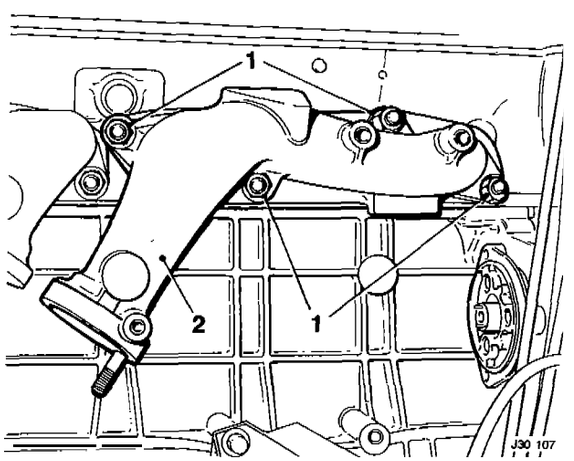


Fig 2

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DATA

TORQUE FIGURES

*Exhaust manifold **to** cylinder head **23-27 Nm***
*Downpipe to manifold **30-35Nm***
*Heat shield to manifold **23-27Nm***

SPANNER SIZES

1Omm
17mm

9/16 AF

OILS/LUBRICANTS/SEALANTS

*Exhaust **sealer TIVOLI KAY ADHESIVES No 5696***

30058

FRONT EXHAUST MANIFOLD GASKET .

RENEW **30.15.20**

Remove the front exhaust manifold in accordance with the method detailed in operation 30.10 36. Discard the manifold gasket.

Reverse the removal procedure to refit the manifold and replacement gasket, ensuring that prior to assembly all joints are coated with the recommended exhaust sealer, and that all the component **parts** are clear of the underbody and chassis.

DATA

TORQUE FIGURES

*Exhaust manifold **to** cylinder head **23-27 Nm***
*Downpipe to manifold **30-35Nm***
*Heat shield to manifold **23-27Nm***

SPANNER SIZES

1Omm
17mm

*9/16 **AF***

OILS/LUBRICANTS/SEALANTS

*Exhaust sealer **TIVOLI KAY** ADHESIVES **No** 5696*

30058

INDUCTION MANIFOLD ENGINE SET

RENEW **30.15.01**

Open the bonnet.
Remove the air cleaner element.
Depressurise the fuel system 19.50.02
Disconnect the injector plugs.
Disconnect the idle speed actuator multi-plug

Disconnect the air conditioning hose from the manifold (AIRCON ONLY).
Remove the dipstick(s) to manifold securing bolt.
Disconnect the cruise control operating rod and vacuum hose.
Disconnect the throttle cable from the linkage (Fig 1).
Slacken off the cable locknut (1 Fig 1), and re-position the cable away from the bracket.
Disconnect the breather hose from the part throttle control valve housing and oil filler tube.
Disconnect the intake elbow hose from the part throttle housing.
Disconnect the air flow meter multi-plug.
Remove the air flow meter earth lead.
Remove the air flow meter mounting securing nut.
Unfasten the airbox retaining clips.
Displace and remove the air flow meter/intake elbow assembly.
Disconnect the fuel return hose from the pressure regulator [Fig 2).
Fit blanking plugs to the hose and regulator.

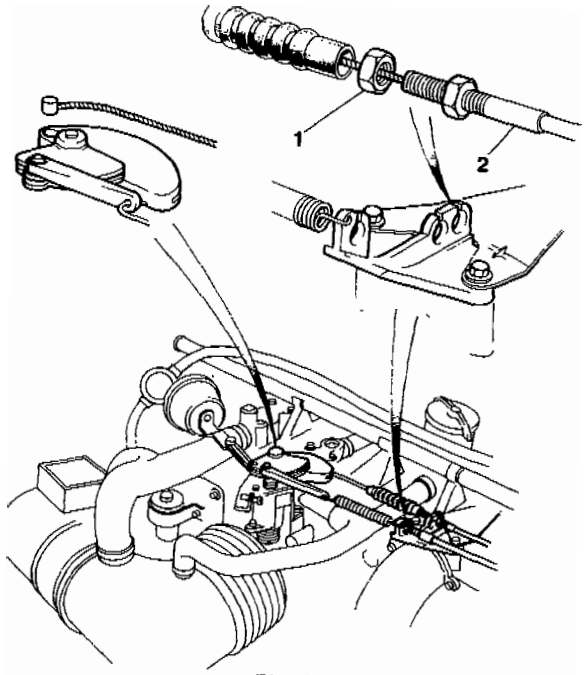
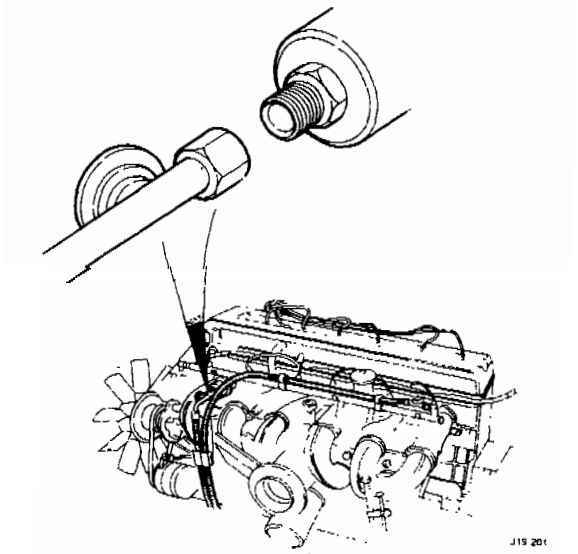
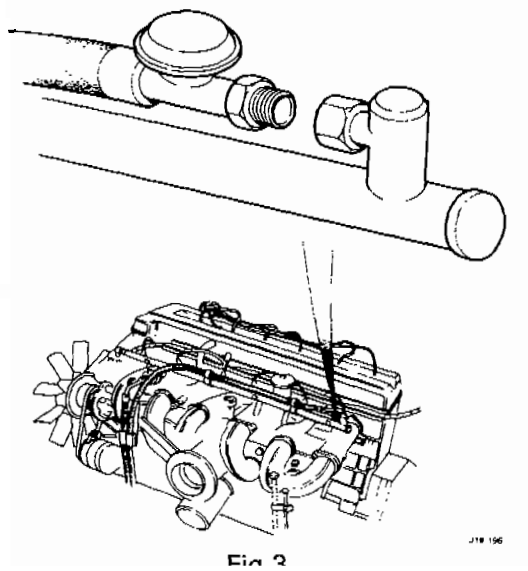


Fig 1


Fig 2

Unclip the fuel feed hose from the fuel rail.
Disconnect the fuel feed hose from the fuel rail (Fig 3).
Re-position the hose away from the rail.
Fit plugs to the hose and rail.
Release the fuel hose to manifold retaining clip.

Re-position the fuel hose away from the manifold.
Disconnect the coolant hoses from the part throttle control housing.
Fit plugs to the hoses to prevent coolant loss.
Disconnect the engine breather hose from the **cam** cover.
Disconnect the throttle potentiometer multi-plug.
Remove the oil filler tube to mounting bracket securing bolt.
Remove the induction manifold to cylinder head securing nuts/bolts.
Re-position the earth lead away from the front manifold securing stud.


Fig 3

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Re-position the engine harness mounting brackets away from the manifold studs.
Remove the oil filler tube to manifold mounting bracket.
Remove the remaining manifold securing bolt (the bolt remains captive).
Remove the manifold assembly.
Remove and discard the manifold gaskets.
Clean the cylinder head gasket face.
Transfer all ancilliary components to the replacement induction manifold.
Fit a new seal to the oil filler tube housing.
Fit new manifold gaskets to the cylinder head.
Fit and align the manifold to the cylinder head.
Ensure that all hoses, harnesses and cables are free.

Reverse the removal procedure to refit the replacement manifold.
Ensure that, **prior** to fitting, the intake tubes are coated with Hylosil and that new 'O' rings are fitted to the injectors.
Adjust the throttle linkage.
Adjust the cruise control linkage.
Refit the air cleaner.
Close the bonnet.

DATA

TORQUE FIGURES

Throttle body to manifold ***23-27Nm***
Cruise control bracket ***to*** *cylinder head* ***9.5-12Nm***
Elbow to manifold ***12.2Nm***
Fuel rail to manifold 9.5-12Nm
Idle air and E.G.R. with purge adaptor to manifold ***9.5-12Nm***
Idle air and E.G.R. without purge adaptor to manifold 9.5-12Nm
Idle air and purge adaptor to manifold ***9.5-12Nm***
Inlet manifold to cylinder head (nuts) ***23-27Nm***
Inlet manifold to cylinder head (bolts) ***23-27Nm***
Throttle body to manifold ***23-27Nm***

SPANNER SIZES

8mm
I Omm
13mm

OILS/LUBRICANTS/SEALANTS

Intake tubes to manifold Hylosil 102

30058

INDUCTION MANIFOLD GASKET ENGINE SET

RENEW **30.15.08**

Open the bonnet.
Depressurise the fuel system 19.50.02
Remove the bolt securing the heater feed pipe to the rear of the manifold.
Re-position the vacuum valve from the heater feed pipe.
Remove the bolt securing the dipstick tube, slacken the clips securing the breather hose to the oil trap turret and disconnect the hose from the trap.
Slacken the clip securing the induction elbow hose and re-position the hose from the elbow.
Disconnect the air flow **meter** multi-plug, cut the ratchet strap securing the harness to the cylinder head front securing bolt.
Disconnect the crank sensor multi-plug and the spark plug leads.
Remove the nuts and bolts securing the manifold and re-position the earth leads away from the studs.
Carefully lift the manifold from the cylinder head ensuring that any harnesses/hoses are not stressed.
Support the manifold using a suitable chock, remove and discard the gaskets.
Clean the mating faces, fit and align the gaskets and reverse the removal procedure to refit the replacement gaskets.

DATA

TORQUE FIGURES

Inlet manifold to cylinder ***head*** **(nuts)** *23-27Nm*
Inlet manifold to cylinder ***head (bolts)*** *23-27Nm*

SPANNER SIZES

8mm
10mm
13mm

30058

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INTAKE TUBE

RENEW 30.15.30

Open the bonnet.
Remove the nuts securing the air by-pass valve to the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Re-position the fuel hose from the retaining bracket and the by-pass valve for access to the lower securing bolt.
Remove the bolt securing the lower mounting bracket followed by the remaining securing bolts.
Remove the by-pass valve/fuel hose mounting from the manifold.
Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and re-position the turret from the throttle housing (Fig 1).
Remove the intake tube to manifold securing bolts and remove the intake tube.
Clean the gasket faces and reverse the removal procedure to refit the replacement intake tube ensuring that 'Hylosil' is applied to the gasket faces prior to reassembly.

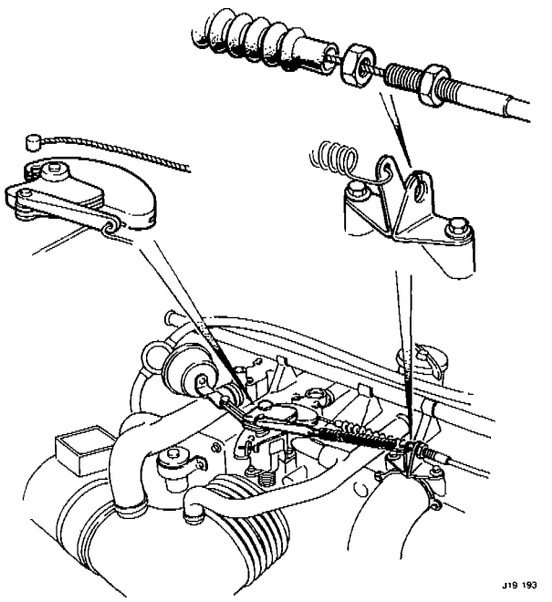


Fig **1**

DATA

TORQUE FIGURES

*Throttle **body to** manifold **23-27Nm***

SPANNER SIZES

6mm
8mm

OILS/LUBRICANTS/SEALANTS

***Intake** tube **to** cylinder head Hylosil 102*

30058

INTAKE TUBE GASKET

RENEW 30.15.31

Open the bonnet.
Remove the nuts securing the air by-pass **valve** to the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Re-position the fuel hose from the retaining bracket and the by-pass valve for access to the lower securing bolt.
Remove the bolt securing the lower mounting bracket followed by the remaining securing bolts.
Remove the by-pass valve/fuel hose mounting from the manifold.

Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and re-position the turret from the throttle housing.
Remove the intake tube to manifold securing bolts and remove the intake tube.
Clean the gasket faces and reverse the removal procedure to refit the intake tube ensuring that **'Hylosil'** is applied to the gasket faces prior to reassembly.

DATA

TORQUE FIGURES

Throttle body to manifold 23-27Nm

SPANNER SIZES

6mm
8mm

OILS/LUBRICANTS/SEALANTS

Intake tube to cylinder head Hylosil 102

30058

INTAKE TUBE GASKET VEHICLE SET

RENEW 30.15.33

Open the bonnet.
Remove the nuts securing the air by-pass valve to the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Re-position the fuel hose from the retaining bracket and the by-pass valve for access to the lower securing bolt.
Remove the bolt securing the lower mounting bracket followed by the remaining securing bolts.
Remove the by-pass valve/fuel hose mounting from the manifold.
Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and re-position the turret from the throttle housing **(Fig 1).**

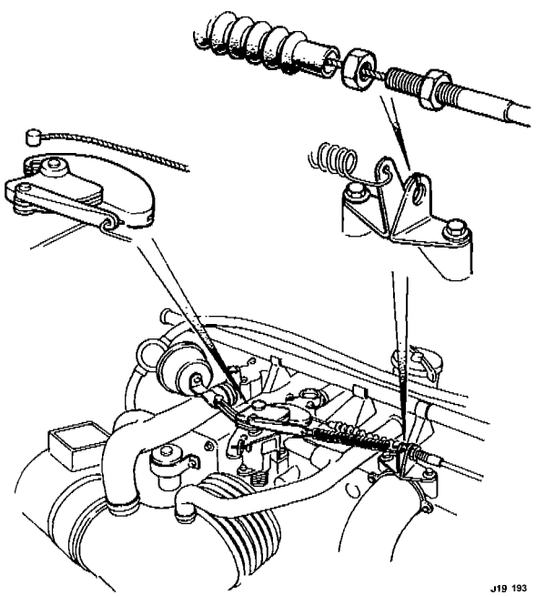


Fig 1

Remove the intake tube to manifold securing bolts and remove the intake tube.
Repeat the procedure **for** the remaining tubes to remove.
Clean the gasket faces and reverse the removal procedure to refit the intake tubes ensuring that 'Hylosil' is applied to the gasket faces prior to reassembly.

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DATA

TORQUE FIGURES

Throttle body to manifold 23-27Nm

SPANNER SIZES

6mm
8mm

OILS/LUBRICANTS/SEALANTS

Intake tube to cylinder head Hylosil 102

30058

INTAKE TUBE VEHICLE SET

RENEW 30.15.32

Open the bonnet.
Remove the nuts securing the air by-pass valve to the mounting rubbers.
Remove the mounting plates and release the fuel hose to manifold retaining clip.
Re-position the fuel hose from the retaining bracket and the by-pass valve for access to the lower securing bolt.
Remove the bolt securing the lower mounting bracket **followed** by the remaining securing bolts.
Remove the by-pass valve/fuel hose mounting from the manifold.
Disconnect the throttle return springs from the linkage and remove the bolts securing the throttle linkage turret to the throttle housing and re-position the turret from the throttle housing (Fig 1).
Remove the intake tube to manifold securing bolts and remove the intake tube.
Repeat the procedure for the remaining tubes to remove.
Clean the gasket faces and reverse the removal procedure to refit the replacement intake tubes ensuring that 'Hylosil' is applied to the **gasket** faces prior to reassembly.

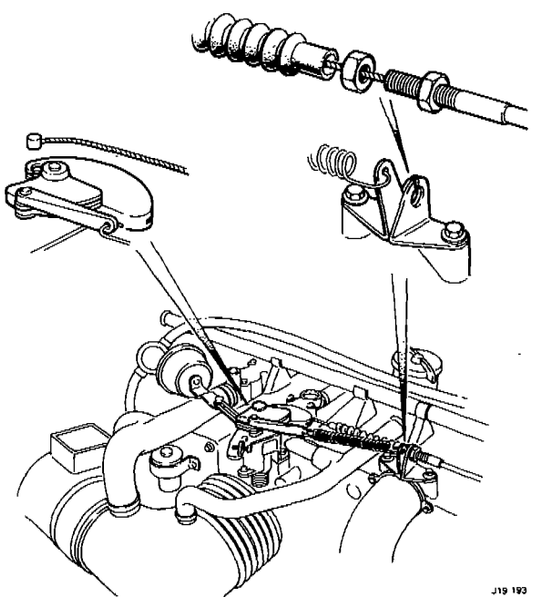


Fig 1

DATA

TORQUE FIGURES

Throttle body to manifold 23-27Nm

SPANNER SIZES

6mm
8mm

OILS/LUBRICANTS/SEALANTS

Intake tube to cylinder head Hylosil 102

30058

REAR EXHAUST MANIFOLD GASKET

RENEW 30.15.21

Jack up the front of vehicle and support with axle stands.
Remove the nuts (1 Fig 1) securing the downpipe assembly (2 Fig 1) to the manifold (3 Fig 1).
Release the securing rings and lower the exhaust system from the manifold.
Open the bonnet.
Remove the heat shield to manifold securing bolts and remove the shield.
Remove the nuts securing the rear manifold to the cylinder head and remove the rear manifold assembly.

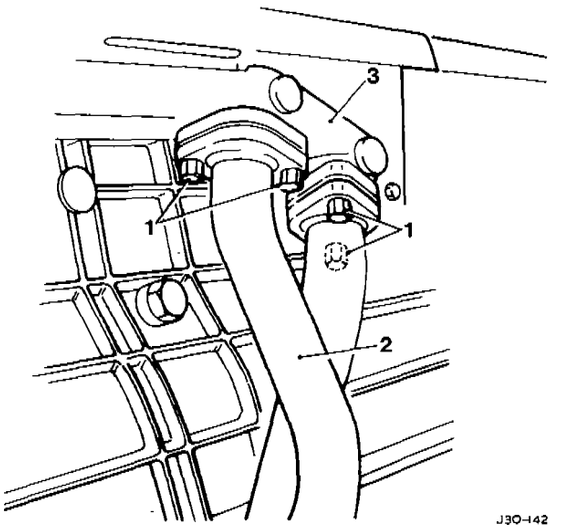


Fig 1

Discard the manifold gaskets.
Remove and discard the downpipe sealing rings, clean the cylinder head and downpipe sealing faces.
Reverse the removal procedure to refit the manifold and replacement gasket, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer, and that all the component parts are clear of the underbody and chassis.

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 23-27 Nm
Downpipe to manifold 30-35Nm
Heat shield to manifold 23-27Nm

SPANNER SIZES

10mm
17mm

9/16 AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696

3005B

REAR EXHAUST MANIFOLD

RENEW 30.15.37

Remove the rear exhaust manifold in accordance with the method detailed in operation 30.15.21.

Reverse the removal procedure to refit the manifold, ensuring that prior to assembly all the joints are coated with the recommended exhaust sealer, and that all the component parts are clear of the underbody and chassis.

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EXHAUST MANIFOLD - ENGINE SET - FEDERAL

RENEW **30.15.38.**

Open the bonnet.
Raise the vehicle at one end, support with two stands
From below:-
Undo the E.G.R. **valve** transfer pipe to the inlet manifold union.
Disconnect the oxygen sensor harness multi-plugs (where fitted).
Cut and remove the harness to the gearbox cooler pipes ratchet strap.
Undo and remove the front pipe to the bell housing mounting securing nuts and bolt.
Displace and remove the mounting bracket.
Undo and remove the front pipe to the manifold securing nuts.

Reposition the securing rings from the studs.
Lower the exhaust system from the manifolds.
From the engine bay:-
Slacken the air pipe to manifold union nuts.
Reposition the air pipes from manifolds.
Renew the exhaust manifold heat shield.
Undo and remove the front manifold to cylinder head securing nuts.
Displace and remove the front manifold assembly
Remove and discard the manifold gasket.
Undo and remove the rear manifold securing nuts.
Carefully displace and remove the rear manifold assembly.
Ensure that the air pipes are not twisted.
Remove and discard the manifold gasket.
Remove and discard the front pipe sealing rings.
Clean the head, manifold and front pipe faces.
Fit and **seat** the new sealing rings to the front pipe.
Fit new gaskets to the cylinder head studs.
Fit but do not fully seat the rear manifold to head studs.
Fit but do not fully tighten the manifold upper securing nuts.
Fully seat the manifold to the head.
Fit and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Fit but do not fully seat the front manifold to the head.
Fit but do not fully tighten the manifold upper securing nuts.
Fully seat the manifold to the head.
Fit and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Refit the heat shield.
Reposition the air pipes to the manifold.
Tighten the pipe to manifold union nuts.
From below:-
Position the exhaust system to the manifold.
Align the securing rings to the studs.
Fit and tighten the front pipe to manifold securing nuts.
Fit and align the front pipe to the bell housing mounting bracket.
Fit and tighten the mounting securing nuts and bolt.

Connect the E.G.R. transfer pipe to the manifold.
Connect the sensor harness multi-plugs.
Secure the harness to the gearbox cooler pipes with the ratchet strap.
Lower the vehicle from the stands
Close the bonnet.

DATA

TORQUE FIGURES

Exhaust *manifold to cylinder* ***head 23-27 Nm***
Front pipe *to manifold 30-35Nm*
Heat shield to manifold 23-27Nm

SPANNER SIZES

10mm
17mm

9/16 AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY **ADHESIVES** ***No 5696***

30058

REAR EXHAUST MANIFOLD - FEDERAL

RENEW 30.15.37

Open the bonnet.
Raise the vehicle at one end, support with two stands.
Disconnect the oxygen sensor harness multi-plugs (where fitted).
Cut and remove the harness to gearbox cooler pipe ratchet strap.
Undo and remove the front pipe to bell housing mounting securing nuts and bolt.
Displace and remove the mounting bracket.
Undo and remove the front pipe to manifold securing nuts.
Reposition the securing rings from the studs.
Lower the exhaust system from the manifolds.
Undo the E.G.R. valve to inlet manifold union nut.
From the engine bay:-
Slacken the air pipe to manifold union nuts.
Reposition the air pipes from the manifolds.
Renew the exhaust manifold heat shield.
Undo and remove the rear manifold securing nuts.
Carefully displace and remove the rear manifold assembly.
Ensure that the air pipes are not twisted.
Remove and discard the manifold gasket.
Remove and discard the front pipe sealing rings.
Clean the head, manifold and front pipe faces.
Fit and seat the new sealing rings to the front pipe.
Fit the new gasket to the cylinder head studs.
Fit but do not fully seat the rear manifold to the head studs.

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Fit but do not fully tighten the manifold upper securing nuts.
Fully seat the manifold to the head.
Fir and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Refit the heat shield.
Reposition the air pipes to the manifold.
Tighten the pipe to manifold union nuts.
From below:-.
Position the exhaust system to the manifold.
Align the securing rings to the studs.
Fit and tighten the front pipe to the manifold securing nuts.
Fit and align the front pipe to bell housing mounting bracket.
Fit and tighten the mounting securing nuts and bolt.
Connect the Lambda sensor harness multi-plugs.
Secure the harness to the gearbox cooler pipe with the ratchet strap.
Connect and tighten the E.G.R. transfer pipe to the manifold.
Lower the vehicle from the stands.
Close the bonnet.

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 23-27 Nm
Front pipe to** manifold **30-35Nm
Heat shield to manifold 23-27Nrn

SPANNER SIZES

1Omm
17mm

9/16 AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696

30058

FRONT EXHAUST MANIFOLD - FEDERAL

RENEW 30.15.36.

Open the bonnet.
Raise the vehicle at one end, support with two stands.
Disconnect the oxygen sensor harness multi-plugs (where fitted).
Cut and remove the harness to gearbox cooler pipe ratchet strap.
Undo and remove the front pipe to bell housing mounting securing nuts and bolt.
Displace and remove the mounting bracket.
Undo and remove the front pipe to manifold securing nuts.

Reposition the securing rings from the studs.
Lower the exhaust system from the manifolds.
Undo the E.G.R. valve transfer pipe to inlet manifold union nut.
From the engine bay:-
Slacken the air pipe to manifold union nuts.
Reposition the air pipes from the manifolds.
Renew the exhaust manifold heat shield.
Undo and remove the front manifold to cylinder head securing nuts.
Displace and remove the front manifold assembly.
Remove and discard the manifold gasket.
Ensure that the air pipes are not twisted.
Remove and discard the front pipe sealing rings.
Clean the head, manifold and front pipe faces.

Fit and seat the new sealing rings to the front pipe.
Fit the new gasket to the head studs.
Fit but do not fully seat the front manifold to the head.
Fit but do not fully tighten the manifold upper securing nuts.
Fully seat the manifold to the head.
Fit and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Refit the heat shield.
Reposition the air pipes to the manifold.
Tighten the pipe to manifold union nuts.
From below:-
Position the exhaust system to the manifold.
Align the securing rings to the studs.
Fit and tighten the front pipe to manifold securing nuts.
Fit and align the front pipe to bell housing mounting bracket.
Fit and tighten the mounting securing nuts and bolt.
Connect the Lambda sensor harness multi-plugs.
Secure the harness to gearbox cooler pipe **with** the ratchet strap.
Connect the E.G.R. transfer pipe to the manifold.
Lower the vehicle from the stands.
Close the bonnet.

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head ***23-27 Nm***
Front pipe to manifold ***30-35Nm***
Heat shield to manifold ***23-27Nm***

SPANNER SIZES

10mm
17mm

*9/16 **AF***

OILS/LUBRICANTS/SEALANTS

*Exhaust sealer TIVOLI **KAY** ADHESIVES **No** 5696*

3005B

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DOWNPIPE CATALYTIC CONVERTOR - FEDERAL

RENEW 17.50.08.

Open the bonnet.
Jack-up the vehicle and place it on 2 stands.
Disconnect the two lambda sensor electrical connectors in the engine compartment and release the three harness retaining clips.
Undo and remove the lambda sensor from the downpipe assembly.
Undo and remove the downpipe catalyst to underfloor catalyst assembly clamp securing nut and bolt (1 Fig 1)
Reposition the clamp from the joint.
Reposition the underfloor assembly from the downpipe.
Displace and remove the sealing ring.
Undo and remove the downpipe to manifold securing nuts (2 Fig 1).
Displace and remove the downpipe assembly.
Remove and discard the downpipe to manifold sealing rings (3 Fig 1).

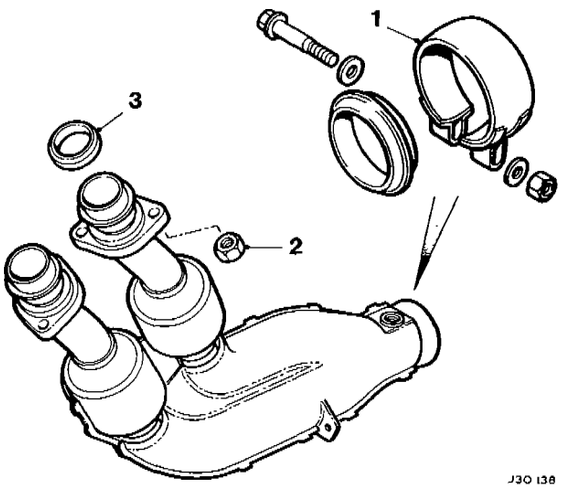


Fig 1

Clean the pipe and the manifold faces.
Place the new downpipe catalyst assembly to the front.
Fit and fully seat the new ring seals to the pipe.
Fit and align the downpipe to the manifold.
Align the retaining rings to the studs.
Fit and tighten the downpipe to manifold securing nuts.
Smear the olive with sealant.
Fit and align the olive to the downpipe.
Reposition the underfloor catalyst assembly to the downpipe.
Reposition the clamp to the joint.
Fit and tighten the clamp nut/bolt.
Refit and connect the lambda sensor assembly.
Lower the vehicle from the stands.

DATA

TORQUE FIGURES

Downpipe assembly to underfloor assembly ***15-18Nm***
Downpipe to manifold ***30-35Nm***

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer* ***TIVOLI KAY ADHESIVES No*** *5696.*

SPANNER SIZES

10mm
13mm

9/16" AF

30058

EXHAUST MANIFOLD HEAT SHIELD - FEDERAL

RENEW **30.15.09.**

Raise the vehicle at one end, support with two stands.
From below:-
Undo the E.G.R. valve transfer pipe (where fitted) to inlet manifold housing securing nut.
Reposition the pipe from the housing.
From the engine bay:-
Undo the transfer pipe to **E.G.R.** valve housing union nut.
Reposition the transfer pipe up onto the cam cover **for** access to the exhaust manifold heat shield.
Undo and remove the **E.G.R.** valve securing nuts.
Displace the valve from the mounting studs, reposition aside for access.
Remove and discard the **E.G.R.** valve to housing gasket.
Displace and remove the housing.
Remove and discard the housing gasket.
Undo and remove the heat shield securing bolts.
Carefully displace and remove the heat shield and place aside.
Remove and discard the heat sielf to manifold **E.G.R.** valve gasket.
Clean the components, gasket faces.

Fit and align the new heat shield gasket to exhaust manifold studs.
Carefully fit and align the new heat shield to the exhaust manifold.
Fit but do not **fully** tighten the heat shield securing bolts.
Fit and align the **E.G.R.** housing to heat shield gasket.
Fit and align the E.G.R. housing.
Fit and align the E.G.R. valve gasket.
Reposition the valve to housing studs.
Fit and tighten the securing nuts.
Final-tighten the heat shield securing bolts.
Reposition the transfer pipe to the E.G.R. valve.
From below:-
Reposition the transfer pips to the inlet manifold housing.
Tighten the pipe union nut.
Lower the vehicle from the stands.
From the engine **bay:-**
Tighten the pipe to E.G.R. valve union nut.
Close the bonnet.

DATA

TORQUE FIGURES

Heat shield to manifold ***23-27Nm***

SPANNER SIZES

10mm
17mm

9/16 ***AF***

OILS/LUBRICANTS/SEALANTS

Exhaust *sealer TIVOLI KAY* ***ADHESIVES*** *No 5696*

30058

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FRONT EXHAUST MANIFOLD GASKET - FEDERAL

RENEW 30.15.20.

Open the bonnet.
Raise the vehicle at one end, support with two stands.
From below:-
Cut and remove the oxygen sensor harness to gearbox cooler pipe ratchet strap (where fitted).
Disconnect the oxygen sensor harness multi-plugs.
Undo and remove the front pipe to manifold securing nuts.
Reposition the securing rings from the studs.
Lower the exhaust system from the manifolds.
Undo the E.G.R. valve transfer pipe to manifold union.
From the engine **bay:-**
Slacken the air pipe to manifold union nuts.
Reposition the air pipes from the manifolds.
Renew the exhaust manifold heat shield.
Undo and remove the front manifold to cylinder head securing nuts.
Displace and remove the front manifold assembly.
Remove and discard the manifold gasket.
Ensure that the air pipes are not twisted.
Remove and discard the front pipe sealing rings.
Clean the head, manifold and front pipe faces.

Fit and seat the new sealing rings to the front pipe.
Fit the new gasket to the head studs.
Fit but do not fully seat the front manifold to the head.
Fit but do not fully tighten the manifold upper securing nuts.
Fully seat the manifold to the head.
Fit and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Refit the heat shield.
Reposition the air pipes to the manifold.
Tighten the pipe to manifold union nuts.
From below:-.
Position the exhaust system to the manifold.
Align the securing rings to the studs.
Fit and tighten the front pipe to the manifold securing nuts.
Connect the transfer pipe to the manifold.
Connect the sensor harness multi-plugs.
Secure the harness **to** the main wiring harness with the ratchet strap.
Lower the vehicle from the stands.
Close the bonnet.

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head **23-27*Nm***
Front **pipe** *to manifold* ***30-35Nm***
Heat shield to manifold ***23-27Nm***

SPANNER SIZES

10mm
17mm
9/16 AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ***ADHESIVES No 5696***

30058

REAR EXHAUST MANIFOLD GASKET - FEDERAL

RENEW **30.15.21.**

Open the bonnet.
Raise the vehicle at one end, support with two stands.
Disconnect the oxygen sensor harness multi-plugs (where fitted).
Cut and remove the harness to gearbox cooler pipe ratchet strap.
Undo and remove the front pipe to manifold securing nuts.
Reposition the securing rings from the studs.
Lower the exhaust system from the manifolds,
Undo the E.G.R. valve to inlet manifold union nut.
From the engine bay:-
Slacken the air pipe to manifold union nuts.
Reposition the air pipes from the manifolds.
Renew the exhaust manifold heat shield.
Undo and remove the rear manifold securing nuts.
Carefully displace and remove the rear manifold assembly.
Ensure that the air pipes are not twisted.
Remove and discard the manifold gasket.
Remove and discard the front pipe sealing rings.
Clean the head, manifold and front pipe faces.

Fit and seat the new sealing rings to the front pipe-
Fit the new gasket to the cylinder head studs,
Fit but do not fully seat the rear manifold to head studs.
Fit but do not fully tighten the manifold upper securing nuts.
Fully seat the manifold to the head.
Fit and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Refit the heat shield.
Reposition the air pipes to the manifold.
Tighten the pipe to manifold union nuts.
From below:-
Position the exhaust system to the manifold.
Align the securing rings to the studs.
Fit and tighten the front pipe to the manifold securing nuts.
Connect the Lambda sensor harness multi-plugs.

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Secure the harness to the gearbox cooler pipe with the ratchet strap.
Connect and tighten the E.G.R. transfer pipe to the manifold.
Lower the vehicle from the stands.
Close the bonnet.

DATA

TORQUE FIGURES

Exhaust *manifold* ***to*** *cylinder head 23-27* ***Nm***
Front *pipe to manifold* ***30-35Nm***
Heat ***shield*** *to manifold* ***23-27Nm***

SPANNER SIZES

10mm
17mm

9/16 AF

OILSILUBRICANTSISEALANTS

Exhaust *sealer TIVOLI* ***KAY ADHESIVES*** *No 5696*

30056

EXHAUST MANIFOLD GASKET - ENGINE SET - FEDERAL

RENEW **30.15.12.**

Open the bonnet.
Raise the vehicle at one end, support with two stands.
From below:-
Undo the E.G.R. valve transfer pipe (where fitted) to inlet manifold union.
Disconnect the oxygen sensor harness multi-plugs.
Cut and remove the harness **to** gearbox cooler pipes ratchet strap.
Undo and remove the front pipe to manifold securing nuts.
Reposition the securing rings from the studs.
Lower the exhaust system from the manifolds.
From the engine **bay:-**
Slacken the air pipe to manifold union nuts.
Reposition the air pipes from the manifolds.
Renew the exhaust manifold heat shield.
Undo and remove the front manifold to cylinder head securing nuts.
Displace and remove the front manifold assembly.
Remove and discard the manifold gasket.
Undo and remove the rear manifold securing nuts.

Carefully displace and remove the rear manifold assembly.
Ensure that the pipes are not twisted.
Remove and discard the manifold gasket.
Remove and discard the front pipe sealing rings.
Clean the head, manifold and front pipe faces.

Fit and seat the new sealing rings to the front pipe.
Fit the new gaskets to the cylinder head studs.
Fit but do not fully seat the rear manifold to head studs.
Fit but do not fully tighten the manifold upper securing nuts.
Fully seat the manifold to the head.
Fit and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Fit but do not fully seat the front manifold to the head.
Fit but do not fully tighten the manifold upper securing nuts,
Fully seat the manifold to the head.
Fit and tighten the remaining securing nuts.
Final-tighten the upper securing nuts.
Refit the heat shield.
Reposition the air pipes to the manifold.
Tighten the pipe to manifold union nuts.
From below:-
Position the exhaust system to the manifold.
Align the securing rings to the studs.
Fit and tighten the front pipe to the manifold securing nuts.
Connect the E.G.R. transfer pipe to the manifold.
Connect the sensor harness multi-plugs.
Secure the harness to the gearbox cooler pipes with the ratchet strap.
Lower the vehicle from the stands.
Close the bonnet.

DATA

TORQUE FIGURES

Exhaust manifold to cylinder head 23-27Nm
Front pipe to manifold 30-35Nm
Heat shield to manifold 23-27Nm

SPANNER SIZES

10mm
17mm

9/16AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696

3005B

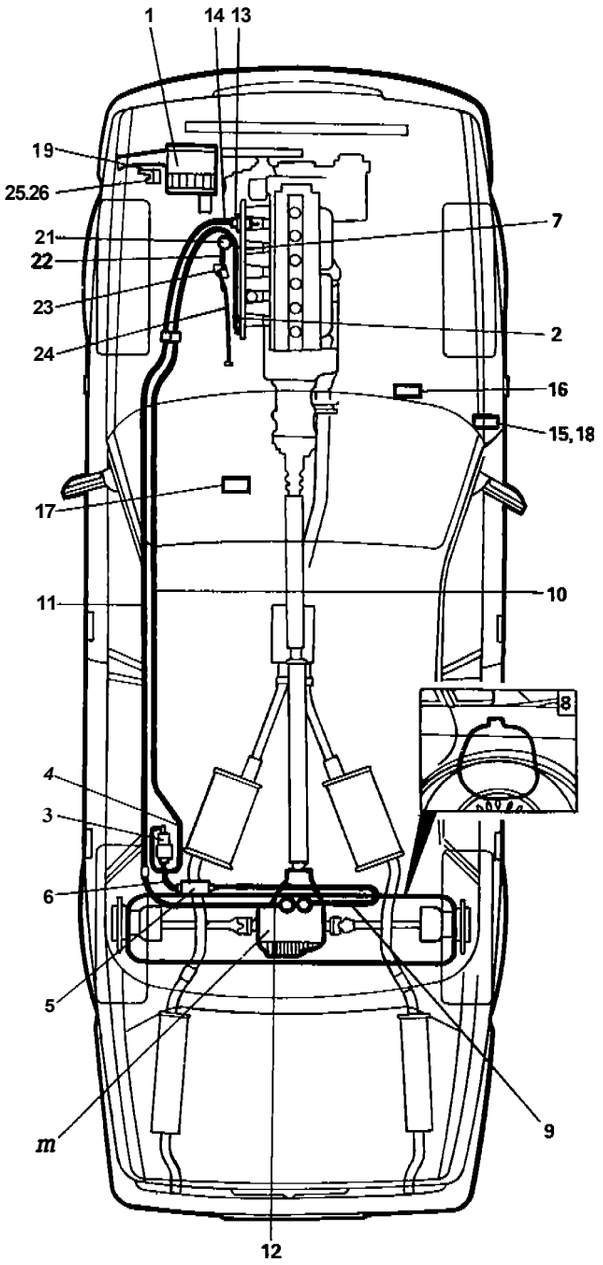
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FUEL FILTER - 91MY	RENEW	19.25.02	19-75
FUEL FILTER TO MAIN LINE HOSE	RENEW	19.40.94	19-16
FUEL PUMP - 90MY	RENEW	19.45.08	19-07
FUEL PUMP MODULE - 91MY	RENEW	19.45.08	19-47
FUEL PUMP TO FUEL FILTER HOSE	RENEW	19.40.92	19-14
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1960C

ILLUSTRATED INDEX



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ILLUSTRATED INDEX – KEY

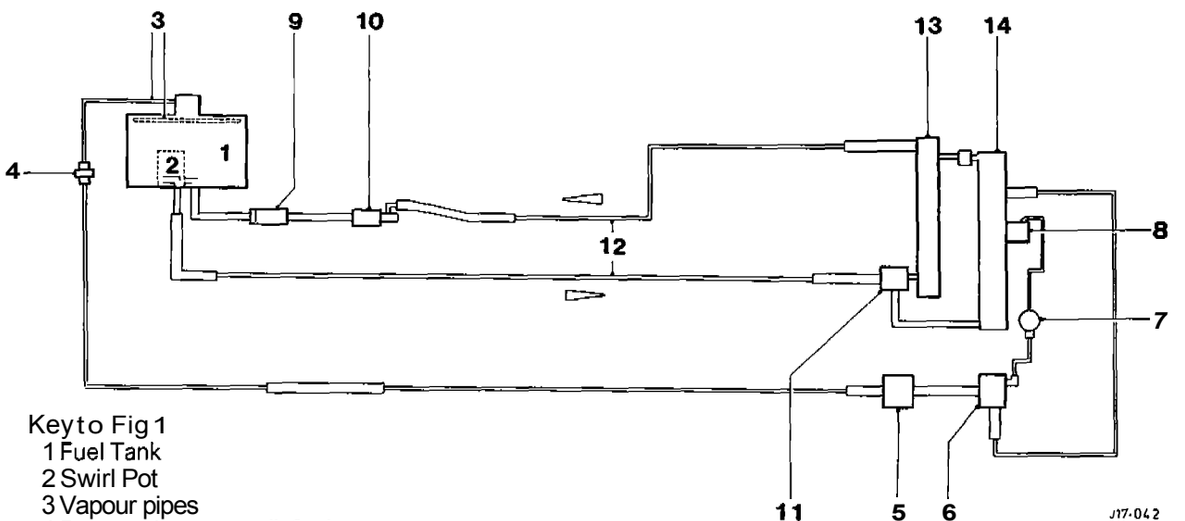
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–	SPEED CONTROL SYSTEM	19.75.00	19-22	2
19	SPEED CONTROL VACUUM PUMP	19.75.01	19-23	2
20	SPEED SENSOR	88.30.03	19-25	2
21	THROTTLE ACTUATOR	19.75.12	19-24	2
22	THROTTLE ACTUATOR LINKAGE ROD	19.75.10	19-24	2
23	THROTTLE VALVE	19.20.04	19-19	2
24	THROTTLE CABLE	19.20.06	19-21	2
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26	VACUUM SUPPLY HOSE	19.75.03	19-23	2

0032K

FUEL SUPPLY SYSTEM

DESCRIPTION 19.00.00

The fuel system used is the recirculatory type.
The fuel tank is mounted across the the car behind the rear passenger seats. An electric pump draws fuel from the fuel tank and delivers it via a filter to the fuel rail mounted on the engine.
A pressure regulator is fitted on the fuel rail to control the fuel line pressure, so that a constant pressure of 241.30 – 310.25 kN/m^2 (35 – 45 lbf/in^2) is maintained across the injectors.
This is accomplished by applying the intake manifold pressure to a diaphragm within the pressure regulator. Excess fuel is returned to the fuel tank via a return hose.
The fuel pump is energised only when the ECU senses an engine cranking signal or an engine running signal.
This prevents the engine being flooded with fuel in the event of an injector sticking open.
Referring to Fig 1, emission control components are detailed more fully in Section 17.



Key to Fig 1
1 Fuel Tank
2 Swirl Pot
3 Vapour pipes
4 Pressure/vacuum relief valve
5 Charcoal canister
6 Purge control valve
7 Thermal vacuum switch
8 Throttle housing
9 Fuel pump
10 Fuel filter
11 Fuel pressure adaptor
12 Fuel pipes
13 Fuel rail
14 Inlet manifold

Fig 1

SAFETY PRECAUTIONS

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS EXTREMELY FLAMMABLE, THEREFORE GREAT CARE MUST BE TAKEN WHEN WORK IS CARRIED OUT ON THE FUEL SYSTEM.
THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:
1 NO SMOKING IN THE WORK AREA.
2 "NO SMOKING" WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3 A CO^2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT,
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTIIATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

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FUEL TANK

RENEW 19.55.01

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4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
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6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red block cable connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Empty the fuel tank into a explosion proof container using suitable fireproof equipment
Raise the vehicle on a ramp.
Remove the clips securing the fuel supply and return hoses.
Disconnect the hoses from the fuel tank. (Fig 1).
Fit protective plugs to the hoses and the tank.
Remove and discard the sealing rings from the hoses.
Lower the vehicle on the ramp.
Open the luggage compartment.
Remove the floor carpet.
Remove the front liner.
Remove the left hand liner.
Remove the right hand liner.

Note and disconnect the cables from the fuel gauge tank unit.
Remove the bolts securing the spare wheel mounting bracket and remove the bracket.
Slacken the tank retaining strap to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace the tank retaining straps for access.
Remove the tank upper sound insulation pad.
Release the evaporative control one way valve to hose securing clip and disconnect the hose from the valve.

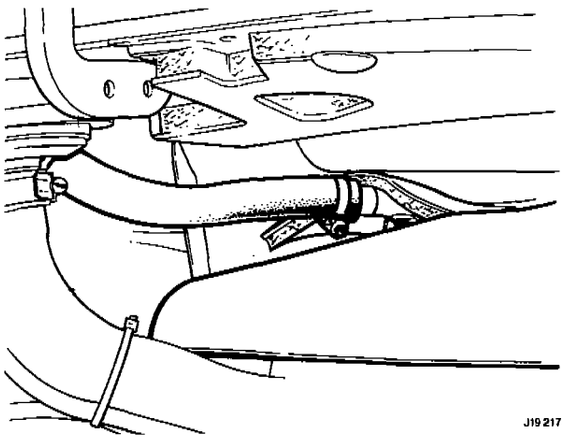


Fig 1

Disconnect the drain tubes from the filler neck and surround.
Cut and remove the drain tube to filler neck securing strap.
Unclip cable harness from the tank clips.
Disconnect the filler flap locking solenoid cable harness block connector.
Cut and remove cable harness retaining strap.
Displace the relay from its mounting bracket for access.
Remove the filler neck surround to body securing bolts.
Displace the filler neck surround from its mounting position.
Displace and remove the fuel tank assembly.
Slacken the breather overflow hose to tank pipe securing hose clip and disconnect the hose from the tank pipe.(1 Fig 1)
Slacken the filler neck assembly securing clip and remove the filler neck/surround assembly.(2 Fig 1)
Remove the filler neck insert.
Remove and discard the filler neck sealing 'O' ring.
Unclip the evaporative control pipe from the fuel tank.
Disconnect and remove the evaporative control hose/pipe assembly from the tank. (3 Fig 1)
Using tool 18G 1001 Displace and remove the fuel gauge tank unit retaining ring.
Displace and remove the fuel gauge tank unit.
Remove and discard the tank unit sealing ring.
Remove the cable harness clips from the fuel tank.
Fitting a new fuel tank is the reversal of the removal procedure.
Ensure new 'O' rings and sealing rings are fitted.
Ensure all electical connections are clean and secure.

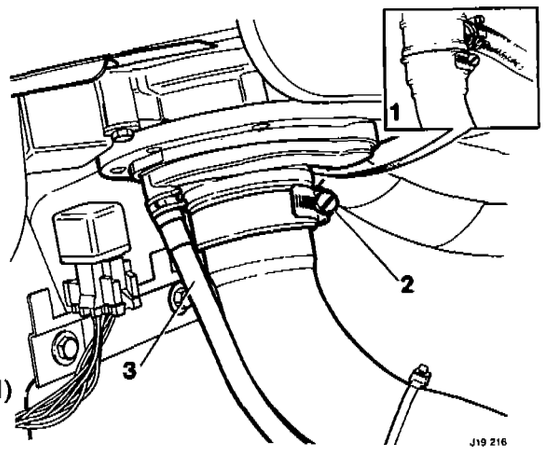


Fig 1

DATA

SERVICE TOOLS

Tank unit spanner 18G1001

TORQUE FIGURES

Anchor bracket securing bolt 22-28Nm
Filler neck to body bolts 2-3Nm
Filler neck hose clip 3.5-4.5Nm
Overflow pipe hose clip 2.5-3.5Nm
Securing strap to anchor bracket 5-6Nm

SPANNER SIZES

8mm
13mm
15mm

0197G

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FUEL PUMP

RENEW 19.45.08

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS EXTREMELY FLAMMABLE. THEREFORE GREAT CARE MUST BE TAKEN WHEN WORK IS CARRIED OUT ON THE FUEL SYSTEM.
THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.
2 "NO SMOKING" WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3 A CO^2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red cable block connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition. Refit the relay.
Disconnect the battery earth lead.

Jack up and place the rear of the vehicle on stands.
Remove the RH road wheel.
From beneath the vehicle cut and remove straps securing the fuel pump feed hose to the axle carrier.
Fit clamps to the fuel feed hose.
Slacken the securing clip and disconnect the fuel feed hose from the fuel pump (1 Fig 1).
Fit protective plugs to the pump and hose.
From the wheel arch undo the fuel pump to filter hose union nut at the pump and reposition the hose from the pump (2 Fig 1).

Fit protective plugs to the pump and hose.
Remove the nuts securing the fuel pump mounting to the axle carrier (3 Fig 1).
Reposition the pump from its mounting position up and forward from the axle carrier.
Displace the rubber insulation boots from the fuel pump cable harness terminals (4 Fig 1).
Remove the terminal nuts and disconnect the electrical Supply cables from the fuel pump (5 Fig 1).
Remove the fuel pump.
Remove the bolt securing the mounting clamp and remove the clamp from the pump (6 Fig 1).
Remove the mounting rubber from the pump.

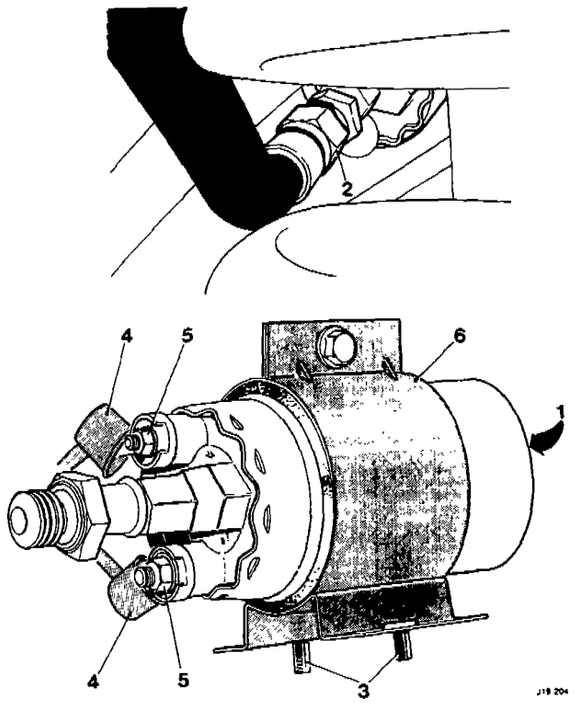


Fig 1

Remove the non-return valve from the pump.
Fitting a new pump is the reversal of the removal procedure.

DATA

TORQUE FIGURES

Hose union nuts 10-12Nm
Pump clamp bolt 7-10Nm
Pump mounting to axle carrier 10-12Nm
Wheel nut to wheel stud (steel wheel) 65-85Nm
Wheel nut to wheel stud (alloy wheel) 88-102Nm

SPANNER SIZES

8mm
10mm
17mm
19mm
22mm

FUEL RAIL

RENEW 19.60.13

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3 A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILIAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red cable block connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay. Open the bonnet.
NOTE: Fig 1 refers to 2.9 engines, Fig 2 refers to 4.0 engines.
Unclip the fuel feed hose from the fuel rail (1 Fig 1/2).
Disconnect the fuel feed hose from the fuel rail (2 Fig 1/21.
Fit protective plugs to the rail and the hose.
Undo the fuel rail to pressure regulator union nut (3 Fig 1/21.

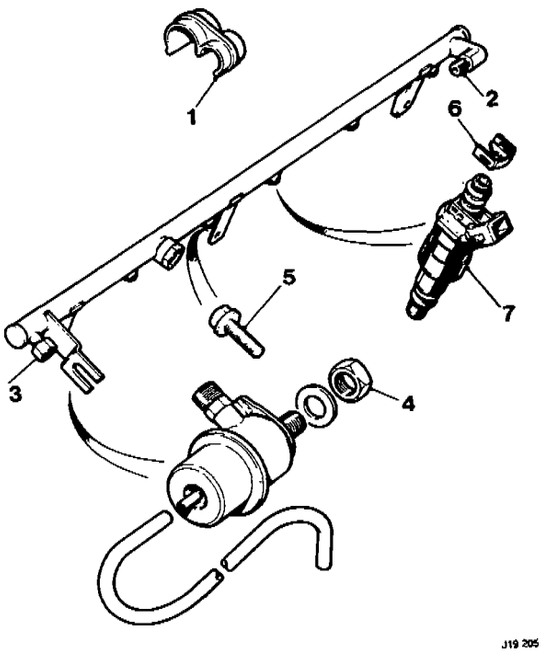


Fig 1

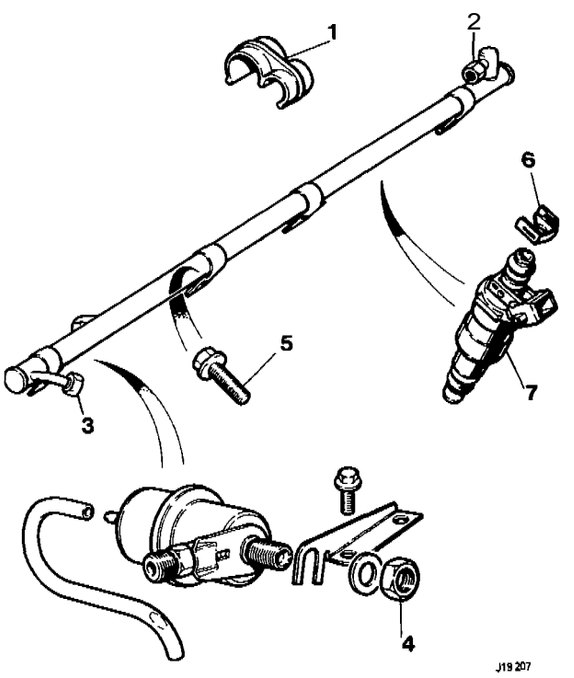


Fig 2

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Slacken the nut securing the pressure regulator to the mounting bracket (4 Fig 1/2 page 8).
Reposition the regulator from the rail mounting.
Fit protective plugs to the regulator and the rail.
Disconnect the cable harness multi-plugs from the fuel injectors.
Remove the bolts securing the fuel rail (5 Fig 1/2 page 8).
Remove the fuel rail/injector assembly.
Fit protective plugs to the inlet manifold.
Remove the clips securing the injectors (6 Fig 1/2 page 8) and remove the injectors (7 Fig 1/2 page 8) from the rail.
Remove and discard the injector 'O' rings.
Fitting a new fuel rail is the reversal of the removal procedure.

DATA

TORQUE FIGURES

Rail securing bolts 7- 10Nm
Rail union nuts 12.5-15Nm

SPANNER SIZES

8mm
17mm
19mm

0197G

FUEL FILTER

RENEW 19.25.02

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THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.
2 "NO SMOKING" WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3 A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

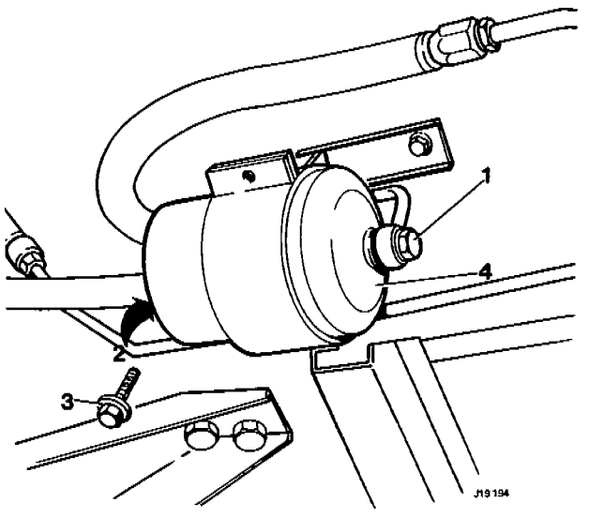


Fig 1

Remove the passenger side dash liner.
Remove the fuel pump relay from the red block cable connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition. Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Jack up and place the rear of the vehicle on stands.
Place a suitable container below the filter.
Remove the filter to feed hose banjo bolt (1 Fig 1) and reposition the hose from the filter.
Retrieve the copper washers from the banjo bolt.
Fit protective plugs to the hose and filter.
Undo the fuel pump to filter hose union nut (2 Fig 1) at the filter and reposition the hose from the filter.
Fit protective plugs to the hose and the filter.
Undo but do not remove the mounting clamp securing nut and bolt (3 Fig 1).
Displace and remove the filter assembly from its mounting (4 Fig 1).
Remove the fuel pump hose to filter adaptor piece.
Remove the filter front plastic cover.
Remove the foam pad from the filter.
Fitting a new filter is the reversal of the removal procedure.

DATA

TORQUE FIGURES

Banjo bolt ***30-40Nm***
Mounting ***clamp*** *nut/bolt* ***7-12Nm***
Union nut ***10-12Nm***

SPANNER SIZES

8mm
17mm
19mm

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FUEL FEED PIPE TO FUEL RAIL HOSE

RENEW 19.40.60

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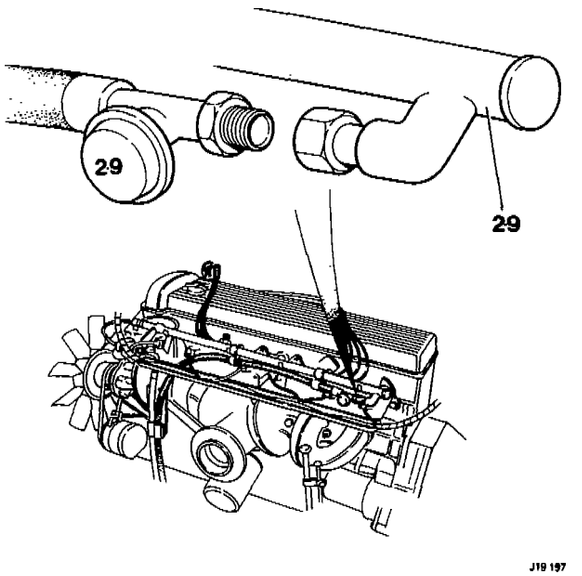


Fig 1

Remove the passenger side dash liner.
Remove the fuel pump relay from the red block cable connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Displace the fuel feed hose from the fuel rail securing clips.
Undo the fuel feed to fuel rail union nut and reposition the hose from the rail (Fig 1 – 2.9 engines: Fig 2 – 4.0 engines).
Fit protective plugs to the fuel rail and the hose.
Release the hose to inlet manifold retaining clip and reposition from the clip.
Undo the hose to to fuel feed pipe union nut.
Remove the hose from the fuel feed pipe and the chassis mounting bracket.
Fit protective plugs to the hose and the fuel feed pipe.
Fitting a new hose is the reversal of the removal procedure.

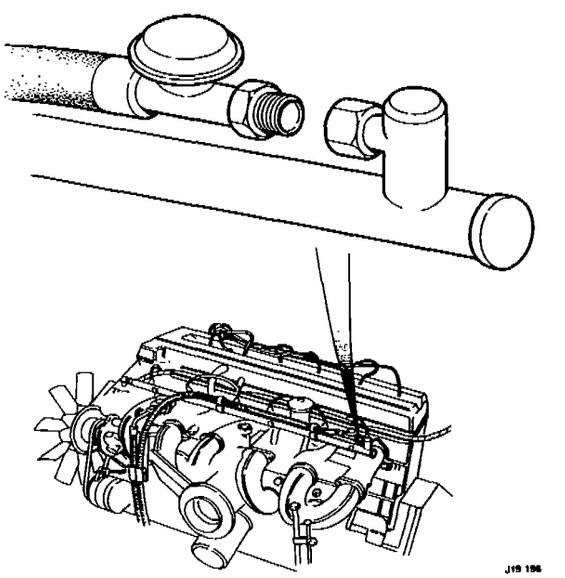


Fig 2

DATA

TORQUE FIGURES

Fuel pipe union nut 10-12Nm
Fuel rail union nut 12.5-15Nm

SPANNER SIZES

17mm
19mm

0197G

FUELTANKTO FUEL PUMP HOSE

RENEW 19.40.74

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9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red block cable connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Empty the fuel tank into a explosion proof container using suitable fireproof equipment.
Raise the vehicle on a ramp.
Slacken the hose to fuel pump securing clip (Fig 1).
Disconnect the hose from the fuel pump.
Fit protective plugs to the hose and to the fuel pump.
Cut and remove the ratchet straps securing the hose to the axle carrier.
Displace and remove the hose to fuel tank retaining clip.
Disconnect the hose from the fuel tank.
Fit protective plugs to the tank and the hose.
Displace and remove the hose assembly from the suspension.
Remove the hose clip, heat sleeve from the hose.
Remove and discard the 'O' ring seals.
Fitting a new hose is the reversal of the removal procedure.

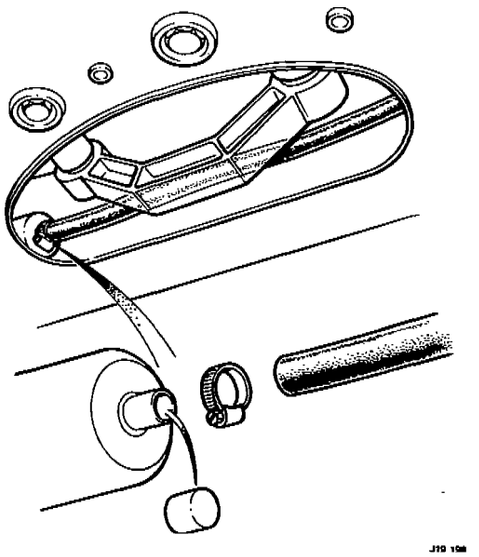


Fig 1

DATA

TORQUE FIGURES

Fuel pump hose clip 3.5-4.5Nm

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MAIN RETURN PIPETOTANK HOSE

RENEW 19.40.85

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS EXTREMELY FLAMMABLE, THEREFORE GREAT CARE MUST BE TAKEN WHEN WORK IS CARRIED OUT ON THE FUEL SYSTEM.
THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.
2 "NO SMOKING" WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3 A CO^2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUELSPILIAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red black cable connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Empty the fuel tank into a explosion proof container using suitable fireproof equipment.
Raise the vehicle on a ramp.
Undo the fuel return hose to the return pipe union nut and disconnect the hose from the pipe.
Remove and discard the "O" ring seal from the return Pipe.
Fit protective plugs to the pipe and the hose.
Displace and remove the hose to tank securing clip (Fig 1).
Disconnect the hose from the tank.
Fit protective plugs to the hose and tank.
Displace and remove the hose from the suspension area.
Remove the hose and the heat sleeve from the hose.
Remove and discard the 'O' ring seal from the hose.
Fitting a new hose is the reversal of the removal procedure.

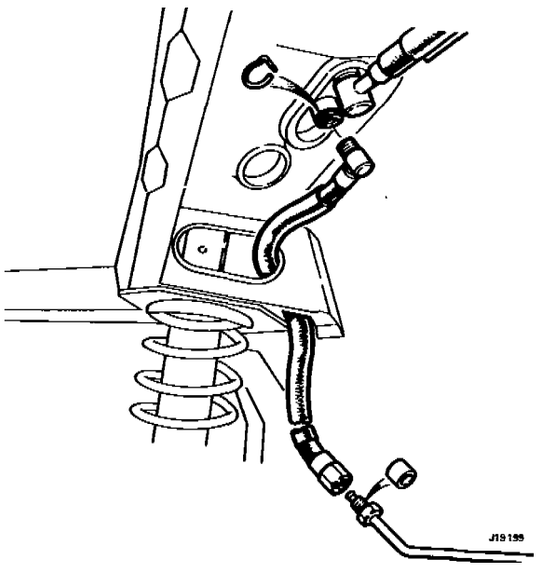


Fig 1

DATA

TORQUE FIGURES

Fuel pipe union nut 10-12Mm

SPANNER SIZES

15mm
19mm

0197G

FUEL PUMP TO FUEL FILTER HOSE

RENEW 19.40.92

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3 A CO^2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILIAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red cable block connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Jack up and place the rear of the vehicle on stands.
Remove the RH road wheel.
From below undo the fuel feed hose to filter union nut and reposition the hose from the filter (Fig 1).
Fit protective plugs to the hose and filter.
Undo the fuel hose to the fuel pump union nut.
Fit protective plugs to the hose and the fuel pump.
Displace and remove the hose.
Fitting a new hose is the reversal of the removal procedure.

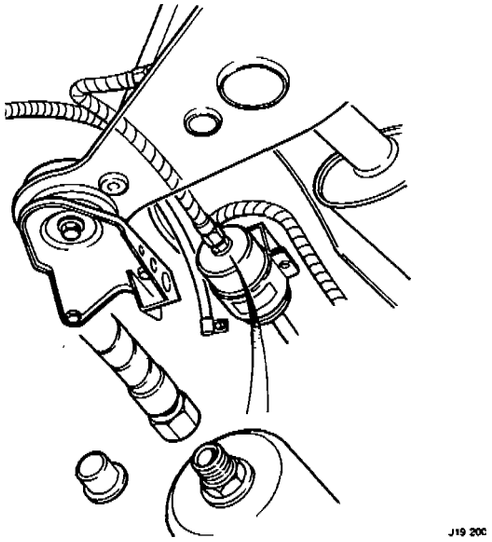


Fig 1

DATA

TORQUE FIGURES

Fuel pipe union nut ***10-12Nm***
Wheel ***nut to*** *wheel* ***stud (steel*** *wheel)* ***65-85Nm***
Wheel ***nut*** *to wheel* ***stud (alloy*** *wheel)* ***88-102Nm***

SPANNER SIZES

17mm
19mm
22mm

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PRESSURE REGULATOR RETURN LINE HOSE

RENEW 19.40.93

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
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3 A CO^2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 **FUEL MUST NOT BE EMPTIED INTO A PIT.**
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red cable block connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay,
Open the bonnet and disconnect the battery earth lead.
Undo the return hose to the regulator union nut and reposition the hose from the rail (Fig 1- 4.0 engines: Fig 2–2.9 engines).
Fit protective plugs to the regulator and the hose.
Release the hose to the inlet manifold retaining clip.
Undo the hose to the return pipe union nut.
Remove the hose from the return pipe and chassis mounting bracket.
Fit protective plugs to the pipe and hose.
Fitting a new hose is the reversal of the removal procedure.

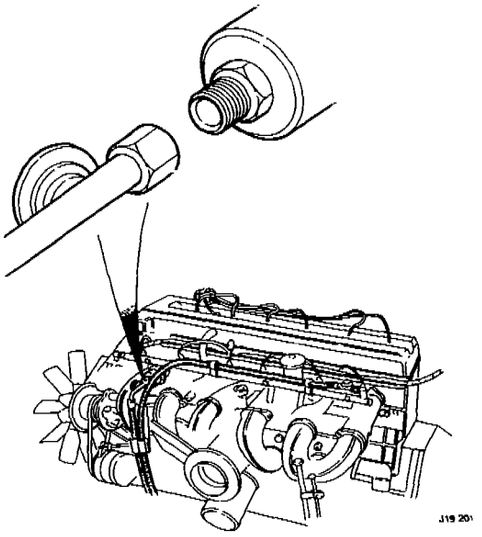


Fig 1

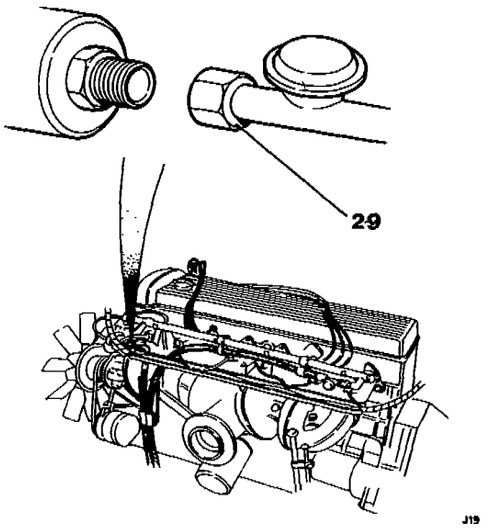


Fig 2

DATA

TORQUE FIGURES

Fuel pipe union nut 10-12Nm
Fuel rail union nut 10-12Nm

SPANNER SIZES

17mm
19mm

0197G

FUEL FILTER TO MAIN LINE HOSE

RENEW 19.40.94

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
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5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
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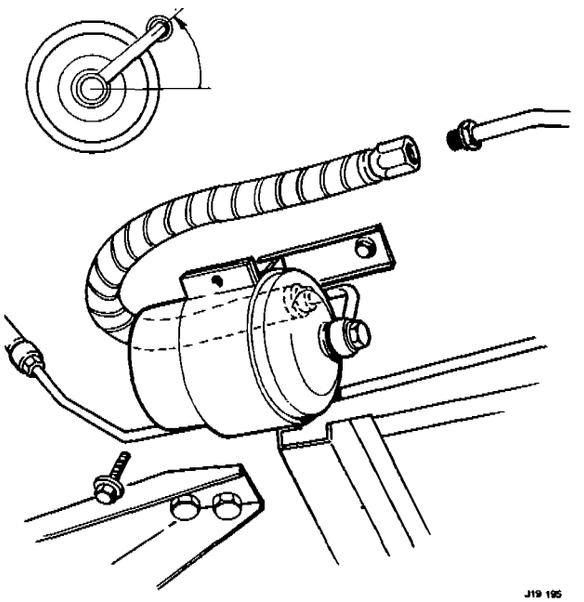


Fig 1

Remove the passenger side dash liner.
Remove the fuel pump relay from the red cable block connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Jack up and place the rear of the vehicle on stands.
Place a suitable container below the fuel filter.
Undo the hose to the main fuel feed pipe union nut and reposition the hose from the fuel feed pipe (Fig 1).
Displace and remove the main fuel pipe seal.
Fit protective plugs to the pipe and hose.
Undo and remove the hose to filter assembly banjo bolt.
Retrieve the copper washers from the filter and the bolt.
Fit protective plugs to the filter and the hose.
Displace and remove the hose from behind the filter assembly.
Fitting a new filter is the reversal of the removal procedure. Ensure that new copper washers are fitted to the banjo unions.

DATA

TORQUE FIGURES

Banjo bolt ***30-40Nm***
Pipe/hose union nut ***10-12Nm***

SPANNER SIZES

15mm
17mm
19mm

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MAIN LINE FUEL FEED PIPE

RENEW 19.40.95

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
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8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.
9 THE DISCARDED TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

Remove the passenger side dash liner.
Remove the fuel pump relay from the red cable block connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet and disconnect the battery earth lead.
Raise the vehicle on a ramp.
Undo the fuel feed pipe to rear hose union nut and disconnect the hose from the pipe.
Remove and discard the sealing ring.
Fit protecive plugs to the hose and the pipe.
Undo the pipe to front hose union nut and disconnect the hose from the pipe.
Remove and discard the sealing ring.
Fit protective plugs to the pipe and the hose.
Remove the pipe clamp securing bolts and remove the pipe clamps (Fig 1).
Displace the pipe from the clamps mounting rubbers and remove the pipe assembly.
Fitting a new pipe is the reversal of the removal procedure.

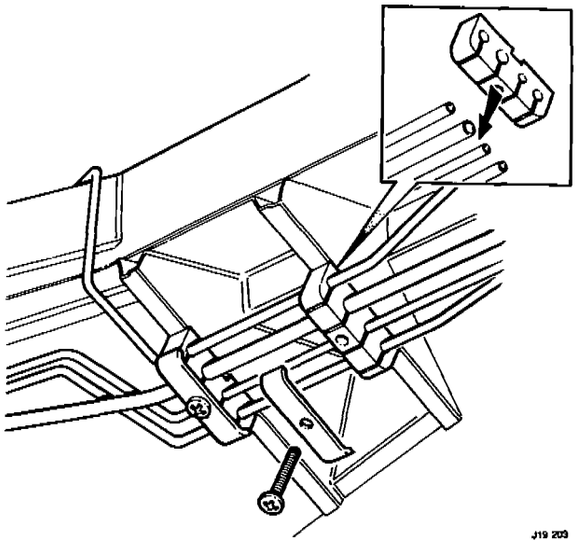


Fig 1

DATA

TORQUE FIGURES

Fuel pipe union nut 10-12Nm

SPANNER SIZES

15mm
19mm

0197G

MAIN FUEL RETURN PIPE

RENEW 19.40.96

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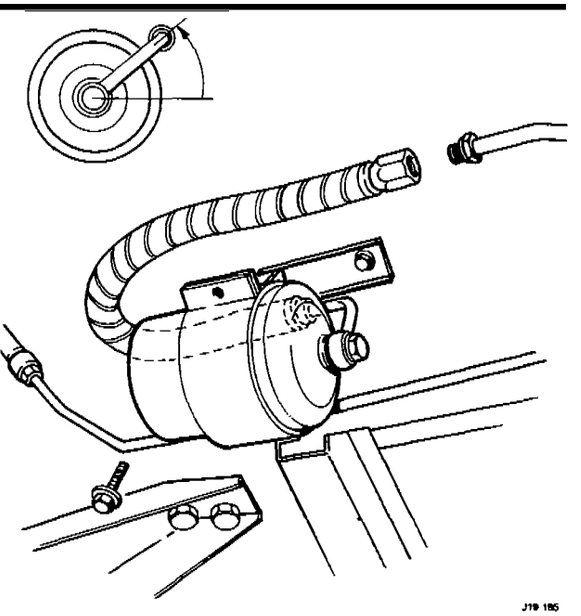


Fig 1

Raise the vehicle on a ramp.
Fit a pipe clamp to the rear fuel return hose,
Remove the fuel filter assembly to body securing bolt and displace the filter for access (Fig 1).
Retrieve the spacers.
Undo the fuel tank breather hose to jacking point 'P' clip securing nut/bolt and reposition the breather hose to one side.
Undo the return pipe to rear hose union nut and disconnect the hose from the pipe.
Remove and discard the sealing ring.
Fit protective plugs to the pipe and hose.
Undo the return pipe to the front hose union nut and disconnect the hose from the pipe.
Remove and discard the sealing ring.
Fit protective plugs to the pipe and the hose.
Remove the bolts securing the pipe retaining clamps and remove the clamps.
Displace the pipe from clamp mounting rubbers and remove the pipe.
Fitting a new fuel return pipe is the reversal of the removal procedure.

DATA

TORQUE FIGURES

Fuel pipe front union nut **10-12Nm**
Fuel pipe rear union nut **10-12Nm**
'P' clip bolt **3.5-4.5Nm**

SPANNER SIZES

8mm
75mm
19mm

0197G

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PRESSURE REGULATOR

RENEW **19.45.11**

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
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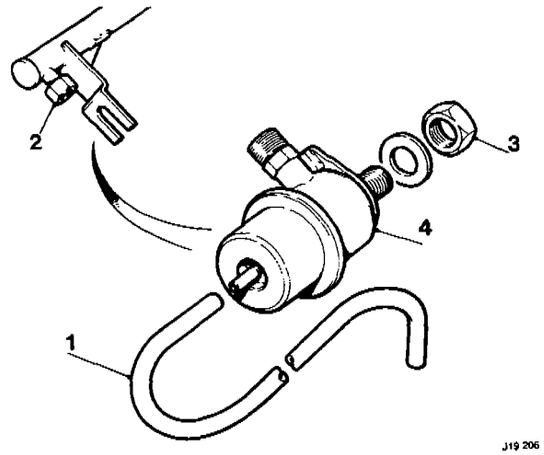


Fig 1

Remove the passenger side dash liner.
Remove the fuel pump relay from the red cable block connector.
Crank the engine to depressurise the fuel system.
Switch off the ignition.
Refit the relay.
Open the bonnet.
Place a cloth under the regulator to catch any fuel leakage.
NOTE: Fig 1 refers to 2.9 engines: Fig 2 refers to 4.0 engines.
Disconnect the vacuum pipe from the regulator (1 Fig 1/2).
Disconnect the fuel return hose and position the hose from the regulator.
Fit protective plugs to the regulator and the hose.
Undo the fuel rail to regulator union nut (2 Fig 1/2).
Remove the nut securing the regulator mounting bracket (3 Fig 1/2) and remove the regulator (4 Fig 1/2).
Fit protective plugs to the regulator and fuel rail.
Fitting a new regulator is the reversal of the removal procedure.

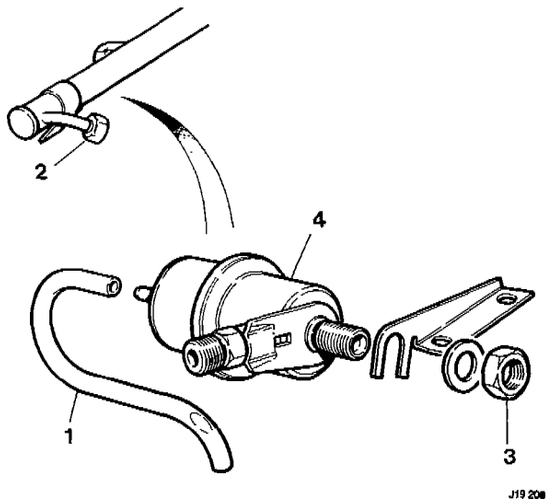


Fig 2

DATA

TORQUE FIGURES

Fuel pipe union nut 10-12Nm
Regulator to bracket 7-10Nm

SPANNER SIZES

8mm
17mm
19mm

0197G

AIR CLEANER ASSEMBLY

RENEW 19.10.05

Unclip the air cleaner cover and remove the cover/ element assembly.
Remove the air cleaner element (1 Fig 1).
Clean the cover and the mating faces.
Unclip the air cleaner box from the air flow meter.
Remove the wing nut (2 Fig 1) from the lower mounting and the nuts (3 Fig 1) from the upper mountings.
Displace and remove the air cleaner box, retaining the 'O' ring seal.
Fitting a new air cleaner assembly is the reversal of the removal procedure.

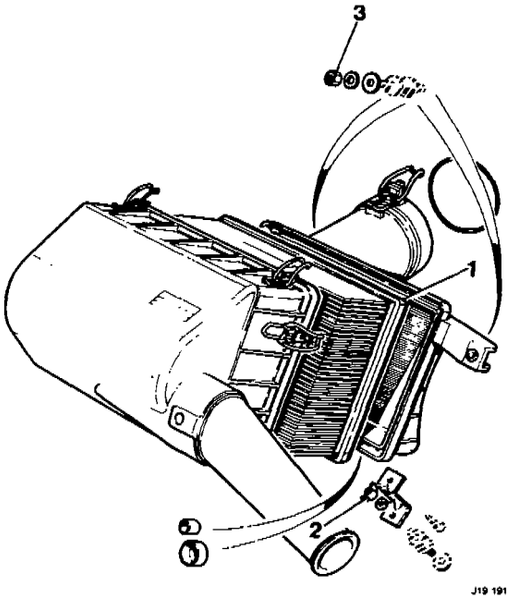


Fig I

DATA

TORQUE FIGURES

Air cleaner mounting nuts	*7-10Nm*

SPANNER SIZES

10mm

THROTTLE VALVE

CHECK AND ADJUST 19.20.04

Slacken the clips securing the breather and supplementary air valve to air intake elbow hose disconnect the hoses from the elbow.
Slacken the clip securing the elbow to air flow meter hose at the air flow meter.
Slacken the clip securing the intake hose to throttle housing.
Remove the nut securing the elbow to the mounting bracket and remove the elbow assembly from the air flow meter.

Remove the elbow/hose assembly from the throttle housing.
Slacken the nut securing the throttle cable to the manifold bracket.
Slacken the kick down cable to manifold bracket lock nut.
Ensure both the throttle and the kick down cables do not restrict the linkage adjustment.
Slacken the throttle stop lock nut.
Using a suitable feeler gauge adjust the throttle stop screw to obtain an air gap of 0.05mm or 0.002in between the butterfly valve and the side of the throttle housing.
Tighten the throttle stop lock nut.
Recheck the butterfly valve setting.
Fit and align the full throttle setting adjustment tool No (JD 131) to the throttle stop plate.
Ensure the pointer aligns with the idle mark 'I' on the throttle linkage (Fig 2).
Slacken the full throttle stop lock nut.

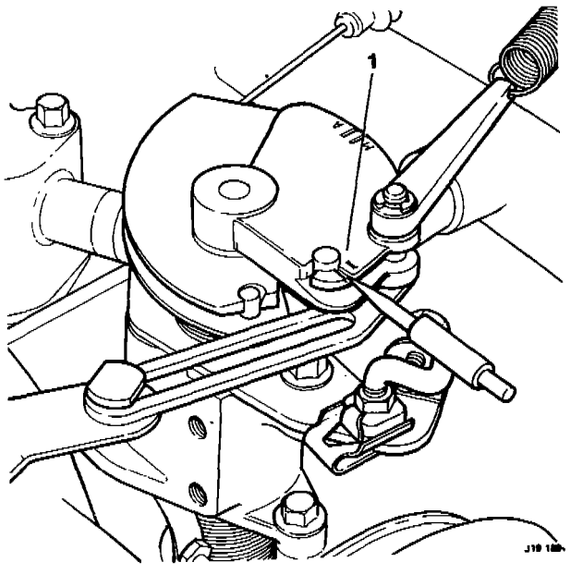


Fig 2

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Fully open the throttle and adjust the full throttle adjusting screw to align the pointer on the special tool to mark 'A' for automatic vehicles or mark 'M' for manual vehicles (1 Fig 1).
Release the throttle linkage and tighten the full throttle stop lock nut.
Remove the full throttle setting tool.

Using a suitable feeler gauge adjust the kick down cable adjusting nut to obtain a gap of 0.76mm or 0.03in between the outer cable and the inner cable crimp clip.
Tighten the lock nut.
Reposition the throttle cable dust cover over the adjuster.
Check and adjust the throttle potentiometer using JDS.
Fit and align elbow/hose assembly to the throttle housing.
Position and tighten the elbow to throttle housing hose clip.
Connect the elbow to the air flow meter.
Tighten the clip securing the elbow to air flow meter hose.
Seat the elbow to the rubber mounting and secure the fixing nut.
Connect the breather and the supplementary air valve hoses to the elbow.
Position and tighten the hose clips.

Checking the base idle speed for 4.0 vehicles only.

Run the engine until normal operating temperature is reached then switch the engine off.
Disconnect the coolant thermister rnulti-plug connector at the thermostat housing (Fig 2).
Connect a 100 ohm 1/4 watt resistor across the multi-plug connections.
Ensure the leads of the resistor do not touch any metal parts of the vehicle.
Switch the ignition 'ON' and wait 10 seconds.
The idle speed stepper motor should now be fully wound in, verify by holding the motor and feeling for vibration.

With the ignition still 'ON' disconnect the idle speed stepper motor multi-plug cable harness connector.
Remove the resistor from the therrnister cable harness connector and reconnect the connector to the thermister.
Start the engine and if necessary adjust the idle speed actuator air bypass screw with a 7/32" allen key to 550 to 600 rev/min.

Checking the base idle speed for 2.9 vehicles only.

Run the engine until normal operating temperature is reached then switch off engine.
Locate the cable harness connector B17 situated under the battery tray.

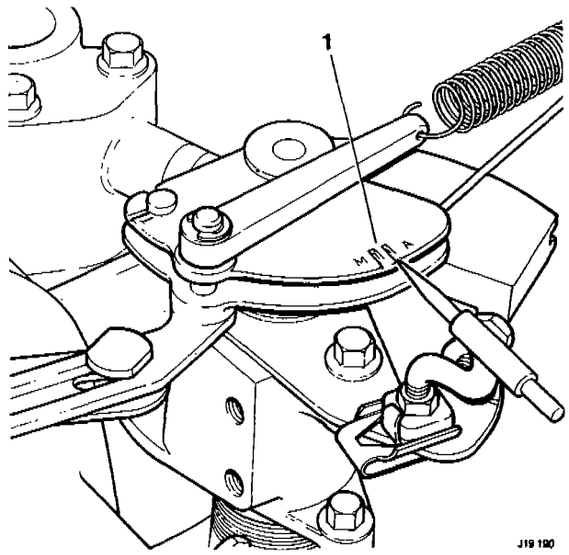


Fig 1

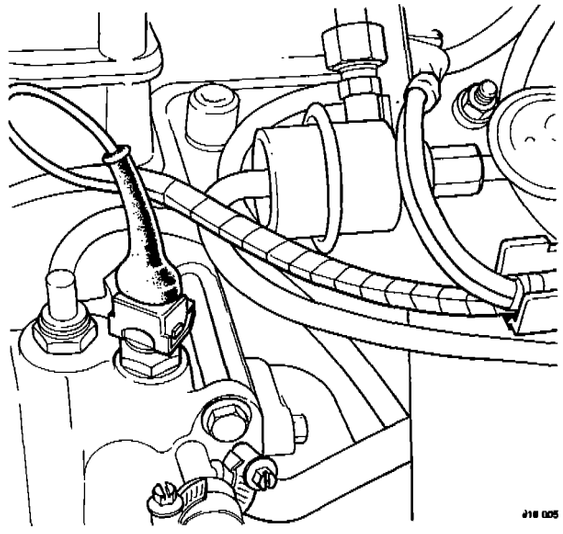


Fig 2

Short the Blue and Slate wire of the connector to **earth.**
Start the engine and if necessary adjust the idle speed actuator air bypass screw with a 3/16" allen key to 500 to 550 rev/min.

DATA

TORQUE FIGURES

Elbow to mounting bracket 7-10Nm
Cable locknuts 14-18Nm
Throttle stop locknut 3.5-4.5Nm

SPANNER SIZES

8mm
10mm
13mm

3/16" Allen key
7/32" Allen key

0197G

THROTTLE CABLE

RENEW 19.20.06

Displace and remove throttle cable to pedal clevis pin split pin.
Open the bonnet.
Displace and remove the throttle cable to linkage retaining clip.
Reposition the cable the linkage.
Undo the cable to bracket lock nut and reposition the cable from the mounting bracket.
Displace the cable from the body grommet.
Displace the grommet from the **body.**
Remove the cable assembly (Fig 1).

Fit and align the new cable to the vehicle.
Fully seat the grommet to the body panel.
Seat the cable into the grommet.
From inside the vehicle position the cable to the throttle **pedal.**
Fit and align the clevis pin.
Secure the clevis pin with a new split pin.
From the engine bay reposition the cable to the throttle bracket.
Connect and secure **the** inner cable to the linkage with the retaining clip.
Tighten the inner cable locknut to remove excessive free play from the cable.
Tighten the lock nut.

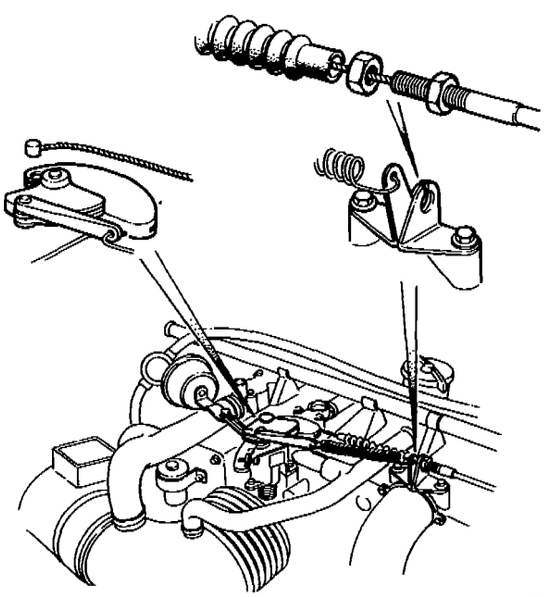


Fig 1

DATA

TORQUE FIGURES

Throttle cable locknuts 14-18Nm

SPANNER SIZES

13mm

0197G

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SPEED CONTROL SYSTEM

DESCRIPTION 19.75.00

The speed control system maintains the vehicle at a drivers selected speed over normal driving conditions, without the need for constant surveillance of the speedometer and continuous drivers use of the throttle pedal.
Once engaged and set the speed control system will control the position of the throttle over a wide range of movement from idle to full throttle to maintain the set speed under different conditions.

System components:

1 Throttle actuator: a vacuum operated device containing bellows attached to the throttle by a mechanical linkage.

2 Electronic Control Module (ECM): a device containing a microprocessor and associated electronic circuits which which evaluates the signals provided by the driver controls, the pedal switches, and road speed sensors. It then a transmitts signals to a vacuum control unit in order to control the vehicle speed. It also retains in memory the speed setting.

3 Vacuum pump and regulator valve: an assembly which increases and decreases the vacuum system pressure depending signals received from the ECM.

4 Dump valve: a device which vents the vacuum system pressure to atmosphere when braking or the throttle returns to idle.

5 Control panel switches: two switches located on the fascia switch panel to the right of the trip computer keyboard. One switch has a three position toggle-action movement that permits 'on', 'off and 'resume/cancel' functions to be selected. The other switch has a push-button movement and generates 'set' and 'accelerate' commands when operated.

6 Brake and clutch switches: two switches which disengage the system when either the clutch (if fitted) or brake pedals are operated. On vehicles fitted with automatic transmission units, the clutch switch is replaced by a shorting plug.

7 Speed control relay: a relay installed on vehicles fitted with automatic transmission units to inhibit system operation in all linear gearbox selector positions other than 'D' (drive) up to and including 1988 1/2 models, and D, 2 and 3 in vehicles from 1989 model onwards. On vehicles fitted with manual transmission units, this relay is omitted and a separate connector permits the incorporation of a shorting plug.

8 Speed sensor: the road speed signal which is taken from the instrument pack provides the control unit with information concerning the vehicle speed from which the necessary control response is determined.

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SPEED CONTROLVACUUM PUMP

RENEW **19.75.01**

Remove the nuts securing the air cleaner to the inner wing valance.
Release the clips securing the air cleaner to the air flowmeter and remove the air cleaner.
Disconnect the hoses from the vacuum pump.
Disconnect the cable harness block connector.
Remove the nuts securing the vacuum pump (1 Fig 1).
Displace and remove the pump (2 Fig 1).
Fitting a new vacuum pump is the reversal of the removal procedure.

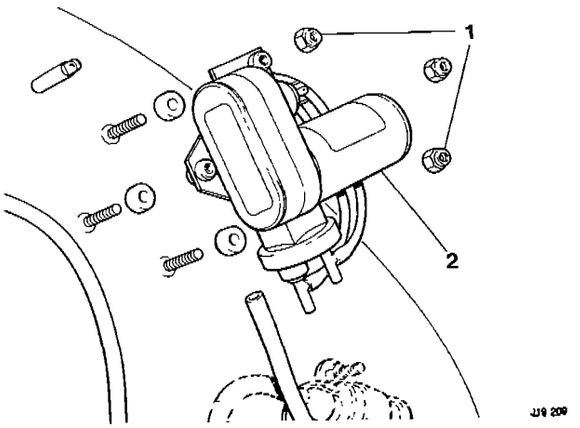


Fig 1

DATA

TORQUE FIGURES

Air cleaner mounting nuts ***7-10Nm***
Vacuum pump nuts ***3.5-4.5Nm***

SPANNER SIZES

8mm
10mm

0197G

VACUUM DUMPVALVE

RENEW **19.75.02**

Remove the nuts securing the air cleaner to the inner wing valance.
Release the clips securing the air cleaner to the air flowmeter and remove the air cleaner.
Disconnect the vacuum hose from the dump valve.
Cut and remove the strap securing the cable harness block connector.
Disconnect the cable harness block connector (1 Fig 2).
Remove the nuts securing the dump valve (2 Fig 2).
Displace and remove the dump valve (3 Fig 2).
Fitting a new dump valve is the reversal of the removal procedure.

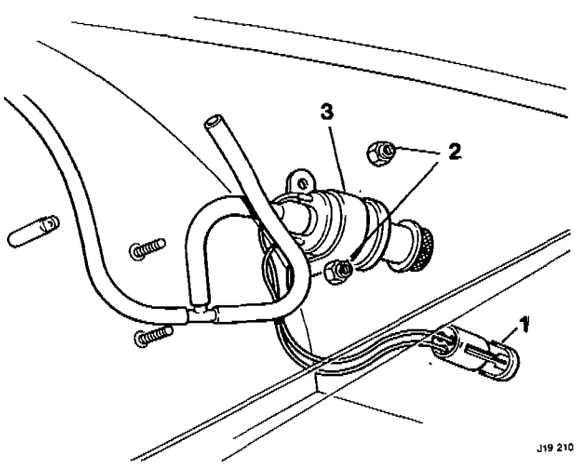


Fig 2

DATA

TORQUE FIGURES

Air cleaner mounting nuts 7-10Nm
Valve nuts 7-10Nm

SPANNER SIZES

8mm
10mm

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VACUUM SUPPLY HOSE

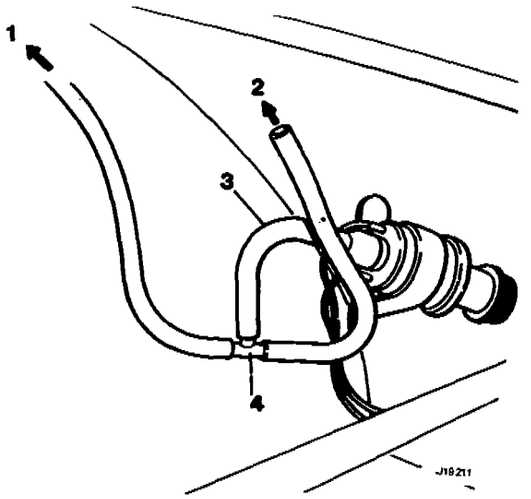


Fig 1

RENEW **19.75.03**

Remove the nuts securing the air cleaner to the inner wing valance.
Release the **clips** securing the air cleaner to the air flowmeter and remove the air cleaner.
Disconnect the hose from the vacuum actuator (1 Fig 1).
Cut and remove the strap securing the vacuum hose to the fuel rail.
Reposition the hose from the manifold.
Disconnect the hose from the vacuum pump (2 Fig 1).
Disconnect hose from dump valve (3 Fig 1).
Disconnect hoses from 'tee' piece (4 Fig 1).
Fitting a new vacuum hose is the reversal of the removal procedure.

DATA

TORQUE FIGURES

Air cleaner mounting nuts 7-10Nm

SPANNER SIZES

10mm

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THROTTLE ACTUATOR LINKAGE ROD

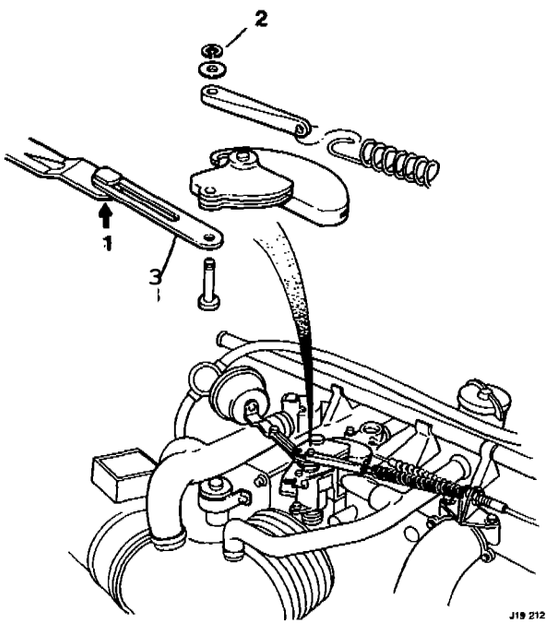


Fig 2

RENEW **19.75.10**

Remove the actuator to link **rod** securing nut (1 Fig 2).
Remove link rod pivot pin and bush,
Displace and remove the actuator link to throttle linkage securing clip (2 Fig 2).
Remove the actuator link rod (3 Fig 2).
Remove the actuator link retaining pin.

Fitting a new throttle actuator linkage rod is the reversal of the removal procedure. Ensure the pivot pin is adjusted to remove **any** free play in the link rod before tightening the actuator pivot pin securing nut.

DATA

TORQUE FIGURES

Link rod securing nut 3.5-4.5Nm

SPANNER SIZES

6mm

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THROTTLE ACTUATOR

RENEW **19.75.12**

Remove the operating rod to actuator securing nut (1 Fig 1).
Remove the operating rod pivot pin and bush.
Reposition the rod from the actuator.
Disconnect the vacuum hose from the actuator (2 Fig 1).
Remove the nut securing the actuator mounting bracket (3 Fig 1).
Displace and remove the actuator (4 Fig 1).
Fitting a new actuator is the reversal of the removal procedure.

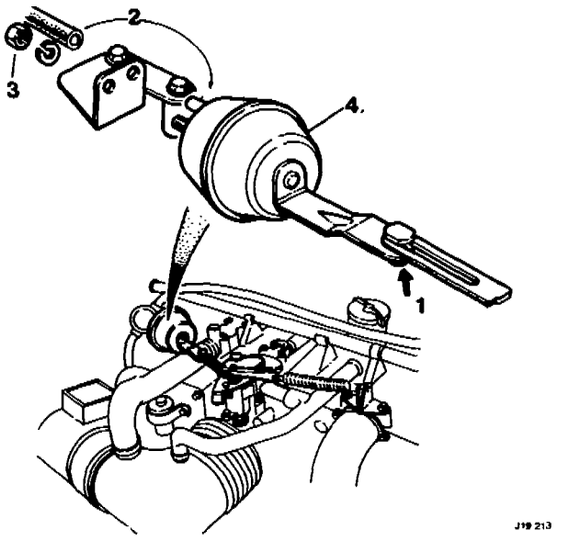


Fig 1

DATA

TORQUE FIGURES

Actuator mounting bracket 3.5-4.5Nm
Link rod securing nut 3.5-4.5Nm

SPANNER SIZES

6mm
8mm

0197G

SPEED CONTROL RELAY

RENEW **86.55.03**

Disconnect the battery earth lead.
Open the front passenger door and remove the 'A' post lower trim pad.
Displace and remove the relay from the red base connector.

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SPEED CONTROL LOGIC MODULE

RENEW **86.80.01**

Disconnect the battery earth lead.
Open the drivers door and remove the drivers side dash liner.
Remove the screw securing the trip computer undertray.
Displace and remove the undertray.
Displace the on/off switch.
Release the trip computer retaining clips and displace the trip computer (Fig 2).
Disconnect the black and brown cable harness block connectors.
Fitting a new module is the reversal of the removal procedure.

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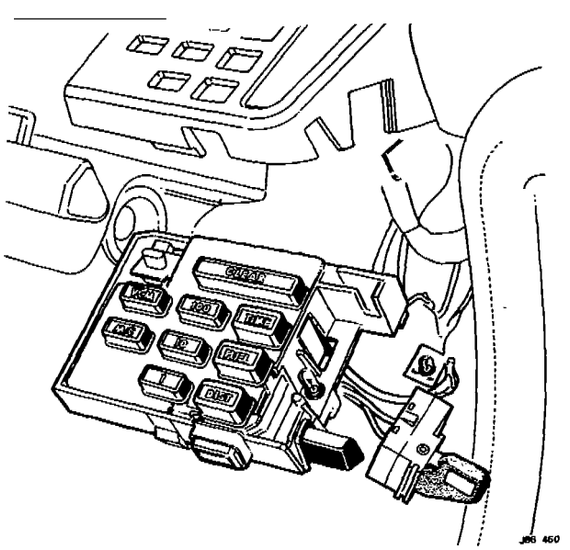


Fig 2

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SPEED SENSOR

RENEW **88.30.03**

Disconnectthe battery earth lead.
Open the luggage compartment and remove the trim.
Disconnect the speed sensor cable harness block connector.
Jack up and place the rear of the vehicle on stands.
Cut and remove cable straps.
Remove the bolts securing the speed sensor.
Displace and remove the sensor (Fig 1).

Fitting a new sensor is the reversal of the removal procedure.

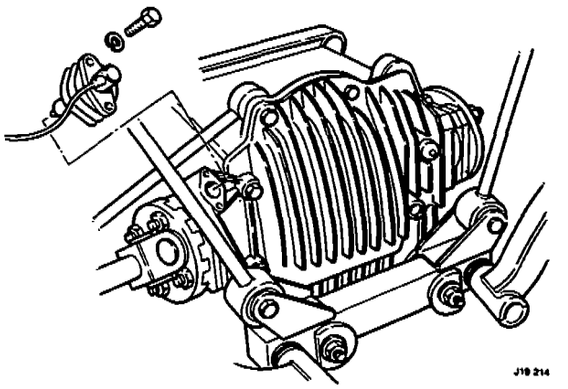


Fig 1

DATA

TORQUE FIGURES

Sensor to mounting 7-10Nm

SPANNER SIZES

8mm

SPEED CONTROL CONTINUIN UNIT

RENEW **19.75.35**

Remove the passenger 'A post lower trim pad.
Remove the continuity unit (1 Fig 2), located behind the fuse box (2 Fig 2).
Fit the new unit and refit the trim pad.

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SPEED CONTROL ECU

RENEW **19.75.21**

Disconnectthe battery earth lead.
Open the front passenger door and remove the passenger side dash liner.
Remove the screws securing the control unit.
Disconnectthe two cable harness block connectors.
Remove the control unit.

Fitting a new control unit is the reversal of the removal procedure.

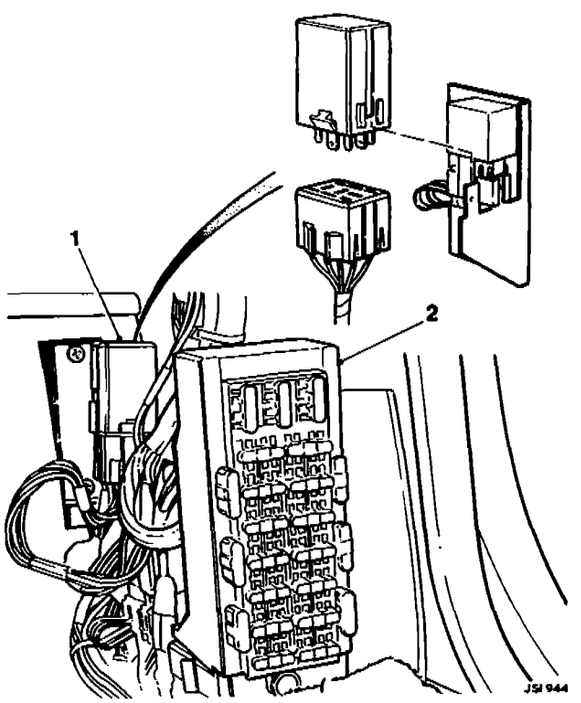


Fig 2

DATA

TORQUE FIGURES

ECU to panel 1.5-2.5Nm

SPANNER SIZES

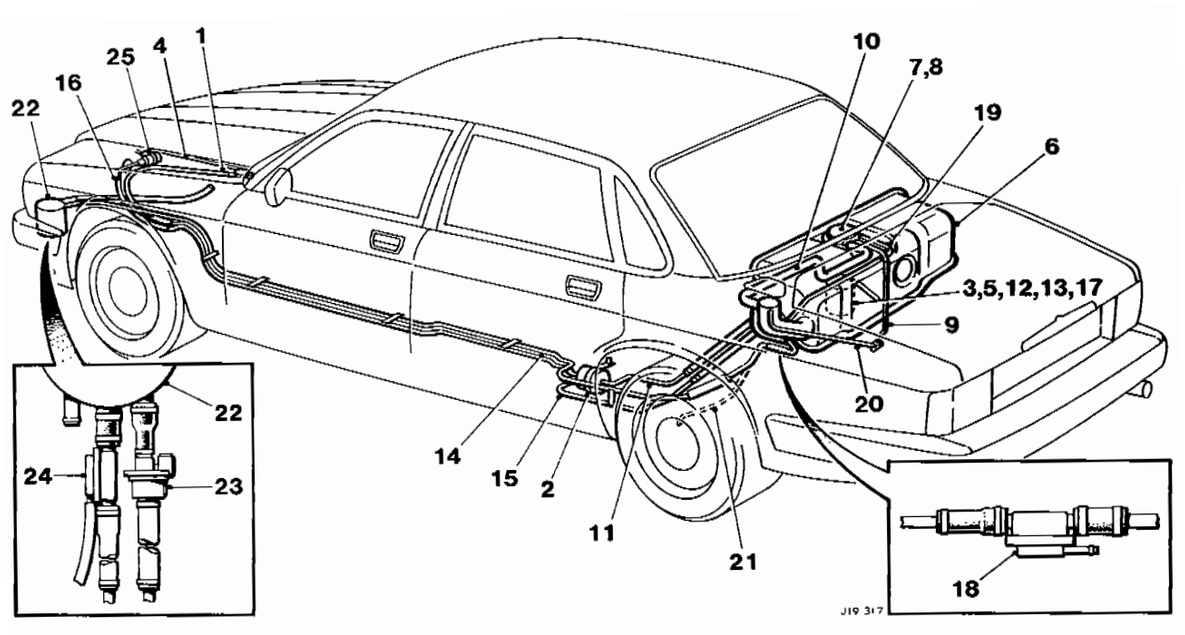
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91MY FUEL SYSTEM

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91MY FUEL SYSTEM - ILLUSTRATED INDEX



91MY ILLUSTRATED INDEX - KEY

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91MY

DESCRIPTION 19.00.00

From 91MY the fuel pump is re-located from beneath the vehicle (90MY), to inside the **fuel** tank, and so revised service methods are included in the following text for affected components, specific to all 3.2 Litre and 4.0 Litre vehicles built from 91MY.

The fuel system used is still of the recirculatory type.
The fuel tank **is** mounted across the car behind the rear passenger **seats.**
The system schematic is shown in Fig. 1. Fuel is drawn from the fuel tank (1 Fig.1) into the in-tank fuel module (2 Fig.1) by the fuel pump (3 Fig.1), with the fuel passing through **a** venturi on the fuel pump pressure side.
A 70 micron filter is incorporated at the inlet port of the module to prevent ingress of particle contaminants.
A further 400 micron rock filter is included at the inlet port of the fuel pump to prevent the passage of smaller particulate contaminants into the fuel pump and the rest of the fuel system.

Fuel is pumped from the base of the fuel tank through a flexible hose to an in-line filter (5 Fig.1). From the filter, fuel flows through underfloor pipework to the front of the vehicle where flexible hose connects the underfloor feed pipe to the inlet port of the fuel rail.

The fuel rail is mounted on the engine (7 Fig,1) with **a** fuel pressure regulator attached at the return port (6 Fig.1). The fuel pressure regulator is used to control fuel line pressure and maintains a constant delivery of fuel to the fuel injectors across the fuel rail. Pressure is kept constant within the range **241.30** - 310.25 kN/m^2 (35 - 45 lbf/in^2).

Non-used fuel from the engine is returned to the in-tank module through return hoses and underfloor pipe.
A 70 micron filter is used in the return inlet of the module to capture debris that may be present in the fuel rail or return line at initial start-up and so prevent it from entering the system.
Both the feed and return ports of the module use non-return valves for safety.

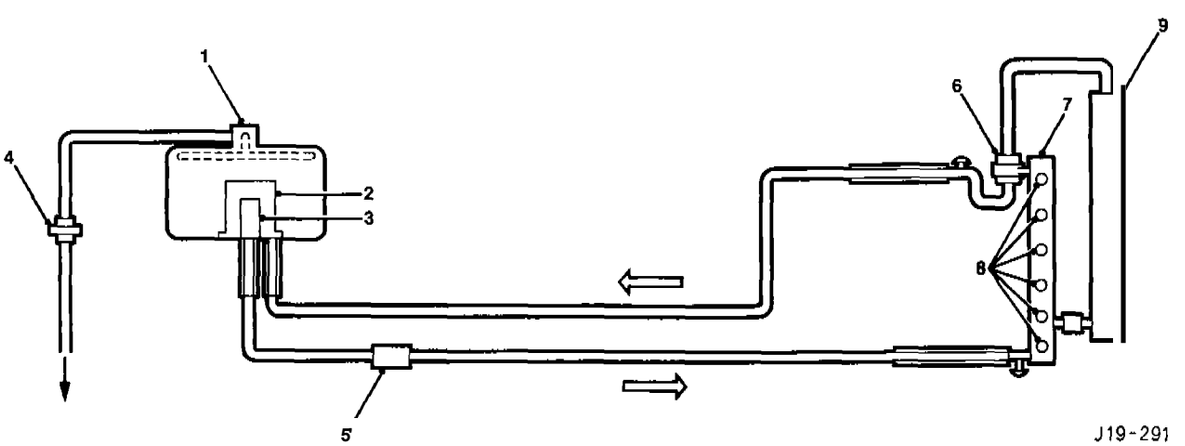


Fig. 1

Key to Fig. 1

1 Fuel Tank
2 In-tank Fuel Pump Module
3 Fuel Pump
4 Tank Pressure Valve (2 psi Rochester Valve)
5 Fuel Filter
6 Fuel Pressure Regulator
7 Fuel Rail
8 Fuel Injectors
9 Inlet Manifold

Note: The 2 psi Rochester valve is located at the fuel tank end for vehicles without evaporative loss control and at the charcoal canister towards the front **of** the vehicle for cars fitted with an evaporative loss control system.

Fuel Pump / In-tank Module

The fuel pump is fitted inside the in-tank module (1 Fig.1), which is fixed to the centre base of the fuel tank, via a rubber cradle (2 Fig.1) and steel bracket (6 Fig.1). The rubber cradle behaves as an accoustic baffle to deaden pump vibration and noise, There are three large tabs (3 Fig.1) and one small tab on the module casing, which locate into slots in the centre recess of the rubber mounting (4 Fig. 1), this ensures that the pump can only be mounted in the correct orientation. The periphery of the rubber mounting incorporates four protrusions each having a locating slot (5 Fig. 1), three slots are large and one is small, which locate onto tabs on the steel support bracket (7 Fig.1).

Note: It is important to ensure correct orientation and fitting of fuel pump module with rubber mounting and steel support bracket.

The fuel pump draws fuel into the module from the fuel tank through a filter in the base of the module (1 Fig.2).

Fuel is pumped out of the module through a port at the top of the module (9 Fig. 1). There are two rubber moulded hoses connected to the top of the module, the short hose (10 Fig. 1) connects from the module's outlet port to the underfloor fuel feed pipe at the base of the fuel tank. The long hose (11 Fig.1) connects the fuel return pipe to the module's return port.

Connections between the hoses and solid pipes are underneath the car. The only direct connection between pump module and the tank is at the evaporative loss flange via a two wire electrical connection (12 Fig.1).

The sump delivers approximately 120 Litres/min. @ 3 Bar

Note: The new fuel pump for 91MY is not interchangeable with that used on 2.9L and 4.0L 90MY vehicles.

The complete fuel pump module is replaced when renewing the fuel pump.

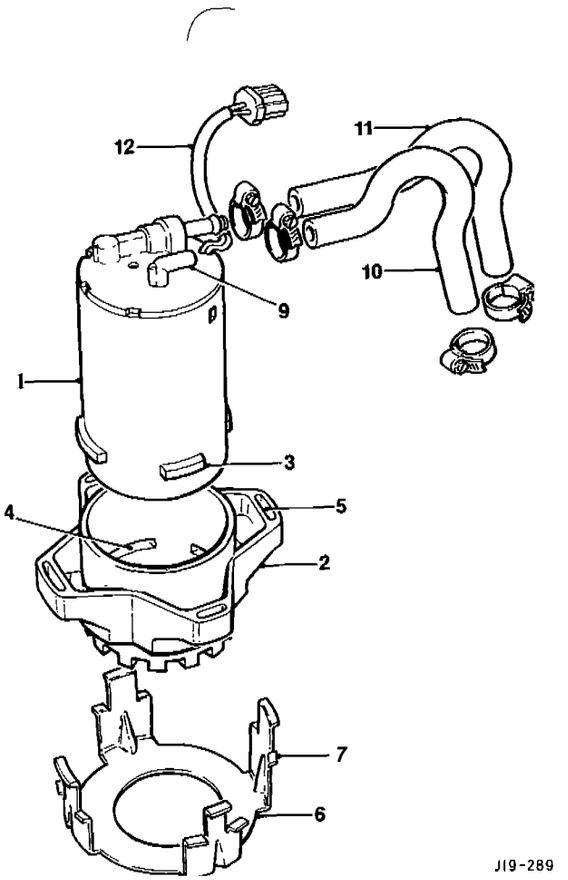


Fig 1

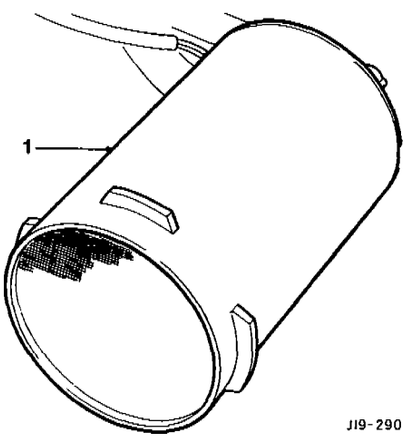


Fig 2

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Fuel Filter

A different make of fuel filter to that used at 90MY is fitted into the underfloor feed pipeline (Fig.1). It is physically smaller than the original filter and is made of stainless steel.

Note: The different types of filter used at 90MY and 91MY vehicles are not interchangeable.

CAUTION: Directions for fuel flow are shown on the filter, it is important that the filter *is* connected the right way round.

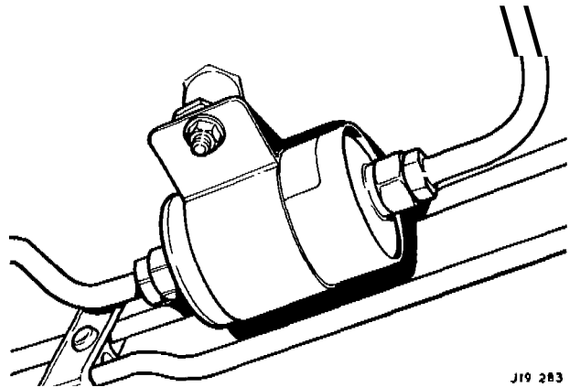


Fig 1

Connectors and Hoses

New Legris quickfit connectors are introduced throughout the fuel system (Fig. 2). At connections between hoses and the underfloor pipes, the pipes have a ridge or paint line to indicate how far the connector should be pushed onto the pipe end.

Note: The different types of connectors and hoses used at 90MY and 91MY vehicles are not interchangeable.

CAUTION: Pipes and component stubs must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

There are two sizes of connector, 8mm and 10mm, this is to ensure that the feed pipe is not connected as the return pipe and vice versa. The 10mm connector is used for the feed line.

The rubber flexible hoses used at 90MY are replaced with PTFE type pipes for 91MY.

Service tool JD 175 is available for the tightening of jubilee clips used for attaching feed and return hoses to the in-tank module.

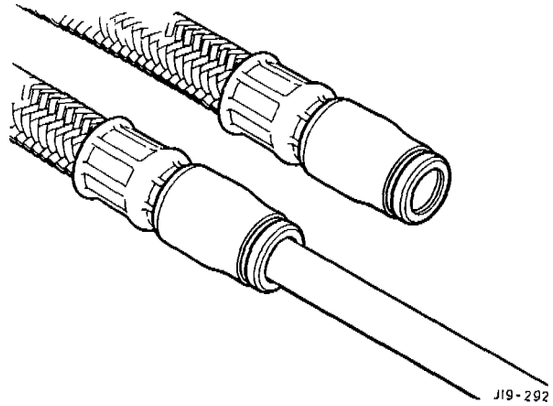


Fig 2

Fuel Tank

There are **two** types of fuel tank assembly (Fig.1), one for use with unleaded fuel only and one for use with leaded / unleaded fuel. Each type is clearly marked, the main difference between the two types is the size of the filler neck aperture. The throat of the unleaded filler neck is smaller than that of the leaded variant to ensure that only petrol pumps with unleaded nozzles can be used.

At **90MY,** the filler neck is connected to the filler cap via a plastic sleeve, for 91**MY** vehicles, the filler neck (1 Fig.1) is in one piece and connects directly with the filler cap (2Fig.1).

The expansion tank present on **90MY** vehicles is removed for **91MY** vehicles. The new tank is designed to shut **off** at **93%** full, leaving **7%** air space in the tank for expansion across the range of expected temperatures. When the tank has run dry, there should be approximately 0.7 litres of fuel remaining in the bottom of the tank which the pump is unable to scavenge.

Note: Due to differences in the fuel evaporative **loss** flange and the in-tank module etc., fuel tanks between 90MY and **91MY** cannot be interchanged.

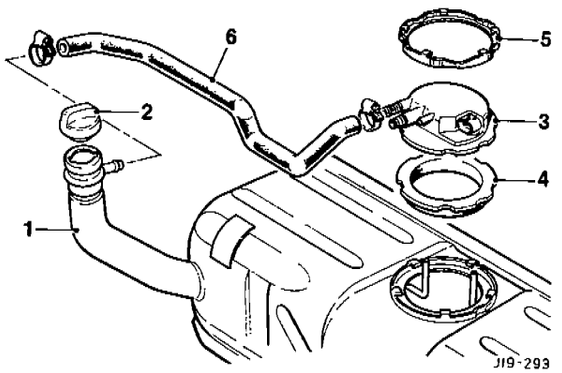


Fig **1**

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Evaporative Loss Flange

There is a new evaporative loss flange (3 Fig.1) fitted to the top of the 91MY fuel tank.

Note: Fuel tanks and evaporative loss flanges between 90 and 91MY cannot be interchanged.

The flange is mounted to the tank by a seal (4 Fig. 1) and locking ring (5 Fig. 1), it has three external outlet ports and one electrical connection.

The large port (1 Fig.2) allows the tank to vent vapour during refuelling and is directly connected to the fuel filler neck (6 Fig. 1).

The intermediate port (2 Fig.2) has a 'Legris' quickfit connector moulded in, and allows for over pressurisation; it is connected to atmosphere by a nylon pipe the outlet of which is underneath the vehicle.

The small outlet port (3 Fig.2) is used for vehicles incorporating evaporative loss control and uses a nylon pipe to connect the tank to the charcoal canister located at the front of the vehicle. For cars not fitted with evaporative loss control, the pipe is vented directly to atmosphere via a hose passing underneath the car. In both evaporative loss control vehicles and non-evaporative loss control vehicles, a 2psi Rochester valve **(Fig.3)** is included in the line, controlled by manifold pressure.

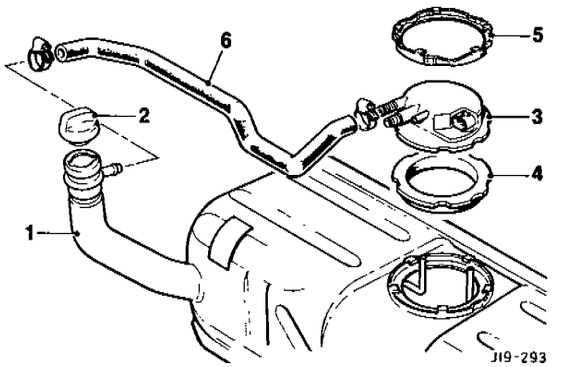


Fig 1

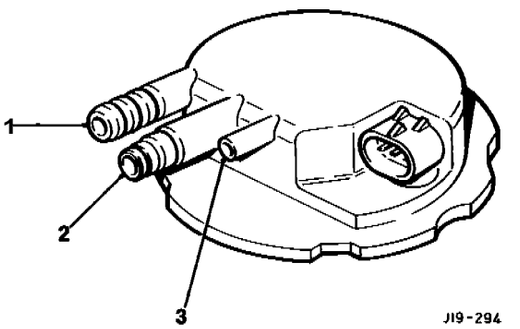


Fig 2

Rochester Valve

A Rochester valve is included in the evaporative loss line for both evaporative control and non-evaporative control vehicles.

CAUTION: It is important that the Rochester valve is fitted the correct way round, the valve has 'Tank' printed on one port and 'Can (or Engine)' printed on the other port for identification. Failure to fit the Rochester valve in the correct orientation could cause tank collapse.

When the engine is running, the valve is open and has an overpressure cracking point of 1.25 psi. If this valve fails to work, the valve in the evaporative loss flange cracks open at 2 - 2.25 psi. If the evaporative loss flange valve also fails to operate, the fuel cap has a pressure relief valve set at 3 - 3.5 psi.

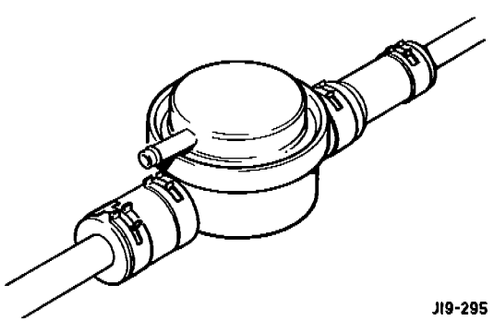


Fig 3

Instrument Gauge

Because of the presence of the in-tank pump, a new float arm (Fig.1) has been introduced at 91MY on the instrument gauge fuel sender unit. The new arm is bent to avoid contact with the in-tank module.

Note: It is not possible to interchange float arms and fuel instrument gauge sender units between 90MY and 91MY vehicles.

The sender unit is connected to the fuel tank using a sealing ring (1 Fig.1) and a locking ring (2 Fig.1).

Fig.2 shows a cross-section of the fuel tank to indicate theoretical float positions against fuel level.

Note: All fuel levels shown are approximations only.

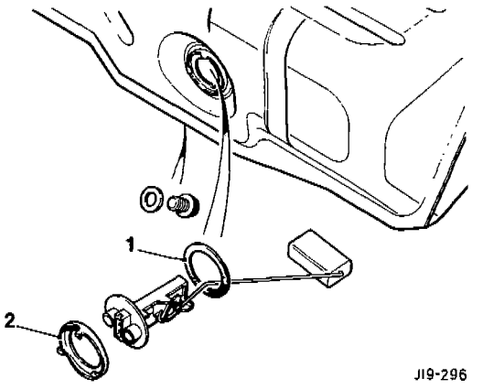


Fig 1

Key to Fig. 2

1 Tank Empty Position (less than 7 Lt. in tank)
2 Tank ¼ Full (15 - 20Lt. in tank)
3 Tank ½ Full (35 - 40Lt. in tank)
4 Tank ¾ Full (55 - 60Lt. in tank)
5 Tank Full (more than 70 Lt. in tank)
6 Fuel expansion space (7%)
7 Unrecorded fuel (approx. 11Lt.)
8 Tank Sender Unit
9 Unrecorded Fuel (approx. 6Lt.)

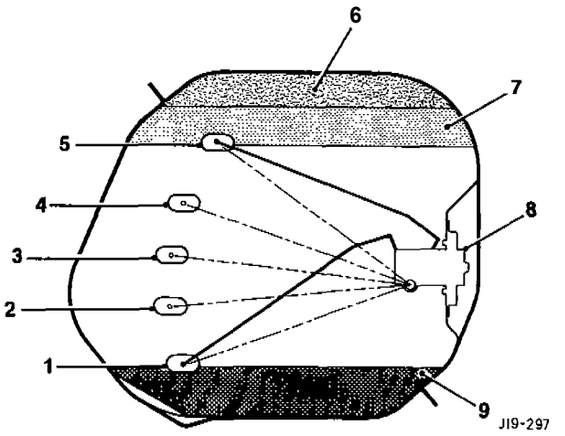


Fig 2

Tank capacity is approximately 90 Litres, and the measurement range of the sender unit is from 6 to 79 Litres.

The resistance of the new sender unit has been changed, this means that if either a 91MY sender unit or instrument pack is fitted to a 90MY vehicle, it must also have the matching unit fitted. A 90MY sender unit cannot be fitted to a 91MY vehicle.

Fuel Pump Relay

The fuel pump relay has been relocated from under the passenger footwell at 90MY to in front of the bulkhead in the engine compartment at 91MY. In addition, the relay base has changed from red to yellow.

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Fuel Injectors

Injector operation is controlled by means of an electrical pulse which actuates a solenoid valve within the injector body. The duration of the pulse, and hence the quantity of the fuel injected, is determined by the Engine Management ECU on the basis of intake air (engine load) and engine speed information derived from air flowmeter and crankshaft sensors. The memory of the ECU contains data matching fuel injector pulse 'OPEN' duration against 16 different engine loads and varying speeds.

Correction factors are applied to the basic injector pulses to compensate for varying conditions. The resultant pulses are then normally applied to the injectors twice per engine cycle, i.e. once per crankshaft revolution, with only half the required amount of fuel being injected at each injector 'open' time.

Changes have been incurred to the 91MY Engine Management System, check the Engine Management Section (18) for full details.

The fuel injectors used at 91MY are the same as those used at 90MY and can be used as a direct replacement.

Fuel Rail

The fuel rail for 3.2 Litre and 4.0 Litre vehicles at 91MY is the same as that used on 90MY 4.0 Litre vehicles and can be fitted as a direct replacement. The fuel rail fitted to 2.9 Litre vehicles becomes obsolete for vehicles manufactured from 91MY.

Fuel Pressure Regulator

The fuel pressure regulator used on 91MY vehicles is the same as that used on 90MY 4.0 Litre vehicles and can be fitted as a direct replacement using the same maintenance procedures.

SAFETY PRECAUTIONS

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.

FUEL VAPOUR IS EXTREMELY FLAMMABLE, THEREFORE GREAT CARE MUST BE TAKEN WHEN WORK IS CARRIED OUT ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.

2 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.

3 A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.

4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.

5 EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.

6 FUEL MUST NOT BE EMPTIED INTO A PIT.

7 THE WORK AREA MUST BE WELL VENTILATED.

8 THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.

9 THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

10 MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

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FUEL TANK

RENEW 19.55.01

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

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3 A CO^2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.

4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.

5 EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSIONPROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.

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10 MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion **proof** container using suitable fireproof equipment.

Raise the vehicle on a '4 Post' ramp.
Displace and remove the retaining clips securing the **fuel** feed and return hoses (1 Fig.1).
Disconnect hoses from fuel tank (2 Fig.1).
Fit protective **plugs** to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp.

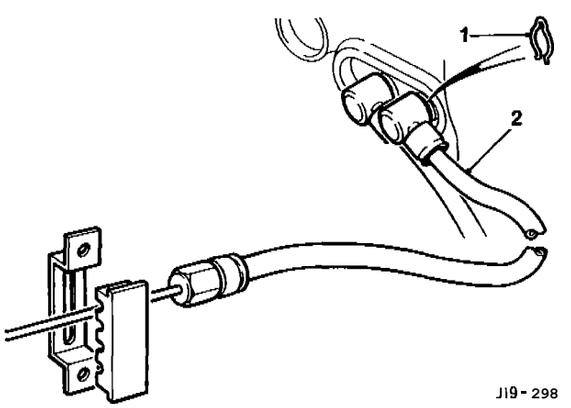


Fig 1

Open the luggage compartment.
Remove spare wheel/wheel cover and **jack.**
Remove the floor carpet.
Remove the boot front and side liner.
Note and disconnect **the** cables from the fuel gauge tank sender unit (Fig. 1).

Note: The top terminal (1 Fig.1) **is** the positive supply terminal; the centre terminal (2 Fig.1) is the earth terminal. The bottom terminal (3 Fig.1) is the warning light terminal and should be blanked **off** with an insulation cover to prevent incorrect connection.

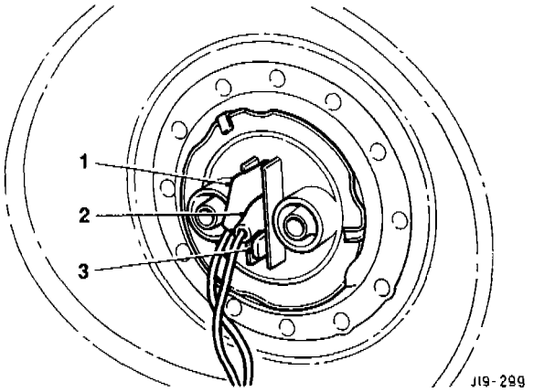


Fig 1

Remove the bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation **pad.**
Disconnect fuel pump link lead from evaporative loss flange connection (1 Fig.2).

Cut and remove harnesses to fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from **fuel** tank retaining strap lower bracket clip.
Release vapour pipe hose to underbody pipe securing clip (1 Fig.3).
Disconnect vapour pipe/hose assembly from underbody pipe,

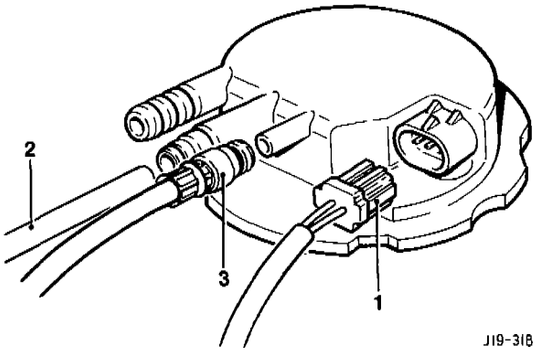


Fig 2

Remove vapour pipe from evaporative flange by pushing back collar on quickfit connector in flange port (2 Fig.2), and pulling pipe from connector.
Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.2), and pulling pipe from connector.

Slacken the tank retaining strap (1 Fig.4) to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.

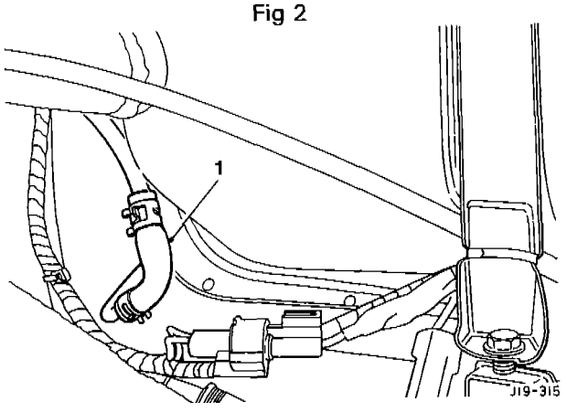


Fig 3

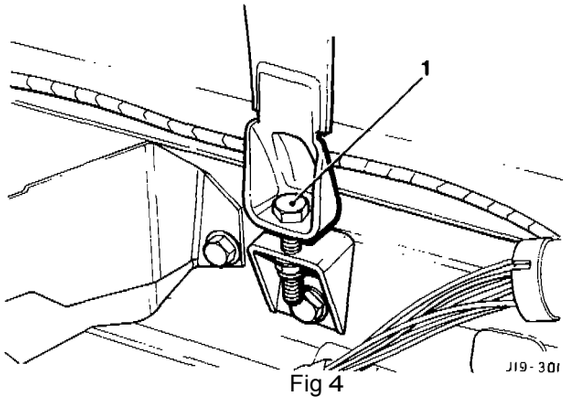


Fig 4

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Cut and remove securing strap holding filler housing solenoid block connector to harness (1 Fig.1).
Disconnect block connector.
Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig. 1).
Disconnect drain tube (3 Fig. 1) from aperture seal.
Open fuel filler flap (1 Fig.2).
Remove fuel filler cap (2 Fig.2).
Remove aperture seal to filler neck garter spring (3 Fig.2).
Undo and remove filler housing to body securing bolts (4 Fig.1).
Displace filler housing from body aperture (remains captive on filler neck).

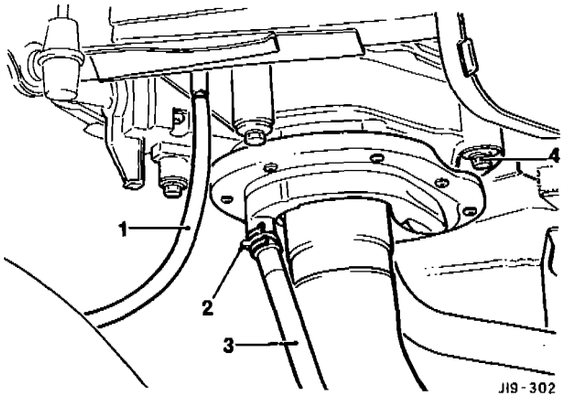


Fig 1

Displace and remove the fuel tank assembly.

Slacken breather hose to evaporative loss flange securing clip (1 Fig.3).
Disconnect hose from evaporative loss flange (2 Fig.3).
Slacken breather hose to fuel tank filler neck securing clip (3 Fig.3).
Disconnect hose from filler neck.
Reposition weld tag upwards (4 Fig.3) to release hose.
Remove breather hose/clip assembly from fuel tank.
Using tool JD 174, release evaporative loss flange to fuel tank lock ring (5 Fig.3).
Remove flange lock ring.

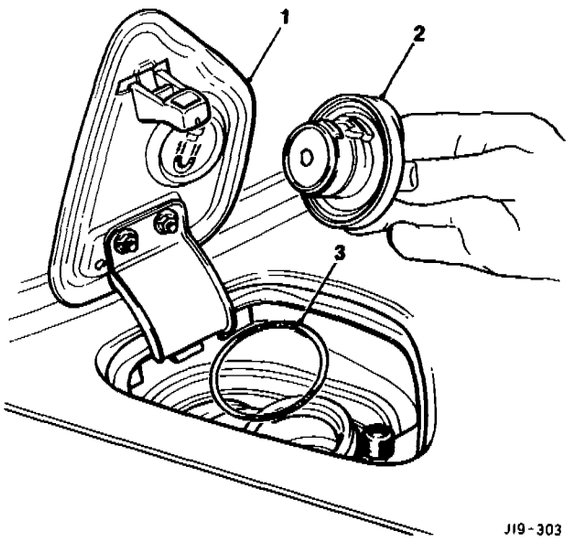


Fig 2

Displace evaporative loss flange from fuel pump harness connector (6 Fig.3).
Remove and discard evaporative loss flange to fuel tank aperture sealing ring (7 Fig.3).

Note: A new evaporative loss flange sealing ring must be fitted every time work is carried out at tank flange.

Using tool JD 175, slacken pump to feed hose securing clip at pump end (8 Fig.3).
Disconnect feed hose from fuel pump (9 Fig.3).
Using tool JD 175, slacken pump to return hose securing clip (10 Fig.3) at pump end.
Disconnect return hose (11 Fig.3) from fuel pump.
Displace fuel pump module from mounting rubber.

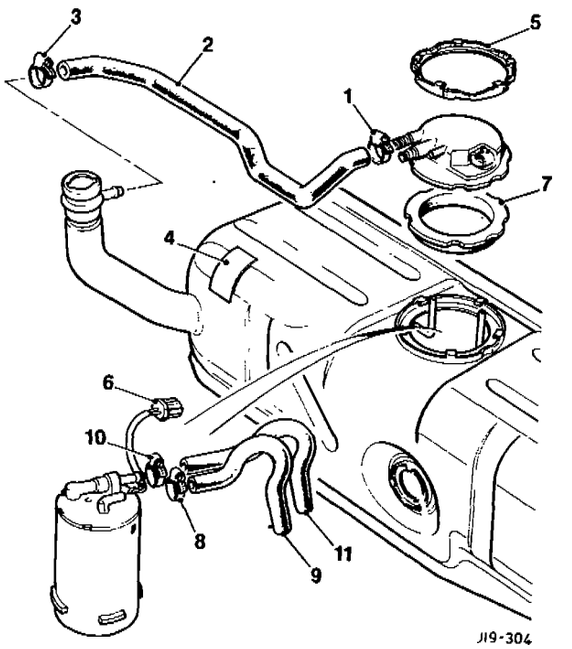


Fig 3

Remove fuel pump module (1 Fig.1) from fuel tank (3 Fig.1).
Displace and remove fuel pump mounting rubber (2 Fig.1) from fuel tank.
Using tool JD 175, slacken pump to tank feed hose securing clip at tank end (4 Fig.1).
Disconnect and remove feed hose (5 Fig.1) from fuel tank.
Using tool JD 175, slacken pump to tank return hose securing clip (6 Fig.1) at tank end.
Disconnect and remove return hose (7 Fig.1) from fuel tank.

Using tool 18G 1001, displace and remove tank sender unit retaining ring (1 Fig.2).
Displace and remove tank sender unit (2 Fig. 2).
Remove and discard tank sender unit sealing ring (3 Fig.2).

Note: A new tank sender unit sealing ring must be fitted every time work is carried out at the tank sender unit.

Undo and remove magnetic drain plug and washer from tank (4 Fig.2).
Clean debris from magnet.

CAUTION: Store old tank in a safe location until it can be properly disposed of.

Fit and tighten magnetic drain plug to new tank (1 Fig.3).

Note: A new sealing washer must be used every time the drain plug is removed and refitted.

Remove backing from outlet pipe body aperture seal and fit to tank (5 Fig.2).

Note: A new aperture seal must be fitted every time the tank is removed and refitted.

Remove backing from retaining strap rubber strips (2 Fig.3) and fit to tank.
Fit new tank sender unit sealing ring.
Fit and seat tank sender unit (3 Fig.3).
Using tool 18G 1001 fit and seat tank sender unit retaining ring.
Fit and fully seat return hose to fuel tank internal pipe (7 Fig.1).
Fit and fully seat feed hose to fuel tank internal pipe (5 Fig.1).

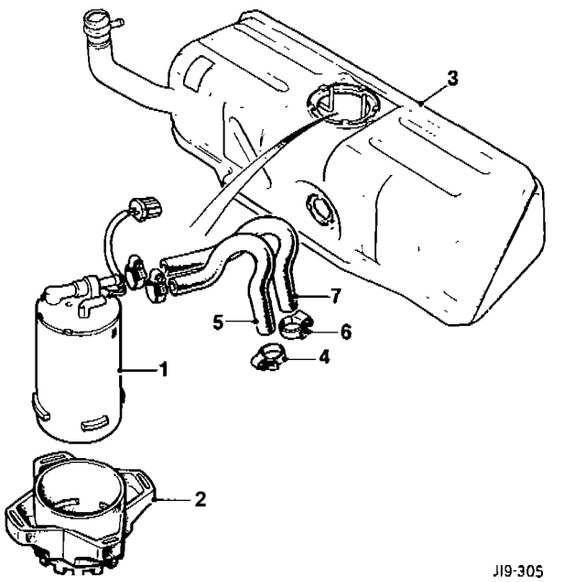


Fig 1

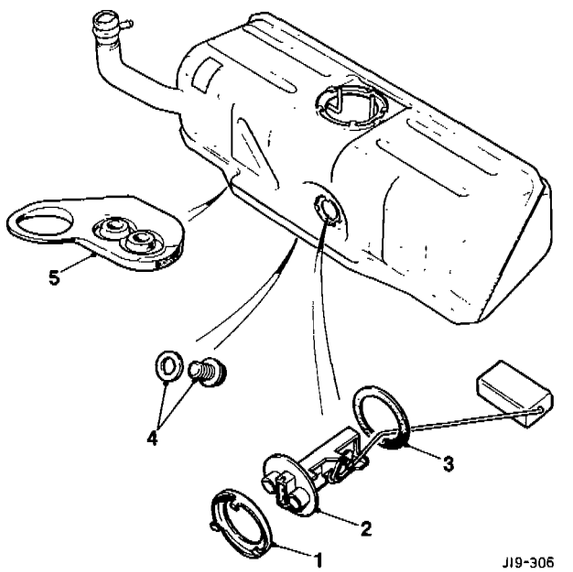


Fig 2

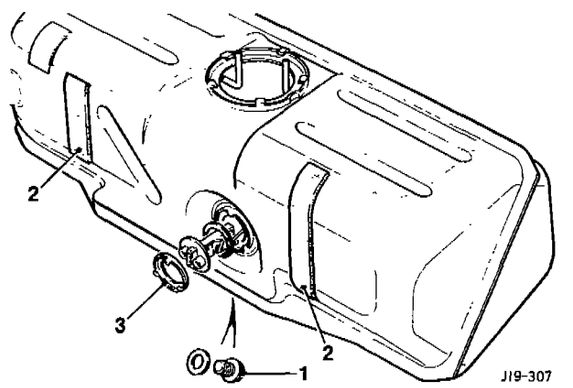


Fig 3

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Fit fuel pump mounting rubber (2 Fig.1) to fuel tank internal mounting lugs.

Note: It is important to ensure correct orientation and fitting of fuel pump module with rubber mounting and steel support bracket. There are three large and one small locating hole in mounting rubber, which mate with lugs on steel support bracket and similarly there are locating lugs and slots between mounting rubber and pump module.

Fit and fully seat fuel pump module (1 Fig.1) to fuel tank mounting rubber.
Connect return hose (7 Fig. 1) to fuel pump.
Connect feed hose (5 Fig. 1) to fuel pump.

Note: Ensure feed and return hoses are fully seated on pump and fuel tank pipes.

Using tool JD 175, tighten tank to pump feed and return hose securing clips (4,6 & 8 Fig.1).

Note: Ensure the hoses are free from twists and lower return hose clip does not foul fuel sender unit float arm.

Fit new evaporative loss flange seal to fuel tank aperture (9 Fig.1).
Connect evaporative loss flange to fuel pump harness connector (10 Fig.1).
Align and seat evaporative loss flange (11 Fig.1) to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank body.

Fit lock ring (12 Fig.1) to evaporative loss flange/tank.
Using service tool JD 174, fully seat lock ring to evaporative loss flange/tank.
Fit breather hose (13 Fig.1) to fuel tank.
Reposition fuel tank weld tag (14 Fig.1) downwards to secure breather hose.
Connect breather hose to fuel tank filler neck.
Tighten breather hose to filler neck securing clip.
Connect breather hose to evaporative loss flange outlet.
Tighten breather hose to evaporative loss flange securing clip.

Fit tank assembly to position in boot.
Fully seat tank into mounting position, ensure that hoses, pipes or harnesses are not trapped by the tank.
Re-connect tank sender unit feed wires.

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal.

Remove adhesive tape securing the tank retaining straps to boot aperture flange.

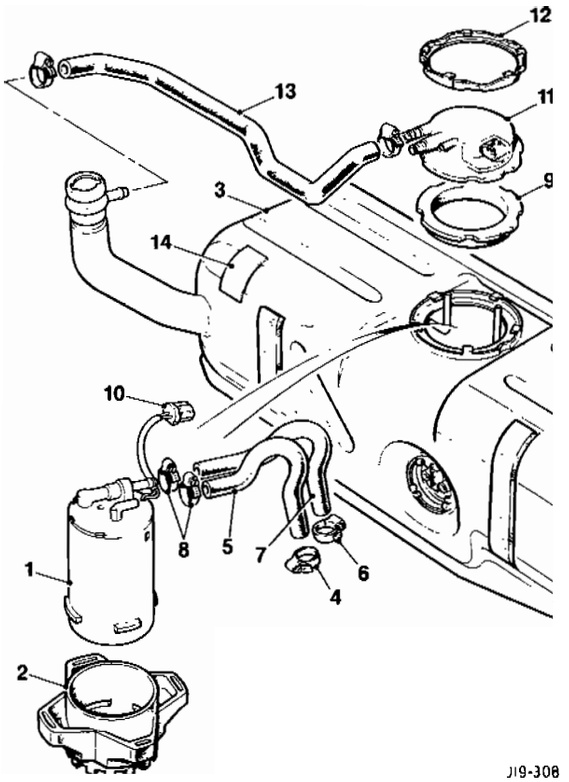


Fig 1

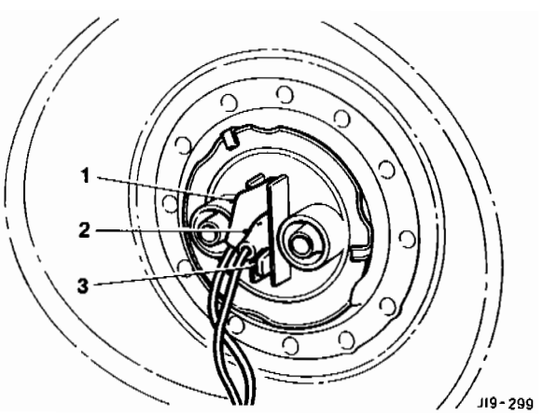


Fig 2

Re-position tank retaining straps to tank.
Re-connect fuel pump link harness to evaporative **loss** flange connection (1 Fig.1).
Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.2).
Reposition and seat vspour hose to underfloor vapour pipe spring clip.
Connect vapour pipe to quickfit connector on evaporative loss flange outlet (3 Fig.1).
Connect over pressure pipe to evaporative **loss** flange quickfit connector (2 Fig. 1)

CAUTION: **Pipes and component stubs must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.**

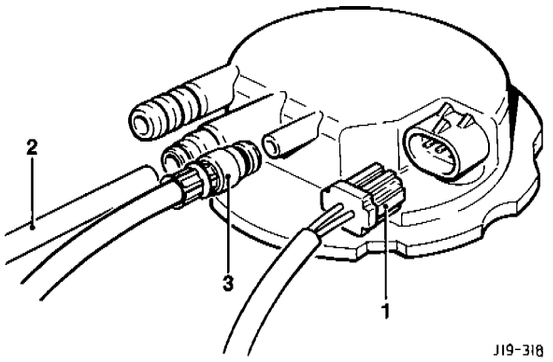


Fig 1

Refit fuel filler aperture housing (Fig 3).
Re-connect fuel filler cap solenoid block connector and secure with strap.
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid block connector (1 Fig.3).
Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.

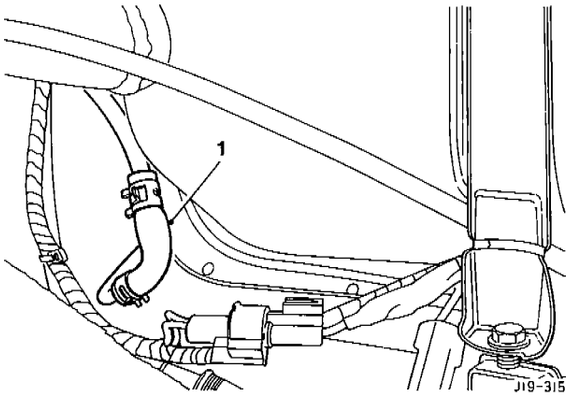


Fig 2

Secure harnesses to fuel rank retaining straps with ratchet straps.
Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel bracket securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.
Raise vehicle on ramp, remove plugs from tank and hoses.

Note: New sealing rings must be fitted to feed and return hoses.

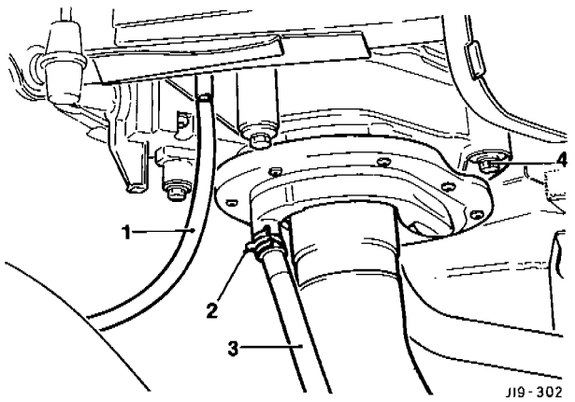


Fig 3

Connect feed and return hoses to fuel tank (Fig.4).
Fit tank feed and return **hose** securing clips (1 Fig.4).

Lower vehicle on ramp.
Refill fuel tank.
Re-connect battery.
Close bonnet.

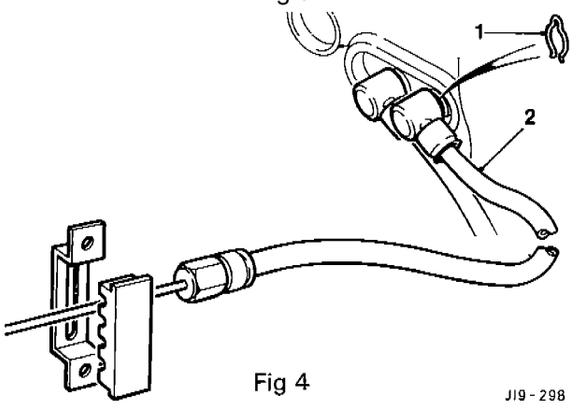


Fig 4

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DATA

SERVICE TOOLS

Evaporative Loss Flange Lock Ring Wrench (JD 174)
Hose Clip to Fuel Pump Driver (JD 175)
Tank Sender Unit Wrench 18G 1001

TORQUE FIGURES

Anchor bracket securing bolt 22-28Nm
Filler neck to ***body bolts 2-3Nm***
Filler neck hose clip ***3.5-4.5Nm***
Fuel Sender Unit Lock Ring 5.5-13 Nm
Overflow pipe hose clip ***2.5-3.5Nm***
Securing strap to anchor bracket ***5-6Nm***

SPANNER SIZES

8mm
13mm
15mm

1960C

FUEL PUMP

RENEW **19.45.08**

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1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSIONPROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion proof container using suitable fireproof equipment.

Raise the vehicle on a ramp.
Displace and remove the retaining clips securing the fuel feed and return hoses (1 Fig. 1).
Disconnect hoses from fuel tank (2 Fig. 1).
Fit protective plugs to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp.

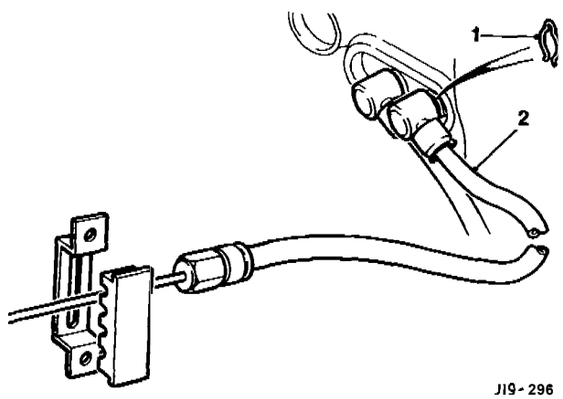


Fig 1

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Open the luggage compartment.
Remove spare wheel and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Cut and remove securing strap holding filler housing solenoid block connector to harness (1 Fig.1).
Disconnect block connector.
Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig.1).
Disconnect drain tube (3 Fig.1) from aperture seal.
Open fuel filler flap (1 Fig.2).
Remove fuel filler cap (2 Fig.2).
Remove aperture seal to filler neck garter spring (3 Fig.2).
Undo and remove filler housing to body securing bolts (4 Fig.1).
Displace filler housing from body aperture (remains captive on filler neck).

Note and disconnect the cables from the fuel gauge tank sender unit (Fig. 3).

Note: The top terminal (1 Fig.3) is the positive supply terminal; the centre terminal (2 Fig.3) is the earth terminal. The bottom terminal (3 Fig.3) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

Remove the bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation pad.

Remove vapour pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.4), and pulling pipe from connector.
Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (2 Fig.4), and pulling pipe from connector.
Disconnect fuel pump link lead from evaporative loss flange connection (1 Fig.4).
Cut and remove harnesses *to* fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from fuel tank retaining strap lower bracket clip.

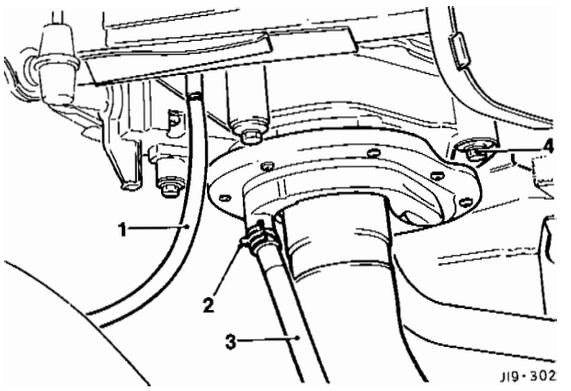


Fig 1

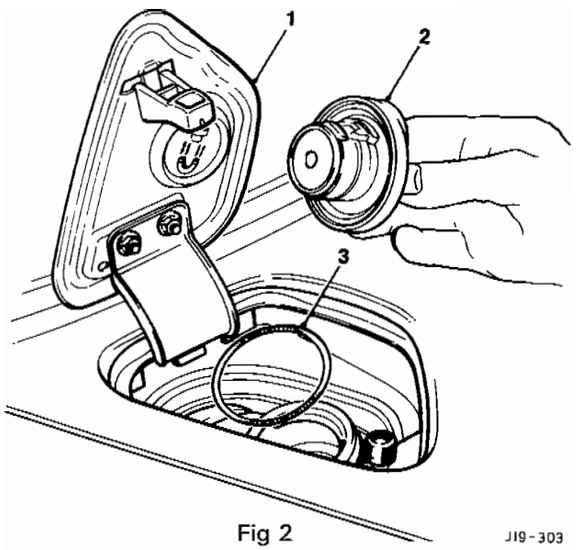


Fig 2

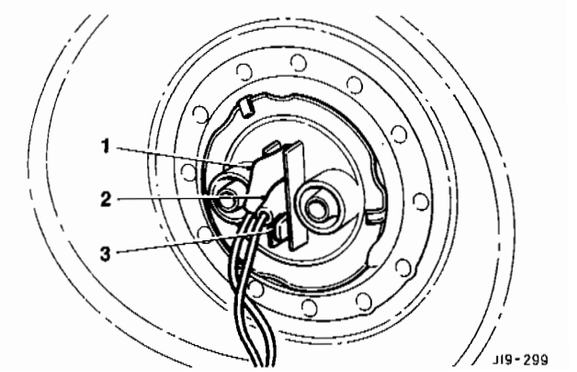


Fig 3

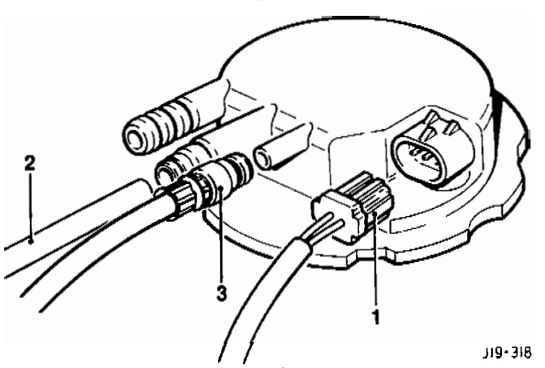


Fig 4

Release vapour pipe hose to underbody pipe securing clip (1 Fig.1).
Disconnect vapour pipe/hose assembly from underbody pipe.
Slacken the tank retaining strap (1 Fig.2) to lower bracket securing **nuts** and bolts.
Remove the tank retaining strap lower bracket **to** body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.
Displace and remove the fuel tank assembly.
Slacken breather hose **to** evaporative loss flange securing clip (1 Fig.3).
Disconnect hose from evaporative loss flange (2 Fig.3).

Using tool JD 174, release evaporative **loss** flange to fuel tank **lock** ring (5 Fig.3).
Remove flange lock ring,
Displace evaporative loss flange from fuel pump harness connector (6 Fig.3).
Remove and discard evaporative **loss** flange to fuel tank aperture sealing ring (7 Fig.3).
Using tool JD 175, slacken pump to feed hose securing clip **at** pump end (8 Fig.3).
Disconnect feed hose from fuel pump (9 Fig.3).
Using tool JD 175, slacken pump to return hose securing clip (10 Fig.3) at pump end.
Disconnect return hose (11 Fig.3) from fuel pump.

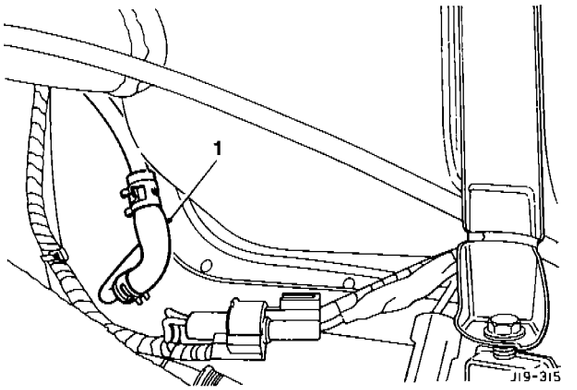


Fig 1

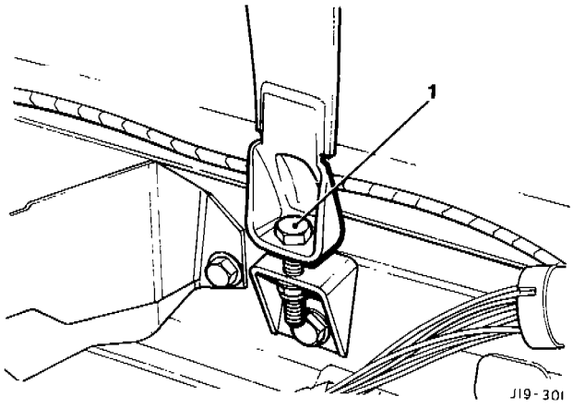


Fig 2

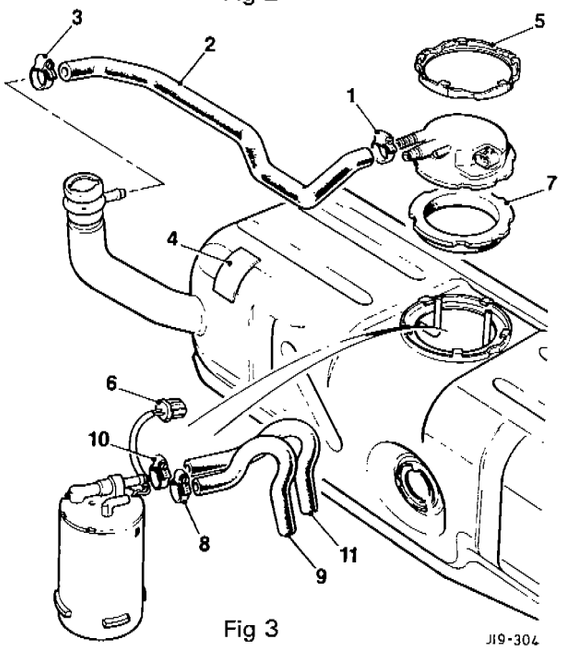


Fig 3

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Displace fuel pump module from mounting rubber (2 Fig. 1).
Remove fuel pump module (1 Fig.1) from fuel tank.

Note: There are three large and one small locating hole (5 Fig.1) in the mounting rubber which mates with the lugs (7 Fig.1) on the steel support bracket. It *is* important to ensure that the correct orientation and fitting of fuel pump module rubber mounting with steel support bracket is maintained.

Fit and fully seat new fuel pump module to fuel tank mounting rubber.

Note: There are three large and one small locating hole in the mounting rubber (4 Fig.1) which mates with the lugs (3 Fig.1) on the fuel pump module. It is important to ensure the correct orientation and fitting of the fuel pump module with the rubber mounting is maintained.

Connect return hose (11 Fig. 1) to fuel pump.
Connect **feed** hose (10 Fig.1) to fuel pump.

Note: Ensure feed and return hoses are fully seated on pump module pipe stubs.

Using tool JD **175,** tighten tank *to* pump feed and return hose securing clips (8 Fig.2).

Note: Ensure the hoses are free from twists and the lower return hose clip does not foul fuel sender unit float arm.

Fit new evaporative **loss** flange seal to fuel tank aperture (9 Fig.2).

Note: A new evaporative **loss** flange seal must be fitted every time work is carried out at the tank flange.

Connect evaporative loss flange to fuel pump harness connector (10 Fig.2).
Align and seat evaporative loss flange (11 Fig.2) to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank body.

Fit lock ring (12 Fig.2) to evaporative loss flange/tank.
Using service tool JD **174,** fully seat lock ring to evaporative loss flange/tank.
Connect breather hose to evaporative loss flange outlet (15 Fig.2).
Tighten breather hose to evaporative **loss** flange securing clip.

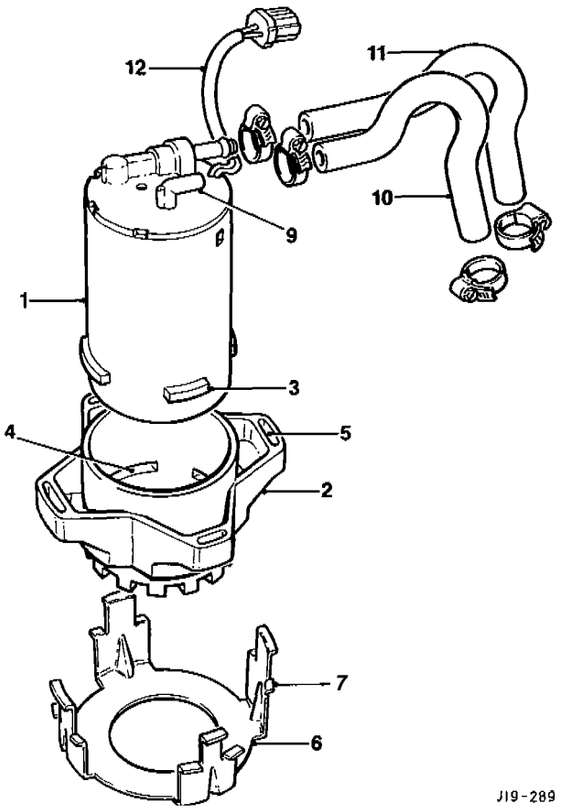


Fig 1

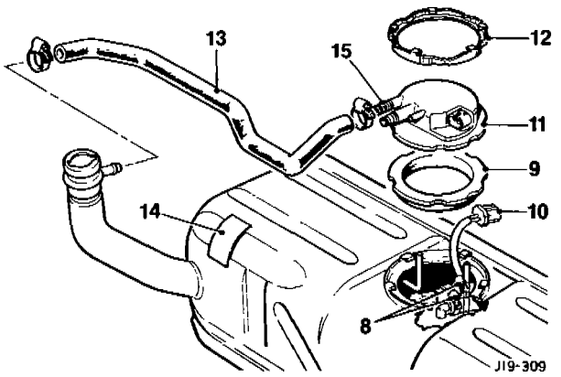


Fig 2

Remove backing from outlet pipe body aperture seal and fit to tank (8 Fig.1).

Note: A new aperture seal must be fitted every time the tank is removed and refitted.

Fit tank assembly to position in boot.
Fully seat tank into mounting position, ensure that hoses, pipes or harnesses are not trapped by the tank.
Re-connect tank sender unit feed wires.

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal.

Remove adhesive tape securing the tank retaining straps to boot aperture flange.
Re-position tank retaining straps to tank.
Re-connect fuel pump link harness to evaporative loss flange connection (1 Fig.3).
Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.4).
Reposition and seat vapour hose to underfloor vapour pipe spring clip.
Connect vapour pipe to quickfit connector on evaporative loss flange outlet (3 Fig.3).
Connect over pressure pipe to evaporative loss flange quickfit connector (2 Fig.3)

CAUTION: Pipes must be fully inserted into connector ends to ensure proper fit; failure to do so could causa fuel leakage.

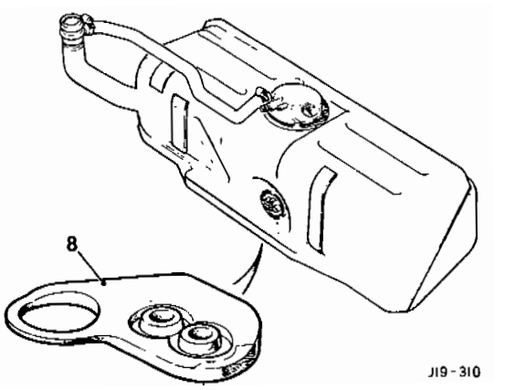


Fig 1

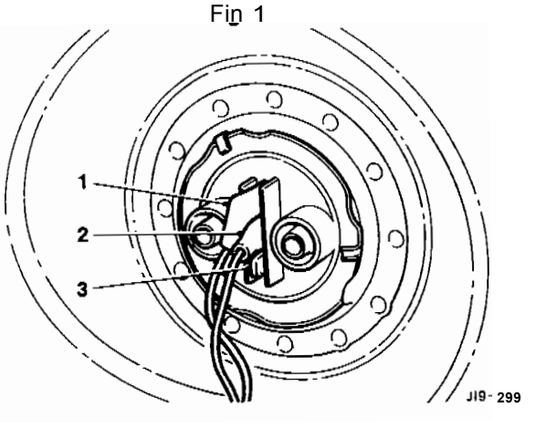


Fig 2

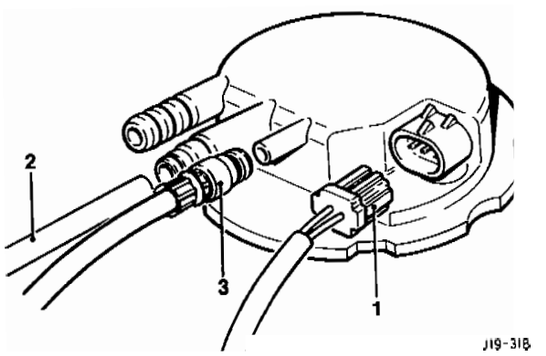


Fig 3

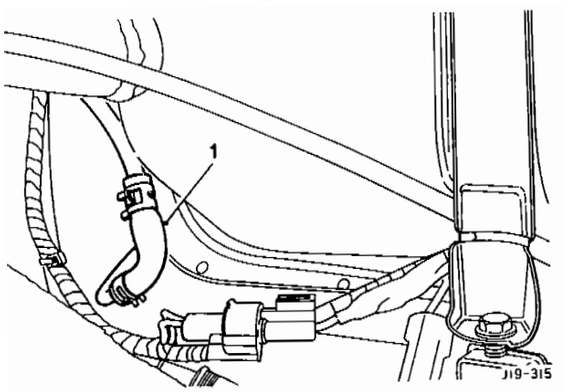


Fig 4

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Refit fuel filler aperture housing (Fig 1).
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid block connector to harness (1 Fig.1).
Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.
Secure harnesses to fuel tank retaining straps with ratchet straps.

Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel bracket securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.

Raise vehicle on ramp, remove **plugs** from tank **and** hoses.

Note: New sealing rings must be fitted to feed and return hoses.

Connect feed and return hoses to fuel tank (Fig.2).
Fit **and** seat tank feed and return hose securing clips (1 Fig.2).
Lower vehicle on ramp.
Refill fuel tank.
Re-connect battery.
Close bonnet.

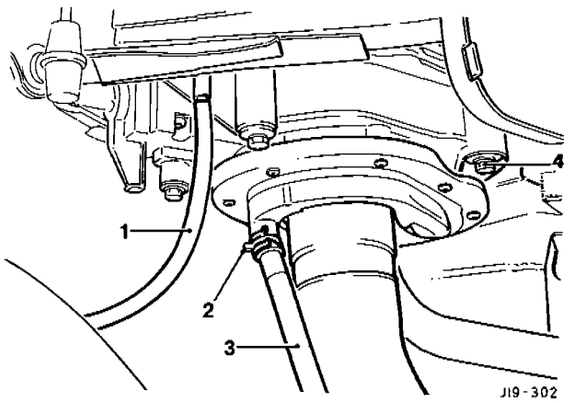


Fig 1

DATA

SERVICE TOOLS

Evaporative Loss Flange Lock Ring Wrench (JD 174)
Hose Clip ***to Fuel Pump*** *Driver (JD* ***175)***

TORQUE FIGURES

Anchor bracket securing ***bolt 22-28Nm***
Filler neck to body bolts ***2-3Nm***
Filler neck hose ***clip 3.5-4.5Nm***
Fuel Sender Unit Lock Ring ***5.5-13 Nm***
Overflow pipe hose clip ***2.5-3.5Nm***
Securing strap to anchor bracket ***5-6Nm***

SPANNER SIZES

8mm
13mm
15mm

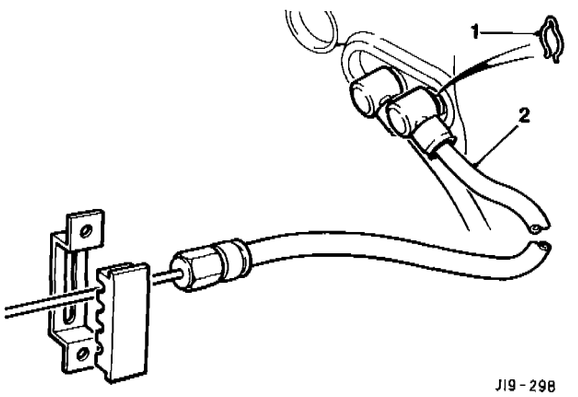


Fig 2

1960C

IN-TANK FUEL PUMP MODULE MOUNTING RUBBER

RENEW **9.55.26**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.

2 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.

3 A C02 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.

4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.

5 EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.

6 FUEL MUST NOT BE EMPTIED INTO A PIT.

7 THE WORK AREA MUST BE WELL VENTILATED.

8 THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK OM THE FUEL SYSTEM.

9 THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

10 MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion proof container using suitable fireproof equipment,

Raise the vehicle on a '4 Post' ramp.
Displace and remove the retaining clips securing the fuel feed and return hoses (1 Fig.1).
Disconnect hoses from fuel tank (2 Fig.1).
Fit protective plugs to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp.

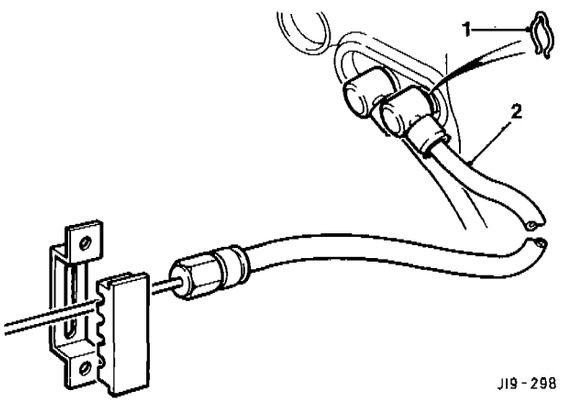


Fig 1

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Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Note and disconnect the cables from the fuel gauge tank sender unit (Fig. 1).

Note: The top terminal (1 Fig.1) is the positive supply terminal; the centre terminal (2 Fig. 1) is the earth terminal. The bottom terminal (3 Fig.1) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

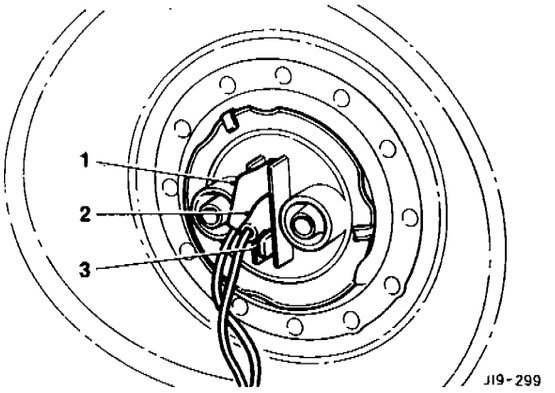


Fig 1

Remove the bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation pad.
Disconnect fuel pump link lead from evaporative loss flange connection (1 Fig.2).

Cut and remove harnesses to fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from fuel tank retaining strap lower bracket clip.
Release vapour pipe hose to underbody pipe securing clip (1 Fig.3).
Disconnect vapour pipe/hose assembly from underbody pipe.
Remove vapour pipe from evaporative flange by pushing back collar on quickfit connector in flange port (2 Fig.2), and pulling pipe from connector.

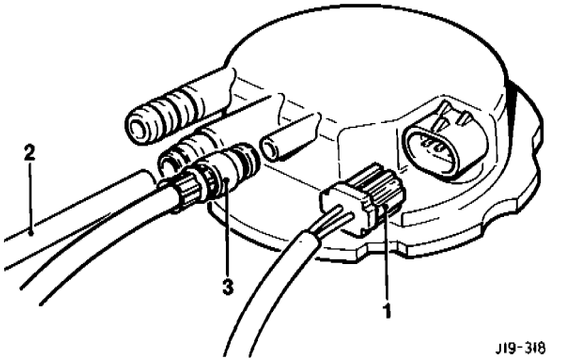


Fig 2

Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.2), and pulling pipe from connector.
Slacken the tank retaining strap (1 Fig.4) to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.

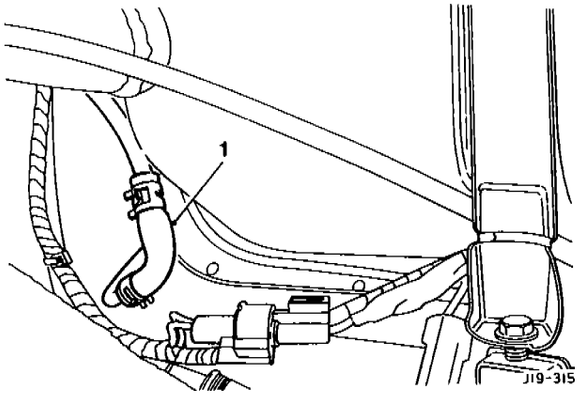


Fig 3

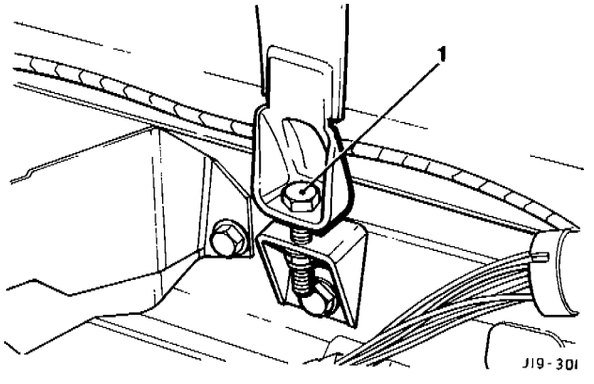


Fig 4

Cut and remove securing strap holding filler housing solenoid (1 Fig. 1) block connector to harness.
Disconnect block connector.
Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig.1).
Disconnect drain tube (3 Fig.1) from aperture seal.
Open fuel filler flap (1 Fig.2).
Remove fuel filler cap (2 Fig.2).
Remove aperture seal to filler neck garter spring (3 Fig.2).
Undo and remove filler housing to body securing bolts (4 Fig.1).
Displace filler housing from body aperture (remains captive on filler neck).
Displace and remove the fuel tank assembly.

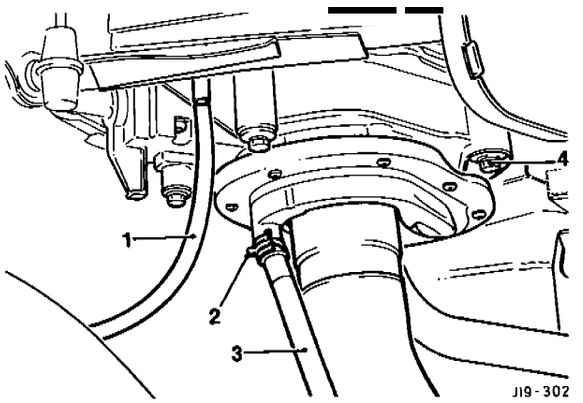


Fig I

Slacken breather hose to evaporative loss flange securing clip (1 Fig.3).
Disconnect hose from evaporative loss flange (2 Fig.3).
Using tool JD 174, release evaporative loss flange to fuel tank lock ring (5 Fig.3).
Remove flange lock ring.
Displace evaporative **loss** flange from fuel pump harness connector (6 Fig.3).
Remove and discard evaporative loss flange to fuel tank aperture sealing ring (7 Fig.3).

Note: A new evaporative loss flange sealing ring must be fitted every time work is carried out at tank flange.

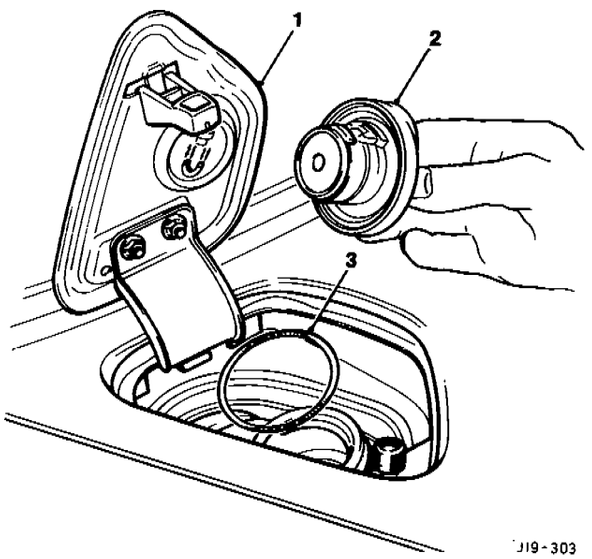


Fig 2

Using tool JD **175,** slacken pump to feed **hose** securing clip at pump end (8 Fig.3).
Disconnect feed hose from fuel pump (9 Fig.3).
Using tool JD 175, slacken pump to return hose securing clip (10 Fig.3) at pump end.
Disconnect return hose (11 Fig.3) from fuel pump.

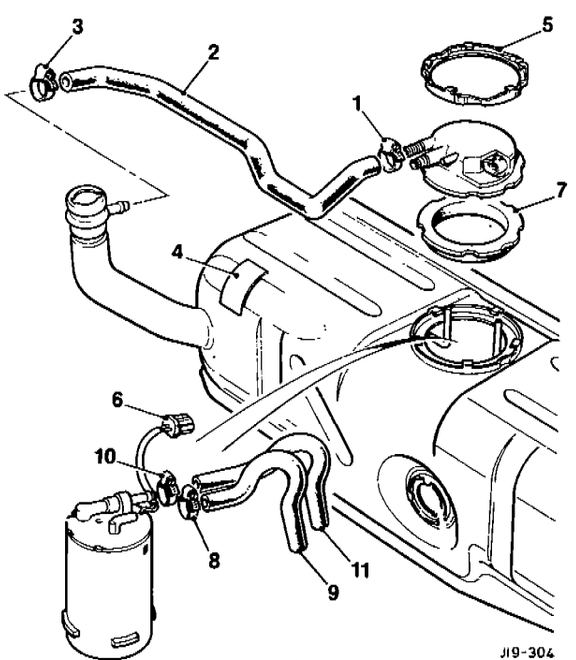


Fig 3

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Displace fuel pump module from mounting rubber.
Remove fuel pump module (1 Fig. 1) from fuel tank (3 Fig. 1).
Displace and remove fuel pump mounting rubber (2 Fig. 1) from fuel tank.

Fit new fuel pump mounting rubber to fuel tank internal mounting lugs.

Note: It is important to ensure correct orientation and fitting of fuel pump module with rubber mounting and steel support bracket. There are three large and one small locating hole in mounting rubber, which mate with lugs on steel support bracket and similarly there are locating lugs and slots between mounting rubber and pump module.

Fit and fully seat fuel pump module (1 Fig. 1) to fuel tank mounting rubber.
Connect return hose (7 Fig. 1) to fuel pump.
Connect feed hose (5 Fig. 1) to fuel pump.

Note: Ensure feed and return hoses are fully seated on pump and fuel tank pipes.

Using tool JD 175, tighten tank to pump feed and return hose securing clips (8 Fig. 1).

Note: Ensure the **hoses** are free from twists and lower return hose clip does not foul fuel sender unit float arm.

Fit new evaporative loss flange seal to fuel tank aperture (9 Fig. 1).
Connect evaporative loss flange to fuel pump harness connector (10 Fig. 1).
Align and seat evaporative **loss** flange (11 Fig. 1) to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank.

Fit **lock** ring (12 Fig. 1) to evaporative loss flange/tank.
Using service tool JD 174, fully seat lock ring to evaporative loss flange/tank.
Connect breather hose to evaporative loss flange outlet.
Tighten breather hose to evaporative **loss** flange securing clip.
Remove backing from outlet pipe body aperture seal and fit to tank (8 Fig. 2).

Note: A new aperture **seal** must be fitted every time the tank is removed and refitted.

Fit tank assembly to position in boot.
Fully seat tank into mounting position, ensure that hoses, **pipes** or harnesses are not trapped by the tank.

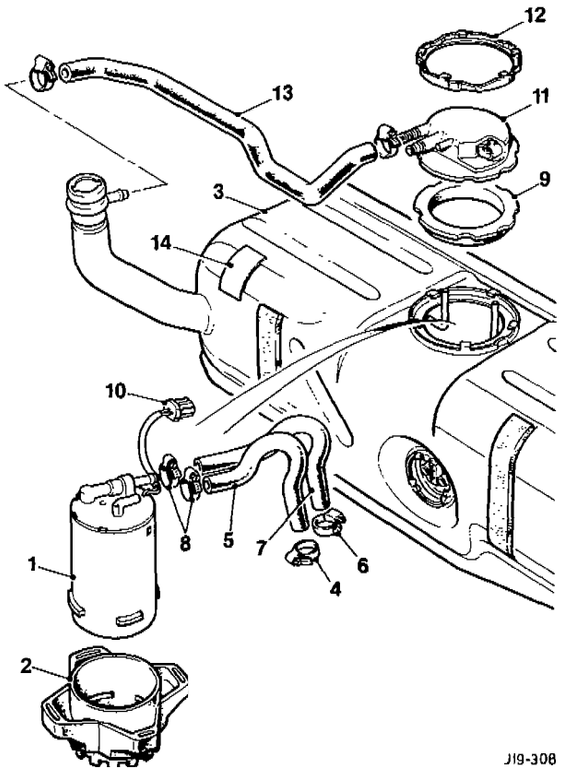


Fig 1

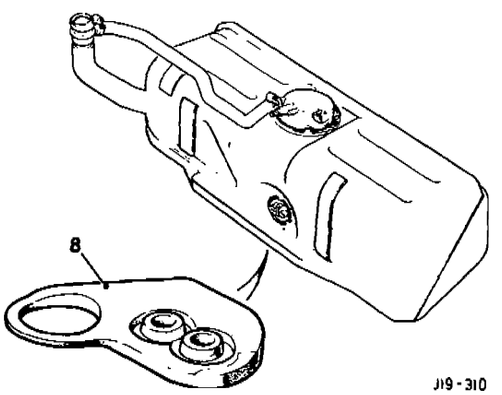


Fig 2

Re-connect tank sender unit feed wires,

Note: The top terminal (1 Fig.1) is the positive supply terminal; the centre terminal (2 Fig. 1) is the earth terminal,

Remove adhesive tape securing the tank retaining straps to boot aperture flange.
Re-position tank retaining straps to tank.
Re-connect fuel pump link harness to evaporative **loss** flange connection (1 Fig.2).
Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.3).
Reposition and seat vapour hose to underfloor vapour pipe spring clip.

Connect vapour pipe to quickfit connector on evaporative **loss** flange outlet (3 Fig.2).
Connect over pressure pipe to evaporative loss flange quickfit connector (2 Fig.2).

CAUTION: Pipes must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

Refit fuel filler aperture housing (Fig 4).
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid block connector (1 Fig.4).

Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.
Secure harnesses to fuel tank retaining **straps** with ratchet straps.
Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel bracket securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.

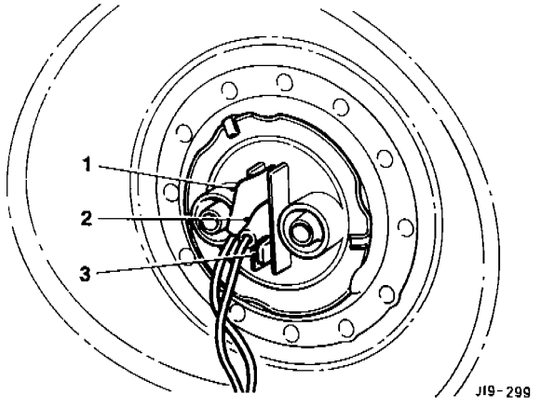


Fig 1

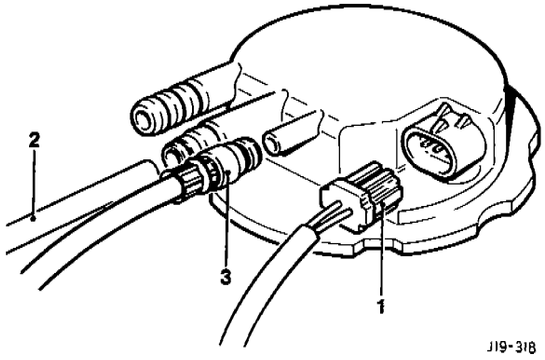


Fig 2

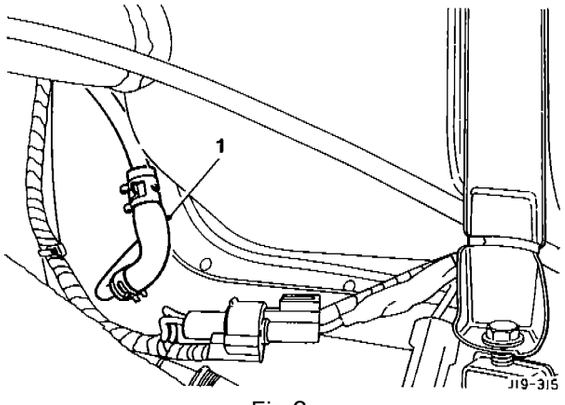


Fig 3

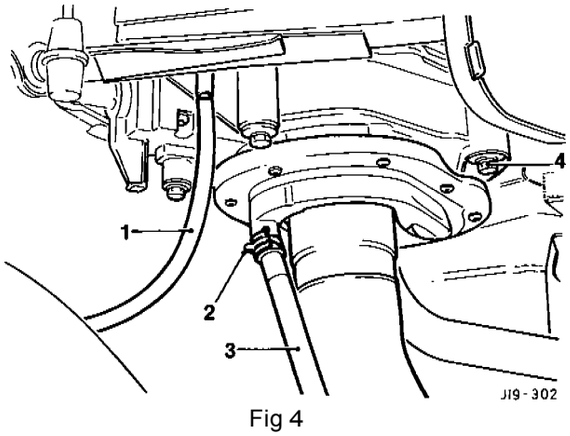


Fig 4

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Raise vehicle on ramp, remove plugs from tank and hoses.

Note: New sealing rings must be fitted to feed and return hoses.

Connect feed and return hoses to fuel tank (Fig.1).
Fit and seat tank feed and return hose securing clips.
Lower vehicle on ramp.
Refill fuel tank.
Reconnect battery.
Close bonnet.

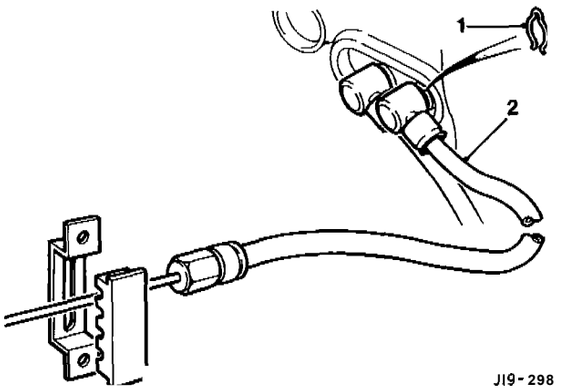


Fig 1

DATA

SERVICE TOOLS

Evaporative Loss Flange Lock Ring Wrench (JD 174)
Hose Clip to Fuel Pump Driver (JD 175)

TORQUE FIGURES

Anchor bracket securing bolt 22-28Nm
filler neck to body bolts 2-3Nm
Filler neck hose clip 3.5-4.5Nm
Overflow pipe hose clip 2.5-3.5Nm
Securing strap to anchor bracket 5-6Nm

SPANNER SIZES

8mm
13mm
15mm

1960C

PUMP MODULE TO FEED PIPE INTERNAL TANK HOSE

RENEW **19.40.86**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion proof container using suitable fireproof equipment.

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Raise the vehicle on a '4 Post' ramp.
Displace and remove the retaining clips securing the fuel feed and return hoses (1 Fig.1).
Disconnect hoses from fuel tank (2 Fig.1).
Fit protective plugs to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp.

Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Note and disconnect the cables **from** the fuel gauge tank sender unit (Fig. 2).

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal. The bottom terminal (3 Fig.2) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

Remove the bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation pad.
Disconnect fuel pump link lead from evaporative loss flange connection (1 Fig.3).

Cut and remove harnesses to fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from fuel tank retaining strap lower bracket clip.
Release vapour **pipe** hose to underbody pipe securing clip (1 Fig.4).
Disconnect vapour pipe/hose assembly from underbody pipe.

Remove vapour pipe from evaporative flange by pushing back collar on quickfit connector in flange port (2 Fig.3), and pulling pipe from connector.
Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.3), and pulling pipe from connector.

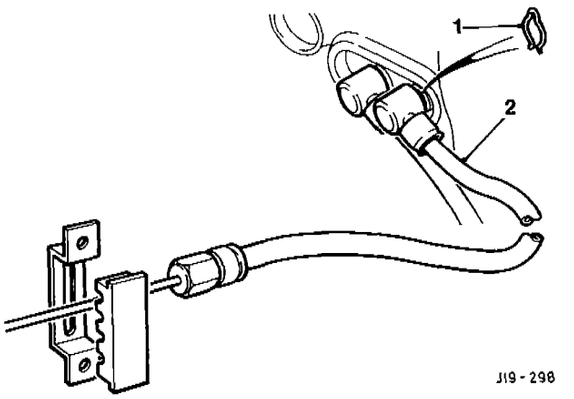


Fig 1

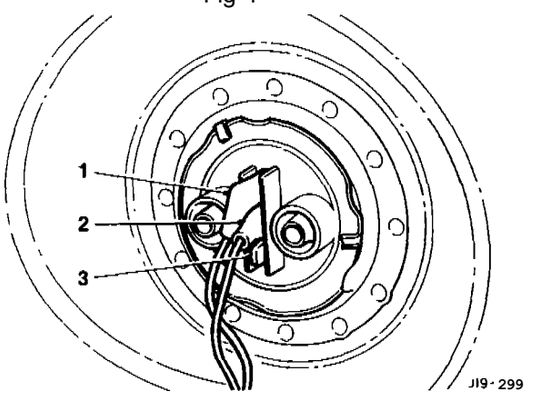


Fig 2

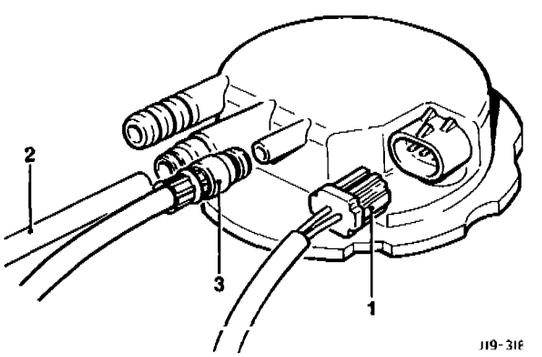


Fig 3

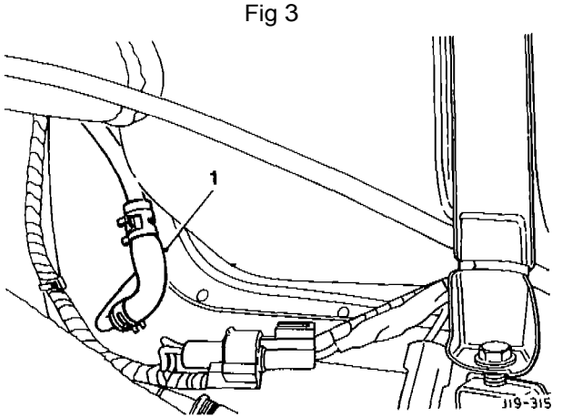


Fig 4

Slacken the tank retaining strap (1 Fig.1) to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.
Cut and remove securing strap holding filler housing solenoid block connector to harness (1 Fig.2).
Disconnect block connector.

Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig.2).
Disconnect drain tube (3 Fig.2) from aperture seal.
Open fuel filler flap (1 Fig.3).
Remove fuel filler cap (2 Fig.3).
Remove aperture seal to filler neck garter spring (3 Fig.3).
Undo and remove filler housing to **body** securing bolts (4 Fig.2).
Displace filler housing from body aperture (remains captive on filler neck).
Displace and remove the fuel tank assembly.

Slacken breather hose to evaporative loss flange securing clip **(1 Fig.4).**
Disconnect hose from evaporative loss flange (2 Fig.4).
Using tool JD 174, release evaporative **loss** flange to fuel tank lock ring (5 **Fig.4).**
Remove flange **lock** ring.
Displace evaporative **loss** flange from fuel pump harness connector (6 Fig.4).
Remove and discard evaporative loss flange to fuel tank aperture sealing ring (7 Fig.4).

Note: **A** new evaporative **loss** flange sealing ring must be fitted every time work is carried out at tank flange.

Using tool JD 175, slacken pump to feed hose securing clip at pump end *(8* Fig.4).
Disconnect feed **hose** from fuel pump (9 Fig.4).
Using tool JD 175, slacken pump to feed hose securing clip at tank end.
Disconnect feed hose (9 Fig.4) from fuel tank end and remove internal feed hose from the fuel tank.

Remove securing clips from the old feed hose.

Fit securing clips to new feed hose.
Connect feed hose to fuel tank internal pipe.
Connect new feed hose to fuel pump module.

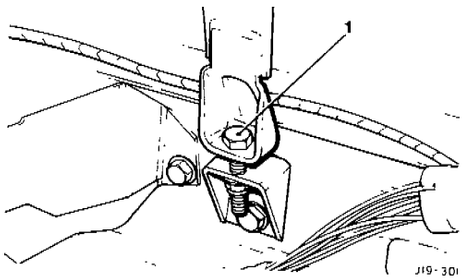


Fig 1

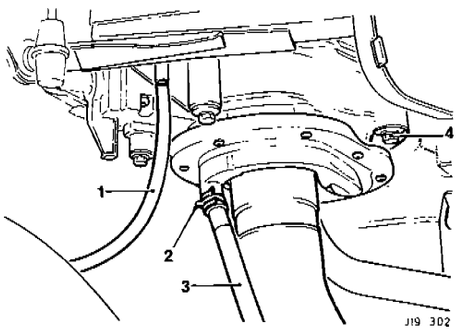


Fig 2

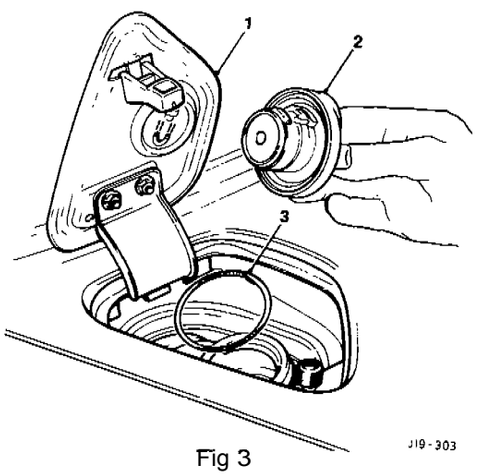


Fig 3

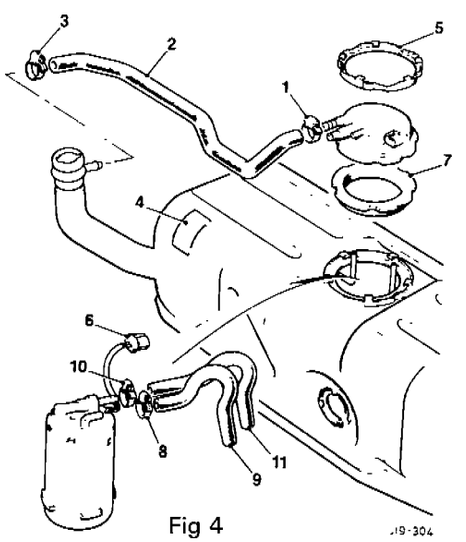


Fig 4

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Note: Ensure feed hose is fully seated on pump and fuel tank pipes.

Using tool JD 175, tighten tank to pump feed hose securing clips (4 & 8 Fig.1).

Note: Ensure the hose is free from twists and does not foul fuel sender unit float arm.

Fit new evaporative loss flange seal to fuel tank aperture (9 Fig.1).
Connect evaporative loss flange to fuel pump harness connector (10 Fig.1).
Align and seat evaporative loss flange (11 Fig.1) to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank. Fit lock ring (12 Fig.1) to evaporative loss flange/tank.

Using service tool JD 174, fully seat lock ring to evaporative loss flange/tank.
Connect breather hose to evaporative loss flange outlet.
Tighten breather hose to evaporative loss flange securing clip.
Remove backing from outlet pipe body aperture seal and fit to tank.

Note: A new aperture seal must be fitted every time the tank is removed and refitted.

Fit tank assembly to position in boot.

Fully seat tank into mounting position, ensure that hoses, pipes or harnesses are not trapped by the tank.

Re-connect tank sender unit feed wires.

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal.

Remove adhesive tape securing the tank retaining straps to boot aperture flange.
Re-position tank retaining straps to tank.
Re-connect fuel pump link harness to evaporative loss flange connection (1 Fig.3).
Connect vapour pipe to quickfit connector on evaporative loss flange outlet (3 Fig.3).
Connect over pressure pipe to evaporative loss flange quickfit connector (2 Fig.3)

CAUTION: Pipes must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

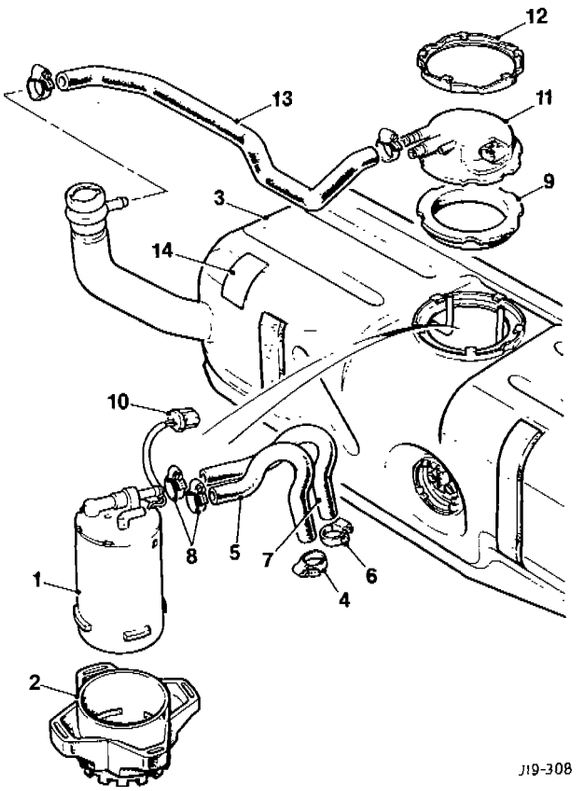


Fig 1

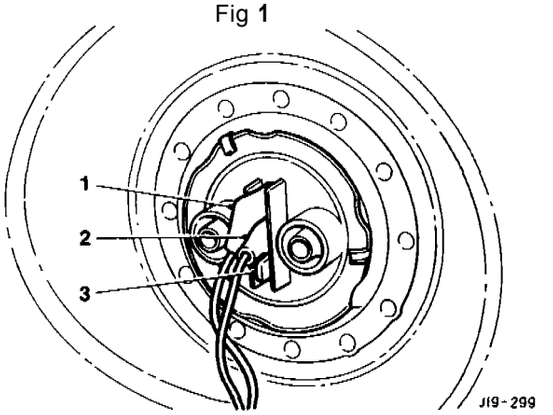


Fig 2

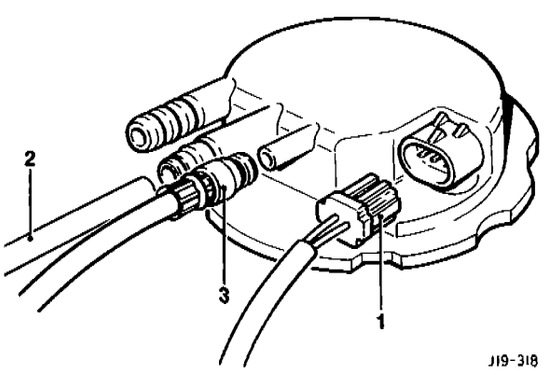


Fig 3

Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.1).
Reposition and seat vapour hose to underfloor vapour pipe spring clip.

Refit fuel filler aperture housing (Fig 2).
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid block connector (1 Fig.2).
Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.
Secure harnesses to fuel tank retaining straps with ratchet straps.

Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel bracket securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.

Raise vehicle on ramp, remove plugs from tank and hoses.

Note: New sealing rings must be fitted to feed and return hoses.

Connect feed and return hoses to fuel tank
Fit and seat tank feed and return hose securing clips (Fig.3) .
Lower vehicle on ramp.
Refill fuel tank
Re-connect battery.
Close bonnet.

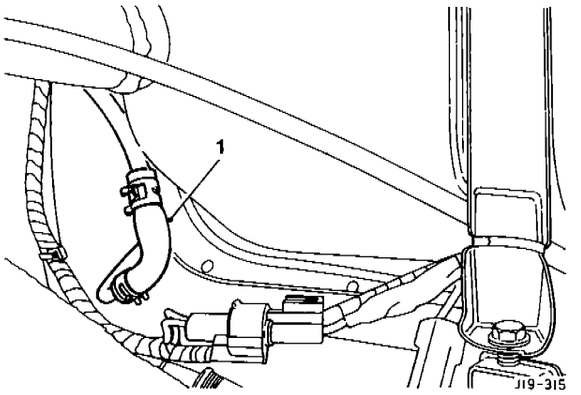


Fig 1

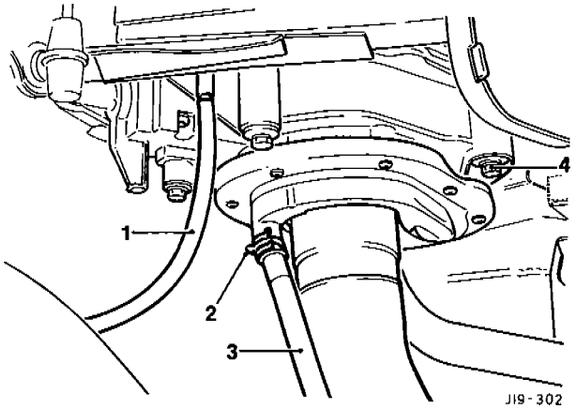


Fig 2

DATA

SERVICE TOOLS

Evaporative Loss Flange Lock Ring Wrench (JD 174)
Hose Clip to Fuel Pump Driver (JD 175)

TORQUE FIGURES

Anchor bracket securing bolt 22-28Nm
Filler neck to body bolts 2-3Nm
Filler neck hose clip 3.5-4.5Nm
Overflow pipe hose clip 2.5-3.5Nm
Securing strap to anchor bracket 5-6Nm

SPANNER SIZES

8mm
13mm
15mm

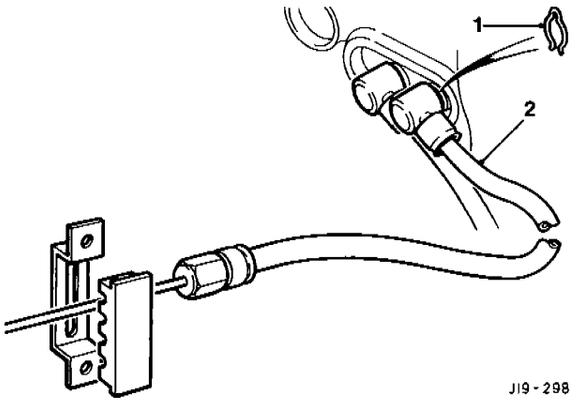


Fig 3

1960C

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FUEL RETURN PIPE TO **PUMP MODULE** INTERNAL **TANK HOSE**

RENEW **19.40.87**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
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THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion **proof** container using suitable fireproof equipment.

Raise the vehicle on a '4 Post' ramp.
Displace and remove the retaining clips securing the fuel feed and return hoses (1 Fig.1).
Disconnect hoses from fuel tank (2 Fig.1).
Fit protective plugs to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp.

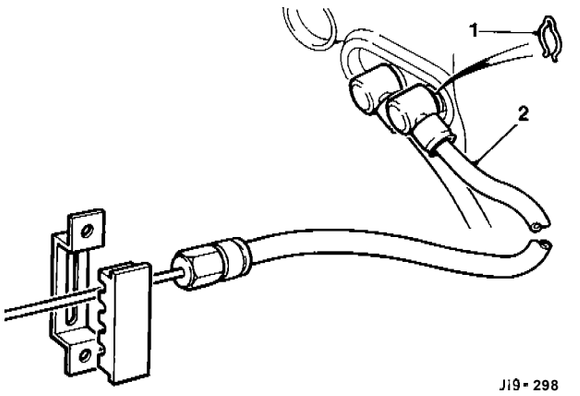


Fig 1

Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Note and disconnect the cables from the fuel gauge tank sender unit (Fig. 2).

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal. The bottom terminal (3 Fig.2) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

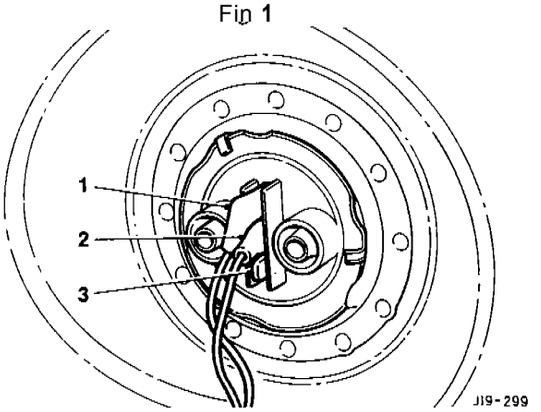


Fig 2

Remove the bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation pad.
Disconnect fuel pump link lead from evaporative loss flange connection (1 Fig.3).

Cut and remove harnesses to fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from fuel tank retaining strap lower bracket clip.
Release vapour pipe hose to underbody pipe securing clip (1 Fig.4).
Disconnect vapour pipe/hose assembly from underbody pipe.

Remove vapour pipe from evaporative flange by pushing back collar on quickfit connector in flange port (2 Fig.31, and pulling pipe from connector.
Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.31, and pulling pipe from connector.

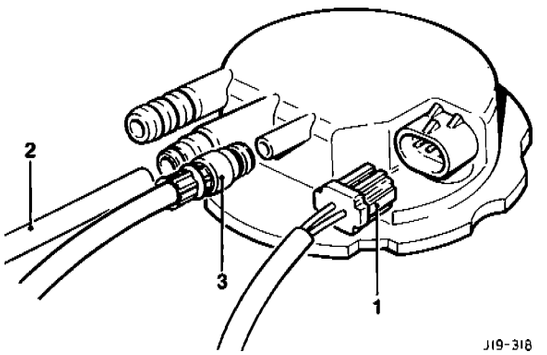


Fig 3

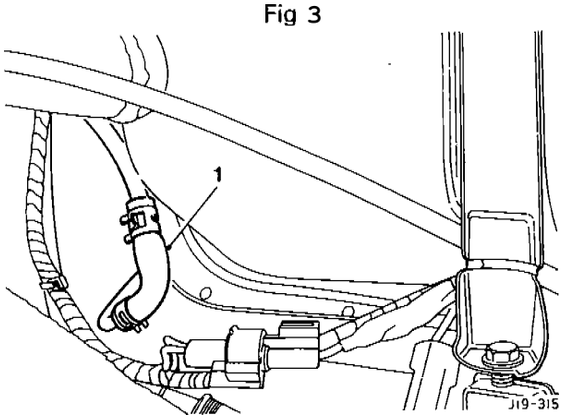


Fig 4

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Slacken the tank retaining strap (1 Fig.1) to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.
Cut and remove securing strap holding filler housing solenoid block connector to harness (1 Fig.2).
Disconnect block connector.

Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig.2).
Disconnect drain tube (3 Fig.2) from aperture seal.
Open fuel filler flap (1 Fig.3).
Remove fuel filler cap (2 Fig.3).
Remove aperture seal to filler neck garter spring (3 Fig.3).
Undo and remove filler housing to body securing bolts (4 Fig.2).
Displace filler housing from body aperture (remains captive on filler neck).
Displace and remove the fuel tank assembly.

Slacken breather hose to evaporative loss flange securing clip (1 Fig.4).
Disconnect hose from evaporative **loss** flange (2 Fig.4).
Using tool JD 174, release evaporative loss flange to fuel tank lock ring (5 Fig.4).
Remove flange lock ring.
Displace evaporative **loss** flange from fuel pump harness connector (6 Fig.4).
Remove and discard evaporative loss flange to fuel tank aperture sealing ring (7 Fig.4).

Note: **A** new evaporative loss flange sealing ring must be fitted every time work is carried out at tank flange.

Using tool JD 175, slacken return **hose** to pump module securing clip at pump end (10 Fig.4).
Disconnect return hose from fuel pump module (11 Fig.4).
Using tool JD **175,** slacken return hose to fuel pump module securing clip at tank end.
Disconnect return hose (1 1 Fig.4) from fuel tank end and remove internal return hose from the fuel tank.
Remove securing clips from old return hose.

Fit securing clips to new return hose.
Connect return hose to fuel tank internal pipe,
Connect return hose to fuel pump module.

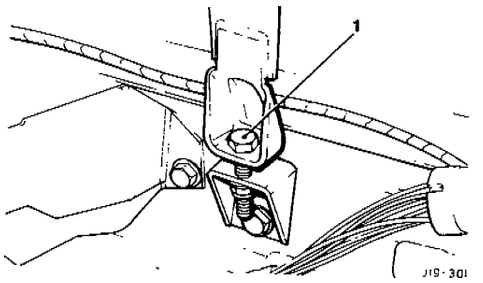


Fig 1

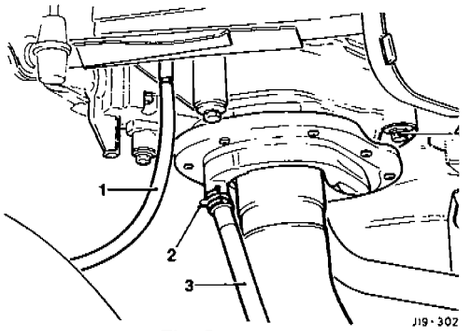


Fig 2

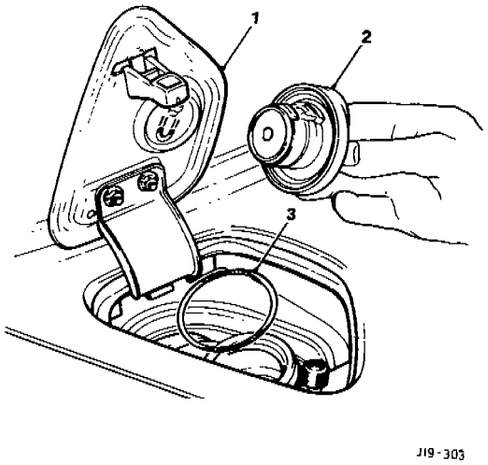


Fig 3

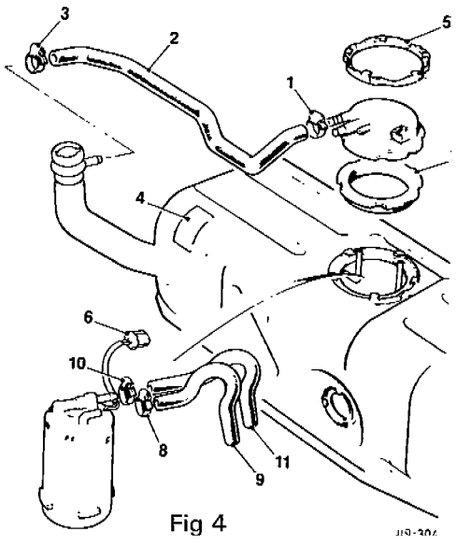


Fig 4

Note: Ensure return hose is fully seated on pump and fuel tank pipes.

Using tool JD 175, tighten tank to pump return hose securing clips (6 & 8 Fig. 1).

Note: Ensure the hose is free from twists and does not foul fuel sender unit float arm.

Fit new evaporative loss flange seal to fuel tank aperture (9 Fig. 1).
Connect evaporative loss flange to fuel pump harness connector (10 Fig. 1).
Align and seat evaporative loss flange (11 Fig. 1) to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank body. Fit lock ring (12 Fig. 1) to evaporative loss flange/tank.

Using service tool JD 174, fully seat lock ring to evaporative loss flange/tank.
Connect breather hose to evaporative loss flange outlet.
Tighten breather hose to evaporative loss flange securing clip.

Remove backing from outlet pipe body aperture seal and fit to tank.

Note: A new aperture seal must be fitted every time the tank is removed and refitted.

Fit tank assembly to position in boot.

Fully seat tank into mounting position; ensure that hoses, pipes or harnesses are not trapped by the tank.
Re-connect tank sender unit feed wires.

Note: The top terminal (1 Fig. 2) is the positive supply terminal; the centre terminal (2 Fig. 2) is the earth terminal.

Remove adhesive tape securing the tank retaining straps to boot aperture flange.
Re-position tank retaining straps to tank.
Re-connect fuel pump link harness to evaporative loss flange connection (1 Fig. 3).
Connect vapour pipe to quickfit connector on evaporative loss flange outlet (3 Fig. 3).
Connect over pressure pipe to evaporative loss flange quickfit connector (2 Fig. 3)

CAUTION: Pipes must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

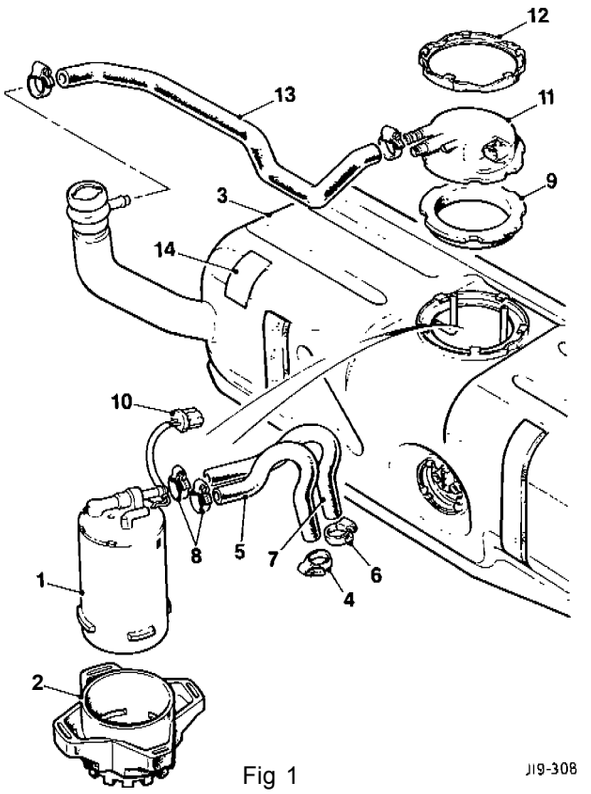
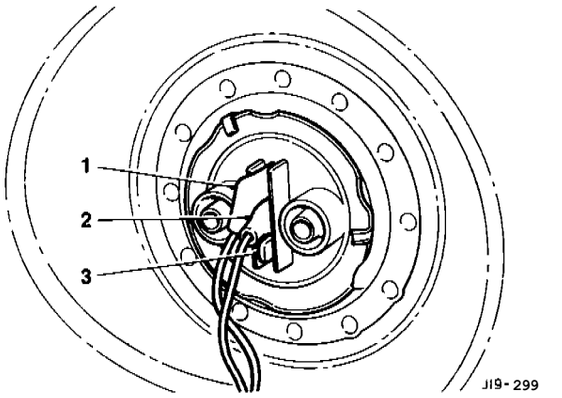
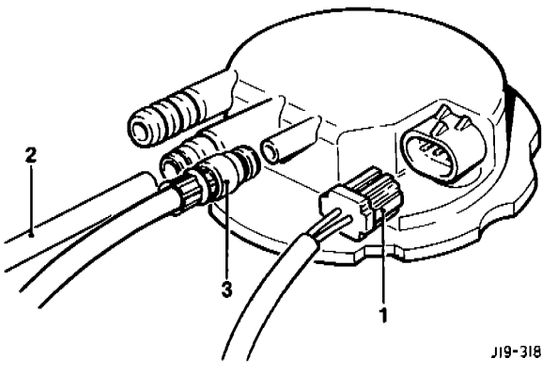


Fig 1 JI9-308



JI9-299

Fig 2



JI9-318

Fig 3

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Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.1).
Reposition and seat vapour hose to underfloor vapour pipe spring clip.

Refit fuel filler aperture housing (Fig 2).
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid block connector (1 Fig.2).
Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.
Secure harnesses to fuel tank retaining straps with ratchet straps.

Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel bracket securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.

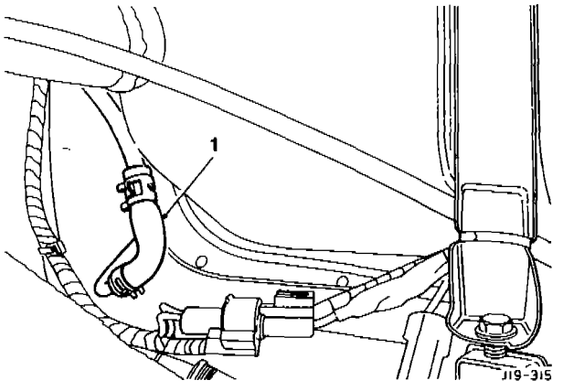


Fig 1

Raise vehicle on ramp, remove plugs from tank and hoses.

Note: New sealing rings must be fitted to feed and return hoses.

Connect feed and return hoses to fuel tank.
Fit and seat tank feed and return hose securing clips (Fig.3).
Lower vehicle on ramp.
Refill fuel tank.
Re-connect battery.
Close bonnet.

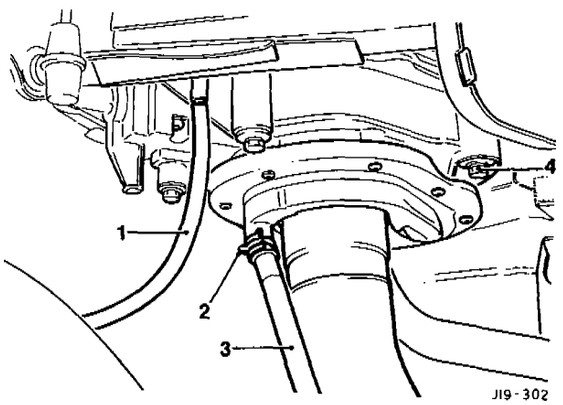


Fig 2

DATA

SERVICE TOOLS

Evaporative Loss Flange Lock Ring Wrench (JD 174)
Hose ***Clip*** *to Fuel* ***Pump Driver (JD 175)***

TORQUE FIGURES

Anchor *bracket* ***securing*** *bolt* ***22-28Nm***
Filler ***neck to body*** *bolts* ***2-3Nm***
Filler *neck* ***hose clip 3.5-4.5Nm***
Overflow pipe *hose* ***clip 2.5-3.5Nm***
Securing strap to anchor bracket 5-6Nm

SPANNER SIZES

8mm
13mm
15mm

1960C

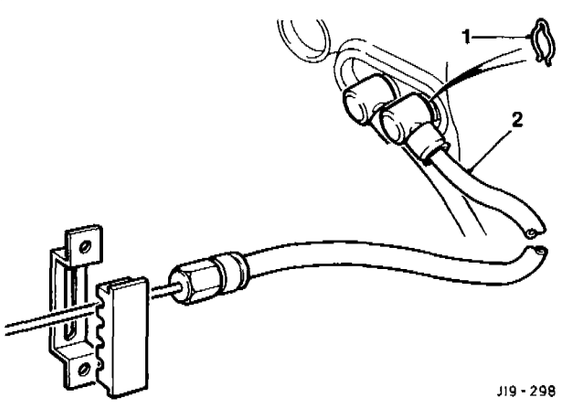


Fig 3

IN-TANK PUMP MODULE INTERNAL FEED AND RETURN HOSES - VEHICLE SET

RENEW **19.40.88**

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3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND,
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSIONPROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion proof container using suitable fireproof equipment.

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Raise the vehicle on a '4 Post' ramp.
Displace and remove the retaining clips securing the fuel feed and return hoses (1 Fig.1).
Disconnect hoses from fuel tank (2 Fig.1).
Fit protective plugs to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp.

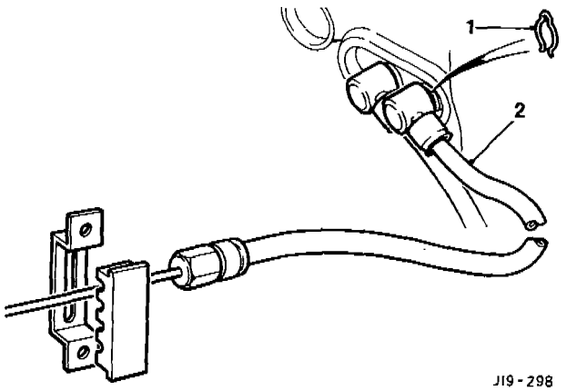


Fig 1

Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Note and disconnect the cables from the fuel gauge tank sender unit (Fig. 2).

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal. The bottom terminal (3 Fig.2) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

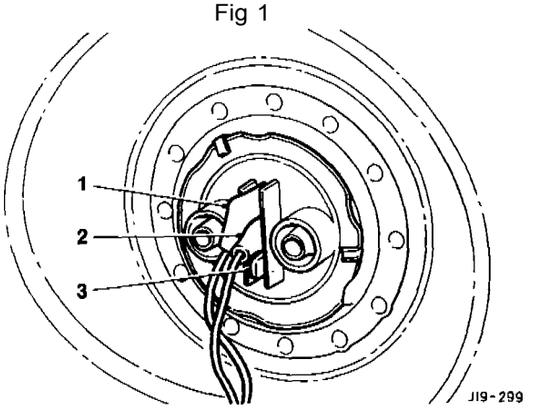


Fig 2

Remove the bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation pad.
Disconnect fuel pump link lead from evaporative loss flange connection (1 Fig.3).

Cut and remove harnesses to fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from fuel tank retaining strap lower bracket clip.
Release vapour pipe hose to underbody pipe securing clip (1 Fig.4).
Disconnect vapour pipe/hose assembly from underbody pipe.

Remove vapour pipe from evaporative **flange** by pushing back **collar** on quickfit connector in flange port (2 Fig.3), and pulling pipe from connector.
Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.3), and pulling pipe from connector.

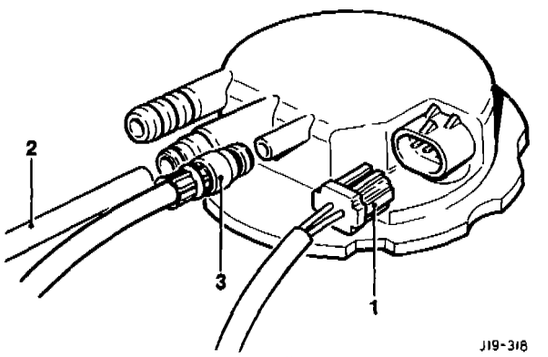


Fig 3

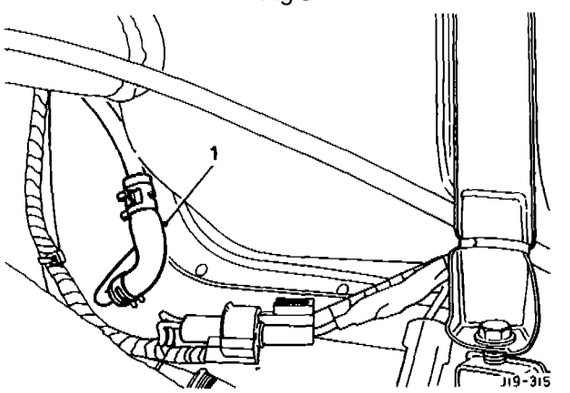


Fig 4

Slacken the tank retaining strap (1 Fig.1) to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.
Cut and remove securing strap holding filler housing solenoid block connector to harness (1 Fig.2).
Disconnect block connector.

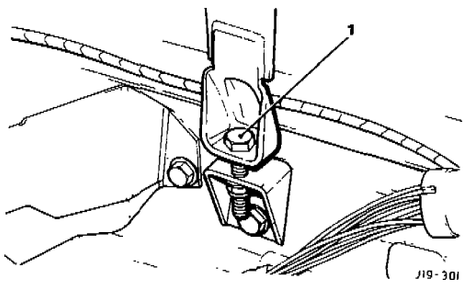


Fig 1

Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig.2).
Disconnect drain tube (3 Fig.2) from aperture seal.
Open fuel filler flap (1 Fig.3).
Remove fuel filler cap (2 Fig.3).
Remove aperture seal to filler neck garter spring (3 Fig.3).
Undo and remove filler housing to body securing bolts (4 Fig.2).
Displace filler housing from body aperture (remains captive on filler neck).
Displace and remove the fuel tank assembly.

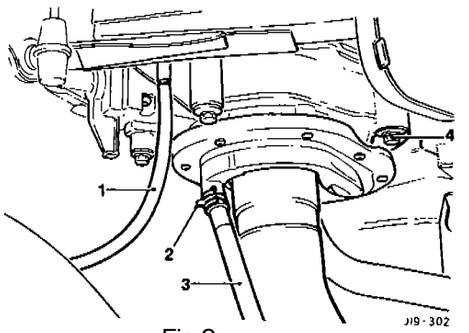


Fig 2

Slacken breather hose to evaporative loss flange securing clip (1 Fig.4).
Disconnect hose from evaporative loss flange (2 Fig.4).
Using tool JD 174, release evaporative loss flange to fuel tank lock ring (5 Fig.4).
Remove flange lock ring.
Displace evaporative loss flange from fuel pump harness connector (6 Fig.4).
Remove and discard evaporative loss flange to fuel tank aperture sealing ring (7 Fig.4).

Note: A new evaporative loss flange sealing ring must be fitted every time work is carried out at tank flange.

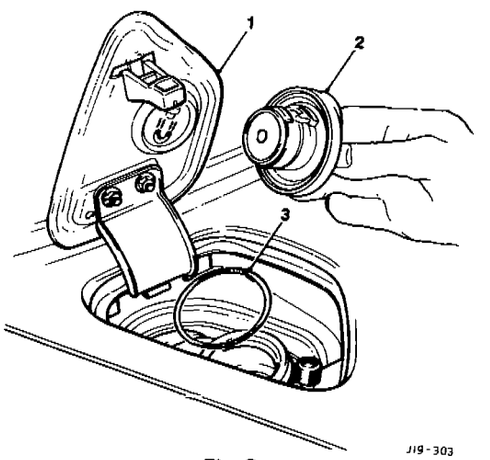


Fig 3

Using tool JD 175, slacken pump to feed hose securing clip at pump end (8 Fig.4).
Disconnect feed hose from fuel pump.
Using tool JD 175, slacken pump to feed hose securing clip at tank end.
Disconnect feed hose (9 Fig.4) from fuel tank end and remove from the fuel tank.
Using tool JD 175, slacken return hose to pump module securing clip at pump end (10 Fig.4).
Disconnect return hose from fuel pump module (11 Fig.4).
Using tool JD 175, slacken return hose to fuel pump module securing clip at tank end.
Disconnect return hose (11 Fig.4) from fuel tank end and remove from the fuel tank.

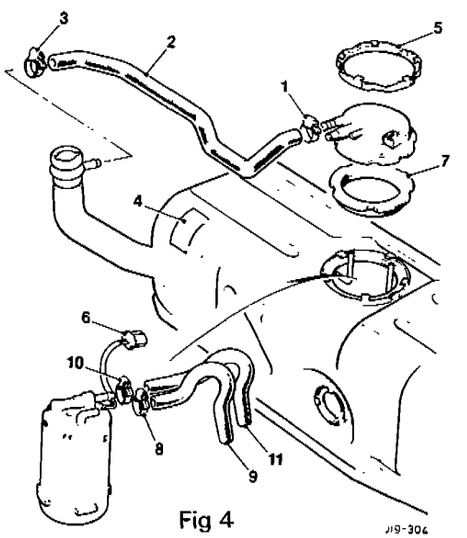


Fig 4

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Remove securing clips from old feed hose.
Remove securing clips from old return hose.

Fit securing clips to new feed hose.
Connect feed hose to fuel tank internal pipe.
Connect feed hose to fuel pump module outlet port.

Fit securing clips to new return hose.
Connect return hose to fuel tank internal pipe.
Connect return hose to fuel pump module return port.

Note: Ensure feed and return hoses are fully seated on pump module and fuel tank pipes.

Using tool JD 175, tighten tank to pump module feed and return hose securing clips (4, 6 & 8 Fig.1).

Note: Ensure the hoses are free from twists and do not foul fuel sender unit float arm.

Fit new evaporative loss flange seal to fuel tank aperture (9 Fig.1).
Connect evaporative loss flange to fuel pump harness connector (10 Fig.1).
Align and seat evaporative loss flange (11 Fig.1) to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank. Fit lock ring (12 Fig.1) to evaporative loss flangehank.

Using service tool JD 174, fully seat lock ring to evaporative loss flange/tank.
Connect breather hose to evaporative loss flange outlet.
Tighten breather hose to evaporative loss flange securing clip.

Remove backing from outlet pipe body aperture seal and fit to tank.

Note: A new aperture seal must be fitted every time the tank is removed and refitted.

Fit tank assembly to position in boot.

Fully seat tank into mounting position, ensure that hoses, pipes or harnesses are not trapped by the tank.
Re-connect tank sender unit feed wires.

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal. The bottom terminal (3 Fig.2) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

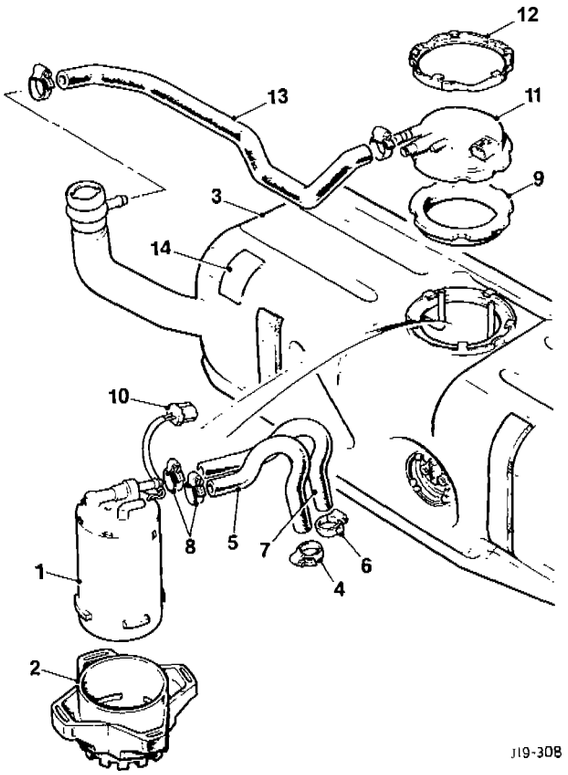


Fig 1

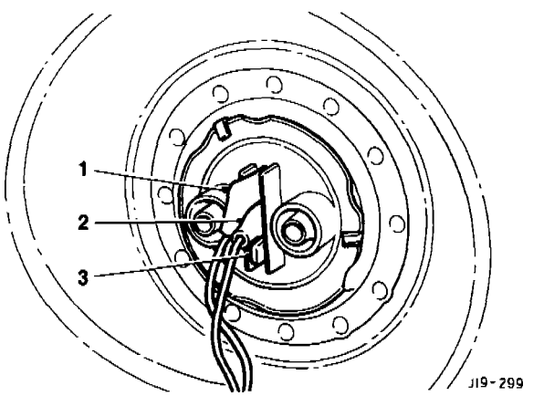


Fig 2

Remove adhesive tape securing the tank retaining straps to boot aperture flange.
Re-position tank retaining straps to tank.
Re-connect fuel pump link harness **to** evaporative **loss** flange connection (1 Fig.1).
Connect vapour pipe to quickfit connector on evaporative **loss** flange outlet (3 Fig. 1).
Connect over pressure pipe to evaporative loss flange quickfit connector (2 Fig. 1)

CAUTION: Pipes must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.2).
Reposition and seat vapour hose to underfloor vapour pipe spring clip.

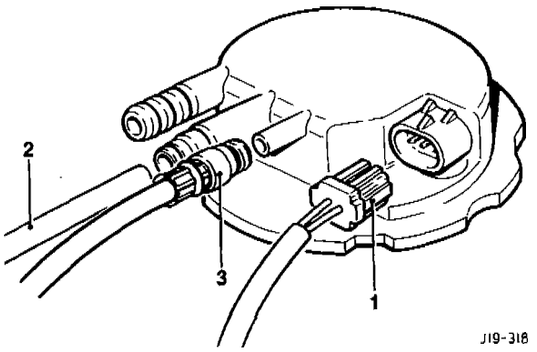


Fig 1

Refit fuel filler aperture housing (Fig 3).
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid block connector (1 Fig.3).
Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.
Secure harnesses to fuel tank retaining straps with ratchet straps.

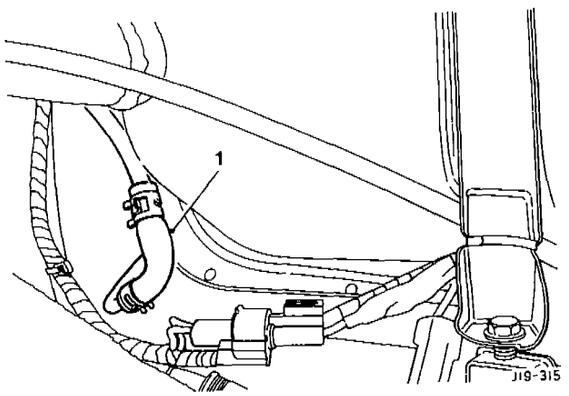


Fig 2

Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel bracket securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.

Raise vehicle on ramp, remove plugs from tank and hoses.

Note: New sealing rings must be fitted to feed and return hoses.

Connect feed and return hoses to fuel tank.
Fit and seat tank feed and return hose securing clips.
Lower vehicle on ramp.
Refill,fuel tank.
Re-connect battery.
Close bonnet.

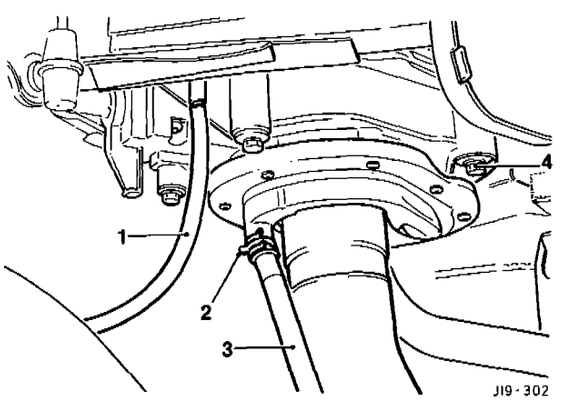


Fig 3

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DATA

SERVICE TOOLS

Evaporative Loss Flange Lock Ring Wrench (JD 174)
Hose Clip to Fuel Pump Driver (JD 175)

TORQUE FIGURES

Anchor bracket securing bolt 22-28Nm
Filler neck to body bolts 2-3Nm
Filler neck hose clip 3.5-4.5Nm
Overflow pipe hose clip 2.5-3.5Nm
Securing strap to anchor bracket 5-6Nm

SPANNER SIZES

8mm
13mm
15mm

1960C

FUEL FILTER

RENEW 19.25.02

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.

Note: From 91MY a new type of fuel filter is fitted into the fuel feed pipeline. The 90MY and 91MY filters are not interchangeable.

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Jack up and place rear of vehicle on stands.
Undo and remove fuel tank to filter hose 'P' clip to body securing screw (1 Fig.1).
Undo and remove fuel filter clamp to rubber mounting bobbin securing nut (1 Fig.2).
Reposition clamp from mounting bobbin.
Place a suitable container below the filter.

Undo the fuel tank to filter hose union nut at filter (2 Fig.1).
Reposition hose from filter.
Remove and discard seal from end of hose.
Fit plugs to hose and filter.
Undo underfloor pipe to filter union nut at filter (3 Fig 1).
Displace and remove fuel filter from underfloor pipe.
Remove and discard seal from underfloor pipe.
Fit plugs to pipe and filter.
Remove securing clamp from filter (4 Fig 1).

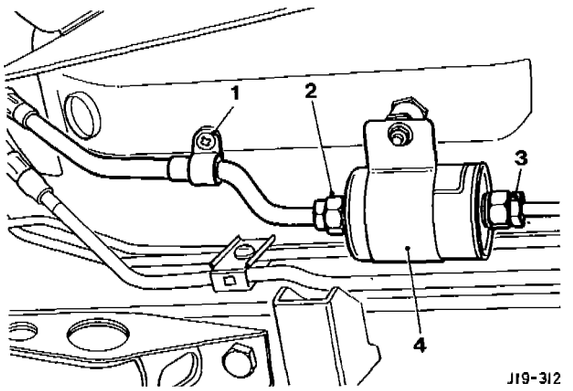


Fig 1

Fit securing clamp to new filter.
Remove plugs from underfloor pipe and filter.
Fit new seal to underfloor pipe.

Note: A new filter to underfloor pipe seal must be fitted every time the fuel filter is removed. Fit filter to underfloor pipe.

Tighten underfloor pipe to filter union nut.
Remove plugs from fuel tank hose and filter.
Fit new seal to hose.

Note: A new 'O' Ring seal must be fitted every time fuel filter is removed.

Connect fuel tank hose to filter.
Tighten hose to filter union nut.
Reposition fuel filter clamp to rubber mounting bobbin.
Fit and tighten clamp to mounting bobbin securing nut.
Reposition fuel tank hose 'P' clip to body fixing hole.
Fit and tighten fuel tank hose 'P' clip to body securing screw.
Remove container from below filter.
Lower vehicle from stands.
Refit battery.
Close bonnet.

DATA

TORQUE FIGURES

Fuel tank to filter 'P' Clip 8-10Nm
Fuel filter clamp to mounting bobbin securing screw 8-10Nm
Fuel filter to pipe/hose union nuts 27-33 Nm

SPANNER SIZES

8mm
17mm
19mm

FUEL TANK TO FILTER HOSE

RENEW **19.40.97**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
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2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA,
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty the fuel tank into an explosion **proof** container using suitable **fireproof** equipment.
Raise the vehicle on a '4 Post' ramp.

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Undo and remove fuel tank to filter hose body 'P' clip securing screw (1 Fig.1).
Undo hose to filter union nut (2 Fig.1).
Disconnect hose from fuel filter.
Remove and discard seal from end of hose.
Fit plugs to hose and filter.
Displace and remove hose to fuel tank retaining clip (3 Fig.1).

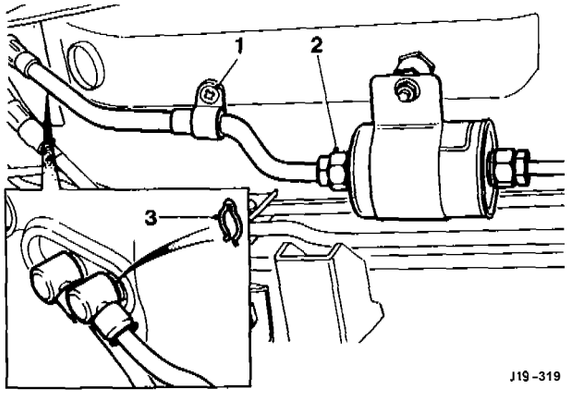


Fig 1

Disconnect hose from tank.
Remove and discard 'O' Ring seals from hose.
fit plugs to hose and tank.
Displace and remove hose assembly from suspension.
Displace and remove 'P' clip from hose.
Remove 'P' clip rubber sleeve from hose.

Note: Rubber hoses have been replaced by PTFE hoses from 91MY.

Fit 'P' clip rubber sleeve to new hose.
Fit and seat 'P' clip to hose.
Lay hose assembly through suspension (Fig. 2) and position to connections.
Remove plugs from hose and tank.
Fit new 'O' Ring seals to hose.

Note: A new 'O' Ring seal must be fitted every time the fuel filter to tank hose is removed.

Connect hose to tank.
Secure hose to tank with retaining clip.
Remove plugs from hose and filter.
Fit new seal to end of hose.
Connect hose to filter.
Tighten hose to filter union nut.

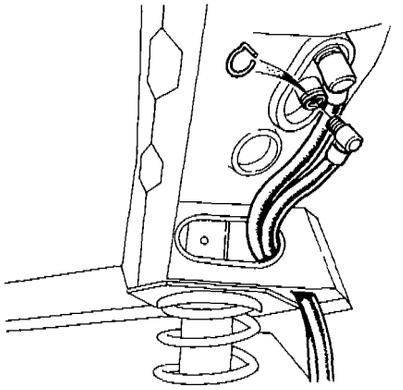


Fig 2

Reposition hose 'P' clip to body securing hole.
Fit and tighten 'P' clip to body securing screw.
Lower vehicle on ramp.
Refit battery.
Close bonnet.
Refill fuel tank.

DATA

TORQUE FIGURES

Fuel tank to filter hose 'P' Clip 8-10Nm
Fuel filter to pipe/hose union nut 27-33Nm

SPANNER SIZES

8mm
17mm
19mm

1960C

MAIN RETURN PIPE TO TANK HOSE

RENEW 19.40.85

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2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty the fuel tank into an explosion proof container using suitable fireproof equipment.
Raise the vehicle on a '4 Post' ramp.

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Place suitable container below hose to collect residual fuel.
Disconnect hose from pipe **by** releasing quickfit connection.
Remove container from beneath hose.
Fit plugs to pipe and hose.
Displace and remove hose to tank securing clips (1 Fig.1).
Disconnect hose from tank.
Fit plugs to hose and tank.
Displace and remove hose from suspension area.

Remove and discard 'O' Ring seals from hose.

Note: Rubber hoses have been replaced by PTFE hoses from 91**MY.**

Reposition new hose **assembly** through suspension (Fig.2) and reposition connections.
Remove plugs from hose and return pipe.
Fit new 'O' ring **seals** to hose.

Note: A new 'O' Ring seal must **be** fitted every time the fuel return pipe to tank hose is removed.

Connect hose to return pipe (Fig.3).

CAUTION: Pipes and component stubs must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

Note: There are two sizes of connector, 8mm and 10mm, this is to ensure that the feed pipe is not connected **as** the return pipe and vice versa. The 10mm connector is used for the feed line.

Remove plugs from hose and tank.
Connect hose to tank.
Secure hose to tank with retaining clip.
Lower vehicle on ramp.
Refill tank with petrol.
Reconnect battery.
Close bonnet.

1960C

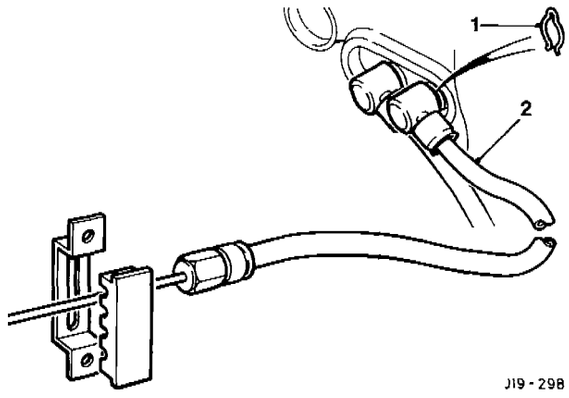


Fig 1

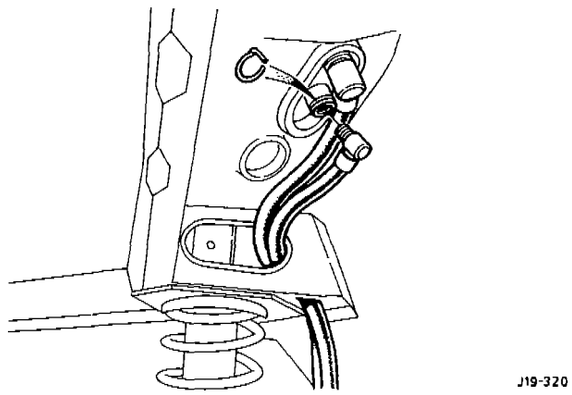


Fig 2

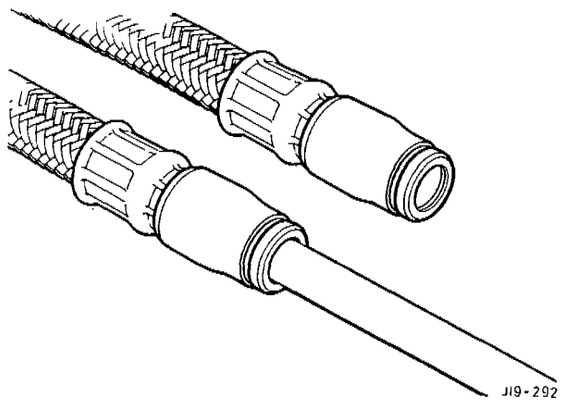


Fig **3**

MAIN LINE FUEL FEED PIPE

RENEW 19.40.95

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
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2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.

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Raise the vehicle on a ramp.
Undo the fuel feed pipe to fuel filter union nut (Fig. 1) and disconnect the pipe from the filter.
Remove and discard the sealing ring.
Fit protective plugs to the filter and pipe.
Release the fuel rail to fuel feed pipe hose quickfit connector by pulling **back** on the connector collar (Fig. 2).
Remove the hose from the fuel feed pipe.
Fit protective plugs to the hose and the fuel feed pipe.
Remove the pipe clamp securing bolts and remove the pipe clamps (Fig 3).
Displace the pipe from the clamps mounting rubbers and remove the pipe assembly.

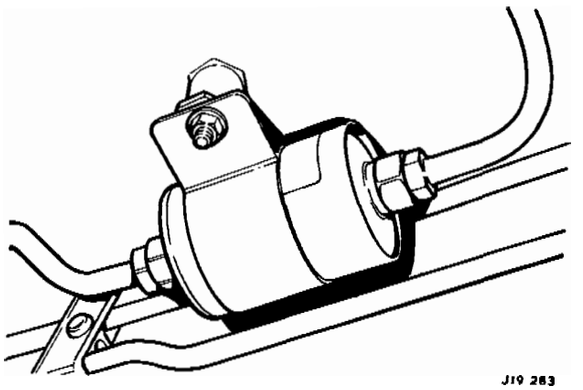


Fig 1

Fitting a new pipe **is** the reversal of the removal procedure

CAUTION: Pipe must be fully inserted into quickfit connector end to ensure proper fit; failure to do so could cause fuel leakage.

Note: There are **two** sizes of connector and pipe, 8mm and 10mm, this is to ensure that the feed pipe is not connected as the return pipe and vice versa. The 10mm connector/pipe is used for the feed line.

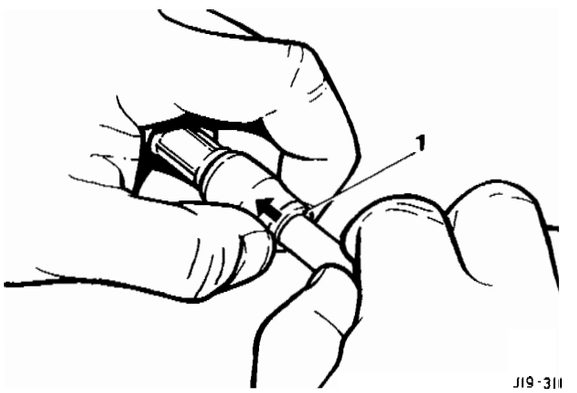


Fig 2

DATA

TORQUE FIGURES

*Fuel **feed pipe to filter** union nut **27-33Nm***
Securing** Clamps **8-10 Nm

SPANNER SIZES

15mm
19mm

1960C

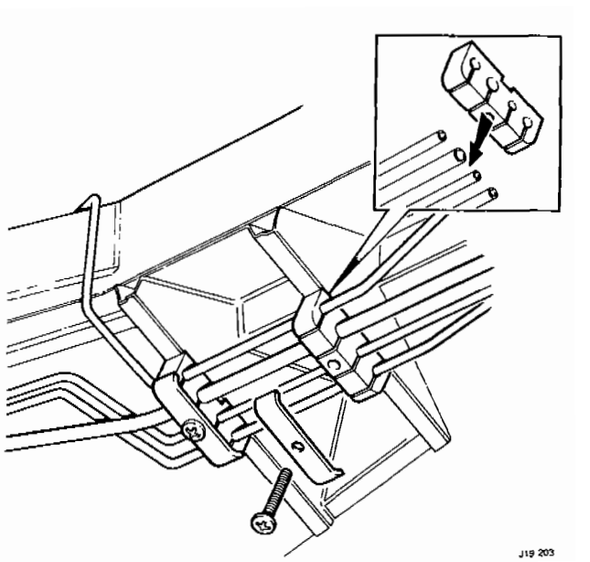


Fig 3

FUEL RAIL

RENEW **19.60.13**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSIONPROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.

Note: From 91MY 2.9 Litre is discontinued. 3.2L and 4.0L have the same type fuel rail.

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Disconnect the fuel feed hose from the fuel rail (2 Fig.1)
Fit protective plugs *to* the fuel feed hose and the fuel rail.
Undo the fuel rail to pressure regulator union nut (3 Fig.1).
Slacken the nut securing the pressure regulator to the mounting bracket (**4** Fig 1).
Reposition the regulator from the rail mounting.
Fit protective plugs to the regulator and the rail.
Disconnect the cable harness multi-plugs from the fuel injectors.
Remove the bolts securing the fuel rail (5 Fig 1).
Remove the fuel rail/injector assembly.
Fit protective plugs to the inlet manifold.
Remove the clips securing the injectors (6 Fig 1) and remove the injectors (7 Fig 1) from the rail.
Remove and discard the injector 'O' rings.
Fitting a new fuel rail is the reversal of the removal procedure.

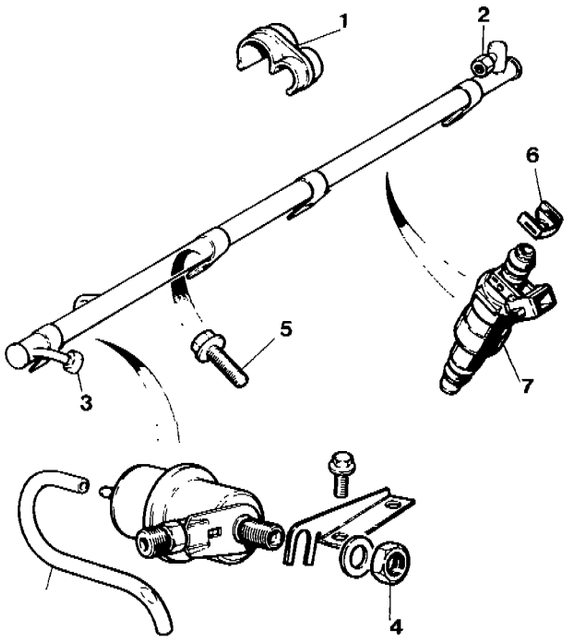


Fig 1

DATA

TORQUE FIGURES

Rail securing ***bolts*** *7-**10Nm***
Rail union nuts ***70 - 12Nm***

SPANNER SIZES

8mm
17mm
19mm

1960C

FUEL FEED PIPE TO FUEL RAIL HOSE

RENEW 19.40.60

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.

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Note: From 91MY 2.9Litre is discontinued. 3.2L and 4.0L have the same type fuel rail. Rubber hoses have been replaced by PTFE hoses from 91MY.

Displace the fuel feed hose from the fuel rail securing clips.
Undo the fuel feed to fuel **rail** union nut and reposition the hose from the rail (Fig 1).
Fit protective plugs to the fuel rail and the hose.
Release the hose to inlet manifold retaining clip and reposition from the clip.
Release the hose to fuel feed pipe quickfit connector by pulling back on the connector collar (1 Fig.2).
Remove the hose from the fuel feed pipe.
Fit protective plugs to the hose and the fuel feed pipe.

Fitting a new hose is the reversal of the removal procedure.

CAUTION: Pipes and component stubs must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

Note: There are **two** sizes **of** connector and pipe, 8mm and 10mm, this is to ensure that the feed pipe is not connected **as** the return pipe and vice versa. The 10mm connector/pipe is used for the **feed** line.

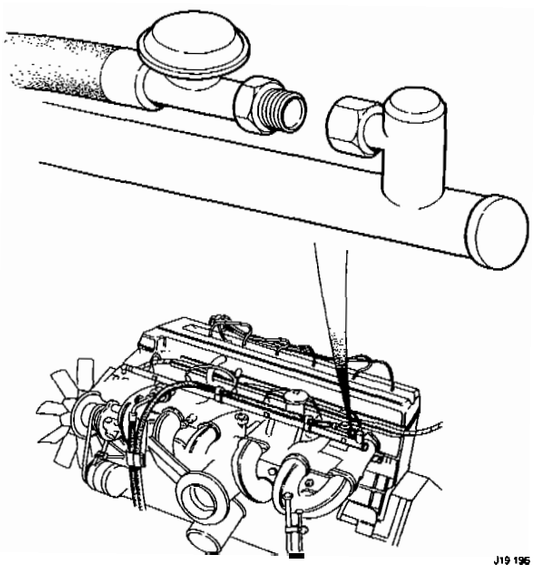


Fig 1

DATA

TORQUE FIGURES

Fuel rail union nut ***10 - 12Nm***
Securing clips 8 - 10Nm

SPANNER SIZES

17mm
19mm

1960C

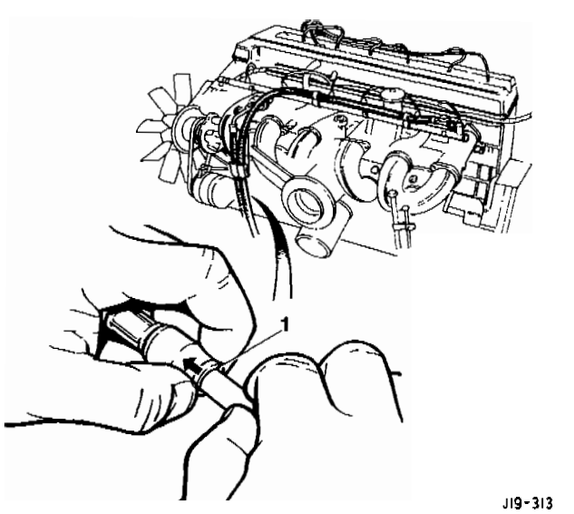


Fig 2

PRESSURE REGULATOR RETURN LINE HOSE

RENEW **19.40.93**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSIONPROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel **pump relay** from **yellow block** connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.

Note: From 91MY 2.9Litre is discontinued. 3.2L and 4.0L have the same type fuel rail.

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Undo the return hose to the regulator union nut and reposition the hose from the rail (Fig 1).
Fit protective plugs to the regulator and the hose.
Release the hose to inlet manifold retaining clip.
Release the hose to fuel return pipe quickfit connector by pulling back on the connector collar (Fig.2).
Remove the hose from the fuel return pipe and the chassis mounting bracket.
Fit protective plugs to the hose and the fuel return pipe.

Fitting a new hose is the reversal of the removal procedure.

CAUTION: **Pipes and component stubs must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.**

Note: There are two sizes of connector, 8mm and 10mm, this is to ensure that the feed pipe is not connected as the return pipe and vice versa. The 10mm connector is used for the feed line.

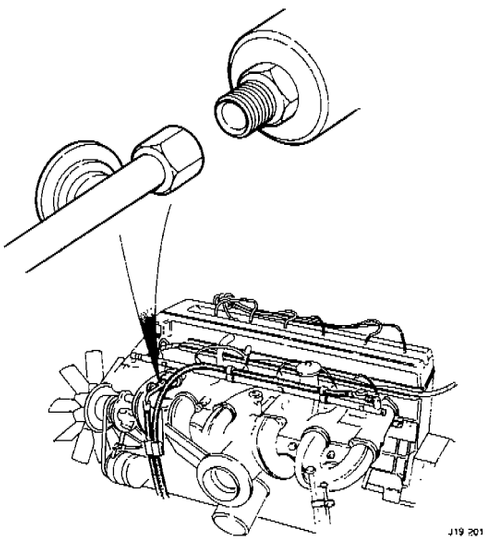


Fig 1

DATA

TORQUE FIGURES

Fuel rail union ***nut 10 - 12Nm***

SPANNER SIZES

17mm
19mm

1960C

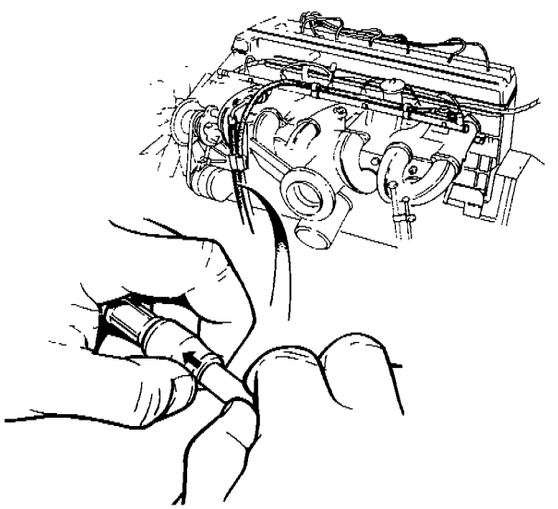


Fig 2

FUEL TANK EVAPORATIVE LOSS FLANGE

RENEW 19.55.24

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

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1. NO SMOKING IN THE WORK AREA,
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion proof container using suitable fireproof equipment.

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Raise the vehicle on a '4 Post' ramp.
Displace and remove the retaining clips securing the fuel feed and return hoses (1 Fig.1).
Disconnect hoses from fuel tank (2 Fig.1).
Fit protective plugs to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp.

Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Note and disconnect the cables from the fuel gauge tank sender unit (Fig. 2).

Note: The top terminal (1 **Fig.2)** is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal. The bottom terminal (3 Fig.2) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

Remove **the** bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation pad.
Disconnect fuel pump link **lead** from evaporative **loss** flange connection (1 Fig.3).

Cut and remove harnesses to fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from fuel tank retaining strap lower bracket clip.
Release vapour pipe hose to underbody pipe securing clip (1 Fig.4).
Disconnect vapour pipe/hose assembly from underbody pipe.

Remove vapour pipe from evaporative flange **by** pushing back collar **on** quickfit connector in flange port (2 Fig.3), and pulling pipe from connector.
Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.3), and pulling pipe from connector.

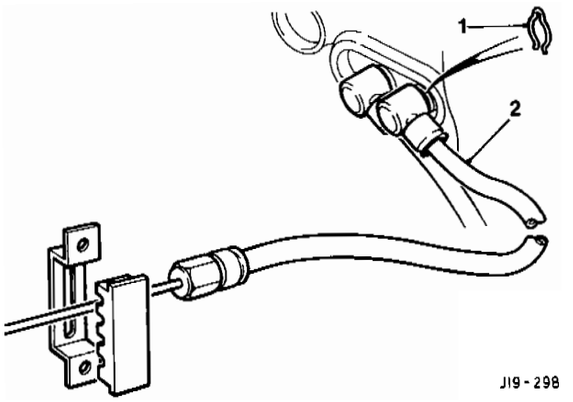


Fig 1

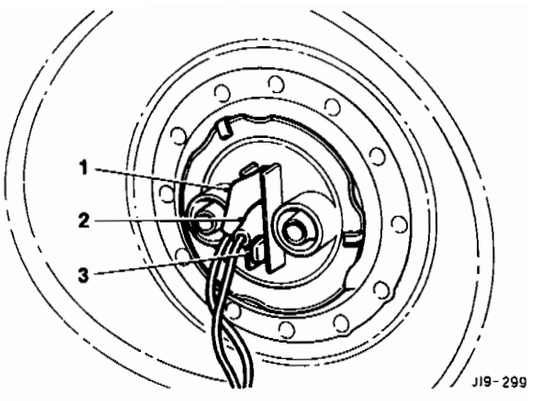


Fig 2

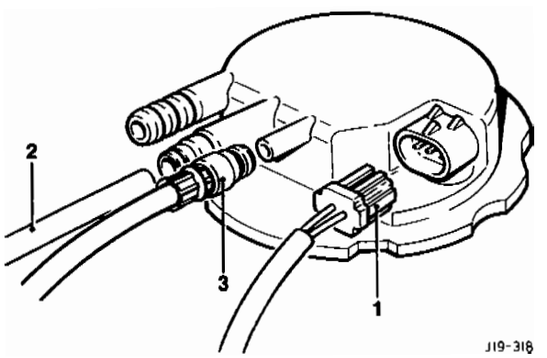


Fig 3

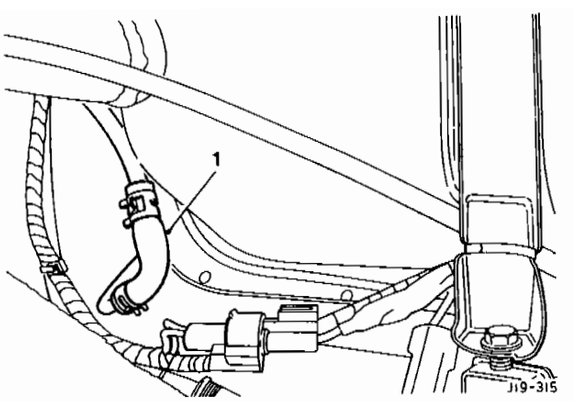


Fig 4

Slacken the tank retaining strap (1 Fig. 1) to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.
Cut and remove securing strap holding filler housing solenoid block connector to harness (1 Fig.2).
Disconnect block connector.

Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig.2).
Disconnect drain tube (3 Fig.2) from aperture seal.
Open fuel filler flap (1 Fig.3).
Remove fuel filler cap (2 Fig.3).
Remove aperture seal to filler neck garter spring (3 Fig.3).
Undo and remove filler housing to body securing bolts (4 Fig.2).
Displace filler housing from body aperture (remains captive on filler neck).
Displace and remove the fuel tank assembly.

Slacken breather hose to evaporative loss flange securing clip (1 Fig.4).
Disconnect hose from evaporative loss flange (2 Fig.4).
Using tool JD **174,** release evaporative loss flange to fuel tank lock ring (5 Fig.4).
Remove flange lock ring.
Displace evaporative loss flange from fuel pump harness connector (6 Fig.4).
Remove and discard evaporative loss flange to fuel tank aperture sealing ring (7 Fig.4).

Note: A new evaporative loss flange to fuel tank aperture sealing ring must be fitted every time work is carried out at tank evaporative loss flange.

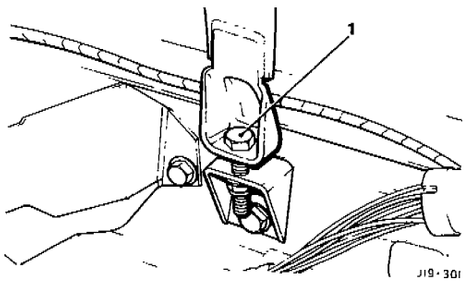


Fig 1

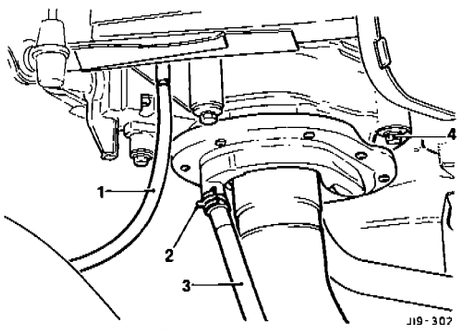


Fig 2

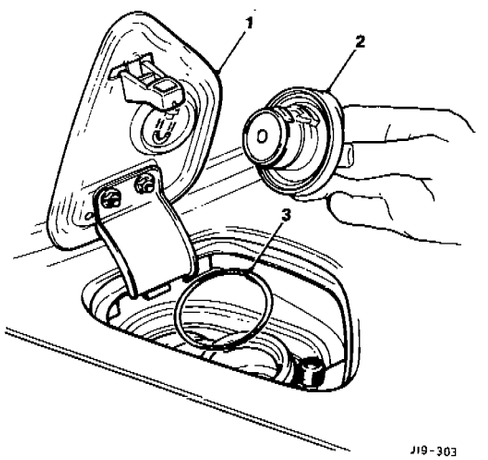


Fig 3

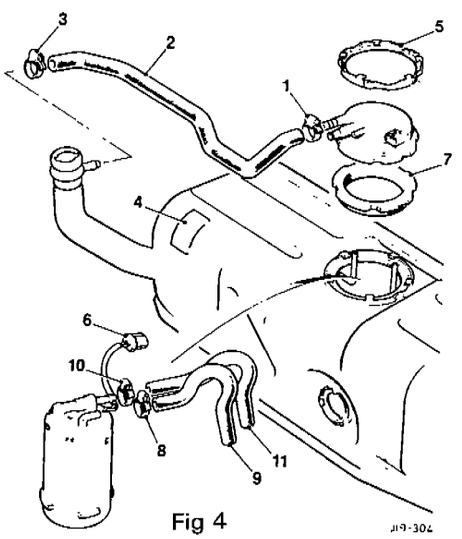


Fig 4

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Fit new evaporative loss flange seal to fuel tank aperture (9 Fig.1).
Connect new evaporative loss flange to fuel pump harness connector (10 Fig.1).
Align and seat new evaporative loss flange (11 Fig.1) to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank body.

Fit lock ring (12 Fig.1) to evaporative loss flange/tank.

Using service tool JD 174, fully seat lock ring to evaporative loss flange/tank.
Connect breather hose to evaporative loss flange outlet (15 Fig.1).
Tighten breather hose to evaporative loss flange securing clip.
Remove backing from outlet pipe body aperture seal and fit to tank.

Note: A new aperture seal must be fitted every time the tank is removed and refitted.

Fit tank assembly to position in boot.

Fully seat tank into mounting position; ensure that hoses, pipes or harnesses are not trapped by the tank.

Re-connect tank sender unit feed wires.

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal.

Remove adhesive tape securing the tank retaining straps to boot aperture flange.
Re-position tank retaining straps to tank.

Re-connect fuel pump link harness to evaporative loss flange connection (1 Fig.3).
Connect vapour pipe to quickfit connector on evaporative loss flange outlet (3 Fig.3).
Connect over pressure pipe to evaporative loss flange quickfit connector (2 Fig.3)

CAUTION: Pipes and component stubs must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.

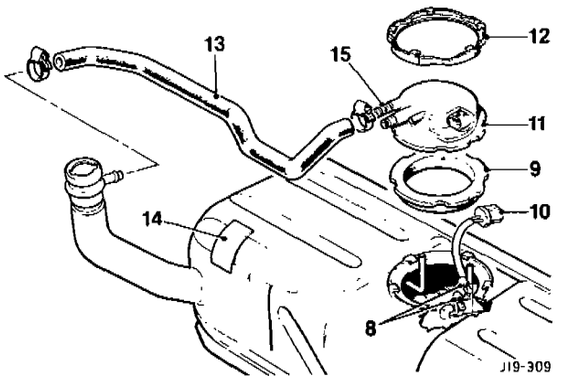


Fig 1

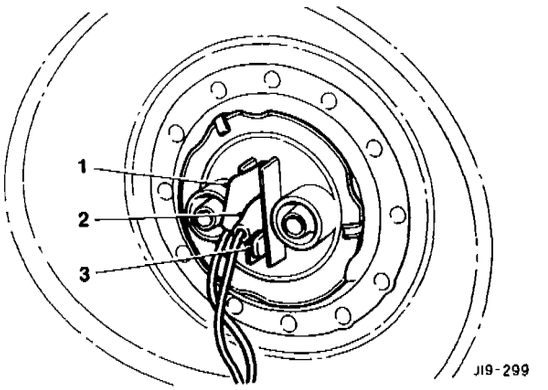


Fig 2

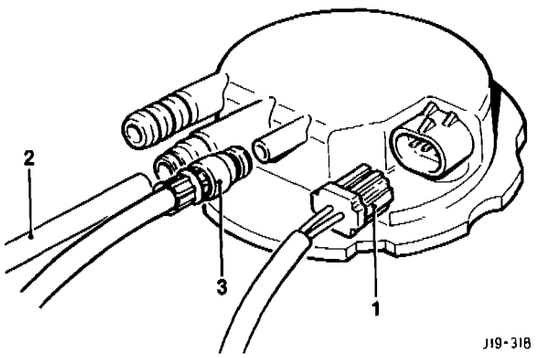


Fig 3

Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.1).
Reposition and seat vapour hose to underfloor vapour pipe spring clip.
Refit fuel filler aperture housing (Fig 2).
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid block connector (1 Fig.2) .
Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.
Secure harnesses to fuel tank retaining straps with ratchet straps.

Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel **bracket** securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.
Raise vehicle on ramp, remove plugs from tank and hoses.

Note: New sealing rings must be fitted to feed and return hoses,

Connect feed and return hoses to fuel tank.

Fit **and** seat tank feed and return hose securing clips.
Lower vehicle on ramp.
Refill fuel tank
Re-connect battery.
Close bonnet.

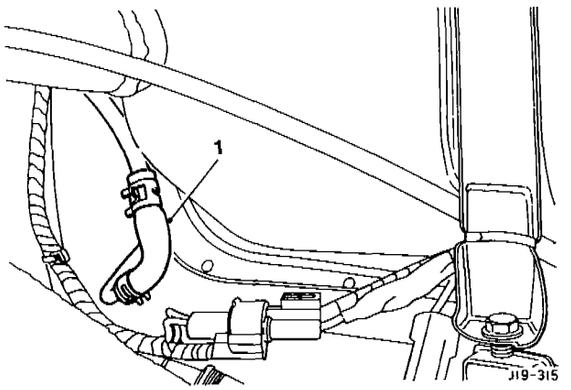


Fig 1

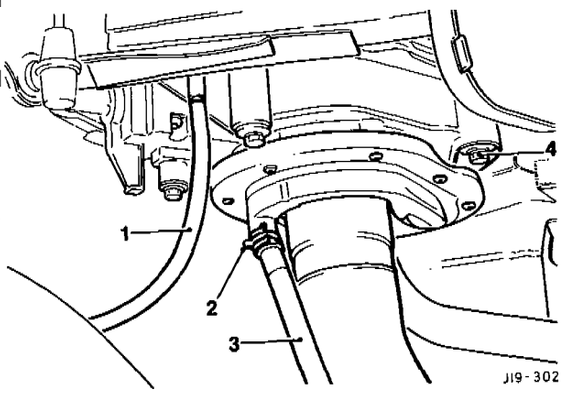


Fig 2

DATA

SERVICE TOOLS

*Evaporative **Loss** Flange Lock Ring Wrench (JD 174)*

TORQUE **FIGURES**

*Anchor bracket securing **bolt** 22-28Nm*
*Filler neck to body bolts **2-3Nm***
*Filler neck hose clip **3.5-4.5Nm***
*Overflow pipe hose clip **2.5-3.5Nm***
*Securing strap to anchor bracket **5-6Nm***

SPANNER SIZES

8mm
13mm
15mm

1960C

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FUEL TANK EVAPORATIVE LOSS FLANGE SEALING RING

RENEW **19.55.25**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1. NO SMOKING IN THE WORK AREA.
2. 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3. A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4. DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5. EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6. FUEL MUST NOT BE EMPTIED INTO A PIT.
7. THE WORK AREA MUST BE WELL VENTILATED.
8. THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9. THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.
10. MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Remove fuel pump relay from yellow block connector located in the engine compartment.
Crank the engine to de-pressurise system.
Switch off ignition.
Refit the fuel pump relay.
Disconnect the battery.
Empty fuel tank into an explosion proof container using suitable fireproof equipment.

Raise the vehicle on a '4 Post' ramp.
Displace and remove the retaining clips securing the fuel feed and return hoses (1 Fig.1).
Disconnect hoses from fuel tank (2 Fig.1).
fit protective plugs to the hoses and tank.
Remove and discard sealing rings from hoses.
Lower vehicle on ramp,

Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Note and disconnect the cables from the fuel gauge tank sender unit (Fig. 2).

Note: The top terminal (1 Fig.2) is the positive supply terminal; the centre terminal (2 Fig.2) is the earth terminal. The bottom terminal (3 Fig.2) is the warning light terminal and should be blanked off with an insulation cover to prevent incorrect connection.

Remove the bolts securing spare wheel mounting bracket and remove the bracket.
Remove the tank upper sound insulation pad.
Disconnect fuel pump link lead from evaporative loss flange connection (1 Fig.3).

Cut and remove harnesses to fuel tank retaining straps and reposition harnesses downwards.
Displace ride level block connector from fuel tank retaining strap lower bracket clip.
Release vapour pipe hose to underbody pipe securing clip (1 Fig.4).
Disconnect vapour pipe/hose assembly from underbody pipe.

Remove vapour pipe from evaporative flange by pushing back collar on quickfit connector in flange port (2 Fig.3), and pulling pipe from connector.
Remove over-pressure pipe from evaporative flange by pushing back collar on quickfit connector in flange port (3 Fig.3), and pulling pipe from connector.

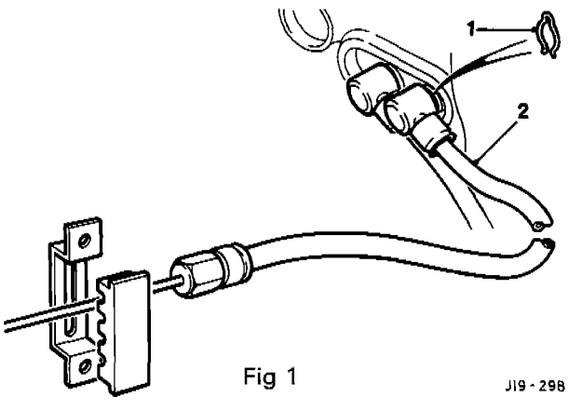


Fig 1

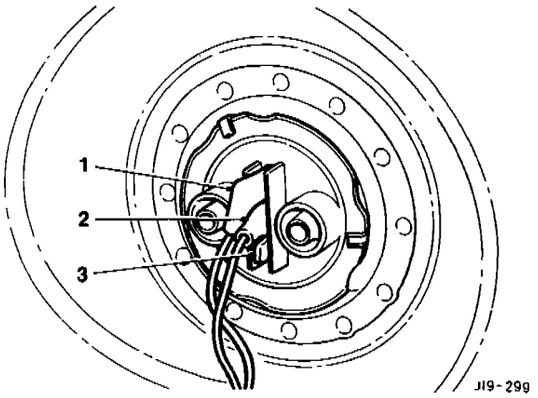


Fig 2

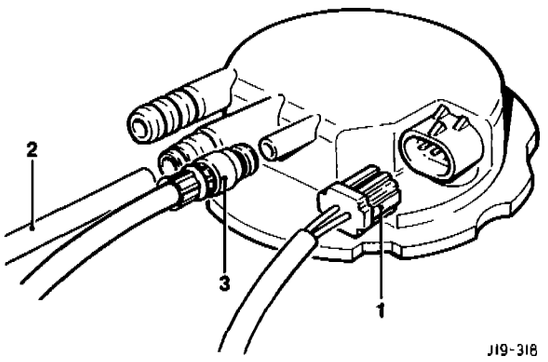


Fig 3

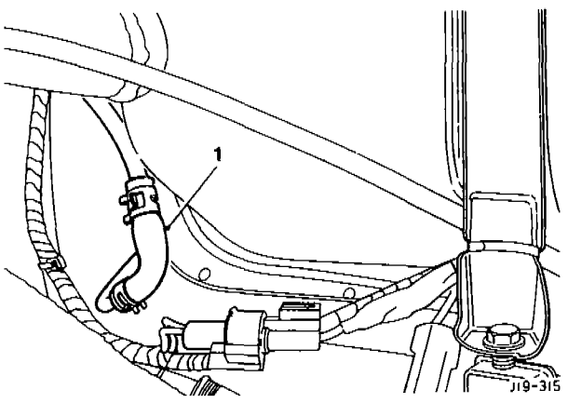


Fig 4

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Slacken the tank retaining strap (1 Fig.1) to lower bracket securing nuts and bolts.
Remove the tank retaining strap lower bracket to body securing bolts.
Displace tank retaining straps upwards for access.
Secure retaining straps to boot aperture flange with adhesive tape.
Cut and remove securing strap holding filler housing solenoid block connector to harness (1 Fig.2).
Disconnect block connector.

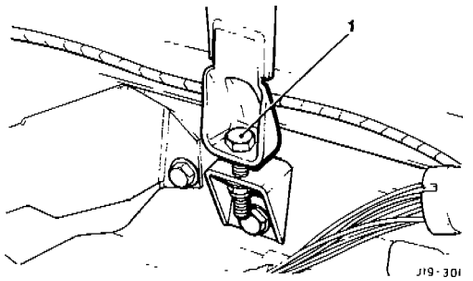


Fig 1

Reposition aperture seal to drain tube securing clip (remains captive on drain tube) - (2 Fig.2).
Disconnect drain tube (3 Fig.2) from aperture seal.
Open fuel filler flap (1 Fig.3).
Remove fuel filler cap (2 Fig.3).
Remove aperture seal to filler neck garter spring (3 Fig.3).
Undo and remove filler housing to body securing bolts (4 Fig.2).
Displace filler housing from body aperture (remains captive on filler neck).
Displace and remove the **fuel** tank assembly.

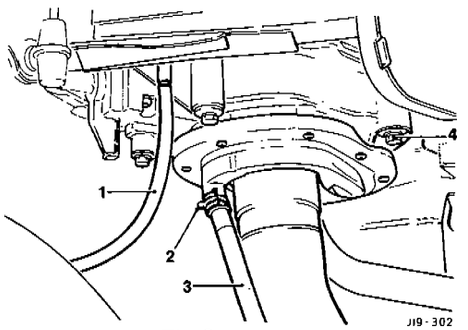


Fig 2

Slacken breather hose to evaporative loss flange securing clip (1 Fig.4).
Disconnect hose from evaporative loss flange (2 Fig.4).
Using tool JD 174, release evaporative **loss** flange to fuel tank lock ring (5 Fig.4).
Remove flange **lock** ring.
Displace evaporative loss flange from fuel pump harness connector (6 Fig.4).
Remove and discard evaporative **loss** flange to fuel tank aperture sealing ring (7 Fig.4).

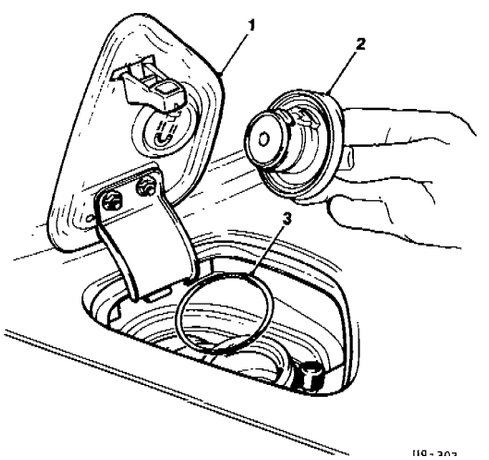


Fig 3

Note: A new evaporative loss flange to fuel tank aperture sealing ring must be fitted every time work is carried out at tank evaporative loss flange.

Fit new evaporative loss flange **seal to** fuel tank aperture.
Connect evaporative **loss** flange **to** fuel pump harness connector.
Align and seat evaporative loss flange to seal and tank.

Note: Ensure the seal remains properly seated between flange and tank body.

Fit lock ring (5 Fig.4) to evaporative **loss flange/tank.**
Using service tool JD 174, fully seat lock ring to evaporative loss **flange/tank.**

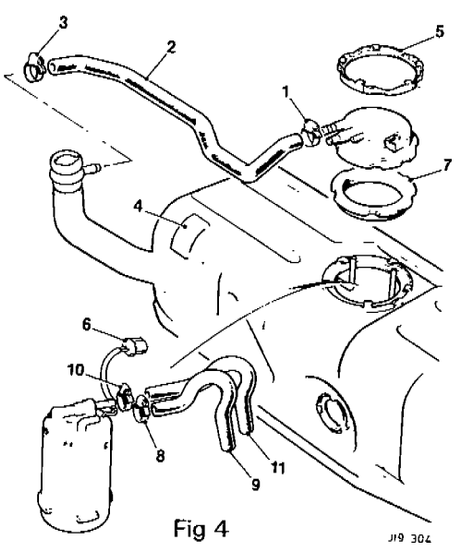


Fig 4

Connect breather hose to evaporative **loss** flange outlet.
Tighten breather hose to evaporative loss flange securing clip.
Remove backing from outlet pipe body aperture seal and **fit** to tank.

Note: **A** new aperture seal must be fitted every time the tank is removed and refitted.

Fit tank assembly to position in boot.
Fully seat tank into mounting position; ensure that hoses, pipes or harnesses are not trapped by the tank.
Re-connect tank sender unit feed wires.

Note: The top terminal (1 **Fig.1**) is the positive supply terminal; the centre terminal (2 Fig.1) is the earth terminal.

Remove adhesive tape securing the tank retaining straps to boot aperture flange.
Re-position tank retaining straps to tank.
Re-connect fuel pump link harness to evaporative loss flange connection (1 Fig.2).
Connect vapour pipe to quickfit connector on evaporative **loss** flange outlet (3 Fig.2).
Connect over pressure pipe to evaporative loss flange quickfit connector (2 Fig.2)

CAUTION: **Pipes must be fully inserted into connector ends to ensure proper fit; failure to do so could cause fuel leakage.**

Re-connect vapour pipe/hose assembly to underfloor vapour pipe (1 Fig.3).
Reposition and seat vapour hose to underfloor vapour pipe spring clip.
Refit fuel filler aperture housing (Fig 4).
Secure fuel filler aperture drain tube to filler neck with ratchet strap.
Re-connect and fit securing strap holding filler housing solenoid **block** connector (1 Fig.4) .

Secure ride level block connector to fuel tank retaining strap lower bracket clip.
Reposition harnesses to fuel tank retaining straps.
Secure harnesses to fuel tank retaining straps with ratchet straps.
Fit and seat fuel tank upper sound insulation pad.
Fit spare wheel mounting bracket.
Fit and tighten spare wheel bracket securing bolts.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close boot.

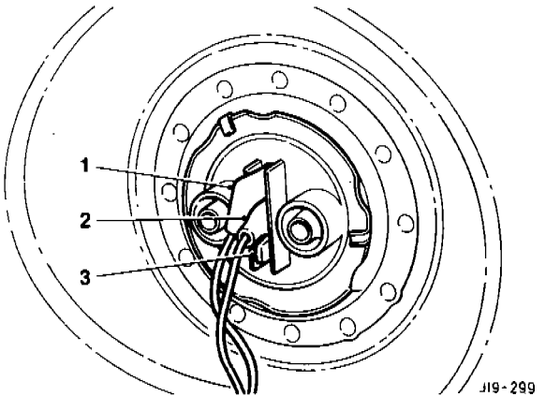


Fig 1

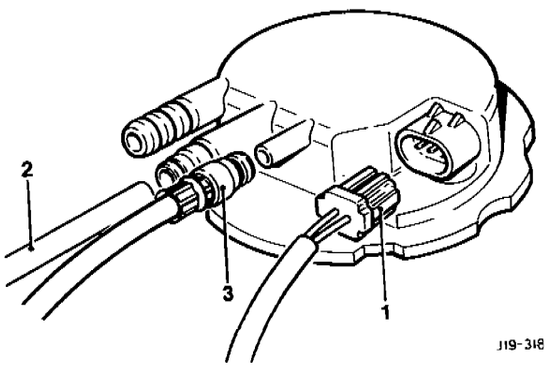


Fig 2

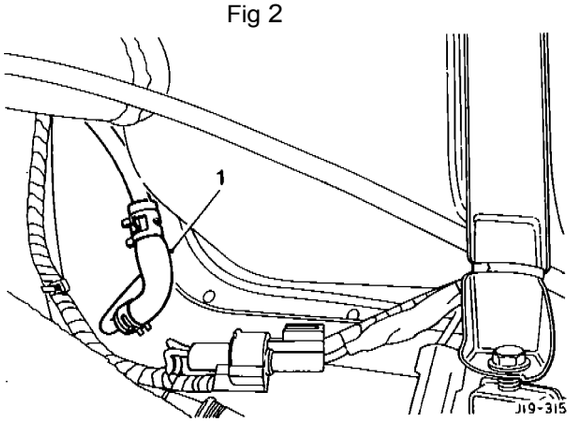


Fig 3

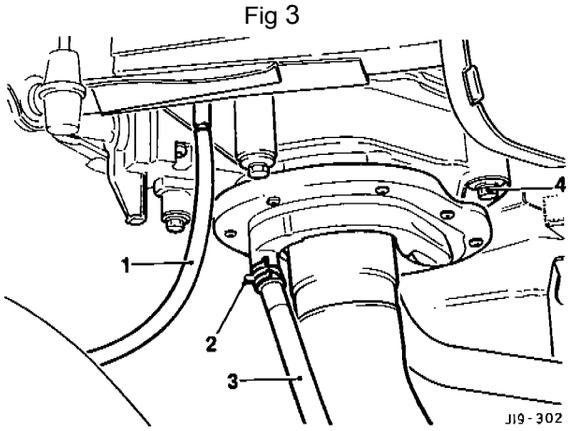


Fig 4

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Raise vehicle on ramp, remove **plugs** from tank and hoses.

Note: New sealing rings must be fitted **to** feed and return hoses.

Connect feed and return hoses to fuel tank **(Fig. 1)**.
Fit and seat tank feed and return hose securing clips (1 Fig.1).
Lower vehicle on **ramp.**
Refill fuel tank.
Re-connect battery.
Close bonnet.

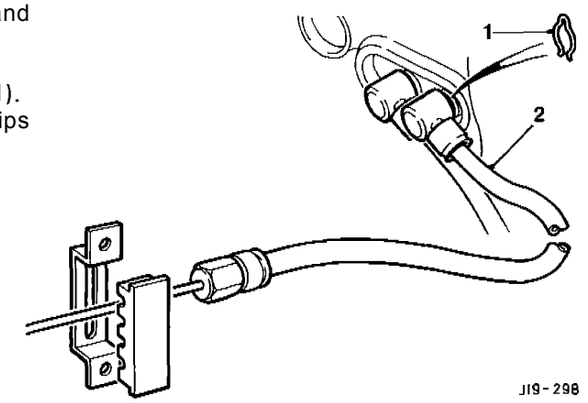


Fig **1**

DATA

SERVICE TOOLS

Evaporative Loss Flange Lock Ring Wrench (JD 174)

TORQUE FIGURES

Anchor bracket securing bolt 22-28Nm
Filler neck to body bolts 2-3Nm
Filler neck hose clip 3.5-4.5Nm
Overflow pipe hose clip 2.5-3.5Nm
***Securing strap to anchor* bracket 5-6Nm**

SPANNER SIZES

8mm
13mm
15mm

1960C

FUEL TANK OVER PRESSURE PIPE

RENEW **19.40.99**

Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Remove fuel tank upper insulation mat.
Remove over-pressure pipe **from** evaporative flange **by** pushing back collar on quickfit connector in flange port (2 Fig.**1**), and pulling pipe from connector.
Displace over pressure pipe from body grommet.

Fit new over pressure pipe through body grommet.
Connect over pressure pipe to evaporative **loss** flange quickfit connector (2 **Fig.**1).

CAUTION: Pipes and component stubs must be fully inserted into connector ends to **ensure proper fit; failure to do so could cause fuel leakage.**

Refit fuel tank upper insulation mat.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close luggage compartment.

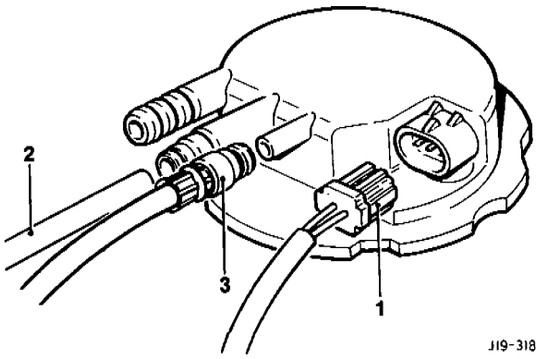


Fig 1

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FUEL TANK TO FILLER NECK BREATHER HOSE

RENEW **19.40.42**

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM,

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.

2 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.

3 A CO_2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.

4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.

5 EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSIONPROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.

6 FUEL MUST NOT BE EMPTIED INTO A PIT.

7 THE WORK AREA MUST BE WELL VENTILATED.

8 THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.

9 THE OLD TANK MUST NOT BE DISPOSED OF UNTIL IT IS RENDERED SAFE FROM EXPLOSION.

10 MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open Bonnet.
Disconnect the battery.
Open the luggage compartment.
Remove spare wheel/wheel cover and jack.
Remove the floor carpet.
Remove the boot front and side liner.
Remove fuel tank upper insulation mat.

Slacken breather hose to evaporative loss flange securing clip (1 Fig.1).
Disconnect hose from flange outlet.
Remove securing clip from hose.
Slacken breather hose to filler neck securing clip (3 Fig.1).
Disconnect hose from filler neck.
Remove securing clip from hose.
Slacken fuel tank left hand retaining strap to lower bracket clamping nut/bolt (Fig.2).
Bend fuel tank weld tag upwards (4 Fig.1).
Remove **old** breather hose.

Fit new breather hose into position behind fuel tank left hand retaining strap.
Bend fuel tank weld tag downwards to secure hose.

Fit breather hose to filler neck securing clip.
Connect hose to filler neck.
Tighten securing clip (3 Fig.1).
Fit breather hose to evaporative loss flange securing clip.
Connect breather hose to flange outlet.
Tighten securing clip (1 Fig.1).
Tighten fuel tank left hand retaining strap to lower bracket clamping nut/bolt.

Refit fuel tank upper insulation mat.
Refit boot side liners and floor carpet.
Refit jack and spare wheel/wheel cover.
Close luggage compartment.
Connect battery.
Close bonnet.

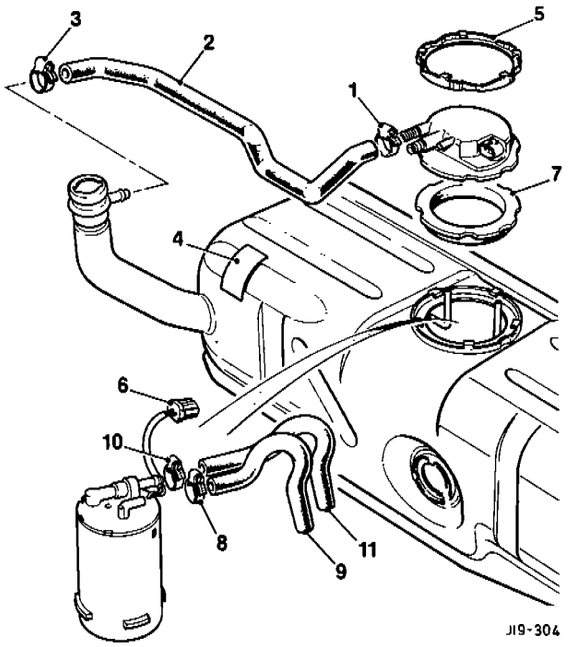


Fig 1

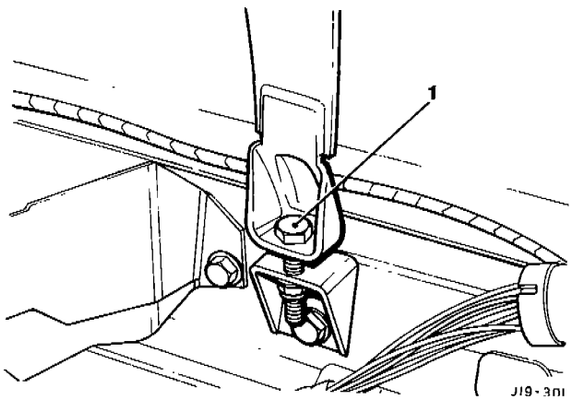


Fig 2

DATA

TORQUE FIGURES

Anchor bracket securing bolt 22-28Nm
Filler neck hose clip 3.5-4.5Nm
Securing strap to anchor bracket 5-6Nm

SPANNER SIZES

8mm
13mm
15mm

1960C

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MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY ENGLAND

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH
THE QUEEN MOTHEP
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
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BY APPOINTMENT TO
HIS ROYAL HIGHNESS THE PRINCE OF WALES
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SERVICE MANUAL

VOLUME 3

Contains Sections

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37, GEARBOX – MANUAL 2.9
37. GEARBOX – MANUAL 4.0
44. GEARBOX –AUTOMATIC 2.9
44. GEARBOX – AUTOMATIC 4.0
47. PROPELLER AND DRIVE SHAFTS
51. FINAL DRIVE
57. STEERING
60. FRONT SUSPENSION
64. REAR SUSPENSION
66. POWER HYDRAULICS
70. BRAKES

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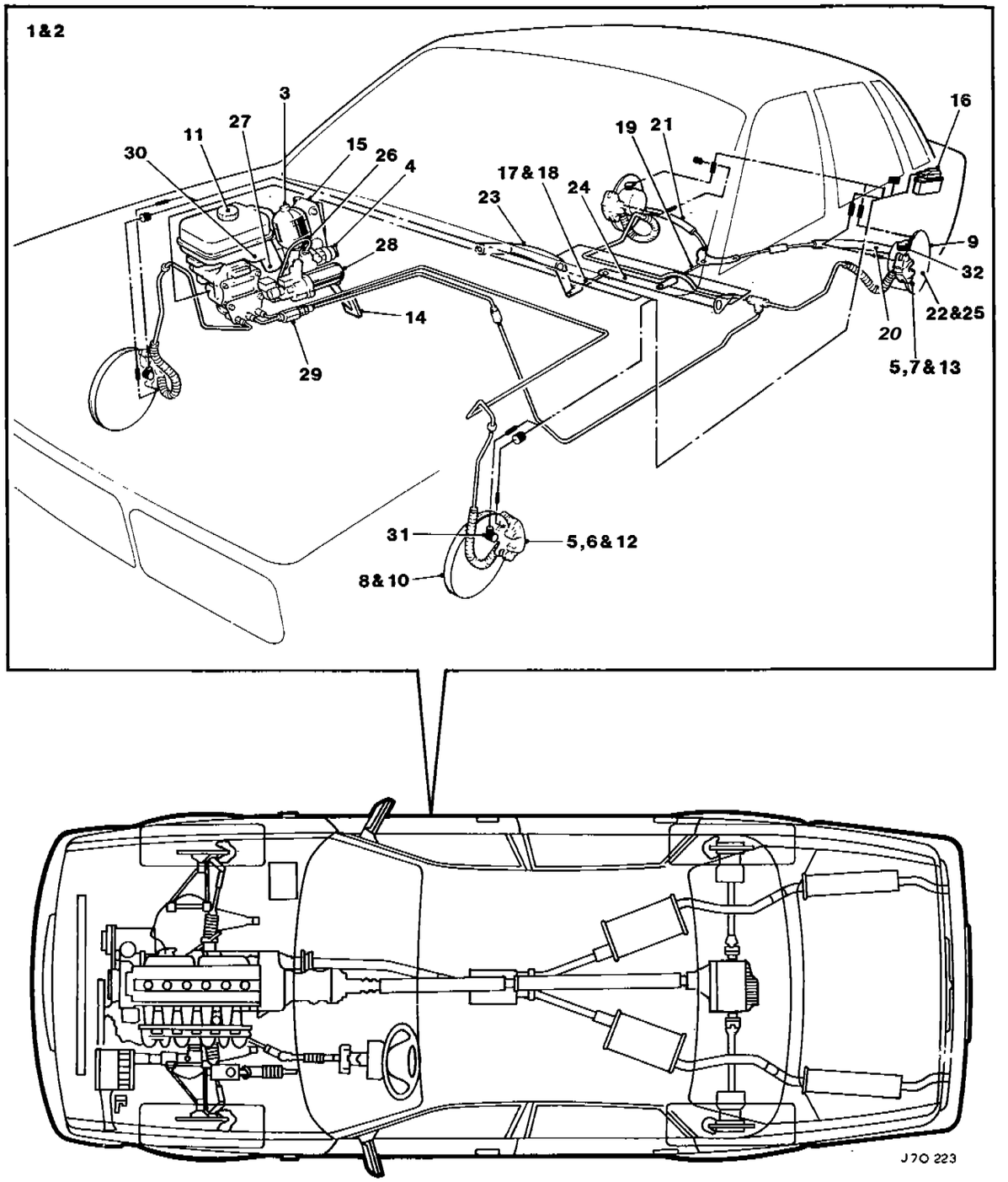
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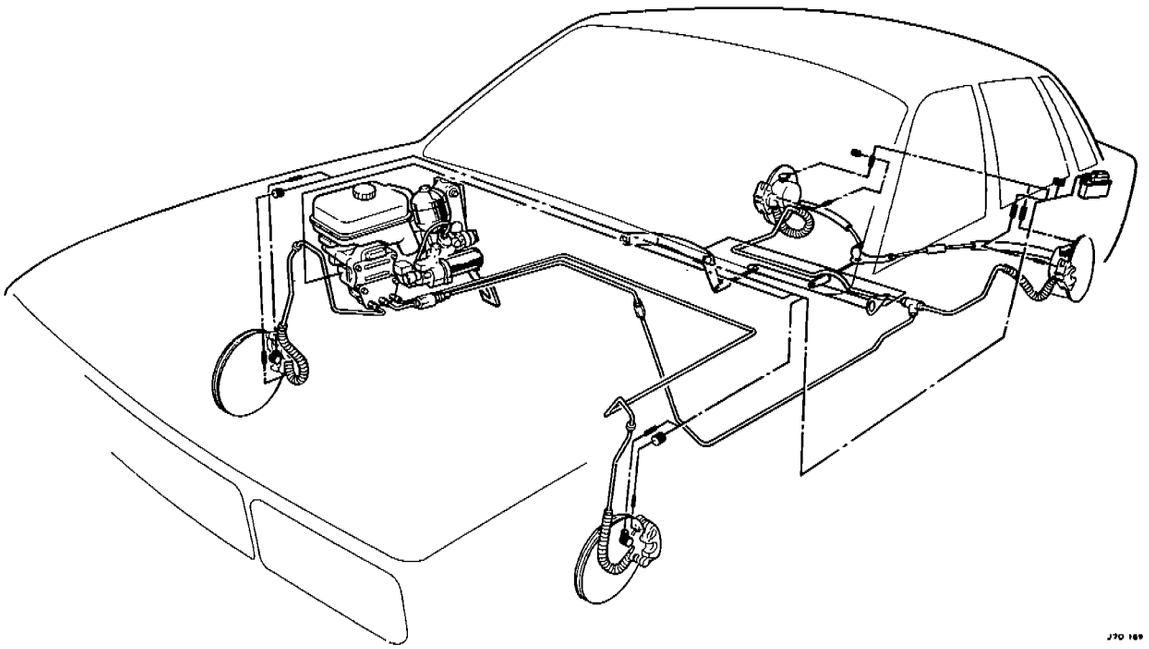
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ANTI-LOCK BRAKE SYSTEM

GENERAL ARRANGEMENT

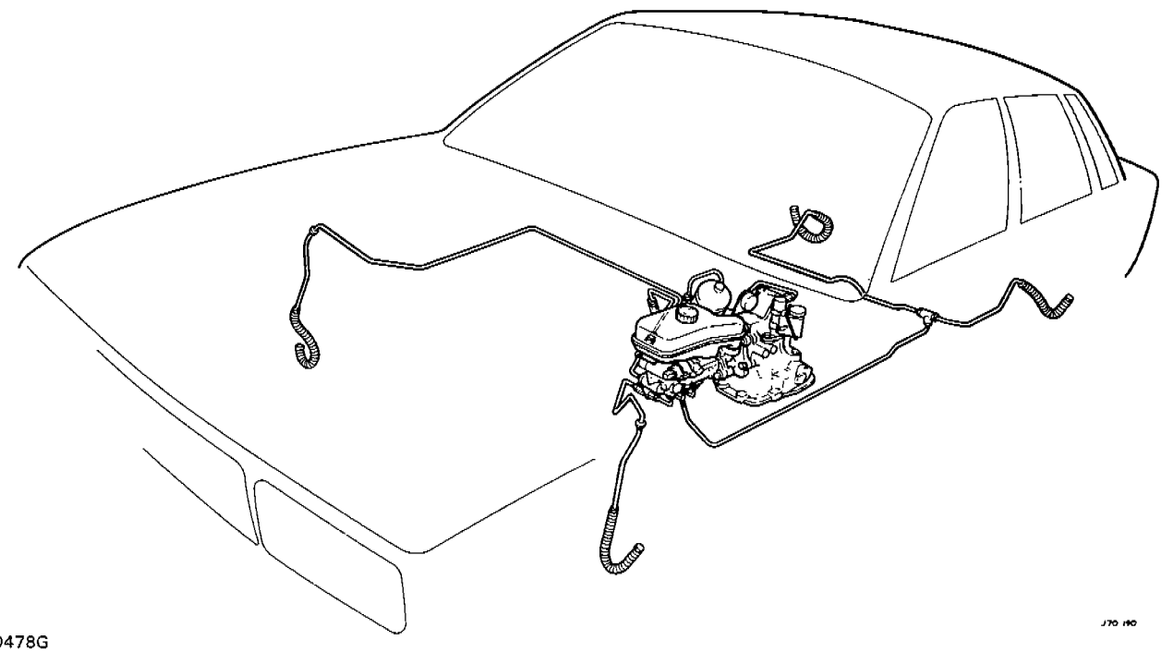
70.00.00

RIGHT HAND DRIVE CONDITION



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LEFT HAND DRIVE CONDITION



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ANTI-LOCK BRAKING SYSTEM

INTRODUCTION *70.00.*00

The hydraulic components necessary for the anti-lock control are integrated with a servo-hydraulic booster (Fig 1) and its operating components; brake fluid is used as the single working fluid. An energy source consisting of an electric motor, a pump. a pressure switch and an accumulator (Fig 2) provides high pressure fluid to operate the booster during normal braking as well as providing a means of increasing brake line pressure when required during anti-lock braking. Also contained in this assembly are the master cylinder the solenoid valves and the reservoir.

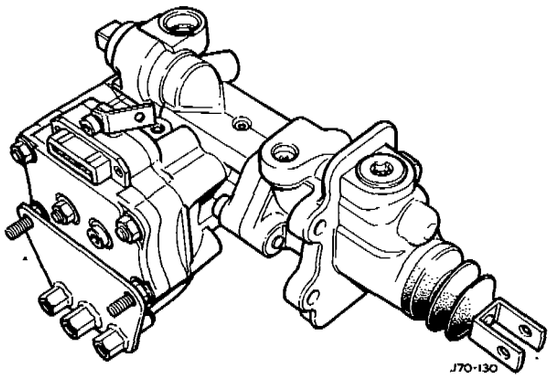


Fig 1

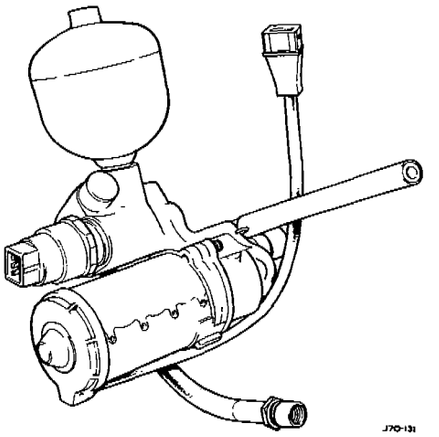


Fig 2

In the installation the front hydraulic circuit is operated conventionally by the master cylinder, assisted by the booster, but the rear circuit is operated directly by the controlled, pressurized fluid in the booster. The front circuit is 'static' and the rear circuit 'dynamic'.
However when the anti-lock control is required, the front also becomes 'dynamic'. Then inlet and outlet solenoid valves operate in each of the three circuits to control the pressure as required to prevent wheel-lock.

Sensors are installed at each wheel. Their wheel speed related signals are processed by an electronic control module which operate the solenoid valves in the hydraulic system. The front wheels are controlled individually and the rear wheels, which are on a single hydraulic circuit, are controlled together on the select low princible. Therefore a tendency for one wheel to lock result in control of both wheels according to the need of the 'locking' wheel.

The state of the anti-lock system is continuously monitored by the control module, which switches off the system automatically if a failure is identified, illuminating a warning lamp and leaving full, boosted braking to all wheels. Warning lamps would also indicate low accumulator pressure or low fluid level in the reservoir.

Note: Should the front hydraulic circuit fail, pedal travel will increase. If the rear hydraulic circuit fails, pedal effort will increase.

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HYDRAULIC BRAKE BOOSTER

One important aspect of the **ABS** is the hydraulic booster (Fig 1) which boosts the pedal force by means *of* hydraulic pressure. The dynamic circuit of the rear brakes is supplied from the hydraulic accumulator via a control valve in the booster.

The pressure in the booster and the rear brake circuit is proportional to the pedal force i.e:

Low pedal force - low pressure

High pedal force - high pressure

The booster is composed of an actuating piston (1 Fig 2) and a booster piston (2 Fig 2). The movable, mechanical connection between the control valve (3 Fig 2) and the two pistons is made by means *of* a scissor-lever mechanism (4 Fig 2).

The control valve (3 Fig 2) opens the pressureless booster chamber to the reservoir (9 Fig 2); simultaneously the channel from the hydraulic accumulator is closed. The accumulator is constantly maintained in an operating pressure range between 140 to 180 bar nominal, 128,5 bar minimum to 195 bar maximum.

As force is applied to the brake pedal, the actuating piston (1 Fig 2) with the scissor (4 Fig 2) moves forward. The two lower articulated balls (5 & 6 Fig 2) move towards one another while the upper balls (7 & *8* Fig 2) move apart. Due to this movement, the control valve (3 Fig 2) opens the intake channel from the accumulator just after it closes the return flow.

In the brake booster, a pressure is built up which is transmitted to the rear brakes and which acting simultaneously on the booster piston (2 Fig 2) boosting the actuating force on the master cylinder piston. At the same time the pressure acts between the booster piston (2 Fig 2) and the actuating piston (1 Fig 2) separating the two parts. The lower articulated balls *(5* & 6 Fig 2) move apart whilst the upper balls move towards one another, this movement closes the intake by means of the control valve; the return flow remains closed.

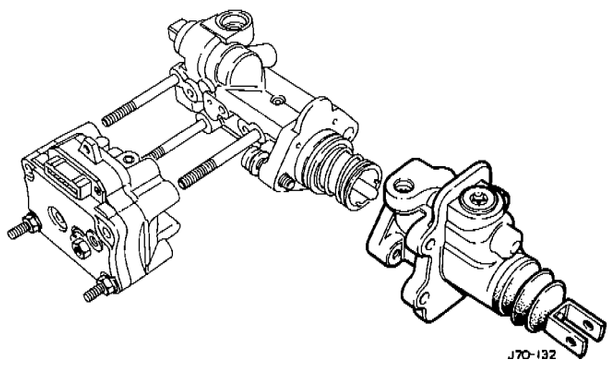


Fig 1

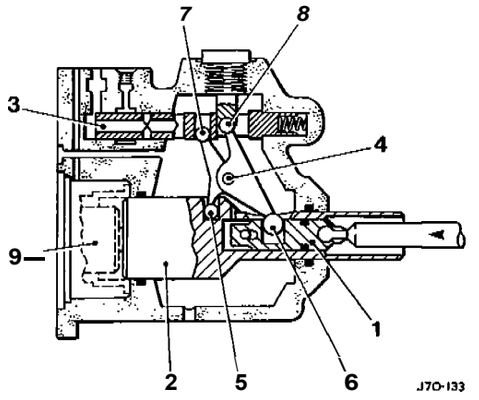


Fig 2

The control valve (3 Fig 2) is closed when the pressure acting on the actuating plate (1 Fig 2) causes a force which is equal to the preset pedal force, i.e. when there is a balance of forces. **The** pressure acting on the annular circle of the booster piston (2 Fig 2) increases the pedal force. The pedal force is increased in the ratio 1 : 4, the booster ratio depends on the ratio of actuating piston area (1 **Fig** 2) to booster piston area (2 Fig 2).

The pressure in the booster is proportional to the pedal force.

In maximum braking position, the control valve is open completely, the entire accumulator pressure of between 128,5 bar min. and 195 bar max. acts on the booster piston. The maximum posible brake boosting is utilized. The brake pressure to the front wheel brakes can only be increased when the pedal force is increased. The brake pressure in rear wheel brakes cannot exceed 195 bar max., even in the case of the pedal force increase.

ELECTRONIC CONTROL UNIT

The electronic control unit (ECU) processes the signals from the four wheel sensors, converts their frequency information into values which correspond to wheel speed and then, with the data received, controls the solenoid valves during braking under **ABS** control.
The ECU (Fig 1) checks the inputs and output signals in order to indicate a **ABS** disturbances, a self-monitoring function is integrated in the ECU and a ABS warning lamp is illuminated in the case of a system failure.

During **ABS** control, the respective solenoid valves in the wheel circuit concerned is controlled. The main valve is controlled when a front wheel is under **ABS** control. In order to enable the wheel to transmit the optimum brake force under all road conditions, the control of the valves must be operate very rapidly, up to 6 times a second.

When the ignition is switched on (Refer to **Fig** 2), battery voltage is supplied to pin 53 of the ECU. The controller will provide an earth connection at pin 34 to activate the main relay coil, provided a system fault has not been detected. Battery voltage is supplied to pin 33 when the main relay is energised which switches the ECU on to start its test routines.

During the test routines, the **ABS** warning lamp is illuminated. The time the lamp is illuminated depends on the charging of the hydraulic accumulator. During this initialization phase of the ECU, the controller will ground pin **52** until tests prove satisfactory. The signal controls a logic input on the instrument pack which controls the **ABS** warning lamp.

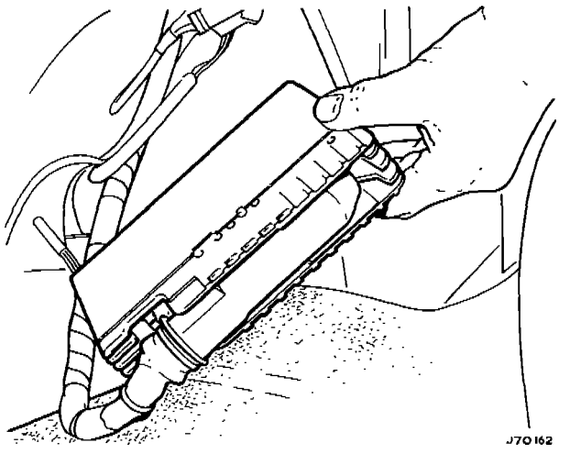


Fig.1.

ABS AND BRAKE WARNING **LAMP** (Fig 2)
The **ABS** warning lamp warns the driver in the case **of** a malfunction in the **ABS** system and indicates that the eletronic control module has switched off the **ABS** system. The consequence is the loss of the anti-lock function, the conventional brake with brake boosting is, however maintained.

The brake warning lamp together with **ABS** warning lamp warns the driver that a problem exists in the conventional braking system, ie loss of brake pressure.
In the case of **a** failure due to faulty plug connections, broken cables **or** defective components, such as sensors or/and solenoid valves, the voltage supply to the main relay is switched off by the ECU via terminal 34, and terminal 33 is no longer supplied with voltage.

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The ABS warning lamp is electronically controlled by the vehicle instrument pack. To activafe the warning lamp, the controller provides a groung signal at pin 52.
If the ECU is not connected the warning will illuminate because it is connected to ground via the **ECU** relay.
Should the ABS and the brake warning lamp illuminate simultaneuosly brake pedal feels normal but the fluid is low.
The brake warning is illuminated because an earth connection for the warning lamp is made via the switch contacts located in the reservoir.

The ABS warning lamp is illuminated because fluid level switch is open and the circuit between terminals 8/51 ***of*** the control module is broken. During the system self test, the **ECU** will recognize this failure and switch terminal 52 of the **ECU** from the warning lamp to earth, at the same time, the system will be partially inhibited.
Should the pedal feel hard (after some brake applications) ie in the case of accumulator pressure below the switching pressure point between ***85*** bar min. and 105 bar max. **(95** bar nominal), no boost braking.
The brake warning lamp illuminates because **the** pressure is below the switching pressure point between 96 bar min. and 112 bar max. (105 bar nominal). The warning lamp switch contacts in the combined pressure switch open, *so* **a** circuit is broken between terminals **1** and 2.
The **ABS** warning lamp illuminates simultaneously because the warning switch contacts open breaking the circuit between terminals 8 **and** 51 of the ECU. During the system self test, the control module will recognize this failure and switch terminal 52 of the ECU from the warning lamp to earth, at the same time, the system will be partially inhibited.

PUMP MOTOR OPERATION

With the pressure in the hydraulic accumulator below 128,5 to 149 bar (lower switching point), the motor will switch on.
When the ignition is switched on battery power is supplied to the relay coil, if the pressure in the hydraulic accumulator is below the lower switching point the coil will be earthed.
Battery power is then supplied to the pump motor via the closed contacts of the relay and a 30 amp fuse.

The motor operates until a pressure of 171 to 195 bar (upper switching point), **is** achieved. Having reached the upper switching point the pressure switch contacts open de-activating the relay thus switching off the pump motor. When the pressure drops to the lower switching point, the pressure switch closes switching on the pump motor so that the system pressure is maintained at between 128,5 **bar** min. to 195 bar max. (140 to 180 bar nominal).

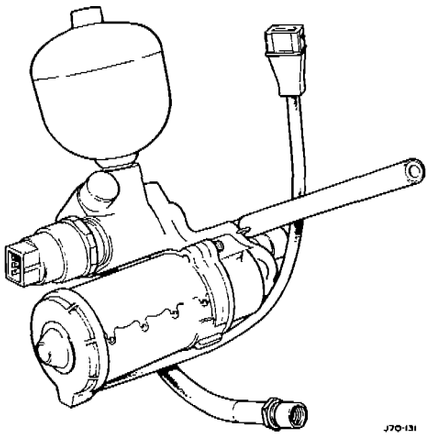


Fig 1

MOTOR PUMP UNIT (Fig 1)

With the motor pump unit, an independent energy supply is obtained by means of a motor and a pump which generates hydraulic energy, and accumulates the pressure energy in a hydraulic accumulator. **From** the hydraulic accumulator the pressure supply for the dynamic circuit of the rear wheel brakes, the hydraulic brake booster and the static circuit of the front wheel brakes is provided during a braking with ABS control.

The motor (1 Fig 1) drives via a coupling (2 Fig 1) a rotor (3 Fig 1) which includes two pistons (4 Fig 1) and two balls (5 Fig 1) which move in an eccentric ring (6 Fig 1). Brake fluid is drawn via the suction channel (7 Fig 1), a filter (8 Fig 1), through the control shaft (9 Fig 1) on the upper side of the lower piston. The rotation causes a reduction of space due to the eccentric ring and ball. The piston is moved towards the control shaft and a pressure is generated.

The pressure opens a check valve (10 Fig 1), is transmitted to the accumulator and to the annular chamber of the control piston in the booster. Simultaneously the pressure acts on the tappet (11 Fig 1) of the combined pressure warning switch (12 Fig 1) and moves it until the upper switching point (171 to 195 bar), is achieved. The pressure switch in the combined pressure switch switches the motor off.

The hydraulic system is protected against damage by the pressure control valve which releases pressure at 210 bar.

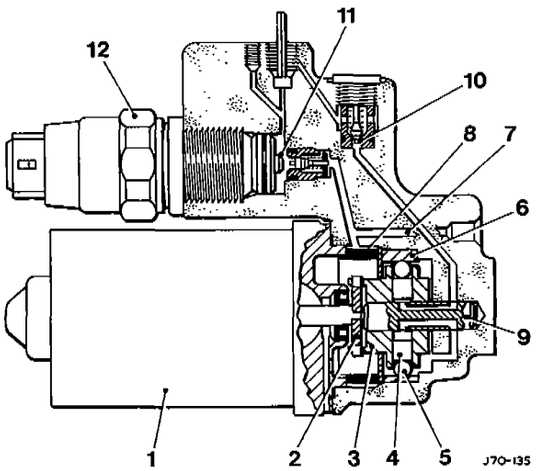


Fig 1

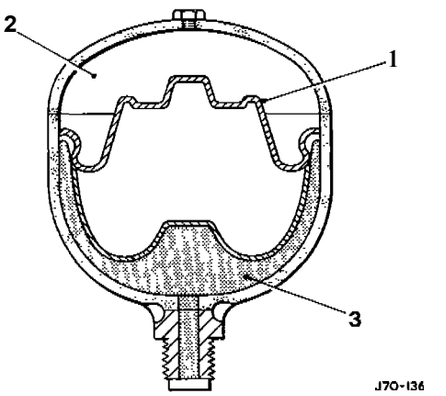


Fig 2

HYDRAULIC ACCUMULATOR

The hydraulic accumulator (Fig 2) accumulates the hydraulic pressure and make it available to the hydraulic system for the booster and rear wheel brakes.
Owing to the fact that fluids are almost incompressable they cannot be used for an accumulation of energy. The additional use of compressible nitrogen gas in the hydraulic accumulator enables an energy accumulation. The gas and fluid must be separated by means of a membrane.

The hydraulic accumulator is composed of a reservoir which is divided into two chambers by a membrane (1 Fig 2). On a new accumulator, the upper chamber (2 Fig 2) is filled with nitrogen gas to an initial pressure of 84 bar. In service this pressure must not fall below 30 bar. Brake fluid supplied by the pump fills the lower chamber (3 fig 2).

With an increasing amount of brake fluid the pressure in the system also increases, the nitrogen gas is compressed and the gas pressure is increased ie the nitrogen volume becomes smaller.
Equally the accumulator volume for the brake fluid increases up to the cut-off (upper switching point) pressure of 171 to 195 bar.
The pressure in the accumulator is maintained by means of a check valve which is integrated in the motor pump unit.

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COMBINED PRESSURE WARNING SWITCH (Fig 1)

The pump generates a pressure in the system which acts on the tappet (1 Fig 2). The tappet moves against a spring (2 Fig 2). At a pressure of 96 to 112 bar the warning switch (3 Fig 2) is actuated.
First, the brake warning light will be extinguished followed a short time after by the ABS warning light. The tappet (1 Fig 2), is moved further by pressure and opens the pressure switch (4 Fig 2), at a pressure between 171 to 195 bar to open the pump relay coil circuit *so* stopping the pump motor.
If, after a number of brake applications or normal leak down, the system pressure falls below the lower switching point (128,5 to **149** bar), the pressure switch (5 Fig 2) closes and the pump **will** operate until the upper switching pressure (171 to 195 bar) is reached. In this way, the system pressure is maintained within the range of 128,5 to 195 bar (140 to 180 bar nominal). **If** due **to** a hydraulic or electrical failure, a pressure drop below the brake warning switch range occurs (96 to 112 bar), the brake warning switch (4 Fig 2) contacts close. The brake warning lamp lights, simultaneously the ABS warning switch (3 Fig 2) contacts open and the circuit between terminals 9 and 10 **of** the **ECU** is broken. The **ECU** is partially inhibited, **ABS** control for the front wheel brakes is switched **off** and the **ABS** warning light is illuminated.

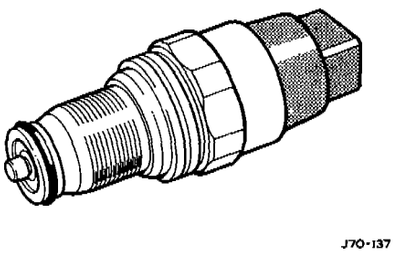


Fig 1

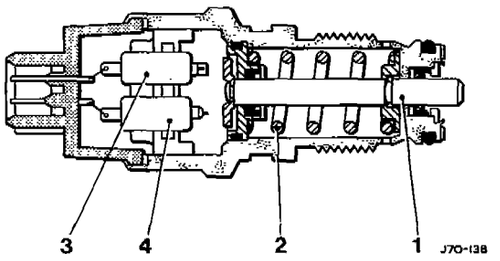


Fig 2

WHEEL SENSORS

At each road wheel **a** speed sensor and a toothed rotor is fitted. By means **of a** magnetic core (1 Fig 3) in a coil (2 Fig 3) **a** sinusoidal alternating voltage signal is generated **by** a toothed rotor (3 Fig 3) breaking the magnetic field and inducing voltage in the coil. The frequency **of** which is dependent on the wheel speed. The voltage is transmitted to the ECU via screened cables. The the air gap between the sensor and the toothed wheel is very important ie **a** large gap will generate a low voltage, and **a** small gap **a high** voltage.

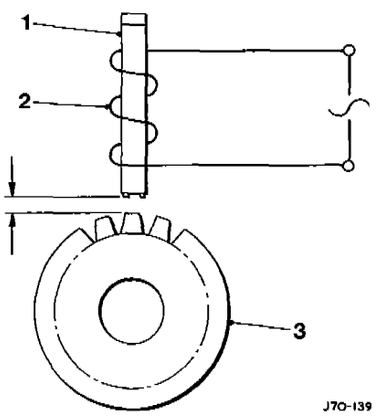


Fig 3

VALVE BLOCK

The valve block contains three pairs of solenoid valves, one pair for each of the front brakes and one pair for the rear brakes. Each pair contain an outlet and an inlet valve. The valves are electronically operated by signals from the ECU. During braking with ABS control, the ECU provides a ground path to the inlet and outlet solenoid valves, which influence the hydraulic pressure to the brakes. The control to the rear brakes is determined by the wheel which first shows a tendency to lock. The brake pressure at both rear wheels is thus determined by the wheel having the lowest friction coefficent.

This ensures that in the case of braking on a surface with low friction coefficient neither of the rear wheels will lock.
All the valves with the exeption of the main valve have a common battery feed which is connected to pin 30 of the main relay.
The positive supply connection to the controller pin 3 is known as the reference voltage, and provides the controller with voltage information from the point of supply to the valves.

Note: During normal braking the anti-lock system will not be activated. However, if the braking force applied is sufficient to overcome tyre/road adhesion the anti-lock system will automatically be activated preventing the road wheel from locking.

With no current flowing through the inlet solenoids the valves are open so that during braking the brake pressure can be applied direct to the wheel brakes.
With no current flowing through the outlet solenoids the valves are closed and disconnect the wheel brakes from the reservoir.
To maintain pressure the outlet valve (1 Fig 1) stays closed, and the inlet valve (2 Fig 1) to a 'wheel with a tendency to lock' closes, ensuring the brake pressure to that wheel cannot be increased.
To decrease pressure the inlet valve closes and the outlet valve opens. The brake pressure to the wheel is decreased.
To increase the pressure to the wheel the inlet valve opens and the outlet valve closes and the brake pressure to the wheel is again increased almost up to the locking pressure limit.
These phases are repeated up to six times a second until the tendency for the wheel to lock is illiminated.

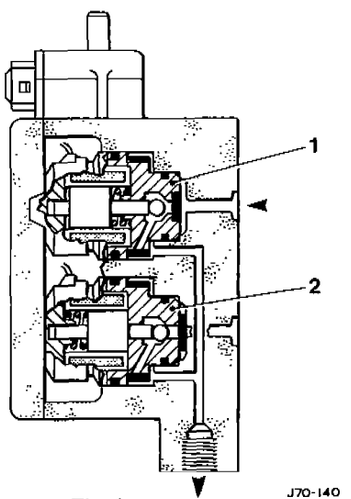


Fig 1

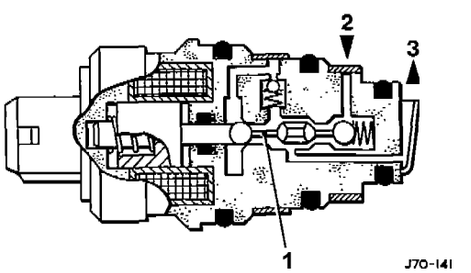


Fig 2

MAIN VALVE

The main valve is a solenoid operated valve which during ABS control supplies the front wheel brakes with pressure and causes a push back of the pedal by applying a pressure to the postioning sleeve.
In a braking position without ABS the solenoid valve (1 Fig 2) is de-energized and connects the reservoir (2 Fig 2) with the master cylinder (3 Fig 2).
The connection between the booster, the master cylinder and the return flow is closed.
At the beginning of ABS control the main solenoid valve is energized and connects the dynamic circuit of the booster with the static circuit of the master cylinder.
The connection between the master cylinder and the reservoir is closed.

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MASTER CYLINDER

The master cylinder (Fig 1) acts exclusively on the front wheel brakes, the static circuit. The pressure in the master cylinder is generated by means of force acting from the booster piston to static fluid column. In addition, the positioning sleeve and the main valve are integrated in the master cylinder.
The brake pressure to the rear wheel brakes is supplied by the hydraulic accumulator through the control valve.

As pressure is applied to the brake pedal, the master cylinder piston (1 Fig 2) is moved forward by the booster piston (5 Fig 2). The central valve (2 Fig 2) closes and a pressure is built up in the front wheel brakes. Simultaneously to the forward movement of the booster piston the positioning sleeve (3 Fig 2) is pulled to the left. The main valve (4 Fig 2) is in an inoperative position. The connection between the master cylinder and the reservoir is open, the connection between the booster and the master cylinder is closed.

Should there be a wheel locking tendency during braking at one or more front wheels, the main valve (4 Fig 2) is controlled by the **ECU.** The main valve closes the connection between the static circuit of the master cylinder and the reservoir.
Simultaneously, the connection between the dynamic circuit in the rear wheel brakes the booster, and the static circuit in the front wheel brakes is made.

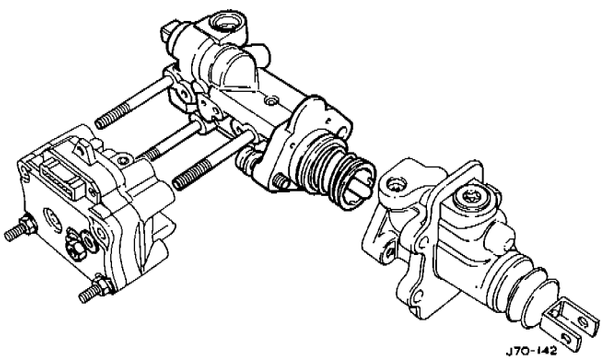


Fig 1

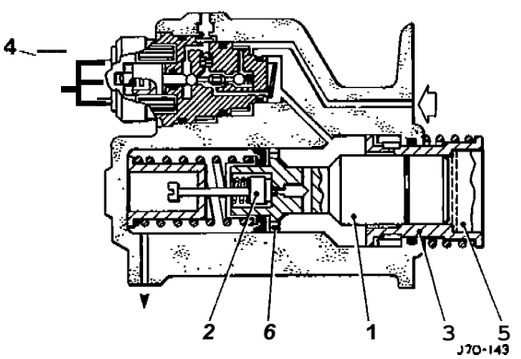


Fig 2

The dynamic pressure is applied to the positioning sleeve (3 Fig 2) which is moved to its stopping point. This movement causes the push back of the booster piston and of the pedal. At the same time, the dynamic flow-in over the primary seal (6 Fig 2) of the master cylinder piston (1 Fig 2) and thus the direct pressure supply in the wheels occurs.

The pressure on the right side of the primary seal is higher than on the left side and due to this the primary seal is pushed forward.
Due to the pressure compensation, the master cylinder piston (1 Fig 2) is pushed to the booster piston (5 Fig 2).
The direct flow into the front wheel brakes and the push back of the pedal, avoids a pedal pulsation during braking under **ABS** control and guarantees at the same time that sufficient reserve is available in case of rear circuit failure.

POSITIONING SLEEVE

The positioning sleeve **is** a safety feature which ensures that in the case of a circuit failure in the rear wheel brakes there sufficient master cylinder stroke left during **ABS** controlled braking.
In its inoperative position the sleeve (1 Fig 1) is at its stopping point. The chamber (2 Fig 1) left of the positioning sleeve is connected with the reservoir via the main valve. The chamber right of the sleeve is connected direct with the reservoir.

Braking without ABS control pressure is applied to the brake pedal, the booster piston (3 Fig 1) moves to the left pushing the positioning sleeve to the left against the spring tension.
Braking on surfaces with a high friction coefficient under ABS control pressure is applied from the dynamic circuit by opening the main valve. The positioning sleeve (1 Fig 1) moves to the right to its stopping point and pushes back the booster piston (3 Fig 1) as well as the brake pedal.
At the beginning of ABS control the brake pedal has a hard pedal feel.

During braking on surfaces with a low friction coefficient the booster piston and the brake pedal moves gradually to the stopping point of the position sleeve. Therefore, no push back movement of the pedal can be felt.

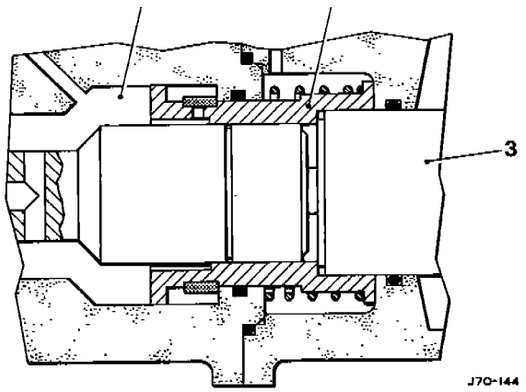


Fig 1

RESERVOIR

The reservoir is composed *of* several chambers. The most important chambers deliver supply to:

1 The front wheel brakes, i.e for the master cylinder via the main valve.
2 The motor pump unit, i.e. for the booster and rear wheel brakes.
3 For the return flow from the booster, the rear brakes, the valve block and the position sleeve.

If due to a leakage, e.g. in the front wheel brakes brake fluid is lost, the necessary amount of fluid for operating the rear wheel brakes is still available. The **ECU** is partially inhibited, the ABS for the front wheel brakes is switched off and the ABS warning light is illuminated.

In the case of a leakage in the rear wheel brakes, a residual amount **of** fluid is available for operating the front wheel brakes to decelerate the vehicle. The ECU is partially inhibited, the **ABS** for the front wheel brakes is switched off and the ABS warning light is illuminated.

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Monitoring the fluid level is made by means of two reed contacts on different levels inside the reservoir which are switched by contact plates (1 Fig 1) on a float stem.
With fluid loss, the lower reed contact (2 Fig 1) switches on the brake warning lamp, the same as a conventional brake system.
With further loss of brake fluid the upper reed contact (3 Fig 1) is opened. The circuit between terminals 8 and 51 is broken. The ECU senses the open circuit during its continuous tests. The ECU is partially inhibited, The ABS for the front wheel brakes is switched off and the ABS warning lamp is illuminated.

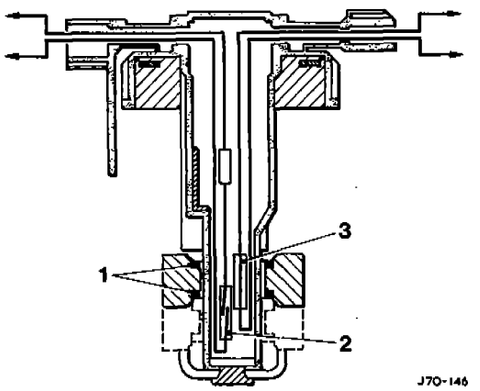


Fig 1

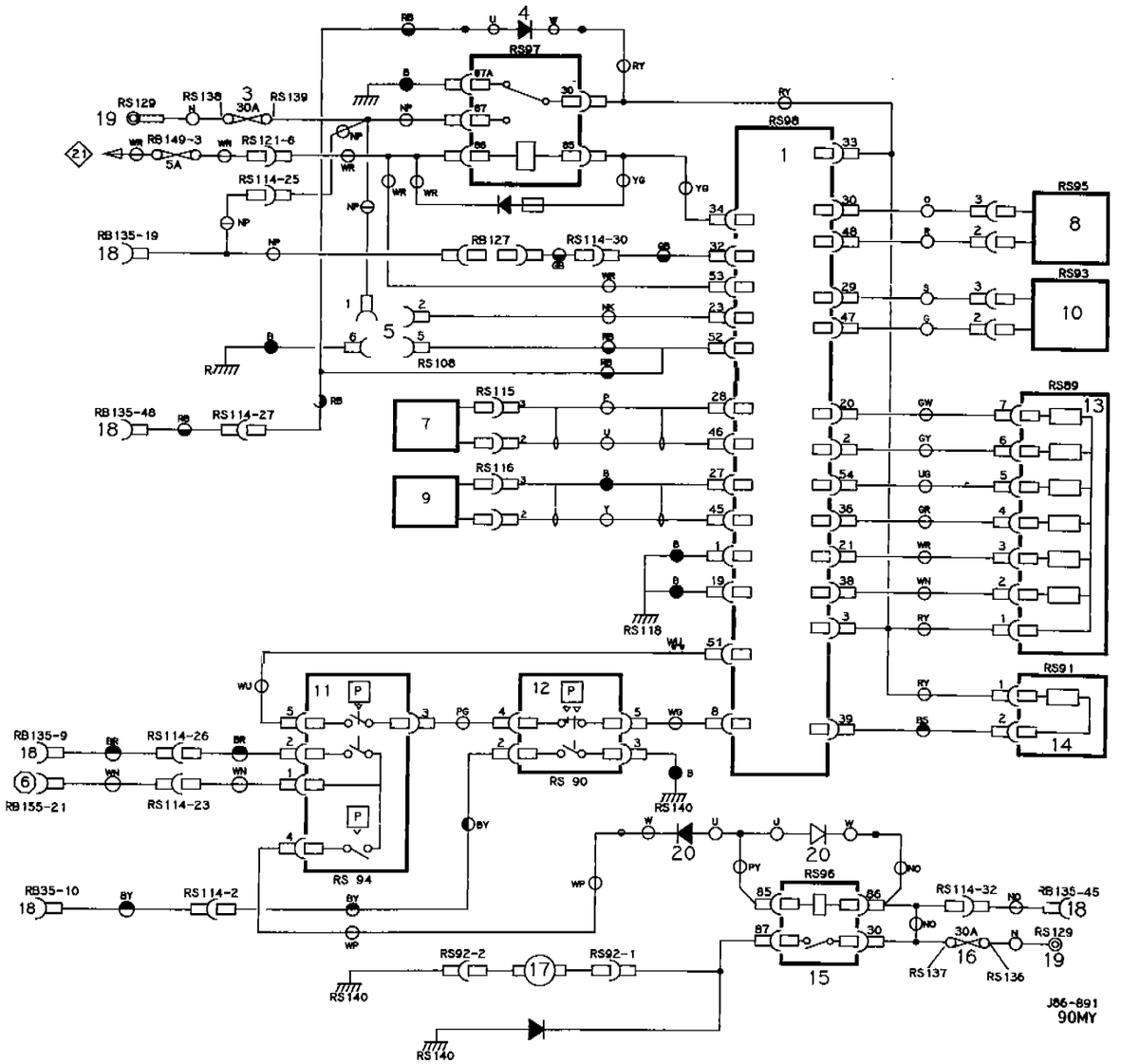
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KEY TO DIAGRAM (RHD)

Anti-lock braking

1 Electronic control unit
2 Main relay
3 **30A** fuse
4 Diode D2
5 Diagnostic socket
6 To ignition switch
7 LH rear wheel speed sensor
8 LH front wheel speed sensor
9 RH rear wheel speed sensor
10 RH front wheel speed sensor
11 Brake Pressure switch (shows low condition)
12 Reservoir (fluid level normal)
13 Valve block
14 Main valve
15 Anti-lock warning light
16 Ignition battery feed
17 Brake fail warning light
18 Pump motor
19 Protection diode D4
20 Pump motor relay
21 Diode D3
22 **30A** fuse
23 Ignition load relay
24 Battery post
25 **To** ignition switch (crank)
26 Brake light switch
27 Diode **D1**

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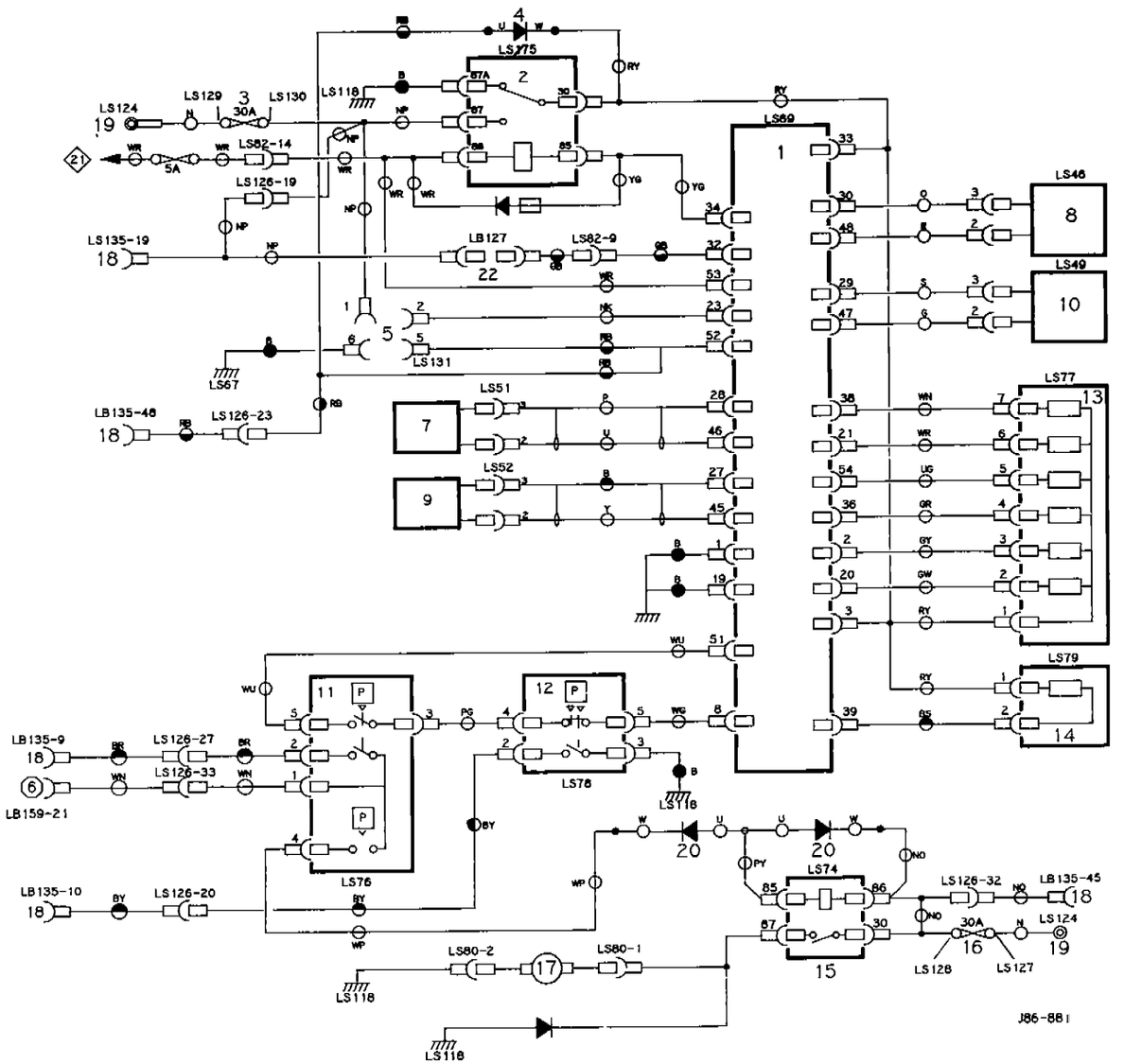
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KEY TO DIAGRAM (LHD)

Anti-lock braking

1 Electronic control unit
2 Main relay
3 30A fuse
4 Diode D2
5 Diagnostic socket
6 To ignition switch
7 LH rear wheel speed sensor
8 LH front wheel **speed** sensor
9 RH rear wheel speed sensor
10 RH front wheel speed sensor
11 Brake Pressure switch (shows low condition)
12 Reservoir (fluid level normal)
13 Valve block
14 Main valve
15 Anti-lock warning light
16 Ignition battery feed
17 Brake fail warning light
18 Pump motor
19 Protection diode D4
20 Pump motor relay
21 Diode **D3**
22 **30A** fuse
23 Ignition **load** relay
24 Battery **post**
25 To ignition switch (crank)
26 Brake light switch
27 Diode D1

0478G



ANTI-LOCK BRAKING SYSTEM

FAULT DIAGNOSIS 70.00.00

SYSTEM TEST

TEST 1 Battery voltage at ABS module Volt-meter connected to terminals 1 and 53 at ABS module Ignition 'ON' should be over 10 volts	- If incorrect check battery condition. - Check wiring from terminal 53 to ignition switch - Check wiring from terminal 1 to earth
TEST 2 Main relay continuity test between Terminals 1 and 33 ABS module Ignition 'OFF' Should have continuitv	- If incorrect remove relay and check wiring from terminal 33 to pin 30 at relay - Check wiring from pin 87a of relay to earth. If **OK** replace relay.
TEST 3 Main relay resistance test. Terminals 34 and 53 ABS module Should be 50 to 100 ohms	- If incorrect remove main relay and check wiring from terminal 34 to pin *85* at relay - Check wiring from pin **86** at relay to battery positive.
TEST 4 Main relay operation Bridge ABS terminals 1 and 34 Voltmeter to ABS terminals 1 & 33 Ignition 'ON' Should be over 10 volts	- If incorrect remove main relay - Checkfuse - Check wiring from pin **87** of relay to **fuse** - Remove bridge wire
TEST 5 Left-hand side rear wheel sensor connector resistance check Connect ohmmeter between termnals 28 and 46 Ignition **'OFF'** Resistance should be 0.8 - 1.4 **K** ohms	- If incorrect check wheel sensor connector - Disconnect wheel sensor and check sensor resistance if incorrect replace sensor. - If resistance of sensor correct check wiring from sensor to **ABS** block connector terminals *28* and **46**
TEST 6 Right-hand side front wheel sensor resistance check Connect ohmmeter between termnals 29 and **47** Ignition 'OFF' Resistance should be 0.8 - 1.4 **K** ohms	- If incorrect check wheel sensor connector - Disconnect wheel sensor and check sensor resistance if incorrect replace sensor. - If resistance of sensor correct check wiring from sensor to **ABS** block connector terminals 29 and 47
TEST 7 Right-hand side rear wheel sensor resistance check Connect ohmmeter between termnals 27 and 45 Ignition 'OFF' Resistance should be 0.8 - 1.4 **K** ohms	- If incorrect check wheel sensor connector - Disconnect wheel sensor and check sensor resistance if incorrect replace sensor. - If resistance *of* sensor correct check wiring from sensor to **ABS** block connector terminals 27 and 45
TEST *8* Left-hand side front wheel **sensor** resistance check Connect ohmmeter between termnals 30 and 48 Ignition 'OFF' Resistance should be 0.8 - 1.4 **K** ohms	- If incorrect check wheel sensor connector - Disconnect wheel sensor and check sensor resistance if incorrect replace sensor. - **If** resistance of sensor correct check wiring from sensor to ABS block connector terminals 30and **48**
TEST 9 Left-hand side rear sensor voltage Raise car on wheel free ramp Spin wheel at 1 rev per second **AC** volt-meter connected to terminals 28 and 46 **ABS** module Ignition **'OFF'** Should be 0.04-0.1 volts	- If incorrect: - Check sensor mounting - Check toothed wheel - Check hub carrier

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TEST 10 Right-hand side front sensor voltage Raise car on wheel free ramp Spin wheel at 1 rev per second **AC** volt-meter connected to terminals 29 and 47 **ASS** module Ignition 'OFF' Should be 0.15-0.7 volts	- If incorrect: - Check sensor mounting - Check toothed wheel - Check vertical link
TEST 11 Right-hand side rear sensor voltage Raise car on wheel free ramp Spin wheel at **1** rev per second **AC** volt-meter connected to terminals 27 and 45 **ABS** module Ignition **'OFF'** Should be 0.04-0.1 volts	- If incorrect: - Check sensor mounting - Check toothed wheel - Check hub carrier
TEST 12 Left-hand side front sensor voltage Raise car on wheel free ramp Spin wheel at 1 rev per second **AC** volt-meter connected to terminals 30 and 85 **ABS** module Ignition 'OFF' Should be 0.1 5-0.7 volts	- If incorrect: - Check sensor mounting - Check toothed wheel - Check vertical link
TEST 13 Sensor cable screen continuitv test Left-hand rear Continuity tester between terminals ***6*** and 1 Ignition 'OFF' Should be no continuity	- **If** incorrect check that sensor is not earthed - Check sensor cable from sensor to module is not earthed
TEST 14 Sensor cable screen continuity test Right-hand front Continuity tester between terminals 28 and 1 Ignition 'OFF' Should be no continuity	- If incorrect check that sensor is not earthed - Check sensor cable from sensor to module is not earthed
TEST 15 Sensor cable screen continuity test Right-hand rear Continuity tester between terminals 27 and 1 Ignition 'OFF' Should be no continuity	- **If** incorrect check that sensor is not, earthed - Check sensor cable from sensor to module is not earthed
TEST 16 Sensor cable screen continuity test Left-hand front Continuity tester between terminals 30 and 1 Ignition 'OFF' Should be no continuity	- If incorrect check that sensor is not earthed - Check sensor cable from sensor to module is not earthed
TEST 17 Check valve block connection Connect volt meter to terminals **1** and 3. Ignition 'ON' should be over **10** volts	- **If no** continuity disconnect the valve block - Check wiring from pin 30 **at** relay to terminal 3 - Check wiring from terminal **3** of module to pin **7** of valve block
TEST 18 Main valve resistance Ohm-meter connected to terminals 3 and 39 of **ABS** module Ignition 'OFF' Correct reading 2 - 5 ohms	- If incorrect disconnect the main valve - Measure main valve resistance - Check continuity of wiring from pin 2 of - valve to terminal 39 of module connector - Check pin 1 terminal **of** valve **to** module connector terminal 3

TEST 19 Check resistance of RH front inlet valve Ohmmeter connected to ABS mudule connector terminals 3 and 38 Ignition 'OFF' Should be 3 - 5 ohms	- If incorrect disconnect valve block and measure resistance between valve pins **1** and 7 - Check wiring from ABS module terminal 38 to pin 6 (LHD) or pin **1** (RHD) *of* valve block
TEST 20 Check resistance of rear inlet valve Ohm-meter connected to ABS module connector terminals 3 and 54 Ignition 'OFF' Should be 3 - 5 ohms	- If incorrect disconnect valve block and measure resistance between valve pins **1** and **7** - Check wiring from ABS module terminal **2** to pin 3 of valve block
TEST 21 Check resistance of LH front inlet valve Ohmmeter connected to ABS module connector terminals 3 and 20 Ignition 'OFF' Should be 3 - 5 ohms	- If incorrect disconnect valve block and measure resistance between valve pins 5 and 7 - Check wiring from ABS module terminal 35 to pin 1 (LHD) and pin 6 (RHD) of valve block
TEST 22 Check resistance of rear outlet valve Ohm-meter connected to **ABS** module connector terminals 3 and 36 Ignition **'OFF'** Should be 5 - 7 ohms	- If incorrect disconnect valve block and measure resistance between valve pins **4** and 7 - Check wiring from ABS module terminal 33 to pin 4 of valve block
TEST 23 Check resistance of RH front outlet valve Ohmmeter connected to ABS module connector terminals 3 and **21** Ignition **'OFF'** Should be 5 - 7 ohms	- If incorrect disconnect valve block and measure resistance between valve pins 5 and 7 - Check wiring from ABS module terminal **16** to pin 2 (LHD and pin 5 (RHD) of valve block
TEST 24 Check resistance of LH front outlet valve Ohm-meter connected to ABS mudule connector terminals 3 and 2 Ignition **'OFF'** Should be 5 - **7** ohms	- If incorrect disconnect valve block and measure resistance between valve pins 5 and 7 - Check wiring from **ABS** module terminal 34 to pin 5 (LHD) and pin 2 (RHD) of valve block
TEST 25 Inlet and outlet valve function Bridge ABS module terminals 1,2 and **20** Ignition 'OFF' - Apply foot brake LH front wheel should be locked Switch ignition 'ON' - Road wheel must now rotate - Brake pedal must not go to the floor	- If an incorrect result is obtained renew valve block - Check electric/hydraulic interconnection
TEST 26 Inlet and outlet valve function Bridge ABS module terminals **1,21** and 38 Ignition 'OFF' - Apply foot brake RH front wheel should be locked Switch ignition 'ON' - Road wheel must now rotate - Brake pedal must not go to the floor	- If an incorrect result **is** obtained renew valve block - Check electric/hydraulic interconnection
TEST 27 Inlet and outlet valve function Bridge **ABS** module terminals 1,36 and 54 Ignition **'OFF'** - Apply foot brake Both rear wheels should be locked Switch ignition 'ON' - Road wheels must now rotate - Brake pedal must not **go** to the floor	- If an incorrect result is obtained renew valve block - Check electric/hydraulic interconnection

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TEST 28 Fluid level warning indicator and pressure warning switch continuity Connect continuity tester to **ABS** terminals 8 and 51 - Switch ignition 'ON and wait for pump to stop running Switch ignition 'OFF' Should have continuitv	- **If** incorrect disconnect reservoir plug, check for continuity between reservoir pins **1** and 2 - Disconnect Pres. warning switch, check plug for continuity between Pressure warning switch pins 3 and ***5*** - Check fluid level - Check wiring between terminals ***8*** and 51
TEST 29 Pressure warning switch operation With the ignition switched **'OFF'** pump the brake pedal 20 times until the pedal becomes hard Connect continuity test to **ABS** terminals 8 and 51 - should be no continuity at **pins** 1 and 2 of fluid level reservoir switch	- **If** incorrect check for no continuity at pins 3 and 5 of pressure warning switch; if continuity exists renew pressure switch
TEST 30 Ground **short** to **pres.** warning switch, fluid level switch circuit. Ohm-meter connected to **ABS** module connector terminals ***8*** and **1**; then 51 and **1.** Should be no continuity	- If incorrect check pressure warning and fluid level switches, wiring between switches and **ABS** connectors ***8*** and **51,** and switches themselves for ground short.

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SINGLE FAILURE WARNINGS

FAILURE	EFFECT	RESULT	INDICATOR
Brake fluid low	Requires topping up	Brake fluid low at level 1	Brake warning light on
Broken sensor		No ABS	ABS warning light on
Partial intermittent failure on front axle		No ABS on rears only	ABS warning light on
Partial intermittent failure on front axle above 40 ksh		No ABS	ABS warning light on
Partial intermittent failure on rear axle above 20 kph		No ABS	ABS warning light on
Partial intermittent failure on rear axle below 20 kph		No ABS	ABS warning light on
Pressure Switch connection broken	Accumulator will not charge	Loss of power assistance. Unboosted front brakes only No ABS	ABS warning light on Brake warning light on VCM display 'FAIL'
30 A main fuse blown (pump motor)	Accumulator will not charge	Loss of power assistance. Unboosted front brakes only No ABS	ABS, brake warning and circuit failure lights on. VCM displays 'FAIL' and 'FUSE 5'
30 A ABS fuse blown		NO ABS	ABS and circuit failure warning light on. VCM displays 'FUSE 6'
Pump connection broken	Accumulator will not charge	Loss of power assistance Unboosted front brakes only No ABS	ABS and brake warning lights on when pressure drops
Brake fluid low at level 2		Boosted brakes ABS on rear only	ABS and brake warning lights on
Failed front hydraulic circuit	Loss of fluid to level 2	Boosted rears with ABS only	ABS and brake warning lights on
Failed rear hydraulic circuit	Loss of fluid	Unboosted front brakes only	ABS and brake warning lights on

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ANTI-LOCK BRAKING SYSTEM

ON-BOARD INTERMITTENT DIAGNOSIS 70.00.00

WARNING LAMP BLINK DISPLAY

A detected system failure can sometimes come from several different failure sources; for example, a failure indicating 'discontinuity of a sensor signal' can be caused by missing wheel sensor teeth, a loose sensor, intermittent sensor connection or trigger failure.

To assist in on-board intermittent fault diagnosis, a warning lamp blink display system has been developed, using numerical codes cross-referenced to code identification charts to identify failures.

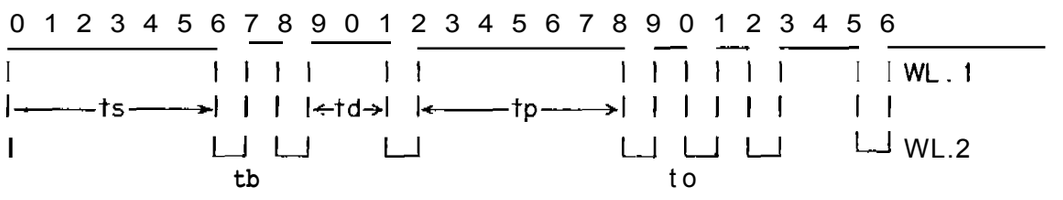
Carry out on-board fault diagnosis procedure as follows:

1 Ensure that the ignition is OFF.
2 Locate the PM4 diagnostic connector in the rear wheel arch, close to the ABS ECU.
3 Insert a 'short' (JDS reference lead) across the black lead (ground) and the brown/pink lead (trigger line to pin 23 of the ECU).
4 Turn on the ignition (position 2) and observe the warning lamp.
5 After six seconds the blink sequence of the first code begins.
6 Count the blink pulses and write down the resulting two-digit number./ After a 6.5 seconds pause, the next code begins, and *so* on, until all the failure codes are read out and warning light remains off.
7 Remove the 'short lead' and switch the ignition 'OFF'.

Fig 1 shows a typical error code output. The first digit (tens) is represented by two flashes (blinks), the second digit (units) by one flash (blink) giving 21. After a 6.5 second pause, the next output is given; the first digit (tens) is represented by three blinks, the second digit (units) by one blink giving 31.

Note: The ECU is only capable *of* dealing with one type of fault at a time, eg code 21 will display but code 22 will not - insted the blink sequence will move on to the next fault type, code 31 or higher. Therefore, on completion of the required maintenance work, carry out the ECU memory erase procedure, then repeat the blink display diagnosis procedure. This will indicate any remaining or new faults in the system.

Note: On completion of all ABS or associated maintenance work, carry out the ECU memory erase procedure (to erase the memory, drive the car at a speed greater than 19mph (30km/h) see page 70-27), then repeat the on-board intermittent fault diagnosis procedure (see above). This will indicate any new/persistent faults still in the system.



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Fig 1

HIGH PRIORITY FAILURES

FAILURE CODE	FIRST DIGIT	FAILURE MODE	FAILURE CAUSES	REPAIR INSTRUCTIONS (See Note 1)	SECOND DIGIT	FAILURE LOCATION
11	1	Redundancy failure	Disturbed/defective redundancy channel harness installation	Check if disturbance affects ABS system. Check prop cable	1	
12	1	Internal ECU failure	Defective ECU	Replace ECU	2	
21	2	Valve failure	Defective valve/ cable harness/power transistor in ECU	Check indicated solenoid valve/terminals for short or interruption (21-27)	1	Main valve
22	2				2	Inlet valve front left
23	2				3	Outlet valve front left
24	2				4	Inlet valve front right
25	2				5	Outlet valve front right
26	2				6	Inlet valve rear
27	2				7	Outlet valve rear

NOTES: 1 If indicated repair instructions do not help, **replace** the ECU.

2 If the warning lamp stays on continuously without any failure code being **displayed,** the failure is probably in the ECU. Check the electric **power** supply **FIRST,** then replace the **ECU.**

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HIGH PRIORITY FAILURES

FAILURE CODE	FIRST DIGIT	FAILURE MODE	FAILURE CAUSES	REPAIR INSTRUCTIONS (See Note 1)	SECOND DIGIT	FAILURE LOCATION
31	3	Sensor failure recognised by 'Trigger Monitoring'	Interrupted/shorted sensor coil/sensor cable, open connector/defective trigger circuit	Check indicated sensor/wire/ terminals for short circuit or interruption (31-34)	1	Sensor front left
32	3				2	Sensor front right
33	3				3	Sensor rear right
34	3				4	Sensor rear left
35	3	Sensor failure recognised by 'Monitoring of Wheel Speed Continuity' at vehicle speed	Intermittently interr-upted/shorted sensor coil/cable. Damaged teeth on sensor wheel/ too large bearing clear-ance/wrong air gap	Check indicated sensor/wire/ terminals for short circuit or interruption (35-38). Check tooth wheel regularity, sensor air gap and bearing clearance See Note 3	5	Sensor front left ABOVE 40km/hr
36	3				6	Sensor front right
37	3				7	Sensor rear right
38	3				8	Sensor rear left
41	4	Sensor failure recognised by 'Wheel Speed Cornparision'	Missing sensor signal (sensor not inserted), too large air gap, tooth wheel not installed	Check air gap/tooth wheel	1	Sensor front left
42	4				2	Sensor front right
43	4				3	Sensor rear right
44	4				4	Sensor rear left

NOTES: 1 If indicated repair instructions do not help, replace the ECU.

2 If the warning lamp stays on continuously without any failure code being displayed, the failure is probably in the ECU.
Check the electric power supply FIRST, then replace the ECU.

3 If repair instructions for display codes 35-38 do not help, proceed with repair instruction 75-78, and vice versa.

HIGH PRIORITY FAILURES

FAILURE CODE	FIRST DIGIT	FAILURE MODE	FAILURE CAUSES	REPAIR INSTRUCTIONS (See Note 1)	SECOND DIGIT	FAILURE LOCATION
51	5	'Pressure reduction & Wheel Response Monitoring' at vehicle speed ABOVE 40km/h	Hydraulically non-operational outlet valve	Check indicated outlet valve hydraulically - See Note 3	1	Outlet valve front left
52	5				2	Outlet valve front right
53	5				3	Outlet valve rear (Same as 54)
54	5				4	Outlet valve rear (Same as 53)
55	5	'Long Term Monitoring of Control Duration'	Long term detection of missing sensor signal (sensor loose, too large air gap	Check indicated sensor, air gap and tooth wheel (55-58)	5	Sensor front left
56	5				6	Sensor front right
57	5				7	Sensor rear right
58	5				8	Sensor rear left
61	6	Warning switch input not process-able	Short circuit/leakage current from battery to warning switch path	Check reservoir, pressure warning switches, and related wires for short circuit and leakage current	1	-

NOTES: 1 If indicated repair instructions do not help, replace the ECU.

2 If the warning lamp stays on continuously without any failure code being displayed, the failure is probably in the ECU.
Check the electric power supply FIRST, then replace the ECU.

3 If repair instructions for display codes 51-54 do not help, proceed with repair instruction 71-74, and vice versa.

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LOW PRIORITY FAILURES (See Note 5)

FAILURE CODE	FIRST DIGIT	FAILURE MODE	FAILURE CAUSES	REPAIR INSTRUCTIONS (See Note 1)	SECOND DIGIT	FAILURE LOCATION
71	7	'Pressure Reduction and Wheel Response Monitoring at speed BELOW 40km/h	Long term detection of RFI	Check indicated sensor ground lead and ECU for proper grounding (71-74) See Note 3	1	Sensor front left
72	7				2	Sensor front right
73	7				3	Sensor rear right
74	7				4	Sensor rear left
75	7	Sensor failure recognised by 'Monitoring of Wheel Speed Continuinuity' at vehicle speed BELOW 40 km/h	Disturbances caused by RFI or ignition, excessive axle vibration, too large bearing clearance/too small air gap	Check indicated sensor ground lead/ECU for proper grounding. Check for axle vibration, loose sensor Mounting, correct bearing clearance/air gap (75-78) See Note 4	5	Sensor front left
76	7				6	Sensor front right
77	7				7	Sensor rear right
78	7				8	Sensor rear left

NOTES:

1. If indicated repair instructions do not help, replace the ECU.
2. If the warning lamp stays on continuously without any failure code being displayed, the failure is probably in the ECU.
   Check the electric power supply FIRST, then replace the ECU.
3. If repair instructions for display codes 71-74 do not help, proceed with repair instruction 51-54, and vice versa.
4. If repair instructions for display codes 75-78 do not help, proceed with repair instruction 35-38, and vice versa.
5. Failures with display codes 71-78 are 'Low priority failures' which cause only temporary and partial control inhibit.
   These failures will be stored in the memory, even though they may not be noticed by the vehicle driver.

WARNING LAMP INDICATIONS WITHOUT ERROR CODE OUTPUT

The on-board diagnosis can only monitor errors that generate electrical signals. The error code information is triggered by the diagnosis trigger input, and displayed by the warning lamp. To avoid bad diagnosis results, the related components must work properly.

TEST CYCLE FOR WARNING SWITCH PATH:
After the ignition is switched on (providing the brake pressure warning light is 'OFF'), the warning lamp (WL) remains 'ON' continuously for 1.7 seconds. Then it flickers (approximately one second) to test the reservoir and pressure switch path. If the warning lamp flickers continuously, this path is open or short circuited to ground potential.

IMPROPER INSTALLATION:
If the main connector is not installed in the ECU (or if the connector is loose), and the ignition is switched on (position 2), the main relay and the ECU relay remain 'resting'. If this is the case, the warning lamp is switched 'ON' by the 'resting ' contact of the ECU relay.

FAILURES OF THE ECU

FAILURES DETECTED BY INTERNAL TIME-OUT:
Certain hardware faults cause the ECU to be switched off by internal time-out. Any hardware fault will cause the warning lamp to light continuously, and, since main power is cut off, the ECU is no longer capable of storing/outputting failure codes.

SHORT CIRCUIT AT THE DIAGNOSIS TRIGGER INPUT:
If the diagnosis trigger input is shorted to ground potential, the ECU goes into the diagnosis output mode when the ignition is switched on and if a failure is stored in the continuous memory.
As the car accelerates and reaches the 8km/h, the short to ground on the diagnosis trigger unit still exists, the ECU is switched off, and the warning lamp lights continuously.

WARNING LAMP PATH FAULTS:
Short circuiting the warning lamp wire to ground potential will activate the warning lamp, but will not affect the anti-lock braking facility. The ECU cannot recognise this short circuit.

DEFECTIVE WARNING LAMP DRIVER:
If there is a defect in the warning lamp driver inside the ECU, either the warning lamp will remain continuously 'OFF', or will stay continuously 'ON', depending on the internal failure cause.

MISCELLANEOUS WARNING LAMP DISPLAYS/CONDITIONS:
In the case of intermittent/defective contacts or leads in the warning lamp driving path, the warning lamp may flicker 'ON/OFF' for undefined periods.

If the warning lamp is 'blown-out' or otherwise damaged/destroyed, no information about the status of the ECU is possible.

Note: The driver will realise that the ABS warning lamp circuitry is faulty, because the lamp will not illuminate during the bulb check cycle on turning the ignition key to position 2.

MEMORY ERASE PROCEDURE

Complete the on-board fault diagnosis procedure, and repair all indicated failures.

Note: Ensure that all failures have been indicated and identified, ie that the warning lamp remains lit continuously at the end of the display cycle (see NOTE at the end of the diagnosis procedure, page 70-22). If the display cycle has not been completed, the failure memory will not erase.
To erase the memory, drive the car at a speed greater than 19mph (30km/h).
The failure memory is now clear.

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ANTI-LOCK BRAKING SYSTEM

BRAKE FLUID LEVEL 70.00.00

WARNING: THE ANTI-LOCK BRAKING SYSTEM OPERATES UNDER HIGH HYDRAULIC PRESSURE, AND GREAT CARE MUST BE EXERCISED WHEN SERVICING OR REPAIRING THE SYSTEM. AVOID SKIN/EYE CONTACT OR INGESTION OF BRAKE FLUID. IF SKIN OR EYES ARE ACCIDENTALLY SPLASHED WITH BRAKE FLUID, RINSE THE AFFECTED AREA IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ATTENTION. IF BRAKE FLUID IS INGESTED, SEEK MEDICAL ATTENTION IMMEDIATELY.

CHECKING THE FLUID LEVEL

Correct brake fluid level is essential for the efficient operation of the brake system (Fig 1).

Note: In some cases the fluid may be above the **'MAX'** mark, this is dependent upon the charged state of the hydraulic unit. Therefore the following procedure for checking or topping up the hydraulic brake fluid level must be followed.

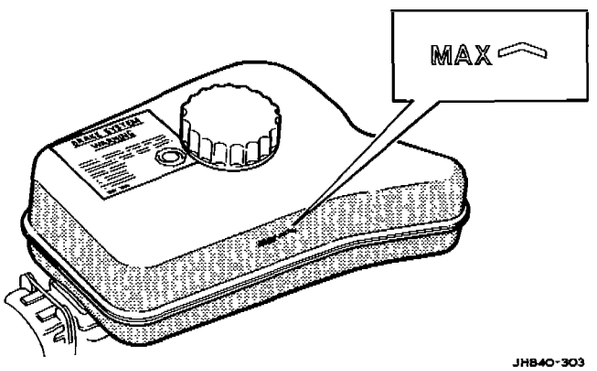


Fig 1

CAUTION: Fluid must not be allowed to contact the vehicle paintwork. Remove any spilt fluid from the paintwork by rinsing away with running water. Methylated spirit (denatured alcohol) must not be used to clean the contaminated area.

1 Ensure the vehicle is on a level surface.

2 With the ignition switched 'OFF' Pump the brake pedal at least 20 times, or until pedal travel becomes hard.

3 Switch the ignition **'ON'.**

4 Wait for the pump to stop running.

5 Check brake fluid level. Fluid level must be be at the **'MAX'** level on the reservoir (Fig 1). **Top** up using the recommended brake fluid.

The efficiency of the brakes may be impaired if fluid is used which does **not** meet JAGUAR specifications. Use ONLY Jaguar Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification. Also do not use brake fluid that has been exposed to atmosphere **for** any length of time. Moisture absorbed from the atmosphere dilutes the fluid and impairs its efficiency.

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FITTING INSTRUCTIONS - GENERAL 70.00.00

BRAKE FLUID

WARNING: BRAKE FLUID IS CORROSIVE. EXTREME CARE MUST BE TAKEN WHEN HANDLING. AVOID SKIN OR EYE CONTACT. AVOID INGESTION. IF SKIN OR EYES ARE ACCIDENTALLY SPLASHED WITH BRAKE FLUID, RINSE THE AFFECTED AREA IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ATTENTION. IF BRAKE FLUID IS INGESTED, SEEK MEDICAL ATTENTION IMMEDIATELY.

CAUTION: Fluid must not be allowed to contact the vehicle paintwork. Remove any spilt fluid from the paintwork by rinsing away with running water. Methylated spirit (denatured alcohol) must not be used to clean the contaminated area.

CLEANING SOLVENTS

CAUTION: Never use methylated spirit (denatured alcohol) for cleaning purposes. Use only **CASTROL/GIRLING** brake cleaning fluid.

THROUGHOUT THE FOLLOWING MAINTENANCE/SERVICE OPERATIONS, ABSOLUTE CLEANLINESS MUST BE OBSERVED TO PREVENT GRIT OR OTHER FOREIGN MATTER CONTAMINATING THE BRAKE SYSTEM. IF THE SYSTEM IS TO BE FLUSHED OR CLEANED THROUGH, ONLY GIRLING BRAKE CLEANING FLUID MUST BE USED. BRAKE SYSTEM COMPONENTS MUST BE WASHED AND ALL TRACES OF CLEANING FLUID REMOVED BEFORE REASSEMBLY.
ALL BRAKE SYSTEM RUBBER COMPONENTS MUST BE DIPPED IN CLEAN BRAKE FLUID AND ASSEMBLED USING THE FINGERS ONLY.

METRICATION

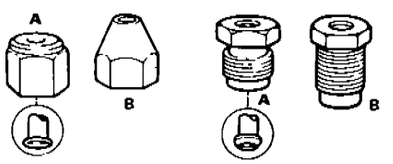


Fig 1

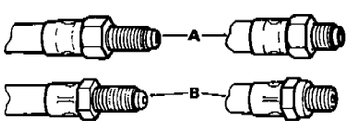


Fig 2



Fig 3

The examples shown in Fig 1, Fig 2 and Fig 3 are intended as an aid to identification of brake components in metric form.
All metric pipe nuts, hose ends, unions and bleed screws are coloured black. The hexagon area of pipe nuts are indented with the letter 'M'.
Metric and UNF pipe nuts are different in shape, and the female nut is **always** used with a trumpet flared pipe, the male nut always having a convex flared pipe. NOTE: A = Metric: B = UNF.
Hose ends differ slightly between metric and UNF.
Copper gaskets are not used with metric hose and a gap exists between the hose end and cylinder,

Metrication does not apply to the following brake components:
1. Rear calipers.
2. Handbrake calipers.
3. Feed pipes from rear three-way connector to rear calipers.
4. Three-way connector.

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HOSES

Fully release the unions (1 fig 1) securing each end of the hose to the fluid pipes.
Withdraw the pipe unions (1 Fig 1) from the hose ends. Plug the ends of the pipes to prevent the loss of fluid and the ingress of dirt.
Remove the mounting bracket locknut (3 Fig 1) and remove the hose (4 Fig 1). Thoroughly clean the hose and examine *for* any signs of wear or damage. Renew the hose if there is any doubt about its condition.
Using compressed air, thoroughly clean the bore of the hose.

Remove all blanking plugs and fit the new hose to the caliper/connector. Secure the hose to the mounting bracket.
Before fully tightening the locknut, ensure that the hose is neither kinked nor twisted. Bleed the brakes.

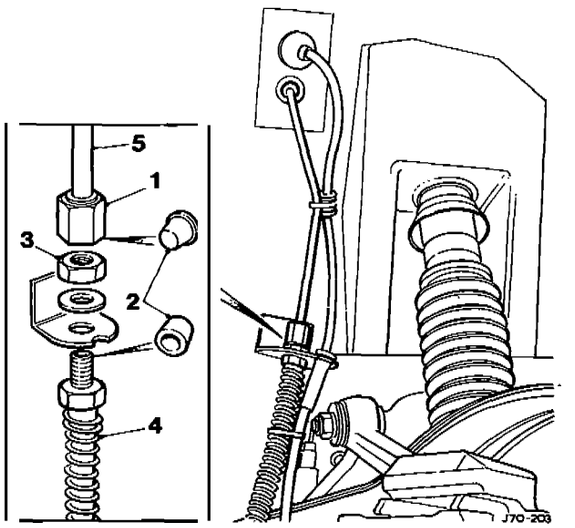


Fig 1

PIPES

fully release the pipe unions (1 Fig 1).
Withdraw the pipe (5 Fig 1) from the car. Plug the pipes (2 Fig 1) to prevent the loss of fluid or the ingress of dirt.
Thoroughly clean and examine the pipe for any signs of damage or deterioration. **Renew** the pipe if there is any doubt about its condition.

Using compressed air, thoroughly clean the bore of the pipe.
Remove all blanking plugs and **fit** the new pipe to the car. Secure the pipe to the body.
Bleed the brakes.

BRAKE HYDRAULIC SYSTEM - ABS

BLEED **70.25.03**

WARNING: THE ANTI-LOCK BRAKING SYSTEM OPERATES UNDER HIGH HYDRAULIC PRESSURE, AND GREAT CARE MUST BE EXERCISED WHEN SERVICING OR REPAIRING THE SYSTEM.
AVOID SKIN/EYE CONTACT OR INGESTION OF BRAKE FLUID. IF SKIN OR EYES ARE ACCIDENTALLY SPLASHED WITH BRAKE FLUID, RINSE THE AFFECTED AREA IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ATTENTION.
IF BRAKE FLUID IS INGESTED, SEEK MEDICAL ATTENTION IMMEDIATELY.



Fig. 1

CAUTION: Fluid must not be allowed to contact the vehicle paintwork. Remove any spilt fluid from the paintwork by rinsing away with running water. Methylated spirit (denatured alcohol) must not be used to clean the contaminated area.

CAUTION: Never use methylated spirit (denatured alcohol) for component cleaning purposes.
Use only CASTROL/GIRLING brake cleaning fluid.

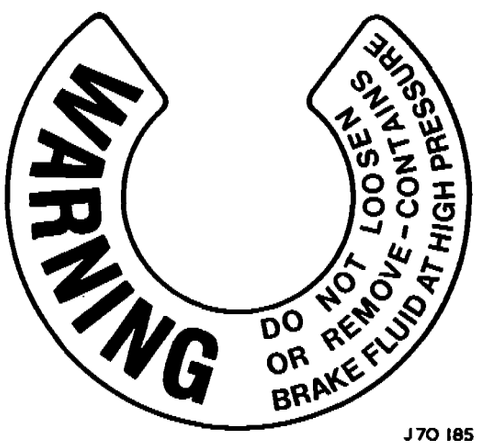


Fig. 2

CAUTION: Throughout the following maintenance/ service operations, absolute cleanliness must be observed to prevent grit or other foreign matter contaminating the brake system.

CAUTION: The following notes must be read before commencing bleed procedure.

Bleeding the ABS brake system is not a routine maintenance operation and should only be necessary when part of the system has been disconnected or the fluid is contaminated.
During the bleeding procedure, it is important that the level of fluid in the reservoir is maintained at approximatelv 2mm below the bottom of the filler neck.

CAUTION: Do not allow the pump motor to run continuously for more than two minutes. If, for any reason, the motor does overrun the two minute time limit, switch the ignition off immediately (position 'O'), and allow the motor to cool for at least ten minutes before continuing with the bleed procedure.

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BLEED PROCEDURE (FRONT BRAKES) - FOR ALL MAINTENANCE WORK, EXCLUDING: THE MOTOR/PUMP UNIT, FLUID INTAKE HOSE, OR ACTUATION UNIT.

Ensure that the vehicle is standing level.
Switch the ignition off.
Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times).
Top up the reservoir to approximately 2mm below the bottom of the filler neck (Fig 1).
Bleed the caliper furthest away from the actuation unit first, ie, the left hand caliper on RHD cars, the right hand caliper on LHD cars.

Note: The following procedure must be done at a rate not faster than 3 seconds per cycle.

Open the bleed nipple (1 Fig 2), fully depress the brake pedal, and hold down.
Close the bleed nipple after a minimal one second.
Release the pedal slowly.
Repeat until the fluid flows air free.

Note: If more than 20 cycles are required, the reservoir must be topped up.

Bleed the remaining caliper using the same procedure.

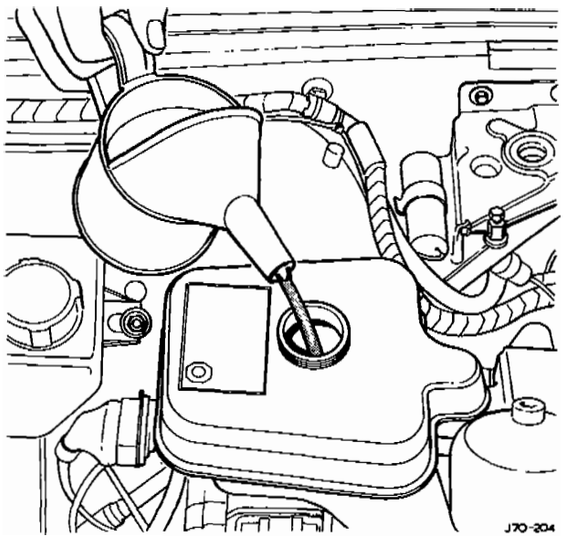


Fig. 1

BLEED PROCEDURE (REAR BRAKES) - FOR ALL MAINTENANCE WORK, EXCLUDING: THE MOTOR/PUMP UNIT, FLUID INTAKE HOSE, OR ACTUATION UNIT.

Ensure that the vehicle is standing level.
Switch the ignition off.
Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times).
Top up the reservoir to approximately 2mm below the bottom of the filler neck (Fig 1).
Open one bleed nipple (1 Fig 3), fully depress the brake pedal, and hold down.
Switch on the ignition and wait (A MINIMUM OF 15 SECONDS) until the fluid flows air free.
Close the bleed nipple. Release the pedal slowly.
Switch off the ignition. Bleed the remaining caliper using the same procedure.

Note: Ensure that the fluid level does not drop more than 10mm below the maximum mark during the above procedure.

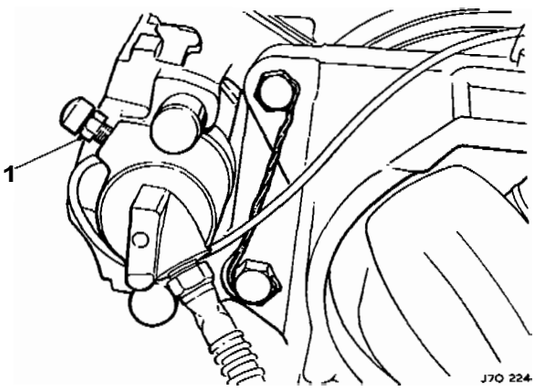


Fig. 2

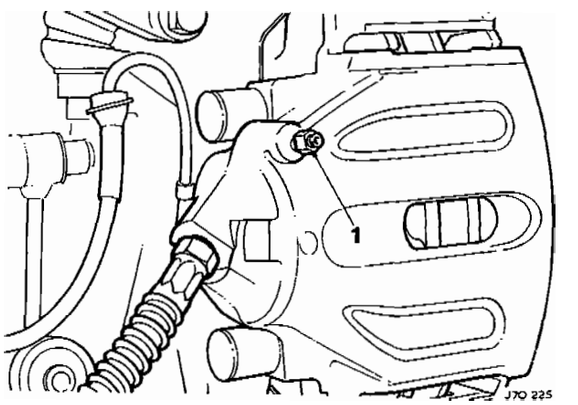


Fig. 3

ON COMPLETION OF **THE BLEED PROCESS:**
Switch on the ignition.
Wait until the accumulator is charged to the upper cut-but point, and top up the reservoir to the maximum level (Fig 1).
Fit and tighten the filler cap. Close the bonnet.

Note: If the fluid level is too high, any excess fluid must be drawn off. This can be done by using the procedure for bleeding the rear brakes.

DATA

TORQUE FIGURES

Bleed screw to caliper 7-13Nm

SPANNER SIZES

7/76AF
11mm

OILS/GREASES

Jaguar Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification.

0478G

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BRAKE FLUID RESERVOIR

RENEW *70.60.07*

Note: Read the notes relating to the ABS system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times).
Open the bonnet. Place suitable absorbent material around the reservoir area to catch any spilt fluid.
Remove the low pressure hose to pump securing clip (1 Fig 1), disconnect the hose, remove and discard the O ring.
Route the end of the hose into a container.
Drain the fluid,
Disconnect the reservoir multi plug.
Remove the reservoir retaining clip bolt (1 Fig 2).
Remove the reservoir taking care not to spill any fluid that may not be fully drained.
Remove the retaining clip and low pressure hose from the reservoir. Remove and discard the O ring/sleeve seals from the actuation unit.

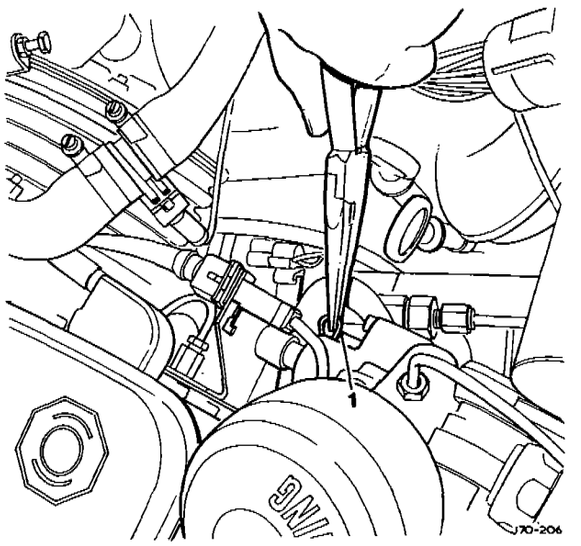


Fig. 1

Fit the retaining clip and low pressure hose to the new reservoir.
Fit new O ring/sleeve seals to the actuation unit.
Place the reservoir into position ensuring it fits correctly to the O ring/sleeve seals in the actuation unit.
Fit and tighten the retaining clip bolt.
Reconnect the multi plug. Connect the low pressure hose to the pump, fit the retaining clip.
Bleed the ABS hydraulic system 70.25.03.
Switch on the ignition.
Wait until the accumulator is charged to the upper cut-out point, and top up the reservoir to the maximum level (Fig 3).
Fit and tighten the filler cap. Close the bonnet.

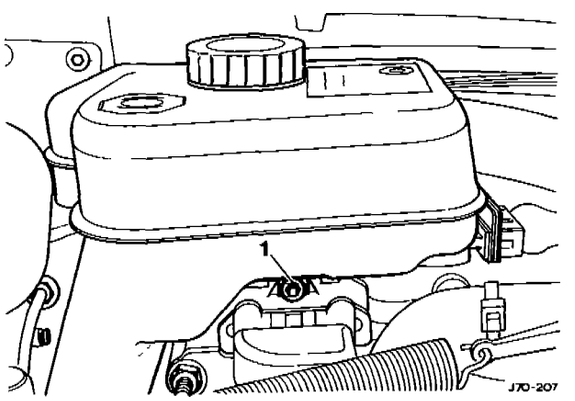


Fig. 2

DATA

TORQUE FIGURES

Bleed ***screw to caliper 7-13Nm***
Reservoir retaining clip bolt 6-8Nm

SPANNER SIZES

7/76 AF
6mm (Allen key)
I Irnm

OILS/GREASES/SEALANTS

Jaguar ***Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification.***

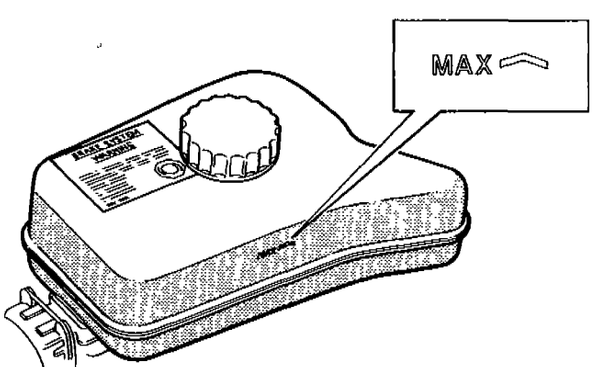


Fig. 3

04786

BRAKE ACTUATION UNIT

RENEW *70.60.06*

Note: Read the notes relating to the **ABS** system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times).
Open the bonnet.
Place suitable absorbent material around the reservoir area to catch any spilt fluid.
Remove the low pressure hose to pump securing clip (1 Fig 1), disconnect the hose, remove and discard the O ring.
Route the end of the hose into a container.
Drain the fluid.
Disconnect the reservoir multi plug.
Remove the reservoir retaining clip bolt (1 Fig 2).
Remove the reservoir taking care not to spill any fluid that may not be fully drained.
Disconnect the actuation unit multi plug. Disconnect the earth lead. Place suitable absorbent material below the valve block unions to catch any spilt fluid,
Disconnect the pipes from the valve block (Fig 3).
Disconnect the high pressure pipe.
Remove the pedal box to bulkhead securing bolts, displace and remove the actuation unit/pedal box assembly.
Remove the actuation unit to pedal securing clip and clevis pin (Fig 1 page 36).
Remove the actuation unit securing bolts, displace and remove the unit.
Remove the high pressure pipe union.
Fit blanking plugs to all ports to prevent fluid leakage.

Remove all blanking plugs from the new actuation unit. Fit the high pressure pipe union to the unit.
Fit the actuation unit to the pedal box, fit and tighten the securing bolts. Connect the brake pedal, fit the clevis pin and securing clip.
Fit the assembly to the vehicle, position the valve block pipes, fully seat the assembly.
Fit and tighten the valve block pipe unions.
Fit and tighten the pedal box securing bolts.
Reconnect the high pressure pipe.
Reconnect the earth lead and multi plug.
Fit new O rings and sleeve seals (Fig 2 page 36) to the actuation unit.
Place the reservoir into position ensuring it fits correctly to the O ring/sleeve seals in the actuation unit.
Fit and tighten the retaining clip bolt.
Reconnect the multi plug. Connect the low pressure hose to the pump, fit the retaining clip.

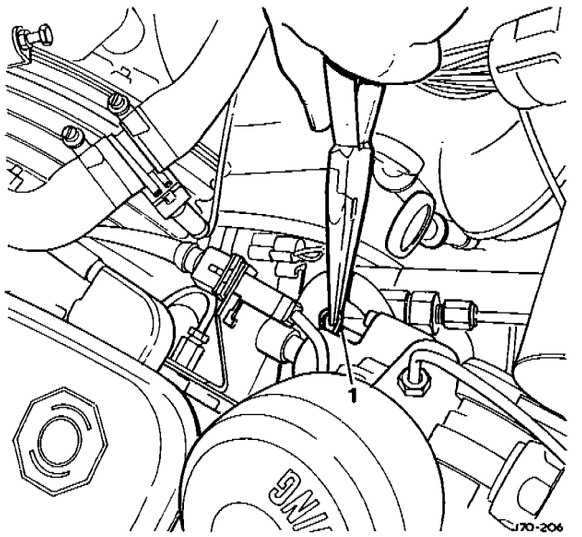


Fig. 1

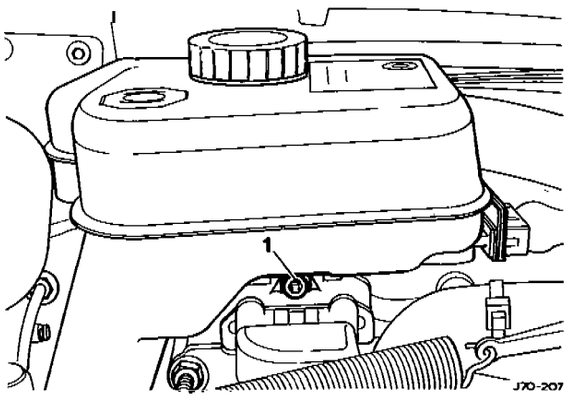


Fig. 2

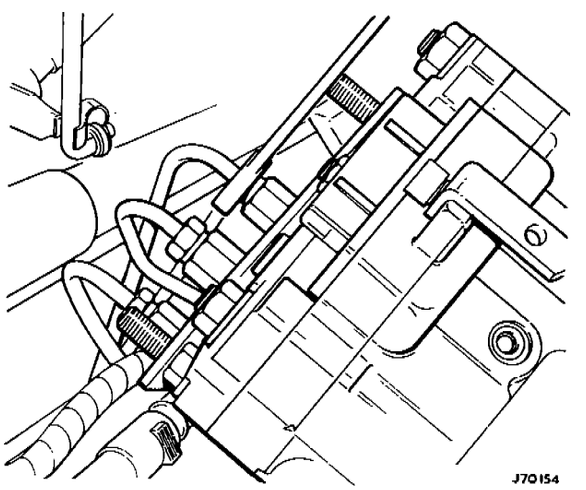


Fig. 3

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Bleed the ABS hydraulic system 70.25.03.
Switch on the ignition.
Wait until the accumulator is charged to the upper cut-out point, and top up the reservoir to the maximum level (Fig 3).
Fit and tighten the filler cap. Close the bonnet.

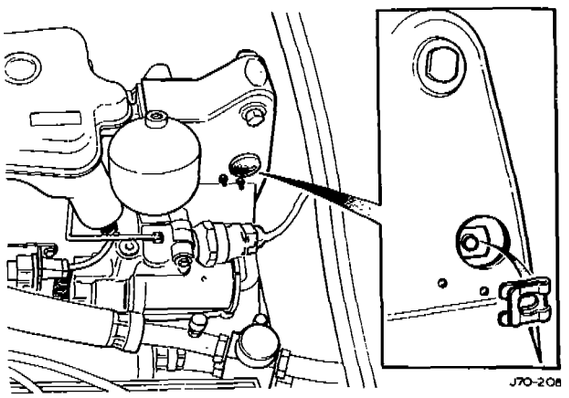


Fig. 1

DATA

TORQUE FIGURES

Bleed screw to caliper ***7-13Nm***
Pedal ***box to body (5/16 UNF bolt) 15-18Nm***
Pedal ***box*** *to body 15/16* ***UNF nut) 15-18Nm***
Reservoir retaining clip bolt ***6-8Nm***

SPANNER SIZES

7/16 ***AF***
1/2 AF
6mm Allen key

*OIL*S/GREASES

Jaguar Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification.

04786

BRAKE ACCUMULATOR

RENEW *70.60.05*

Note: Read the notes relating to the ABS system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

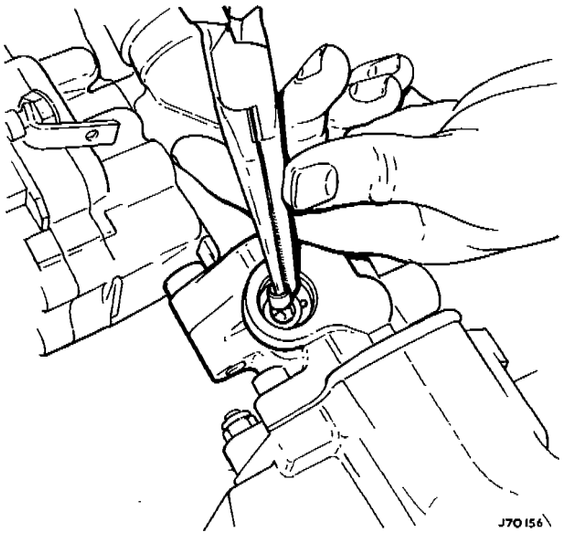


Fig. 2

Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times),
Open the bonnet. Place suitable absorbent material around the accumulator area to catch any spilt fluid.
Slacken off and remove the accumulator Remove and discard the O ring seal. Clean the surrounding area.

Fit a new O ring to the replacement accumulator.
Fit and tighten the accumulator.
Switch on the ignition.
Wait until the accumulator is charged to the upper cut-out point, and the ABS warning light is extinguished.
Switch off the ignition. Close the bonnet.

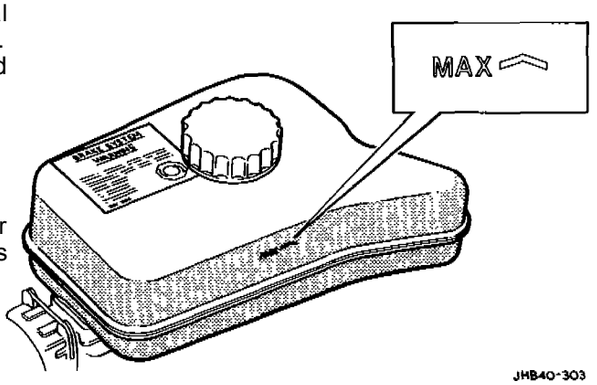


Fig. 3

DATA

TORQUE FIGURES

Accumulator to pump ***40-46Nm***

04786

MOTOR/PUMP UNIT

RENEW *70.60.08*

Note: Read the notes relating to the **ABS** system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times).
Open the bonnet. Place suitable absorbent material around the reservoir area to catch any spilt fluid.
Remove the low pressure hose to pump securing clip (1 Fig 1), disconnect the hose, remove and discard the O ring.
Route the end of the hose into a container. Drain the fluid.
Disconnect the pressure warning switch and motor multi plugs (Fig 2).
Disconnect the bundy pipe at the motor/pump unit end (Fig 3).
Remove the motor/pump special mounting bolt.
Displace and remove the motor/pump unit.
Slacken off and remove the accumulator. Remove and discard the O ring seal. Remove the pressure warning switch. Clean the surrounding area.

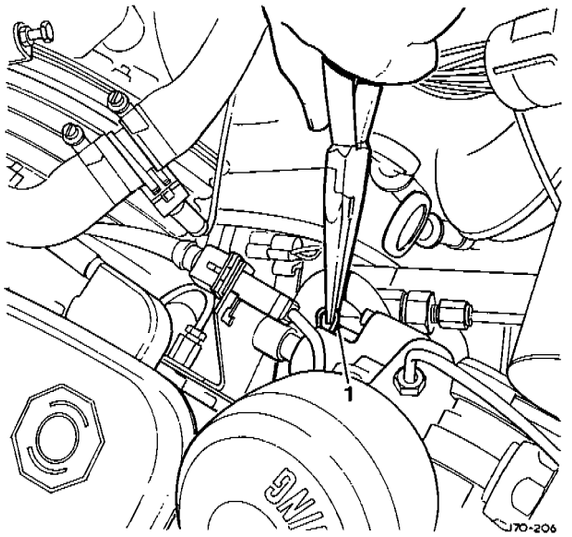


Fig. 1

Fit a new O ring to the pressure warning switch.
Fit the pressure warning switch to the new motor/pump unit.
Fit a new O ring to the accumulator. Fit and tighten the accumulator.
Fit the assembly to the vehicle, route the harness through the mounting bracket.
Fit and tighten a new special bolt.
Fit a new O ring to the low pressure hose, fit the hose and retaining clip,
Reconnect the bundy pipe at the motor/pump unit end.
Reconnect the multi plugs.
Bleed the **ABS** hydraulic system 70.25.03.
Switch on the ignition.
Wait until the accumulator is charged to the upper cut-out point, and top up the reservoir to the maximum level.
Fit and tighten the filler cap. Close the bonnet.

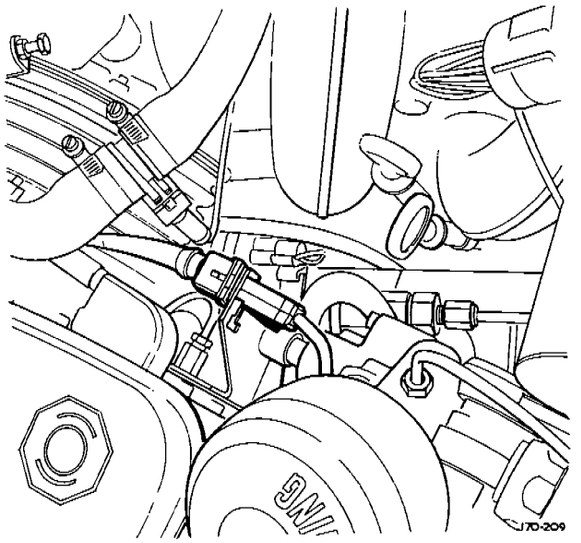


Fig. 2

DATA

TORQUE FIGURES

Accumulator to pump 40-46Nm
Bleed screw to caliper 7-13Nm
Pump/motor mounting bolt 7-9Nm

SPANNER SIZES

7/16 AF
1/2AF

OILS/GREASES

Jaguar Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification.

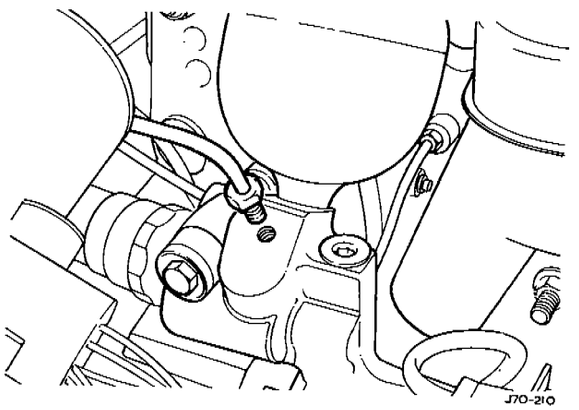


Fig. 3

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PRESSURE WARNING SWITCH

RENEW 70.60.09

Note: Read the notes relating to the **ABS** system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times).
Open the bonnet. Disconnect the pressure warning switch multi plug.
Place suitable absorbent material around the switch area to catch any spilt fluid.
Slacken off and remove the switch (1 Fig 1) complete with O ring (2 Fig 1).
Fit the pressure warning switch/O ring assembly to the pump.
Reconnect the multi plug.

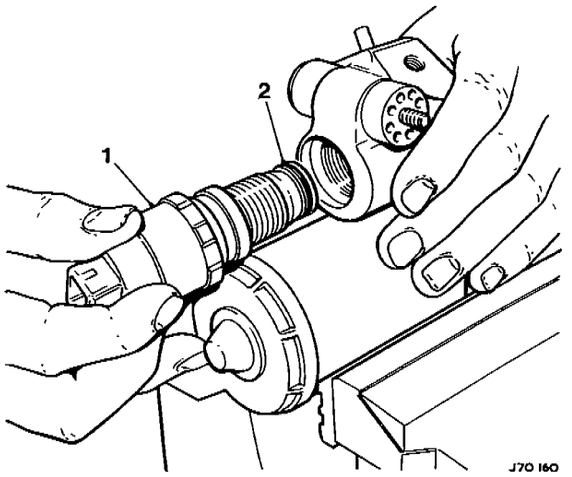


Fig. 1

Note: The correct switch for the **XJ6** has a blue connector.

Bleed the **ABS** hydraulic system 70.25.03.
Clean the working area.
Fit and tighten the filler cap. Close the bonnet.

DATA

OILS/GREASES

Jaguar Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification.

PRESSURE REDUCING VALVE

RENEW 70.60.10

Note: Read the notes relating to the **ABS** system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

Discharge the hydraulic accumulator by operating the brake pedal until the pedal goes hard (approximately 20 times).
Open the bonnet. Place suitable absorbent material around the pressure reducing valve area to catch any spilt fluid.
Disconnect the pipe unions (1 Fig 2).
Remove the valve (2 Fig 2).
Position the new valve to the vehicle, fit and tighten the valve unions.
Clean the working area.
Bleed the **ABS** hydraulic system 70.25.03.
Switch on the ignition. Wait until the accumulator is charged to the upper cut-out point, top up the reservoir to the maximum level (Fig 3).
Fit and tighten the filler cap. Close the bonnet.

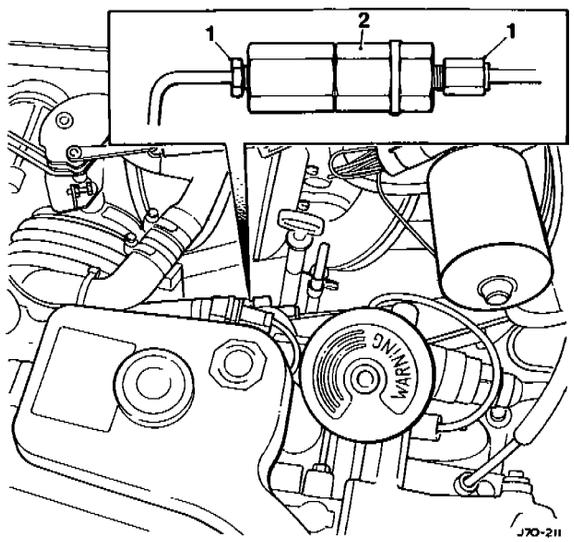


Fig. 2

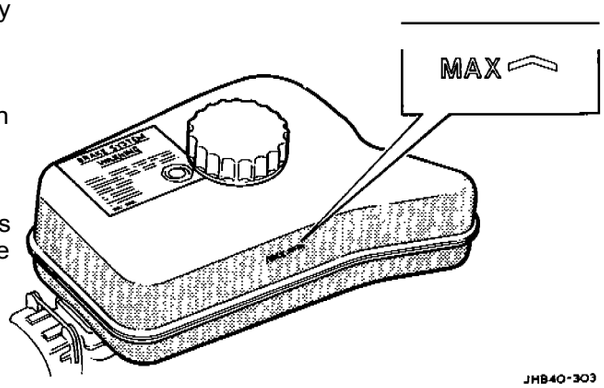


Fig. 3

DATA

OILS/GREASES

Jaguar Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification.

LOW PRESSURE HOSE

RENEW 70.15.12

Open the bonnet. Place suitable absorbent material around the hose area to catch any fluid.
Remove the low pressure hose to pump securing clip (1 Fig 1), remove the hose, and discard the O ring.
Route the hose into a container. Drain the fluid.
Remove the brake fluid reservoir 70.60.07.
Disconnect and discard the low pressure hose from the reservoir then fit the **new** hose.
Refit the reservoir.
Fit the **elbow** to the new hose, fit a new O ring.
Connect the elbow **to** the pump, fit the clip.
Bleed the ABS hydraulic system 70.25.03.
Switch on the ignition.
Wait until the accumulator is charged to the upper cut-out point, and top **up** the reservoir **to** the maximum level (Fig 2).
Fit and tighten the filler **cap.** Close the bonnet.

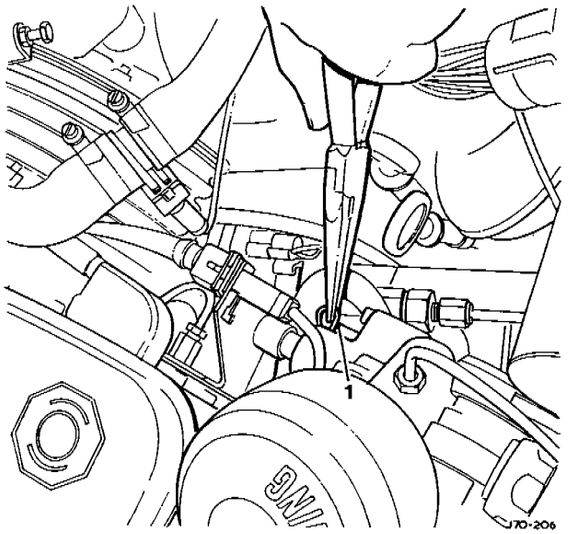


Fig. 1

DATA

TORQUE FIGURES

Bleed screw to caliper 7-13Nm
Reservoir retaining clip bolt 6-8Nm

SPANNER SIZES

7/16 AF
6mm (Allen key)
1 Imrn

OILS/GREASES/SEALANTS

***Jaguar Brake and** Clutch **Fluid** or Castrol Girling **Universal** to/or **exceeding DOT 4** specification.*

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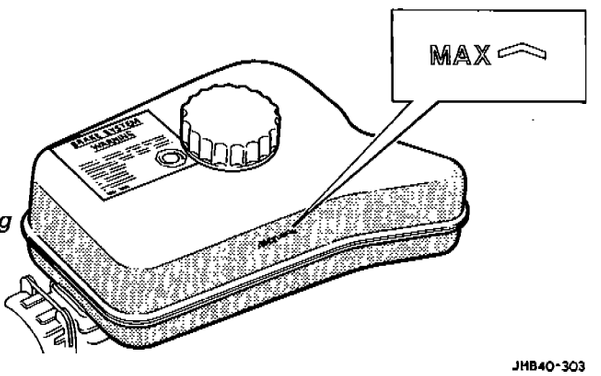


Fig. 2

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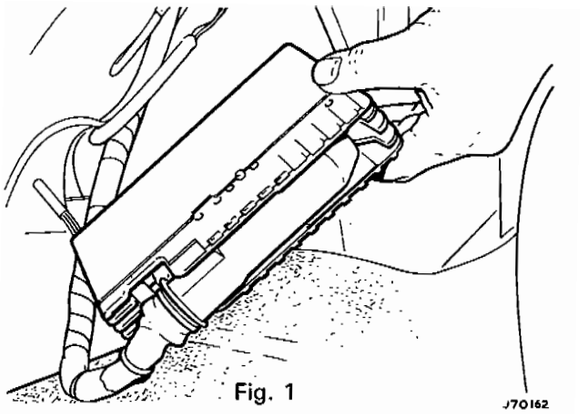
ELECTRONIC CONTROL UNIT

RENEW 70.60.02

Open the boot. Remove the driver side liner.
Release the ECU retaining strap. Displace the ECU from the carrier (Fig 1).
Disconnect the multi plug (Fig 2), remove the ECU.

Fit the new ECU to position, connect the multi plug.
Fit the ECU to the carrier, fit the retaining strap.
Refit the side liner and close the boot.

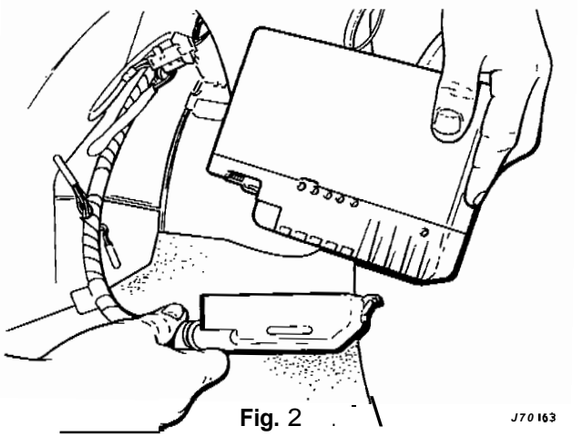
04786


Fig. 1 J70162

WHEEL SPEED SENSOR REAR

RENEW 70.60.04

Drive the vehicle on to a ramp. Open the boot. Remove the boot floor carpet and the boot front liner.
Locate and disconnect the sensor **block** connector (Fig. 3). Push the sensor harness and grommet through the grommet hole to the underside of the vehicle.
Raise the ramp.
Cut and remove the harness ratchet straps on the underside of the vehicle.
Remove the sensor securing bolt and remove the sensor assembly (Fig. 4).
Fitting a new sensor is a straight reversal of the removal procedure.
Fit new ratchet straps to the harness on the underside of the vehicle.
Lower the ramp.
Ensure the sealing grommet is correctly fitted to the boot floor and reconnect the sensor block connector.
Refit the boot liner and carpet. Close the boot.


Fig. 2 J70163

DATA

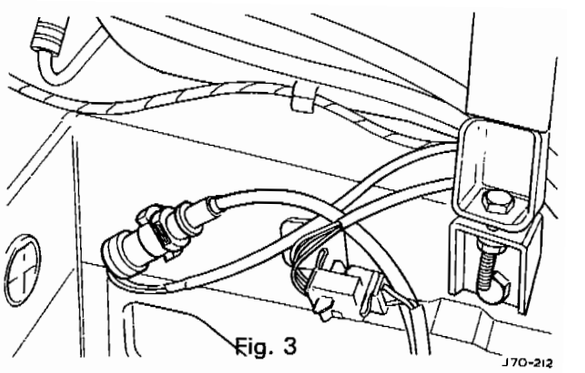
TORQUE FIGURES

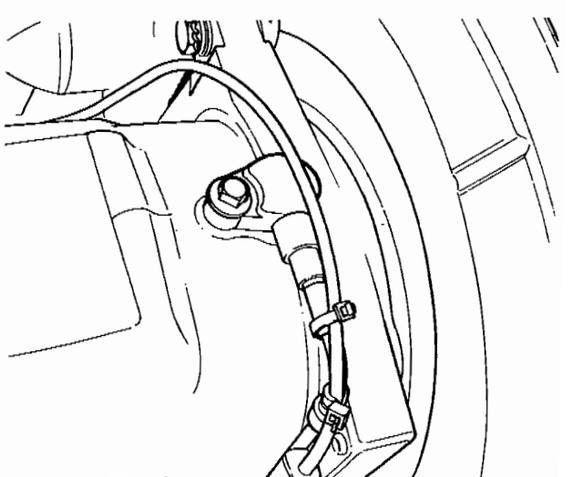
Wheel sensor bolt 8.5-11Nm

SPANNER SIZES

8mm

0478G


Fig. 3 J70-212


Fig. 4 J70-213

WHEEL SPEED SENSOR FRONT

RENEW ***70.60.03***

Drive the vehicle on to a ramp.
Open the bonnet. Disconnect the sensor multi plug.
Displace the body grommet from the inner wing valance. Raise the ramp.
Remove the sensor securing bolt (1 Fig 1) and displace the sensor from the hub.
Displace the harness carrier grommets.
Displace and remove the sensor and harness.
Fit the new sensor into position, route through the inner wing and seat the harness to the carrier grommets.
Fit the sensor to the hub, fit and tighten the securing bolt.
Fit the body grommet to the inner wing.
Lower the ramp. Route the harness to the connector, connect the multi plug. Secure the harness with new ratchet straps.

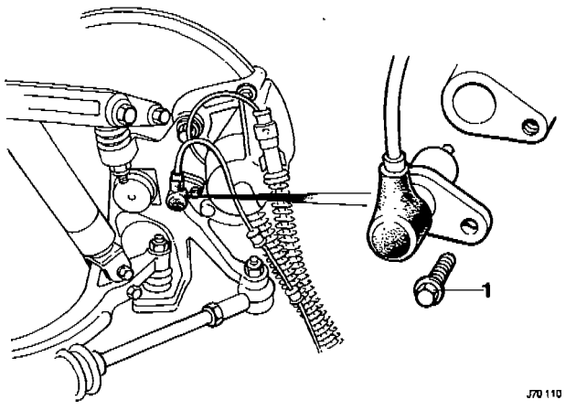


Fig. 1

DATA

TORQUE FIGURES

Wheel** sensor bolt **8.5-11Nm

SPANNER SIZES

8mm

HIGH PRESSURE PIPE

RENEW **70.15.11**

Note: Read the notes relating to the **ABS** system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

Discharge the hydraulic accumulator **by** operating the brake pedal until the pedal goes hard (approximately 20 times).
Open the bonnet. Remove the high pressure pipe union nut (Fig 2) and fit a blanking plug to the pump outlet.
Disconnect the high pressure pipe union nut from the master cylinder/booster unit and discard the old pipe.
Ensure all the pipe connections and surrounding area are clean. DO NOT allow any ingress *of* dirt into the system.
Fit the new pipe to the master cylinder/booster unit but do not tighten the pipe union. Fit the other end of the pipe to the pump connection then, tighten both pipe union nuts.
Close the bonnet.
Bleed the **ABS** hydraulic ***system*** 70.25.03.
Check the brake fluid level. Fluid level must be be at the 'MAX' level on the reservoir (Fig 3). Top up using recommended brake fluid.
Fit the filler cap. **Close** the bonnet.

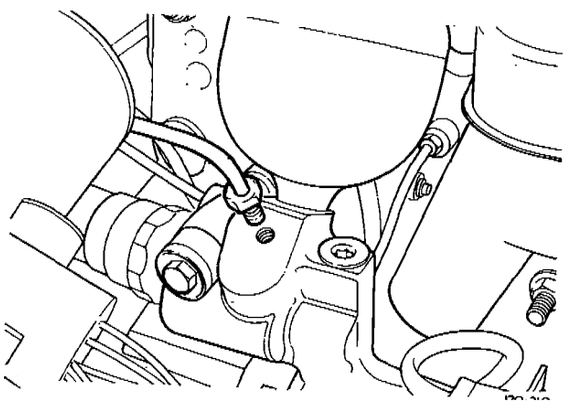


Fig. 2

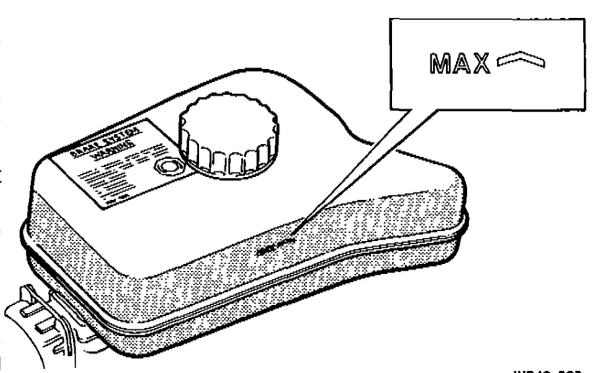


Fig. 3

DATA

OILS/GREASES

*Jaguar Brake and Clutch **Fluid or** Castrol Girling Universal to/or exceeding **DOT 4** specification.*

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ANTI-LOCK BRAKING HYDRAULIC SYSTEM

PRESSURE TEST *70.00.00*

Note: Read the notes relating to the **ABS** system bleed procedure before commencing this operation - Section 70.25.03 pages 70-31.

Note: Under ideal conditions this test should be carried out at **20°** Centigrade room temperature.

Drive the car on to a ramp.
Discharge the system by opergting the brake pedal approximately 20 times.
Open the bonnet. Disconnect the bundy pipe from the motor/pump unit (Page **70-41** Fig 2).
Fit the hydraulic adaptor to the high pressure outlet (Fig 1).
Raise the ramp. Remove the bleed nipples and fit adaptors to both front brake calipers *(Fig* 2).
Remove the bleed nipple and fit an adaptor to one rear brake caliper (Fig 3).
Lower the ramp.
Connect the flexible pipe to the ***250*** bar gauge.
Connect the other end to the adaptor on the motor pump unit, noting the different threads.

CAUTION: Always connect the **flexible pipe to** the **gauge first,** then **to the adaptor.**

Switch the ignition on (position 2), noting the immediate reading up to approximately 80 bar.
Note the elapsed time when the Brake **and ABS** warning lights go out - up to a maximum of 40 seconds with an approximate 1 second differential between the two lights.
Note the reading on the pressure gauge - should be **125** bar.
Note the elapsed time when the pump cuts out - up to a maximum of 60 seconds.
Note the reading on the pressure gauge - should be no more than 190 bar.

Ensure that the hydraulic circuit ***is*** pressurised (pump not running) and the ignition is on (position 2).
Press the **brake** pedal continuously.
Note the reading on the pressure gauge when the pump is activated - should be **140** bar.
The pressure should be restored **to 180** bar.
Stop braking.
The pressure will then be restored to 190 bar.
Switch the ignition off (position 0).

Remove the pump/motor fuse.
Switch the ignition on (position 2).
Press the brake pedal hard (approximately 7 times).
Note the reading on the pressure gauge when the warning light comes on - should be approximately **105** bar.
Continue pressing the pedal (approximately 20 times) until the pressure gauge reads 0 (zero) bars.
Switch the ignition off (position 0).
Refit the pump/motor fuse.

Switch the ignition on (position 2), and wait until maximum pressure is attained - 190 bar.

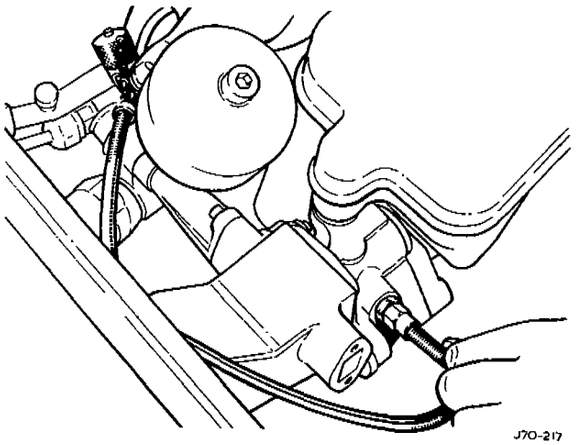


Fig. 1

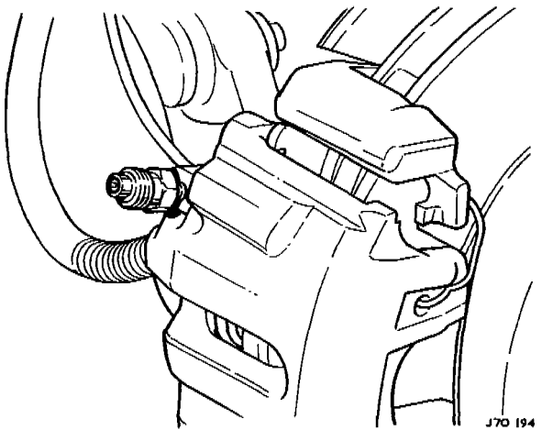


Fig. 2

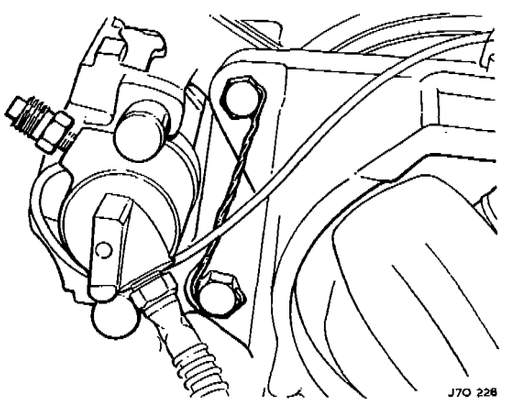


Fig. 3

Switch the ignition off (position 0), and wait 3 minutes for the pressure to stabilise.
Reset the 'tell-tale' needle on the pressure gauge.
After 5 minutes has elapsed, check that the pressure leak is no more than 10 bar.
Remove the gauge and flexible pipe from the motor/pump unit. Raise the ramp.
Connect the second flexible pipe to the second pressure gauge. Connect both flexible pipes to the adaptors.
Lower the ramp.
Switch the ignition on (position 2), and wait until maximum pressure is attained (up to 60 seconds).
Switch the ignition off (position 0).
Position the brake pedal operating tool (Fig 1) and adjust the knurled nut until both pressure gauges read 100 bar.
Wait 3 minutes for the pressure to stabilise.
Reset the 'tell-tale' needle on both pressure gauges.
After 5 minutes has elapsed, check that the pressure leak is no more than 5 bar.
Remove the brake pedal operating tool.
Leaving one front gauge still in circuit, transfer a flexible pipe and pressure gauge to the rear adaptor.
Switch the ignition on (position 2), and wait (up to a maximum of 60 seconds) until maximum pressure is attained - 180 bar.
Switch the ignition off (position 0).

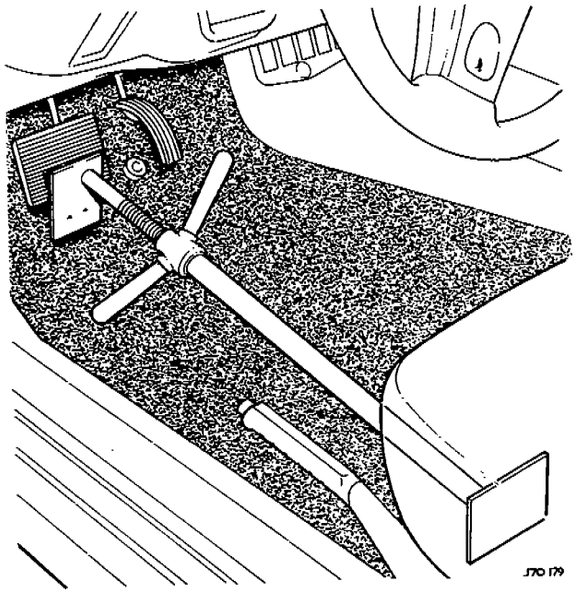


Fig. 1

Position the brake pedal operating tool and adjust the knurled nut until the rear pressure gauge reads 100 bar.
THE FRONT AND REAR SYSTEMS SHOULD DIFFER BY NO MORE THAN 8.5 BAR (HIGHER ON THE FRONT SYSTEM).
Wait 3 minutes for the pressure to stabilise.
Reset the 'tell-tale' needle on both pressure gauges.
After 5 minutes has elapsed, check that the pressure leak is no more than 5 bar.
Remove the brake pedal operating tool (Fig 1).
Discharge the system, refit the bleed nipples and high pressure hose.
Bleed the ABS hydraulic system 70.25.03.
Examine the system for external leaks.

Note: Any faults found during the pressure test should be referred to the HYDRAULIC SYSTEM FAULT DIAGNOSIS CHART for identification and remedy.

DATA

TORQUE FIGURES

Bleed ***screw to caliper 7-13Nm***
High pressure pipe union 7-12Nm

SPANNER SIZES

7/16 AF
I Irnrn
17mm

OILS/GREASES

Jaguar Brake and Clutch Fluid or Castrol Girling Universal to/or exceeding DOT 4 specification.

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BRAKE CALIPER - FRONT

RENEW *70.55.02*

Slacken off the front road wheel nuts ¼ turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Slacken the caliper feed pipe union nut.
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1), see warning.
Fully unscrew and remove the caliper from the brake hose. Fit and secure a suitable plug to the brake caliper hose to prevent loss of fluid and the ingress of dirt. Use of a Hose Clamp will help reduce the loss of fluid.
Clean and examine the brake pads.

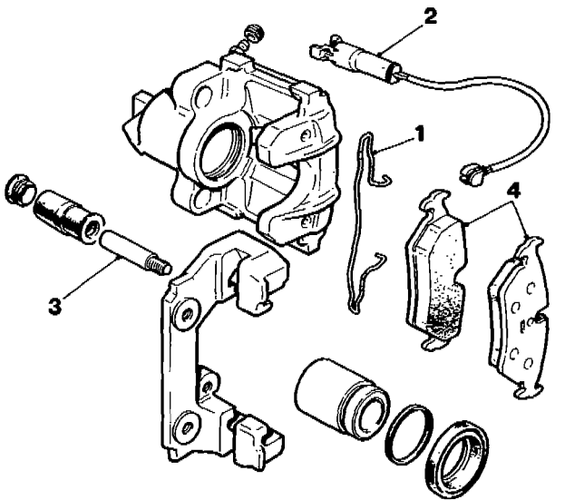


Fig. 1

WARNING: BRAKE LINING DUST CAN CONTAIN ASBESTOS WHICH IF INHALED, CAN DAMAGE YOUR HEALTH. ALWAYS USE A VACUUM BRUSH TO REMOVE DRY BRAKE LINING DUST. NEVER USE AN AIR LINE.

Place the replacement caliper to the front of the carrier then remove the plugs from the caliper and hose.
Fit but do not fully tighten the caliper feed hose.
Remove the hose clamp.
Ensure the caliper piston is fully retracted then fit the brake pads to the caliper.

Note: If the pads are worn to the minimum thickness, new pads MUST be fitted.

Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers.
Final tighten the feed hose union nut.
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Refit the road wheel.
Bleed the brake system 70.25.02.

Note: It may be necessary to run the engine to give power assistance to the brake pedal.

Pump the brake pedal several times to move the brake pads to their operating positions.

WARNING: APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKE WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

Apply an effort to the **brake** pedal and inspect all disturbed connections.

DATA

TORQUE FIGURES

Bleed nipple to caliper 7-13Nm
*Caliper carrier to **hub** carrier **55-62Nm***
Caliper carrier to vertical link 102-128Nm
*Caliper to carrier **31-35Nm***
Hydraulic hose to caliper 10-12Nm
*Wheel nut **to stud** (steel wheel) 65-85 Nm*
*Wheel nut to **stud** (alloy wheel) 88-102Nrn*

SPANNER SIZES

11mm
13mm
15mm
17mm
22mm

OILS/GREASES

Brake fluid Castrol Girling universal brake and clutch fluid (clear to amber)
*Caliper securing **bolts** **Molykote 111***

04786

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BRAKE CALIPER - REAR

RENEW ***70.55.03***

Slacken off the rear road wheel nuts ¼ turn each.
Jack up the rear of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Slacken the caliper feed pipe union nut.
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1), see warning.
Fully unscrew and remove the caliper from the brake hose. Fit and secure a suitable plug to the brake caliper hose to prevent loss of fluid and the ingress of dirt. Use of a Hose Clamp will help reduce the loss of fluid.
Clean and examine the brake pads.

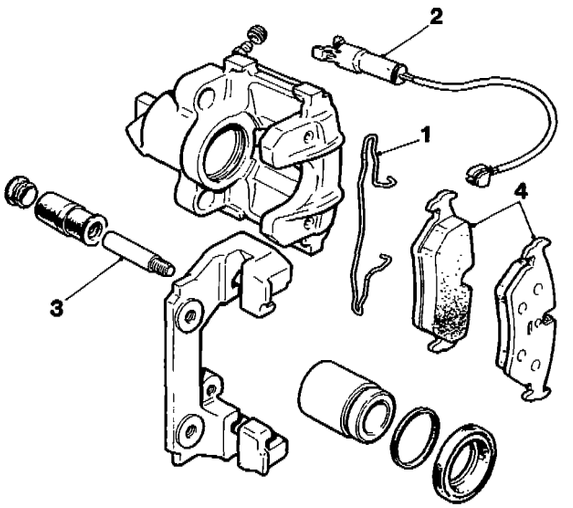


Fig. 1

WARNING: BRAKE LINING DUST CAN CONTAIN ASBESTOS WHICH IF INHALED, CAN DAMAGE YOUR HEALTH. ALWAYS USE A VACUUM BRUSH TO REMOVE DRY BRAKE LINING DUST. NEVER USE AN AIR LINE.

Place the replacement caliper to the front of the carrier then remove the plugs from the caliper and hose.
Fit but do not fully tighten the caliper feed hose.
Remove the hose clamp.
Ensure the caliper piston is fully retracted then fit the brake pads to the caliper.

Note: If the pads are worn to the minimum thickness, new pads MUST be fitted.

Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers.
Final tighten the feed hose union nut.
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Refit the road wheel.
Bleed the brake system 70.25.02.

Note: It may be necessary to run the engine to give power assistance to the brake pedal.

Pump the brake pedal several times to move the brake pads to their operating positions.

WARNING: APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKE WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

Apply an effort to the brake pedal and inspect all disturbed connections.

DATA

TORQUE FIGURES

Bleed nipple to caliper ***7-13Nm***
Caliper carrier to hub carrier ***55-62Nm***
Caliper carrier to vertical link ***102-128Nm***
Caliper to carrier ***31-35Nm***
Hydraulic hose to caliper ***10-12Nm***
Wheel nut to stud (steel wheel) ***65-85 Nm***
Wheel nut to stud (alloy wheel) ***88-102 Nm***

SPANNER SIZES

11mm
13mm
15mm
17mm
22mm

OILS/GREASES

Brake fluid Castrol Girling universal brake and clutch fluid (clear to amber)
Caliper securing bolts ***Molykote 111***

04780

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BRAKE CALIPER

OVERHAUL 70.55.15

Slacken off the appropriate road wheel nuts ¼ turn each.
Jack up the front/rear of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Slacken the caliper feed pipe union nut.
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1), see warning.
Fully unscrew and remove the caliper from the brake hose. Fit and secure suitable plugs to the brake caliper and hose to prevent loss of fluid and the ingress of dirt. Use of a **Hose** Clamp will help reduce the loss of fluid.

Note: If both front or rear calipers have been removed from the car, take care not to mix up left and right hand caliper bodies.

Cut and remove the carrier securing bolt lockwire.
Unscrew the carrier securing bolts and remove the carrier.
Remove all brake dust from the caliper, carrier and disc. Thoroughly clean the pad abutment areas, avoid damaging the piston and dust cover.

WARNING: BRAKE LINING DUST CAN CONTAIN ASBESTOS WHICH IF INHALED, CAN DAMAGE YOUR HEALTH. ALWAYS USE A VACUUM BRUSH TO REMOVE DRY BRAKE LINING DUST. NEVER USE AN AIR LINE.

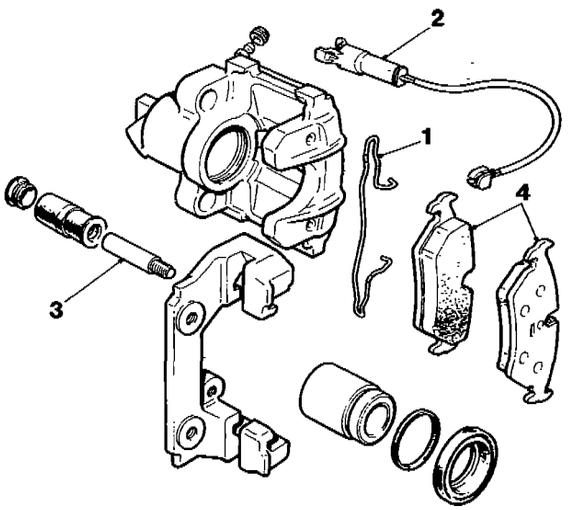
DISMANTLING

Eject the **piston** by gently applying low pressure air to the inlet port (Fig 2). Use a piece *of* wood to prevent the piston from being damaged.
The piston dust cover cannot be removed until the piston has been ejected (Fig 3).
Remove the piston, pull out the dust cover and extract the piston seal from the bore.
Remove the bleedscrew and clip from the caliper body.

CLEANING AND INSPECTION

CAUTION: **Never** use petrol. **When cleaning brake components only use the recommended fluid. Use of petrol, paraffin or other mineral based fluids can prove dangerous.**

Examine all the components for signs of wear, damage and corrosion. Pay particular attention to the piston and cylinder bore.
Remove body corrosion with a wire brush or wire wool. No attempt should be made to clean a badly corroded or scored cylinder bore.



J70 226

Fig. 1

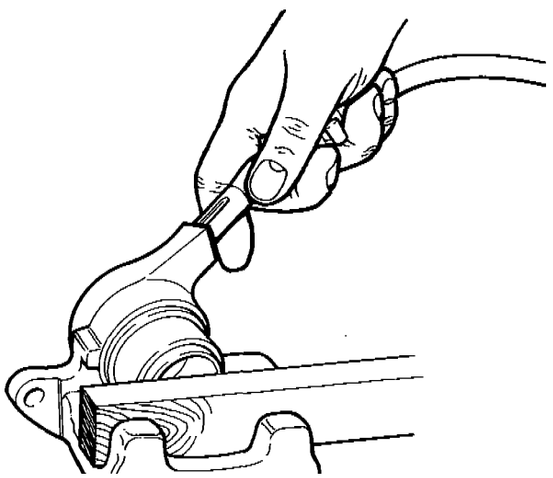

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Fig. 2

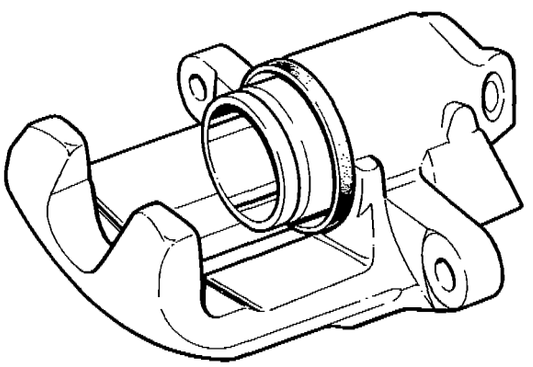

J70 116

Fig. 3

CALIPER SECURING BOLTS

Inspect the securing bolts, ensure that they are not corroded or seized and that the caliper is free to move on them.

If the bolts are difficult to remove or are corroded in anyway, they MUST be replaced together with new dust covers.

CAUTION: No attempt should be made to clean corroded bolts.

GENERAL: All parts must be in good working order. Where doubt exists new parts should be fitted.

REASSEMBLING

CAUTION: Ensure that working surfaces and hands are clean. Use only brake **fluid *of* the correct specification (see DATA) to lubricate the new seals when fitting.**

Lubricate the new piston seal, carefully fit to the inner groove of the piston bore.

Lubricate, and fit the dust cover over the piston. Continue pulling the dust cover along the piston, extending the convolutions, until the inner sealing lip is almost at the end of the piston.

Offer the piston and dust cover assembly into the piston bore. Locate the dust cover lip in the groove of the piston bore.

Gently but firmly push the piston fully home through the dust cover.

Note: Ensure that the dust cover is not trapped between the piston and the bore, and that the inner lip *of* the dust cover is correctly located in the inner groove in the piston bore.

Refit the bleed screw to the caliper body.

Lubricate the securing bolts and bores with the special grease, Molycote 111, supplied in the Service Kit.

CAUTION: Do not use any other type of grease.

Fit and align the carrier to the vertical link. Tighten the carrier securing bolts then secure with lockwire.

Place the caliper to the front ***of*** the carrier then remove the plugs from the caliper and hose.

Fit but do not fully tighten the caliper feed **hose.** Remove the hose clamp.

Ensure the caliper piston is fully retracted then fit the brake pads to the caliper.

Note: If the pads are worn to the minimum thickness, new pads MUST be fitted.

Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.

Fit and fully seat the dust covers.

Final tighten the feed hose union nut.

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Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe (Fig 1).
Refit the road wheel.
Bleed the brake system 70.25.02.

Note: It may be necessary to run the engine to give power assistance to the brake pedal.

Pump the brake pedal several times to move the brake pads to their operating positions.

WARNING: APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKE WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

Apply an effort to the brake pedal and inspect all disturbed connections.

Note: If new pads have been fitted, care should be taken when braking. Brake gently several times from 80 to 50 Km/hr (50 to 30 m.p.h.), and only brake fully when the pads have bedded with the disc surface. Prolonged and heavy braking should be avoided for the first 80 Km (50 miles), until the new pads have bedded in.

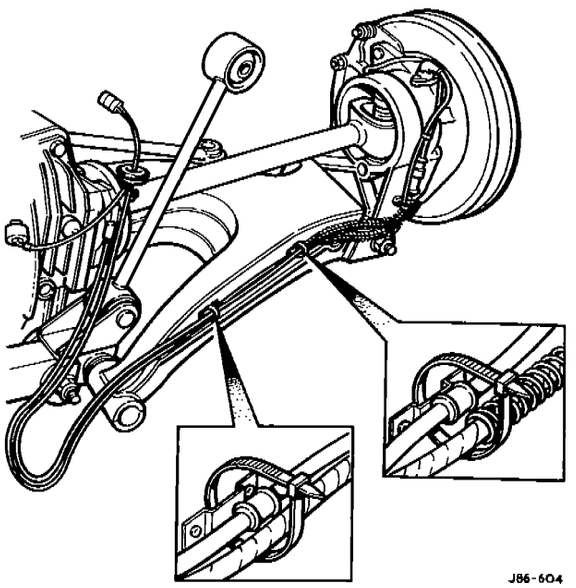


Fig. 1

DATA

TORQUE FIGURES

Bleed nipple to caliper 7-13Nm
Caliper carrier to hub carrier 55-62Nm
Caliper to carrier 31-35Nm
Wheel nut to wheel stud (steel wheel) 65-85 Nm
Wheel nut to wheel stud (alloy wheel) 88-102 Nm

TOLERANCES

Front brake disc run out 0.004" MAX
Front brake disc parallelism 0.0005" MAX
Rear brake disc run out 0.004" MAX
Rear brake disc parallelism 0.0005" MAX

SPANNER SIZES

11mm
13mm
15mm
17mm
22mm

OILS/GREASES

Brake fluid Castrol Girling universal brake and clutch fluid (clear to amber)
Caliper securing bolts Molykote 111

BRAKE PADS - FRONT

RENEW 70.40.02

Slacken off the front road wheel nuts ¼ turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1).
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Place the caliper to the front of the carrier.
Ensure the caliper piston is fully retracted then fit the new brake pads to the caliper.
Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers.
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Lift the road wheel/tyre assembly up to the hub.
Align the wheel with the marked stud. Fit and tighten the securing nuts.
Pump the brake pedal several times to centralize the brake pads.

Repeat the procedure for the other side brake disc.
Remove the axle stands, lower the vehicle and recheck the torque of the wheel nuts.

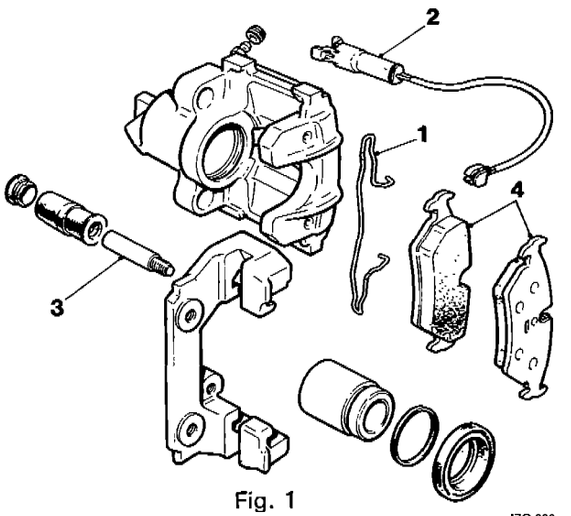


Fig. 1
J7O 220.

DATA

TORQUE FIGURES

Caliper to carrier **31-35Nm**
Wheel nut to stud (steel wheel) **65-85Nm**
Wheel nut **to stud** *(alloy wheel)* **88-102Nm**

TOLERANCES

Front brake disc run out 0.004" MAX
Front brake disc parallelism 0.0005" MAX

SPANNER SIZES

13mm
17mm
22mm

OILS/GREASES

Caliper securing bolts **Molykote 111**

0478G

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BRAKE PADS - REAR

RENEW 70.40.03

Slacken off the rear road wheel nuts ¼ turn.
Jack up the rear of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1).
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Place the caliper to the front of the carrier.
Ensure the caliper piston is fully retracted then fit the new brake pads to the caliper.
Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers,
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Lift the road wheel/tyre assembly up to the hub.
Align the wheel with the marked stud. Fit and tighten the securing nuts.
Pump the brake pedal several times to centralize the brake pads.

Repeat the procedure for the other side brake disc.
Remove the axle stands, lower the vehicle and recheck the torque of the wheel nuts.

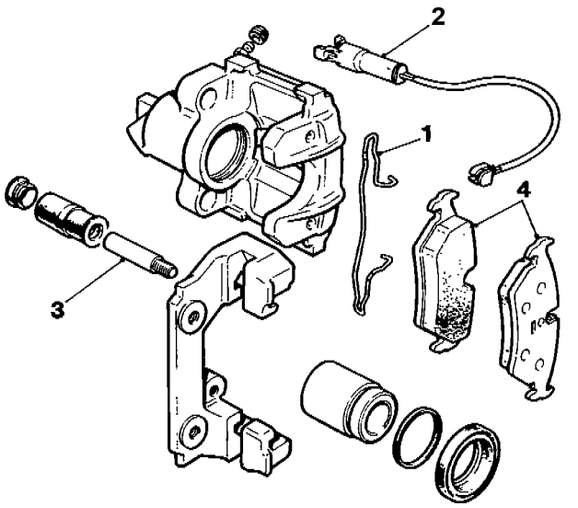


Fig. 1

DATA

TORQUE FIGURES

Caliper to carrier ***31-35Nm***
Wheel nut to stud (steel wheel) ***65-85 Nm***
Wheel nut to stud (alloy wheel) ***88-102 Nm***

TOLERANCES

Rear brake disc run out 0.004" MAX
Rear brake disc parallelism 0.0005" MAX

SPANNER SIZES

13mm
17mm
22mm

OILS/GREASES

Caliper securing bolts ***Molykote 111***

0478G

BRAKE DISC - FRONT

RENEW 70.10.10

Slacken off the front road wheel nuts ¼ turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1).
Cut and remove the carrier securing bolt lockwire.
Unscrew the carrier securing bolts and remove the carrier.
Remove the disc securing screw (1 Fig 2) and remove the disc.
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Fit the replacement disc to the hub.
Fit and tighten the securing screw.
Fit and align the carrier to the vertical link. Tighten the carrier securing bolts then secure with lockwire.
Place the caliper to the front of the carrier.
Ensure the caliper piston is fully retracted then fit the brake pads to the caliper.

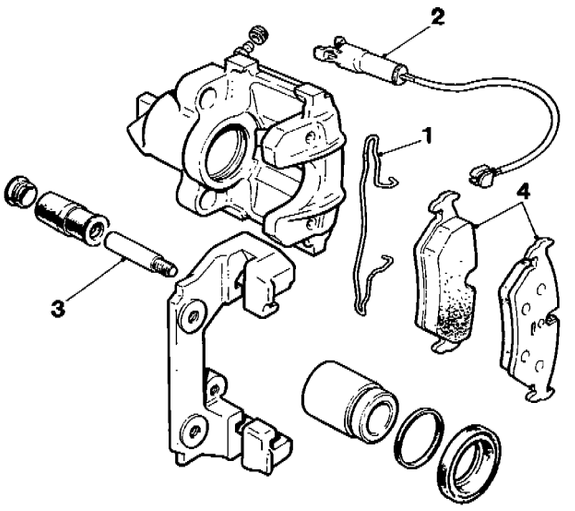


Fig. 1

Note: If the pads are worn to the minimum thickness, new pads **MUST** be fitted.

Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers.
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Lift the road wheel/tyre assembly up to the hub.
Fit and tighten the securing nuts.
Pump the brake pedal several times to centralize the brake pads.

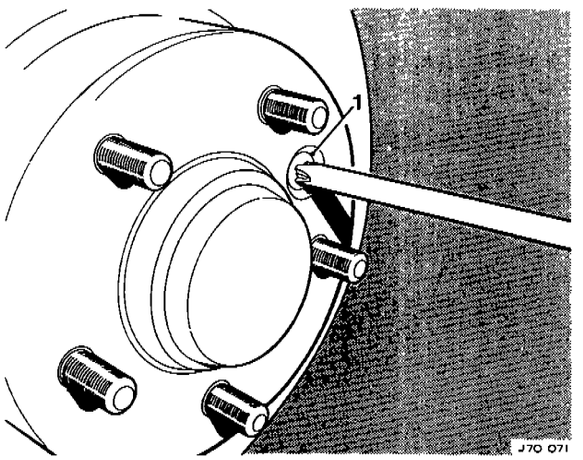


Fig. 2

DATA

TORQUE FIGURES

Caliper carrier to vertical link ***102-128Nm***
Caliper ***to*** *carrier* ***31-35Nm***
Disc to hub ***11-16Nm***
Wheel nut to stud (steel wheel) ***65-85 Nm***
Wheel nut to stud (alloy wheel) ***88-102 Nm***

TOLERANCES

Front brake disc run out 0.004" ***MAX***
Front brake disc parallelism 0.0005" MAX

SPANNER SIZES

13mm
17mm
22mm

OILS/GREASES

Caliper securing bolts ***Molykote 111***

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BRAKE DISC - REAR

RENEW **70.10.11**

Slacken off the rear road wheel nuts ¼ turn each.
Jack up the rear of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig. 1).
Cut and remove the carrier securing bolt lockwire.
Unscrew the carrier securing bolts and remove the carrier.
Remove the disc securing screw (1 Fig 2) and remove the disc.
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Fit the replacement disc to the hub.
Fit and tighten the securing screw.
Fit and align the carrier to the vertical link. Tighten the carrier securing bolts then secure with lockwire.
Place the caliper to the front of the carrier.
Ensure the caliper piston is fully retracted then fit the brake pads to the caliper.

Note: If the pads are worn to the minimum thickness, new pads MUST be fitted.

Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers.
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Lift the road wheel/tyre assembly up to the hub.
Fit and tighten the securing nuts.
Pump the brake pedal several times to centralize the brake pads.

Note: It may be necessary to run the engine to give power assistance to the brake pedal.

WARNING: APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKE WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

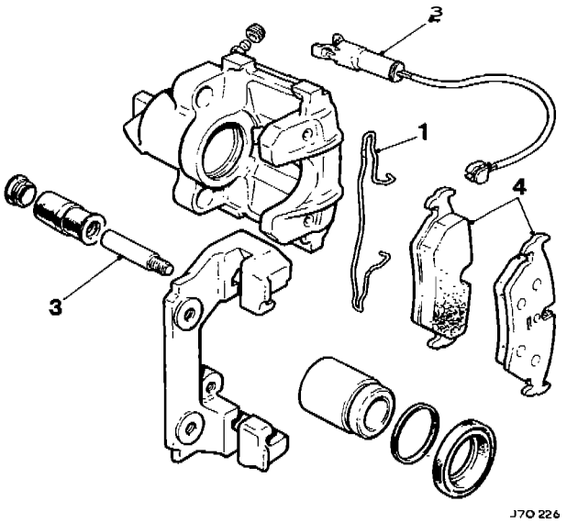


Fig. 1

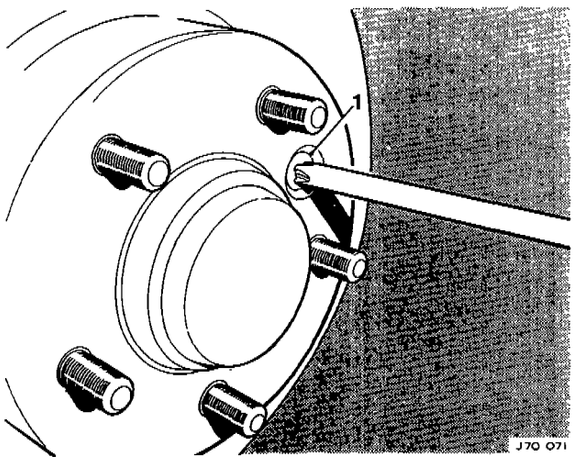


Fig. 2

DATA

TORQUE FIGURES

Caliper carrier to vertical link **102-128Nm**
Caliper to carrier **31-35Nm**
Disc to hub **11-16Nm**
Wheel nut **to** *stud (steel wheel)* **65-85 Nm**
Wheel nut to stud (alloy **wheel) 88-102 Nm**

TOLERANCES

Rear brake disc run out 0.004" **MAX**
Rear *brake disc parallelism 0.0005" MAX*

SPANNER SIZES

13mm
15mm
17mm
22mm

OILS/GREASES

Caliper securing **bolts Molykote 111**

0478G

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BRAKE DISC SHIELD - FRONT

RENEW 70.10.18

Slacken off the appropriate road wheel nuts ¼ turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1).
Cut and remove the carrier securing bolt lockwire.
Unscrew the carrier securing bolts and remove the carrier.
Remove the disc securing screw (1 Fig 2) and remove the disc.
Taking **all** necessary safety precautions remove the brake dust from around the caliper area.
Remove the front hub grease cap (1 Fig 1 page 70-57).
Remove the hub nut split pin (2 Fig 1 page 70-57).
Remove the hub nut cover (4 Fig 1 page 70-57).
Remove the hub nut (3 Fig 1 page 70-57) and washer (5 Fig 1 page 70-57).
Remove the hub and outer bearing (6 Fig 1 page 70-57).
Remove the outer bearing and seal from the hub.
Remove the inner bearing (1 Fig 2 page 70-57) and seal from the stub axle (2 Fig 2 page 70-57).
Remove the disc shield to stub axle (1 Fig 3 page 70-57) securing screws (3 Fig 3 page 70-57), remove the **disc** shield collar (4 Fig 3 page 70-57) and remove the disc shield (2 Fig 3 page 70-57).
Fit the new disc shield and collar, align the holes, fit and tighten the securing screws.
Refit the outer bearing and new seal to the hub.
Fit the inner bearing and new seal to the stub axle.
Pack the hub and coat the stub axle with Shell Retinax **A** grease.
Lubricate the hub seal track.
Fit the hub assembly to the stub axle.
Fit the hub nut and washer. Tighten the nut to obtain an end float of 0.0762-0.0254mm (0.003-0.001in).
Align the hub nut cover **and** secure with a new split pin. Refit the grease cap.
Fit the disc to the hub. Fit and tighten the securing screw.
Fit and align the carrier to the vertical link. Tighten the carrier securing bolts then secure with lockwire.
Place the caliper to the front of the carrier.
Ensure the caliper piston is fully retracted then fit the brake pads to the caliper.

Note: If the **pads** are worn to the minimum thickness, new pads MUST be fitted.

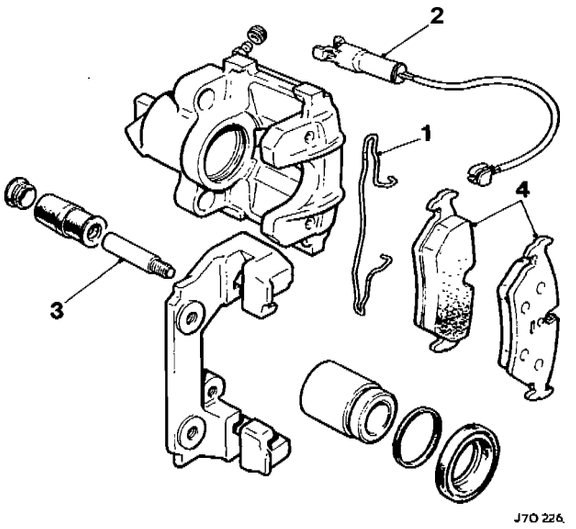


Fig. 1

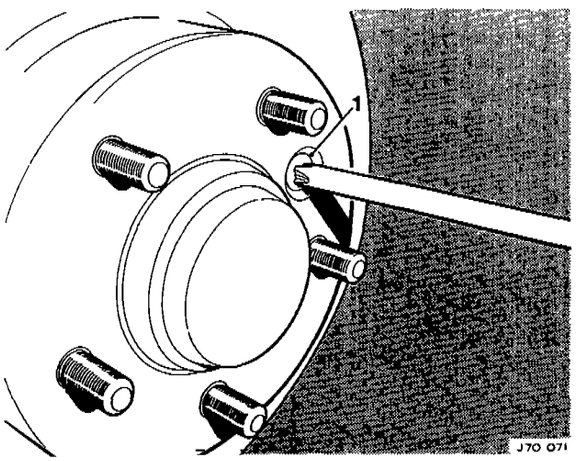


Fig. 2

Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers.
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Lift the road wheel/tyre assembly up to the hub.
Fit and tighten the securing nuts.
Pump the brake pedal several times to centralize the brake **pads.**

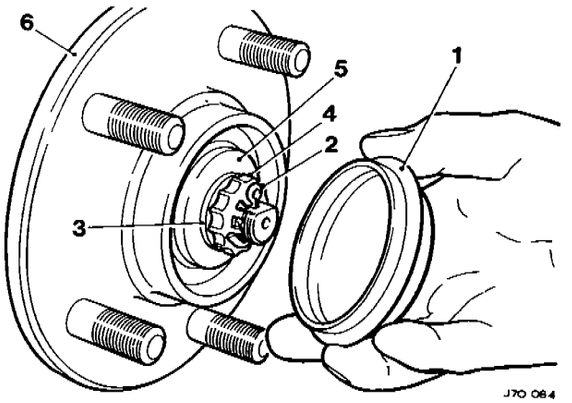


Fig. 1

DATA

TORQUE FIGURES

Caliper carrier to vertical link ***102-128Nm***
Caliper to carrier ***31-35Nm***
Disc ***to*** *hub* ***11-16Nm***
Disc shield ***to*** *vertical link* ***7-10Nm***
Wheel nut to stud (steel ***wheel) 65-85 Nm***
Wheel nut to ***stud*** *(alloy wheel)* ***88-102 Nm***

TOLERANCES

Front brake disc run out 0.004" ***MAX***
Front brake ***disc*** *parallelism 0.0005"* ***MAX***
Front hub to stub ***axle*** *end* ***float*** *0.0762-0.0254mm (0.003-0.001in)*

SPANNER SIZES

13mm
17mm
22mm
No 4 Posi

OILS/GREASES

Caliper securing ***bolts*** *Molykote* ***111***

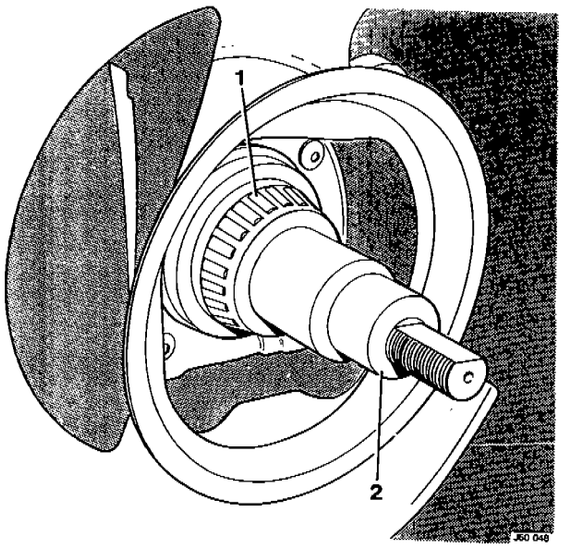


Fig. 2

0478G

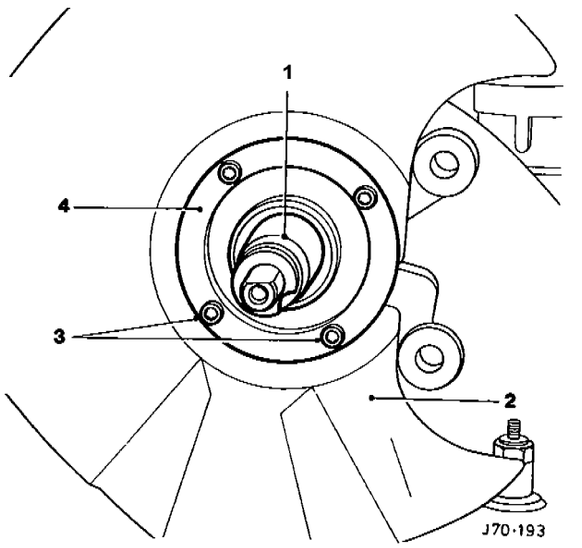


Fig. 3

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HANDBRAKE CABLE

ADJUST 70.35.10

Chock the wheels
Open the door and release the handbrake lever.
Jack up the rear of the vehicle and support with axle stands.
Slacken off the adjuster locknut (1 Fig 1) and tighten the adjuster (2 Fig 1) to take any slack out of the cable.
Tighten the locknut. The handbrake should be fully on between three and five 'clicks'.

Remove the axle stands and lower the vehicle.
Remove the chocks and close the door.

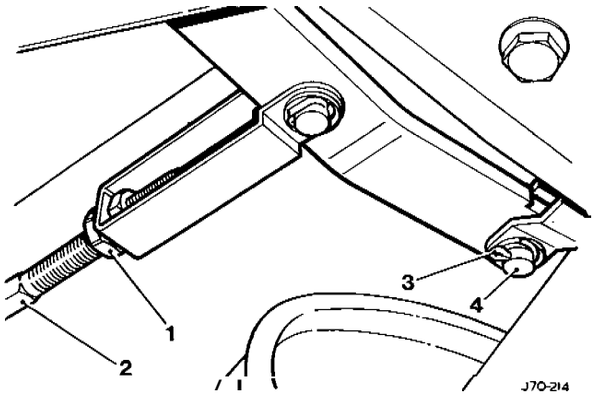


Fig. 1

DATA

SPANNER SIZES

13mm

0478G

HANDBRAKE CABLE ASSEMBLY - FRONT

RENEW 70.35.14

Chock the wheels.
Open the door and release the handbrake lever.
Jack up the rear *of* the vehicle and support with axle stands.
Remove the cable to handbrake lever split pin (1 Fig 2) and clevis pin (2 Fig 2).
Remove the cable to relay lever split pin (3 Fig 1) and clevis pin (4 Fig 1).
Remove the washers, and remove the cable assembly.
Clean all components and examine for wear, ie ovality of holes and steps on the clevis pins.
Grease all levers and clevis pins.
Reverse the removal procedure to refit the cable.

Note: Use new split pins during assembly, never re-use old ones.

Slacken *off* the adjuster locknut and tighten the adjuster to take any slack out of the cable.
Tighten the locknut. The handbrake should be fully on between three and five 'clicks'.
Remove the axle stands and lower the vehicle.
Remove the chocks and close the door.

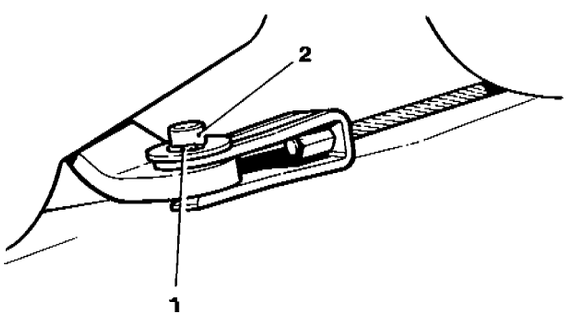


Fig. 2

DATA

SPANNER SIZES

13mm

OILS/GREASES

Compensator/clevis pins/cable adjuster/cable - Thelsons high melting point grease

0478G

HANDBRAKE CABLE ASSEMBLY - INTERMEDIATE

RENEW 70.35.35

Chock the wheels.
Open the door and release the handbrake lever.
Jack up the rear *of* the vehicle and support with axle stands.
Remove the split pin (1 Fig 1) and clevis pin (2 Fig 1) securing one end **of** the intermediate cable (3 Fig 1) to the relay lever (4 Fig 1).
Disconnect the inner cable joiner (1 Fig 2).
Remove the compensator, intermediate cable and adjuster assembly.
Unscrew the forked adjuster from the threaded part of the intermediate cable assembly, and unscrew the locknut.
Remove the split pin (1 Fig 3) and clevis pin (2 Fig 3) securing the compensator (3 Fig 3) to the intermediate cable (4 Fig 3).
Remove the clevis pin washer and compensator.
Clean all components and examine for wear, ie ovality **of** holes and steps on the clevis pins.
Fit the locknut and forked adjuster to the threaded part of the new intermediate cable assembly. **Do** not fully tighten at this stage.
Refit the compensator to the intermediate cable. Fit the clevis pin, washer and a new split pin.

Note: Use new split pins during assembly, never re-use old ones.

Feed the RH inner cable through the compensator and reconnect to the LH inner cable at the cable joiner.
Grease the cables, clevis pins, adjuster thread and compensator.
Fit the forked adjuster to the relay lever. Fit the clevis pin, washer and **a** new split pin.
Tighten the adjuster to take any slack out of the cable.
Tighten the locknut. The handbrake should be fully on between three and five 'clicks'.
Remove the axle stands and lower the vehicle.
Remove the chocks and close the door.

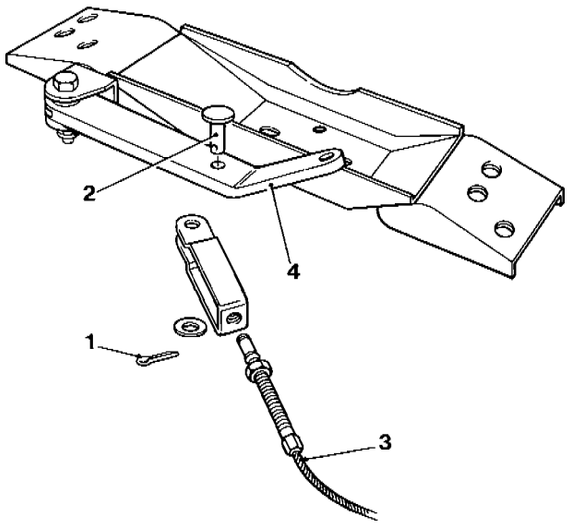


Fig. 1

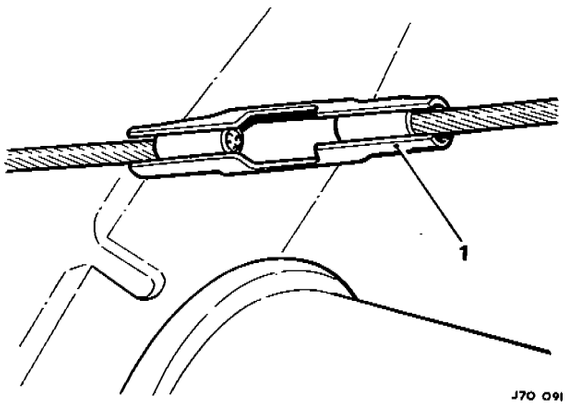


Fig. 2

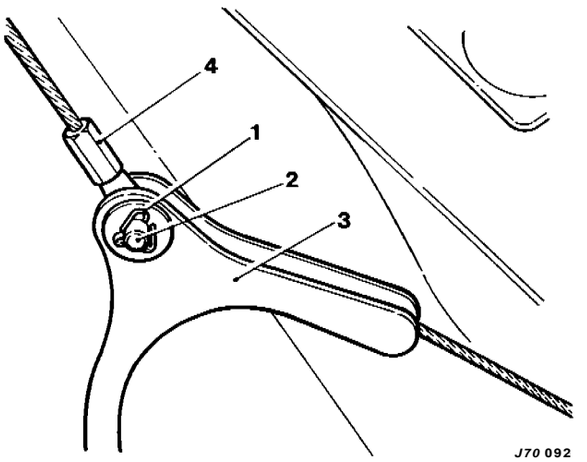


Fig. 3

DATA

SPANNER SIZES

13mm

OILS/GREASES

Compensator Thelsons high melting point grease
Clevis pins Thelsons high melting point grease
Cable adjuster Thelsons high melting point grease
Cable Thelsons high melting point grease

0478G

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HANDBRAKE CABLE ASSEMBLY - REAR RH

RENEW 70.35.30

Chock the wheels. Open the door and release the handbrake lever.
Slacken off the RH rear road wheel nuts ¼ turn each.
Jack up the rear of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Remove the caliper and disc assembly in accordance with the method detailed in 70.10.11.

Note: When carrying out the following operation, refer to arrangement drawing, Fig. 1.

Positioning the hub cut out as necessary, release handbrake shoe retaining clips, springs and return springs and release the handbrake shoe assembly.
Withdraw handbrake shoes from the handbrake operating linkage and adjuster. Displace and remove adjuster.
Remove outer cable retaining clip from the rear of the backplate.
Disconnect cable at the cable joiner.
Remove the circlip securing the outer cable *to* the subframe front plate..
Pull the cable rearwards and disconnect from the subframe.
Position the rear hub cut out in line with the handbrake operating linkage.
Manoeuvre the linkage and withdraw clevis pin, withdraw cable and linkage.
Clean all components and check for serviceability.
Insert new cable through hub carrier.
Insert the cable through the subframe front plate and secure with the circlip.
Connect cable at cable joiner.
Fit and align cable to operating linkage.
Lightly lubricate the clevis pin and insert pin to linkage.
Fit and fully seat cable retaining clip to rear of backplate.
Lightly lubricate shoe to backplate contact faces with appropriate grease. Lubricate adjuster.
Assemble adjuster to handbrake shoes, assemble shoes to the backplate. Ensure lower edge of shoes locate into operating linkage.
Positioning hub cutout as necessary, refit retaining springs, clips and return springs.
Adjust adjuster barrel as required and refit the disc and caliper assembly.
Adjust the central underfloor adjuster to take any slack out of the cable. The handbrake should be fully on between three and five 'clicks'.
Refit the road wheel.
Remove the stands and lower the vehicle.
Recheck the torque of the wheel nuts.
Remove the chocks.

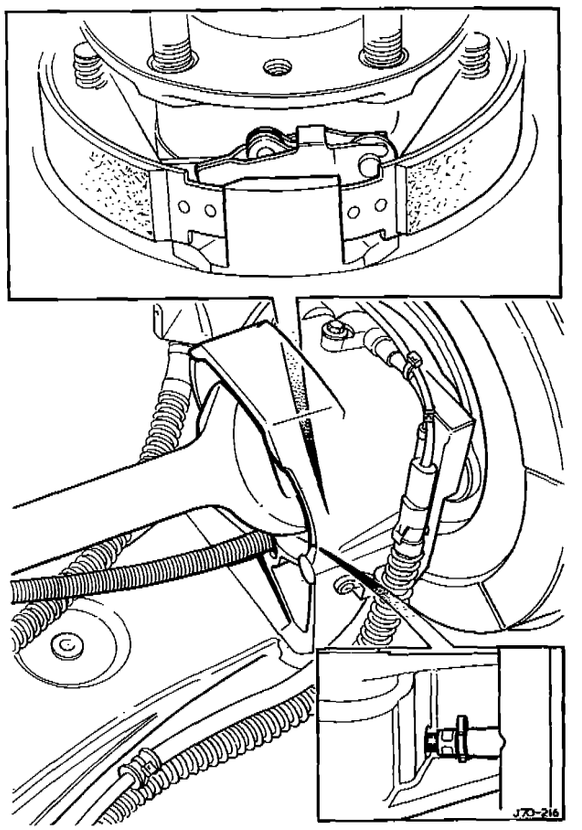


Fig. 1

DATA

TORQUE FIGURES

Wheel nut to stud (steel wheel) 65-85 Nm
Wheel nut to stud (alloy wheel) 88-102 Nm

SPANNER SIZES

13mm
22mm

OILS/GREASES

Thelsons high melting point grease

HANDBRAKE CABLE ASSEMBLY - REAR LH

RENEW 70.35.29

Chock the wheels. Open the door and release the handbrake lever.
Slacken off the LH rear road wheel nuts ¼ turn each.
Jack up the rear of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Remove the caliper and disc assembly in accordance with the method detailed in 70.10.1 1.

Note: When carrying out the following operation, refer to arrangement drawing, Fig. 1.

Positioning the hub cut out as necessary, release handbrake shoe retaining clips, springs and return springs and release the handbrake shoe assembly.
Withdraw handbrake shoes from the handbrake operating linkage and adjuster. Displace and remove adjuster.
Remove outer cable retaining clip from the rear of the backplate.
Disconnect cable at the cable joiner and remove from compensator.
Remove the circlip securing the outer cable to the subframe front plate.
Pull the cable rearwards and disconnect **from** the subframe.
Position the **rear** hub cut out in line with the handbrake operating linkage.
Manoeuvre the linkage and withdraw clevis pin, withdraw cable and linkage.
Clean all components and check for serviceability.
Insert new cable through hub carrier.
Insert the cable through the subframe front plate and secure with the circlip.
Position cable around compensator and connect cable at cable joiner.
Fit and align cable to operating linkage.
Lightly lubricate the clevis pin and insert pin to linkage.
Fit and fully seat cable retaining clip to rear of backplate.
Lightly lubricate shoe to backplate contact faces with appropriate grease. Lubricate adjuster.
Assemble adjuster to handbrake shoes, assemble shoes to the backplate. Ensure lower edge of shoes locate into operating linkage.
Positioning hub cutout as necessary, refit retaining springs, clips and return springs.
Adjust adjuster barrel as required and refit the disc and caliper assembly.
Adjust the central underfloor adjuster to take any slack out of the cable. The handbrake should be fully on between three and five 'clicks'.
Refit the road wheel.
Remove the stands and lower the vehicle.
Recheck the torque of the wheel nuts.
Remove the chocks.

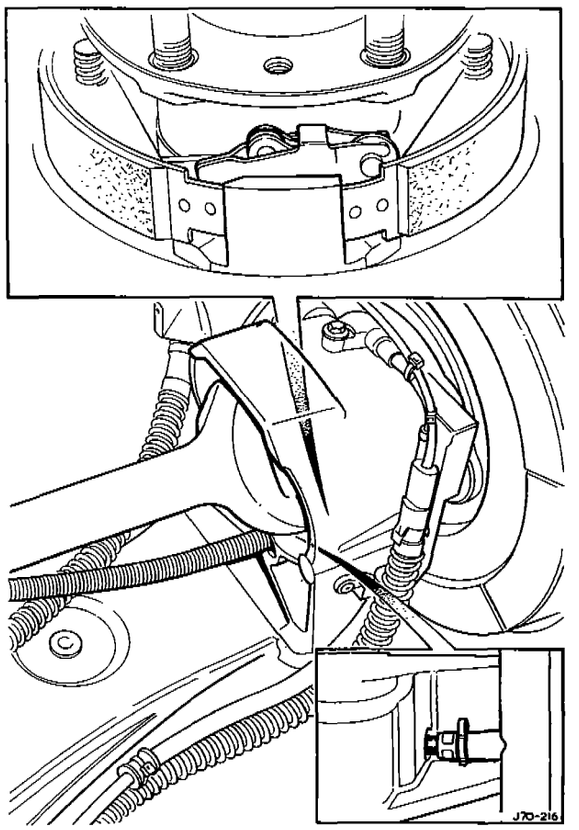


Fig. 1

DATA

TORQUE FIGURES

Wheel nut to ***stud (steel*** *wheel)* ***65-85 Nm***
Wheel nut *to* ***stud*** *(alloy wheel)* ***88-102 Nm***

SPANNER SIZES

13mm
22mm

OILS/GREASES

Thelsons high ***melting*** *point grease*

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HANDBRAKE EXPANDER ASSEMBLY

RENEW 70.35.36

Slacken off the rear road wheel nuts ¼ turn each.
Jack up the rear of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Carefully displace and remove the caliper retaining spring (1 Fig 1). Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig 1).
Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig 1).
Remove the caliper from the carrier.
Displace and remove the brake pads (4 Fig 1).
Cut and remove the carrier securing bolt lockwire.
Unscrew the carrier securing bolts and remove the carrier.
Remove the disc securing screw (1 Fig 2) and remove the disc.
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Fully slacken the adjuster (1 Fig 3) and remove the shoe hold down springs (2 Fig 3).
Align the cut out in the hub to aid removal.
Use of a spring removal tool is recommended. Strong pliers may be used, but there is a risk of both personal injury and **loss** of components, should the pliers slip.

Note: It is necessary to hold a screwdriver against each spring post to prevent turning.

Ease the two shoes (3 Fig 3) complete with adjuster assembly away from the back plate.
Remove the adjuster upper return spring (4 Fig 3), brake shoes and lower return spring (5 Fig 3).

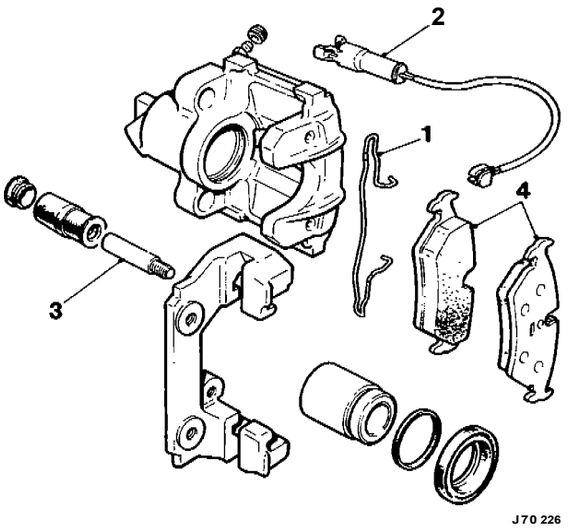


Fig. 1

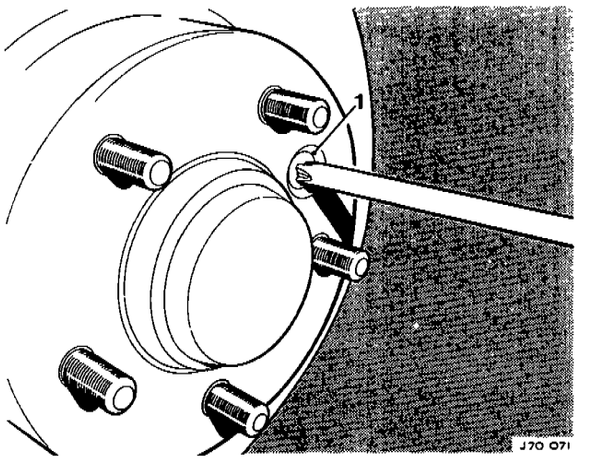


Fig. 2

ADJUSTER

Dismantle the adjuster assembly. Clean and examine all components for wear **or** damage, replacing parts as necessary.
Re-assemble the adjuster, lightly grease the threads using a suitable grease, i.e. Girling Mechanical Brake Grease. Ensure that the adjuster **is** fully closed, i.e. at its shortest length, prior to reassembly of the brake.

HANDBRAKE OPERATING MECHANISM

Locate and disconnect the brake cable securing clip (6 Fig 3). Ease out the expander assembly and remove the brake cable. Remove the expander assembly together with the rollers (7 Fig 3).
Thoroughly clean all the components and examine for wear or damage, renew parts as necessary.
Liberally grease the components using a suitable grease, i.e. Girling Mechanical Brake Grease and reassemble. Ensure that the stops are correctly located in their mating slots.
Refit the brake cable and expander assembly.

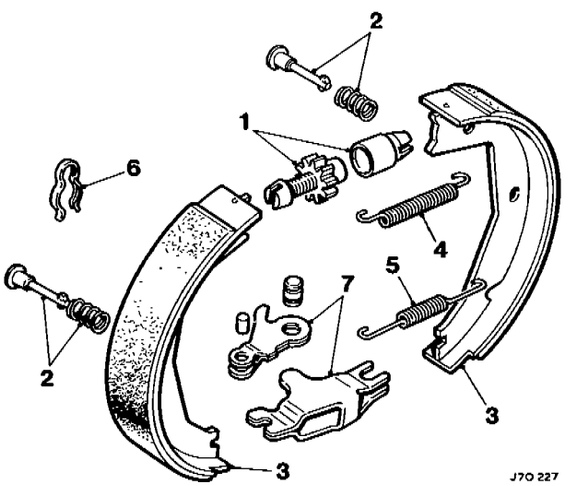


Fig. 3

REASSEMBLING

Lightly grease the shoe tips and back plate contact area.
Refit the brake shoes with the lower spring in position. Fit the adjuster and upper spring to the brake shoes and secure with the hold down springs.
centralize the brake shoes and wind out the adjuster until the disc/drum can just be fitted. Fit and tighten the disc securing screw.
Continue to adjust the shoes until they lock the disc/drum. Ensure that the handbrake lever in the car is fully off and reconnect the handbrake cable to the draw link.
Slacken the adjuster until the disc/drum can be rotated without excessive drag. Light running contact is permissable.
Fit and align the carrier to the vertical link. Tighten the carrier securing bolts then secure with lockwire.
Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper securing bolts.
Fit and fully seat the dust covers.
Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.
Ensure that the harness cannot foul or chafe.
Lift the road wheel/tyre assembly up to the hub.
Fit and tighten the securing nuts.
Remove the axle stands, lower the vehicle and recheck the torque of the wheel nuts.

Pump the brake pedal several times to centralize the brake pads.

DATA

TORQUE FIGURES

Caliper carrier to vertical link ***102-128Nm***
Caliper to carrier ***31-35Nm***
Disc to hub ***11-16Nm***
Wheel nut to stud (steel wheel) ***65-85 Nm***
Wheel nut to stud (alloy wheel) ***88- 102 Nm***

TOLERANCES

Rear brake disc run out 0.004" MAX
Rear brake disc parallelism 0.0005" MAX

SPANNER SIZES

13mm
15mm
17mm
22mm

OILS/GREASES

Handbrake mechanical components (inside drum) - Girling mechanical brake grease.

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HANDBRAKE RELAY LEVER

RENEW *70.35.22*

Chock the wheels. Open the door and release the handbrake lever.
Jack up the rear of the vehicle and support with axle stands.
Remove the split pin (1 Fig 1) securing the handbrake front cable clevis pin (2 Fig 1) to the relay lever (3 Fig 1).
Release the front cable from the relay lever.
Remove the split pin securing the intermediate cable clevis pin (4 Fig 1) to the relay lever and release the intermediate cable (5 Fig 1).
Remove the bolts securing the relay lever bracket to the propellor shaft securing bracket.
Remove the relay lever pivot bolt, nut and washer (1 Fig 2).
Remove the relay lever assembly (3 Fig 2).
Remove the relay lever bearing bush (2 Fig 2).
Clean all components and check for wear and damage.
Reverse the above procedure, ensure that the cables are correctly adjusted.

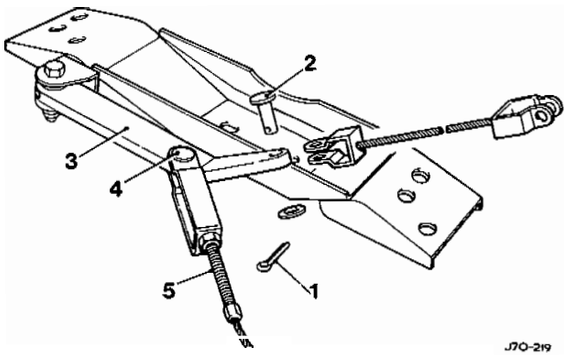


Fig. 1

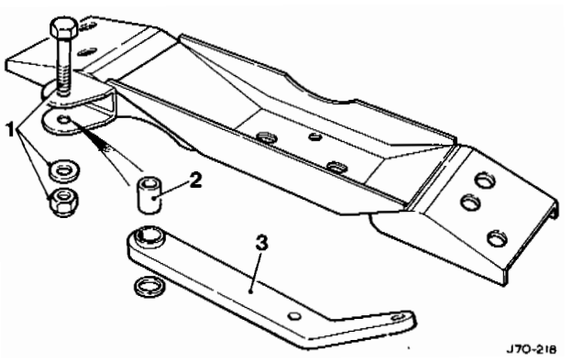


Fig. 2

DATA

SPANNER SIZES

13mm

OILS/GREASES

Relay lever Castrol LM Multipurpose Grease.

0478G

HANDBRAKE LEVER ASSEMBLY

RENEW **70.35.08**

Chock the wheels. Open the door and release the handbrake lever.
Jack up the front of the vehicle and support with axle stands.
Remove the split pin (1 Fig 1) securing the handbrake front cable clevis pin (2 Fig 1) to the handbrake lever (3 Fig 1).
Release the front cable from the handbrake lever.
Remove the bolt securing the seat cushion and remove the cushion retaining plate.
Lift the cushion for access to the seat belt pad block connector, situated below the cushion.
Disconnect the seat belt pad block connector.
Remove the harness securing ratchet strap.
Remove the seat cushion.
Unclip and remove the handbrake lever trim cover.
Carefully move aside the transmission tunnel carpeting to gain access.
Disconnect the handbrake warning light leads from the switch, i.e. one lucar connector and one setscrew secured eyelet, with nylon insulator bush.
Remove the three bolts (1 Fig 2) securing the handbrake lever assembly (2 Fig 2) to the transmission tunnel. Move aside the earth leads and withdraw the handbrake lever assembly.
Remove the blanking plate (3 Fig 2).
Remove the nyloc pivot nut (4 Fig 2) and plain washer. Tap out the shaft from the lever and ratchet assembly. Remove the ratchet and switch assembly.
Fit the ratchet and switch assembly to the shaft, secure with the plain washer and nyloc nut.
Refit the lever assembly to the transmission tunnel.
Ensure that the rubber gasket is correctly seated and that the two earth leads are correctly secured by the front securing bolt.
Connect the switch lucar to the handbrake switch.
Fit and secure the earth eyelet lead with the setscrew through the nylon insulator bush.
Refit the trim cover.
Refit the driver's seat cushion.
Ensure that the handbrake lever is fully released. Refit the handbrake cable to the lever, fit the clevis pin and secure with a new split pin.
Adjust the handbrake cables, operation 70.35.10.

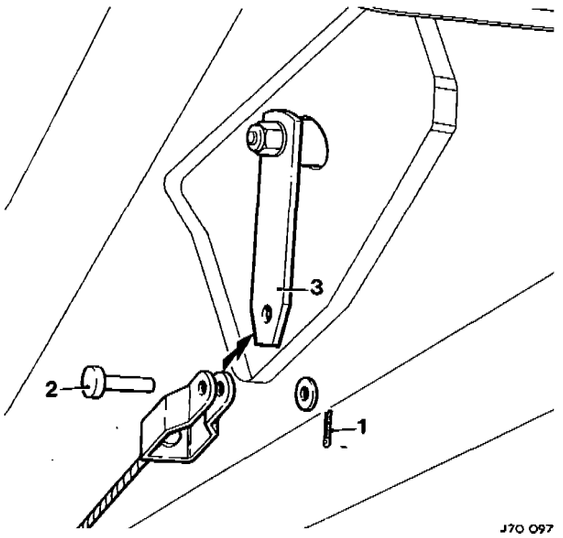


Fig. 1

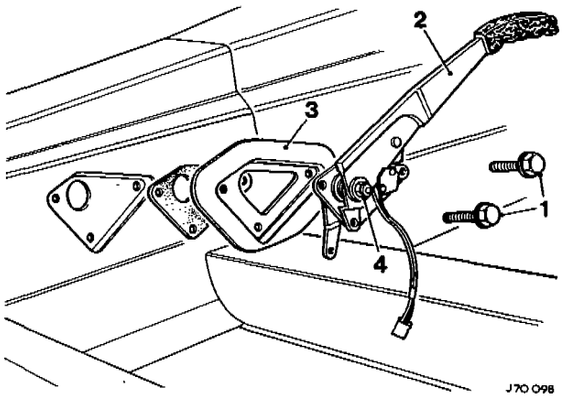


Fig. 2

DATA

TORQUE FIGURES

Handbrake lever to body ***22-28Nm***
Warning light switch to lever ***2-3Nm***
Handbrake casing to shaft ***44-52Nm***

OILS/GREASES

Clevis ***pins Castrol LM Multipurpose Grease.***
Cables ***Castrol LM Multipurpose Grease.***

0478G

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HANDBRAKE SHOES

RENEW 70.40.05

Slacken off the rear road wheel nuts ¼ turn each.
Jack up the rear **of** the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wtieel and tyre assembly.
Remove the other side road wheel.
Remove the caliper and disc assembly in accordance with the method detailed in 70.10.11.
Release the handbrake.
Remove the disc securing screw (1 Fig 1) and remove the disc.
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Fully slacken the adjuster (1 Fig 2) and remove the shoe hold down springs (2 Fig 2).
Align the cut out in the hub to aid removal.
Use *of* a spring removal tool is recommended. Strong pliers may be used, but there is a risk of both personal injury and loss of components, should the pliers slip.

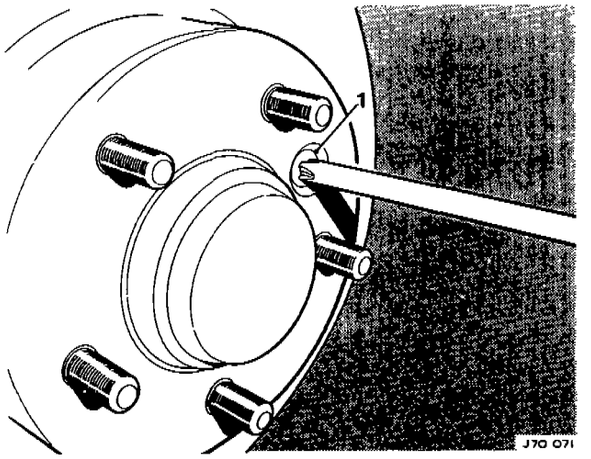


Fig. 1

Note: It is necessary to hold a screwdriver against the rear of each spring post to prevent turning.

Ease the two shoes (3 Fig 2) complete with adjuster assembly away from the back plate.
Remove the adjuster upper return spring (4 Fig 2), brake shoes and lower return spring (5 Fig 2).

ADJUSTER

Dismantle the adjuster assembly. Clean and examine all components for wear **or** damage, replacing parts **as** necessary.
Re-assemble the adjuster, lightly grease the threads using a suitable grease, i.e. Girling Mechanical Brake Grease. Ensure that the adjuster is fully closed, i.e. at its shortest length, prior to reassembly *of* the brake.

HANDBRAKE OPERATING MECHANISM

Locate and disconnect the brake cable securing clip (6 Fig 2). Ease out the expander assembly and remove the brake cable. Remove the expander assembly together with the rollers (7 Fig 2).
Thoroughly clean all the components and examine for wear or damage, renew parts as necessary.
Liberally grease the components using a suitable grease, i.e. Girling Mechanical Brake Grease and reassemble, referring to Fig 1. Ensure that the stops are correctly located in their mating slots.
Refit the brake cable and expander assembly.

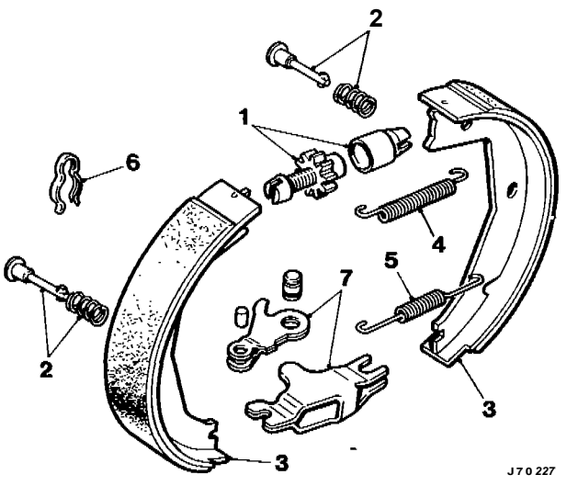


Fig. 2

REASSEMBLING

Lightly grease the shoe tips and back plate contact area.

CAUTION: Do not get any grease onto the lining material. Light surface contamination can be removed with emery cloth, but heavy penetration of grease or fluid will render the material unsuitable for further use and the linings must be replaced.

Refit the brake shoes with the lower spring in position. Fit the adjuster and upper spring to the brake shoes and secure with the hold down springs.

Centralize the brake shoes (3 Fig 1) and wind out the adjuster (1 Fig 1) until the disc/drum can just be fitted. Fit and tighten the disc securing screw.

Continue to adjust the shoes until they lock the disc/drum. Ensure that the handbrake lever in the car is fully off and reconnect the handbrake cable to the draw link.

Slacken the adjuster until the disc/drum can be rotated without excessive drag. Light running contact is permissable.

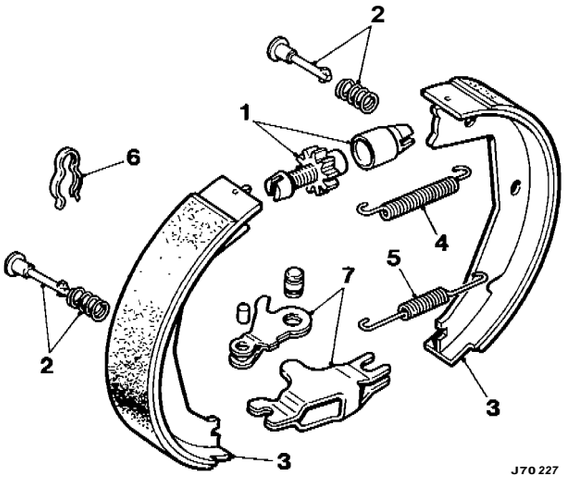


Fig. 1

Fit and align the carrier to the vertical link. Tighten the carrier securing bolts then secure with lockwire.

Place the caliper to the front of the carrier.

Ensure the caliper piston is fully retracted then fit the brake pads to the caliper.

Reposition the caliper/pad assembly to the carrier then fit and tighten the caliper sscuring bolts.

Fit and fully seat the dust covers.

Fit and fully seat the caliper retaining spring. Connect the brake pad sensor harness multi-plug then reposition the plug into the retaining clip.

Ensure the harness is correctly routed (Fig 2).

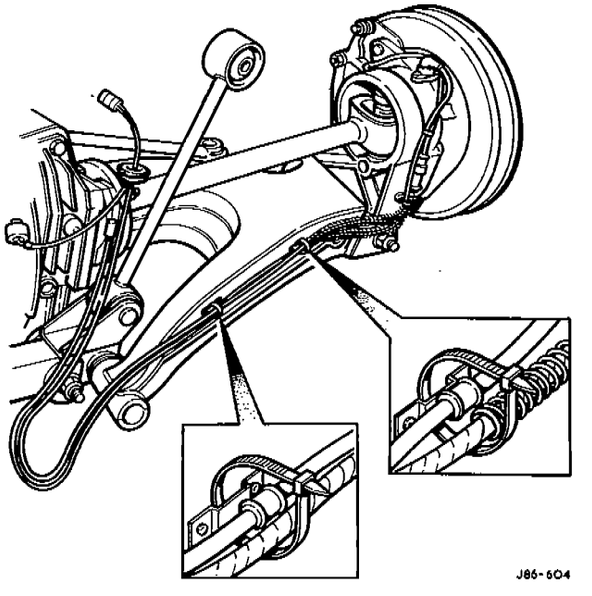


Fig. 2

Lift the road wheel/tyre assembly up to the hub.

Align the wheel with the marked stud. Fit and tighten the securing nuts.

Repeat the procedure for the other side brake shoe assembly.

Remove the axle stands, lower the vehicle and recheck the torque of the wheel nuts.

Pump the brake pedal several times to centralize the brake pads.

Note: It may be necessary to run the engine to give power assistance to the brake pedal.

WARNING: APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKE WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

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DATA

TORQUE FIGURES

Caliper carrier to vertical link ***102-128Nm***
Caliper ***to*** *carrier* ***31-35Nm***
Disc to hub ***11-16Nm***
Wheel nut to stud (steel wheel) ***65-85 Nm***
Wheel nut ***to*** *stud (alloy wheel)* ***88-102 Nm***

TOLERANCES

Rear brake disc ***run*** *out 0.004"* ***MAX***
Rear brake disc parallelism 0.0005" ***MAX***

SPANNER SIZES

13mm
15mm
17mm
22mm

OILS/GREASES

Caliper securing bolts ***Molykote 111***
Handbrake mechanical components (inside drum)
Girling mechanical brake grease.

04786

RENEW 70.35.01

Remove the pedal box grommets for access to the brake pedal/power servo clevis pin (Fig 1).
Remove the brake pedal/power servo clevis pin retaining clip (Fig 1).
Remove the brake light switch plate to pedal box securing bolts.
Re-position the plate for access.
Remove the brake pedal box to bulkhead bracket.
Remove the pedal pivot shaft securing nut.
Open the driver's door. Remove the brake pedal rubber foot pad.
Remove the brake pedal pivot shaft.
From inside the vehicle, retrieve the brake pedal and spring.
Clean all components and examine for wear.
Fit the pivot shaft spring to the new brake pedal.

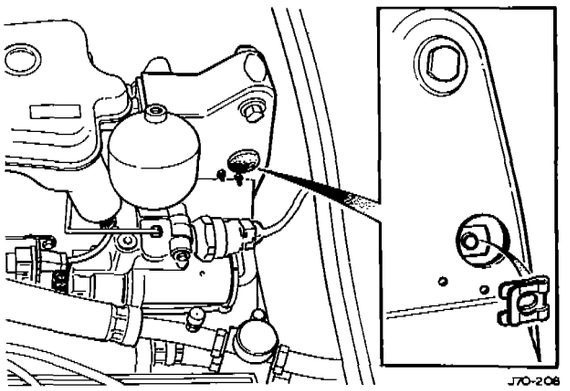


Fig. 1

Lubricate the brake pedal bushes.
Fit and align the pedal assembly into the pedal box.
Compress the spring against the pedal box casing to allow full engagement of the pedal and pivot shaft.
Hold the pedal in position and fit the pivot shaft.
Fit and tighten the pivot shaft securing nut.
Fit and tighten the bulkhead/pedal box bracket.
Fit the brake light switch plate assembly (Fig 2) to the pedal box. Do not fully tighten the securing bolts at this stage.
Refit the power servo to brake pedal clevis yoke.
Fit the clevis pin and retaining clip. Grease the clevis assembly.
Refit the pedal box grommets.
From inside the vehicle, fit and align the brake pedal foot pad.
Switch the ignition on.
Depress the brake pedal.
From the engine bay, adjust the brake light switch plate.
Finally tighten the brake light switch plate securing bolts.
Check the operation of the brake lights.
Switch the ignition off.
Close the door. Close the bonnet.

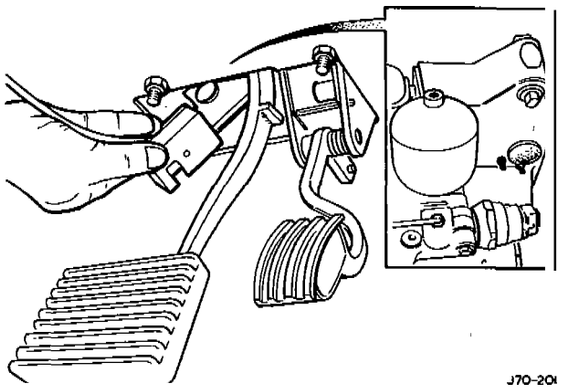


Fig. 2

DATA

TORQUE FIGURES

Power servo to pedal box ***22-28Nm***
'Pedal steady bracket to ***pedal*** *box* ***18-20Nm***
Pedal steady bracket to bulkhead ***18-20Nm***
Brake switch mounting plate ***5-7Nm***
Pedal pivot shaft to pedal box ***15-20Nm***

SPANNER SIZES

13mm
17mm

OILS/GREASES

Clevis ***pins Castrol LM Multipurpose Grease.***

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BRAKE PEDAL

OVERHAUL *70.35.02*

Remove the brake pedal box to bulkhead bracket.
Re-position the interior carpet for access.
Disconnect the brake light and cruise control switch multi plugs (Fig 1).
Remove the brake pedal box securing nuts.
Remove the brake pedal box assembly.
fit the pedal box assembly to a vice.
Remove the brake switch plate bolts (Fig 2).
Displace the switch/plate assembly (Fig 2).
Remove the brake pedal foot pad.
Slacken and remove the pivot shaft securing nut.
Remove the pivot shaft.
Displace the pedal and return spring.
Discard the pedal box to body gasket.
Remove the pedal box mounting studs.
Remove the pedal box from the vice.
Clean all components and examine for wear.
Fit the pedal box to the vice.
Refit and tighten the mounting studs.
Fit a new return spring to the pedal.
Lubricate the pedal, spring and bushes.
Fit and align the pedal to the pedal box.
Compress the return spring against the casing to fully seat the pedal.
Fit the pivot shaft. Fit and tighten the securing nut.
Fit a new brake pedal foot pad.
Fit and align a new brake switch plate gasket to the pedal box.
Fit the switch assembly, feeding the harness through the pedal box
Fit, do not tighten the switch securing bolts.
Fit and align a new gasket to the pedal box.
Remove the pedal box assembly from the vice.
Fit and align the assembly to the vehicle.
From inside the vehicle, fit and tighten the pedal box securing nuts.
Reconnect the multi plugs. Re-position the carpet.
Switch the ignition on.
Press the brake pedal. From the engine bay, adjust the brake light switch plate.
Finally tighten the brake light switch plate securing bolts.
Check the operation of the brake lights.
Switch the ignition off. Close the door.
Refit the bulkhead mounting bracket.
Refit the power servo. Close the bonnet.

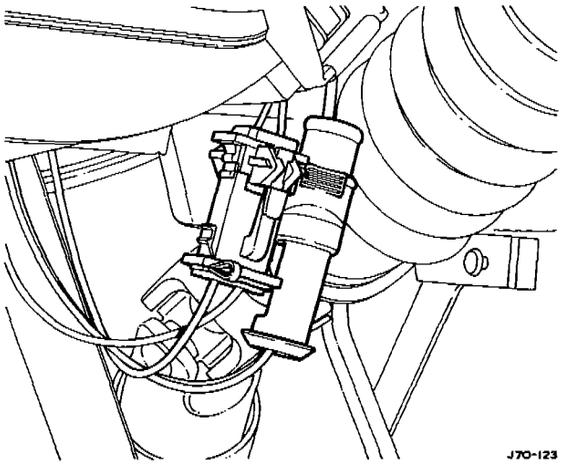


Fig. 1

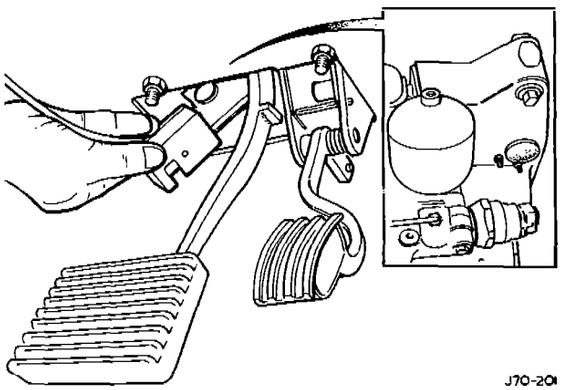


Fig. 2

DATA

TORQUE FIGURES

Pedal steady bracket to pedal ***box 18-20Nm***
Pedal steady bracket to bulkhead ***18-20Nm***
Pedal ***pivot*** *shaft to pedal* ***box 15-20Nm***

SPANNER SIZES

13mm
17mm

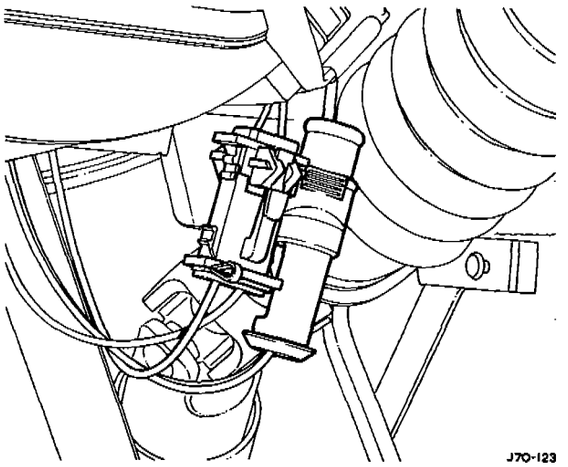
OILS/GREASES

Clevis ***pins Castrol LM Multipurpose Grease.***

BRAKE PEDAL BOX

RENEW 75.35.03

Remove the brake pedal box to bulkhead bracket.
Re-position the carpet for access.
Disconnect the brake light and cruise control switch multi plugs (Fig 1).
Remove the brake pedal box securing nuts.
Remove the brake pedal box assembly.
Fit the pedal box assembly to a vice.
Remove the brake switch plate bolts (Fig 2).
Remove the switch/plate assembly (Fig 2).
Remove the pivot shaft securing nut.
Remove the pivot shaft.
Remove the pedal and return spring.
Remove and discard the pedal box to body gasket.
Remove the pedal box mounting studs.
Remove the pedal box from the vice.
Clean all components and examine for wear.
Fit the new pedal box to the vice.
Refit and tighten the mounting studs.
Fit a new return spring to the pedal.
Lubricate the pedal, spring and bushes.
Fit and align the pedal to the pedal box.
Compress the return spring against the casing to fully seat the pedal.
Fit the pivot shaft. Fit and tighten the securing nut.
Fit and align a new brake switch plate gasket to the pedal box.
Fit the switch assembly, feeding the harness through the pedal box.
Fit, do not tighten the switch securing bolts.
Fit and align a new gasket to the pedal box.
Remove the pedal box assembly from the vice.
Fit and align the assembly to the vehicle.
From inside the vehicle, fit and tighten the pedal box securing nuts.
Reconnect the multi plugs. Re-position the carpet. Switch the ignition on.
Press the brake pedal.
Adjust the brake light switch plate.
Finally tighten the brake light switch plate securing bolts.
Check the operation of the brake lights.
Switch the ignition off. Close the door.
From the engine bay, Refit the bulkhead mounting bracket. Refit the power servo.



Fig, 1

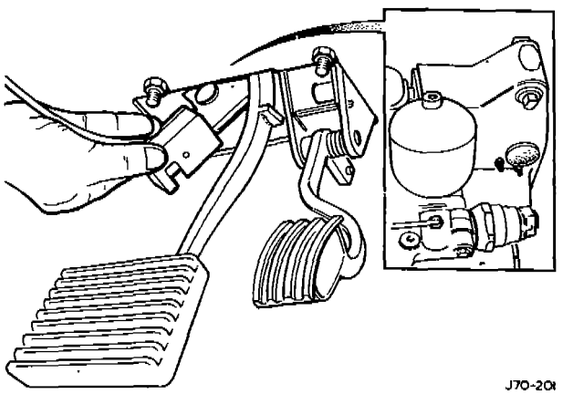


Fig. 2

DATA

TORQUE FIGURES

Power servo to pedal box ***22-28Nm***
Pedal steady bracket to pedal box ***18-20Nm***
Pedal steady bracket to bulkhead ***18-20Nm***
Brake switch mounting plate ***5-7Nm***
Pedal pivot shaft to pedal box ***15-20Nm***

SPANNER SIZES

13mm
17mm

OILS/GREASES

Clevis pins ***Castrol LM Multipurpose Grease.***

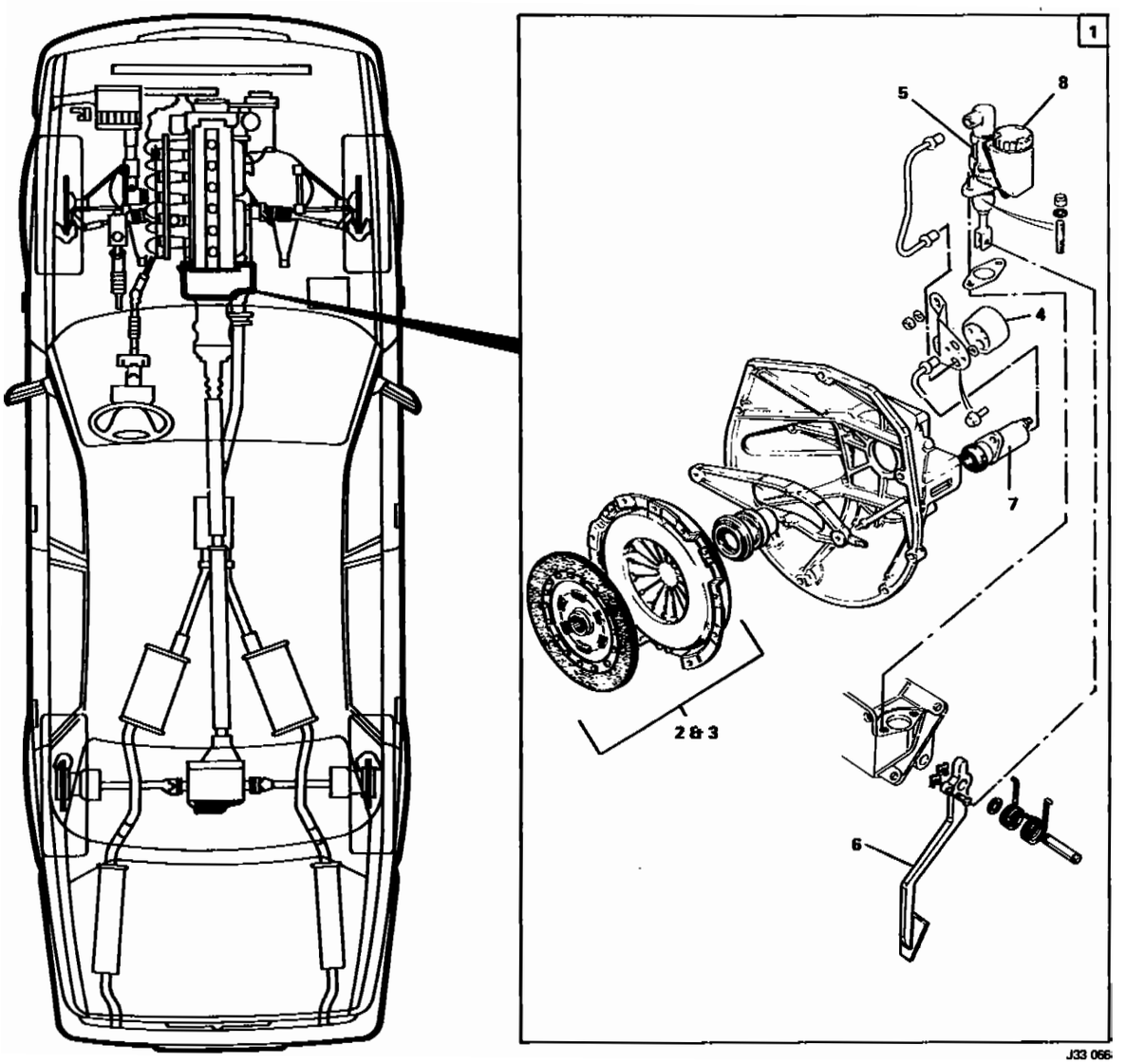
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0032K

CLUTCH

DESCRIPTION

33.00.00

The clutch is a single plate, diaphragm type, and is operated hydraulically by a slave cylinder mounted to the gearbox bell housing. This is in turn operated by a clutch master cylinder through a series of hydraulic pipes and a damper. The piston in the master cylinder is moved by a push rod by the clutch pedal, which is mounted to the bulkhead and is positioned to the left of the brake pedal.

The 4.0 engine uses a twin-mass flywheel configuration with built-in springs to provide a smooth take-up of drive. The flywheel is extremely heavy, and great care must be taken when lifting it from the vehicle.

CAUTION: The hydraulic fluid used in the clutch hydraulic system is injurious to car paintwork. Utmost precautions MUST at all times be taken to prevent spillage of fluid. Should fluid be accidentally spilled onto the paintwork, wipe fluid off immediately with a cloth moistened with denatured alcohol (methylated spirits).

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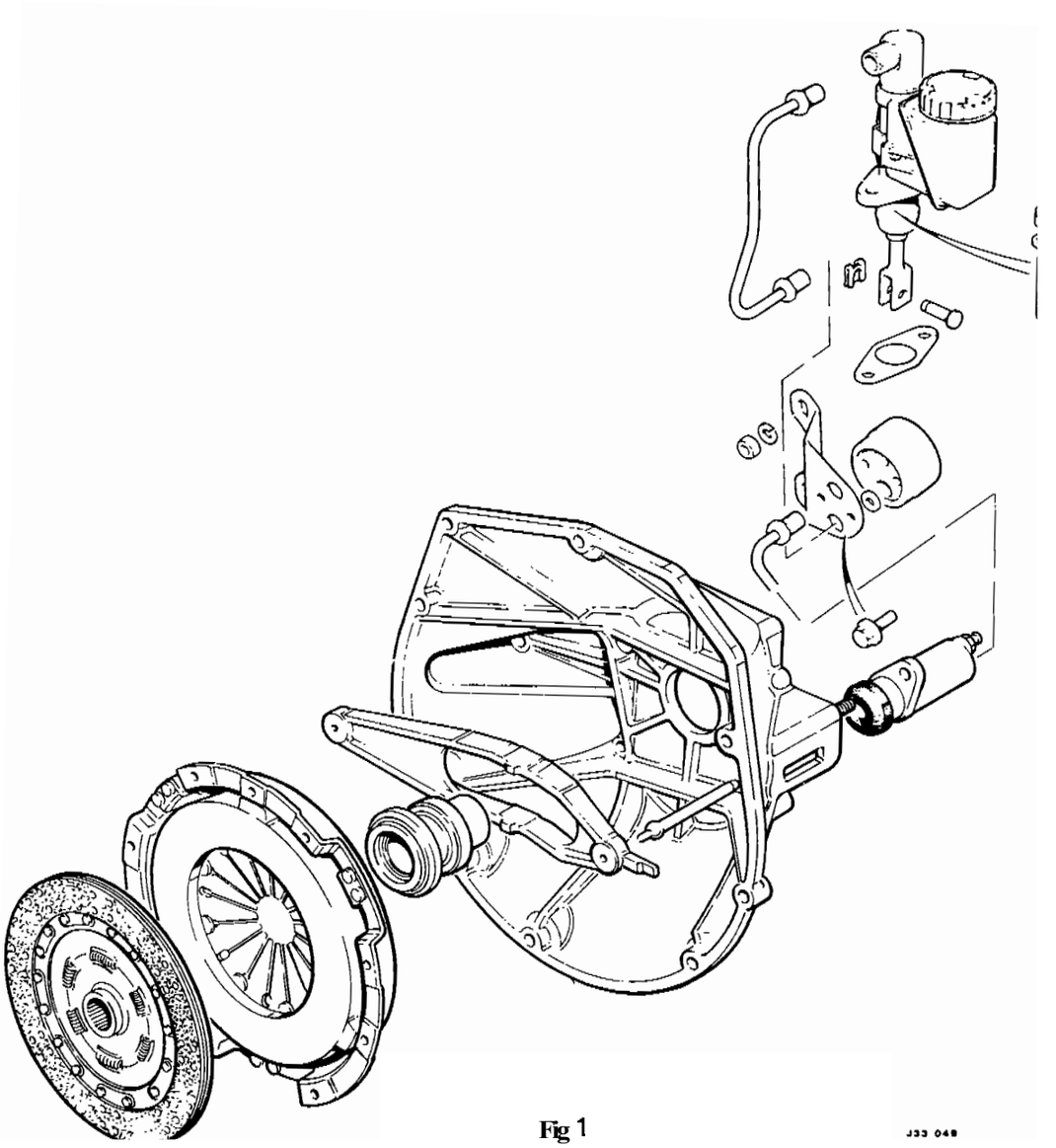


Fig 1 J33 048

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CLUTCH FAULT DIAGNOSIS

Symptom	Possible Cause	Check	Remedy
	Hydraulic system defects	Check fluid level in reservoir.	Replenish as necessary and bleed system if necessary
		Check for air in the svstem	Bleed the svstem.
Rattling Clutch	Operating mechanism faults	Check for defective pedal	Replace return spring.
	Clutch unit faults	Check for damaged pressure plate.	Replace pressure plate
		Check splines on clutch driven plate and primary pinion shaft for wear.	Replace as necessary clutch plate, or primary pinion.
		Check clutch driven plate for loose or broken springs and for warping.	Replace driven plate
		Check for wear in the clutch withdrawal mechanism	Replace as necessary.
		Check for worn primary pinion Bearing.	Replace as necessary
Squeaking clutch	Primary pinion bearing fault.	Check for seizing on shaft or in flywheel.	Lubricate or replace as necessary.
Vibrating clutch or clutch judder (often proceeded by clutch grab)	Clutch unit faults	Check the clutch driven plate for distortion and damage and for loose or broken torque.	Replace driven plate springs.
		Check for oil and other foreign matter on the clutch friction linings.	Replace driven plate and clean related parts.
		Check for incorrectly fitted clutch pressure plate.	Dismantle from clutch and refit where applicable.
		Check that contact witness on friction linings is evenly distributed.	Replace driven plate as necessary
	Defects other than in clutch unit.	Check for loose flywheel fixings. Check flywheel run-out	Tighten to correct torque loading.
		Check for loose engine mountings.	Tighten mounting nuts and bolts.
		Check for worn propeller shaft universal joints.	Replace as necessary
		Check for bent primary pinion shaft.	Replace as necessary
Stiff clutch operation	Operating linkage fault	Check for damaged moving parts in operating linkage.	Replace as necessary

Symptom	Possible Cause	Check	Remedy
		Check for seized linkage recheck operation.	Lubricate linkage as necessary.
Clutch knocks	Clutch Fault	Check for worn clutch driven plate hub splines.	Replace driven plate.
	Primary pinion bearing	Check for wear in bearing	Replace as necessary
Fractured clutch plate	Incorrect fitting method	Damage may be caused by accidental loading during fitting.	Always support gearbox weight during fitting.
		Check mating components for damage.	Replace driven plate.
Excessive lining wear	Overloading vehicle	Refer to Owner's handbook for permissible load details	Fit replacement clutch assembly.
	Driving with left foot resting on clutch pedal	Check as described under 'slipping clutch'	Fit replacement clutch assembly.
Grabbing clutch (Harsh engagement from standing start, often followed by clutch judder)	Operating mechanism faulty.	Check operating for wear and binding which usually indicates a binding withdrawal thrust bearing.	Free off bearing. Replace as necessary.
		Check pedal for sticking parts including return spring.	Free off pedal and check for damaged and distorted Replace as necessary.
	Clutch unit faults faces.	Check for oil on friction driven plate. Rectify oil	Clean off cover. Replace leak.
		Check clutch plate and flywheel for wear. Check flywheel runout. Check also for glazing on driven plate linings.	Reclaim or replace as applicable.
		Check for driven plate hub splines sticking on pinion shaft. Check pinion shaft for wear.	Free driven plate and check for wear and distortion.
		Check for broken or weak pressure springs. Check torque damper springs in clutch driven plate.	Replace as necessary.
	Engine mounting faults	Check for damaged or deteriorated engine mountings. Check fixings for looseness.	Replace as necessary
Slipping clutch (indicated by vehicle road speed not responding to engine speed increases)	Faulty driving technique	Ensure that none of the Remedy conditions prevail.	Do not increase engine speed with clutch partially engaged. Do not drive with left foot resting on clutch pedal.

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Symptom	Possible Cause	Check	Remedy
	Operating mechanism faulty	Check for binding with-drawal lever	Free lever and check for wear and distortion.
		Check for binding of clutch pedal moving components	Free off seized or binding components.
	Clutch unit faults	Check for oil on friction faces.	Clean off metal faces. Replace driven plate. Rectify oil leak.
		Check for broken or weak pressure springs.	Replace cover as necessary.
		Check clutch plates and flywheel for wear and distortion	Reclaim or replace as applicable clutch plate flywheel.
		Check clutch driven plate for fractures and distortion.	Replace driven plate and check mating components for damage.
		Damage may be caused by accidental loading during assembly of gearbox to engine,	Always support gearbox weight during refitting.
Dragging or spinning clutch	Clutch unit faults	Check for primary pinion bearing seized.	Rectify or replace as necessary.
		Check clutch driven plate hub for binding on primary pinion splines. Check for too thick friction linings. Ensure linings are good.	Replace as necessary.
		Check for distorted clutch pressure plate and clutch cover.	Replace as necessary
		Check for foreign matter in clutch unit.	Clean and replace components as necessary.

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CLUTCH ASSEMBLY (2.9)

RENEW **33.10.06**

Remove the rear inlet manifold securing nuts and pull the earth leads clear of the studs.
Fit lifting eye JD 124 to the rear inlet manifold studs.
Fit Service Tool MS 53B (Fig 1) and take the weight of the engine with the hook.
Remove the fan cowl. Remove the gear knob.
Remove the propeller shaft.
Remove the exhaust down pipe support bracket and the down pipe/intermediate pipe clamp.
Remove the olive and secure the exhaust aside.
Remove the slave cylinder nuts (1 Fig 2) from the bell housing and remove the push rod.
Disconnect the gearbox switch connectors.
Using a jack/support channel, take the weight of the gearbox and remove the bolts securing the rear mounting to the body. Lower the jack and remove the rear mounting assembly.
Using MS 53B, lower the gearbox and engine assembly.
Disconnect the gear selector shaft universal joint securing nut/bolt, remove the wavy washer and remove bolts securing the remote control.
Remove the mounting rubbers and washers.
Remove the gearbox switch for access to the upper right hand gearbox/bell housing securing bolt.
Remove the remaining gearbox/bell housing securing bolts and remove the gearbox assembly.
Reposition the clutch slave cylinder from the bell housing.
Remove the gearbox insulation **pad.**
Remove the bell housing to adaptor plate securing bolts and nuts, reposition the earth leads and remove the bell housing.

Hold the flywheel in one position and remove the bolts (1 Fig 3) securing the clutch cover (2 Fig 3) to the flywheel (3 Fig 3).
CAUTION: MAKE A NOTE OF THE POSITION OF ANY BALANCE WEIGHTS RELATIVE TO THE CLUTCH COVER. Remove the balance weights.
Remove the clutch assembly and remove the drive plate from the cover.
Clean the face of the flywheel and dowels.
Check the flywheel face for scoring, should this be excessive the flywheel may be skimmed see DATA (TOLERANCES) for limits.
Remove bolts (1 Fig 1 page 9) securing the flywheel to the crankshaft and remove the flywheel.
Remove the spigot bush (2 Fig 1 page 9) from the flywheel and clean aperture.
Lubricate the spigot bush aperture and fit the replacement bush.
Align and fit the flywheel to the crankshaft and torque tighten the securing bolts.
Fit the replacement clutch assembly to the flywheel ensuring that the 'flywheel side' of the drive plate faces the flywheel and align with a dummy input shaft.
Fit the balance weights to the clutch cover and secure with the bolts,
Remove the dummy shaft.

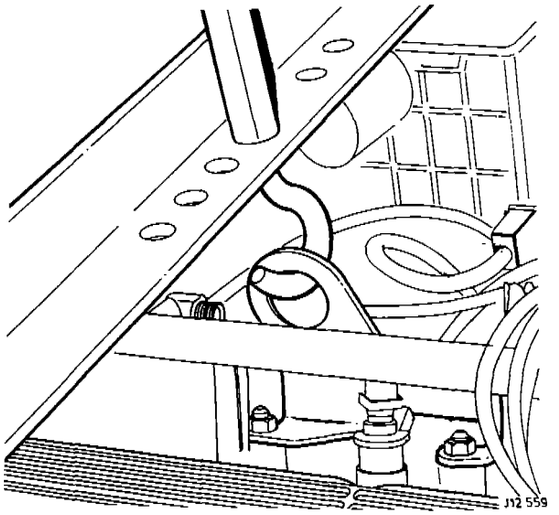


Fig 1

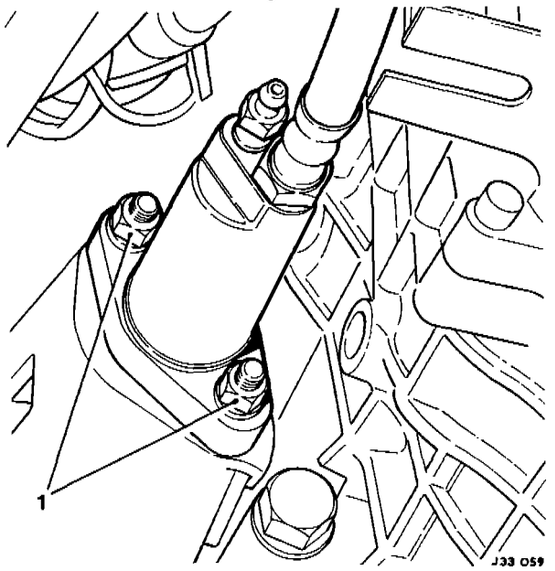


Fig 2

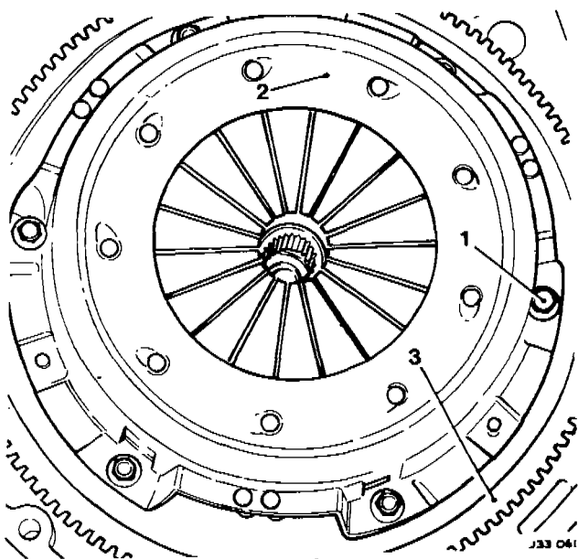


Fig 3

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Remove the circlip securing the clutch release arm pivot and remove the assembly.
Slacken and remove the release arm pivot pin.
Remove the bearing (1 Fig 2) from the release arm assembly (2 Fig 2), grease the bearing seat, fit the new bearing to the release arm **assembly.**
Re-assemble the release arm ensuring that the pivots are greased with Molykote FB 180.

Fit the bell housing **to** the adaptor plate, fit **and** torque tighten the securing bolts/nuts.
Fit the insulation pad in position, secure with string.
Lift the gearbox into position, fit and tighten the bolts.
Refit the upper switch.
Fit the mounting rubbers and washers, reconnect the selector shaft.
Raise the engine by tightening the **hook** nut on tool MS 53B and refit the rear mounting.
Refit the slave cylinder. Reconnect the exhaust system.
Refit the propeller shaft.
Lower the ramp. Release and remove tool MS 53B.
Refit the fan cowl.
Remove the engine lifting eye.
Fill the gearbox with the recommended grade of **oil** to the lower threads of the filler plug aperture.

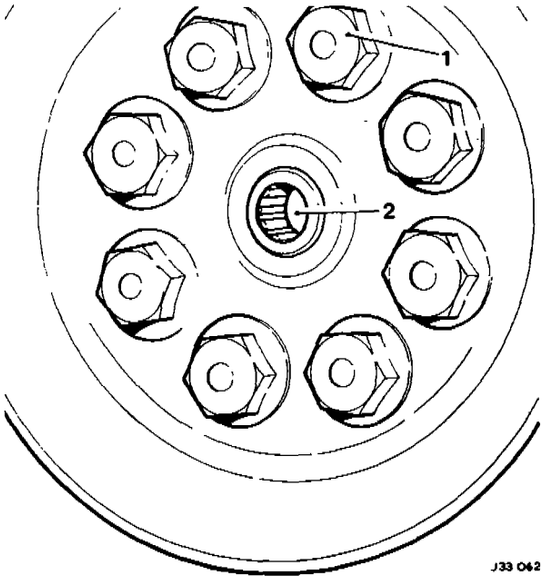


Fig 1

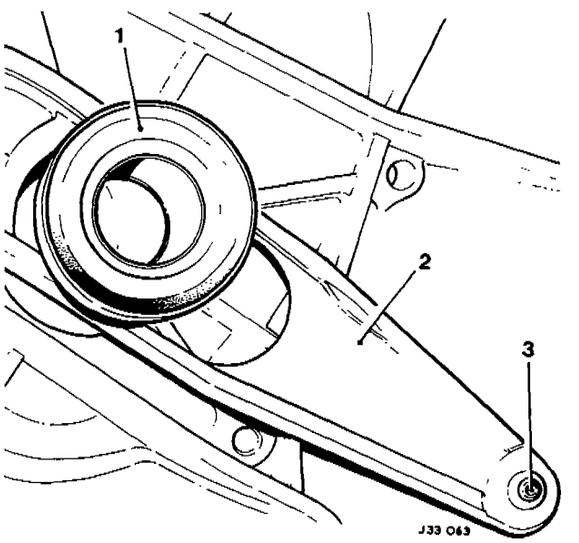


Fig 2

DATA

Maximum material removal allowance to clean up the clutch face 1 mm.

SERVICE TOOLS

***MS 53B** Engine support bracket*
***JD 124** Engine lifting bracket*

TORQUE FIGURES

Bell housing** to **adaptor plate 49-54Nm
Clutch cover to** flywheel **23-27Nm
Flywheel to crankshaft 95-105Nm
Propeller shaft centre mounting to** body **22-28Nm
Propeller shaft to gearbox 95-105Nm
Slave cylinder to bell housing 23-27Nm

SPANNER SIZES

10mm
13mm
17mm
9/16AF

OILS/SEALANTS/LUBRICANTS

Withdraw arm pivots Molykote FB 180 grease.

0189G

CLUTCH ASSEMBLY (4.0)

RENEW **33.10.01**

Remove the rear inlet manifold securing nuts and pull the earth leads clear of the studs.
Fit lifting eye **18G 1465** to the rear inlet manifold studs.
Fit Service **Tool** MS 538 (Fig 1) and take the weight of the engine with the hook.
Remove the fan cowl. Remove the gear knob.
Remove the propeller shaft.
Remove the exhaust down pipe support bracket and the down pipe/intermediate pipe clamp.
Remove the olive and secure the exhaust aside.
Remove the slave cylinder nuts from the bell housing and remove the push rod.
Disconnect the gearbox switch connectors.
Using a jack/support channel, take the weight of the gearbox and remove the bolts securing the rear mounting to the body. Lower the jack and remove the rear mounting assembly.
Using MS **53B,** lower the gearbox and engine assembly.
Disconnect the gear selector shaft universal joint securing nut/bolt, remove the wavy washer and remove bolts securing the remote control.
Remove the mounting rubbers and washers.
Remove the gearbox switch for access to the upper right hand gearbox/bell housing securing bolt.
Remove the remaining gearbox/bell housing securing bolts and remove the gearbox assembly (1 Fig 2).
Remove the gearbox insulation **pad.**

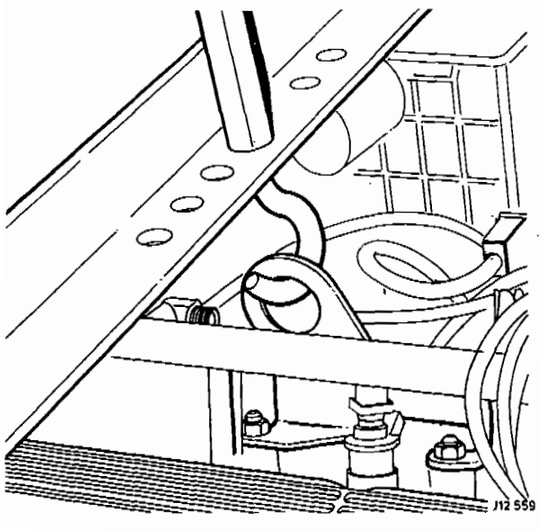


fig 1

Hold the flywheel in one position and remove the bolts securing the clutch cover to the flywheel.
CAUTION: MAKE **A NOTE** O f **THE POSITION OF ANY BALANCE WEIGHTS** RELATIVE TO **THE** CLUTCH **COVER.**
Remove the balance weights.
Remove the clutch cover/drive plate assembly.

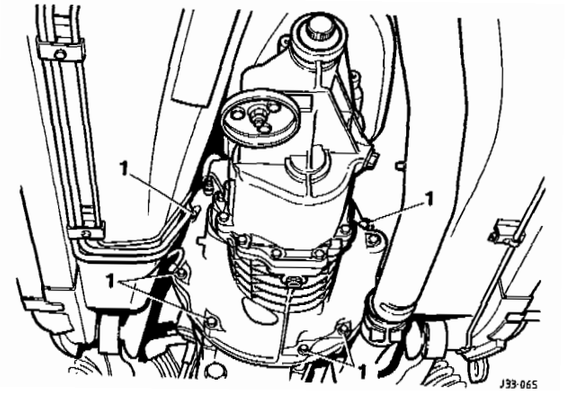


fig 2

Remove the eight securing bolts **(1** Fig 3) and remove the flywheel (2 Fig 3).
WARNING: THE TWIN-MASS FLYWHEEL IS EXTREMELY HEAVY. **ASSISTANCE MAY** BE REQUIRED DURING **REMOVAL.**

Clean the face of the flywheel and dowels.
Check the flywheel face for scoring, should this be excessive the flywheel may be skimmed see **DATA (TOLERANCES)** for limits.
Fit a new spigot bearing to the flywheel.
Refit the flywheel **to** the crankshaft and torque tighten the securing bolts.
Fit the clutch assembly to the flywheel ensuring that the larger, rounded boss faces the flywheel
Align the clutch with a dummy input shaft.
Fit the balance weights to the clutch cover and torque tighten **the** securing bolts.
Remove the dummy shaft.

Remove the circlip securing the clutch release arm pivot and remove the assembly.
Slacken and remove the release arm pivot pin.

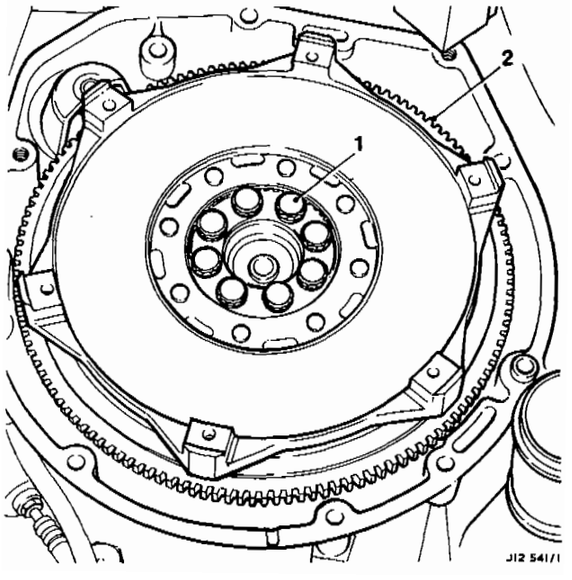


Fig 3

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Remove the bearing (1 Fig 2) from the release arm assembly (2 Fig 2), grease the bearing seat, fit the new bearing to the release arm assembly.
Re-assemble the release arm ensuring that the pivots are greased with Molykote FB 180.

Fit the insulation pad in position, secure with string.
Lift the gearbox into position, fit and torque tighten the bolts.
Refit the gearbox switch.
Fit the mounting rubbers and washers, reconnect the selector shaft.
Raise the engine by tightening the hook nut on tool MS 53B and refit the rear mounting.
Refit the slave cylinder. Reconnect the exhaust system.
Refit the propeller shaft.
Lower the ramp. Release and remove tool MS 53B.
Refit the fan cowl.
Remove the engine lifting eye.
Fill the gearbox with the recommended grade of oil to the lower threads of the filler plug aperture.

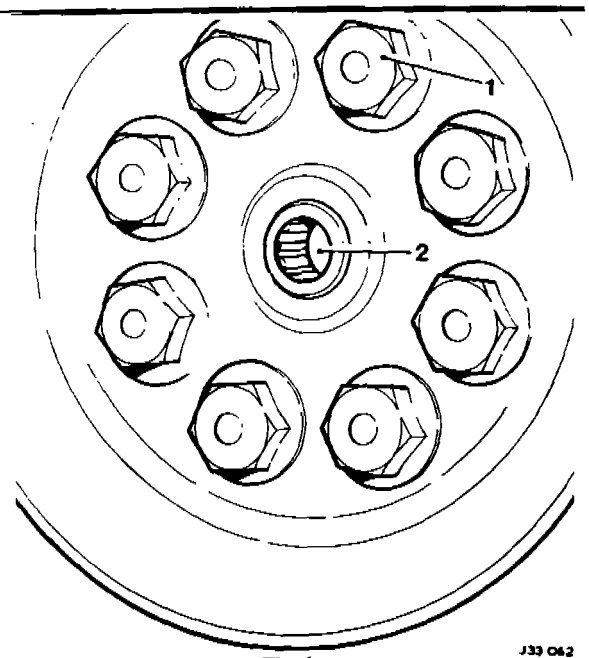


Fig 1

DATA

Maximum material removal allowance to clean up the clutch face 1 mm.

SERVICE TOOLS

MS 53B Engine support bracket
18G 1465 Engine lifting bracket

TORQUE FIGURES

Bell housing to adaptor plate 49-54Nm
Clutch cover to flywheel 23-27Nm
Flywheel ***to crankshaft 95-105Nm***
Propeller shaft to gearbox 95-105Nm
Slave cylinder to bell housing 23-27Nm

SPANNER SIZES

10mm
13mm
17mm
9/16AF

OILS/SEALANTS/LUBRICANTS

Withdraw 1 arm pivots Molykote FB 180 grease.

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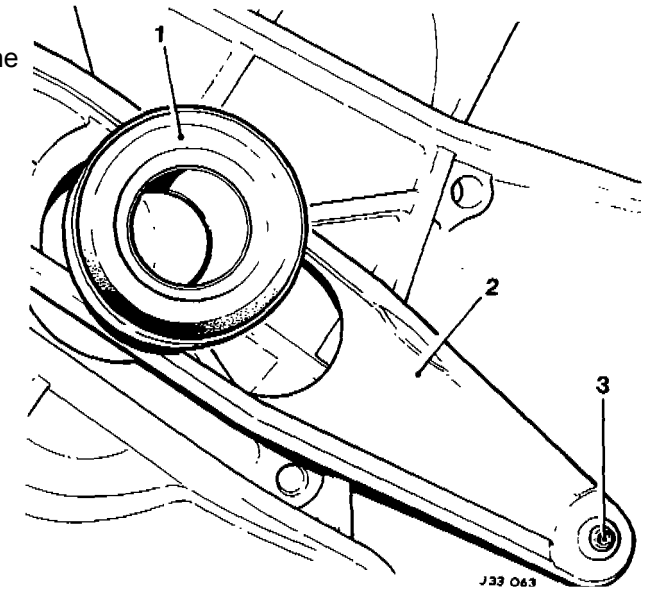


Fig 2

CLUTCH PEDAL

RENEW **33.30.02**

Remove the pedal box.
Using a large screwdriver to disengage the return spring (1 Fig 1) from the pedal (2 Fig 1). Remove the spring clip (3 Fig 1) washer (4 Fig 1) and clevis pin (5 Fig 1) securing the pedal arm to the master cylinder push rod.
Remove the locating pin. Tap the clutch shaft (6 Fig 1) from the pedal box casting and recover the pedal return spring and washers.
Locate the return spring on the pedal boss.
Smear the clutch shaft with suitable grease.
Tap the clutch shaft through the casting, locating the groove to the outside edge, and a washer at either side of the pedal boss.
Fit the pedal arm to the master cylinder push rod and secure using a clevis pin, plain washer and new split pin.
Refit the pedal box and bleed the hydraulic system 33.15.01 page 17.

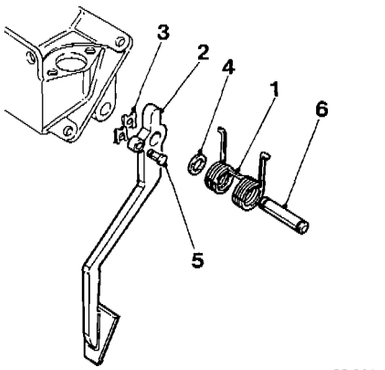


Fig 1

DATA

TORQUE FIGURES

Pedal housing to body 24-30Nm
Pedal steady bracket to housing 18-20Nm

SPANNER SIZES

13mm
15mm

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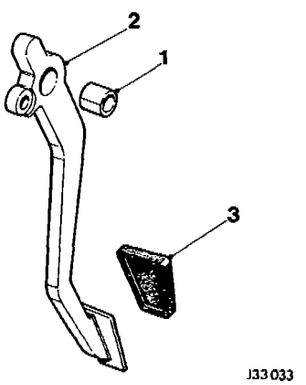


Fig 2

CLUTCH PEDAL

OVERHAUL **33.10.07**

Remove the clutch pedal 33.30.02 page 12.
Using a suitable mandrel, press the bush (1 Fig 2) from the pedal boss (2 Fig 2).
Using a suitable mandrel, press the new bearing bushes in from each side.
Press until the bush is flush with the sides of the pedal.
Lightly ream the bush to the size using the pedal shaft to check fit.
Smear bushes with a suitable grease.
Fit the clutch pedal 33.30.02 page 12 and fit a new rubber (3 Fig 2).

DATA

TORQUE FIGURES

Pedal ***housing to body 24-30Nm***
Pedal steady ***bracket to housing 18-20Nm***

SPANNER SIZES

13mm
15mm

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MASTER CYLINDER

RENEW 33.20.01

Remove the pedal 33.30.02 page 12.
Note the fitted postion of the return spring, disconnect the spring from the pedal.
Remove and discard the securing clip (1 Fig 1)
Withdraw the clevis pin (2 Fig 1).
Remove nuts and spring washers (3 Fig 1) securing the master cylinder to pedal box.
RHD cars only: Remove the setscrew nut and washers securing the master cylinder to the pillar.
Withdraw the brake fluid reservoir bracket, lift off the master cylinder (4 Fig 1) and shims (if fitted – 5 Fig 1).

To refit the new cylinder, reverse the removal procedure and bleed the hydraulic system 33.15.01 page 17.
CAUTION: The hydraulic fluid used in the clutch system is injurious to car paintwork. Utmost precautions MUST be taken at all times to prevent spillage of fluid. Should fluid be accidentally spilled on paintwork, wipe fluid off immediately with a cloth moistened with denatured alcohol (methylated spirits).

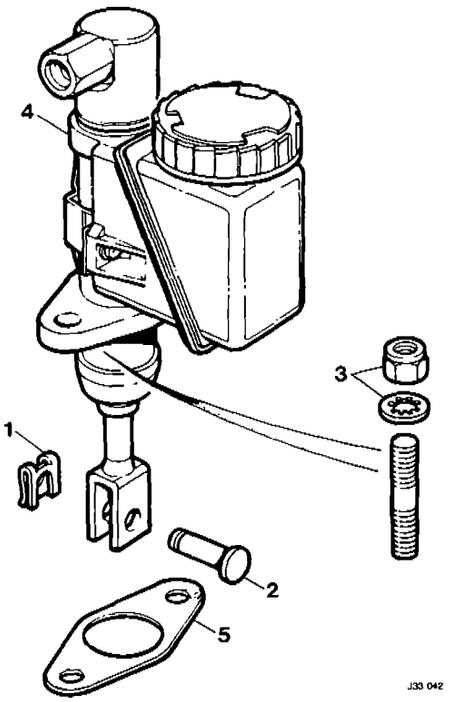


Fig 1

DATA

TORQUE FIGURES

Master cylinder to housing 22-28Nm
Hydraulic pipe to master cylinder 16-19Nm
Bleed nipple to slave cylinder 16-19Nm

SPANNER SIZES

13mm

OILS/GREASES/FLUIDS

Clutch master cylinder ***Castrol Girling Universal/ Disc***

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CLUTCH MASTER CYLINDER

OVERHAUL 33.20.07

WARNING: USE ONLY CLEAN BRAKE FLUID OR DENATURED ALCOHOL (METHYLATED SPIRITS) FOR CLEANING. ALL TRACES OF CLEANING FLUID MUST BE REMOVED BEFORE REASSEMBLY. ALL COMPONENTS MUST BE LUBRICATED WITH CLEAN BRAKE FLUID AND ASSEMBLED USING THE FINGERS ONLY.

Dismantling:
Remove the master cylinder 33.20.01 page 13.
Detach the rubber boot (1 Fig 1) from the end of the barrel and move the boot along the push rod (2 Fig 1).
Press the push rod, remove the circlip (3 Fig 1).
Withdraw the push rod, piston (4 Fig 1), piston washer (5 Fig 1), main cup, (6 Fig 1) spring retainer (7 Fig 1) and spring (8 Fig 1).
Remove the secondary cup (9 Fig 1) from the piston.

Inspection:
Examine the cylinder bore for scoring.
Throughly wash out the reservoir, and ensure the by-pass hole in the cylinder bore is clear. Dry using compressed air or a lint-free cloth.
Lubricate the new seals with clean brake fluid.

Reassembling:
If necessary, fit end plug on the new gasket.
Fit the spring retainer to the small end of the spring, bend over the retainer ears to secure.
Insert the spring, large end leading into the cylinder bore, follow with the main cup, lip foremost. Ensure the lip is not damaged on the circlip groove. Using the fingers only, stretch the secondary cup on the piston with the small end towards the drilled end and groove engaging the ridge. Gently work round the cup with the fingers to ensure correct bedding.
Insert the piston washer into the bore, curved edge towards main cup.
Insert the piston, drilled end foremost.
Fit rubber boot to the push rod.
Offer the push rod to the piston and press into the bore until the circlip can be fitted behind the push rod stop ring.
CAUTION: It is important to ensure that the circlip is fitted correctly into the groove.
Locate the rubber boot in the groove.

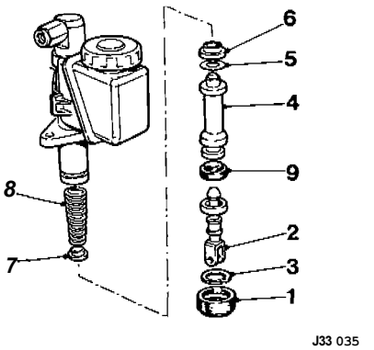


Fig 1

DATA

TORQUE FIGURES

Master cylinder to housing **22-28Nm**
Hydraulic pipe to master cylinder **16-19Nm**
Bleed nipple to *slave cylinder* **16-19Nm**

SPANNER SIZES

13mm

OILS/GREASES/FLUIDS

Jaguar Brake Fluid or Castrol Girling Universal/ Disc

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CLUTCH SLAVE CYLINDER

RENEW 33.35.01

Disconnect the pipe from the slave cylinder, plug or tape the pipe to prevent the ingress of any dirt.
Remove the nuts (1 Fig 1) and spring washers securing the slave cylinder *to* the gearbox.
Slide the slave cylinder (2 Fig 1) off the mounting studs, slide the rubber boot along the push rod, withdraw the cylinder from the push rod (3 Fig 1).
To reassemble, reverse the removal operations **and** bleed the clutch hydraulic system 33.15.01 page 33-17.

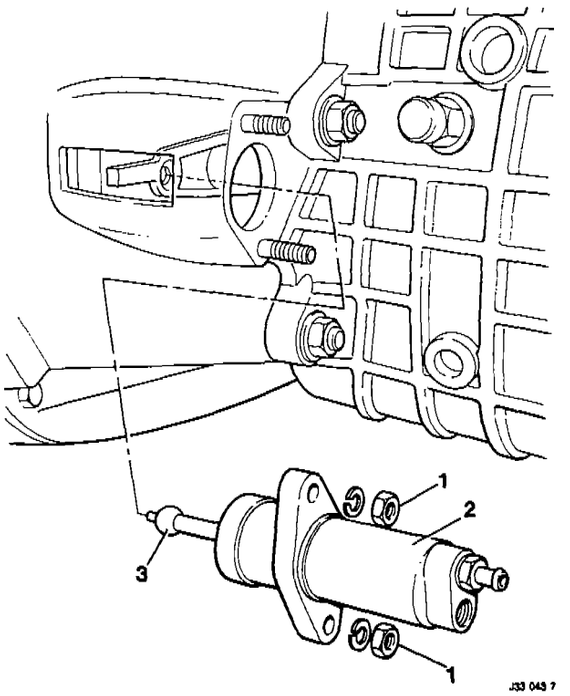


Fig 1

DATA

TORQUE FIGURES

Slave cylinder ***to bell*** *housing* ***23-27Nm***
Hydraulic ***pipe to*** *slave cylinder* ***16-19Nm***
Bleed nipple to slave cylinder ***16-19Nm***

SPANNER SIZES

13mm

OILS/GREASES/FLUIDS

Jaguar Brake Fluid *or* ***Castrol Girling Universal/ Disc***

SLAVE CYLINDER

OVERHAUL 33.35.07

Remove the slave cylinder 33.35.01 page 15.
Dismantle the cylinder.
The new parts in the kit will indicate which used parts should be discarded.
Clean the remaining parts and the cylinder thoroughly with unused brake fluid of the recommended type and place the cleaned Darts on to a clean sheet of paper.
Examine the cylinder bore and the pistons for. signs or corrosion, ridges or score marks. Provided the working surfaces are in perfect condition, new seals from the kit can be fitted, but if there is any doubt as to the condition of the parts then a new cylinder must be fitted.
Fit the new seal (1 Fig 2) to the piston (2 Fig 2) with the flat back of the seal against the shoulder.
Lubricate the seal and the cylinder bore with unused brake fluid of the recommended type and reassemble the cylinder.
Before fitting the dust cover (3 Fig 2), smear the sealing areas with rubber grease.
Squeeze the remainder of the grease from the sachet into the cover to help protect the internal parts.

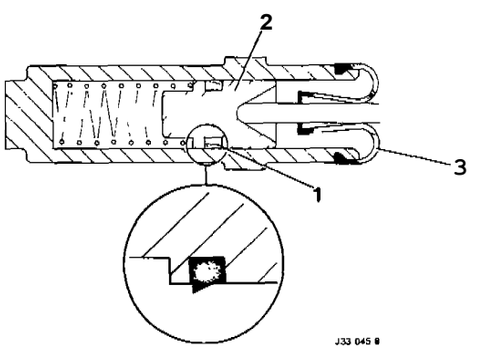


Fig 2

Refit the slave cylinder to the vehicle **and** bleed the system 33.15.01 page 17.

DATA

TORQUE FIGURES

*Slave cylinder **to** bell housing **23-27Nm***
*Hydraulic pipe **to** slave cylinder **16-19Nm***
*Bleed nipple **to** slave cylinder **16-19Nm***

SPANNER SIZES

13mm

OILS/GREASES/FLUIDS

Jaguar Brake Fluid or Castrol Girling Universal/ Disc

0189G

CLUTCH HYDRAULIC PIPE DAMPER

RENEW **33.15.05**

Disconnect the hydraulic pipes (1 Fig 1).
Remove the securing bolts (2 Fig 1) and remove the damper (3 Fig 1).
Refit the new damper and secure with the bolts, reconnect the hydraulic pipes and bleed the system 33.15.01 page 17.

DATA

TORQUE FIGURES

*Bleed nipple to slave cylinder **16-19Nm***
*Clutch damper **to** mounting bracket **7-10Nm***
*Hydraulic **pipes to** clutch damper **16-19Nm***

SPANNER SIZES

8mm
13mm

OILS/GREASES/FLUIDS

Clutch master cylinder Castrol Girling Universal/ Disc

0189G

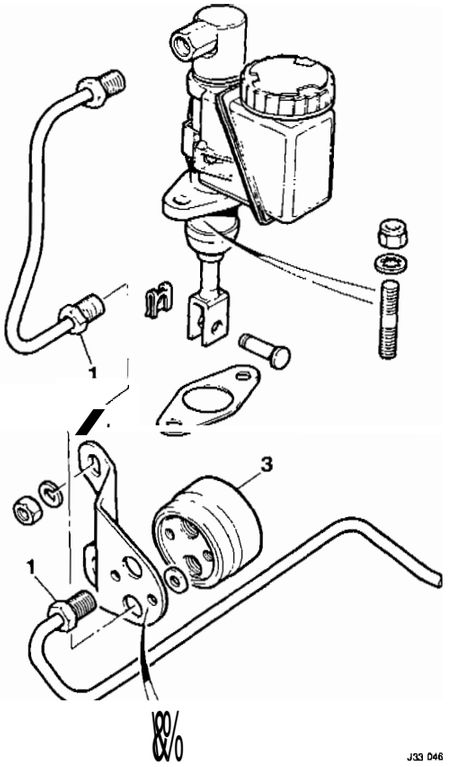


Fig 1

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HYDRAULIC SYSTEM

BLEED 33.15.01

CAUTION: Only use Castrol-Girling brake fluid in the hydraulicsystem.
Remove reservoir filler cap. Top up the reservoir to the correct levelwith hydraulicfluid.
Attach one end of a bleed tube (1 **Fig** 1) to the slave cylinder bleed nipple (2 Fig1).
Partially fill a clean container **(3 Fig** 1) with hydraulic fluid. Immerse the other end of the bleed tube in the fluid.
Slacken the slave cylinder bleed nipple.
Pump the clutch pedal slowly up and down, pausing between each stroke.
Top up the reservoir with fresh hydraulic fluid after every three pedal strokes.
CAUTION: Do not use fluid bled from the system for topping up purposes as this will contain air. If the fluid has been in use for some time it should be discarded. Fresh fluid bled from the system may be used after it has stood for a few hours allowing all the air bubbles to disperse.
Pump the clutch pedal until the pedal becomes firm, tighten the bleed nipple.
Top up the reservoir, refit the filler cap.
Apply the working pressure to the clutch pedal for two to three minutes and examine the system for leaks.

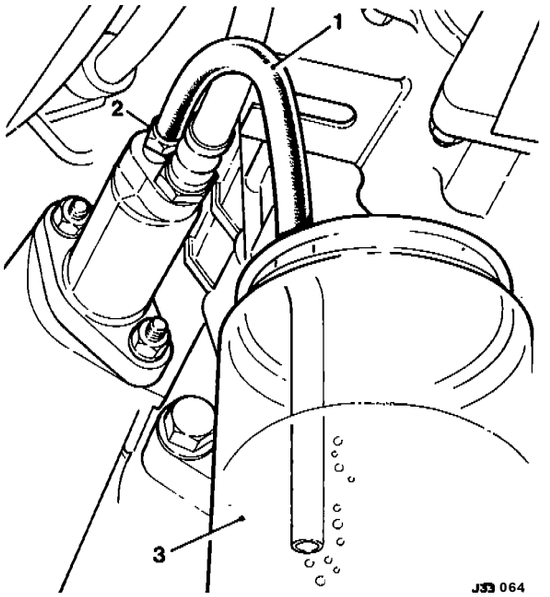


fig 1

DATA

TORQUE FIGURES

Bleed nipple to ***slave cylinder 16-19Nm***

SPANNER SIZES

13mm

OILS/GREASES/FLUIDS

Clutch master cylinder Castrol Girling Universal, Disc

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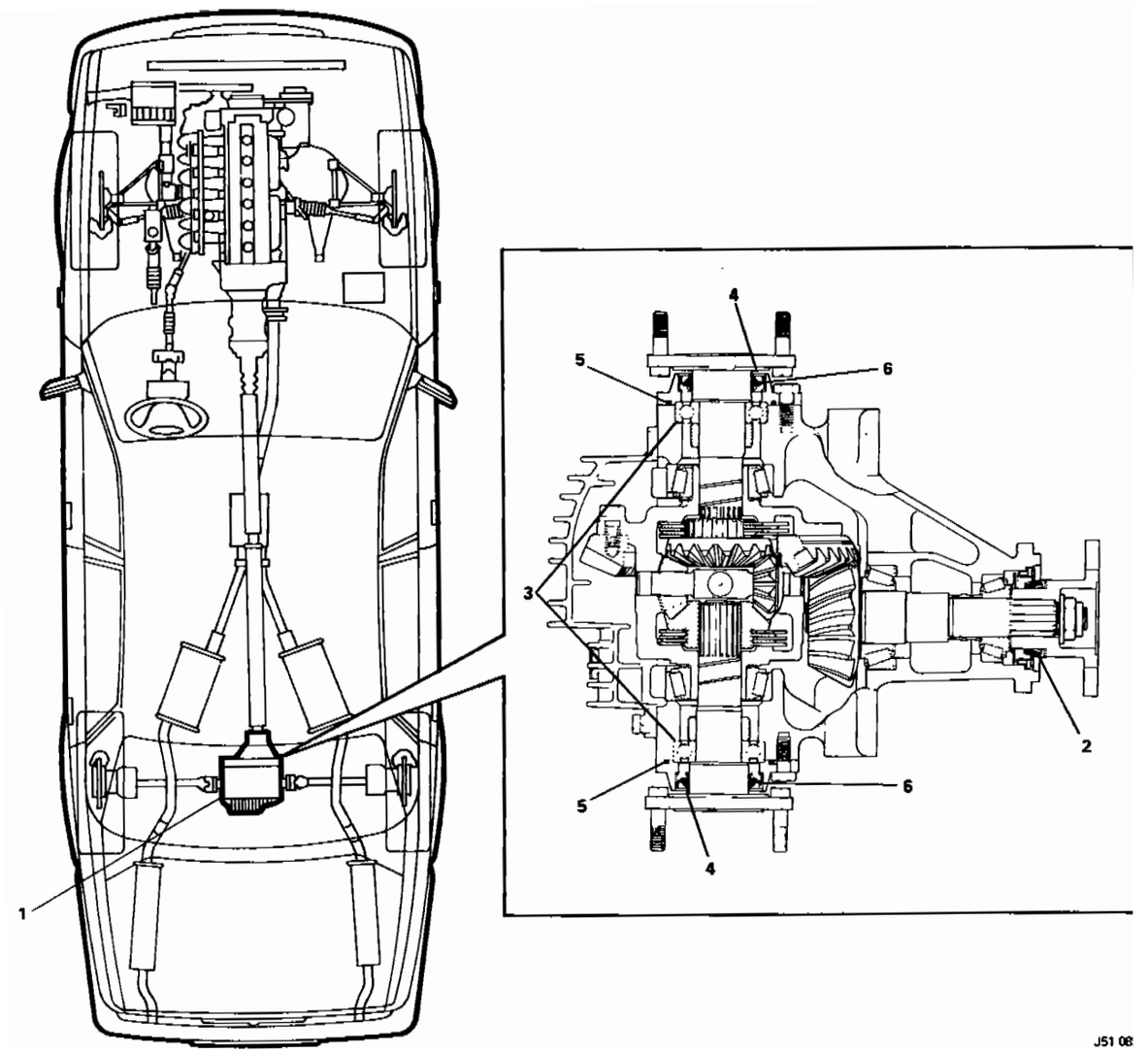
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OUTPUT SHAFT HOUSING OIL SEAL	RENEW	51.20.19	51-15
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ILLUSTRATED INDEX



ILLUSTRATED INDEX–KEY

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0032K

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FINAL DRIVE UNIT

DESCRIPTION 51.00.00

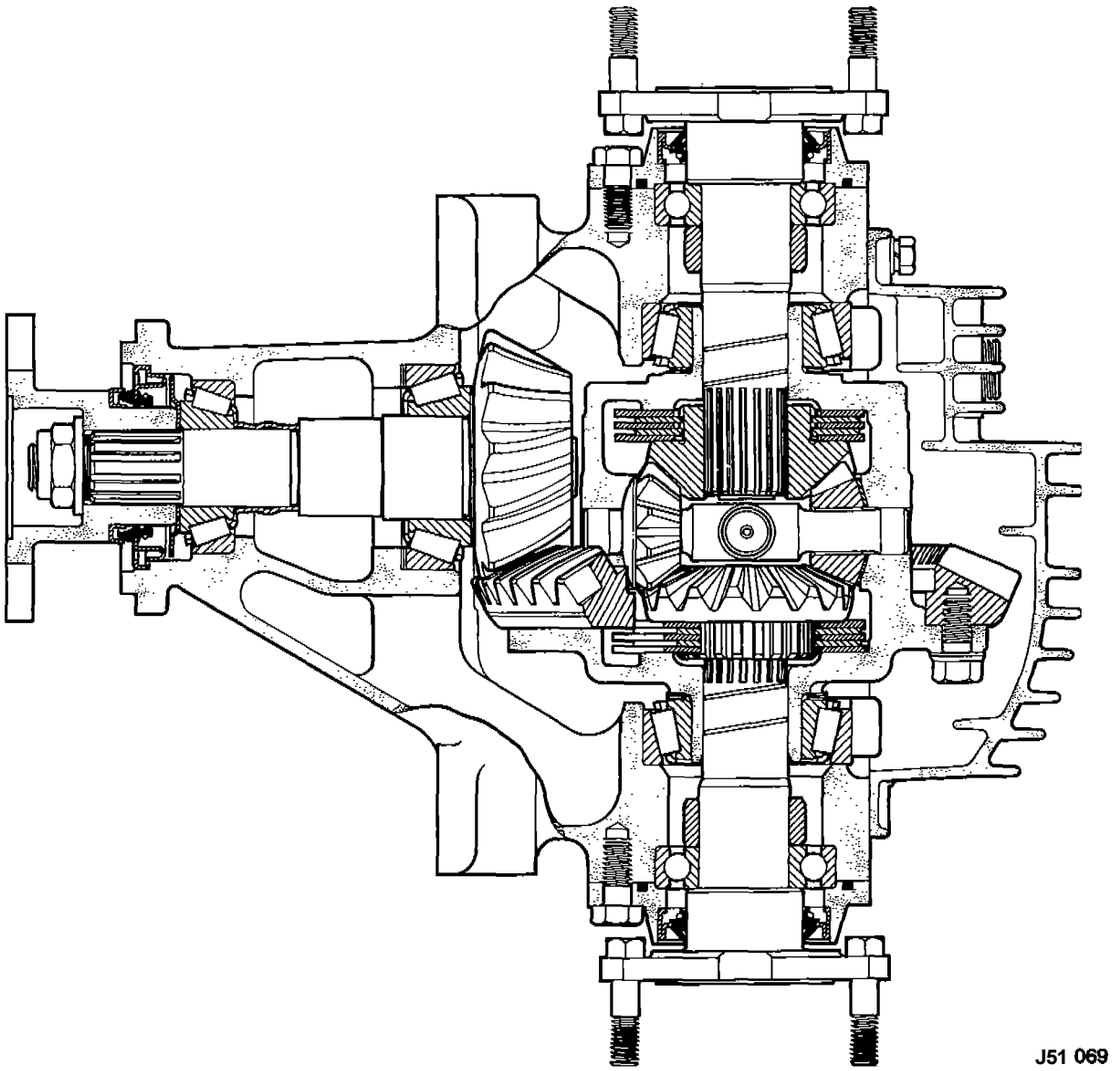
The transmission unit is available in either 'Powr-Lok or non 'Powr-Lok form. When a **'Powr-Lok'** is specified it is identified by a tab bearing the letters PL situated under one of the bolts securing the rear cover.

A 'Powr-Lok' differential differs from a conventional bevel gear unit by the addition of clutch plates loaded by input torque to oppose rotation of the output shafts relative to the differential cage.

Clutch plates are splined to the cage, and their mating discs to the output bevels. The loading between plates and discs increases with input torque due partly to the separating forces of the bevels and also to the bevel pinion cross-shafts being carried on ramps instead of being positively located in the cage.

Increase in input torque causes the cross shafts to move 'up' the ramps and, by pressing plates and discs together to 'lock the differential, gives the effect of a differential-less axle at maximum torque without increasing the disadvantages of this type of axle in low-torque conditions.

Some low-torque stiffness, to reduce one-wheel-spin on ice, is provided by forming the outer plates as Belleville washers to produce compression between plates and discs. If one wheel is prevented from turning and the propeller shaft is disconnected, a torque is required to turn the other wheel.



J51 069

SECTIONED VIEW OF **POWR-LOK** DIFFERENTIAL

FINAL DRIVE UNIT

FAULT DIAGNOSIS 51.00.00

TO CHECK THE TOOTH CONTACT PATTERN

Sparingly paint eight or ten of the drive gear teeth with a stiff mixture of engineers blue. Move the painted gear teeth in mesh with the pinion until a good impression of the total contact is obtained. The result should conform with the ideal tooth contact pattern (Fig 1).

A The HEEL is the larger outer end of the tooth.

B The TOE is the small or inner end of the tooth.

C The DRIVE side of the drive gear tooth is convex.

D The COAST side of the drive gear tooth is concave.

Fig 1 – Ideal tooth contact pattern.

Fig 2 – High tooth contact pattern.

Fig 3 – Low tooth contact pattern.

Fig 4 – Toe contact pattern.

Fig 5 – Heel contact pattern.

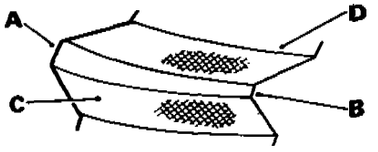


Fig 1

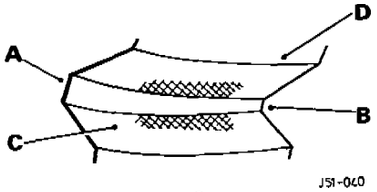


Fig 2

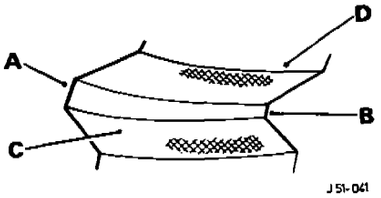


Fig 3

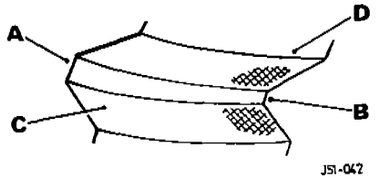


Fig 4

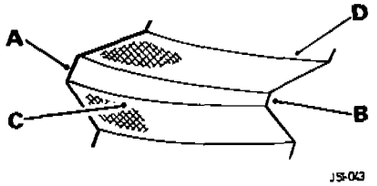


Fig 5

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TOOTH PATTERN DIAGNOSIS

Contact pattern:

The ideal tooth bearing impression on the drive and coast sides of the gear teeth is evenly distributed over the working depth of the tooth profile and is located nearer to the toe (small end) than the heel (large end). This type of contact permits the tooth bearing to spread towards the heel under operating conditions when allowance must be made for deflection.

FAULT	RECTIFICATION
In High Tooth Contact it will be observed that the tooth contact is heavy on the drive face, or addendum. To rectify this condition, move the pinion deeper into mesh, that is, reduce the pinion cone setting distance, by adding shims between the pinion inner bearing cup and the housing and fitting a new collapsible spacer.	Move the drive pinion deeper into mesh i.e. reduce the pinion cone setting.
In Low Tooth Contact it will be observed that the tooth contact is heavy on the drive gear flank or dedendum. This is the opposite condition from that shown in High Tooth Contact and is therefore corrected by moving the pinion out of mesh, that is, increase the pinion cone setting distance by removing shims from between the pinion inner bearing cup and housing and fitting a new collapsible spacer.	Move the drive pinion out of mesh i.e. increase the pinion cone setting.
Toe Contact occurs when the bearing is concentrated at the small end of the tooth.	Move the drive gear out of mesh, that is, increase backlash, by transferring shims from the drive gear side of the differential to the opposite side.
Heel contact is indicated by the concentration of the bearing at the large end of the tooth.	Move the drive gear closer into mesh, that is, reduce backlash, by adding shims to the drive gear side of the differential and removing an equal thickness of shims from the opposite side.
	NOTE: It is important to remember when making this adjustment to correct a heel contact that sufficient backlash for satisfactory operation must be maintained. If there is insufficient backlash the gears will at least be noisy and have a greatly reduced life, whilst scoring of the tooth profile and breakage may result. Therefore, always maintain a minimum backlash requirement of 0.10mm (0.004in).

FINAL DRIVE UNIT

RENEW **51.25.13**

Remove the passenger side dash liner.
Remove the fuel pump relay from the multi plug (second relay from the left, red multi plug).
Open the drivers door and crank the engine for 10 seconds to depressurise the fuel system.
Remove the rear road wheels.
From below, cut the ratchet straps securing the fuel pump feed hose to the axle carrier.
Fit pipe clamps to the feed hose, slacken the clip securing the feed hose to the fuel pump and disconnect the hose.
From above, slacken the filter hose union at the pump and disconnect.
Fit plugs to the pump and hose.
Remove the nuts securing the fuel pump to the axle carrier and position the pump upwards and forwards away from its mounting.
Peel back the rubber insulation boots from the pump terminals and remove the nuts securing the feed wires to the terminals and remove the fuel pump.
Slacken the clamp securing the mounting clamp to the pump and remove the clamp.
Remove the mounting rubber and non-return valve from the pump.

Remove the caliper lower securing bolt, pivot the caliper for access to the brake pack and remove the outer brake pad. Disconnect the inner pad wear sensor block connector.
Remove the remaining caliper securing bolt and secure the caliper to the bump stop.
Repeat the procedure for the second caliper.
Cut the ratchet straps securing the wear sensors to the suspension unit.
Remove the bolts securing the speed sensor to the final drive and displace the sensor from its mounting (Fig 1).
Remove the split pin (2 Fig 2) and clevis (1 Fig 2) securing the handbrake cable (3 Fig 2) to the yoke (4 Fig 2), collect the washer.
Disconnect the rear cables at the joiner and remove the yoke from the cable.

Remove the bolts (5 Fig 2) securing the propeller shaft (6 Fig 2) to the differential drive flange and seperate the flanges.
Remove the bolts securing the overaxle pipe mountings to the subframe.
Take the weight of the rear suspension on a jack.
Remove the bolts securing the front mounting to the body, collect the mounting bracket, bolt and spacer.
Disconnect the rubber from the body mounting peg.
Remove the bolt securing the tie bar to the body.
Remove the bracket and spacer.
Disconnect the subframe mounting rubber from the body mounting peg, remove the rear strut to body securing bolt (1 Fig 3) and shock absorber lower securing bolt and nut (1 Fig 1 page 51-08).
Repeat the procedure for the other side.
Lower the unit from the vehicle on the jack and manoeuvre from beneath the vehicle.

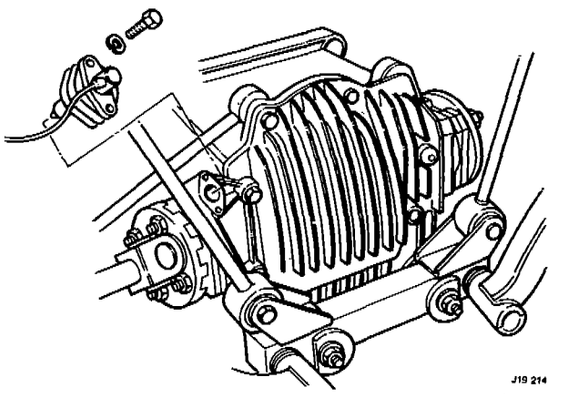


Fig 1

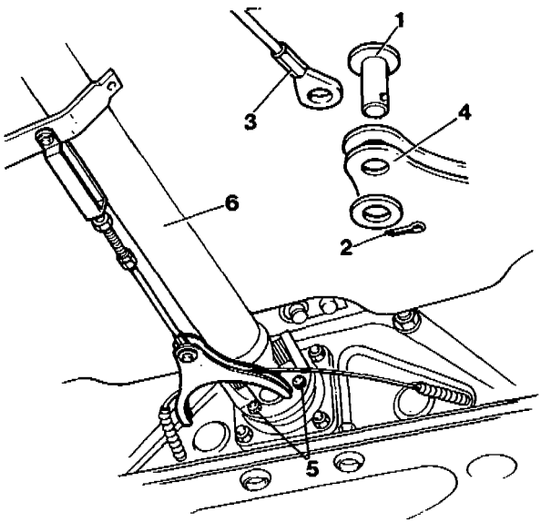


Fig 2

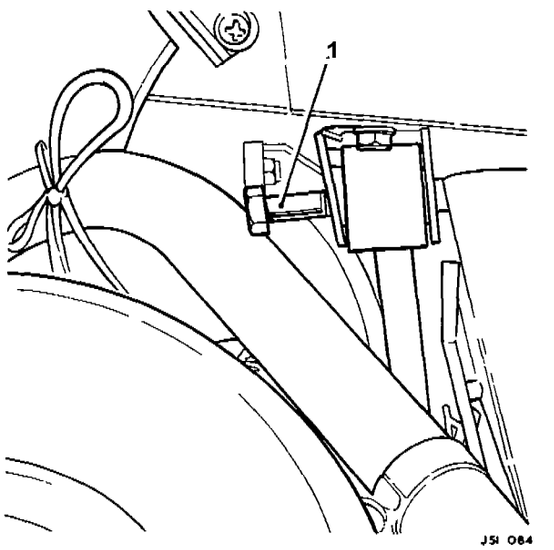


Fig 3

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Remove the nuts and bolts securing the drive shaft to the differential output flange.
Remove the circlip securing the handbrake outer cable to the frame and remove the cable from the frame.
Disconnect the drive shaft from the output shaft and collect the camber shim.
Remove the lower wishbone fulcrum bolt securing nut and drift out the bolt.
Remove the fulcrum tube (1 Fig 2), spacing washers (2 Fig 2) and remove the lower wishbone/drive shaft assembly (3 Fig 2).
Repeat the procedure for the second side.

Invert the assembly and remove the nuts securing the differential to the carrier.
Remove the spacers and rear carrier assembly.
Remove the subframe lower securing bolts and rear bracket.
Remove the bolts securing the final drive nose plate.
Remove the nuts securing the final drive to the front carrier/front frame.
Remove the nuts and bolts securing the tie bar to the final drive (1.2 Fig 3).
Remove the subframe assembly.
Remove the front frame to front carrier spacers and remove the front carrier.
Remove the nose plate securing studs and the rear pendulum bolts.
Remove the bolts securing the road speed sensor mounting bracket to the differential and collect the bracket.
Clean all components and check for wear and distortion.
Reverse the removal procedure to fit the replacement differential unit.
Ensure that the differential unit is filled with new oil.

Refit the rear road wheels.
Refit the relay and dash liner.
Secure the dash liner with the screws.

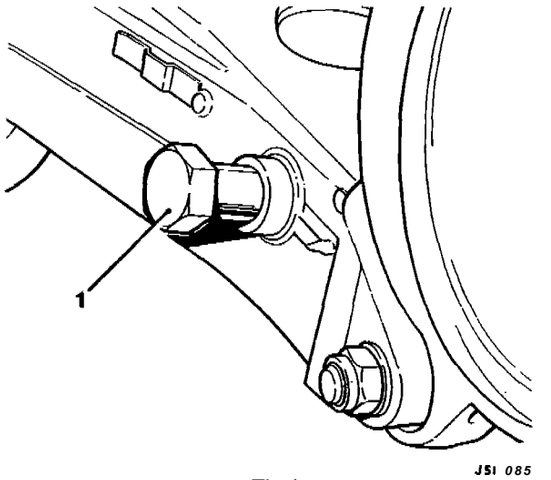


Fig 1

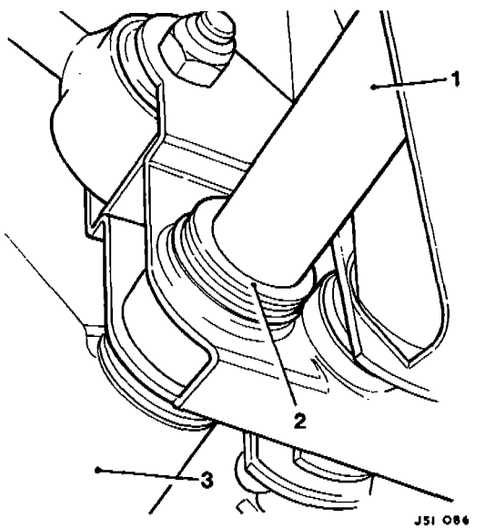


Fig 2

DATA

TORQUE FIGURES

Caliper to carrier **31-40Nm**
Differential strut to top bracket **80-100Nm**
Differential strut top bracket to body **45-55Nm**
Differential strut to wishbone tie **85-105Nm**
Drive shaft to differential **78-95Nm**
Frame centre boss **92-112Nm**
Frame outer bracket **92-110Nm**
Frame to rear mounting **92-112Nm**
Front mounting to axle carrier **22-28Nm**
Fuel feed hose to pump (clip) **2.2-2.5Nm**
Fuel pump feed hose to pump (union) **10-12Nm**
Fuel pump mounting bracket to axle carrier **7-10Nm**
Lower mounting bracket to body **40-50Nm**
Mounting bracket to drive unit **45-55Nm**
Pendulum to differential mounting stud **160-200Nm**
Propeller shaft to differential **95-105Nm**
Road speed sensor mounting bracket **22-28Nm**
Road speed sensor to mounting bracket **7-8Nm**
Spring and damper to wishbone **160-200Nm**

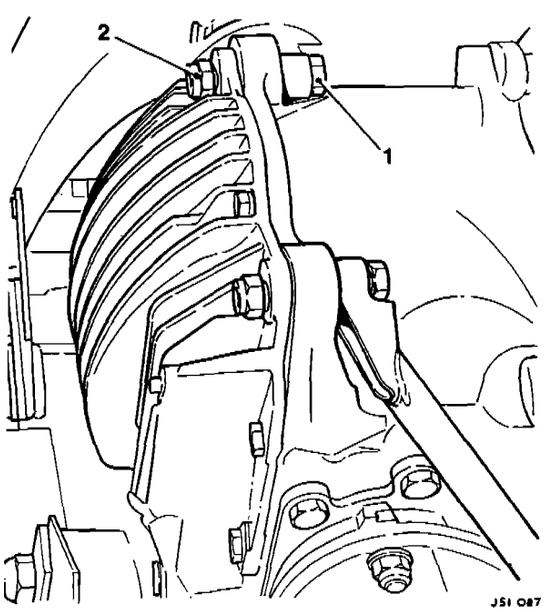


Fig 3

DATA (CONTINUED)

TORQUE FIGURES

Stud differential nose **47-57Nm**
Upper link mounting 92-112**Nm**
Wheel nut to wheelstud (STEEL WHEEL) **65-85Nm**
Wheel nut to wheelstud (ALLOY WHEEL) **88-102** *Nm*
Wishbone to drive unit 85-**105Nm**

SPANNER SIZES

8mm
10mm
13mm
17mm
19mm
22mm
24mm
30mm

OILS/GREASES/SEALANTS

Caliper to carrier bolts/guide pins – Molykote 7 1
Differential oil – Shell Spirax Super 90 0
Lower shock absorber bolt – Castrol LM
Lower wishbone to differential pendulum shaft – Castrol LM
Subframe centre and rear securing bolts **– Loctite**

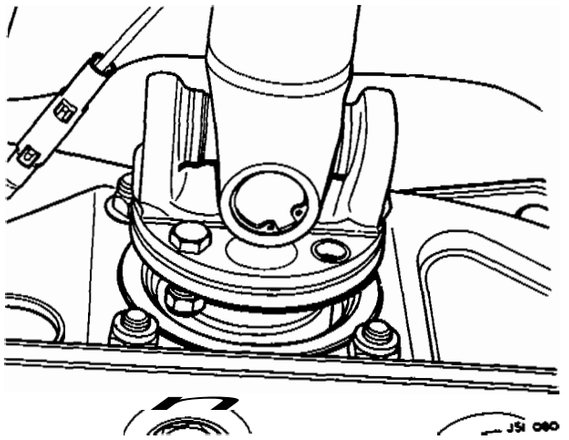
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FINAL DRIVE UNIT PINION OIL SEAL

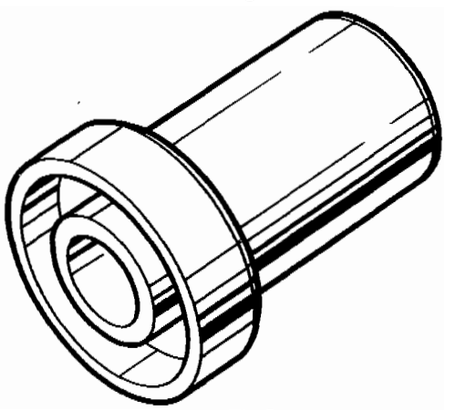
RENEW **51.20.01**

Raise the vehicle on a ramp. Remove the propshaft to drive flange securing bolts (Fig **1**).
Repositionthe prop shaft for access.
Using a torque wrench, measure the torque required to turn the pinion through the backlash.
Ensurethatthe pinion is resetbeforeeach measurement.
Markthe flange securing nuttto pinionshaft. Removethe pinion flange securing nut and place a two leg puller to the front. Undo the tool centre bolt and fit and align the pullerto the pinion flange. Tighten the tool centre bolt to the extractflange.


Fig 1

Place the puller aside and using suitable seal remover tool, displace and remove the pinion seal. Clean flange and casing seal faces.

Fit and align the new seal to Service Tool **18G 1428A** (Fig 2). Fit and fully seatthe seal to the casing and place tool aside.
Lubricate the pinion seal and fit and fuly seat the drive flange to the pinion/seal. Fit and tighten the drive flange securing nut to mark. Using a suitable torque wrench check pinion pre-load (35-55 lbs inch).


Fig 2

Reposition the propshaft to the drive flange. Fit and tighten the securing nuts/bolts. Undo and remove the final drive oil filler plug then clean the plug. Check and top upthe oil level. Fitandtighten the filler plug.
Lowerthe ramp.

DATA

SERVICE TOOLS

***18G1428A** Oil seal installer*

TORQUE FIGURES

*Propeller **shaft to drive flange 95-105Nm***
Wheelnutto wheelstud (STEEL WHEEL) 65-85 Nm
Wheelnutto wheelstud (ALLOY WHEEL) 88-102 Nm

SPANNER SIZES

29mm
9/16 AF

0204G

OUTPUT SHAFT BEARING

RENEW **51.10.22**

Remove the road wheel.
Turn the drive shaft for access to first securing nut (1 Fig 1) and remove drive shaft to final drive flange securing nut.
Turn shaft for access and remove remaining nuts.

Place a suitable stand to the front. Reposition the drive shaft from the flange and position hub onto the stand. Ensure that the brake hose is not stressed – displace and remove the spacer from the flange. Undo and remove the first output shaft securing bolt. Reposition the output flange for access.
Repeat for the remaining securing bolts.
Displace and remove the output shaft assembly and remove and discard 'O' ring seal. Clean the output shaft and final drive faces.
Displace and remove the output shaft shims from final drive. Open vice and insert output shaft assembly, tightening to fit.
Mark the bearing retaining collar with punch. Pilot drill the bearing retaining collar, then open out to 1/2" (1 Fig 2) taking care not to drill the output shaft. Using suitable chisel, break retaining collar at drilling (2 Fig 2). Open vice.

Place the output shaft assembly to press and close the vice.
Reposition the press retaining plates under the seal housing (Fig 3).
Using the press, displace shaft from the seal housing and collar. Remove the shaft, seal housing, bearing and retaining collar from the press.

Place a suitable block of wood to the front, place seal/housing to the wood and using suitable drift, displace and remove seal from housing.
Clean the shaft and seal housing, together with shims.
Place the output seal housing to the press and place the seal replacer tool JD 550-1 (1 Fig 1 page 12) and driver handle 18G 134 (2 Fig 1 page 12) to the front. Fit and align the new seal to the tool.
Fit and align the tool/seal assembly to the housing using press. Fully seat the seal to the housing ensuring the seal is square to the housing when fitting.

Remove the housing/tool assembly from the press and place tool JD 550-1 aside. Place output shaft to front and lubricate the seal. Fit and align the seal housing assembly to the output shaft. Place a new bearing to the fornt and lubricate the bearing. Align the bearing to the output shaft assembly and place a suitable block of wood to press fit and align output shaft assembly to press/wooden block. Ensure that the flange securing studs do not rest on the press plate.

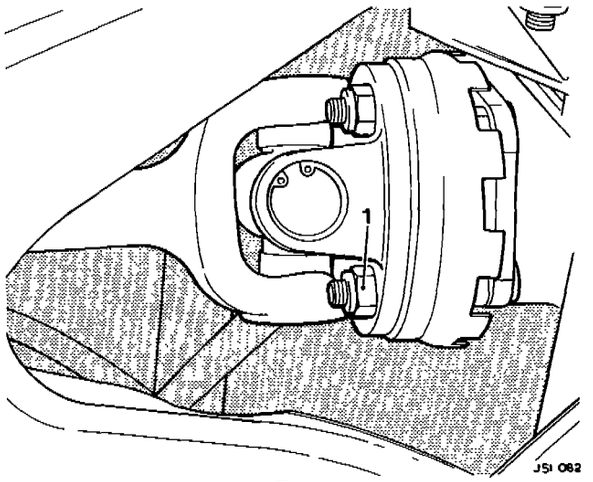


Fig 1

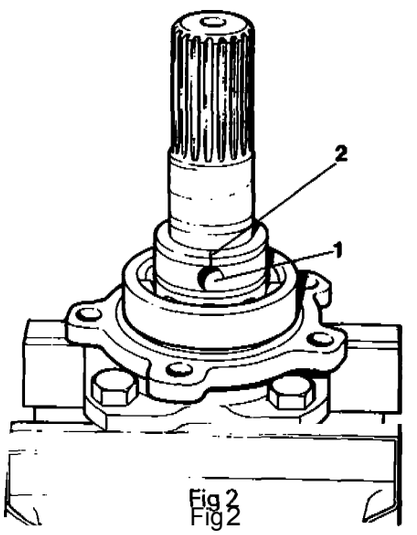


Fig 2
Fig 2

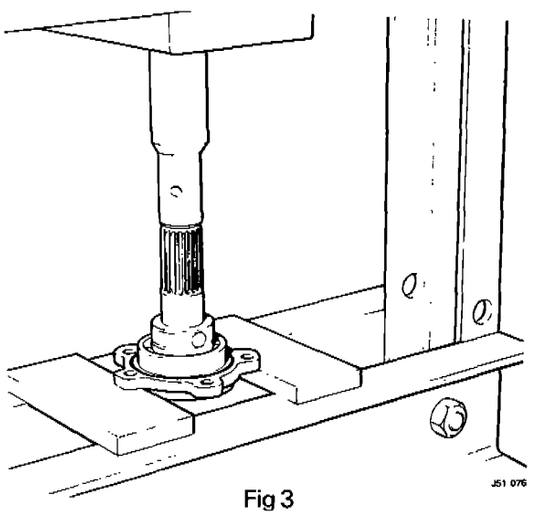


Fig 3

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Place the bearing replacer tool **SL** 7 to output shaft/ bearing.
Press the bearing fully home and displace and remove tool SL 7. Fit a new bearing retaining collar to the shaft assembly and fit and align **SL** 7 to the collar.
Press the retaining collar full home and displace and remove **SL** 7.
Remove the output shaft assembly from the press and fit and align shims to final drive.
Offer up the output shaft assembly WITHOUT the O ring seal. Fit and fully seat the assembly. DO NOT fit the securing bolts.
Measure the gap between the bearing housing and the casing. The correct gap should be 0.003-0.005in.
If the gap is correct, remove the shaft assembly, fit the O ring seal, and refit the assembly to the casing. Fit and tighten the securing bolts.
If the gap is incorrect, remove the shaft assembly and re-shim until the correct clearance is obtained.
NOTE: There should always be three shims behind the bearing.
When the clearance is correct, fit the O ring seal and fit the assembly to the casing. Fit and tighten the securing bolts.

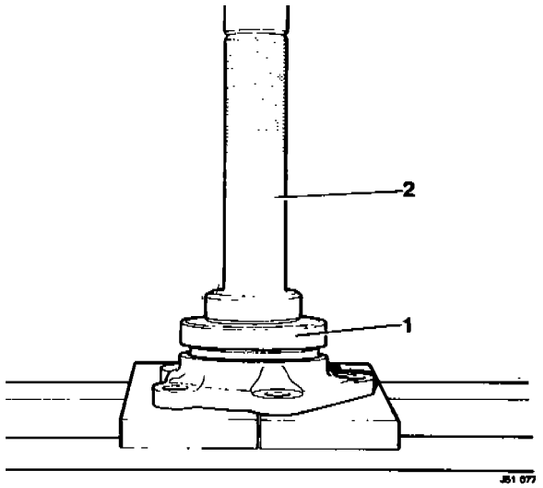
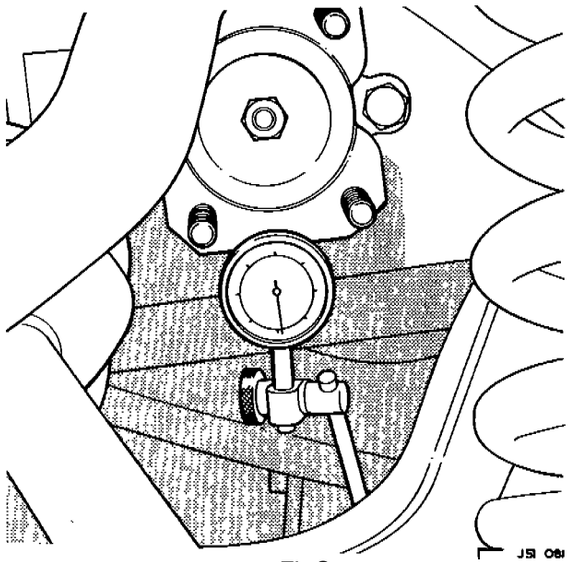


Fig 1

Fit a magnetic dial gauge to the output flange and measure the end float (Fig 2).
The correct end float should be 0.001-0.006in (this end float is pre-set, built into the bearing). If the end float is outside the given tolerances, the output shaft bearing must be replaced.
Reconnect the output shaft. Fit and tighten the securing bolts.
Refit the road wheel.


Fig 2

DATA

Bearing housing ***gap 0.003-0.005 inch***
Output *shaft end float* ***0.001-0.006 inch***

SERVICE TOOLS

SL 7 *Bearing cone and cup replacer*
JD 550-1 *Oil seal adaptor*
18G 134 *Driver handle*

TORQUE FIGURES

Oil seal housing to differential ***51-58Nm***
Output shaft to differnetial ***78-95Nm***
Wheel nut ***to*** *wheelstud (STEEL WHEEL) 65-85Nm*
Wheel nut to wheelstud (ALLOY WHEEL) ***88-102 Nm***

SPANNER SIZES

13mm
17mm
22mm
11/16AF

0204G

OUTPUT SHAFT OIL SEAL

RENEW **51.20.04**

Remove the road wheel.
Turn the drive shaft for access to first securing nut (1 Fig 1) and remove drive shaft to final drive flange securing nut.
Turn shaft for access and remove remaining nuts.

Place a suitable stand to the front. Reposition the drive shaft from the flange and position hub onto the stand. Ensure that the brake hose is not stressed – displace and remove the spacer from the flange. Undo and remove the first output shaft securing bolt. Reposition the output flange for access.
Repeat for the remaining securing bolts.
Displace and remove the output shaft assembly and remove and discard 'O' ring seal. Clean the output shaft and final drive faces.
Displace and remove the output shaft shims from final drive. Open vice and insert output shaft assembly, tightening to fit.
Mark the bearing retaining collar with punch. Pilot drill the bearing retaining collar, then open out to 1/2″ (1 Fig 2) taking care nor to drill the output shaft. Using suitable chisel, break retaining collar at drilling (2 Fig 2). Open vice.

Place the output shaft assembly to press and close the vice.
Reposition the press retaining plates under the seal housing (Fig 3).
Using the press, displace shaft from the seal housing and collar. Remove the **shaft,** seal housing, bearing and retaining collar from the press.

Place a suitable block of wood to the front, place seal/housing to the wood and using suitable drift, displace and remove seal from housing.
Clean the shaft and seal housing, together with shims.
Place the output seal housing to the press and place the seal replacer tool JD 550-1 (1 Fig 1 page 14) and driver handle 18G 134 (2 Fig 1 page 14) to the front. Fit and align the new seal to the tool.
Fit and align the tool/seal assembly to the housing using press. Fully seat the seal to the housing ensuring the seal is square to the housing when fitting.

Remove the housing/tool assembly from the press and place tool JD 550-1 aside. Place output shaft to front and lubricate the seal. Fit and align the seal housing assembly to the output shaft. Place a new bearing to the front and lubricate the bearing. Align the bearing to the

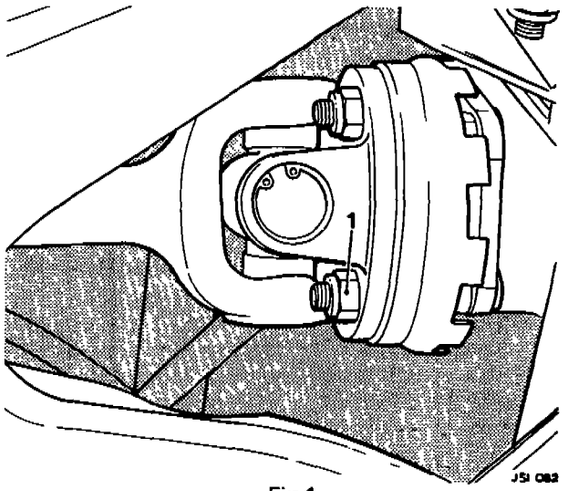


Fig 1

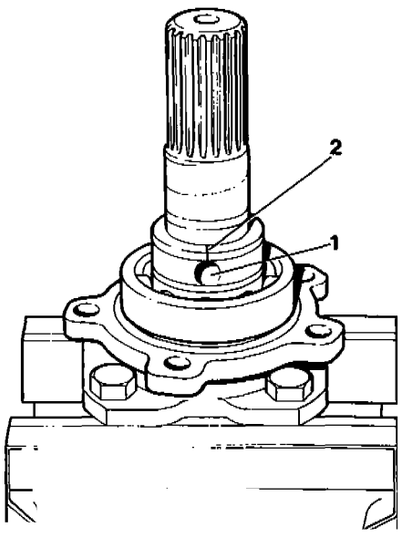
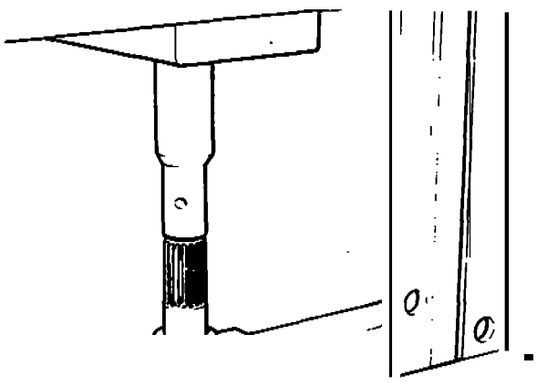


Fig 2



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Place the bearing replacer tool SL 7 to output shaft/ bearing (Fig 2).
Press the bearing fully home and displace and remove tool SL 7. Fit a new bearing retaining collar to the shaft assembly and fit and align SL 7 to the collar.
Press the retaining collar full home and displace and remove SL 7.
Remove the output shaft assembly from the press and fit and align shims to final drive.
Offer up the output shaft assembly WITHOUT the O ring seal. Fit and fully seat the assembly. DO NOT fit the securing bolts.
Measure the gap between the bearing housing and the casing. The correct gap should be 0.003-0.005in.
If the gap is correct, remove the shaft assembly, fit the O ring seal, and refit the assembly to the casing. Fit and tighten the securing bolts.
If the gap is incorrect, remove the shaft assembly and re-shim until the correct clearance is obtained.
NOTE: There should always be three shims behind the bearing.
When the clearance is correct, fit the O ring seal and fit the assembly to the casing. Fit and tighten the securing bolts.

Fit a magnetic dial gauge to the output flange and measure the end float (Fig 3).
The correct end float should be 0.001-0.006in (this end float is pre-set, built into the bearing). If the end float is outside the given tolerances, the output shaft bearing must be replaced.
Reconnect the output shaft. Fit and tighten the securing bolts.
Refit the road wheel.

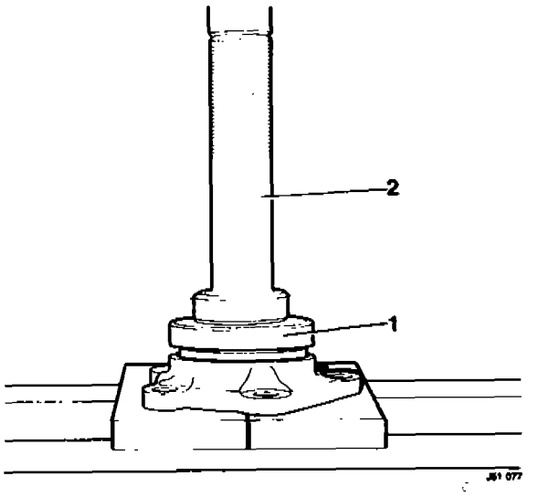


Fig 1

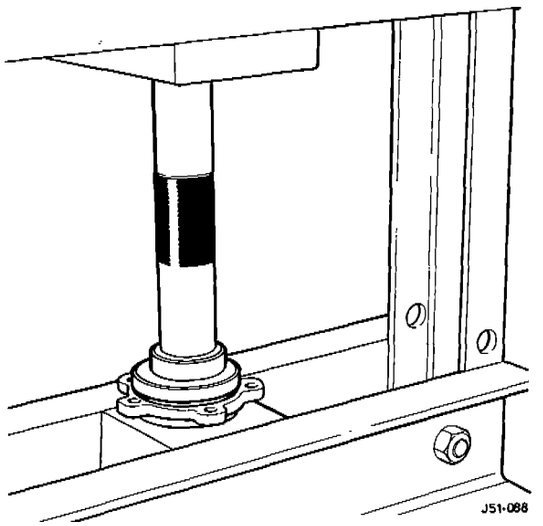
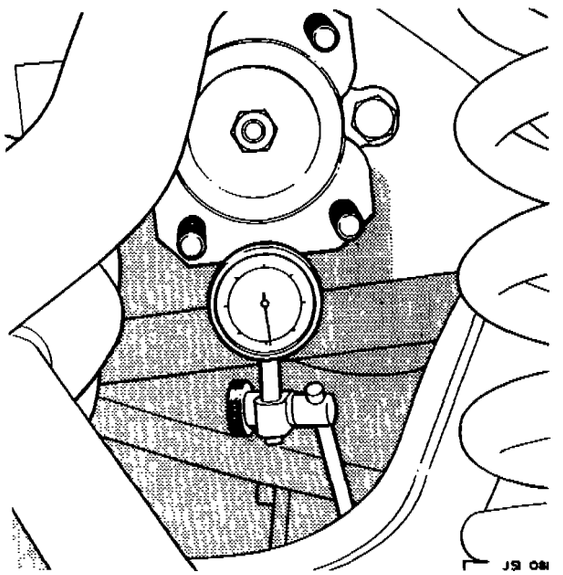


Fig 2


Fig 3

DATA

Bearing housing gap ***0.003-0.005 inch***
Output shaft end ***float 0.001-0.006 inch***

SERVICE TOOLS

SL 7 Bearing cone and cup replacer
JD ***550-1*** *Oil seal adaptor*
18G ***134*** *Driver* ***handle***

TORQUE FIGURES

Oil seal housing to differential ***51-58Nm***
Output shaft to differnetial ***78-95Nm***
Wheelnut to wheelstud (STEEL WHEEL) 65-85 Nm
Wheelnut to wheelstud (ALLOY WHEEL) 88-102 Nm

SPANNER SIZES

13mm
17mm
22mm
11/16AF

0204G

OUTPUT SHAFT HOUSING OIL SEAL

RENEW **51.20.19**

Remove the road wheel.
Turn the drive shaft for access to first securing nut (1 Fig 1) and remove drive shaft to final drive flange securing nut.
Turn shaft for access and remove remaining nuts.

Place a suitable stand to the front. Reposition the drive shaft from the flange and position hub onto the stand. Ensure that the brake hose is not stressed – displace and remove the spacer from the flange. Undo and remove the first output shaft securing bolt. Reposition the output flange for access.
Repeat for the remaining securing bolts.
Displace and remove the output shaft assembly and remove and discard 'O' ring seal. Clean the output shaft and final drive faces.
Fit the new 'O' ring seal.
Reconnect the output shaft. Fit and tighten the securing bolts.
Refit the road wheel.

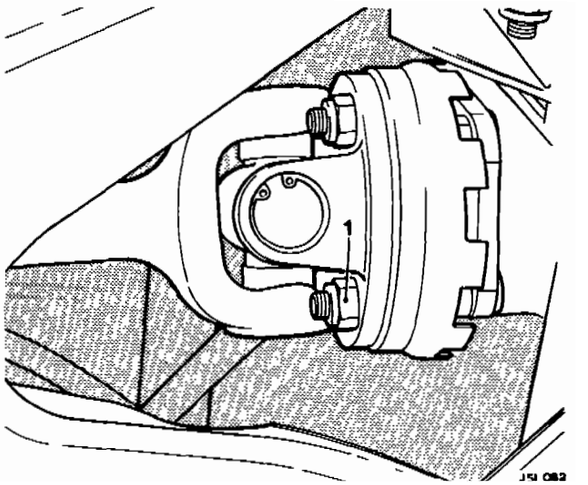


Fig 1

DATA

TORQUE FIGURES

Oil seal ***housing*** *to differential* ***51-58Nm***
Output shaft ***to*** *differential* ***78-95Nm***
Wheel nut to wheel stud ***(STEEL WHEEL) 65-85 Nm***
Wheel nut ***to*** *wheel stud* ***(ALLOY WHEEL) 88-102 Nm***

SPANNER SIZES

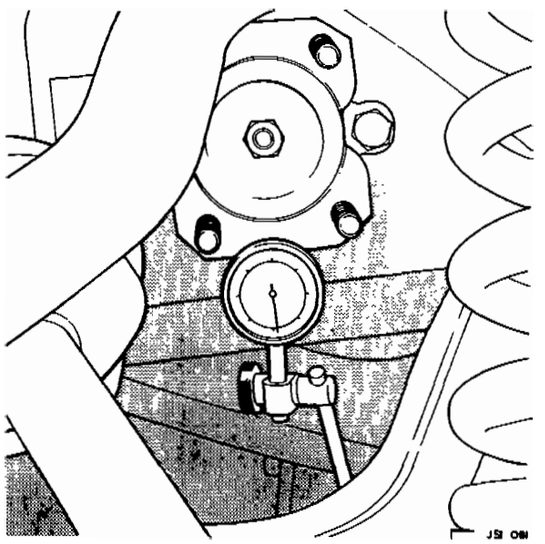
17mm
11/16AF

OUTPUT SHAFT END FLOAT

CHECK **51.10.24**

Remove the road wheel.
Fit and align the magnetic dial gauge to the lower plate, repositioning the dial gauge to the output shaft flange (Fig 2). Tighten the dial gauge adjusting nuts and, using a suitable lever, check and note the output shaft end float.

The correct end float should be 0.001-0.006in (this end float is pre-set, built into the bearing). If the end float is outside the given tolerances, the output shaft bearing must be renewed 51.10.22 page 11.
Refit the road wheel.


Fig 2

DATA

Output shaft *end float* ***0.001-0.006 inch***

TORQUE FIGURES

Wheel nut ***to*** *wheel stud* ***(STEEL*** *WHEEL)* ***65-85Nm***
Wheel nut to wheel stud ***(ALLOY WHEEL) 88-102Nm***

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FINAL DRIVE UNIT CLUTCH PLATES

RENEW **51.91.02**

To overcome Powr Lok differential noise when cornering, a revised Powr Lok clutch pack has been introduced from VIN 557874. Final drive units incorporating the revised clutch packs are identified by a unit serial number after 88H 75025.

Where Powr Lok differential noise is experienced with final drive units prior to the above serial number the revised clutch packs may be fitted as follows:

Parts Required: JLM 1715 – Clutch Pack Kit comprising:

2 off	Grooved tagged plate
2 off	Tagged plate
4 off	Friction disc
4 off	Thin tagged plate
2 off	Belville plate
2 off	Differential side gear
2 off	Lower wishbone stud

Remove the final drive unit from the vehicle 51.25.13 page 07.
Clean the unit and drain the oil.
Secure the unit and remove and discard the lower wishbone studs.
NOTE: The final drive unit may be secured to a suitable work bench by drilling 2 x 15 mm diameter holes in the bench 125 mm apart, 75 mm from the edge of the bench and securing with 2 suitable bolts (Fig 1).
Remove the rear cover.
Remove the output shaft assemblies from the unit, retaining the shims and shaft assemblies separately for re-assembly into their original positions.
Mark the pinion flange, main casing and crownwheel with a dab of paint (A Fig 2) to ensure correct re-assembly).

Position a suitable dial gauge as shown in Fig 1 and measure the backlash between the crownwheel and pinion gears at 3 places equally spaced around the crownwheel. Record the average of the 3 readings.
NOTE: The pinion should be locked when the backlash is measured.
Remove the differential bearing caps, noting the markings on the caps and main casing (B Fig 2).

Fit the main casing stretcher tool (Tool Number GKN 131) as illustrated in Fig 3, position the dial gauge as shown and tighten the clamp nuts to stretch the casing 0.25 mm (0.010).
Using a suitable lever, displace and extract the differential assembly from the main case.
Remove the stretcher tool.
Displace and remove the bearing races from the differential assembly and place aside, suitably marked, to ensure re-assembly into their original positions.

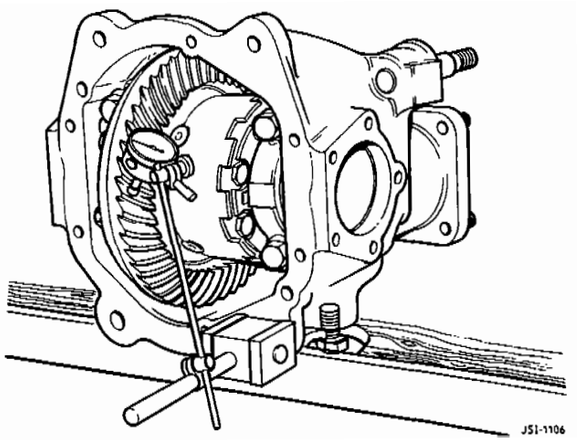


Fig 1

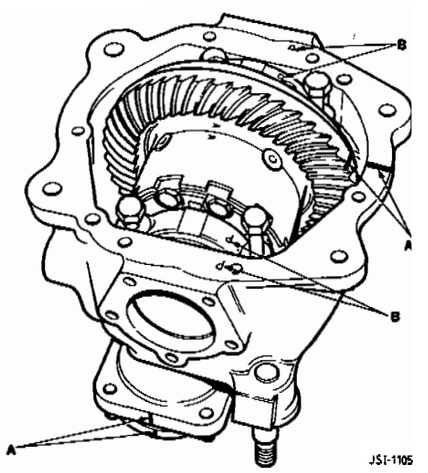


Fig 2

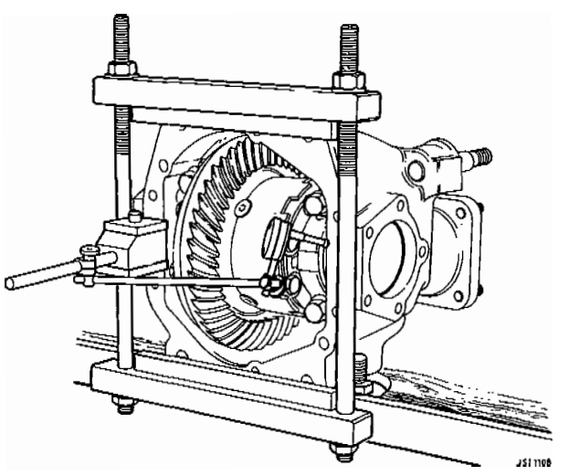


Fig 3

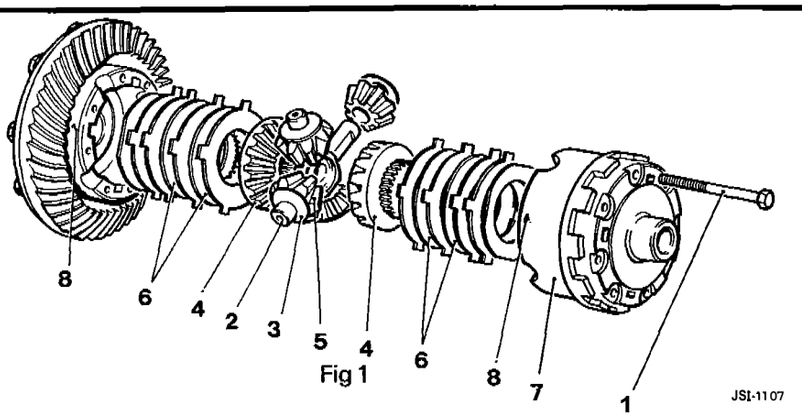


Fig 1

Place the differential assembly on to a bench and remove the case bolts (1 Fig 1).
Remove the button half of the differential case (7 Fig 1).
Mark the cross pin ends and differential case to ensure that the cross pin, pinion mates and thrust washers are all refitted into their original positions during re-assembly.

Remove the cross pin complete with pinion mates and thrust washers (2,3,5 Fig 1).
Remove and discard the differential side gear and clutch plate pack from each half of the differential case (4,6 Fig 1).
Carefully clean all components.

If the final drive unit serial number is prior to 87E 22566 and had a total of 5 clutch plates each side (including the belville plate), re-assemble the differential assembly clutch packs into the differential casing halves in accordance with Fig 2 (6 plates each side. Note the orientation of the belville plates; discard surplus new plates).

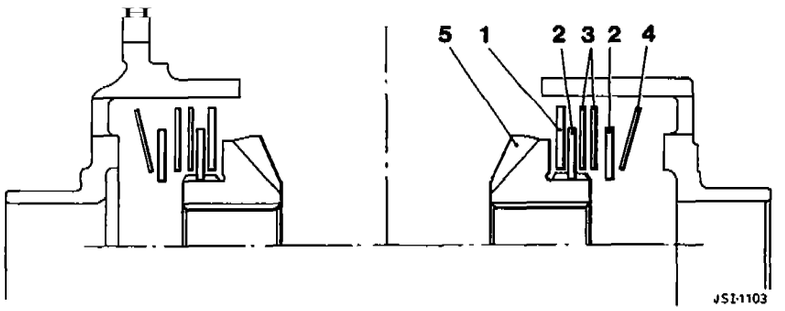


Fig 2

1 Grooved tagged clutch plate – groove towards side gear
2 Friction disc
3 Thin tagged clutch plate
4 Belville clutch plate
5 Differential side gear

NOTE: Each plate should be coated with Shell Spirax Super 90 oil during assembly. The thin plates and belville plates are identified by two diagonally-opposite notches on the circumference of the plate.

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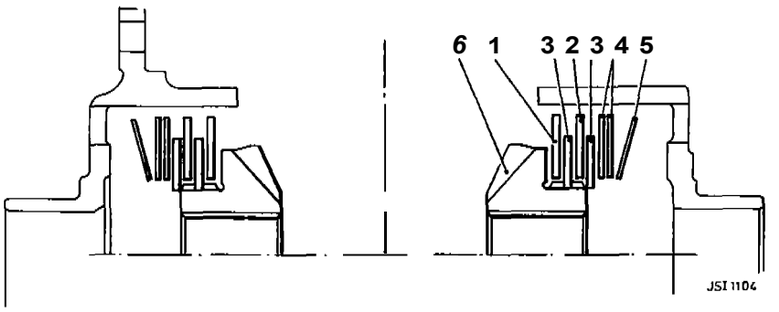


Fig 1

If the unit serial number is post 87E **22565** and had a total of 6 plates each side (including the belville plate) then re-assemble the differential assembly clutch packs into the differential casing halves in accordance with Fig 1. (7 plates each side. Note the orientation of the belville plates).

1 Grooved tagged clutch plate – groove towards side gear
2 Tagged clutch plate
3 Friction disc
4 Thin tagged clutch plate
5 Belville clutch plate
6 Differential side gear

NOTE: Each plate should be coated with Shell Spirax Super 90 oil during assembly. The thin plates and belville plates are identified by **two** diagonally opposite notches on the circumference of the plate.

Locate the new differential side gears into the clutch pack splines and refit the cross pin complete with the pinion mates and thrust washers, ensuring that the marks from operation 16 are correctly aligned.

Refit the button half of the differential case, ensuring that the case markings (8 Fig 1 page 17) are aligned and torque the fixing bolts in a diagonal sequence to **67** Nm.
NOTE: Loctite Studlock 273 should be applied to the bolt threads prior to fitment.

Turn the pinion to align the paint marks on the pinion flange and the main casing.
Lubricate the differential bearings and locate the bearing races to their original bearings.
Fit the main casing stretcher tool (GKN 131) to the main casing as illustrated in Fig 2 and tighten the clamp nuts to stretch the casing 0.25 mm (0.010) .

Fit the differential assembly into the main casing, ensuring that the paint marks on the crownwheel and casing are aligned.
Fit the differential bearing caps, but do not fully tighten the securing bolts. Ensure the markings on the bearing caps and main casing are aligned.
Remove the main casing stretcher tool from the casing and fully tighten the bearing cap fixing bolts to 122 Nm (90 lbft).

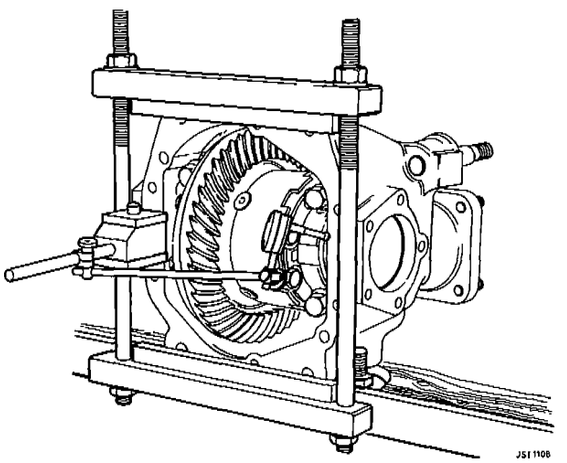


Fig 2

Measure the backlash between the crownwheel and pinion gears, as shown in Fig 1, at 3 places equally spaced around the crownwheel. Calculate the average of the three readings and compare this with the figure recorded previously.
The average backlash should be within 0.038 mm (0.0015") of the original figure.
Fit the output shaft assemblies and their respective shims into their original sides and torque the fixing bolts to 58 Nm (43 lbf.ft).

NOTE: Loctite Studlock 273 should be applied to the bolt threads prior to fitment.

Apply Hylosil 101 RTV jointing compound to the rear cover joint face. Locate the cover to the main case and loosely fit the new lower wishbone studs.

Fit the rear cover fixing bolts and tighten to 29 Nm (22 lbf.ft). Fully tighten the lower wishbone studs to 270 Nm (200 lbf.ft).
Remove the final drive unit from the bench, ensuring that the oil drain plug is tight and place the unit on to a level surface. Fill the unit to the correct level with Shell Spirax Super 90 oil.

Refit the final drive unit to the vehicle 51.25.13 page 07.

NOTE: To allow sufficient 'bedding in' of the new clutch packs avoid tight turns or figure-of-eight testing for 30 miles.

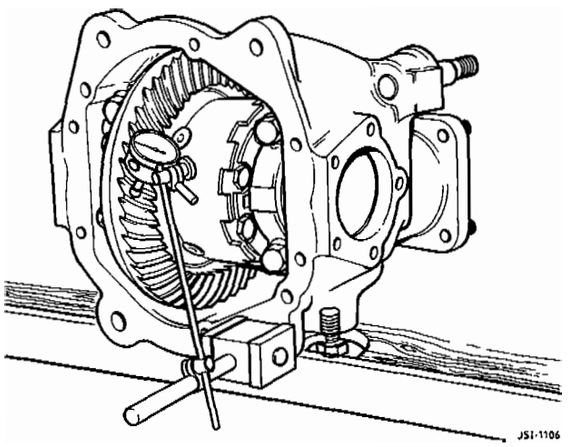


Fig 1

DATA

Backlash – 0.038 mm (0.0015")
Casing 'stretch' required – 0.25 mm (0.010").

TORQUE FIGURES

Bearing cap fixing bolts 122 Nm
Differential case bolts (in diagonal sequence) 67 Nm
Lower wishbone studs 270 Nm
Output shaft bolts 58 Nm
Rear cover fixing bolts 29 Nm

OILS/GREASES/SEALANTS

Differential oil – Shell Spirax Super 90

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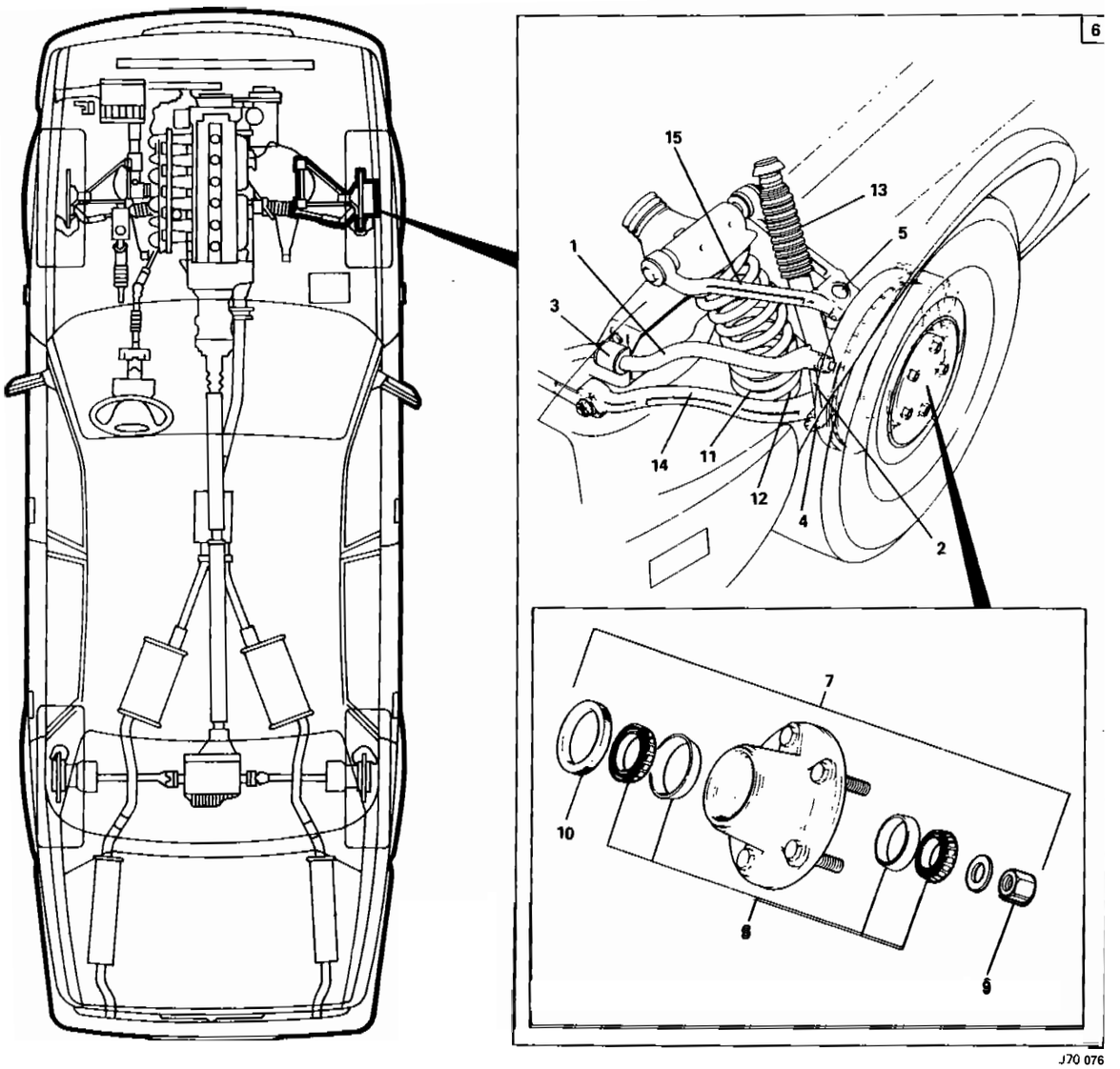
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ILLUSTRATED INDEX



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0032K

FRONT SUSPENSION

DESCRIPTION 60.00.00

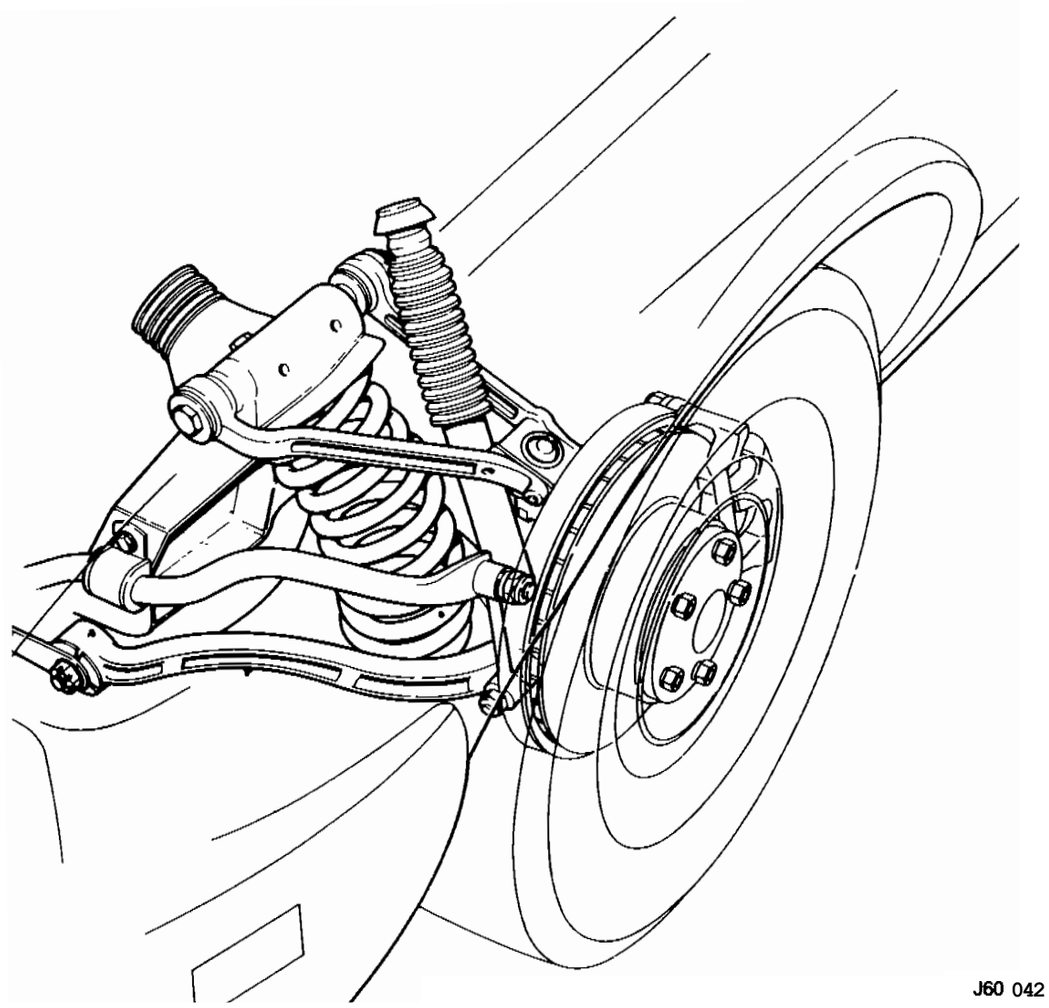
The front suspension is independent and consists of unequal length upper and lower wishbones (arranged to provide an anti-dive effect under braking), steel coil springs, telescopic hydraulic dampers and an anti-roll bar.

All suspension (except the damper) and engine loads are fed into a pressed steel crossbeam which is isolated from the body by rubber bushes. This mounting method allows the necessary amount of compliance.

The degree of castor and camber are factory set and are not adjustable.

A single forging forms the vertical link and steering arm. Cast iron hubs rotate on twin tapered roller bearings.

0031G



J60 042

GENERAL ARRANGEMENT

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ANTI-ROLL BAR

RENEW 60.10.01

Jack up the vehicle, support with axle stands.
Remove the nuts and bolts (1,2 Fig 1) securing the roll bar (3 Fig 1) to the front crossmember (4 Fig 1).
Remove the roll bar clamp plates (5 Fig 1).
Remove the nuts (1 Fig 2) securing the lower link arm (2 Fig 2) and remove the roll bar assembly (3 Fig 2).
Remove the mounting rubbers (6 Fig 1) and discard the roll bar.

Fit mounting rubbers to the new roll bar.
Fit the link arms, fit and tighten the securing nuts/bolts.
Align the assembly to the vehicle, locate the link arms. Fit and tighten the link arm securing nuts.
Align the roll bar clamp plates, fit and tighten the securing nuts/bolts.
Remove the axle stands and lower the vehicle.

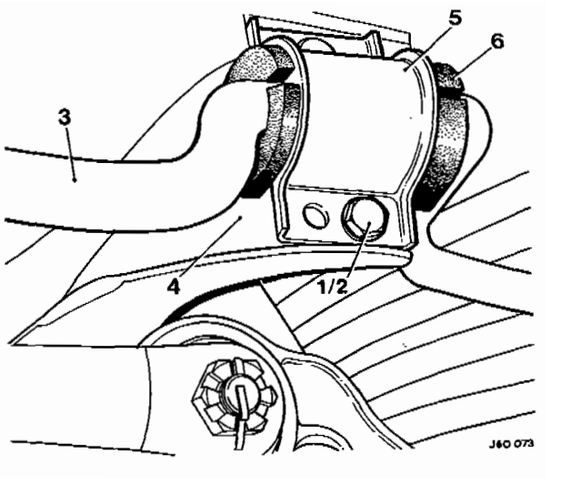


Fig 1

DATA

TORQUE FIGURES

Anti-roll bar to link 55-60Nm
Crossmember inner upper bolts 22-28 ""
Crossmember outer lower bolts 24-30Nm
Link to lower wishbone 55-60 ""

SPANNER SIZES

13mm
22mm

5/8AF
11/16AF

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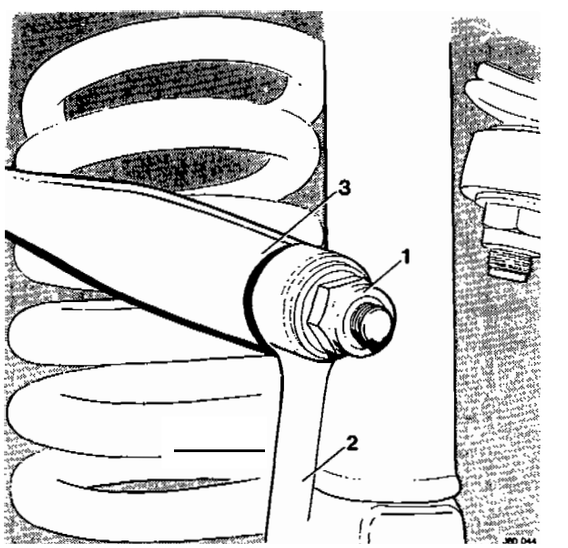


Fig 2

ANTI-ROLL BAR LINK ARM

RENEW **60.10.02**

Slacken off the front road wheel nuts 1/4 turn each.
Jack up the vehicle, support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, remove the remaining wheel nuts.
Remove the road wheel/tyre assembly.
Remove the link arm lower securing nut (1 Fig 1).
Remove the link arm upper securing nut (2 Fig 1).
Remove the link arm (3 Fig 1) from first, the upper securing bolt, then the lower securing bolt.

Fit the new link atm to the lower securing bolt.
Position the link arm over the upper securing bolt.
Fit and tighten the upper **and** lower nuts.
Refit the **road** wheel assembly, fit and tighten the wheel nuts.
Remove the axle stands and lower the vehicle.
Re-check the wheel nut torque.

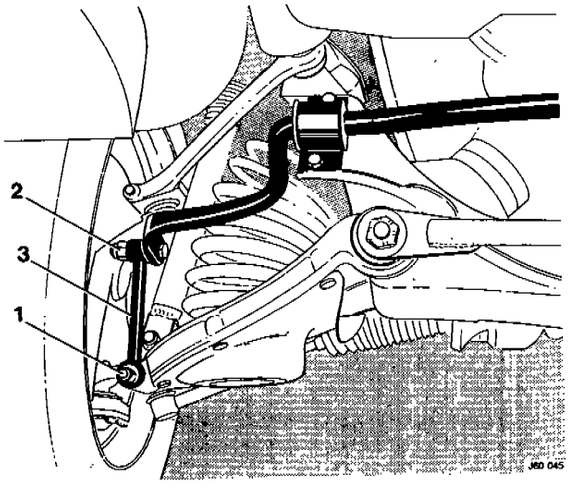


Fig 1

DATA

TORQUE FIGURES

Anti-roll bar to link ***55-60Nm***
Link ***to*** *lower wishbone* ***55-60Nm***
Wheelnut to stud (steel wheel) ***65-85Nm***
Wheelnut to stud (alloy wheel) ***88-102Nm***

SPANNER SIZES

5/8AF
11/16AF

0031G

ANTI-ROLL BAR RUBBER

RENEW **60.10.04**

Jack up the vehicle, support with axle stands.
Remove the nuts and bolts (1,2 Fig 2) securing the roll bar (3 Fig 2) to the front crossmember (4 Fig 2).
Remove the roll bar clamp plates (5 Fig 2).
Remove the mounting rubbers (6 Fig 2).
Fit the new mounting rubbers to the roll bar.
Align the roll bar clamp plates, fit and tighten the securing nuts/bolts.
Remove the axle stands and lower the vehicle.

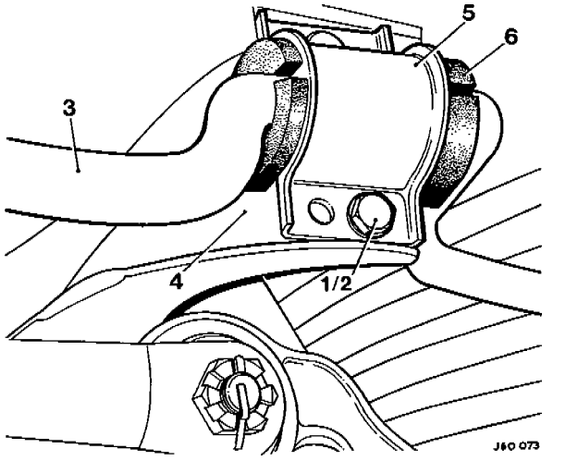


Fig 2

DATA

TORQUE FIGURES

Crossmember inner upper bolts 22-28Nm
Crossmember outer lower bolts 24-30"

SPANNER SIZES

13mm

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HUB ASSEMBLY

RENEW 60.25.01

Slacken off the front road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel/tyre assembly.
Disconnect the brake pad wear sensor block connector (Fig 1).

Remove the lower guide pin bolt (1 Fig 3) from the caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.

Remove the brake pads and remove the upper guide pin bolt.
Re-position the caliper for access to the carrier securing bolts (3 Fig 3), cut and remove the lockwire (4 Fig 3).
Remove the carrier securing bolts and remove the carrier.
Remove the disc securing screw and remove the disc.

Prise off the hub grease cap (1 Fig 1 page 8).
Remove the hub nut split pin and cover (2,3 Fig 1 page 8).
Remove the hub nut and washer.
Remove the hub assembly (4 Fig 1 page 8).
Remove the outer bearing from the hub.
Using a suitable punch, remove the inner (5 Fig 2 page 8) and outer (2 Fig 2 page 8) bearing tracks.
Remove the inner bearing (1 Fig 3 page 8) and seal from the stub axle (2 Fig 3 page 8).

Clean all components and examine for wear and damage. Replace all damaged components.
Refit the inner bearing track to the new hub using Service Tool 18G 134 and adaptor JD 550-5/1.
Refit the outer bearing track to the new hub using Service Tool 18G 134 and adaptor JD 550-5/2.
Fit the outer bearing and seal to the hub.

Fit the inner bearing and a new seal to the stub axle.
Pack the hub and coat the stub axle with Shell Retinax A grease.
Lubricate the hub seal track.
Fit the hub assembly to the stub axle.
Fit the hub nut and washer. Tighten the nut to obtain an end float of 0.0762-0.0254mm (0.003-0.001in).
Align the hub nut cover and secure with a new split pin.
Refit the grease cap.
Refit the front disc assembly.

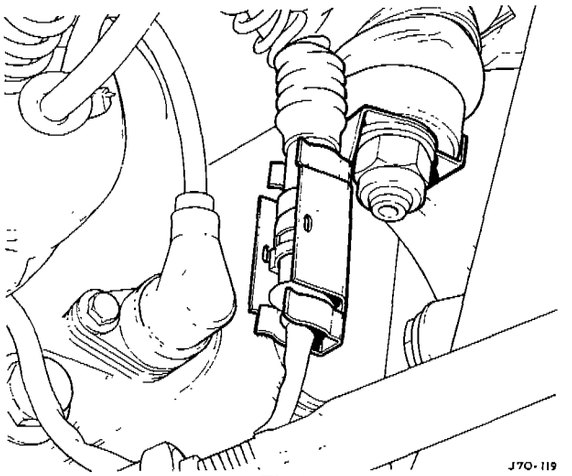


Fig 1

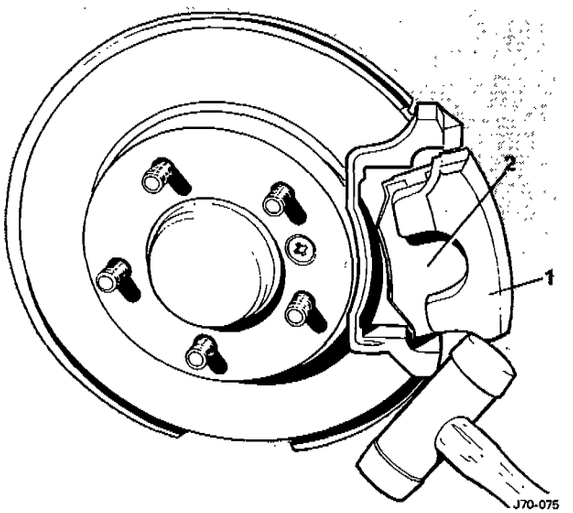


Fig 2

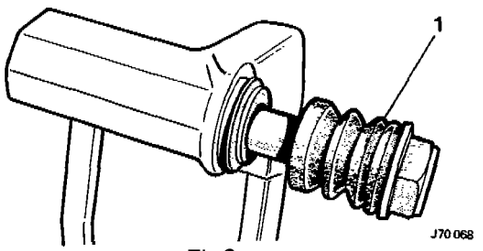


Fig 3

Refit the **road** wheel.
Lower the vehicle **from** the axle stands.
Pump the brake pedal to centralise the pads.

DATA

Front hub to stub axle end float	0.0762-0.0254mm (0.003-0.001 in)
Front brake disc run-out	0.004in maximum
Front brake disc run out (parallelism)	0.005in maximum

SERVICE TOOLS

18G134 Driver handle
***JD 550-5/1** Adaptor*
***JD 550-5/2** Adaptor*

TORQUE FIGURES

Caliper carrier to vertical link 102-128Nm
*Caliper to carrier **31-40Nm***
*Disc to hub **11-16Nm***
*Wheelnut **to** stud (steel wheel) **65-85Nm***
*Wheelnut to stud (alloy wheel) **88-102Nm***

SPANNER SIZES

13mm
17mm
22mm
15/16 AF

OILS/GREASES

*Hub bearings/cap Shell **Retinax** A*
Seal lip cavities Shell Alvania 3

0031G

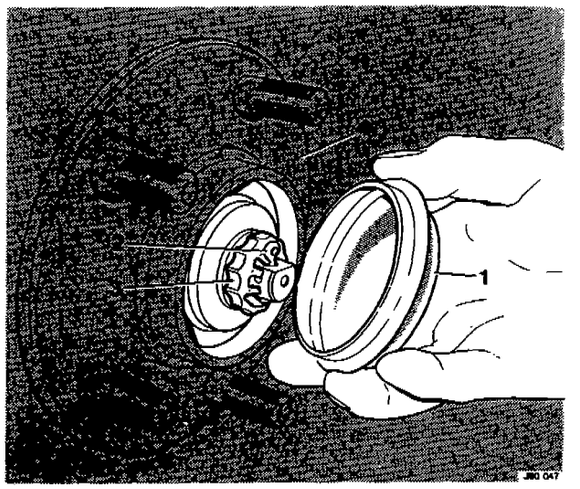


Fig 1

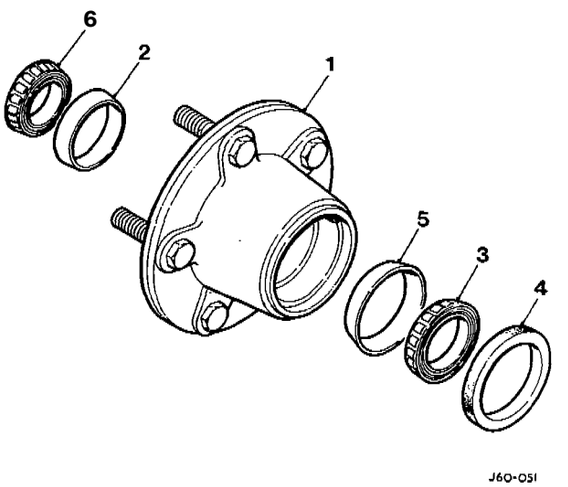


Fig 2

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HUB BEARING END FLOAT

CHECK AND ADJUST 60.25.12

Slacken off the road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Prise off the hub grease cap (1 Fig 1).
Remove the hub nut split pin and cover (2,3 Fig 1).
Tighten the nut to obtain an end float of 0.0762-0.0254mm (0.003-0.001in).
Align the hub nut cover and secure with a new split pin.
Refit the grease cap.
Refit the road wheel.
Lower the vehicle from the stand.

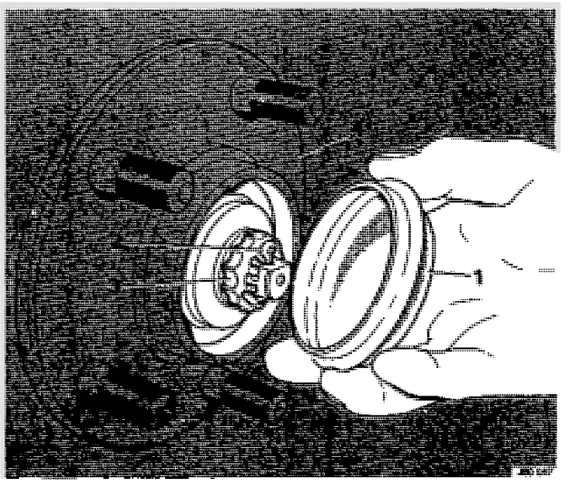


Fig 1

DATA

Front hub to stub axle end float	0.0762-0.0254mm (0.003-0.001 in)
Front brake disc run out	0.004in maximum
Front brake disc run out (parallelism)	0.005in maximum

TORQUE FIGURES

Wheel nut to stud (steel wheel) 65-85 ""
Wheel nut to stud (alloy wheel) 88-102Nm

SPANNER SIZES

22mm
15/16 AF

OILS/GREASES

Hub bearings/cap Shell Retinax A

0031G

HUB BEARING

RENEW 60.25.16

Slacken off the front road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel/tyre assembly.
Disconnect the brake pad wear sensor block connector (Fig 1).

Remove the lower guide pin bolt (1 Fig 3) from the caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.

Remove the brake pads and remove the upper guide pin bolt.
Re-position the caliper for access to the carrier securing bolts (3 Fig 3). cut and remove the lockwire (4 Fig 3).
Remove the carrier securing bolts and remove the carrier.
Remove the disc securing screw and remove the disc.

Prise off the hub grease cap (1 Fig 1 page 8).
Remove the hub nut split pin and cover (2,3 Fig 1 page 8).
Remove the hub nut and washer.
Remove the hub assembly (4 Fig 1 page 8).
Remove the outer bearing from the hub.
Using a suitable punch, remove the inner (5 Fig 2 page 8) and outer (2 Fig 2 page 8) bearing tracks.
Remove the inner bearing (1 Fig 3 page 8) and seal from the stub axle (2 Fig 3 page 8).

Clean all components and examine for wear and damage. Replace all damaged components.
Fit the new inner bearing track to the hub using Service Tool 18G 134 and adaptor JD 550-5/1.
Fit the new outer bearing track to the new hub using Service Tool 18G 134 and adaptor JD 550-5/2.
Fit the outer bearing and seal to the hub.

Fit the inner bearing and a new seal to the stub axle.
Pack the hub and coat the stub axle with Shell Retinax A grease.
Lubricate the hub seal track.
Fit the hub assembly to the stub axle.
Fit the hub nut and washer. Tighten the nut to obtain an end float of 0.0762-0.0254mm (0.003-0.001 in).
Align the hub nut cover and secure with a new split pin.
Refit the grease cap.
Refit the front disc assembly.

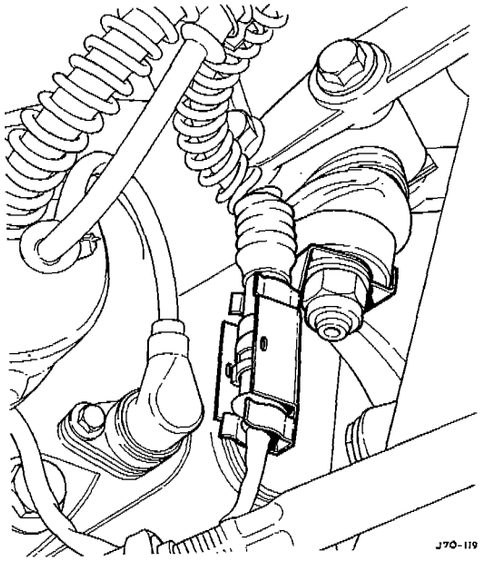


Fig 1

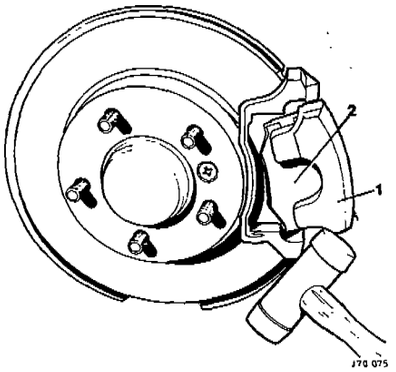


Fig 2

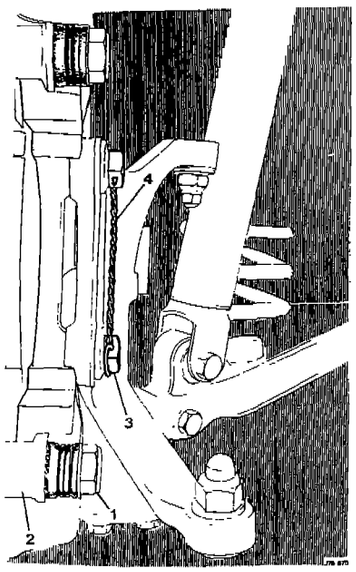


Fig 3

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Refit the road wheel.
Lower the vehicle from the axle stands.
Pump the brake pedal to centralise the pads.

DATA

Front hub to stub axle end float	0.0762-0.0254mm (0.003-0.001in)
Front brake disc run out	0.004in maximum
Front brake disc run out (parallelism)	0.005in maximum

SERVICE TOOLS

18G 134 Driver handle
JD 550-5/1 Adaptor
JD 550-5/2 Adaptor

TORQUE FIGURES

Caliper carrier to vertical link 102-128Nm
Caliper to carrier 31-40Nm
Disc to hub 11-16Nm
Wheelnut to stud (steel wheel) 65-85Nm
Wheelnut to stud (alloy wheel) 88-102Nm

SPANNER SIZES

13mm
17mm
22mm
15/16A F

OILS/GREASES

Hub bearings/cap Shell Retinax A
Seal lip cavities Shell Alvania 3

0031G

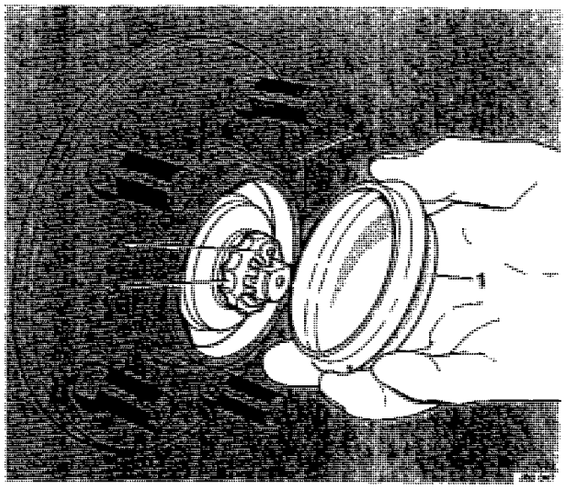


Fig 1

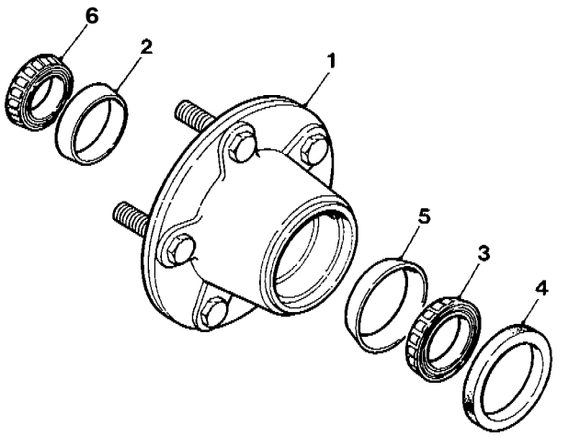


Fig 2

J60-051

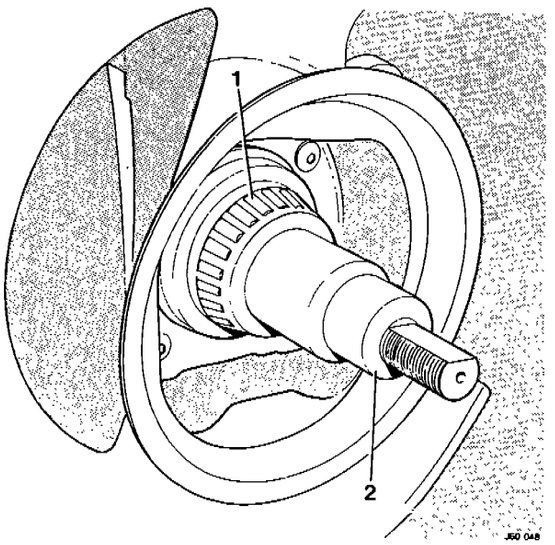


Fig 3

HUB OIL SEAL

RENEW 60.25.17

Slacken off the front road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel/tyre assembly.
Disconnect the brake pad wear sensor block connector (Fig 1).

Remove the lower guide pin bolt (1 Fig 3) from the caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the brake pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.

Remove the brake pads and remove the upper guide pin bolt.
Re-position the caliper for access to the carrier securing bolts (3 Fig 3), cut and remove the lockwire (4 Fig 3).
Remove the carrier securing bolts and remove the carrier.
Remove the disc securing screw and remove the disc.

Prise off the hub grease cap (1 Fig 1 page 8).
Remove the hub nut split pin and cover (2.3 Fig 1 page 8).
Remove the hub nut and washer.
Remove the hub assembly (4 Fig 1 page 8).
Remove the outer bearing from the hub.
Using a suitable punch, remove the inner (5 Fig 2 page 8) and outer (2 Fig 2 page 8) bearing tracks.
Remove the inner bearing (1 Fig 3 page 8) and seal from the stub axle (2 Fig 3 page 8).

Clean all components and examine for wear and damage. Replace all damaged components.
NOTE: Pack the seal lip cavities with Shell Alvania 3 prior to fitting.
Fit the outer bearing and new seal to the hub.

Fit the inner bearing and a new seal to the stub axle.
Pack the hub and coat the stub axle with Shell Retinax A grease.
Lubricate the hub seal track.
Fit the hub assembly to the stub axle.
Fit the hub nut and washer.
Tighten the nut to obtain an end float of 0.0762-0.0254mm (0.003-0.001in).
Align the hub nut cover and secure with a new split pin.
Refit the grease cap.
Refit the front disc assembly.
Refit the road wheel.
Lower the vehicle from the axle stands.

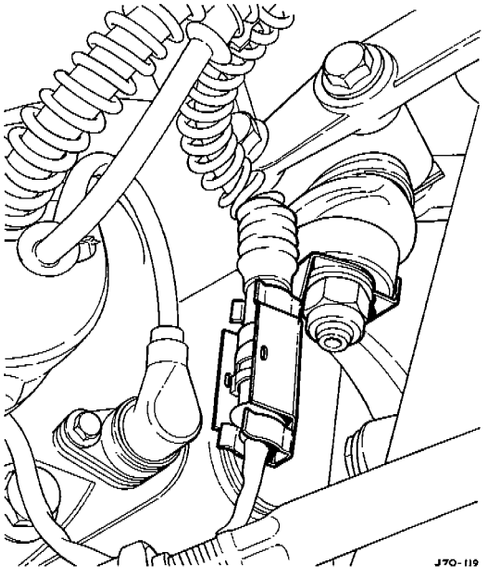


Fig 1

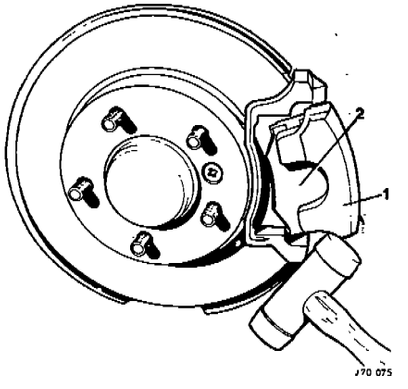


Fig 2

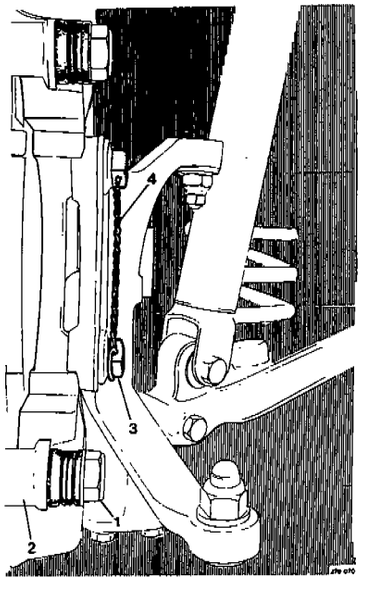


Fig 3

www.JagDocs.com

Pump the brake pedal to centralise the pads.

DATA

Front hub to stub axle end float	0.0762-0.0254mm (0.003-0.001 in)
Front brake disc run out	0.004in maximum
Front brake disc run out (parallelism)	0.005in maximum

SERVICE TOOLS

18G 134 Driver handle
JD 550-5/1 Adaptor
JD 550-5/2 Adaptor

TORQUE FIGURES

Caliper carrier to vertical link ***102-128Nm***
Caliper to carrier ***31-40Nm***
Disc to hub ***11-16Nm***
Wheel *nut to stud (steel wheel)* ***65-85Nm***
Wheelnut ***to*** *stud (alloy wheel)* ***88-102Nm***

SPANNER SIZES

13mm
17mm
22mm
15/16A*F*

OILS/GREASES

Hub bearings/cap Shell ***Retinax*** *A*
Seal lip cavities Shell ***Alvania*** *3*

0031G

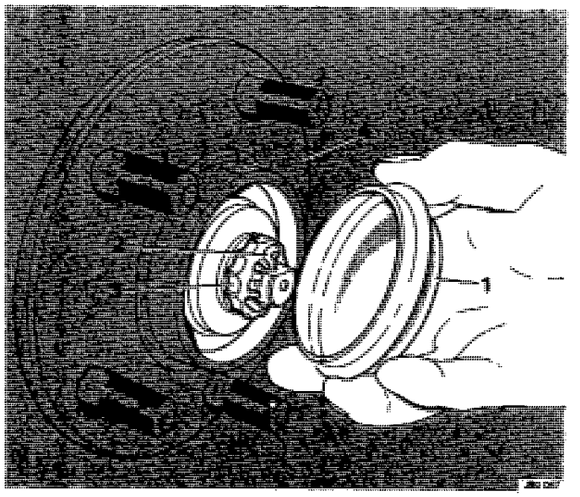
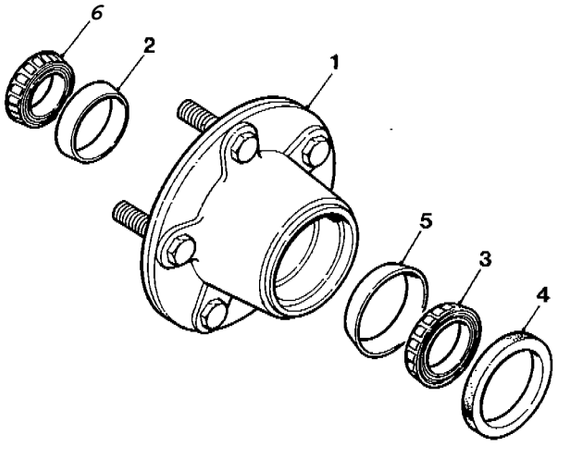


Fig 1



J60-051

Fig 2

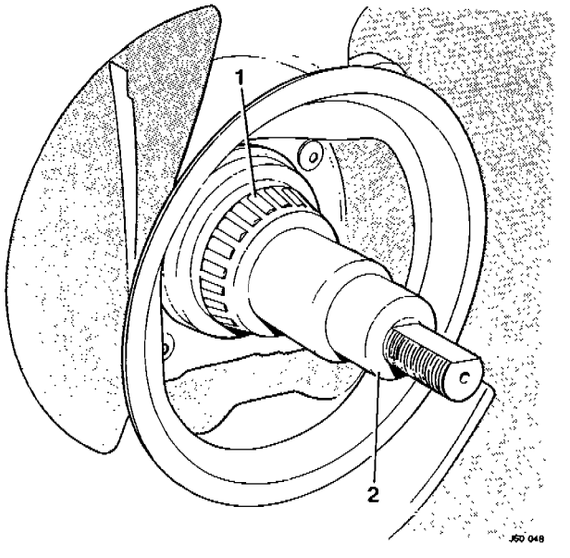


Fig 3

SHOCK ABSORBER

RENEW 60.30.02

Slacken off the road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Take the weight of the suspension using Service Tool JD **133,** and remove the shock absorber upper securing/ locknuts (1 Fig 1).
Remove the two washers (2 Fig **1**) and micron buffer (3 Fig 1).
Remove the anti roll bar lower link arm securing nut **(1** Fig 2), and remove the link arm (2 Fig 2) for access.
Remove the shock absorber lower securing nut **(3** Fig 2) and bolt, manually compress the shock absorber and remove it from the vehicle.
Remove the micron buffer and washer.
Press out the bush (4 Fig 2) from the lower wishbone (5 Fig 2), using Service Tool JD **135.**
Fit a **new** mounting bush to the lower wishbone using Service Tool JD 135.
Fit the micron buffer and washer to the new shock absorber, manually compress the shock absorber and fit the assembly to the vehicle.
Engage the upper stud through the mounting hole.
Fit and tighten the shock absorber lower bolt.
Fit the anti roll bar lower link arm, fit and tighten the securing bolt.

Fit the buffer and washers to the shock absorber upper mounting stud, fit and tighten the securing/lock nuts.
Release Service Tool JD **133** from the suspension.
Refit the road wheel and tyre assembly, noting the wheel to stud relationship.
Fit and tighten the road wheel nuts.
Lower the vehicle, check the wheel nuts.

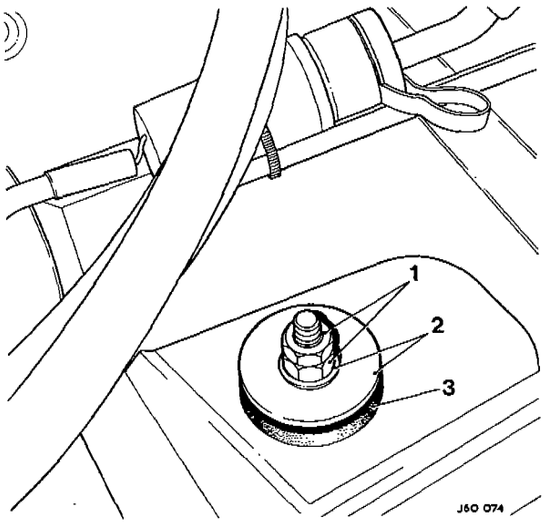


Fig 1

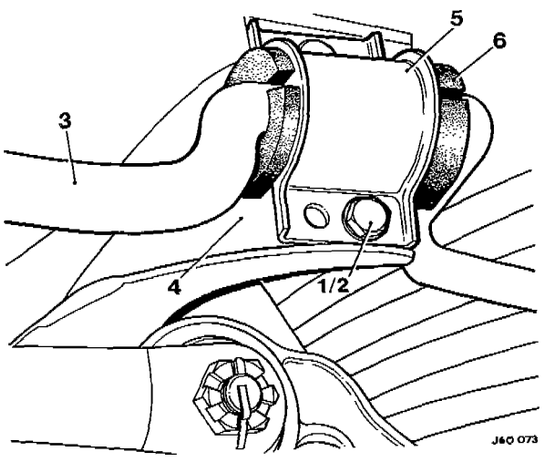


Fig 2

DATA

SERVICE TOOLS

*JD **135** Remover/replacer damper lower bush*
JD 133 Camber tie down link front

TORQUE FIGURES

*Anti roll bar to lower wishbone **55-60 ""***
*Shock absorber **to** lower mounting 61-**68Nm***
*Shock absorber **to** upper mounting **35-43Nm***
*Wheelnut **to** stud (steel wheel) **65-85Nm***
*Wheelnut to stud (alloy wheel) **88-102Nm***

SPANNER SIZES

9/16 AF
5/8 AF
11/16 AF

OILS/ GREASES

Lower shock absorber bolt L M Multipurpose grease.

0031G

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BALL JOINT – LOWER

RENEW **60.15.03**

Slacken off the road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 1) upwards to gain access to the pads (2 Fig 1).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.

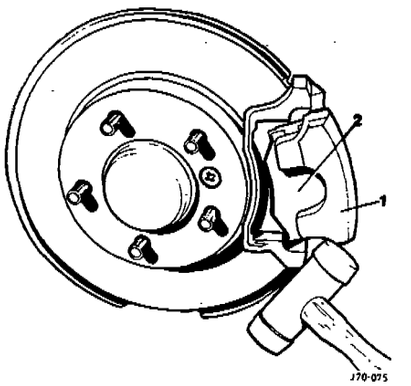


Fig 1

Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Remove the track rod end to steering arm securing nut.
Fit Service Tool JD 100 (1 Fig 2) to the track rod end joint and break the taper.
Remove the upper ball joint (2 Fig 3) securing bolts (1 Fig 3), note the position and collect the castor shims (3 Fig 3).
Remove the lower ball joint securing nut, fit Service Tool JD 100 and break the taper.

Remove the stub axle assembly.
Remove the lower ball joint to lower wishbone securing bolts (2 Fig 2), and remove the ball joint assembly.

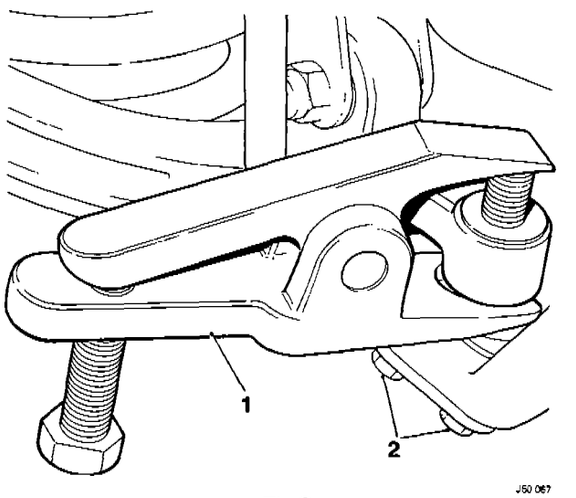


Fig 2

Clean the mating faces and shims.
Fit the new ball joint assembly. Fit and tighten the ball joint securing bolts.
Refit the stub axle to the lower wishbone.
Fit and tighten the lower ball joint securing nut.
Fit the upper ball joint securing bolts. Do not fully tighten at this stage.
Refit the castor shims.
Finally tighten the upper ball joint securing bolts.
Reconnect the track rod end to the steering arm. Fit and tighten the securing nut.
Refit the caliper to the carrier. Fit and tighten the upper securing bolt.

Refit the brake pads to the carrier.
Ensure that the caliper piston is fully retracted.
Re-position the caliper over the pads and align the lower bolt hole.
Fit and tighten the caliper lower securing bolt.
Reconnect the pad wear sensor block connector (Fig 1 page 16).
Refit the road wheel. Lower the vehicle from the stands.

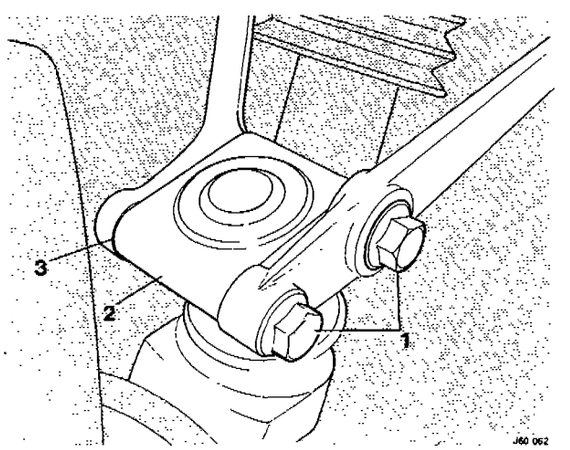


Fig 3

Carry out steering geometry check using suitable equipment (see DATA).

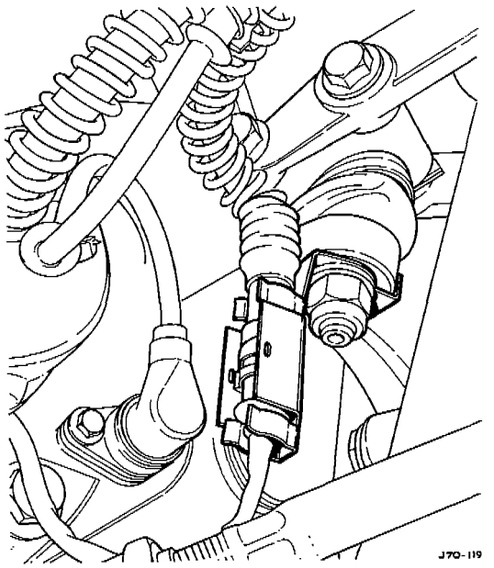


Fig 1

DATA

Camber angle	0 to –0.5"
Castor angle	3.5 to 4.5"
Wheel alignment	Parallel to 1.6mm toe in (inclusive)

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

SERVICE TOOLS

JD 100 Swivel hub ball pins remover

TORQUE FIGURES

Caliper to carrier 31-40Nm
Lower balljoint to wishbone 61-75Nm
Lower balljoint to vertiwl link 28-33Nm
Track rod end to steering arm 61-68Nm
Upper balljoint to wishbone 75-80 ""
Upper balljoint to vertical link 47-68 ""
Wheel nut to stud (steel wheel) 65-85Nm
Wheelnut to stud (alloy wheel) 88-102Nm

SPANNER SIZES

13mm
15mm
17mm
19mm
22mm
1/2 AF
7/8 AF
15/16 AF

OILS/GREASES

Upper and lower ball joints – Multi purpose lithium based grease NLCI consistency No 2

0031G

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BALL JOINT – UPPER

RENEW **60.15.07**

Slacken off the RH road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Remove the upper ball joint (2 Fig 1) securing bolts (1 Fig 1), note the position and collect the castor shims (3 Fig 1).
Displace the upper wishbones for access.
Remove the upper ball joint securing nut (1 Fig 2). fit Service Tool JD100 and break the taper.
Remove the ball joint (2 Fig 2) and tool.
Clean the mating faces and shims.
Fit the new ball joint assembly.
Fit and tighten the ball joint securing nut.
Fit the ball joint securing **bolts.** Do not tighten at this stage.
Refit the castor shims.
Finally tighten the ball joint securing bolts.
Refit the road wheel. Lower the vehicle to the ground.
Carry out steering geometry check using suitable equipment (see DATA).

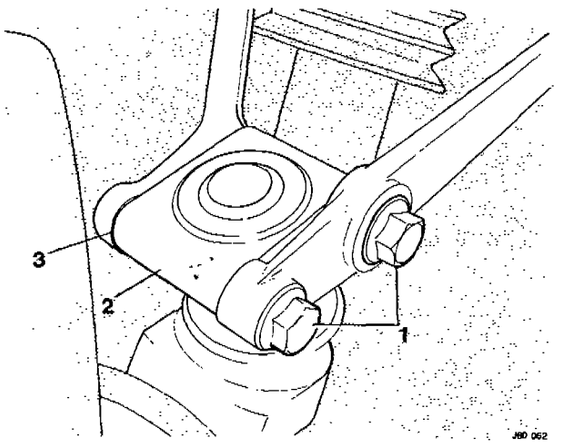


Fig 1

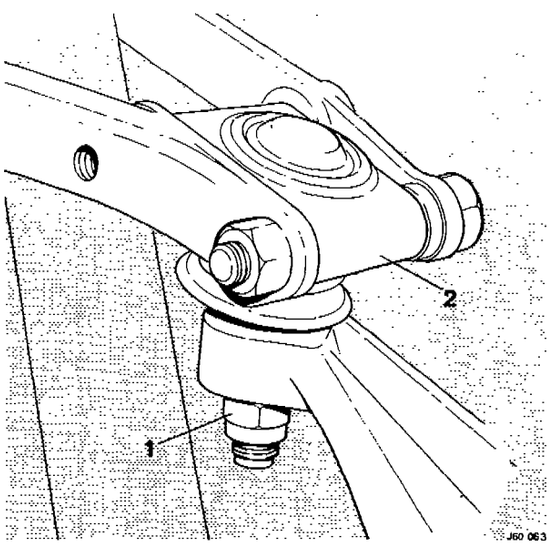


Fig 2

DATA

Camber angle	0 to –0.5°
Castor angle	3.5 to 4.5"
Wheel alignment	Parallel to 1.6mm toe in (inclusive)

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

SERVICE TOOLS

JD 100 Ball joint remover

TORQUE FIGURES

Upper ball joint to wishbone 75-80Nm
Upper ball joint to vertical link 47-68 "'
Wheel nut to stud (steel wheel) 65-85Nm
Wheel nut to stud (alloy wheel) 88-102Nm

SPANNER SIZES

15mm
17mm
19mm
22mm

OILS/GREASES

Upper ball joint – Multi purpose lithium based grease NLCI consistency No 2

0031G

WISHBONE – LOWER

RENEW **60.35.22**

Jack up the front of the vehicle and support with axle stands.
NOTE: Ensure the vehicle is high enough to access Service Tool JD 115.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel and tyre assembly.
Fit the lower adaptors to the tool, and fit Service Tool JD115 to the front spring (Fig 1). Engage the dowel in the slots in the suspension turret top.
ENSURE THAT THE DOWEL IS SEATED CORRECTLY.

Tighten the tool to tension the spring until the load is taken off the spring pan.
Remove the spring pan securing bolts, slacken off the tool wing nut to release the tension on the spring and release the tool from the suspension turret.
Remove the tool from the suspension assembly.
Remove the spring plates and road spring from the tool.
Disconnect the brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper (1 Fig 2) upwards to gain access to the pads (2 Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover.

Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Remove the track rod end (2 Fig 3) to steering arm (3 Fig 3) securing nut (1 Fig 3).
Fit Service Tool JD 100 to the track rod end joint and break the taper.
Remove the steering rack to crossmember securing bolts, and remove the spacers.
Remove the upper ball joint (5 Fig 3) securing bolts (4 Fig 3), note the position and collect the castor shims (6 Fig 3).
Remove the split pin securing the fulcrum shaft nut.
Remove the fulcrum shaft nut.
Remove the shock absorber lower mounting securing bolt/nut.
Lower the wishbone/stub axle assembly.
Partially remove the fulcrum bolt to remove the front wishbone.
Remove the serrated washer.
Manoeuvre the steering rack to finally remove the fulcrum bolt and the rear wishbone/stub axle assembly.
Remove the remaining serrated washer.

Replace all bushes using the tools listed below, grease all pivots prior to assembly.
Reverse the removal procedure to refit the wishbones.

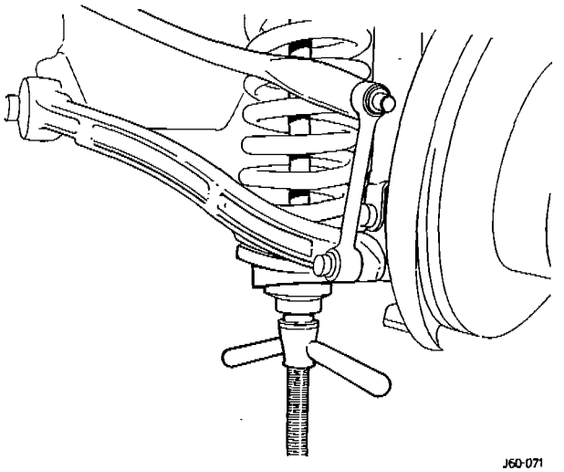


Fig 1

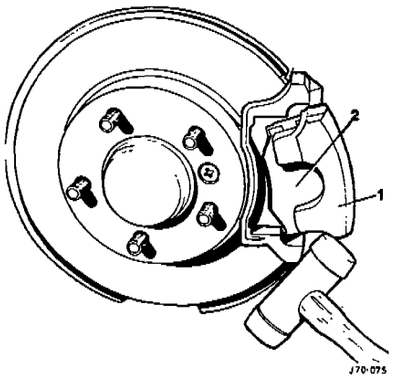


Fig 2

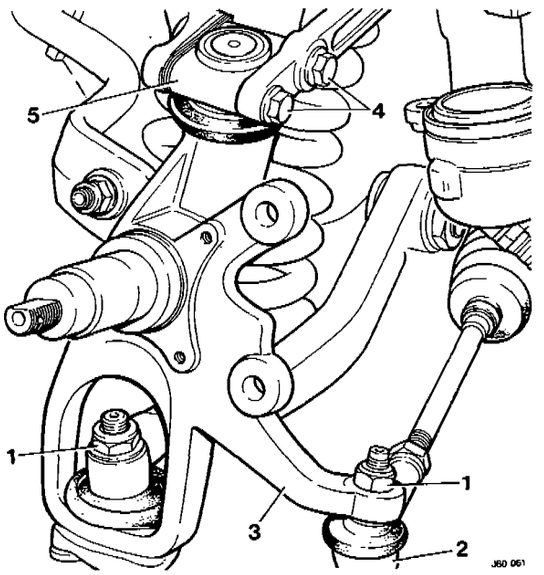


Fig 3

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Ensure that the brake pad wear sensor block connector is fitted correctly (Fig 1).
Refit the road wheel. Lower the vehicle to the ground.
Carry out steering geometry check using suitable equipment (see DATA).

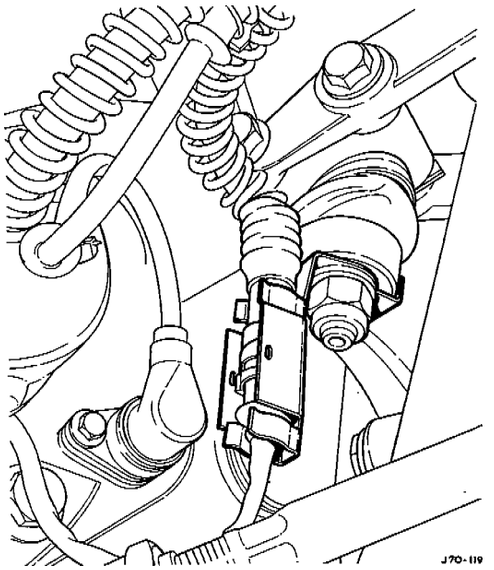


Fig 1

DATA

Camber angle	0 to –0.5"
Castor angle	3.5 to 4.5"
Wheel alignment	Parallel to 1.6mm toe in (inclusive)

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

SERVICE TOOLS

JD 100 Swivel hub ball pins remover
JD 115 Spring compressor
JD 135 Remover/replacer damper lower bush
JD 143 Basic tool
JD 143-1 Adaptor ring
JD 143-2 Anvil adaptor
JD 143-3 Adaptor bush remover/replacer
JD 143-4 Adaptor bush remover/replacer

TORQUE FIGURES

Anti roll bar to lower wishbone 55-60Nm
Caliper to carrier 31-40Nm
Lower ball joint to wishbone 61-75Nm
Lower ball joint to vertical link 28-33Nm
Lower wishbone to fulcrum shaft 43-68 "
Shock absorber to lower mounting 61-68Nm
Steering rack to crossmember bracket 26-29Nm
Track rod end to steering arm 61-68Nm
Upper ball joint to wishbone 75-80 "
Upper ball joint to vertical link 47-68 "
Wheelnut to stud (steel wheel) 65-85 "
Wheelnut to stud (alloy wheel) 88-102Nm

SPANNER SIZES

13mm
15mm
17mm
19mm
22mm
1/2 AF
7/8A F
15/16A F

OILS/GREASES

Lower shock absorber bolt – LM ***Multi purpose grease.***
Lower wishbone to crossmember fulcrum shaft – ***LM Multipurpose grease.***
Upper and lower ball joints – ***Multi purpose lithium based grease NLCI consistency No 2***

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WISHBONE – UPPER

RENEW 60.35.18

Slacken off the LH road wheel nuts 1/4 turn each.
Jack up the front of the vehicle and support with axle stands.
Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.
Remove the road wheel **and** tyre assembly.
Remove the upper ball joint (2 Fig **1**) securing bolts **(1** Fig **1**), note the position and collect the castor shims (3 Fig **1**).
Remove the accumulator clamp securing bolt, remove the bracket securing bolts, and re-position the accumulator for access.
Remove the upper wishbone pivot bolt nut **(1** Fig 2) and outer spacer washer (2 Fig 2).
Displace the pivot bolt (3 Fig 2) for access to remove the wishbone assembly **(4 Fig** 2).
Remove the rear wishbone assembly.
Remove the spacer washer.
Displace **and** remove the pivot bolt.
Remove the spacer washer from the pivot bolt.
Remove the wishbone from the pivot bolt.
Remove the second spacer washer from the pivot bolt.
Remove the outer washers and thrust washers **from** the wishbone assembly.
Remove the Pheonix bushes from the wishbone using a suitable press and press tools **(1** & 2 Fig 3).
Clean all components, inspect for wear and damage.
Replace worn or damaged components as necessary.
Fit the new Pheonix bushes to the wishbone using a suitable press and press tools **(1** & 2 Fig **4).**
Reverse the removal procedure to refit the replacement wishbones.
Refit the road wheel. Lower the vehicle.

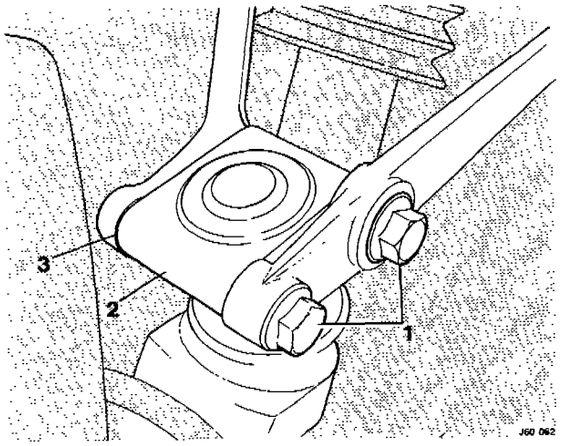


Fig 1

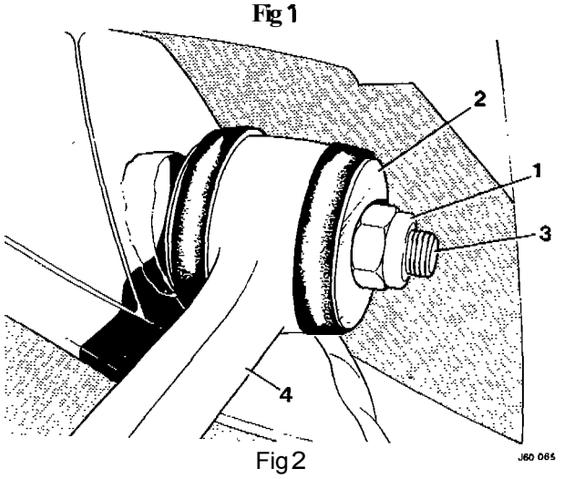


Fig 2

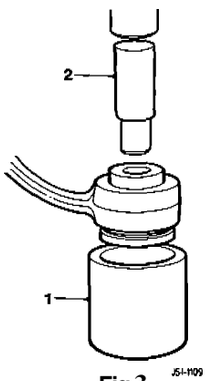


Fig 3

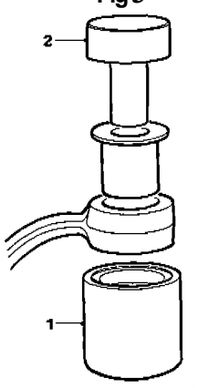


Fig 4

DATA

TORQUE FIGURES

*Upper ball **joint** to wishbone **75-80Nm***
*Wheel nut to **stud** (steel wheel) **65-85Nm***
*Wheel nut to **stud** (alloy wheel) **88-102Nm***
*Wishbone to pivot bolt/fulcrum **shaft** **61-75Nm***

SPANNER SIZES

15mm
22mm

OILS/GREASES

*Wishbone **to** crossmember fulcrum shaft – **L M Multi purpose grease***

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ROAD SPRING

RENEW 60.20.01

Jack up the front of the vehicle and support with axle stands.
NOTE: Ensure the vehicle is high enough to access Service Tool JD 115.
Remove one road wheel/tyre assembly.
Fit the lower adaptors to the tool, and fit Service Tool JD115 to the front spring (Fig 1). Engage the dowel in the slots in the suspension turret top.
ENSURE THAT THE DOWEL IS SEATED CORRECTLY.

Tighten the tool to tension the spring until the load is taken off the spring pan.
Remove the spring pan securing bolts, slacken off the tool wing nut to release the tension on the spring and release the tool from the suspension turret.
Remove the service tool.
Remove the spring plates and road spring from the tool.
Assemble the new road spring and new plastic spring plates to JD 115.
Fit and engage the tool to the suspension turret.
ENSURE THAT THE DOWEL IS FULLY SEATED IN THE SLOT IN THE SUSPENSION TURRET.

Align the spring pan inner bolt holes, fit guide studs to the inner bolt positions and tighten the wing nut of JD 115 to tension the spring. Ensure that the lower adaptors are correctly seated. Fit guide bolts as the spring is being compressed.
When the spring pan is fully seated, remove the guide bolts and studs one at a time and replace with NEW securing bolts.
WARNING: NEVER RE-USE OLD SPRING PAN BOLTS. ALWAYS RENEW THEM.

Release the service tool wing nut and remove the tool adaptors from the suspension unit.
Refit the road wheel and tyre assembly, noting the wheel to stud relationship.
Fit and tighten the road wheel nuts.
Lower the vehicle, check the wheel nuts.

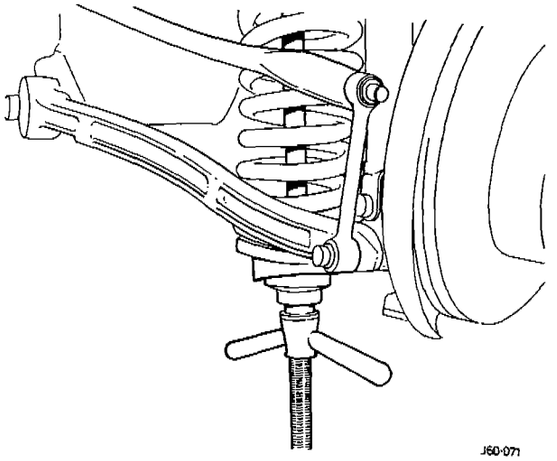


Fig 1

DATA

SERVICE TOOLS

JD 115 Spring compressor

TORQUE FIGURES

Spring pan to lower wishbone 55-60 ""
Wheel nut to stud (steel wheel) 65-85 ""
Wheel nut to stud (alloy wheel) 88-102Nm

SPANNER SIZES

13mm
22mm
15/16AF

0031G

ROAD SPRING PAN

RENEW **60.20.03**

Jack up the front of the vehicle and support with axle stands.
NOTE: Ensure the vehicle is high enough to access Service Tool JD 115.
Remove one road wheel/tyre assembly.
Fit the lower adaptors to the tool, and fit Service Tool JD115 to the front spring (Fig 1). Engage the dowel in the slots in the suspension turret top.
ENSURE THAT THE DOWEL IS SEATED CORRECTLY.

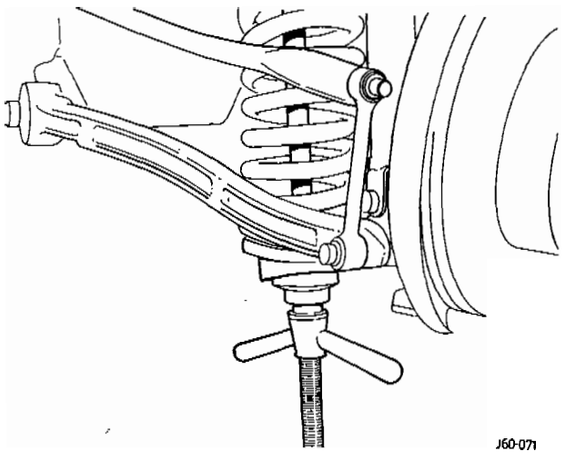


Fig1

Tighten the tool to tension the spring until the load is taken off the spring pan.
Remove the spring pan securing bolts, slacken *off* the tool wing nut to release the tension on the spring and release the tool from the suspension turret.
Remove the service tool.
Remove the spring plates and road spring from the tool.
Assemble the road spring and new plastic spring plates to JD 115.
Fit and engage the tool to the suspension turret.
ENSURE THAT THE DOWEL IS FULLY SEATED IN THE SLOT IN THE SUSPENSION TURRET.

Align the new spring pan inner bolt holes, fit guide studs to the inner bolt positions and tighten the wing nut of JD 115 to tension the spring. Ensure that the lower adaptors are correctly seated. Fit guide bolts as the spring is being compressed.
When the spring pan is fully seated, remove the guide bolts and studs one at a time and replace with NEW securing bolts.
WARNING: NEVER RE-USE OLD SPRING PAN BOLTS. ALWAYS RENEW THEM.

Release the service tool wing nut and remove the tool adaptors from the suspension unit.
Refit the road wheel and tyre assembly, noting the wheel to stud relationship.
Fit and tighten the road wheel nuts.
Lower the vehicle, check the wheel nuts.

DATA

SERVICE TOOLS

JD 115 Spring compressor

TORQUE FIGURES

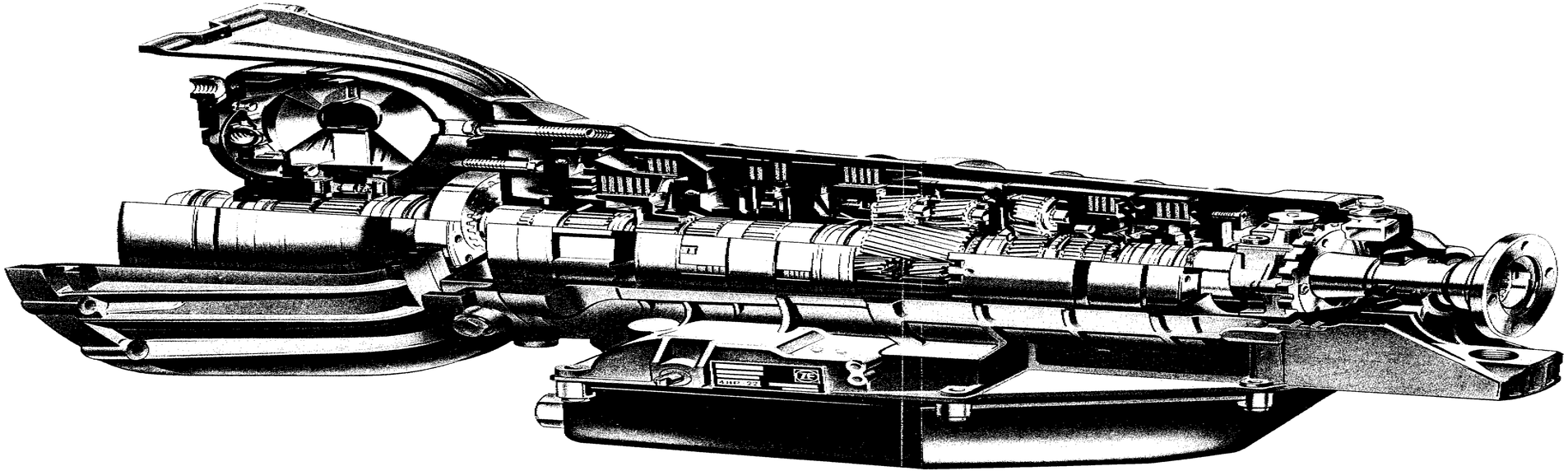
Spring pan to lower wishbone 55-60Nm
Wheel nut to stud (steel wheel) 65-85Nm
Wheel nut to stud (alloy wheel) 88-102Nm

SPANNER SIZES

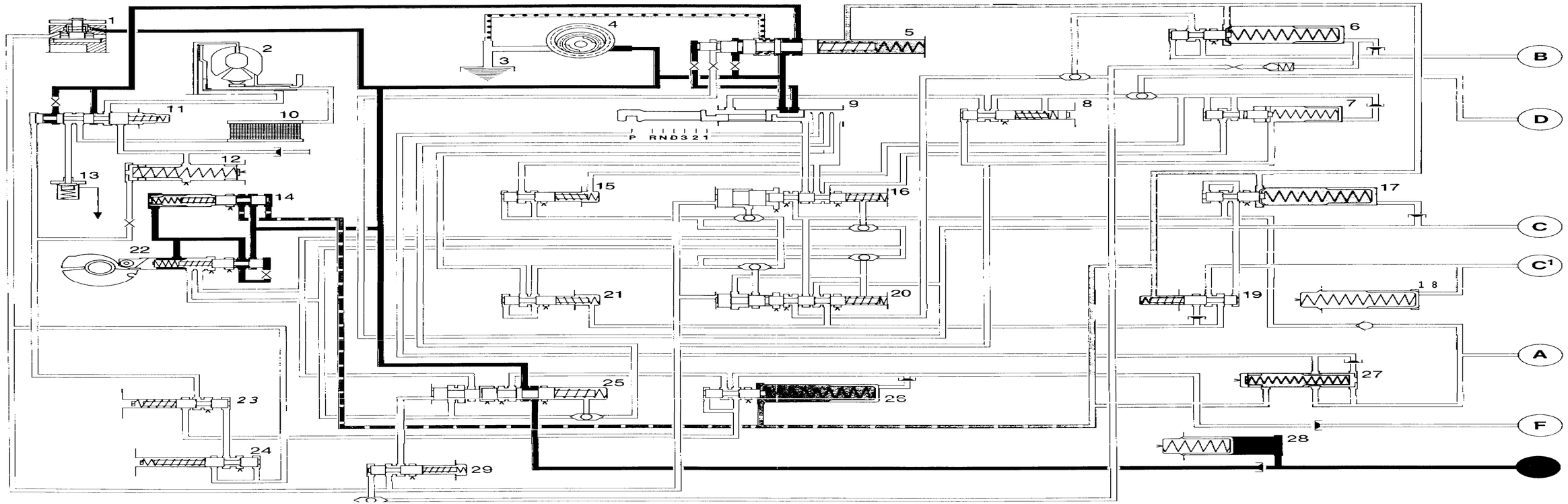
13mm
22mm
15/16AF

.0031G

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OIL FLOWCHART



POSITION P **PARK**

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AUTOMATIC TRANSMISSION ZF 4HP 22

OILFLOWCHART

POSITION P
PARK

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERT — CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

0343b

ÖLDURCHFLUSSTABELLE

STELLUNG P
PARKEN

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WAHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

0343b

DIAGRAMME D'ECOULEMENT D'HUILE

POSITION P
STATIONNEMENT

1 REGUCATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE E
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS
25 D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ETRANGLEMENT
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUA
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DCAGRAMME DELLA MANDATA D'OLIO

POSIZIONE P
PARCHEGGIO

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1 - 2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2ma MARCIA
22 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
23 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
24 VALVOLA DI CAMBIO 3-4
25 VALVOLA E SMORZATORE FRIZIONE F
26 SMOAZATORE FRIZIONE A
27 SMOAZATORE FRIZIONE E
28 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DELACEETE

POSICION P
APARCAA

5 REGULADOA
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOA DE EMBRAGUE 3
7 VALVULA Y AMORTIGUADOR DE EMBAAGUED
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR. EMBRAGUE DEL CONVERTIDOR
13 VALVUCA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1 - 2
17 VALVULA DEL EMERAGUEC
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VALVULA Y AMORTIGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELEADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOA
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
E EMBRAGUE B
C EMERAGUE C
C' EMERAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMERAGUE F

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HYDRAULISCHE DRUKREGELING

STAND P
PARKEREN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KOPPELDEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTAND WIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPEUNGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1 - 2
17 KLEP, C-KOPPELING
18 DEMPEA C'-KOPPELING
19 KLEP C'-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKCEP 3-4
26 DEMPER EN DRUKREGELING KOPPELING F
27
28 DEMPER E-KOPPELING
29 VERLIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

¶ UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII REGELDRUK
VIII
IX BLOKKEERDRUK
X MODULATIEDRUK
XI
XII

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E
F F-KOPPELING

0343b

オイルの流れ図

「P」の位置

駐　車

1 ガバナー
2 トルクコンバーター
3 ケース
4 オイルポンプ
5 プレッシャーレギュレーティングバルブ
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーター＆後退用バルブ
12 コンバータークラッチダンパー
13 ワンウェイバルブ
14 モジュレーターバルブ
15 第 1 速ギアインヒビター
16 1 - 2 シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2 - 3 シフトバルブ
21 第 2 速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3 - 4 シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気管
II 絞り
III 開口
IV 分岐
V 本管
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

位置 P

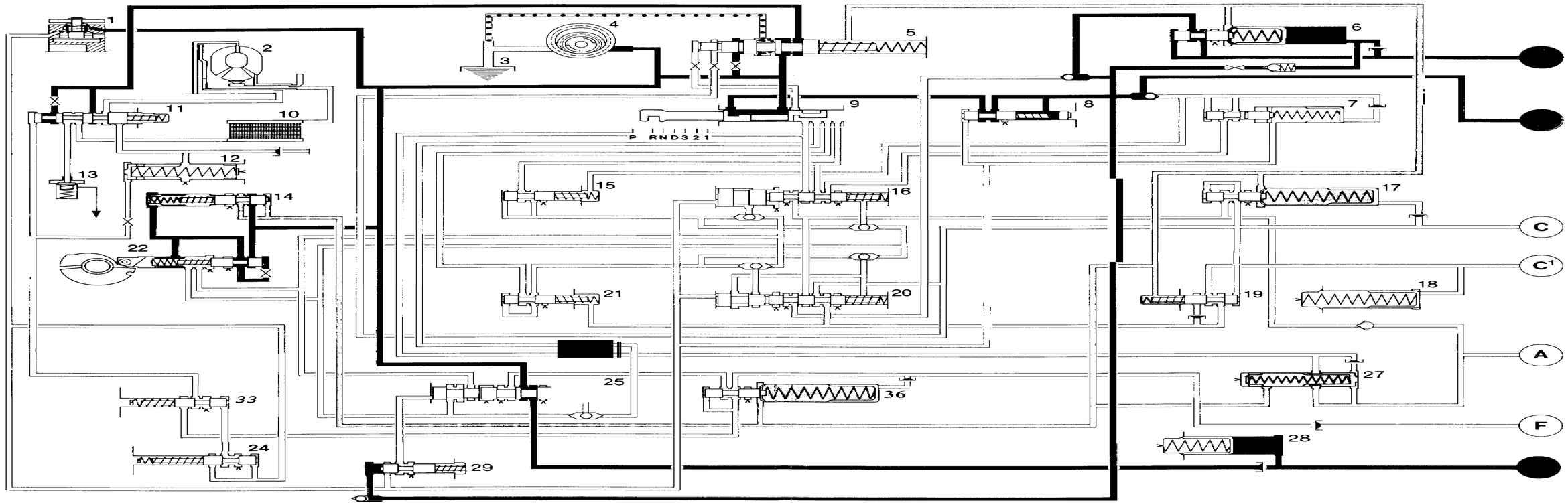
停放車

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車檔禁止
9 手控閥
10 油冷卻器
11 變矩器與後退閥
12 變矩器離合器阻尼器
13 單向閥
14 調制器閥
15 第一檔禁止
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器阻尼器
19 C' 離合器閥
20 2-3 換檔閥
21 第二檔禁止
22 節流閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4 換檔閥
26 F 離合器閥與阻尼器
27 A 離合器阻尼器
28 E 離合器阻尼器
29 F 離合器倒檔閥（倒車）

I 排氣管
II 節流閥
III 孔口
IV 支流管
V 干管
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION R REVERSE

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OIL FLOW CHART

POSITION A
REVERSE

1 GOVERNOR
2 TORQUE CONVERTER
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1 - 2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A ACLUTCH
B BCLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG R
RÜCKWÄRTSGANG

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLWMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DAMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION A
MARCHE ARRIERE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMLERE
16 TIROIR DE PASSAGE 1 - 2
17 TEROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TEROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE
24 TIROIR A HYSTERESIS
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGEC'
D EMBRAYAGED
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE A
RETROMARCIA

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOCA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1 - 2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONEC'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
22 INIBIZIONE 2da
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DIBLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PASSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION R
MARCHA ATAAS

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMERAGUE B
7 VALVULA Y AMORTIGUADOA DE EMBRAGLIE D
8 RADIATORE DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVEASORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1 - 2
17 VALVULA DEL EMBAAGUEC
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS EMBAAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORTIGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRA — E A
28 AMORTIGUADOR DE EMBAAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I SCARICO
II FARFALLA
III ORIFICIO
IV DERIVACION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DIBLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PASSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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HYDRAULISCHE DRUKREGELING

STAND R
ACHTERUIT

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EINDEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KCEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 ÉENRICHTINGSKLEP
14 MODULATORKLEP
15 EERSTEVERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C' KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 DEMPER KOPPELING
27 DEMPER E-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII REGELDRUK
VIII SMEERDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「R」の位置
後退ギア

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 手動バルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第1速ギアインヒビター
16 1-2シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3シフトバルブ
21 第2速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップ コントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ(後退用)

I 排気
II スロットル
III オリフィス
IV 支流管
V 本管
VI 調整圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

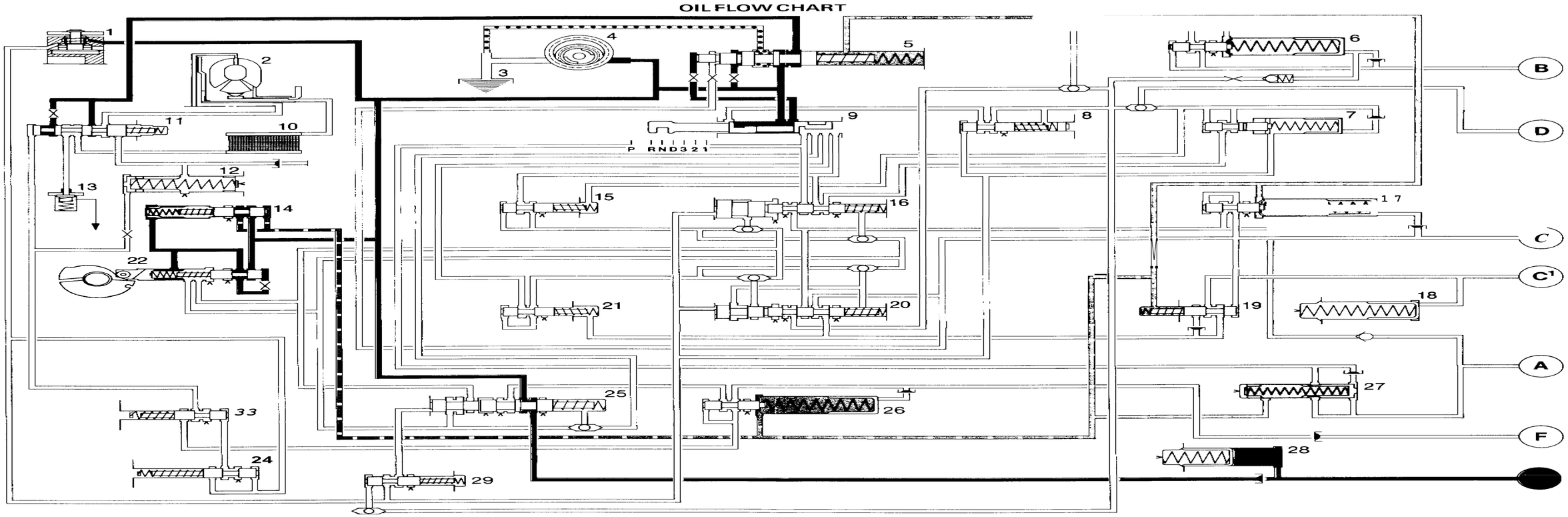
位置 R
倒車

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥和片簧
7 D 離合器閥和片簧
8 倒車檔制止
9 手控閥
10 油冷卻器
11 換向器和控制閥
12 換向器離合器閥片簧
13 單向閥
14 調制器閥
15 第一速檔制止
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器閥片簧
19 C' 離合器閥
20 2-3 換檔閥
21 第二速檔制止
22 節流閥
23 變矩器離合器鎖閉控制閥
24 換向器離合器滯後閥
25 3-4 換檔閥
26 F 離合器閥和片簧
27 A 離合器片簧
28 E 離合器片簧
29 F 離合器制止閥(倒車)

I 排氣管
II 節流閥
III 節流孔
IV 支流管
V 主管
VI 換向器壓力
VII 節流閥壓力
VIII 調壓器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION N NEUTRAL

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OIL FLOW CHART

POSITION N
NEUTRAL

1 GOVERNOR
2 TORQUE CONWEATOR
3 SUMP
4 PUMP
5 PRESSUREREGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH COCK UP CONTROL VALVE
24 CONVERTOR CLUTCHHYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 ECLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG N
NEUTRAL

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UNDRÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RUCKSCHAGSVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRUCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII REGLERDRUCK
VIII DROSSELDRUCK
IX REGLERDRUCK
X SPERRDRUCK
XI MODULIERDRUCK
XII PUMPENDAUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION N
POINT MORT

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET A MORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROISSEURD'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEURD'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE D'ECONVERTISSEUR
24 TIROIR A HYSTERESIS
D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUA D'EMBRAYAGE F
27 AMORTISSEUR D'EMERAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE N
FOLLE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 VALVULA E SMORZATORE FRIZIONE 6
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DE INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALWOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMEIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA AFARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALWOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALWOLA DI CAMBIO 3-4
26 VALVOLA ESMORZATORE FRIZIONE F
27 SMORZATORE FAIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION
DELACEITE

POSICION N
PUNTO MUERTO

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 POMPA
5 VALVULA REGULADORA DEPRESIO I
6 VALVULA Y AMORTIGUADOR DE EMERAGUE E
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VACVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMSRAGUEC
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DELEMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DELCONVERTIDOR
25 VALVULA DE CAMEIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMERAGUE A
28 AMORTIGUADOR DE EMERAGUEE
29 VALVULA INHIBICION DE EMERAGUE F

I RETORNO
II CARRERA DEL ACELERADOR
III BIFURCACION
IV PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODUCACEON
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBAAGUE A
B EMBAAGUE B
C EMBAAGUE C
C' EMBAAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND N
NEUTRAAL

1 REGULATEUR
2 KOPPELOMVORMER
3 POMP
4 POMP
5 DRUKREGELKLEP
6 KLEP ENDEMPEA, E-KOPPELING
7 KLEP END EMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENOE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2de VERSNELLING
22 SCHAKELKLEP 2-3
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPERE-KOPPELING
29 VERLICHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMSCHAKELDRUK
VII REGULATEURDRUK
VIII REGULATEURDRUK
IX ELOKKEERDRUK
X MODULATIEDRUK
XI BOMDRUK
XII SMEERDRUK

A A-KOPPELING
E E-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

03.43b

オイルの流れ図

「N」の位置
ニュートラル

1 オバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後進ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １-２シフトバルブ
17 C クラッチバルブ
18 C クラッチダンパー
19 C' クラッチバルブ
20 ２-３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 ３-４シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退時）

I 排気
II 絞り
III 開口
IV 分岐
V 主圧
VI コンバーター圧力
VII スロットル圧力
VIII 調整器圧力
IX ガバナー圧力
X ロッキング圧力
XI 調整圧力
XII ポンプ圧力
XII 潤滑圧力

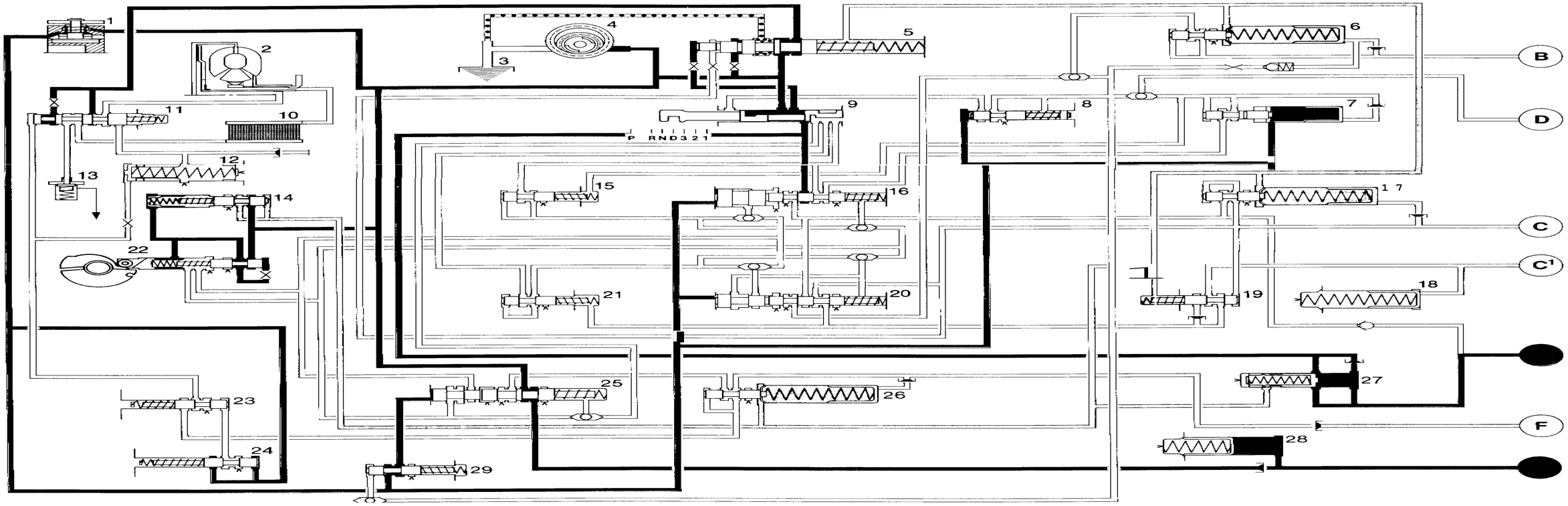
A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

位置 N
空檔

1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B 離合器閥和油缸器
7. D 離合器閥和油缸器
8. 倒車鎖制止
9. 手控閥
10. 油冷却器
11. 變速器閥和油缸
12. 變速器離合器閥缸器
13. 單向閥
14. 調制器閥
15. 第一檔制止
16. 1-2 換檔閥
17. C 離合器閥
18. C' 離合器閥缸器
19. C' 離合器閥
20. 2-3 換檔閥
21. 第二檔制止
22. 節流閥
23. 變矩器離合器操縱閥
24. 變矩器離合器滯後閥
25. 3-4 換檔閥
26. F 離合器閥和缸器
27. A 離合器缸器
28. E 離合器缸器
29. F 離合器制止閥（倒車）

OIL FLOW CHART



POSITION D **DRIVE** 1 IDLE

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OIL FLOW CHART

POSITION D
1ST GEAR
IDLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PSSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ERSTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG E, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DAMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V HAUPTDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
1ire VITESSE
ACCELERATION POTALE

1 REGUCATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE 3
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUICE
11 CONVERTISSEUR ET TIROIR
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELESTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRATAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
1a PRIME
A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE E
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA SMORZATORE FRIZIONEF
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESIONE PRINCIPALE
VI PRESIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
1.ª VELOCIDAD
MAXIMA ACELERACION

2 [illegible]DOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE E
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR. EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1.ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUEC'
20 VALVULA DE CAMBIO 2-3
21 INHIBICIOND E 2.ª VELOCIDAD
22 MARIPOSA DELACELERADOR
23 VALVULA DE CONTROL BLOQUEO DEL EMERAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DELCONVERTIDOR
VII PRESION DELACELERADOR
VIII PRESION DELREGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUEA
B EMBRAGUEB
C EMBAAGUEC
C' EMBRAGLIE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
1e VERSN.
VOLGAS NORMAAL RIJDEN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 [illegible]DE KLEP
10 [illegible]
11 OMVORMER EN ACHTERUITKLEP
12 [illegible]
13 [illegible]
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 [illegible]
19 [illegible]
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENLNGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KOEPENDEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPERE-KOPPELING
29 [illegible]KLEP (ACHTERUIT)

I UITLAAT
II GAS
III [illegible]
IV [illegible]
V [illegible]DRUK
VI [illegible]
VII GASDRUK
VIII REGULATEURDRUK
IX [illegible]MODULATIEDRUK
X [illegible]
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第 1 速
アイドリング

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 一方向弁
14 モジュレーターバルブ
15 第 1 速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3 シフトバルブ
21 第 2 速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4 シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ(後退用)

1 排気
II 絞り
III オリフィス
IV 支管
V 主圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX 調圧圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

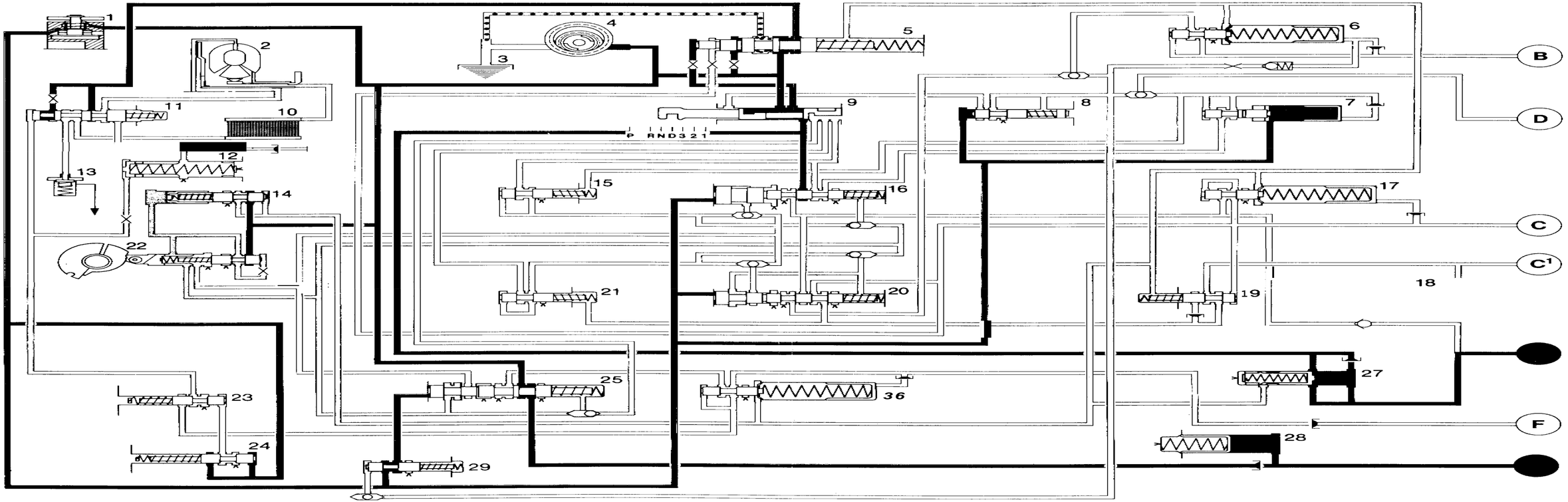
油流程図

位置 D
第一速
低速

値 57.5

1 調速器
2 変矩器
3 油槽
4 油泵
5 減壓閥
6 B 離合器閥組成元器
7 D 離合器閥組成元器
8 倒車檔齒輪止
9 手控閥
10 油冷卻器
11 變矩器及倒車閥
12 變矩器離合器閥組成器
13 單向閥
14 調制閥
15 第一檔齒輪止
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器閥
19 C' 離合器閥
20 2-3 換檔閥
21 第二檔齒輪止
22 節氣門閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4 換檔閥
26 F 離合器閥及減震元器
27 A 離合器閥及元器
28 E 離合器閥及元器
29 F 離合器倒車閥(倒車)

OIL FLOW CHART



POSITION D DRIVE 7 FULL THROTTLE

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AUTOMATICTRANSMISSION ZF 4HP 22

OIL FLOW CHART

POSITION D
DRIVE 1
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VAL 'E
6 3 CLUTCH VALVE AND DAMI ER
7 D CLUTCH VALVE AND DAM EA
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCHLOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ERSTER GANG
KICKDOWN

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCK REGELVENTIC
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPGUNG C', VENTIL
20 SCHALTVENTIC 2-3
21 2.GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERSEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRAVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIEDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
1ère VITESSE
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIA D'INVESAON
12 AMORTISSEUR D'EMBRAYAGE DE CONVEATISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DU CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBAAYAGEA
B EMBAAYAGEB
C EMBRAYAGE C
C' EMBAAYAGEC'
D EMBRAYAGED
E EMBRAYAGEE
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
MARCIA
RIDUZIONE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DI REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE
13 CONVERTITORE
14 VALVOLA UNIDIREZIONALE
15 VALVOLA MODULATRICE
16 INIEIZIONE 1ma
17 VALVOLA CAMBIO 1-2
18 VALVOLA FRIZIONE C
19 SMORZATORE FRIZIONE C'
20 VALVOLA FRIZIONE C'
21 VALVOLA CAMBIO 2-3
22 INIBIZIONE 2nda
23 VALVOLA A FARFALLA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZIONE
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION
DELACEITE

POSICION D
1ª VELOCIDAD
RETIRAROR

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CAATER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 RADIATORE OLIO
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONA t
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DELEMBAAGUEC
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DELEMBAAGWC'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBAAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORTIGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMERAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETDANO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBAAGUE B
C EMBRAGUE C
C' EMBAAYAGEC'
D EMBAAGUED
E EMBRAGUEE
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
1e VERSN.
KICKDOWN

7 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUIT TANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 TERUGSLAGVENTIL
14 MODULATORKLEP
15 BEGRENZER 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP OMVORMER-KOPPELING
25 KLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)

F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI BOMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C
C' C'-KOPPELING
D D-KOPPELING
E
F F-KOPPELING

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オイルの流れ図

「D」の位置
第１速
スロットル全開
キックダウン

7 レギュレーター
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 手動弁
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバーターカラッチダンパー
13 逆止弁
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバーターカラッチロックアップコントロールバルブ
24 コンバーターカラッチヒステリシスバルブ
25 3-4 シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II ガス
III スロットル
IV オリフィス
V 二又
VI 高圧
VII コンバーター圧力
VIII スロットル圧力
IX ガバナー圧力
X ロッキング圧力
XI 調整圧力
XII ポンプ圧力
XIII 潤滑圧力

A A 摩擦板
B B 摩擦板
C C 摩擦板
C' C' 摩擦板
D D 摩擦板
E E 摩擦板
F F 摩擦板

油流程図

位置 D
第一速
絞弁開全開

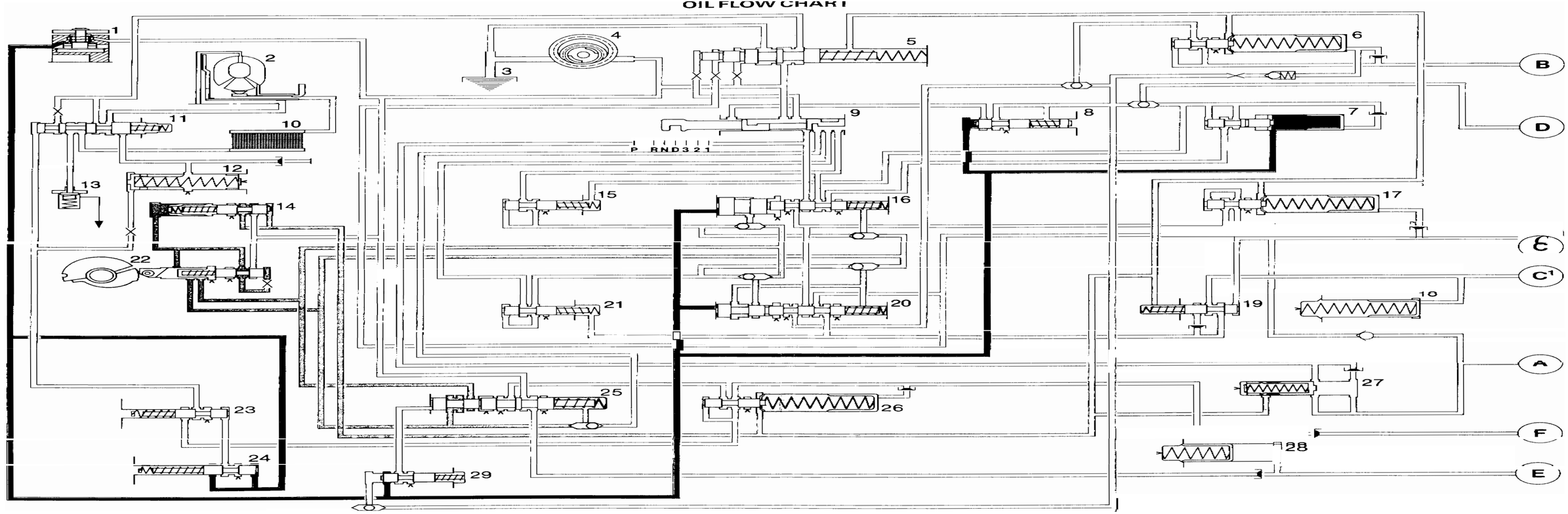
7.5

1 調速器
2 変矩器
3 油槽
4 油栓
5 圧力調整弁
6 B 摩擦板用油圧装置
7 D 摩擦板用油圧装置
8 後進ギヤインヒビター
9 手動弁
10 オイルクーラー
11 逆流防止弁
12 後退装置摩擦板用油圧装置
13 逆止弁
14 調和装置
15 第一速ギヤインヒビター
16 1-2 シフト弁
17 C 摩擦板用油圧装置
18 C' 摩擦板用油圧装置
19 C' 摩擦板用油圧装置
20 2-3 シフト弁
21 第二速ギヤインヒビター
22 スロットル弁
23 コンバーターカラッチロックアップ調和装置用油圧調和弁
24 コンバーターカラッチ摩擦板用油圧調和弁
25 3-4 シフト弁
26 F 摩擦板用油圧装置
27 A 摩擦板用油圧装置
28 E 摩擦板用油圧装置
29 F 摩擦板用油圧装置（後進）

I 排気装置
II ガス
III スロットル
IV 絞弁
V 二又
VI 高圧
VII 調速器圧力
VIII 油槽圧力
IX 調速器圧力
X 調和圧力
XI 圧力
XII 調和圧力

A A 摩擦板
B B 摩擦板
C C 摩擦板
C' C' 摩擦板
D D 摩擦板
E E 摩擦板
F F 摩擦板

OIL FLOW CHART



I V
II VI
III VII
IV VIII
IX
X
XI
XII

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POSITION D DRIVE 1ST GEAR KICKDOWN

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OIL FLOWCHAAT

POSITION D
1ST GEAR
KICKDOWN

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND **DAMPER**
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR **INHIBIT**
9 MANUAL VALVE
10 **OIL COOLER**
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 **MODULATOR** VALVE
15 **1ST** GEAR **INHIBIT**
16 1-2 **SHIFT VALVE**
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR **INHIBIT**
22 THROTTLE VALVE
23 **CONVERTOR** CLUTCH LOCK **UP CONTROL** VALUE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND **DAMPER**
27 A **CLUTCH** DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE **(REVERSE)**

I EXHAUST
II **THROTTLE**
III **ORIFICE**
IV **BRANCH**
V **MAIN PRESSURE**
VI CONVERTER **PRESSURE**
VII THROTTLE **PRESSURE**
VIII GOVERNOR **PRESSURE**
IX **LOCKING PRESSURE**
X **MODULATION PRESSURE**
XI WMP PRESSURE
XII LUBRICATION **PRESSURE**

A A CLUTCH
B B CLUTCH
C **C CLUTCH**
C' **C' CLUTCH**
D D CLUTCH
E E CLUTCH
F **F CLUTCH**

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ERSTER GANG
KICKDOWN

1 REGLER
2 DREHMOMENTWANDLER
3 **ÖLWANNE**
4 ÖLPUMPE
5 **DRUCKREGELVENTIL**
6 **KUPPLUNG B, VENTIL UND DÄMPFUNG**
7 **KUPPLUNG D, VENTIL UND DÄMPFUNG**
8 **RÜCKWÄRTSGANGSSPERRE**
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 **HYSTERESEVENTIL** WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 **KUPPLUNG F, VENTIL UND DÄMPFUNG**
27 **KUPPLUNG A, DÄMPFUNG**
28 KUPPLUNG E, DÄMPFUNG
29 **KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)**

I **ABFLUSS**
II **DROSSEL**
III **ÖFFNUNG**
IV VERZWEIGUNG
V **ARBEITSDRUCK**
VI **WANDLERDRUCK**
VII **DROSSELDRUCK**
VIII REGLERDRUCK
IX **SPERRDRUCK**
X **MODULIERDRUCK**
XI **PUMPENDRUCK**
XII **SCHMIERDRUCK**

A KUPPLUNG A
B **KUPPLUNG B**
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E **KUPPLUNG E**
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
1ère VITESSE
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 **TIROIR** DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
13 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESES D'EMBRAYAGE DE CONVERTISSEUR
25 **TIROIR DE** PASSAGE 3-4
26 TIROIR E T AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 **TIROIR** D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DU CONVERTISSEUR
VII PRESS—N D' ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMMI DELLA **MANDATA D'OLIO**

POSIZIONE D
1a PRIMA
KICKDOWN

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI **INVERSIONE**
12 SMORZATORE FRIZIONE **CONVERTITORE**
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 **INIB**IZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONEC'
20 VALVOLA CAMBIO 2-3
21 **INIBIZIONE** 2nda
22 VALVOLA A **FARFALLA**
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE **FRIZIONE** E
29 VALVOLA INIBIZIONE FRIZIONE F

I SCARICO
II FARFALLA
III ORIFICIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE **CONVERTITORE**
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONEC'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
1ª VELOCIDAD
RETIRARORA

1 REGULADOR
2 CONVERTIDOR DE PAR
3 **DEPOSITO**
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR. EMBRAGUE DEL CONVERTIDOR
13 VALVULA **UNI**DIRECCIONAL
14 VALVULA MODULADORA
15 **INHIBICION** DE 1ª **VELOCIDAD**
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR **DEL** EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 **INHIBICION** DE 2ª **VELOCIDAD**
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL BLOQUEO DEL EMBAAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE **CAMBIO** 3-4
26 VOLVULA Y AMORTIGUADOR DE EMBRAGUEF
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV **DERIVACION**
V **PRESION PRINCIPAL**
VI PRESION DEL CONVERTIDOR
VII **PRESION** DEL ACELERADOR
VIII PRESION DEL **REGULADOR**
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE E
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
KICKDOWN

1 REGULATEUR
2 **KOPPEL**OMVORMER
3 **OLIEPAN**
4 **BOMP**
5 **REGELKLEP**
6 KLEP EN DEMPER B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 **HAND**BEDIENDE KLEP
10 **OLIEKOELER**
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 **EENRICHTINGSKLEP**
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 C-KOPPELING DEMPER
19 **KLEP**, C'-KOPPELING
20 SCHAKELKLEP 2-3
21 **BEGRENZER**, 2e VERSNELLING
22 **GASBEDIENINGSKLEP**
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 **HYSTERESISKLEP** OMVORMER-**KOPPELING**
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 **VEILIGHEIDSKLEP (ACHTERUIT)** F-**KOPPELING**

I **UIT**LAAT
II GAS
III SLOTVULLING
IV **AFTAKKING**
V **HOOFDDRUK**
VI OMVORMER**DRUK**
VII **REGELDRUK**
VIII **BLOKKEERDRUK**
IX
X MODULATIEDRUK
XI POMPDRUK
XII **SMEERDRUK**

A A-**KOPPELING**
B B-KOPPELING
C C-**KOPPELING**
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第１速
キックダウン

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 一方向弁
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップ コントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4 シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II ガス
III スロットル
IV 絞り
V 主圧
VI 高圧
VII レギュラー圧力
VIII スロットル圧力
IX ガバナー圧力
X ロッキング圧力
XI 調整圧力
XII ポンプ圧力
潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

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油流程圖

位置 D
第一檔
自動鎖合

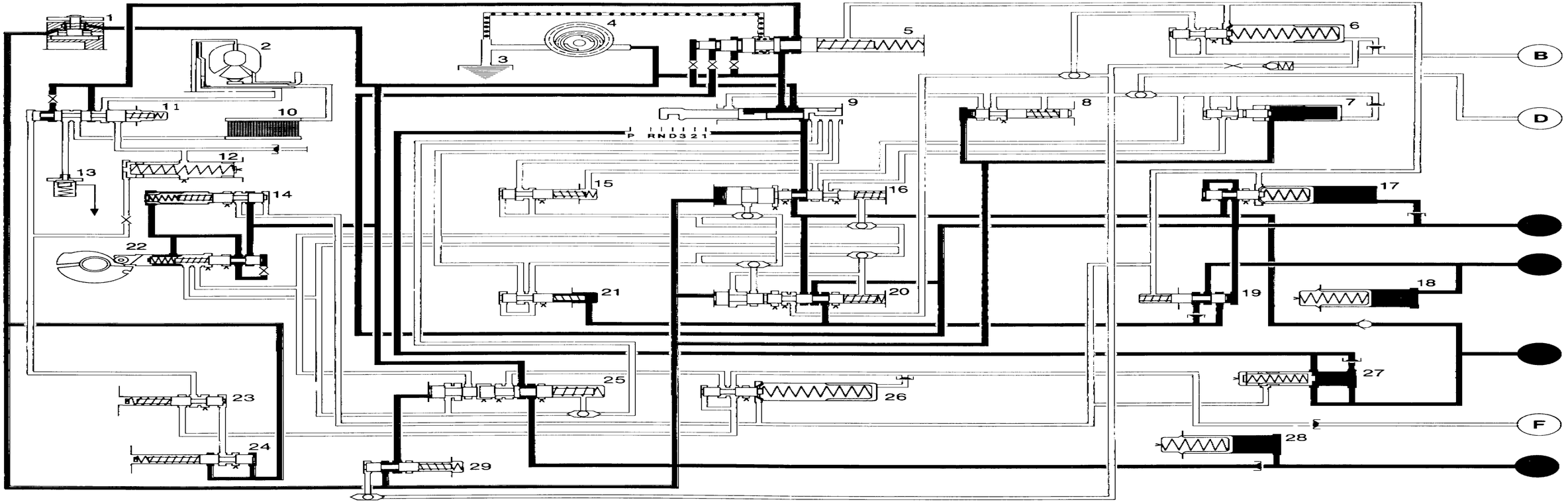
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1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B 離合器閥與阻尼器
7. D 離合器閥與阻尼器
8. 倒車檔制止
9. 手控閥
10. 油冷卻器
11. 換向器與單向閥
12. 換向器離合器與阻尼器
13. 單向閥
14. 調制器閥
15. 第一檔制止
16. 1-2 換檔閥
17. C 離合器閥
18. C' 離合器與阻尼器
19. C' 離合器閥
20. 2-3 換檔閥
21. 第二檔制止
22. 節流閥
23. 變矩器離合器鎖閉控制閥
24. 變矩器離合器滯後閥
25. 3-4 換檔閥
26. F 離合器與阻尼器
27. A 離合器阻尼器
28. E 離合器阻尼器
29. F 離合器制止閥（倒車）

I 排氣
II 氣
III 節流閥
IV 節流孔
V 主壓
VI 高壓
VII 調壓器壓力
VIII 調速器壓力
IX 換閂壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D DRIVE 2ND GEAR IDLE

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OIL FLOWCHART

POSITION D
2ND GEAR
IDLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI W.M.P PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
LWEITER GANG
LEERLAUF

1 REGLER
2 DREHMOMENT WANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WAHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG. DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII KUPPLUNGSDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
a KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
2ème VITESSE
RALENTI

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR E I AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
52 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CFAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II PAPILLONNEUR
III ORIFICE
IV RACCORD
V PRESSION PRENCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
2a PRIMA
MINIMO

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 AADIATORE OLIO
11 CONVERTITORE E VALVOLA DE INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFICIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE BA
a
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F

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DEAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
2-VEL — IDAD
RALENTI

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA DE INVERSION
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVOLA CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MAREPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORTIGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELEAADOA
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
2e VERSN.
STATIONAIR TOERE — AN

7 REGULATEUR
2 CORREC MVORMER
3
4 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-
25 KOPPELINGSKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VELIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING

C' C'-KOPPELING
D D-KOPPELING
E E-KOPPEUNG
F F-KOPPELING

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オイルの流れ図

「D」の位置
第２速
アイドリング

1. ガバナー
2. トルクコンバーター
3. オイルパン
4. ポンプ
5. 圧力調整弁
6. B クラッチバルブとダンパー
7. D クラッチバルブとダンパー
8. 後退ギアインヒビター
9. マニュアルバルブ
10. オイルクーラー
11. コンバーター後退用バルブ
12. コンバータークラッチダンパー
13. ワンウエイバルブ
14. モジュレーターバルブ
15. 第１速ギアインヒビター
16. １－２シフトバルブ
17. C クラッチバルブ
18. C'クラッチダンパー
19. C'クラッチバルブ
20. ２－３シフトバルブ
21. 第２速ギアインヒビター
22. スロットルバルブ
23. コンバータークラッチロックアップコントロールバルブ
24. コンバータークラッチヒステリシスバルブ
25. ３－４シフトバルブ
26. F クラッチバルブとダンパー
27. A クラッチダンパー
28. E クラッチダンパー
29. F クラッチインヒビターバルブ（後退用）

I 排気
II 絞り
III 開口
IV 分岐
V 本圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

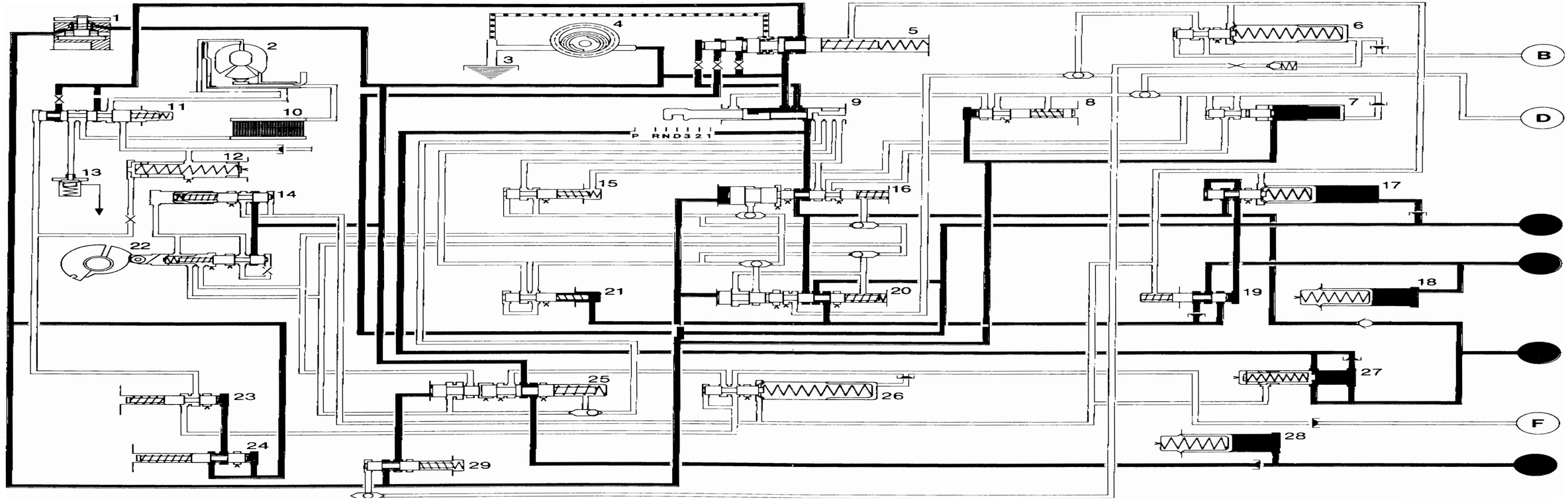
位置 D
第二檔
低速

1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B 離合器閥和阻尼器
7. D 離合器閥和阻尼器
8. 倒車檔鎖止
9. 手控閥
10. 油冷卻器
11. 離合器單向閥
12. 離合器離合器阻尼器
13. 單向閥
14. 調油器閥
15. 第一檔鎖止
16. 1-2 換檔閥
17. C 離合器閥
18. C'離合器阻尼器
19. C'離合器閥
20. 2-3 換檔閥
21. 第二檔鎖止
22. 節流閥
23. 離合器離合器鎖閉控制閥
24. 離合器離合器滯後閥
25. 3-4 換檔閥
26. F 離合器閥和阻尼器
27. A 離合器閥尼器
28. E 離合器阻尼器
29. F 離合器鎖止閥（倒車）

I 排氣
II 節流閥
III 節流孔
IV 分流
V 主壓
VI 離合器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION D DRIVE 2ND GEAR FULL THROTTLE

I II III IV V VI VII VIII IX X XI XII

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OIL FLOW CHART

POSITION D
2ND GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERT — AND REVERSING VALVE
12 CONVERT — CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1–2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATOR PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A ACLUTCH
a B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ZWEITER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WMLSCHIEBEA
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I AEFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDAUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
a KUPPLUNG E
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
2ème VITESSE
ACCELERATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMLERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMERAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELETION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCOAD
V PRESSION PRINCIPALE
VI PRESSION DU CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DU REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMERAYAGEC
C' EMERAYAGE C'
D EMBRAYAGE D
E EMERAYAGEE
F EMERAYAGEF

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
A 2ª MARCIA
ACCELERAZIONE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VACVOLA FRIZIONE C
18 TIROIR D'EMBRAYAGE C
19 AMORTISSEUR D'EMERAYAGE C'
20 VACVOLA FRIZIONE C'
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VACVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FAAFALLA
III DEPRESSIONE
IV
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
a FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FAIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE ACEITE

POSICION D
MARCHA 2ª VELOCIDAD
ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA DE REGULACION DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 MARCHA ATRAS
9 VALVULA MANUAL
10 RADIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA DE INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR DE
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VACVOLA DEL EMBRAGUE C
18 VALVULA DEL EMBRAGUE C'
19 AMORTIGUADOR DEL EMBRAGUE C'
20 VACVOLA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DE ACELERADOA
23 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE (INVERSIONE)

27 EMBRAGUEADOR DE EMERAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I MARIPOSA DELA CELERADOR
II
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACEON
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMSRAGUE B
C EMBRAGUEC
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
2e VERSN.
VOLGAS

1 REGULATEUR
2 CONVERTOMVORMER
3
4 POMP
5 DRUKREGELKCEP
6 KLEP EN DEMPER, B-KOPPELING
7 KCEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDSCHEERKLEP
10
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 EEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKFEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKCEP, KOPPELINGS-OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28
29 VEILIGHEIDSKLEP (ACHTERUIT)

F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKRACK
V
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI SMEERDRUK
XII

A A-KOPPELING
a B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第２速
スロットル全開

1 REGULATEUR
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバーターとクラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １－２シフトバルブ
17 C クラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 ２－３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップ
コントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 ３－４シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III 開放
IV 変成器
V 主圧
VI 調整器圧力
VII 調速機圧力
VIII 調整器圧力
IX 調圧力
X 調整圧力
XI 潤滑圧力
XII 調滑圧力

A A 調整器
B B 調整器
C C 調整器
C' C'調整器
D D 調整器
E E 調整器
F F 調整器

油流程図

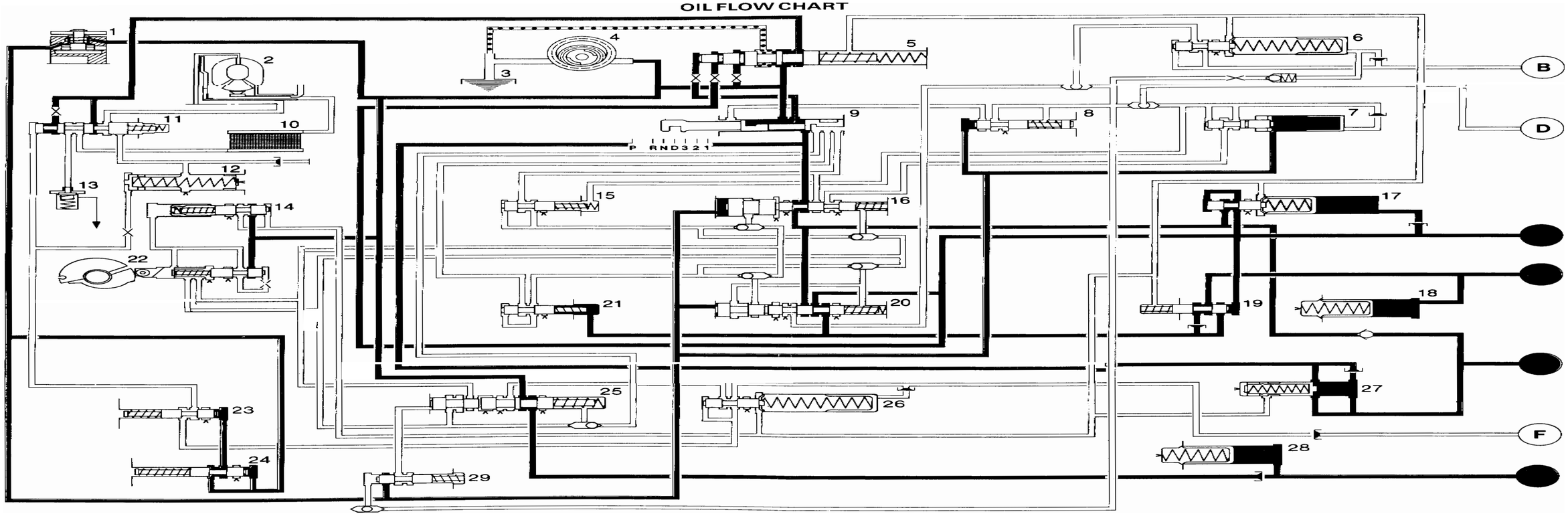
位置 D
第二速
絞弁開全開

1 調速器
2 変矩器
3 油槽
4 油ポ
5 調整弁
6 B調整器開閉用弁器
7 D 調整器開閉用弁器
8 後進ギヤ止め
9 手動弁
10 油冷却器
11 逆転調整器開閉用弁
12 調整器調整器用弁器
13 一方向弁
14 調節弁
15 第一速ギヤ止め
16 １－２シフト弁
17 C 調整器弁
18 C'調整器ダンパー
19 C'調整器弁
20 ２－３シフト弁
21 第二速ギヤ止め
22 スロットル弁
23 変矩器調整器開閉用装置
24 変矩器調整器用弁
25 ３－４シフト弁
26 F 調整器弁とダンパー
27 A 調整器ダンパー
28 E 調整器ダンパー
29 F 調整器止め弁（後退）

I 排気
II 絞り
III 解放
IV 変成器
V 主圧
VI 調整器圧力
VII 調速機圧力
VIII 調整器圧力
IX 調圧力
X 調整圧力
XI 潤滑圧力
XII 調滑圧力

A A 調整器
B B 調整器
C C 調整器
C' C'調整器
D D 調整器
E E 調整器
F F 調整器

OIL FLOW CHART



POSITION D DRIVE 2ND GEAR KICKDOWN

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OIL FLOW CHART

POSITION D
2 W D GEAR
KICKDOWN

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VACVE AND DAMPER
8 REVERSE GEARINHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRA
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI W M P PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B E CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ZWEITER GANG
KICKDOWN

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
2ème VITESSE
KICKDOWN
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMERAYAGE E
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMERAYAGE C'
20 TIROIR D E PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR E T AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D

KICKDOWN

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE

6 PRESSIONE SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VALVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE Ima
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIEZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMEIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSJONEREGOLATORE
IX PRESSIONE BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
E FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
MAXIMA VELOCIDAD
KICKDOWN

1 REGULADOR
2 CONVERTIDOA DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADORDE ACEITE
11 SMORZATORE FRIZIONE CONVERTITORE
12 AMORTIGUADOR. EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1 - 2
17 VALVULA DE LEMBRAGUE C
18 AMORTIGUADOR DEL EMERAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELEAADOR
23 VALVULA DI STERESIS DELLA FRIZIONE CONVERTITORE BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMERAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV ELEVACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMERAGWEA
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
KICKDOWN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EINDKLMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELEA
11 SMORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'I KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOGEDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPEUNG

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オイルの流れ図

「D」の位置
第２速
キックダウン

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 Fクラッチバルブとダンパー
27 Aクラッチダンパー
28 Eクラッチダンパー
29. Fクラッチインヒビターバルブ(後退用)

1 排気
II 絞り口
III 開口
IV 分岐
V 入口
VI 潤滑圧力
VII ガバナー圧力
VIII ニンバーター圧力
IX スロットル圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

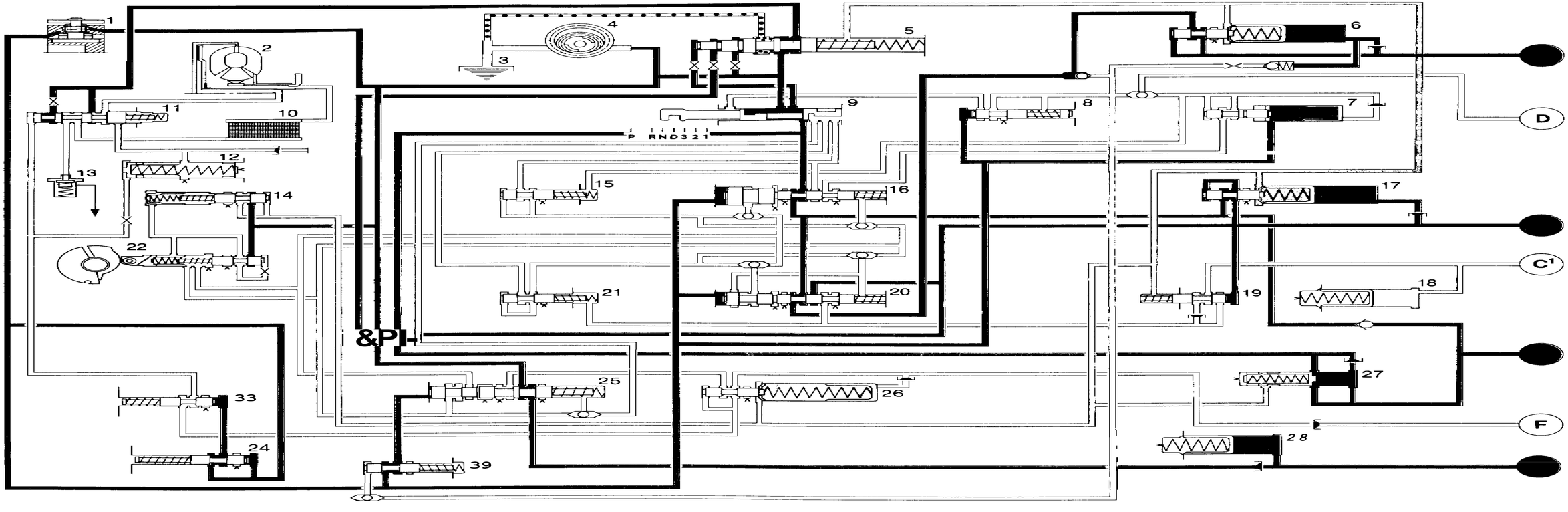
位置 D
第二檔
自動跳合

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車閉鎖閥
9 手控閥
10 油冷卻器
11 變速器與液壓閥
12 變矩器離合器與阻尼器
13 單向閥
14 調制器閥
15 第一檔閉鎖
16 1-2換檔閥
17 C離合器閥
18 C'離合器阻尼器
19 C'離合器閥
20 2-3換檔閥
21 第二檔閉鎖
22 節流閥
23 變矩器離合器鎖緊控制閥
24 變矩器離合器滯後閥
25 3-4換檔閥
26 F離合器與阻尼器
27 A離合器阻尼器
28 E離合器阻尼器
29. F離合器閉鎖閥(倒車)

I 排氣裝置
II 節流閥
III 節流孔
IV 支流管
V 主壓
VI 變速器壓力
VII 調壓閥壓力
VIII 調速器壓力
IX 節閥壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION D DRIVE 3RD GEAR PART THROTTLE

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OIL FLOW CHART

POSITION D
3RD GEAR
PART THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSUREREGULATINGVALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSEGEARINHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATORVALVE
15 1ST GEAR INHIBIT
16 1-2SWIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCHHYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTERPRESSURE
VII THROTTLE PRESSURE
VIII GOVERNORPRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
a B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
DRITTER GANG
TEILGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UNDDÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPEREADRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
a KUPPLUNG a
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DEAGRAMME D'ECOULEMENT D'HUILE

POSITION D
3ème VITESSE
ACCELERATION PARTIELLE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DELIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUA D'EMERAYAGE DE CONVERTISSEUR
13 CLAPETDE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELETION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DECONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT DE EMBRAYAGE F(MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSIONPRINCIPALE
VI PRESSIONDE CONVERTISSEUR
VII PRESSIOND'ACCELERATION
VIII PRESSIONDE REGULATEUR
IX PRESSIONDE VERROUILLAGE
X PRESSIONDE MODULATION
XI PRESSIONDE POMPE
XII PRESSIONDE GRAISSAGE

A EMBRAYAGE A
E EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
AD ACCELERAZIONE PARZIALE

1 REGOLATORE
2 CONVERTITORE DICOPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSPONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONED
8 INIBIZIONE RETROMARCIA
9 VOLVA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRLCE
15 INIBIZIONE 1ma
16 EMPECHEMENT DE PREMIERE
17 TIROIR DE PASSAGE 1-2
18 SMORZATORE FRIZIONE C
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFACLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMEIO 3-4
26 VALVOLA E SMORZATORE FRIZIONEF
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONEPRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONEDI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DFAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
3ª VELOCIDAD
BLOQUEO ACELERACION PARCIAL

1 REGUCADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUES B
7 VALVULA Y AMORTIGUADOR DE EMERAGUE D
8 ENBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 RADIATORE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMERAGUEC
18 AMORTIGUADOR DELEMBRAGUE C'
19 VALVULA DEL EMBRAGUEC'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARLPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DELEMBRAGUE DEL CONVERTIDOR
24 VALVULA DEHISTERESIS
25 EMERAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INHIBICION DE EMBAAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DELACELERADOA
III ORIFICIO
IV DERIVACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL AEGUCADOR
IX PRESION DE BLOQUEO
X PRESION DEMODULACION
XI PRESION DE LA BOMBA
XII PRESION DELUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
3e VERSN.
GEDEELTELIJK GAS

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HITSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKECKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VELIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV
V HOOFDDRUK
VE OMVORMERDRUK
VII REGELDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI
XII

A A-KOPPELING
a B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第３速
スロットル半開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後進ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ(後退用)

I 排気
II スロットル
III 絞り
IV 分岐
V 本圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
a B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程図

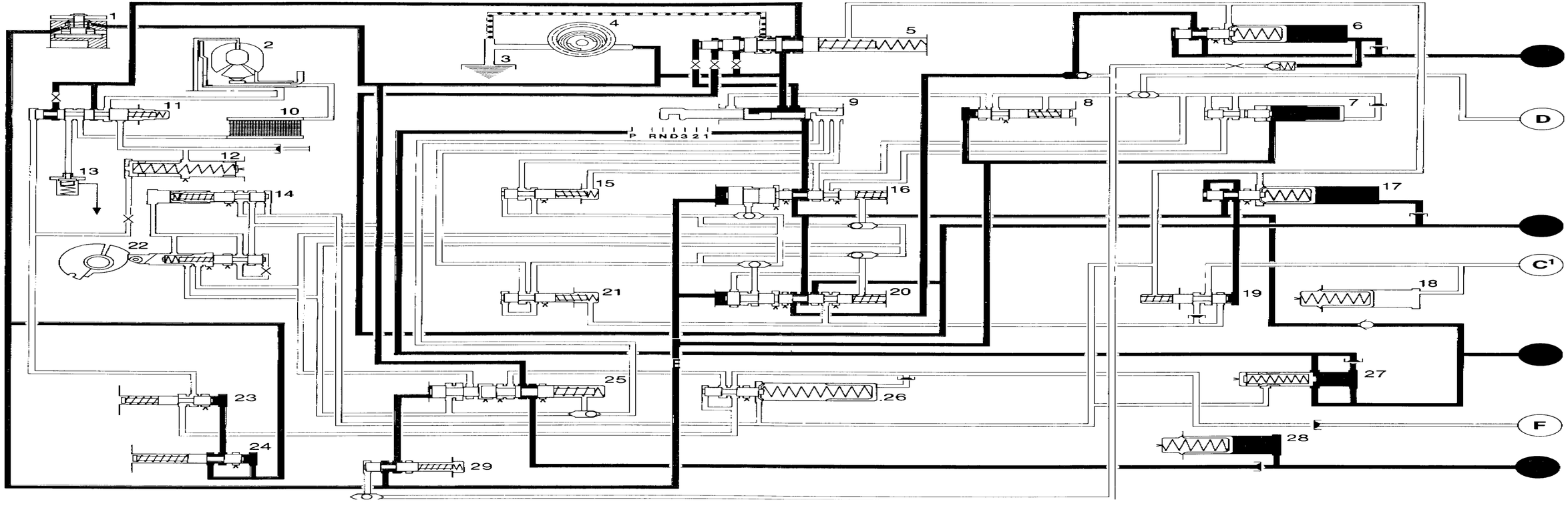
位置 D
第三檔
節流閥部分鎖閉

1 調速器
2 變矩器
3 油槽
4 油泵
5 壓力調整閥
6 B 離合器閥和減震器
7 D 離合器閥和減震器
8 倒車檔互鎖閥
9 手控閥
10 油冷卻器
11 換向器閥及回授閥
12 換向器離合器減震器
13 單向閥
14 調壓閥
15 第一檔互鎖閥
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器減震器
19 C' 離合器閥
20 2-3 換檔閥
21 第二檔互鎖閥
22 節流閥
23 變矩器離合器鎖止控制閥
24 變矩器離合器滯後閥
25 3-4 換檔閥
26 F 離合器閥和減震器
27 A 離合器減震器
28 E 離合器減震器
29 F 離合器互鎖閥(倒車)

I 排氣
II 節流閥
III 節流孔
IV 分流
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖緊壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓力

A A 離合器
a B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D DRIVE 3RD GEAR FULL THROTTLE

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OIL FLOW CHART

POSITION D
3RD GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSUREREGULATINGVALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCHVALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1 - 2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOA CLUTCH HYSTERLSIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAJN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
a B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
DRITTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENT WANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WAHLSCHEIBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1 -GANG-SPERRE
16 SCHALTVENTIL 1 - 2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2 -GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUWLUNG A, DÄMPFUNG
28 KUPPLUNG E DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
a KUPPLUNG a
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
3ème VITESSE
ACCELERATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1 -2
17 TIROIR DE MEAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUICLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTLSSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSIONPRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSIONDE ACCELERATION
VIII PRESSIONDE REGULATEUR
IX PRESSIONDE VERROUILLAGE
X PRESSIONDE MODULATION
XI PRESSIONDE POMPE
XII PRESSIONDE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE E
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
3a PRIMA
A TUTTO GAS .

1 REGOCATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 PRESSIONE VALVOCA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIEZIONE 1ma
16 VALVOCA CAMBIO 1-2
17 VALVOCA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVM A FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI STERESI DELLA DELCONVERTISSEUR
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODOLAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
E FRIZIONE E A
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
3a VELOCIDAD
MAXIMA ACELERACEON

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAG—E DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAC
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMEIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DECONTROL BLOQUEO DELEMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMRRAGUE DELCONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADORDE EMBRAGUE A
28 AMORTIGUADORDE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESIONPRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DEMODULACION
XI PRESIONE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
a EMERAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
3 e VERSN
VOLGAS

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 DRUKREGELKLEP
5
6 KLEP E NDEMPER, B-KOPPELING
7 KLEP E NDEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODUCATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1 - 2
17 REMPERKOPPELING
18
19 KFEP, C-KOPPELING
20 SCHAAKELKCEP 2–3
21 EEGRENZER 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS.
VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-
KOPPELINGS
25 SCHAKELKLEP 3–4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV
V
VI
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI
XII

A A-KOPPELING
E B-KOPPELING
C' C-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第３速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後進ギヤインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエーバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコックアップ
24 コントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4シフトバルブ
27 Aクラッチダンパー
28 Eクラッチダンパー
29 Fクラッチインヒビターバルブ(後退用)

I 排気装置
II 絞弁
III 開口
IV 分流管
V 主圧
VI 変速圧
VII コンバーター圧力
VIII 調圧弁圧力
IX ブロック圧力
X 変調圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
a Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

位置 D
第三速
節流閥全開

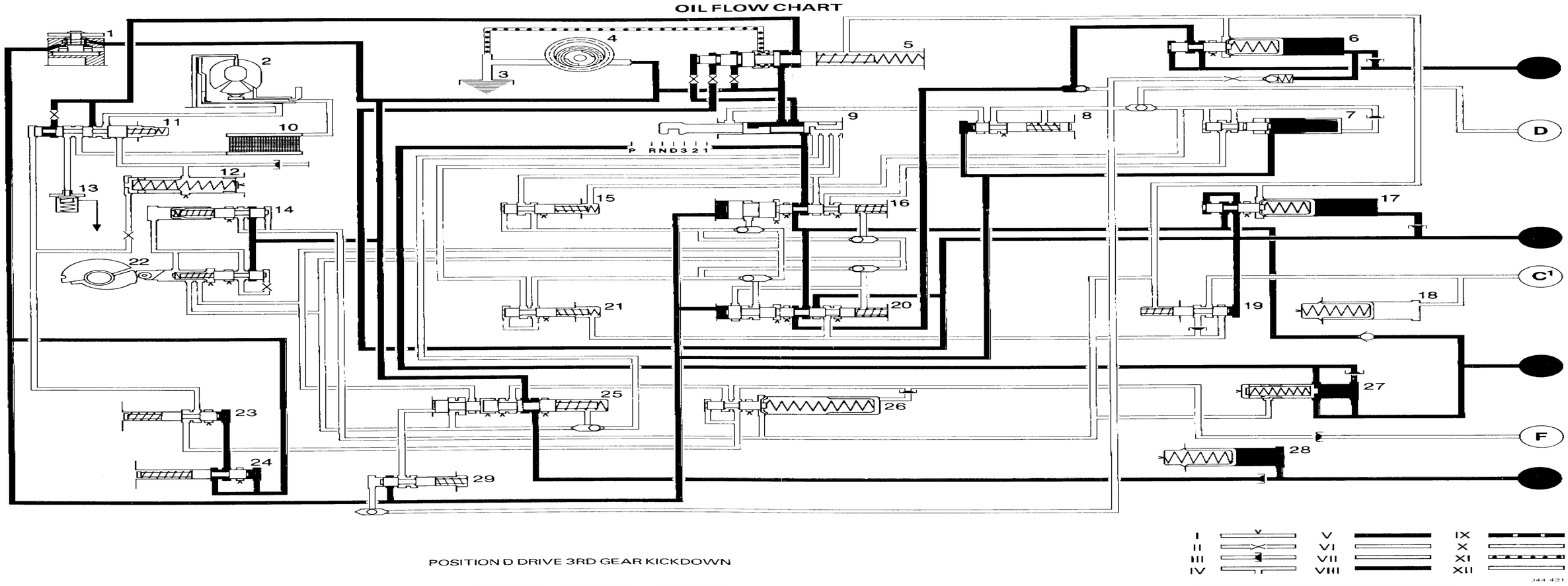
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1 調速器
2 變矩器
3 油盤
4 油泵
5 調壓閥
6 B離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車慣性制止
9 手控閥
10 油冷卻器
11 變矩器與倒車閥
12 離合器離合器與阻尼器
13 單向閥
14 調節閥
15 第一速慣性止
16 1-2換擋閥
17 C離合器閥
18 C'離合器閥阻尼器
19 C'離合器閥
20 2-3換擋閥
21 第二速慣性止
22 節流閥
23 變矩器離合器閥門控制
24 離合器離合器閥
25 3-4換擋閥
26 F離合器閥與阻尼器
27 A離合器阻尼器
28 E離合器阻尼器
29 F 離合器制止閥(倒車)

I 排氣
II 節流閥
III 節流孔
IV 分流管
V 主閥
VI 變速器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 慣性壓力
X 調制壓力
XI 泵壓
XII 潤滑壓力

A A離合器
a B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION D DRIVE 3RD GEAR KICKDOWN

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OIL FLOW CHART

POSITION D
3RD GEAR
KICKDOWN

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSUREREGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVEASE GEARINHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTORAND REVERSINGVALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAINPRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI W M P PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
DRITTER GANG
KICKDOWN

1 REGLER
2 DREHMOMENT WANDGER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UNDDÄMPFUNG
7 KUPPLUNG D, VENTIL UNDDÄMPFUNG
8 RÜCKWARTSGANGSPERRE
9 VORLAUFSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULATORDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
3ème VITESSE
RETROGRADATEON

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET A MORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDSSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBAAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS
25 D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
TIROIR ET A MORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBAAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECWAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBAAYAGEA
B EMBAAYAGEB
C EMBRAYAGEC
C' EMBRAYAGE C'
D EMBAAYAGED
E EMBRAYAGEE
F EMBRAYAGEF

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
3a PRIMA
KICKDOWN

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVOLA E SMORZATORE FRIZIONE B
8 INIGIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 AADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONEC'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARAESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INBIZIONE FAIZIONE F (INVERSIONE)

I SCARICO
II FAAFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRAINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PAESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONEC
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
3ª VELOCIDAD
KICKDOWN

1 REGULADORETRARDOR
2 CONVERTIDORDE PAR
3 CAATER
4 BOMBA
5 VALVWLA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA E SMORZATORE FRIZIONE B
8 INIGIZIONE RETROMARCHA
9 VOLVOLA MANUALE
10 AADIATORE DLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREEIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1 - 2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICIONDE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVEATIDOA
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE VALVE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUEE
29 VALVULA INHIBICION DE EMERAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV EIFURCACION
V PRESSION PRINCIPAL
VI PRESIONDEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBAAGUEA
B EMBRAGUEE
C EMBAAGUEC
C' EMBRAGUE C'
D EMBRAGUED
E EMBRAGUEE
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
KICKDOWN

1 REGULATEUR
2 CONVERTOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDSBEDIENDE KLEP
10 OLIEKOELER
11 OMVOAMER EN ACHTERUITKCEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VEASNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
SCHAKELKLEP 2-3
20
21 EEGRENZER 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDAUK
IX BLOKKEERDRUK
XI SMEERDRUK

A A-KOPPELING
E B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第３速
キックダウン

1 レギュレーター
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバーターダンパー
13 逆止弁
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １－２シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 ２－３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 ３－４シフトバルブ
26 FクラッチバルブとダンパーA
27 Aクラッチダンパー
28 Eクラッチダンパー
29 Eクラッチインヒビターバルブ（後退用）
F-KOPPELING

I 排気
II ガス
III オープニング
IV オフィス
V 主圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

「D」位置
第三檔
自動降合

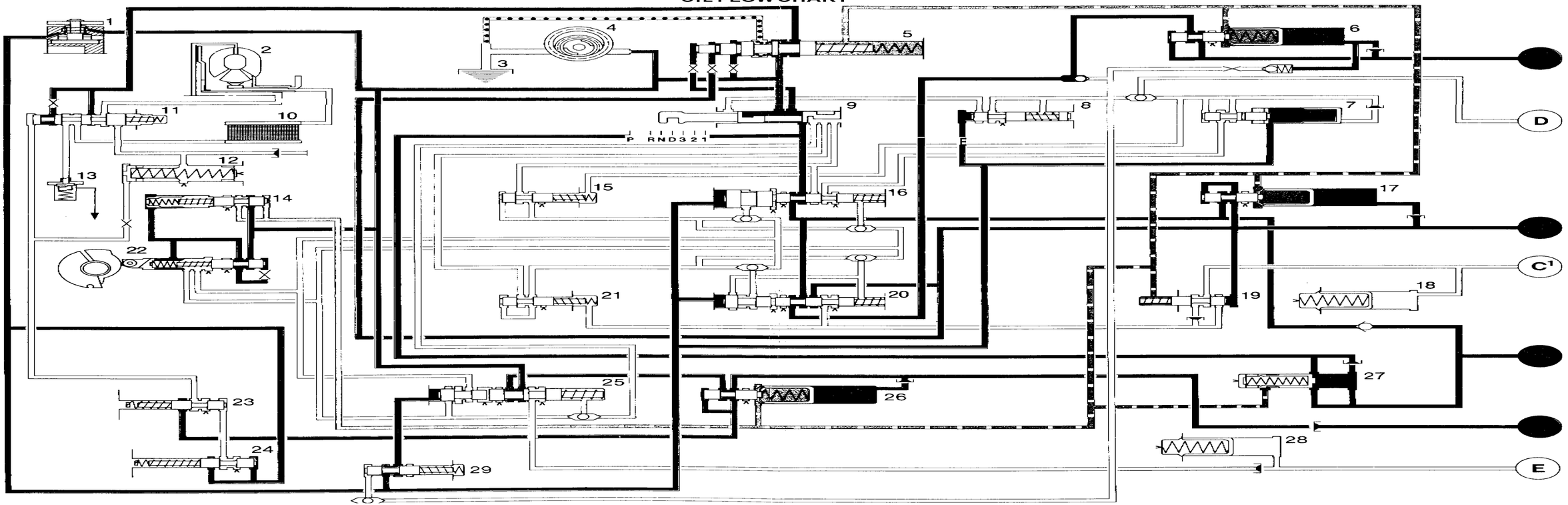
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1 減速器
2 變矩器
3 油槽
4 油泵
5 壓力調節閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車檔鎖閉器
9 手動閥
10 油冷却器
11 變矩器與倒車閥
12 變矩器離合器阻尼器
13 單向閥
14 調節器閥
15 第一檔鎖閉器
16 1-2換檔閥
17 C離合器閥
18 C'離合器阻尼器
19 C'離合器閥
20 2-3換檔閥
21 第二檔鎖閉器
22 節流閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4換檔閥
26 F離合器閥與阻尼器
27 A離合器阻尼器
28 E離合器阻尼器
29 F離合器鎖止閥（倒車用）
F-KOPPELING

1 排氣
II 節流閥
III 節流孔
IV 分流
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調壓力
XI 泵壓
XII 潤滑壓力

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION D DRIVE **4TH GEAR PART THROTTLE**

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OIL FLOW CHART

POSITION D
4TH GEAR
PART THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH COCK UP CONTROL VALVE
24 CONVERTOH CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A ACLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D DCLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
VIERTER GANG
TEILGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWARTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RUCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUMG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWARTSGANG)

I ABFLUSS
II DROSSEL
III OFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ÉCOULEMENT D'HUILE

POSITION D
4ème VITESSE
ACCELERATION PARTIELLE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE L'HUILE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE E
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARAIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVEASION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENTDE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGEC'
19 TIROIR D'EMBRAYAGEC'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENTDE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR DE COMMANDE DE VERROUILAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DECONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSIONPRINCIPALE
VI PRESSIONDE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSIONDE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
4a VELOCITÀ
A D ACCELERAZIONE PARZIALE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOCA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FREZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INBIZIONE 1ma
16 VALVOCA CAME 10 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA AFARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
4ª VELOCIDAD
RETIRAROR

1 REGULADOR
2 CONVERTIDORDE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUEB
7 VALVULA Y AMORTIGUADOR DE EMBRAGUED
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBAAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMEAAGUE C
18 AMORTIGUADOA DEL EMBRAGUEC'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIEICION D E 2ª VELOCIDAD
22 MARIPOSA DEL ACELEAADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUEDEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUEF
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION D E EMBRA——E F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESIONPRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERACION
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBAAGUE A
B EMBAAGUEB
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUEF

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HYDRAULISCHE DRUKREGELING

STAND D
4e VERSN.
GEDEELTELIJK GAS

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP E N DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1 - 2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGS KLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP ENDEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)

I UITLAAT
II GAS
III SLOTVLAK
IV OPENING
V HOOFDDRUK
VI OMVOA MERDRUK
VII REGULEURDRUK
VIII BLOKKEERDRUK
IX DRUKVERSCHIL
X MODULATIEDRUK
XI DOORMEERDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第４速
スロットル半開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 Fクラッチバルブとダンパー
27 Aクラッチダンパー
28 Eクラッチダンパー
29. Fクラッチインヒビターバルブ（後退用）

I 排気
II 絞り
III スロットル
IV 分岐
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII 調整器圧力
IX ガバナー圧力
X Dクラッチ圧力
XI 調整圧力
XII ポンプ圧力
XIII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

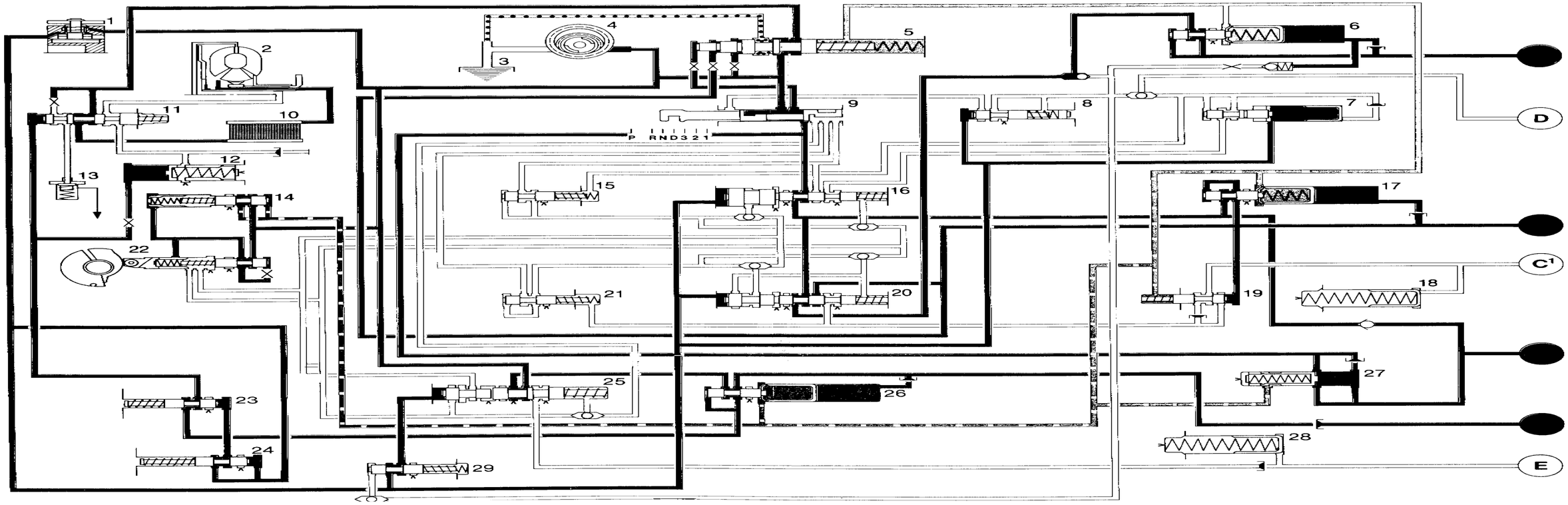
油流程圖

位置 D
第四檔
節流閥部分開

5

1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B離合器閥和阻尼器
7. D離合器閥和阻尼器
8. 倒車檔閉鎖
9. 手控閥
10. 油冷卻器
11. 換向器閥和阻尼閥
12. 換向器離合器阻尼器
13. 單向閥
14. 調制器閥
15. 第一檔制止
16. 1-2換檔閥
17. C離合器閥
18. C'離合器阻尼器
19. C'離合器閥
20. 2-3換檔閥
21. 第二檔制止
22. 節流閥
23. 換向器離合器鎖閉控制閥
24. 換向器離合器滯後閥
25. 3-4換檔閥
26. F離合器閥和阻尼器
27. A離合器阻尼器
28. E離合器阻尼器
29. F離合器測止閥（倒車）

OIL FLOW CHART



J44 433

POSITION D DRIVE 4TH GEAR PART THROTTLE LOCK UP

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OIL FLOWCHART

POSITION D
4TH GEAR
PART THROTTLE LOCK UP

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATOR PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
VIERTERGANG
TEILGASARRETIERUNG

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG E, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
13 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
4ème VITESSE
VERROUILLAGE D'ACCELERATION PARTIELLE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PAINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
BLOCCAGGIO AD
ACCELERAZIONE PARLIALE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
3 VALVOLA E SMORZATORE FRIZIONE D
8 INBIZIONE METROMARCIA
9 VOLVOCA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FAIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FAIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INEIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTETORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DELACEITE

POSICION D
4ª VELOCIDAD
BLOQUEO ACELERACION PARCIAL

1 REGUCADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA AMORTIGUADOR DE EMBRAGUE E
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INBIZIONE DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA DE INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL ERRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE D EL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO DEL ACELEAADOR
II
III ORIFICIO
IV EIFURCACION
V PAESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESIONDE BLOQUEO
X PRESIONDE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
4e VERSN.
GEDEELTELIJK GAS GEBLOKKEERD

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVOAMER EN ACHTEAUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
13 KOPPELINGSDEMPING
18
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e WERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV HOOFDDRUK
V
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B E-KOPPELING
C C-KOPPELING
C' D-KOPPELING
D
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図
「D」の位置
第４速
スロットル半開ロックアップ

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 油力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後進ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １－２シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 ２－３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 ３－４シフトバルブ
26 Fクラッチバルブとダンパー
27 Aクラッチダンパー
28 Eクラッチダンパー
29 Fクラッチインヒビターバルブ（後進用）

I 排気
II スロットル
III オリフィス
IV 分岐
V 主圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

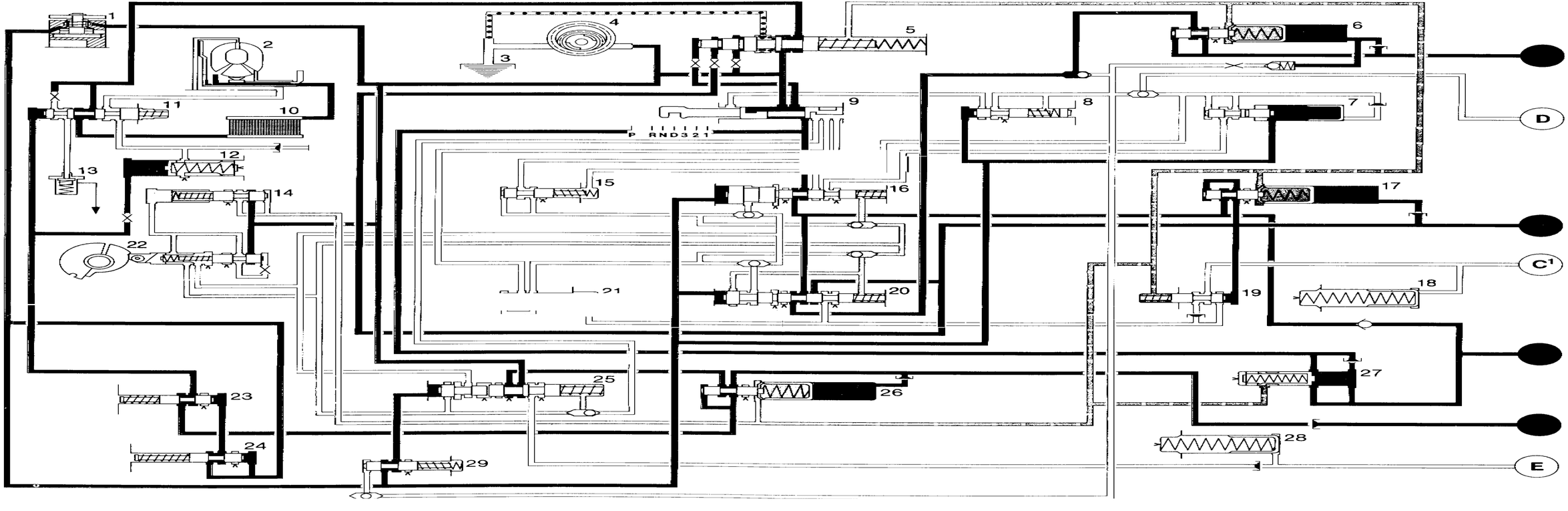
油流程圖
位置 D
第四檔
節流閥部分鎖閉

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車檔閉止
9 手控閥
10 油冷卻器
11 變矩器與反向閥
12 變矩器離合器與阻尼器
13 單向閥
14 調制器閥
15 第一檔閉止
16 1-2換檔閥
17 C離合器閥
18 C'離合器阻尼器
19 C'離合器閥
20 2-3換檔閥
21 第二檔閉止
22 節流閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4換檔閥
26 F離合器閥與阻尼器
27 A離合器阻尼器
28 E離合器阻尼器
29 F離合器閉止閥（倒車）

I 排氣
II 節流閥
III 節流孔
IV 支流管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 潤滑壓力

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION D **DRIVE 4TH GEAR FULL THROTTLE LOCK UP**

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OIL FLOW CHART

POSITION D
4TH GEAR
FULL THROTTLE LOCK UP

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
VIERTER GANG
VOLLGASARRETIERUNG

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG E, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 HANDSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNGA, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG E
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D' HUILE

POSITION D
4ème VITESSE
VERROUILLAGE D'ACCELERATION TOTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR E D'AMORTISSEUR D'EMERAYAGE E
7 TIROIR ET AMORTISSEUR D'EMERAYAGE D
8 EMPECHEMENT D E MARCHE ARRIERE
9 TIROIR MANNEL
10 REFROIDISSEUR D'HUICE
11 CONVERTISSEURET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMERAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGEC'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENTD E SECONDE
22 TIROIR D' ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE34
26 TIROIR E AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEURD'EMBRAYAGE A
28 AMORTISSEURD'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV PRISECORD
V PRESSIONPRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION D E VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSIONDE POMPE
XII PRESSION D E GRAISSAGE

A EMBRAYAGEA
B EMBRAYAGEB
C EMBRAYAGE C
C' EMBRAYAGEC'
D EMBRAYAGED
E EMBRAYAGEE
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
4a PRIMA
BLOCCAGGIO A TUTTO GAS

1 REGOCATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PAESSIONE
6 VALVOLA ESMORZATORE FRIZIONE E
7 VALVOLA ESMORZATORE FRIZIONED
8 INBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATOREFRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA ESMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

II SERRATOIA

III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE EA

C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
4ª VELOCIDAD
BLOQUEO MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 BOMBA
4 VALVULA AMORTIGUADOR DE PAESSIONE
5 VALVULA N AMORTIGUADOR DE VALVULA REGULADORA DE PRESION
6 VALVULA AMORTIGUADOR DE INVERSION DE MARCHA ATRAS
7 VALVULA MANUAL
8 ENFRIADOR DE ACEITE
9 CONVERTIDOR Y VALVULA DE INVERSION
10 VALVULA UNIDIRECCIONAL
11 VALVULA MODULATRICE
12 AMORTIGUADOR DEL EMBRAGUE C
13 VALVULA MODULADORA
14 INHIBICION DE 1ª VELOCIDAD
15 VALVULA DE CAMBIO 1-2
16 VALVULA DE EMBRAGUE C
17 VALVULA DEL EMBRAGUE C'
18 AMORTIGUADOR DEL EMBAAGUE C'
19 VALVULA DEL EMBRAGUEC'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 VALVULA DE CONTROL BLOQUEO
23 VALVULA DECONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVENTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV EIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBAAGUEA
B EMBRAGUEE
C EMBRAGUE C
C' EMBRAGUEC'
D EMBRAGWED
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
4e VERSN.
VOLGAS GEBLOKKEERD

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP E N DEMPER, B-KOPPELING
7 KLEP E N DEMPER, C-KOPPELING
8 ACHTERUITTANOWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 UMVORMER KOPPELENGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP C-KOPPELING
18 DEMPERC'-KOPPELING
19 KLEP C-KOPPELING
20 SCHAKELKLEP2-3
21 BEGRENZER 2e VERSNECUNG
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A KOPPELING
28 DEMPER E-KOPPELING
29 VEELIGHEIDSKLEP (ACHTERUIT)
F F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII SGSDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第 4 速
スロットル全開、ロックアップ

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第1速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3シフトバルブ
21 第2速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 Fクラッチバルブとダンパー
27 Aクラッチダンパー
28 Eクラッチダンパー
29 Fクラッチインヒビターバルブ(後退用)

I 排気
II 絞り
III 開口
IV 分岐
V 本圧
VI 変換器圧力
VII 調整圧力
VIII 調速器圧力
IX 締付圧力
X 調圧圧力
XI ポンプ圧力
XII 潤滑圧力

A A締付器
B B締付器
C C締付器
C' C'締付器
D D締付器
E E締付器
F F締付器

油流程圖

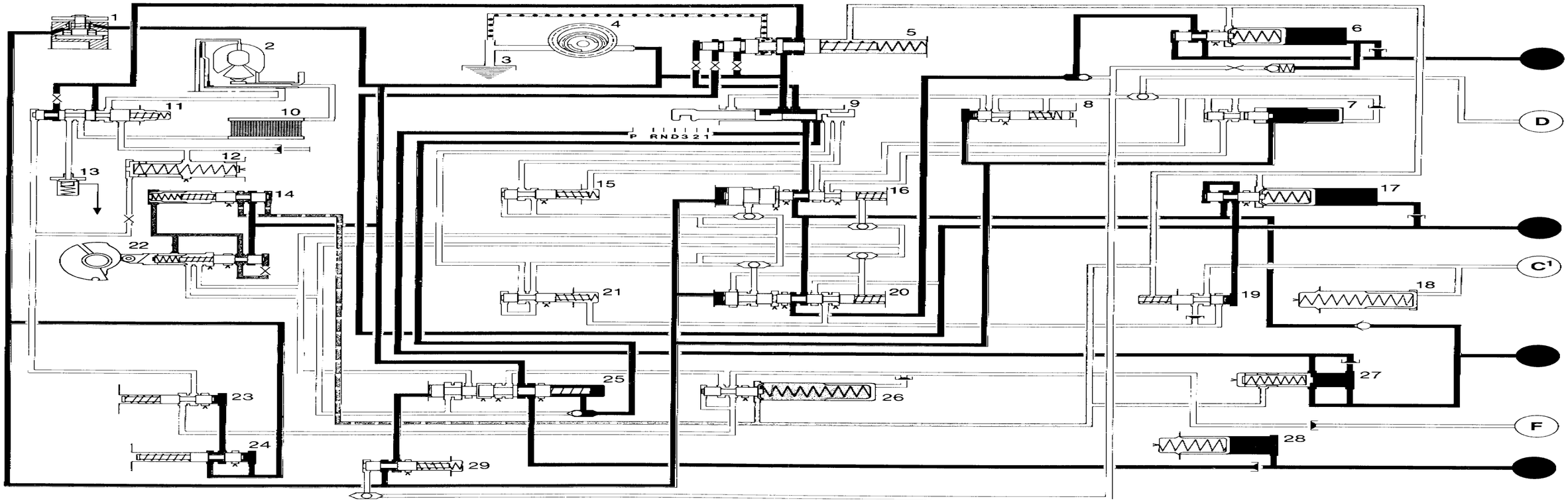
位置 D
第四檔
節流閥全鎖閉鎖

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車檔禁止閥
9 手控閥
10 油冷卻器
11 變矩器與倒檔閥
12 變矩器離合器阻尼器
13 單向閥
14 調制器閥
15 第一檔禁止
16 1-2換檔閥
17 C離合器閥
18 C'離合器阻尼器
19 C'離合器閥
20 2-3換檔閥
21 第二檔禁止閥
22 節流閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4換檔閥
26 F離合器閥與阻尼器
27 A離合器阻尼器
28 E離合器阻尼器
29 F離合器制止閥(倒車)

I 排氣節流
II 節流孔
III 開孔
IV 支流管
V 主壓
VI 變矩器壓力
VII 調壓閥壓力
VIII 調速器壓力
IX 換檔壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓力

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION 3 DRIVE 3RD GEAR PART THROTTLE

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OIL FLOW CHART

POSITION 3
3RD GEAR
PART THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERT — AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH COCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HTSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PAESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PAESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 3
DRITTER GANG
TEILGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1. GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2. GANG SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FUR WANDLER-ÜBERBRUCKUNGSKUPPLUNG
24 HTSTEASESEVENTIL, WANDLER-ÜBERBRUCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DAMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII SCHMIERDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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MAGRAMME D'ECOULEMENT D'HUILE

POSITION 3
3ème VITESSE
ACCELERATION PARTIELLE

1 REGULATEUR
2 CONVERTESSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMOATISSEUH D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDJSSEUR D'HUICE
11 CONVERTISSEUR ET TIROIR
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1 - 2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBAAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II REFROIDLERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSIONE DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSIONDE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSIONDE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 3
3ª PRIMA
AD ACCELERAZIONE PARZIALE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE E
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE I ma
16 VALVOLA CAMBJO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFAUA
III ORIFIZIO
IV DERIVAZION
V PASSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFACLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

3ª POSICION
EMBRAGUE

ACELERACION PARCIAL

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 POMP
5 VALVULA DE REGULACION DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMERAGUE B
7 VALVULA Y AMORTIGUADOR DE EMERAGUE D
8 INIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMSRAGUE DEC
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALSVULA DEL EMSRAGUE C
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACCELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBAAGUE DEL CONVERTIDOR
24 VALVUFA DE HISTERESIS, EMERAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOA
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBAICACION

A EMERAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBAAGUE C'
D EMBRAGUE D
E EMBAAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 3
3e VERSN
GEDEELTELIJK GAS

1 REGULATEUR
2 OMVORMER
3 POMP
4 DRUKREGELKLEP
5 KLEP EN DEMPER, B-KOPPELING
6 KLEP EN DEMPER, C-KOPPELING
7 ACHTERUIT TANDWIELBEGRENZER
8 HANDBEDIENDEKLEP
9 MANUEEL VENTIEL
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 ÉNRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPEA C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS.
24 VERGRENDELING VAN OMVORMER HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN EMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)
F F-KOPPELING

I UITLAAT
II GAS
III OPPERVLAKKING
IV VOORDORUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGELATEURDRUK
IX BLOKKEERDRUK
X MODULATISDRUK
XI BOVENDRUK
XII

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E
F F-KOPPELING

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オイルの流れ図

「3」の位置
第３速
スロットル半開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 油力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １－２シフトバルブ
17 C クラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 ２－３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 ３－４シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II 絞り
III 開口
IV 分岐
V 主圧
VI 変速機圧力
VII 調圧弁圧力
VIII 調整圧力
IX 油圧弁圧力
X 調整圧力
XI 油圧
XII 潤滑圧力

A A 摩擦板
B B 摩擦板
C C 摩擦板
C' C'摩擦板
D D 摩擦板
E E 摩擦板
F F 摩擦板

油流程圖

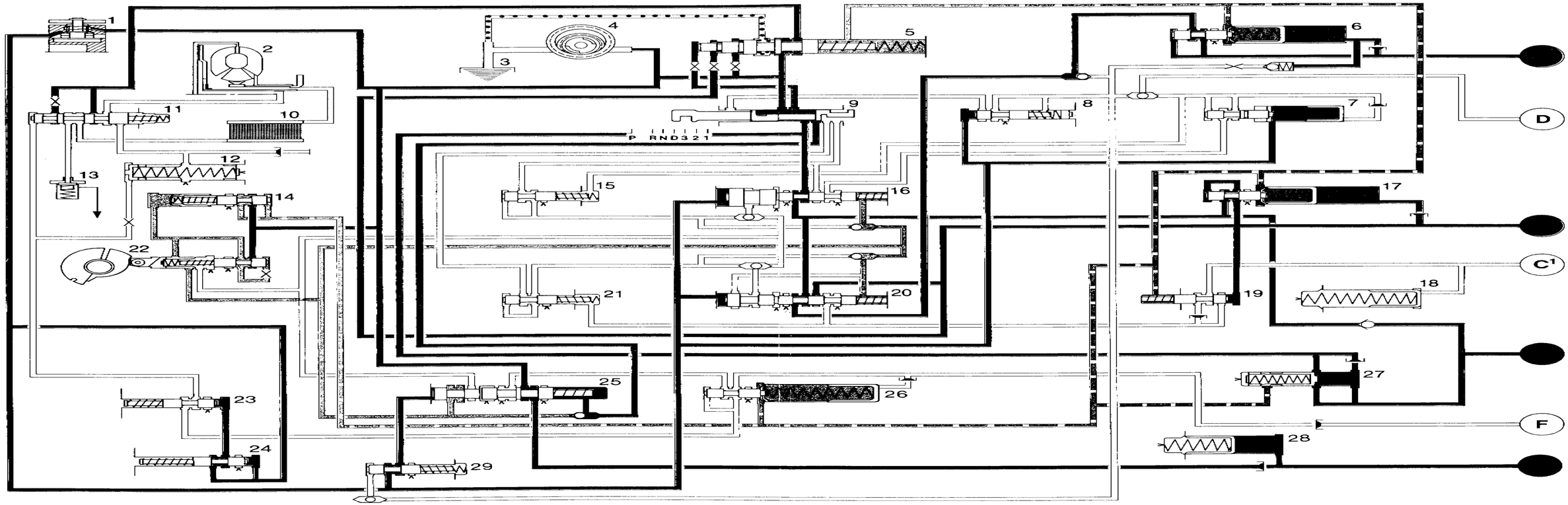
位置 3
第三檔
節流閥部分開

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車檔鎖止
9 手控閥
10 油冷卻器
11 調速器與後退閥
12 變矩器離合器與阻尼器
13 單向閥
14 調制器閥
15 第一檔鎖止
16 1-2 換檔閥
17 C 離合器閥
18 C'離合器阻尼器
19 C'離合器閥
20 2-3 換檔閥
21 第二檔鎖止
22 節流閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4 換檔閥
26 F 離合器閥與阻尼器
27 A 離合器阻尼器
28 E 離合器阻尼器
29 F 離合器鎖止閥（倒車）

1 排氣
II 節流
III 開口
IV 分流
V 主壓
VI 變速器壓力
VII 調壓閥壓力
VIII 調壓器壓力
IX 油壓閥壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C'離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION 3 DRIVE 3RD GEAR FULL THROTTLE

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OIL FLOW CHART

POSITION 3
3RD GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVEASE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRSSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 3
DRITTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WAHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
IX REGLERDRUCK
X SPERRDRUCK
XI MODULIERDRUCK
XII PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 3
3ème VITESSE
ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR D'AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTESSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMFERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEKTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION D E CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGLATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION D E POMPE
XII PRESSION DE GRAISSAGE

A EMBRATAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 3
3a PRIMA
A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIEZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOCA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOCA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIEZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRILIONE F
27 SMORZATORE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INBIZIONE FRIZIOP, dEF (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
E FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DELACEITE

POSICION 3
3ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVWLA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE A
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 EMBRAGUED
9 INHIBICION DE MARCHA ATRAS
10 VALVULA MANUAL
11 RADIATORE OLIO
12 CONVERTITORE E VALVOCA DI INVERSIONE
13 SMORZATORE FRIZIONE CONVERTITORE
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DE EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INIEZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADORDE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL A CELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMERAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 3
3e VERSN.
VOLGAS

1 REGULATEWR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 DEMPER OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGAENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPEUNG
29 VEILIGHEIDSKLEP (ACHTERUIT)

F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKENG
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
E B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「3」の位置
第３速
スロットル全開

1 調速器
2 変矩器
3 油槽
4 油泵
5 調整閥
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4 シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II 絞り
III 開口
IV 分岐
V 主圧
VI 変矩器圧力
VII 調圧弁圧力
VIII 調速器圧力
IX 締切圧力
X 調圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

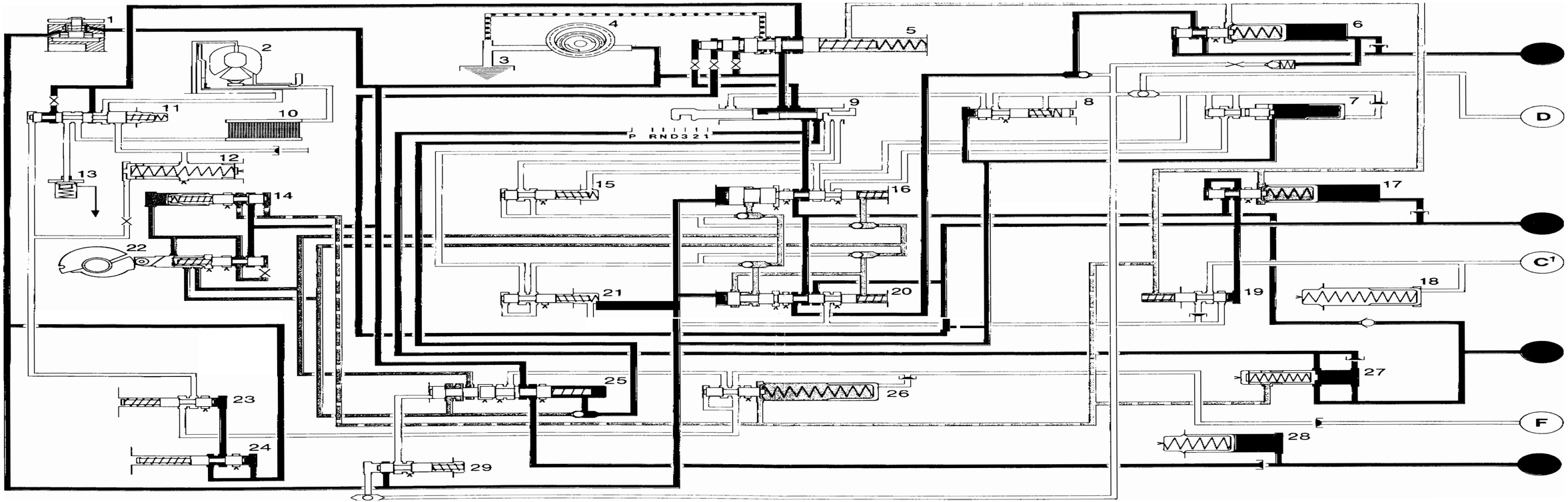
位置 3
第三檔
節流閥全開

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥和阻尼器
7 D 離合器閥和阻尼器
8 倒車互鎖閥
9 手動閥
10 油冷卻器
11 變矩器與後退閥
12 離合器離合器和阻尼器
13 單向閥
14 調壓器閥
15 第一檔互鎖閥
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器阻尼器
19 C' 離合器閥
20 2-3 換檔閥
21 第二檔互鎖閥
22 節流閥
23 變矩器離合器離閉控制閥
24 變矩器離合器滯後閥
25 3-4 換檔閥
26 F 離合器閥和阻尼器
27 A 離合器阻尼器
28 E 離合器阻尼器
29 F 離合器互鎖閥（倒車）

I 排氣
II 節流閥
III 節流孔
IV 支管
V 干壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閥壓力
X 調壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION *3* — 3RD GEAR KICKDOWN

I — V
II — VI
III — VII
IV — VIII
IX
X
XI
XII

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OIL FLOW CHART

POSITION 3
3 RD GEAR
KICKDOWN

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 E CLUTCH VALVE AND DAMPER
7 F CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPEA
19 C' CLUTCHVALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOA CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI W M P PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
a B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 3
DRITTER GANG
KICKDOWN

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIC
6 KUPPLUNG B, VENTIL UNDD ÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWARTSGANGSSPERRE
9 WÄHLSCHIEBER
10 ÖLKUHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDCERKUPPLUNG, DAMPFUNG
13 RUCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RUCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
a KUPPLUNG a
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 3
3ème VITESSE
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET M RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENTDE SECONDE
22 TIROIR D'ACCELEXION
23 TIROIR DE COMMANDE DE VERROUILAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR AMORTISSEUR D'EMBRAYAGEF
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSIONDE REGULATEUR
IX PRESSIONDE VERROUILLAGE
X PRESSIOND E MODULATION
XI PRESSIONDE POMPE
XII PRESSION D E GRAISSAGE

A EMERAYAGEA
B EMBRAYAGEB
C EMBRAYAGEC
C' EMBRAYAGE C'
D EMBRAYAGED
E EMBRAYAGEE
F EMBRAYAGEF

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 3
3a VELOCITA
KICKDOWN

1 REGOLATORE
2 CONVERTITORE DICOPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE 6
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCEA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FAIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFICIO
IV RACCORDO
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE EA
C FRIZIONEC
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DELACEITE

POSICION 3
3ª VELOCIDAD
RETIRARON

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTEDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBAAGUEC'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICIONDE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VALVULA E AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMERAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA A INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I MATORIGA DEL ACELERADOR
II
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODUCACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE 3
C EMBRAGUEC
C' EMBRAGUEC'
D EMBRAGUED
E EMBRAGUEE
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 3
3e VERS.N
KICKDOWN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, E-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDSCHEIDENDE KLEP
10
11 OMVORMER ENACHTERUITKLEP
12 OMVORMER KOPPELENGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKCEP
15 EEGRENZER, 1e VERSNELUNG
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPERC'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKCEP 2-3
21 EEGRENZER, 2e VERSNELUNG
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPERE-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOGEDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
a B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「3」の位置
第３速
キックダウン

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアーインヒビター
9 マニュアルバルブ
10
11 オイルクーラー
12 コンバーターと後退用バルブ
13 コンバータークラッチダンパー
14 ワンウエイバルブ
15 モジュレーターバルブ
16 第１速ギアインヒビター
17 1-2シフトバルブ
18 C クラッチバルブ
19 C クラッチダンパー
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II 絞り
III オリフィス
IV 分岐
V 油圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

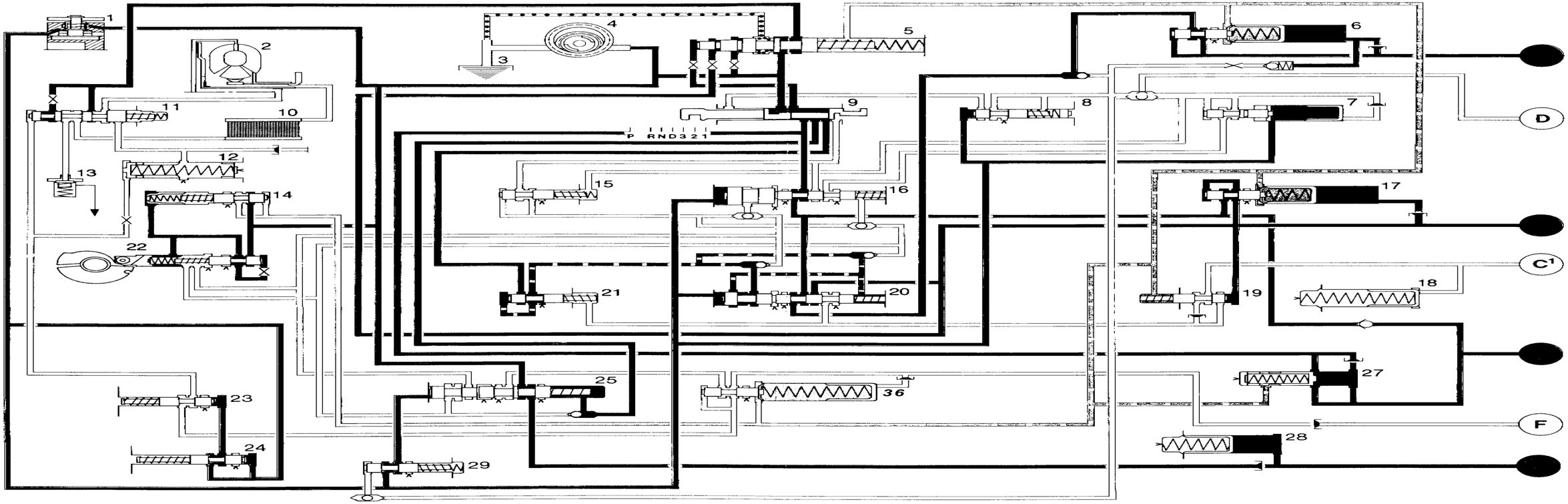
A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

位置 3
第三檔
自動傳合

I 調速器
II 變矩器
III 油槽
IV 油泵
V 壓力調整閥
VI 離合器閥和阻尼器
VII 離合器閥和阻尼器
VIII 調速器閥
IX 後退檔齒輪互鎖閥
X 手動閥
XI 油冷卻器
XII 變矩器閥和離合器閥
XIII 後退檔齒輪互鎖閥
XIV 1-2換檔閥
XV C離合器閥
XVI C'離合器閥和阻尼器
XVII 2-3換檔閥
XVIII 2檔齒輪互鎖閥
XIX F離合器閥和阻尼器
XX 節氣門閥
XXI 離合器閥和阻尼器(倒車)

OIL FLOWCHART



POSITION 2 – 3RD GEAR DLING

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OIL FLOW CHART

POSITION 2
3 RD GEAR
IDLING

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 E CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVEASE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 2
DRITTER GANG
LEERLAUF

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG E, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLEA
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DAMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FUR WANDLER-ÜBERBAUCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI WMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUWLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULE MENT D' HUILE

POSITION 2
3ème VITESSE
RALENTI

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE D E PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMERATAGE D
8 EMPECHEMENT D E MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR
12 AMORTISSEUR D'EMBRAYAGE D E
13 CLAPET D E RETENUE
14 TIROIR D E MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELECTION
23 TIROIR DE COMMANDE D E VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR D E PASSAGE3-4
26 TIROIR E TAMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPA LE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION D E POMPE
XII PRESSION DE GRAISSAGE

A EMBRATAGEA
B EMBRAYAGEB
C EMBRATAGEC
C' EMBRAYAGEC'
D EMBRATAGED
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 2
3a PRIMA
MINIMO

1 REGOLATORE
2 CONVERTISSEUR DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA D E REGOLAZIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 EMPECHEMENT DE PREMIERE
17 TIROIR DE PASSAGE 1-2
18 TIROIR D'EMBRAYAGE C
19 AMORTISSEUR D'EMBRAYAGE C'
20 TIROIR D'EMBRAYAGE C'
21 TIROIR DE PASSAGE 2-3
22 EMPECHEMENT DE SECONDE
23 TIROIR D'ACCELECTION
24 TIROIR DE COMMANDE D E VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR D E PASSAGE3-4
26 TIROIR E TAMORTISSEUR
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I SCARICO
II FARFAUA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION 2
3ª VELOCIDAD

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 POMPA
5 VALVOLA DE REGOLACION
6 VALVULA REGULADORA D E PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICIONE DE MARCHA ATRAS
9 VOLVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGVE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAM810 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMEIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR D E EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DE LA ACELERADOR
VIII PRESIONDEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESLONDE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUEC
C' EMBRAGUEC'
D EMBRAGUE D
E EMBRAGUEE
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 2
3-STATIONAIR TOEREWTAN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER EEN VERSNELLING
16
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 GASSPEUNINGSVERGRENDELING
22
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTEUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENINGEN
IV
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX ELOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
E 3-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「2」の位置
第３速
アイドリング

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １ー２シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 ２ー３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 ３ー４シフトバルブ
26 Fクラッチバルブとダンパー
27 Aクラッチダンパー
28 Eクラッチダンパー
29 Fクラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分岐管
V 主圧
VI コンバーター圧力
VII スコットル圧力
VIII ガバナー圧力
IX ラッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

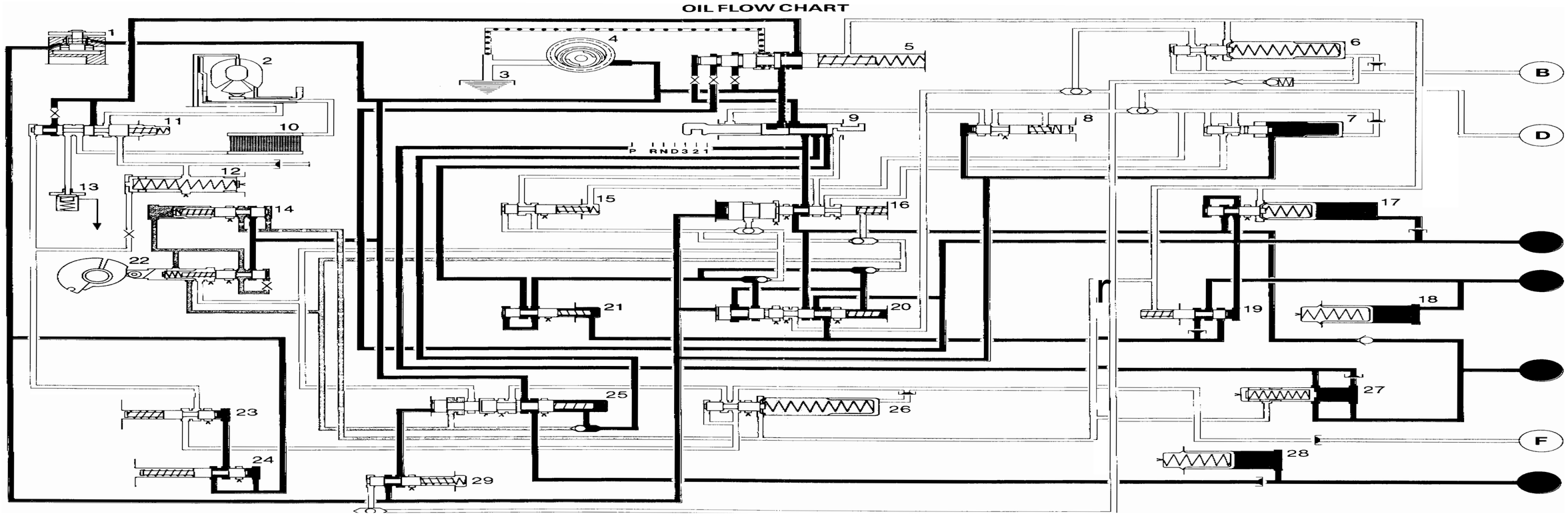
A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流経図

位置 2
第三速
低速

1 調整器
2 変矩器
3 油槽
4 油ポ
5 調整弁
6 B摩擦板制御用ピ器
7 D 摩擦板制御用ピ器
8 後退ギアインヒビター
9 手動弁
10 油冷却器
11 変矩器用ピ器
12 変矩器摩擦板ピ器
13 一方向弁
14 調整器弁
15 第一速制止
16 １ー２シフト弁
17 C摩擦板弁
18 C'摩擦板ピ器
19 C'摩擦板弁
20 ２ー３シフト弁
21 第２速制止
22 スロットル弁
23 変矩器摩擦板制御用
24 変矩器摩擦板ヒ器弁
25 ３ー４シフト弁
26 F摩擦板ピ器
27 A摩擦板ピ器
28 E摩擦板ピ器
29 F摩擦板ピ器

OIL FLOW CHART



POSITION 2 – 2ND GEAR FULL THROTTLE

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OIL FLOW CHART

POSITION 2
2ND GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C¹ CLUTCH DAMPER
19 C¹ CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCKUP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C¹ C¹ CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 2
ZWEITER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNGS E. VENTIL UND DÄMPFUNG
7 KUPPLUNG D. VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RUCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C¹, DÄMPFUNG
19 KUPPLUNG C¹, VENTIL
20 SCHALTVENTIC 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRUCKUNGSKUPPLUNG
24 HYSTERESEVENTIC, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C¹ KUPPLUNG C¹
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUCLE

POSITION 2
2ème VITESSE
ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
3 EMPECHEMENTMMARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEURD'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C¹
19 TIROIR D'EMBRAYAGE C¹
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENTDE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE D'ECONVERTISSEUA
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVEATISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II REGULATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSIONDE CONVERTISSEUR
VII PRESSIONDE ACCELERATION
VIII PRESSIONDE REGULATEUR
IX PRESSIONDE VERROUILLAGE
X PRESSIONDE MODULATION
XI PRESSIONDE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGEC
C¹ EMBRAYAGEC¹
D EMBRAYAGED
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATAD'OLIO

POSIZIONE 2
2a PRIMA
A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA ESMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVEATITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE DI 1ª VELOCITÀ
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C¹
19 VALVOLA FRIZIONE C¹
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2ma
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FAIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FAIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMOAZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II ORIFIZIOLA
III DERIVAZION
IV PRESSIONE PRINCIPALE
V PRESSIONE CONVERTITORE
VI PRESSIONE FARFALLA
VII PRESSIONE REGOLATORE
VIII PRESSIONE DI BLOCCAGGIO
IX PRESSIONE DI MODULAZIONE
X PRESSIONE POMPA
XI PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C¹ FRIZIONE C¹
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION 2
2ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA DE AMORTIGUADOR DE EMBRAGUEB
7 VALVULA Y AMOATIGUAQOR DE EMBRAGUEO
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOA
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C¹
19 VALVULA DEL EMBRAGUEC¹
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DECAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBAAGUEA
B EMBRAGUE B
C EMBRAGUE C
C¹ EMBRAGUE C¹
D EMBRAGUE D

F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 2
2e VEAXN.
VOLGAS

1 REGULATEVR
2 KOPPELOMVORMER
4 POMP
6 DRUKBEGRENZER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
9 VLOEIBERDIENSBLIVELBEGRENZER
10 OLIEKOELER
11 OMVORMEREN ACHTERUITKLEP
12 OMVORMER KOPPELENGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C¹-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVOAMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPEA A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)

F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
E B-KOPPELING
C C-KOPPELING
C¹ C¹-KOPPELING
B B-KOPPELING

F F-KOPPELING

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オイルの流れ図

「2」の位置
第2速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後進ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウェイバルブ
14 モジュレーターバルブ
15 第1速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C¹クラッチダンパー
19 C¹クラッチバルブ
20 2-3シフトバルブ
21 第2速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 Fクラッチバルブとダンパー
27 Aクラッチダンパー
28 Eクラッチダンパー
29 Fクラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分岐管
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII レギュレター圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C¹ C¹クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

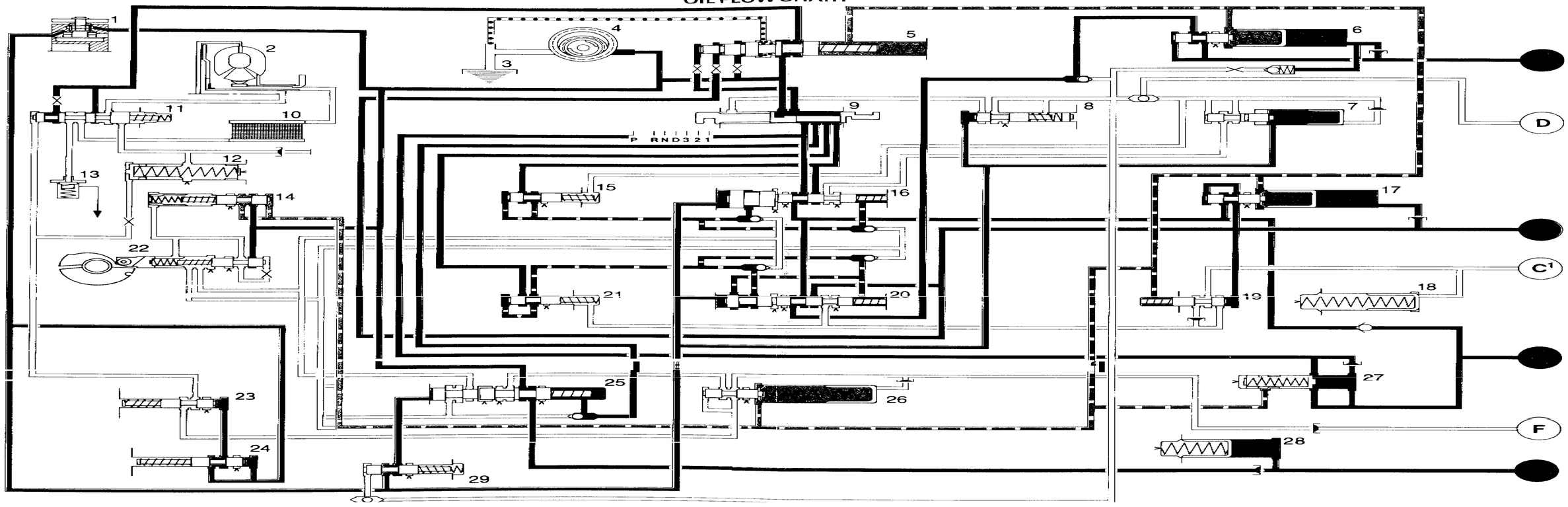
位置 2
第二檔
節流閥全開

1 減速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車檔閥
9 手動閥
10 冷卻器
11 油泵調節閥
12 變矩器離合器閥
13 單向閥
14 調油器閥
15 第一檔閉鎖
16 1-2換檔閥
17 C離合器閥
18 C¹離合器閥與阻尼器
19 C¹離合器閥
20 2-3換檔閥
21 第二檔閉鎖
22 節流閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4換檔閥
26 F離合器閥與阻尼器
27 A離合器閥阻尼器
28 E離合器閥阻尼器
29 F離合器倒車閉鎖閥（倒車）

I 排氣
II 節流閥
III 節流孔
IV 分油管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調壓器壓力
IX 鎖閉壓力
X 調節壓力
XI 泵壓
XII 潤滑壓力

A A離合器
B B離合器
C C離合器
C¹ C¹離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



IDLING

I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII

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OIL FLOW CHART

POSITION 1
3RD GEAR
IDLING

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 1
DRITTER GANG
LEERLAUF

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIC FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNGF, VENTIL UNO DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RUCKWARTSGANG)

I ABFLUSS
II DROSSEL
III OFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 1
3ème VITESSE
RALENTI

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LUIQUIDE
4 POMPE
5 AOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRATAGEB
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVEATISSEUA
13 CCAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENTD E PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRATAGE C'
19 TIROIR D'EMERATAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENTD E SECONUDE
22 TIROIR D'ACCELEXTION
23 TIROIR DE COMMANDE DE VERROUILAGE D'EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSIONE DE MODULATION
XI PRESSIONE DE POMPE
XII PRESSIONDE GRAISSAGE

A EMBRAYAGEA
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGEC'
D EMBRAYAGED
E EMBRAYAGEE
F EMBRAYAGEF

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 1
3a PRIMA
MARCIA **AL MINIMO**

1 REGOLATORE
2 CONVERTITORE DICOPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADLATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2ma
22 [illegible]
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONEF
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSFONE PRINCLPALE
VI PRESSIONE CONVERTITORE
VII PRESSLONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE EA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE LA ACEITE

POSICION 1
3ª VELOCIDAD
RALENTI

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULA--ORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUEB
7 VALVULA Y AMORTIGUADOR DE EMBRAGUED
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUEC
18 AMORTIGUADOR DEL EMBRAGUEC'
19 VALVULA DEL EMBRAGUEC'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DELCONVERTIDOR
24 VALVULA DE HISTERESIS EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE EMBRAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACECERADOR
III ORIFICACION

V PRESION PRINCIPAC
VI PRESION DE CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESLON DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMEA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUEC
C' EMBAAGUEC'
D EMBRAGUED
E EMBRAGUEE
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 1
STATIONAIRETOERewTAN

1 AEGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP ENDEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMEREN ACHTERUITKLEP
12 OMVORMERKOPPELINGSDEMPER
13 ÉENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP ENDEMER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV HOOFDDRUK
V OMVORMERDRUK
VI SMEERDRUK
VII REGULATEURDRUK
VIII SLOTKLEPDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「1」の位置
第３速
アイドリング

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバーターとクラッチダンパー
13 一方向弁
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチロックアップコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4シフトバルブ
26 Fクラッチバルブとダンパー
27 Aクラッチダンパー
28 Eクラッチダンパー
29 Fクラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 支管
V 本圧
VI コンバーター圧力
VII スロットル圧力
VIII 調整装置圧力
IX ガバナー圧力
X ロッキング圧力
XI 調整圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

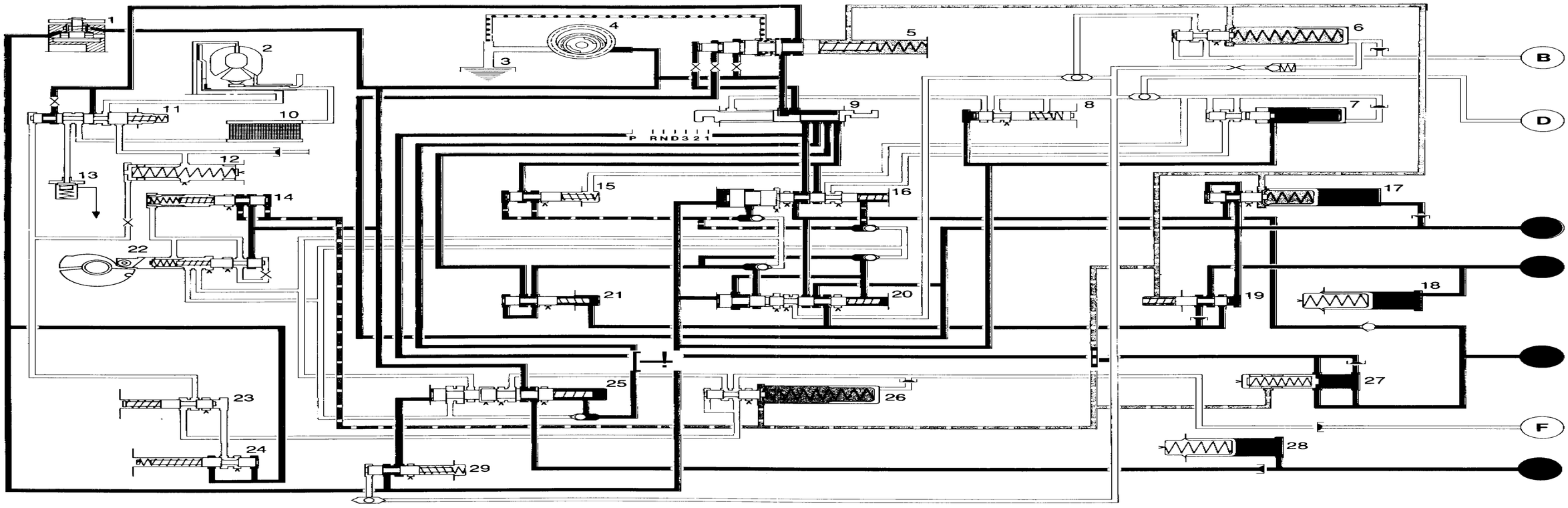
位置 1
第三檔
低速

1 調速器
2 變矩器
3 油槽
4 油泵
5 壓力調整閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車檔閉鎖
9 手控閥
10 油冷卻器
11 變矩器與倒車閥
12 變矩器與離合器與阻尼器
13 單向閥
14 調制器閥
15 第一檔閉鎖
16 1-2換檔閥
17 C離合器閥
18 C'離合器與阻尼器
19 C'離合器閥
20 2-3換檔閥
21 第二檔閉鎖
22 節流閥
23 變矩器離合器鎖住閥控制閥
24 變矩器離合器滯後閥
25 3-4換檔閥
26 F離合器與阻尼器
27 A離合器與阻尼器
28 E離合器阻尼器
29 F離合器閉止閥（倒車）

I 排氣
II 節流
III 孔口
IV 支管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調整裝置壓力
IX 調速器壓力
X 調制壓力
XI 泵壓
XII 潤滑壓力

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION 1
2ND GEAR
IDLING

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OIL FLOW CHART

POSITION 1
2ND GEAR
IDLING

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 E CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 1
ZWEITER GANG
LEERLAUF

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPEARE
22 DROSSELVENTIL
23 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG E
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 1
2ème VITESSE
RALENTI

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LLOUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARAIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'A CCELEXTION
23 TIROIR DE COMMANDE DE VERROUILLAGE D'EMERAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE D E CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F

27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 1
2a PRIMA
MARCIA AL MINIMO

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA D E REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 LEVA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 AMMORTISSATORE FRIZIONE CONVERTITORE
13 VALVOLA DI RIEZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C
20 VALVOCA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALCA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOCA DI CAMBIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III CARTZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PAESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE ACEITE

POSICION 1
2ª VELOCIDAD
RALENTI

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 RADIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA DE INVERSION
12 AMORTIGUADOR EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCLONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMERAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL ELOQUEO DEL EMBAAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORLTGUADORDE EMBRAGUE F

27 AMORTIGUADOR DE EMERAGUE A
28 AMORTIGUADOR DE EMBRAGUE E
29 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DE LACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMERAGUEA
B EMBRAGUE B
C EMBRAGUEC
C' EMBRAGUEC'
D EMBRAGUED
E EMERAGUEE
F EMERAGUEF

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HYDRAULISCHE DRUKREGELING

STAND 1
2E GANG
STATIONAIR TOEREWTAN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP ENDEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 TERUGSCHAKELVERGRENDELING
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMEREN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP KOPPELINGS-VEAGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 MMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT)

F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODUCATIEDAUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

- 1J の位置
- 第２速
- アイドリング

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 逆止弁
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4 シフトバルブ
26 E クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II 絞り
III 開口
IV 分岐
V 主圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

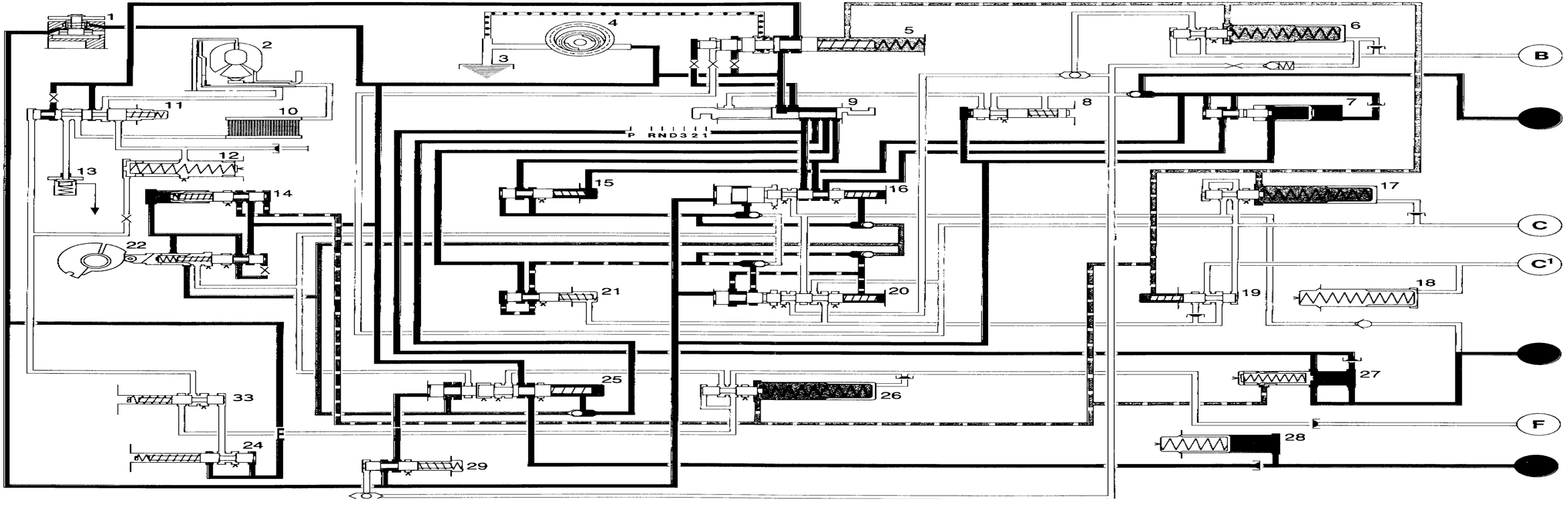
- 1 速
- 第二檔
- 低速

1 速車盤
2 渦輪器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車擋閥
9 手控閥
10 油冷卻器
11 換向器與單向閥
12 換向器離合器阻尼器
13 單向閥
14 調節閥
15 第一檔閉鎖
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器阻尼器
19 C' 離合器閥
20 2-3 換檔閥
21 第二檔閉鎖
22 節流閥
23 換向器離合器調節閥
24 換向器離合器滯後閥
25 3-4 換檔閥
26 E 離合器閥與阻尼器
27 A 離合器阻尼器
28 E 離合器阻尼器
29 F 離合器閉鎖閥（倒車）

1 排氣裝置
II 節流閥
III 開孔
IV 支流管
V 主壓
VI 換向器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 閉鎖壓力
X 調節壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION 1
1ST GEAR
FULL THROTTLE

I II III IV V VI VII VIII IX X XI XII

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OIL FLOWCHART

POSITION 1
1ST GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C¹ CLUTCH DAMPER
19 C¹ CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALUE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III OAIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C¹ C¹ CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 1
ERSTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WAHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1.-2.
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C¹, DÄMPFUNG
19 KUPPLUNG C¹, VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C¹ KUPPLUNG C¹
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 1
1re VITESSE
ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C¹
19 TIROIR D'EMBRAYAGE C¹
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR DE COMMANDE DE VERROUILLAGE D EMBRAYAGE DE CONVERTISSEUR
24 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR DE PASSAGE 3-4
26 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
27 AMORTISSEUR D'EMBRAYAGE A
28 AMORTISSEUR D'EMBRAYAGE E
29 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ETRANGLEMENT
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C¹ EMBRAYAGE C¹
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DEAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 1
A TUTTA FORZA

1 REGOCATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE DI PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1 - 2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C¹
19 VALVOLA FRIZIONE C¹
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
25 VALVOLA DI CAMEIO 3-4
26 VALVOLA E SMORZATORE FRIZIONE F
27 SMORZATORE FRIZIONE A
28 SMORZATORE FRIZIONE E
29 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C¹ FRIZIONE C¹
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

0343b

DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION 1
1ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESEON
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGVED
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVUICA INVERSORA DOR. EMBRAGUE DEL CONVERTIDOR
12 SMORTIGUADORE FRIZIONE
13 VALVULA UNIDIRECCIONAL
14 VALVOLA MODULADORA
15 INIBICIONE 1ma
16 VALVULA DE CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C¹
19 VALVOLA FRIZIONE C¹
20 VALVOLA CAMBIO 2-3
21 INIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VOLVULA Y AMORITGUADOA DE EMBRAGUE A
27 AMORTIGUADORDE EMBRAGUE E
28 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACECERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C¹ EMBRAGUE C¹
D EMBRAGUED
E EMBRAGUE E
F EMBRAGUE F

0343b

HYDAAULISCHE **DRUKREGELING**

STAND 1
1e VERSN.
VOLGAS

1 REGULATEVR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER B-KOPPELING
7 KLEPEN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1 - 2
17 KLEP, C-KOPPELING
18 DEMPER C¹-KOPPELING
19 KOEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMEADRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C¹ C¹-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「1」の位置
第 1 速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後進ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウェーバルブ
14 モジュレーターバルブ
15 第 1 速ギアインヒビター
16 1 - 2 シフトバルブ
17 Cクラッチバルブ
18 C¹クラッチダンパー
19 C¹クラッチバルブ
20 2 - 3 シフトバルブ
21 第 2 速ギアインヒビター
22 スロットルバルブ
23 コンバータークラッチコックアップ コントロールバルブ
24 コンバータークラッチヒステリシスバルブ
25 3-4 シフトバルブ
26 F クラッチバルブとダンパー
27 A クラッチダンパー
28 E クラッチダンパー
29 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 二叉
V 本管
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A 離合器
B B クラッチ
C C クラッチ
C¹ C¹ クラッチ
D D 離合器
E E 離合器
F F クラッチ

油流程圖

位置 1
第一等速
節流閥全開

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥和阻尼器
7 D 離合器閥和阻尼器
8 倒車檔互鎖
9 手控閥
10 油冷卻器
11 變矩器和倒車閥
12 變矩器離合器阻尼器
13 單向閥
14 調制器閥
15 第一檔互鎖
16 1-2 換檔閥
17 C 離合器閥
18 C¹ 離合器阻尼器
19 C¹ 離合器閥
20 2-3 換檔閥
21 第二檔互鎖
22 節流閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滯後閥
25 3-4 換檔閥
26 F 離合器閥和阻尼器
27 A 離合器阻尼器
28 E 離合器阻尼器
29 F 離合器制止閥（倒車）

1 排氣管
II 節流閥
III 節流孔
IV 支流管
V 主管
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C¹ C¹ 離合器
D D 離合器
E E 離合器
F F 離合器

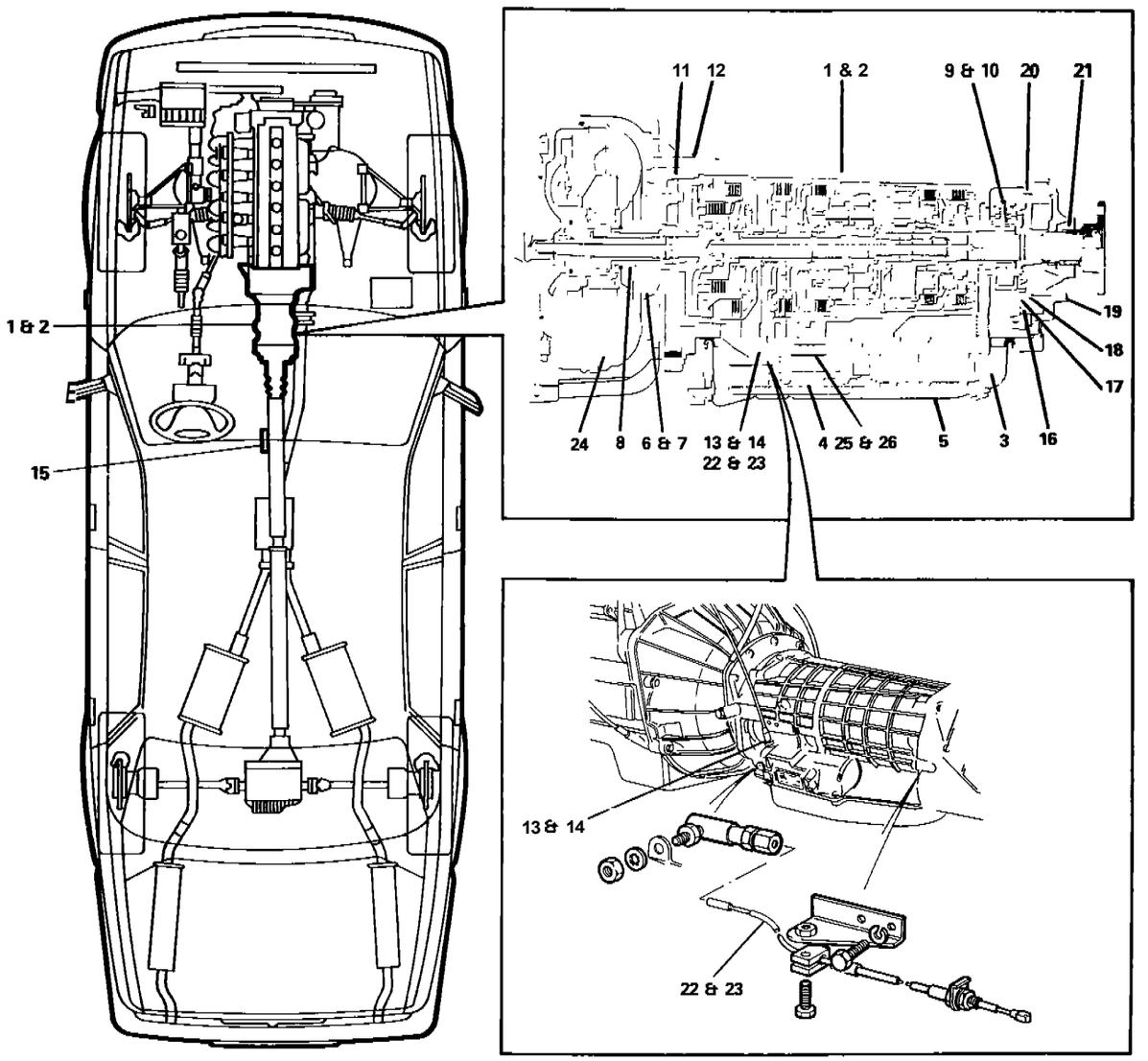
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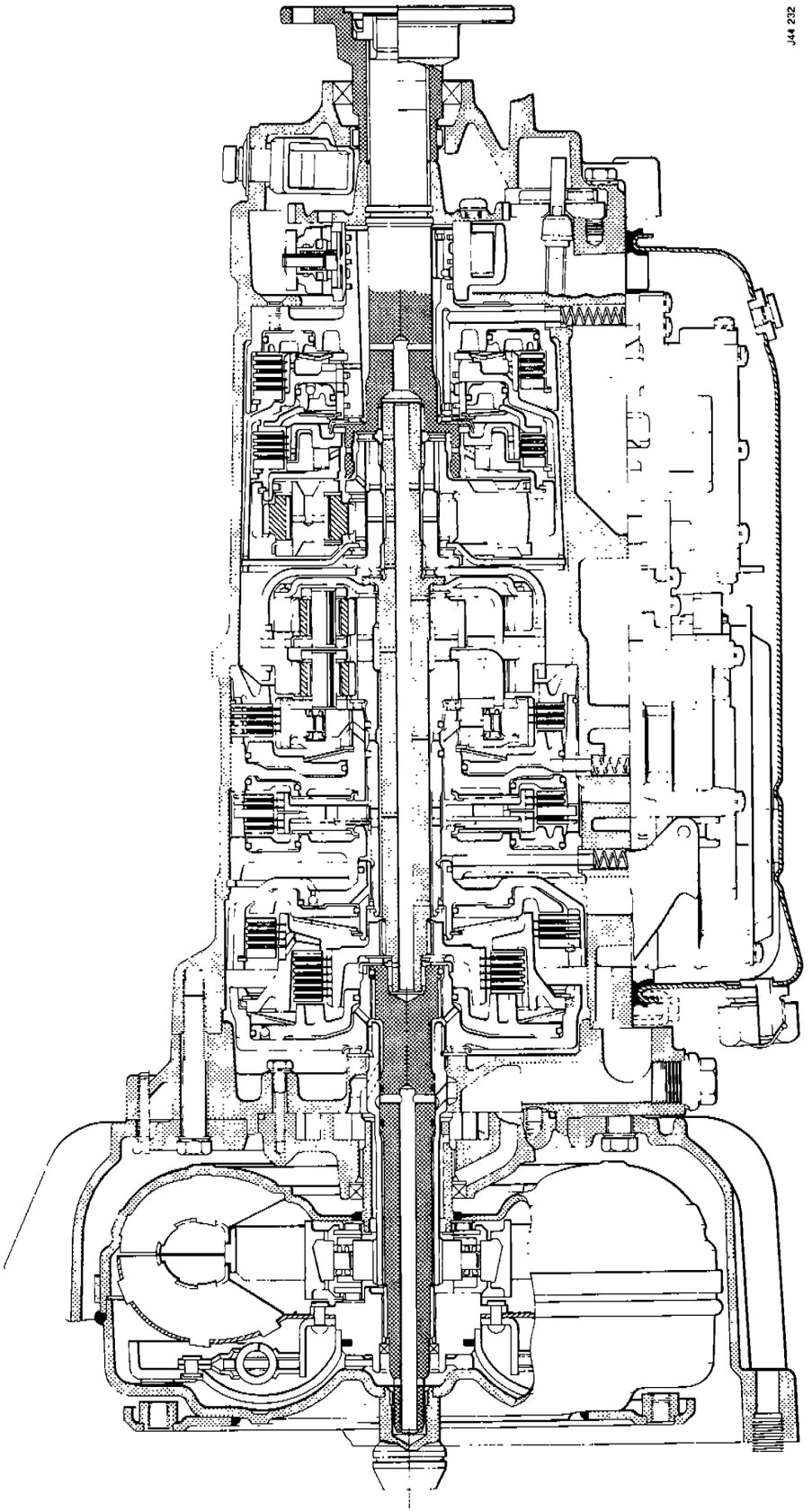
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4 HP 22 CUTAWAY VIEW



AUTOMATIC TRANSMISSION

DESCRIPTION 44.00.00

The ZF 4 HP 22 automatic transmission unit consists of a hydromatic torque converter with integrated lock-up clutch and rear mounted four speed planetary unit.

The mechanical planetary gear is of simple design with four forward speeds and one reverse (coupled to the converter), the latter is operative in all gears. On reaching a particular road speed when travelling in 4th gear with a particular accelerator position, the converter is locked up so that a purely mechanical power transmission is achieved.

The control elements used are hydraulically actuated multi-disc clutches and freewheel units. The hydraulically operated control unit (valve block) is located in the fluid pan. Actuation points of the automatic control unit depend on the position of the accelerator pedal and the road speed of the vehicle. The transmission unit is operated by a selector lever. Gear changes occur automatically at predetermined points.

The driver can override the control unit by kickdown, i.e. the next lower gear is engaged for high-speed acceleration and the change to the next higher gear does not take place before the maximum speed of engine is reached.

AUTOMATIC TRANSMISSION COMPONENTS

The ZF 4 HP 22 automatic transmission unit features the three-component principle:
1 Hydrodynamic (hydromatic) torque converter
2 Four-speed epicyclic gear train
3 Hydraulic automatic gear shift unit.

HYDROMATIC TORQUE CONVERTER

The hydromatic torque converter consists of an impeller, a turbine and a stator, the latter mounted on a one-way clutch.

These elements are enclosed within a common housing in such a way as to form a closed circuit through which the oil flows when the transmission is in operation.

The torque multiplication effect is at its greatest when the vehicle is driven away from a standstill. The stator bears against the housing through its one-way clutch, and deflects the oil so that its flow is accelerated. As road speed builds up, the impeller and turbine wheels turn at almost the same speed, so that the stator ceases to accelerate the oil flow, and instead is disengaging from the housing and turning freely in the flow of oil. The torque converter at this stage acts as a fluid coupling.

These characteristics make is possible to dispense with the clutch pedal, The engine cannot normally stall because it is not rigidly linked to the driven wheels, The converter's operating characteristics can be varied to Suit those of the vehicle's engine.

FOUR-SPEED EPICYCLIC GEAR TRAIN

The converter drives a mechanical epicyclic gear train providing four forward ratios and reverse. Top gear is a step-up or overdrive ratio for maximum economy.
Hydraulically actuated multi-disc clutches and brakes are used to select the various gear ratios.
Built-in freewheels permit gear shifts without any interruption of the power flow. A low-loss oil pump in the front section of the transmission housing supplies the converter, the automatic gear shift and the lubrication circuit. A mechanical parking lock is provided to prevent the vehicle from moving once stationary.

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SELECTOR UNIT

If the vehicle is driven normally, without unduly high engine speeds being used, the selector unit will cause upshifts to take place at quite low engine speeds, to ensure optimum economy.
In difficult driving conditions, for example in town traffic, fuel consumption is actually lower than with a conventional manual-shift gearbox, which is often left in too low a ratio by the driver, so that engine speed rises excessively.

The automatic control system, with selector valve, control pistons and pressure valves, is located in the lower part of the transmission housing.
Shift points are governed by accelerator pedal position and road speed. Pulses equivalent to road speed are derived from a centrifugal governor on the output shaft. The entire system operates hydraulically.

Gear shifts take place at predetermined speeds, depending on the amount by which the accelerator is depressed.
In special circumstances the system can be overridden by pressing the accelerator down beyond the normal full-throttle position (kick down), to select a lower gear immediately when maximum acceleration is needed. In this event, the next upwards shift does not take place until almost the maximum engine speed, that is to say at a far higher road speed than usual.
This arrangement ensures that engine power can be utilized fully in all gears.

AUTOMATIC TRANSMISSION

OPERATION **44.00.00**

Position P: Park. Select only when the vehicle is standing still. In the "Park" position the driven wheels are locked.

Position R: Reverse.

Position N: Neutral. Engine disconnected from driveline and wheels.

Postion D: Drive. All four speed ranges are selected automatically.

Position 3: Automatic selection of the lowest three ratios in the automatic transmission only.

Position 2: Select this setting to prevent the automatic transmission from shifting up to the 3rd (top) speed range.
The 1st and 2nd ranges remain available, for example, to make full use of engine braking effect on downhill gradients.

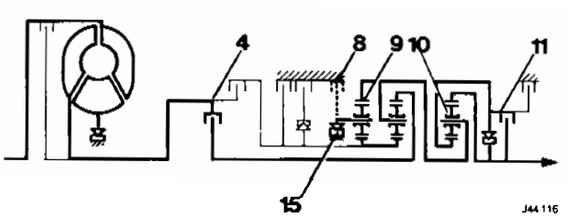
Postion 1: Intended primarily for steep mountain passes, the ramps of indoor car parks etc. The automatic transmission remains in the 1st speed range regardless of throttle opening.

NOTE: Positions 1 or 2 can be selected at any travelling speed. Safety valves prevent premature down-shifts and over-speeding of the engine.

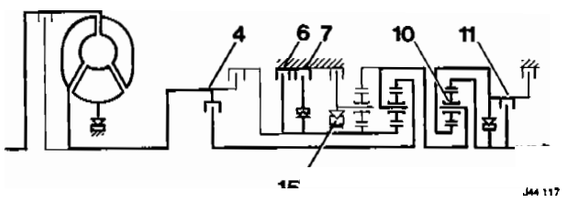
Kick-down: Depress the accelerator pedal fully – beyond the normal full-throttle stop – and the automatic transmission will shift down immediately to a lower gear (ratio depends on road speed).

CLUTCH OPERATION

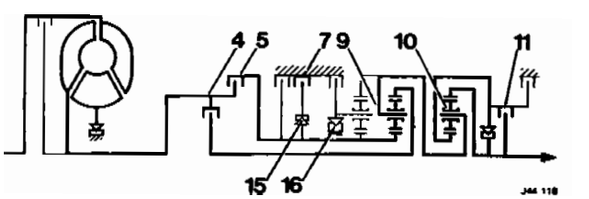
1ST GEAR
Clutches 4 and 11 are engaged.The front planet gear carrier if gear set 9 is locked against the housing through freewheel 15 when the engine is pulling, but is overrun when the engine is coasting. Epicyclic gear set 10 rotates as a solid block, with the front planet gear carrier. In addition, in selector lever position 1 and in speed range 1, clutch 8 is enagaged to permit engine braking.



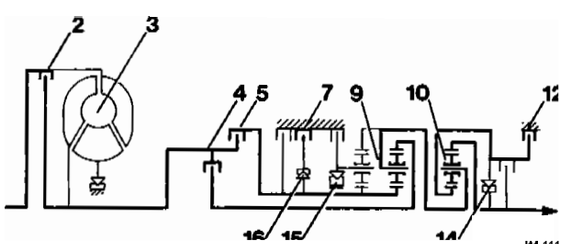
2ND GEAR
Clutches 4, 6, 7 and 11 are engaged. Freewheel 15 overruns. The hollow shaft with the sun wheel of epicyclic gear set 10 also rotates, as a solid block.



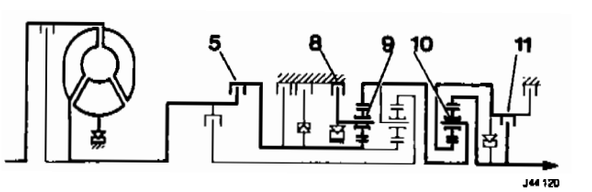
3RD GEAR
Clutches 4, 5 , 7 and 11 are engaged. Freewheels 15 and 16 are overrun. Epicyclic gear sets 9 and 10 rotate as a solid block at a ratio of 1:1.



4TH GEAR
Clutches 4, 5,7 and 12 are engaged. Freewheels 14, 15 and 16 are overrun. Epicyclic gear set 9 rotates as a solid block. The hollow shaft with the sun wheel of epicyclic gear set 10 is locked. Above a predetermined road speed, clutch 2 locks torque converter 3 solid to prevent slip.



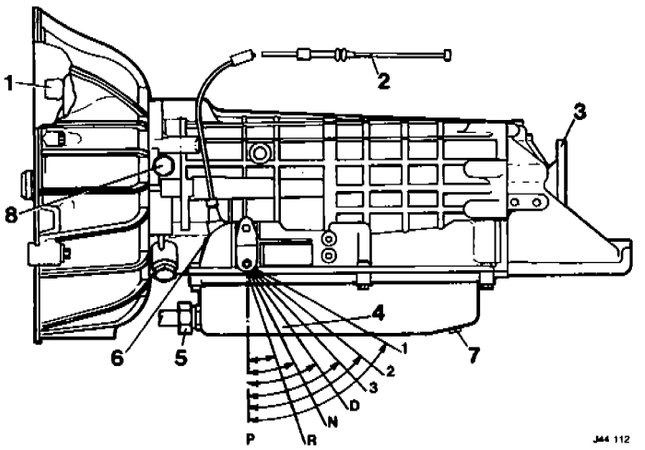
REVERSE
Clutches 5,8 and 11 are engaged. Since the front planet gear carrier of epicyclic gear set 9 is locked, the direction of output-shaft rotation is reversed. Epicyclic gear set 10 also rotates, as a solid block.



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AUTOMATIC TRANSMISSION

DATA/SHIFT SPEEDS 44.00.00



Key to diagram

1 Hydrodynamic torque converter

2 Throttle cable

3 Output flange

4 Selector lever positions:
P – Park
R – Reverse
N – Neutral
D – Automatic control
(1st to 4th speed)
3 – Low gear and braking
(1st to 3rd speed)
2 – Low gear and braking
(1st to 2nd speed)
1 – Low gear and braking in
slower version (1st speed only)

5 Connection for oil inlet pipe

6 Connection for starter inhibitor and reversing light switch

7 Oil outlet

8 Connection from oil cooler

TRANSMISSION TYPE	ZF 4 HP 22
Ratios (mechanical):	
1st gear	2.73
2nd gear	1.56
3rd gear	1.00
4th gear	0.73
reverse	2.09

WEIGHT (without torque converter) approximate	45.5 Kg
Oil capacity*	8.0 Litres

The maximum torque multiplication of the torque converter is from 1.9 to 2.3

"Initial filling of transmission unit and converter.

AUTOMATIC TRANSMISSION

SHIFT SPEEDS **44.00.00**

4.09:1 AXLE RATIO

THROTTLE POSITION		UPSHIFTS			
Light Throttle		1-2	2-3	3-4	TCC ON
	M.P.H.	8-12	12-20	20-30	45-55
	Km/h	13-19	19-32	32-48	72-88
Output Shaft rpm		550-575	850-1000	1235-1525	2700-2875

THROTTLE POSITION		UPSHIFTS		
Up to Detent (90% Full Throttle)		1-2	2-3	3-4
	M.P.H.	20-33	50-63	75-93
	Km/h	32-77	80-101	120-149
Output Shaft rpm		1225-1615	2935-3250	4150-4875

THROTTLE POSITION		UPSHIFTS		
Through Detent (Full Throttle)		1-2	2-3	3-4
	M.P.H.	27-40	57-70	85-105
	Km/h	43-64	91-112	136-168
Output Shaft rpm		1610-2040	3260-3575	4785-5525

THROTTLE POSITION		DOWN SHIFTS		
Kickdown (Maximum)		4-3	3-2	2-1
	M.P.H.	66-101	42-66	20-35
	Km/h	106-162	67-106	32-5
Output Shaft rpm		3725-5290	2450-3390	1200-1740

THROTTLE POSITION		DOWN SHIFTS		
Part Throttle Downshift (90% rnax)		4-3	3-2	2-1
	M.P.H.	57-70	35-48	12-25
	Km/h	91-112	56-77	19-40
Output Shaft rpm		3250-3650	2050-2425	850-120

TCC ON = TORQUE CONVERTOR CLUTCH ON
TCC OFF = TORQUE CONVERTOR CLUTCH OFF

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THROTTLE POSITION Zero Throttle (Roll Out)		DOWN SHIFTS TCC OFF	4-3	3-2	2-I
	M.P.H.	45-55	16-25	11-16	5-10
	Km/h	72-88	26-40	18-26	8-1
Output Shaft rpm		2600-2790	875-1190	750-800	385-440

THROTTLE POSITION Manual Shift (Max Throttle)		DOWN SHIFTS 4-3	3-2	2-1
	M.P.H.	NOT INHIBITED	55-70	24-3%
	Km/h	NOT INHIBITED	88-112	38-61
Output shaft rpm		NOT INHIBITED	3375-3915	1410-1890

STALL SPEEDS

ENGINE CAPACITY	EMISSION TYPE	ENGINE SPEED	TOLERANCE
2.9 Litre	'A GERMAN	2100 RPM	+ 150 RPM
2.9Litre	'B'	2100 RPM	+ 150 RPM

TRANSMISSION UNIT PRESSURES

2.9 **ENGINE –UK**

	IDLE (STATIONARY)	FULL THROTTLE (STALL)
DRIVE	630-710kPa	780-950kPa
REVERSE	1070-1150kPa	1620-1780kPa

AUTOMATIC TRANSMISSION UNIT

FAULT DIAGNOSIS 44.00.00

The following tables (pages 11-17) are intended as a guide to diagnosis of faults which may occur in the transmission unit.

INTITIAL CHECKS

Complete these checks before carrying out any diagnostic work.

1 Check the transmission unit oil level.
2 Check the kickdown cable adjustment.
3 Check the selector cable adjustment.
4 Check the engine tune.
5 Carry out a stall test.
6 Carry out a road test.

FAULT	POSSIBLE CAUSE	ACTION
POSITION P		
Park does not engage	Incorrect setting of selector between control lever and transmission.	Adjust setting
	Too much friction in parking lock mechanism	Replace components, cam, connection rod and eventually pawl
Park position does not hold	Incorrect setting of selector rods between control lever and transmission,	Adjust setting
Starter motor will not operate	Starter inhibitor switch faulty.	Replace switch
	Incorrect setting of selector lever	Adjust setting
	Faulty selector lever	Replace lever.
	Position P or N not selected	Select P or N
POSITION N		
Engine will not rotate.	Starter inhibitor switch faulty.	Replace switch
	Incorrect setting of selector lever	Adjust setting
	Faulty selector lever	Replace lever.
	Position N not selected	Select N
Vehicle moves in Position N	Wrong setting of gear change rods between control lever and transmission.	Adjust setting
	A Clutch defective (seized up)	Service/Renew transmission

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FAULT	POSSIBLE CAUSE	ACTION
POSITION R		
No reverse gear	Incorrect setting of selector rods between control lever and gearbox.	Adjust setting
	Dirty oil filter	Renew filter
High pitched squeaking noise	No 3rd gear (B Clutch destroyed)	Service/Renew transmission
	No engine braking in Position 1, 1st gear. (D clutch destroyed)	Service/Renew transmission.
	No engine braking in 2nd and 3rd gear, also in Position 1, 1st gear (E Clutch destroyed).	Service/Renew transmission.
	Reverse gear safety valve faulty.	Service/Renew control unit
Slipping or shaking from start in reverse gear.	B or E Clutch, or brake D defective.	Service/Renew transmission
Strong jerk when engaging positions P-R or N-R, or distinct double jerk at P-R or N-R (below 1500 RPM engine speed).	Damper B defective (will give the same symptoms when changing from 2nd to 3rd gear).	Service/Renew control unit
Reverse light does not illumiunate (bulbs, fuses and cables OK).	Starter inhibitor switch faulty.	Replace switch
	Incorrect setting of selector lever	Adjust setting
	Faulty selector lever	Replace lever.
	Position R not Selected	Select R
POSITION D		
No drive	Dirty oil filter	If no debris in sump, just replace filter, otherwise replace transmission
	A Clutch defective	Service/Renew transmission
	One way clutch 1st gear slips	Service/Renew transmission
	Wrong setting of gear change rods between control lever and transmission.	Adjust setting
Slipping or shaking upon initial forward movement.	A Clutch damaged	Service/Renew transmission

FAULT	POSSIBLE CAUSE	ACTION
POSITION D **(CONTINUED)**		
Strong jerk N-D (below 1500 RPM engine speed.	A Clutch faulty	Service/Renew transmission
	A Clutch damper faulty	Service/Renew control unit.
Gear change functions faulty (in cold or warm state)		
Change 1-2/2-1	Governor dirty	Replace governor
	Shift valve 1-2 sticking	Replace control unit
Change 1-2	Brake C and/or C faulty	Service/Renew transmission
Change 2-3/3-2	Governor dirty	Replace governor
	Shift valve 2-3 sticking	Replace control unit
Change 2-3	B Clutch faulty	Service/Renew transmission
Change 3-4/4-3	Governor dirty	Replace governor
	Shift valve 3-4 sticking	Replace control unit
Change 3-4	Brake F defective	Service/Renew transmission
Vehicle starts in 2nd gear	Governor sleeve sticking	Replace governor
	Shift valve 1-2 sticking	Service/Renew control unit
Vehicle starts in 3rd gear	Governor sleeve sticking	Replace governor
	Shift valve 1-2 and 2-3 sticking	Service/Renew control unit
Gearbox changes 1-3	Shift valve 2-3 sticking	Service/Renew control unit
SHIFTSPEEDS		
No changes at light throttle setting	Dirty governor	Replace governor
	Shift valves sticking	Service/Renew control unit
Change points in-correct at full throttle setting.	Throttle cable setting incorrect.	Adjust setting
No changes at Kick-Down 1-2/2-1	Throttle cable setting incorrect.	Adjust setting
No changes ar Kick-Down 2-3/3-2	Throttle cable setting incorrect.	Adjust setting
No changes at Kick-Down 4-3	4-3 Kick-Down valve sticking.	Service/Renew control unit

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FAULT	POSSIBLE CAUSE	ACTION
SHIFT SPEEDS (CONTINUED)		
Gear change quality		
Harsh changes at low throttle	Defective damper Modulation pressure too high Clutch plates damaged	Service/Renew control unit Service/Renew control unit Service/Renew transmission
Soft changes at full throttle and Kick-Down.	Defective damper Modulation pressure too low Clutch plates damaged	Service/Renew control unit Service/Renew control unit Service/Renew transmission
Harsh changes at full throttle and Kick-Down.	Incorrect modulation pressure Defective damper	Service/Renew control unit Service/Renew control unit
POSITION 3, 3RD GEAR		
No engine braking	Clutch E damaged	Service/Renew transmission
POSITION 2		
Manual change 3-2 faulty	Locking valve 2 sticking Governor sticking	Service/Renew control unit Service/Renew governor
No engine braking	Brake C' or E Clutch damaged	Service/Renew transmission
POSITION 1		
Manual change 2-1 faulty	Locking valve 1 sticking Governor sticking	Service/Renew control unit Service/Renew governor
No engine braking	Brake D or E Clutch damaged.	Service/Renew transmission
Change points at incorrect speeds	WK safety valve sticking No 4th gear Governor pressure incorrect	Service/Renew control unit Service/Renew control unit Service/Renew governor
Gear change too harsh	Lock up damper faulty Torque convener faulty	Service/Renew control unit Service/Renew torque convener
No lock-up	Control unit faulty Lock up valve or damper faulty No 4th gear	Service/Renew control unit Replace torque converter. Service/Renew control unit
GENERAL		
Throttle cable sticking	Nipple in throttle cam is worn Too much friction in sleeve of throttle cable Throttle pressure piston sticking	Replace cable Replace cable Service/Renew control unit
Noisy and no drive after long journey	Oil filter on control unit dirty	If there is no burnt lining in oil sump, then only replace filter, otherwise replace transmission.
Very noisy and no drive	Flexi-plate is worn or broken Pump drive worn	Replace flexi-plate or torque converter Replace transmission

FAULT	POSSIBLE CAUSE	REMEDY
OIL LEAKS		
Oil dripping from bell housing	Seal ring in pump housing damaged	Replace seal
	Pump housing porous	Replace pump housing
	Converter leaking from welded seam	Replace converter
Leakage between transmission and oil sump.	Incorrect torque of bolts	Tighten bolts
	Sump gasket damaged	Replace gasket
Leakage between intermediate plate and main housing (especially at pump pressure point)	Bell housing bolts have worked loose	Tighten bolts
	Gasket broken	Replace gasket
Oil loss at tacho connections	Damaged 'O' ring on tacho	Replace 'O' ring
	Oil seal in tacho faulty	Replace tacho sleeve
Oil leak from throttle connection cable	'O' ring connection damaged	Replace 'O' ring or complete cable
Oil leak at output	Output oil seal damaged	Replace seal
Loss of oil through breather	Oil level too high	Check level.
	Incorrect oil	Remove transmission, ensure that it is completely drained (including torque converter, oil cooler and pipes)
	No breather cap	Fit cap or change breather
	'O' ring breather damaged	Remove tail housing
		Replace 'O' ring
	Securing clip faulty	Replace clip
Leakage in cooler pipes	Loose connections	Re-tighten
	Pipes damaged	Replace pipes
	Cooler leaks	Replace cooler
Oil leak at intermediate plate	Blanking plus loose	Tighten plugs
		Replace washers
Leakage between main housing and tail housing.	Loose bolts	Re-tighten
	Gasket damaged	Replace gasket
NOISES		
High pitched squeaking noise, dependent on engine RPM, in all gears, when oil is warm, accompanied by intermittent drive after long journey	Dirty filter	If no debris in sump, replace filter, otherwise replace transmission unit

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FAULT	POSSIBLE CAUSE	REMEDY
NOISES (CONTINUED)		
High pitched noise in all positions, especially if oil is cold	Low oil level Leaking control unit	Top up as required Remove control unit
Very noisy when in lock-up	Torsion damper faulty	Replace torque converter
Torsional vibrations from engine when in lock-up.	Engine RPM is too low, lock-up shift point incorrect	Remove control unit

0194G

AUTOMATIC TRANSMISSION UNIT

RENEW **44.20.01**

Disconnectthe kickdown cable from the throttle linkage.
Remove the bolt securing the transmission dipstick tube to the inlet manifold.
Fit Service Tool **JD** 124 to the rear of the inlet manifold and take the weight of the engine with MS53B **(Fig** 1).
Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side **of** the vehicle.
Taking the weight **of** the transmission unit, remove the rear mounting to body securing **bolts,** lower the jack and collect the spacer.
Disconnect the propeller shaft from the drive flange.
Remove the clamp **bolt** securing the selector cable to the bracket and the selector lever to shaft securing nut.
Place a drain tin below the dipstick tube and disconnect the union, drain the remaining fluid and fit a **dummy** plug to the sump.
Remove the clamp securing the transmission **cooling** pipes to the transmission (Fig 2), disconnect the pipes and fit a dummy plug to the apertures.
Remove the drain tin.
Remove the blanking plug from the torgue converters securing bolt access aperture (Fig 3), and remove the crankshaft/drive plate securing bolts, turning the crankshaft for access to remove each bolt.

Lower the engine/transmission unit using MS53B ensuring that the engine **does** not foul the steering rack.
Remove the bell housing bolts and remove the transmission **(1** Fig **1** page 64).

Lift the replacement unit and torque converter into position, fit and tighten the bell housing bolts.
Align the torque converter/drive plate, securing bolt holes, fit and tighten the bolts.
Refit the blanking plug and stone guard.
Refit the oil cooler pipes to the transmission ensuring new sealing washers are used, secure with the sump bracket.
Reposition the kickdown cable to the bell housing and refit the dipstick tube.
Raise the engine/transmission unit using MS53B, reconnect the selector lever and cable clamp to the mounting bracket.
Refit the propeller shaft to the drive flange, raise the rear of the unit into position fit the spacers **arid** secure with the mounting bolts.
Refit the exhaust front pipe to the intermediate pipe and manifold.
Remove Service **Tool** MS53B align the fan cowl, refit and adjust the kickdown cable.
Remove the engine lifting eye JD 124 and replace the manifold securing nuts.

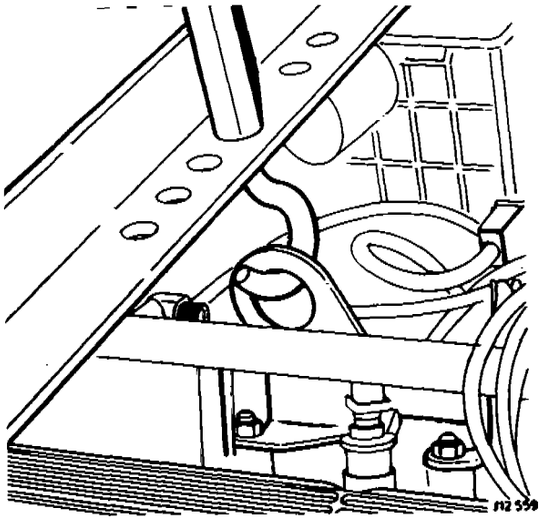


Fig 1

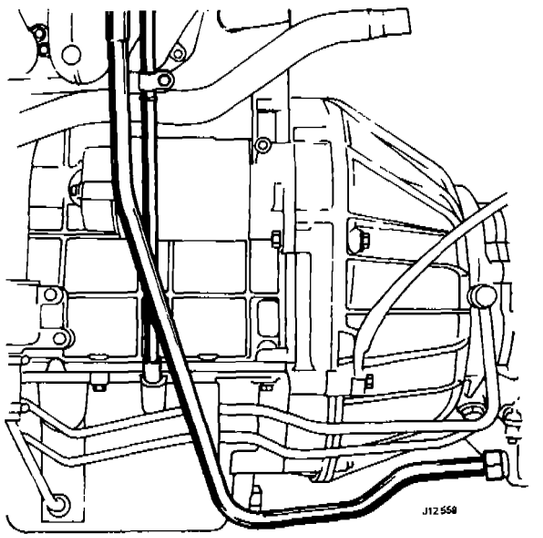


Fig 2

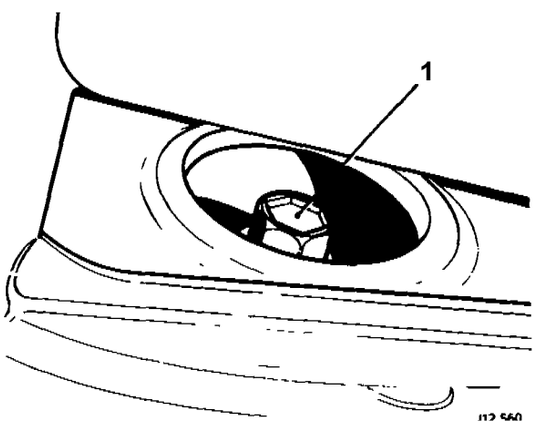


Fig 3

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Align and secure the dipstick tubes to the inlet manifold. Refill with transmission fluid.

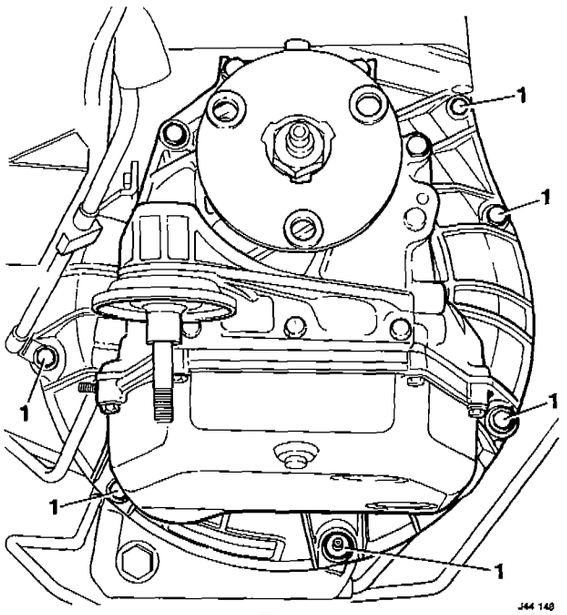


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket

TORQUE FIGURES

Base plate assembly to mounting pan 7-10Nm
Base plate assembly to side plate 7-10Nm
Dipstick tube nut 20Nm
Down pipe to intermediate pipe 15-18Nm
Drain plug 15Nm
Drive plate to torque convertor 49-54Nm
Exhaust tie nut/stud 9.5-12.5Nm
Intermediate pipe to silencer 15-18Nm
Oil cooler pipe banjo bolt 32-36"
Propeller shaft to gearbox 95-105Nm
Rear engine mounting bracket to body 20-25Nm
Selector lever nut to shaft 23-27Nm
Torque convertor housing to adaptor 49-54Nm
Torque convertor housing to block/sump 49-54Nm

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

0194G

AUTOMATIC TRANSMISSION UNIT

OVERHAUL **44.20.06**

Remove the transmission unit 44.20.01.
Remove the torque converter assembly 44.17.07
Fit the unit to the bench clamp using Service Tool JD 111.
Tighten the clamp onto the unit (do not overtighten due to possible distortion of casing).
Remove the bolts securing the sump to the case.
Remove the sump and discard the gasket.
Collect the two magnets.
Move the screws securing the oil filter.
Remove the filter disgard the filter 'O' ring.
Remove the screws securing the valve block.
Lift off the valve block assembly.

Remove the circlips (1 Figs 1 and 2) securing the seal springs.
Lift out the springs.
Using Service Tool JD126 remove oil seals.
Disconnect the kick down inner cable from the throttle valve cap using Service Tool JD 110.
Remove the outer cable from the unit casing.
Remove the cable sealing 'O' ring.
Set the selector in the Park position.
Knock in the rear drive flange nut securing ring tabs.
Remove the ring and undo and remove the flange securing nut.
Remove the drive flange.
Remove the bolts securing the rear extension to main case.
Remove the rear extension.
Discard the gasket.
Select Neutral.
Remove the screw securing the parking pawl locating bracket.
Remove the bracket.
Remove the guide plate pawl, spring and pivot pin.
Slide the governor rearwards from the shaft discard the output shaft 'O' ring.

Remove the screws securing the F clutch cylinder.
Reposition the Service Tool JD 111 to leave the gearbox in a vertical position.
Remove the bolts securing the bell housing.
Remove the bolts securing the bell housing and front pump.
Remove the bell housing pump assembly and discard the gasket.
Move the pump to A clutch thrust bearing (1 Fig 3) and remove the A clutch assembly (2 Fig 3).

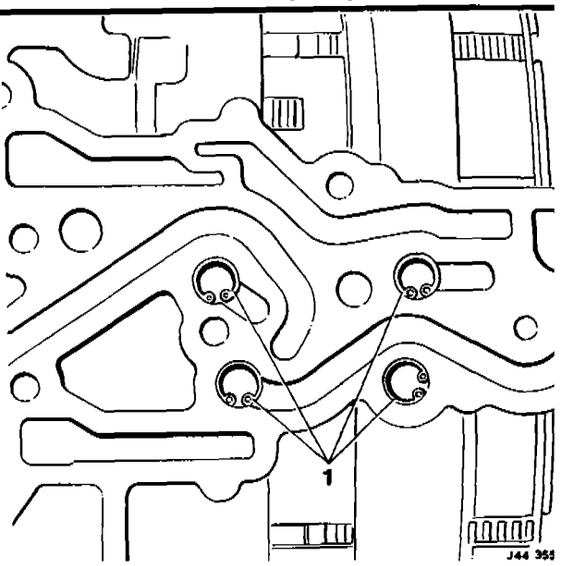


Fig 1

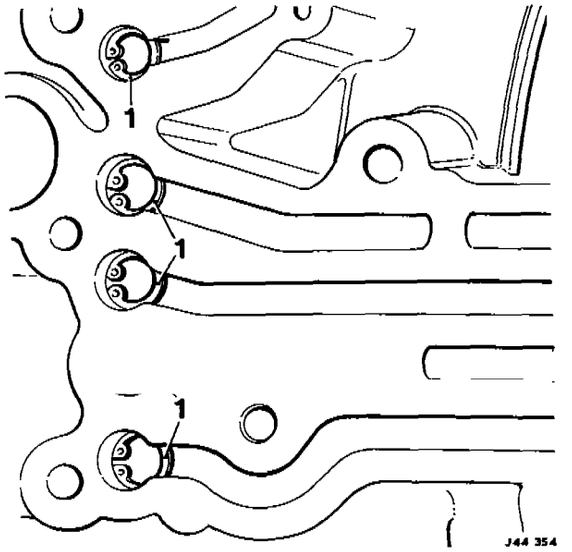


Fig 2

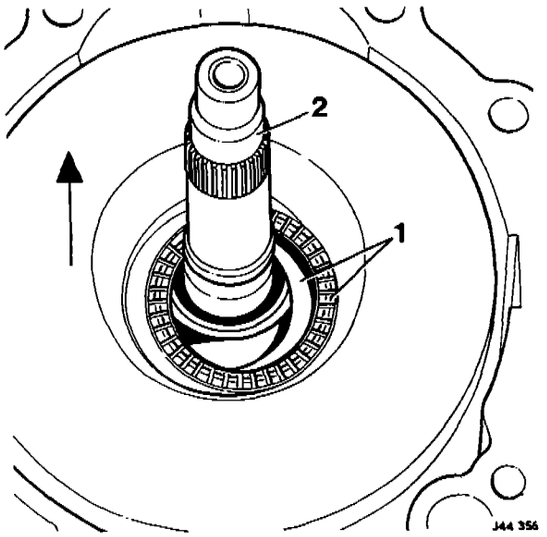


Fig 3

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Remove the inner carrier to clutch assembly thrust bearing (1 Fig 1).
Remove the inner carrier (2 Fig 1).

Using suitable circlip pliers remove the snap ring (1 Fig 2) securing the B clutch.

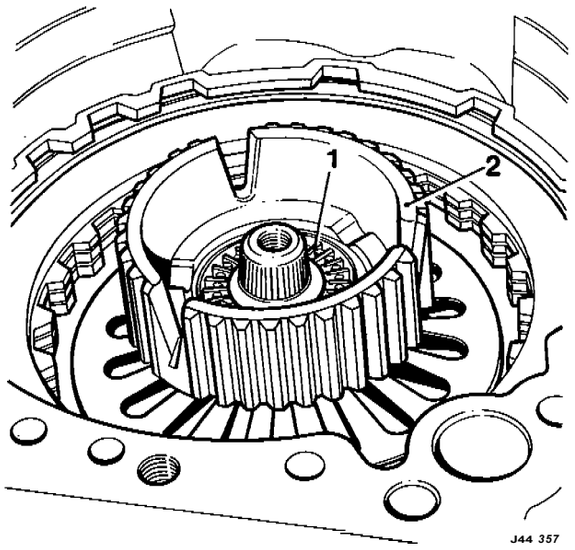


Fig 1

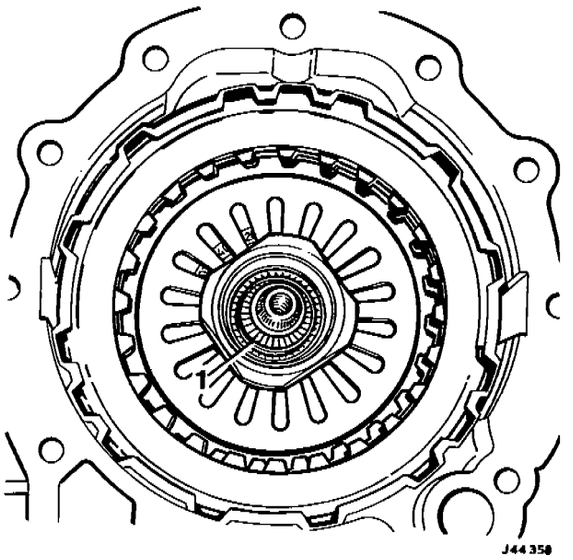


Fig 2

Using 2 hooks (1 Fig 3), twist and pull the B clutch assembly upwards till the first stop is felt.
Push the clutch assembly downwards and remove the B clutch assembly.
Remove the washer and 'O' ring.
Remove C, C1 and D clutch assemblies.
Remove the snap rings securing the assembly.

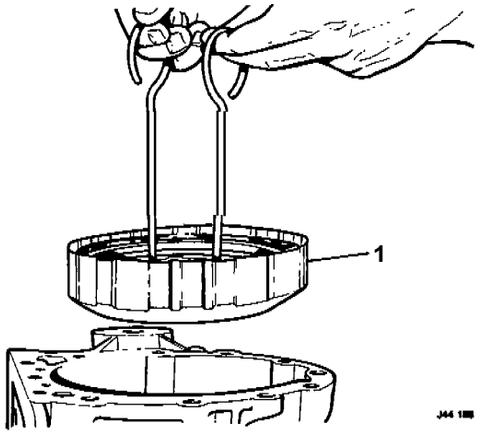


Fig 3

Assemble Service Tool JD 109 to the shaft.
Disconnect and remove the clutch assembly (1 Fig 1).

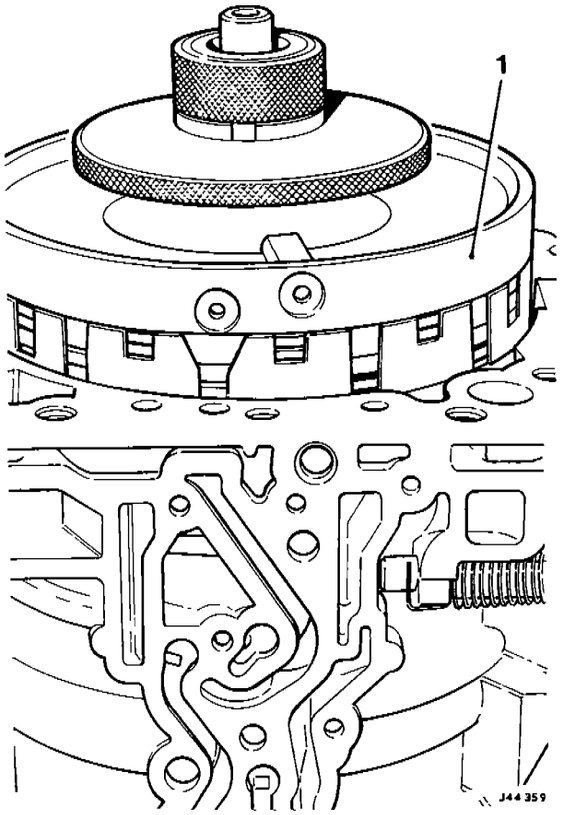


Fig 1

Remove the thrust bearing assembly (1 Fig 2), rear plantary set and output shaft.
Remove the sun gear and the planatary set.
Remove the carrier to output shaft thrust bearing assembly.
Remove the output shaft assembly.
Remove the output shaft thrust bearing assembly including brass thrust washer.

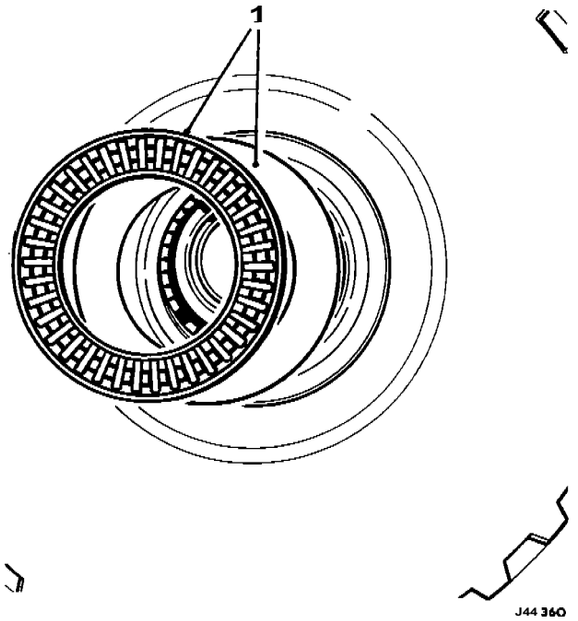


Fig 2

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Remove the E clutch assembly.
Remove F clutch assembly.
Invert the gearbox case with the Service Tool.
Remove the roll pin securing the selector shaft.
Remove the shaft.
Remove the throttle valve cam return spring and cam assembly.
Remove the selector quadrant parking rod (1 Fig 1) and remove the parking rod from the selector quadrant.
Remove the shaft seal.
Clean the gearbox casing.
Clean all components parts prior to assembly.

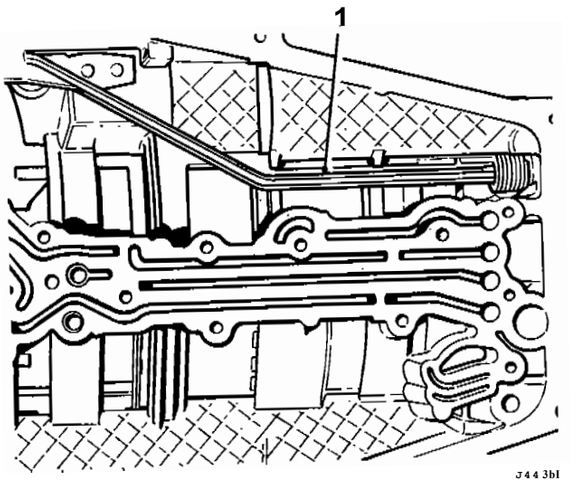


Fig 1

Lubricate the selector shaft seal and using a suitable 13mm (1 Fig 2) socket fit/seat the oil seal to the case.

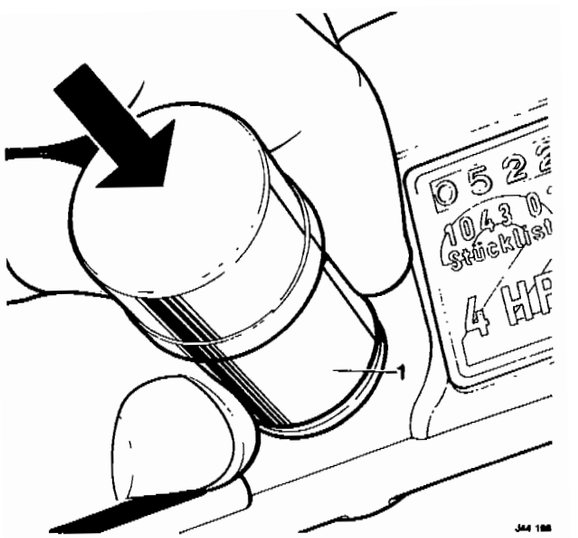


Fig 2

Lubricate the selector shaft and fit the shaft (2 Fig 3) through the seal and into the casing.
Assemble the park rod (1 Fig 3) to the quadrant and fit the park rod quadrant assembly to the selector shaft.
Position the shaft through the assembly.
Lubricate the throttle valve cam bearing and fit the cam assembly to the shaft.
Fit and engage the cam return spring (4 Fig 3) to the shaft cam and case (3 Fig 3).
Reposition the shaft fully into the casing.
Align the roll pin holes in the shaft quadrant and refit the roll pin (5 Fig 3).

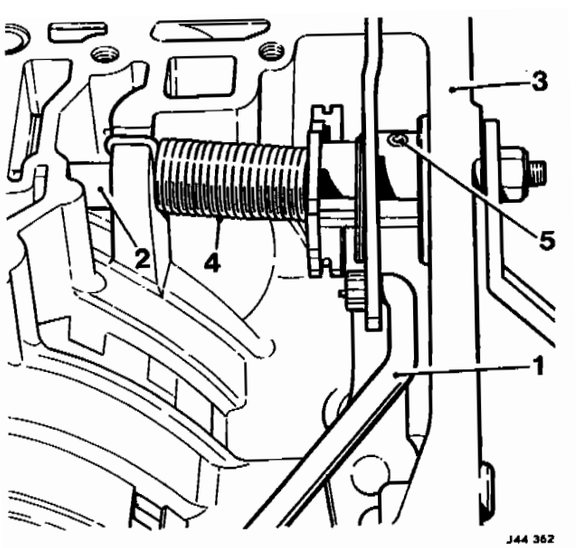


Fig 3

F CLUTCH OVERHAUL

Remove the snap ring (1 Fig 1) securing the clutch plate and remove the clutch pack assembly (1 Fig 2).
Remove the sealing rings.
Fit Service Tool JD 107 to the clutch.
Compress clutch and remove the collets.
Slacken the tool centre nut to relieve tension from the spring.
Remove the Service Tool and adaptor collar JD 107-1.
Remove the piston spring from the housing and using a suitable block of hard wood tap the F clutch piston assembly onto the wood to displace the piston assembly.
Discard the piston seals.
Clean all component parts, fit new sealing rings and reverse the removal procedure to reassemble the F clutch.
Refit the F clutch assembly to the transmission ensuring that the oil feed holes are aligned.
Fit and tighten the F clutch cylinder securing screws and align the clutch plates.
Reposition the unit/Service Tool adaptor into a vertical position with the bell housing face uppermost.

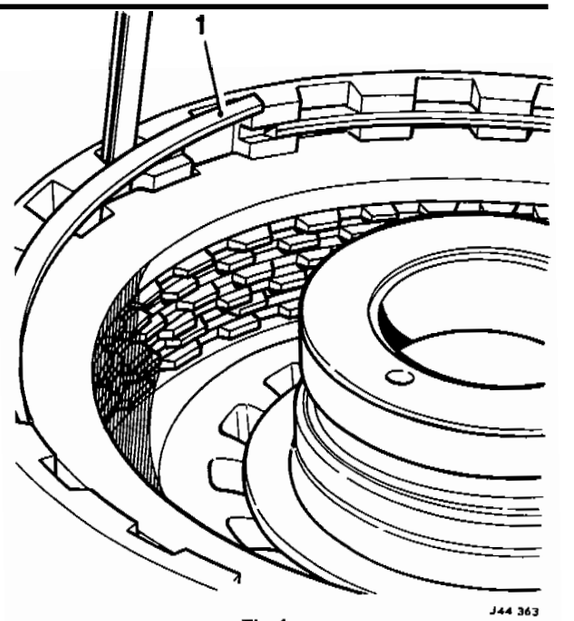


Fig 1

E CLUTCH OVERHAUL

Remove the snap ring (1 Fig 3) securing the clutch plate and remove the clutch pack assembly.
Remove the piston.
Remove the 'O' Ring.
Replace the 'O' ring and refit the piston.

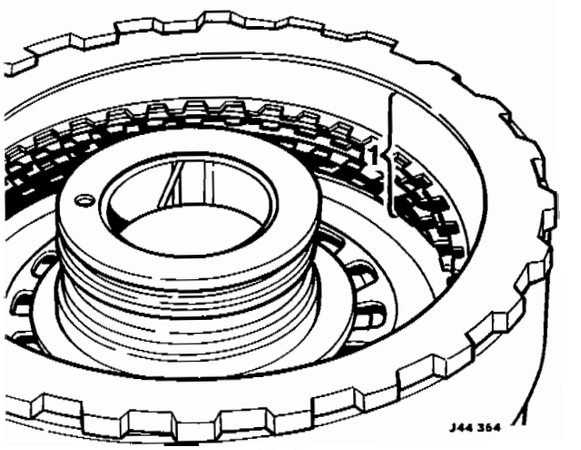


Fig 2

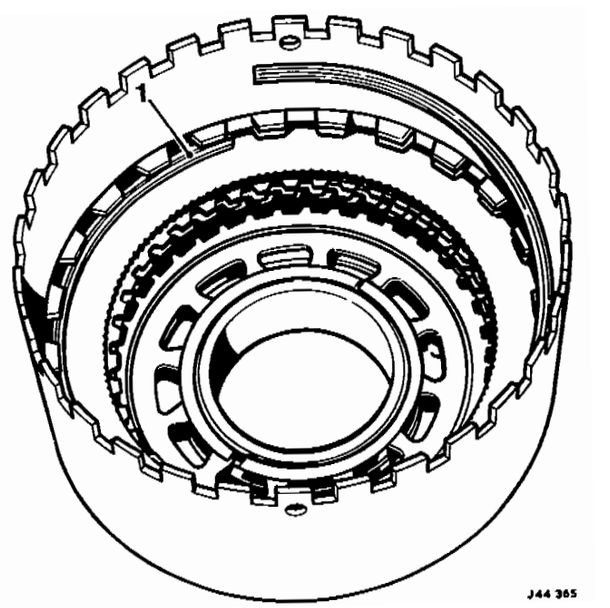


Fig 3

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Using Service Tool JD 107 (1 Fig 1) compress the spring and remove the collets (2 Fig 1).
Slacken the centre nut of and remove the adaptor collar JD 107-1.

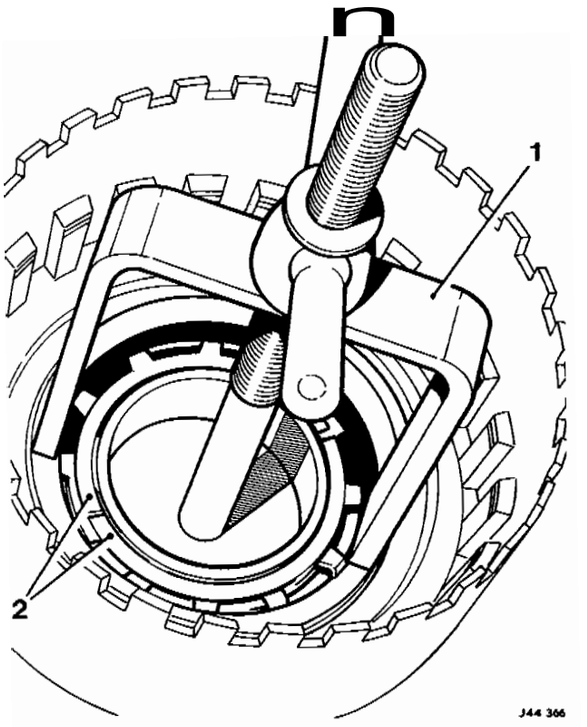


Fig 1

Remove the Service Tool and remove the piston spring (1 Fig 2) from the housing.
Using an air line remove the piston from the housing.
Remove and discard the piston seals.
Clean the piston housing assembly.
Clean all component parts and reverse the removal procedure to reassemble the E Clutch ensuring that when the clutch plates are assembled, they are fitted metal fibre metal and end with the thick metal plate prior to securing with the snap ring
Fit and seat the E clutch assembly to the F clutch using a twisting motion to seat the E clutch
Align all of the E clutch plates

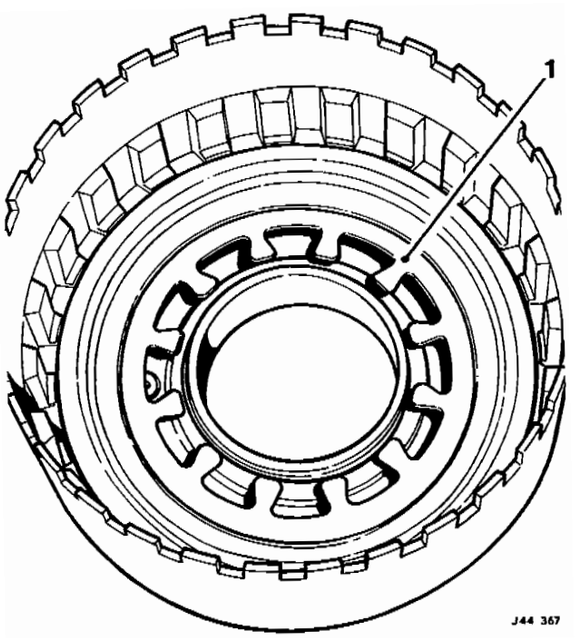


Fig 2

OUTPUT ASSEMBLY OVERHAUL

Using suitable circlip pliers remove the snap ring (1 Fig 1) securing the output shaft (2 Fig 1) to the rear one way clutch (3 Fig 1).
Remove the one way clutch from the shaft.

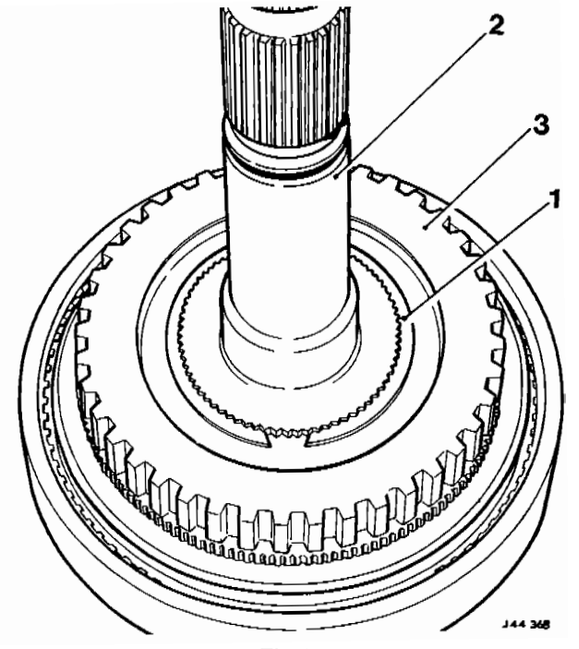


Fig 1

Remove the E clutch hub (1 Fig 2), and using a clockwise twisting motion remove the one way clutch assembly (2 Fig 2).
Remove the clutch roller assembly from the clutch hub.
Remove the clutch rollers and remove snap ring securing the inner gear to the outer gear.
Remove the inner gear.

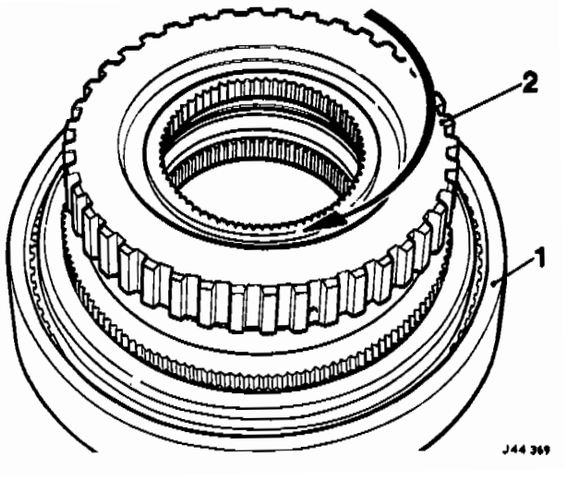


Fig 2

Clean all component parts and reverse the removal procedure to reassemble, ensuring that when the one way clutch (1 Fig 3) is assembled that an anti-clockwise motion is used to ensure the one way clutch is fully seated.
Check the clearance between the one way clutch and gear and fit the E clutch hub.
Lubricate the thrust bearing.
Fit the washer and bearing to the E clutch.
Apply Vaseline to the thrust washer and brass thrust washer.
Fit washers to the output shaft assembly.
Fit and seat the output shaft assembly to the E clutch using a twisting motion to ensure the shaft is fully seated.

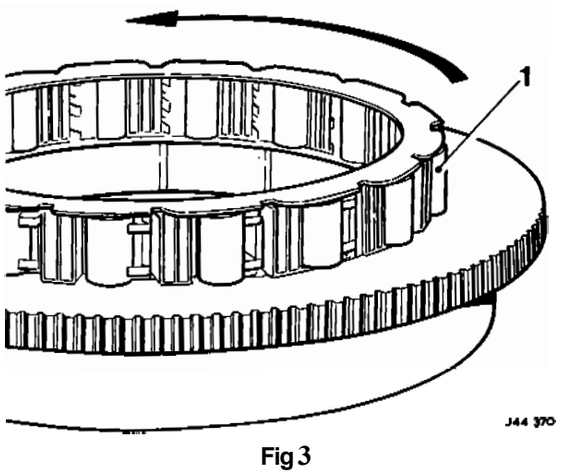


Fig 3

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REAR PLANETARY SET OVERHAUL

Unhook and remove the sealing ring from the carrier.
Clean the assembly.
Lubricate the replacement sealing ring and fit and hook the sealing ring to the carrier.
Lubricate the thrust bearing and fit the washer and bearing to the output shaft.
Apply Vaseline to the carrier and fit the thrust washer to the carrier.
Fit and seat the carrier assembly to the output shaft.
Refit the sun gear.

C, C1 AND D Clutch assembly overhaul.

Fit the clutch assembly to a bench vice.
Remove Service Tool JD 109.
Remove the C1 clutch piston (1 Fig 1).
Remove the C1 clutch plates as an assembly (2 Fig 1).

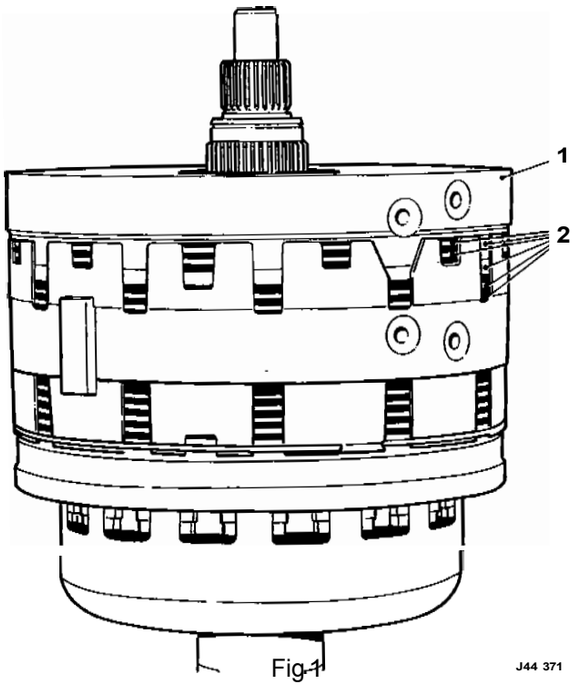


Fig 1

Remove the one way clutch assembly (1 Fig 2).
Remove the **C** clutch assembly and the C-D clutch piston assembly.
Remove the snap ring securing the D clutch plates.

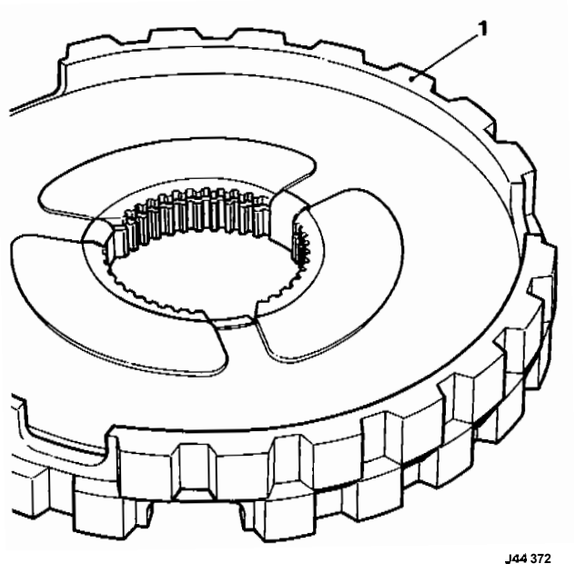


Fig 2

Remove the one way clutch/planet gear set (1 Fig 1).

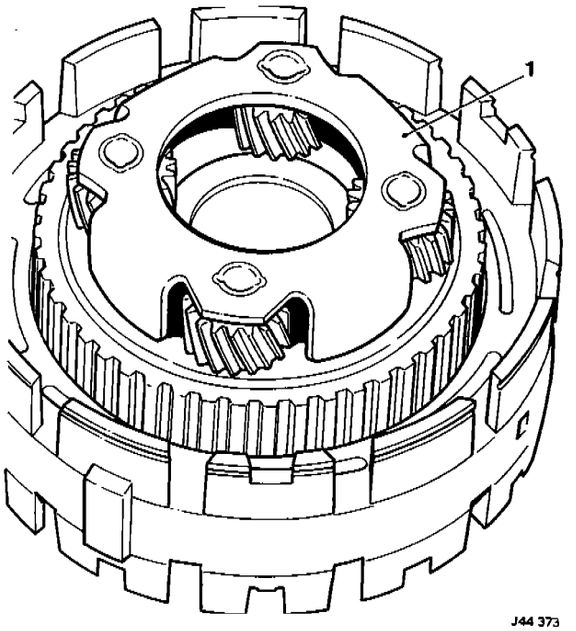


Fig 1

Remove the sun gear and unhook and remove the sealing rings (1 Fig 2).
Remove the D clutch brake ring.
Remove the snap rings securing the lower planet carrier.

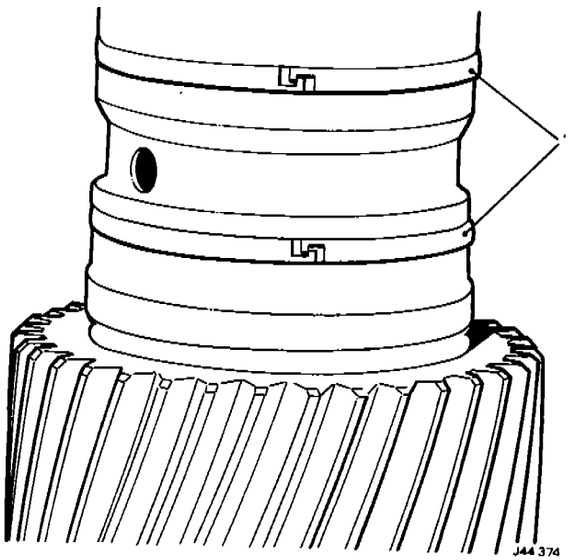


Fig 2

Remove the gear (1 Fig 3).
Remove the lower planet gear set.

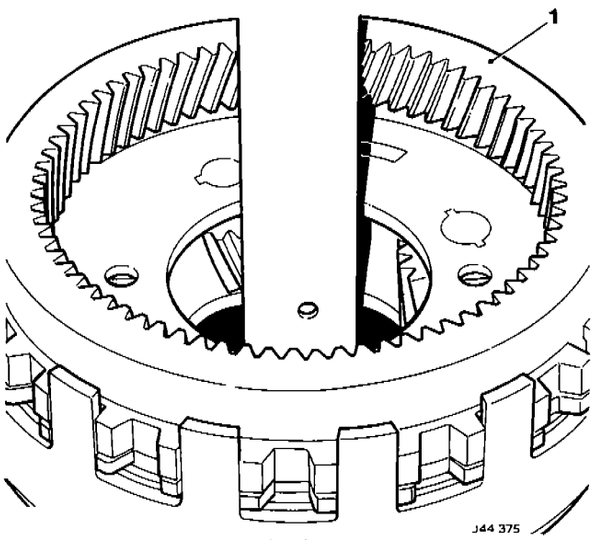


Fig 3

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Remove the thrust bearing assembly (1 Fig 1).
Remove the centre shaft assembly (2 Fig 1).
Remove the thrust bearing assembly.
Remove the snap ring securing the outer gear to the shaft.
Remove the gear from the shaft.

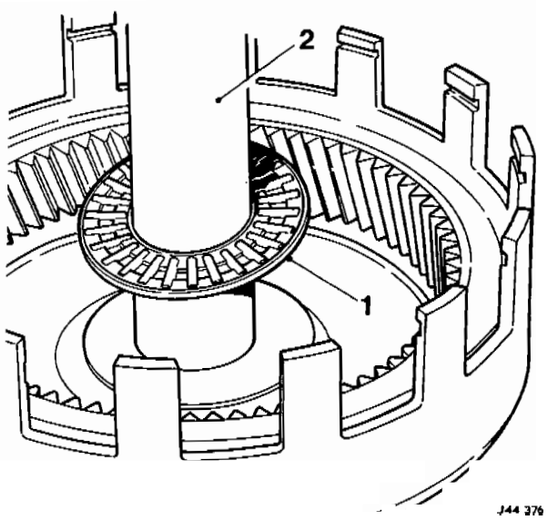


Fig 1

Remove the spacing ring (1 Fig 2) and remove the spacing ring retaining snap ring (2 Fig 2).
Remove the lower clutch carrier from the stand.
Clean all component parts and overhaul the clutch pistons.
Fit Service Tool JD 107 to the housing (1 Fig 3).
Fit the piston spring compressor ring to the tool.
Tighten the tool centre nut and remove the collets (2 Fig 3).
Slacken the tool centre nut and remove the adaptor collar JD 107-1.
Remove the Service Tool.
Remove the piston spring from the housing and using an air line displace the piston from the housing.
Remove and discard the piston seals.
Clean the piston and housing assemblies.
Fit and align new seals to the piston and lubricate.
Fit the piston to the housing and reverse the strip procedure to reassemble the housing.
Fit the spacing ring and the spacing ring snap ring.
Lubricate and fit the thrust bearing.
Place the shaft to the front and fit the outer gear.
Fit the snap ring securing the gear and fit the assembly to the clutch carrier.
Lubricate and fit the thrust bearing.
Lubricate the **lower** planatary gear set and fit gear and fit the snap ring securing the **gear.**
Fit the D Clutch brake ring.
Place the C-D piston assembly to the front.
Lubricate the planatary gear one way clutch assembly and fit the gear clutch assembly to the piston assembly.
Lubricate the D clutch plates and assemble. Thin metal, fibre, metal, fibre, metal, etc plates in that order.
Fit the snap ring securing the clutch plate.
Fit and hook the sealing rings to the sun gear.

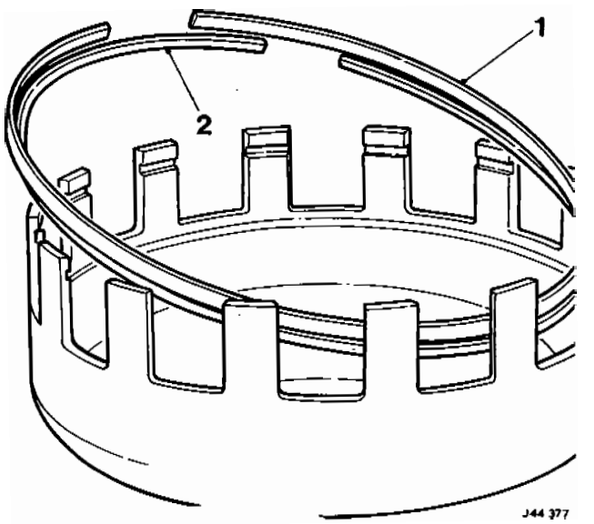


Fig 2

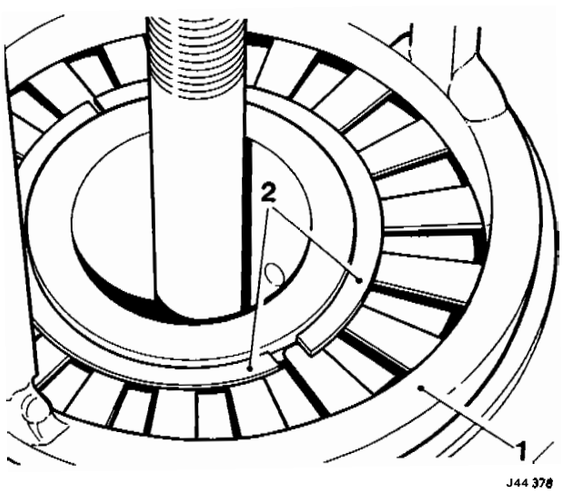


Fig 3

Lubricate the sealing rings and assemble the D clutch and sun gear.
Fit and engage the assembly to the stand Service tool.
Lubricate the upper one way clutch assembly and align the clutch splines.
Fit and seat the assembly to the stand OBEN to the top).
Lubricate the C clutch plates.
Assemble the metal fibre metal plates
(metal plate last).
Lubricate the C I clutch plates.
Assemble fibre metal fibre metal plates avoid the 'V' section location.
Fit the C piston assembly.
Assemble Service Tool JD 109 to the assembly.
Lift the complete assembly from the stand.
Move the stand aside.
Lubricate the bearing and thrust washer.
Fit the thrust washer and bearing to the gearbox.
Smear the thrust washer with Vaseline and fit the thrust washer to the clutch assembly.
Fit and seat the complete assembly to the gearbox.
Fit the snap rings securing the complete clutch assembly.

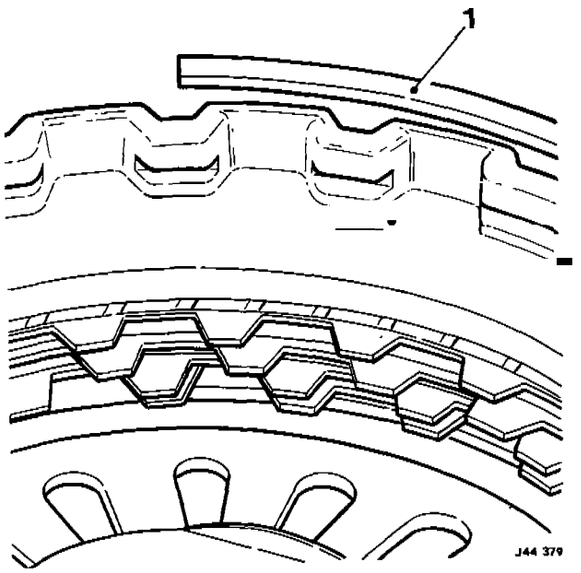


Fig 1

B CLUTCH OVERHAUL

Remove the snap ring (1 Fig 1) securing the clutch plate.
Remove the clutch plates as an assembly.
Unhook and remove the sealing ring.
Overhaul the piston and clean as necessary.
Fit Service Tool JD 107 to the clutch assembly (1 Fig 2).
Fit the piston spring compression ring to the Service Tool.
Tighten the centre nut and remove the collets.
Remove the Service Tool.
Remove the piston spring from the housing and using an air line remove the piston from the housing.
Remove and discard the pistons seals.
Clean the piston housing assemblies.
Fit and align the new seals to the piston.
Lubricate the seals.
Fit and fully seat the piston to the housing.
Reverse the remaining overhaul procedure to reassemble the clutch, ensuring that prior to the clutch plates being assembled they are lubricated and as they are assembled to the housing they are assembled wavy washer, metal plate fibre plate metal plates etc. ending with a thick metal plate.

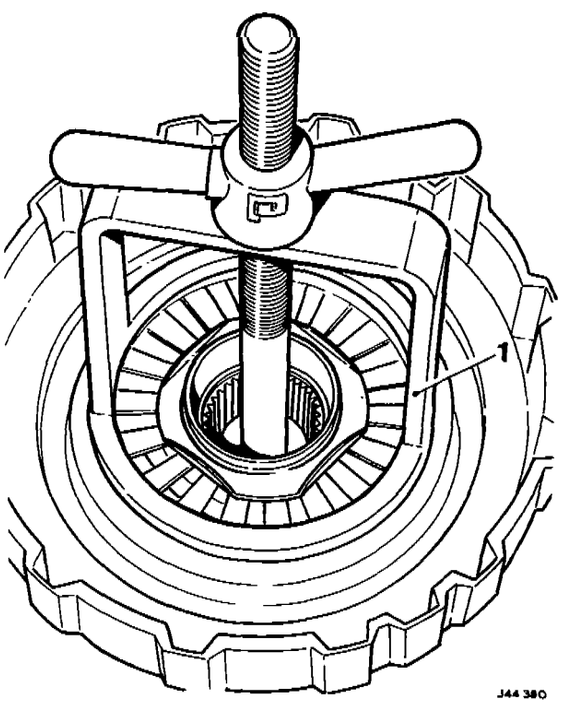


Fig 2

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Fit the snap ring securing the clutch plate.
Fit and seat the B clutch assembly to the gearbox.
Fit the 'O' ring to the shaft.
Fit the washer.
Using suitable circlip pliers, fit the snap rings securing the clutch.
Align the clutch plates.

A CLUTCH OVERHAUL

Remove the input shaft (1 Fig 1).
Unhook and remove the sealing rings (2 Fig 1).
Remove and discard the 'O' ring (3 Fig 1).
Apply downward pressure to the clutch hub and remove the hub securing snap ring.
Remove the clutch hub (1 Fig 2) and remove the clutch plates as an assembly.
Remove piston spring (2 Fig 2).
Overhaul the piston and clean all components.
Use an air line to displace the piston from the housing.
Remove and discard the 'O' ring seals.
Clean the piston assembly and A clutch housing.
Fit new seals to the piston and lubricate.
Fit the piston to the housing.

Lubricate the clutch plates and assembly wavy washer, metal plate fibre plate and metal plate etc. finish with the second wavy plate.
Fit the clutch spring and fit and align the clutch carrier.
Invert the asssembly on the bench.
Compress the springs and fit the snap ring.
Fit an 'O' ring to the input shaft.
Fit and hook the sealing rings to the input shaft.
Lubricate the sealing rings.
Fit and seat the input shaft to A clutch.
Fit the inner hub to the clutch assembly.
Lubricate the thrust bearing fit the washer and bearing to the gearbox.
Apply Vaselene to the thrust washer.
Fit the washer to the clutch assembly.
Fit and seat the clutch assembly to the gearbox ensuring that both sets of clutch plates are fully engaged.

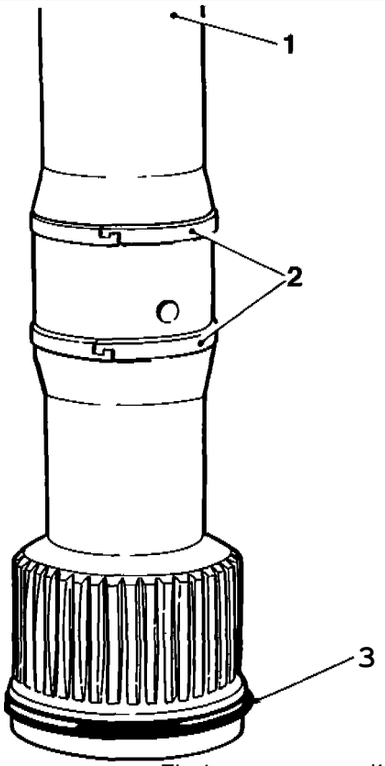
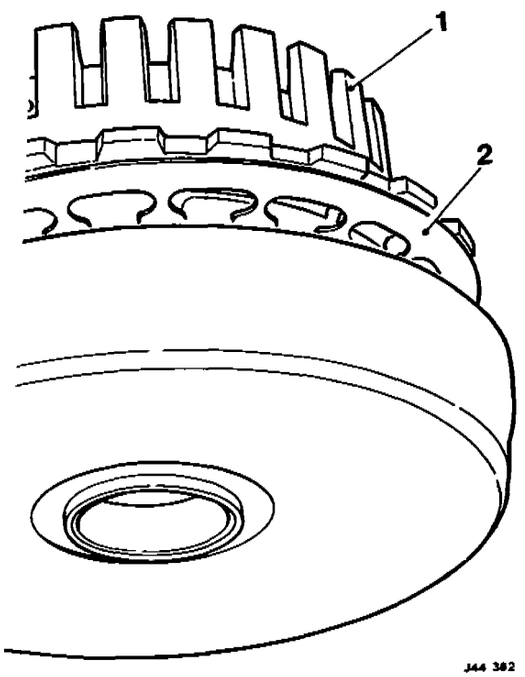


Fig 1 J44 341



J44 382

Fig 2

FRONT PUMP ASSEMBLY OVERHAUL

Remove the bolts securing the bell housing.
Remove the bell housing leaving two opposing bolts in the oil pump slack.
Remove the remaining bolts.
Lightly tap the bolt heads of the two bolts left in to release the pump from the plate.

Remove the intermediate plate.
Remove the gears from pump.
Remove and discard the pump 'O' ring.
Remove and discard the front oil seal.
Clean all components.
Assemble the gears into pump ensuring that the centre pop mark on the gears is facing upwards.
Lubricate the gears.
Fit an 'O' to the pump.
Lubricate the 'O' ring, fit and align the pump to the intermediate plate.
Fit and tighten the pump securing bolts.
Invert the assembly on the bench.
Lubricate the front oil seal.
Fit and seat the oil seal to the pump.
Fit and align the bell housing.
Fit but do not tighten the bell housing securing bolts.
Fit the intermediate plate to the casing gasket.
Lubricate the thrust bearing assembly and fit into the gearbox.
Fit and align the front pump/bell housing assembly to the gearbox.
Fit and tighten four securing bolts (90° apart).

GEAR TRAIN ENDFLOAT-CHECK AND ADJUST

Fit Service Tool JD 106 (1 Fig 1) to the stator shaft.
Tighten the screws (2 Fig 1) securing the tool to the shaft.
Ensure that the tool is fully seated onto the shaft.
Fully seat the tool inner collar to the shaft.
Tighten the inner collar securing screw.
Lift the tool/shaft assembly ensuring that the lift is vertical (3 Fig 1).
Measure the gap between the tool inner collar and shaft using suitable feeler gauges.
Slacken the screws securing the tool to the shaft and remove the tool.
Remove the pump/bell housing assembly securing bolts and remove the housing.
Remove the shim and measure.
Select replacement shim, measure and fit.
Refit bell housing/pump assembly and tighten the four securing bolts (90° apart).
Recheck the end float.
Fit and tighten the remaining front pump securing bolts and finally tighten the bell housing securing bolts.

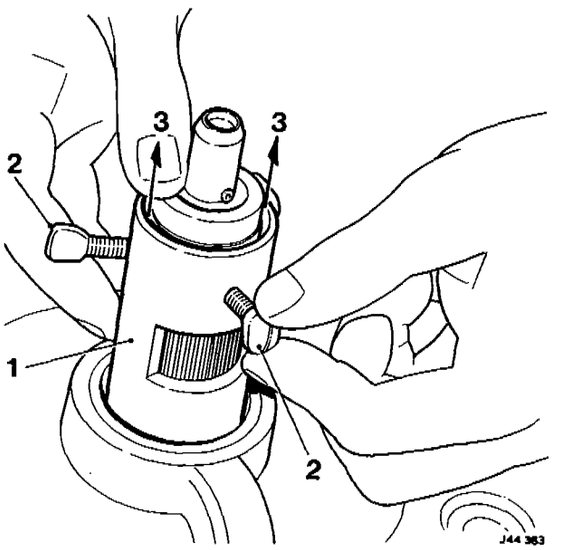


Fig 1

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GOVERNOR ASSEMBLY OVERHAUL

Remove the screws (1 Fig 1) securing the park gear (2 Fig 1) to the governor and remove the park gear.
Remove the screws securing the governor opposing valve.
Remove the plate and spacers.
Remove the valve housing.
Remove the valve spring and spring guide from the housing.
Undo and remove the valve to base securing screws (5 Fig 1). Remove the base.
Remove the valve weight securing circlip.
Remove the valve weight, body, sleeve and spring.
Clean all component parts.
Fit and align the opposing valve, spring and guide to the body (10 Fig 1).
Fit and align the opposing valve body assembly to the governor.
Fit and align the spacers (9 Fig 1) and retaining plate (7 Fig 1), secure with the screws (8 Fig 1).
Fit the spring to the valve and fit the valve sleeve.
Fit the valve body and valve weight.
Compress the spring and fit the weight securing circlip.
Lubricate the valve assembly.
Fit a brace and fit and tighten the valve securing screws.
Fit the park gear and secure with the screws.

Reposition the transmission unit Service Tool adaptor into a horizontal postion i.e. valve block face uppermost.
Fit the 'O' ring to the output shaft.
Lubricate the 'O' ring.
Fit and seat the governor assembly over the sealing rings.
Clean the pawl spring pivot and guide plate.
Lubricate the pivot and fit to the unit.
Fit the spring to the pivot.
Fit the pawl to the pivot and spring.
Reposition the pawl below the actuator rod and **fully** seat on the pivot.
Fit and seat the guide plate and the locating plate.
Fit and tighten the locating plate securing screw.

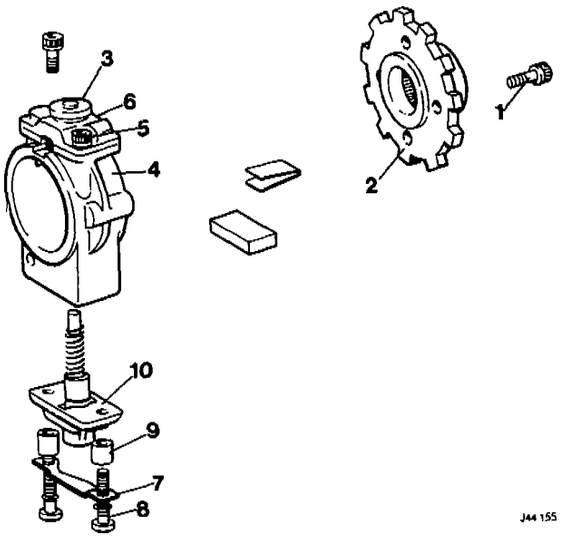


Fig 1

REAR EXTENSION OVERHAUL

Using Service Tool J D **104** remove the roller bearing.
Insert the assembly on a suitable wooden block and remove the oil seal.
Remove the breather **cap** and remove the breather securing the circlip.
Remove the breather (1 Fig **1**).
Remove and discard the breather **'O'** ring **(2** Fig **1**).
Clean the rear extension breather and cap.
Clean the bearing.
Fit a new ring to the breather and fit the breather to the extension and secure with circlip.
Fit the breather cap.
Lubricate the rear oil seal and using Service **Tool** JD 102 fit and seat the rear seal to the housing.
Invert the assembly on the wooden block.
Lubricate the bearing and using Service Tool JD **104** fit and seat the bearing to the rear extension.
Fit a replacement gasket to the rear extension and fit the extension assembly.
Fit and tighten the bolts securing the rear extension assembly to the main case.
Apply "Hylomar" to the flange securing nut and splines.
Clean the rear drive flange and fit the rear flange to the transmission.
fit and tighten the flange nut.
Fit a new securing nut locking ring.
Peen over the ring in the tab positions.
Using Service Tool JD **126** fit and seal the oil seals.
Fit seal securing springs.
Compress the springs and retain with circlips (Fig 2).
Fit a new 'O' ring to the kickdown cable.
Lubricate the **'O'** ring and rotate the throttle valve cam against spring pressure.
Fit the cable to the unit and engage the inner cable into slot in the throttle valve cam.
Fully seat the cable into the gearbox casing.
Pull the kickdown inner cable to set the throttle valve cam into the correct position.
Fit and align the valve block and connect to the selector quadrant.
Release the kickdown cable.
Fit but **do** not tighten the valve **block** securing **screws.**

Using Service Tool JD 103 between the valve body and the throttle valve pin align the valve block to set the correct distance between the valve block and cam.
Finally tighten the valve block securing screws.
Remove Service Tool JD **103.**
Clean the oil filter and fit new 'O' ring.
Fit the filter to the valve block and secure with **the bolts.**
Clean the sump and magnets.
Fit the magnets to the sump.
Fit a new gasket to the sump.
Fit and align the sump.

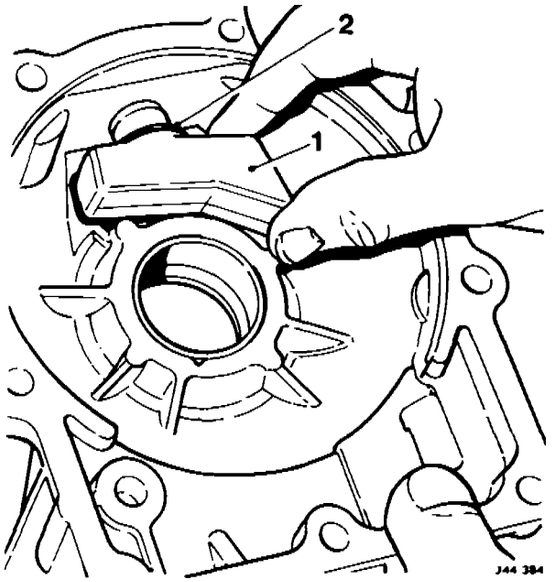


Fig 1

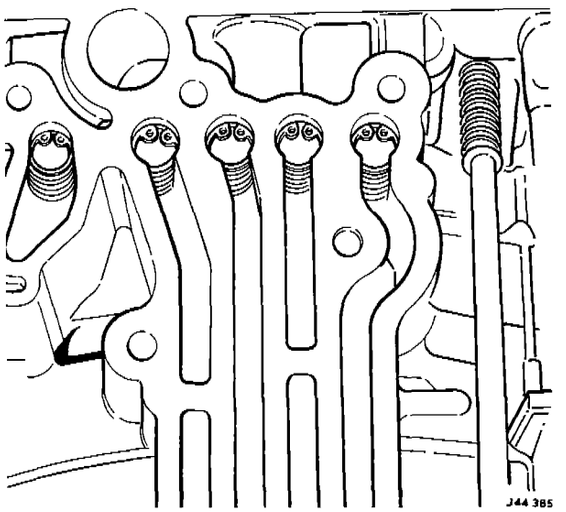


Fig **2**

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Fit clamps to the sump noting that the curved clamps are fitted to the corners.
Fit and tighten the clamp securing bolts.
Refit the torque converter.
Refit the transmission unit 44.20.01,
Reset the kickdown cable. With the throttle in the idle position, take up any slack between the transmission cable and the throttle spindle.
Adjust the ferrule on the cable to achieve a gap between the crimp and the end of the ferrule of 0.75mm + 5mm (Fig 1).
Open the throttle to 100%. ensuring that the pedal cam contacts the throttle stop, and measure the distance between the crimp and the end of the ferrule. This should be 44mm or greater (Fig 1).
Check by depressing the pedal to the pedal stop and ensure that this condition is achieved.
Adjust the pedal stop as necessary (Fig 2).

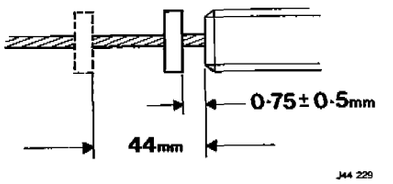


Fig 1

DATA

Front pump end float ***0.3-1.5mm***

SERVICE TOOLS

JD 102 Oil seal replacer
JD 103 Selector linkage gauge
JD ***104*** *Bearing remover/replacer*
JD ***106*** *Oil pump end float gauge*
JD 107 Clutch spring compressor
JD ***107-*** *1 Adaptor – Clutch spring compressor*
JD ***108*** *O ring and snap ring replacer*
JD ***109*** *Gear train remover*
JD 110 Kickdown cable remover
JD 111 Transmission holding adaptor
JD 126 Valve block seal remover/replacer

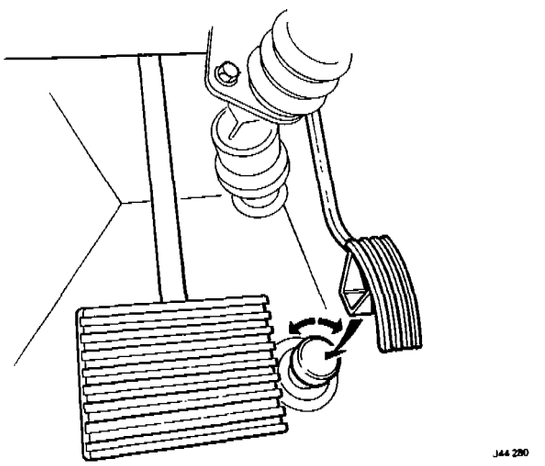


Fig 2

TORQUE FIGURES

Base plate assembly to mounting pan ***7- 10Nm***
Base plate assembly to side plate ***7-10Nm***
Dipstick tube nut ***20Nm***
Drain plug ***15Nm***
Selector lever nut to shaft ***23-27Nm***
Torque convertor housing to adaptor ***49-54Nm***
Torque convertor housing to block/sump ***49-54Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAYADHESIVES No 5696.***
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16AF
5mm Allen key

0194G

TORQUE CONVERTER

RENEW 44.17.07

Remove the transmission unit 44.20.01.
Fit Service Tool lifting handles JD 105 to the torque converter (Fig 1).
Remove the converter (2 Fig 1) from the transmission unit.
Remove the lifting handles and place the converter aside.

Clean the torque converter and mating faces.
Fit the lifting handles to the replacement torque converter assembly.
Fit the torque converter to the transmission unit.
Refit the transmission unit 44.20.01.

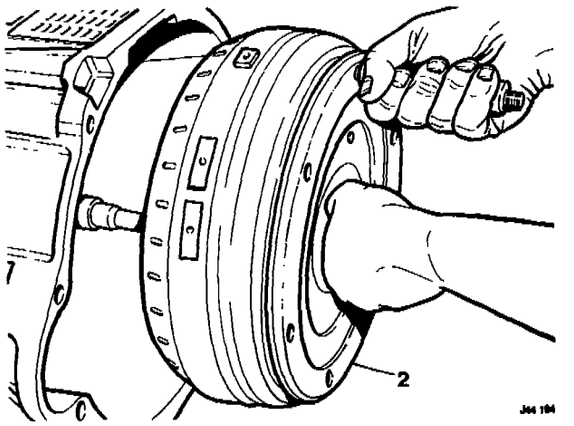


Fig 1

DATA

SERVICE TOOLS

JD 105 Converter lifting handles

TORQUE FIGURES

Base plate assembly to mounting pan **7-10Nm**
Base plate assembly to side plate **7-10Nm**
Dipstick tube nut **20Nm**
Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Drive plate to torque convertor **49-54Nm**
Exhaust tie nut/stud **9.5-12.5Nm**
Gearbox to bell housing **46Nm**
Intermediate pipe to silencer **15-18Nm**
Oil cooler pipe banjo bolt **32-36Nm**
Propeller shaft to gearbox **95-105Nm**
Pump bolts **10Nm**
Rear engine mounting bracket to body **20-25Nm**
Selector lever nut to shaft **23-27Nm**
Torque convertor housing to adaptor **49-54Nm**
Torque convertor housing to block/sump **49-54Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KA YADHESIVES **No 5696.**
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

0194G

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FRONTPUMP

RENEW 44.32.01

Remove the intermediate plate gasket 44.20.11.
Remove all except two of the bolts (1 Fig 1) securing the front pump cover to the intermediate plate.
Tap the heads of the two (loose) bolts to remove the pump assembly (2 Fig 1).
Remove the bolts and remove the pump.
Clean all component parts.
Fit the new pump to the intermediate plate.
Fit and tighten the bolts.
Refit the intermediate plate gasket 44.20.11.

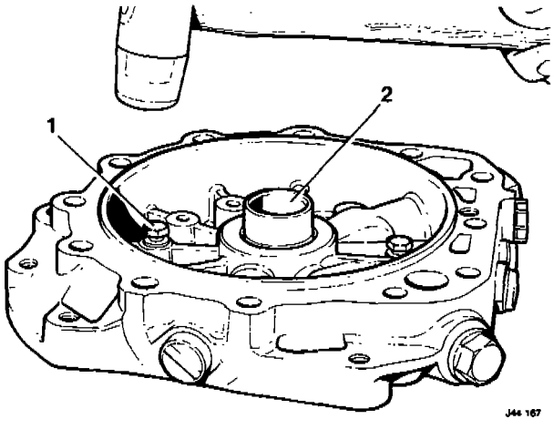


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket

TORQUE FIGURES

Base plate assembly to mounting pan **7-10Nm**
Base plate assembly to side plate **7-10Nm**
Dipstick tube nut **20Nm**
Down pipe to intermediate pipe **15-18Nm**
Drain plug 15Nm
Drive plate to torque convertor **49-54Nm**
Exhaust tie nut/stud **9.5-12.5Nm**
Gearbox to bell housing **46Nm**
Intermediate pipe to silencer **15-18Nm**
Oil cooler pipe banjo bolt **32-36Nm**
Pump bolts **10Nm**
Propeller shaft to gearbox **95-105Nm**
Rear engine mounting bracket to body **20-25Nm**
Selector lever nut to shaft **23-27Nm**
Torque convertor housing to adaptor **49-54Nm**
Torque convertor housing to block/sump **49-54Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KAYA DHESIVES No 5696.
Transmission fluid **Esso** *Dexron* **II**

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen **key**

0194G

FRONT PUMP

OVERHAUL 44.32.04

Remove the front pump 44.32.01
Remove the gears from the pump and discard the front oil seal.
Clean the pump and gears.
Lubricate the gears and fit to the pump with the centre dots uppermost (1 Fig 1).
Refit the front pump using Service Tool JD 106 (Fig 2).
Check that the gears rotate freely.
Fit and seat the front seal using Service Tool JD 102.
Refit the front pump 44.32.01

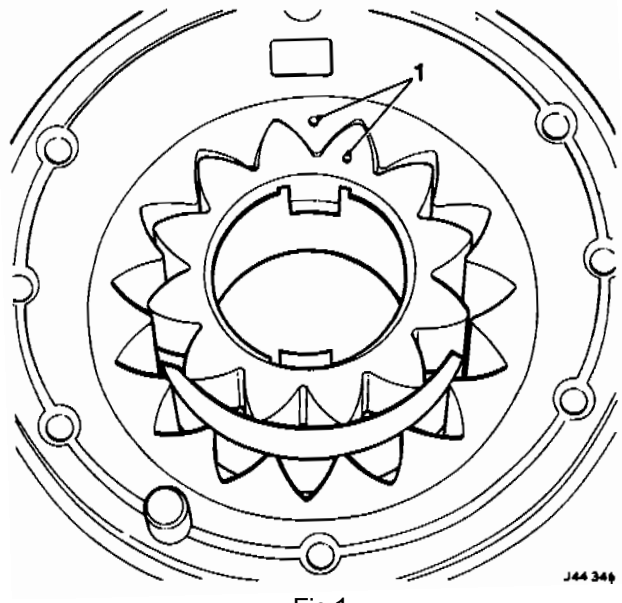


Fig 1

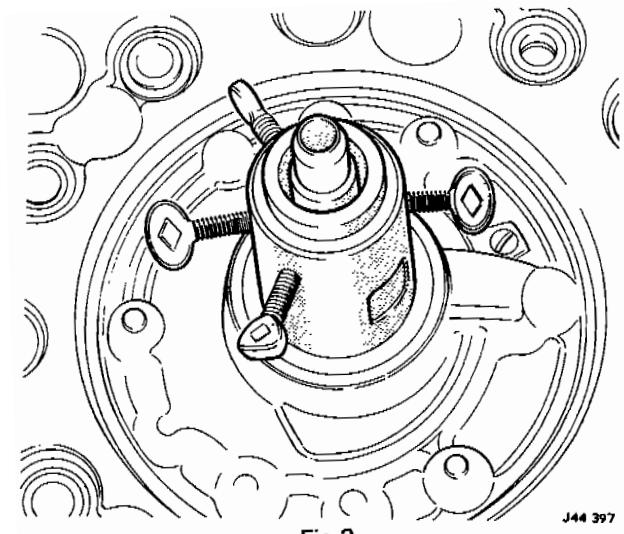


Fig 2

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 106 Rotation sleeve/end float gauge
JD 124 Engine lifting bracket

TORQUE FIGURES

Baseplate assembly to mounting pan **7-10Nm**
Base plate assembly to side plate **7-10Nm**
Dipstick tube nut **20Nm**
Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Drive plate to torque convertor **49-54Nm**
Exhaust tie nut/stud **9.5-12.5Nm**
Gearbox to bell housing **46Nm**
Intermediate pipe to silencer **15-18Nm**
Oil cooler pipe banjo bolt 32-36Nm
Pump bolts **10Nm**
Propeller shaft to gearbox **95-105Nm**
Rear engine mounting bracket to body **20-25Nm**
Selector lever nut to shaft **23-27Nm**
Torque convertor housing to adaptor **49-54Nm**
Torque convertor housing to block/sump **49-54Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

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FRONT PUMP OIL SEAL

RENEW 44.32.07

Remove the front pump 44.32.01
Remove and discard the front oil seal.
Clean the pump.
Lubricate the new seal and fit to the pump using Service Tool JD **102** (1 Fig 1).
Refit the front pump 44.32.01

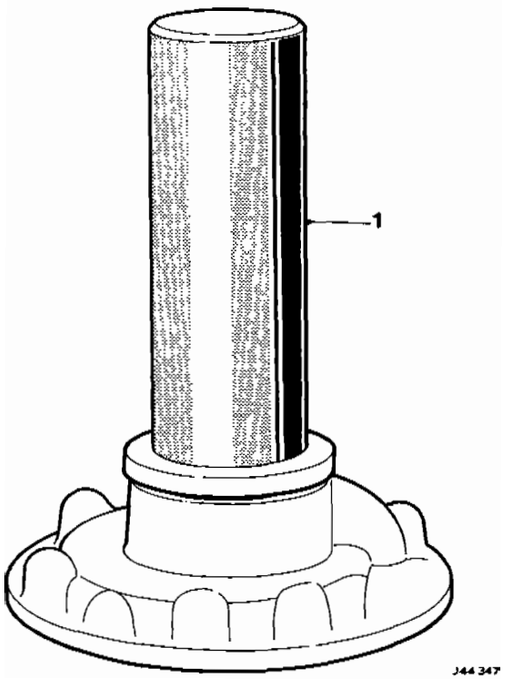


Fig 1

DATA

SERVICE TOOLS

MS 530 Engine support bracket
*JD **102** Oil seal replacer*
*JD **124** Engine lifting bracket*

TORQUE FIGURES

*Base plate assembly to mounting pan **7-10Nm***
*Base **plate** assembly to side plate **7-10Nm***
*Dipstick tube nut **20Nm***
*Down pipe to intermediate pipe **15-18Nm***
*Drain plug **15Nm***
*Drive plate **to** torque convertor **49-54Nm***
*Exhaust tie nut/stud **9.5-12.5Nm***
*Gearbox to bell housing **46Nm***
*Intermediate pipe to silencer **15-18Nm***
Oil cooler pipe banjo bolt 32-36 "
*Pump **bolts** 10Nm*
*Propeller shaft to gearbox **95-105Nm***
*Rear engine mounting bracket to body **20-25Nm***
*Selector lever nut **to** shaft **23-27Nm***
*Torque convertor housing to adaptor **49-54Nm***
*Torque convertor housing **to** block/sump **49-54Nm***

OILS/SEALANTS/LUBRICANTS

*Exhaust sealer **TIVOLI KAY ADHESIVES** No 5696.*
*Transmission fluid **Esso Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16 AF

5mm Allen key

0194G

INTERMEDIATE PLATE GASKET

RENEW 44.20.11

Remove the converter assembly 44.17.07.
Remove the converter housing to pump assembly securing bolts (1 Fig 1).
While holding the input shaft (2 Fig 1) in this position, remove the convertor housing and pump assembly (3 Fig 1).
Remove and discard the intermediate plate casing gasket.
Clean gasket and mating faces.
Fit a **new** gasket, fit the converter/pump assembly, fit and tighten the securing bolts.
Refit the converter assembly 44.17.07.

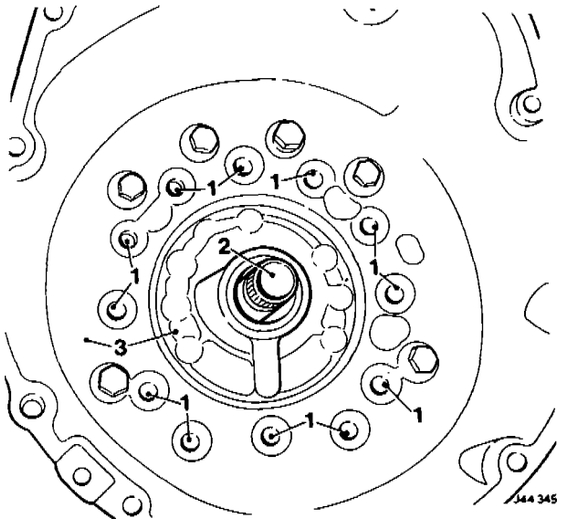


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 102 Oil seal replacer
JD 105 Converter lifting handles
JD 124 Engine lifting bracket

TORQUE FIGURES

Base plate assembly to mounting pan 7-10Nm
Base plate assembly to side plate 7-10Nm
Dipstick tube nut 20Nm
Down pipe to intermediate pipe 15-18Nm
Drain plug 15Nm
Drive plate to torque convertor 49-54Nm
Exhaust tie nut/stud 9.5-12.5Nm
Gearbox to bell housing 46Nm
Intermediate pipe to silencer 15-18Nm
Oil cooler pipe banjo bolt 32-36Nm
Propeller shaft to gearbox 95-105Nm
Pump bolts 10Nm
Rear engine mounting bracket to body 20-25Nm
Selector lever nut to shaft 23-27Nm
Torque convertor housing to adaptor 49-54Nm
Torque convertor housing to block/sump 49-54Nm

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KA YADHESIVES No 5696.
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

0194G

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INTERMEDIATE PLATE

RENEW 44.20.10

Remove the intermediate plate gasket 44.20.11.
Remove the converter housing.
Remove the thrust washer. Remove the intermediate plate bolts, leave two bolts **slack** but in position opposite each other, tap the bolt heads to release the pump from the plate.
Remove the bolts.
Remove the **plate** from the **pump** and remove and discard the pump 'O' ring
Remove the blanking plate plugs and place the intermediate plate aside.
Clean all components parts.
Fit a new 'O' ring to the pump, lubricate the 'O' ring and pump gears. Ensure the marks align (**1** Fig 1).

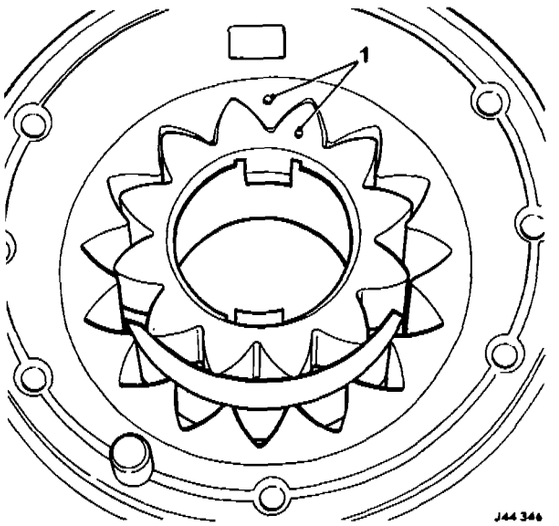


Fig 1

Fit and align the pump to the intermediate plate and tighten the securing bolts.
Refit the convertor housing and intermediate plate gasket.
Fit the convener housing pump assembly **to** the unit and tighten four securing bolts 90° apart.
Fit Service Tool JD 106 to the input shaft.
Tighten the tool securing screws, gently tap the input shaft to fully seat the gear train.
Seat the tool in the collar.
Tighten the collar flange screw to ensure that all movement is removed between the stator **shaft** and collar.
Lift the tool to check the end float between the inner collar and sector shaft (1 **Fig** 2). ensure the pull is directly upwards.
Slacken the inner clamp screw and base clamp screws and remove the Service Tool.
Remove the pump housing assembly and bolts.
Remove the assembly and shims.
Measure the shims with **a** micrometer. Select replacement shims and fit.
Reassemble the pump and secure with four **bolts.**
Refit the Service Tool and recheck **the** end float.
Refit the intermediate plate gasket 44.20.11.

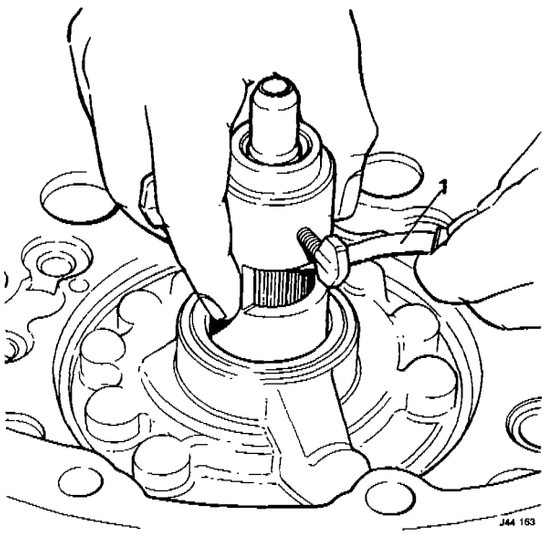


Fig 2

DATA

Pump end float ***0.3-1.5mm***

SERVICE TOOLS

MS 53B *Engine support bracket*
JD 102 *Oil seal replacer*
JD 105 *Converter lifting handles*
JD 106 ***End*** *float gauge*
JD 124 *Engine lifting bracket*

TORQUE FIGURES

Pump bolts ***10Nm***

SPANNER SIZES

13mm
9/16 AF

0194G

REAR EXTENSION HOUSING GASKET

RENEW **44.20.19**

Fit Service Tool JD 124 to the rear of the inlet manifold and take the weight of the engine with Service Tool MS53B (Fig 1).
'Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side of the vehicle.
Taking the weight of the transmission unit, remove the rear mounting to body securing bolts, lower the jack and collect the spacer.
Disconnect the propeller shaft from the drive flange.
Remove the bolts securing the rear mounting to the body and using MS 538, lower the gearbox and mounting assembly.
Remove the mounting assembly and spacers.
Remove the bolts (1 Fig 2) securing the rear extension housing to the maincase and remove the housing (2 Fig 2).
Fit a new gasket to the replacement extension housing, fit to the gearbox and secure with the bolts.
Coat the output splines with 'Hylomar' and refit the gearbox output flange splines.
Refit the propeller shaft.
Lift the gearbox into position, fit the mounting to the gearbox and body.
Clean the exhaust olive, refit the intermediate pipe to the downpipe.
Lower the vehicle and remove Service tools MS 53B and JD 124.
Refill the transmission with fluid.

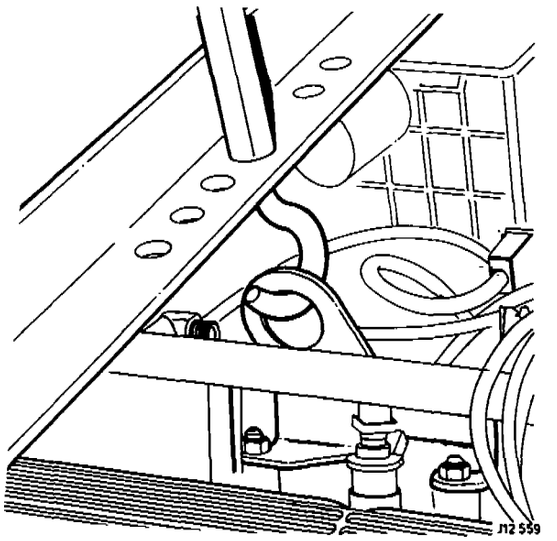


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket

TORQUE FIGURES

Down pipe to intermediate pipe 15-18Nm
Drain plug 15Nm
Output flange 100Nm
Rear extension housing to main case 23Nm

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KAYADHESIVES No 5696.
Output shaft splines HYLOMAR
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm

9/16AF

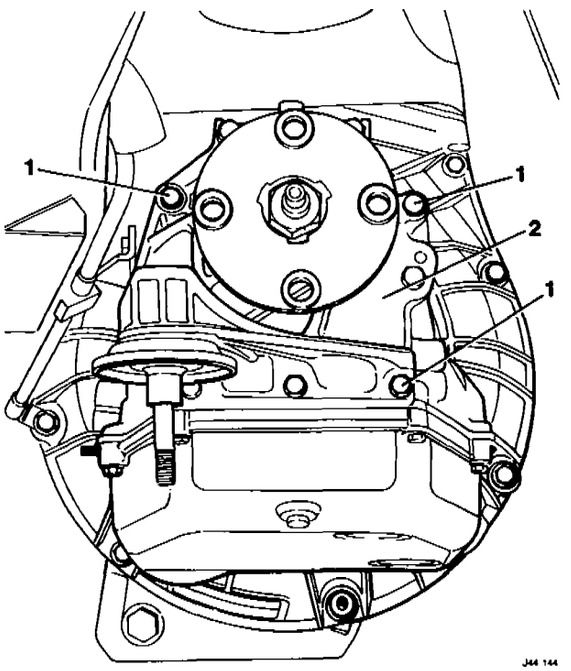


Fig 2

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REAR EXTENSION HOUSING OIL SEAL

RENEW 44.20.18

Fit Service Tool JD 124 to the rear of the inlet manifold and take the weight of the engine with Service Tool MS53B (Fig 1).
Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side of the vehicle.
Disconnect the propeller shaft from the drive flange.
Remove the bolts securing the rear mounting to the body and using MS 53B, lower the engine/transmission assembly.
Remove the mounting assembly and spacers.
Disconnect the propshaft from the drive flange.
Open the door and select Park.
Prior to removing the drive flange securing nut place a suitable drain tin below.
Remove the drive flange securing nut and drive flange.
Using suitable seal remover remove the seal from the extension.
Clean its mounting position, lubricate seal and using Service Tool JD 102 (1 Fig 2) fit the rear oil seal to the rear extension.
Refit the mounting assembly.
Raise the engine/transmission. Fit the mounting bolts.
Refit the exhaust.
Remove the service tools.
Replenish the transmission fluid.

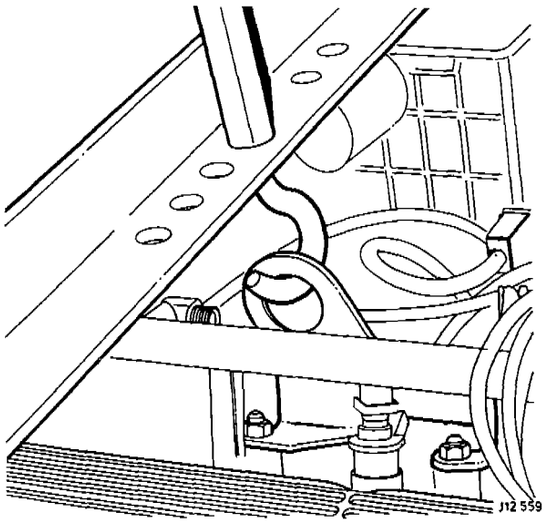


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket
JD 102 Oil seal replacer

TORQUE FIGURES

Drain plug 15Nm
Output flange 100Nm

OILS/SEALANTS/LUBRICANTS

Output shaft splines HYLOMAR
Transmission fluid Dexron II

SPANNER SIZES

10mm
13mm
17mm
30mm
9/16AF

0194G

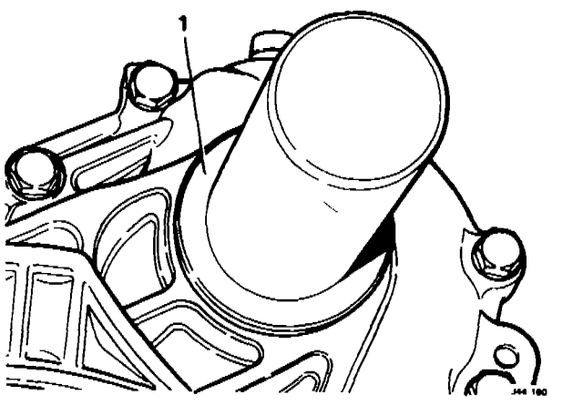


Fig 2

REAR EXTENSION HOUSING

RENEW 44.20.15

Remove the rear extension housing gasket 44.20.19.
Remove the rear mounting peg and spring pan, remove the bolts securing the selector cable mounting bracket and remove the bracket.
Using Service Tool JD 124 remove the bearing from the extension housing.
Remove the cap and circlip securing the breather (1 Fig 1), remove the breather and O ring (2 Fig 1).
Remove the rear oil seal.
Fit a new 'O' ring to the breather, fit the assembly to the replacement housing, fit a replacement oil seal to the housing using Service Tool JD 102 (1 Fig 2) and fit the breather cap.
Refit the selector mounting bracket and secure with the bolts.
Fit the spring pan and mounting peg, fit a gasket to the replacement extension housing, fit to the gearbox and secure with the bolts.
Refit the gearbox output flange.
Refit the propeller shaft, clean the exhaust olive and using a recommended exhaust sealant refit the intermediate pipe to the downpipe.
Refill the transmission with fluid.

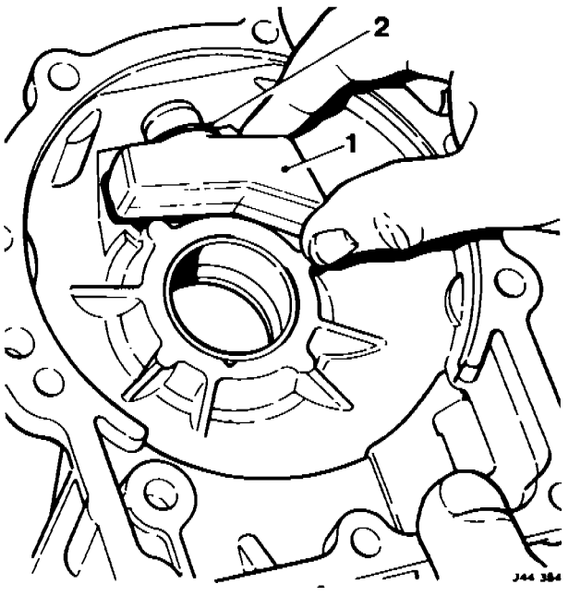


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer
JD 104 Rear extension bearing replacer

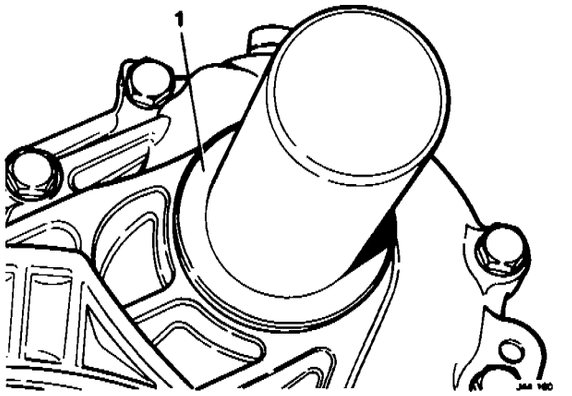


Fig 2

TORQUE FIGURES

Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Intermediate pipe to silencer **15-18Nm**
Output flange **100Nm**
Propeller shaft to gearbox 95-105Nm
Rear extension housing to main case **23Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KAYA DHESIVES No 5696.
Output shaft splines HYLOMAR
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm

9/16AF

0194G

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FLUID

RENEW 44.24.02

Raise the vehicle on a ramp.
Place a drain tin **below** the transmission fluid pan drain plug, remove the **plug** and drain the oil. Fit and tighten the drain plug.
Refill the unit with fluid (approximately 3.0 litres – 5.3 Imperial pints).
Start the engine and move the selector several times through all positions and back to neutral.
Check the oil level (Fig 1) with the engine running.

NOTE: Ensure that the fluid is **hot** and the vehicle **is** on level ground.

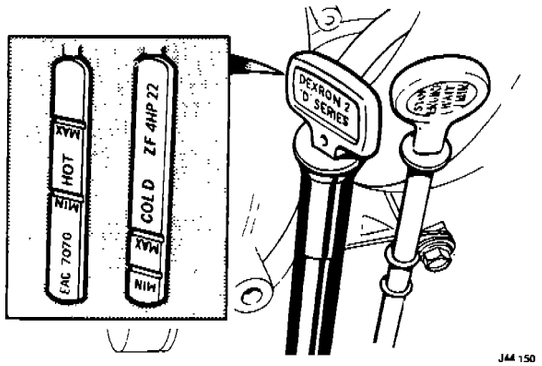


Fig 1

DATA

TORQUE FIGURES

Drain plug ***15Nm***

OILS/SEALANTS/LUBRICANTS

Transmission fluid ***Dexron II***

SPANNER SIZES

5mm Allen key

FLUID PAN

RENEW 44.24.04

Drain the transmission fluid 44.24.02.
Refit the fluid pan drain plug (**1 Fig** 2).
Disconnect the dipstick tube from the fluid pan.
Disconnect the intermediate pipe from the front **pipe** and collect the sealing olive.
Remove the fluid pan clamp securing bolts (2 Fig 2) and remove the pan (3 Fig 2) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Reconnect the dipstick tube.
Refit the exhaust.
Replenish the transmission fluid 44.24.02.

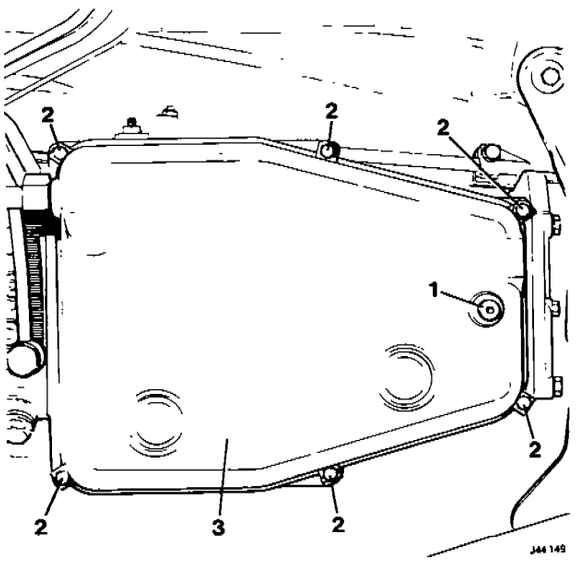


Fig 2

DATA

TORQUE FIGURES

Dipstick tube nut ***20Nm***
Drain plug ***15Nm***
Fluid pan mounting bolts ***8Nm***

OILS/SEALANTS/LUBRICANTS

Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
13mm

5mm Allen key

FLUID FILTER

RENEW 44.24.07

Drain the transmission fluid 44.24.02.
Refit the fluid pan drain plug (1 Fig 1).
Disconnect the dipstick tube from the fluid pan.
Disconnect the intermediate pipe from the front pipe and collect the sealing olive.
Remove the fluid pan clamp securing bolts (2 Fig 1) and remove the pan (3 Fig 1) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Remove the filter screws, and remove the filter.

Fit the replacement filter, fit and tighten the screws.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Reconnect the dipstick tube.
Refit the exhaust.
Replenish the transmission fluid 44.24.02.

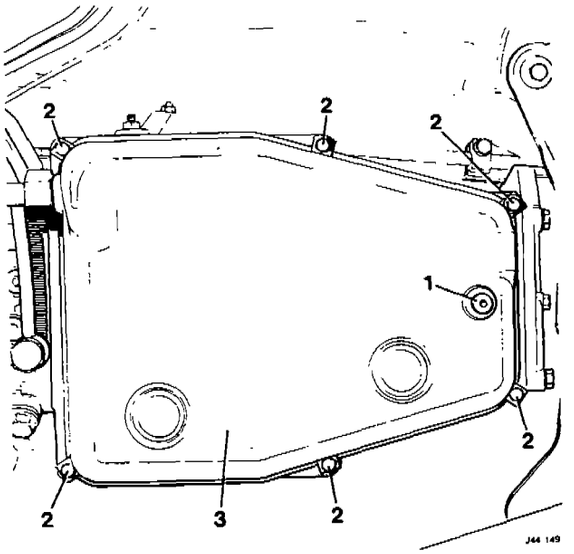


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut 20Nm
Drain plug 15Nm
Fluid pan mounting bolts 8Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm

5mm Allen key

0194G

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VALVE BLOCK ASSEMBLY

RENEW **44.40.01**

Remove the transmission fluid filter 44.24.07.
Remove the valve block securing screws (1 Fig 1) and carefully lower the block.
Clean the mating face for the valve block.

NOTE: Before fitting the valve block, pull the kickdown cable (1 Fig 2) to lift the cam to the vertical position. To fit the pressure valve and separator plate, engage the quadrant in the operating valve.
Do not tighten the valve block screws, leave it just moveable, and set the distance from the pin of the throttle to the housing at 11.5 mm, using Service Tool JD 103.
Ensure no pressure is applied to the kickdown cable, and finally tighten the valve block.
Check that when the throttle is fully open, the clearance between the stop and the outer cable is 39mm (ensure that the accelerator pedal is at the fuel throttle and not the kickdown position).
Fit the filter, fit and tighten the screws.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Reconnect the dipstick tube.
Refit the exhaust.
Replenish the transmission fluid 44.24.02.

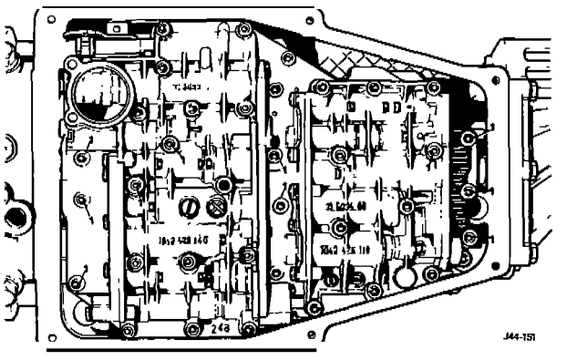


Fig 1

DATA

SERVICE TOOLS

JD 103 Linkage setting gauge

TORQUE FIGURES

Dipstick tube nut 20Nm
Drain plug 15Nm
Fluid pan mounting bolts 8Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm

5mm Allen key

0194G

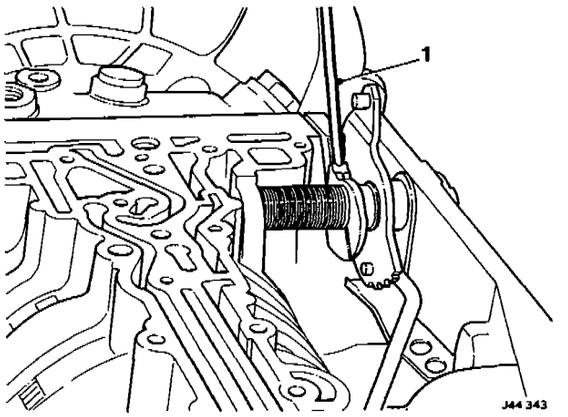


Fig 2

VALVE BLOCK ASSEMBLY

OVERHAUL 44.40.04

Remove the valve block assembly 44.40.01.

THROTTLE VALVE BLOCK OVERHAUL

Remove the screws securing the throttle valve to the main valve assembly.
Split the main valve assembly from the throttle valve.
Carefully remove the reverse inhibit valve spring retaining clip (1 Fig 1).
Remove the spring collar (2 Fig 1) and spring (3 Fig 1).
Remove the reverse inhibit valve (4 Fig 1) and screws (5 Fig 1) securing the modulator valve cover plate (6 Fig 1).
Remove the plate.
Remove the modulator valve damper (7 Fig 1) and spring (8 Fig 1).
Note the position of and remove the modulator valve retaining clip (9 Fig 1).
Remove the modulator valve (10 Fig 1) and kick down valve (11 Fig 1) and the spring (12 Fig 1).
Note the position of and remove the kickdown valve retaining clip (I 3 Fig 1).
Remove the throttle. valve (14 Fig 1) and clean the throttle valve block.
Lubricate all components prior to assembly.
Reverse the removal procedure to reassemble the throttle valve block.
Note that the throttle valve retaining clip flat face of the clip faces away from the valve spring, also that the flat side of the modulator valve retaining clip faces away from the valve spring and also when fitting the modulator valve cover plate ensure that the plate lug engages into the kickdown valve.

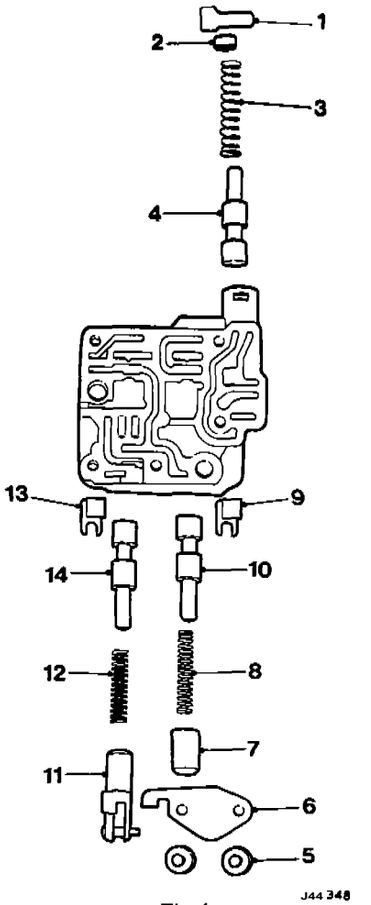
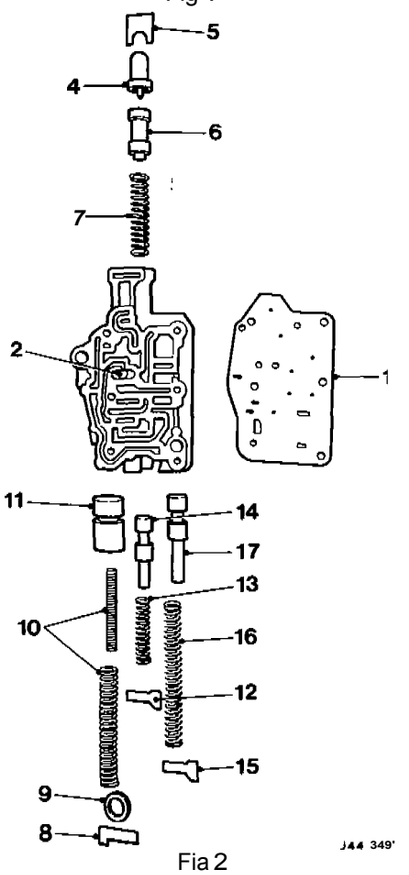


Fig 1

THERMO VALVE BLOCK OVERHAUL

Remove the screws securing the thermo valve block to the main valve block and split main valve block from the thermo valve block, ensuring that the sandwich plate remains with the thermo valve block.
Remove the sandwich plate (1 Fig 2) from the thermo valve ensuring that the nylon ball (2 Fig 2) remains in the valve block.
Remove the clutch plastic ball, depress the thermo valve (4 Fig 2) slightly and remove the retaining clip (5 Fig 2).
Remove the therrno valve assembly (6 Fig 2) and spring (7 Fig 2).
Carefully remove the converter clutch damper retaining clip (8 Fig 2) remove the washer (9 Fig 2), springs (10 Fig 2), damper (11 Fig 2).
Carefully remove the clip (12 Fig 2) retaining the torque converter valve spring (13 Fig 2).
Remove the spring and valve (14 Fig 2).
Carfully remove the clip (15 Fig 2) retaining the torque converter clutch hysteresis valve spring (16 Fig 2).
Remove the spring and valve (17 Fig 2).
Clean the valve block and all components
Lubricate all components prior to reassembly and reverse the removal procedure ensuring that when the thermo valve is fitted that the front face of the valve faces the therrno switch.



Fia 2

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REAR VALVE BLOCK OVERHAUL

Remove the screws securing the rear valve block to the main valve block.
Firmly hold the rear valve block to the main valve block and invert the assembly.
Very carefully split the main valve block assembly from the rear valve block ensuring that the restrictor washers remain in the rear valve block

Remove the one way valve (1 Fig 1) and spring (2 Fig 1) from the rear valve block (3 Fig 1).
Note the position of and size of the restrictor washers (4 Fig 1) and ball (5 Fig 1) relative to the valve block.
Remove the screws (1 Fig 2) securing the C & E clutch damper cover plate and remove the plate (2 Fig 2).
Remove the C clutch damper springs (3 Fig 2) and damper (4 Fig 2). and the E clutch damper springs (5 Fig 2) and damper (6 Fig 2).
Note the position of and remove the retaining clip (7 Fig 2) securing the F clutch valve (8 Fig 2).
Remove the F clutch valve and remove first gear inhibit valve spring (9 Fig 2) and valve (10 Fig 2).
Remove 3-4 shift valve spring (11 Fig 2) and valve (12 Fig 2).

Remove the screws securing the F clutch damper. cover plate and remove the plate (1 Fig 3).
Remove the 2nd gear inhibit valve spring (2 Fig 3) and valve (3 Fig 3).
Remove the F clutch damper (4 Fig 3) and spring (5 Fig 3) and remove the spring seat washer (6 Fig 3).
Remove the 3-4 kickdown valve spring (7 Fig 3) and valve (8 Fig 3) and remove the remaining 3-4 shift valve (9 Fig 3).
Clean the rear valve block and all component valve springs and cover plates.
Lubricate all components prior to assembly and reverse the removal procedures to re assemble ensuring that the F clutch valve locates in the F clutch damper spring seat and that the flat face of the retaining clip faces away from the damper.

Also ensure that when the restricters are fitted to the valve block they are fitted to the positions they were removed from and are also the correct way up.
Ensure that when the manual valve block is inverted that the restrictors and balls remain in the manual valve block

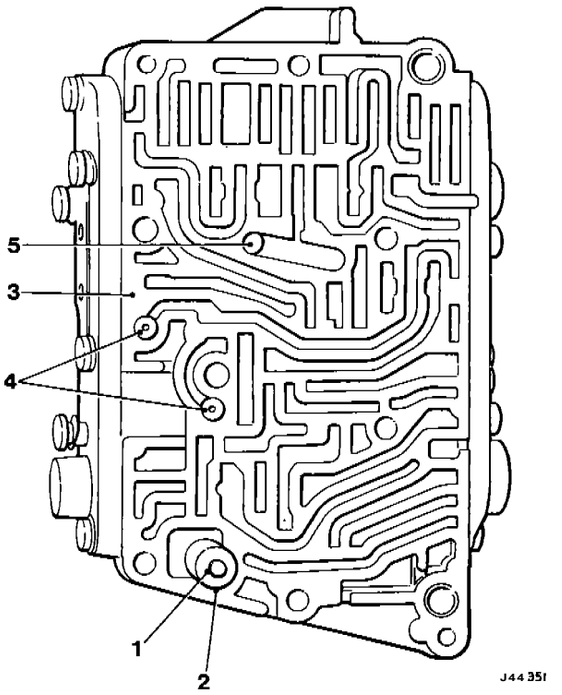


Fig 1

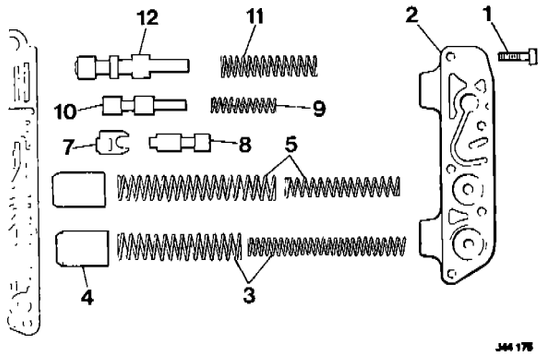


Fig 2

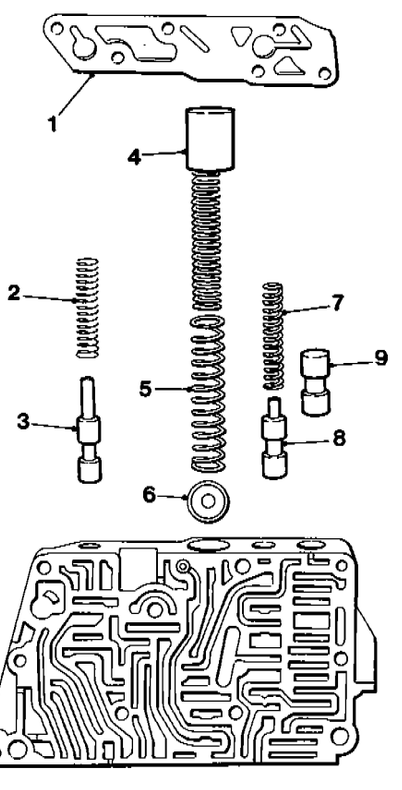


Fig 3

MANUAL VALVE BLOCK OVERHAUL

CAUTION: Make a note of the hole size, way up and position the restrictors (1 Fig 1), prior to removal.
Remove the restrictors and plastic ball.
Remove the manual control valve (2 Fig 1) and remove the screws securing the C and D clutch cover plate (Fig 2).
Remove the plate.
Remove the C Clutch valve (2 Fig 2) and spring (3 Fig 2).
Remove the 2-3 shift valve piston (4 Fig 2).
Note the position of and remove the C clutch valve retaining clip (5 Fig 2).
Remove the valve (6 Fig 2).
Remove the B clutch damper (7 Fig 2) springs (8 Fig 2) and spring seat (9 Fig 2).
Remove the B clutch check ball capsule (10 Fig 2).
Remove the 1-2 shift valve piston (11 Fig 2).
Remove the D clutch damper (12 Fig 2) spring (13 Fig 2) and washer (14 Fig 2).
Note the position of remove the D clutch valve retaining clip (15 Fig 2).
Remove the D clutch valve (16 Fig 2) and collar (17 Fig 2).

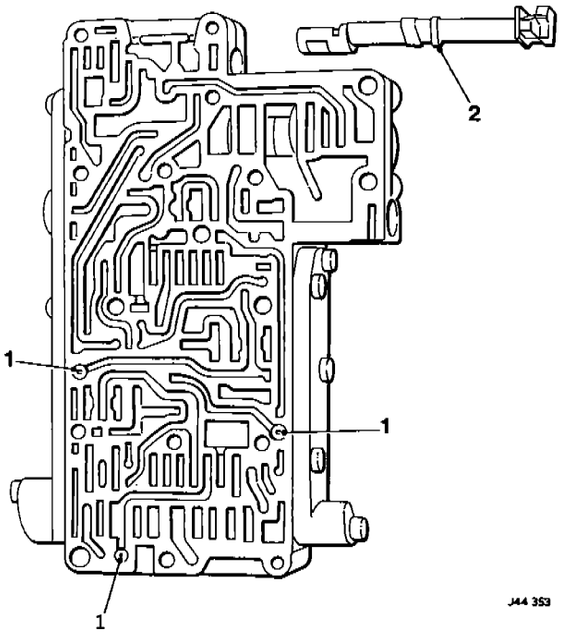


Fig 1

Remove the primary regulator valve spring (18 Fig 2) and regulator valve (19 Fig 2).
Remove the screws securing the remaining cover plate.
Remove the plate and remove the torque converter pressure valve (1 Fig 3) and spring (2 Fig 3).
Move the 2-3 shift valve spring (3 Fig 3) and valve (4 Fig 3) and remove C clutch damper (5 Fig 3) spring (6 Fig 3) and spring seat (7 Fig 3).
Note the position of and remove the B clutch valve retaining clip (8 Fig 3).
Remove the valve (9 Fig 3).
Remove the 1-2 shift valve spring (10 Fig 3) and valve (11 Fig 3).
Carefully remove the A clutch valve spring retaining clip (12 Fig 3) and remove spring seat (13 Fig 3) and spring (14 Fig 3).
Remove the A clutch valve (15 Fig 3), clean the valve block end plate covers and all remaining components.
Lubricate all components prior to assembly and reverse the removal procedure to reassemble ensuring that the flat face of the clip that secures B clutch valve faces away from the cover plate.
Ensure that the flat side of the clip retaining the D clutch valve faces the damper/spring.
Ensure that the B clutch damper spring seat engages fully onto the valve.
Ensure that the clip securing the C clutch valve faces the cover plate.
Lubricate, fit and align the manual control valve.
Fit and align the plastic ball and restrictors to the valve block.
Place the block aside.

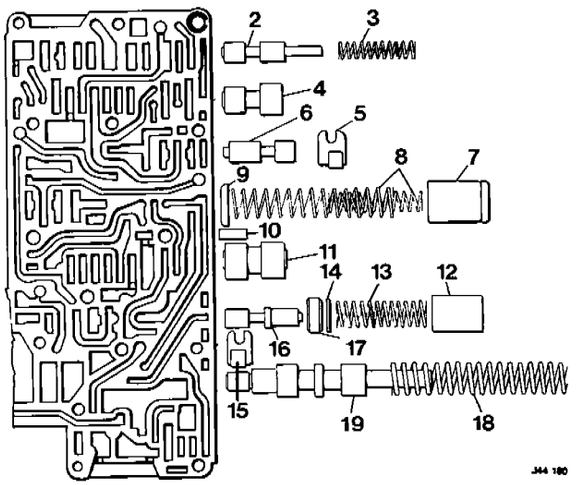


Fig 2

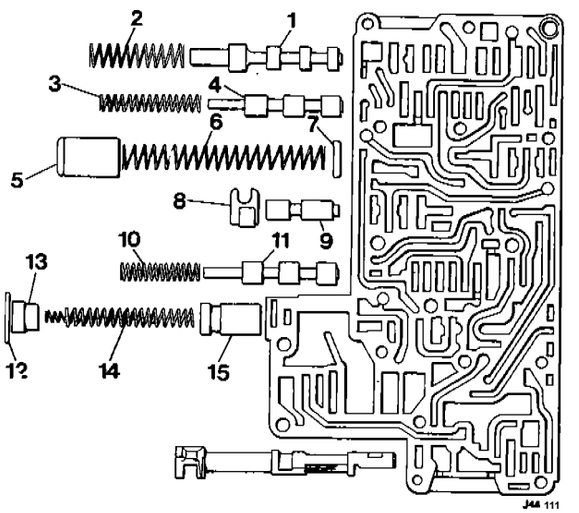


Fig 3

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MAIN GALLERY PLATE OVERHAUL

Remove the screws securing the main gallery cover plate.
Remove the plate and ensure that the restrictors and plastic balls remain in position in the plate (**Fig 1**).

Remove and discard the cover plate gasket, note the position of and diameter of the plastic balls.
Remove the balls, note the positon and hole size of restrictors and remove.
Clean the plate cover, balls and restrictors.
Reverse the removal procedure to reassemble.
Fit and align the gallery plate assembly to the manual valve block ensuring that the manual valve lug locates in the gallery plate channel.
Holding the manual valve firmly to the gallery plate invert it but do not tighten the valve block to gallery plates securing screw.
Fit and seat the valve block to gallery plate oil feed pipe.
Fit and align the throttle valve block to gallery plate but do not tighten the securing screws.
Fit and align the thermo valve block to the gallery plate.
Fit but do not tighten the securing screws.
Invert the main assembly and fit the rear valve block.
Fit and tighten rear valve block securing screws, finally tighten the remaining securing screws.
Refit the valve block 44.40.01.

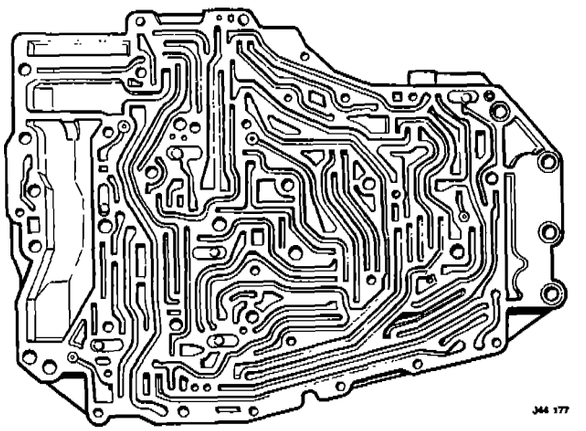


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut ***20Nm***
Down pipe to intermediate pipe ***15- 18Nm***
Drain plug ***15Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Intermediate pipe to silencer ***15-18Nm***
Fluid pan mounting bolts ***8Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KA YADHESIVES No 5696.***
Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
13mm

1Omm Allen key

0194G

GOVERNOR ASSEMBLY

RENEW **44.22.01**

Remove the rear extension housing 44.20.15.
Remove the parking pawl spring.
Remove the park lock wheel and bearing collar.
Remove the screws (1 Fig 1) securing the park lock wheel to the governor and remove the wheel (2 Fig 1).
Clean the output shaft and replace the three governor seals (1 Fig 2).
Fit the park lock wheel to the governor and tighten the screws and fit the assembly to the output shaft.
Fit the bearing collar to the output shaft.
Refit the parking pawl spring.
Refit the rear extension housing 44.20.15.

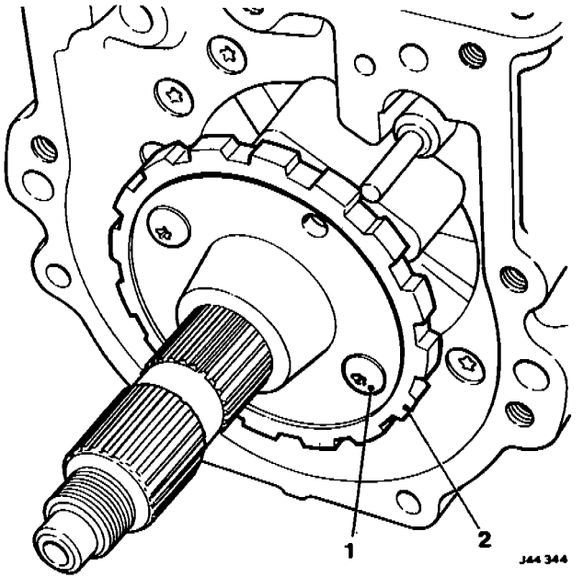


Fig 1

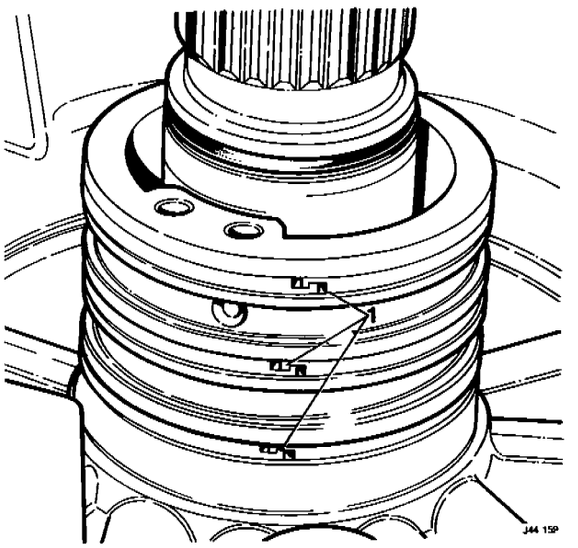


Fig 2

DATA

SERVICE TOOLS

MS53B *Engine support bracket*
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer

TORQUE FIGURES

Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Governor bolts ***10Nm***
Intermediate pipe to silencer ***15-18Nm***
Output flange ***100Nm***
Propeller shaft to gearbox ***95-105Nm***
Rear extension housing ***to*** *main case 23Nm*

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI*** *KAY* ***ADHESIVES***
Output ***shaft*** *splines* ***HYLOMAR***
Transmission fluid Dexron ***II***

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm

9/16AF

0194G

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GOVERNOR ASSEMBLY

OVERHAUL 44.22.04

Remove the governor assembly 44.22.01.
Remove the screws (1 Fig 1) securing the park gear (2 Fig 1) to the governor and remove the park gear.
Remove the screws securing the governor opposing valve.
Remove the plate and spacers.
Remove the valve housing.
Remove the valve spring and spring guide from the housing.
Undo and remove the valve to base securing screws (5 Fig 1). Remove the base.
Remove the valve weight securing circlip.
Remove the valve weight, body, sleeve and spring.
Clean all component parts.
Fit and align the opposing valve, spring and guide to the body (10 Fig 1).
Fit and align the opposing valve body assembly to the governor.
Fit and align the spacers (9 Fig 1) and retaining plate (7 Fig 1), secure with the screws (8 Fig 1).
Fit the spring to the valve and fit the valve sleeve.
Fit the valve body and valve weight.
Compress the spring and fit the weight securing circlip.
Lubricate the valve assembly.
Fit and tighten the valve securing screws.
Refit the governor assembly **44.22.01.**

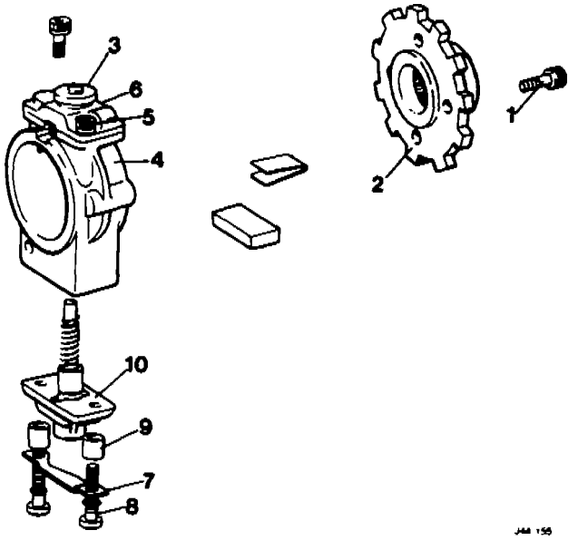


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer

TORQUE FIGURES

Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Governor bolts ***10Nm***
Intermediate pipe to silencer ***15-18Nm***
Output flange ***100Nm***
Propeller shaft to gearbox ***95-105Nm***
Rear extension housing to main case ***23Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES***
Output shaft splines ***HYLOMAR***
Transmission fluid Dexron ***II***

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm
9/16AF

0194G

PARK LOCK WHEEL

RENEW 44.28.24

Remove the rear extension housing 44.20.19.
Remove the park lock wheel assembly.
Remove the screws (1 Fig 1) securing the park lock wheel to the governor and remove the park lock wheel (2 Fig 1).
Clean all component parts.
Fit the governor to the new wheel.
Replace the three governor seals (1 Fig 2).
Fit the park lock wheel to the transmission.
Refit the rear extension housing 44.20.19.

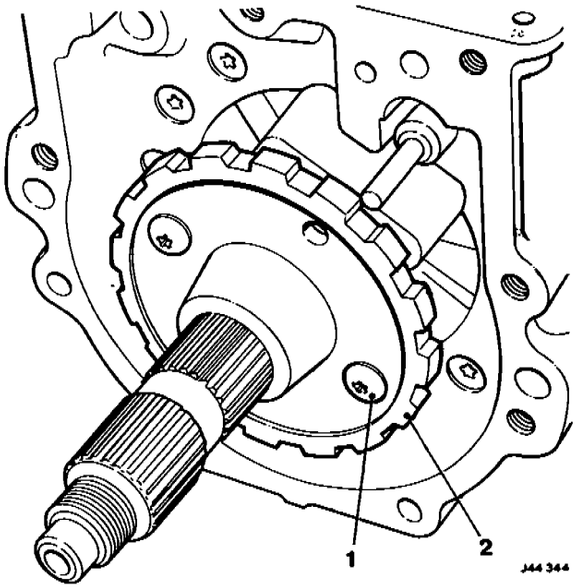


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer

TORQUE FIGURES

Down pipe to intermediate pipe 15-18Nm
Drain plug 15Nm
Intermediate pipe to silencer 15-18Nm
Output flange 100Nm
Propeller shaft to gearbox 95-105Nm
Rear extension housing to main case 23Nm

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLIKA YADHESIVES
Output shaft splines HYLOMAR
Transmission fluid Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm

9/16AF

0194G

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PARK LOCK PAWLASSEMBLY

RENEW 44.28.07

Remove the rear extension housing 44.20.19.
Remove the parking pawl guide plate and bracket (1 Fig 1), remove the parking pawl and spring (2 Fig 1).
Remove the pivot pin (3 Fig 1) and clean all the components.
Lubricate and fit the pivot pin and spring, locate the anchor leg.
Fit the pawl to the spring and locate the pawl anchor leg.
Reposition the pawl over the pivot pin and fit the guide plate and retaining bracket.
Fit the guide plate retaining screw.
Refit the rear extension housing 44.20.19.

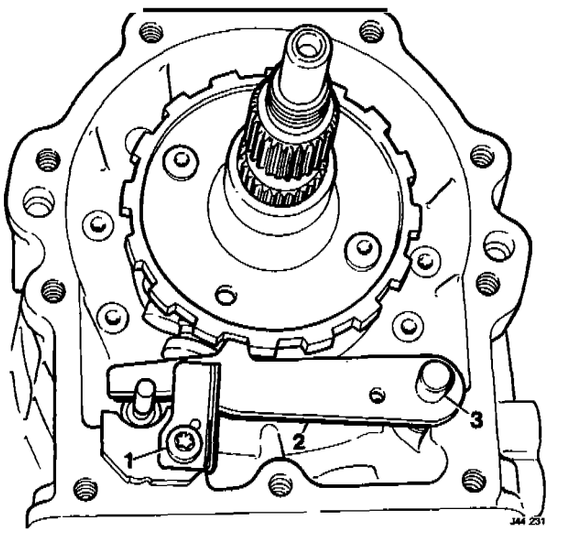


Fig 1

DATA

SERVICETOOLS

MS 53B Engine support bracket
***JD** 124 Engine lifting bracket*
***JD 102** Rear extension oil seal replacer*

TORQUE FIGURES

Down pipe to intermediate pipe 15-18Nm
*Drain plug **15Nm***
*Intermediate pipe **to** silencer **15-18Nm***
*Output flange **100Nm***
Propeller shaft to gearbox 95-105Nm
*Rear extension housing **to** main case **23Nm***

OILS/SEALANTS/LUBRICANTS

*Exhaust sealer **TIVOLI KA YADHESIVES***
*Output **shaft** splines **HYLOMA** R*
*Transmission fluid **Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm

9/16AF

0194G

PARK LOCKACTUATOR ROD

RENEW 44.28.01

Remove the valve block assembly 44.40.01.
Remove the selector lever/shaft securing nut (1 Fig 1) and disconnect the lever from the shaft.
Remove the roll pin (2 Fig 1) securing the selector quadrant to the selector shaft and disconnect the shaft.
Remove the throttle valve cam return spring (3 Fig 1) and remove the cam from the shaft.
Remove the quadrant actuation rod (4 Fig 1) from the quadrant.
Clean all components and mating surfaces.
Fit the actuator rod to the quadrant and selector shaft ensuring that the actuator rod passes under the parking pawl.
Fit the return spring to the throttle valve cam, lubricate the throttle valve cam bearing and selector shaft, tension the spring and locate over the gearbox anchor, position and push the selector shaft fully home.
Align the quadrant to the shaft and secure with the roll pin.
Refit the selector lever to the selector shaft and secure with a nut.
Refit the valve block assembly 44.40.01.

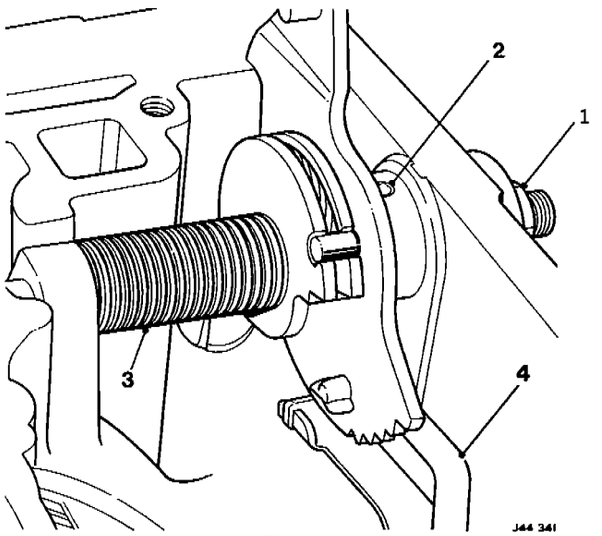


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut 20Nm
Down pipe to intermediate pipe 15-18Nm
Drain plug 15Nm
Exhaust tie nut/stud 9.5-12.5Nm
Intetmediate pipe to silencer 15-18Nm
Parking pawl 10Nm
Sump mounting bolts 8Nm
Valve block to case 8Nm

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KA YADHESIVES
Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm

5mm Allen key

0194G

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KICKDOWN CABLE-INITIAL SETTING

CHECK AND ADJUST 44.00.00

Slacken the cable locknut (Fig 1), manually open the throttle linkage to full throttle position (NOT KICKDOWN) and measure the distance from the outer cable to the crimp.
Adjust the outer cable locknuts until the distance between the crimp and the outer cable is 39mm. Tighten the cable locknut.

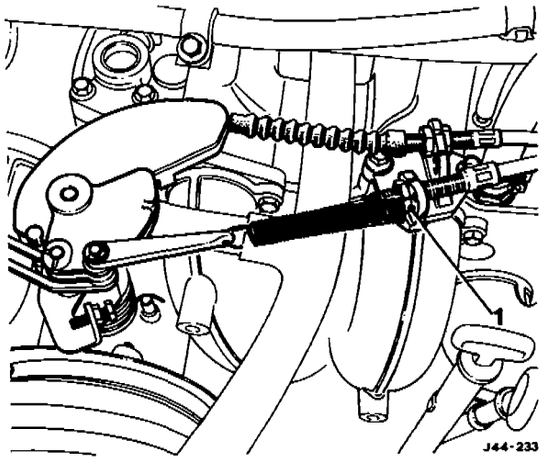


Fig 1

DATA

Distance between crimp and outer cable 39mm

SPANNER SIZES

20mm

KICKDOWN CABLE

RENEW 44.15.25

Select position 'N'.
Disconnect the kickdown inner cable from the throttle linkage, slacken the locknut securing the outer cable from the mounting bracket and disconnect the cable (Fig 1).
Remove the fluid pan 44.24.04.
Feed the cable between engine and the bulkhead.
Pull the inner cable to rotate the cam/spring (3 Fig 2) sufficiently to disconnect the inner cable (1 Fig 2) using Service Tool JD 110 to depress the cable tangs, remove the cable.
Fit a new O ring (1 Fig 3) to the new cable, lubricate, fit and seat into position.
Rotate the cam, engage the cable nipple (2 Fig 2) into the slot in the cam and release the cam.
Refit the fluid pan 44.24.04.
Position the cable between bulkhead and cylinder head, fit the outer cable into the bracket. Fit the inner, leave the locknut loose.
Manually open the throttle linkage to full throttle position (NOT KICKDOWN) and measure the distance from the outer cable to the crimp.
Adjust the outer cable locknuts until a distance from the crimp to the outer cable is 39mm.
Tighten the cable locknut, close the throttle.
Replenish the transmission with fluid 44.24.02.

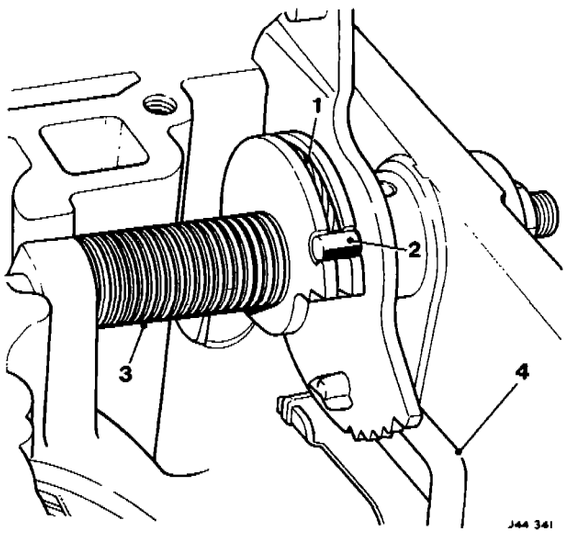


Fig 2

DATA

TORQUE FIGURES

Drain plug 15Nm
Fluid pan mounting bolts 8Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm
5mm Allen key

0194G

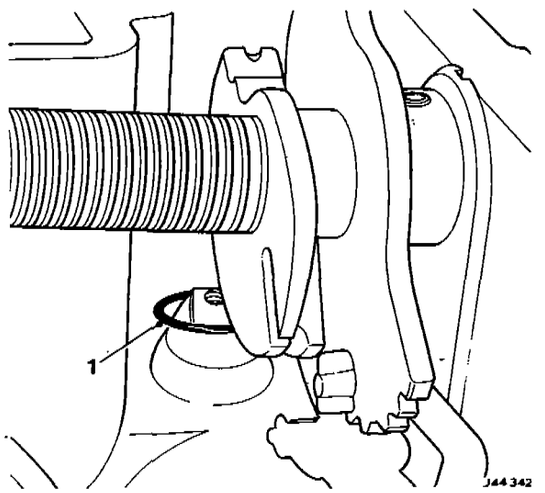


Fig 3

SELECTOR CABLE ASSEMBLY

RENEW **44.15.08**

WARNING: DO NOT DRIVE OR ATTEMPT TO DRIVE THE VEHICLE WITH THE MANUAL SELECTION LINKAGE DISCONNECTED OR THE 'J' GATE COVER DISCONNECTED.

Raise the vehicle on a ramp.
Remove the nut (1 Fig 1) securing the cable to the gearbox selector lever.
Remove the bolt securing the cable clamp (2 Fig 1) to the gearbox mounting bracket.
From above, remove the console finisher 76.25.19 (1 Fig 2) and remove the screws securing the gearbox linear switch.
Move switch for access and remove the nuts securing the selector cable to the selector assembly.
Remove the locknut securing the cable to the bracket (3 Fig 1).
Displace the cable from the bracket and disconnect the inner cable from the selector lever assembly.
Remove the centre console glove box for access.
Reposition the selector cable into the glove box area and remove the locknuts from cable.
Remove the bracket from the cable.
Remove the front seat cushions 76.70.02
Displace the carpet for access to the cable grommet.
Repostion the cable grommet through the body to the underside and remove the cable assembly.
Remove the cable end lock nut and remove the cable to gearbox connector end assembly.
Remove the cable clamp and remove the cable grommet.

Discard the cable assembly.
Reverse the removal procedure to refit the selector cable to the vehicle.

Note: To enable the cable to be fitted from the front of the vehicle over the rear mounting cross member and enter into the body aperture, a draw string should be tied to the end of the cable.
Reset and adjust the gearbox liner switch 44.15.13. Refit the console finisher.

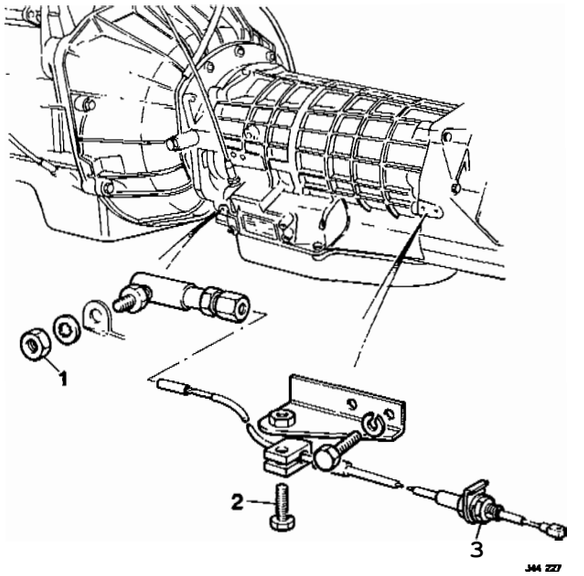


Fig 1

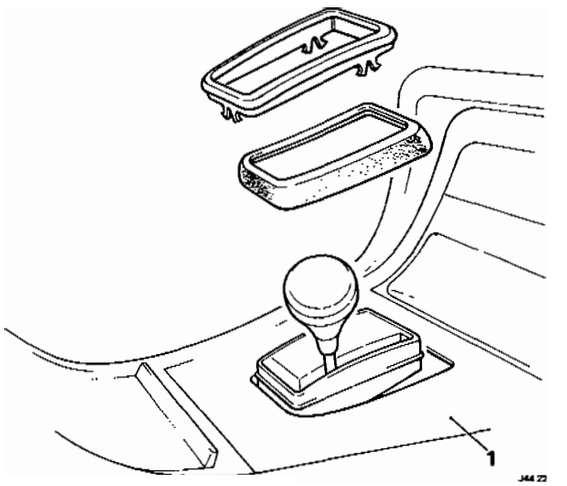


Fig 2

DATA

TORQUE FIGURES

Cable block to cable abutment bracket 14-18Nm
Control cable to gearbox lever 8-12Nm
Gear control cable to adjustable ball end 40-50Nm
Lower cable bracket to transmission unit 7-10Nm

SPANNER SIZES

10mm
11mm
13mm
20mm

0194G

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SELECTOR CABLE ASSEMBLY

CHECK AND ADJUST **44.15.07**

WARNING: DO NOT DRIVE OR ATTEMPT TO DRIVE THE VEHICLE WITH THE MANUAL SELECTION LINKAGE DISCONNECTED OR THE 'J' GATE COVER DISCONNECTED.

Check the following prior to carrying out adjustment:

1 The engine starts only when the gear selector is in 'P' or 'N' positions.
2 The reversing lights illuminate only when position 'R' is selected.
3 The instrument pack gear indicator corresponds with the gear selector indicator.
4 The transmission park lock mechanism is engaged when the gear selector is in the 'P' position.
5 The gear selector aligns centrally with position 'R' and 'N' detents in the gear selector module gate.
6 The gear selector shifts smoothly across the J-gate in position 'D'.

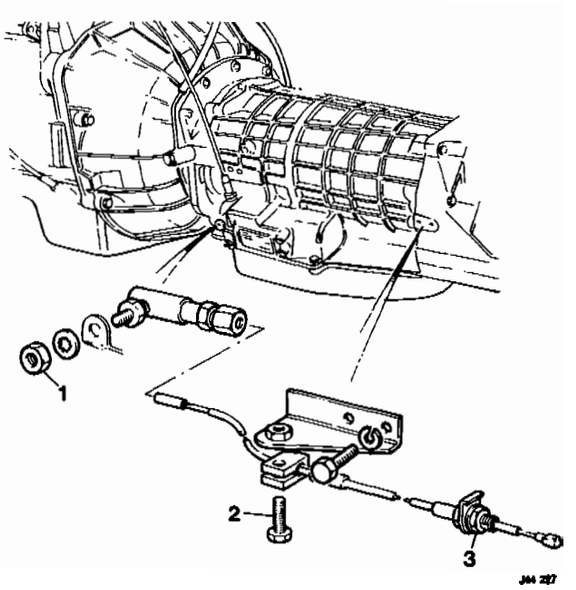


Fig 1

ADJUSTMENT

Ensure that the gear selector lever is in position 'N'.
Raise the vehicle on a ramp.
Remove the nut securing the selector cable to the gearbox selector lever (1 Fig 1).
Disconnect the cable from the lever.
Ensure that the selector lever is fully home in position P.
Slacken the cable connector end locknut (3 Fig 1) and position the cable connector end to the gearbox selector lever.
Fit and tighten the cable to lever securing lock nut.
Tighten the connector end locknut.
Lower the vehicle.

DATA

TORQUE FIGURES

Control cable to gearbox lever 8-12Nm
Gear control cable to adjustable ball end 40-50Nm
Lower cable bracket to transmission unit 7-10Nm

SPANNER SIZES

8mm
11mm
13mm
20mm

0194G

LINEAR SWITCH

RENEW **44.15.12**

Disconnectthe battery earth lead.
Removethe console finisher 76.25.19.
Removethe linear switch securing screws (1 Fig 1).
Displacethe switch (2 Fig 1) for access and disconnect the harness block connectors.
Removethe switch assembly.

Select position 'N' Neutral.
Fitthe new switch to position.
Fit but do not tighten the screws.
Position Service Tool JD 127 setting gauge between the linear switch and side plate (Fig 1).
Ensurethat the slot of the gauge is fully located on to the pin of the linear switch.
Tighten the screws, removethe gauge.
Check that the vehicle will only start in PARK or NEUTRAL.
Re-adjust as required.
Check that the instrument pack gear indicator corresponds with the gear selector indicator.

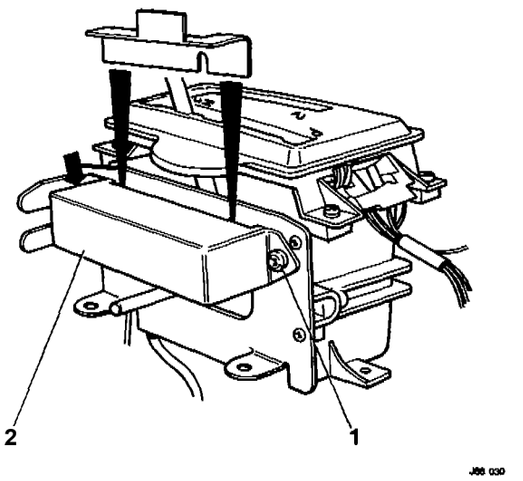


Fig 1

DATA

SERVICE TOOLS

JD 727 Linear switch setting gauge

TORQUE FIGURES

Switch to mounting plate screws 2-3Nm

SPANNER SIZES

No 4 Pozi

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AUTOMATIC TRANSMISSION ZF 4HP 22

OIL FLOW CHART

POSITION P
PARK

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 VALVE P
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR **INHIBIT**
9 MANUAL VALVE
10 **OIL** COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 **MODULATOR** VALVE
15 1ST GEAR **INHIBIT**
16 1-2 **SHIFT** VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 **2ND** GEAR **INHIBIT**
22 **THROTTLE** VALVE
23 **THERMO** VALVE
24 **CONVERTOR CLUTCH** LOCK **UP CONTROL** VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 **SHIFT VALVE**
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 **F CLUTCH INHIBIT** VALVE (REVERSE)

I EXHAUST
II **THROTTLE**
III **ORIFICE**
IV **BRANCH**
V **MAIN** PRESSURE
VI **CONVERTER** PRESSURE
VII **THROTTLE** PRESSURE
VIII **GOVERNOR PRESSURE**
IX **LOCKING PRESSURE**
X MODULATION **PRESSURE**
XI PUMP **PRESSURE**
XII **LUBRICATION PRESSURE**

A A CLUTCH
B **B CLUTCH**
C **C CLUTCH**
C' **C' CLUTCH**
D **D CLUTCH**
E E CLUTCH
F **F CLUTCH**

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ÖLDURCHFLUSSTABELLE

STELLUNG P
PARKEN

1 **REGLER**
2 **DREHMOMENTWANDLER**
3 **ÖLWANNE**
4 **ÖLPUMPE**
5 **DRUCKREGELVENTIL**
6 **KUPPLUNG B, VENTIL UND DÄMPFUNG**
7 **KUPPLUNG D, VENTIL UND DÄMPFUNG**
8 **RÜCKWÄRTSGANGSPERRE**
9 **WÄHLSCHIEBER**
10 **ÖLKÜHLER**
11 **WANDLER UND RÜCKSCHALTVENTIL**
12 **WANDLERKUPPLUNG, DÄMPFUNG**
13 **RÜCKSCHLAGVENTIL**
14 **MODULATORVENTIL**
15 1.-GANG-SPERRE
16 **SCHALTVENTIL 1-2**
17 **KUPPLUNG C, VENTIL**
18 **KUPPLUNG C', DÄMPFUNG**
19 **KUPPLUNG C', VENTIL**
20 **SCHALTVENTIL 2-3**
21 2.-GANG-SPERRE
22 **DROSSELVENTIL**
23 **THERMOVENTIL**
24 **STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG**
25 **HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG**
26 **SCHALTVENTIL 3-4**
27 **KUPPLUNG F, VENTIL UND DÄMPFUNG**
28 **KUPPLUNG A, DÄMPFUNG**
29 **KUPPLUNG E, DÄMPFUNG**
30 **KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)**

I **ABFLUSS**
II **DROSSEL**
III **ÖFFNUNG**
IV **VERZWEIGUNG**
V **ARBEITSDRUCK**
VI **WANDLERDRUCK**
VII **DROSSELDRUCK**
VIII **REGLERDRUCK**
IX **SPERRDRUCK**
X **MODULIERDRUCK**
XI **PUMPENDRUCK**
XII **SCHMIERDRUCK**

A **KUPPLUNG A**
B **KUPPLUNG B**
C **KUPPLUNG C**
C' **KUPPLUNG C'**
D **KUPPLUNG D**
E **KUPPLUNG E**
F **KUPPLUNG F**

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION P
STATIONNEMENT

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 **POMPE**
5 **SOUPAPE** REGULATRICE DE PRESSION
6 TIROIR E T AMORTISSEUR D'EMBRAYAGE B
7 TIROIR E T AMORTISSEUR D'**EMBRAYAGE** D
8 EMPECHEMENT DE MARCHE ARRIERE
9 **TIROIR MANUEL**
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE **RETENUE**
14 TIROIR DE MODULATION
15 EMPECHEMENT DE **PREMIERE**
16 TIROIR DE PASSAGE 1-2
17 TIROIR D. **EMBRAYAGE** C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 **TIROIR** DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELEXTION
23 TIROIR THERMOSTATIQUE
24 **TIROIR** DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'**EMBRAYAGE** F
28 AMORTISSEUR D'**EMBRAYAGE** A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F **(MARCHE ARRIERE)**

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV **RACCORD**
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX **PRESSION** DE VERROUILLAGE
X PRESSION DE **MODULATION**
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C **EMBRAYAGE** C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE P
PARCHEGGIO

1 **REGOLATORE**
2 CONVERTITORE DI COPPIA
3 COPPA
4 **POMPA**
5 VALVOLA DI REGOLAZIONE PRESSONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E **SMORZATORE** FRIZIONE D
8 **INIBIZIONE RETROMARCIA**
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI **INVERSIONE**
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA **UNIDIREZIONALE**
14 CONVERTIDORA MODULATRICE
15 **INIBIZIONE** 1ma
16 VALVOLA **CAMBIO** 1-2
17 VALVOLA **MODULADORA**
18 **SMORZATORE** FRIZIONE C'
19 VALVOLA FRIZIONE **C'**
20 VALVOLA CAMBIO 2-3
21 **INIBIZIONE** 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO **FRIZIONE** CONVERTITORE
25 VALVOLA DI **ISTERESI** DELLA **FRIZIONE** CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 **SMORZATORE FRIZIONE** A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F **(INVERSIONE)**

I SCAR——
II FARFALLA
III **ORIFIZIO**
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESS—NE FARFALLA
VIII **PRESSIONE REGOLATORE**
IX **PRESSIONE DI BLOCCAGGIO**
X **PRESSIONE DI MODULAZIONE**
XI **PRESSIONE** POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B **FRIZIONE BA**
C **FRIZIONE** C
C' **FRIZIONE** C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE ACEITE

POSICION P
APARCAR

1 REGULADOR
2 CONVERTIDOR DE PAR
3 **CARTER**
4 **BOMBA**
5 VALVULA REGUCADORA DE **PRESION**
6 VALVULA Y AMORTI — ADOR DE EMBRAGUE **B**
7 VALVULA Y AMORTIGUADOR DE EMERAGUED
8 **INHIBICION** DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNICIRECCIONAL
14 VALVULA **MODULADORA**
15 **INHIBICION** DE 1ª VEL — IDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 **AMORTIGUADOR** DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE **CAMBIO** 2-3
21 **INHIBICION** 2nda
22 VALVULA A FARFALLA
23 VALVULA TERMICA
24 VALVULA DE CONTROLLO DE **FRIZIONE** CONVERTITORE
25 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 **VOLVULA** Y **AMORTIGUADOR** DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III **ORIFICIO** CION
IV **I**
V **PRESION** PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII **PRESION DEL REGULADOR**
IX **PRESION DE** BLOQUEO
X **PRESION DE** MODULACION
XI **PRESION DE** LA BOMBA
XII **PRESION DE LUBRICACION**

A EMBRAGUE A
B **EMBRAGUE B**
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND **'P'**
PARKEREN

1 REGULATEUA
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP END EMPER. **B-KOPPELING**
7 KLEP END EMPER. C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 **EENRICHTINGSKLEP**
14 **VERDRENGELREGELKLEP**
15 **VERSNELLING**
16 SCHAKELKLEP 1-2
17 KLEP. C-KOPPELING
18 DEMPERC'-KOPPELING
19 KLEP. C-KOPPELING
20 **SCHAKELKLEP** 2-3
21 BEGRENZER, 2e **VERSNELLING**
22 GASBEDIENINGSKLEP
23 **REGELKLEP 2E KOPPELINGS-**
24 VERGRENDELING VAN OMVORMER
25 HYSTEESISKLEP. OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP ENDEMPER F-KOPPELING
28 DEWERA-KOPPELING
29 DEWERE-KOPPELING
30 **VEILGHEIDSKLEP (ACHTERUIT)**
F-KOPPEUNG

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGELSTEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI **DRUKREGELDRUK**
XII

A A-KOPPELING
B B-KOPPELING
C **C-KOPPELING**
C' **C'-KOPPELING**
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「P」の位置
駐　車

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第1速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3シフトバルブ
21 第2速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4シフトバルブ
27 Fクラッチバルブとダンパー
28 Aクラッチダンパー
29 Eクラッチダンパー
30 Fクラッチインヒビターバルブ（後退用）

I 排気管
II 絞り
III 開度
IV オリフィス
V 二叉
VI 高圧
VII コンバーター圧力
VIII スロットル圧力
IX ガバナー圧力
X ロッキング圧力
XI 調整圧力
XII ポンプ圧力
潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

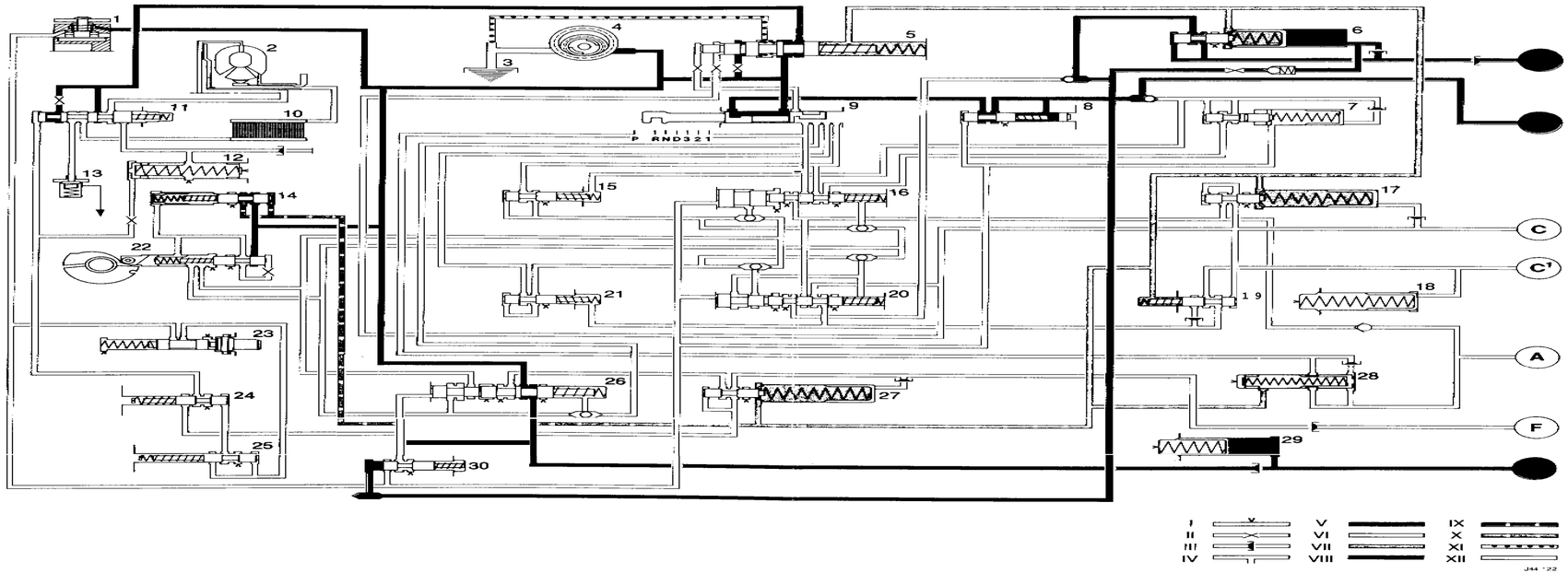
位置 P
停放車

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥和減振器
7 D 離合器閥和減振器
8 倒車鎖制止
9 手控閥
10 油冷却器
11 變矩器和後退閥
12 變矩器離合器閥和減振器
13 單向閥
14 調制器閥
15 第一檔鎖止
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器閥和減振器
19 C' 離合器閥
20 2-3 換檔閥
21 第二檔鎖止
22 節流閥
23 熱調閥
24 變矩器離合器鎖閉控制閥
25 變矩器離合器滯後閥
26 3-4 換檔閥
27 F 離合器閥和減振器
28 A 離合器閥和減振器
29 E 離合器閥和減振器
30 F 離合器鎖止閥（倒車）

I 排氣管
II 節流閥
III 節流孔
IV 孔口
V 二叉
VI 壓力
VII 變矩器壓力
VIII 節流閥壓力
IX 調壓閥壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION R
REVERSE

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AUTOMATIC TRANSMISSION ZF 4HP 22

OIL FLOW CHART

POSITION R
REVERSE

1 **GOVERNOR**
2 TORQUE CONVERTOR
3 SUMP
4 **PUMP**
5 **PRESSURE** REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE **AND** DAMPER
8 REVERSE GEAR **INHIBIT**
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 **ONE** WAY VALVE
14 **MODULATOR** VAL?
15 **1ST** GEAR **INHIBIT**
16 1-2 **SHIFT** VALVE
17 C CLUTCH VALVE
18 C1 CLUTCH DAMPER
19 C1 CLUTCH VAL?
20 2-3 **SHIFT VALVE**
21 2ND GEAR INHIBIT
22 **THROTTLE** VALVE
23 THERMO VALVE
24 **CONVERTOR CLUTCH** LOCK UP CONTROL VALVE
25 CONVERTOR **CLUTCH** HYSTERISIS VALVE
26 **3-4 SHIFT** VAL?
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH **INHIBIT** VALVE (REVERSE)

I EXHAUST
II **THROTTLE**
III **ORIFICE**
IV BRANCH
V **MAIN PRESSURE**
VI CONVERTER PRESSURE
VII **THROTTLE** PRESSURE
VIII **GOVERNOR PRESSURE**
IX **LOCKING PRESSURE**
X MODULATION PRESSURE
XI **PUMP** PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C **C CLUTCH**
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F **F CLUTCH**

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ÖLDURCHFLUSSTABELLE

STELLUNG R
RÜCKWÄRTSGANG

1 **REGLER**
2 **DREHMOMENTWANDLER**
3 **ÖLWANNE**
4 **ÖLPUMPE**
5 **DRUCKREGELVENTIL**
6 **KUPPLUNG B, VENTIL UND DÄMPFUNG**
7 **KUPPLUNG D, VENTIL UND DÄMPFUNG**
8 **RÜCKWÄRTSGANGSPERRE**
9 **HANDSCHIEBER**
10 **ÖLKÜHLER**
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 **RÜCKSCHLAGVENTIL**
14 **MODULATORVENTIL**
15 **1.-GANG-SPERRE**
16 **SCHALTVENTIL 1-2**
17 **KUPPLUNG C, VENTIL**
18 **KUPPLUNG C', DÄMPFUNG**
19 **KUPPLUNG C', VENTIL**
20 **SCHALTVENTIL 2-3**
21 **2.-GANG-SPERRE**
22 **DROSSELVENTIL**
23 **THERMOVENTIL**
24 **STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG**
25 **HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG**
26 **SCHALTVENTIL 3-4**
27 **KUPPLUNG F, VENTIL UND DÄMPFUNG**
28 **KUPPLUNG A, DÄMPFUNG**
29 **KUPPLUNG E, DÄMPFUNG**
30 **KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)**

I **ABFLUSS**
II **DROSSEL**
III **ÖFFNUNG**
IV **VERZWEIGUNG**
V **ARBEITSDRUCK**
VI **WANDLERDRUCK**
VII **DROSSELDRUCK**
VIII **REGLERDRUCK**
IX **SPERRDRUCK**
X **MODULIERDRUCK**
XI **PUMPENDRUCK**
XII **SCHMIERDRUCK**

A **KUPPLUNG A**
B **KUPPLUNG B**
C **KUPPLUNG C**
C' **KUPPLUNG C'**
D **KUPPLUNG D**
E **KUPPLUNG E**
F **KUPPLUNG F**

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION R
MARCHE ARRIERE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 **POMPE**
5 SOUPAPE REGULATRICE **DE** PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE **B**
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE **ARRIERE**
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'**INVERSION**
12 AMORTISSEUR D'EMBRAYAGE DE **CONVERTISSEUR**
13 **CLAPET** DE **RETENUE**
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 **TIROIR D'ACCELERATION**
23 TIROIR **THERMOSTATIQUE**
24 TIROIR DE COMMA — EDE VERROUILLAGE D EMBRAYAGE DE CONVERTISSEUR
25 **TIROIR** A HYSTERESIS **D'EMBRAYAGE** DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 **TIROIR** ET AMORTISSEUR D'EMBRAYAGE F
28 **AMORTISSEUR** D'EMBRAYAGE A
29 **AMORTISSEUR** D'EMBRAYAGE E
30 **TIROIR** D'EMPECHEMENT D'EMBRAYAGE F **(MARCHE** ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V **PRESSION PRINCIPALE**
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII **PRESSION DE REGULATEUR**
IX PRESSION DE VERROUILLAGE
X **PRESSION DE MODULATION**
XI **PRESSION DE POMPE**
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B **EMBRAYAGE B**
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE R
RETROMARCIA

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 **COPPA**
4 **POMPA**
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 **RADIATORE OLIO**
11 CONVERTITORE E VALVOLA **DI** INVERSIONE
12 SMORZATORE **FRIZIONE** CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA **MODULATRICE**
15 INIBIZIONE 1ma
16 VALVOLA **CAMBIO** 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA **DI CONTROLLO** ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA **DI** ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE **FRIZIONE** A
29 SMORZATORE **FRIZIONE** E
30 VALVOLA INIBIZIONE FRIZIONE F **(INVERSIONE)**

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X **PRESSIONE** DI **MODULAZIONE**
XI
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION A
MARCHA **ATRAS**

1 REGULADOR
2 **CONVERTIDOR** DE PAR
3 CARTER
4 **BOMBA**
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y **AMORTIGUADOR** DE EMBRAGUE B
7 VALVULA Y **AMORTIGUADOR** DE EMBRAGUE D
8 **INHIBICION** DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 **CONVERTIDOR** Y VALVULA **DE INVERSION**
12 **AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR**
13 **VALVULA UNIDIRECCIONAL**
14 **VALVULA MODULADORA**
15 **INHIBICION DE 1ª VELOCIDAD**
16 **VALVULA DE CAMBIO 1-2**
17 **VALVULA DEL EMBRAGUE C**
18 **AMORTIGUADOR DEL EMBRAGUE C'**
19 **VALVULA DEL EMBRAGUE C'**
20 **VALVULA DE CAMBIO 2-3**
21 **INHIBICION DE 2ª VELOCIDAD**
22 **MARIPOSA DEL ACELERADOR**
23 **TERMOVALVULA**
24 **VALVULA DE CONTROL, BLOQUEO** FRIZIONE CONVERTITORE
25 **VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR**
26 VALVULA DE CAMBIO 3-4
27 **VOLVULA Y AMORITGUADOR DE EMBRAGUE F**
28 **AMORTIGUADOR DE EMBRAGUE A**
29 **AMORTIGUADOR DE EMBRAGUE E**
30 **VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)**

I RETORNO
II MARIPOSA DEL ACELERADOR
III **ORIFICIO**
IV **BIFURCACION**
V **PRESION PRINCIPAL**
VI **PRESION DEL CONVERTIDOR**
VII **PRESION DEL ACELERADOR**
VIII PRESION DEL REGULADOR
IX **PRESION DE BLOQUEO**
X **PRESION DE MODULACION**
XI **PRESION DE LA BOMBA**
XII **PRESION** DE LUBRICACION

A **EMBRAGUE A**
B **EMBRAGUE B**
C **EMBRAGUE C**
C' **EMBRAGUE C'**
D **EMBRAGUE D**
E **EMBRAGUE E**
F **EMBRAGUE F**

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HYDRAULISCHE DRUKREGELING

STAND R
ACHTERUIT

1 REGULATEUR
2 **KOPPELOMVORMER**
3 CARTER
4 **POMP**
5 **DRUKREGELKLEP**
6 **KLEP EN DEMPER, B-KOPPELING**
7 **KLEP EN DEMPER, C-KOPPELING**
8 **ACHTERUITTANDWIELBEGRENZER**
9 **HANDBEDIENDE KLEP**
10 OLIEKOELER
11 **OMVORMER EN ACHTERUITKLEP**
12 **KOPPELOMVORMER KOPPELINGSDEMPER**
13 **EENRICHTINGSKLEP**
14 **MODULATORKLEP**
15 **BEGRENZER, 1e VERSNELLING**
16 **SCHAKELKLEP 1-2**
17 **KLEP, C-KOPPELING**
18 **DEMPER C'-KOPPELING**
19 **KLEP, C-KOPPELING**
20 **SCHAKELKLEP 2-3**
21 **BEGRENZER, 2e VERSNELLING**
22 **GASBEDIENINGSKLEP**
23 **THERMOKLEP**
24 **REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER**
25 **HYSTERESISKLEP, OMVORMER-KOPPELING**
26 **SCHAKELKLEP 3-4**
27 **KLEP EN DEMPER, F-KOPPELING**
28 **DEMPER A-KOPPELING**
29 **DEMPER E-KOPPELING**
30 **VEILIGHEIDSSKLEP (ACHTERUIT) F-KOPPELING**

I **UITLAAT**
II GAS
III OPENING
IV **AFTAKKING**
V **HOOFDDRUK**
VI **OMVORMERDRUK**
VII **GASDRUK**
VIII **REGULATEURDRUK**
IX **BLOKKEERDRUK**
X **MODULATIEDRUK**
XI **POMPDRUK**
XII **SMEERDRUK**

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「R」の位置
後退ギア

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 **圧力調整弁**
6 **B クラッチバルブとダンパー**
7 **D クラッチバルブとダンパー**
8 **後退ギアインヒビター**
9 **マニュアルバルブ**
10 **オイルクーラー**
11 **コンバーターと後退用バルブ**
12 **コンバーター クラッチダンパー**
13 **ワンウエイバルブ**
14 **モジュレーターバルブ**
15 **第 1 速ギアインヒビター**
16 **1-2 シフトバルブ**
17 **C クラッチバルブ**
18 **C1 クラッチダンパー**
19 **C1 クラッチバルブ**
20 **2-3 シフトバルブ**
21 **第 2 速ギアインヒビター**
22 **スロットルバルブ**
23 **サーモバルブ**
24 **コンバーター クラッチ ロックアップ コントロール バルブ**
25 **コンバーター クラッチ ヒステリシス バルブ**
26 **3-4 シフトバルブ**
27 **F クラッチバルブとダンパー**
28 **A クラッチダンパー**
29 **E クラッチダンパー**
30 **F クラッチインヒビターバルブ(後退用)**

I **排気**
II スロットル
III オリフィス
IV **ニス**
V **高圧**
VI **コンバーター圧力**
VII **スロットル圧力**
VIII **ガバナー圧力**
IX **ロッキング圧力**
X **調整圧力**
XI **ポンプ圧力**
XII **潤滑圧力**

A **A クラッチ**
B **B クラッチ**
C **C クラッチ**
C' **C' クラッチ**
D **D クラッチ**
E **E クラッチ**
F **F クラッチ**

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油流程圖

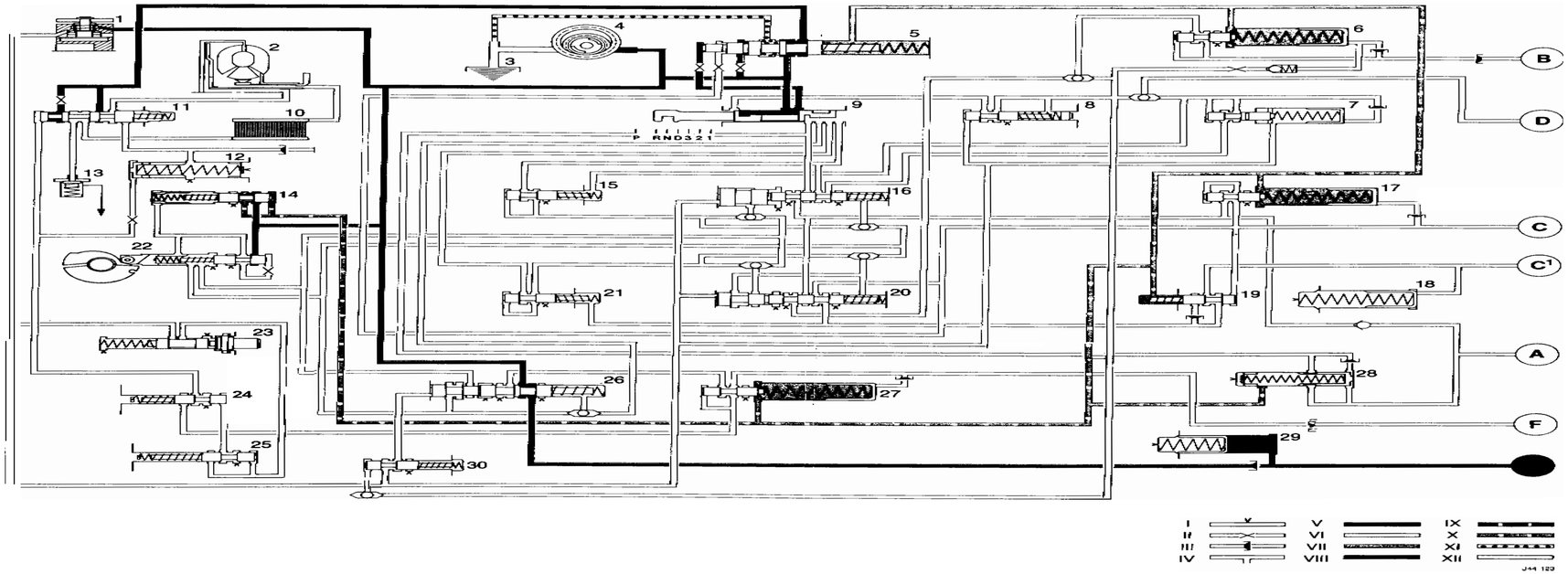
位置 R
倒車

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 後退檔互鎖閥
9 手控閥
10 機油冷卻器
11 變矩器與倒車閥
12 變矩器離合器阻尼器
13 單向閥
14 調速器閥
15 第一速檔互鎖閥
16 1-2 換檔閥
17 C 離合器閥
18 C 離合器阻尼器
19 C1 離合器閥
20 2-3 換檔閥
21 二速檔互鎖閥
22 節氣門閥
23 溫度閥
24 變矩器離合器鎖閉控制閥
25 變矩器離合器滯後閥
26 3-4 換檔閥
27 F 離合器閥與阻尼器
28 A 離合器阻尼器
29 E 離合器阻尼器
30 F 離合器制止閥(倒車)

I 排氣
II 節氣門
III 節流閥
IV 節流孔
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION N
NEUTRAL

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AUTOMATIC TRANSMISSION ZF 4HP 22

OILFLOWCHART

POSITION N
NEUTRAL

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAW PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI VMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG N
NEUTRAL

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG E, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1 - 2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION N
POINT MORT

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 SOUPAPE DE DISTRIBUTEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE N
FOLGE N

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
5 PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE E
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE **CIRCULACION DEL ACEITE**

POSICION N
PUNTO MUERTO

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULA ——A DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 AMORTIGUADOR DE EMBRAGUE D
8 IMPEDIMENTO DE MARCHA ATRAS
9 VALVULA MANUAL
10 RADIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
12 AMORTIGUADOR DE EMBRAGUE C
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1 - 2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND N
NEUTRAAL

1 REGULATEUR
2 KOPPELOMVOA MER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEPENDEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1 - 2
17 KLEP, C-KOPPELING
18 DEMPER C-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 THEA MOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEPENDEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV HOOFDDRUK
V
VI OMVORMERDRUK
VII REGELDRUK
VIII
IX BLOKKEERDRUK
X MODULATIEDRUK
XI SMEERDRUK
XII

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「N」の位置

ニュートラル

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第 1 速ギアインヒビター
16 1 - 2 シフトバルブ
17 C クラッチバルブ
18 C クラッチダンパー
19 C' クラッチバルブ
20 2 - 3 シフトバルブ
21 第 2 速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3 - 4 シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II ガス
III スロットル
IV オリフィス
V 二叉
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

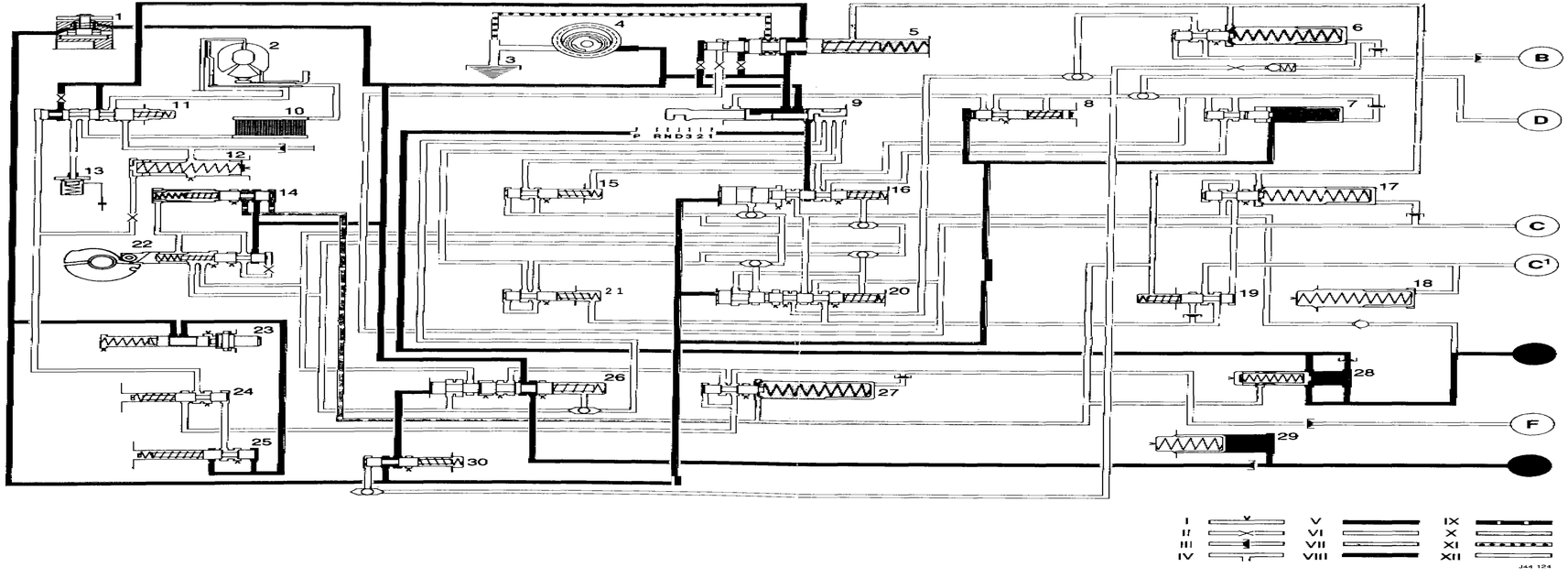
油流程圖

位置 N

空檔

1. 調速器
2. 液力變矩器
3. 油槽
4. 油泵
5. 油壓調節閥
6. B 離合器閥與阻尼器
7. D 離合器閥與阻尼器
8. 倒車互鎖裝置
9. 手動閥
10. 機油冷卻器
11. 變矩器與倒車閥
12. 變矩器離合器減振器
13. 單向閥
14. 調壓閥
15. 一檔互鎖裝置
16. 1-2 換檔閥
17. C 離合器閥
18. C 離合器減振器
19. C' 離合器閥
20. 2-3 換檔閥
21. 二檔互鎖裝置
22. 節氣門閥
23. 溫控閥
24. 變矩器離合器鎖閉控制閥
25. 變矩器離合器滯後閥
26. 3-4 換檔閥
27. F 離合器閥與阻尼器
28. A 離合器阻尼器
29. E 離合器阻尼器
30. F 離合器互鎖閥（倒車）

OIL FLOW CHART



POSITION D
DRIVE I
IDLE

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OIL FLOWCHART

POSITION D
1ST GEAR
IDLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ERSTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGSVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
1ère VITESSE
ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
1a PRIME
A TUTTO GAS

1 REGOLATORE
2 CONVEATITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DEREGOLAZIONE
6 VALVOLA REGOLADORE SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIRECIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA ESMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV PRESSIONE PRINCIPALE
V
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE DI LUBRIFICAZIONE
XII

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE LA CEITE

POSICION D
1ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 ENBRAGUE MARCHA ATAAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVIA-A DEL EMBRAGUE C'
18 AMORTIGUADOR DEL EMBRAGLIE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE CAMBIO 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS EMBRAGUE DELCONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV PRESION PRINCIPAL
V
VI PRESION DEL CONVERTIDOR
VII PRESION DEL REGULADOR
VIII PRESION DE BLOQUEO
IX PRESION DE MODULACION
X PRESION DE LA BOMBA
XI PRESION DE LUBRICACION
XII

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUEC'
D EMBRAGUED
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
1e VERSN.
VOLGAS NORMAAL RIJDEN

1 REGULATEUR
2 CONVERTEOMVORMER
4 POMP
5 DRUKREGELKLEP
6 KLEPENDEMPER, B-KOPPELING
7 KLEPENDEMPER, C-KOPPELING
8 ACHTERUIT TANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 VERRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
18 BEGRENSKOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEPENDEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT)
1 EHKOPPELING

II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII BLOKKEERDRUKLIJK

X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK
IX EK-KOPPELING

C. C-KOPPELING
C1 C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第 1 速
アイドリング

1. ガバナー
2. トルクコンバーター
3. オイルパン
4. ポンプ
5. 圧力調整弁
6. B クラッチバルブとダンパー
7. D クラッチバルブとダンパー
8. 後退ギアインヒビター
9. マニュアルバルブ
10. オイルクーラー
11. コンバーターと後退用バルブ
12. コンバータークラッチダンパー
13. ワンウエイバルブ
14. モジュレーターバルブ
15. 第 1 速ギアインヒビター
16. 1-2 シフトバルブ
17. C クラッチバルブ
18. C'クラッチダンパー
19. C'クラッチバルブ
20. 2-3 シフトバルブ
21. 第 2 速ギアインヒビター
22. スロットルバルブ
23. サーモバルブ
24. コンバーターロックアップコントロールバルブ
25. コンバータークラッチヒステリシスバルブ
26. 3-4 シフトバルブ
27. F クラッチバルブとダンパー
28. A クラッチダンパー
29. E クラッチダンパー
30. F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分岐
V 本管
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C'クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

位置 D
第一檔
低速

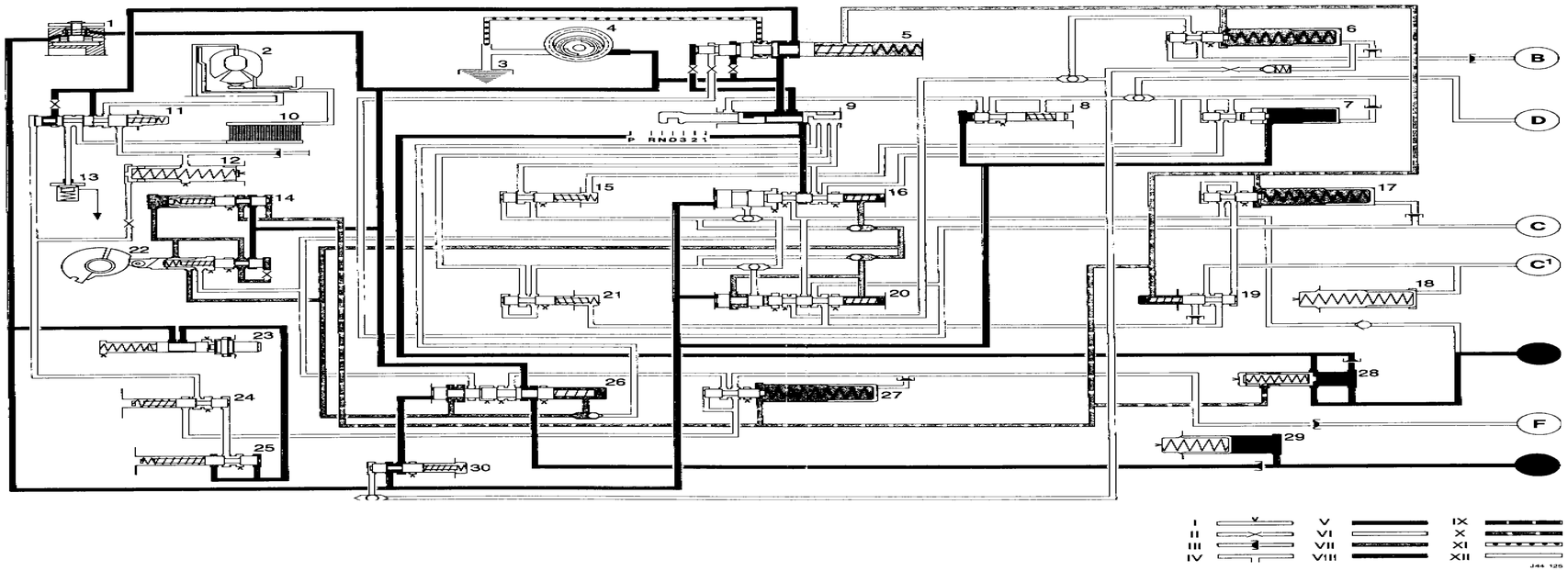
備 57.5

1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B 離合器閥與阻尼器
7. D 離合器閥與阻尼器
8. 倒車離合器
9. 手控閥
10. 油冷卻器
11. 換向器與單向閥
12. 換向器離合器閥與阻尼器
13. 單向閥
14. 調壓閥
15. 第一檔制止
16. 1-2 換檔閥
17. C 離合器閥
18. C'離合器閥與阻尼器
19. C'離合器閥
20. 2-3 換檔閥
21. 第二檔制止
22. 節流閥
23. 熱閥
24. 換向器離合器鎖閉控制閥
25. 換向器離合器滯後閥
26. 3-4 換檔閥
27. F 離合器閥與阻尼器
28. A 離合器阻尼器
29. E 離合器阻尼器
30. F 離合器制止閥（倒車）

I 排氣
II 節流閥
III 節流孔
IV 支流管
V 主管
VI 換向器壓力
VII 節流閥壓力
VIII 調壓器壓力
IX 鎖閉壓力
X 調節壓力
XI 泵壓
XII 潤滑壓力

A A 離合器
B B 離合器
C C 離合器
C' C'離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D
DRIVE 1
FULL THROTTLE

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OIL FLOW CHART

POSITION D
DRIVE 1
FULL THROTTLE

1 GOVERNOR
2 TOAQUE CONVEATOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 AEVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVEATOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
15 ONE WAY VALVE
14 MODULATORVALVE
15 1ST GEAR INHIBIT
16 1-2SHIFT VALVE
17 C CLUTCH VALVE
18 C¹ CLUTCH DAMPER
19 C¹ CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PAESSUAE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C¹ C¹ CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ERSTER GANG
KICKDOWN

1 REGLER
2 DREHMOMENTWANDLER
3 OLWANNE
4 OLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG **e**, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C¹, DÄMPFUNG
19 KUPPLUNG C¹, VENTIL
20 SCHALTVENTIL 2-3
21 2.GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL WANDLER-ÜBERBRUCKUNGSSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUMG
30 KUPPLUNG F, SPERRVENTIL (RUCKWARTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDAUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNGA
B KUPPLUNGB
C KUPPLUNGC
C¹ KUPPLUNGC¹
D KUPPLUNGD
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
1ère VITESSE
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR
7 C EMBRAYAGE C
TIROIR ET AMORTISSEUR D'EMBRAYAGE D
a EMPECHEMENTDE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C¹
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DECONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARFIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSIOND'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGEA
B EMBRAYAGE B
C EMBRAYAGE C
C¹ EMBRAYAGE C¹
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGEF

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
KICKDOWN

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 VALVOLA E SMORZATORE FRIZIONE E
VALVOLA Y AMORTIGUADOR DE EMBRAGUE D
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 REFRIDISSEURD'HUILE CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
73 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C¹
19 VALVOLA FRIZIONE C¹
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II ORIFIZIO LA
III
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C¹ FRIZIONE C¹
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DELACEITE

POSICION D
1ª VELOCIDAD
RETIRARCH

2 SOLVAETIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
VALVULA Y AMORTIGUADOR DE EMBRAGUE B
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
7 VALVULA E SMORZATORE FRIZIONE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
73 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DE4EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C¹
19 VALVULA DELEMBRAGUE C¹
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERAWR
23 TERMOVALVULA
24 VALVULA DE CONTROL, BLOQUEO DELEMBRAGUE DELCONVERTIDOR
25 VALVULA DE HISTERESIS, EMBRAGUEDELCONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VALVULA Y AMORITGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DELACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A

C EMBRAGUE C
C¹ EMBRAGUE C¹
D EMBRAGUE D
E EMBRAGUE E

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HYDAAULISCHE DRUKREGELING

STAND **D**
KICKERBAIN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELVENTIEL, B-KOPPELING
6
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN OMVORMER EP PEF
12
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPERC¹-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
III ORIFICE

IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
XI SMEERDRUK

XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C¹ C¹-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図
「D」の位置
第１速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後進ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーター上後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 C クラッチバルブ
18 C¹クラッチダンパー
19 C¹クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

1 排気
I スロットル
II オリフィス
IV 二又
V 主圧
VI コンバーター圧力
VII スロットル圧力
IX ガバナー圧力
X ロッキング圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C¹ C¹クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖
位置 D
第一檔
節流閥全開

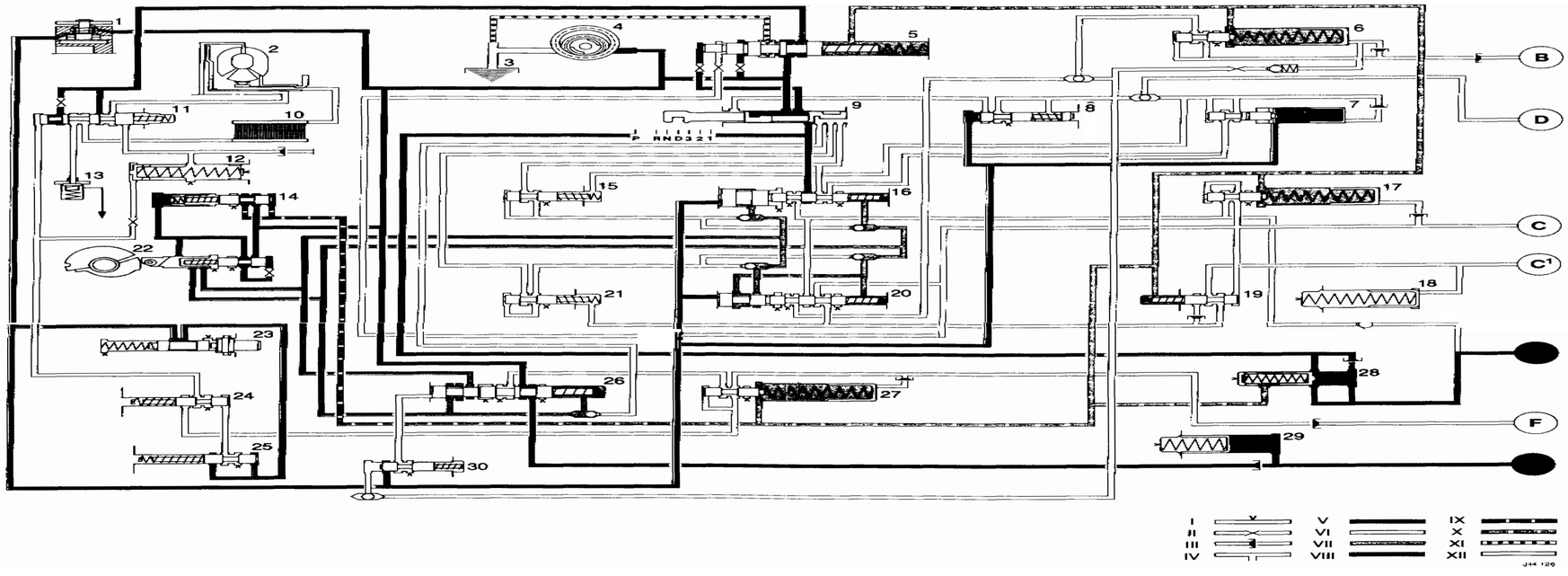
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1. 減速器
2. 變矩器
3. 油槽
4. 油泵
5. 油壓調節閥
6. B 離合器閥和阻尼器
7. D 離合器閥和阻尼器
8. 倒車檔鎖止
9. 手控閥
10. 油冷卻器
11. 換流器單向閥
12. 換流器離合器閥和阻尼器
13. 單向閥
14. 調制器閥
15. 第一檔鎖止
16. 1-2換檔閥
17. C 離合器閥
18. C¹離合器阻尼器
19. C¹離合器閥
20. 2-3換檔閥
21. 第二檔鎖止
22. 節流閥
23. 熱閥
24. 換流器離合器鎖閉控制閥
25. 換流器離合器滯變閥
26. 3-4換檔閥
27. F 離合器閥和阻尼器
28. A 離合器阻尼器
29. E 離合器阻尼器
30. F 離合器制止閥（倒車）

1 排氣
I 節流閥
II 孔口
IV 分流
V 主壓
VI 換流器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X I 泵壓
X II 潤滑壓力

A A 離合器
B B 離合器
C C 離合器
C¹ C¹離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D
1ST GEAR
KICKDOWN

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OIL FLOW CHART

POSITION D
1ST GEAR
KICKDOWN

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 CLUTCH VALVE AND DAMPER
7 CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANICH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESS—E
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
a a CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ERSTER GANG
KICK**DOWN**

1 REGLER
2 **DREHMOMENT**WANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 **KUPPLUNG** B, **VENTIL UND DÄMPFUNG**
7 **KUPPLUNG** D, VENTIL UND DÄMPFUNG
8 **RÜCKWÄRTSGANGSPERRE**
9 **WÄHLSCHIEBER**
10 ÖLKÜHLER
11 **WANDLER UND** RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.GANG-SPERRE
16 SCHALTVENTIL 1-2
17 **KUPPLUNG** C, VENTIL
18 **KUPPLUNG** C', DAMPFUNG
19 **KUPPLUNG** C', VENTIL
20 SCHALTVENTIL 2-3
21 **2.-GANG-SPERRE**
22 DROSSELVENTIL
23 THE **MOVENTIL**
24 **STEUERVENTIL** FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II **DROSSEL**
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII **DROSSELDRUCK**
VIII REGLERDRUCK
IX **SPERRDRUCK**
X **MODULIERDRUCK**
XI PUMPENDRUCK
XII **SCHMIERDRUCK**

A **KUPPLUNG** A
B **KUPPLUNG** B
C KUPPLUNG C
C' **KUPPLUNG** C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
1ère VITESSE
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE **REGULATRICE** DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET **AMORTISSEUR** D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 **REFROIDISSEUR** D'HUILE
11 CONVERTISSEUR ET **TIROIR** D'INVERSION
12 **AMORTISSEUR** D'EMBRAYAGE DE **CONVERTISSEUR**
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE **C'**
19 TIROIR **D'EMBRAYAGE C'**
20 **TIROIR** DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 **TIROIR D'ACCELERATION**
23 **TIROIR THERMOSTATIQUE**
24 TIROIR DE **COMMANDE** DE **VERROUILLAGE** D'EMBRAYAGE DE **CONVERTISSEUR**
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 **TIROIR** DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 **AMORTISSEUR** D'EMBRAYAGE A
29 **AMORTISSEUR** D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III **ORIFICE**
IV RACCORD
V **PRESSION PRINCIPALE**
VI **PRESSION** DECONVERTISSEUR
VII **PRESSION** D'ACCELERATION
VIII **PRESSION** DE **REGULATEUR**
IX **PRESSION** DE VERROUILLAGE
X **PRESSION** DE **MODULATION**
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B **EMBRAYAGE B**
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGED
E EMBRAYAGEE
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
1a PRIMA
KICKDOWN

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 **COPPA**
4 POMPA
5 VALVOLA DE REGOLAZIONE **PRESSIONE**
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE **FRIZIONE D**
8 **INIBIZIONE RETROMARCIA**
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA **FRIZIONE** C'
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA **CAMBIO** 2-3
21 **INIBIZIONE 2nda**
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI **DELLA** FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE **F**
28 **SMORZATORE** FRIZIONE A
29 **SMORZATORE** FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I **SCARICO**
II FARFALLA
III ORIFIZIO
IV **DERIVAZION**
V **PRESSIONE PRINCIPALE**
VI PRESIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C **FRIZIONE** C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
1ª VELOCIDAD
RETIRARON

1 REGULADOR
2 CONVERTIDOR DE PAR
3 **BOMBA**
4
5 VALVULA REGULA —— A DE PRESION
6 CAVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUAWR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBICIONE 1ma
16 VALVOLA CAMBD 1-2
17 VALVOLA **FRIZIONE** C'
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA **CAMBIO** 2-3
21 **INIBICIONE 2nda**
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESIS. EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I MANOMETRO DEL ACELERADOR
II
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI **PRESION** DELCONVERTIDOR
VII **PRESION** DEL ACELERADOR
VIII **PRESION** DEL REGULADOR
IX **PRESION** DE **BLOQUEO**
X **PRESION** DE MODULACION
XI **PRESION** DE LA BOMBA
XII **PRESION** DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBAAGUE C'
D EMBRAGUE D
E **EMBRAGUE** E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
KICKDOWN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN **DEMPER**, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 **OLIEKOELER**
11 OMVORMER EN ACHTERUETKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 **MODULATORKLEP**
15 BEGRENZER 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER 2e VERSNELLENG
22 GASBEDIENINGSKLEP
23 THERMO**KLEP**
24 REGELKLEP- KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-**KOPPELING**
26 **KOPPELDEMPER** A-KOPPELING
27
28 **DEMPER** A-KOPPEUNG
29 **DEMPER** E-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT)

I F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPEUNG
B **B-KOPPELING**
C C-KOPPELING
C' **C'-KOPPELING**
D **D-KOPPELING**
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第 1 速
キックダウン

1. ガバナー
2. トルクコンバーター
3. オイルパン
4. ポンプ
5. 圧力調整弁
6. B クラッチバルブとダンパー
7. D クラッチバルブとダンパー
8. 後退ギアインヒビター
9. マニュアルバルブ
10. オイルクーラー
11. コンバーターと後退用バルブ
12. コンバータークラッチダンパー
13. 一方向弁
14. モジュレーターバルブ
15. 第 1 速ギアインヒビター
16. 1-2 シフトバルブ
17. C クラッチバルブ
18. C' クラッチダンパー
19. C' クラッチバルブ
20. 2-3 シフトバルブ
21. 第 2 速ギアインヒビター
22. スロットルバルブ
23. サーモバルブ
24. コンバータークラッチロックアップ コントロールバルブ
25. コンバータークラッチヒステリシスバルブ
26. 3-4 シフトバルブ
27. F クラッチバルブとダンパー
28. A クラッチダンパー
29. E クラッチダンパー
30. F クラッチインヒビターバルブ(後退用)

I 排気
II スロットル
III オリフィス
IV 二又
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

位置 D
第一檔
自動跳合

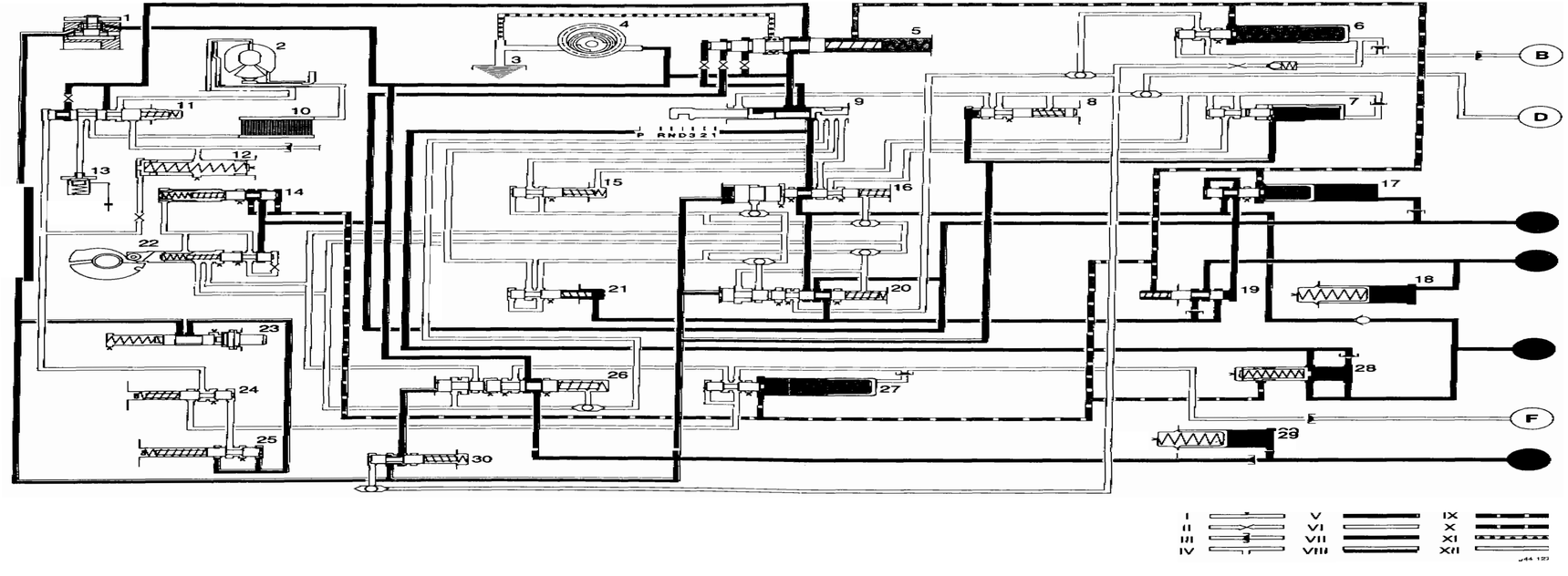
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1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車檔測止
9 手控閥
10 油冷卻器
11 變矩器與反向閥
12 變矩器離合器與阻尼器
13 單向閥
14 調制器閥
15 第一檔測止
16 1-2 換檔機閥
17 C 離合器閥
18 C' 離合器阻尼器
19 C' 離合器閥
20 2-3 換檔機閥
21 C' 離合器閥
22 節流閥
23 熱閥
24 變矩器離合器鎖閉控制閥
25 變矩器離合器滯後閥
26 3-4 換檔閥
27 F 離合器閥與阻尼器
28 A 離合器阻尼器
29 E 離合器阻尼器
30 F 離合器倒車閉鎖閥

I 排氣
II 節流閥
III 節流孔
IV 分流管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 閉鎖壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



IDLE

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OILFLOWCHART

POSITION D
2ND GEAR
IDLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 E CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C1 CLUTCH DAMPER
19 C1 CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C1 C1 CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ZWEITER GANG
LEERLAUF

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 HANDSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C1, DÄMPFUNG
19 KUPPLUNG C1, VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C1 KUPPLUNG C1
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
2ème VITESSE
RALENTI

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C1
19 TIROIR D'EMBRAYAGE C1
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C1 EMBRAYAGE C1
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
2a PRIMA
MINIMO

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE E
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIEZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C1
19 VALVOLA FRIZIONE C1
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE EA
C FRIZIONE C
C1 FRIZIONE C1
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE LA ACEITE

POSICION D
2ª VELOCIDAD
RALENTI

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VOLVOLA MANUAL
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGWEC1
19 VALVULA DEL EMBRAGUE C1
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS
26 EMBRAGUE DEL CONVERTIDOR
27 VALVULA DE CAMBIO 3-4
28 SMORZATORE FRIZIONE F
29 VOLVULA Y AMORTIGUADOR DE EMERAGUE F
30 AMORTIGUADOR DE EMBRAGUE A
31 AMORTIGUADOR DE EMBRAGUE E
32 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C1 EMBRAGUE C1
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
2e VERSN
STATIONAIR TOEREWTAN

1 REGELVOLVORMER
2 [illegible]
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENOE KLEP
10 OLIEKELER
11 OMVORMER EN ACHTERUITKLEP
12 KOPPELINGSDEMPER
13 [illegible]
14 MODULATORKLEP
15 BEGRENZER 1e VERSNELLING
16 [illegible]
17 KLEP, C-KOPPELING
18 [illegible]
19 [illegible]
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASPEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPERE-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI [illegible]
XII [illegible]

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C1 C1-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図
「D」の位置
第2速
アイドリング

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 プレッシャーレギュレーティングバルブ
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後進ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第1速ギアインヒビター
16 1-2シフトバルブ
17 C クラッチバルブ
18 C1 クラッチダンパー
19 C1 クラッチバルブ
20 2-3 シフトバルブ
21 第2速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4 シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ(後退用)

I 排気
II スロットル
III オリフィス
IV 二又
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C1 C1 クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

位置 D
第二檔
低速

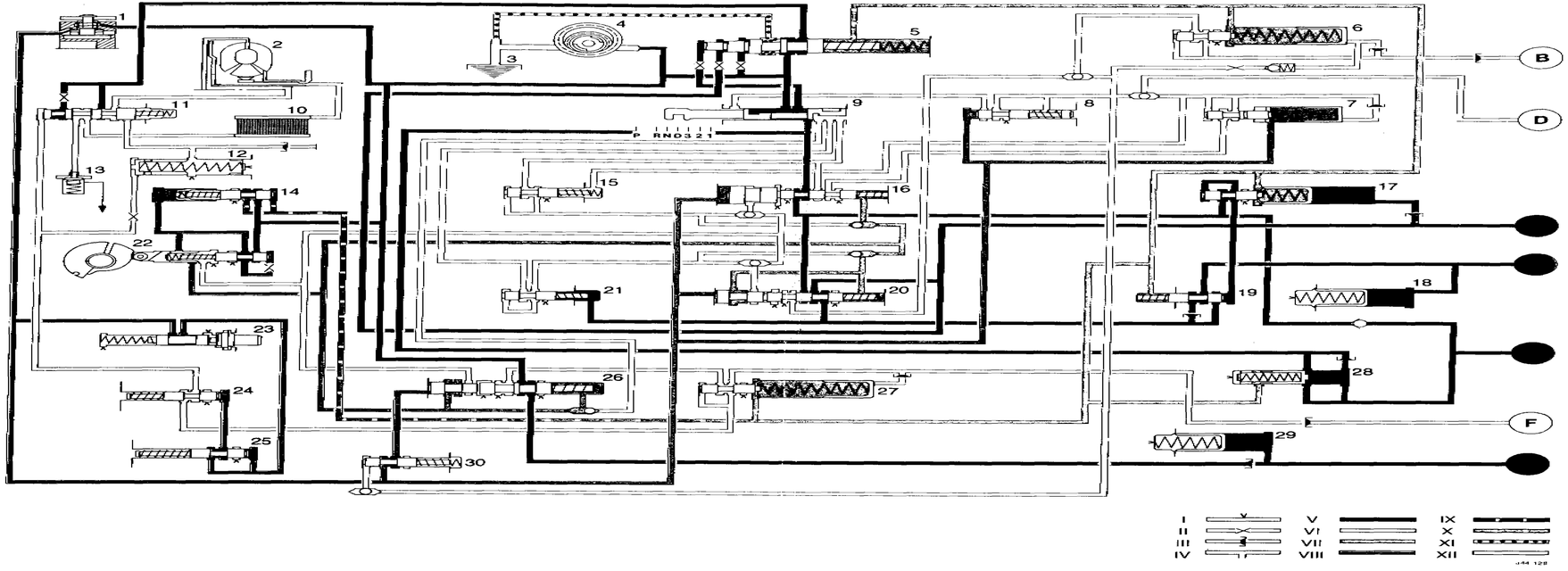
備考5

1 調速器
2 變矩器
3 油槽
4 油泵
5 油壓調節閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車閥
9 手控閥
10 油冷卻器
11 單向變矩器與倒車閥
12 變矩器離合器與阻尼器
13 單向閥
14 調制器閥
15 第一檔制止
16 1-2換檔閥
17 C離合器閥
18 C1離合器與阻尼器
19 C1離合器閥
20 2-3換檔閥
21 第二檔制止
22 節流閥
23 熱閥
24 變矩器離合器鎖閉控制閥
25 變矩器離合器滯後閥
26 3-4換檔閥
27 F離合器閥與阻尼器
28 A離合器阻尼器
29 E離合器阻尼器
30 F離合器制止閥(倒車)

1 排氣裝置
II 節流孔
III 節流孔
IV 交流管
V 主壓
VI 節流器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A離合器
B B離合器
C C離合器
C1 C1離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION D
2ND GEAR
FULL THROTTLE

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AUTOMATIC TRANSMISSION ZF 4HP 22

OIL FLOW CHART

POSITION D
2ND GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONWERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1 - 2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAA INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STEUUNG D
ZWEITER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKUHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRUCKUNGSKUPPLUNG
25 HTSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III OFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DAOSVELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
2ème VITESSE
ACCELERATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE [illegible] EMBRAYAGE DU CONVERTISSEUR
25 TIROIR A HYSTERESI D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 [illegible]
30 [illegible]

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGAAMMDELLAMANDATAD'OLIO

POSIZIONE D
2a PRIMA
A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI FNVERSIONE
12 SMORZATORE FRIZIONE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONEC'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FAIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONEDI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSINE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE AA

C FRIZIONE C
C' FRIZIONEC'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
2ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 BOMBA
4
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE 3
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MAACHA ATRAS
9 VOLVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA DE INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ªVELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DELEMBRAGUE C
18 AMORTIGUADOR DEL EMERAGUEC'
19 VALVULA DE4EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL BLOQUEO DELEMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESS, EMBRAGUEDEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VALVULA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALA INIBIZIONE FRIZIONE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION

VI PRESION PRINCIPAL
VII PRESION DEL CONVERTIDOR
VIII PRESION DEL ACELERADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUEA
B EMBRAGUEB
C EMBRAGUEC
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUEF

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HYDRAULISCHE DRUKREGELING

STAND D
2e VERSN.
VOLGAS

1 REGULATEUR
2 KOPPELOMVORMER
3 BOMPER
4
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDEEDIENDEKLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EERSRICHTINGSKLEP
14 MODULATORKLEP
15 BEGAENZER, 1e VERSNELLING
16 SCHAKELKLEP 1 - 2
17 KLEP, C-KOPPELING
18 DEMPERC'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPERE-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT)

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第２速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 一方向弁
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １－２シフトバルブ
17 C クラッチバルブ
18 C クラッチダンパー
19 C クラッチバルブ
20 ２－３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップ コントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 ３－４シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II ガス
III スロットル
IV オリフィス
V 本圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

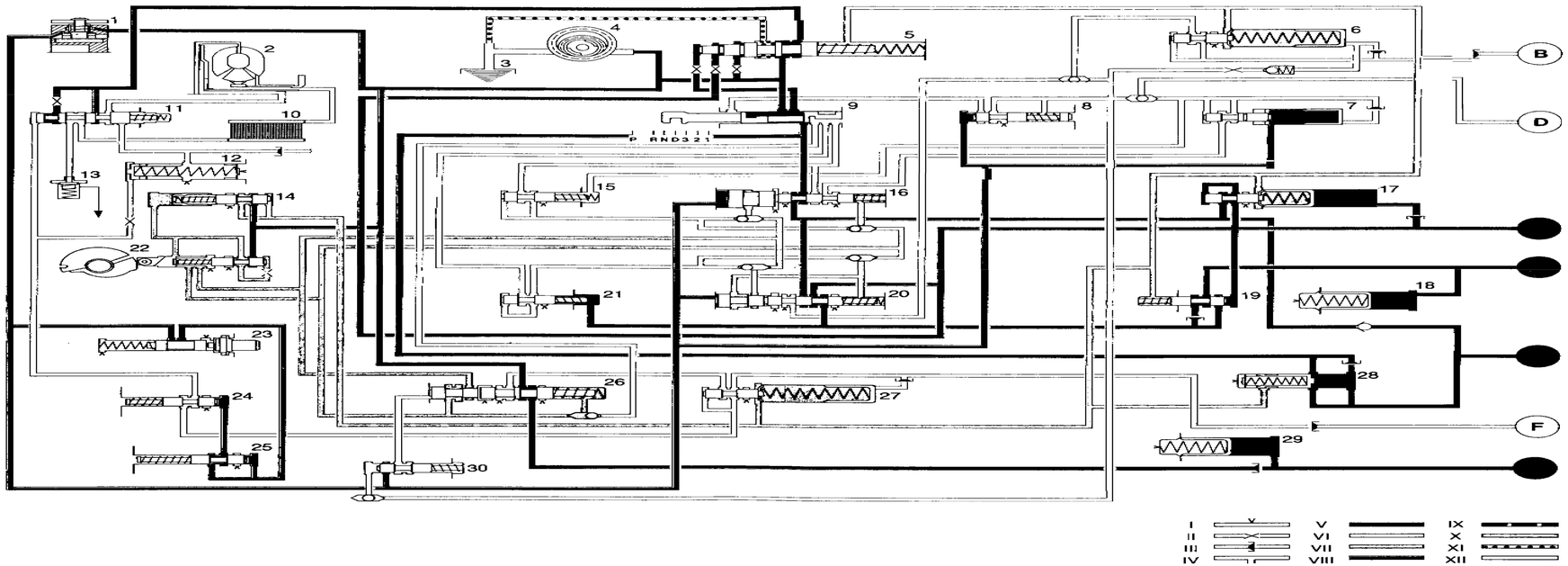
位置 D
第二檔
節流閥全開

1 調速器
2 液力變矩器
3 油底殼
4 油泵
5 油壓調節閥
6 B 離合器閥和阻尼器
7 D 離合器閥和阻尼器
8 倒檔鎖閥
9 手控閥
10 機油冷卻器
11 倒車和後退閥
12 液力變矩器離合器閥
13 單向閥
14 調壓閥
15 一檔鎖閥
16 1－2 換擋閥
17 C 離合器閥
18 C 離合器阻尼器
19 C' 離合器閥
20 2－3 換擋閥
21 二檔鎖閥
22 節氣門閥
23 溫控閥
24 液力變矩器離合器鎖止閥和控制閥
25 液力變矩器離合器遲滯閥
26 3－4 換擋閥
27 F 離合器閥和阻尼器
28 A 離合器阻尼器
29 E 離合器阻尼器
30 F 離合器閥（倒檔用）

I 排氣
II 節氣門
III 孔口
IV 分流
V 工作壓力
VI 液力變矩器壓力
VII 節氣門壓力
VIII 調速器壓力
IX 鎖止壓力
X 調壓壓力
XI 油泵壓力
XII 潤滑壓力

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D
2ND GEAR
KICKDOWN

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OIL FLOWCHART

POSITION D
2ND GEAR
KICKDOWN

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 8 CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
16 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
ZWEITER GANG
KICKDOWN

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG 8, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
2ème VITESSE
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET ORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 [illegible]
11 [illegible] JR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION I [illegible] ION
VIII PRESSION I [illegible] JR
IX PRESS N DE ERRO
X PRESSION DE [illegible]
XI PRESSION DE D I [illegible] GE
XII PRESSION DE [illegible]

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' [illegible]
D [illegible]
E [illegible]
F [illegible]

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
2a PRIMA
KICKDOWN

2 [illegible]
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 [illegible]
10 [illegible]
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE I ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZIONI
V PRESSIONE PRINCIPALE
VI PRESIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DELACEETE

POSICION D
1ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR.
3 CARTER
4 BOMBA
5 VALVOLA DE REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA DE INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMERAGUE C
18 AMORTIGUADOR DEL EMERAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVOLA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORTIGUADOR DE
28 [illegible] DOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
1e VERSN.
KICKDOWN

1 REGULATEUR
2 [illegible] OMVORMER
3 [illegible]
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, 8-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 BEPERKTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP C'-KOPPELING
20 BEGRENZER 2e/3e VERSNELLING
21 [illegible]
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A [illegible]
29 DEMPER E [illegible]
30 VERLIGHEIDSKLEP [illegible] EI F-KOPPELING

I [illegible]
II GAS
III [illegible] PENING
IV [illegible] FTAKKING
V [illegible] D [illegible] K
VI [illegible] [illegible] RI [illegible]
VII [illegible] [illegible] J
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第２速
キックダウン

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 二又
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII レギュレーター圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

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油流程圖

位置 D
第二檔
自動跳合

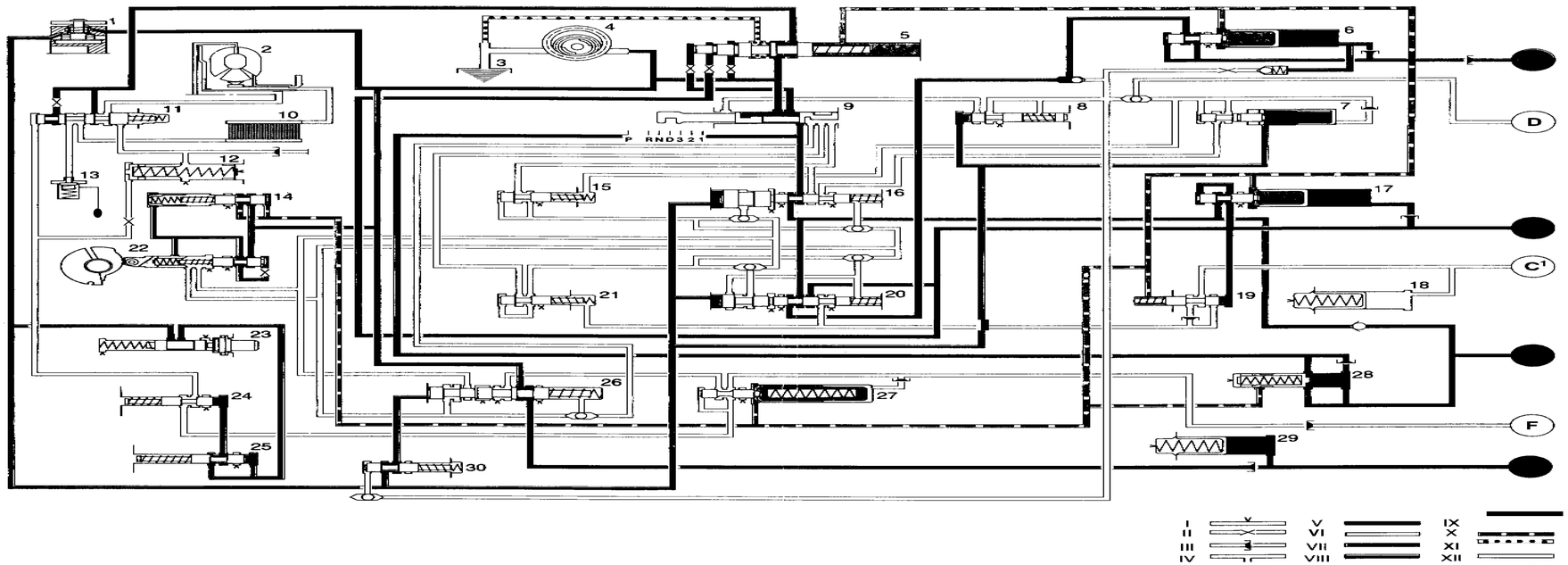
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1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車檔制止
9 手控閥
10 油冷卻器
11 變流器與反向閥
12 變流器離合器鎖定器
13 單向閥
14 調制器閥
15 第一檔制止
16 1-2換檔閥
17 C 離合器閥
18 C' 離合器阻尼器
19 C' 離合器閥
20 2-3換檔閥
21 第二檔制止
22 節流閥
23 熱閥
24 變流器離合器鎖閉控制閥
25 變流器離合器滯變閥
26 3-4換檔閥
27 F 離合器閥與阻尼器
28 A 離合器阻尼器
29 E 離合器阻尼器
30 F 離合器制止閥（倒車）

I 排氣
II 節氣門
III 節流孔
IV 支流管
V 主壓
VI 變流器壓力
VII 節流閥壓力
VIII 調壓器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D
3 RD GEAR
PART THROTTLE

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OIL FLOW CHART

POSITION D
3RD GEAR
PART THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 **PUMP**
5 **PRESSURE** REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR **INHIBIT**
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 **CONVERTOR** CLUTCH DAMPER
13 ONE WAY VALVE
14 **MODULATOR** VALVE
15 1ST GEAR **INHIBIT**
16 1-2SHIFT VALVE
17 C CLUTCH VALVE
18 **C¹ CLUTCH DAMPER**
19 **C¹ CLUTCH VALVE**
20 2-3 SHIFT VALVE
21 **2ND GEAR INHIBIT**
22 THROTTLE VALVE
23 **THERMO** VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH **VALVE** AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH **INHIBIT** VALVE **(REVERSE)**

I EXHAUST
II **THROTTLE**
III ORIFICE
IV **BRANCH**
V MAIM**PRESSURE**
VI **CONVERTER** PRESSURE
VII THROTTLE PRESSURE
VIII **GOVERNOR** PRESSUAE
IX LOCKING PRESSURE
X **MODULATION** PRESSURE
XI PUMP**PRESSURE**
XII **LUBRICATION PRESSURE**

A A CLUTCH
B B CLUTCH
C **C CLUTCH**
C¹ **C¹ CLUTCH**
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
DRITTER GANG
TEILGAS

1 REGLER
2 **DREHMOMENT**WANDLER
3 **ÖLWANNE**
4 ÖL**PUMPE**
5 DRUCK**REGELVENTIL**
6 **KUPPLUNG**B, **VENTIL** UND DAMPFUNG
7 **KUPPLUNG** D, **VENTIL** UND DAMPFUNG
8 RÜCKWART'SGANGSPERRE
9 WÄHLSCHIEBER
10 **ÖLKÜHLER**
11 WAND**ER** UND RÜCKSCHALTVENT**IL**
12 **WANDLERKUPPLUNG**, DAMPFUNG
13 RÜCKSCHLAGVENT**IL**
14 MODULATORVENT**IL**
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 **KUPPLUNG C, VENTIL**
18 KUPPLUNG C¹, DÄMPFUNG
19 **KUPPLUNG** C¹, VENTIL
20 SCH**ALTVENTIL 2-3**
21 **2.-GANG-SPERRE**
22 DROSSELVENT**IL**
23 THERMOVENT**IL**
24 STEUERVENTIL FÜR WANDLER-**ÜBERBRUCKUNGSKUPPLUNG**
25 HYSTEREVENTIL WANDLER **ÜBERBRUCKUNGSKUPPLUNG**
26 SCHALTVENTIL 3-4
27 **KUPPLUNG** F, VENTIL **UND** DÄMPFUNG
28 **KUPPLUNG** A, DAMPFUNG
29 **KUPPLUNG** E, DÄMPFUNG
30 KUPPLUNGF, SPERRVENTIL (RUCKWARTSGANG)

I **ABFLUSS**
II **DROSSEL**
III ÖFFNUNG
IV VERZWEIGUNG
V **ARBEITSDRUCK**
VI **WANDLERDRUCK**
VII **DROSSELDRUCK**
VI REGLER**DRUCK**
IX SPERR**DRUCK**
X **MODULIERDRUCK**
XI PUMPEN**DRUCK**
XII SCHMIER**DRUCK**

A KUPPLUNG A
B KUPPLUNG 3
C KUPPLUNG C
C¹ KUPPLUNG C¹
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
3e PHASE
ACCELERATION PARTIELLE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE **DE** PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARAIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET **TIROIR**
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 **EMPECHEMENT** DE PREMIERE
16 **TIROIR** DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBAAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 **EMPECHEMENT** DE SECONDE
22 TIROIR D'**ACCELERATION**
23 TIROIR **THERMOSTATIQUE**
24 TIROIR **DE** COMMANDE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 **TIROIR** DE PASSAGE **3-4**
27 TIROIR ET **AMORTISSEUR** D'EMBRAYAGE F
23 AMORTISSEUR **D'EMBRAYAGE** A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE

I **ECHAPPEMENT**
II ACCELERATEUR
III **ORIFICE**
IV **RACCORD**
V PRESS—N PRINCIPALE
VI PRESSON DE CONVERTISSEUR
VII PRESSOND'ACCELERATION
VIII PRESSON**DE REGULATEUR**
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
I I E PRESSION DE GRAISSAGE

A EMBRAYAGE A
B **EMBRAYAGE B**
C **EMBRAYAGE C**
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA **D'OLIO**

POSIZIONE D
3a FASE
AD **ACCELERAZIONE PARZIALE**

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE **a**
7 VALVOLA E SMORZATORE FRIZIONE D
8 **INIBIZIONE** RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 **CONVERTITORE** E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONACE
14 VALVOLA MODULATRICE
15 **INIBIZIONE** Tma
16 VACVOLA **CAMBIO** 1-2
17 VALVOLA FRIZIONE C
18 VALVOLA E SMORZATORE FRIZIONE C¹
19 VALVOLA FRIZIONE C'
20 VALVOLA **CAMBIO 2-3**
21 **INIBIZIONE** 2nd
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO AARESTO FRIZIONE CONVERTITORE
25 VALVOLA DISTERESI DELLA FRIZIONE **CONVERTITORE**
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV **DERIVAZION**
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI **MODULAZIONE**
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A **FRIZIONE** A
B FRIZIONE **BA**
C **FRIZIONE C**
C¹ FRIZIONE C¹
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGAAMA DE **CIRCULACION** DEL **ACEITE**

POSICION D
3ª VELOCIDAD
BLOQUEO ACELERACION **PARCIAL**

1 AEGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 **INHIBICION** DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSOAA
12 **AMORTIGUADOR**, EMBAAGUE DEL
13 **CONVERTIDOR**
14 VALVULA MODULADORA
15 **INHIBICION** DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DE LEMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C¹
19 VALVULA DE LEMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DE LACELERADOR
24 **VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR**
25 **VALVULA DE HISTERESIS DEL CONVERTIDOR**
26 **VALVULA DE CAMBIO** 3-4
27 VOLVULA Y AMORTIGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DELACELERADOR
III **ORIFICIO**
IV **BIFURCACION**
V **PRESION** PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII **PRESION** DLACELERADOR
VIII PRESION DEL **REGULADOR**
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBAAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE **DRUKREGELING**

STAND D
3e **VERSN.**
GEDEELTELIJK GAS

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP ENDEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 **A**FTERUITTANDWIELBEGRENZER
9 HANDBEDIENCE KLEP
10 **OLIEKOELER**
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER**A** EN ACHTERUITKLEP
13 **E**BNRICHTINGSKLEP
14 MODULATORKLEP
15 EGRENZER. 1e **V**ERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C¹-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 **TEMPERATUURAFHANKELIJKE**-KOPPELINGS-
24 VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-**KOPPELING**
26 KLEP EN DEMPER, F-KOPPELING
28 DEMPE**A** A-KOPPELING
29 DEMPER E-KOPPELING
30 VELIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A **A-KOPPELING**
B **B-KOPPELING**
C
C' C¹-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図
「D」の位置
第３速
スロットル半開

ガバナー
トルクコンバーター
オイルパン
ポンプ
圧力調整弁
B クラッチバルブとダンパー
C クラッチバルブとダンパー
後退ギアインヒビター
マニュアルバルブ
オイルクーラー
コンバーターと後退用バルブ
コンバーククラッチダンパー
コンバーククラッチバルブ
モジュレーターバルブ
第１速ギアインヒビター
１－２シフトバルブ
C クラッチバルブ
C¹クラッチダンパー
C¹クラッチバルブ
２－３シフトバルブ
第２速ギアインヒビター
スロットルバルブ
サーモバルブ
コンバーククラッチロックアップコントロールバルブ
コンバーククラッチヒステリシスバルブ
ケルビンダンパー
３－４シフトバルブ
F クラッチバルブとダンパー
A クラッチダンパー
E クラッチダンパー
F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV ニス
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C¹ C¹クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

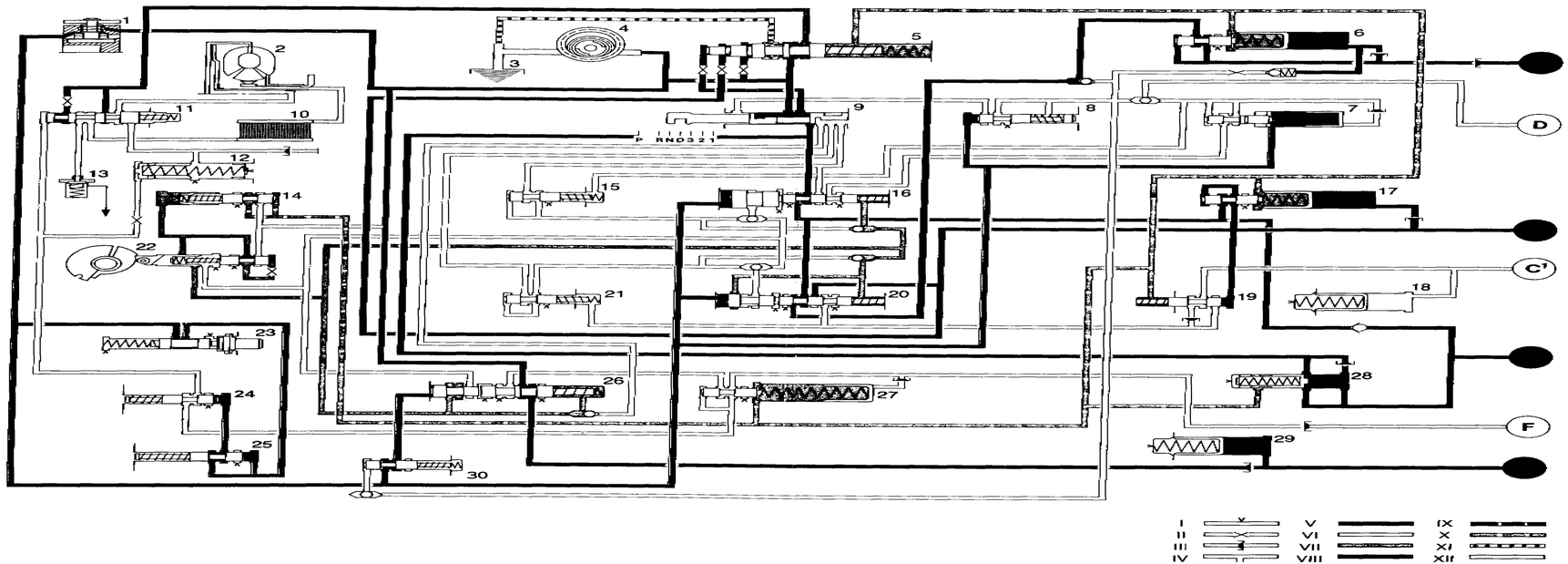
油流程圖
位置 D
第三檔
節流閥部分鎖閉

1 調速器
2 變矩器
3 油槽
4 油泵
5 壓力調節閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車閉鎖閥
9 手動閥
10. 油冷卻器
11. 油泵前蓋
12. 離合器閥與阻尼器
13. 單向閥
14 調壓閥
15. 第一檔閉鎖
16. 1-2 換檔閥
17. C 離合器閥
18. C¹離合器閥
19. C¹離合器閥與阻尼器
20. 2-3 換檔閥
21. 第二檔閉鎖閥
22 節流閥
23. 溫度閥
24. 離合器離合器調節閥
25. 離合器離合器滯後閥
26. 3-4 換檔閥
27. F 離合器閥與阻尼器
28. A 離合器阻尼器
29. E 離合器阻尼器
30. F 離合器閉止閥（倒車）

I 排氣管
II 節流閥
III 節流孔
IV 多孔節
V 主壓
VI 離合器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C¹ C¹離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D
3RD GEAR
FULL THROTTLE

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OIL FLOWCHART

POSITION D
3RD GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 E CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
E E CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
DRITTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNGS-B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DAMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ÉCOULEMENT D'HUILE

POSITION D
3e PRIME VITESSE
ACCELERATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 PCMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE D'EMBRAYAGE
25 TIROIR A HYSTERESIS
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DU CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
3a PRIMA
A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONED
8 INISIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONACE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VAEVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMEIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCAAICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
E FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION D
1ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA LNVERSORA
12 AMORTIGUADOR. EMBRAGUE D EL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMERAGUEC
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL. BLOQUEO DEL EMERAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PAINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
3e VERSN.
VOLGAS

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMERKOPPELINGSDEMPER
13 ÉENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPERC'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELUNG
22 GASBEDIENINGSKLEP
23 REGELMOLEKEP
24 VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KOEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPERE-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT)

I UITLAAT
II GAS
III OPENING
IV REGELORGLIK
V
VI OMVORMERDRUK
VII GASDRUK
VII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E
F F-KOPPELING

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オイルの流れ図

「D」の位置
第３速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 一方向弁
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C' クラッチダンパー
19 C' クラッチバルブ
20 2-3 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチコックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4 シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III 絞り口
IV 分岐
V 主圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

位置 D
第三檔
節流閥全開

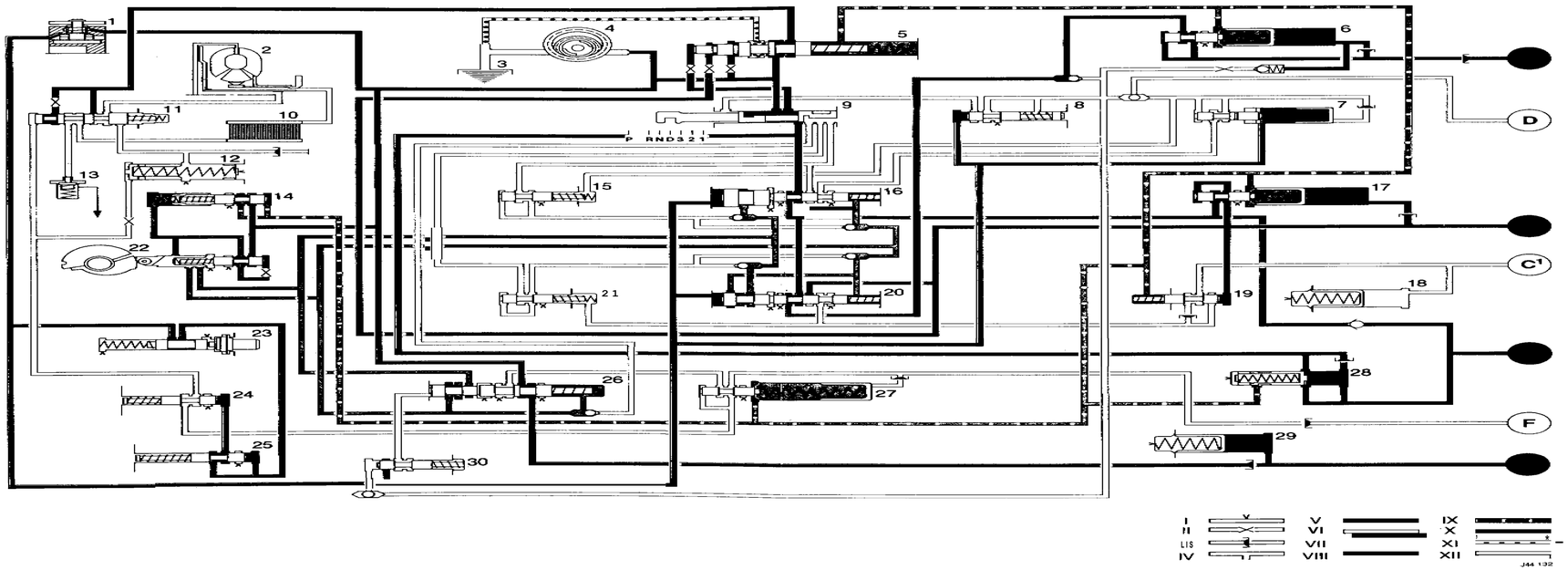
7.5

1 減速器
2 轉矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與減振器
7 D 離合器閥與減振器
8 倒車檔鎖止器
9 手控閥
10 油冷卻器
11 換向器與倒檔閥
12 離合器離合器閥與減振器
13 單向閥
14 調制器閥
15 第 1 速檔鎖止閥
16 1-2 換檔閥
17 C 離合器閥
18 C' 離合器減振器
19 C' 離合器閥
20 2-3 換檔閥
21 第 2 速檔鎖止閥
22 節流閥
23 熱閥
24 離合器離合器鎖閉控制閥
25 離合器離合器滯後閥
26 3-4 換檔閥
27 F 離合器閥與減振器
28 A 離合器減振器
29 E 離合器減振器
30 F 離合器倒車閉鎖閥（倒車）

1 排氣
2 節流閥
3 節流孔
4 油泵
5 主壓
6 轉矩器壓力
7 節流閥壓力
8 調制器壓力
9 潤滑壓力

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION D
3RD GEAR
KICKDOWN

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OIL FLOW CHART

POSITION D
3RD GEAR
KICKDOWN

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PAESSURE REGULATING VALVE
6 E CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C¹ CLUTCH DAMPER
19 C¹ CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HVSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A ACLUTCH
B BCLUTCH
C CCLUTCH
C¹ C¹CLUTCH
D DCLUTCH
E ECLUTCH
F FCLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
DRITTER GANG
KICKDOWN

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG E, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLEAKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C¹, DÄMPFUNG
19 KUPPLUNG C¹, VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL WANDLER-ÜBERBRUCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
E KUPPLUNG B
C KUPPLUNG C
C¹ KUPPLUNG C¹
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
3ème VITESSE
RETROGRADATION

1 REGUCATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE E
7 TIROIR ET AMORTISSEUR D'EMBRAYAGED
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIRMANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE
25 TIROIR A HYSTERESIS
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAVAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUA
III ORIFICE
IV RACCORD
V PRESSIONPRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSIOND'ACCELERATION
VIII PRESSION D REGULATEUR
IX PRESSIOND E VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSIONDE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAVAGEA
E EMBRAYAGE B
C EMBRAYAGE C
C¹ EMBRAYAGE C¹
D EMBRAYAGED
E EMBRAYAGEE
F EMBRAYAGEF

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DIAGRAMMDELLA MANDATA D'OLIO

POSIZIONE D
3a PRIMA
KICKDOWN

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE 3
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONFERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C¹
19 VALVOLA FRIZIONE C¹
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2ma MARCIA
22 VALVOLA TERMICA
23 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
24 TERMOVALVLA
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INWERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE E A
C FRIZIONE C
C' FRIZIONE C¹
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DELACEITE

POSICION D
3ª VELOCIDAD
RETIRARON

5 ARGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUED
8 INIBICION DE MARCHA ATRAS
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONFERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBICION DE 1ª VEL.—EDAD
16 VALVOLA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMERAGUE C¹
19 VALVULA DEL EMBRAGUE C¹
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVLA
24 VALVULA DE CONTROL BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS, EMERAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE EMBRAGUE F (INWERSIONE)

I UITLAAT
II ORIFICIO
III AFTAKKING
IV HOOFDDRUK
V OMVORMERDRUK
VI SCHUIFVENTIELDRUK
VII SCHUIFVENTIELDRUK
VIII
IX BLOKKEERDRUK
X MODULATIEDRUK
XI DRUKREGELAAR
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C¹ C¹-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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HYDRAULISCHE DRUKREGELING

STAND D
3e VERSN.
KICKDOWN

1 REGULATELFR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDEEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODUCATORKLEP
15 BEGRENZER, 1e VERSNELLFNG
16 SCHAKELKLEP 1-2
17 KLEP C-KOPPELING
18 DEMPERC¹-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 VEILIGHEIDSKLEP (ACHTERUIT)

I UITLAAT
II ORIFICE
III AFTAKKING
IV HOOFDDRUK
V OMVORMERDRUK
VI SCHUIFVENTIELDRUK
VII SCHUIFVENTIELDRUK
VIII
IX BLOKKEERDRUK
X MODULATIEDRUK
XI DRUKREGELAAR
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C¹ C¹-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第３速
キックダウン

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバーターダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアーインヒビター
16 シフトバルブ
17 C クラッチバルブ
18 C¹ クラッチバルブ
19 C クラッチダンパー
20 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバーターロックアップ コントロールバルブ
25 コンバーターロックヒステリシスバルブ
26 シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分岐
V 本圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C¹ C¹ クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

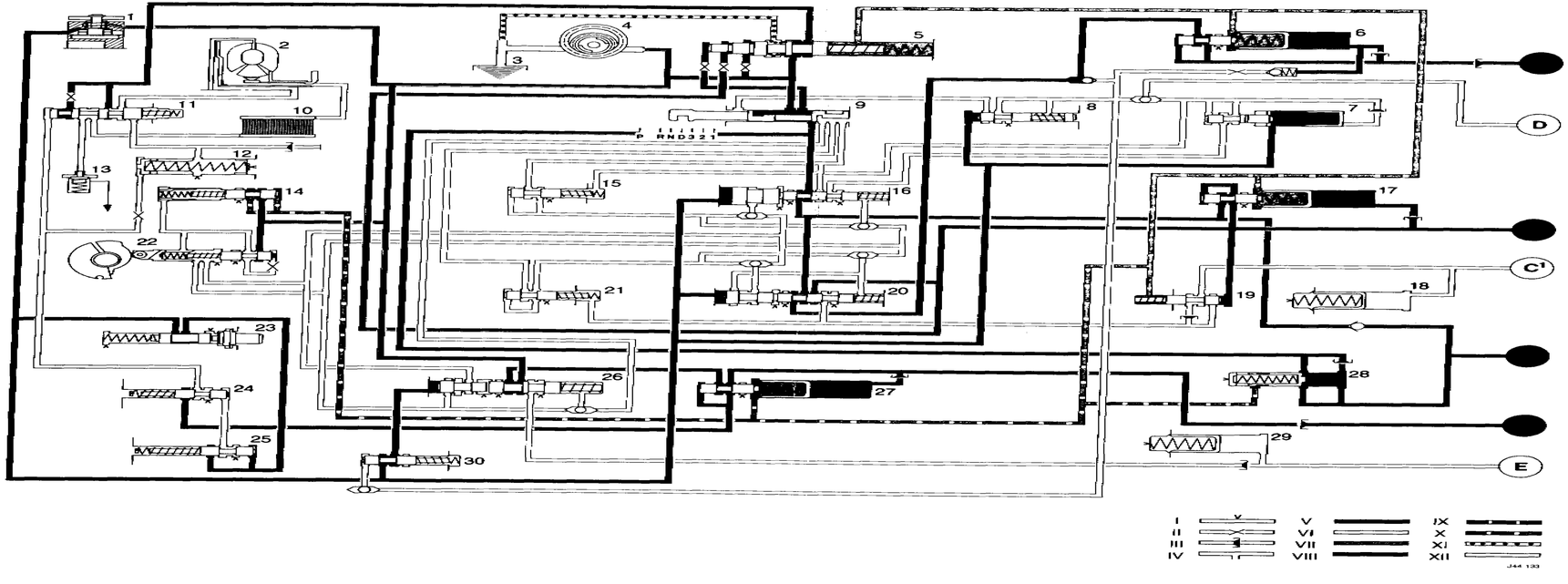
油流程圖

位置 D
第三檔
自動跳合

級 5

1 調速器
2 氣壓器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車檔制止
9 手控閥
10 冷油器
11 變矩器與單向閥
12 變矩器離合器阻尼器
13 單向閥
14 調制閥
15 第一檔制止
16 二速檔閥
17 C 離合器閥
18 C¹ 離合器阻尼器
19 C¹ 離合器閥
20 二三速閥
21 第二檔制止
22 節氣門閥
23 溫度閥
24 變矩器離合器鎖住閥與控制閥
25 變矩器離合器滯後閥
26 三四速閥
27 F 離合器閥與阻尼器
28 A 離合器阻尼器
29 E 離合器阻尼器
30 F 離合器倒檔閥與阻尼器

OIL FLOW CHART



POSITION D
4TH GEAR
PART THROTTLE

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OILFLOWCHART

POSITION D
4TH GEAR
PART THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE **REGULATING** VALVE
6 **S** CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR **INHIBIT**
9 MANUAL VALVE
10 OIL **COOLER**
11 CONVERTER AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1**ST** GEAR **INHIBIT**
16 1-2 SHIFT **VALVE**
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2**ND** GEAR **INHIBIT**
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 **SHIFT** VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH **INHIBIT** VALVE (REVERSE)

I EXHAUST
II THROTTLE
III **ORIFICE**
IV **BRANCH**
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII **THROTTLE** PRESSURE
VIII GOVERNOR PRESSURE
IX COOKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B E CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E**CLUTCH**
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
VIERTER GANG
TEILGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG E, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 **RÜCKWÄRTSGANGSPERRE**
9 **WÄHLSCHIEBER**
10 **ÖLKÜHLER**
11 **WANDLER** UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 **MODULATORVENTIL**
15 **1 -GANG-SPERRE**
16 **SCHALTVENTIL** 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 **SCHALTVENTIL 2-3**
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIC
24 **STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG**
25 HYSTERESEVENTIL WANDLER-**ÜBERBRÜCKUNGSKUPPLUNG**
26 **SCHALTVENTIL 3-4**
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V AREEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
E KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
4ème VITESSE
ACCELERATION PARTIELLE

1 REGUCATEUR
2 CONVEATISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGED
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DERETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECOMDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DECONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORITSSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'**EMPECHEMENT** D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEJA
III **ORIFICE**
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGEA
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGEE
F EMBRAYAGEF

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DIAGAAMM DELLA MANDATA **D'OLIO**

POSIZIONE D
4a PRIMA
AD ACCELERAZIONE PARZIALE

1 REGOCATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E **SMORZATORE** FRIZIONE B
7 VALVOLA E **SMORZATORE** FRIZIONE D
8 **INIBIZIONE** RETROMARCIA
9 VOLVOLA **MANUALE**
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA **UNIDIREZIONALE**
14 VALVOLA MODULATRICE
15 **INIBIZIONE** 1ma
16 VALVOLA **CAMBIO** 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA **CAMBIO** 2-3
21 **INIBIZIONE** 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA **DI** CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE **CONVERTITORE**
VII PRESSIONE C FARFALLA
VIII PRESSIONE REGOLATORE
IX **PRESSIONE DI BLOCCAGGIO**
X PRESSIONE DI **MODULAZIONE**
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONED
E FRIZIONEE
F FRIZIONE F

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DIAGRAMA DE **CIRCULACION**
DEL ACEITE

POSICION D
4ª VELOCIDAD
RETIRAROR

1 REGWLADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 **VALVULA** REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE E
7 VALVULA Y AMORTIGUADOR DE EMERAGUED
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA **UNIDIRECCIONAL**
14 VALVULA MODULADORA
15 **INHIBICION** DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL **EMBRAGUE** C
18 AMORTIGUADOR DEL EMERAGUEC'
19 VALVULA DEL EMBRAGUEC'
20 **VALVULA DE CAMBIO** 2-3
21 **INHIBICION DE 2ª VELOCIDAD**
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL. BLOQUEO DEL **EMBRAGUE** DEL CONVERTIDOR
25 **VALVULA DE** HISTERESIS
26 EMBRAGUE DEL CONVERTIDOR
27 **VALVULA DE CAMBIO 3-4**
28 VALVULA Y AMORITGUADOR DE EMBRAGUE F
30 **VALVULA INHIBICION** DE EMBRAGUE F (MARCHA ATRAS)

I **RETORNO**
II MARIPOSA **DEL** ACELERADOR
III **ORIFICIO**
IV EIRURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION **DEL** ACELERADOR
VIII PRESION DEL REGULADOR
IX **PRESION DE BLOQUEO**
X PRESION **DE** MODULACION
XI PRESION DE LA BOMBA
XII **PRESION** DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBAAGUEC
C' EMBRAGUEC'
D EMBRAGUED
E EMBRAGUEE
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND **D**
GED DE **VIERSNK** GAS

1 AEWLATEUR
2 KOPPELOMVORMER
3 CARTER
4 **POMP**
5 DRUKREGELKLEP
6 KLEPENDEMPER, B-KOPPELING
7 KLEPENDEMPER, C-KOPPELING
8 **ACHTERUITTANDWIELBEGRENZER**
9 HANDBEDIENGE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 **EENRICHTINGSKLEP**
14 **MODULATORKLEP**
15 BEGRENZER, 1e VERSNECLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 **DEMPER** C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 **GASBEDIENINGSKLEP**
23 THERMOKLEP
24 **REGELKLEP**, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEPENDEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 **KLEPDEMPER** (ACHTERUIT)

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII **GASDRUK**
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII **SMEERDRUK**

A A-KOPPELING
a **B-KOPPELING**
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置

第４速

スロットル半開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウェイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップ コントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4 シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分流
V 本圧
VI コンバーター圧力
VII レギュレーター圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C'クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

5

1. 調速器
2. 変矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B 離合器與制動片差器
7. D 離合器與制動片差器
8. 倒車檔制止
9. 手控閥
10. 油冷卻器
11. 變矩器與後退閥
12. 變矩器離合器與片差器
13. 單向閥
14. 調制器閥
15. 第一檔制止
16. 1-2 換檔閥
17. C 離合器閥
18. C'離合器減震器
19. C'離合器閥
20. 2-3 換檔閥
21. 第二檔制止
22. 節流閥
23. 熱閥
24. 變矩器離合器鎖閉控制閥
25. 變矩器離合器滯後閥
26. 3-4 換檔閥
27. F 離合器與制動片差器
28. A 離合器減震器
29. E 離合器減震器
30. F 離合器倒車制止閥（倒車）

1 排氣
II 節氣門
III 孔口
IV 分流
V 主壓
VI 變矩器壓力
VII 調壓器壓力
VIII 調速器壓力
IX 鎖緊壓力
X 調制壓力
XI 泵壓
XII 潤滑壓力

A A 離合器
B B 離合器
C C 離合器
C' C'離合器
D D 離合器
E E 離合器
F F 離合器

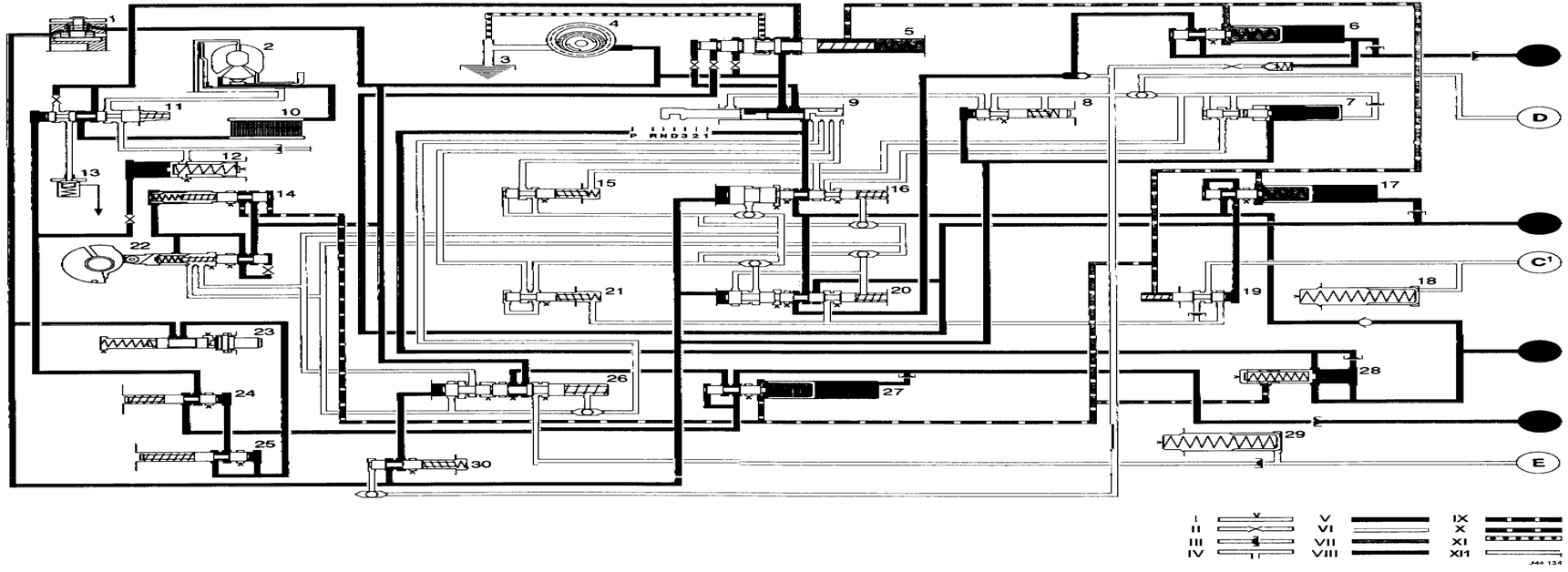
油流程圖

位置 D

第四檔

節流閥部分開

OIL FLOW CHART



POSITION D
4TH GEAR
PART THROTTLE LOCKUP

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OIL FLOWCHART

POSITION D
4TH GEAR
PARTTHROTTLE LOCK UP

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2SHIFT VALVE
17 C CLUTCH DAMPER
18 C' CLUTCH VALVE
19 2-3SHIFT VALVE
20 2ND GEAR INHIBIT
21 THROTTLE VALVE
22 THERMO VALVE
23 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
24 CONVERTOR CLUTCH HYSTERISIS VALVE
25 3-4 SHIFT VALVE
26 F CLUTCH VALVE AND DAMPER
27 A CLUTCH DAMPER
28 E CLUTCH DAMPER
29 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
VIERTER GANG
TEILGASARRETIERUNG

5 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 **ÖLPUMPE**
5 DRUCKREGELVENT**IL**
6 **KUPPLUNG B, VENTIL UND DÄMPFUNG**
7 **KUPPLUNG D, VENTIL UND DÄMPFUNG**
8 RUCKWÄRTSGANGSPERRE
9 **WÄHLSCHIEBER**
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG- **DÄMPFUNG**
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 **SCHALTVENTIL 1-2**
17 **KUPPLUNG C, VENTIL**
18 **KUPPLUNG C', DÄMPFUNG**
19 **KUPPLUNG C', VENTIL**
20 SCHALTVENTIL 2-3
21 **2.-GANG-SPERRE**
22 **DROSSELVENTIL**
23 THERMOVENTIL
24 STEUERVENTIL **FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG**
25 HYSTERESEVENTIL, WANDLER-**ÜBERBRÜCKUNGSSKUPPLUNG**
26 **SCHALTVENTIL 3-4**
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNGA, DÄMPFUNG
29 KUPPLUNG E **DÄMPFUNG**
30 KUPPLUNG F, SPERRVENTIL **(RÜCKWÄRTSGANG)**

I **ABFLUSS**
II **DROSSEL**
III ÖFFNUNG
IV **VERZWEIGUNG**
V **ARBEITSDRUCK**
VI **WANDLERDRUCK**
VII **DROSSELDRUCK**
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A **KUPPLUNG A**
B **KUPPLUNG B**
C **KUPPLUNG C**
C' **KUPPLUNG C'**
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION D
4ème VITESSE
VERROUILLAGE D'ACCELERATION PARTIELLE

1 REGULATEUR
2 CONVERTISSEUR **DE** COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR D'AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR **D'EMBRAYAGE** E
30 TIROIR D'EMPECHEMENT D EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II **ACCELERATEUR**
III ORIFICE
IV **RACCORD**
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
4a PRIMA
BLOCCAGGIO AD ACCELERAZIONE PARZIALE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA **FRIZIONE** C
18 **SMORZATORE** FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA **CAMBIO** 2-3
21 **INIBIZIONE 2nda**
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE **CONVERTITORE**
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 **VALVOLA** INIBIZIONE FRIZIONE F **(INV**ERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX **PRESSIONE DI BLOCCAGGIO**
X PRESSIONE DI **MODULAZIONE**
XI **PRESSIONE POMPA**
XII **PRESSIONE** DI LUBRIFICAZIONE

A **FRIZIONE** A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DCAGRAMA DE CIRCULACION DELACECTE

POSICION D
4ª VELOCIDAD
BLOQUEO ACCELERACION PARCIAL

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 **BOMBA**
5 VALVULA REGULADORA DE PRESION
6 VALVULA AMORTIGUADOR DE **EMBRAYAGE B**
7 VALVULA AMORTIGUADOR DE **EMBRAYAGE D**
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA **INVERSORA**
12 **AMORTIGUADOR**, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALWLA MODULADORA
15 **INHIBICION DE** 1ª VELOCIDAD
16 **VALVULA** DECAMBIO 1-2
17 **VALVULA** DEL EMBRAGUE C
18 **AMORTIGUADOR** DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA **CAMBIO** 2-3
21 **INHIBICION** DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE **CONTROL** BLOQUEO DEL EMBRAGUEDE CONVERTIDOR
25 VALVULA DEHISTERESIS. EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE
28 AMORTIGUADOR DE EMBRAGLIE A
29 **AMORTIGUADOR DE EMBRAGUE** E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II **ACELERACION DEL ACELERADOR**
III ORIFICIO
IV **BINRCACION**
V **PRESION PRINCIPAL**
VI **PRESION DEL CONVERTIDOR**
VII **PRESION DEL ACELERADOR**
VIII **PRESION DEL REGULADOR**
IX **PRESION DE BLOQUEO**
X **PRESION DE MODULACION**
XI **PRESION DE LA BOMBA**
XII **DE LUBRICACION**

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBAAGUED
E EMBRAGUEE
F **EMBRAGLIE F**

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HYDRAULISCHE DRUKREGELING

STAND D
4e VERSN.
GEDEELTELIJK GAS GEBLOKKEERO

1 REGULATEUR
2 KOPPELOMVORMER
3 **CARTER**
4 POMP
5 **DRUK**REGELKLEP
6 KLEP ENDEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 **OLIEKOELER**
11 OMVORMER EM ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 **EENRICHTINGSKLEP**
14 **MODULATORKLEP**
15 BEGRENZER, 1e VERSNELLING
16 SCHAKELKLEP 1 - 2
17 KLEP, C-**KOPPELING**
18 MMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN **OMVORMER**
25 HYSTERESISKLEP, OMVORMER-**KOPPELING**
26 **SCHAKELKLEP 3-4**
27 KLEPENDEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 **INHIBISHEIDSKLEP (ACHTERUIT)**

I **UITLAAT**
II GAS
III **OPENING**
IV **HOOFDDRUK**
V
VI OMVORMERDRUK
VII **GASDRUK**
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII **SMEERDRUK**

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D **D-KOPPELING**
E
F F-KOPPELING

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オイルの流れ図

「D」の位置
第４速
スロットル半開ロックアップ

1. ガバナー
2. トルクコンバーター
3. オイルパン
4. ポンプ
5. **圧力**調整弁
6. B クラッチバルブとダンパー
7. D クラッチバルブとダンパー
8. バック**ギアイン**ヒビター
9. マニュアルバルブ
10. オイルクーラー
11. コンバーターと後退用バルブ
12. コンバータークラッチダンパー
13. ワンウエイバルブ
14. モジュレーターバルブ
15. 第１速ギアインヒビター
16. １-２シフトバルブ
17. C クラッチバルブ
18. C'クラッチダンパー
19. C'クラッチバルブ
20. ２-３シフトバルブ
21. 第２速ギアインヒビター
22. スロットルバルブ
23. サーモバルブ
24. コンバータークラッチロックアップ コントロールバルブ
25. コンバータークラッチヒステリシスバルブ
26. ３-４シフトバルブ
27. F クラッチバルブとダンパー
28. A クラッチダンパー
29. E クラッチダンパー
30. F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 二又
V 主圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X **調整**圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C'クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

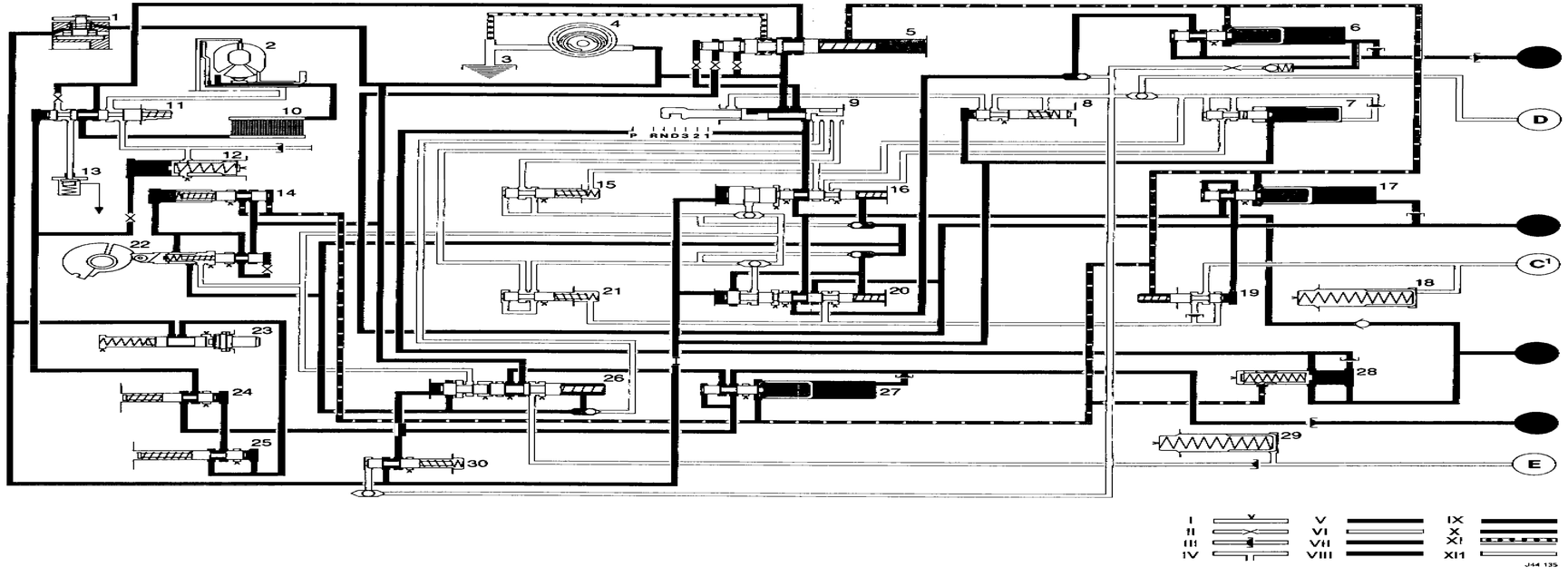
位置 D
第四檔
節流閥部分鎖閉

1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B離合器閥和阻尼器
7. D離合器閥和阻尼器
8. 倒車檔制止
9. 手控閥
10. 冷卻器閥
11. 換流器與反向閥
12. 換流器離合器閥和阻尼器
13. 單向閥
14. 調制器閥
15. 第一檔制止
16. 1-2換檔閥
17. C離合器閥
18. C'離合器閥和阻尼器
19. C'離合器閥
20. 2-3換檔閥
21. 第二檔制止
22. 節流閥
23. 熱閥
24. 換流器離合器鎖閉控制閥
25. 換流器離合器滯後閥
26. 3-4換檔閥
27. F離合器閥和阻尼器
28. A離合器阻尼器
29. E離合器阻尼器
30. F離合器制止閥（倒車）

I 排氣
II 節流閥
III 節流孔
IV 支流管
V 主壓
VI 換流器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調壓力
XI 泵壓
XII 潤滑壓

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION D
4TH GEAR
FULL THROTTLE LOCK UP

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OIL FLOW CHART

POSITION **D**
4TH GEAR
FULL THROTTLE LOCK UP

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSE NG VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERESIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI W M P PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG D
VIERTER GANG
VOLLGASARRETIERUNG

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RUCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DAMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPCUNG A, DAMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUN-G
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION **D**
4ème VITESSE
PLEIN GAZ
VERROUILLAGE D'ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMERAYAGE A
B EMERAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMERAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE D
4a PRIMA
BLOCCAGGIO A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 **POMPA**
5 VALVOLA DE REGOLAZIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTLTORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MOWLATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA **CAMBIO** 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FAIZIONE F (INVERSIONE)

I SCARICO
II FARFALA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGAAMA DE CIRCULACION DEL ACEITE

POSICION D
BLOQUEO MAXIMA ACELERACION

1 REGULA——
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA **MANUAL**
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL **CONVERTIDOR**
13 VALVULA UNIDIRECCIONAL
14 VALVULA **MODULADORA**
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 VALVULA DE **ACELERADOR**
23 VALVULA DE **CONTROL, BLOQUEO** DEL EMBRAGUE DEL CONVERTIDOR
24 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE CAMBIO 3-4
26 VALVULA Y AMORTIGUADOR DE EMBRAGUE F
27 AMORTIGUADOR DE **EMBRAGUE** A
28 AMORTIGUADOR DE **EMBRAGUE** E
29 **VALVULA INHIBICION** DE EMBRAGUE F (MARCHA ATRAS)

II MANDRIGA DEL ACELERADOR
III **ORIFICIO**
IV BIFURCACION
V PRESION PRINCIPAL
VI **PRESION DEL CONVERTIDOR**
VII PRESION DEL ACELERADOR
VIII **PRESION** DEL **REGULADOR**
IX PRESION DE BLOQUEO
X **PRESION DE MODULACION**
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBAAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND D
4DE VERSN.
VOLGAS GEBLOKKEERD

1 REGULATEUR
2 KOPPELOMVORMER
3
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 KOPPELOMVORMER VERSNELLING
16
17 KLEP, C-KOPPELING
18 DEMPER C-KOPPELING
19 KLEP, C-KOPPELING
20 KOPPELOMVORMER VERSNELLING
21
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELINGS
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 VEILGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOGDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「D」の位置
第４速
スロットル全開、ロックアップ

I ガバナー
II トルクコンバーター
III オイルパン
IV ポンプ
V 圧力調整弁
VI Bクラッチバルブとダンパー
VII Cクラッチバルブとダンパー
VIII 後退ギアインヒビター
IX マニュアルバルブ
X オイルクーラー
XI コンバーターと後退用バルブ
XII コンバーターCクラッチダンパー
XIII モジュレーターバルブ
XIV 第１速ギアインヒビター
XV １-２シフトバルブ
XVI Cクラッチバルブ
XVII C'クラッチダンパー
XVIII C'クラッチバルブ
XIX ２-３シフトバルブ
XX 第２速ギアインヒビター
XXI スロットルバルブ
XXII 熱応答弁
XXIII コンバーターロックアップ
XXIV コンバータークラッチヒステリシスバルブ
XXV ３-４シフトバルブ
XXVI Fクラッチバルブとダンパー
XXVII Aクラッチダンパー
XXVIII Eクラッチダンパー
XXIX Fクラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分岐
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X ポンプ圧力
XI 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

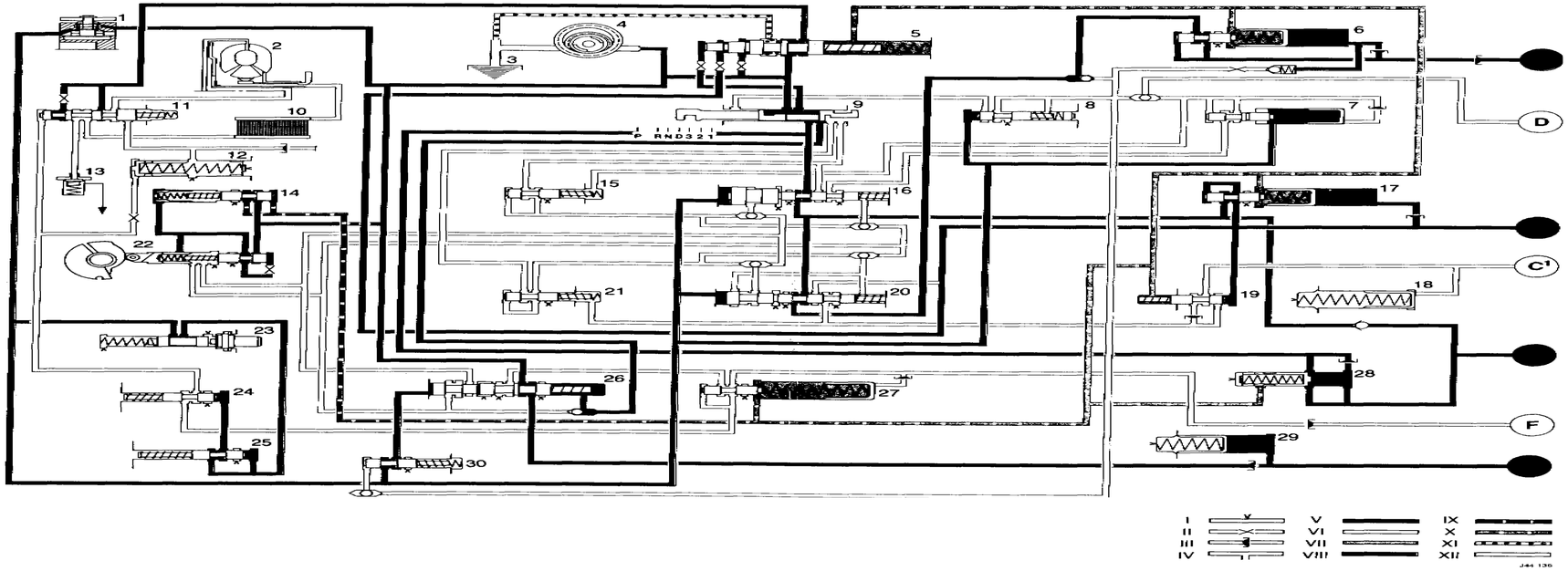
位置 D
第四檔
節流閥全開閉鎖

I 調速器
II 變矩器
III 油槽
IV 油泵
V 壓力調整閥
VI B離合器閥和阻尼器
VII C離合器閥和阻尼器
VIII 後退檔自動閉鎖器
IX 手動閥
X 油冷卻器
XI 倒車離合器閥
XII C離合器減振器
XIII 換檔調節閥
XIV 一檔閉鎖器
XV 1-2換檔閥
XVI C離合器閥
XVII C'離合器減振器
XVIII C'離合器閥
XIX 2-3換檔閥
XX 二檔閉鎖器
XXI 節流閥
XXII 熱應答閥
XXIII 變矩器鎖止調節閥
XXIV 變矩器離合器滯後閥
XXV 3-4換檔閥
XXVI F離合器閥和阻尼器
XXVII A離合器減振器
XXVIII E離合器減振器
XXIX F離合器倒車閉鎖閥

I 排氣管路
II 節流閥
III 節流孔
IV 支管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖緊壓力
X 泵壓力
XI 潤滑壓力

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION 3
3RD GEAR
PART THROTTLE

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OIL FLOW CHART

POSITION 3
3RD GEAR
PARTTHROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 **SUMP**
4 **PUMP**
5 PRESSURE **REGULATING** VALVE
6 B CLUTCH VALVE **AND** DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR **INHIBIT**
16 **1-2** SHIFTVALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 **2ND** GEAA **INHIBIT**
22 THROTTLE VALVE
23 THERMO VALVE
24 **CONVERTOR** CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCHHYSTERISIS VALVE
26 **3-4** SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH **INHIBIT** VALVE (REVERSE)

I EXHAUST
II **THROTTLE**
III OAIRICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE **PRESSURE**
VIII **GOVERNORPRESSURE**
IX LOCKINGPRESSURE
X **MODULATION** PRESSURE
XI PUMP PRESSURE
XII **LUBRICATON** PRESSURE

A A CLUTCH
B **B** CLUTCH
C **C CLUTCH**
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 3
DRITTER GANG
TEILGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 **KUPPLUNGS**B, VENTIL UND DÄMPFUNG
7 **KUPPLUNG** D, VENTIL UND **DÄMPFUNG**
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 **ÖLKÜHLER**
11 WANDLER UND **RÜCKSCHALTVENTIL**
12 **WANDLERKUPPLUNG**, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 **MODULATORVENTIL**
15 1.-GANG-SPERRE
16 **SCHALTVENTIL 1-2**
17 **KUPPLUNG** C, VENTIL
18 **KUPPLUNG** C', DÄMPFUNG
19 **KUPPLUNG** C', VENTIL
20 **SCHALTVENTIL 2-3**
21 **2.-GANG-SPERRE**
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 **HYSTERESEVENTIL, WANDLER-**ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNGF, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, **DÄMPFUNG**
29 KUPPLUNG E **DÄMPFUNG**
30 KUPPLUNGF, SPERRVENTIL **(RÜCKWÄRTSGANG)**

I ABFLUSS
II **DROSSEL**
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI **WANDLERDRUCK**
VII **DROSSELDRUCK**
VI AEGLERDRUCK
IX **SPERRDRUCK**
X MODULATORDRUCK
XI PUMPENDRUCK
XII **SCHMIERDRUCK**

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 3
3ème VITESSE
ACCELERATION PARTIELLE

1 REGULATEUR
2 CONVERTISSEUR **DE** COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE **DE** PRESSION
6 TIROIR DE L'AMORTISSEUR D'EMBRAYAGE E
7 TIROIR ET **AMORTISSEUR** D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGEDE CONVERTISSEUR
13 CLAPET DE RETENUE
14 **TIROIR DE MODULATION**
15 **EMPECHEMENT DE PREMIERE**
16 **TIROIR** DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGEC'
20 **TIROIR** DE PASSAGE **2-3**
21 EWECHEMENT DE SECONDE
22 **TIROIR** D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DECOMMANDE DE VERROUILLAGE D'EMBRAYAGE
25 DECONVERTISSEUR
TIROIR A HYSTERESIS D'**EMBRAYAGE** DECONVERTISSEUR
26 TIROIR DE PASSAGE **3-4**
23 TIROIR **ET AMORTISSEUR** D'EMBRAYAGE F
23 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR **D'EMBRAYAGE** E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE **ARRIERE)**

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DECONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE **POMPE**
XII **PRESSION DE** GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F **EMBRAYAGE** F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 3
3ª PRIMA
A D ACCELERAZIONE PARZIALE

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 **COPPA**
4 **POMPA**
5 VALVOLA DEREGOLAZIONE PRESSIONE
6 VALVOLA ESMORZATORE FRIZIONE B
7 VALVOLA ESMORZATORE FRIZIONE D
8 **INIBIZIONE** RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO VALVOLA DI
11 INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1 - 2
17 VALVOLA FRIZIONE C
18 **SMORZATORE FRIZIONE** C'
19 VALVOLA DEL EMBRAGUE C
20 VALVOLA CAMBIO 2-3
21 **INIBIZIONE 2nda**
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI **CONTROLLO** ARRESTO
FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
VALVOLA DI CAMBIO 3-4
27 VALVOLA E **SMORZATORE FRIZIONE** F
28 **SMORZATORE FRIZIONE** A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III **ORIFIZIO**
IV **DERIVAZION**
V PRESSIONE PRINCIPALE
VI **PRESISONE CONVERTITORE**
VII **PRESSIONE** FARFALLA
VIII **PRESSIONE REGOLATORE**
IX PRESSBONE **DI BLOCCAGGIO**
X PRESSIONE DI MODULAZIONE
XI **PRESSIONE POMPA**
XII PRESSIONE DI **LUBRIFICAZIONE**

A FRIZIONE A
B FRIZIONE EA
C **FRIZIONE C**
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE LACEITE

POSICION 3
3ª VELOCIDAD
ACELERACION PARCIAL

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE **PRESION**
6 VALVULA Y AMORTIGUADOR DE EMBRAGUEB
7 VALVULA Y AMORTIGUADOR DE EMERAGUED
8 **INHIBICION** DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA DE **INMERSORA**ADOR, EMBRAGUE DEL CONVERTIDCR
12 VALVULA UNIDIRECCIONAL
13 VALVULA **MODULADORA**
14 **INHIBICION DE 1ª VELOCIDAD**
15 VALVULA DE **CAMBIO** 1-2
16 VALVULA DEL EMBRAGUE C
17 AMORTIGUADOR DEL **EMBRAGUE** C'
18 VALVULA DEL EMBRAGUE C'
19 VALVOLA CAMBBO 2-3
20 **INBIZIONE 2nda**
21 VALVULA A FARFALLA
22 VALVOLA TERMICA
23 VALVOLA DE **CONTROLLO** ARRESTO
FRIZIONE CONVERTITORE
24 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS.
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE **EMBRAGUE** F
28 **SMORZATORE FRIZIONE** A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE **EMBRAGUE** F (MARCHA ATRAS)

I **RETORNO**
II MARIPOSA DEL ACELERADOR
III **ORIFICIO**
IV **DERIVACION** PRINCIPAL
V PRESION DEL CONVERTIDOR
VI **PRESION DEL** ACELERADOR
VII PRESION DEL REGULA——
VIII PRESION DE LA BOMBA
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE **B**
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND3
3e VERSN.
GEDEELTELIJK GAS

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 **BEGRENZER**, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP C-KOPPELING
18 KLEP, C'-KOPPELING
19 **KLEP**, C-**KOPPELING**
20 SCHAKELKLEP 2-3
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 **THERMOKLEP**
24 **REGELKLEP** KOPPELINGS-**VERGRENDELING** VAN **OMVORMER**
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 **DEMPER** A-KOPPELING
29 **DEMPER** E-KOPPELING
30 **VERGRENDELINGSKLEP** (ACHTERUIT) F-KOPPELING

I **UITLAAT**
II GAS
III **OPENING**
IV **AFDEKPLAAT**
V ——
VI **OMVORMERDRUK**
VII GASDRUK
VIII REGULATEURDRUK
IX **SMEERDRUK**
X ——
XI **POMPDRUK**
XII SMEEADRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図
「3」の位置
第３速
スロットル半開

1 調整器
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2 シフトバルブ
17 C クラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3 シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップ コントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4 シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III 開口
IV カバープレート
V ——
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C'クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖
位置 3
第三檔
節流閥部分開

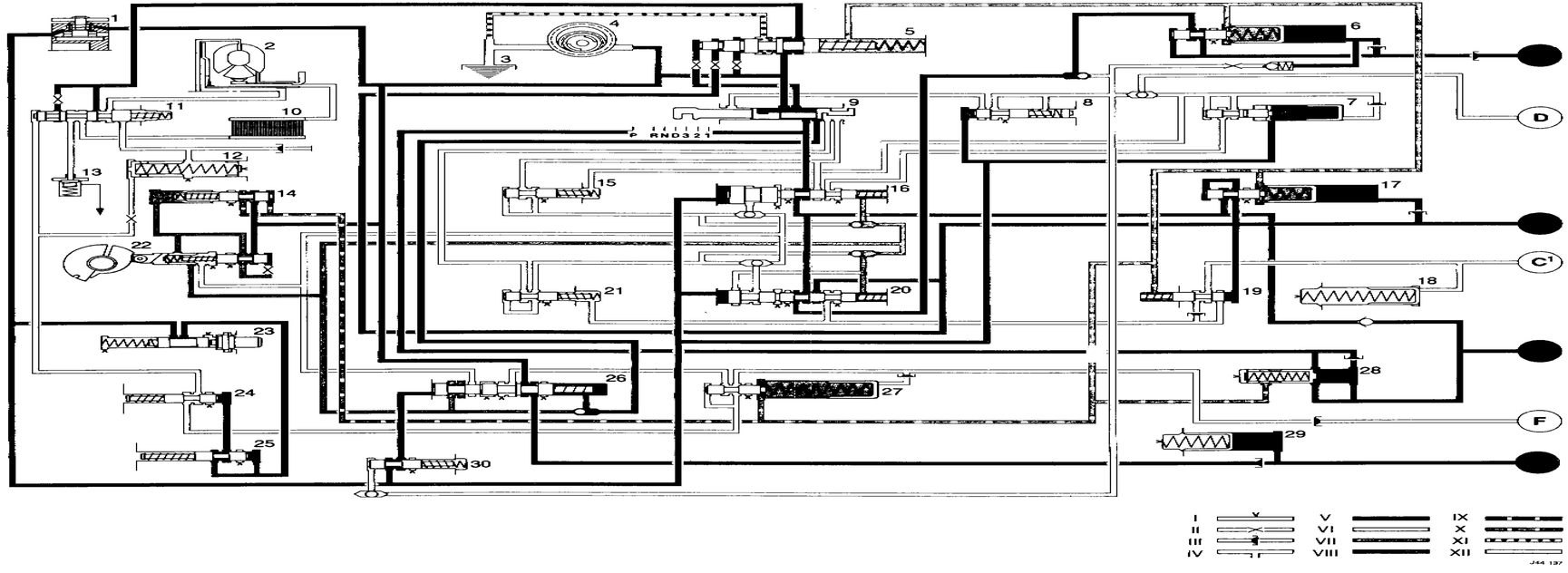
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1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B 離合器閥和阻尼器
7 D 離合器閥和阻尼器
8 倒車檔測止
9 手控閥
10 油冷却器
11 換向器和定向閥
12 換向器離合器阻尼器
13 單向閥
14 調制器閥
15 第一檔測止
16 1-2 換向閥
17 C 離合器閥
18 C' 離合器阻尼器
19 C' 離合器閥
20 2-3 換向閥
21 第二檔測止
22 節流閥閥
23 熱敏閥
24 離合器離合器鎖閉控制閥
25 換向器離合器滯後閥
26 3-4 換向閥
27 F 離合器閥和阻尼器
28 A 離合器阻尼器
29 E 離合器阻尼器
30 F 離合器測止閥（倒車）

I 排氣
II 節流閥
III 開口
IV 蓋板
V ——
VI 換向器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖緊壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION 3
3 RD GEAR
FULL THROTTLE

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OILFLOWCHART

POSITION 3
3RD GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 W M P
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B 6 CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 3
DRITTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DAMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 HANDHEBEL
10 WANDLER UND RÜCKSCHALTVENTIL
11 WANDLERKUPPLUNG, DÄMPFUNG
12 RÜCKSCHLAGVENTIL
13 MODULATORVENTIL
14 1-GANG-SPERRE
15 SCHALTVENTIL 1-2
16 KUPPLUNG C, VENTIL
17 KUPPLUNG C', DÄMPFUNG
18 KUPPLUNG C', VENTIL
19 SCHALTVENTIL 2-3
20 2-GANG-SPERRE
21 DROSSELVENTIL
22 THERMOVENTIL
23 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
24 HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 SCHALTVENTIL 3-4
26 KUPPLUNG F, VENTIL UND DÄMPFUNG
27 KUPPLUNG A, DÄMPFUNG
28 KUPPLUNG E, DÄMPFUNG
29 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)
30

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VIII AEGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 3
3ème UITESSE
ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE D EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVEATISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
a EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 3
3a PRIMP.
A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE
6 VALVOLA ESMORZATORE FRIZIONE 6
7 VALVOLA ESMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VALVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSORA
12 SMORZATORE FRIZIONE CONVEATITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2na
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI M L L A FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA ESMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRIESISSONECONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI CONVERTISSEUR
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION 3
3ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 BOMBA
4
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 RADIATORE DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBAAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DE LEMBBAAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VALVULA Y AMORTIGUADOR DE
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
a EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGLIE F

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HYDRAULISCHE DRUKREGEUNG

STAND 3
3. VERSN.
VOLGAS

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 OLIEPOMP
5 OLIEREGELKLEP
6
7 KLEP EN DEMPER, B-KOPPELING
8 KLEP EN DEMPER, C-KOPPELING
9 ACHTERUITTANDWIELBEGRENZER
10 HANDBEDIENDE KLEP
11 OLIEKOELER
12 OMVORMER EN ACHTERUITKLEP
13 OMVORMER EN KOPPELINGSDEMPER
14 TERUGSCHRIJFKLEP
15 MODULATORKLEP
16 BEGRENZER, 1e VERSNELLING
17 SCHAKELKLEP 1-2
18 KLEP, C-KOPPELING
19 DEMPER C'-KOPPELING
20 TERUGSCHRIJFKLEP
21 BEGRENZER, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 VERLIGHEIDSKLEP (ACHTERUIT)
F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' D-KOPPELINGS
D
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「3」の位置
第３速
スロットル全開

1. ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5. 圧力調整弁
6. Bクラッチバルブとダンパー
7. Dクラッチバルブとダンパー
8 後退ギアインヒビター
9. マニュアルバルブ
10. オイルクーラー
11 コンバーターと後退用バルブ
12. コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15. 第１速ギアインヒビター
16. 1-2シフトバルブ
17. Cクラッチバルブ
18. C'クラッチダンパー
19. C'クラッチバルブ
20. 2-3シフトバルブ
21. 第２速ギアインヒビター
22. スロットルバルブ
23. サーモバルブ
24. コンバータークラッチコックアップ コントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26. 3-4シフトバルブ
27. Fクラッチバルブとダンパー
28. Aクラッチダンパー
29. Eクラッチダンパー
30. Fクラッチインヒビターバルブ（後退用）
I 排気
II スロットル
III オリフィス
IV 分岐管
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

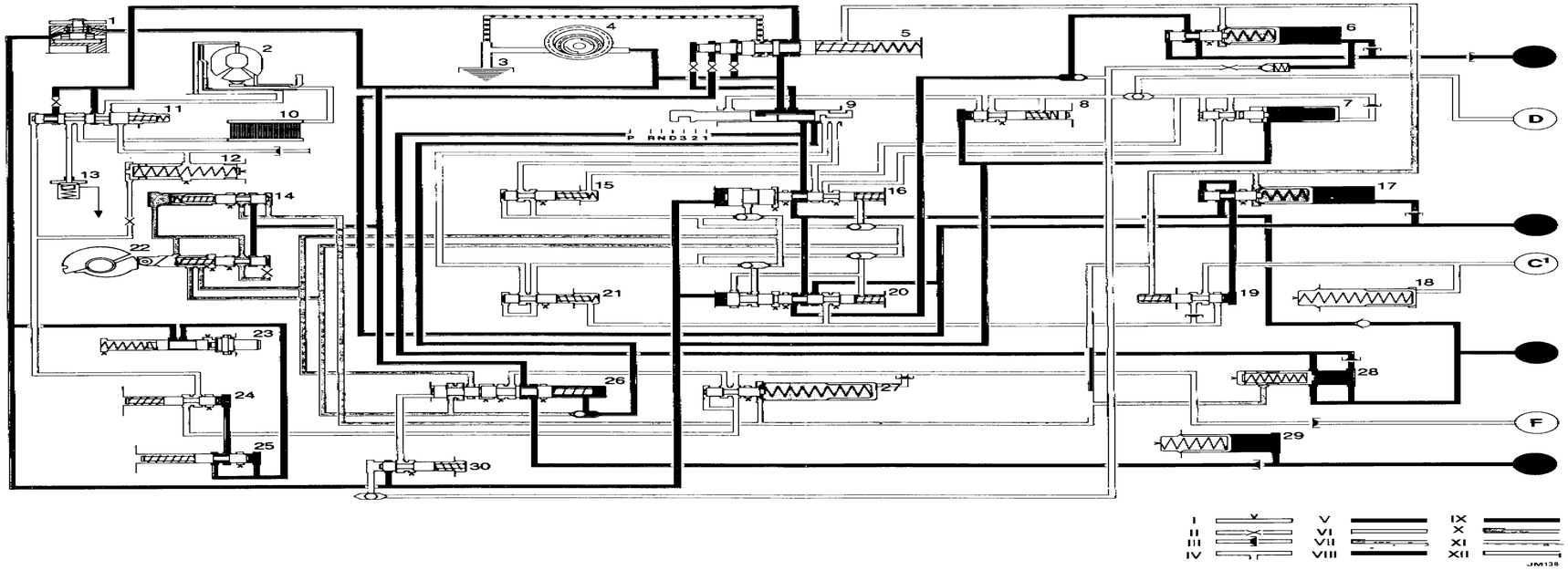
油流程圖

位置 3
第三檔
節流閥全開

1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 壓力調整器
6. B離合器閥和阻尼器
7. D離合器閥和阻尼器
8. 倒車閉鎖
9. 手動閥
10. 油冷卻器
11. 換向器和倒向閥
12. 離合器離合器阻尼器
13. 單向閥
14. 調節閥
15. 第一檔禁止
16. 1-2換檔閥
17. C離合器閥
18. C'離合器阻尼器
19. C'離合器閥
20. 2-3換檔閥
21. 第二檔禁止
22. 節流閥
23. 熱閥
24. 離合器離合器鎖閉控制閥
25. 離合器離合器滯後閥
26. 3-4換檔閥
27. F離合器閥和阻尼器
28. A離合器阻尼器
29. E離合器阻尼器
30. F離合器倒退閥（倒車）
I 排氣
II 節流閥
III 孔口
IV 分流管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 換擋壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION *3*
3 RD GEAR
KICKDOWN

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OIL FLOW CHART

POSITION 3
3RD GEAR
KICKDOWN

1 **GOVERNOR**
2 TORQUE CONVERTOR
3 **SUMP**
4 W M P
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 **MANUAL** VALVE
10 **OIL COOLER**
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 **ONE** WAY VALVE
14 **MODULATOR** VALVE
15 1ST GEAR **INHIBIT**
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 **SHIFT** VALVE
21 2ND GEAR **INHIBIT**
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH **INHIBIT** VALVE (REVERSE)

I EXHAUST
II **THROTTLE**
III **ORIFICE**
IV BRANCH
V MAIN **PRESSURE**
VI CONVERTER PRESSURE
VII **THROTTLE** PRESSURE
VIII GOVERNOR PRESSURE
IX **LOCKING PRESSURE**
X MODULATION PRESSURE
XI W M P **PRESSURE**
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 3
DRITTER GANG
KICKDOWN

1 **REGLER**
2 DREHMOMENTWANDLEA
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 **KUPPLUNG** B, VENTIL UND **DÄMPFUNG**
7 **KUPPLUNG** D, **VENTIL UND** DÄMPFUNG
8 **RÜCKWÄRTSGANGSPERRE**
9 **WÄHLSCHIEBER**
10 **ÖLKÜHLER**
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 **MODULATORVENTIL**
15 1-GANG-**SPERRE**
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 **KUPPLUNG** C', DÄMPFUNG
19 **KUPPLUNG** C', VENTIL
20 **SCHALTVENTIL** 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 **THERMOVENTIL**
24 **STEUERVENTIL** FÜR WANDLER-**ÜBERBRÜCKUNGSKUPPLUNG**
25 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND **DÄMPFUNG**
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RUCKWÄRTSGANG)

I ABFLUSS
II **DROSSEL**
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI **REGLERDRUCK**
VII **DROSSELDRUCK**
VIII **REGLERDRUCK**
IX SPEARDRUCK
X MODULIERDRUCK
XI **PUMPENDRUCK**
XII SCHMIERDRUCK

A **KUPPLUNG** A
a KUPPLUNG B
C **KUPPLUNG** C
C' **KUPPLUNG** C'
D **KUPPLUNG** D
E **KUPPLUNG** E
F **KUPPLUNG** F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 3
3ème VITESSE
RETROGRADATION

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE L'HUILE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESS——
6 **TIROIR** ET AMORTISSEUR D'EMBRAYAGE B
3 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 **TIROIR MANUEL**
10 REFROIDISSEUR D'HUILE
11 **CONVERTISSEUR ET TIROIR** D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE **MODULATION**
15 EMPECHEMENT DE PREMIERE
16 **TIROIR DE PASSAGE** 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 **TIROIR** DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VERROUILLAGE **D'EMBRAYAGE** DE CONVERTISSEUR
25 **TIROIR** A HYSTERESIS
D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
23 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 **AMORTISSEUR** D'EMBRAYAGE A
29 **AMORTISSEUR** D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV **RACCORD**
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C **EMBRAYAGE** C
C' EMBRAYAGE C'
D EMBRAYAGE D
E **EMBRAYAGE** E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 3
3a PRIMA
KICKDOWN

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 **COPPA**
4 **POMPA**
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE **B**
7 VALVOLA E **SMORZATORE** FRIZIONE D
8 **INIBIZIONE** RETROMARCIA
9 VOLVOLA MANUALE
10 **RADIATORE OLIO**
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 **INIBIZIONE** 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO
FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA **FRIZIONE CONVERTITORE**
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE **FRIZIONE** A
29 SMORZATORE **FRIZIONE** E
30 VALVOLA **INIBIZIONE** FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV **DERIVAZIONE**
V PRESSIONE PRINCIPALE
VI PRESSIONE **CONVERTITORE**
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSI——E DI LUBRIFICAZIONE

A FRIZIONE A
a FRIZIONE B A
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE ACEITE

POSICION 3
3ª VELOCIDAD
KICKDOWN

1 **REGULADOR** DE PAR
2 CONVERTIDOR
3 CARTER
4 **POMBA**
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 **INHIBICION DE** MARCHA ATRAS
9 VALVULA MANUAL
10 **ENFRIADOR DE ACEITE**
11 CONVERTIDOR Y VALVULA DE INVERSION
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVULA **MODULADORA**
15 INHIBICION DE **1ª VELOCIDAD**
16 VALVULA **DE CAMBIO** 1-2
17 VALVULA DEL EMBRAGUE C
18 **AMORTIGUADOR** DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA **DE** L ACELERADOR
23 TERMOVALVULA
24 VALVULA DE **CONTROL**, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS, EMBAAGUE DEL CONVERDIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y **AMORITGUADOR DE** EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA **INHIBICION DE** EMBRAGUE F (INVERSION)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV **BIFURCACION**
V **PRESION PRINCIPAL**
VI PRESION DEL CONVERTIDOR
VII **PRESION** DEL ACELERADOR
VIII **PRESION** DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
a EMBRAGUE B
C **EMBRAGUE** C
C' C'
D EMBRAGUE D
E **EMBRAGUE** E
F **EMBRAGUE** F

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HYDRAULISCHE **DRUKREGELING**

STAND 3
3-VERSN.
KICKDOWN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 **POMP**
5 **DRUK**REGEL**KLEP**
6 KLEP EN **DEMPER**, B-KOPPELING
7 KLEP EN **DEMPER**, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 **OLIE**KOEL**ER** EN DE **KLEP**
10 **OMVORMER** EN **ACHTERUITKLEP**
11 OMVORMER **KOPPELINGS**DEMPER
12 OMVORMER **KOPPELINGS**KLEP
13 **TERUG**SLAG**KLEP**
14 **MODULATOR**KLEP
15 **BEGRENZER**, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP **C-KOPPELING**
18 **DEMPER** C'-KOPPELING
19 KLEP, **C-KOPPELING**
20 **SCHAKELKLEP** 2-3
21 **BEGRENZER**, 2e VERSNELLING
22 GAS**BE**DIE**NING'S KLEP**
23 THERM**OKLEP**
24 **REGEL**KLEP-, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-**KOPPELING**
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 **DEMPER A-KOPPELING**
29 **DEMPER E-KOPPELING**
30 **VEILIGHEIDS**KLEP (ACHTERUIT) F-**KOPPELING**

I UITLAAT
II GAS
III **OPENING**
IV **AFTAKKING**
V **HOOFDDRUK**
VI OMVORMER**DRUK**
VII **GAS**DRUK
VIII REGULATEURDRUK
IX **BLOKKEER**DRUK
X **MODULATIEDRUK**
XI **SMEER**DRUK
XII

A **A-KOPPELING**
a **B-KOPPELING**
C **C-KOPPELING**
C' **C'-KOPPELING**
D **D-KOPPELING**
E **E-KOPPELING**
F **F-KOPPELING**

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オイルの流れ図

「3」の位置
第３速
キックダウン

1 レギュレーター
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 **圧力調整弁**
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 １-２シフトバルブ
17 C クラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 ２-３シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 ３-４シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オフィス
IV 二叉
V 油圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C'クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

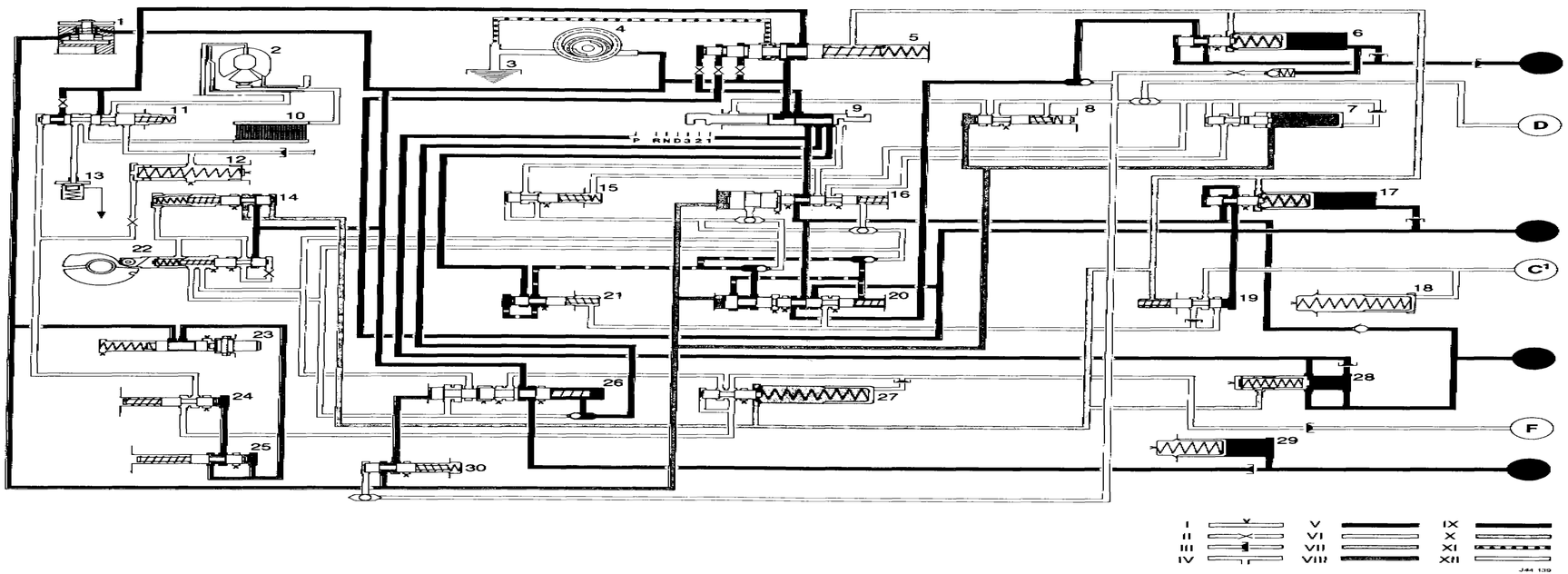
位置 3
第三檔
自動鎖合

1. 調整器
2. 變矩器
3. 油槽
4. 油泵
5. 調壓閥
6. B 離合器閥和阻尼器
7. D 離合器閥和阻尼器
8. 倒車檔制止
9. 手控閥
10. 油冷卻器
11. 變矩器與倒退閥
12. 變矩器離合器阻尼器
13. 單向閥
14. 調制器閥
15. 第一檔制止
16. 1-2 換檔閥
17. C 離合器閥
18. C'離合器阻尼器
19. C'離合器閥
20. 2-3 換檔閥
21. C'離合器閥
22. 節流閥
23. 溫控閥
24. 變矩器離合器鎖閉控制閥
25. 變矩器離合器滯後閥
26. 3-4 換檔閥
27. F 離合器閥和阻尼器
28. A 離合器阻尼器
29. E 離合器阻尼器
30. F 離合器制止閥（倒車）

I 排氣
II 節流閥
III 節流孔
IV 支流管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖緊壓力
X 調壓壓力
XI 泵壓
XII 潤滑壓力

A A 離合器
B B 離合器
C C 離合器
C' C'離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION *2*
3RD GEAR
IDLING

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OIL FLOW CHART

POSITION 2
3RD GEAR
IDLING

1 GOVEANOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSUREREGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSENG VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVEATOA CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 2
DRITTER GANG
LEERLAUF

1 REGLER
2 DREHMOMENTWANDLER
3 **OLWANNE**
4 **OLPUMPE**
5 DRUCKREGELVENTIL
6 **KUPPLUNG** B, VENTIL UND DÄMPFUNG
7 **KUPPLUNG** D, **VENTIL** UND DÄMPFUNG
8 **RÜCKWÄRTSGANGSPERRE**
9 **WÄHLSCHIEBER**
10 ÖLKÜHLER
11 WANDLER UND **RÜCKSCHALT**VENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL **2-3**
21 2.GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL **FÜR** WANDLER-**ÜBERBRUCKUNGS**KUPPLUNG
25 HYSTERESEVENTIL, WANDLER-**ÜBERBRÜCKUNGS**KUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNGF, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, **DÄMPFUNG**
29 KUPPLUNGE, DÄMPFUNG
30 KUPPLUNGF, **SPERRVENTIL** (**RÜCKWÄRTSGANG**)

I ABFLUSS
II **DROSSEL**
III **OFFNUNG**
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VI **DROSSELDRUCK**
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNGA
B KUPPLUNGB
C KUPPLUNGC
C' KUPPLUNGC'
D KUPPLUNGD
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 2
3ème VITESSE
RALENTI

1 REGULATEUR
2 CONVEATISSEUR D E COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE **PRESSION**
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D-EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 **TIROIR MANUEL**
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR **D'INVERSION**
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE **2-3**
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE **COMMANDE DE VERROUILLAGE** D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D-EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D-EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D-EMBRAYAGE E
30 **TIROIR D'EMPECHEMENT** D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III **ORIFICE**
IV **RACCORD**
V PRESSIONPRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE **MODULATION**
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRATAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE **D**
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA **D'OLIO**

POSIZIONE 2
3a PRIMA
MINIMO

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 **COPPA**
4 **POMPA**
5 VALVOLA DEREGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE **FRIZIONE** B
7 VALVOLA E SMORZATORE **FRIZIONE** D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA **MODULATRICE**
15 **INIBIZIONE 1ma**
16 VALVOLA **CAMBIO** 1 - 2
17 VALVOLA **FRIZIONE** C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO AARESTO **FRIZIONE** CONVERTITORE
25 VALVOLA DI ISTERESI DELLA **FRIZIONE** CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE **FRIZIONE** F
28 **SMORZATORE FRIZIONE** A
29 **SMORZATORE** FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F

I SCARICO
II FARFALLA
III **ORIFIZIO**
IV **DERIVAZION**
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE E FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI **BLOCCAGGIO**
X PRESSI——E **DI MODULAZIONE**
XI PRESSIONE POMPA
XII PRESSI——E DI **LUBRIFICAZIONE**

A **FRIZIONE** A
a **FRIZIONE BA**
C **FRIZIONE** C
C' FRIZIONE C'
D **FRIZIONE** D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE LA CEITE

POSICION 2
3-VELOCIDAD
RALENTI

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE **B**
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE **D**
8 INHIBICION DE MARCHA ATRAS
9 VOLVULA MANUAL
10 RADIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL **CONVERTIDOR**
13 VALVULA UNIWRECCIONAL
14 VALVULA MODULADORA
15 **INHIBICION DE 1ª VELOCIDAD**
16 VALVULA DE CAMBIO 1 - 2
17 VALVULA DEL **EMBRAGUE** C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL, **BLOQUEO** DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS, EMERAGUE DEL **CONVERTIDOR**
26 VALVULA DE CAMBIO 3-4
27 VOLVULA Y AMORITGUADOR DE **EMBRAGUE** F
28 AMORTIGUADOR DE **EMBRAGUE** A
29 AMORTIGUADOR DE **EMBRAGUE** E
30 VALVULA **INHIBICION** DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MAREPOSA DEL ACELERADOR
III **ORIFICIO**
IV **BIFURCACION**

VI **PRESION DEL CONVERTIDOR**
VII PRESION DEL ACELERADOA
VIII PRESION DEL REGULADOR

IX **PRESION DE REGULACION**
X PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUEA
B EMBRAGUEB
C EMBRAGUEC
C' EMBRAGUEC'
D EMBRAGUED
E EMBRAGUEE
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 2
3-STATIONAIR TOEREWTAN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 **DRUKREGELKLEP**
6 KLEP EN DEMPER, B-KOPPELING
7 KLEP EN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMSLAGVENTIEL EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 **MODULATORKLEP**
15 **BEGRENZER, 1e VERSNELLING**
16 SCHAKELKLEP 1 - 2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 **BEGRENZER, 2e VERSNELLING**
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-KOPPELING
26 SCHAKELKLEP 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-KOPPELING
30 VERLIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I **UITLAAT**
II GAS
III OPENING
IV AFTAKKING
V **HOOFDDRUK**
VI OMVORMERDRUK
VII GASDRUK
VIII SMEERDRUK

IX MODULATIEDRUK
X **POMPDRUK**
XII SMEERDRUK

A A-KOPPELING
a B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「2」の位置
第３速
アイドリング

油流程図
位置２
第三檔
低速

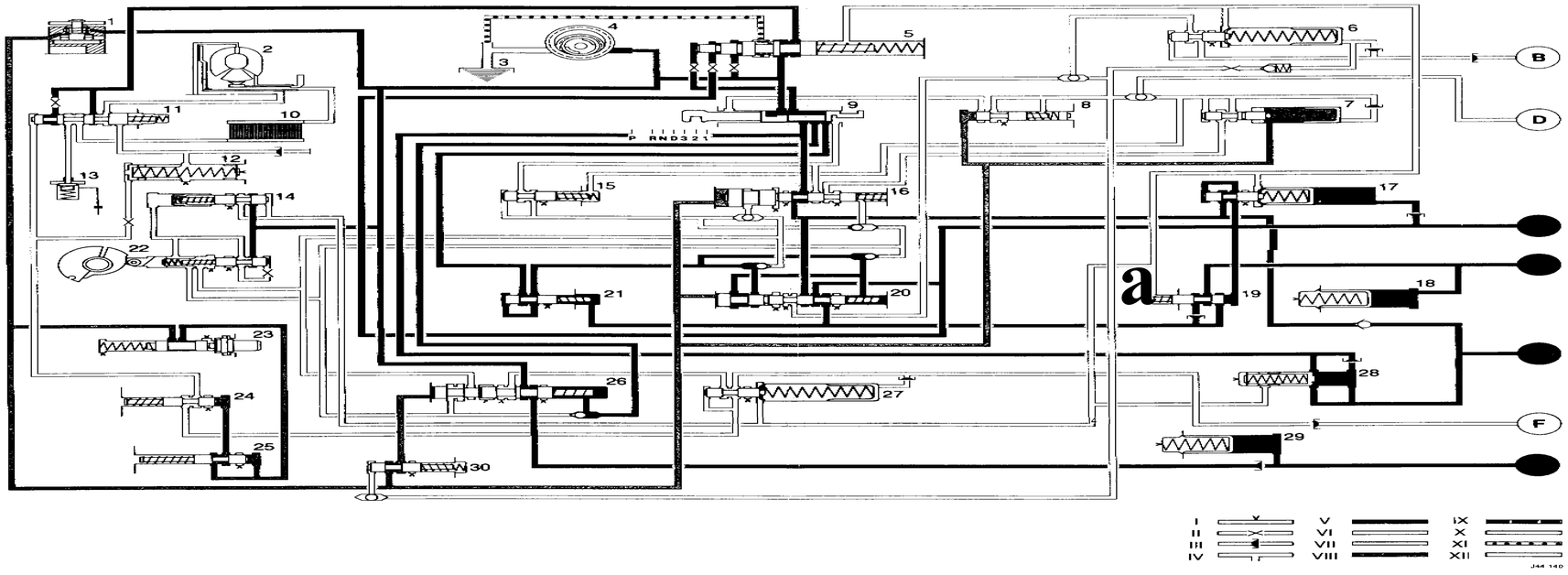
1. ガバナー
2. トルクコンバーター
3. オイルパン
4. ポンプ
5. 圧力調整弁
6. B クラッチバルブとダンパー
7. D クラッチバルブとダンパー
8. 後退ギアインヒビター
9. マニュアルバルブ
10. オイルクーラー
11. コンバーターと後退用バルブ
12. コンバータークラッチダンパー
13. ワンウエイバルブ
14. モジュレーターバルブ
15. 第１速ギアインヒビター
16. 1-2 シフトバルブ
17. C クラッチバルブ
18. C' クラッチダンパー
19. C' クラッチバルブ
20. 2-3 シフトバルブ
21. 第２速ギアインヒビター
22. スロットルバルブ
23. サーモバルブ
24. コンバータークラッチロックアップ コントロールバルブ
25. コンバータークラッチヒステリシスバルブ
26. 3-4 シフトバルブ
27. F クラッチバルブとダンパー
28. A クラッチダンパー
29. E クラッチダンパー
30. F クラッチインヒビターバルブ（後退用）

1 排気
II スロットル
III オリフィス
IV 二又
V 高圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C' C' クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

1 潤滑装置
2 変矩器
3 油槽
4 油泵
5 減壓閥
6 B 離合器閥與阻尼器
7 D 離合器閥與阻尼器
8 倒車檔閉止
9 手控閥
10 油冷却器
11 換向器與单向閥
12 換向器離合器阻尼器
13 單向閥
14 調制器閥
15 第一檔閉止
16 1-2檔檔閥
17 C離合器閥
18 C'離合器阻尼器
19 C'離合器閥
20 2-3檔檔閥
21 第二檔閉止
22 節流閥
23 熱閥
24 換向器離合器鎖閉控制閥
25 換向器離合器滯閉閥
26 3-4檔檔閥
27 F離合器閥與阻尼器
28 A 離合器阻尼器
29 E 離合器阻尼器
30 F 離合器倒止閥（倒車）

OIL FLOW CHART



POSITION 2
2ND GEAR
FULL THROTTLE

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OIL FLOW CHART

POSITION 2
2ND GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSUREREGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCHVALVE AND DAMPER
8 REVERSEGEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERT — AND REVERSING VALVE
12 CONVERT — CLUTCH DAMPER
13 ONEWAY VALVE
14 MODULATORVALVE
15 1ST GEAR INHIBIT
16 1-2SHIFT VALVE
17 C CLUTCH VALVE
18 C¹ CLUTCH DAMPER
19 C¹ CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMOVENTIL
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERT — CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A UUTCH
B B CLUTCH
C C CLUTCH
C¹ C¹ CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 2
ZWEITER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UNDRÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C¹, DÄMPFUNG
19 KUPPLUNG C¹, VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRUCKUNGSKUPPLUNG
25 HYSTERESEVENTIL WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C¹ KUPPLUNG C¹
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DCAGRAMME D'ECOULEMENT D'HUILE

POSITION 2
2ème VITESSE
ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DEL'IQUIDS
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D' EMBRAYAGE E
7 TIROIR ET AMORTISSEUR D'EMBAAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C¹
19 TIROIR D'EMBRAYAGE C¹
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE VEADOUILCAGE D'EMBRAYAGE DE CONVEATISSEUR
25 TIROIR A HYSTERESIS D' EMBRAYAGE DE CONVEATISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D' EMBRAYAGE A
29 AMORTISSEUR D' EMBRAYAGE E
30 TIROIR D' EMPECHEMENT D' EMBRAYAGE F (MARCHE ARRIERE

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSIOND' ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSIONDE VERROUILLAGE
X PRESSIONDE MODULATION
XI PRESSIONDE POMPE
XII PRESSIONDE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C¹ EMBRAYAGE C¹
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 2
A 2a VELOCITA

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE SMORZATORE FRIZIONE B
6 VALVOLA E SMORZATORE FRIZIONE D
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RET—MARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DE INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA CAMBIO 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C¹
19 VALVOLA FRIZIONE C¹
20 VALVOLA CAMBIO 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C'
C¹
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DCAGRAMA DE CIRCULACION DE ACEITE

POSICION 2
2ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAYAGE B
7 AMORTIGUADOR DE EMBRAYAGE D
8 INHIBICION DE MARCHA ATRAS
9 VALVULA MANUAL
10 ENFRIADOR DE ACEITE
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR DIRECCIONAL
13
14 VALVULA MODULADORA
15 INHIBICION DE 1ª VELOCIDAD
16 VALVULA DE CAMBIO 1-2
17 VALVULA DEL EMBAAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C¹
19 VALVULA DEL EMBRAGUE C¹
20 VALVULA DE CAMBIO 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
25 VALVULA DE HISTERESIS EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VALVULA Y AMORITGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBAAGUE A
29 AMORTIGUADOR DE EMBAAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II MARPPOSA DEL ACELERADOR
III ORIFICIO
IV DERIVACION PRINCIPAL
V
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESION DEL REGUADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 2
2e VERSN.
VOLGAS

1 AEGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEPEN DEMPER, E-KOPPEUNG
7 KLEPEN DEMPER, C-KOPPELING
8 ACHTERUITTANDWIELBEGRENZER
9 HANDBEDIENDE KLEP
10 OLIEKOELER
11 OMVORMER EN ACHTERUITKLEP
12 OMVORMER KOPPELINGSDEMPER
13 EENRICHTINGSKLEP
14 MODULATORKLEP
15 BEGRENZER, I e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 EEGRENZER 2a VERSNELLING
22 GASBEDIENINGSKLEP
23 THERMOKLEP
24 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVOAMER
25 HYSTERESISKLEP, OMVORMER-KOPPELINGS
26 SCHAKELKLEP 3-4
27 KLEPEN DEMPER, F-KOPPELING
28 DEMPEA A-KOPPEUNG
29 DEMPER E-KOPPELING
30 VELIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING
C C-KOPPELING
C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「2」の位置
第２速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 B クラッチバルブとダンパー
7 D クラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 ワンウエイバルブ
14 モジュレーターバルブ
15 第１速ギアインヒビター
16 1-2シフトバルブ
17 C クラッチバルブ
18 C¹クラッチダンパー
19 C¹クラッチバルブ
20 2-3シフトバルブ
21 第２速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4シフトバルブ
27 F クラッチバルブとダンパー
28 A クラッチダンパー
29 E クラッチダンパー
30 F クラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III 開放口
IV 支点
V 本圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロックング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A A クラッチ
B B クラッチ
C C クラッチ
C¹ C¹クラッチ
D D クラッチ
E E クラッチ
F F クラッチ

油流程圖

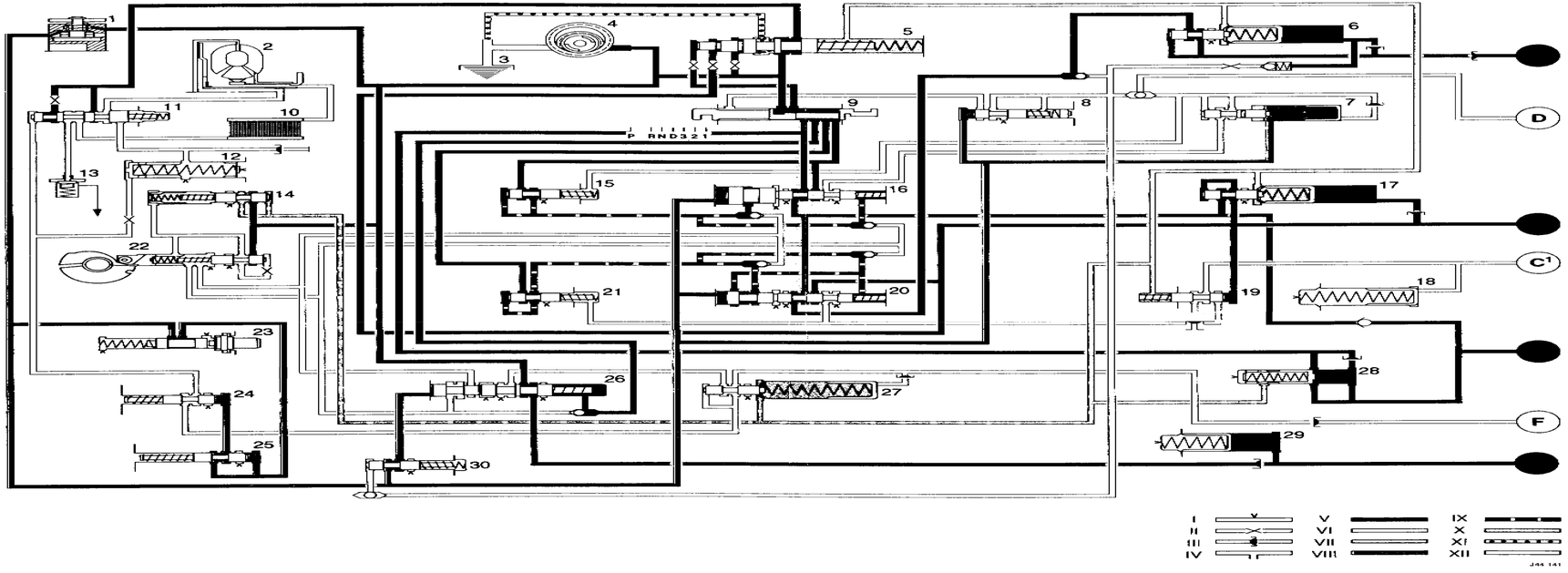
位置 2
第二檔
節流閥全開

1 調速器
2 變矩器
3 油槽
4 油泵
5 油壓調整閥
6 B離合器閥和阻尼器
7 D離合器閥和阻尼器
8 後退檔互鎖閥
9 手控閥
10 油冷卻器
11 變矩器閥和後退閥
12 變矩器離合器阻尼器
13 單向閥
14 調制器閥
15 第一檔互鎖閥
16 1-2換檔閥
17 C離合器閥
18 C¹離合器阻尼器
19 C¹離合器閥
20 2-3換檔閥
21 第二檔互鎖閥
22 節流閥閥
23 變矩器離合器鎖閉控制閥
24 變矩器離合器滑閥
25 變矩器離合器滯後閥
26 3-4換檔閥
27 F離合器閥和阻尼器
28 A離合器阻尼器
29 E離合器阻尼器
30 F離合器換檔閥（倒車）

1 排氣
I 節氣門
II 節流閥
III 孔口
IV 支承管
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調節壓力
XI 泵壓
XII 潤滑壓力

A A離合器
B B離合器
C C離合器
C¹ C¹離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION 1
3 RD GEAR
IDLING

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OIL FLOW CHART

POSITION 1
3RD GEAR
IDLING

1 GOVERNOR
2 TORQUE CONVERTOR
3 **SUMP**
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE **AND** DAMPER
8 REVERSE GEAR **INHIBIT**
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 **SHIFT** VALVE
21 2ND GEAR **INHIBIT**
22 THROTTLE VALVE
23 **THERMO** VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 **HYSTERESEVENTIL** WANDLER-ÜBERBRUCKUNGSKUPPLUNG
26 3-4 SHIFT VALVE
27 **F** CLUTCH VALVE **AND** DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH **INHIBIT** VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV **BRANCH**
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII **THROTTLE PRESSURE**
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
xi PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B **B** CLUTCH
C C CLUTCH
C' **C'** CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 1
DRITTER GANG
LEERLAUF

1 **REGLER**
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNGS**B**. VENTILUND DÄMPFUNG
7 KUPPLUNG**D**, **VENTIL** UND DÄMPFUNG
8 **RÜCKWÄRTSGANGSPERRE**
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 **MODULATORVENTIL**
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 **KUPPLUNG** C, **VENTIL**
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 **THERMOVENTIL**
24 STEUERVENTIL FÜR WANDLER-ÜBERBRUCKUNGSKUPPLUNG
25 **HYSTERESEVENTIL** WANDLER-ÜBERBRUCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DAMPFUNG
29 KUPPLUNGE, **DAMPFUNG**
30 **KUPPLUNG** F, SPERRVENTIL (RÜCKWÄRTSGANG)

I **ABFLUSS**
II **DROSSEL**
III ÖFFNUNG
IV **VERZWEIGUNG**
V **ARBEITSDRUCK**
VI WANDLERDRUCK
VII **DROSSELDRUCK**
VI **REGLERDRUCK**
IX SPERR**DRUCK**
X **MODULIER**DRUCK
XI **PUMPENDRUCK**
XII SCHMIERDRUCK

A KUPPLUNG A
B KUPPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D **KUPPLUNG** D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 1
3e PRIME VITESSE
RALENTI

1 REGUCATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 **POMPE**
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 **INHIBICION** DE MARCHA ATRAS
10 REFROIDISSEUR **D'HUILE**
11 INVERSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 **VALVOLA MODULATION**
15 EMPECHEMENT CE PREMIERE
16 **TIROIR** DE PASSAGE 1-2
17 TIROIR **D'** EMBRAYAGE C
18 **AMORTISSEUR** D EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR **THERMOSTATIQUE**
24 TIROIR DE **COMMANDE** DE VERROUILLAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 **TIROIR** DE PASSAGE 3-4
27 SOUPAPE AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 **TIROIR** D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSDN DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION **DE MODULATION**
XI PRESSION DE POMPE
XII PRESSDN DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C **EMBRAYAGE** C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 1
3a PRIMA
MARCIA AL MINIMO

1 **REGO**CATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 **POMPA**
5 VALVOLA DE REGOLAZIONE PRESS**IONE**
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADEATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 **SMORZATORE FRIZIONE CONVERTITORE**
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 VALVOLA **CAMBIO** 1-2
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA **FRIZIONE** C'
20 VALVOLA **CAMBIO** 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI **CONTROLLO** ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE **FRIZIONE** A
29 SMORZATORE **FRIZIONE** E
30 VALVOLA **INIBIZIONE** FRIZIONE F **(INVERSIONE)**

I SCARICO
II FARFALLA
III **ORIFIZIO**
IV DERIVAZION
V **PRESSIONE** PRINCIPALE
VI **PRESSIONE** CONVERTITORE
VII **PRESSIONE** FARFALLA
VIII **PRESSIONE** REGOLATORE
IX **PRESSIONE DI BLOCCAGGIO**
X PRESSIONE DI **MODULAZIONE**
XI PRESSIONE **POMPA**
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C **FRIZIONE** C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DE LA ACEITE

POSICION 1
3ª VELOCIDAD
RALENTI

1 REGULADOR
2 CONVERTIDOR DE PAR
3 **BA**NNEAR
4
5 VALVULA REGULA**DORA** DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE**B**
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE**D**
8 **INHIBICION** DE MARCHA ATRAS
9 VALVULA MANUAL
10 **ENFRIADOR** DE ACEITE
11 CONVERTIDOR Y VALVULA **INVERSORA**
12 **AMORTIGUADOR**, EMBRAGUE DEL **CONVERTIDOR**
13 VALVULA UNIDIRECCIONAL
14 VALVULA MODULADORA
15 **INHIBICION** DE 1ª **VELOCIDAD**
16 VALVULA DE **CAMBIO** f-2
17 VALVULA DEL EMBRAGUE C
18 **AMORTIGUADOR** DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE CAMBIO 2-3
21 **INHIBICION** DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE CONTROL, BLOQUEO DEL **EMBRAGUE** DEL CONVERTIDOR
25 VALVULA DE HISTERESS EMBRAGUE DEL **CONVERTIDOR**
26 VALVULA DE CAMBIO 3-4
27 VALVULA Y AMORTIGUADOR DE EMBRAGUE F
28 AMORTIGUADOR DE EMBRAGUE A
29 **AMORTIGUADOR** DE **EMBRAGUE** E
30 **VALVULA INHIBICION** DE EMBRAGUE F **(MARCHA** ATRAS)

I RETORNO
II MARIPOSA **DEL** ACELERADOR
III **ORIFICIO**
IV **BIFURCACION**
V **PRESION PRINCIPAL**
VI **PRESION DEL CONVERTIDOR**
VII **PRESION DEL ACELERADOR**
VIII **PRESION DEL REGULADOR**
IX **PRESION DE BLOQUEO**
X **PRESION DE MODULACION**
XI **PRESION DE LA BOMBA**
XII **PRESION DE LUBRICACION**

A EMBRAGUE A
a EMBRAWE3
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAWEF

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HYDRAULISCHE DRUKREGELING

STAND 1
3de VERSN.
STATIONAIR TOEREWTAN

1 **REGULATEUR**
2 **KOPPELOMVORMER**
3 CARTER
4 POMP
5 DRUKREGELKLEP
6 KLEP **E NDEMPER**, B-KOPPELING
7 KLEP **EN DEMPER**, C-KOPPELING
8 **ACHTERUITTANDWIELBEGRENZER**
9 **HANDBEDIENDE** KLEP
10 OLIEKOELEA
11 OMVORMER E N ACHTERUITKLEP
12 **OMVORMER KOPPELINGSDEMPER**
13 **EENRICHTINGSKLEP**
14 **BEGRENKER BRA WERSNELLING**
15
16 SCHAKELKLEP 1-2
17 KLEP, C-KOPPELING
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 **SCHAKELKLEP** 2-3
21 **BEGRENZER**, 2e VERSNELLING
22 GASBEDIENINGSKLEP
23 **THERMOKLEP**
24 **REGELKLEP, KOPPELINGS-** VERGRENDELING VAN OMVORMER
25 HYSTERESSKLEP, OMVORMER-**KOPPELING**
26 **SCHAKELKLEP** 3-4
27 KLEP EN DEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPERE-KOPPELING
30 **VEILIGHEIDSKLEP** (ACHTERUIT) **F-KOPPELING**

I **UITSAAT**
II
III OPENING
IV **AFTAKKING**
V **HOOFDDRUK**
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX **BLOKKEERDRUK**
X **MODULATIEDRUK**
XI **POMPDRUK**
XII **SMEERDRUK**

A A-KOPPELING
B **B-KOPPELING**
C **C-KOPPELING**
C' C'-KOPPELING
D **D-KOPPELING**
E E-KOPPELING
F **F-KOPPELING**

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オイルの流れ図

「1」の位置
第３速
アイドリング

1. ガバナー
2. トルクコンバーター
3. オイルパン
4. ポンプ
5. 圧力調整弁
6. Bクラッチバルブとダンパー
7. Dクラッチバルブとダンパー
8. 後退ギアインヒビター
9. マニュアルバルブ
10. オイルクーラー
11. コンバーターと後退用バルブ
12. コンバータークラッチダンパー
13. ワンウエイバルブ
14. モジュレーターバルブ
15. 第１速ギアインヒビター
16. １-２シフトバルブ
17. Cクラッチバルブ
18. C'クラッチダンパー
19. C'クラッチバルブ
20. ２-３シフトバルブ
21. 第２速ギアインヒビター
22. スロットルバルブ
23. サーモバルブ
24. コンバータークラッチロックアップコントロールバルブ
25. コンバータークラッチヒステリシスバルブ
26. ３-４シフトバルブ
27. Fクラッチバルブとダンパー
28. Aクラッチダンパー
29. Eクラッチダンパー
30. Fクラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分岐
V 作動圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

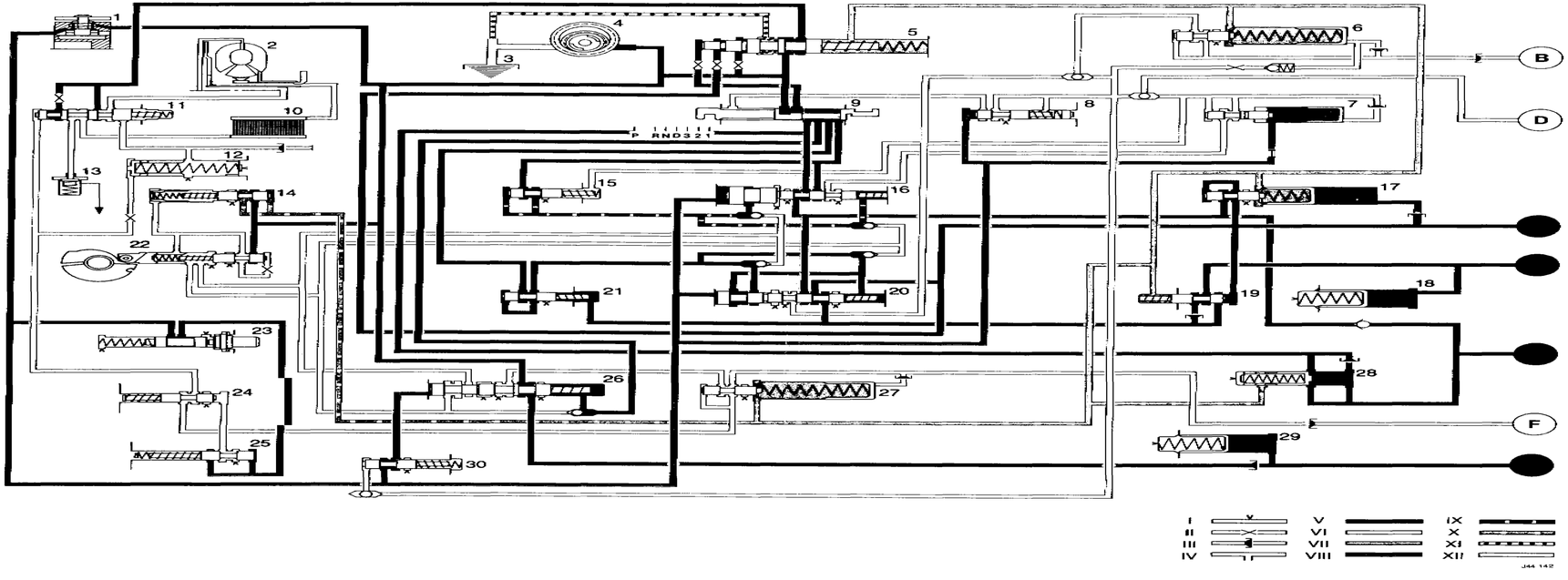
位置 1
第三檔
低速

1 調速器
2 變矩器
3 油槽
4 油泵
5 壓力調整閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車檔互鎖閥
9 手控閥
10 油冷卻器
11 換向器與離合器閥
12 換向器與離合器阻尼器
13 單向閥
14 調制器閥
15 一檔互鎖閥
16 1-2 換檔閥
17 C離合器閥
18 C'離合器阻尼器
19 C'離合器閥
20 2-3 換檔閥
21 二檔互鎖閥
22 節流閥
23 溫控閥
24 變矩器離合器鎖定控制閥
25 變矩器離合器遲滯閥
26 3-4 換檔閥
27 F 離合器閥與阻尼器
28 A離合器阻尼器
29 E 離合器阻尼器
30 F 離合器換檔閥（倒車）

I 排氣
II 節氣門
III 孔口
IV 分支
V 工作壓
VI 換向器壓力
VII 節氣閥壓力
VIII 調速器壓力
IX 鎖止壓力
X 調制壓力
XI 泵壓
XII 潤滑壓

A A 離合器
B B 離合器
C C 離合器
C' C' 離合器
D D 離合器
E E 離合器
F F 離合器

OIL FLOW CHART



POSITION 1
2ND GEAR
IDLING

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OIL FLOW CHART

POSITION 1
2ND GEAR
IDLING

1 GOVERNOR
2 **TORQUE CONVERTOR**
3 **SUMP**
4 **PUMP**
5 PRESSURE **REGULATING** VALVE
6 B CLUTCH VALVE **AND** DAMPER
7 D CLUTCH **VALVE** AND DAMPER
8 REVERSE GEAR **INHIBIT**
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR **AND REVERSING** VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONEWAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2SHIFT VALVE
17 C CLUTCHVALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR **INHIBIT**
22 **THROTTLE VALVE**
23 THERMO VALVE
24 CONVERTOR CLUTCHLOCK **UP** CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3—4SHIFT VALVE
27 F CLUTCH VALVE **AND** DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 **F CLUTCH INHIBIT** VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII **GOVERNOR PRESSURE**
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI **PUMP** PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B B CLUTCH
C C CLUTCH
C' C' CLUTCH
D D **CLUTCH**
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 1
ZWEITER GANG
LEERLAUF

1 REGLER
2 DREHMOMENTWANDLER
3 **ÖLWANNE**
4 **ÖLPUMPE**
5 **DRUCKREGELVENTIL**
6 **KUPPLUNG B, VENTIL UND DÄMPFUNG**
7 **KUPPLUNG D, VENTIL UND DÄMPFUNG**
8 RÜCKWÄRTSGANGSPERRE
9 **WÄHLSCHIEBER**
10 **ÖLKÜHLER**
11 **WANDLER UND RÜCKSCHALTVENTIL**
12 **WANDLERKUPPLUNG, DÄMPFUNG**
13 **RÜCKSCHLAGVENTIL**
14 **MODULATORVENTIL**
15 **1. GANG-SPERRE**
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 **KUPPLUNG C', DÄMPFUNG**
19 **KUPPLUNG C', VENTIL**
20 **SCHALTVENTIL 2-3**
21 **2. GANG-SPERRE**
22 **DROSSELVENTIL**
23 **THERMOVENTIL**
24 STEUERVENTIL FÜR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 **HYSTERESEVENTIL, WANDLER-ÜBERBRÜCKUNGSKUPPLUNG**
26 **SCHALTVENTIL 3-4**
27 **KUPPLUNG F, VENTIL UND DÄMPFUNG**
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI **WANDLERDRUCK**
VII **DROSSELDRUCK**
VI **REGLERDRUCK**
IX **SPERRDRUCK**
X **MODULIERDRUCK**
XI **PUMPENDRUCK**
XII **SCHMIERDRUCK**

A KUPPLUNG A
B KUPPLUNG B
C **KUPPLUNG C**
C' **KUPPLUNG C'**
D **KUPPLUNG D**
E **KUPPLUNG E**
F **KUPPLUNG F**

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 1
2ème VITESSE
RALENTI

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 **POMPE**
5 SOUPAPE REGULATRICE DE **PRESSION**
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE **ARRIERE**
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR **D'INVERSION**
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D'EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 **TIROIR** D'ACCELERATION
23 TIROIR **THERMOSTATIQUE**
24 TIROIR DE COMMANDE **DE** VERROUILLAGE **D'EMBRAYAGE DE** CONVERTISSEUR
25 TIROIR A HYSTERESIS D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 **TIROIR** ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'**EMPECHEMENT** D'EMBRAYAGE F **(MARCHE** ARRIERE)

I ECHAPPEMENT
II **ACCELERATEUR**
III ORIFICE
IV RACCORD
V **PRESSION** PRINCIPALE
VI **PRESSION** DE CONVERTISSEUR
VII **PRESSION DE ACCELERATION**
VIII PRESSION DE REGULATEUR
IX PRESSION DE **VERROUILLAGE**
X PRESSION DE MODULATION
XI **PRESSION DE POMPE**
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGED
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OIJO

POSIZIONE 1
2a PRIMA VELOCITÀ
MARCIA AL MINIMO

1 RE——LATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE **PRESSIONE**
6 VALVOLA ESMORZATORE **FRIZIONE** B
7 VALVOLA E **SMORZATORE FRIZIONE** D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE **CONVERTITORE**
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 EMPECHEMENT DE PREMIERE
17 TIROIR DE PASSAGE 1-2
18 **SMORZATORE** FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA **CAMBIO** 2-3
21 INIBIZIONE **2nda**
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI **CONTROLLO ARRESTO FRIZIONE CONVERTITORE**
25 VALVOLA DISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBIO 3-4
27 VALVOLA ESMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 **SMORZATORE FRIZIONE** E
30 VALVOLA INIBIZIONE FRIZIONE F **(INVERSIONE)**

I SCARICO
II FARFALLA
III ORIFIZIO
IV **DERIVAZION**
V **PRESSIONE PRINCIPALE**
VI PRESSIONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII **PRESSIONE** REGOLATORE
IX PRESSIONE DI **BLOCCAGGIO**
X PRESS——DI MODULAZIONE
XI PRESSIONE **POMPA**
XII PRESSIONE DI **LUBRIFICAZIONE**

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E **FRIZIONE** E
F **FRIZIONE** F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION 1
2ª VELOCIDAD
RALENTI

1 REGULADOR DE PAR
2
3 CARTER
4
5 VALVULA REGULA——A DE PRESION
6 VALVULA Y AMORTIGUADOR DE **EMBRAGUAJE** B
7 VALVULA E **SMORZATORE FRIZIONE** D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE **CONVERTITORE**
13 VALVOLA UNIDIRECCIONAL
14 VALVOLA MODULADORA
15 INHIBICION DE 1ª **VELOCIDAD**
16 VALVULA DE CAMBIO 1-2
17 **VALVULA** DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVULA DE **CAMBIO** 2-3
21 INHIBICION DE 2ª VELOCIDAD
22 MARIPOSA DEL ACELERADOR
23 TERMOVALVULA
24 VALVULA DE **CONTROL. BLOQUEO** DEL EMBRAGUE **DEL** CONVERTIDOR
25 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
26 VALVULA DE CAMBIO 3-4
27 VOLVULA **Y AMORITGUADOR** DE
28 AMORTIGUADOR DE EMBRAGUE A
29 AMORTIGUADOR DE EMBRAGUE E
30 VALVULA INHIBICION DE EMBRAGUE F (MARCHA ATRAS)

I RETORNO
II EMBRAGUE DEL ACELERADOR
III ORIFICIO
IV **DERIVACION** PRINCIPAL
V
VI PRESION DEL CONVERTIDOR
VII **PRESION** DEL ACELERADOR
VIII **PRESION DEL REGULADOR**
IX **PRESION** DE BLOQUEO
X **PRESION** DE MODULACION
XI **PRESION DE LA BOMBA**
XII **PRESION** DE LUBRICACION

A EMBRAGUE A
a EMBRAGUE B
C' **EMBRAGUE C**
C' **EMBRAGUE C'**
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 1
2e VERSN.
STATIONAIR TOEREWTAN

1 REGULATEUR
2 KOPPELOMVORMER
3 CARTER
4 **POMP**
5 DRUKREGELKLEP
6 KLEP ENDEMPER, B-KOPPELING
7 KLEP ENDEMPER, C-KOPPELING
8 ACHTERUITTAND WIELBEGRENZER
9 HANDBEDIENDE KLEP
10 **OLIEKOELER**
11 OMVORMER E NACHTERUITKLEP
12 **OMVORMER** KOPPELINGSDEMPER
13 **EENRICHTINGSKLEP**
14 **MODULATORKLEP**
15 **BEGRENZER**, 1e VERSNELLING
16 SCHAKELKLEP 1-2
17 KLEP C-**KOPPELING**
18 DEMPER C'-KOPPELING
19 KLEP, C-KOPPELING
20 SCHAKELKLEP 2-3
21 **BEGRENZER**, 2e **VERSNELLING**
22 GASBEDIENINGSKLEP
23 **THERMOKLEP**
24 **REGELKLEP. KOPPELINGS-**VERGRENDELING VAN OMVORMER
25 HYSTERESISKLEP, OMVORMER-**KOPPELING**
26 SCHAKELKLEP 3-4
27 KLEP ENDEMPER, F-KOPPELING
28 DEMPER A-KOPPELING
29 DEMPER E-**KOPPELING**
30 VEILIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III **OPENING**
IV **AFTAKKING**
V **HOOFDDRUK**
VI **OMVORMERDRUK**
VII **GASDRUK**
VIII **REGULATEURDRUK**
IX **BLOKKEERDRUK**
X **MODULATIEDRUK**
XI **POMPDRUK**
XII **SMEERDRUK**

A A-KOPPELING
B **B-KOPPELING**
C **C-KOPPELING**
C' **C'-KOPPELING**
D **D-KOPPELING**
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「1」の位置
第２速
アイドリング

1. ガバナー
2. トルクコンバーター
3. オイルパン
4. ポンプ
5. 圧力調整弁
6. Bクラッチバルブとダンパー
7. Dクラッチバルブとダンパー
8. 後退ギアインヒビター
9. マニュアルバルブ
10. オイルクーラー
11. コンバーターと後退用バルブ
12. コンバータークラッチダンパー
13. ワンウエイバルブ
14. モジュレーターバルブ
15. 第１速ギアインヒビター
16. 1-2シフトバルブ
17. Cクラッチバルブ
18. Cクラッチダンパー
19. C'クラッチバルブ
20. 2-3シフトバルブ
21. 第２速ギアインヒビター
22. スロットルバルブ
23. サーモバルブ
24. コンバータークラッチロックアップコントロールバルブ
25. コンバータークラッチヒステリシスバルブ
26. 3-4シフトバルブ
27. Fクラッチバルブとダンパー
28. Aクラッチダンパー
29. Eクラッチダンパー
30. Fクラッチインヒビターバルブ（後退用）

I 排気
II スロットル
III オリフィス
IV 分岐
V 本圧
VI コンバーター圧力
VII スロットル圧力
VIII ガバナー圧力
IX ロッキング圧力
X 調整圧力
XI ポンプ圧力
XII 潤滑圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

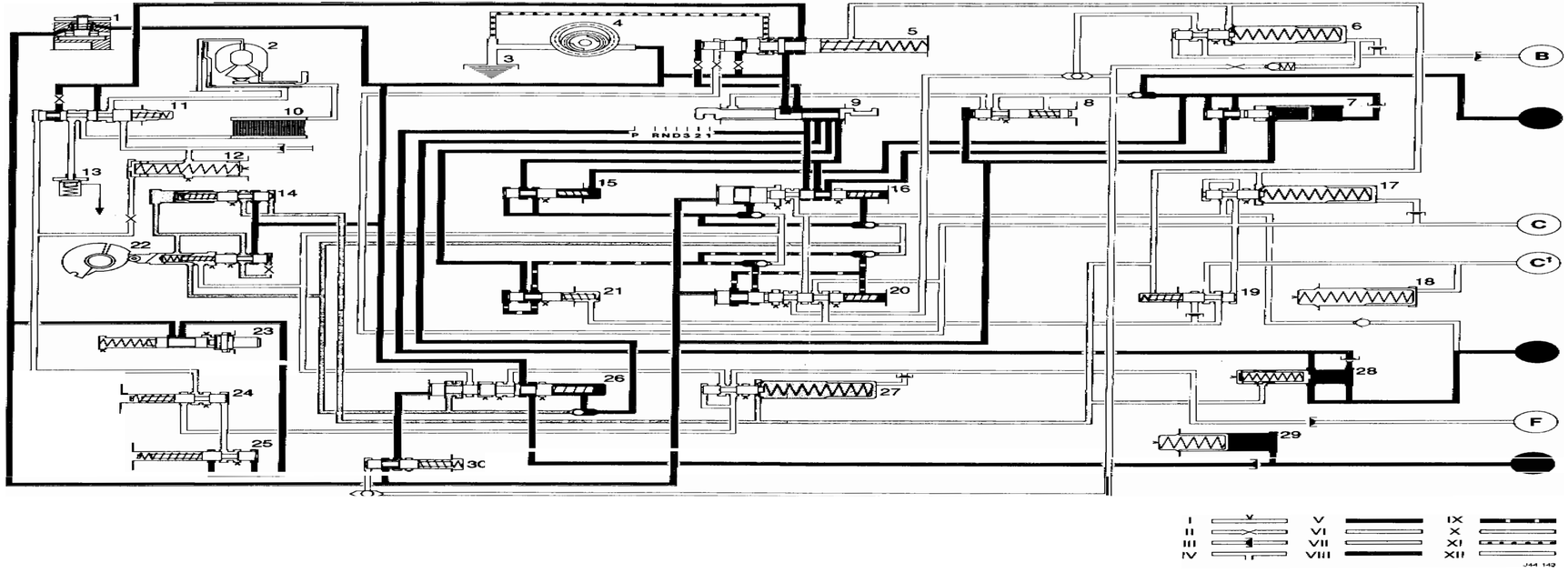
位置 1
第二檔
低速

1. 調速器
2. 變矩器
3. 油槽
4. 油泵
5. 壓力調整閥
6. B離合器閥與阻尼器
7. D離合器閥與阻尼器
8. 倒車檔閉止
9. 手控閥
10. 油冷卻器
11. 換向器與單向閥
12. 換向器離合器與阻尼器
13. 單向閥
14. 調節器閥
15. 第一檔閉止
16. 1-2換檔閥
17. C離合器閥
18. C離合器阻尼器
19. C'離合器閥
20. 2-3換檔閥
21. C'離合器閥
22. 油門閥
23. 熱閥
24. 換向器離合器鎖閉控制閥
25. 換向器離合器滯後閥
26. 3-4換檔閥
27. F離合器閥與阻尼器
28. A離合器阻尼器
29. E離合器阻尼器
30. F離合器閉止閥（倒車）

I 排氣
II 節氣門
III 節流孔
IV 分流
V 主壓
VI 變矩器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 閉鎖壓力
X 調節壓力
XI 泵壓
XII 潤滑壓

A A離合器
B B離合器
C C離合器
C' C'離合器
D D離合器
E E離合器
F F離合器

OIL FLOW CHART



POSITION 1
1ST GEAR
FULL THROTTLE

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OIL FLOW CHART

POSITION 1
1ST GEAR
FULL THROTTLE

1 GOVERNOR
2 TORQUE CONVERTOR
3 SUMP
4 PUMP
5 PRESSURE REGULATING VALVE
6 B CLUTCH VALVE AND DAMPER
7 D CLUTCH VALVE AND DAMPER
8 REVERSE GEAR INHIBIT
9 MANUAL VALVE
10 OIL COOLER
11 CONVERTOR AND REVERSING VALVE
12 CONVERTOR CLUTCH DAMPER
13 ONE WAY VALVE
14 MODULATOR VALVE
15 1ST GEAR INHIBIT
16 1-2 SHIFT VALVE
17 C CLUTCH VALVE
18 C' CLUTCH DAMPER
19 C' CLUTCH VALVE
20 2-3 SHIFT VALVE
21 2ND GEAR INHIBIT
22 THROTTLE VALVE
23 THERMO VALVE
24 CONVERTOR CLUTCH LOCK UP CONTROL VALVE
25 CONVERTOR CLUTCH HYSTERISIS VALVE
26 3-4 SHIFT VALVE
27 F CLUTCH VALVE AND DAMPER
28 A CLUTCH DAMPER
29 E CLUTCH DAMPER
30 F CLUTCH INHIBIT VALVE (REVERSE)

I EXHAUST
II THROTTLE
III ORIFICE
IV BRANCH
V MAIN PRESSURE
VI CONVERTER PRESSURE
VII THROTTLE PRESSURE
VIII GOVERNOR PRESSURE
IX LOCKING PRESSURE
X MODULATION PRESSURE
XI PUMP PRESSURE
XII LUBRICATION PRESSURE

A A CLUTCH
B E CLUTCH
C C CLUTCH
C' C' CLUTCH
D D CLUTCH
E E CLUTCH
F F CLUTCH

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ÖLDURCHFLUSSTABELLE

STELLUNG 1
ERSTER GANG
VOLLGAS

1 REGLER
2 DREHMOMENTWANDLER
3 ÖLWANNE
4 ÖLPUMPE
5 DRUCKREGELVENTIL
6 KUPPLUNG B, VENTIL UND DÄMPFUNG
7 KUPPLUNG D, VENTIL UND DÄMPFUNG
8 RÜCKWÄRTSGANGSPERRE
9 WÄHLSCHIEBER
10 ÖLKÜHLER
11 WANDLER UND RÜCKSCHALTVENTIL
12 WANDLERKUPPLUNG, DÄMPFUNG
13 RÜCKSCHLAGVENTIL
14 MODULATORVENTIL
15 1.-GANG-SPERRE
16 SCHALTVENTIL 1-2
17 KUPPLUNG C, VENTIL
18 KUPPLUNG C', DÄMPFUNG
19 KUPPLUNG C', VENTIL
20 SCHALTVENTIL 2-3
21 2.-GANG-SPERRE
22 DROSSELVENTIL
23 THERMOVENTIL
24 STEUERVENTIL FUR WANDLER-ÜBERBRÜCKUNGSKUPPLUNG
25 HYSTERESEVENTIL WANDER-ÜBERBRÜCKUNGSKUPPLUNG
26 SCHALTVENTIL 3-4
27 KUPPLUNG F, VENTIL UND DÄMPFUNG
28 KUPPLUNG A, DÄMPFUNG
29 KUPPLUNG E, DÄMPFUNG
30 KUPPLUNG F, SPERRVENTIL (RÜCKWÄRTSGANG)

I ABFLUSS
II DROSSEL
III ÖFFNUNG
IV VERZWEIGUNG
V ARBEITSDRUCK
VI WANDLERDRUCK
VII DROSSELDRUCK
VI REGLERDRUCK
IX SPERRDRUCK
X MODULIERDRUCK
XI PUMPENDRUCK
XII SCHMIERDRUCK

A KUPPLUNG A
B KWPLUNG B
C KUPPLUNG C
C' KUPPLUNG C'
D KUPPLUNG D
E KUPPLUNG E
F KUPPLUNG F

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DIAGRAMME D'ECOULEMENT D'HUILE

POSITION 1
1a PIVITESSE
ACCELERATION POTALE

1 REGULATEUR
2 CONVERTISSEUR DE COUPLE
3 CUVETTE DE LIQUIDE
4 POMPE
5 SOUPAPE REGULATRICE DE PRESSION
6 TIROIR ET AMORTISSEUR D'EMBRAYAGE B
7 TIROIR ET AMORTISSEUR D'EMBRAYAGE D
8 EMPECHEMENT DE MARCHE ARRIERE
9 TIROIR MANUEL
10 REFROIDISSEUR D'HUILE
11 CONVERTISSEUR ET TIROIR D'INVERSION
12 AMORTISSEUR D'EMBRAYAGE DE CONVERTISSEUR
13 CLAPET DE RETENUE
14 TIROIR DE MODULATION
15 EMPECHEMENT DE PREMIERE
16 TIROIR DE PASSAGE 1-2
17 TIROIR D-EMBRAYAGE C
18 AMORTISSEUR D'EMBRAYAGE C'
19 TIROIR D'EMBRAYAGE C'
20 TIROIR DE PASSAGE 2-3
21 EMPECHEMENT DE SECONDE
22 TIROIR D'ACCELERATION
23 TIROIR THERMOSTATIQUE
24 TIROIR DE COMMANDE DE L'EMBRAYAGE D'EMBRAYAGE DE CONVERTISSEUR
25 TIROIR A HYSTERESIS
D'EMBRAYAGE DE CONVERTISSEUR
26 TIROIR DE PASSAGE 3-4
27 TIROIR ET AMORTISSEUR D'EMBRAYAGE F
28 AMORTISSEUR D'EMBRAYAGE A
29 AMORTISSEUR D'EMBRAYAGE E
30 TIROIR D'EMPECHEMENT D'EMBRAYAGE F (MARCHE ARRIERE)

I ECHAPPEMENT
II ACCELERATEUR
III ORIFICE
IV RACCORD
V PRESSION PRINCIPALE
VI PRESSION DE CONVERTISSEUR
VII PRESSION D'ACCELERATION
VIII PRESSION DE REGULATEUR
IX PRESSION DE VERROUILLAGE
X PRESSION DE MODULATION
XI PRESSION DE POMPE
XII PRESSION DE GRAISSAGE

A EMBRAYAGE A
B EMBRAYAGE B
C EMBRAYAGE C
C' EMBRAYAGE C'
D EMBRAYAGE D
E EMBRAYAGE E
F EMBRAYAGE F

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DIAGRAMM DELLA MANDATA D'OLIO

POSIZIONE 1
1a PIVITESSA
A TUTTO GAS

1 REGOLATORE
2 CONVERTITORE DI COPPIA
3 COPPA
4 POMPA
5 VALVOLA DE REGOLAZIONE PRESSIONE
6 VALVOLA E SMORZATORE FRIZIONE B
7 VALVOLA E SMORZATORE FRIZIONE D
8 INIBIZIONE RETROMARCIA
9 VOLVOLA MANUALE
10 RADIATORE OLIO
11 CONVERTITORE E VALVOLA DI INVERSIONE
12 SMORZATORE FRIZIONE CONVERTITORE
13 VALVOLA UNIDIREZIONALE
14 VALVOLA MODULATRICE
15 INIBIZIONE 1ma
16 EMPECHEMENT DE PREMIERE
17 VALVOLA FRIZIONE C
18 SMORZATORE FRIZIONE C'
19 VALVOLA FRIZIONE C'
20 VALVOLA CAMBD 2-3
21 INIBIZIONE 2nda
22 VALVOLA A FARFALLA
23 VALVOLA TERMICA
24 VALVOLA DI CONTROLLO ARRESTO FRIZIONE CONVERTITORE
25 VALVOLA DI ISTERESI DELLA FRIZIONE CONVERTITORE
26 VALVOLA DI CAMBD 3-4
27 VALVOLA E SMORZATORE FRIZIONE F
28 SMORZATORE FRIZIONE A
29 SMORZATORE FRIZIONE E
30 VOLVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I SCARICO
II FARFALLA
III ORIFIZIO
IV DERIVAZION
V PRESSIONE PRINCIPALE
VI PRESISONE CONVERTITORE
VII PRESSIONE FARFALLA
VIII PRESSIONE REGOLATORE
IX PRESSIONE DI BLOCCAGGIO
X PRESSIONE DI MODULAZIONE
XI PRESSIONE POMPA
XII PRESSIONE DI LUBRIFICAZIONE

A FRIZIONE A
B FRIZIONE BA
C FRIZIONE C
C' FRIZIONE C'
D FRIZIONE D
E FRIZIONE E
F FRIZIONE F

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DIAGRAMA DE CIRCULACION DEL ACEITE

POSICION 1
1ª VELOCIDAD
MAXIMA ACELERACION

1 REGULADOR
2 CONVERTIDOR DE PAR
3 CARTER
4 BOMBA
5 VALVULA REGULADORA DE PRESION
6 VALVULA Y AMORTIGUADOR DE EMBRAGUE B
7 VALVULA Y AMORTIGUADOR DE EMBRAGUE D
8 INIBICION DE MARCHA ATRAS
9 VOLVOLA MANUAL
10 RADIATORE OLIO
11 CONVERTIDOR Y VALVULA INVERSORA
12 AMORTIGUADOR, EMBRAGUE DEL CONVERTIDOR
13 VALVULA UNIDIRECCIONAL
14 VALVOLA CAMBIO 1-2
15 INHIBICION DE 1ª VELOCIDAD
16 SMORZATORE FRIZIONE C'
17 VALVULA DEL EMBRAGUE C
18 AMORTIGUADOR DEL EMBRAGUE C'
19 VALVULA DEL EMBRAGUE C'
20 VALVOLA DE CAMBIO 2-3
21 INBICION 2nda
22 VALVULA A FARFALLA
23 INHIBICION DE 2ª VELOCIDAD
24 MARIPOSA DEL ACELERADOR
25 TERMOVALVULA
26 VALVULA DE CONTROL, BLOQUEO DEL EMBRAGUE DEL CONVERTIDOR
27 VALVULA DE HISTERESIS, EMBRAGUE DEL CONVERTIDOR
28 VALVULA DE CAMBIO 3-4
29 VOLVULA Y AMORTIGUADOR DE EMBRAGUE F
30 VALVOLA INIBIZIONE FRIZIONE F (INVERSIONE)

I RETORNO
II MARIPOSA DEL ACELERADOR
III ORIFICIO
IV BIFURCACION
V PRESION PRINCIPAL
VI PRESION DEL CONVERTIDOR
VII PRESION DEL ACELERADOR
VIII PRESDN DEL REGULADOR
IX PRESION DE BLOQUEO
X PRESION DE MODULACION
XI PRESION DE LA BOMBA
XII PRESION DE LUBRICACION

A EMBRAGUE A
B EMBRAGUE B
C EMBRAGUE C
C' EMBRAGUE C'
D EMBRAGUE D
E EMBRAGUE E
F EMBRAGUE F

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HYDRAULISCHE DRUKREGELING

STAND 1
1e VERSNELLING
VOLGAS

1 KOPPELOMVORMER
2 CARTER
3 POMP
4 DRUKREGELKLEP
5 KLEP EN DEMPER, B-KOPPELING
6 KLEP EN DEMPER, C-KOPPELING
7 ACHTERUITVERSNELLINGSKLEP
8 HANDBEDIENDE KLEP
9 OLIEKOELER
10 OMVORMER EN ACHTERUITKLEP
11 OMVORMER KOPPELINGSDEMPER
12 EENRICHTINGSKLEP
13 MODULATORKLEP
14 BEGRENZER, DRUKVERSNELLING
15 1e VERSNELLING
16 KLEP, C-KOPPELING
17 DEMPER C'-KOPPELING
18 KLEP, C-KOPPELING
19 SCHAKELKLEP 2-3
20 BEGRENZER, 2e VERSNELLING
21
22 THERMOKLEP
23 REGELKLEP, KOPPELINGS-VERGRENDELING VAN OMVORMER
24 HYSTERESISKLEP, OMVORMER-KOPPELING
25 SCHAKELKLEP 3-4
26 KLEP EN DEMPER, F-KOPPELING
27 DEMPER A-KOPPELING
28 DEMPER E-KOPPELING
29 VEILIGHEIDSKLEP (ACHTERUIT) F-KOPPELING

I UITLAAT
II GAS
III OPENING
IV AFTAKKING
V HOOFDDRUK
VI OMVORMERDRUK
VII GASDRUK
VIII REGULATEURDRUK
IX BLOKKEERDRUK
X MODULATIEDRUK
XI POMPDRUK
XII SMEERDRUK

A A-KOPPELING
B B-KOPPELING

C' C'-KOPPELING
D D-KOPPELING
E E-KOPPELING
F F-KOPPELING

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オイルの流れ図

「1」の位置
第1速
スロットル全開

1 ガバナー
2 トルクコンバーター
3 オイルパン
4 ポンプ
5 圧力調整弁
6 Bクラッチバルブとダンパー
7 Dクラッチバルブとダンパー
8 後退ギアインヒビター
9 マニュアルバルブ
10 オイルクーラー
11 コンバーターと後退用バルブ
12 コンバータークラッチダンパー
13 一方向弁
14 モジュレーターバルブ
15 第1速ギアインヒビター
16 1-2シフトバルブ
17 Cクラッチバルブ
18 C'クラッチダンパー
19 C'クラッチバルブ
20 2-3シフトバルブ
21 第2速ギアインヒビター
22 スロットルバルブ
23 サーモバルブ
24 コンバータークラッチロックアップコントロールバルブ
25 コンバータークラッチヒステリシスバルブ
26 3-4シフトバルブ
27 Fクラッチバルブとダンパー
28 Aクラッチダンパー
29 Eクラッチダンパー
30 Fクラッチインヒビターバルブ(後退用)

I 排気
II ガス
III スロットル
IV オリフィス
V 二又
VI 高圧
VII コンバーター圧力
VIII スロットル圧力
IX ガバナー圧力
X ロッキング圧力
XI 調整圧力
XII ポンプ圧力

A Aクラッチ
B Bクラッチ
C Cクラッチ
C' C'クラッチ
D Dクラッチ
E Eクラッチ
F Fクラッチ

油流程圖

位置 1
第一檔
節流閥全開

1 調速器
2 變矩器
3 油槽
4 油泵
5 調壓閥
6 B離合器閥與阻尼器
7 D離合器閥與阻尼器
8 倒車檔測止
9 手控閥
10 油冷卻器
11 變流器與反向閥
12 變流器離合器阻尼器
13 單向閥
14 調制器閥
15 第一檔測止
16 1-2 換擋閥
17 C離合器閥
18 C1離合器阻尼器
19 C1離合器閥
20 2-3 換擋閥
21 第二檔測止
22 節流閥
23 第二檔測止
24 變流器離合器鎖閉控制閥
25 變流器離合器滯後閥
26 3-4 換擋閥
27 F離合器閥與阻尼器
28 A離合器阻尼器
29 E離合器阻尼器
30 F離合器測止閥(倒車)

I 排氣管
II 油泵吸管
III 節流閥
IV 支流管
V 主壓
VI 變流器壓力
VII 節流閥壓力
VIII 調速器壓力
IX 鎖閉壓力
X 調制壓力
XI 泵壓
XII 調滑壓

A A離合器
B B離合器
C C離合器
C' C1離合器
D D離合器
E E離合器
F F離合器

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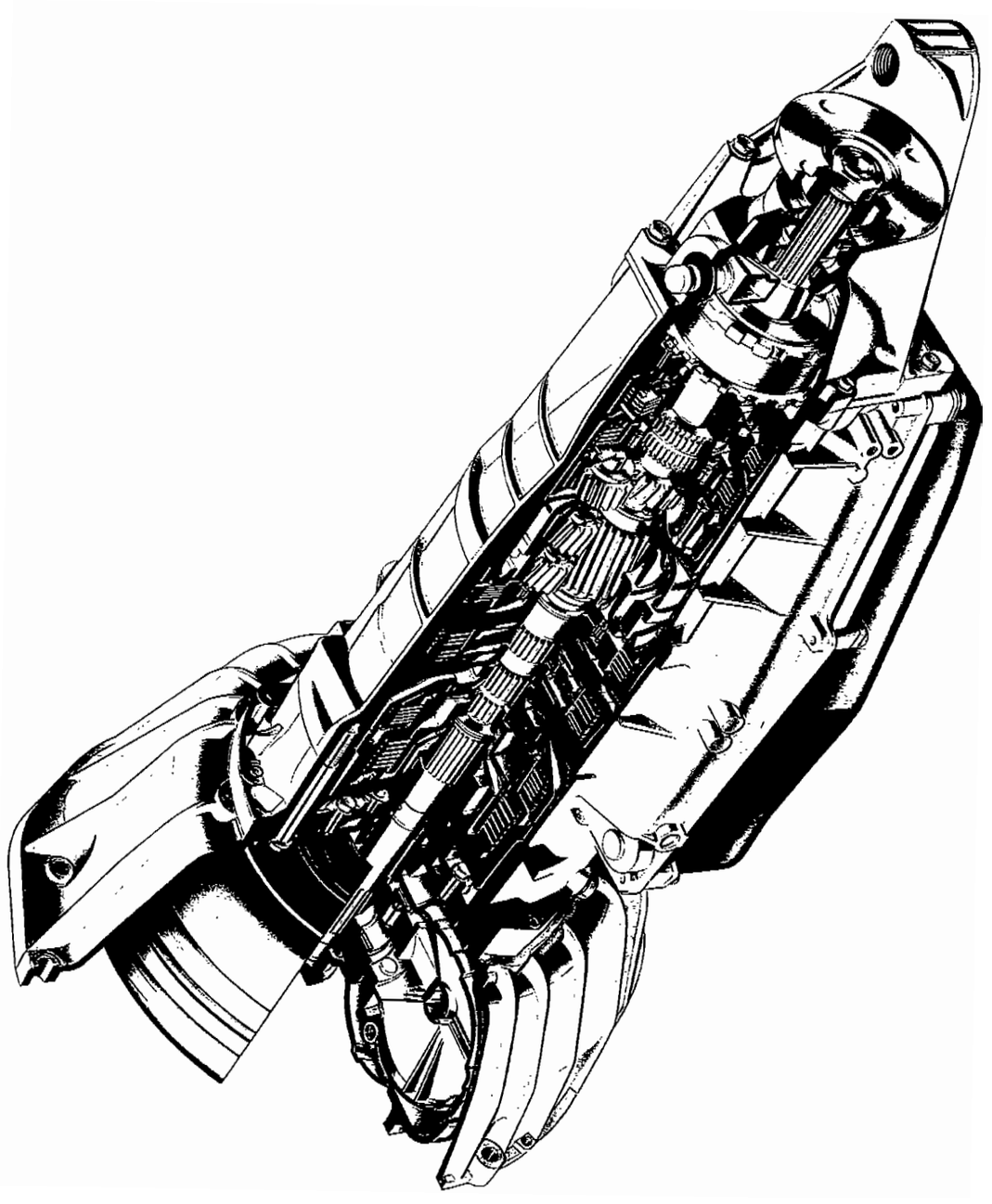
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AUTOMATIC TRANSMISSION

DESCRIPTION 44.00.00

1990 Model Year 4.01 vehicles will be fitted with the ZF 4HP 24 E9 automatic transmission unit. The 4HP 24 E9 utilizes a microprocessor equipped Electronic Control Unit to control solenoid and pressure control valves. The transmission itself is similar to the 4HP 22, apart from a strengthened A clutch, the governor replaced by a toothed disc and magnetic sensor, uprated torque converter and other minor changes (refer to the 4HP 22 Transmission (2.9) section for hydraulic system descriptions). The new transmission has a 30% higher torque handling capacity than the ZF 4HP 22.
Main differences between the 4HP 22 and the 4HP 24 E9 are as follows:

1 New valve block and spring assemblies (changed characteristics) to cope with the new adjustment of modulation and working pressures. New rotary transmission switch to select gear positions.

2 The torque converter is of a larger diameter, and the bearing face of the converter has been lengthened to take higher engine output. The bell housing and pump housing have been dimensionally increased to compensate. The splines on the input shaft are longer and both piston rings are made of cast iron to improve sealing.

3 The A clutch diameter has been enlarged to take the higher torque transmitted by the 4.01 engine. The 6 steel and lined friction plates have been enlarged to suit. The intermediate plate has been widened to accommodate the larger A clutch.

4 The 2nd gear stator has been strengthened, the two components that make up the stator are rivetted together. 3rd gear stator has changed from a roller to a one-way clutch.

5 4th gear planet carrier has been reinforced. The output shaft and flange have also been reinforced.

6 The oil pan is deeper to prevent foaming of the oil. An additional sleeve has been included to improve oil suction.

7 The mechanical speed governor has been replaced by a toothed disc and magnetic sensor.

8 A sport mode switch which, when engaged, gives a higher performance range than normal.

9 The kick-down cable has been replaced by a pressure switch, located below the throttle pedal.

4HP 24 E9 COMPONENTS

ELECTRONIC CONTROL UNIT
The ECU controlling the new transmission continously monitors the speed of the output shaft and throttle position. By interpolation from a pre-programmed control map, the most suitable gear for the prevailing conditions is selected.

The ECU controls the solenoid and pressure control valves which, in turn control the valve block and gear shifts. Information is fed to the ECU from sensors, and if any electronic component fails, the basic functions will be retained by the hydraulic system (P, R, N, D3 or 04).

The ECU is located in the passenger footwell, behind the dash liner. A decoder is located adjacent to the ECU. The decoder enables the rotary transmission switch to 'talk to the illumination module and ECU.

The ECU is supplied with battery voltage when the ignition is switched on (there is also a separate uninterrupted battery voltage supply for the diagnostic memory.

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ELECTRONIC CONTROL UNIT (CONTINUED)

The ECU is protected against polarity reversal. The ECU connector is 55 pin and all inputs and outputs can withstand short circuit between positive and ground (except power ground).

Gear change refinement is improved as a result of the electronic control, which interfaces with the engine management system and retards the ignition momentarily on upshifts, to reduce the torque input as the gear change takes place.

ROTARY TRANSMISSION SWITCH

Gear selection is achieved via a multi-contact mechanically controlled rotary transmission switch. The switch is housed in an aluminium casting and consists of a selector bar attached to a (squared) pivot, and a quadrant upon which is located strategically-placed copper segments.

When a gear is selected, the selector bar moves across the quadrant to a pre-determined position to contact the copper segments. The copper segments are set out in seven bands across the quadrant, and each band provides an output or combination of outputs, via the decoder, to the ECU.

Outputs to the ECU are in the form of a three-digit (XYZ) code. The three-digit code takes up three bands on the quadrant, the remaining four bands are used for reverse, ground and start inhibit (2).

ROTARY TRANSMISSION SWITCH LOGIC FUNCTIONS

PIN	Z	Y	X
P	0	0	1
R	0	1	1
N	0	1	0
D	1	1	0
3	1	1	1
2	1	0	1
1	1	0	0

0 = Switch open
1 = Contact closed to ground

DECODER MODULE

The function of the decoder module is to 'translate' the three-digit codes from the rotary transmission switch into single-line signals to feed the illumination module.

The decoder also provides information regarding:

1 Cruise control, ie when cruise control can or can not be engaged.

2 Indicates when the vehicle is not in 'P (park).

3 Links the transmission ECU to the engine management ECU.

DECODER MODULE LOGIC FUNCTIONS

INPUTS										OUTPUTS		
X	Y	Z	P	R	N	D	3	2	1	CRUISE CONTROL INHIBIT	NOT-PARK SIGNAL	IDLE FUEL SIGNAL
0	1	1	0	1	1	1	1	1	1	1	1	**0**
0	0	1	1	0	1	1	1	1	1	1	**0**	**1**
1	0	1	1	1	0	1	1	1	1	1	**0**	**0**
1	0	0	1	1	1	0	1	1	1	0	0	1
0	0	0	1	1	1	1	0	1	1	0	0	1
0	1	0	1	1	1	1	1	0	1	0	*0*	1
1	1	0	1	1	1	1	1	1	0	1	**0**	1

0 = Ground
1 = Open circuit

SPORT MODE SWITCH

Two alternative pre-programmed maps are available for selection by the driver using a 'push-push' sport mode switch located on the 'J' gate surround:

1 'Normal mode' – designed for everyday use, it achieves the best compromise between the minimum effort needed for the tractive effort required at the road wheels. With the selector in the 'D' position, torque converter lock-up occurs only in fourth gear. However, if position '3 is selected then the lock-up will occur in third gear – providing a useful alternative when travelling at moderate speeds on hilly roads or when towing.

2 'Sport' mode – with this map selected, the transmission becomes more sensitive to changes in throttle position and will change down more readily and at higher engine speeds. Gears are also held onto longer when accelerating in 'Sport' mode and part throttle changes down to first gear are possible. Torque converter lock-up only occurs in fourth gear with 'D' selected.

SPEED SENSOR

The mechanical governor has been replaced by a toothed disc and magnetic sensor located on the output shaft. The sensor sends signals to the ECU via a screened cable. One revolution of the toothed disc is equal to 36 pulses.

SOLENOID VALVES

The valve block is controlled by one pressure regulator and three solenoid valves, which are energised on receipt of signals from the ECU. The three solenoid valves are of the 2-way/inlet closed when not energised type, and the pressure regulator is a 2-way pressure relief valve (control edge closed when not energised).
The pressure regulator is factory-calibrated and is not adjustable in service.

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KICK-DOWN SWITCH

The kick-down cable arrangement has been replaced by a kick-down switch located below the throttle pedal. The switch is pressure-operated and adjustable. The switch contacts are 'normally open', maximum voltage drop across the contacts is 25mV at 15mA.

ECU CONNECTIONS – PIN LOCATIONS (Fig 1)

PIN	FUNCTION	PIN	FUNCTION
1	Ignition power supply (+)	29	–
2	Vehicle speed sensor (+)	30	–
3	Engine speed signal	31	–
4	–	32	Torque control
5	Solenoid valve MV1	33	Position code Z
6	Pressure control valve	34	–
7	Digital ground	35	–
8	Throttle potentiometer signal	36	–
9	Pin code 1 – catalyst	37	–
10	Pin code 3	38	Vehicle speed sensor (–)
11	–	39	Permanent battery supply
12	–	40	–
13	–	41	Kick–down switch
14	Position code Y	42	Solenoid valve lock-up
15	Diagnostic L-line	43	Programme push-button (sport)
16	System fault indicator	44	Throttle potentiometer ground
17	–	45	Throttle potentiometer supply
18	–	46	–
19	Solenoid valves supply	47	–
20	Vehicle speed sensor screen	48	–
21	Injector time ti (torque signal)	49	Programme indication lamp (sport)
22	–	50	Position code X
23	–	51	Diagnostic K-line
24	Solenoid valve MV2	52	–
25	Torque control (select)	53	–
26	Power ground	54	–
27	–	55	–
28	Pin code 2		

MODEL VARIANT DISCRIMINATION

MODEL	PIN 9	PIN 28
XJ6 Catalyst	Grounded	Open circuit
XJ6 Won-catalyst	Open circuit	Open circuit

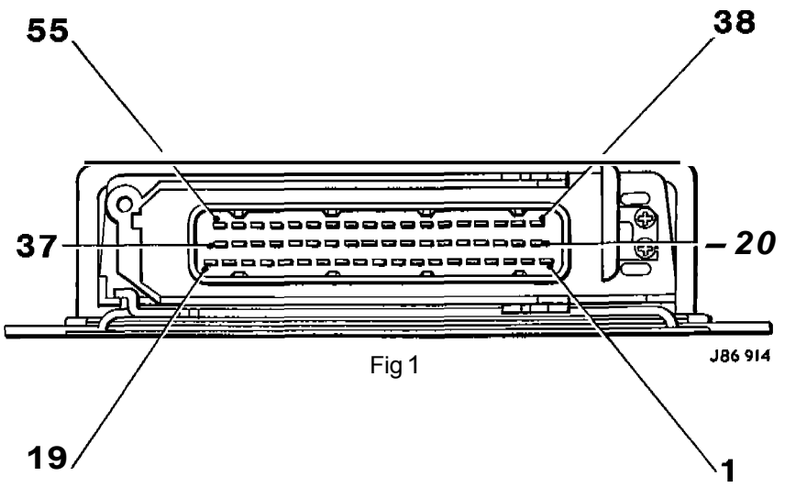


Fig 1

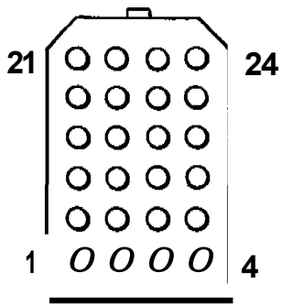
ROTARY TRANSMISSION SWITCH CONNECTIONS – PIN LOCATIONS

CONNECTOR GB1 (Fig 1)

PIN	SIZE (mm^2)	CABLE COLOUR	FUNCTION
1	1.0	BK	Switch common
2	0.5	LGB	Code X output
3	0.5	LGP	Code Y output
4	0.5	LGW	Code Z output
5	0.5	WP	Start inhibit ground
6	0.5	RW	Start inhibit output
7	–	–	–
8	0.5	SG	Reverse lights output
9	1.0	RY	Solenoids output
10	1.0	YB	MV1 solenoid
11	1.0	YP	MV2 solenoid
12	1.0	YU	MWVK solenoid
13	–	–	–
14	1.0	OG	Pressure regulator
15	0.5	R	Road speed sensor
16	0.5	U	Road speed sensor
17	–	–	–
18	–	–	–
19	–	–	–
20	0.5	W	Ground (screen)
21	–	–	–
22	–	–	–
23	–	–	–
24	–	–	–

CONNECTOR GB7 (Fig 2)

PIN	SIZE (mm^2)	CABLE COLOUR	FUNCTION
B	1.0	OG	Pressure regulator
D	–	–	–
E	0.5	U	Road speed sensor
F	0.5	R	Road speed sensor
H	1.0	YB	MV1 solenoid
1.0	YP	YB	MV2 solenoid
L	1.0	YU	MWVK solenoid
M	1.0	RY	Solenoids supply



04766 Fig 1

GB1

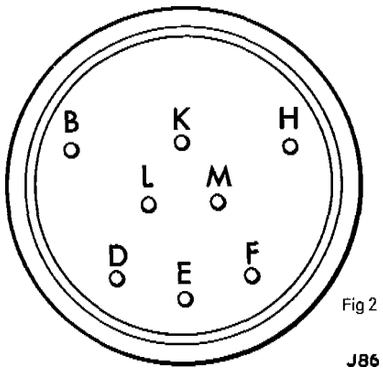


Fig 2 J86 911

GB7

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DECODER MODULE PIN CONNECTIONS (Fig 1)

PIN	DESCRIPTION	LOADING	PIN	DESCRIPTION	LOADING
1	Third gear	Gnd/open circuit	14	Neutral	Gnd/open circuit
2	Second gear	Gnd/open circuit	15	Park	Gnd/open circuit
3	Reverse	Gnd/open circuit	16	–	–
4	Drive	Gnd/open circuit	17	–	–
5	First gear	Gnd/open circuit	18	–	–
6	–	–	19	–	–
7	–	–	20	Logic ground	Gnd to battery
8	–	–	21	Power ground	Gnd
9	Not-park	Gnd/open circuit	22	–	–
10	Ign supply	12V 0.5A supply	23	–	–
11	Y input	Gnd/open circuit	24	–	–
12	Z input	Gnd/open circuit	25	Cruise inhibit	Gnd (250mA) or open circuit
13	X input	Gnd/open circuit	26	Idle fuel	Gnd/open circuit

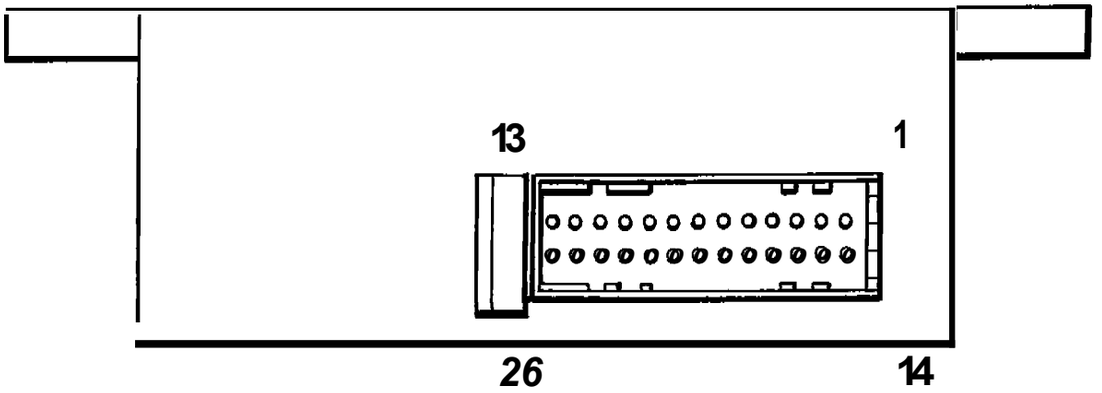


Fig 1

J86 912

GENERAL DATA

Fluid capacity	10.2 litres
Fluid type	Dexron 11D
Preferred brands	Castrol Transmax M Castrol TQ Dexron 11
Weight (inc. fluid &converter)	83.2kg

TRANSMISSION RATIOS

1st	2.48
2nd	1.48
3rd	1.00
4th	0.73
Reverse	2.09
Final drive	3.58
MPH/1000 rpm in top	29.2

TORQUE CONVERTER

Nominal size (dia.)	280mm
Torque	322Nm at 2000rpm
tall speed	2000rpm

SHIFT SPEEDS

MAXIMUM SHIFT SPEED THROUGH DETENT

SELECTOR POSITION SHIFT	D 1-2	D 2-3	D 3-TCC4
ECONOMY MODE:			
TAILSHAFT RPM	2016	3488	5152
ENGINE RPM	5174	5328	–
ROAD SPEED (MPH)	43	74	109
(KPH)	70	119	145
SPORT MODE:			
TAILSHAFT RPM	2016	3488	5152
ENGINE RPM	5174	5328	–
ROAD SPEED (MPH)	43	74	109
(KPH)	70	119	145

KICKDOWN AVAILABLE UP TO (THROUGH DETENT)

SELECTOR POSITION SHIFT	D TCC4-3	D 3-2	D 2-1
ECONOMY MODE:			
TAILSHAFT RPM	4288	2192	1568
ENGINE RPM	–	–	–
ROAD SPEED (MPH)	91	62	33
(KPH)	146	99	53
SPORT MODE:			
TAILSHAFT RPM	4288	2192	1568
ENGINE RPM	–	–	–
ROAD SPEED (MPH)	91	62	33
(KPH)	146	99	53

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SHIFT SPEEDS (CONTINUED)

KICKDOWN AVAILABLE UP TO (AT ZERO THROTTLE)

SELECTOR POSITION **SHIFT**	**1 (INHIBITED)** **2-1**	**2 (INHIBITED)** **3-2**	**3 (INHIBITED)** **4-3**
ECONOMY MODE:			
TAILSHAFT RPM	1568	2912	4288
ENGINE RPM	–	–	–
ROAD SPEED (MPH)	33	62	91
(KPH)	53	99	146
SPORT MODE:			
TAILSHAFT RPM	1568	2912	4288
ENGINE RPM	–	–	–
ROAD SPEED (MPH)	33	62	91
(KPH)	53	99	146

UP TO DETENT DOWNSHIFT (MAXIMUM)

SELECTOR POSITION	D	D	D
SHIFT	TCC4-3	3-2	2-1
ECONOMY MODE:			
TAILSHAFT RPM	3520	2144	352
ENGINE RPM	–	–	–
ROAD SPEED (MPH)	74	45	7
(KPH)	120	73	12
SPORT MODE:			
TAILSHAFT RPM	4288	2912	1344
ENGINE RPM	–	–	–
ROAD SPEED (MPH)	91	62	28
(KPH)	146	99	46

UP TO DETENT

SELECTOR POSITION	D	D	D
SHIFT	1-2	2-3	**3-TCC4**
ECONOMY MODE:			
TAILSHAFT RPM	1632	2912	4128
ENGINE RPM	4263	4514	4341
ROAD SPEED (MPH)	34	62	87
(KPH)	55	99	140
SPORT MODE:			
TAILSHAFT RPM	2016	3488	5152
ENGINE RPM	5174	5328	–
ROAD SPEED (MPH)	43	74	109
(KPH)	69	119	175

SHIFT SPEEDS (CONTINUED)

ZERO THROTTLE

SELECTOR POSITION	D	D	D	D
SHIFT	TCC OFF IN 4	4-3	3-4	2-1
ECONOMY MODE:				
TAILSHAFT RPM	2176	864	544	480
ENGINE RPM	–	–	–	–
ROAD SPEED (MPH)	46	18	11	10
(KPH)	74	29	18	16
SPORT MODE:				
TAILSHAFT RPM	2304	864	544	480
ENGINE RPM	–	–	–	–
ROAD SPEED (MPH)	49	18	11	10
(KPH)	78	29	18	16

LIGHT THROTTLE

SELECTOR POSITION	D	D	D	D
SHIFT	1-2	2-3	3-4	TCC ON IN 4
ECONOMY MODE:				
TAILSHAFT RPM	608	1024	1376	2368
ENGINE RPM	–	–	–	–
ROAD SPEED (MPH)	13	22	29	50
(KPH)	21	35	47	81
SPORT MODE:				
TAILSHAFT RPM	672	1216	1695	2560
ENGINE RPM	–	–	–	–
ROAD SPEED (MPH)	14	26	36	54
(KPH)	23	41	53	87

NOTES:

1 Tailshaft and engine speeds are theoretical figures for a given axle ratio of 3.58:1

2 Performance figures given are nominal and are +10%
–00%

3 Tyre size = 220/65 VR 390, revolutions/mile = 793.

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OPERATION

Position P:	Park. Select only when the vehicle is standing still. In the 'Park' position the drive wheels are locked.
Position R:	Reverse.
Position N:	Neutral. Engine disconnected from driveline and wheels.
Postion D:	Drive. All four speed ranges are selected automatically.
Position 3:	Automatic selection of the lowest three ratios in the automatic transmission only.
Position 2:	Select this setting to prevent the automatic transmission from shifting up to the 3rd speed range. The 1st and 2nd ranges remain available, for example, to make full use of engine braking effect on downhill gradients.
Postion 1	Intended primarily for steep mountain passes, the ramps of indoor car parks etc. The automatic transmission remains in the 1st speed range regardless of throttle opening. **NOTE:** Positions 1 or 2 can be selected at any travelling speed. Safety valves prevent premature down-shifts and over-speeding of the engine.
Kick-down:	Depress the accelerator pedal fully – beyond the normal full-throttle stop – and the automatic transmission will shift down immediately to a lower gear (ratio depends on road speed).

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OIL FLOW CHART – POSITION '1'

1 Oil pump
2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C^1 Clutch valve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
12 Gear change valve
13 Lubrication valve
14 Reverse locking valve,
15 Lock-up control valve
16 ECU – inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle valve
19 Engine speed (rpm)
20 Transmission speed (rpm)
21 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D clutch valve and damper
28 E clutch damper
29 F clutch valve and damper
30 1-2 shift valve
31 2-3 shift valve
32 3-4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C^1 C^1 clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III Orifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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FAULT DIAGNOSIS 44.00.00

The following tables (pages 32-37) are intended as a guide to diagnosis of faults which may occur in the transmission unit.

INITIAL CHECKS

Complete these checks before carrying out any diagnostic work.

1 Check the transmission unit oil level.
2 Check the kickdown switch adjustment.
3 Check the selector cable adjustment.
4 Check the engine tune,
5 Carry out a stall test.
6 Carry out a road test.

FAULT	POSSIBLE CAUSE	ACTION
POSITION P		
Park does not engage	Incorrect setting of selector between control lever and transmission.	Adjust setting
	Too much friction in parking lock mechanism	Replace components, cam, connection rod and eventually pawl
Park position does not hold	Incorrect setting of selector rods between control lever and transmission.	Adjust the setting
Starter motor will not operate	Starter inhibitor switch faulty.	Replace switch
	Incorrect setting of selector lever	Adjust setting
	Faulty selector lever	Replace lever.
	Position P or N not selected	Select P or N
POSITION N		
Engine will not rotate.	Starter inhibitor switch faulty.	Replace switch
	Incorrect setting of selector lever	Adjust setting
	Faulty selector lever	Replace lever.
	Position N not selected	Select N
Vehicle moves in Position N	Wrong setting of gear change rods between control lever and transmission.	Correct setting
	A Clutch defective (seized up)	Service/Renew transmission

FAULT	POSSIBLE CAUSE	ACTION
POSITION R		
No reverse gear	Incorrect setting of selector rods between control lever and gearbox.	Correct setting
	Dirty oil filter	Renew filter
High pitched squeaking noise	No 3rd gear (B Clutch destroyed)	Service/Renew transmission
	No engine braking in Position 1, 1st gear. (D clutch destroyed)	Service/Renew transmission.
	No engine braking in 2nd and 3rd gear, also in Position 1, 1st gear (E Clutch destroyed).	Service/Renew transmission.
	Reverse gear safety valve faulty.	Service/Renew control unit
Slipping or shaking from start in reverse gear.	B or E Clutch, or brake D defective.	Service/ Renew transmission
Strong jerk when engaging positions P-R or N-R, or distinct double jerk at P-R or N-R (below 1500 RPM engine speed).	Damper B defective (will give the same symptoms when changing from 2nd to 3rd gear).	Service/Renew control unit
Reverse light does not illumiunate (bulbs, fuses and cables OK).	Starter inhibitor switch faulty.	Replace switch
	Incorrect setting of selector lever	Adjust setting
	Faulty selector lever	Replace lever.
	Position R not Selected	Select R
POSITION D		
No drive	Dirty oil filter	If no debris in sump, just replace filter, otherwise replace transmission
	A Clutch defective	Service/Renew transmission
	One way clutch 1st gear slips	Service/Renew transmission
	Wrong setting of gear change rods between control lever and transmission.	Correct setting
Slipping or shaking upon initial forward movement.	A Clutch damaged	Service/Renew transmission

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FAULT	POSSIBLE CAUSE	ACTION
POSITION D (CONTINUED)		
Strong jerk N-D (below 1500 RPM engine speed.	A Clutch faulty	Service/Renew transmission
	A Clutch damper faulty	Service/Renew control unit
Gear change functions faulty (in cold or warm state)		
Change 1-2/2-1	Speed sensing wheel faulty	Replace wheel
	Shift valve 1-2 sticking	Replace control unit
Change 1-2	Brake C and/or C faulty	Service/Renew transmission.
Change 2-3/3-2	Speed sensing wheel faulty	Replace wheel
	Shift valve 2-3 sticking	Replace control unit
Change 2-3	B Clutch faulty	Service/Renew transmission
Change 3-4/4-3	Speed sensing wheel faulty	Replace wheel
	Shift valve 3-4 sticking	Replace control unit
Change 3-4	Brake F defective	Service/Renew transmission
Vehicle starts in 2nd gear	Speed sensing wheel faulty	Replace wheel
	Shift valve 1-2 sticking	Service/Renew control unit
Vehicle starts in 3rd gear	Speed sensing wheel faulty	Replace wheel
	Shift valve 1-2 and 2-3 sticking	Service/Renew control unit
Gearbox changes 1-3	Shift valve 2-3 sticking	Service/Renew control unit
SHIFT **SPEEDS**		
No changes at light throttle setting	Speed sensing wheel faulty	Replace wheel
	Shift valves sticking	Service/Renew control unit
Change points in-correct at full throttle setting.	Throttle cable setting incorrect.	Correct setting
No changes at Kick-Down 1-2/2-1	Throttle cable setting incorrect.	Correct setting
No changes at Kick-Down 2-3/3-2	Throttle cable setting incorrect.	Correct setting
No changes at Kick-Down 4-3	4-3 Kick-Down valve sticking.	Service/Renew control unit

FAULT	POSSIBLE CAUSE	ACTION
SHIFT SPEEDS (CONTINUED)		
Gear change quality		
Harsh changes at low throttle	Defective damper	Service/Renew control unit
	Modulation pressure too high	Service/Renew control unit
	Clutch plates damaged	Service/Renew transmission
Soft changes at full throttle and Kick-Down.	Defective damper	Service/Renew control unit
	Modulation pressure too low	Service/Renew control unit
	Clutch plates damaged	Service/Renew transmission
Harsh changes at full throttle and Kick-Down.	Incorrect modulation pressure	Service/Renew control unit
	Defective damper	Service/Renew control unit
POSITION 3, 3RD GEAR		
No engine braking	Clutch E damaged	Service/Renew transmission
POSITION 2		
Manual change 3-2 faulty	Locking valve 2 sticking	Service/Renew control unit
	Speed sensing wheel faulty	Service/Renew wheel
No engine braking	Brake C or E Clutch damaged	Service/Renew transmission
POSITION 1		
Manual change 2-1 faulty	Locking valve 1 sticking	Service/Renew control unit
	Speed sensing wheel faulty	Service/Renew speed sensing wheel
No engine braking	Brake D or E Clutch damaged	Service/Renew transmission
Change points at incorrect speeds	WK safety valve sticking	Service/Renew control unit
	No 4th gear	Service/Renew control unit
Gear change too harsh	Lock up damper faulty	Service/Renew control unit
	Torque converter faulty	Service/Renew torque converter
No lock-up	Control unit faulty	Service/Renew control unit
	Lock up valve or damper faulty	Service/Renew torque converter.
	No 4th gear	Service/Renew control unit
GENERAL		
Throttle cable sticking	Nipple in throttle cam is worn	Replace cable
	Too much friction in sleeve of throttle cable	Replace cable
	Throttle pressure piston sticking	Service/Renew control unit
Noisy and no drive after long journey	Oil filter on control unit dirty	If there is no burnt lining in oil sump, then only replace filter, otherwise replace transmission.
Very noisy and no drive	Flexi-plate is worn or broken	Replace flexi-plate or torque converter
	Pump drive worn	Replace transmission

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FAULT	POSSIBLE CAUSE	ACTION
OIL LEAKS		
Oil dripping from bell housing	Seal ring in pump housing damaged Pump housing porous Converter leaking from welded seam	Replace seal Replace pump housing Replace converter
Leakage between transmission and oil sump.	Incorrect torque of bolts Sump gasket damaged	Tighten bolts Replace gasket
Leakage between intermediate plate and main housing (especially at pump pressure point)	Bell housing bolts have worked loose Gasket broken	Tighten bolts Replace gasket
Oil loss at tacho connections	Damaged 'O' ring on tacho Oil seal in tacho faulty	Replace 'O' ring Replace tacho sleeve
Oil leak from throttle connection cable	'O' ring connection damaged	Replace 'O' ring or complete cable
Oil leak at output	Output oil seal damaged	Replace seal
Loss of oil through breather	Oil level too high Incorrect oil	Check level. Remove transmission, ensure that it is completely drained (including torque converter, oil cooler and pipes)
	No breather cap	Fit cap or change breather
	'O' ring breather damaged	Remove tail housing Replace 'O' ring
	Securing clip faulty	Replace clip
Leakage in cooler pipes	Loose connections Pipes damaged Cooler leaks	Re-tighten Replace pipes Replace cooler
Oil leak at intermediate plate	Blanking plug loose	Tighten plugs Replace washers
Leakage between main housing and tail housing.	Loose bolts Gasket damaged	Re-tighten Replace gasket
NOISES		
High pitched squeaking noise, dependent on engine RPM, in all gears, when oil is warm, accompanied by intermittent drive after long journey	Dirty filter	If no debris in sump, replace filter, otherwise replace transmission unit

FAULT	POSSIBLE CAUSE	ACTION
NOISES (CONTINUED)		
High pitched noise in all positions, especially if oil is cold	Low oil level Leaking control unit	Top up as required Service/Renew control unit
Very noisy when in lock-up	Torsion damper faulty	Replace torque converter
Torsional vibrations from engine when in lock-up.	Engine RPM is too low, lock-up shift point incorrect	Service/Renew control unit

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AUTOMATIC TRANSMISSION UNIT

RENEW **44.20.01**

Disconnectthe kickdown cable from the throttle linkage.
Remove the bolt securing the transmission dipstick tube to the inlet manifold.
Fit Service Tool 18G 1465 to the rear of the inlet manifold and take the weight of the engine with MS53B (Fig 1).
Place drain tin below the transmission, drain the fluid.
Disconnect the front exhaust pipe.
Taking the weight **of** the transmission unit, remove the rear mounting to body securing bolts, lower the jack and collectthe spacer.
Disconnectthe propeller shaft from the drive flange.
Remove the rotary transmission switch/cable assembly/ harness (1,2 Fig 2) complete. Reposition the switch assembly away from the work area.
Remove the selector cable bracket clamp.
Place a drain tin below the dipstick tube (Fig 3),and disconnect the union, drain the remaining fluid and fit a dummy plug to the sump.
Remove the clamp securing the transmission cooling pipes to the transmission, disconnect the pipes and fit a dummy plug to the apertures. Removethe drain tin.
Remove the blanking plug from the torgue converters securing bolt access aperture (1 Fig **4) ,** and remove the crankshaft/drive plate securing bolts, turning the crankshaftfor access to remove each bolt.

Lower the engine/transmission unit using MS53B ensuring that the engine does not foul the steering rack.
Remove the bell housing bolts and remove the transmission (1 Fig 1 page 33).

Lift the transmission unit into position, fit and tighten the bell housing bolts.
Tighten the torque converter bolts as follows:

1 Turn the crankshaftfor access to the first converter to drive plate securing bolt **(1** Fig 4).
Align the converter to drive plate bolt hole.
Fit but do not fully tighten the converter to drive plate securing bolt.
2 Turn the crankshaftfor access to the second securing bolt hole.
Fit but do not fully tighten the second securing bolt.
3 Turn the crankshaft for access to the remaining securing bolt hole.
Fit and torque tighten the remaining securing bolt.
4 Torquetighten the remaining **two** securing bolts.

Refitthe blanking plug and stone guard.
Refit the oil cooler pipes to the transmission ensuring new sealing washers are used, secure with the sump bracket.

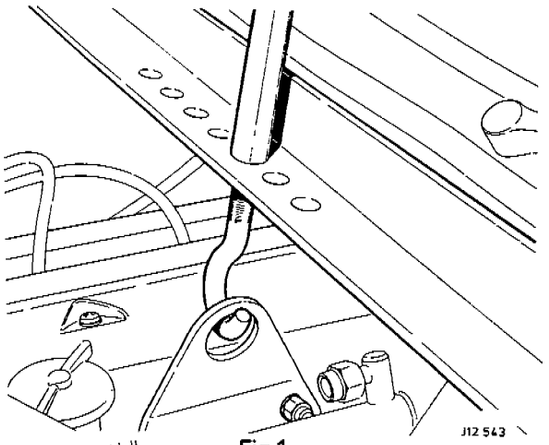


Fig 1

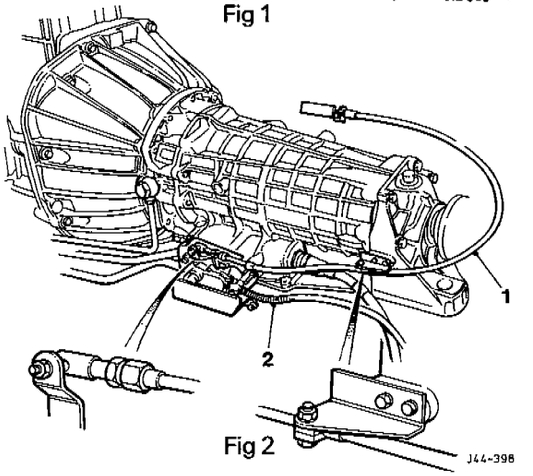


Fig 2

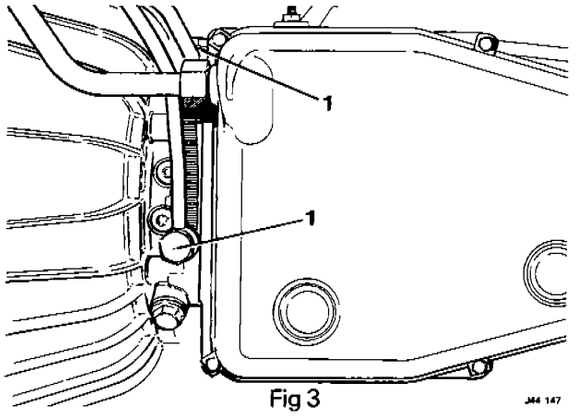


Fig 3

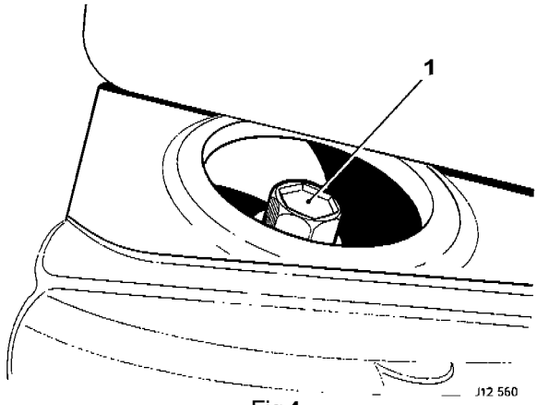


Fig 4

Reposition the kickdown cable to the bell housing and refit the dipstick tube.
Raise the engine/transmission unit using MS53B.

Refit the rotary transmission switch/cable/harness assembly to the selector shaft. Fit but do not tighten the securing nuts.
Ensure that the selector lever is in neutral.
Adjust the switch to enable Service Tool JD 161 to be fitted, thus aligning the selector shaft and switch.
Torque tighten the switch securing bolts.
Remove the tool.
Refit the propeller shaft to the drive flange, raise the rear of the unit into position fit the spacers and secure with the mounting bolts.
Refit the exhaust front pipe to the intermediate pipe and manifold.
Remove Service Tool MS53B align the fan cowl, refit and adjust the kickdown cable.
Remove the engine lifting eye 18G 1465 and replace the manifold securing nuts.
Align and secure the dipstick tubes to the inlet manifold.
Refill with transmission fluid.

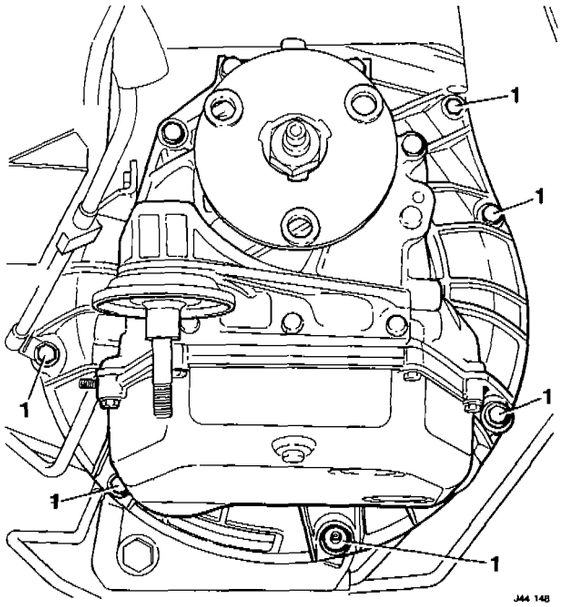


Fig 1

DATA

SERVICE TOOLS

MS 538 Engine support bracket
***186 1465** Engine lifting bracket*

TORQUE FIGURES

Base** plate assembly to mounting pan **7-10Nm
*Dipstick tube nut **20Nm***
*Down pipe to intermediate pipe **15-18Nm***
*Drain plug **15Nm***
*Drive plate to crankshaft **95-105Nm***
*Drive plate to torque convertor **49-54Nm***
*Exhaust tie nut/stud **9.5-12.5Nm***
*Intermediate pipe **to** silencer **15-18Nm***
*Oil cooler pipe banjo bolt **32-36Nm***
*Propeller **shaft to** gearbox 95-105Nm*
*Rear engine mounting bracket to body **20-25Nm***
*Torque convertor housing to adaptor **49-54Nm***
*Torque convertor housing to block/sump **49-54Nm***

OILS/SEALANTS/LUBRICANTS

*Exhaust sealer TIVOLIKA YADHESIVES **No 5696***
*Transmission fluid Dexron **IID***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16 AF
5mm Allen key

0476G

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FLUID

RENEW **44.24.02**

Raise the vehicle on a ramp.
Place a drain tin below the transmission fluid pan drain plug, remove the plug and drain the oil. Fit and tighten the drain plug.
Refill the unit with fluid (approximately 3.0 litres – 5.3 Imperial pints).
Start the engine and move the selector several times through all positions and back to neutral.
Check the oil level (Fig 1) with the engine running.
NOTE: Ensure that the fluid is hot and the vehicle is on level ground.

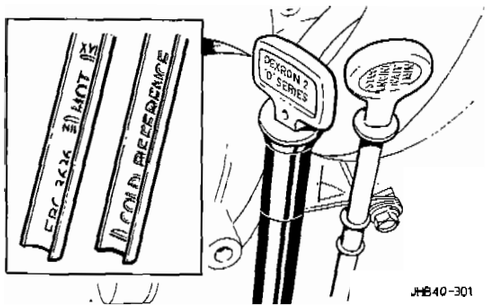


Fig 1

DATA

TORQUE FIGURES

Drain plug ***15Nm***

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron ***II***

SPANNER SIZES

5mm Allen key

FLUID PAN

RENEW **44.24.04**

Drain the transmission fluid 44.24.02.
Refit the fluid pan drain plug (1 Fig 2).
Disconnect the dipstick tube from the fluid pan.
Slacken off and remove the rotary switch protection cover securing bolts, and remove the cover.
Remove the fluid pan clamp securing bolts (2 Fig 2) and remove the pan (3 Fig 2) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Refit the rotary switch protection cover.
Reconnect the dipstick tube.
Replenish the transmission fluid 44.24.02.

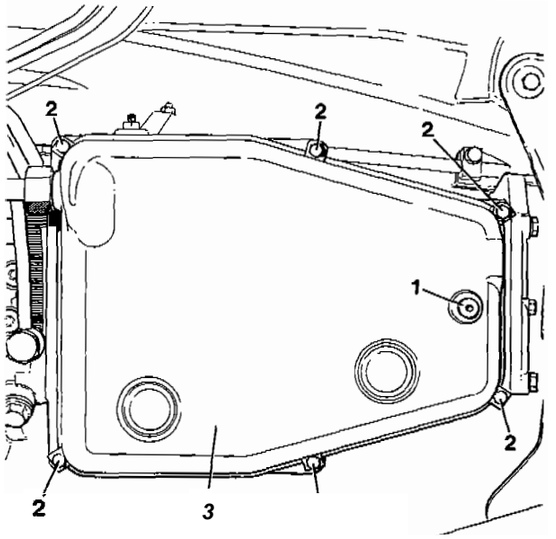


Fig 2

DATA

TORQUE FIGURES

Dipstick *tube nut* ***20Nm***
Drain plug ***15Nm***
Fluid pan mounting bolts ***8Nm***

OILS/SEALANTS/LUBRICANTS

Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
13mm
5mm *Allen key*

FLUID FILTER

RENEW **44.24.07**

Raise the vehicle on a ramp.
Place a drain tin below the transmission fluid pan drain plug, remove the plug and drain the oil.
Refit the fluid pan drain plug (1 Fig 1).
Disconnect the dipstick tube from the fluid pan.
Slacken off and remove the rotary switch protection cover securing bolts, and remove the cover.
Remove the fluid pan clamp securing bolts (2 Fig 1) and remove the pan (3 Fig 1) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Remove the filter screws, and remove the filter.

Fit the replacement filter, fit and tighten the screws.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Refit the rotary switch protection cover.
Reconnect the dipstick tube.
Refill the unit with fluid (approximately 3.0 litres - 5.3 Imperial pints).
Start the engine and move the selector several times through all positions and back to neutral.
Check the oil level with the engine running.
NOTE: Ensure that the fluid is hot and the vehicle is on level ground.

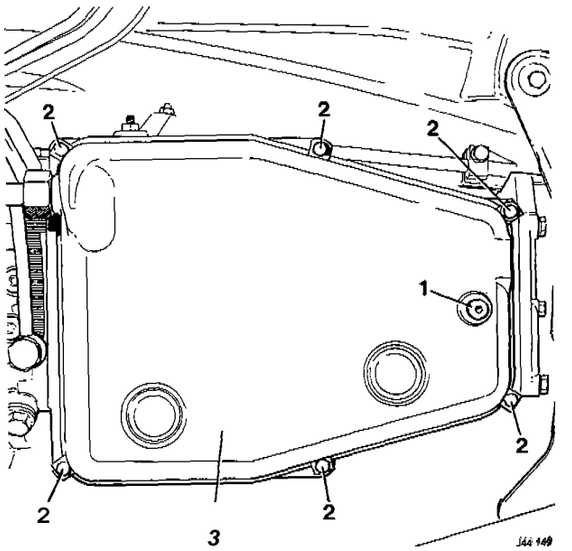


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut 20Nm
Drain plug 15Nm
Fluid pan mounting bolts 8Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm

5mm Allen key

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VALVE BLOCK ASSEMBLY

RENEW **44.40.01**

Raise the vehicle on a ramp.
Place a drain tin below the fluid pan drain plug, remove the plug and drain the oil.
Refit the fluid pan drain plug (1 Fig 1).
Disconnect the dipstick tube from the fluid pan.
Slacken off and remove the rotary switch protection cover bolts, and remove the cover.
Remove the fluid pan clamp securing bolts (2 Fig 1) and remove the pan (3 Fig 1) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Remove the filter screws, and remove the filter.
Displace the speed sensor harness from the valve block body.
Slacken off and remove the sensor retaining clip securing screws.
Displace the sensor/clip from the casing.
Disconnect the rotary switch harness multi-plug.
Slacken off and remove the switch harness to casing securing nut.
Remove the valve block screws (1 Fig 2) and lower the block, ensure that the multi-plug socket is displaced from the casing aperture.
Clean the mating face for the valve block.
Discard the multi-plug socket O ring.
Fit a new O ring to the multi-plug socket.
Fit the valve block assembly into position, ensuring that the gear selector quadrant peg is engaged into the manual valve, and the multi-plug socket is seated in the casing (the flat on the socket locates in the vertical LH side of the case).
Fit but do not tighten the valve block securing screws.
Gently push the valve block forward, hold in position, and fully tighten the screws.
Fit and tighten the multi-plug socket securing nut.
Connect the harness to the socket
Fit the speed sensor into position, fit the retaining clip and tighten the screws.
Secure the harness to the valve block body.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Refit the rotary switch protection cover.
Reconnect the dipstick tube. Refill the unit with fluid. Start the engine and move the selector through all positions and back to neutral. Check the oil level.

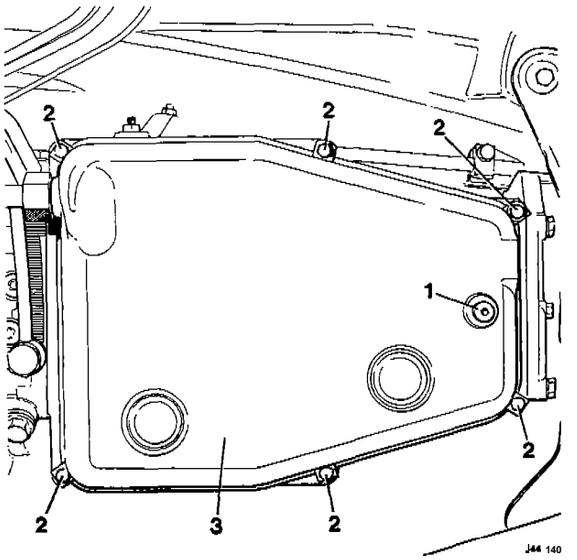
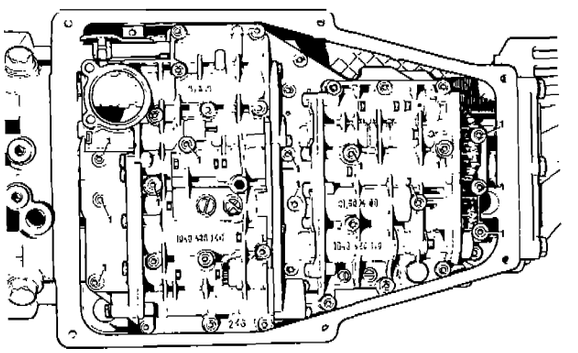


Fig 1


Fig 2

DATA

TORQUE FIGURES

Dipstick tube nut 20Nm
Drain plug 15Nm
Fluid pan mounting bolts 8Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
73mm
5mm Allen key

FRONT PUMP OIL SEAL

RENEW **44.32.07**

Remove the transmission unit 44.20.01 page 38.
Fit Service Tool lifting handles JD 105 to the torque converter (Fig 1).
Remove the converter (2 Fig 1) from the transmission unit.
Remove the lifting handles and place the converter aside.
Using a suitable puller, remove and discard the front oil seal. Clean the pump/seal surround.
Lubricate the new seal and fit to the pump using Service Tool JD 102 (1 Fig 2).

Clean the torque converter and mating faces.
Fit the lifting handles to the replacement torque converter assembly.
Fit the torque converter to the transmission unit.
Refit the transmission unit 44.20.01.

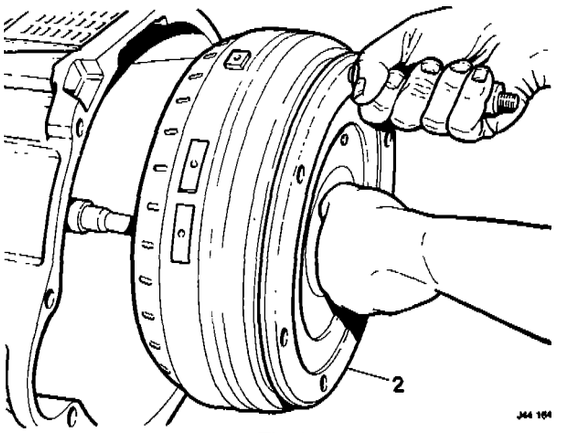


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 102 Oil seal replacer
JD 124 Engine lifting bracket
JD 105 Converter lifting handles

TORQUE FIGURES

Base plate assembly to mounting pan 7- 10Nm
Base plate assembly to side plate 7-10Nm
Dipstick tube nut 20Nm
Down pipe to intermediate pipe 15-18Nm
Drain plug 15Nm
Drive plate to torque convertor 49-54Nm
Exhaust tie nut/stud 9.5-12.5Nm
Gearbox to bell housing 46Nm
Intermediate pipe to silencer 15-18Nm
Oil cooler pipe banjo bolt 32-36 ""
Pump bolts 10Nm
Propeller shaft to gearbox 95- 105Nm
Rear engine mounting bracket to body 20-25Nm
Selector lever nut to shaft 23-27Nm
Torque convertor housing to adaptor 49-54Nm
Torque convertor housing to block/sump 49-54Nm

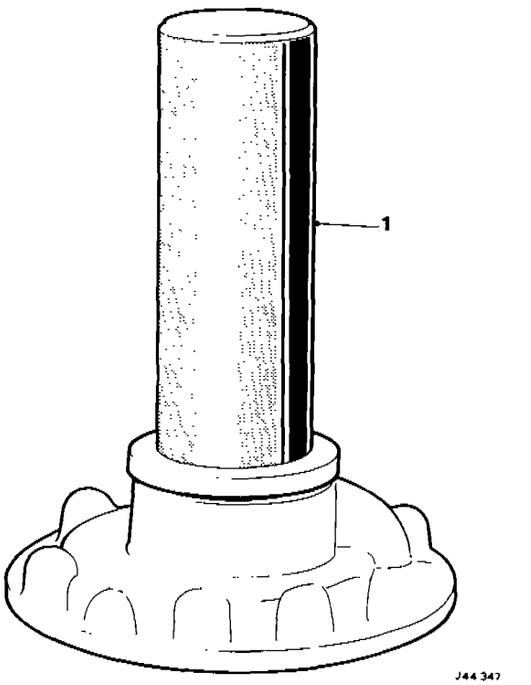


Fig 1

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLIKA YADHESIVES No 5696.
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16AF
5mm Allen key

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FRONT PUMP

RENEW 44.32.01

Remove the transmission unit 44.20.01 page 38.
Fit Service Tool lifting handles JD 105 to the torque converter (Fig 1). Remove the converter (2 Fig 1) from the transmission unit.
Remove the lifting handles.
Remove the converter housing to pump assembly securing bolts (1 Fig 2).
While holding the input shaft (2 Fig 2) in this position, remove the converter housing and pump assembly (3 Fig 2).
Remove and discard the intermediate plate gasket.
Remove all except two of the bolts (1 Fig 3) securing the front pump cover to the intermediate plate.
Tap the heads of the two (loose) bolts to remove the pump assembly (2 Fig 3).
Remove the bolts and remove the pump.
Fit the new pump to the intermediate plate.
Fit and tighten the bolts.
Fit a new intermediate plate gasket, fit the converter/pump assembly, fit and tighten the securing bolts.
Refit the torque converter.
Refit the transmission unit 44.20.01.

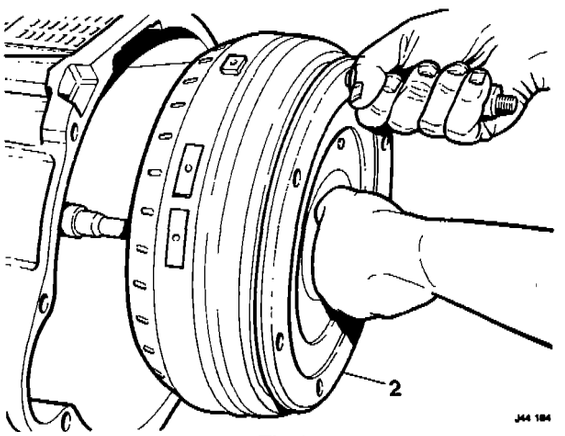


Fig 1

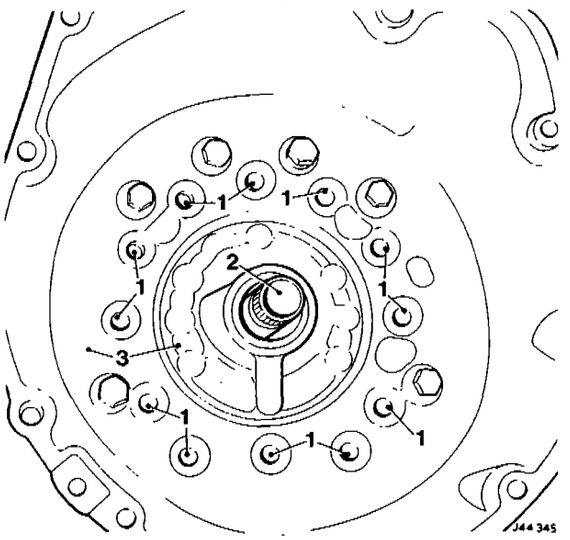


Fig 2

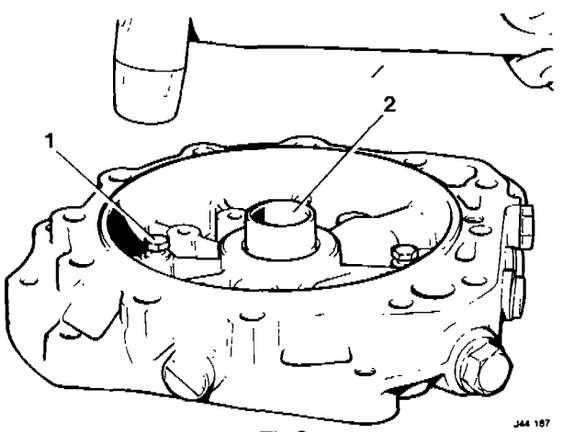


Fig 3

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 102 Oil seal replacer
JD 105 Converter lifting handles
JD 124 Engine lifting bracket

TORQUE FIGURES

Base plate assembly to side plate **7-10Nm**
Dipstick tube nut **20Nm**
Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Drive plate to torque convertor **49-54Nm**
Gearbox to bell housing **46Nm**
Intermediate pipe to silencer **15-18Nm**
Oil cooler pipe banjo bolt 32-36 **"**
Pump bolts **10Nm**
Propeller shaft to gearbox **95-105Nm**
Rear engine mounting bracket to body **20-25Nm**
Selector lever nut to shaft **23-27Nm**
Torque convertor housing to adaptor **49-54Nm**
Torque convertor housing to block/sump **49-54Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KAYADHESIVES No **5696.**
Transmission fluid **Esso** *Dexron* **II**

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm
9/16AF
5mm Allen key

INTERMEDIATE PLATE

RENEW **44.20.10**

Remove the transmission unit 44.20.01 page 38.
Fit Service Tool lifting handles JD 105 to the torque converter (Fig 1). Remove the converter (2 Fig 1) from the transmission unit.
Remove the lifting handles.
Remove the converter housing to pump assembly securing bolts (1 Fig 2).
While holding the input shaft (2 Fig 2) in this position, remove the convertor housing and pump assembly (3 Fig 2).
Remove and discard the intermediate plate casing gasket.
Clean gasket and mating faces.
Fit a new gasket, fit the converter/pump assembly, fit and tighten the securing bolts.
Refit the torque converter.
Refit the transmission unit 44.20.01.

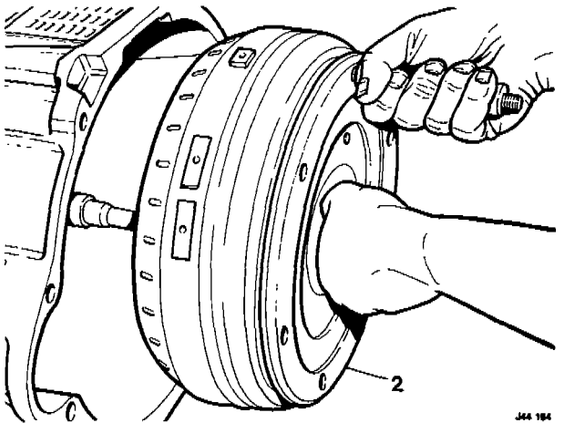


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 102 Oil seal replacer
JD 105 Converter lifting handles
JD 124 Engine lifting bracket

TORQUE FIGURES

Base plate assembly to mounting pan **7-10Nm**
Base plate assembly to side plate **7-10Nm**
Dipstick tube nut **20Nm**
Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Drive plate to torque convertor **49-54Nm**
Exhaust tie nut/stud **9.5-12.5Nm**
Gearbox to bell housing **46Nm**
Intermediate pipe to silencer **15-18Nm**
Oil cooler pipe banjo bolt **32-36Nm**
Propeller shaft to gearbox **95-105Nm**
Pump bolts **10Nm**
Rear engine mounting bracket to body **20-25Nm**
Selector lever nut to shaft **23-27Nm**
Torque convertor housing to adaptor **49-54Nm**
Torque convertor housing to block/sump **49-54Nm**

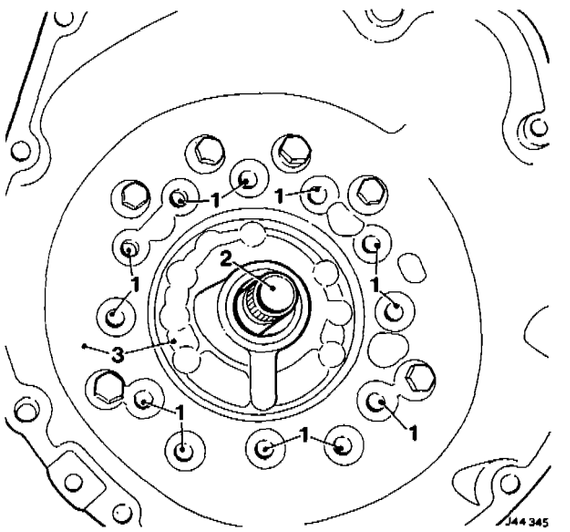


Fig 2

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16AF
5mm Allen key

04766

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TORQUE CONVERTER

RENEW 44.17.07

Remove the transmission unit 44.20.01 page 38.
Fit Service Tool lifting handles JD 105 to the torque converter (Fig 1). Remove the converter (2 Fig 1) from the transmission unit.
Remove the lifting handles.

Clean the torque converter and mating faces.
Fit the lifting handles to the replacement torque converter assembly.
Fit the torque converter to the transmission unit.
Refit the transmission unit 4-4.20.01.

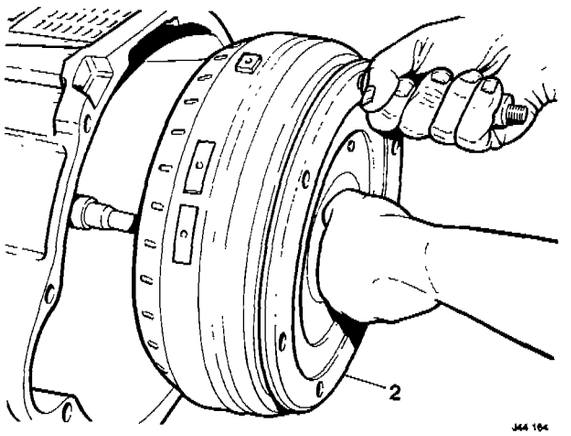


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
***JD 124** Engine lifting bracket*
***JD 105** Converter lifting handles*

TORQUE FIGURES

*Base plate assembly to mounting pan 7-**10Nm***
*Base plate assembly to side plate 7-**10Nm***
*Dipstick tube nut **20Nm***
*Down pipe to intermediate pipe 15-**18Nm***
*Drain **plug 15Nm***
*Drive plate to torque convertor **49-54Nm***
*Exhaust tie nut/stud 9.5-**12.5Nm***
*Gearbox **to** bell housing **46Nm***
*Intermediate pipe to silencer 15-**18Nm***
*Oil cooler pipe banjo bolt **32-36Nm***
*Pump bolts **10Nm***
*Propeller **shaft** to gearbox 95-**105Nm***
*Rear engine mounting bracket to body **20-25Nm***
*Selector lever nut to shaft **23-27Nm***
*Torque convertor housing to adaptor **49-54Nm***
*Torque convertor housing to block/sump **49-54Nm***

OILS/SEALANTS/LUBRICANTS

*Exhaust sealer **TIVOLI KAY ADHESIVES No 5696.***
*Transmission fluid **Esso Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16A F
5mm Allen key

0476G

REAR EXTENSION HOUSING GASKET

RENEW **44.20.19**

Fit Service Tool JD 124 to the rear of the inlet manifold and take the weight of the engine with Service Tool **MS53B** (Fig 1).
Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side of the vehicle.
Taking the weight of the transmission unit, remove the rear mounting to **body** securing bolts, lower the jack and collect the spacer.
Disconnect the propeller shaft from the drive flange.
Remove the bolts securing the rear mounting to the body and using MS 53B, lower the gearbox and mounting assembly.
Remove the mounting assembly and spacers.
Remove the bolts (1 Fig 2) securing the rear extension housing to the rnaincase and remove the housing (2 Fig 2).
Fit a new gasket to the replacement extension housing, fit to the gearbox and secure with the bolts.
Coat the output splines with 'Hylomar' and refit the gearbox output flange splines.
Refit the propeller shaft.
Lift the gearbox into position fit the mounting to the gearbox and body.
Clean the exhaust olive, refit the intermediate pipe to the downpipe.
Lower the vehicle and remove Service tools **MS 53B** and **JD** 124.
Refill the transmission with fluid.

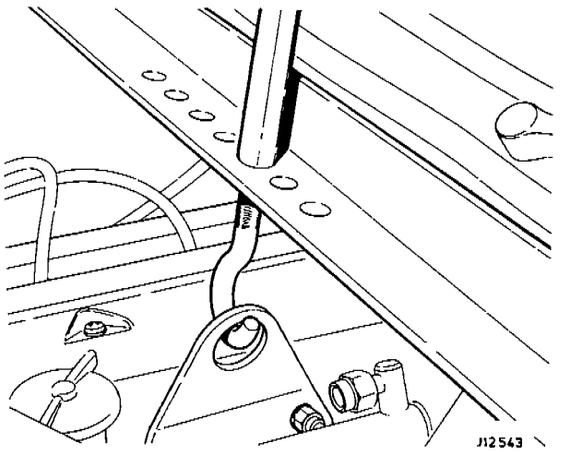


Fig 1

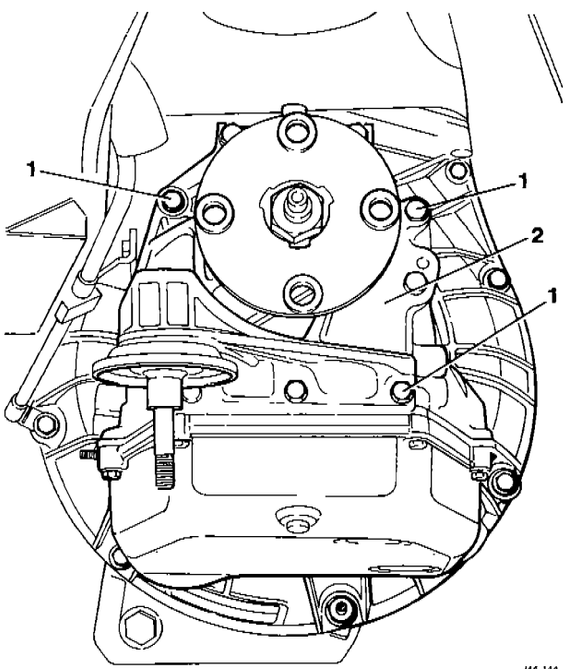


Fig 2

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket

TORQUE FIGURES

Down pipe to intermediate pipe ***15-18Nm***
Drain ***plug 15Nm***
Output flange ***100Nm***
Rear extension housing ***to*** *main case* ***23Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Output shaft splines HYLOMAR
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
I Omm
13mm
17mm
30mm
9/16AF

0476G

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REAR EXTENSION HOUSING OIL SEAL

RENEW **44.20.18**

Fit Service Tool JD 124 to the rear of the inlet manifold and take the weight of the engine with Service Tool MS53B (Fig 1).
Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side of the vehicle.
Disconnect the propeller shaft from the drive flange.
Remove the bolts securing the rear mounting to the body and using MS 53B, lower the engine/transmission assembly.
Remove the mounting assembly and spacers.
Disconnect the propshaft from the drive flange.
Open the door and select Park.
Prior to removing the drive flange securing nut place a suitable drain tin below.
Remove the the drive flange securing nut and drive flange.
Using suitable seal remover remove the seal from the extension.
Clean its mounting position, lubricate seal and using Service Tool JD 102 (1 Fig 2) fit the rear oil seal to the rear extention.
Refit the mounting assembly.
Raise the engine/transmission. Fit the mounting bolts.
Refit the exhaust.
Remove the service tools.
Replenish the transmission fluid.

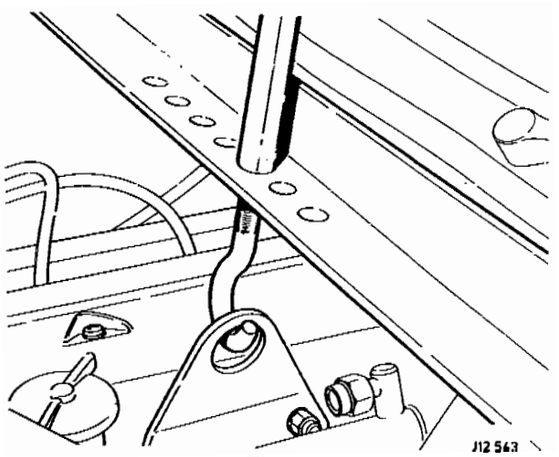


Fig 1

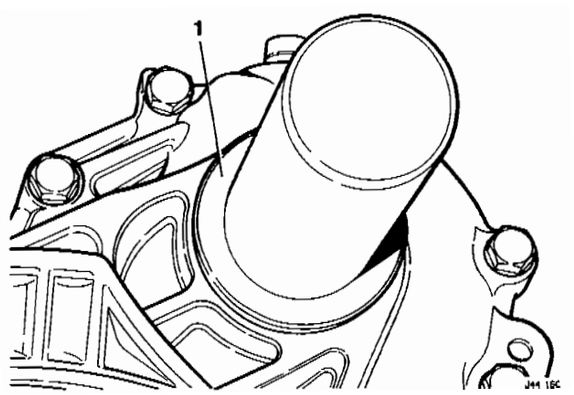


Fig 2

DATA

SERVICE TOOLS

***MS 53B** Engine support bracket*
***JD 124** Engine lifting bracket*
***JD 102** Oil seal replacer*

TORQUE FIGURES

Drain plug 15Nm
Output flange 100Nm

OILS/SEALANTS/LUBRICANTS

Output shaft splines HYLOMAR
Transmission fluid Dexron II

SPANNER SIZES

10mm
13mm
17mm
30mm
9/16AF

0476G

REAR EXTENSION HOUSING

RENEW 44.20.15

Remove the rear extension housing gasket 44.20.19.
Remove the rear mounting peg and spring pan, remove the bolts securing the selector cable mounting bracket and remove the bracket.
Using Service Tool JD 124 remove the bearing from the extension housing.
Remove the cap and circlip securing the breather (1 Fig 1), remove the breather and O ring (2 Fig 1).
Remove the rear oil seal.
Fit a new 'O' ring to the breather, fit the assembly to the replacement housing, fit a replacement oil seal to the housing using Service Tool JD 102 (1 Fig 2) and fit the breather cap.
Refit the selector mounting bracket and secure with the bolts.
Fit the spring pan and mounting peg, fit a gasket to the replacement extension housing, fit to the gearbox and secure with the bolts.
Refit the gearbox output flange.
Refit the propeller shaft, clean the exhaust olive and using a recommended exhaust sealant refit the intermediate pipe to the downpipe.
Refill the transmission with fluid.

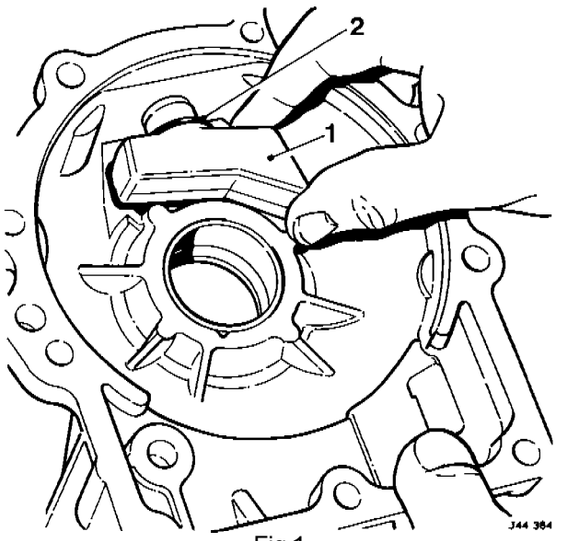


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer
JD 104 Rear extension bearing replacer

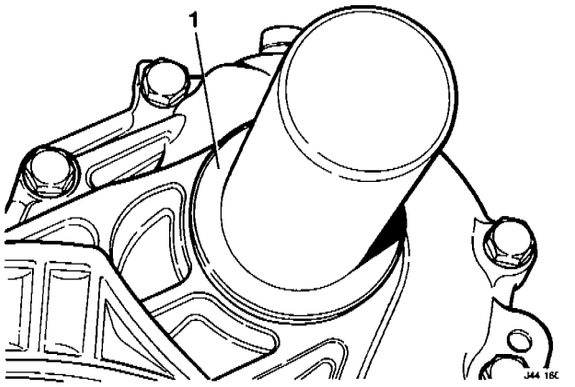


Fig 2

TORQUE FIGURES

Downpipe to intermediate pipe 15-18Nm
Drain plug 15Nm
Intermediate pipe to silencer 15-18Nm
output flange 100Nm
Propeller shaft to gearbox 95-105Nm
Rear extension housing to main case 23Nm

OILS/SEALANTS/LUBRICANTS

Exhaust sealer TIVOLI KA YADHESIVES No 5696.
Output shaft splines HYLOMAR
Transmission fluid Esso Dexron II

SPANNER SIZES

8mm
10mm
13mm
I 7mm
30mm

9/16AF

0476G

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SPEED SENSOR

RENEW 44.15.34

Raise the vehicle on a ramp.
Place a drain tin below the fluid pan drain plug, remove the plug and drain the oil.
Refit the fluid pan drain plug (1 Fig 1).
Disconnect the dipstick tube from the fluid pan.
Slacken off and remove the rotary switch protection cover bolts, and remove the cover.
Remove the fluid pan clamp securing bolts (2 Fig 1) and remove the pan (3 Fig 1) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Remove the filter screws, and remove the filter.
Displace the speed sensor harness from the valve block body.
Slacken off and remove the sensor retaining clip securing screws.
Displace the sensor/clip from the casing.
Remove the sensor from the harness connector (Fig 2).

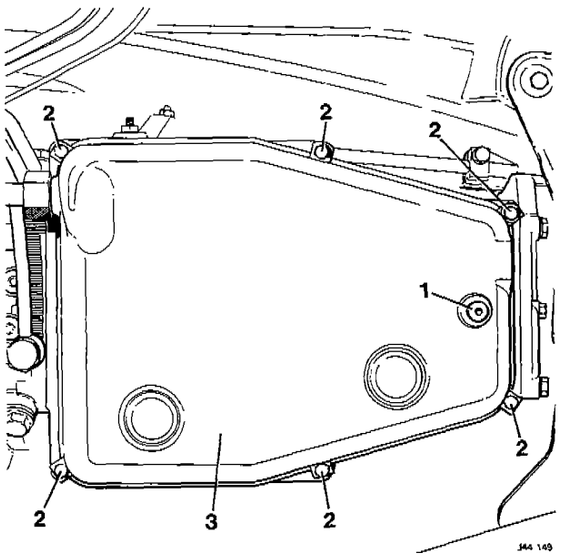


Fig 1

Clean the sensor, clip, and mating surfaces.
Fit the replacement sensor to the harness connector.
Fit the speed sensor into position, fit the retaining clip and tighten the screws.
Secure the harness to the valve block body.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Refit the rotary switch protection cover.
Reconnect the dipstick tube. Refill the unit with fluid. Start the engine and move the selector through all positions and back to neutral. Check the oil level.

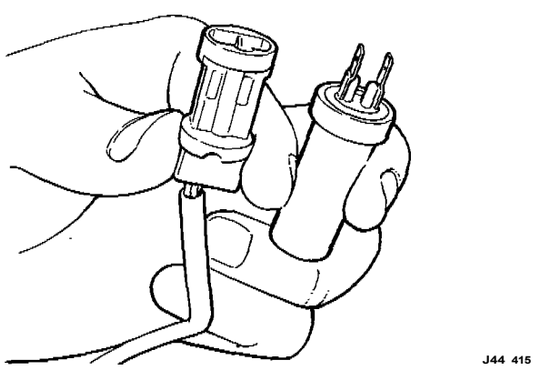


Fig 2

DATA

TORQUE FIGURES

Dipstick tube nut 20Nm
Drain plug 15Nm
Fluid pan mounting bolts 8Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm
5mm Alien key

0476G

INTERNAL HARNESS

RENEW **44.15.35**

Raise the vehicle on a ramp.
Place a drain tin below the fluid pan drain plug, remove the plug and drain the oil.
Refit the fluid pan drain plug (1 Fig 1).
Disconnect the dipstick tube from the fluid pan.
Slacken off and remove the rotary switch protection cover bolts, and remove the cover.
Remove the fluid pan clamp securing bolts (2 Fig 1) and remove the pan (3 Fig 1) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.

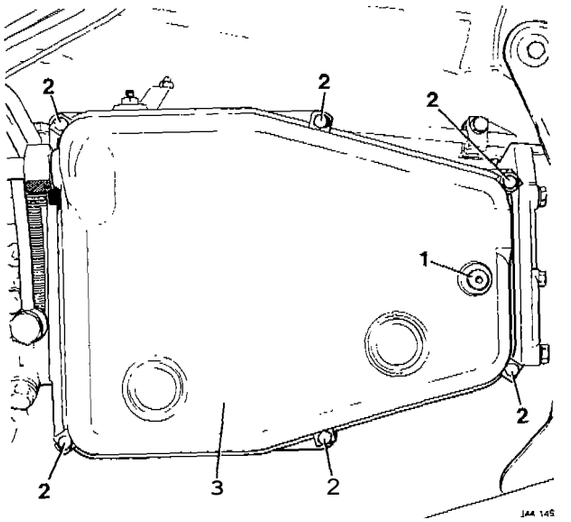


Fig 1

Remove the filter screws, and remove the filter.
Displace the speed sensor harness from the valve block body.
Slacken off and remove the sensor retaining clip securing screws.
Displace the sensor/clip from the casing.
Disconnect the rotary switch harness multi-plug.
Slacken off and remove the switch harness to casing securing nut.
Remove the valve block screws and lower the block, ensure that the multi-plug socket is displaced from the casing aperture.
Clean the mating face for the valve block.

Note the cable runs and solenoid connector order for re-assembly.
Displace the harness from the valve block retaining clips.
Displace and remove the harness securing spring clips (1 Fig 2).
Expand and remove the solenoid multi-plug retaining clips (2 Fig 2 – Note: a thin, sharpened rod will assist removal).
Displace and remove the harness.

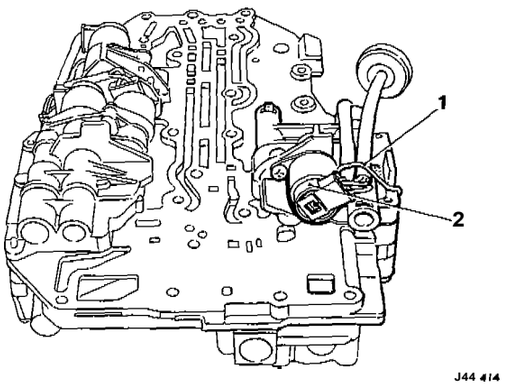


Fig 2

Position the new harness to the valve body, fit the solenoid multi-plug retaining clips. Fit the spring clips.
Fit the harness to valve block retaining clips.

Fit the valve block assembly into position, ensuring that the gear selector quadrant peg is engaged into the manual valve, and the multi-plug socket is seated in the casing (the flat on the socket locates in the vertical LH side of the case).
Fit but do not tighten the valve block securing screws.
Gently push the valve block forward, hold in position, and fully tighten the screws.
Fit and tighten the multi-plug socket securing nut.
Connect the harness to the socket.
Fit the speed sensor into position, fit the retaining clip and tighten the screws.
Secure the harness *to* the valve block body.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Refit the rotary switch protection cover.
Reconnect the dipstick tube. Refill the unit with fluid.
Start the engine and move the selector through all positions and back to neutral.

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Check the oil level (Fig 1).

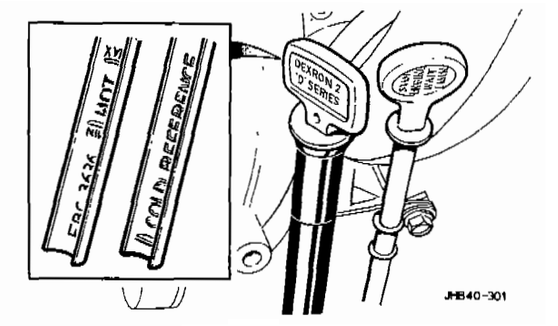


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut **20Nm**
Drain plug **15Nm**
Fluid pan mounting bolts **8Nm**

OILS/SEALANTS/LUBRICANTS

Transmission fluid **Dexron II**

SPANNER SIZES

8mm
13mm
5mm Allen key

INTERNAL HARNESS MULTI-PLUG O RING

RENEW **44.24.20**

Raise the vehicle on a ramp.
Place a drain tin below the fluid pan drain plug, remove the plug and drain the oil.
Refit the fluid pan drain plug.
Disconnect the dipstick tube from the fluid pan.
Slacken off and remove the rotary switch protection cover bolts, and remove the cover.
Remove the fluid pan clamp securing bolts (2 Fig 2) and remove the pan (3 Fig 2) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.

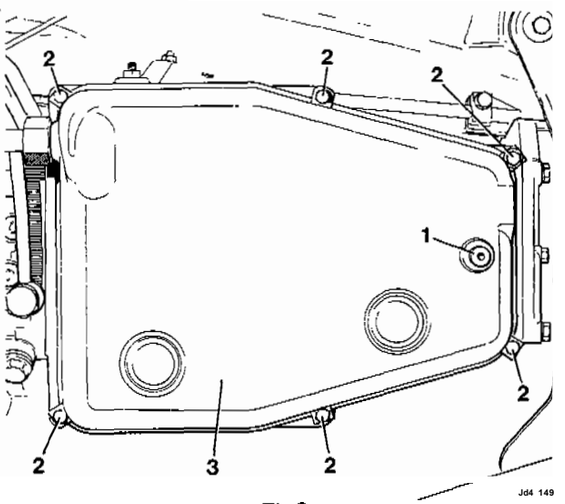


Fig 2

Remove the filter screws, and remove the filter.
Displace the speed sensor harness from the valve block body.
Slacken off and remove the sensor retaining clip securing screws.
Displace the sensor/clip from the casing.
Disconnect the rotary switch harness multi-plug.
Slacken off and remove the switch harness to casing securing nut.

Remove the valve block screws (1 Fig 3) and lower the block, ensure that the multi-plug socket is displaced from the casing aperture.
Clean the mating face for the valve block.
Discard the multi-plug socket O ring.

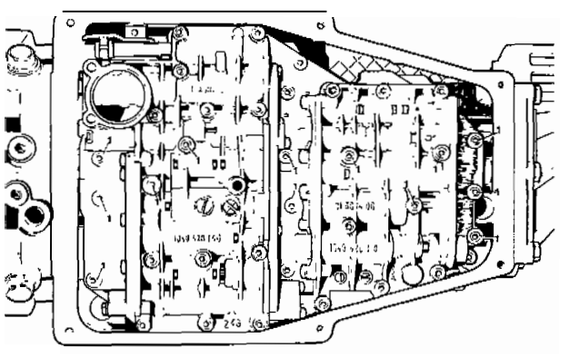


fig 3

Fit a new O ring to the multi-plug socket.
Fit the valve block assembly into position, ensuring that the gear selector quadrant peg is engaged into the manual valve, and the multi-plug socket is seated in the casing (the flat on the socket locates in the vertical LH side of the case).

Fit but do not tighten the valve block securing screws. Gently push the valve block forward, hold in position, and fully tighten the screws.

Fit and tighten the multi-plug socket securing nut. Connect the harness to the socket.
Fit the speed sensor into position, fit the retaining clip and tighten the screws.

Secure the harness to the valve block body.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Refit the rotary switch protection cover.
Reconnect the dipstick tube. Refill the unit with fluid. Start the engine and move the selector through all positions and back to neutral. Check the oil level (Fig 1).

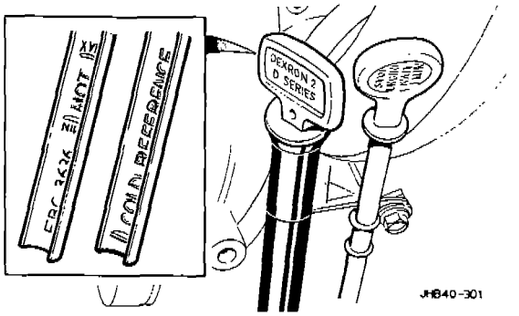


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut 20Nm
Drain plug 15Nm
Fluid pan mounting bolts 8Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm
5mm Allen key

04766

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SELECTOR CABLE ASSEMBLY

CHECK/ADJUST 44.15.07

Drive the vehicle on to a ramp.
Open the centre console armrest, remove the ashtray securing screws and remove the ashtray.
Displace the sport mode switch from its surround and disconnect the harness (Fig 1).
Slacken off and remove the console veneer panel wing nuts. Remove the selector surround and veneer panel, retrieve the spacers.
Select 'N' neutral.
Slacken off the selector cable rear adjustment locknut and wind the nut to the end of its thread. Wind the front adjustment locknut to the end of its thread.
Raise the ramp.
From below, slacken off and remove the selector cable ball pin to selector lever securing nut (Fig 2).
Displace the ball pin from the selector lever.
Ensure that the selector lever is in 'N' neutral position – ie the third detent from (and including) the rearmost position.
Refit the ball pin to the selector lever.
Fit and tighten the securing nut.
Lower the ramp.
Adjust the selector cable nuts so that the selector lever freely engages the 'N' neutral position notch.
Tighten the rear lock nut, ensuring that the tabwasher tangs engage the slots in the bracket.
Refit the veneer panel, ensure that the spacers are correctly positioned. Refit the selector surround.
Fit the sport mode switch. Refit the ashtray, close the armrest.

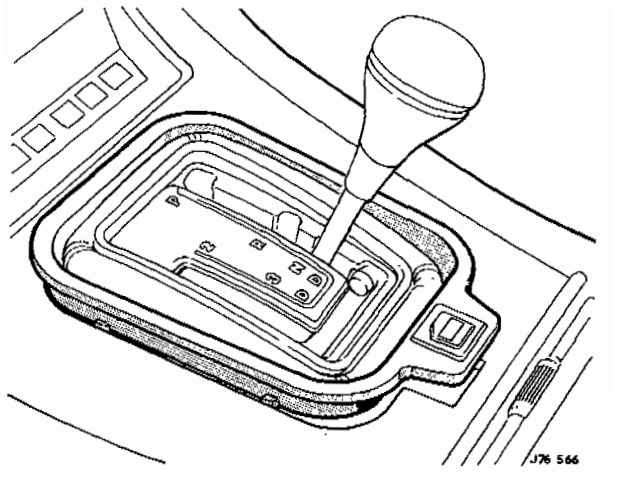


Fig 1

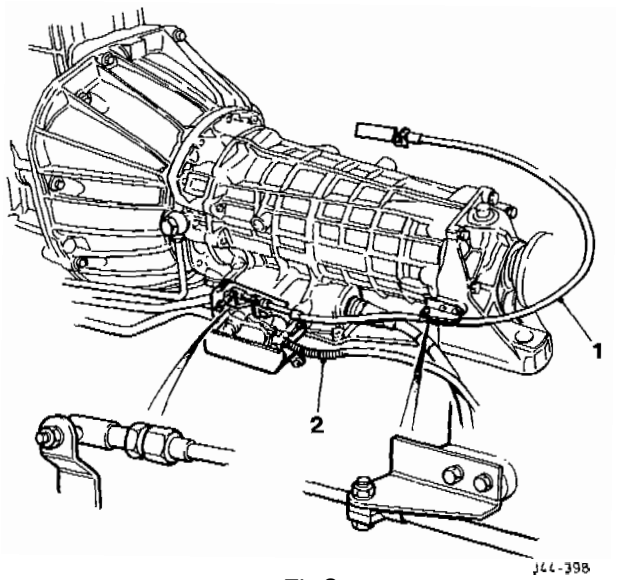


Fig 2

DATA

Cable bracket** lower **to transmission unit 7-10Nm
Control** cable to **gearbox lever 8-12Nm
Gear control cable to adjustable ball end 40-50Nm

SPANNER SIZES

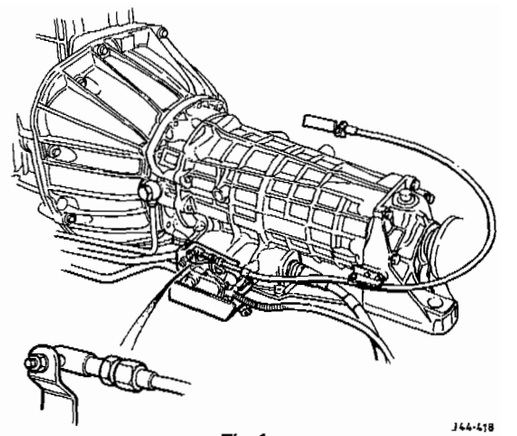
8mm
11mm
13mm
20mm

0476G

SELECTOR CABLE ASSEMBLY

RENEW *44.15.08*

Drive the vehicle on to a ramp.
Raise the ramp.
From below, slacken off and remove the selector cable ball pin to selector lever securing nut (Fig 1).
Displace the ball pin from the selector lever.
Remove the rotary switch (Fig. 2) harness securing screws.
Remove the selector cable mounting bracket.
Displace the cable from the tunnel 'P' clip.
Reposition the tunnel sound proofing upwards to aid cable removal.
Position the cable over the rear mounting crossmember to hang free below the tunnel.
Lower the ramp.


Fig 1

From inside the car:–
Open the centre console armrest, remove the ashtray securing screws and remove the ashtray.
Displace the sport mode switch from its surround and disconnect the harness (Fig 3).
Slacken off and remove the console veneer panel wing nuts. Remove the selector surround and veneer panel, retrieve the spacers.
Remove the deflector bracket. Cut and remove the rotary switch harness strap.
Displace and remove the centre fuse *box.*
Select 'N' neutral.
Slacken off the selector cable rear adjustment locknut, displace the cable assembly from the sliding block and adjustment bracket.
Remove the locknut and washer.
Reposition the cable sealing grommet.

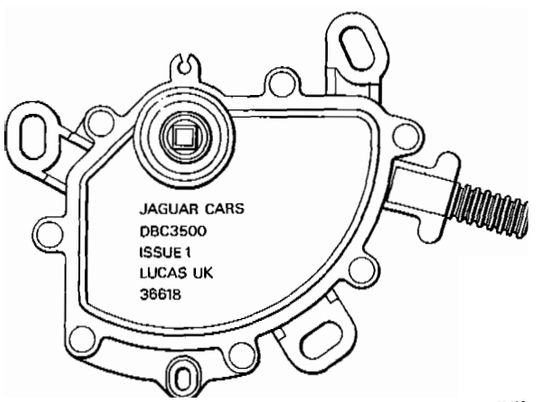


Fig 2

From below:–
Displace and remove the cable assembly.

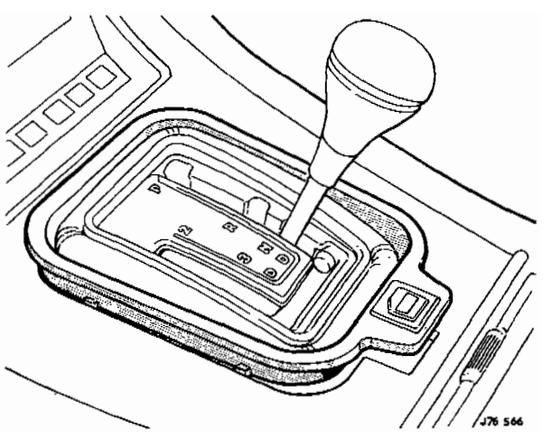
NOTE:
New cable preset:- Eyelet to ball pin centre line measurement = 1147mm (with ball pin trunnion 10-11mm thread engagement).

Fit the new cable through the tunnel aperture to suspend (grommet to the inside of the vehicle).

From above:–
Fit the cable adjustment locknuts and washers to the extremes of the cable thread.

NOTE:
The tab washer is fitted to the rear locknut with the tang facing forward.

Fully seat the cable on to the sliding block assembly and adjustment locknuts.
Fit and tighten the cable to the sliding block securing nut.
Fully seat the grommet to the tunnel.


Fig 3

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From below:–
Reposition the selector cable (over the rear mounting crossmember).
Reposition the sound proofing.
Fit the cable mounting bracket to the mounting studs.
Fit the 'P' clip to the selector cable and secure to the stud.
Fit the rotary switch 'P' clip to the selector cable bracket.

Ensure that the selector lever is in 'N' neutral position – ie the third detent from (and including) the rearmost position.

Refit the ball pin to the selector lever.
Fit and tighten the securing nut.
Lower the ramp.
Adjust the selector cable nuts so that the selector lever freely engages the 'N' neutral position notch.
Tighten the rear lock nut, ensuring that the tabwasher tangs engage the slots in the bracket.
Refit the fuse box and deflector bracket.
Refit the veneer panel, ensure that the spacers are correctly positioned, Refit the selector surround.
Fit the sport mode switch. Refit the ashtray, close the armrest.

DATA

Cable bracket lower to transmission unit 7-10Nm
Control cable to gearbox lever 8-12Nm
Gear control cable to adjustable ball end 40-50Nm

SPANNER SIZES

8mm
11mm
13mm
20mm

04768

KICKDOWN SWITCH

ADJUST 44.15.23

Open the bonnet.
Fit and align throttle stop adjustment gauge JD 131 to the throttle stop plate, ensure that the pointer aligns with the idle mark 'I' on the throttle linkage (Fig 1).
Slacken off the full throttle stop lock nut.
Fully open the throttle. and adjust the full throttle adjusting screw to align the pointer on the special tool to mark 'M' (1 Fig 2).
Release the throttle linkage and tighten the full throttle stop lock nut.

Open the drivers door, displace the draught welting from the lower 'A post area.
Remove the 'A post lower trim pad securing screws and remove the pad.

From the engine compartment – rotate the throttle quadrant for access. Fit the throttle stop/kickdown setting gauge JD 162 on to the quadrant and tighten the Allen screw.
Gently return the throttle quadrant against its stop.

From inside the car:–
Reposition the footwell carpet from the kickdown switch area.
Cut and remove the ratchet strap securing the kickdown switch harness to the side harness.
Disconnect the kickdown switch block connector.
Place a thin piece of paper over the kickdown switch operating pad. Press the throttle pedal down (by hand) until resistance is felt (approximately 90% full throttle).
Adjust the kickdown switch up/down until the paper can just be released from in between the pedal and pad with minimal resistance.
Release the throttle pedal. Remove the paper.
Reconnect the switch connector and secure the harness with a new ratchet strap.
Refit the footwell carpet and trim pad.

From the engine compartment – reposition the quadrant switch for access.
Remove throttle stop/kickdown setting gauge JD 162.
Remove throttle stop adjustment gauge JD 131.
Gently return the throttle quadrant against its stop.
Close the bonnet.

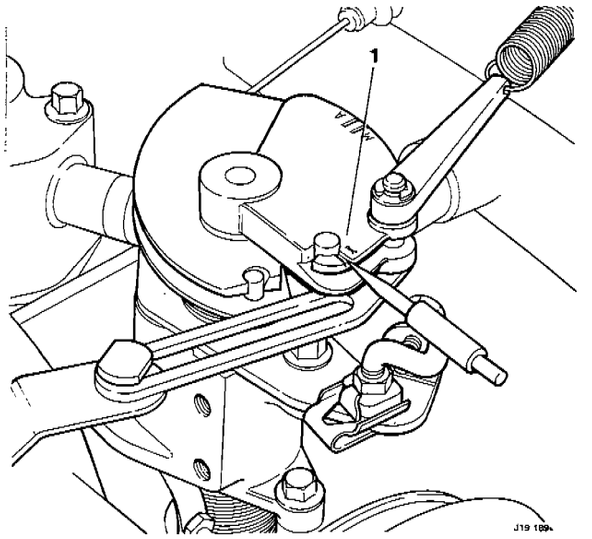


Fig 1

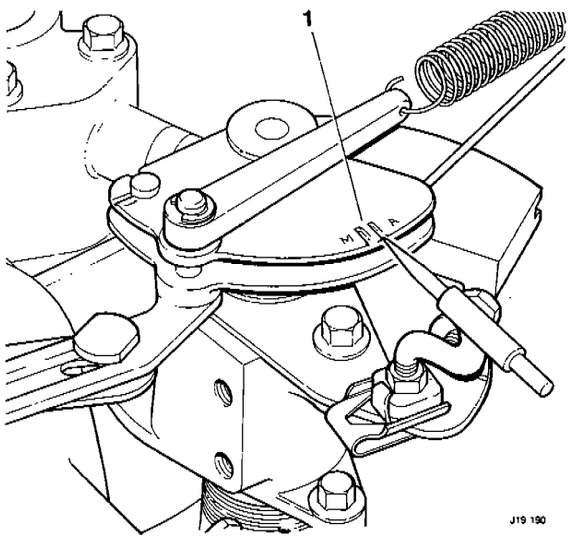


Fig 2

DATA

SERVICE TOOLS

JD 131 *throttle* ***stop*** *adjustment* ***gauge***
JD 162 *Throttle stop/kickdown setting* ***gauge***

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KICKDOWN SWITCH

RENEW **44.15.38**

Fit and align throttle stop adjustment gauge JD 131 to the throttle stop plate, ensure that the pointer aligns with the idle mark 'I' on the throttle linkage (Fig 1).
Slacken off the full throttle stop lock nut.
Fully open the throttle and adjust the full throttle adjusting screw to align the pointer on JD 131 to mark 'M' (1 Fig 2).
Release the throttle linkage and tighten the full throttle stop lock nut.
Displace the draught welting from the lower 'A post area. Remove the 'A post lower trim pad securing screws and remove the pad.

From the engine compartment – rotate the throttle quadrant for access. Fit the throttle stop/kickdown setting gauge JD 162 on to the quadrant and tighten the Allen screw.
Gently return the throttle quadrant against its stop.

From inside the car:–
Reposition the footwell carpet from the kickdown switch area.
Cut and remove the ratchet strap securing the kickdown switch harness to the side harness.
Disconnect the kickdown switch block connector.
Unscrew and remove the kickdown switch (making a note of its approximate position on the stud) from the adjustment stud.
Slacken off and remove the adjustment stud, remove the floor pan retainer (dished pressing).

Fit the floor pan retainer to the under carpet.
Fit and tighten the adjustment stud to the floor pan. Fit the new switch to its approximate original position on the adjustment stud

Place a thin piece of paper over the kickdown switch operating pad. Press the throttle pedal down (by hand) until resistance is felt (approximately 90% full throttle).
Adjust the kickdown switch up/down until the paper can just be released from in between the pedal and pad with minimal resistance.
Release the throttle pedal. Remove the paper.
Reconnect the switch connector and secure the harness with a new ratchet strap.
Refit the footwell carpet and trim pad.

From the engine compartment:–
Reposition the quadrant switch for access.
Remove throttle/kickdown setting gauge JD 162.
Remove throttle stop adjustment gauge JD 131.
Gently return the throttle quadrant to its stop.
Close the bonnet.

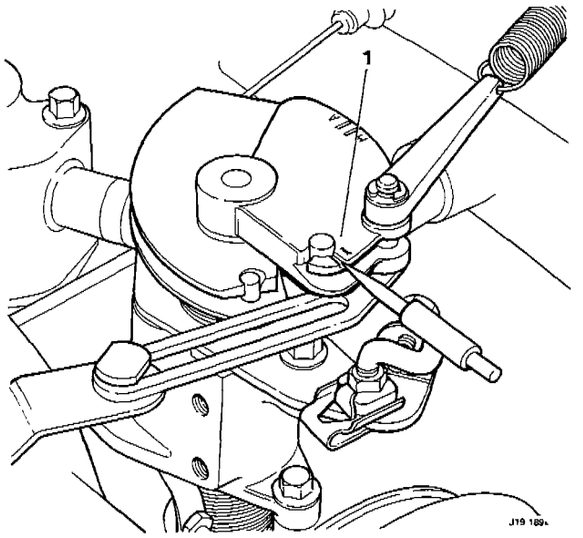


Fig 1

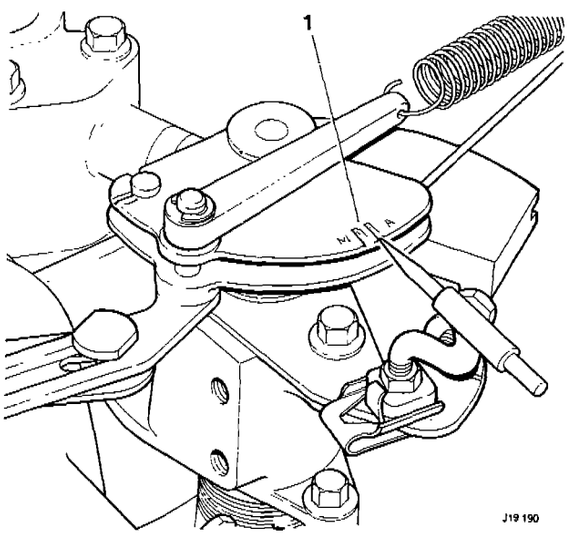


Fig 2

DATA

SERVICE TOOLS

JD 131 *Throttle* ***stop*** *adjustment* ***gauge***
JD 162 *Throttle stop/kickdown* ***setting gauge***

0476G

ROTARY TRANSMISSION SWITCH

ADJUST 44.15.37

Drive the car on to a ramp. Raise the ramp.
Select 'N', ensure that the selector stalk is central in the neutral notch.
Remove the rotary switch protection cover securing bolts, and remove the cover (1 Fig 1).
Slacken off the rotary switch to mounting bracket securing nuts. Displace the rubber blanking plug from the switch centre boss (2 Fig 1).
Fit JD 161 switch setting tool to align the switch rotor with the switch body.

NOTE: Correct setting of the switch is extremely important. Be very precise in carrying out this procedure, JD 161 is a precision tool and should be treated as such.

After careful alignment, evenly tighten the switch securing nuts.
Disengage and remove JD 161, fit the blanking plug to the centre bass.
Refit the protection cover. Lower the ramp.

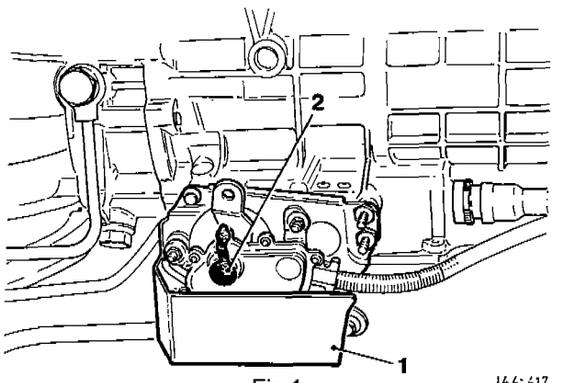


Fig 1

DATA

SERVICE TOOLS

JD 161 Rotary switch setting tool

TORQUE FIGURES

Protection cover to sump pan bolts 15-18Nm
Rotary switch to mounting bracket nuts 15-18Nm

SPANNER SIZES

11mm
13mm

0476G

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ROTARY TRANSMISSION SWITCH

RENEW **44.15.36**

Open the bonnet and disconnect the battery.

From inside the car:–
Remove both driver and passenger side dash liners.
Select 'N' position. Open the centre console armrest, remove the ashtray securing screws and remove the ashtray.
Displace the sport mode switch from its surround and disconnect the harness.

Slacken off and remove the console veneer panel wing nuts. Remove the selector surround and veneer panel, retrieve the spacers.
Cut and remove the rotary switch harness strap.
Disconnect the switch harness block connector.
Reposition the carpet for access to the harness tunnel grommet and ratchet strap. Cut and remove the strap securing the switch harness to the powered seat harness.

Open the fascia glove box lid. Displace and remove the centre vent veneer panel (four clips attached to the back face of the panel).
Displace and remove the centre vent.
Slacken off and remove the centre console upper securing screws (access is through the centre vent aperture).
Displace and remove the centre console to tunnel 'quarter-turn' fasteners.
Move the console rearwards to disengage the rear securing slot. Raise the console to give clearance for rotary switch multi-plug withdrawal.
Withdraw the multi-plug and harness, reposition to the footwell area.

Raise the ramp.

From below:–
Remove the rotary switch protection cover securing bolts, and remove the cover (Fig 1).
Slacken off and remove the rotary switch to mounting bracket securing nuts.
Remove the 'P clip from the switch harness.
Disconnect the switch multi-plug from the transmission unit multi-pin socket.
Displace the switch from the selector shaft and mounting studs.
Displace the harness grommet from the tunnel.
Remove the switch/harness assembly, withdrawing the multi-plug through the tunnel aperture.

Place the new rotary switch in position, feed the harness through the tunnel aperture. Seat the tunnel grommet.
Connect the switch harness to the transmission unit multi-pin socket.

Displace the rubber blanking plug from the switch centre boss.
Fit JD 161 switch setting tool to align the switch rotor with the switch body.

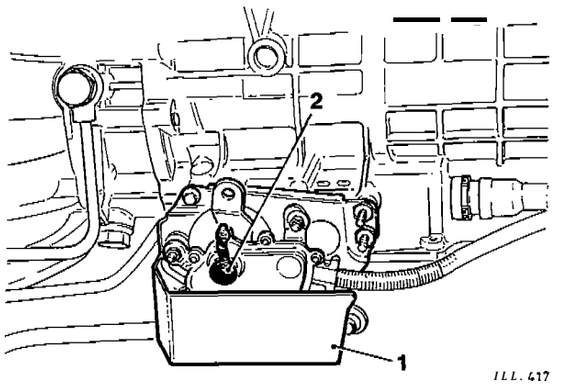


fig 1

Fit the switch/tool assembly to the selector shaft and mounting studs.

NOTE: Ensure that the gear selector and the selector shaft remain in 'N' throughout the operation. Correct setting of the switch is extremely important. Be very precise in carrying out this procedure, JD **161** is a precision tool and should be treated as such.

After careful alignment, evenly tighten the switch securing nuts.
Disengage and remove JD **161** (a draw hole is provided in the tool to aid square withdrawal), fit the blanking plug to the switch centre boss.
Fit the 'P' clip to the switch harness, secure the clip to the mounting bracket.
Ensure that the switch harness is **fully** entered through the grommet and clear of the prop shaft.
Refit the switch protection cover.

Lower the ramp.

From inside the car:–
Raise the rear of the console, feed the multi-plug/ harness through to its final position.
Engage and seat the console rear securing slot.
Fit and tighten the console upper securing screws.
Secure the console to tunnel 'quarter-turn' fasteners.
Refit the centre vent and veneer panel.
Close the fascia glove box lid.
Connect the rotary switch multi-plug. **Secure** the switch harness to the selector cable and deflector with new ratchet straps.
Secure the switch harness to the powered seat harness with a new ratchet strap.
Reposition the carpet. Refit the centre console veneer panel and gear selector surround.
Refit the sport mode switch.
Fit the ashtray to the console aperture, close the armrest.
Refit the driver and passenger dash liners.
Reconnect the battery.

DATA

SERVICE TOOLS

JD 161** Rotary switch setting **tool

TORQUE FIGURES

*Centre console securing screws **8-12Nm***
*Protection cover **to** sump pan **bolts** **15-18Nm***
*Rotary switch **to** mounting bracket nuts **15-18Nm***

SPANNER SIZES

8mm
10mm
11mm
13mm

04760

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PARK LOCK WHEEL

RENEW 44.28.24

Remove the rear extension housing 44.20.19 page 47.
Remove the park lock wheel assembly.
Remove the screws securing the park lock wheel to the speed sensor wheel and remove the park lock wheel.
Clean all component parts.
Fit the park lock wheel to the sensor wheel.
Replace the three governor seals (1 Fig 1).
Fit the park lock wheel to the transmission.
Refit the rear extension housing 44.20.19.

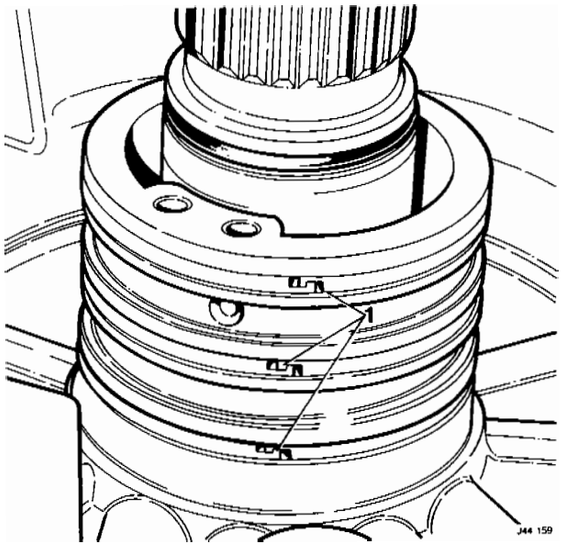


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer

TORQUE FIGURES

Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Intermediate pipe to silencer **15-18Nm**
Output flange **100Nm**
Propeller shaft to gearbox **95**- *105Nm*
Rear extension housing to main case **23Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer **TIVOLI KA Y ADHESIVES**
Output *shaft splines* **HYLOMA** *R*
Transmission fluid Dexron **II**

SPANNER SIZES

8mm
I Omm
13mm
17mm
30mm

9/16AF

0476G

PARK LOCK PAWLASSEMBLY

RENEW **44.28.07**

Remove the rear extension housing 44.20.19 page 47.
Remove the parking pawl guide plate and bracket (1 Fig 1), remove the parking pawl and spring (2 Fig 1).
Remove the pivot pin (3 Fig 1) and clean all the components.
Lubricate and fit the pivot pin and spring, locate the anchor leg.
Fit the pawl to the spring and locate the pawl anchor leg.
Reposition the pawl over the pivot pin and fit the guide plate and retaining bracket.
Fit the guide plate retaining screw.
Refit the rear extension housing 44.20.19.

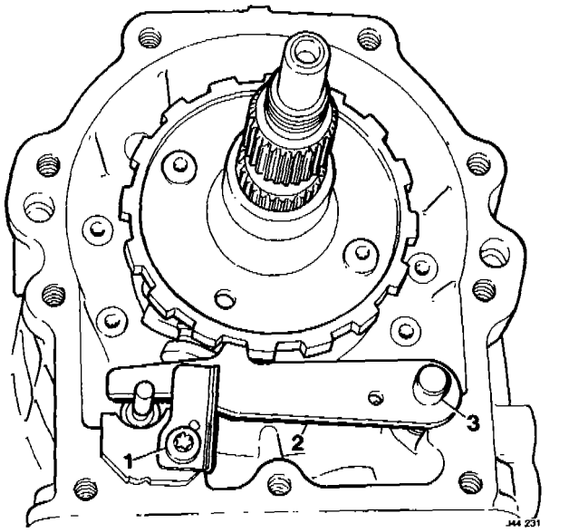


Fig 1

DATA

SERVICE TOOLS

MS 538 Engine support bracket
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer

TORQUE FIGURES

Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Intermediate pipe to silencer **15-18Nm**
Output flange **100Nm**
Propeller shaft to gearbox **95-105Nm**
Rear extension housing to main case **23Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer **TIVOLI** *KA YADHESIVES*
Output shaft splines HYLOMAR
Transmission fluid **Dexron II**

SPANNER SIZES

8mm
10mm
13mm
I 7mm
30mm

9/16AF

04766

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PARK LOCK ACTUATOR ROD

RENEW 44.28.01

Remove the valve block assembly 44.40.01 page 41.
Remove the selector lever/shaft securing nut (1 Fig 1) and disconnect the lever from the shaft.
Remove the roll pin (2 Fig 1) securing the selector quadrant to the selector shaft and disconnect the shaft.
Remove the throttle valve cam return spring (3 Fig 1) and remove the cam from the shaft.
Remove the quadrant actuation rod (4 Fig 1) from the quadrant.
Clean all components and mating surfaces.
Fit the actuator rod to the quadrant and selector shaft ensuring that the actuator rod Passes under the parking pawl.
Fit the return spring to the throttle valve cam, lubricate the throttle valve cam bearing and selector shaft, tension the spring and locate over the gearbox anchor, position and push the selector shaft fully home.
Align the quadrant to the shaft and secure with the roll pin.
Refit the selector lever to the selector shaft and secure with a nut.
Refit the valve block assembly 44.40.01 .

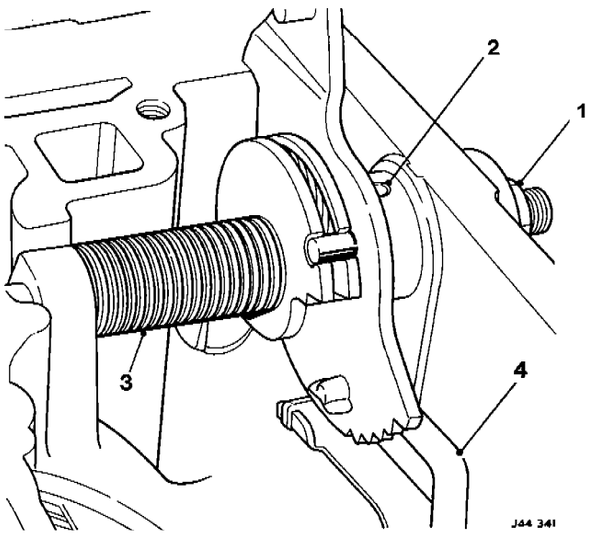


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut **20Nm**
Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Exhaust tie nut/stud **9.5-12.5Nm**
Intermediate pipe to silencer **15-18Nm**
Parking pawl **10Nm**
Sump mounting bolts **8Nm**
Valve block to case **8Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer **TIVOLI KAY ADHESIVES**
Transmission fluid **Dexron II**

SPANNER SIZES

8mm
13mm

5mm Allen key

04766

ELECTRONIC CONTROL UNIT

RENEW **44.15.32**

Open the bonnet. Disconnectthe battery.
Remove the passenger side dash liner and fascia closing panel.
Removethe A post lower trim pad.
Disconnect the multi-plug connector from the transmission ECU.
Slacken off and remove the ECU inner rear securing screw and displacethe harness ratchet strap support.
Slacken off and remove the remaining ECU securing screws.
Displace and removethe ECU.

Fit the new ECU into position. Fit and tighten three screws (not the inner rear screw).
Position the harness ratchet strap support to align with the remaining (inner rear) screw hole.
Fit and tighten the remaining screw, ensure that the ratchet strap support is secure.
Reconnectthe ECU multi-plug.
Refitthe A post lower trim pad.
Refitthe closing panel and dash liner.
Reconnectthe battery.

DATA

TORQUE FIGURES

ECU mounting screws ***8-12Nm***

SPANNER SIZES

11mm

04766

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ELECTRONIC DECODER MODULE

RENEW **44.15.33**

Open the bonnet. Disconnect the battery.
Remove the passenger side dash liner.
Slacken off the relay panel front securing screws.
Slacken off and remove the relay panel rear securing screws. Displace the panel and disengage the panel slots from the slackened front screws.
Carefully ease out the decoder module multi-plug retaining clip to its stop.
Disconnect the decoder module multi-plug.
Slacken off the module front securing screw/nut.
Slacken off and remove the module rear securing screw/nut.
Displace the decoder module.

Fit the new module to the mounting panel, fit and tighten the screws/nuts.
Reconnect the module multi-plug, push home the retaining clip.
Position the mounting panel to the slackened front securing screws.
Fit and tighten the rear securing screws. Final tighten the front securing screws.
Refit the dash liner, reconnect the battery.

DATA

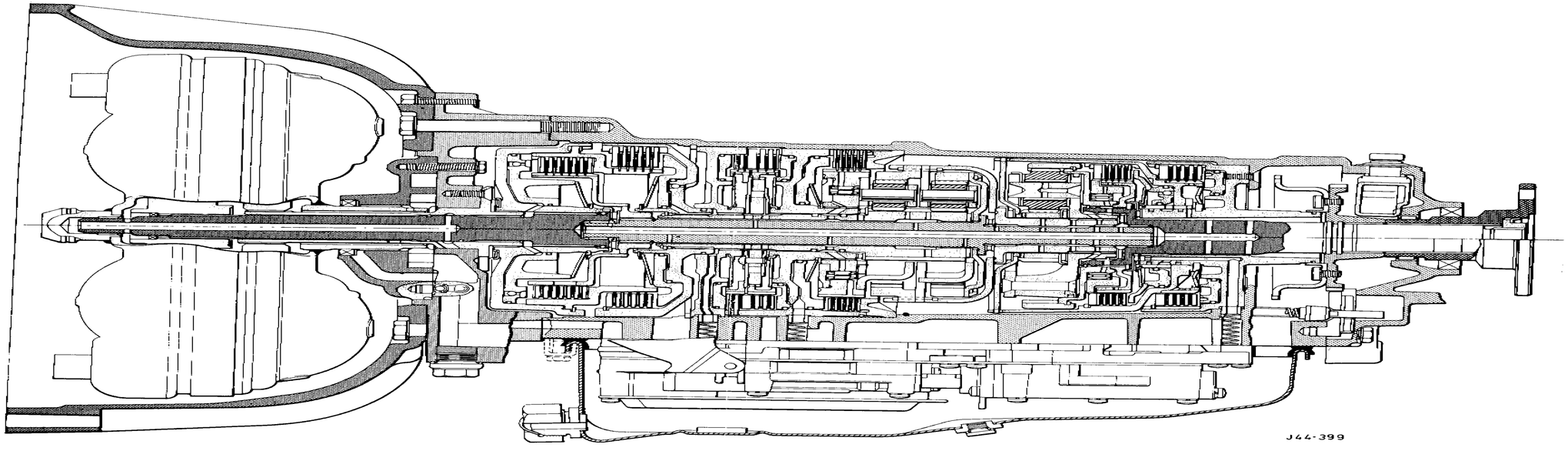
TORQUE FIGURES

Decoder module mounting screws 8-12Nm
Relay mounting panel screws 8-12Nm

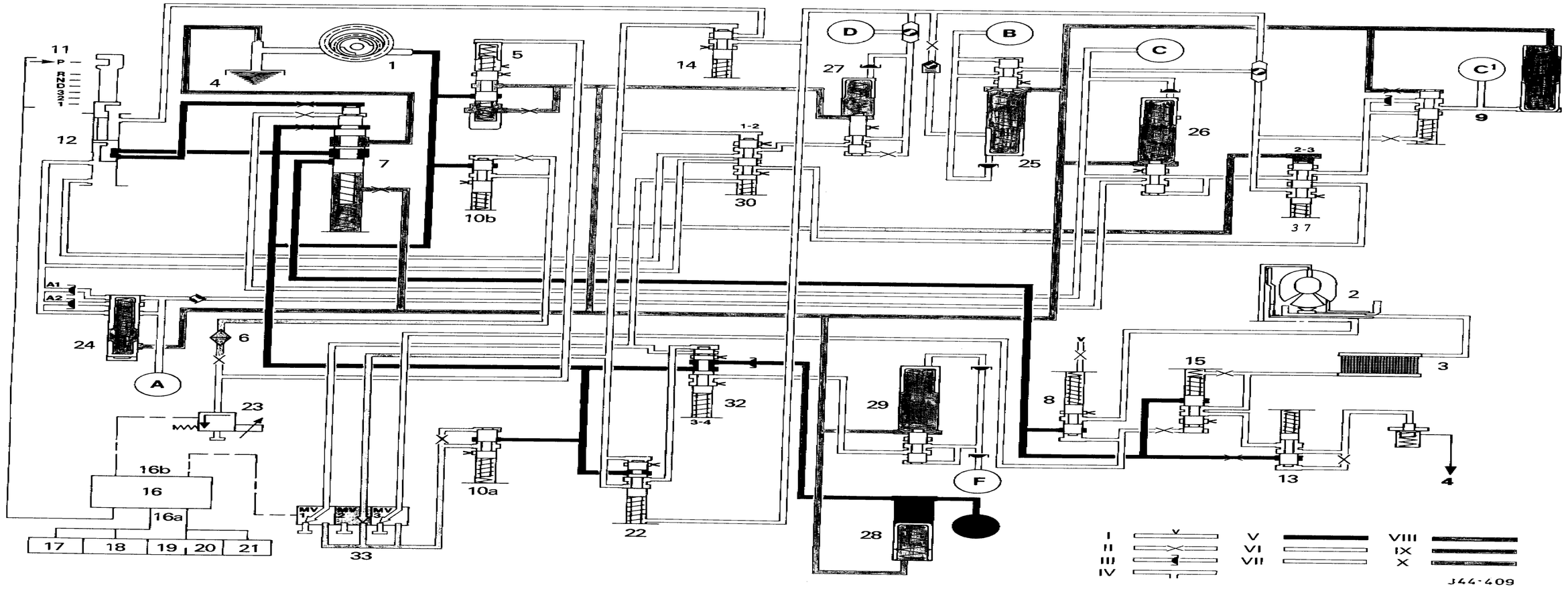
SPANNER SIZES

11mm

04760



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OIL FLOW CHART – POSITION 'P' PARK

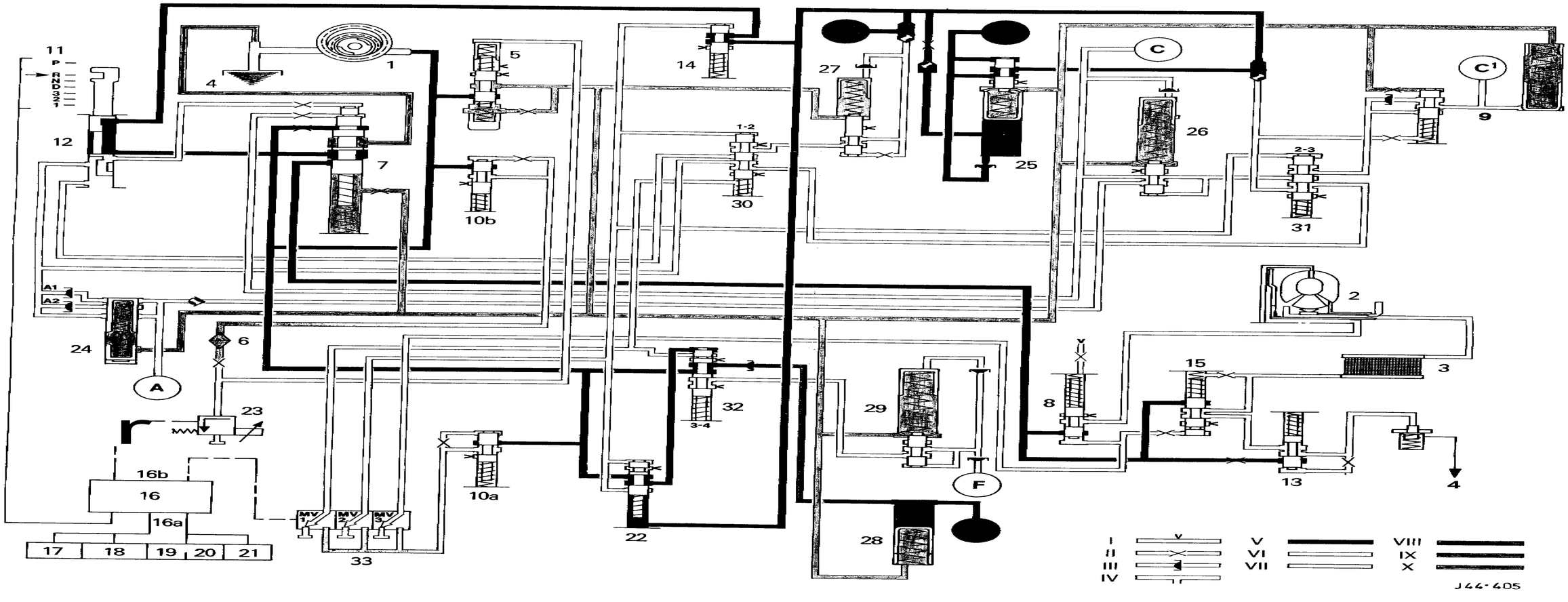
1 Oil pump
2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C^1 Clutch varve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
12 Gear change valve
13 Lubrication valve
14 Reverse locking valve
15 Lock-up control valve
16 ECU – inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle valve
39 Engine speed (rpm)
20 Transmission speed (rpm)
21 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D clutch valve and damper
28 E clutch damper
29 F clutch valve and damper
30 7-2 shift waive
31 2-3 shift valve
32 3-4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C^1 C^1 clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III 0 rifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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A2
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23
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MV 2
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10a
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32
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J44-405

OIL FLOW CHART – POSITION 'R' REVERSE

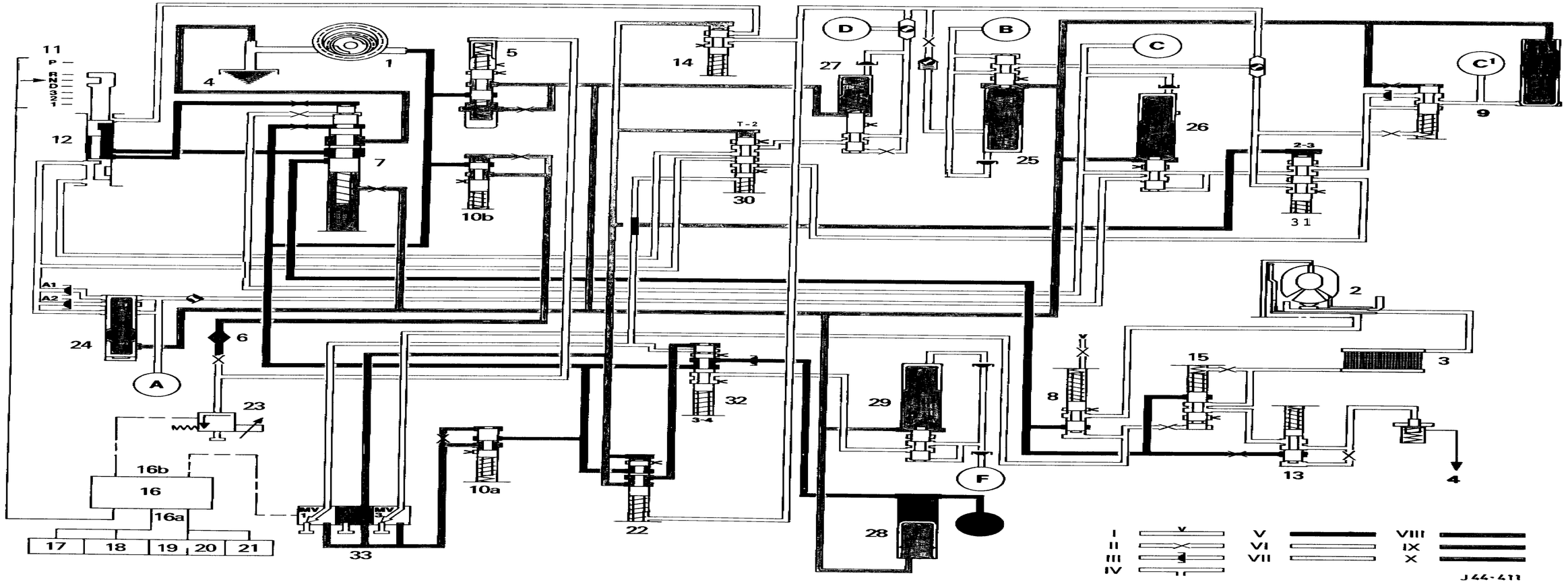
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2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C^1 Clutch valve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
12 Gear change valve
13 Lubrication valve
14 Reverse locking valve
15 Lock-up control valve
16 ECU – inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle valve
19 Engine speed (rpm)
20 Transmission speed (rpm)
21 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D clutch valve and damper
28 E clutch damper
29 F clutch valve and damper
30 1-2 shift valve
31 2-3 shift valve
32 3-4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C^1 C^1 clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III Orifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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0 J L FLOW CHART – POSITION 'N' NEUTRAL

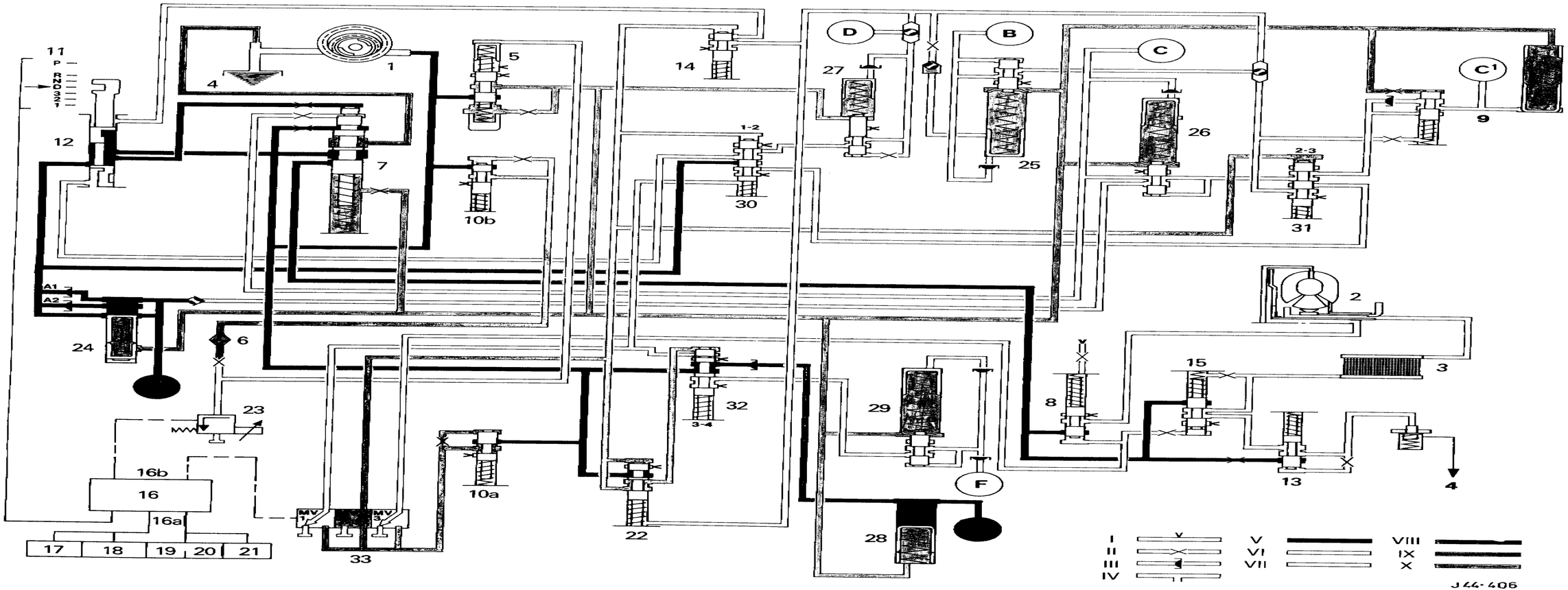
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2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C¹ Clutch valve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
7 2 Gear change valve
1 3 Lubrication valve
14 Reverse locking valve
15 Lock-up control valve
1 6 ECU – Inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle valve
1 9 Engine speed (rpm)
20 Transmission speed (rpm)
2 3 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D crutch valve and damper
28 E clutch damper
29 F clutch valve and damper
30 1-2 shift valve
31 2-3 shift valve
32 3-4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C¹ C¹ clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III Orifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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J44-406

OIL FLOW CHART – POSITION 'D' 1

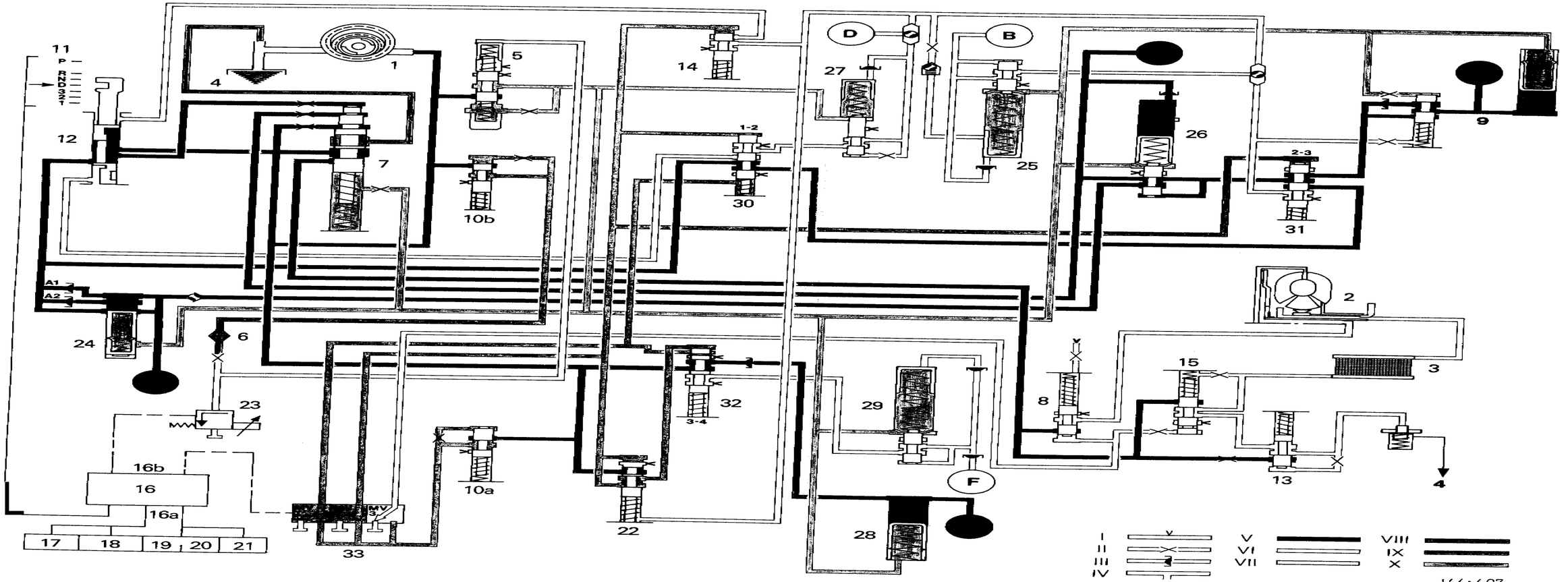
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2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C1 Clutch valve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
12 Gear change vatve
13 Lubrication valve
14 Reverse locking valve
15 Lock-up control valve
16 ECU – inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle varve
19 Engine speed (rpm)
20 Transmission speed (rpm)
21 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D clutch valve and damper
28 E clutch damper
29 F clutch varve and damper
30 1-2 shift valve
31 2-3 shift valve
32 3-4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C1 C1 clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III Orifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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J44-407

OIL FLOW CHART – POSITION 'D' 2

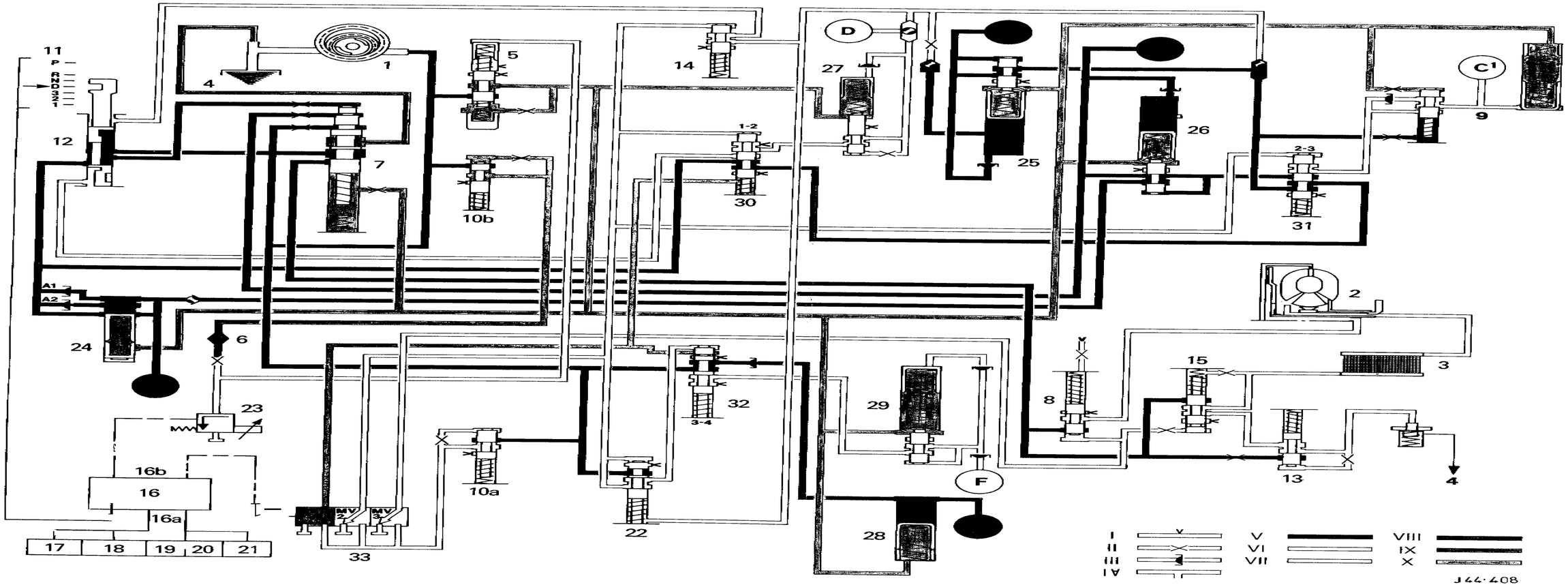
1 Oil pump
2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C^1 clutch valve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
12 Gear change valve
13 Lubrication valve
14 Reverse locking valve
15 Lock-up control valve
16 ECU – inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle valve
19 Engine speed (rpm)
20 Transmission speed (rpm)
21 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D clutch valve and damper
28 E dutch damper
29 F clutch valve and damper
30 1-2 shift valve
31 2-3 shift valve
32 3-4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C^1 C^1 clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III Orifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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J44-408

OIL FLOW CHART – POSITION 'D' 3

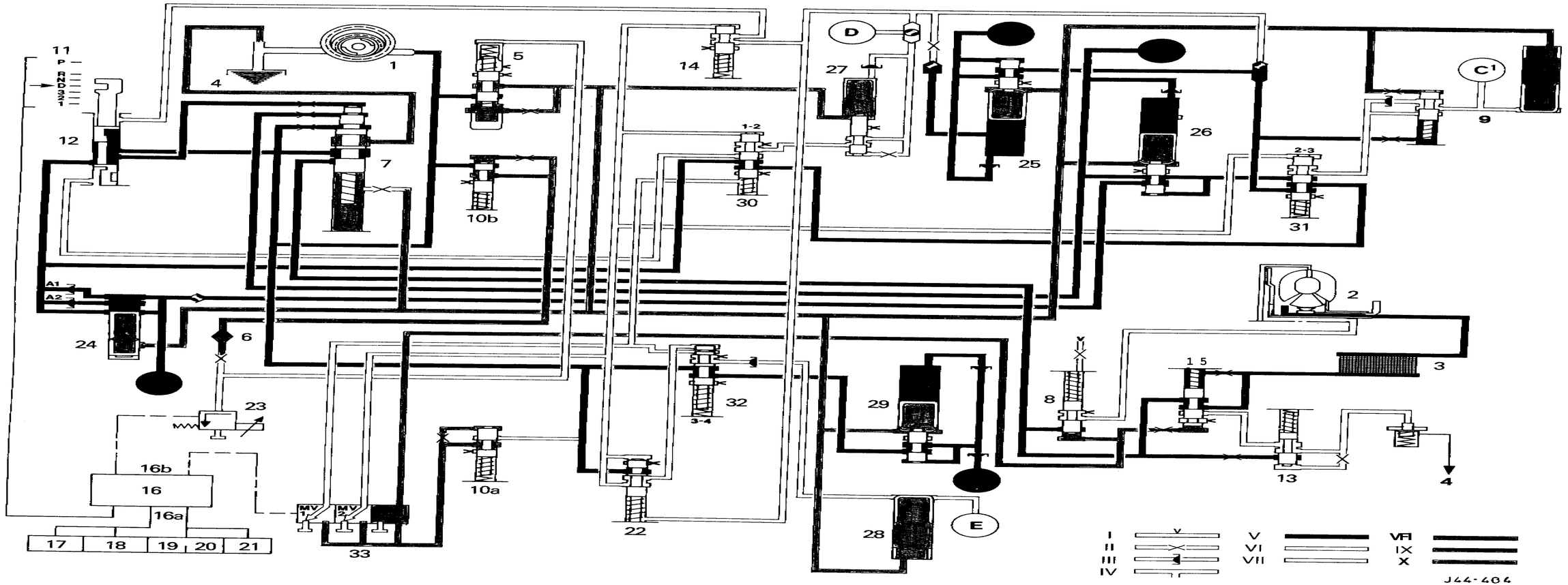
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2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C^1 Clutch valve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
3 2 Gear change valve
1 3 Lubrication valve
14 Reverse locking valve
15 Lock-up control valve
16 ECU – inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle valve
19 Engine speed (rpm)
20 Transmission speed (rpm)
21 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D clutch valve and damper
28 E clutch damper
29 F clutch valve and damper
30 1–2 shift valve
31 2–3 shift valve
32 3–4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C^1 C^1 clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III Orifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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OIL FLOW CHART – POSITION 'D' 4 LOCK-UP

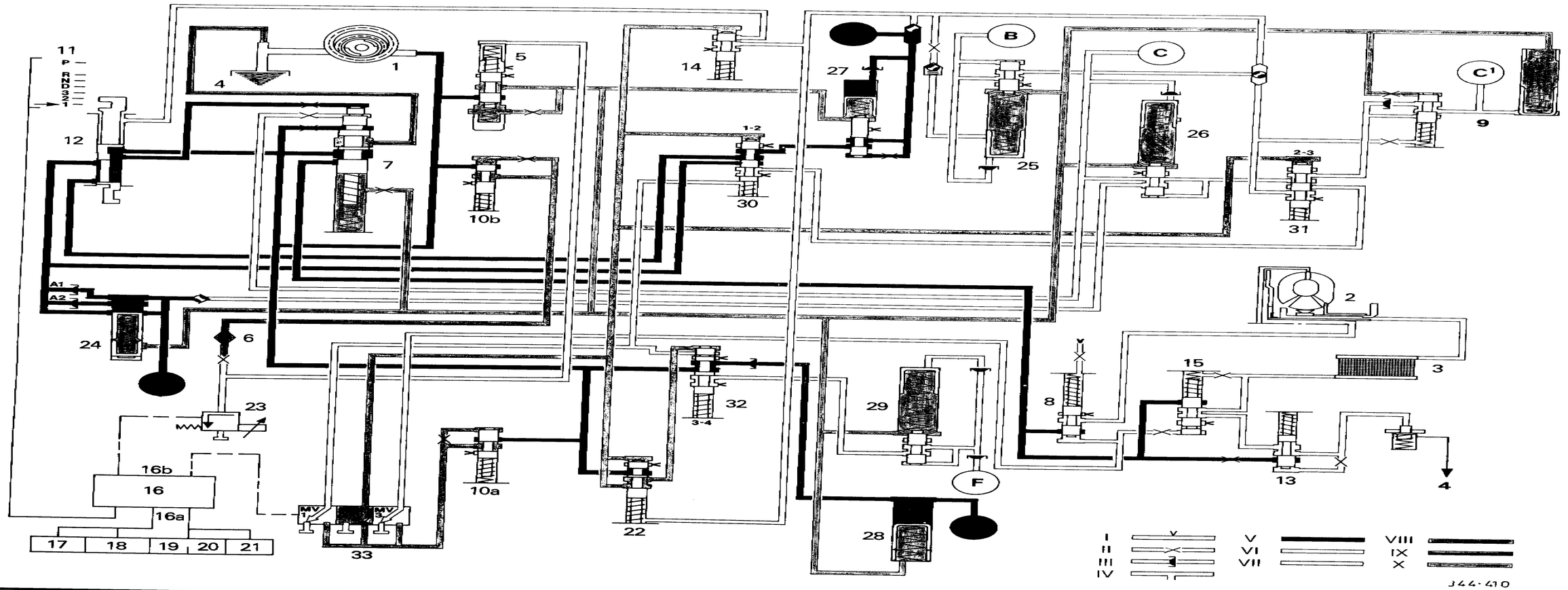
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2 Torque converter
3 Oil cooler
4 Sump
5 Modulation pressure valve
6 Oil filter
7 Main pressure valve
8 Torque converter pressure valve
9 C1 Clutch valve and damper
10 Pressure valves – 1 (10a) and 2 (10b)
11 Gear selector
12 Gear change valve
13 Lubrication valve
14 Reverse locking valve
15 Lock-up control valve
16 ECU – inputs (16a) and outputs (16b)
17 Engine torque
18 Throttle valve
19 Engine speed (rpm)
20 Transmission speed (rpm)
21 Drive programme
22 Safety valve
23 Pressure regulator
24 A clutch damper
25 B clutch valve and damper
26 C clutch valve and damper
27 D clutch valve and damper
28 E clutch damper
29 F clutch valve and damper
30 1-2 shift valve
31 2-3 shift valve
32 3-4 shift valve
33 Solenoid valves MV1/MV2/MV3

A A clutch
B B clutch
C C clutch
C1 C1 clutch
D D clutch
E E clutch
F F clutch

I Exhaust
II Throttle
III Orifice
IV Branch
V Main pressure
VI Converter pressure
VII Throttle pressure
VIII Governor pressure
IX Locking pressure
X Modulation pressure
XI Pump pressure
XII Lubrication pressure

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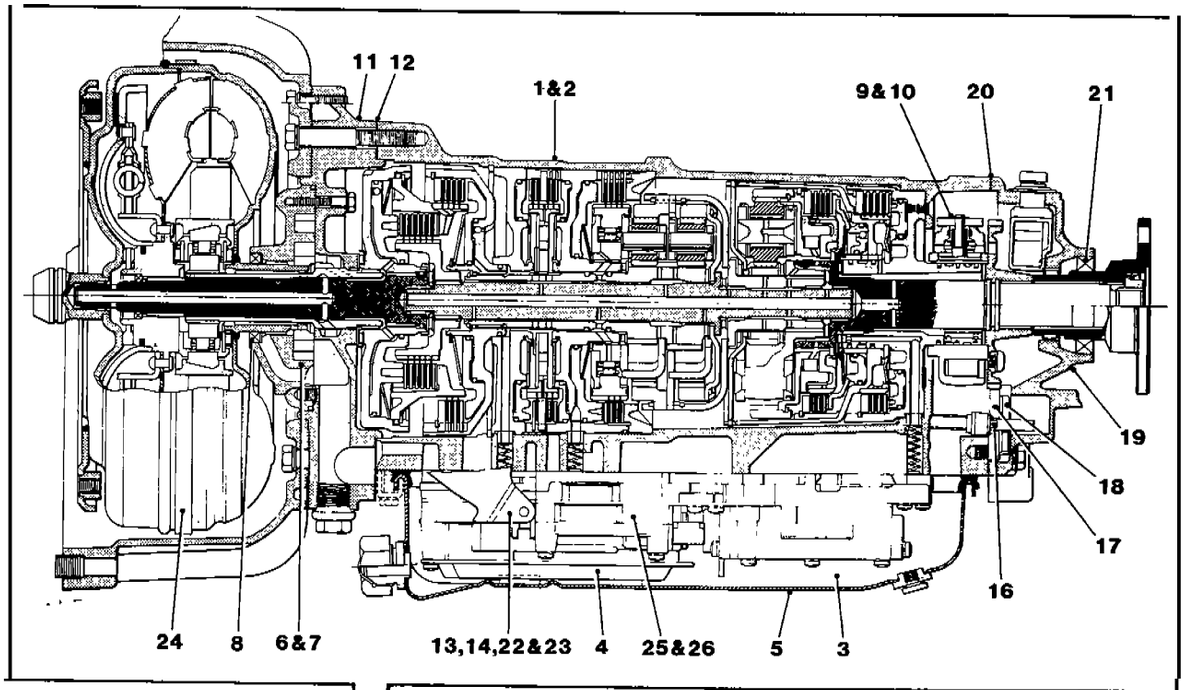
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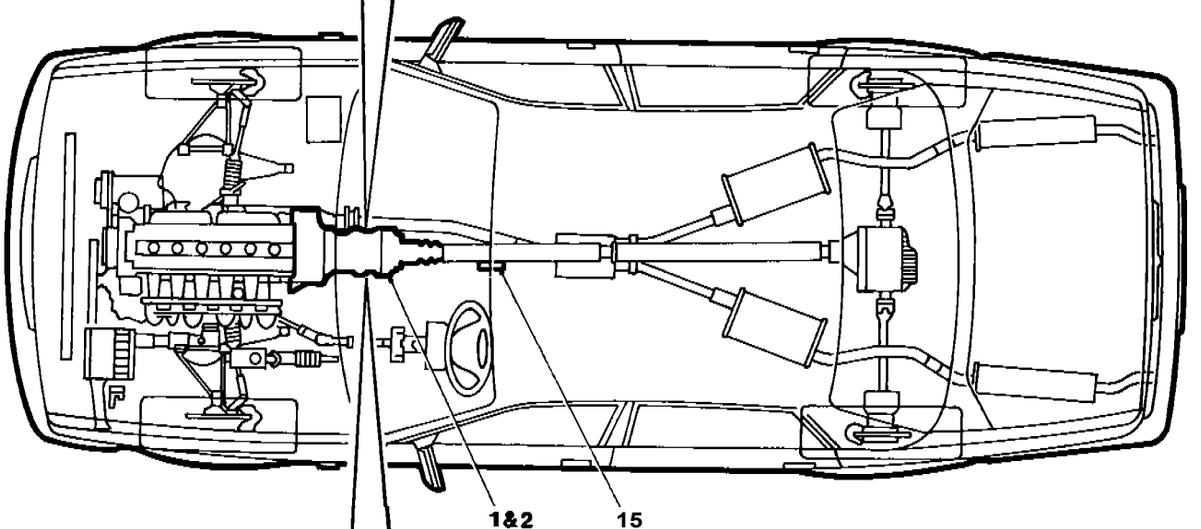
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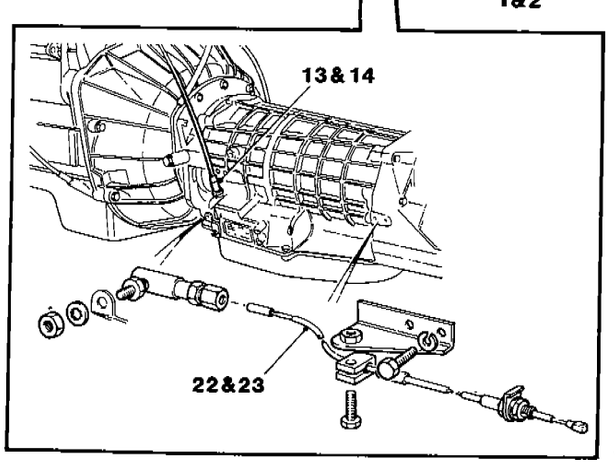
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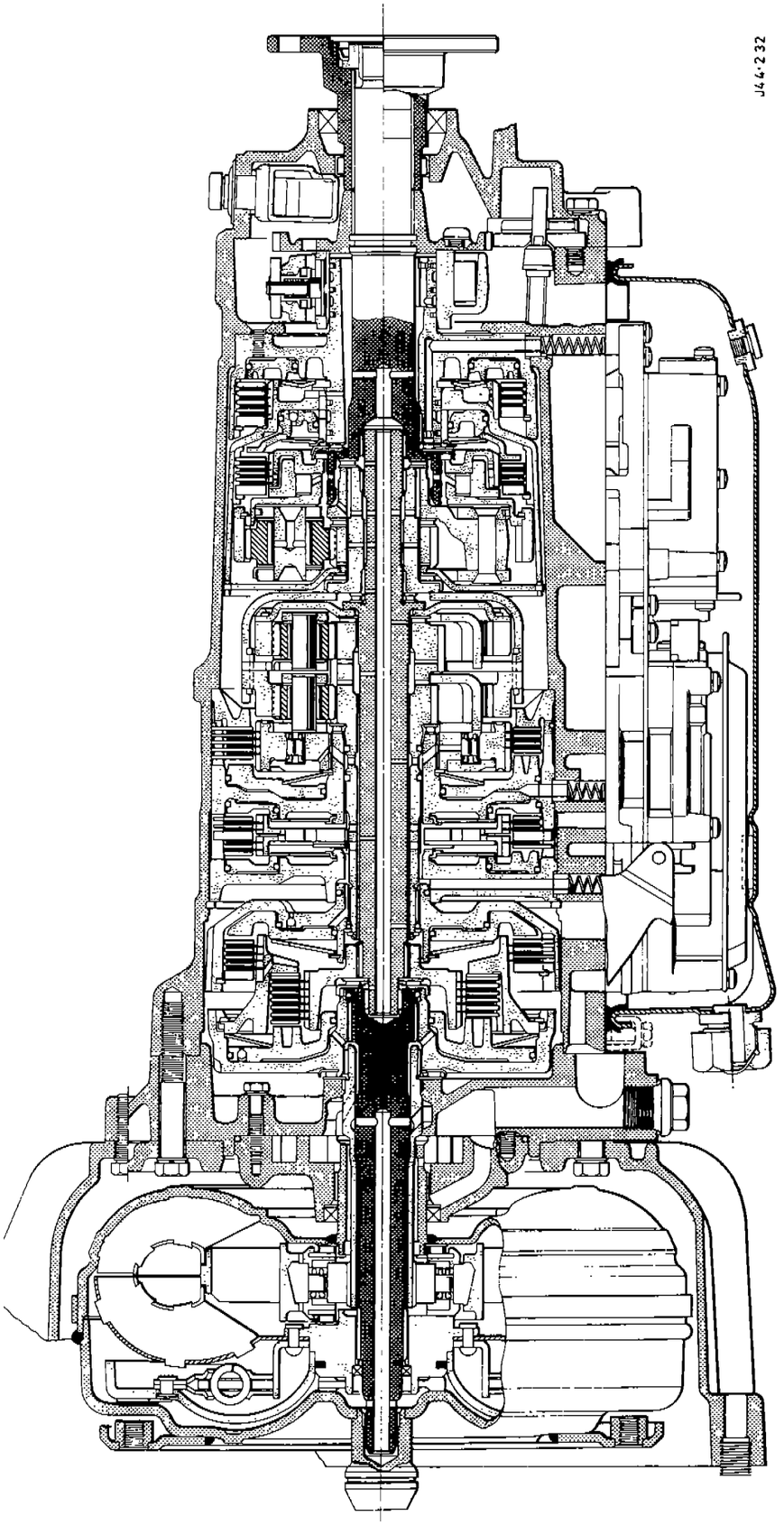
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4 HP 22 CUT AWAY VIEW



AUTOMATIC TRANSMISSION

DESCRIPTION 44.00.00

The ZF 4 HP 22 automatic transmission unit consists of a hydromatic torque converter with integrated lock-up clutch and rear mounted four speed planetary unit.

The mechanical planetary gear is of simple design with four forward speeds and one reverse (coupled to the converter), the latter is operative in all gears. On reaching a particular road speed when travelling in 4th gear with a particular accelerator position, the converter is locked up so that a purely mechanical power transmission is achieved.

The control elements used are hydraulically actuated multi-disc clutches and freewheel units. The hydraulically operated control unit (valve block) is located in the fluid pan. Actuation points of the automatic control unit depend on the position of the accelerator pedal and the road speed of the vehicle. The transmission unit is operated by a selector lever. Gear changes occur automatically at predetermined points.

Below predetermined speeds, the driver can override the control unit by kickdown, i.e. the next lower gear is engaged for high-speed acceleration and the change to the next higher gear does not take place before the maximum speed of engine is reached.

AUTOMATIC TRANSMISSION COMPONENTS

The ZF 4 HP 22 automatic transmission unit features the three-component principle:

1 Hydrodynamic (hydromatic) torque converter
2 Four-speed epicyclic gear train
3 Hydraulic automatic gear shift unit.

HYDROMATIC TORQUE CONVERTER

The hydromatic torque converter consists of an impeller, a turbine and a stator, the latter mounted on a one-way clutch.

These elements are enclosed within a common housing in such a way as to form a closed circuit through which the oil flows when the transmission is in operation.

The torque multiplication effect is at its greatest when the vehicle is driven away from a standstill. The stator bears against the housing through its one-way clutch, and deflects the oil so that its flow is accelerated. As road speed builds up, the impeller and turbine wheels turn at almost the same speed, so that the stator ceases to accelerate the oil flow, and instead is disengaging from the housing and turning freely in the flow of oil. The torque converter at this stage acts as a fluid coupling.

These characteristics make it possible to dispense with the clutch pedal, The engine cannot normally stall because it is not rigidly linked to the driven wheels. The converter's operating characteristics have been selected to suit those of the vehicle's engine.

FOUR-SPEED EPICYCLIC GEAR TRAIN

The converter drives a mechanical epicyclic gear train providing four forward ratios and reverse. Top gear is a step-up or overdrive ratio for maximum economy.

Hydraulically actuated multi-disc clutches and brakes are used to select the various gear ratios.

Built-in freewheels permit gear shifts without any interruption of the power flow. A low-loss oil pump in the front section of the transmission housing supplies the converter, the automatic gear shift and the lubrication circuit. A mechanical parking lock is provided to prevent the vehicle from moving, with 'P' selected, once stationary.

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SELECTOR UNIT

If the vehicle is driven normally, without unduly high engine speeds being used, the selector unit will cause upshifts to take place at quite low engine speeds, to ensure optimum economy.

In difficult driving conditions, for example in town traffic, fuel consumption is actually lower than with a conventional manual-shift gearbox, which is often left in too low a ratio by the driver, so that engine speed rises excessively.

The automatic control system, with selector valve, control pistons and pressure valves, is located in the lower part of the transmission housing.

Shift points are governed by accelerator pedal position and road speed. Pressure related to road speed is derived from a centrifugal governor on the output shaft. The entire system operates hydraulically.

Gear shifts take place at predetermined speeds, depending on the amount by which the accelerator is depressed.

In special circumstances the system can be overridden by pressing the accelerator down beyond 90% of full-throttle (kick down), to select a lower gear immediately when maximum acceleration is needed. In this event, the next upwards shift does not take place until almost the maximum engine speed, that is to say at a far higher road speed than usual.

This arrangement ensures that engine power can be utilized fully in all gears.

Note: There is a maximum speed for each gear above which kick down will not be effective. Kick down is set at 90% of full throttle. Full throttle pedal movement will, under normal driving conditions, operate the kick down successfully.

AUTOMATIC TRANSMISSION

OPERATION 44.00.00

Position P: Park. Select only when the vehicle is standing still. In the 'Park' position the driven wheels are locked.

Position R: Reverse.

Position N: Neutral. Engine disconnected from driveline and wheels.

Position D: Drive. All four speed ranges are selected automatically.

Position 3: Automatic selection of the lowest three ratios in the automatic transmission only.

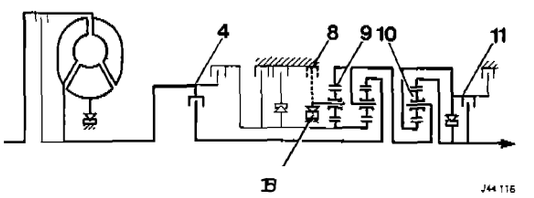
Position 2: Select this setting to prevent the automatic transmission from shifting up to the 3rd (top) speed range.
The 1st and 2nd ranges remain available, for example, to make full use of engine braking effect on downhill gradients.

Note: Position 2 can be selected at any travelling speed. Safety valves prevent premature down-shifts and over-speeding of the engine.

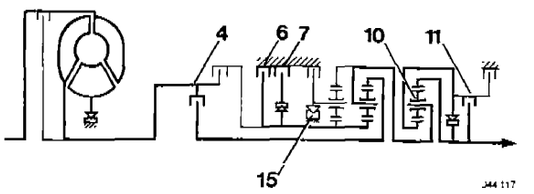
Kick-down: Despress the accelerator pedal fully (or beyond 90%) and the automatic transmission will shift down immediately to a lower gear (ratio depends on road speed).

CLUTCH OPERATION

1ST GEAR
Clutches **4** and 11 are engaged. The front planet gear carrier of gear set 9 is locked against the housing through freewheel 15 when the engine is pulling, but is overrun when the engine is coasting. Epicyclic gear set 10 rotates as a solid block, with the 2nd planet set. In addition, in selector lever position 2 and in speed range 1 & 2, clutch **8** is enagaged to permit engine braking.

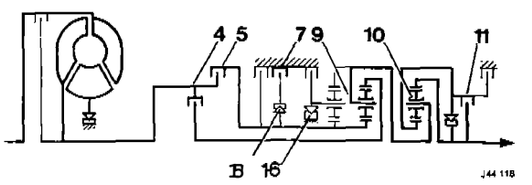


2ND GEAR
Clutches 4, 6, 7 and 11 are engaged. Freewheel 15 overruns. Clutches 6 and 7 lock the sun gear to the housing.

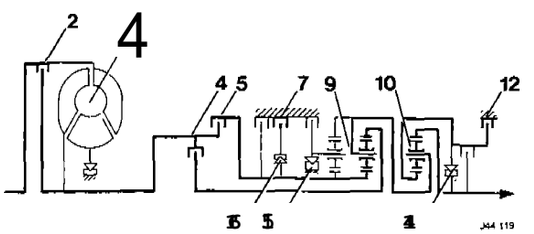


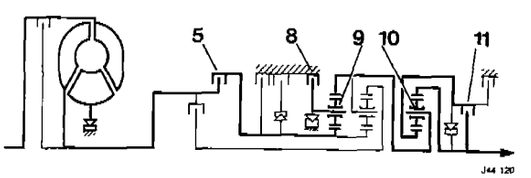
3RD GEAR
Clutches **4, 5**, 7 and 11 are engaged. Freewheels 15 and 16 are overrun. Epicyclic gear sets 9 and 10 rotate as a solid block at a ratio of 1:1.

4TH GEAR
Clutches 4, 5, 7 and 12 are engaged. Freewheels 14, 15 and 16 are overrun. Epicyclic gear set 9 rotates as a solid block. The hollow shaft with the sun wheel of epicyclic gear set 10 is locked. Above a predetermined road speed, clutch 2 locks torque converter 3 solid to prevent slip.



REVERSE
Clutches 5, **8** and 11 are engaged. Since the front planet gear carrier of epicyclic gear set 9 is locked, the direction of output-shaft rotation is reversed. Epicyclic gear set 10 also rotates, as a solid block.





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AUTOMATIC TRANSMISSION

DATA/SHIFT SPEEDS 44.00.00

Key to diagram

1 Hydrodynamic torque converter

2 Throttle cable

3 Output flange

4 Selector lever positions:
P - Park
R - Reverse
N - Neutral
D - Automatic control (1st to 4th speed)
3 - Low gear and braking (1st to 3rd speed)
2 - Low gear and braking (1st to 2nd speed)

5 Dipstick tube.

6 Oil outlet drain plug.

7 Oil cooler connections.

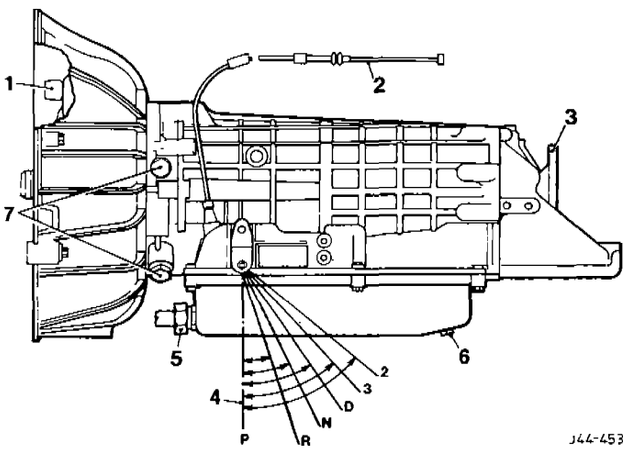


Fig 1

TRANSMISSION TYPE	ZF 4 HP 22
Ratios (mechanical):	
1st gear	2.48
2nd gear	1.48
3rd gear	1.00
4th gear	0.73
reverse	2.09

WEIGHT (without torque converter) approximate	45.5 Kg
Oil capacity*	8.0 Litres

The maximum torque multiplication of the torque converter is 2.11

*Initial filling of transmission unit and converter.

AUTOMATIC TRANSMISSION

SHIFT SPEEDS 44.00.00

4.09:1 AXLE RATIO

THROTTLE POSITION	UP SHIFTS			
Light Throttle	1-2	2-3	3-4	TCC ON
M.P.H.	10-11	16-23	24-29	49-53
Km/h	16-18	26-37	38-47	79-85
Output Shaft rpm	555-588	872-1229	1287-1562	2628-2838

THROTTLE POSITION	UP SHIFTS		
Up to Detent (90% Full Throttle)	1-2	2-3	3-4
M.P.H.	32-38	58-64	79-91
Km/h	51-61	94-104	127-147
Output Shaft rpm	1704-2038	3147-3473	4265-4928

THROTTLE POSITION	UP SHIFTS		
Through Detent (Full Throttle)	1-2	2-3	3-4
M.P.H.	37-43	65-71	90-103
Km/h	60-69	104-114	145-166
Output Shaft rprn	2010-2316	3489-3805	4871-5542

THROTTLE POSITION	DOWN SHIFTS		
Kickdown (Maximum)	4-3	3-2	2-1
M.P.H.	86-99	61-67	30-37
Km/h	139-160	98-108	48-60
Output Shaft rpm	4645-5344	3272-3621	1609-2003

THROTTLE POSITION	DOWN SHIFTS		
Part Throttle Downshift (90% max)	4-3	3-2	2-1
M.P.H.	64-71	42-48	22-31
Km/h	102-114	67-78	36-50
Output Shaft rpm	3431-3803	2240-2599	1204-1673

TCC ON = TORQUE CONVERTOR CLUTCH ON
TCC OFF = TORQUE CONVERTOR CLUTCH OFF

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THROTTLE POSITION	DOWN SHIFTS			
Zero Throttle (Roll Out)	TCC OFF	4-3	3-2	2-1
M.P.H.	47-51	16-22	13-14	7-8
Km/h	76-82	24-35	22-23	11-13
Output Shaft rorn	2538-2748	806-1184	722-775	377-447

THROTTLE POSITION	DOWN SHIFTS	
Manual Shift (Max Throttle)	4-3	3-2
M.P.H.	NOT INHIBITED	67-76
Km/h	NOT INHIBITED	108-123
Output shaft rprn	NOT INHIBITED	3629-4110

STALL SPEEDS

ENGINE CAPACITY	EMISSION TYPE	ENGINE SPEED	TOLERANCE
3.2 Litre	All types	2100 RPM	±150 RPM

TRANSMISSION UNIT PRESSURES

3.2 ENGINE

	IDLE (STATIONARY)	FULL THROTTLE (STALL)
DRIVE	630-710 kPa	780-950 kPa
REVERSE	1070-1150 kPa	1620-1780 kPa

AUTOMATIC TRANSMISSION UNIT

FAULT DIAGNOSIS 44.00.00

The following tables (pages 11-17) are intended as a guide to diagnosis of faults which may occur in the transmission unit.

INITIAL CHECKS

Complete these checks before carrying out any diagnostic work.

1 Check the transmission unit oil level (vehicle at normal operating temperature).
2 Check the kickdown cable adjustment.
3 Check the selector cable adjustment.
4 Check the engine tune.
5 Carry out a stall test.
6 Carry out a road test.

FAULT	POSSIBLE CAUSE	ACTION
POSITION P - PARK		
Park does not engage	Incorrect setting *of* selector between control lever and transmission	Adjust setting
	Too much friction in parking lock mechanism	Replace components, cam,connection rod and eventually pawl
Park position does not hold	Incorrect setting of selector rods between control lever and transmission	Adjust the setting
Starter motor will not operate	Starter inhibitor switch faulty	Replace switch
	Incorrect setting *of* selector lever	Adjust setting
	Faulty selector lever	Replace lever
	Position P or N not selected	Select P or N
POSITION N - NEUTRAL		
Engine will not rotate	Starter inhibitor switch faulty	Replace switch
	Incorrect setting *of* selector lever	Adjust setting
	Faulty selector lever	Replace lever
	Position N not selected	Select N
Vehicle moves in Position N	Wrong setting of gear change rods between control lever and transmission	Adjust setting
	A Clutch defective (seized up)	Service/Renew transmission

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FAULT	POSSIBLE CAUSE	ACTION
POSITION R - REVERSE		
No reverse gear	Incorrect setting of selector rods between control lever and gearbox	Adjust setting
	Dirty oil filter	Renew filter
	Jammed reverse inhibit valve	Replace control unit
High pitched squeaking noise	No 3rd gear (B Clutch destroyed)	Service/Renew transmission
	No engine braking in Position 2, 1st gear. (D clutch destroyed)	Service/Renew transmission
	No engine braking in 2nd and 3rd gear, also in Position 2, 1st gear (E Clutch destroyed)	Service/Renew transmission
	Reverse gear safety valve faulty.	Service/Renew control unit
Slipping or shaking from start in reverse gear	B or E Clutch, or brake D defective	Service/Renew transmission
Strong jerk when engaging positions P-R or N-R, or *distinct double jerk* at P-R or N-R (below 1500 RPM engine speed)	Damper B defective (will give the same symptoms when changing from 2nd to 3rd gear)	Service/Renew control unit
Note: A double thump may be a feature *of* 'R' (reverse) engagement.		
Reverse light does not illumiunate (bulbs, fuses and cables OK)	Starter inhibitor switch faulty.	Replace switch
	Incorrect setting of selector lever	Adjust setting
	Faulty selector lever	Replace lever.
	Position R not Selected	Select R
POSITION D - AUTO. CONTROL (1st to 4th speed)		
No drive	Dirty oil filter	If no debris in sump, just replace filter, otherwise replace transmission
	A Clutch defective	Service/Renew transmission
	One way clutch 1st gear slips	Service/Renew transmission
	Wrong setting *of* gear change rods between control lever and transmission	Adjust setting

FAULT	POSSIBLE CAUSE	ACTION
POSITION D (CONTINUED)		
Slipping or shaking upon initial forward movement	A Clutch damaged	Service/Renew transmission
Strong jerk N-D (below 1500 RPM engine speed.	A Clutch faulty	Service/Renew transmission
	A Clutch damper faulty	Service/Renew control unit
Gear change functions faulty (in cold or warm state)		
Change 1-2/2-1	Governor dirty	Replace governor
	Shift valve 1-2 sticking	Replace control unit
Change 1-2	Brake C' and/or C faulty	Service/Renew transmission
Change 2-3/3-2	Governor dirty	Replace governor
	Shift valve 2-3 sticking	Replace control unit
Change 2-3	B Clutch faulty	Service/Renew transmission
Change 3-4/4-3	Governor dirty	Replace governor
	Shift valve 3-4 sticking	Replace control unit
Change 3-4	Brake F defective	Service/Renew transmission
Sudden shifts	Dampers sticking	Service/Renew control unit
Vehicle starts in 2nd gear	Governor sleeve sticking	Replace governor
	Shift valve 1-2 sticking	Service/Renew control unit
Vehicle starts in 3rd gear	Governor sleeve sticking	Replace governor
	Shift valve 1-2 and 2-3 sticking	Service/Renew control unit
Gearbox changes 1-3	Shift valve 2-3 sticking	Service/Renew control unit
No shifts	Dampers sticking	Service/Renew control unit
SHIFT SPEEDS		
No changes at light throttle setting	Dirty governor	Replace governor
	Shift valves sticking	Service/Renew control unit
Change points incorrect at full throttle setting.	Throttle cable setting incorrect.	Adjust setting

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FAULT	POSSIBLE CAUSE	ACTION
SHIFT SPEEDS (CONTINUED)		
No changes at Kick-Down 1-212-1	Throttle cable setting incorrect.	Adjust setting
No changes at Kick-Down *2-313-2*	Throttle cable setting incorrect.	Adjust setting
Gear change quality		
Poor changes	Throttle valve setting incorrect	Adjust setting
Harsh changes at low throttle	Defective damper Modulation pressure to high	Service/Renew control unit
	Clutch plates damaged	ServicelRenew transmission
Soft changes at full throttle & Kick-Down	Defective damper Modulation pressure too low	Service/Renew control unit
	Clutch plates damaged	Service/Renew transmission
Harsh changes at full throttle and Kick-Down	Incorrect modulation pressure Defective damper	Service/Renew control unit
POSITION 3 - LOW GEAR & BRAKING (1st to 3rd speed)		
No engine braking	Clutch E damaged	ServicelRenew transmisssion
POSITION 2 - LOW GEAR & BRAKING (1st and 2nd speed)		
Manual change 3-2 faulty	Locking valve 2 sticking Governor sticking	ServicelRenew control unitlgovernor
No engine braking	Brake C or E Clutch damaged	Service/Renew transmission
No engine braking (1st speed)	Brake D or E Clutch damaged.	Service/Renew transmission
LOCK UP SHIFTS		
Change points at incorrect speeds	WK safety valve sticking No 4th gear Governor pressure incorrect	ServicelRenew control unit/governor
Gear change too harsh	Lock up damper faulty Torque converter faulty (splines sticking)	Service/Renew control unit/torque converter
No lock-up	Control unit faulty Lock up valve or damper faulty	Service/Renew control unit/torque converter
	No 4th gear	ServicelRenew control unit
GENERAL		
Throttle cable sticking	Nipple in throttle cam is worn	Replace cable
	Too much friction in sleeve of throttle cable	Replace cable
	Throttle pressure piston sticking	ServicelRenew control unit

FAULT	POSSIBLE CAUSE	ACTION
GENERAL (CONTINUED)		
Noisy and no drive after long journey	Oil filter on control unit dirty	If there is no burnt lining in oil sump, then only replace filter, otherwise replace transmission
Very noisy and no drive	Flexi-plate is worn or broken	Replace flexi-plate or torque converter
	Pump drive worn	Replace transmission
OIL LEAKS		
Oil dripping from bell housing	Seal ring in pump housing damaged	Replace seal
	Pump housing porous	Replace pump housing
	Converter leaking from welded seam	Replace converter
Leakage between transmission and oil sump	Incorrect torque of bolts	Tighten bolts to spec.
	Sump gasket damaged	Replace gasket
Leakage between intermediate plate and main housing (especially at pump pressure point)	Bell housing bolts have worked loose	Tighten bolts
	Gasket broken	Replace gasket
Oil leak from throttle connection cable	'O' ring connection damaged	Replace 'O' ring or complete cable
Oil leak at output	Output oil seal damaged	Replace seal
Loss of oil through breather	Oil level too high	Check level.
	Incorrect oil	Remove transmission, ensure that it is drained(including torque converter, oil cooler and pipes)
	Breather blocked	Change breather, check for foul condition of foam insulating pad
	No breather cap	Fit cap or change breather
	'O' ring breather damaged	Remove tail housing Replace 'O' ring
	Securing clip faulty	Replace clip
Leakage in cooler pipes	Loose connections Pipes damaged Cooler leaks	Re-tighten Replace pipes Replace cooler
Oil leak at intermediate plate	Blanking plug loose	Tighten plugs Replace washers
Leakage between main housing and tail housing	Loose bolts Gasket damaged	Re-tighten Replace gasket

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FAULT	POSSIBLE CAUSE	ACTION
NOISES		
High pitched squeaking noise, dependent on engine RPM, in all gears, when oil is warm, accompanied by intermittent drive after long journey	Dirty filter	If no debris in sump replace filter
	Clutch damage on gear shaft	Replace transmission unit
High pitched noise in all positions, especially if oil is cold	Low oil level	Top up as required
	Leaking control unit	Service/Renew control unit
Very noisy when in lock-up	Torsion damper faulty	Replace torque converter
Torsional vibrations from engine when in lock-up	Engine RPM is too **low,** lock-up shift point incorrect	Service/Renew control unit

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AUTOMATIC TRANSMISSION UNIT

RENEW 44.20.01

Disconnect the kickdown cable from the throttle linkage.
Remove the bolt securing the transmission dipstick tube to the inlet manifold.
Fit Service Tool JD 124 to the rear of the inlet manifold and take the weight of the engine with MS53B (Fig 1).
Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side of the vehicle.
Taking the weight of the transmission unit, remove the rear mounting to body securing bolts, lower the jack and collet the spacer.
Disconnect the propeller shaft from the drive flange.
Remove the clamp bolt securing the selector cable to the bracket and the selector lever to shaft securing nut.
Place a drain tin below the dipstick tube and disconnect the union, drain the remaining fluid and fit a dummpy plug to the sump.
Remove the clamp securing the transmission cooling pipes to the transmission (Fig 2), disconnect the pipes and fit a dummy plug to the apertures.
Remove the drain tin.
Remove the blanking plug from the torgue converters securing bolt access aperture (Fig 3), and remove the crankshaft/drive plate securing bolts, turning the crankshaft for access to remove each bolt.

Lower the engine/transmission unit using MS53B ensuring that the engine does not foul the steering rack.
Remove the bell housing bolts and remove the transmission (1 Fig 1 page 64).

Lift the replacement unit and torque converter into position, fit and tighten the bell housing bolts.
Align the torque converter/drive plate, securing bolt holes, fit and tighten the bolts.
Refit the blanking plug and stone guard.
Refit the oil cooler pipes to the transmission ensuring new sealing washers are used, secure with the sump bracket.
Reposition the kickdown cable to the bell housing and refit the dipstick tube.
Raise the engine/transmission unit using MS53B, reconnect the selector lever and cable clamp to the mounting bracket.
Refit the propeller shaft to the drive flange, raise the rear of the unit into position fit the spacers and secure with the mounting bolts.
Refit the exhaust front pipe to the intermediate pipe and manifold.
Remove Service Tool MS53B align the fan cowl, refit and adjust the kickdown cable.
Remove the engine lifting eye JD 124 and replace the manifold securing nuts.

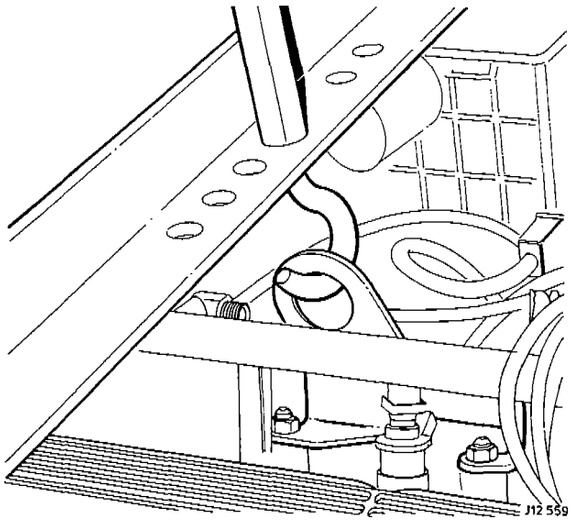


Fig 1

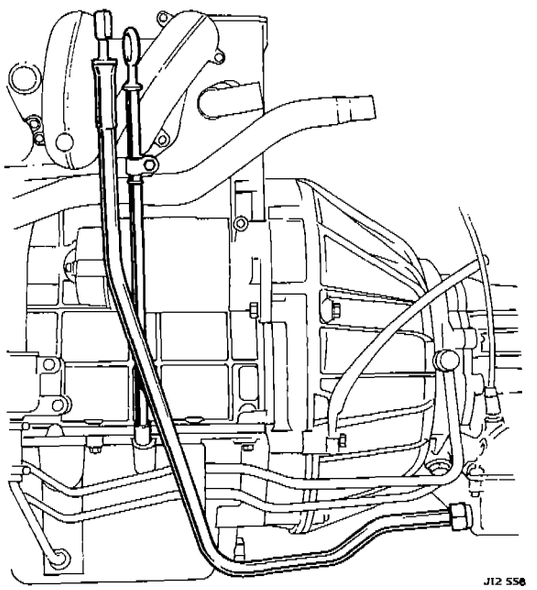


Fig 2

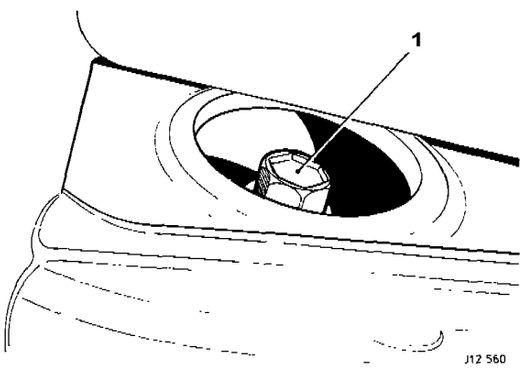


Fig 3

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Align and secure the **dipstick** tubes to the inlet manifold.

Refill with transmission fluid.

DATA

SERVICE TOOLS

MS 53B *Engine support bracket*
JD 124 *Engine lifting bracket*

TORQUE FIGURES

Base plate assembly to mounting pan ***7-10Nm***
Base plate assembly to side plate ***7-10Nm***
Dipstick tube nut ***100Nm***
Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Drive plate to torque convertor ***49-54Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Intermediate pipe to silencer ***15-18Nm***
Oil cooler pipe banjo bolt ***32-36Nm***
Propeller shaft to gearbox ***95-105Nm***
Rear engine mounting bracket to ***body 20-25Nm***
Selector lever nut to shaft ***23-27Nm***
Torque convertor housing to adaptor ***49-54Nm***
Torque convertor housing to block/sump ***49-54Nm***

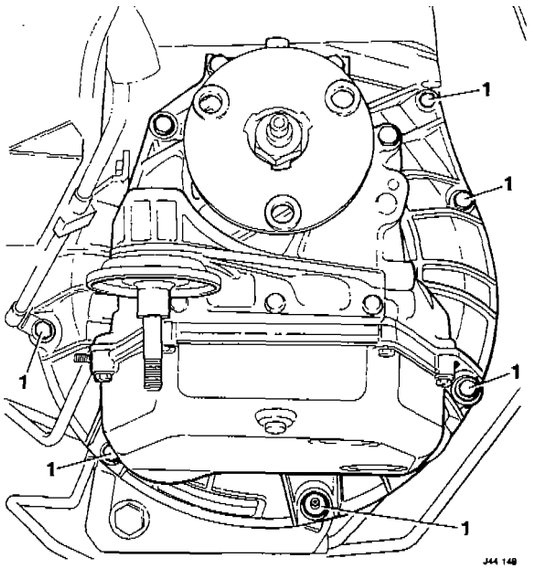


Fig 1

OILSISEALANTSILUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

0055K

AUTOMATIC TRANSMISSION UNIT

OVERHAUL 44.20.06

Remove the transmission unit 44.20.01.

Remove the torque converter assembly 44.17.07.

Fit the unit to the bench clamp using Service Tool JD 111.

Tighten the clamp onto the unit (do not overtighten due to possible distortion of casing).

Remove the bolts securing the sump to the case.

Remove the sump and discard the gasket.

Collect the two magnets.

Move the screws securing the oil filter.

Remove the filter discard the filter 'O' ring.

Remove the screws securing the valve block.

Lift off the valve block assembly.

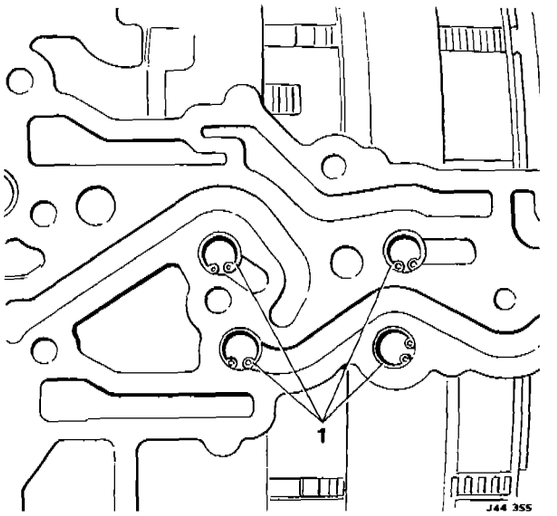


Fig 1

Remove the circlips (1 Figs 1 and 2) securing the seal springs.

Lift out the springs.

Using Service Tool JD126 remove oil seals.

Disconnect the kick down inner cable from the throttle valve cap using Service Tool JD 110.

Remove the outer cable from the unit casing.

Remove the cable sealing 'O' ring.

Set the selector in the Park position.

Knock in the rear drive flange nut securing ring tabs.

Remove the ring and undo and remove the flange securing nut.

Remove the drive flange.

Remove the bolts securing the rear extension to main case.

Remove the rear extension.

Discard the gasket.

Select Neutral.

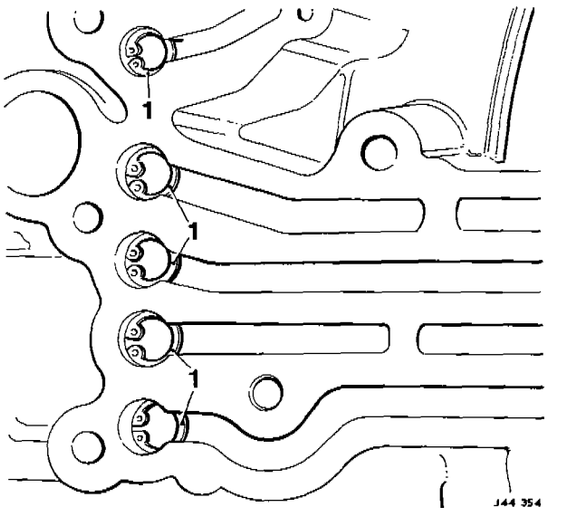


Fig 2

Remove the screw securing the parking pawl locating bracket.

Remove the bracket.

Remove the guide plate pawl, spring and pivot pin.

Slide the governor rearwards from the shaft discard the output shaft 'O' ring.

Remove the screws securing the F clutch cylinder.

Reposition the Service Tool JD 111 to leave the gearbox in a vertical position.

Remove the bolts securing the bell housing.

Remove the bolts securing the bell housing and front pump.

Remove the bell housing pump assembly

and discard the gasket,

Move the pump to A clutch thrust bearing (1 Fig 3) and remove the A clutch assembly (2 Fig 3).

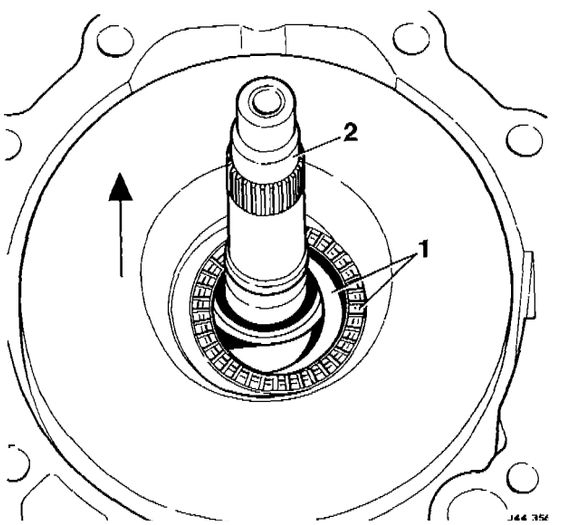


Fig 3

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Remove the inner carrier to clutch assembly thrust bearing (1 Fig 1).

Remove the inner carrier (2 Fig 1).

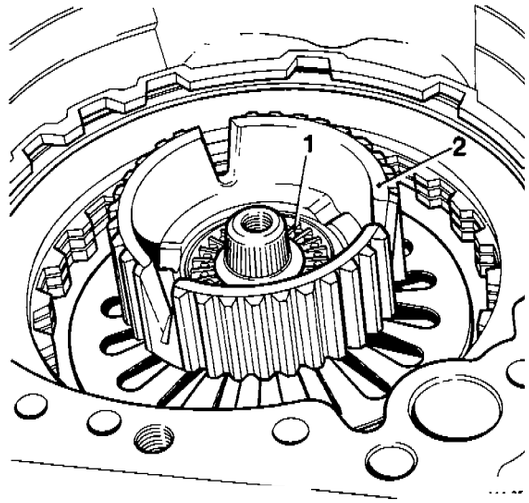


Fig 1

Using suitable circlip pliers remove the snap ring (1 Fig 2) securing the B clutch.

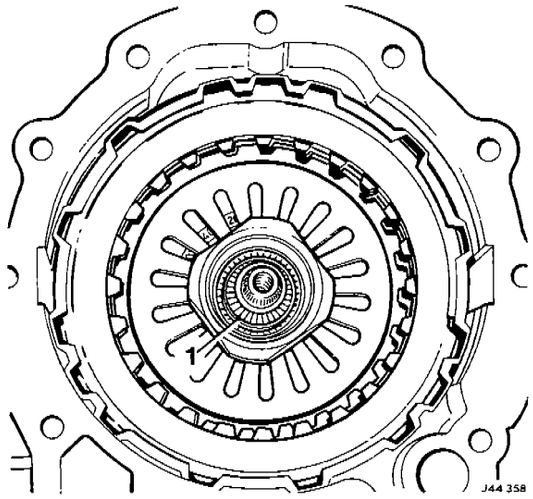


Fig 2

Using 2 hooks (1 Fig 3), twist and pull the B clutch assembly upwards till the first stop is felt.

Push the clutch assembly downwards and remove the B clutch assembly.

Remove the washer and 'O' ring.

Remove C, C1 and D clutch assemblies.

Remove the snap rings securing the assembly.

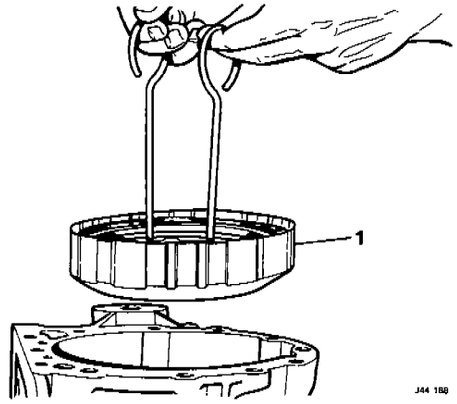
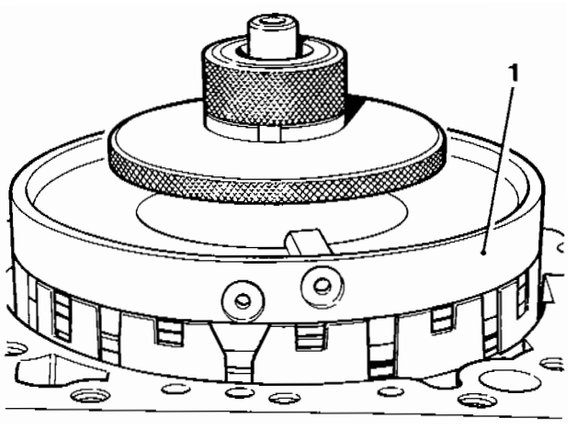


Fig 3

Assemble Service Tool JD 109 to the shaft.

Disconnect and remove the clutch assembly (1 Fig 1).



Remove the thrust bearing assembly (1 Fig 21, rear planetary set and output shaft.

Remove the sun gear and the planetary set.

Remove the carrier to output shaft thrust bearing assembly.

Remove the output shaft assembly.

Remove the output shaft thrust bearing assembly including brass thrust washer.

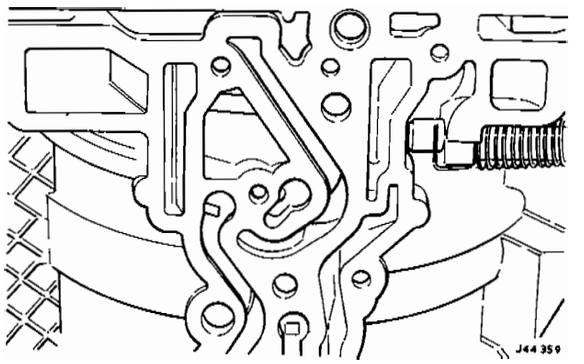


Fig 1

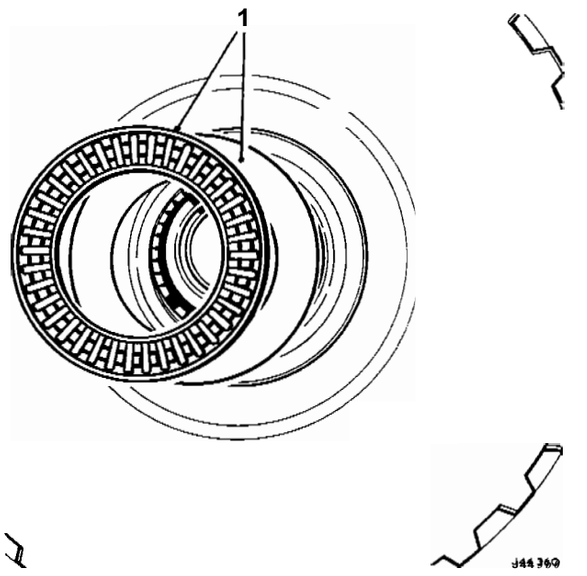


Fig 2

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Remove the **E** clutch assembly.

Remove F clutch asssembly.

Invert the gearbox case with the Service Tool.

Remove the roll pin securing the selector shaft.

Remove the shaft.

Remove the throttle valve cam return spring and cam assembly.

Remove the selector quadrant parking rod (1 Fig 1) and remove the parking rod from the selector quadrant.

Remove the shaft seal.

Clean the gearbox casing.

Clean all components parts prior to assembly.

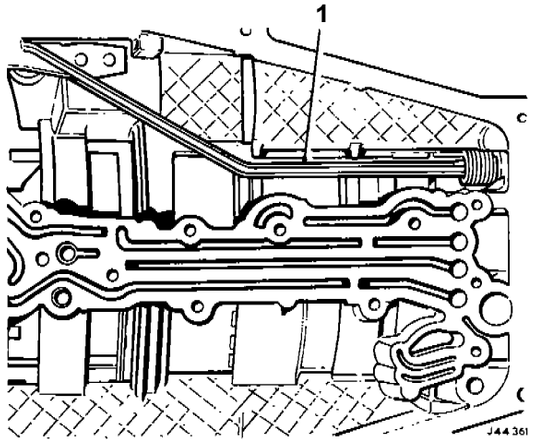


Fig **1**

Lubricate the selector shaft seal and using **a** suitable 13mm (1 Fig 2) socket fit seat the oil seal to the case.

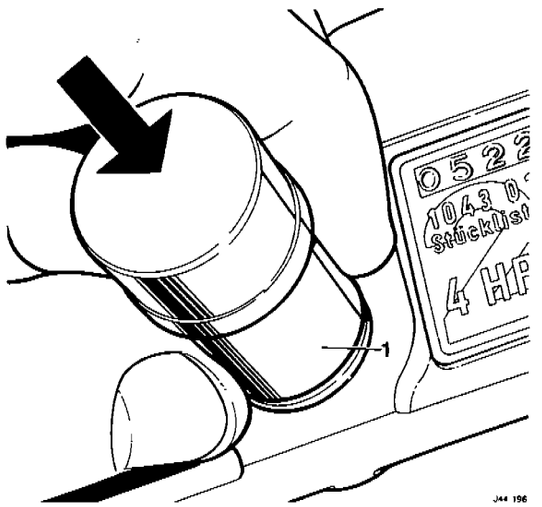


Fig 2

Lubricate the selector shaft and fit the shaft (2 Fig 3) through the seal and into the casing.

Assemble the park rod (1 Fig 3) to the quadrant and fit the park rod quadrant assembly to the selector shaft.

Position the shaft through the assembly.

Lubricate the throttle valve cam bearing and fit the cam assembly to the shaft.

Fit and engage the cam return spring (4 Fig 3) to the shaft cam and case (3 Fig 3).

Reposition the shaft fully into the casing.

Align the roll pin holes in the shaft quadrant and refit the roll pin (5 fig 3).

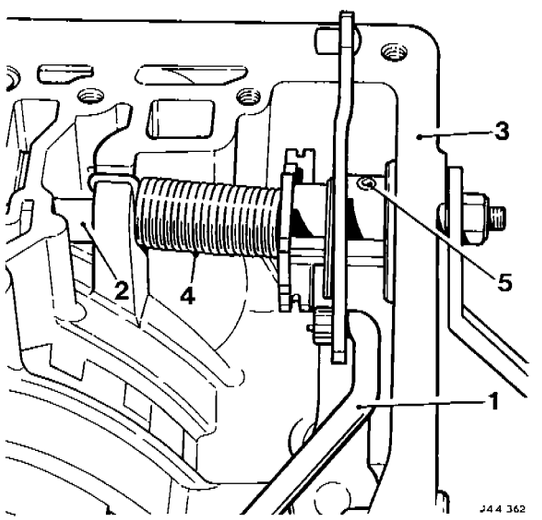


Fig 3

F CLUTCH OVERHAUL

Remove the snap ring (1 Fig 1) securing the clutch plate and remove the clutch pack assembly (1 Fig 2).

Remove the sealing rings.

Fit Service Tool JD 107 to the clutch.

Compress clutch and remove the collets.

Slacken the tool centre nut to relieve tension from the spring.

Remove the Service Tool and adaptor collar JD 107-1.

Remove the piston spring from the housing and using a suitable block of hard wood tap the F clutch piston assembly onto the wood to displace the piston assembly.

Discard the piston seals.

Clean all components parts, fit new sealing rings and reverse the removal procedure to reassemble the F clutch.

Refit the F clutch assembly to the transmission ensuring that the oil feed holes are aligned.

Fit and tighten the F clutch cylinder securing screws and align the clutch plates.

Reposition the unit/Service Tool adaptor into a vertical position with the bell housing face uppermost.

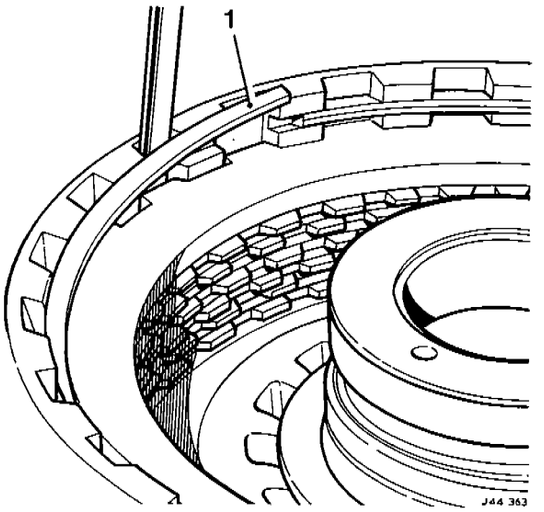


Fig 1

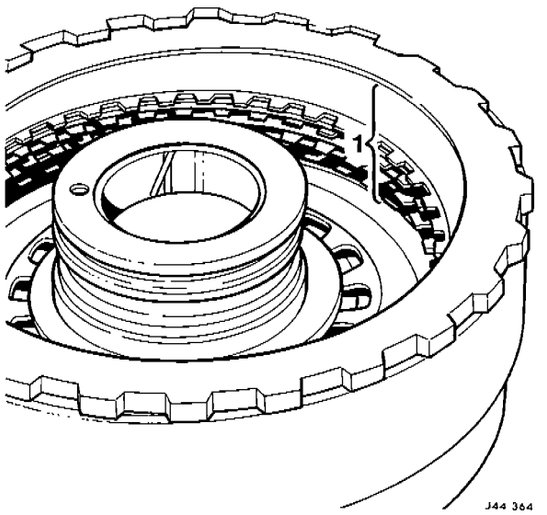


Fig 2

E CLUTCH OVERHAUL

Remove the snap ring (1 Fig 3) securing the clutch plate and remove the clutch pack assembly.

Remove the piston.

Remove the 'O' Ring.

Replace the 'O' ring and refit the piston.

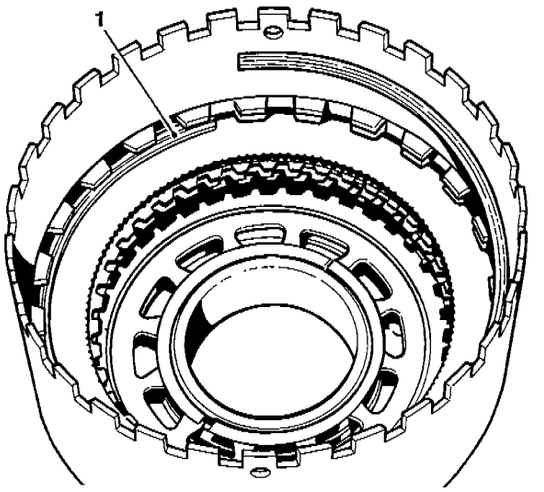


Fig 3

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Using Service Tool JD 107 (1 Fig 1) compress the spring and remove the collets (2 Fig 1).

Slacken the centre nut of and remove the adaptor collar JD 107-1.

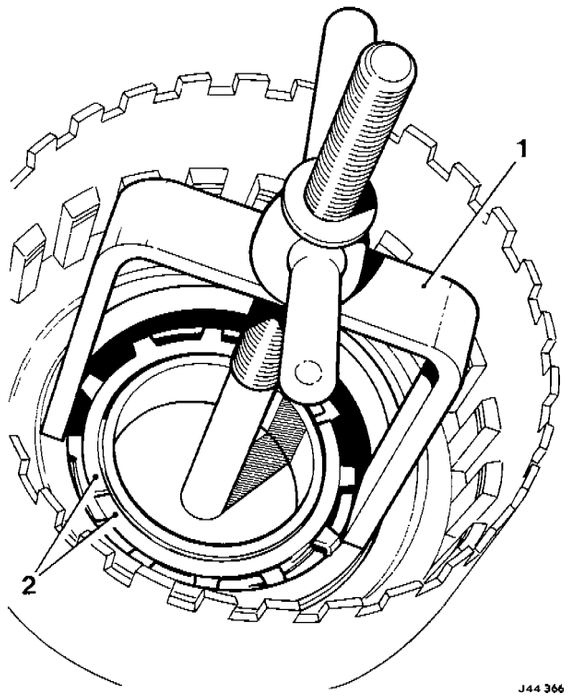


Fig 1

Remove the Service Tool and remove the piston spring (1 Fig 2) from the housing.

Using an air line remove the piston from the housing.

Remove and discard the piston seals.

Clean the piston housing assembly.

Clean all component parts and reverse the removal procedure to reassemble the **E** Clutch ensuring that when the clutch plates are assembled, they are fitted metal fibre metal and end with the thick metal plate prior to securing with the snap ring

Fit and seat the **E** clutch assembly to the F clutch using a twisting motion to seat the E clutch

Align all of the **E** clutch plates

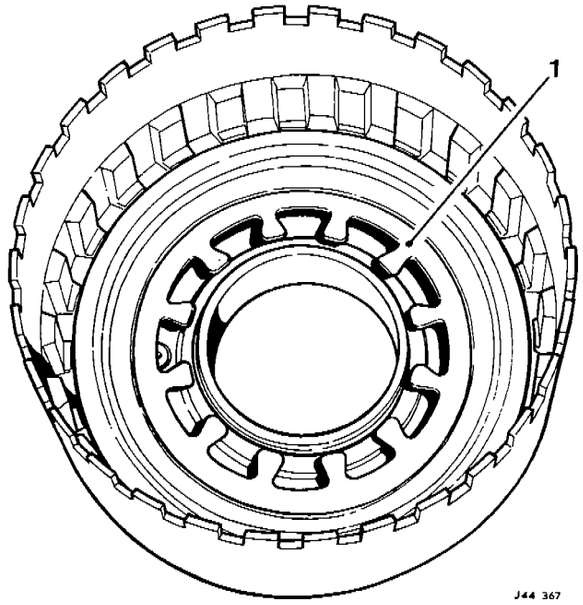


Fig 2

OUTPUT ASSEMBLY OVERHAUL

Using suitable circlip pliers remove the snap ring (1 Fig 1) securing the output shaft (2 Fig 1) to the rear one way clutch (3 Fig 1).

Remove the one way clutch from the shaft.

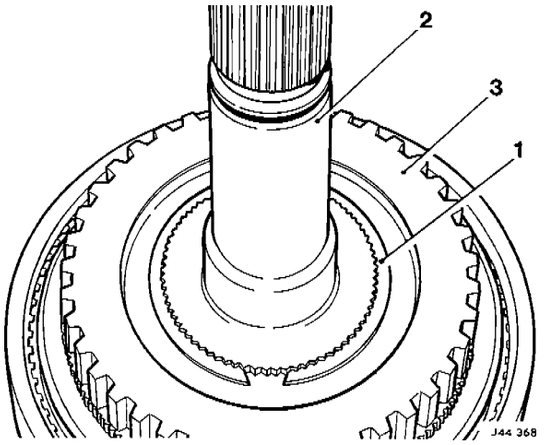


Fig 1

Remove the E clutch hub (1 Fig 2), and using a clockwise twisting motion remove the one way clutch assembly (2 Fig 2).

Remove the clutch roller assembly from the clutch hub.

Remove the clutch rollers and remove snap ring securing the inner gear to the outer gear.

Remove the inner gear.

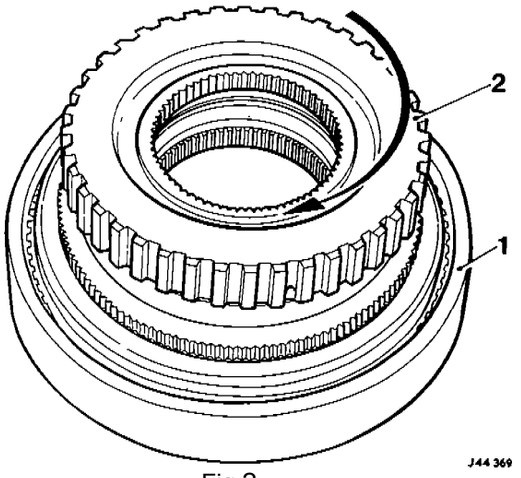


Fig 2

Clean all components parts and reverse the removal procedure to reassemble, ensuring that when the one way clutch (1 Fig 3) is assembled that an anti-clockwise motion is used to ensure the one way clutch is fully seated.

Check the clearance between the one way clutch and gear and fit the E clutch hub.

Lubricate the thrust bearing.

Fit the washer and bearing to the **E** clutch.

Apply Vaseline to the thrust washer and brass thrust washer.

Fit washers to the output shaft assembly.

Fit and seat the output shaft assembly to the E clutch using a twisting motion to ensure the shaft is fully seated.

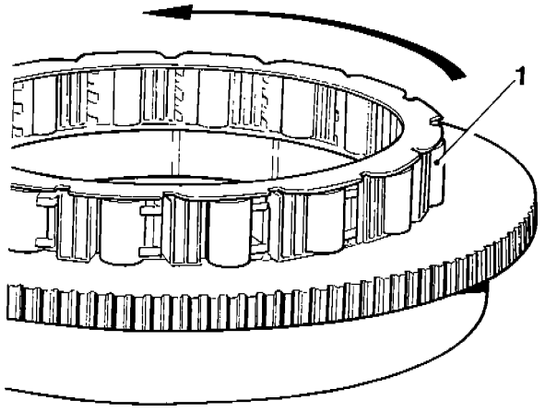


Fig 3

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REAR PLANETARY SET OVERHAUL

Unhook and remove the sealing ring from the carrier.

Clean **the** assembly.

Lubricate the replacement sealing ring and fit **and** hook the sealing ring to the carrier.

Lubricate the thrust bearing and fit the washer and bearing to the output shaft.

Apply Vaseline to the carrier and fit the thrust washer to the carrier.

Fit and seat the carrier assembly to the output shaft.

Refit the sun gear.

C, C1 AND D Clutch assembly overhaul

Fit the clutch assembly to **a** bench vice.
Remove Service Tool JD 109.

Remove the C1 clutch piston (1 Fig 1).

Remove the C1 clutch **plates** as **an** assembly (2 Fig 1).

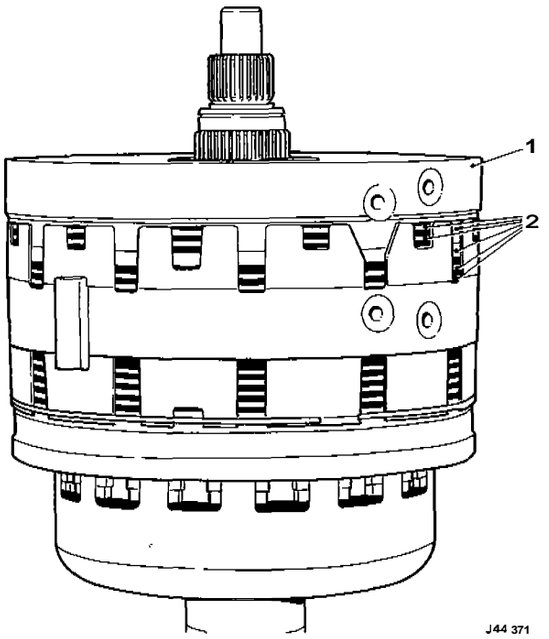


Fig **1**

Remove the one way clutch assembly (1 **Fig** 2).

Remove the C clutch assembly and the C-D clutch piston assembly.

Remove the snap ring securing the **D** clutch plates.

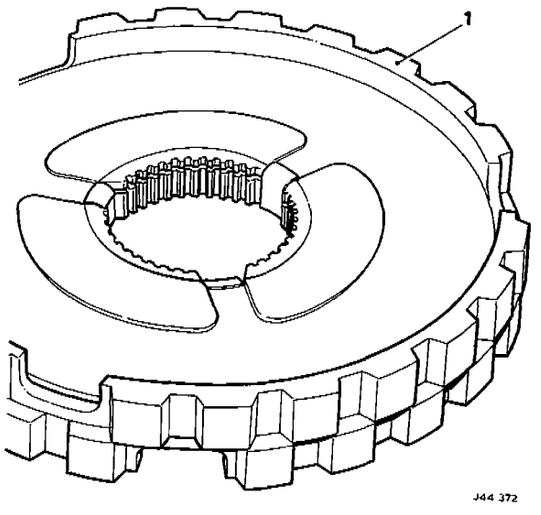


Fig 2

Remove the one way clutch/planet gear set (1 Fig 1).

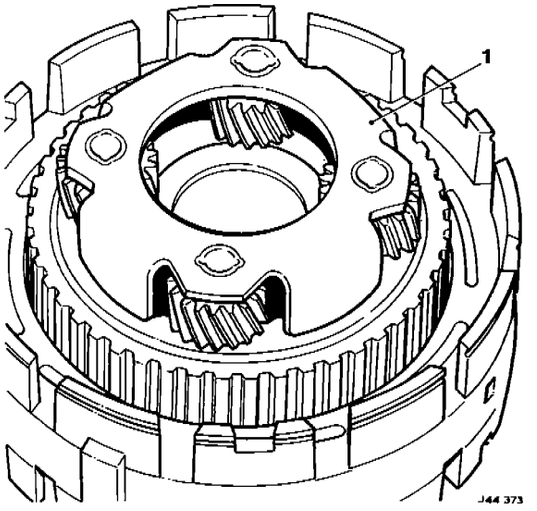


Fig 1

Remove the sun gear and unhook and remove the sealing rings (1 Fig 2).

Remove the D clutch brake ring.

Remove the snap rings securing the lower planet carrier.

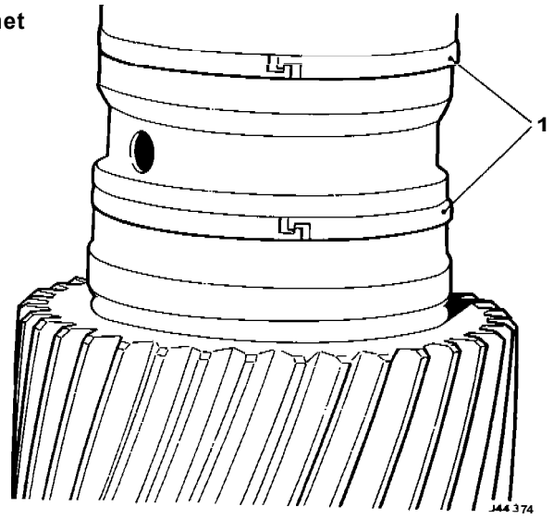


Fig 2

Remove the gear (1 Fig 3).

Remove the lower planet gear set.

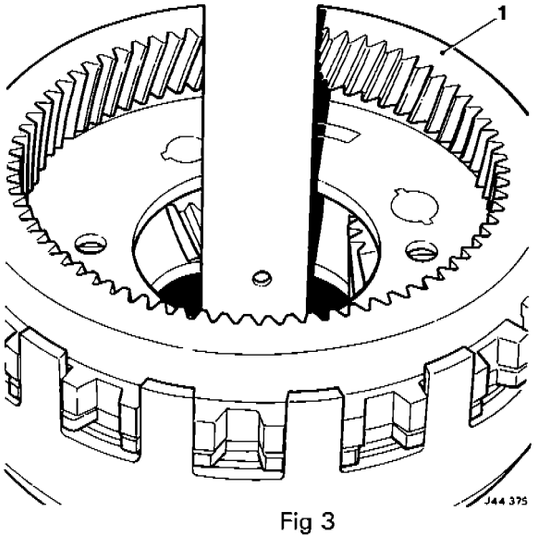


Fig 3

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Remove the thrust bearing assembly (1 Fig 1).
Remove the centre shaft assembly (2 Fig 1).
Remove the thrust bearing assembly.
Remove the snap ring securing the outer gear to the shaft.
Remove the gear from the shaft.

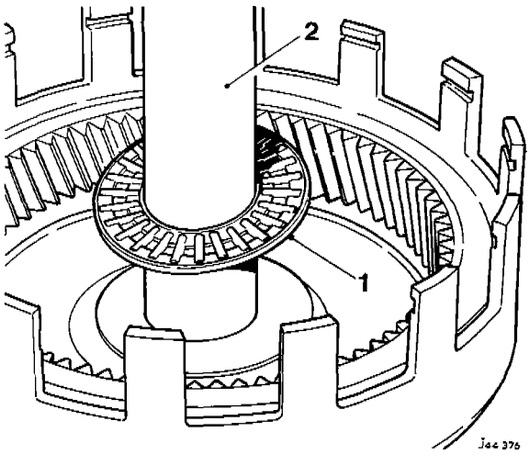


Fig 1

Remove the spacing ring (1 Fig 2) and remove the spacing ring retaining snap ring (2 Fig 2).
Remove the lower clutch carrier from the stand.
Clean all component parts and overhaul the clutch pistons.
Fit Service Tool JD 107 to the housing (1 Fig 3).
Fit the piston spring compressor ring to the tool.
Tighten the tool centre nut and remove the collets (2 Fig 3).
Slacken the tool centre nut and remove the adaptor collar JD 107-1.
Remove the Service Tool.
Remove the piston spring from the housing and using an air line displace the piston from the housing.
Remove and discard the piston seals.
Clean the piston and housing assemblies.
Fit and align new seals to the piston and lubricate.
Fit the piston to the housing and reverse the strip procedure to reassemble the housing.
Fit the spacing ring and the spacing ring snap ring.
Lubricate and fit the thrust bearing.
Place the shaft to the front and fit the outer gear.
Fit the snap ring securing the gear and fit the assembly to the clutch carrier.
Lubricate and fit the thrust bearing.
Lubricate the lower planatary gear set and fit gear and fit the snap ring securing the gear.
Fit the D Clutch brake ring.
Place the C-D piston assembly to the front.
Lubricate the planatary gear one way clutch assembly and fit the gear clutch assembly to the piston assembly.
Lubricate the D clutch plates and assemble. Thin metal, fibre, metal, fibre, metal, etc plates in that order.
Fit the snap ring securing the clutch plate.
Fit and hook the sealing rings to the sun gear.

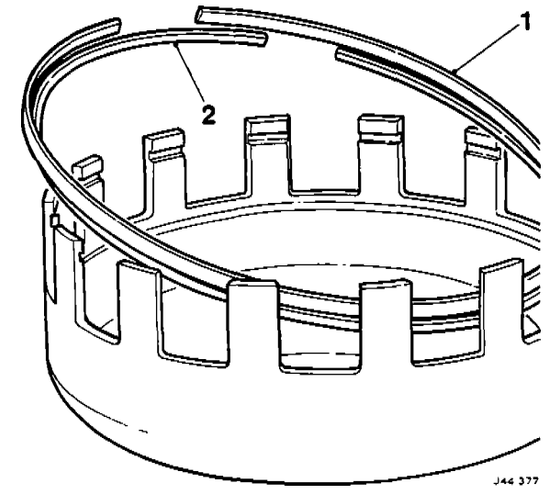


Fig 2

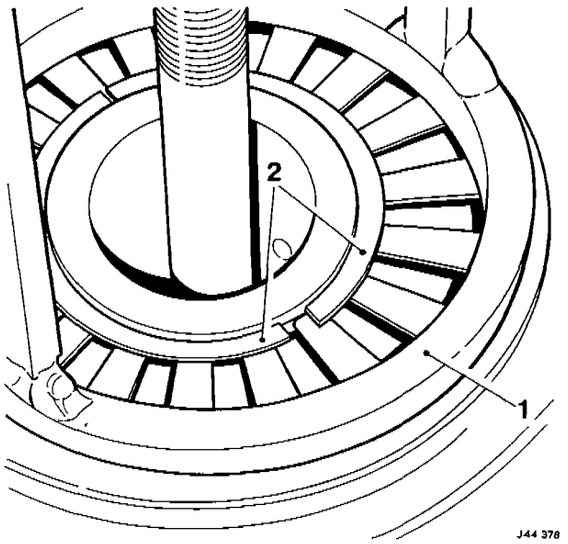


Fig3

Lubricate the sealing rings and assemble the D clutch and sun gear.

Fit and engage the assembly to the stand Service tool.

Lubricate the upper one way clutch assembly and align the the clutch splines.

Fit and seat the assembly to the stand (OBEN to the top).

Lubricate the C clutch plates.

Assemble the metal fibre metal plates (metal plate last).

Lubricate the C1 clutch plates.

Assemble fibre metal fibre metal plates avoid the 'V' section location.

Fit the C piston assembly,

Assemble Service Tool JD 109 to the assembly.

Lift the complete assembly from the stand.

Move the stand aside.

Lubricate the bearing and thrust washer.

Fit the thrust washer and bearing to the gearbox.

Smear the thrust washer with Vaseline and fit the thrust washer to the clutch assembly.

Fit and seat the complete assembly to the gearbox.

Fit the snap rings securing the complete clutch assembly.

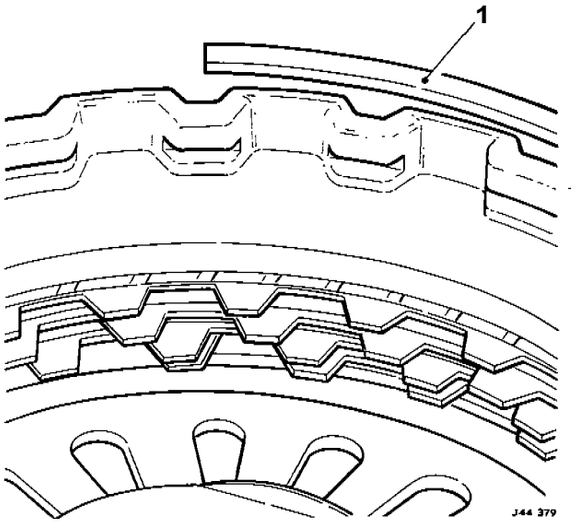


Fig 1

B CLUTCH OVERHAUL

Remove the snap ring (1 Fig 1) securing the clutch plate.

Remove the clutch plates as an assembly.

Unhook and remove the sealing ring.

Overhaul the piston and clean as necessary.

Fit Service Tool JD 107 to the clutch assembly (1 Fig 2).

Fit the piston spring compression ring to the Service Tool.

Tighten the centre nut and remove the the collets.

Remove the Service Tool.

Remove the piston spring from the housing and using an air line remove the piston from the housing.

Remove and discard the pistons seals.

Clean the piston housing assemblies.

Fit and align the new seals to the piston.

Lubricate the seals.

Fit and fully seat the piston to the housing.

Reverse the remaining overhaul procedure to reassemble the clutch, ensuring that prior to the clutch plates being assembled they are lubricated and as they are assembled to the housing they are assembled wavy washer, metal plate fibre plate metal plates etc. ending with a thick metal plate.

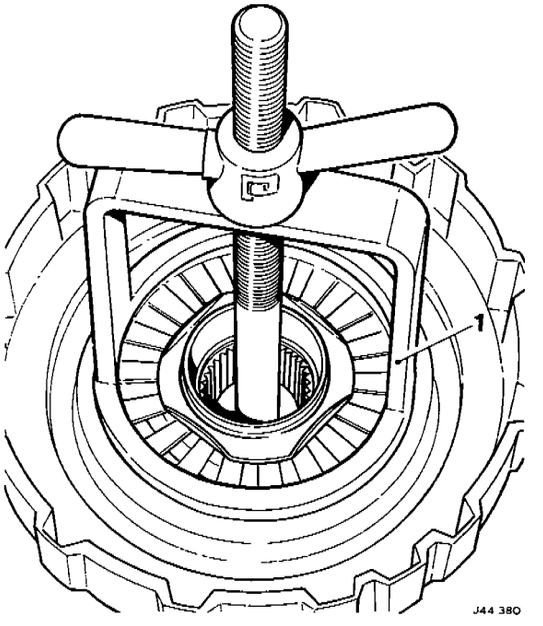


Fig 2

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Fit the snap ring securing the clutch plate.
Fit and seat the B clutch assembly to the gearbox.
Fit the 'O' ring to the shaft.
Fit the washer.
Using suitable circlip pliers, fit the snap rings securing the clutch.
Align the clutch plates.

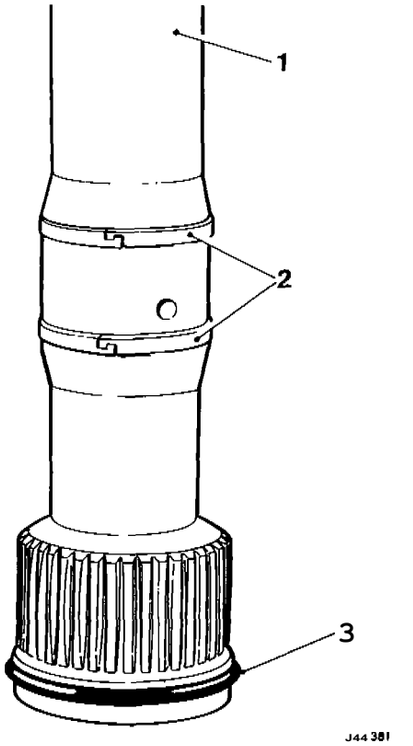


Fig 1

A CLUTCH OVERHAUL

Remove the input shaft (1 Fig 1).
Unhook and remove the sealing rings (2 Fig 1).
Remove and discard the 'O' ring (3 Fig 1).
Apply downward pressure to the clutch hub and remove the hub securing snap ring.
Remove the clutch hub (1 Fig 2) and remove the clutch plates as an assembly.
Remove piston spring (2 Fig 2).
Overhaul the piston and clean all components.
Use an air line to displace the piston from the housing.
Remove and discard the 'O' ring seals.
Clean the piston assembly and **A** clutch housing.
Fit new seals to the piston and lubricate.
Fit the piston to the housing.

Lubricate the clutch plates and assembly wavy washer, metal plate fibre plate and metal plate etc. finish with the second wavy plate.
Fit the clutch spring and fit and align the clutch carrier.
Invert the asssembly on the bench.
Compress the springs and fit the snap ring.
Fit an 'O' ring to the input shaft.
Fit and hook the sealing rings to the input shaft.
Lubricate the sealing rings.
Fit and seat the input shaft to **A** clutch.
Fit the inner hub to the clutch assembly.
Lubricate the thrust bearing fit the washer and bearing to the gearbox.
Apply Vaselene to the thrust washer.
Fit the washer to the clutch assembly.
Fit and seat the clutch assembly to the gearbox ensuring that both sets of clutch plates are fully engaged.

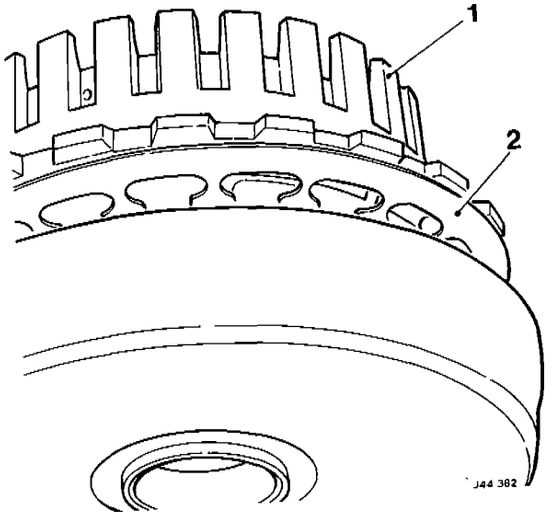


Fig 2

FRONT PUMP ASSEMBLY OVERHAUL

Remove the bolts securing the bell housing.
Remove the bell housing leaving two opposing bolts in the oil pump **slack.**
Remove the remaining bolts.
Lightly tap the bolt heads of the two bolts left in to release the pump from the plate.

Remove the intermediate plate.
Remove the gears from pump.
Remove and discard the pump 'O' ring.
Remove and discard the front oil seal.
Clean all components.
Assemble the gears into **pump** ensuring that the centre pop mark on the gears is facing upwards.
Lubricate the gears.
Fit an 'O' to the pump.
Lubricate the 'O' ring, fit and align the pump to the immediate plate.
Fit and tighten the pump securing bolts.
Invert the assembly on the bench.
Lubricate the front oil seal.
Fit and seat the oil seal to the pump.
Fit and align the bell housing.
Fit but do not tighten the bell housing securing bolts.
Fit the intermediate plate to the casing gasket.
Lubricate the thrust bearing assembly and **fit** into the gearbox.
Fit and align the front pump/bell housing assembly to the gearbox.
Fit and tighten four securing bolts (90o apart).

GEAR TRAIN ENDFLOAT - CHECK AND ADJUST

Fit Service Tool JD 106 (1 Fig 1) to the stator shaft.
Tighten the screws (2 Fig 1) securing the tool to the shaft.
Ensure that the tool if fully seated onto the shaft.
Fully seat the tool inner collar to the shaft.
Tighten the inner collar securing screw.
Lift the tool/shaft assembly ensuring that the **lift** is vertical (3 Fig 1).
Measure the gap between the tool inner collar and shaft using suitable feeler gauges.
Slacken the screws securing the tool to the shaft and remove the tool.
Remove the pump/bell housing assembly securing bolts and remove the housing.
Remove the shim and measure.
Select replacement shim, measure and fit.
Refit bell housing/pump assembly and tighten the four securing bolts (90o apart).
Recheck the end float.
Fit and tighten the remaining front pump securing bolts and finally tighten the bell housing securing bolts.

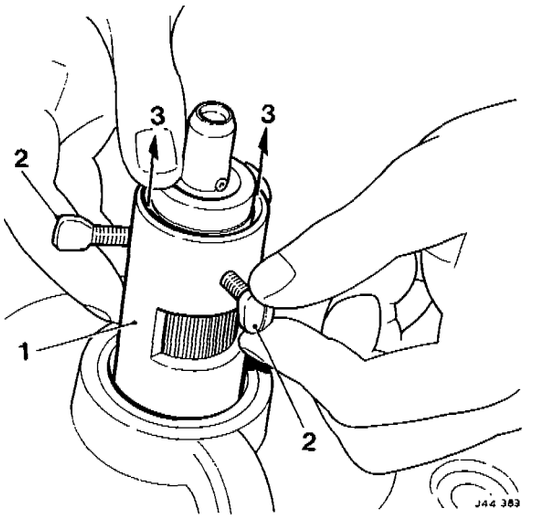


Fig 1

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GOVENOR ASSEMBLY OVERHAUL

Remove the screws (1 Fig 1) securing the park gear (2 Fig 1) to the governor and remove the park gear.
Remove the screws securing the governor opposing valve.
Remove the plate and spacers.
Remove the valve housing.
Remove the valve spring and spring guide from the housing.
Undo and remove the valve to base securing screws (5 Fig 1). Remove the base.
Remove the valve weight securing circlip.
Remove the valve weight, body, sleeve and spring.
Clean all component parts.
Fit and align the opposing valve, spring and guide to the body (10 Fig 1).
Fit and align the opposing valve body assembly to the govenor.
Fit and align the spacers (9 Fig 1) and retaining plate (7 Fig 1), secure with the screws (8 Fig 1).
Fit the spring to the valve and fit the valve sleeve.
Fit the valve body and valve weight.
Compress the spring and fit the weight securing circlip.
Lubricate the valve assembly.
Fit a brace and fit and tighten the valve securing screws.
Fit the park gear and secure with the screws.

Reposition the transmission unit Service Tool adaptor into a horizontal postion i.e. valve block face uppermost.
Fit the 'O' ring to the output shaft.
Lubricate the 'O' ring.
Fit and seat the governor **assembly** over the sealing rings.
Clean the pawl spring pivot and guide plate.
Lubricate the pivot and fit to the unit.
Fit the spring to the pivot.
Fit the pawl to the pivot and spring.
Reposition the pawl below the actuator rod and fully seat on the pivot.
Fit and seat the guide plate and the locating plate.
Fit and tighten the locating plate securing screw.

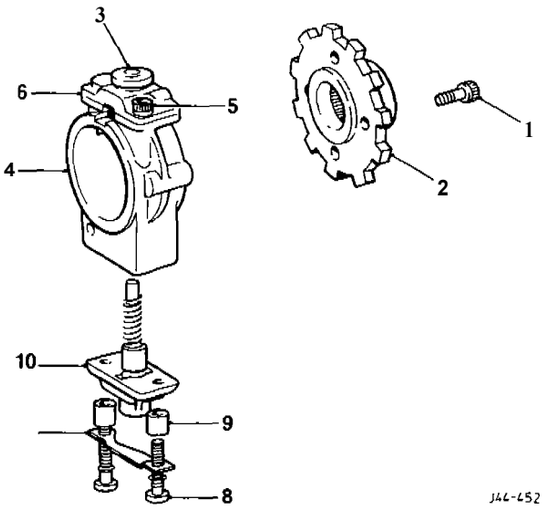


Fig 1

REAR EXTENSION OVERHAUL

Using Service Tool JD 104 remove the roller bearing.
Insert the assembly on a suitable wooden block and remove the oil seal.
Remove the breather cap and remove the breather securing the circlip.
Remove the breather (1 Fig 1).
Remove and discard the breather 'O' ring (2 Fig 1).
Clean the rear extention breather and cap.
Clean the bearing.
Fit a new ring to the breather and fit the breather to the extention and secure with circlip.
Fit the breather cap.
Lubricate the rear oil seal and using Service Tool JD 102 fit and seat the rear seal to the housing.
Invert the assembly on the wooden block.
Lubricate the bearing and using Service Tool JD 104 fit and seat the bearing to the rear extension.
Fit a replacement gasket to the rear extension and fit the extension assembly.
Fit and tighten the bolts securing the rear extension assembly to the main case.
Apply 'Hylomar' to the flange securing nut and splines.
Clean the rear drive flange and fit the rear flange to the transmission.
Fit and tighten the flange nut.
Fit a new securing nut locking ring.
Peen over the ring in the tab positions.
Using Service Tool JD 126 fit and seal the oil seals.
Fit seal securing springs.
Compress the springs and retain with circlips (Fig 2).
Fit a new 'O' ring to the kickdown cable.
Lubricate the 'O' ring and rotate the throttle valve cam against spring pressure.
Fit the cable to the unit and enagage the inner cable into slot in the throttle valve cam.
Fully seat the cable into the gearbox casing.
Pull the kickdown inner cable to set the throttle valve cam into the correct position.
Fit and align the valve block and connect to the selector quadrant.
Release the kickdown cable.
Fit but do not tighten the valve block securing screws.

Using Service Tool JD 103 between the valve body and the throttle valve pin align the valve block to set the correct distance between the valve block and cam.
Finally tighten the valve block securing screws.
Remove Service Tool JD 103.
Clean the oil filter and fit new 'O' ring.
Fit the filter to the valve block and secure with the bolts.
Clean the sump and magnets.
Fit the magnets to the sump.
Fit a new gasket to the sump.
Fit and align the sump.

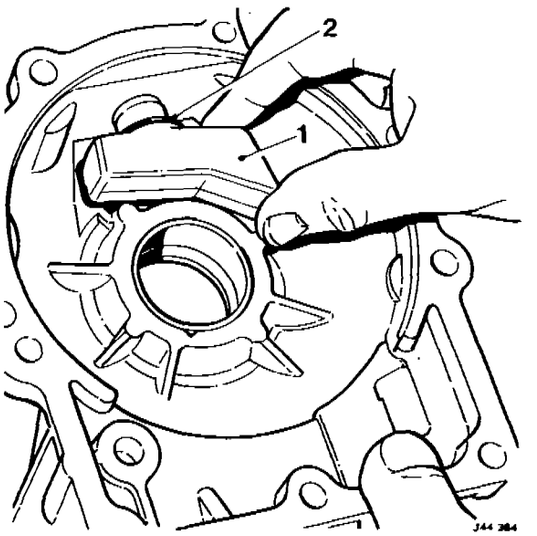


Fig 1

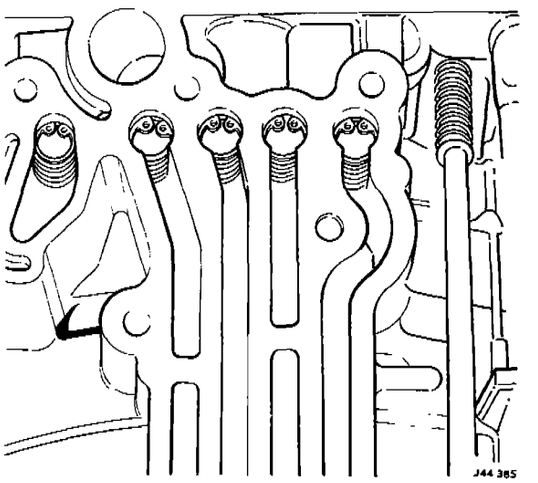


Fig 2

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Fit clamps to the sump noting that the curved clamps are fitted to the corners.
Fit and tighten the clamp securing bolts.
Refit the torque converter.
Refit the transmission unit 44.20.01.
Reset the kickdown cable. With the throttle in the idle position, take up any slack between the transmission cable and the throttle spindle.
Adjust the ferrule on the cable to achieve a gap between the crimp and the end *of* the ferrule of 0.75mm +/- 0,5mm (Fig 1).
Open the throttle to 100%, ensuring that the pedal cam contacts the throttle stop, and measure the distance between the crimp and the end **of** the ferrule. This should be 44mm or greater (Fig 1).
Check by depressing the pedal to the pedal stop and ensure that this condition is achieved.
Adjust the pedal stop as necessary (Fig 2).

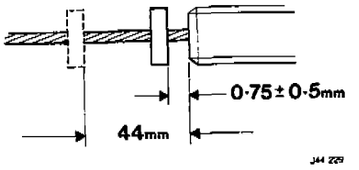


Fig 1

DATA

Front pump end float ***0.3-1.5mm***

SERVICE TOOLS

JD 102 *Oil seal replacer*
JD 103 *Selector linkagegauge*
JD 104 *Bearing remover/replacer*
JD 106 *Oil pump end float gauge*
JD 107 *Clutch spring compressor*
JD 107-1 *Adaptor - Clutch spring compressor*
JD 108 *O ring and snap ring replacer*
JD 109 *Gear train remover*
JD 110 *Kickdown cable remover*
JD 111 *Transmission holding adaptor*
JD 126 *Valve block seal remover/replacer*

TORQUE FIGURES

Base plate assembly to mounting **pan** *7-10Nm*
Base plate assembly to side plate ***7-10Nm***
Dipstick tube nut ***100Nm***
Drain ***plug 15Nm***
Selector lever nut ***to*** *shaft* ***23-27Nm***
Torque convertor housing ***to*** *adaptor* ***49-54Nm***
Torque convertor housing to block/sump ***49-54Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Transmission fluid ***Esso Dexron II***

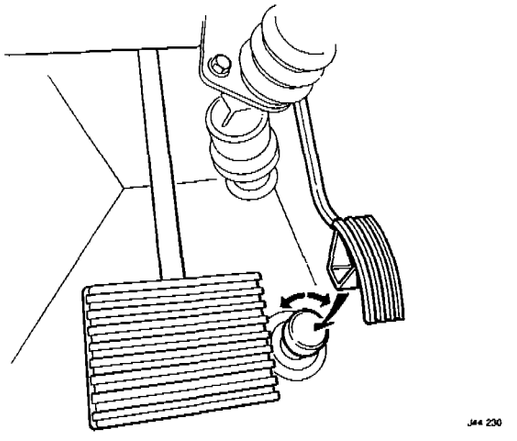


Fig 2

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm
9/16AF
5mm Allen key

0055K

TORQUE CONVERTER

RENEW 44.17.07

Remove the transmission unit 44.20.01.
fit Service Tool lifting handles **JD** 105 to the torque converter **(Fig** 1).
Remove the converter (2 **Fig** 1) from the transmission unit.
Remove the lifting handles and place the converter aside.

Clean **the** torque converter and mating faces.
Fit the lifting handles to the replacement torque converter assembly.
Fit the torque Converter to the transmission unit.
Refit the transmission unit 44.20.01.

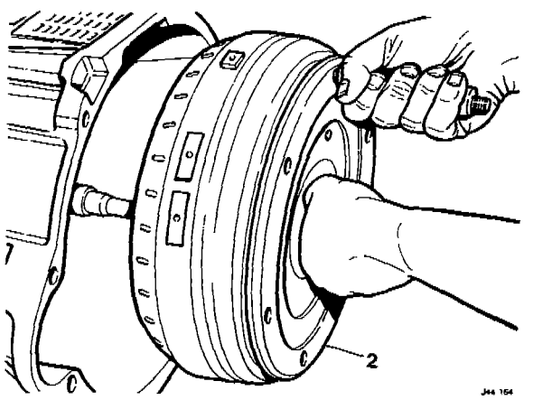


Fig 1

RATA

SERVICE TOOLS

JD 105 *Converter lifting handles*

TORQUE FIGURES

Base plate assembly to mounting pan ***7-10Nm***
Base plate assembly to side plate ***7-10Nm***
Dipstick tube nut ***100Nm***
Down pipe to intermediate ***pipe 15-18Nm***
Drain ***plug 15Nm***
Drive plate to torque convertor ***49-54Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Gearbox to bell housing ***46Nm***
Intermediate pipe to silencer ***15-18Nm***
Oil cooler pipe banjo bolt ***32-36Nm***
Propeller shaft ***to*** *gearbox* ***95-105Nm***
Pump ***bolts 10Nm***
Rear engine mounting bracket to body ***20-25Nm***
Selector lever nut to shaft ***23-27Nm***
Torque convertor housing to adaptor ***49-54Nm***
Torque convertor housing to block/sump ***49-54Nm***

OILSISEALANTSILUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
1Omm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen ***key***

0055K

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FRONT PUMP

RENEW 44.32.01

Remove the intermediate plate gasket 44.20.11.
Remove all except two of the bolts (1 Fig 1) securing the front pump cover to the intermediate plate.
Tap the heads of the two (loose) **bolts** to remove the pump assembly (2 Fig 1).
Remove the bolts and remove the **pump.**
Clean all component parts.
Fit the new pump to the intermediate plate.
Fit and tighten the bolts.
Refit the intermediate plate **gasket** 44.20.11.

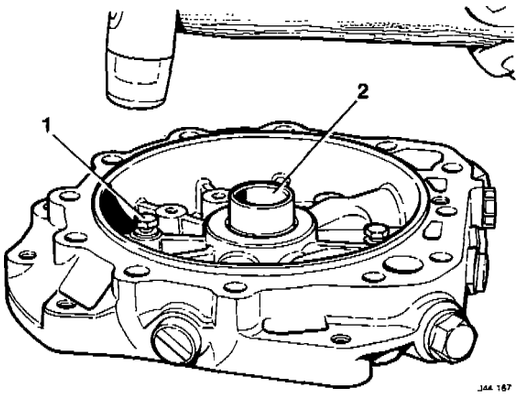


Fig 1

DATA

SERVICE TOOLS

MS 53B *Engine support bracket*
JD 124 *Engine lifting bracket*

TORQUE FIGURES

Base plate assembly to mounting pan ***7-10Nm***
Base plate ***assembly*** *to* ***side*** *plate* ***7-10Nm***
Dipstick tube nut ***100Nm***
Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Drive plate to torque convertor ***49-54Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Gearbox to bell housing ***46Nm***
Intermediate pipe to silencer ***15-18Nm***
Oil cooler pipe banjo bolt ***32-36Nm***
Pump bolts ***10Nm***
Propeller shaft to gearbox ***95-105Nm***
Rear engine mounting bracket to body ***20-25Nm***
Selector lever nut to shaft ***23-27Nm***
Torque convertor housing to adaptor ***49-54Nm***
Torque convertor housing ***to*** *block/sump* ***49-54Nm***

OILSISEALANTSILUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen **key**

0055K

FRONT PUMP

OVERHAUL 44.32.04

Remove the front pump 44.32.01
Remove the gears from the pump and discard the front oil seal.
Clean the pump and gears.
Lubricate the gears and fit to the pump with the centre dots uppermost (1 Fig 1).
Refit the front pump using Service Tool JD **106** (Fig 2). Check that the **gears** rotate freely.
Fit and seat the front seal using Service Tool JD 102.
Refit the front pump 44.32.01

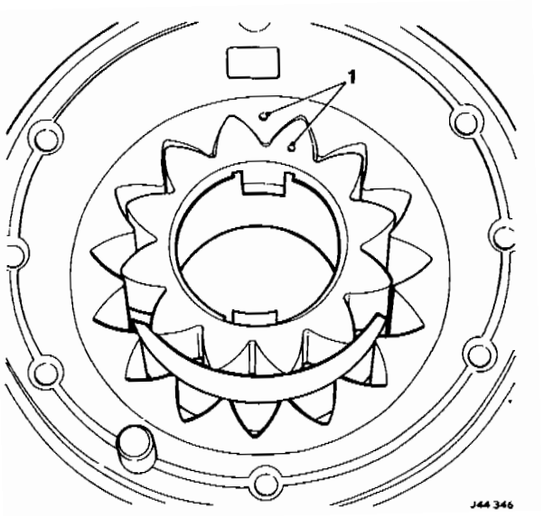


Fig 1

DATA

SERVICE TOOLS

MS 53B *Engine support bracket*
JD 106 *Rotation sleeve/end float gauge*
JD 124 *Engine lifting bracket*

TORQUE FIGURES

Base plate assembly to mounting pan ***7-10Nm***
Base plate assembly to side plate ***7-10Nm***
Dipstick tube nut ***100Nm***
Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Drive plate to torque convertor ***49-54Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Gearbox to bell housing ***46Nm***
Intermediate pipe to silencer ***15-18Nm***
Oil cooler pipe banjo bolt ***32-36Nm***
Pump bolts ***10Nm***
Propeller shaft to gearbox ***95-105Nm***
Rear engine mounting bracket to body ***20-25Nm***
Selector lever nut to shaft ***23-27Nm***
Torque convertor housing to adaptor ***49-54Nm***
Torque convertor housing to block/sump ***49-54Nm***

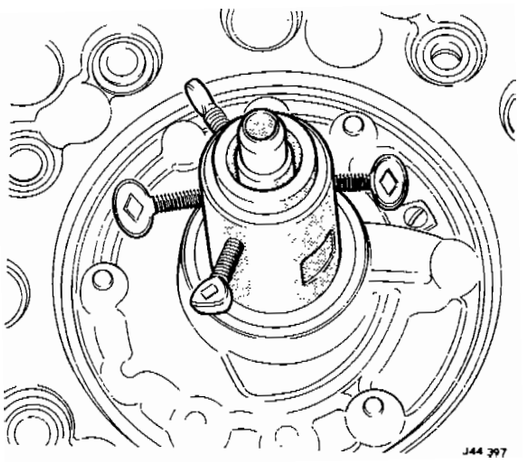


Fig 2

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

0055K

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FRONT PUMP OIL SEAL

RENEW 44.32.07

Remove the front pump 44.32.01
Remove and discard the front oil seal.
Clean the pump.
Lubricate the new seal and fit to the pump using Service Tool JD 102 (1 Fig 1).
Refit the front pump 44.32.01

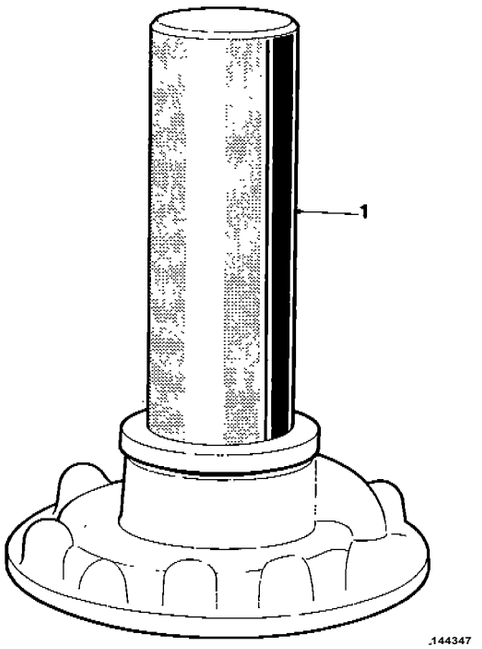


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 102 Oil seal replacer
JD 124 Engine lifting bracket

TORQUE FIGURES

Base plate assembly to mounting pan **7-10Nm**
Base plate assembly to side plate **7-10Nm**
Dipstick tube nut **100Nm**
Down pipe to intermediate pipe **15-18Nm**
Drain **plug 15Nm**
Drive plate to torque convertor **49-54Nm**
Exhaust tie nut/stud **9.5-12.5Nm**
Gearbox **to** *bell housing* **46Nm**
Intermediate pipe to silencer **15-18Nm**
Oil cooler pipe banjo bolt **32-36Nm**
Pump bolts **10Nm**
Propeller shaft to gearbox **95-105Nm**
Rear engine mounting bracket to body **20-25Nm**
Selector lever nut to shaft **23-27Nm**
Torque convertor housing to adaptor **49-54Nm**
Torque convertor housing to block/sump **49-54Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer **TIVOLI KAY ADHESIVES No 5696.**
Transmission fluid **Esso Dexron II**

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

0055K

INTERMEDIATE PLATE GASKET

RENEW 44.20.11

Remove the converter **assembly** 44.17.07.
Remove the converter housing to pump assembly securing **bolts** (1 **Fig** 1).
While holding the input shaft (2 Fig **1**) in this position, remove **the** convertor housing and pump **assembly** (3 Fig 1).
Remove and discard the intermediate plate casing gasket.
Clean gasket and mating faces.
Fit a new gasket, fit the converter/pump assembly, fit and tighten the securing bolts.
Refit the converter assembly 44.17.07.

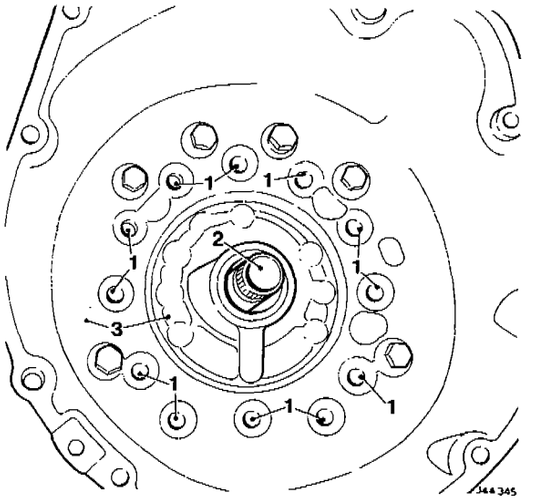


Fig **1**

DATA

SERVICE TOOLS

MS 538 *Engine support bracket*
JD 102 Oil *seal replacer*
JD 105 *Converter lifting handles*
JD 124 *Engine lifting bracket*

TORQUE FIGURES

Base plate assembly to mounting pan ***7-10Nm***
Base plate assembly to side plate ***7-10Nm***
Dipstick tube nut ***100Nm***
Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Drive plate to torque convertor ***49-54Nm***
Exhaust *tie nut/stud* ***9.5-12.5Nm***
Gearbox to bell housing ***46Nm***
Intermediate pipe to silencer ***15-18Nm***
Oil cooler pipe banjo bolt ***32-36Nm***
Propeller shaft ***to*** *gearbox* ***95-105Nm***
Pump bolts ***10Nm***
Rear engine mounting bracket to body ***20-25Nm***
Selector lever nut to shaft ***23-27Nm***
Torque convertor housing ***to*** *adaptor* ***49-54Nm***
Torque convertor housing to block/sump ***49-54Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
20mm
30mm

9/16AF

5mm Allen key

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INTERMEDIATE PLATE

RENEW 44.20.10

Remove the intermediate plate gasket 44.20.11.
Remove the converter housing.
Remove the thrust washer. Remove the intermediate plate bolts, leave two bolts slack but in position opposite each other, tap the bolt heads to release the pump from the plate.
Remove the bolts.
Remove the plate from the pump and remove and discard the pump 'O' ring
Remove the blanking plate plugs and place the intermediate plate aside.
Clean all components parts.
Fit a new 'O' ring to the pump, lubricate the 'O'ring and pump gears. Ensure the marks align (1 Fig 1).

Fit and align the pump to the intermediate plate and tighten the securing bolts.
Refit the convertor housing and intermediate plate gasket.
Fit the converter housing pump assembly to the unit and tighten four securing bolts 90° apart.
Fit Service Tool JD **106** to the input shaft.
Tighten the tool securing screws, gently **tap** the input shaft to fully seat the gear train.
Seat the tool in the collar.
Tighten the collar flange screw to ensure that all movement is removed between the stator shaft and collar.
Lift the tool to check the end float between the inner collar and sector shaft (1 Fig 2), ensure the pull is directly upwards.
Slacken the inner clamp screw and base clamp screws and remove the Service Tool.
Remove the pump housing assembly and bolts.
Remove the assembly and shims.
Measure the shims with a micrometer. Select replacement shims and fit.
Reassembly the **pump** and secure with four bolts.
Refit the Service Tool and recheck the end float.
Refit the intermediate plate gasket 44.20.11.

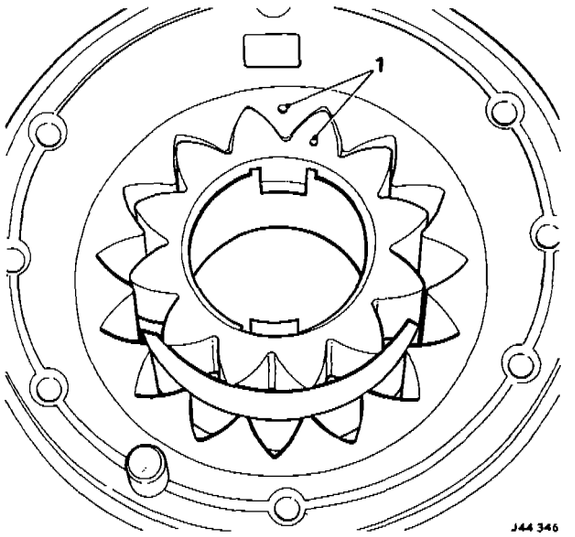


Fig 1

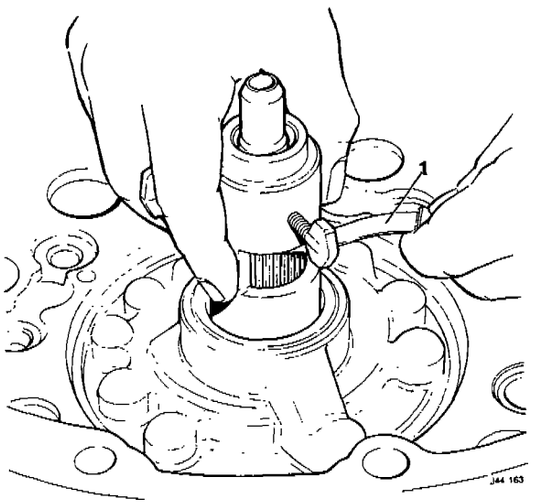


Fig **2**

DATA

Pump end float ***0.3-1.5mm***

SERVICE TOOLS

MS 536 *Engine* ***support bracket***
JD 102 Oil *seal replacer*
JD 105 *Converter lifting handles*
JD 106 *End float gauge*
JD 124 *Engine lifting bracket*

TORQUE FIGURES

Pump bolts ***10Nm***

SPANNER SIZES

13mm
9/16 AF

0055K

REAR EXTENSION HOUSING GASKET

RENEW **44.20.19**

Fit Service Tool JD 124 to the rear of the inlet manifold and take the weight of the engine with Service Tool MS53B (Fig 1).
Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side of the vehicle.
Taking the weight of the transmission unit, remove the rear mounting to body securing bolts, lower the jack and collect the spacer.
Disconnect the propeller shaft from the drive flange.
Remove the bolts securing the rear mounting to the body and using **MS** 53B, lower the gearbox and mounting assembly.
Remove the mounting assembly and spacers.
Remove the bolts (1 Fig 2) securing the rear extension housing to the maincase and remove the housing (2 **Fig** 2).
Fit a new gasket to the replacement extension housing, fit to the gearbox and secure with the bolts.
Coat the output splines with 'Hylomar' and refit the gearbox output flange splines.
Refit the propeller shaft.
Lift the gearbox into position fit the mounting to the gearbox and body.
Clean the exhaust olive, refit the intermediate pipe to the downpipe.
Lower the vehicle and remove Service tools **MS** 53B and JD 124.
Refill the transmission with fluid.

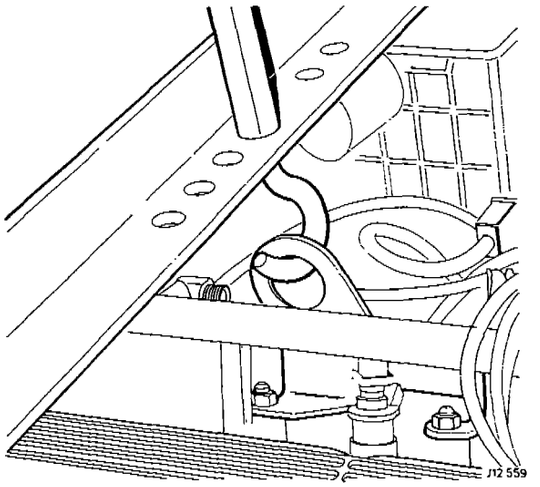


Fig 1

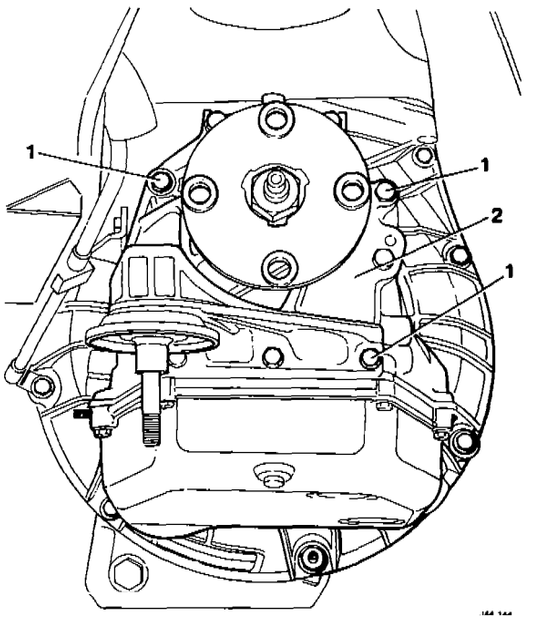


Fig 2

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket

TORQUE FIGURES

Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Output flange ***100Nm***
Rear extension housing to main case 23Nm

OILSISEALANTSILUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Output shaft splines HYLOMAR
Transmission fluid Esso ***Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm
9/16AF

0194G

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REAR EXTENSION HOUSING OIL SEAL

RENEW 44.20.18

Fit Service Tool JD 124 to the rear of the inlet manifold and take the weight of the engine with Service Tool MS53B (Fig 1).
Place drain tin below the transmission, remove drain plug, allow fluid to drain into the tray and replace the plug.
Remove the exhaust front pipe and secure the remainder of the system to one side of the vehicle.
Disconnect the propeller shaft from the drive flange.
Remove the bolts securing the rear mounting to the body and using **MS** 53B, lower the engine/transmission assembly.
Remove the mounting assembly and spacers.
Disconnect the propshaft from the drive flange.
Open the door and select Park.
Prior to removing the drive flange securing nut place a suitable drain tin below.
Remove the the drive flange securing nut and drive flange.
Using suitable seal remover remove the seal from the extension.
Clean its mounting position, lubricate seal and **using** Service Tool JD 102(1 Fig 2) fit the rear oil seal to the rear extention.
Refit the mounting assembly.
Raise the engine/transmission. Fit **the** mounting bolts.
Refit the exhaust.
Remove **the** service tools.
Replenish the transmission fluid.

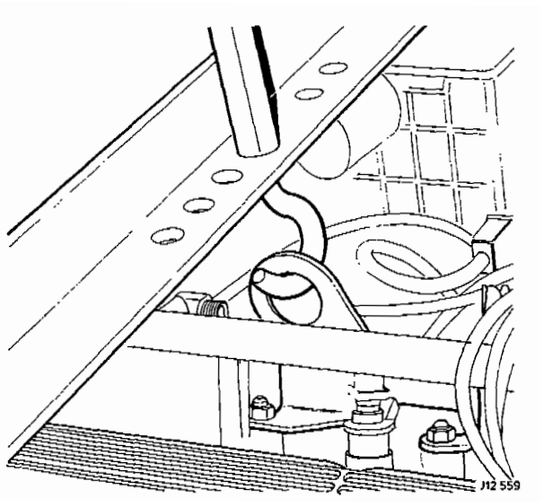


Fig 1

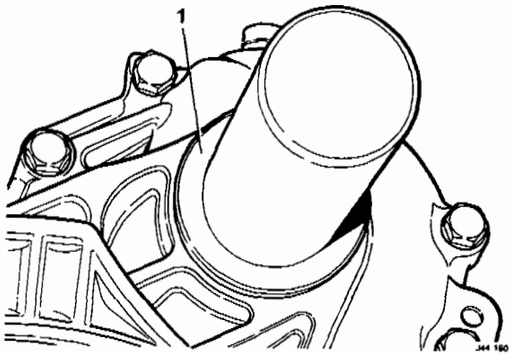


Fig 2

DATA

SERVICE TOOLS

MS 53B *Engine* ***support bracket***
JD 124 *Engine lifting* ***bracket***
JD 102 *Oil* ***seal replacer***

TORQUE FIGURES

Drain plug 15Nm
Output *flange* ***100Nm***

OILS/SEALANTS/LUBRICANTS

Output shaft splines HYLOMAR
Transmission fluid Dexron II

SPANNER SIZES

10mm
13mm
17mm
30mm
9/16AF

0055K

REAR EXTENSION HOUSING

RENEW 44.20.15

Remove the rear extension housing gasket 44.20.19.
Remove the rear mounting peg and spring pan, remove the bolts securing the selector cable mounting bracket and remove the bracket.
Using Service Tool JD 124 remove the bearing from the extension housing.
Remove the cap and circlip securing the breather (1 Fig 1), remove the breather and O ring (2 Fig 1).
Remove the rear oil seal.
Fit a new 'O' ring to the breather, fit the assembly to the replacement housing, fit a replacement oil seal to the housing using Service Tool JD 102 (1 Fig 2) and fit the breather cap.
Refit the selector mounting bracket and secure with the bolts.
Fit the spring pan and mounting peg, fit a gasket to the replacement extension housing, fit to the gearbox and secure with the bolts.
Refit the gearbox output flange.
Refit the propeller shaft, clean the exhaust olive and using a recommended exhaust sealant refit the intermediate pipe to the downpipe.
Refill the transmission with fluid.

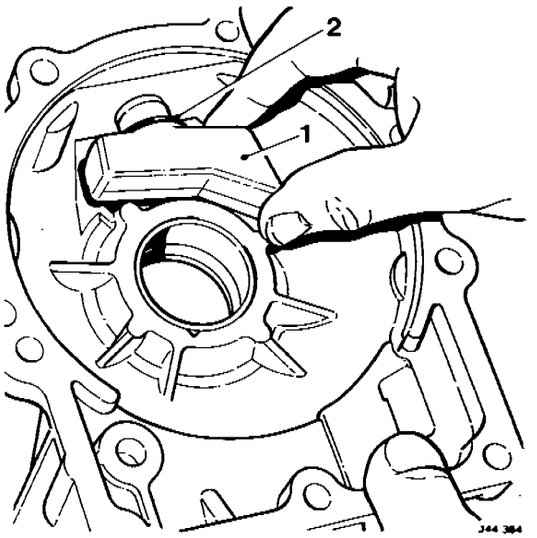


Fig 1

DATA

SERVICE TOOLS

MS 53B *Engine support bracket*
JD 124 *Engine lifting bracket*
JD 102 *Rear extension oil seal replacer*
JD 104 *Rear extension bearing replacer*

TORQUE FIGURES

Down *pipe to intermediate pipe* ***15-18Nm***
Drain plug ***15Nm***
Intermediate pipe to silencer ***15-18Nm***
Output *flange* ***100Nm***
Propeller shaft ***to*** *gearbox* ***95-105Nm***
Rear extension housing to main ***case 23Nm***

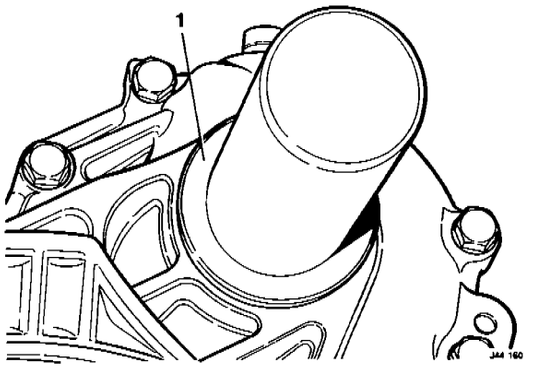


Fig 2

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KA Y ADHESIVES No 5696.***
Output shaft splines ***HYLOMAR***
Transmission fluid ***Esso Dexron II***

SPANNER SIZES

8mm
1Omm
13mm
17mm
30mm

9/16AF

0055K

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FLUID

RENEW 44.24.02

Raise the vehicle on a ramp.
Place a drain tin below the transmission fluid pan drain plug, remove the plug and drain the oil. Fit and tighten the drain plug.
Refill the unit with fluid (approximately 3.0 litres - 5.3 Imperial pints).
Start the engine and move the selector several times through all positions and back to neutral.
Check the oil level (Fig 1) with the engine running.

Note: Ensure that the fluid **is** hot and the vehicle is on level ground.

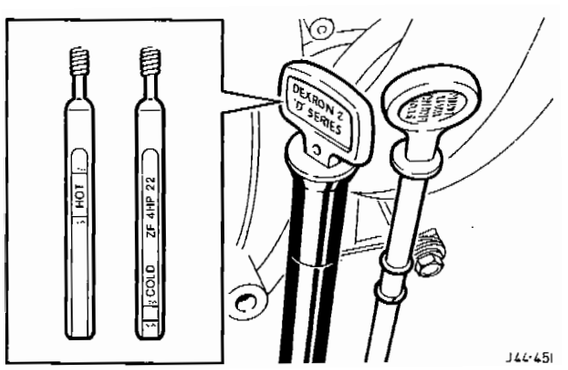


Fig 1

DATA

TORQUE FIGURES

Drain plug ***15Nm***

OILS/SEALANTS/LUBRICANTS

Transmission fluid ***Dexron II***

SPANNER SIZES

5mm Allen ***key***

FLUID PAN

RENEW 44.24.04

Drain the transmission fluid 44.24.02.
Refit the fluid pan drain plug (1 **Fig** 2).
Disconnect the dipstick tube from the fluid pan.
Disconnect the intermediate pipe from the front pipe and collect the sealing olive.
Remove the fluid pan clamp securing bolts (2 Fig 2) and remove the pan (3 Fig 2) **and** sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Reconnect the dipstick tube.
Refit the exhaust.
Replenish the transmission fluid 44.24.02.

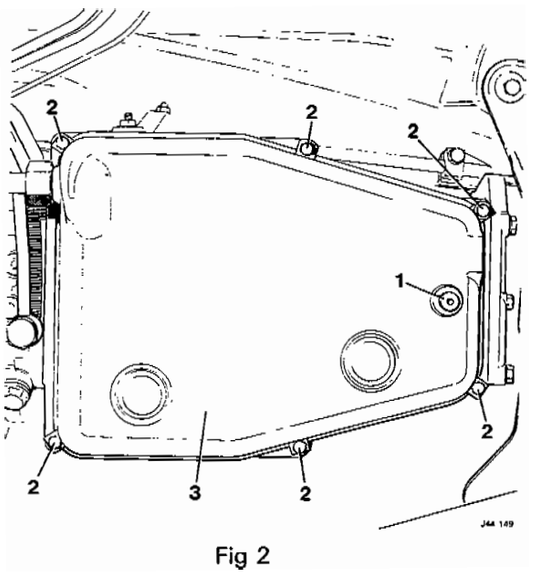


Fig 2

DATA

TORQUE FIGURES

Dipstick tube nut ***100Nm***
Drain plug ***15Nm***
Fluid pan mounting bolts ***6Nm***

OILS/SEALANTS/LUBRICANTS

Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
13mm
5mm Allen ***key***

FLUID FILTER

RENEW 44.24.07

Drain the transmission fluid 44.24.02.
Refit the fluid pan drain **plug** (1 Fig 1).
Disconnect the dipstick tube from the fluid pan.
Disconnect the intermediate pipe from the front pipe and collect the sealing olive.
Remove the fluid pan clamp securing bolts (2 Fig 1) and remove the pan (3 Fig 1) and sealing rubber assembly.
Discard the rubber, clean the pan and magnets.
Remove the filter screws, and remove the filter.

Fit the replacement filter, fit and tighten the screws.
Fit a replacement gasket to the pan, lift into position and secure with the clamps and bolts.
Reconnect the dipstick tube.
Refit the exhaust.
Replenish the transmission' fluid 44.24.02.

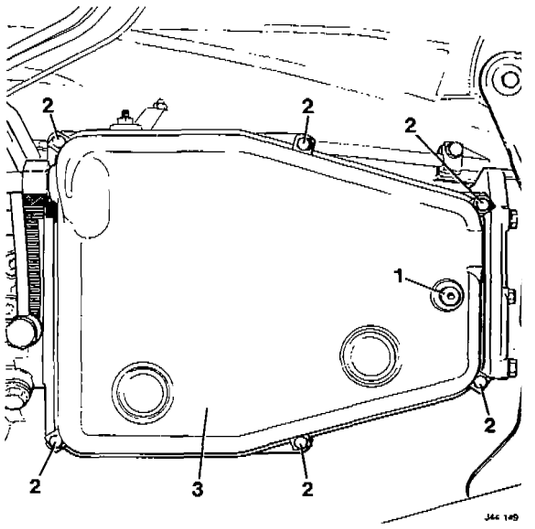


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut 100Nm
Drain plug 15Nm
Fluid pan mounting bolts 6Nm

OILS/SEALANTS/LUBRICANTS

Transmission fluid Dexron II

SPANNER SIZES

8mm
13mm

5mm Allen key

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VALVE BLOCK ASSEMBLY

RENEW 44.40.01

Remove the transmission fluid filter 44.24.07.
Remove the valve block securing screws (1 Fig 1) and carefully lower the **block.**
Clean the mating face *for* the valve block.

Note: Before fitting the valve block, pull the kickdown cable (1 **Fig** 2) to lift the cam to the vertical position. To fit the pressure valve and separator plate, engage the quadrant in the operating valve.
Do not tighten the valve block screws, leave **it** just moveable, and set the distance from the **pin** of **the** throttle to the housing at 11.5 mm, using Service **Tool JD** 103.
Ensure no pressure is applied to the kickdown cable, and finally tighten the valve **block.**
Check that when the-throttle is fully open, **the** clearance between the stop and the outer cable is 39mm (ensure that the accelerator pedal is at the fuel throttle and not the kickdown position).
Fit the filter, fit and tighten the screws.
Fit a replacement gasket to the pan, **lift** into position and secure with the clamps **and** bolts.
Reconnect the dipstick tube.
Refit the exhaust.
Replenish the transmission fluid 44.24.02.

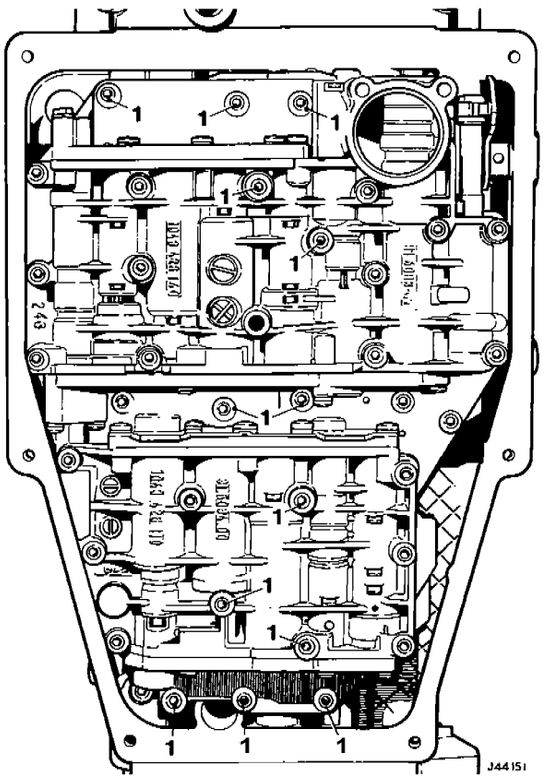


Fig 1

DATA

SERVICE TOOLS

JD 103 Linkage setting gauge

TORQUE FIGURES

*Dipstick tube nut **100Nm***
*Drain plug **15Nm***
Fluid pan mounting bolts 6Nm

OILS/SEALANTS/LUBRICANTS

*Transmission fluid Dexron **II***

SPANNER SIZES

8mm
13mm

*5mm **Allen key***

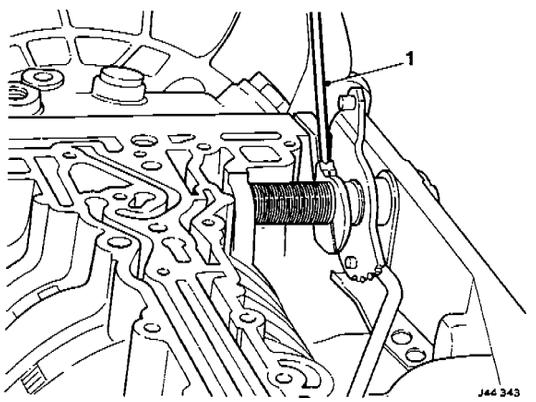


Fig 2

0055K

VALVE BLOCK ASSEMBLY

OVERHAUL 44.40.04

Remove the valve block assembly 44.40.01

THROTTLE VALVE BLOCK OVERHAUL

Remove the screws securing the throttle valve to the main valve assembly.
Split the main valve assembly from the throttle valve.
Carefully remove the reverse inhibit valve spring retaining clip (1 Fig 1).
Remove the spring collar (2 Fig 1) and spring (3 Fig 1).
Remove the reverse inhibit valve (4 Fig 1) and screws (5 Fig 1) securing the modulator valve cover plate (6 Fig 1).
Remove the plate.
Remove the modulator valve damper (7 Fig 1) and spring (8 Fig 1).
Note the position of and remove the modulator valve retaining clip (9 Fig 1).
Remove the modulator valve (10 Fig 1) and throttle valve (11 Fig 1) and the spring (12 Fig 1).
Note the position of and remove the kickdown valve retaining clip (13 Fig 1).
Remove the throttle valve (14 Fig 1) and clean the throttle valve block.
Lubricate all components prior to assembly.
Reverse the removal procedure to reassemble the throttle valve block.
Note that the throttle valve retaining clip flat face of the clip faces **away** from the valve spring, also that the flat side of the modulator valve retaining **clip** faces away from the valve spring and also when fitting **the** modulator valve cover plate ensure that the plate lug engages into the throttle valve.

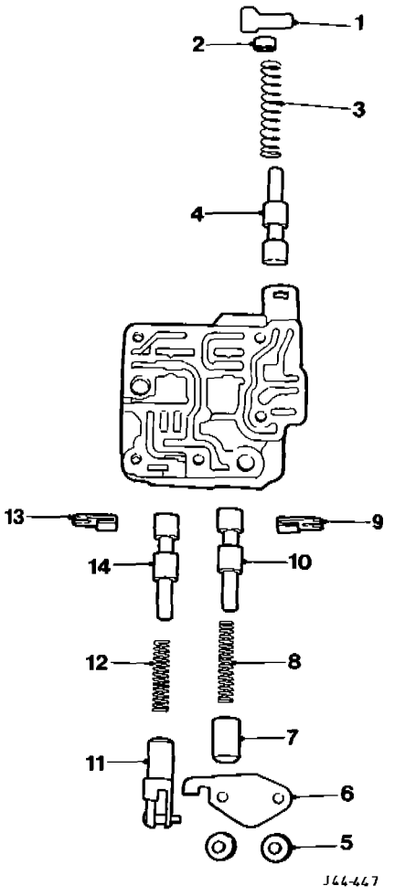


Fig 1

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REAR VALVE BLOCK OVERHAUL

Remove the screws securing the rear valve block to the main valve block.
Firmly hold the rear valve block to the main valve block and invert the assembly.
Very carefully split the main valve block assembly from the rear valve block ensuring that the restrictor washers remain in the rear valve block

Remove the one way valve (1 Fig 1) and spring (2 Fig 1) from the rear valve block (3 Fig 1).
Note the position of and size of the restrictor washers (4 Fig 1) relative to the valve block.
Remove the screws (1 Fig 2) securing the C & E clutch damper cover plate and remove the plate (2 Fig 2).
Remove the C' clutch damper springs (3 Fig 2) and damper (4 Fig 2), and the E clutch damper springs (5 Fig 2) and damper (6 Fig 2).
Note the position of and remove the retaining clip (7 Fig 2) securing the F damper valve (8 Fig 2).
Remove the F clutch valve and remove first gear inhibit valve spring (9 Fig 2) and valve (10 Fig 2).
Remove 3-4 shift valve spring (11 Fig 2) and valve (12 Fig 2).

Remove the screws securing the F clutch damper cover plate and remove the plate (1 Fig 3).
Remove the 2nd gear inhibit valve spring (2 Fig 3) and valve (3 Fig 3).
Remove the F clutch damper (4 Fig 3) and spring (5 Fig 3) and remove the spring seat washer (6 Fig 3).
Remove the F damper safety valve spring (7 Fig 3) and valve (8 Fig 3) and remove the remaining 3-4 shift valve (9 Fig 3).
Clean the rear valve block and **all** component valve springs and cover plates.
Lubricate **all** components prior **to** assembly and reverse the removal procedures to re assemble ensuring that the F clutch valve locates in the F clutch damper spring seat and that the flat face of the retaining clip faces away from the damper.

Ensure that when the restrictors are fitted to the valve block they are fitted to the positions they were removed from and are also the correct way up (F and E Fig 3).
Ensure that when the manual valve block is inverted, the restrictors and balls remain in the valve block by lightly coating with petroleum jelly (Vaseline).

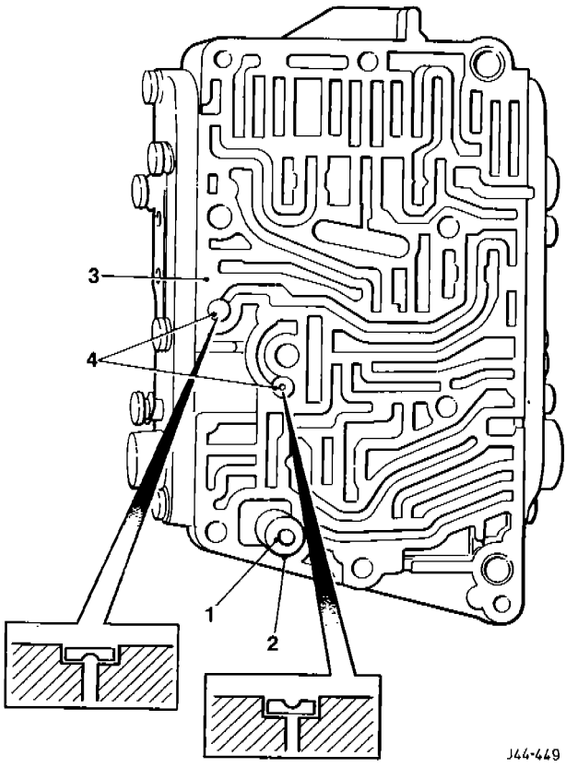


Fig 1

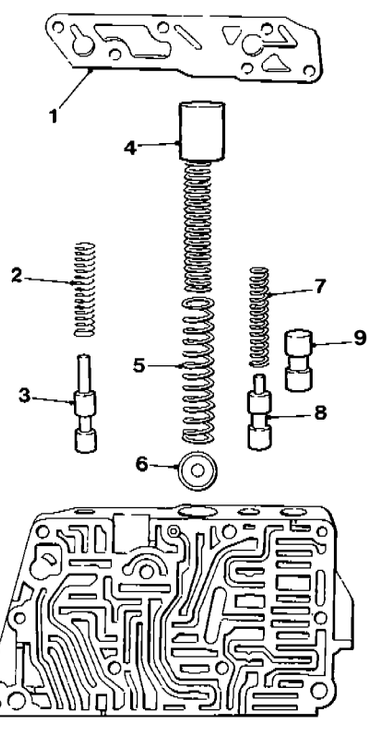


Fig 3

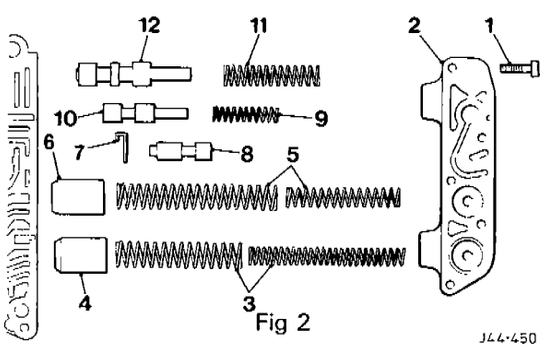


Fig 2

MANUAL VALVE BLOCK OVERHAUL

CAUTION: **Make a** note **of** the **hole** size, **way up and** position **the** restrictors **(1 Fig 1), prior to** removal.

Remove the restrictors and plastic ball.
Remove the manual control valve (2 Fig 1) and remove the screws securing the C and **D** clutch cover plate (Fig 2).
Remove the plate.
Remove the C' valve (2 Fig 2) and spring (3 Fig 2).
Remove the 2-3 shift valve piston (4 Fig 2).
Note the position of and remove the C damper valve retaining clip (5 Fig 2).
Remove the valve (6 Fig 2).
Remove the **B** clutch damper (7 Fig 2) springs (8 Fig 2) and spring seat (9 Fig 2).
Remove the B clutch check ball capsule (10 **Fig** 2).
Remove the 1-2 shift valve piston (11 Fig 2).
Remove the D clutch damper (12 Fig 2) spring (13 Fig 2) and washer (14 Fig 2).
Note the position *of* and remove the D clutch valve retaining clip (15 Fig 2).
Remove the D clutch valve (16 Fig 2) and collar (17 Fig 2).
Remove the primary regulator valve spring (18 Fig 2) and regulator valve (19 Fig 2).
Remove the screws securing the remaining cover plate.
Remove the plate and remove the torque converter pressure valve (1 Fig 3) and spring (2 Fig 3).
Move the 2-3 shift valve spring (3 Fig 3) and valve (4 Fig 3) and remove C clutch damper (5 Fig 3) spring (6 Fig 3) and spring seat (7 Fig 3).
Note the position of and remove the **B** clutch valve retaining clip (8 Fig 3).
Remove the valve (9 Fig 3).
Remove the 1-2 shift valve spring (10 Fig 3) and valve (11 Fig 3).
Carefully remove the **A** clutch valve spring retaining clip (12 Fig 3) and remove spring seat (13 Fig 3) and spring (14 Fig 3).
Remove the **A** clutch valve (15 Fig 3), clean the valve block end plate covers and all remaining components.
Lubricate all components prior to assembly and reverse the removal procedure to reassemble ensuring that the flat face of the clip that secures B clutch valve faces away from the cover plate.
Ensure that the flat side of the clip retaining the D clutch valve faces the damper/spring.
Ensure that the B clutch damper spring seat engages fully onto the valve.
Ensure that the clip securing the C clutch valve faces the cover plate.
Lubricate fit and align the manual control valve.
Fit and align the plastic ball and restrictors to the valve block.
Place the block aside.

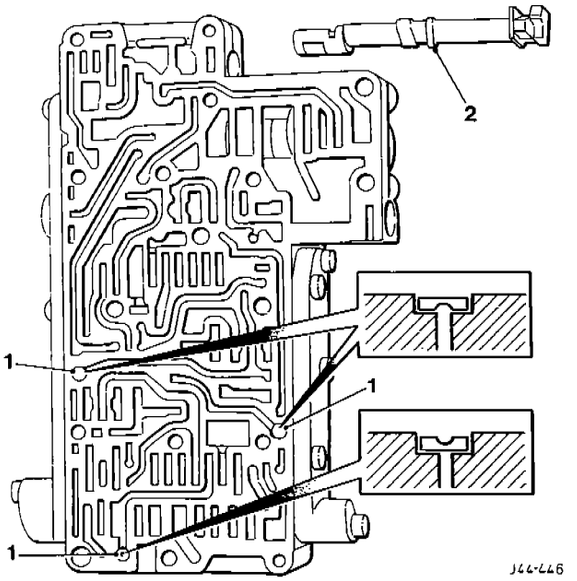


Fig 1

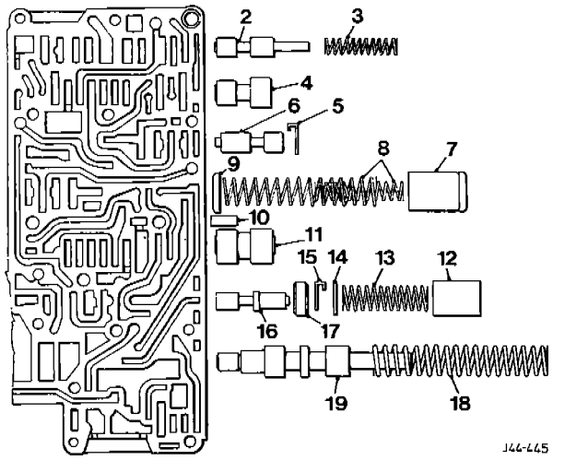


Fig 2

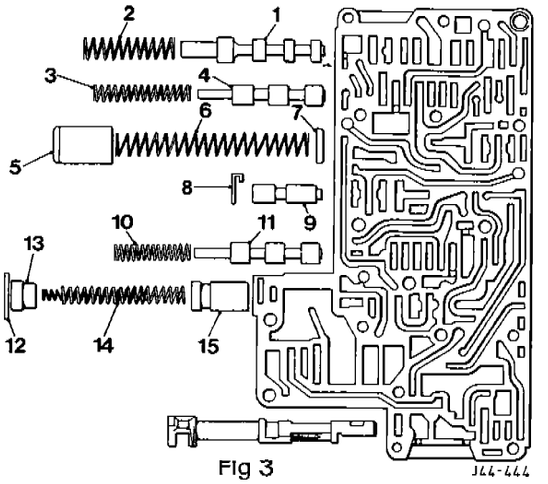


Fig 3

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MAIN GALLERY PLATE OVERHAUL

Remove the screws securing the main gallery cover plate.
Remove the plate and ensure that the restrictors and plastic balls remain in position in the plate (Fig 1).

Remove and discard the cover plate gasket, note the position of and diameter of the plastic balls.
Remove the balls, note the positon and hole size of restrictors and remove.
Clean the plate cover, balls and restrictors.
Reverse the removal procedure to reassemble.
Fit and align the gallery plate assembly to the manual valve block ensuring that the manual valve lug locates in the gallery plate channel.
Holding the manual valve firmly to the gallery plate invert it but do not tighten the valve block to gallery plates securing screw.
Fit and seat the valve block to gallery plate oil feed pipe.
Fit and align the throttle valve block to gallery plate but do not tighten the securing screws.
Fit and align the thermo valve block to the gallery plate.
Fit but do not tighten the securing screws.
Invert the main assembly and fit the rear valve block.
Fit and tighten rear valve block securing screws finally tighten the remaining securing screws.
Refit the valve block 44.40.01.

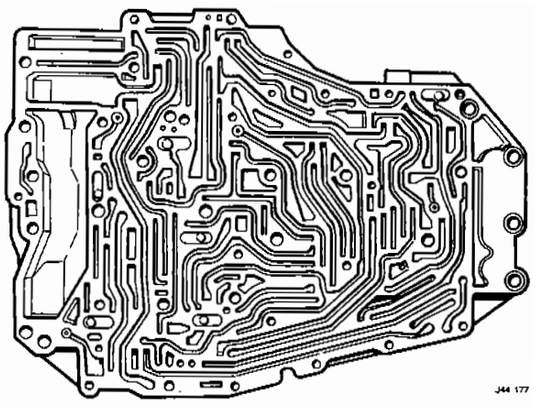


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut ***100Nm***
Down *pipe to intermediate* ***pipe 15-18Nm***
Drain ***plug 15Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Intermediate pipe to silencer ***15-18Nm***
Fluid pan mounting bolts ***6Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES No 5696.***
Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
13mm

10mm Allen ***key***

0055K

GOVERNOR ASSEMBLY

RENEW 44.22.01

Remove the rear extension housing 44.20.15.
Remove the parking pawl spring.
Remove the park lock wheel and bearing collar.
Remove the screws (1 Fig 1) securing the park lock wheel to the governor and remove the wheel (2 Fig 1).
Clean the output shaft and replace the three governor seals (1 Fig 2).
Fit the park lock wheel to the governor and tighten the screws and fit the assembly to the output shaft.
Fit the bearing collar to the output shaft.
Refit the parking pawl spring.
Refit the rear extension housing 44.20.15.

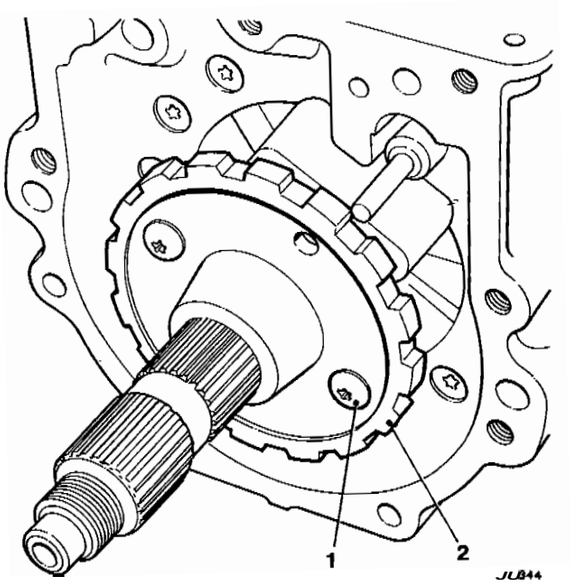


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket
JD 102 Rear extension oil seal replacer

TORQUE FIGURES

Down pipe to intermediate pipe **15-18Nm**
Drain plug **15Nm**
Governor bolts **10Nm**
Intermediate pipe to silencer **15-18Nm**
Output flange **100Nm**
Propeller shaft to gearbox 95-105Nm
Rear extension housing to main case **23Nm**

OILS/SEALANTS/LUBRICANTS

Exhaust sealer **TIVOLI KAY ADHESIVES**
Output shaft splines **HYLOMAR**
Transmission fluid **Dexron II**

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm

9/16AF

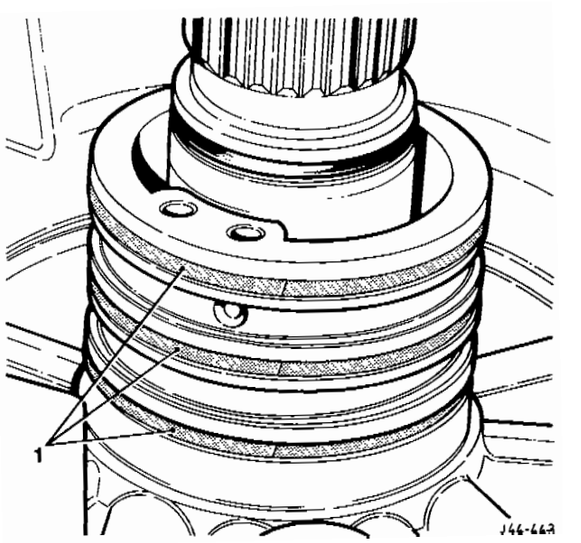


Fig 2

0055K

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GOVENOR ASSEMBLY

OVERHAUL 44.22.04

Remove the governor assembly 44.22.01.
Remove the screws (1 Fig 1) securing tho park gear (2 Fig 1) to the governor and remove the park gear.
Remove the screws securing the governor opposing valve.
Remove the plate and spacers.
Remove the valve housing.
Remove the valve spring and spring guide from the housing.
Undo and remove the valve to base securing screws (5 Fig 1). Remove the base.
Remove the valve weight securing circlip.
Remove the valve weight, body, sleeve and spring.
Clean all component parts.
Fit and align the opposing valve, spring and guide to the body (10 Fig 1).
Fit and align the opposing valve body assembly to the govenor.
Fit and align the spacers (9 Fig 1) and retaining plate (7 Fig 1), secure with the screws (8 Fig 1).
Fit the spring to the valve and fit the valve sleeve.
Fit the valve body and valve weight.
Compress the spring and fit the weight securing circlip.
Lubricate the valve assembly.
Fit and tighten the valve securing screws.
Refit the governor assembly 44.22.01.

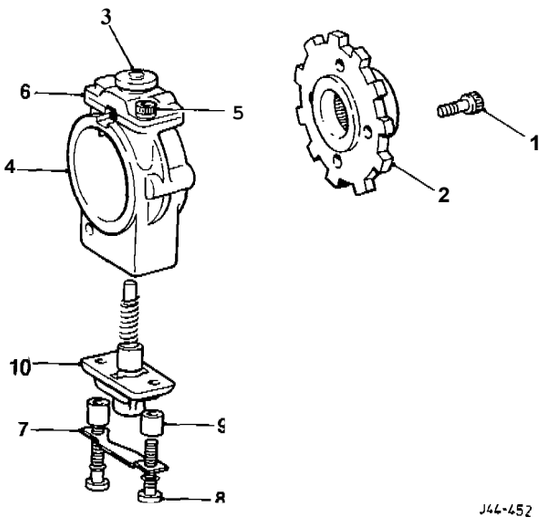


Fig 1

DATA

SERVICE TOOLS

MS 53B *Engine* ***support*** *bracket*
JD 124 *Engine lifting bracket*
JD 102 Rear extension oil seal replacer

TORQUE FIGURES

Down ***pipe*** *to intermediate pipe* ***15-18Nm***
Drain plug ***15Nm***
Governor bolts ***10Nm***
Intermediate pipe to silencer ***15-18Nm***
Output flange ***100Nm***
Propeller ***shaft*** *to gearbox* ***95-105Nm***
Rear extension housing to main case ***23Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES***
Output shaft splines ***HYLOMAR***
Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm
9/16AF

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PARK LOCK WHEEL

RENEW **44.28.24**

Remove the rear extention housing 44.20.19.
Remove the park **lock** wheel assembly.
Remove the screws (1 Fig 1) securing the park lock wheel to the governor and remove the **park** lock wheel (2 Fig 1).
Clean all component parts.
Fit the governor to the new wheel.
Replace the three governor seals (1 Fig 2).
Fit the park lock wheel to the transmission.
Refit the rear extention housing 44.20.1 9.

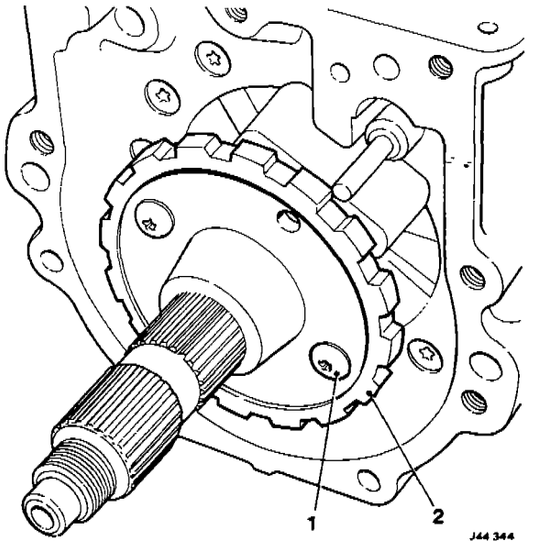


Fig 1

DATA

SERVICE TOOLS

MS 538 *Engine support bracket*
JD 124 *Engine lifting bracket*
JD 102 *Rear extension oil seal replacer*

TORQUE FIGURES

Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Intermediate pipe ***to*** *silencer* ***15-18Nm***
Output flange ***100Nm***
Propeller shaft to gearbox ***95-105Nm***
Rear extension housing to main case ***23Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES***
Output shaft splines ***HYLOMAR***
Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
10mm
13mm
17mm
30mm

9/16AF

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PARK LOCK PAWL ASSEMBLY

RENEW **44.28.07**

Remove the rear extention housing 44.20.19.
Remove the parking pawl guide plate and bracket (1 Fig 1), remove the parking pawl and spring (2 Fig 1).
Remove the pivot pin (3 Fig 1) and clean **all** the components.
Lubricate and fit the pivot pin and spring, locate the anchor leg.
Fit the pawl to the spring and locate the pawl anchor leg.
Reposition the pawl over the pivot pin and fit the guide plate and retaining bracket.
Fit the guide plate retaining screw.
Refit the rear extention housing 44.20.19.

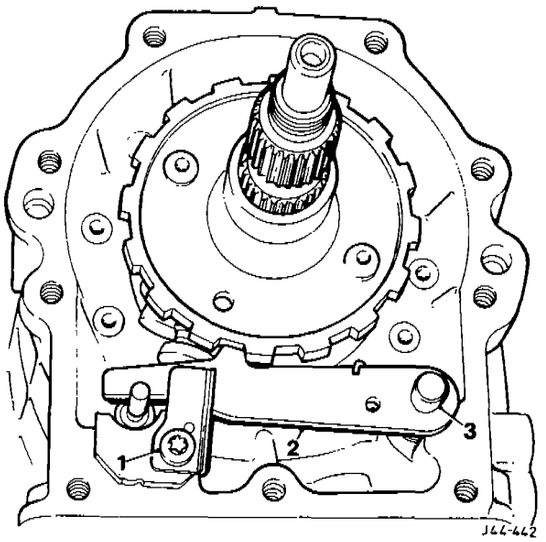


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
*JD **124** Engine lifting bracket*
*JD **702** Rear extension oil seal replacer*

TORQUE FIGURES

*Down pipe to intermediate pipe **75-18Nm***
*Drain plug **15Nm***
*Intermediate pipe **to** silencer **15-18Nm***
*Output flange **100Nm***
*Park pawl guide plate/bracket fixing bolt **10Nm***
*Propeller shaft to gearbox **95-105Nm***
*Rear extension housing to main case **23Nm***

OILS/SEALANTS/LUBRICANTS

*Exhaust sealer **TIVOLI** KAY ADHESIVES*
Output shaft splines HYLOMAR
*Transmission fluid Dexron **II***

SPANNER SIZES

8mm
1Omm
13mm
17mm
30mm

9/16AF

0194G

PARK LOCK ACTUATOR ROD

RENEW 44.28.01

Remove the valve **block** assembly 44.40.01.
Remove the selector lever/shaft securing nut (1 Fig 1) and disconnect the lever from the shaft.
Remove the roll pin (2 Fig 1) securing the selector quadrant to *the* selector shaft and disconnect the shaft.
Remove the throttle valve cam return spring (3 Fig 1) and remove the cam from the shaft.
Remove the quadrant actuation **rod** (4 Fig 1) from the quadrant.
Clean all components and mating surfaces.
Fit the actuator rod to the quadrant and selector shaft ensuring that the actuator rod passes under the parking pawl.
Fit the return spring to the throttle valve cam, lubricate the throttle valve cam bearing and selector shaft, tension the spring and locate over the gearbox anchor, position and push the selector shaft fully home.
Align the quadrant to the shaft **and** secure with the roll pin.
Refit the selector lever to the selector shaft and secure with **a** nut.
Refit the valve block assembly 44.40.01.

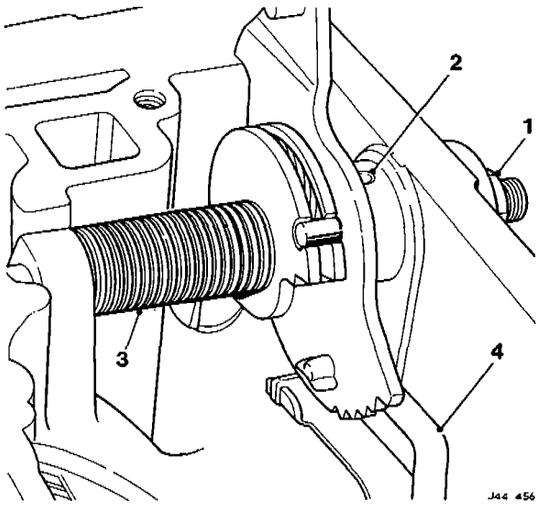


Fig 1

DATA

TORQUE FIGURES

Dipstick tube nut ***100Nm***
Down pipe to intermediate pipe ***15-18Nm***
Drain plug ***15Nm***
Exhaust tie nut/stud ***9.5-12.5Nm***
Intermediate pipe to silencer ***15-18Nm***
Parking pawl ***10Nm***
Sump mounting ***bolts 8Nm***
Valve block to case ***8Nm***

OILS/SEALANTS/LUBRICANTS

Exhaust sealer ***TIVOLI KAY ADHESIVES***
Transmission fluid ***Dexron II***

SPANNER SIZES

8mm
13mm

5mm Allen key

0055K

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KICKDOWN CABLE-INITIAL SETTING

CHECK AND ADJUST 44.00.00

Reset the kickdown cable. With the throttle in the idle position, take up any slack between the transmission cable and the throttle spindle.
Slacken the cable locknut (Fig 1). Adjust the ferrule on the cable to achieve a gap between the crimp and the end of the ferrule of 0.75mm +/- 0,5mm (Page 44-80 Fig 1). Tighten the locknut.
Open the throttle to 100%, ensuring that the pedal cam contacts the throttle stop, and measure the distance between the crimp and the end of the ferrule. This should be 44mm or greater (Page 44-80 Fig 1).
Check by depressing the pedal to the pedal stop and ensure that this condition is achieved.
Adjust the pedal stop as necessary (Page 44-80 Fig 2).

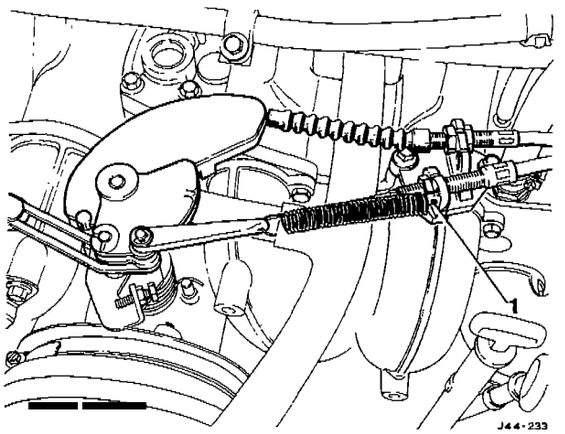


Fig 1

KICKDOWN CABLE

RENEW 44.15.25

Select position 'N'.
Disconnect the kickdown inner cable from the throttle linkage, slacken the locknut securing the outer cable from the mounting bracket and disconnect the cable (Fig 1).
Remove the fluid pan 44.24.04.
Feed the cable between engine and the bulkhead.
Pull the inner cable to rotate the cam/spring (3 Fig 2) sufficiently to disconnect the inner cable (1 Fig 2) using Service Tool JD 110 to depress the cable tangs, remove the cable.
Fit a new O ring (1 Fig 3) to the new cable, lubricate, fit and seat into position.
Rotate the cam, engage the cable nipple (2 Fig 2) into the slot in the cam and release the cam.
Refit the fluid pan 44.24.04.
Position the cable between bulkhead and cylinder head, fit the outer cable into the bracket. Fit the inner, leave the locknut loose.
Manually open the throttle linkage to full throttle position (NOT KICKDOWN) and measure the distance from the outer cable to the crimp.
Adjust the outer cable locknuts until a distance from the crimp to the outer cable is 39mm.
Tighten the cable locknut, close the throttle.
Replenish the transmission with fluid 44.24.02.

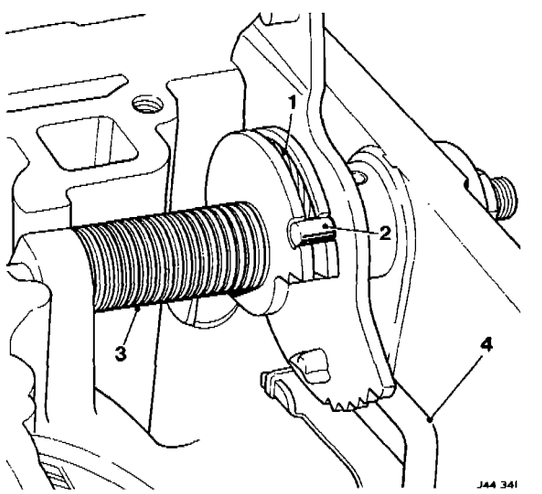


Fig 2

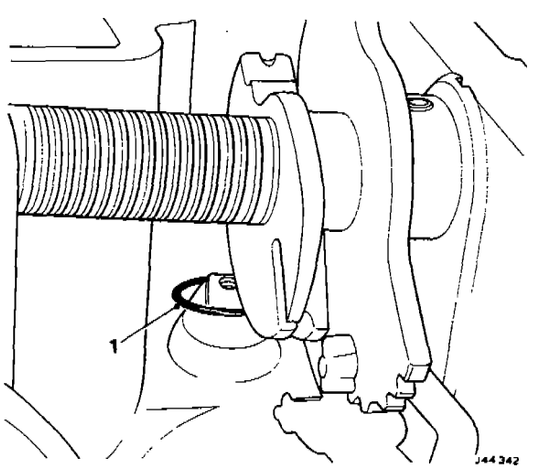


Fig 3

DATA

TORQUE FIGURES

*Drain **plug 15Nm***
*Fluid **pan** mounting bolts **6Nm***

OILS/SEALANTS/LUBRICANTS

*Transmission fluid **Dexron II***

SPANNER SIZES

8mm
13mm
*5mm **Allen key***

0055K

SELECTOR CABLE ASSEMBLY

RENEW **44.15.08**

WARNING: **DO NOT DRIVE OR ATTEMPT TO DRIVE THE VEHICLE WITH THE MANUAL SELECTION LINKAGE DISCONNECTED OR THE 'J' GATE COVER DISCONNECTED.**

Raise the vehicle on a ramp.
Remove the nut (1 Fig 1) securing the cable to the gearbox selector lever.
Remove the bolt securing the cable clamp (2 Fig 1) to the gearbox mounting bracket.
From above, remove the console finisher 76.25.19 (1 Fig 2) and remove the screws securing the gearbox linear switch.
Move switch for access and remove the nuts securing the selector cable to the slector assembly.
Remove the locknut securing the cable to the bracket (3 Fig 1).
Displace the cable from the bracket and disconnect the inner cable from the selector lever assembly.
Remove the centre console glove box for access.
Reposition the selector cable into the glove box area and remove the locknuts from cable.
Remove the bracket from the cable.
Remove the front seat cushions 76.70.02
Displace the carpet for access to the cable grommet.
Repostion the cable grommet through the body to the underside and remove the cable assembly.
Remove the cable end lock nut and remove the cable to gearbox connector end assembly.
Remove the cable clamp and remove the cable grommet.

Discard the cable assembly.
Reverse the removal procedure to refit the selector cable to the vehicle.

Note: To enable the cable to be fitted from the front of the vehicle over the **rear** mounting cross member and enter into the body aperture a draw string should be tied to the end of the cable.

Reset and adjust the gearbox liner switch 44.15.13.
Refit the console finisher.

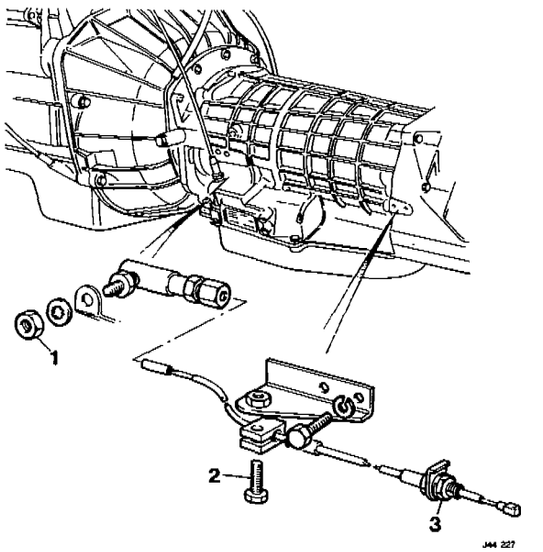


Fig 1

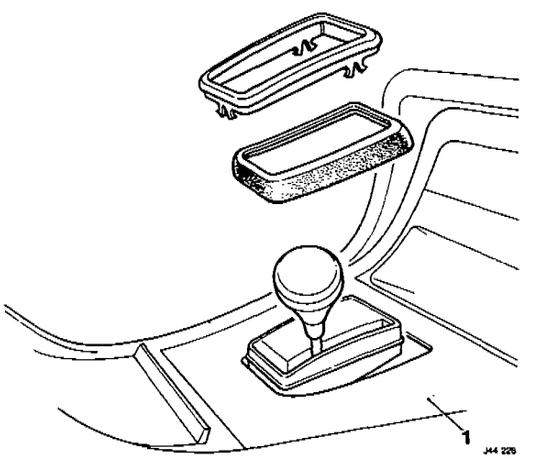


Fig **2**

DATA

TORQUE FIGURES

Cable bracket lower to transmission unit ***7-10Nm***
Cable block to cable abutment bracket ***14-18Nm***
Control cable to gearbox lever ***8-12Nm***
Gear control cable to adjustable ball end ***40-50Nm***

SPANNER SIZES

10mm
11mm
13mm
20mm

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SELECTOR CABLE ASSEMBLY

CHECK AND ADJUST 44.15.07

WARNING: DO NOT DRIVE OR ATTEMPT TO DRIVE THE VEHICLE WITH THE MANUAL SELECTION LINKAGE DISCONNECTED OR THE 'J' GATE COVER DISCONNECTED.

Check the following prior to carrying out adjustment:

1 The engine starts only when the gear selector is in **'P'** or 'N' positions.
2 The reversing lights illuminate only when position **'R'** is selected.
3 The instrument pack gear indicator corresponds with the gear selector indicator.
4 The transmission park lock mechanism is engaged when the gear selector is in the 'P' position,
5 The gear selector aligns centrally with position 'R' and 'N' detents in **the** gear selector module gate.
6 The gear selector shifts smoothly across the J-gate in position 'D'.

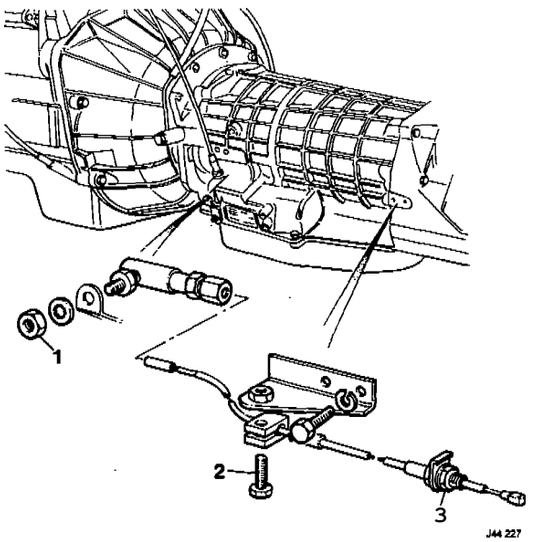


Fig 1

ADJUSTMENT:
Ensure that the gear selector lever is in position 'N'.
Raise the vehicle on a ramp.
Remove the nut securing the selector cable to the gearbox selector lever (1 Fig 1).
Disconnect the cable **from** the lever.
Ensure that the selector lever is fully home in position P.
Slacken the cable connector end locknut (3 Fig 1) and position the cable connector end to the gearbox selector lever.
Fit and tighten the cable to lever securing lock nut.
Tighten the connector end locknut.
Lower the vehicle.

DATA

TORQUE FIGURES

Cable bracket lower to transmission unit 7-10Nm
Control cable to gearbox lever 8-12Nm
Gear control cable to adjustable ball end 40-50Nm

SPANNER SIZES

8mm
17mm
13mm
20mm

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LINEAR SWITCH

RENEW **44.15.12**

Disconnect the battery earth lead.
Remove the console finisher 76.25.19.
Remove the linear switch securing screws (1 Fig 1).
Displace the switch (2 Fig 1) **for** access and disconnect the harness **block** connectors.
Remove the switch assembly.

Select position 'N' Neutral.
Fit the new switch to position.
Fit but do not tighten the screws.
Position Service Tool JD 127 setting gauge between the linear switch and side plate (Fig 1).
Ensure that the slot of the gauge **is** fully located **on** to the pin of the linear switch.
Tighten the screws, remove the gauge.
Check that the vehicle will only start in PARK or NEUTRAL.
Re-adjust as required.
Check that the instrument pack gear indicator corresponds with the gear selector indicator.

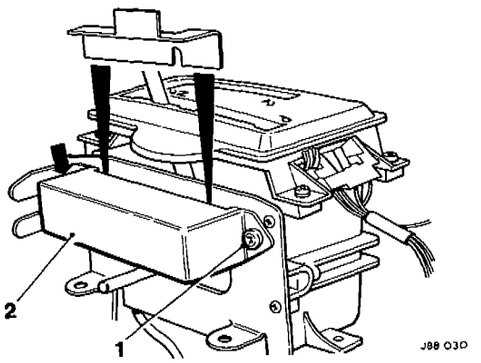


Fig 1

DATA

SERVICE TOOLS

JD 127 Linear switch setting gauge

TORQUE FIGURES

Switch to mounting plate screws 2-3Nm

SPANNER SIZES

No 4 Pozi

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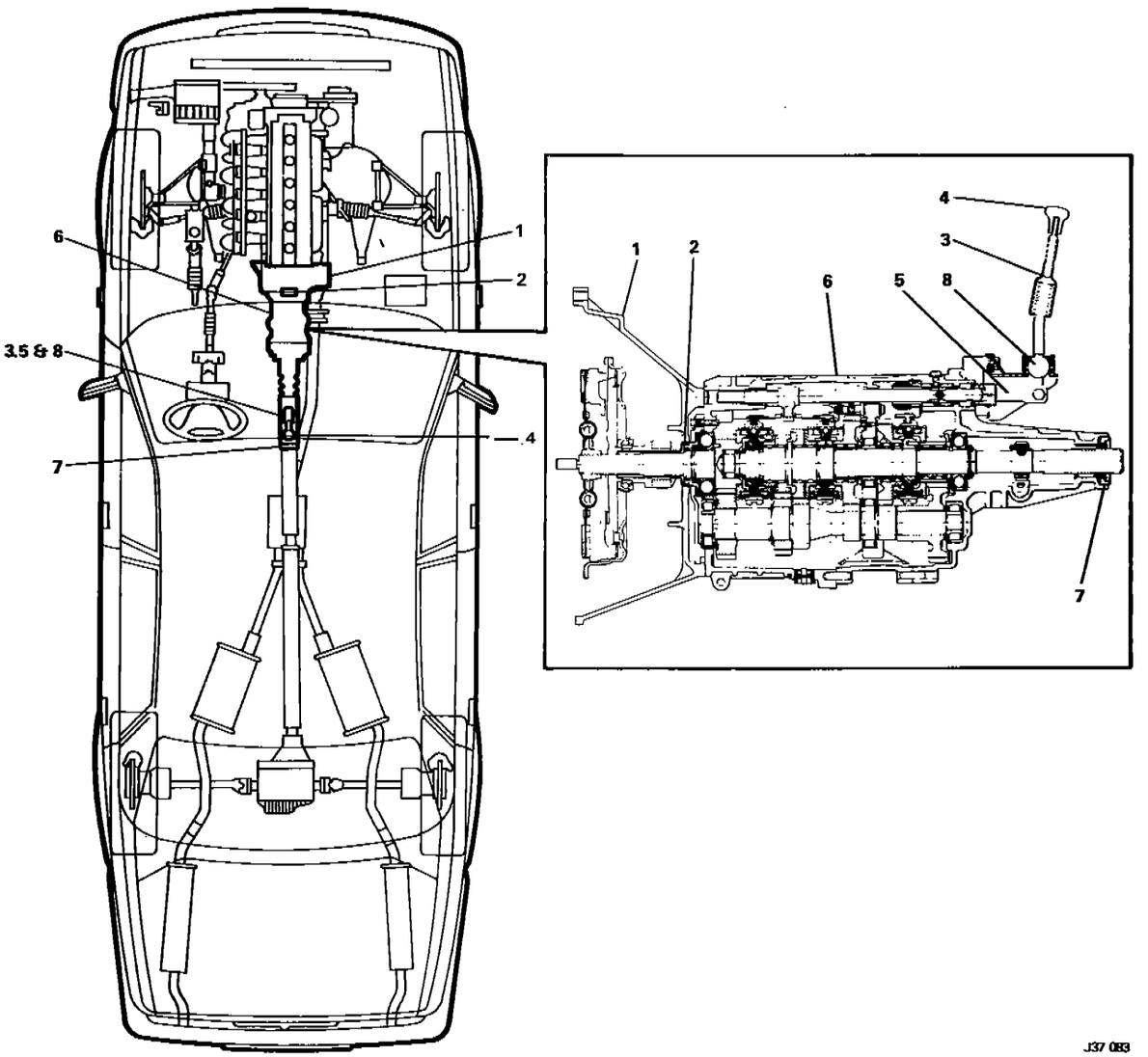
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ILLUSTRATED INDEX – KEY

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GEARBOX

DESCRIPTION 37.00.00

The Getrag 265 gearbox fitted to 2.9 litre engined cars is a 5-speed unit, incorporating synchromesh on all forward gears. Gear selection is by a centrally mounted lever, connected to the transmssion selector shaft via a pivoting joint.

All the gears are engaged by a single selector shaft operating three rods which move the selector forks.

The drive pinion is supported at the rear by a duplex ball bearing situated in the rear casing. At the front, a spigot on the first motion shaft engages in a needle roller bearing in the flywheel.

The mainshaft is supported at the front by a caged roller bearing situated in the drive pinion counterbore, in the centre by a roller bearing supported by the intermediate casing, and at the rear by a duplex bearing in the rear casing.

Each of the forward speed mainshaft gears incorporates an integral synchromesh mechanism, the clutch hubs being splined to the mainshaft and situated between each pair of gears.

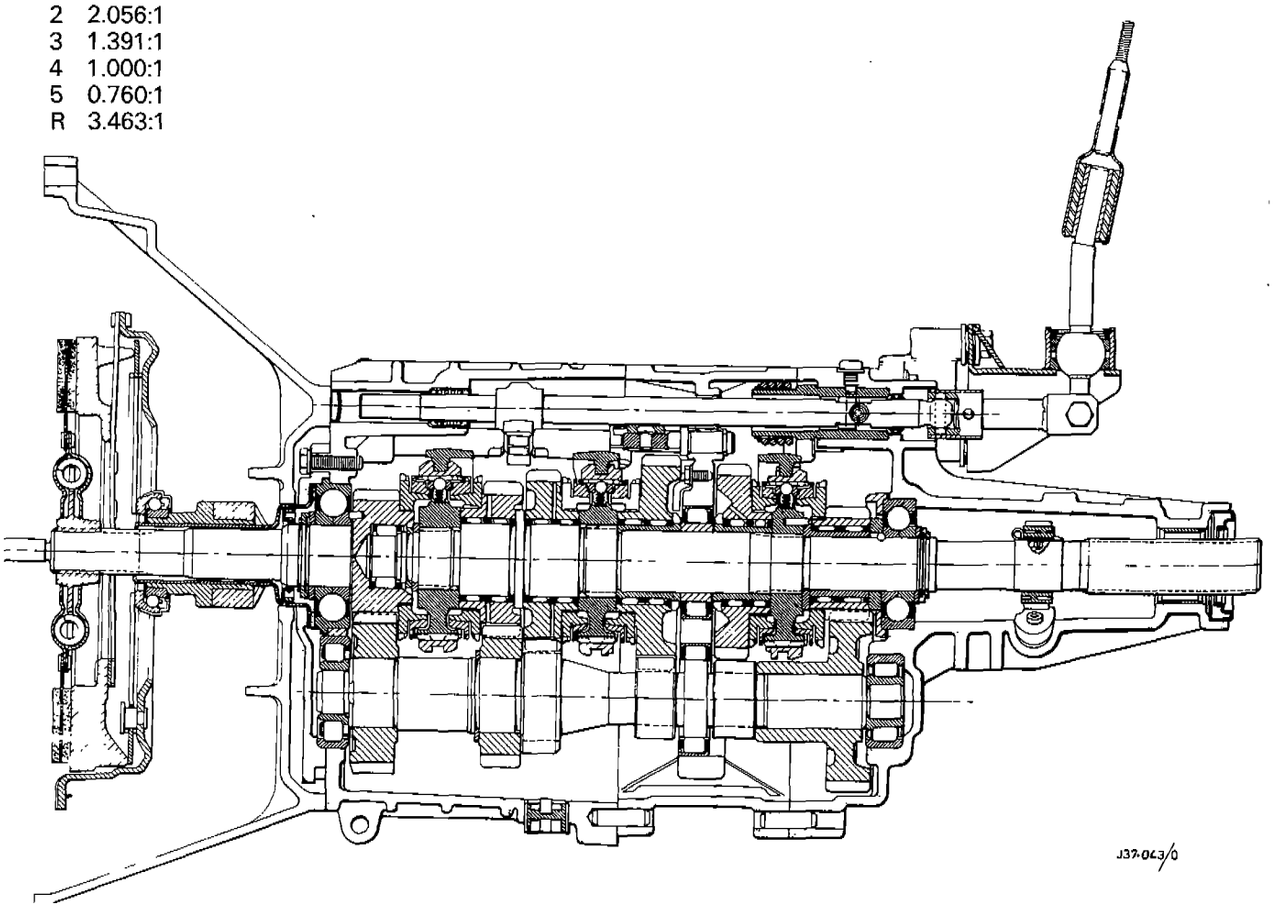
The countershaft is supported at the front by a roller bearing situated in the front casing, in the centre by a roller bearing in the intermediate casing, and at the rear by a roller bearing situated in the rear casing.

The reverse idler gear is supported by two caged roller bearings, is in constant mesh, and is situated on a stationary shaft.

Longitudinal location of the idler gear is controlled by a spacer abutting on the shaft

Ratios

1 3.573:1
2 2.056:1
3 1.391:1
4 1.000:1
5 0.760:1
R 3.463:1



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GEARBOX ASSEMBLY

RENEW **37.20.01**

Remove the rear inlet manifold securing nuts and pull the earth leads clear of the studs.
Fit lifting eye JD 124 to the rear inlet manifold studs.
Fit Service Tool MS 536 (Fig 1) and take the weight of the engine with the hook.
Remove the fan cowl securing clips (1 Fig 2) and lift out the cowl.
Remove the gear lever knob.

Remove the split pin and clevis pin (1 Fig 3) securing the handbrake cable adjuster (2 Fig 3) to the compensator (3 Fig 3).
Reposition the left hand rear cable and yoke assembly to one side.
Remove the nuts (1 Fig 1 page 4) securing the propeller shaft flange (2 Fig 1 page 4) to the differential drive flange.
Remove the centre bearing mounting plate to body securing bolts (1 Fig 2 page 4).
Carefully remove the centre mounting plate from above the exhaust.
Remove the propeller shaft from the differential flange and slide rearwards to remove from the vehicle.
Fit a suitable plug to the gearbox spline.

Remove the exhaust down pipe support bracket and the down pipe/intermediate pipe clamp.
Remove the olive and secure the exhaust aside.
Remove the slave cylinder nuts (1 Fig 3 page 6) from the bell housing and remove the push rod.
Disconnect the gearbox switch connectors.
Using a jack/support channel, take the weight of the gearbox and remove the bolts securing the rear mounting to the body. Lower the jack and remove the rear mounting assembly.
Using MS 53B, lower the gearbox and engine assembly.
Disconnect the gear selector shaft universal joint securing nut/bolt, remove the wavy washer and remove bolts securing the remote control.
Remove the mounting rubbers and washers.
Remove the gearbox switch for access to the upper right hand gearbox/bell housing securing bolt.
Remove the remaining gearbox/bell housing securing bolts and remove the gearbox assembly.

Transfer selector shaft, the drive flange and the remote control bridge pieces and the switches to the replacement gearbox.
Fit the gearbox, fit and tighten the bolts.
Refit the upper switch.
Fit the mounting rubbers and washers, reconnect the selector shaft.
Raise the engine by tightening the hook nut on tool MS 53B and refit the rear mounting.
Refit the slave cylinder.
Reconnect the exhaust system.
Grease the propeller shaft splines. Fit the propeller shaft into position.
Fit the centre mounting plate, fit and tighten the securing bolts.

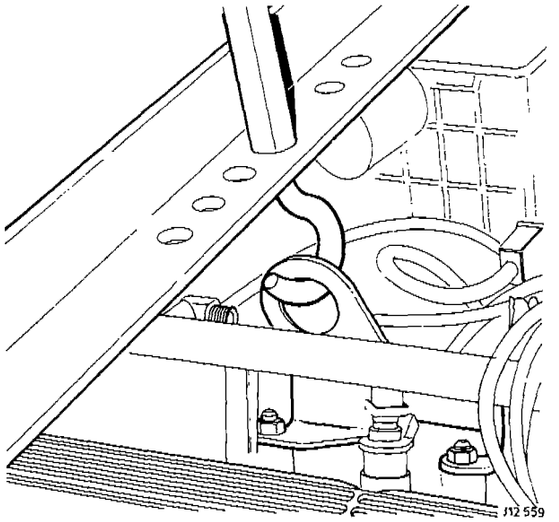


Fig 1

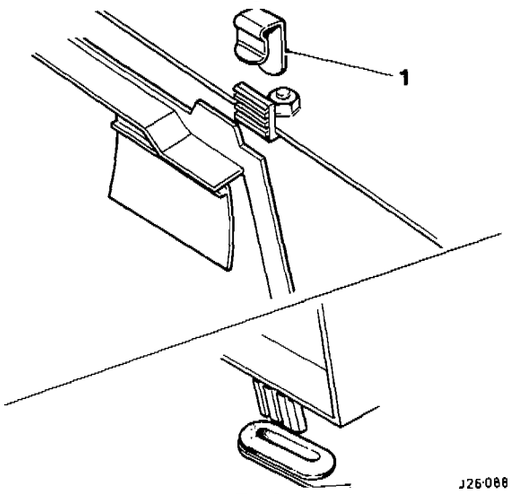


Fig 2

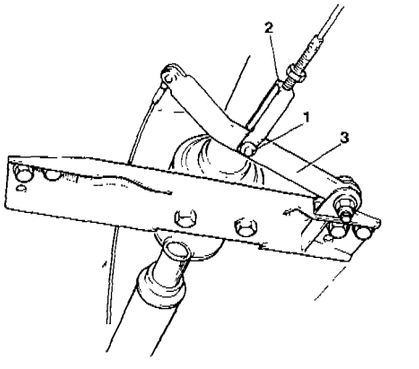


Fig 3

Fit and tighten the flange securing bolts.
Check the alignment **of** the propeller shaft by standing at the rear of the vehicle and 'eyeing' the centre bearing. The bearing should be positioned just to the left of centre. To adjust, slacken off the bearing to mounting plate securing bolts, reposition the bearing, and tighten the bolts.

Reconnect the handbrake **cable** adjuster, fit the clevis pin and split pin.
NOTE: Always renew split pins, do not re-use old ones.
Lower the **ramp.** Release and remove tool **MS** 53B.
Refit the fan cowl, fit the securing clips.
Remove the engine lifting eye.
Check/fill the gearbox with the recommended grade *of* oil to the lower threads of the filler plug aperture.

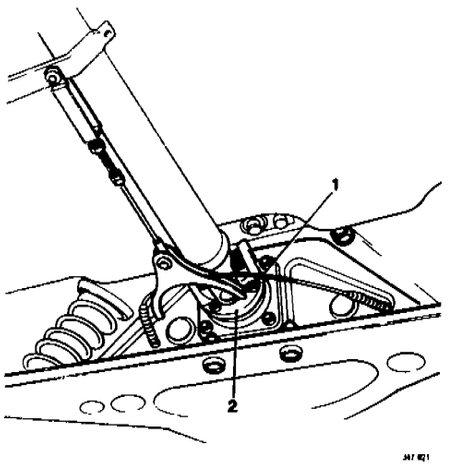


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket

TORQUE FIGURES

Bell housing ***to adaptor plate 49-54Nm***
Centre bearing to body 22-28Nm
Centre bearing to mounting plate 22-24Nm
Manifold *to* ***cylinder*** *head* ***23-27Nm***
Propeller *shaft* ***flange bolts 37-43.5Nm***
Remote control to gearbox 23-27Nm
Slave cylinder ***to bell housing 23-27Nm***

SPANNER SIZES

13mm
15mm
19mm

9/16AF
3/4AF

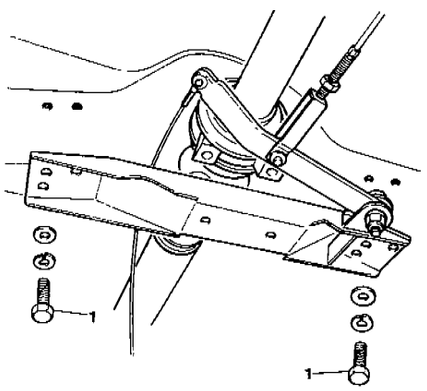


Fig 2

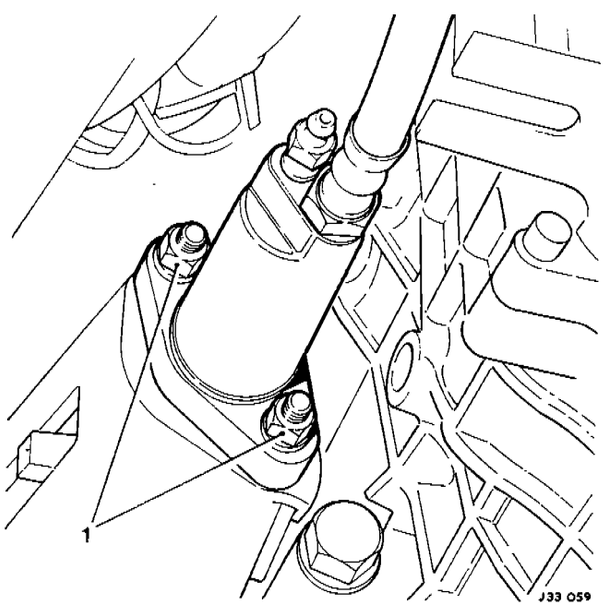


Fig 3

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BELL HOUSING

RENEW 37.12.07

Remove the gearbox 37.20.01.
Reposition the clutch slave cylinder (1 Fig **1**) from the bell housing.
Remove the gearbox insulation pad.
Remove the bell housing to adaptor plate securing bolts (2 Fig 1) and nuts, reposition the earth leads and remove the bell housing (3 Fig 1).
Transfer the release arm pivot securing circlip/arm assembly, the release arm pivot and the slave cylinder securing studs to the new housing.
Fit the housing to the adaptor plate, fit and torque tighten the securing bolts/nuts.
Fit the insulation pad in position, secure with string.
Refit the gearbox 27.20.01.
Remove the string securing the insulation pad.

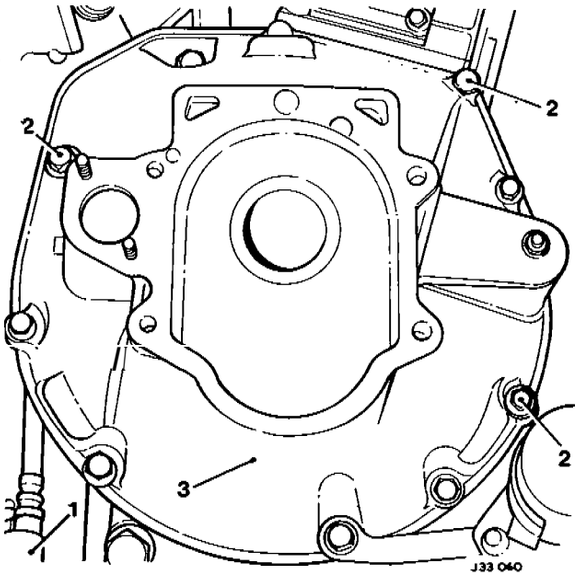


Fig 1

DATA

SERVICE TOOLS

MS 53B *Engine support bracket*
JD *124 Engine lifting bracket*

TORQUE FIGURES

Bell housing to gearbox ***70-80Nm***
Bell housing to adaptor plate ***49-54Nm***
Manifold to cylinder head ***23-27Nm***
Propeller shaft to axle ***95-105Nm***
Slave cylinder to bell housing ***23-27Nm***

SPANNER SIZES

10mm
13mm
15mm
19mm

9/16AF
3/4AF

0190G

FRONT OIL SEAL

RENEW 37.23.06

Remove the gearbox 37.20.01.
Drain the oil from the gearbox.
Remove the seven bolts (1 Fig 1) securing the thrust plate (2 Fig 1) to gearbox and remove the plate.
Prise the seal (3 Fig 1) from the housing.
Clean the thrust plate and remove the spiral spring from the seal prior to installing the seal in the housing.
Press the seal into the plate and refit the spiral spring to the seal.
Coat the lip of the seal with grease, and the transmission case cover with roller bearing grease, and fit the plate to the gearbox ensuring that any shims removed are replaced.
Coat all the bolts with Loctite 573.
Fit the four lower bolts first followed by the top three.
Refit the gearbox 37.20.01.

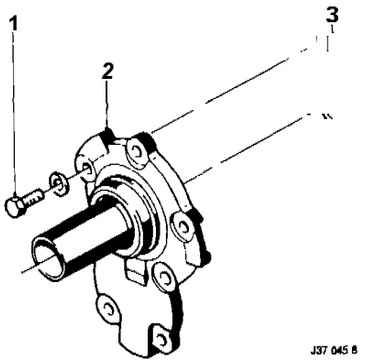


Fig 1

DATA

SERVICE TOOLS

MS 53B *Engine* ***support*** *bracket*
JD *124 Engine lifting bracket*

TORQUE FIGURES

Bell housing ***to*** *gearbox* ***70-80Nm***
Front cover to gearbox lower bolts (4) ***16-20Nm***
Front cover to gearbox upper bolts (3) ***23-27Nm***
Manifold to cylinder head ***23-27Nm***
Propeller shaft ***to axle 95-105Nm***

SPANNER SIZES

10mm
13mm
19mm

9/16AF
3/4AF

OILS/SEALANTS/LUBRICANTS

Thrustplate bolts ***'Loctite573'***
Gearbox oil ***'Castol Hypoy Light' EP 80W*** *or to specification* ***API GL4***

0190G

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REAR OIL SEAL

RENEW 37.23.01

Raise the vehicle on a ramp.
Remove the split pin and clevis pin (1 Fig 1) securing the handbrake cable adjuster (2 Fig 1) to the compensator (3 Fig 1).
Reposition the left hand rear cable and yoke assembly to one side.
Remove the nuts (1 Fig 2) securing the propeller shaft flange (2 Fig 2) to the differential drive flange.
Remove the centre bearing mounting plate to body securing bolts (1 Fig 3).
Carefully remove the centre mounting plate from above the exhaust.
Remove the propeller shaft from the differential flange and slide rearwards to remove from the vehicle.
Fit a suitable plug to the gearbox spline.

Remove the rear oil seal (1 Fig 4).
Clean the seal mounting face. Fit the replacement seal into position, apply sealant to the outer edge of the seal and fit the seal to the gearbox.

Grease the propeller shaft splines. Fit the propeller shaft into position.
Fit the centre mounting plate, fit and tighten the securing bolts.
Fit and tighten the flange securing bolts.
Check the alignment of the propeller shaft by standing at the rear of the vehicle and 'eyeing' the centre bearing. The bearing should be positidned just to the left of centre. To adjust, slacken off the bearing to mounting plate securing bolts, reposition the bearing, and tighten the bolts.

Reconnect the handbrake cable adjuster, fit the clevis pin and split pin.
NOTE: Always renew split pins, do not re-use old ones.
Lower the ramp.

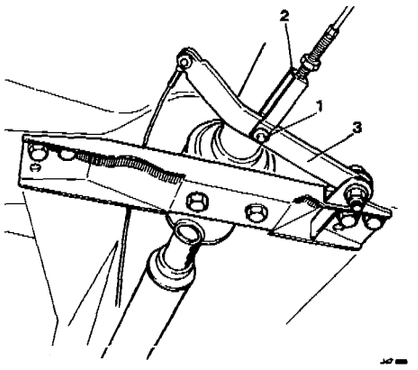


Fig 1

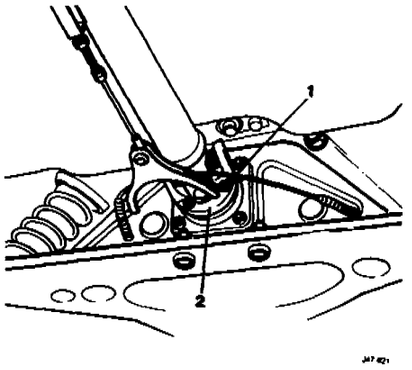


Fig 2

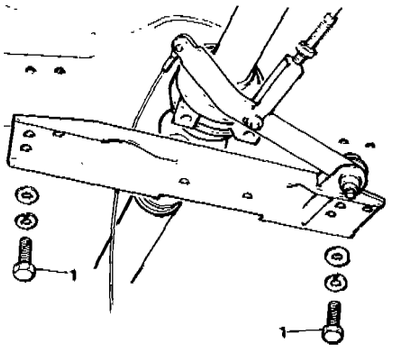


Fig 3

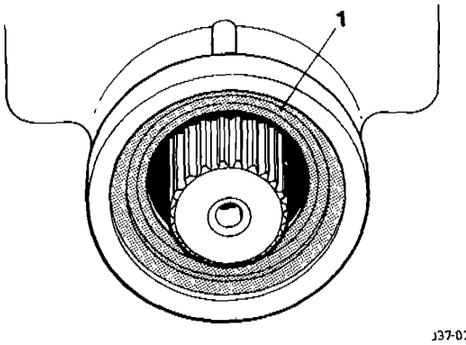


Fig 4

DATA

TORQUE FIGURES

Centre bearing to body 22-28Nm
Centre bearing to mounting plate 22-24Nm
Propeller shaft flange bolts 37-43.5Nm

SPANNER SIZES

13mm
9/16AF
3/4AF

OILS/SEALANTS/LUBRICANTS

Gearbox oil 'Castol Hypoy Light' EP 80W or to specification API GL4

0190G

GEAR LEVER KNOB

RENEW **37.16.11**

Displace the gear lever gaiter for access and slacken *off* the gear lever knob lock nut (1 Fig 1), remove the gear lever knob (2 Fig 1).
Fit the replacement knob, tighten the lock nut.
Reposition the gaiter.

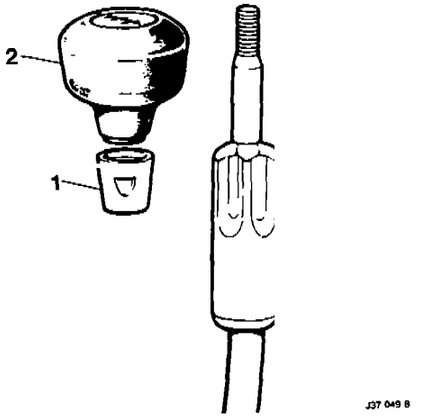


Fig 1

DATA

SPANNER SIZES

16mm

0190G

GEAR LEVER

RENEW ***37.16.04***

Remove the remote control assembly 37.16.20. Remove the remote control assembly (1 Fig 2) lever securing circlip (2 Fig 2), collar (3 Fig 2), spring (4 Fig 2) and the lever (5 Fig 2).
Remove the spacer from the lever, remove the upper nylon cup (6 Fig 2) and the lower nylon spacer (7 Fig 2).
Clean the gear lever and all other component parts, check for wear and distortion and replace as necessary.
Fit the nylon cup to the mounting and grease the new gear lever ball, fit the lower spacer, spring and collar, compress the spring and secure with the snap ring.
Refit the remote control assembly 37.16.20.

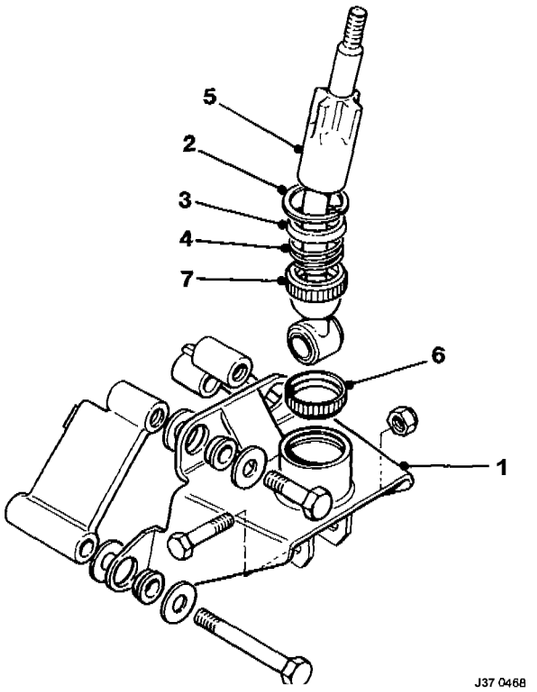


Fig 2

DATA

TORQUE FIGURES

Gear lever housing to pedestal 23 to 27Nm
Gear ***lever pivot bolt - Nut 23 to 27Nm***
Pedestal to gearbox 23 to 27Nm

SPANNER SIZES

13mm
1/2AF

0197G

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GEAR SELECTOR SHAFT

RENEW **37.16.40**

Remove the remote control assembly 37.16.20.
Slide the selector shaft universal joint cover back (1 Fig 1), remove the selector shaft retaining pin (2 Fig 1) and collect the shaft (3 Fig 1).
Remove the pin securing the universal joint and remove the joint.
Clean all components, examine for wear or damage and replace as necessary.
Lubricate all new or components to be re-used with clean gearbox oil, and fit the universal joint to the rear selector shaft, secure with the retaining pin, assemble to the gearbox and secure with the retaining pin.
Reposition the retaining cover.
Refit the remote control assembly 37.16.20.

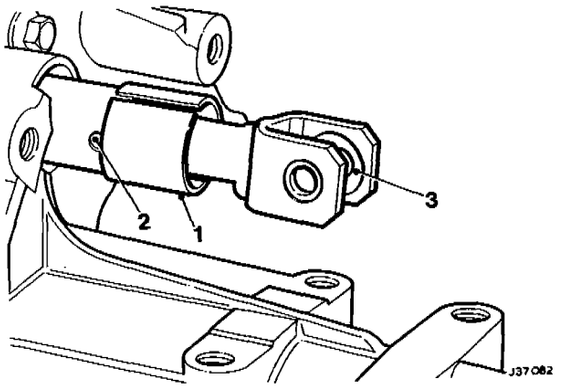


Fig 1

DATA

TORQUE FIGURES

Gear lever housing to pedestal 23 to 27Nm
Gear lever pivot bolt-Nut 23 to 27Nm
Pedestal to gearbox 23 to 27Nm

SPANNER SIZES

13mm

1/2AF

0190G

GEAR CHANGE REMOTE CONTROL ASSEMBLY

OVERHAUL **37.16.20**

Remove the rear inlet manifold securing nuts and pull the earth leads clear of the studs.
Fit lifting eye JD 124 to the rear inlet manifold studs.
Fit Service Tool MS 53B (Fig 2) and take the weight of the engine with the hook.
Remove the fan cowl securing clips (1 Fig 3) and lift out the cowl.
Remove the gear lever knob.

Remove the split pin and clevis pin (1 Fig 1 page 12) securing the handbrake cable adjuster (2 Fig 1 page 12) to the compensator (3 Fig 1 page 12).
Reposition the left hand rear cable and yoke assembly to one side.
Remove the nuts (1 Fig 2 page 12) securing the propeller shaft flange (2 Fig 2 page 12) to the differential drive flange.
Remove the centre bearing mounting plate to body securing bolts (1 Fig 2 page 12).
Carefully remove the centre mounting plate from above the exhaust.

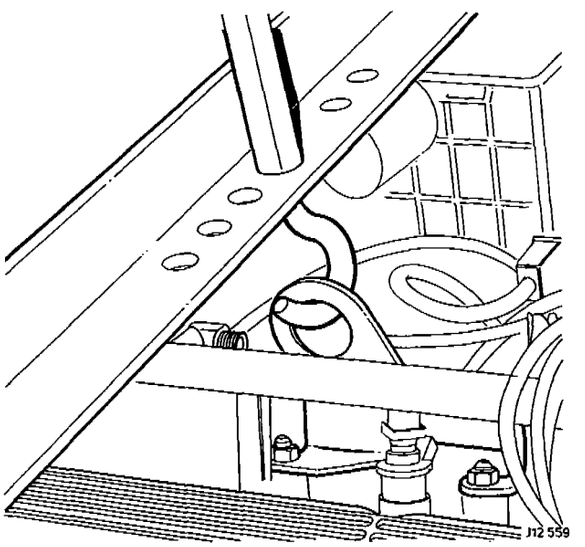


Fig 2

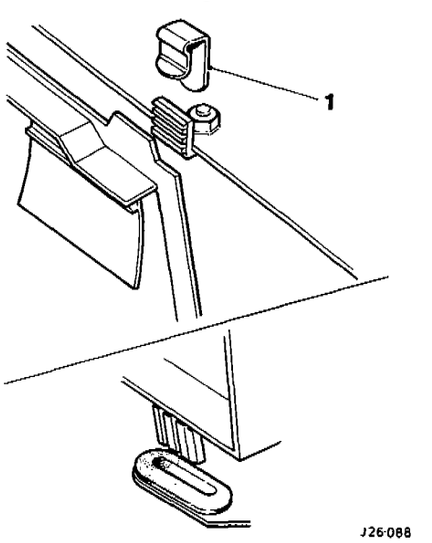


Fig 3

Remove the propeller shaft from the differential flange and slide rearwards to remove from the vehicle.
Fit a suitable plug to the gearbox spline.

Remove the exhaust down pipe support bracket and the down pipe/intermediate pipe clamp.
Remove the olive and secure the exhaust aside.
Using a jack/support channel, take the weight of the gearbox and remove the bolts securing the rear mounting to the body.
Lower the jack and remove the rear mounting assembly.
Using MS **53B,** lower the gearbox and engine assembly.
Slacken the gear lever to rear shaft securing nut/bolt **(1** Fig **3).**
Remove the control mounting securing bolts (2 Fig **3)** and remove the gear lever bolt.

Pull the gear change lever (1 Fig **1** page **13)** from the selector shaft (2 Fig 1 page **13)** and remove the remote control/gear lever assembly.
Remove the mounting rubbers and washers.
Remove the circlip (4 Fig **1** page **13)** and remove the gear lever assembly.
Remove the collar (5 Fig **1** page **13)** and spring **(6** Fig **1** page **13)** from the lever, remove the gear lever lower nylon cup from the control.

Clean all the component parts and inspect for wear or damage and replace as necessary.
Fit the lower nylon cup, grease the gear lever ball, fit the spring and collar to the lever.
Compressing the spring with the gear lever assembly, secure the snap ring.
Lubricate the gear lever and lower spacer and position the assembly into the mounting.
Ensure the lever is in the gaiter (3 Fig 1 page **13)** and position the lever into the yoke, ensure the lever is fitted correctly.
Fit but do not tighten the gear lever securing nut and bolt.
Fit the lower LH mounting rubber and washer. Align the mounting bracket and fit the remaining spacer and rubber. Fit but do not tighten the mounting securing bolt.
Repeat for the remaining rubbers and finally tighten the securing bolts.
Finally tighten the gear lever securing nut and bolt.

Tighten **MS** 53B hook nut to raise the gearbox into position.
Fit the gearbox mounting to the body.
Reconnect the exhaust system.
Grease the propeller shaft splines. Fit the propeller shaft into position.
Fit the centre mounting plate, fit and tighten the securing bolts.
Fit and tighten the flange securing bolts.
Check the alignment of the propeller shaft by standing at the rear of the vehicle and 'eyeing' the centre bearing. The bearing should be Positioned iust to the left of centre. To adjust, slacken off the bearing to mounting plate securing bolts, reposition the bearing, and tighten the bolts.

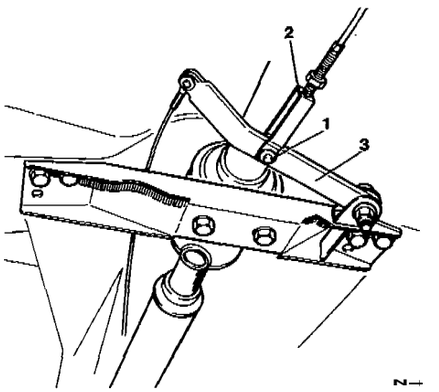


Fig 1

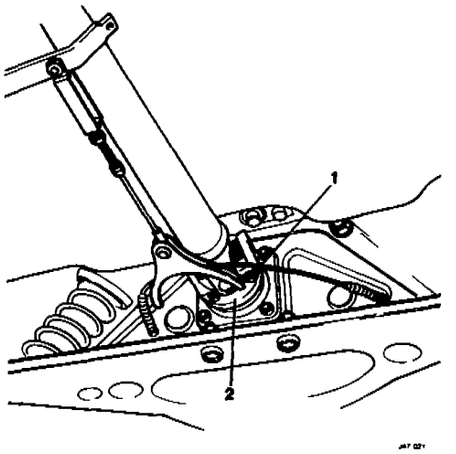


Fig 2

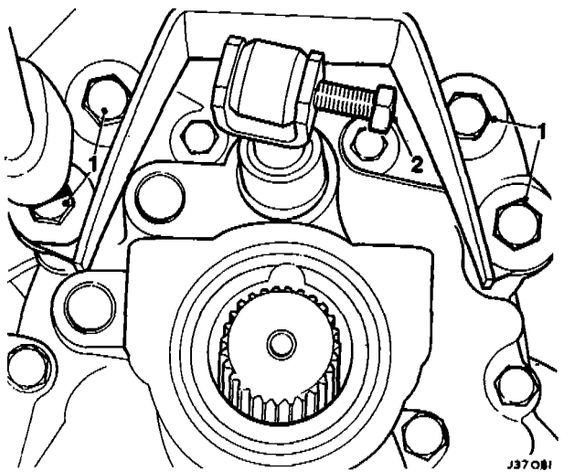


Fig 3

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Reconnectthe handbrake cable adjuster, fit the clevis pin and split pin.
NOTE: Always renew split pins, do not re-use old ones.
Lower the ramp.
Release *and* remove tool MS 53B.
Refit the fan cowl, fit the securing clips.
Remove the engine lifting eye.

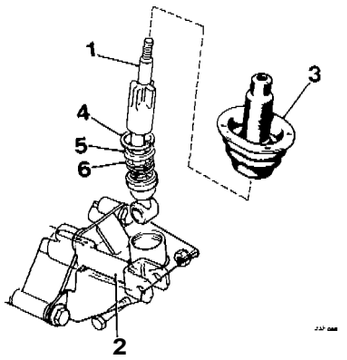


Fig 1

DATA

SERVICE TOOLS

MS 53B Engine support bracket
JD 124 Engine lifting bracket

TORQUE FIGURES

Gear lever housing to pedestal 23 to 27Nm
Gear fever ***pivot*** *bolt - Nut* ***23 to 27Nm***
Manifold ***to cylinder head 23-27Nm***
Pedestal to gearbox 23 to 27Nm

SPANNER SIZES

13mm
16mm

9/16AF
3/4AF

0190G

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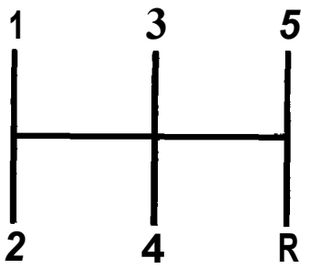
GEARBOX ASSEMBLY

DESCRIPTION 37.00.00

An uprated manual gearbox, the Getrag 290, to cater for the increased torque output, is introduced for 4.0 litre engined vehicles.

A three plane gate is illustrated in Fig 1

A new clutch serves the gearbox on the 4.0 litre engine which has an increased diameter (280mm in lieu of 240mm) and a new twin mass flywheel to damp out torsional vibrations and shock loads.



J37 O84

Fig 1

NOTE: The Getrag 290 manual gearbox **MUST** be filled with automatic transmission fluid, Dexron IID specification.

FRONT OIL SEAL

RENEW **37.23.06.**

Open the door.
Open the bonnet.
Raise the vehicle on a ramp.
Remove the propeller shaft 47.15.01 'Renew'.
Remove the gearbox assembly (1 Fig 1) 37.20.01 'Renew'.
Place the gearbox on a bench.
Place the drain tray in position.
Undo and remove the front cover securing bolts.
Displace and remove the front cover.
Note and remove the shims.
Fit the assembly to a vice.
Displace and remove the oil seal from the assembly.
Clean the front cover and gasket faces.
Clean the shims.

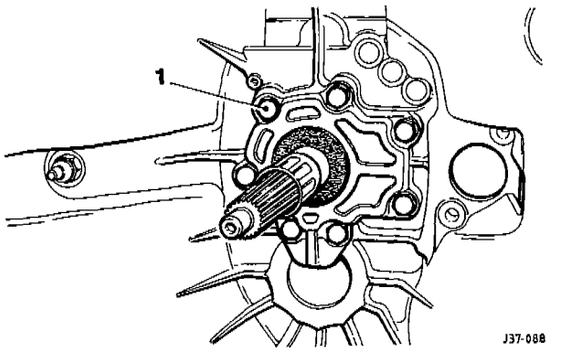


Fig 1

Lubricate the seal face.
Fit and seat the seal to the assembly.
Fit the shims to the cover.
Apply sealant to the front cover.
Lubricate the seal lip.
Fit and seat the front cover to the gearbox.
Fit and tighten the cover securing bolts.
Undo and remove the gearbox filler plug.
Fill the gearbox to the correct level.
Fit and tighten the filler plug.
Remove the drain tray.
Fit the gearbox using a unit lift.
Refit the gearbox assembly 37.20.01.
Refit the propshaft 47.15.01.
Lower the vehicle on the ramp.

DATA

SERVICE TOOLS

18G 1465 Engine lifting brackets
MS 53 Engine support bracket

TORQUE FIGURES

Front cover to gearbox 23-27Nm
Front pipe to intermediate pipe 15-18Nm

SPANNER **SIZES**

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.
Front cover to gearbox Loctite 573
Front cover securing bolts Loctite 573
Gearbox oil Automatic transmission fluid Dexron IID

30028

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REAR OIL SEAL

RENEW **37.23.01.**

Raise the vehicle on a ramp.
Renew the propellor shaft.
Using a "snap on" oil seal remover, displace and remove the rear oil seal (1 Fig 1).
Clean the seal mounting face.

Apply the sealant to the seal outer face.
Fit and seat the seal to the gearbox.
Refit the propshaft.
Lower the vehicle on the ramp.

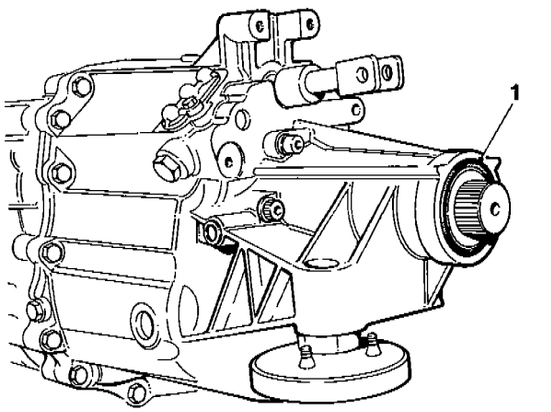


Fig 1

DATA

SERVICE TOOLS

'SNAP ON' Oil seal remover.

OILS/LUBRICANTS/SEALANTS

Gearbox oil Automatic transmission fluid Dexron IID

30028

GEAR LEVER HOUSING

RENEW **37.16.03.**

Open the door.
Open the bonnet.
Disconnect the battery.
Remove the gear lever knob.
Undo and remove the manifold rear securing nuts.
Reposition the earth leads from the studs.
Fit the lifting eye 18G 1465 to the studs.
Fit and tighten the securing nuts.
Place the engine support tool MS 53 across the wing channels.
Tighten the wing channel bracket securing nuts/bolts.
Fit the engine support hook to MS 53 and engage onto the lifting eye.
Tighten the hook nut to take the weight of the engine.
Raise the ramp.
From below:-
Undo and remove the exhaust front pipe to the intermediate pipe clamp securing nut/bolt.
Reposition the clamp from the joint.
Reposition the intermediate pipe aside.
Displace and remove the sealing olive.
Support the rear mounting with a jack.
Undo and remove the rear mounting plate securing bolts.
Carefully lower the jack and the mounting assembly.
Remove the mounting spring and the plate from the jack.
Undo the engine support hook to lower the rear of the gearbox, ensuring that the pipes, hoses and harness, etc are clear.

From below:-.
Undo and remove the gear lever to the gear selector yoke securing nut/bolt.
Reposition the yoke from the lever.
Displace and remove the wavy washer.
Undo and remove the gear lever mounting bracket to the gearbox securing bolts.
Displace and remove the mounting rubbers, spacers, rubbers and washers from the mounting bracket.
Withdraw the lever from, the gaiter, reposition the assembly over the gearbox and remove from the exhaust side of the box.

Fit and align the gear lever assembly in vice.
Release the gear lever nylon cup retaining tangs.
Remove the gear lever/nylon cup assembly.
Remove the nylon cup from the lever.
Remove the mounting bracket.
Clean the components.

Place the new mounting bracket in a vice.
Lubricate the lever ball pivot.
Fit and fully seat the nylon cup to the gear lever.
Fit the gear lever assembly to the mounting bracket, ensuring that the locking tangs fully locate.
Remove the lever assembly from the vice.
Align and fit the gear lever assembly to the vehicle.
Fit the mounting rubbers, spacers and washers to the bracket.
Reposition the mounting to the gearbox.
Fit and tighten the securing bolts.
Fit the wavy washer to the gear lever bush.
Reposition the lever into the selector yoke.
Fit and tighten the selector yoke securing nut/bolt.
From above:-
Tighten the engine support nut to raise the rear of the gearbox.
Place the jack under the rear engine mounting.
Jack-up the mounting into position.
Fit but do not fully tighten the mounting securing bolts.
Lower the jack from the mounting.
Undo and remove the engine support hook.
From below:-
Centralise the rear mounting.
Final-tighten the rear mounting securing bolts.
Clean the exhaust olive.
Smear the olive with exhaust sealer.
Fit and align the olive to the front pipe.
Reposition the intermediate pipe to the front pipe.
Reposition the clamp.

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Fit and tighten the clamp securing nut/bolt.
Lower the vehicle on the ramp.
From the engine bay:-
Undo and remove the lifting eye securing nuts.
Remove the lifting eye.
Reposition the earth leads to the studs.
Fit and tighten the securing nuts.
Close the bonnet.
Refit the gear knob.
Close the door.

DATA

SERVICE TOOLS

18G 1465 Engine lifting brackets
MS 53 Engine support bracket

TORQUE FIGURES

Front pipe to intermediate pipe 15-18Nm

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

3002B

GEAR LEVER

RENEW 37.16.04.

Open the door.
Open the bonnet.
Disconnect the battery.
Remove the gear lever knob.
Undo and remove the manifold rear securing nuts.
Reposition the earth leads from the studs.
Fit lifting eye 18G 1465 to the studs.
Fit and tighten the securing nuts.
Place engine support tool MS 53 across the wing channels.
Tighten the wing channel bracket securing nuts/bolts.
Fit the engine support hook to MS 53 and engage onto the lifting eye.
Tighten the hook nut to take the weight of the engine.
Raise the vehicle ramp.
From below:-
Undo and remove the exhaust front pipe to the intermediate pipe clamp securing nut/bolt.
Reposition the clamp from the joint.
Reposition the intermediate pipe aside.
Displace and remove the sealing olive.
Place the jack channel to position.
Raise the unit with the jack, on stands.
Support the rear mounting with the jack.
Undo and remove the rear mounting plate securing bolts.

Carefully lower the jack and the mounting assembly.
Remove the mounting spring and plate from the jack.
Undo the engine support hook to lower the rear of the gearbox, ensuring that pipes, hoses and the harness, etc are clear.

From below:-
Undo and remove the gear lever to the gear selector yoke securing nut/bolt.
Reposition the yoke from the lever.
Displace and remove the wavy washer.
Undo and remove the gear lever mounting bracket to the gearbox securing bolts.
Displace and remove the mounting rubbers, spacers, rubbers and washers from the mounting bracket.
Withdraw the lever from the gaiter, reposition the assembly over the gearbox and remove from the exhaust side of the box.
Fit and align the gear lever assembly to a vice.
Release the gear lever nylon cup retaining tangs.
Displace and remove the gear lever/nylon cup assembly; place to the front.
Displace and remove the nylon cup from the lever.
Place the lever aside.
Remove the mounting bracket.
Clean the components.

Secure the mounting bracket in a vice.
Place the new lever to the front.
Lubricate the lever ball pivot.
Fit and fully seat the nylon cup to the gear lever.
Fit and fully seat the gear lever assembly to the mounting bracket, ensuring that the locking tangs fully locate.
Remove the lever assembly from the vice.
Fit and align the gear lever assembly to the vehicle.
Fit and fully seat the mounting rubbers, spacers and washers to the bracket.
Reposition the mounting to the gearbox.
Fit and tighten the securing bolts.
Fit and align the wavy washer to the gear lever bush.
Reposition the lever into the selector yoke.
Fit and tighten the selector yoke securing nut/bolt.

From above:-
Tighten the engine support nut to raise the rear of the gearbox.
Fit and align the rear engine mounting and spring to the jack.
Raise/lower the unit with the jack, no stands.
Jack-up the mounting into position.
Fit but do not fully tighten the mounting securing bolts.
Lower the jack from the mounting.
Undo and remove the engine support hook.

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From below:-
Centalise the rear mounting.
Final-tighten the rear mounting securing bolts.
Clean the exhaust olive.
Smear the olive with exhaust sealer.
Fit and align the olive to the front pipe.
Reposition the intermediate pipe to the front pipe.
Reposition the clamp.
Fit and tighten the clamp securing nut/bolt.
Lower the vehicle on the ramp.

From the engine bay:-
Undo and remove the lifting eye securing nuts.
Remove the lifting eye.
Reposition the earth leads to the studs.
Fit and tighten the securing nuts.
Close the bonnet.
Refit the gear knob.
Close the door.

DATA

SERVICE TOOLS

18G 1465 Engine lifting brackets
MS 53 Engine support bracket

TORQUE FIGURES

Front pipe to intermediate pipe 15- 18Nm

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KAY ADHESIVES No 5696.

3002B

GEAR LEVER HOUSING MOUNTINGS

RENEW **37.16.06.**

Open the door.
Open the bonnet.
Disconnect the battery.
Undo and remove the manifold rear securing nuts.
Reposition the earth leads from the studs.
Fit lifting eye 18G 1465 to the studs.
Fit and tighten the securing nuts.
Place engine support tool MS 53 across the wing channels.
Tighten the wing channel bracket securing nuts/bolts.
Fit the engine support hook to MS 53 and engage onto the lifting eye.
Tighten the hook nut to take the weight of the engine.
Raise the vehicle ramp.

From below:-
Undo and remove the exhaust front pipe to the intermediate pipe clamp securing nut/bolt.
Reposition the clamp from the joint.
Reposition the intermediate pipe aside.
Displace and remove the sealing olive.
Place the jack channel to position.
Raise/lower the unit with the jack, no stands.
Support the rear engine mounting with the jack.
Undo and remove the rear mounting plate securing bolts.
Carefully lower the jack and mounting assembly.
Remove the mounting spring and plate from the jack.
Undo the engine support hook to lower the rear of the gearbox, ensuring that pipes, hoses and the harness, etc are clear.
Undo and remove the gear lever mounting bracket to the gearbox securing bolts.
Displace and remove the mounting rubbers, spacers, rubbers and washers from the mounting bracket.

Fit and fully seat the mounting rubbers, spacers and washers to the bracket.
Reposition the mounting to the gearbox.
Fit and tighten the securing bolts.

From above:-
Tighten the engine support nut to raise the rear of the gearbox.
Fit and align the rear engine mounting and spring to the jack.
Raise/lower the unit with the jack, no stands.
Jack-up the mounting into position.
Fit but do not fully tighten the mounting securing bolts.
Lower the jack from the mounting.
Remove the jack channel.
Undo and remove the engine support hook.

From below:-
Centralise the rear mounting.
Final-tighten the rear mounting securing bolts.
Clean the exhaust olive.
Smear the olive with exhaust sealer.
Fit and align the olive to the front pipe.
Reposition the intermediate pipe to the front pipe.
Reposition the clamp.
Fit and tighten the clamp securing nut/bolt.
Lower the vehicle on the ramp.

From the engine bay:-
Undo and remove the lifting eye securing nuts.
Remove the lifting eye.

Reposition the earth leads to the studs.
Fit and tighten the securing nuts.
Close the bonnet.
Close the door.

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DATA

SERVICE TOOLS

18G 1465 Engine lifting brackets
MS 53 Engine support bracket

TORQUE FIGURES

Front pipe to intermediate pipe 15-18Nm
Gear lever housing to gearbox 23-27Nm

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLI KA YADHESIVES No 5696.

GEAR LEVER ASSEMBLY

STRIP AND REBUILD 37.16.10.

Open the door.
Open the bonnet.
Disconnect the battery.
Renew the gear lever knob.
Undo and remove the manifold rear securing nuts.
Reposition the earth leads from the studs.
Fit lifting eye 18G 1465 to the studs.
Fit and tighten the securing nuts.
Place engine support tool MS 53 across the wing channels.
Tighten the wing channel bracket securing nuts/bolts.
Fit the engine support hook to MS 53 and engage onto the lifting eye.
Tighten the hook nut to take the weight of the engine.
Raise the vehicle on a ramp.

From below:-
Undo and remove the exhaust front pipe to the intermediate pipe clamp securing nut/bolt.
Reposition the clamp from the joint.
Reposition the intermediate pipe aside.
Displace and remove the sealing olive.
Support the rear mounting with the jack.
Undo and remove the rear mounting plate securing bolts.

Carefully lower the jack and the mounting assembly.
Remove the mounting spring and plate from the jack.
Undo the engine support hook to lower the rear of the gearbox, ensuring that pipes, hoses and the harness, etc are clear.

From below:-
Undo and remove the gear lever to the gear selector yoke securing nut/bolt.
Reposition the yoke from the lever.
Displace and remove the wavy washer.
Undo and remove the gear lever mounting bracket to the gearbox securing bolts.
Displace and remove the mounting rubbers, spacers, rubbers and washers from the mounting bracket.
Withdraw the lever from the gaiter, reposition the assembly over the gearbox and remove from the exhaust side of the box.
Fit the gear lever assembly to a vice.
Release the gear lever nylon cup retaining tangs.
Displace and remove the gear lever/nylon cup assembly; place to the front.
Displace and remove the nylon cup from the lever.
Remove the mounting bracket.
Clean the components.

Place the mounting bracket in a vice.
Lubricate the lever ball pivot.
Fit and fully seat the nylon cup to the gear lever.
Fit and fully seat the gear lever assembly to the mounting bracket, ensuring that the locking tangs fully locate.
Remove the lever assembly from the vice.
Fit and align the gear lever assembly to the vehicle.
Fit and fully seat the mounting rubbers, spacers and washers to the bracket.
Reposition the mounting to the gearbox.
Fit and tighten the securing bolts.
Fit and align the wavy washer to the gear lever bush.
Reposition the lever into the selector yoke.
Fit and tighten the selector yoke securing nut/bolt.

From above:-
Tighten the engine support nut to raise the rear of the gearbox.
Fit and align the rear engine mounting and spring to the jack.
Raise/lower the unit with the jack, no stands.
Jack-up the mounting into position.
Fit but do not fully tighten the mounting securing bolts.
Lower the jack from the mounting.
Remove the jack.
Undo and remove the engine support hook.

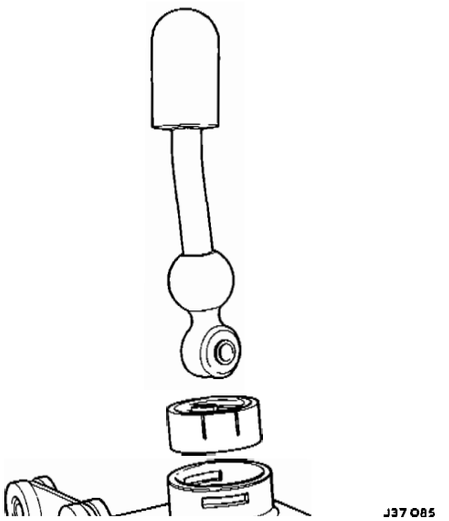


Fig 1

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From below:-
Centralise the rear mounting.
Final-tighten the rear mounting securing bolts.
Clear the exhaust olive.
Smear the olive with exhaust sealer.
Fit and align the olive to the front pipe.
Reposition the intermediate pipe to the front pipe.
Reposition the clamp.
Fit and tighten the clamp securing nut/bolt.
Lower the vehicle on the ramp.

From the engine bay:-
Undo and remove the lifting eye securing nuts.
Remove the lifting eye.
Reposition the earth leads to the studs.
Fit and tighten the securing nuts.
Close the bonnet.
Refit the gear knob.
Close the door.

DATA

SERVICE TOOLS

18G 1465 Engine lifting brackets
MS 53 Engine support bracket

TORQUE *FIGURES*

Front pipe to intermediate pipe **15-18Nm**
Gear lever housing to gearbox **23-27Nm**

SPANNER SIZES

11mm
13mm

OILS/LUBRICANTS/SEALANTS

Exhaust sealer ***TIVOLI KA Y ADHESIVES No 5696.***

3002B

GEARBOX ASSEMBLY

RENEW 37.20.01.

Open the door.
Open the bonnet.
Disconnect the battery.
Undo and remove the inlet manifold rear securing nuts.
Displace the earth leads from the studs.
Fit the dummy lifting eye.
fit and tighten the lifting eye securing nuts.

Fit and align engine retaining tool MS 53 across the wing channels, align to the rear lifting eye.
Fit and engage the retaining hook.
Tighten the hook nut to take the weight of the engine.
Remove the fan cowl retaining clips.
Displace the fan cowl upward.
Raise the vehicle on a ramp.
Remove the propellor shaft 47.15.01.
Secure the exhaust system aside.
Undo and remove the front pipe to the manifold securing nuts.
Displace and remove the front pipe assembly.
Undo and remove the slave cylinder securing nuts.
Displace the slave cylinder from the bell housing.
Remove the slave cylinder push rod.
Reposition and disconnect the gearbox switch block connector.
Place the jack channel to position.
Raise/lower the unit with the jack, no stands.
Take the weight of the mounting on the jack.
Undo and remove the rear mounting to the body securing bolts.
Lower the jack and remove the rear mounting assembly.
Remove the jack.
Remove the jacking channel.
Remove the mounting spring.
Remove the spring mounting rubber.

From above:-
Undo the retaining tool hook nut to lower the rear of the gearbox, do not allow the engine to foul at the back.

From below:-
Undo and remove the selector shaft universal joint securing nut/bolt.
Reposition the selector from the lower gear lever.
Remove the wavy washer from the selector.
Undo and remove the gear selector remote control securing bolts.
Remove the mounting rubbers and washers.
Reposition the remote control assembly for access.
Undo and remove the earth lead to the gearbox securing bolt.
Reposition the earth lead.
Undo and remove the gearbox to the engine adaptor plate securing bolts (1 Fig 1); note leave 2 opposing bolts in.

Note: 2 bolts left in for safety.
Using a unit lift take the weight of the gearbox.
Undo and remove the remaining gearbox to adaptor Plate securing bolts.
Displace the gearbox from the rear of the engine and carefully lower the unit lift.

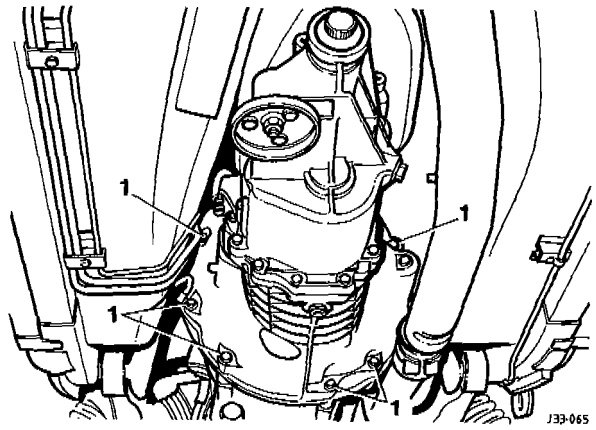


Fig 1

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Displaceand removethe clutch release bearing assembly from the release lever.
Displace and remove the clutch release lever retaining clip.
Displaceand removethe lever (Fig 1).
Undo and removethe gearbox switch.
Undo and removethe rear mounting securing nuts/bolt.
Removethe rear mounting assembly.
Repositionthe selectorshaft pin cover.
Displace and remove the selector shaft to universaljoint pin.
Removethe universaljoint body.
Removethe gearbox from the unit lift.
Placethe gearboxto the drain area.
Undo and remove the gearbox drain plug and allow to drain.
fit and tighten the drain plug, as required.

Fitthe new gearbox to the unit lift.
Undo and removethe gearbox level plug.
Fillthe gearboxwith oil.
Fitand tighten the gearbox level plug.
Cleanthe components and mating faces.

Lubricatethe selector output shaft.
Fitthe universaljoint assembly to the selectorshaft.
Fitand seat the universaljoint pin.
Reposition the retaining cover over the universal joint pin.
Fitand align the rear mounting assembly.
Fitand tighten the mounting assemblysecuring bolt.
Fitand tighten the gearboxswitch.
Lubricatethe clutch release lever.
Fit and align the lever to the gearbox, engage onto the pivot bolt.
Fitand fully seatthe leverto the pivot retaining clip.
Lubricatethe release bearing housing.
Fitand fully seatthe bearing assembly to the lever.
Select the third forward gear.
Movethe gearbox underthe ramp, raisethe gearbox into position.
Reposition the gearbox into the clutch and fully seat againstthe adaptor plate.
During the above operation, adjustthe tilt angles.
Fitthe gearboxto a unit lift and refit gearbox.
Positionthe earth leadto the gearbox.
Tighten the earth lead securing bolt.
Connectthe gearbox switch and position the multi-plug above the insulation pad.
Clean the clutch slavecylinder push rod.
Lubricate, the push rod.
Fitthe push rod to the slave cylinder.
Repositionthe slave cylinderto the mounting studs.
Fitand tighten the slave cylinder securing nuts.

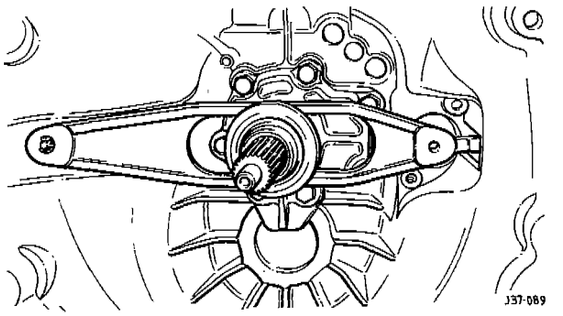


Fig 1

Fit and seat the remote control mounting rubbers and spacers.
Align the remote control to the gearbox.
Fit the mounting rubber backing washers.
Align the mounting securing bolt holes.
Fit and tighten the remote control mounting securing bolts.
Fit and align the wavy washer to the lower gear lever.
position the selector shaft to the lower gear lever.
Apply lubricant to the selector/lever assembly.
Fit and tighten the selector to the gear lever securing nut/bolt.
From above:-
Tighten the **MS** 53 hook nut to raise the gearbox into position.
From below:-
Place the jacking channel in position.
Fit the spring to the rear mounting assembly.
Fit the upper rubber to the mounting spring.
Using a jack, fit and seat the mounting **assembly** to the body/gearbox.
Fit but do not fully tighten the mounting securing **bolts.**
Lower and remove the jack.
Remove the jack.
From above:-
Fully undo the **MS** 53 hook nut.
From below:-
Final-align the mounting to the gearbox/body.
Final-tighten the mounting bolts.
Place the front pipe in a vice.
Remove and discard the front pipe to manifold sealing rings.
Clean the faces.
Fit and fully seat the new rings to the pipe.
Remove the front **pipe** from the vice.
Fit and align the front pipe to the manifold.
Align the retaining rings to the studs.
Fit and tighten the securing nuts.
Refit the propshaft assembly 47.15.01.
Untie the exhaust system.
Lower the vehicle ramp.
Reposition the fan cowl to the mounting.
Fit the fan cowl securing clips.
Remove the **MS** 53 hook.
Remove **MS** 53.
Undo and remove the dummy lifting eye securing nuts.

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Remove the dummy lifting eye.
Reposition the earth leads to the studs.
Fit and tighten the manifold securing nuts.
Close the bonnet.

DATA

SERVICE TOOLS

ISG 1465 Engine lifting brackets
MS 53 Engine support bracket

TORQUE FIGURES

Bell housing to cylinder block 49-54Nm
Front pipe to intermediate pipe 15-18Nm
Front pipe to manifold 30-35Nm
Gear lever housing to gearbox 23-27Nm

SPANNER SIZES

10mm
13mm
15mm
19mm

9/16" AF
3/4 "AF

OILS/LUBRICANTS/SEALANTS

Exhaust sealer TIVOLIKA YADHESIVES No 5696.
Gearbox oil Automatic transmission fluid Dexron IID

30028

GEARBOX - GETRAG *265* (3.2)

DESCRIPTION *37.00.00*

The components and service procedures for the 3.2 (Getrag 265) gearbox are the **same** as for 2.9 models.

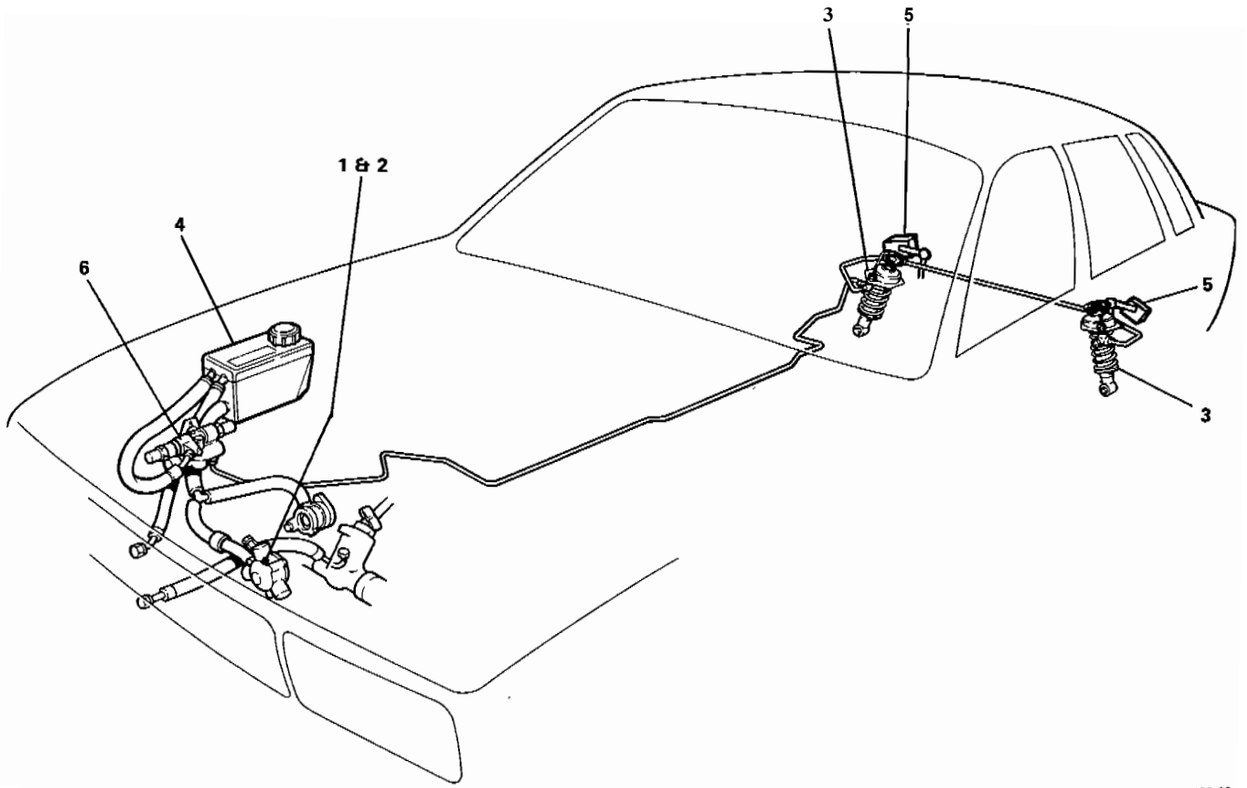
Refer to Section 37 (2.9) for details of service requirements and operations.

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0038G



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0038G

POWER HYDRAULIC SYSTEM - Pre. 90 Model Year

DESCRIPTION 66.00.00

CAUTION: The hydraulic power system uses JAGUAR/CASTROL HYDRAULIC SYSTEMS MINERAL OIL (HSMO). Use of other oil may result in system failure.

Store the HYDRAULIC SYSTEM MINERAL OIL ONLY IN ITS ORIGINAL CONTAINER. Keep the container clean and tightly closed as contamination will result in mechanical failure or costly repairs.

The hydraulic power braking and payload compensated levelling system uses a power hydraulic system to provide power assisted brake operation and can also provide self levelling, which automatically adjusts the vehicle trim to maintain the correct body attitude with respect to the road. Trim adjustments undertaken by the system are limited to those which compensate for laden/unladen (bulk load) changes over the rear axle rather than those experienced when cornering or negotiating undulating road surfaces.

CAUTION: Since the system corrects the vehicle trim to compensate for rear axle load changes, it is possible to grossly overload the vehicle without any perceptible difference in trim height. It is essential that the specified vehicle weight is not exceeded.

The system, which responds to trim deflections maintained over and above a period of 20 seconds, contains the following items:

Accumulator assembly: A vessel within which hydraulic system mineral oil is stored at a pressure of 91-101 Bar (nominal), being supplied by a mechanically driven pump.
Charge switch: a pressure actuated switch which responds to oil pressure changes within the accumulator, and transmits a signal to the unloader solenoid valve.
Low pressure switch: a pressure actuated switch which, in addition to providing low pressure warnings on the instrument pack, inhibits suspension-up valve operation at system pressures below 54 bar (800 lb/in^2).
Non return valve: Prevents pressurised oil escaping to the reservoir from the accumulator, via. the valve block assembly;
Solenoid valve block: contains a solenoid unloader valve, which distributes the oil flow in the system. Suspension-up/down solenoid valves which, under ride height sensor control, increase or decrease the oil pressure applied to the struts.
Trapped Line Pressure Valve (integral part of down solenoid valve assembly): A non return valve which ensures that a minimum oil pressure of 27 bar (400lb/in^2) is retained within the levelling system.
Pressure relief valve: permits high pressure oil to return to the reservoir in the event of gross vehicle overloading or the system becoming over pressurised.
Pump: a three piston radial device which operates at 0.75 times engine speed and delivers 0.7 litre/min (0.153 gal/min) at 600 rev/min.
Oil reservoir: a 1.5 litre (0.33 gal) vessel which stores a supply of mineral oil for use by the system. A float-switch is incorporated to give low oil level warnings on the instrument pack.
Levelling struts: an integral part of the rear suspension which extend and retract in response to oil pressure changes made by the suspension up/down valves.
Ride height sensor: a device which monitors the body-to-axle distance and controls the suspension up/down valves to maintain the correct trim.
Brake booster: This unit fits between the brake pedal and the master cylinder using the accumulator pressure to boost the pedal effort.

Note: In the event of a system failure, a number of power assisted brake applications are available from the pressure remaining in the accumulator and self levelling of the vehicle is abandoned. Un-assisted brake operation still remains after the accumulator is exhausted.

A schematic illustration of the power hydraulic circuit for pre. 90 model year vehicles is shown on Page 66-07, Fig. 1.

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POWER HYDRAULIC SYSTEM

OPERATION *66*.00.00

The operation of the power hydraulic system can be divided into the following functions:
Charging the system.
Trim up compensation.
Trim down compensation.
Power assisted brake operation.

Charging the System
When the ignition is switched on and the engine has remained stationary for a period sufficient for the pressure in the accumulator to drop below 54 bar (800 lb/in^2), the action of the low pressure switch causes a low pressure warning to be given on the instrument pack. This is a normal situation, the warning being initiated by the removal of a logic earth from the power brake relay which in turn inhibits suspension-up valve operation. Charging the system occurs when the engine is started. The unloader valve closes and thus, forces the oil flow from the pump into the accumulator.
The accumulator contains a diaphragm which divides the unit into two chambers; an upper chamber within which nitrogen gas is contained, and a lower chamber into which mineral oil is forced under the influence of the pump. As mineral oil enters the lower chamber, the diaphragm is moved upwards against the nitrogen which in turn is compressed until the system operating pressure of 100 bar (1500 lb/in^2(nominal)) is reached. At this pressure, contacts of the charge switch open and the unloader valve de-energises thus allowing oil to flow back to the reservoir. Pressure loss within the accumulator occurs during normal braking applications. Eventually the contacts *of* the charge switch will close and result in the charging cycle being repeated.

Trim **Up** Compensation
Provided that the engine is running and the pressure within the accumulator is greater than **54** bar (800 lb/in^2) levelling up can take place. The ride. height sensor energises a relay after a 20 second period **of** it detecting a car low condition. The relay in turn energises the solenoids of both the unloader and suspension-up valves which link the pump line to the suspension line and accumulator. The accumulator charge is maintained by it's non return valve. Accumulator charging will then occur when the levelling system pressure reaches the accumulator stored pressure. Should **a** low pressure condition exist, i.e. low pressure switch contacts open, actuation of the suspension-up solenoid is inhibited and the unloader solenoid valve assembly is actuated by the charge switch.

Trim **Down** Compensation
With the ignition on, the ride height sensor actuates the solenoid of the suspension-down valve after a 20 second period of it detecting a car high condition. With the suspension-down valve open, mineral oil within the rear damper/struts is vented back to the reservoir as the struts retract to the correct trim height. **A** minimum pressure of 27 Bar (400lb/in^2) is maintained by the trapped line pressure valve.

Power Braking **Operation**
Accumulator oil pressure is applied to the brake booster at all times and produces a return force of approximately 9 kg (20 lb) to push the piston to the fully off position. When brake application is made oil pressure is fed to the servo chamber, giving assistance to the application. The degree of assistance is governed by a rubber reaction disc located between the booster and the output push rod. The force from this reaction disc causes the high pressure feed to the servo chamber to be closed, creating a 'balance' condition. If additional braking is required then further pressure on the pedal will re-open the high pressure oil port to the servo until 'balance' is again achieved. This 'balance' point maybe achieved at any given pedal effort up to the limit of boost.
When the brakes are released the servo pressure is vented to the reservoir, the piston assembly will return to its fully off position under the influence of the inherent 9kg (20 lb) return force.

POWER HYDRAULIC SYSTEM - Post 90 Model Year

DESCRIPTION *66.00.00*

CAUTION: The hydraulic power system uses JAGUAR/CASTROL HYDRAULIC SYSTEMS MINERAL OIL (HSMO). Use of other oil may result in system failure.

Store the HYDRAULIC SYSTEM MINERAL OIL ONLY IN ITS ORIGINAL CONTAINER. Keep the container clean and tightly closed as contamination will result in mechanical failure or costly repairs.

The hydraulic power steering and payload compensated levelling system uses a power hydraulic system to provide power assisted steering operation and can also provide self levelling, which automatically adjusts the vehicle trim to maintain the correct body attitude with respect to the road. Trim adjustments undertaken by the system are limited to those which compensate for laden/unladen (bulk load) changes over the rear axle rather than those experienced when cornering or negotiating undulating road surfaces.

CAUTION: Since the system corrects the vehicle trim to compensate for rear axle load changes, it is possible to grossly overload the vehicle without any perceptible difference in trim height. It is essential that the specified vehicle weight is not exceeded.

The system, which responds to trim deflections maintained over and above a period of 20 seconds, contains the following items:

Suspension-up, down and unloader solenoid valves: These valves, under ride height sensor control, increase or decrease the oil pressure applied to the struts.
Trapped Line Pressure Valve (integral part of down solenoid valve assembly): A non return valve which ensures that a minimum oil pressure of 27 bar (400lb/in^2) is retained within the levelling system.
Pressure relief valve: permits high pressure oil to return to the reservoir in the event of gross vehicle overloading or the system becoming over pressurised.
Pump: a three piston radial device which operates at 0.75 times engine speed and delivers 0.7 litre/min (0.153 gal/min) at 600 rev/min.
Oil reservoir: a vessel which stores a supply of mineral oil for use by the system.
Levelling strut: is an integral part of the rear suspension which extend and retract in response to oil pressure changes made by the suspension-up/down valves.
Ride height sensor: a device which monitors the body-to-axle distance and controls the suspension-up/down valves to obtain the correct trim.

A schematic illustration of the power hydraulic circuit for post 90 model year vehicles is shown on Page 66-07, Fig.2.

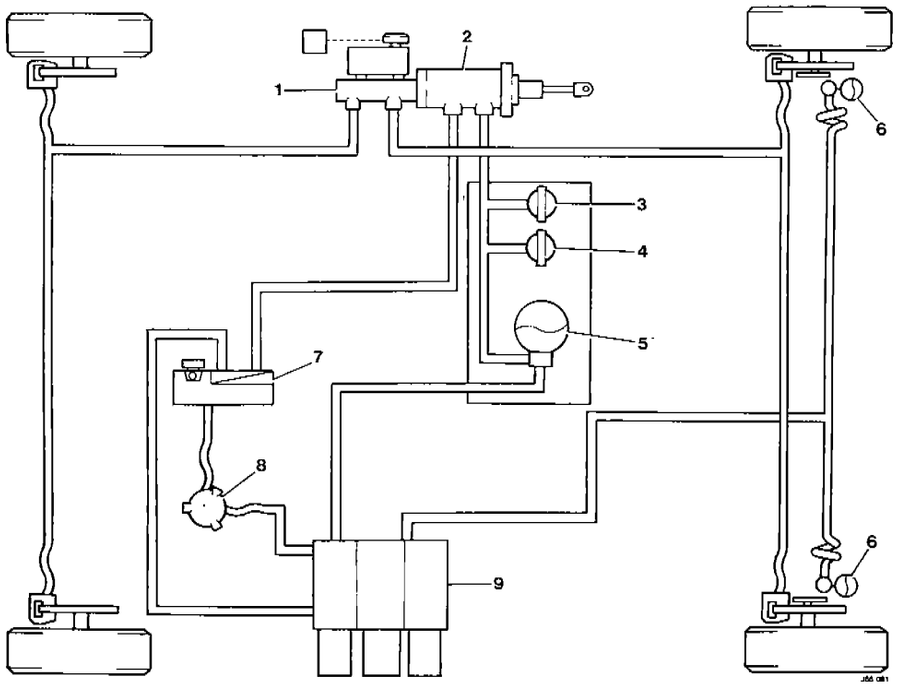
RIDE LEVELLING SYSTEM OPERATION

The operation of the power hydraulic system can be divided into the following functions:
Trim up compensation.
Trim down compensation.

Trim Up Compensation (ENGINE RUNNING ONLY)
The ride height sensor energises a relay after a 20 second period of it detecting a car low condition. The relay in turn energises the solenoids of both the unloader and suspension-up valves prevents oil flow to the reservoir and thus forces the fluid into the stuts.

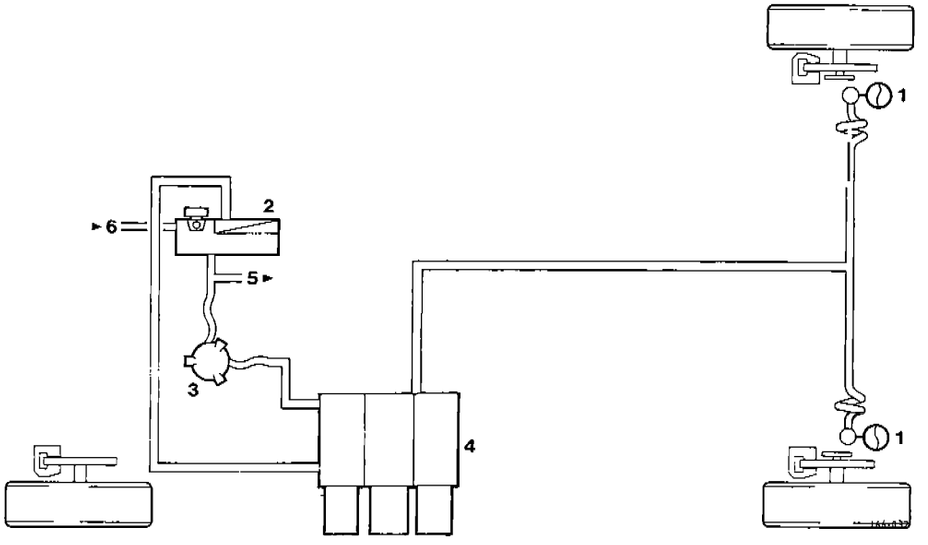
Trim Down Compensation
The ride height sensor actuates the solenoid of the suspension-down valve after a 20 second period of it detecting a car high condition. With the suspension-down valve open, mineral oil within the rear damper/struts is vented back into the systems reservoir, the struts retract to the correct trim height. A minimum pressure of 27 Bar (400lb/in^2) is maintained by the trapped line pressure valve.

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1. Brake master cylinder
2. Power servo
3. Low pressure warning switch
4. Charge switch
5. Accumulator
6. Self levelling strut
7. System reservoir
8. Pump
9. Valve block

Fig. 1. Power Hydraulic Circuit - Pre. 90 MY (schematic only)



1. Self levelling strut
2. System reservoir
3. Pump
4. Valve block
5. TO power steering pump
6. Return from power steering

Fig.2. Power Hydraulic Circuit - Post 90 MY (schematic only)

RIDE HEIGHT SYSTEM

DEPRESSURISING *66.20.00*

WARNING: THE REAR STRUTS, CONTROL VALVE AND CONNECTING PIPES CONTAIN GAS AND OIL MAINTAINED AT A HIGH PRESSURE. PRIOR TO SYSTEM DISTURBANCE, IE MAINTENANCE WORK, THE SYSTEM MUST BE DEPRESSURISED.

Attach a length of hose to the line bleed screw (1 Fig 1), located on the three way pipe connector on the rear left hand levelling strut mounting plate.

Place the free end *of* the hose in **a** suitable container.
Slacken off the line bleed screw half a turn and allow the fluid to drain into the container.
Re-tighten the bleed screw.

Note: During bleeding, the rear of the **of** the vehicle will fall.

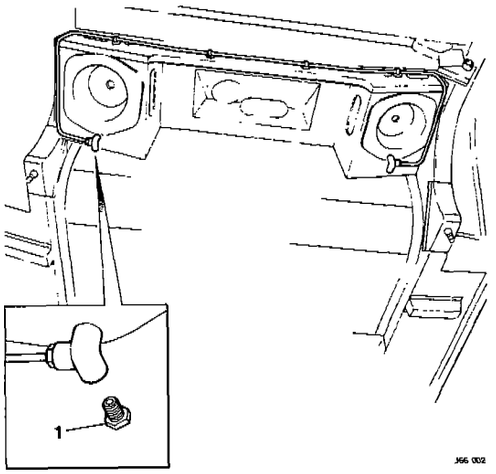


Fig. **1**

RIDE HEIGHT SENSOR

RENEW **66.40.01**

Open the bonnet and disconnect the battery earth lead.
Jack up the rear of the vehicle and support with axle stands.
Remove the sensor link arm securing nut and remove the link arm (1 Fig 2).
Remove the sensor securing nuts (2 Fig 2).
Disconnect the multi-pin **plug** (3 Fig 2).
Remove the sensor (4 Fig 2).
Reverse the removal procedure to fit the new sensor.
Remove the axle stands and **lower** the vehicle.
Reconnect the battery lead and close the bonnet.

VALVE BLOCK

RENEW **66.30.04**

Open the bonnet and disconnect the battery earth lead.
Depressurise the self levelling strut pressure line 66.20.00 (where fitted).
Cut and remove the cable harness block connector securing **strap.**
Disconnect the block connector.
Remove the inner wing pipe clamp securing bolt, and remove the clamp.

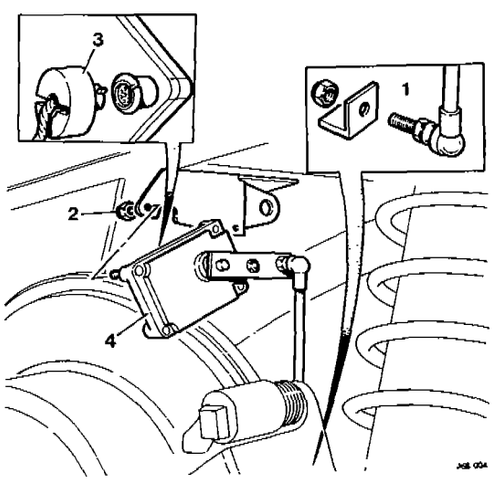


Fig. 2

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Remove the valve block securing nuts (1 Fig 1).
Remove the air conditioning compressor thermal fuse from the securing stud.
Place a cloth below the valve block to catch any escaping fluid.
Unscrew the valve block union nuts and disconnect the pipes (2 Fig 1).
Fit protective caps/plugs to the pipes and valve block.

Remove the valve block (3 Fig 1) from the studs.
Reverse the removal procedure to fit the new valve block.
Remove the stands and lower the vehicle.
Reconnect the battery lead and close the bonnet.
Check/top up the fluid and bleed as required, see bleed operation 66.00.00, page 66-12.

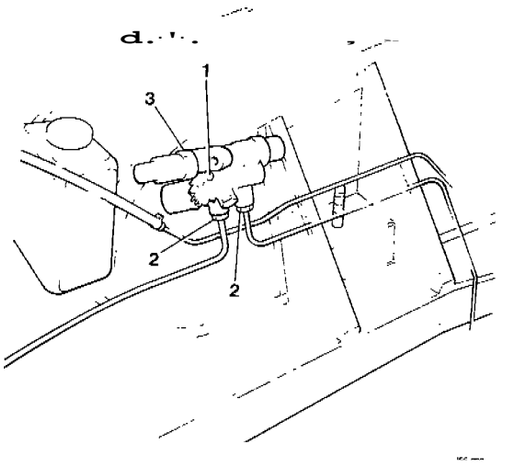


Fig. 1

DATA

TORQUE FIGURES

Servo to valve block pipe union nuts ***16-19Nm***
Pipe to accumulator union nuts ***9.5-10.5Nm***
Pipe to power servo union nut ***16-19Nm***
Pipe to reservoir union nut ***17-19Nm***

PUMP

RENEW **66.30.01**

Open the bonnet.
Place a cloth below the pump to catch any escaping fluid.
Remove the pressure pipe bracket securing bolt.
Disconnect the pressure pipe from the pump.
Disconnect the feed hose from the pump.
Ensure protective caps/plugs are fitted to the pipes and pump.
Remove the pump to timing cover securing bolts (1 Fig 2).
Displace and remove the pump (2 Fig 2).
Reverse the removal procedure to fit the new pump.
Check/top up the fluid and bleed as required, see bleed operation 66.00.00, page 66-12.

DATA

TORQUE FIGURES

Pump securing bolts ***23-27Nm***
Pressure pipe union nut ***11-14Nm***
Inlet hose clip ***1.5-3.5Nm***

PUMP DRIVE COUPLING

RENEW ***66.30.02***

Remove the pump 66.30.01.
Displace and remove the drive coupling (3 Fig 2).
Reverse the removal procedure to fit the new coupling.
Check/top up the fluid as required.

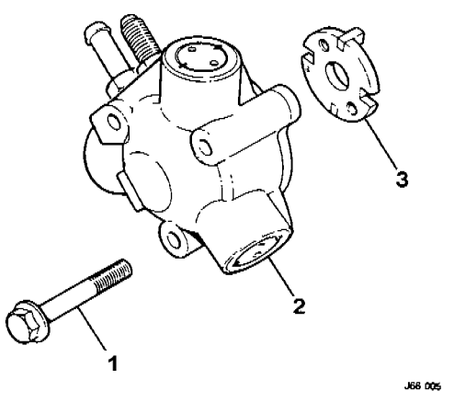


Fig. 2

DATA

TORQUE FIGURES

Pump** securing **bolts 23-27Nm

RESERVOIR

RENEW **66.30.05**

Open the bonnet.
Remove the nuts securing the reservoir to the body and displace the reservoir from its mounting studs.
Remove the mounting bobbins from the reservoir.
Slacken the clip securing the feed hose to the power steering pump.

Place a suitable container below and remove the reservoir cap.
Disconnect the pump feed hose and drain the hydraulic fluid.
Refit the hose to the power steering pump and tighten the clip.
Slacken the clips securing the hoses to the reservoir and discard the reservoir.
Fit protective caps/plugs to the hoses.
Reverse the removal procedure to fit the new reservoir.
Check/top up the fluid and bleed **as** required, see bleed operation 66.00.00, page **66-1**2.

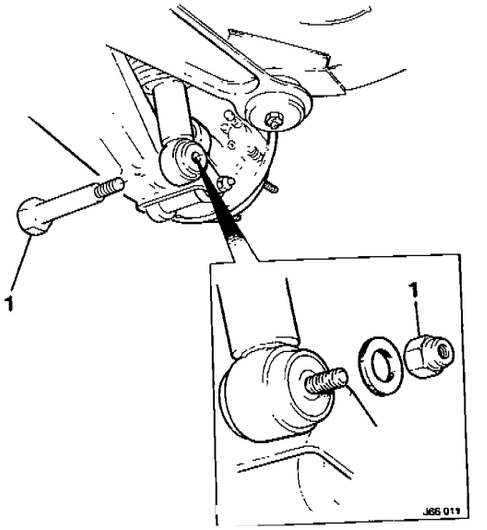


Fig. **1**

DATA

TORQUE FIGURES

*Hose **clips 3Nm***

REAR STRUT (SELF-LEVELLING)

RENEW **66.20.01**

Jack up the rear of the vehicle and support with axle stands.
Attach **a** length of hose to the line bleed screw located on the three way pipe connector at the rear left hand side of the ride height pressure pipe.
Place the free end of the hose in a suitable container.
Slacken off the line bleed screw half a turn and allow the fluid to drain into the container.
Re-tighten the bleed screw.
Remove the appropriate road wheel, noting the stud to wheel relationship.
Disconnect the hydraulic pipe to connector union nut.
Fit protective caps/plugs to the pipe and connector.

Remove the strut lower securing bolt/nut (1 Fig 1).
Remove the strut to body securing bolts (remove the front inner bolt first) (Fig 2).
Remove the strut assembly (Fig 3).
Remove the feed pipe from **the** strut and connector.
Fit plugs to the pipe and connector.
Remove the restrictor from the strut and fit a plug to the strut.

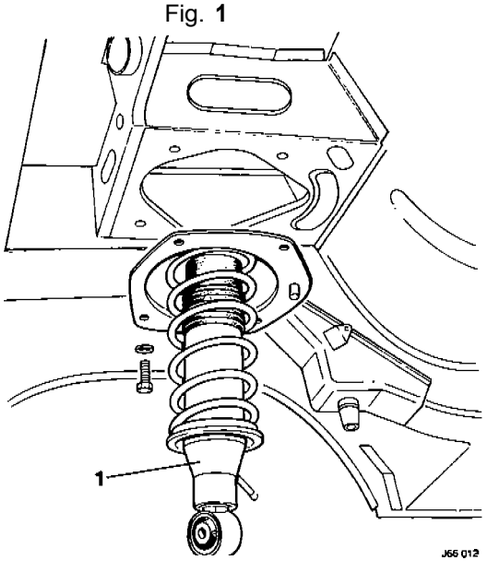


Fig. 2

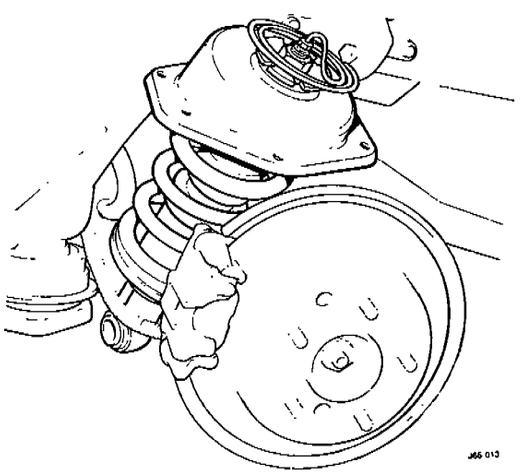


Fig. **3**

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Note the position of the mounting plate to the strut.
Fit the strut assembly to Service Tool JD 125.
Engage the spring retaining arms.
Tighten the tool centre bolt to compress the spring.
Fit the tool/strut assembly to a vice, to grip on the upper castellated washer. Close the vice and hold the assembly.
Remove the strut upper securing nut.
Displace and remove the tool/strut assembly from the washer.
Open the vice. Remove the washer from the vice.
Remove the micron buffer from the strut.
Remove the strut mounting ring, micron ring, spring seat and seating washer from the strut.
Remove the micron buffer, spacer and washer from the strut.
Remove the strut assembly from the spring.
Remove the lower spring seating washer from the strut.
Discard the strut.
Reverse the removal procedure to fit the new strut.

Note: Ensure the strut is fully extended before fitting the spring compressor.

Keep the protective caps/plugs in place until just before fitting.
Ensure cleanliness at all times during re-assembly, especially pipe ends and unions.
Check/top up the fluid and bleed as required, see bleed operation 66.00.00, page 66-12.
Remove the axle stands and lower the vehicle.

DATA

SERVICE TOOLS

JD 725 Rear ***road spring compressor.***

TORQUE FIGURES

Strut securing *bolts* ***22-28Nm***
Pipe union nuts ***16-19Nm***

POWER HYDRAULICS SYSTEM

FLUIDS **66.00**.00

CAUTION: Use only JAGUAR or CASTROL HYDRAULIC SYSTEMS MINERAL OIL (HSMO) when filling the system.

POWER HYDRAULICS SYSTEM

TOP UP ***66.00.00***

CAUTION: The system is filled with Jaguar/Castrol Hydraulic System Mineral Oil (HSMO). If any other specification fluid is used the system will become contaminated and the system will have to be purged.

The reservoir contains the fluid for the power steering and rear ride levelling system (where fitted). The fluid level must only be checked when the engine is COLD and the vehicle is in an unladen condition, i.e. no. passenger's or luggage.
Wipe clean and remove the combined filler cap and dipstick from the fluid reservoir; take great care to prevent any foreign matter from entering. Using a lint free cloth, wipe the dipstick clean, refit the filler cap then remove and inspect the oil level shown on the dipstick, which must be between the 'H' and **'ADD'** marks.
If necessary, top up with correct specification fluid, DO NOT OVERFILL (refer. to Recommended Lubricants and Fluids in Section 09).
Replace the cap and ensure that it is fully tightened.

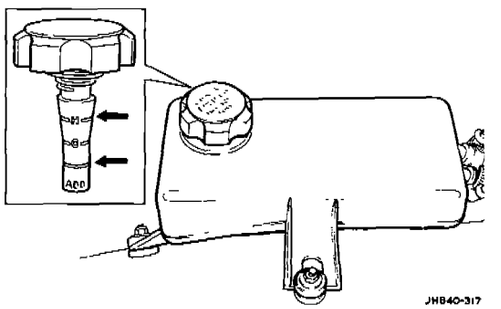


Fig. 1

POWER HYDRAULICS SYSTEM

BLEED **66.00.00**

CAUTION: Use only JAGUAR or CASTROL HYDRAULIC SYSTEMS MINERAL OIL (HSMO) when filling the system.

Drive the vehicle on to a ramp.
Open the bonnet.

Check/top up the power hydraulic system reservoir with new (HSMO) oil.
Firmly apply the handbrake.
Ensure that the vehicle is in 'P' (AUTO ONLY).
Ensure that the vehicle is in Neutral (**MANUAL** ONLY).
Start the engine. Raise the ramp.
Disconnect the ride height sensor link rod (1 Fig 2) from the RH wishbone, and raise the ride height sensor link arm (2 Fig 2) 2-3 cm. The rear of the vehicle will rise. Stop the engine when 'pulsing ' is felt in the strut feed pipe.
Remove the dust cover from the bleed screw, located at the top of the LH strut assembly.
Using a suitable pipe and container, bleed out 1/2 - ¾ pint of hydraulic fluid, ie one strut full.

Note: The vehicle will return to its normal height during the bleeding operation.

Lower the ramp. Check/top up the power hydraulic system reservoir.
Start the engine. Raise the ramp.
Raise the ride height sensor link arm 2-3 cm.
Stop the engine when 'pulsing' is felt in the strut feed pipe.
Repeat the bleeding precedure.
Refit the bleed screw dust cover.
Lower the ramp. Check/top up the power hydraulic system reservoir.
Start the engine. Raise the ramp.
Using the ride height sensor link, raise the rear of the car. When pulsing can be felt in the strut feed pipe, reconnect the link arm to the RH wishbone. The vehicle will return to its normal ride height.
Lower the ramp and switch off the engine. Check/top up the power hydraulic system reservoir.

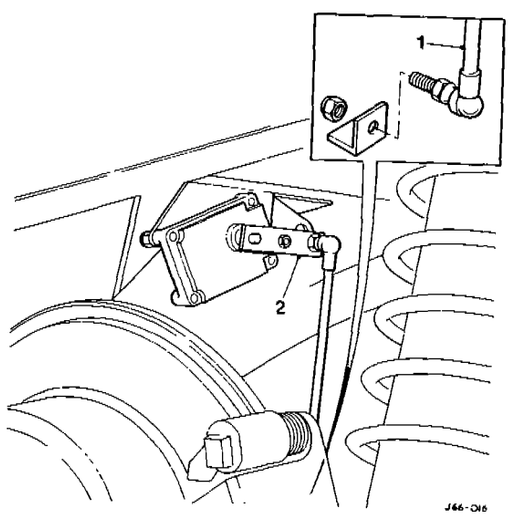


Fig. 2

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Note: Bleed the steering system as follows:

Run the engine and top up the reservoir. After 30 seconds running, perform 3 lock to **lock** turns of the steering wheel. Allow the engine to run for a further 60 seconds, then turn off and allow to stand for 5 minutes. This will allow any air bubbles suspended in the fluid to disperse.
Top up to the correct level and replace the reservoir cap.
Close the bonnet.

DATA

TORQUE FIGURES

Hose clips ***2Nm***
Accumulator *union* ***nut 9.5-10.5Nm***

SPANNER SIZES

13mm

OILS/SEALANTS

Power hydraulic system *JAGUAR/CASTROL HYD-* ***RAULIC SYSTEMS*** *MINERAL OIL (HSMO)*

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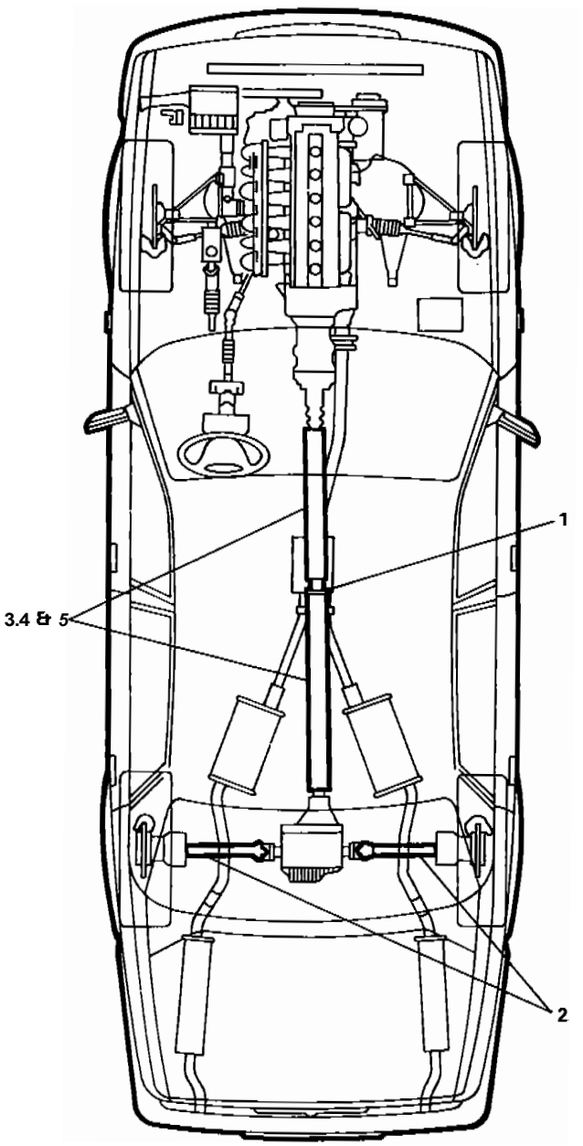
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ILLUSTRATED INDEX



ILLUSTRATED INDEX – KEY

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PROPELLER SHAFT

ALIGN 47.15.51

Drive the vehicle onto a ramp.
Slacken the bolts (1 Fig 1) securing the centre bearing to the mounting plate.
Standing at the rear of the vehicle 'eye' the propeller shaft centre bearing and position the mounting just to the left of centre.
Tighten the centre bearing to mounting plate bolts.

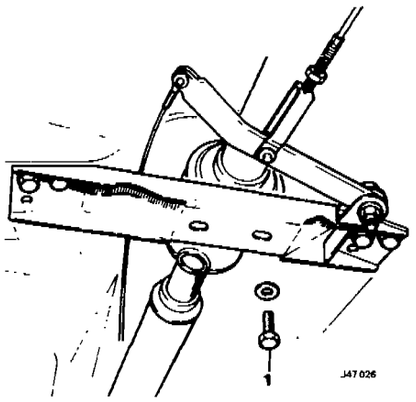


Fig 1

TORQUE FIGURES

Centre bearing to mounting plate ***22-24Nm***

SPANNER SIZES

13mm

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PROPELLER SHAFT

RENEW 47.15.01

Select a forward gear.
Remove the split pin and clevis pin (1 Fig 2) securing the handbrake cable adjuster (2 Fig 2) to the compensator (3 Fig 2).
Reposition the **left** hand rear cable and yoke **assembly** to one side.
Remove the nuts (1 Fig 3) securing the propeller shaft flange (2 Fig 3) to the differential drive flange. Repeat the procedure for the gear box end of the propeller shaft (automatic transmission only).
Remove the centre bearing mounting plate to body securing bolts (1 Fig 4).
Carefully remove the centre mounting plate from above the exhaust.
Remove the propeller shaft from the differential flange and slide rearwards to remove from the vehicle.
Fit a suitable plug to the gearbox spline (manual gear boxes only), clean the differential and gear box (manual gear boxes only) drive flange(s).
Grease the propeller shaft drive splines and reverse the removal procedure to refit the replacement propeller shaft.
Align the propeller shaft 47.15.51 page 2.

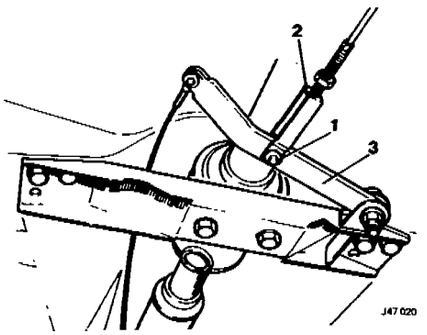


Fig 2

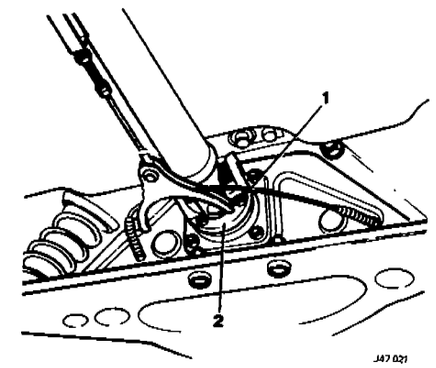


Fig 3

TORQUE FIGURES

Centre bearing to body ***22-28Nm***
Centre bearing to mounting plate ***22-24Nm***
Propeller ***shaft*** *coupling to axle* ***95-105Nm***
Propeller ***shaft*** *coupling to transmision (automatic only)* ***95****- 105Nm*

SPANNER SIZES

13mm
9/16 AF

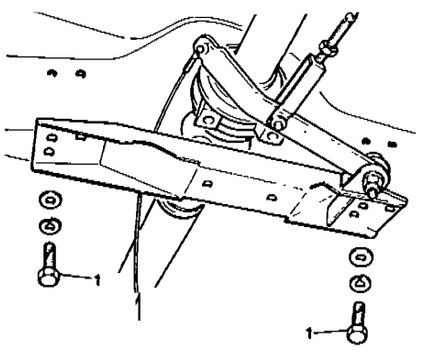


Fig 4

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PROPELLER SHAFT

OVERHAUL 47.15.10

Select a forward gear.
Remove the split pin and clevis pin (1 Fig 1) securing the handbrake cable adjuster (2 Fig 1) to the compensator (3 Fig 1).
Reposition the left hand rear cable and yoke assembly to one side.
Remove the nuts (1 Fig 2) securing the propeller shaft flange (2 Fig 2) to the differential drive flange (repeat the procedure for the transmission end of the propeller shaft (automatic transmission only).

Remove the centre bearing mounting plate to body securing bolts (1 Fig 3).
Carefully remove the centre mounting plate from above the exhaust.
Remove the propeller shaft from the differential flange and slide rearwards to remove from the vehicle.
Fit a suitable plug to the gearbox tail extension (manual gearboxes only).
Remove the centre bearing 47.15.32 page 47-06.

Remove the grease nipples, place shaft in vice and remove two opposed circlips (1 Fig 1 page 47-06).
NOTE: Tap bearing slightly inwards to assist removal of circlips.

Tap one bearing inwards to displace opposite bearing.
Trap displaced bearing in vice and remove shaft and joint from bearing.
Replace shaft in vice, displace second bearing by tapping joint spider across and extract second bearing.
Remove two grease seals.
Detach spider, with end section of shaft, from centre section of shaft.
Place end section of shaft in vice and repeat above operations.
Remove spider from end section of shaft.
Examine bearing races and spider journals for signs of looseness, load markings, scoring or distortion.
NOTE: Spider or bearings should not be renewed separately, as this will cause premature failure of the replacement.

It is essential that bearing races are a light drive fit in yoke trunnion.
Remove bearing assemblies from one replacement spider, if necessary, retain rollers in housings with petroleum jelly.
Leave grease shields in position.
Fit spider to one end section of shaft.
Fit two bearings and circlips in end section trunnions.
Use a soft round drift against bearing housings.
Insert spider in trunnions of shaft.
Fit two bearings and circlips in centre section trunnions.
Fit grease nipple to spider.
Refit the propeller shaft.
Align the propeller shaft 47.15.01 page 47-04.

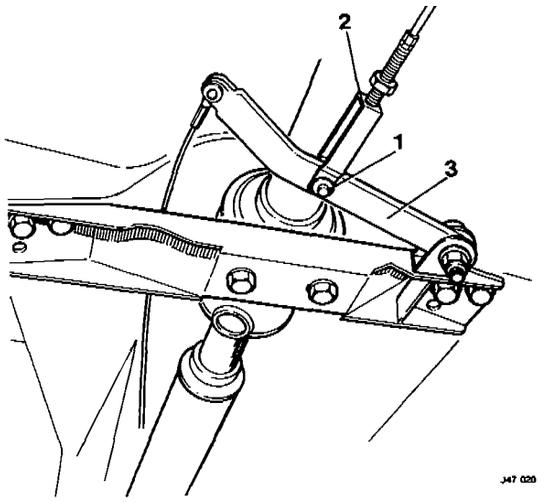


Fig 1

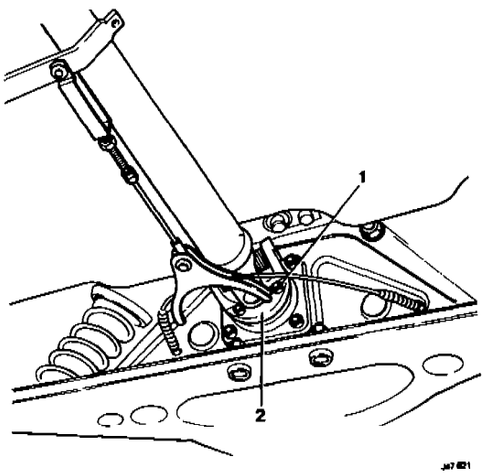


Fig 2

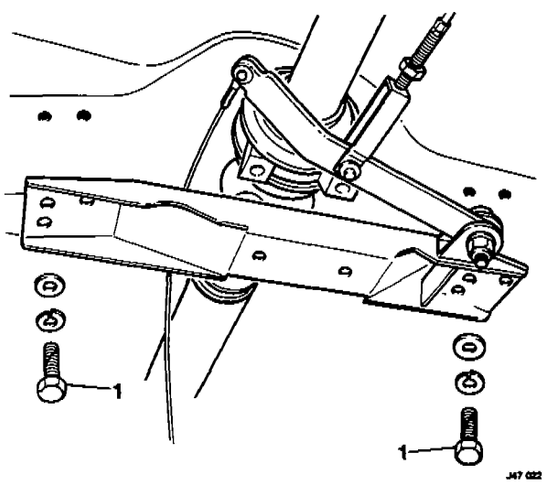


Fig 3

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DATA

TORQUE FIGURES

Centre bearing to body 22-28Nm
Centre bearing to mounting plate 22-24Nm
Propeller shaft coupling to axle 95-105Nm
Propeller shaft coupling to transmission (automatic only) 95-105Nm
Rear shaft to universal joint securing bolt 95-105Nm

SPANNER SIZES

13mm
17mm
9/16 AF

CENTRE BEARING

RENEW 47.15.32

Select a forward gear.
Remove the split pin and clevis pin securing the handbrake cable adjuster to the compensator.
Reposition the left hand rear cable and yoke assembly to one side.
Remove the nuts securing the propeller shaft flange to the differential drive flange.
Remove the centre bearing mounting plate to body securing bolts (1 Fig 2).
Carefully remove the centre mounting plate from above the exhaust.
Remove the propeller shaft from the differential flange and slide rearwards to remove from the vehicle.
Fit a suitable plug to the gearbox rear extension.

Knock down the tab ear of the tab washer securing the rear shaft to universal joint securing bolt, remove the bolt.
Mark the relationship between the front and rear shaft and remove the rear shaft.
Using a suitable press, press the centre bearing from the rear shaft.
Grease the replacement bearing prior to assembly and press the bearing onto the rear shaft, lightly grease the rear spline and align the rear shaft to the universal joint, fit spacer and secure the rear shaft with the bolt ensuring that a new tab washer is used.
Refit the propeller shaft 47.15.01 page 47-04.

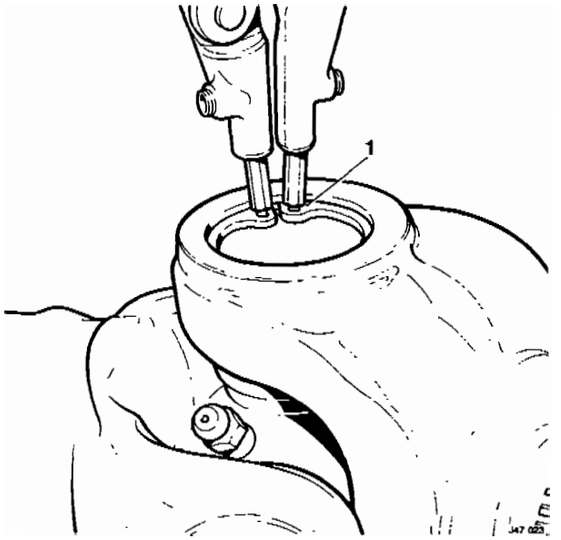


Fig 1

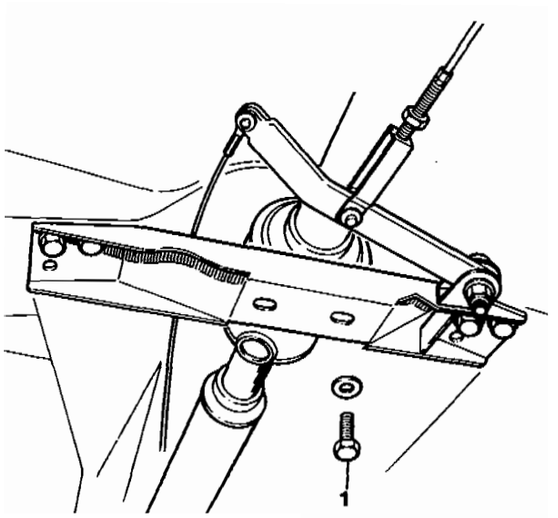


Fig 2

TORQUE FIGURES

Centre bearing to body 22-28Nm
Propeller shaft coupling to axle 95-105Nm
Propeller shaft coupling to transmission (auto only) 95-105Nm
Rear shaft to universal joint 95-105Nm

SPANNER SIZES

13mm
17mm
9/16 AF

DRIVE SHAFT ASSEMBLY

RENEW 47.10.01

Remove the rear road wheel.
Remove the rear caliper lower securing bolt (1 Fig 1) and pivot the caliper (2 Fig 1) upwards.
Remove the outer pad, carefully displace the lockwire securing the pad carrier bolt.
Remove the upper caliper securing bolt and secure the caliper to the bump stop rubber.
Remove the clevis pin securing the handbrake expander to the handbrake cable.
Remove the hub to driveshaft nut.
Fit thread protector JD 1D/7 to the drive shaft thread (Fig 2), fit Service Tool No JD 1D (Fig 3) to the hub, tighten the centre bolt to withdraw the hub.
Pull the handbrake cable from the hub and lower the hub from the drive shaft.
Remove the nuts/bolts securing the shaft to the differential and remove the drive shaft assembly.
Lift the replacement drive shaft into position and secure with the nuts and bolts.
Loctite the hub splines and reposition the hub onto the drive shaft.
Refit the handbrake cable to the hub.
Connect the expander mechanism, fit the clevis.
Reposition the caliper and secure with the bolt.
Fit the outer pad, reposition the lockwire, swing the caliper down over the pads and align the lower bolt hole.
Fit and tighten the securing bolt.
Connect the brake pad wear sensor block connector and reposition the harness to the mounting bracket and secure the harness with a ratchet strap.
Refit the road wheel.

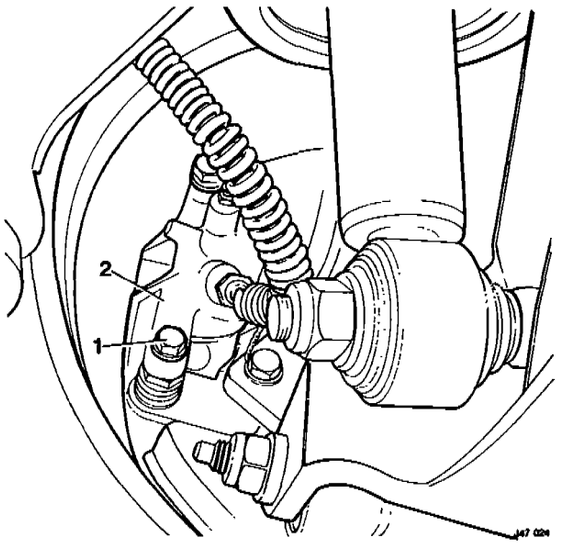


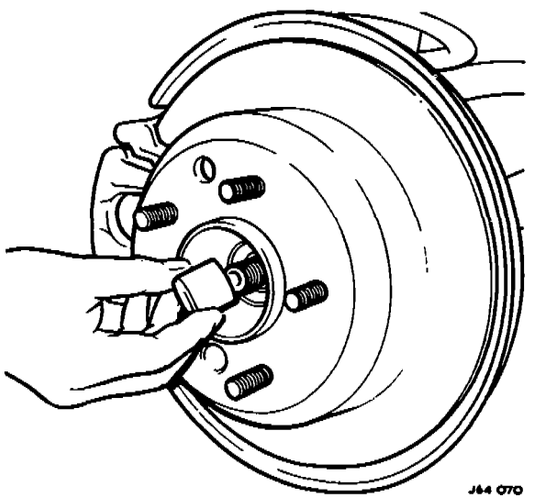
Fig 1

SERVICE TOOLS

JD 1D Hub remover
JD1D/7 Threadprotector

TORQUE FIGURES

Caliper to carrier 31-40Nm
Drive shaft to differential 78-95Nm
Drive shaft to hub 300-320Nm
Wheel nut to wheel stud (steel wheel) 65-85 Nm
Wheel nut to wheel stud (alloy wheel) 88-102 Nm


Fig 2

TOLERANCES

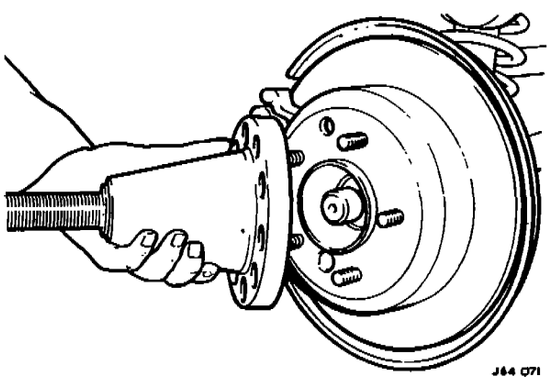
Rear brake disc run out 0.004"
Rear brake disc run out (Parallelism) 0.0005"

OILS/GREASES

Caliper to carrier bolts/guide pins Molykote 111
Hub to drive shaft Loctite

SPANNER SIZES

13mm
22mm
27mm
9/16" AF
5/8" AF
11/16" AF


Fig 3

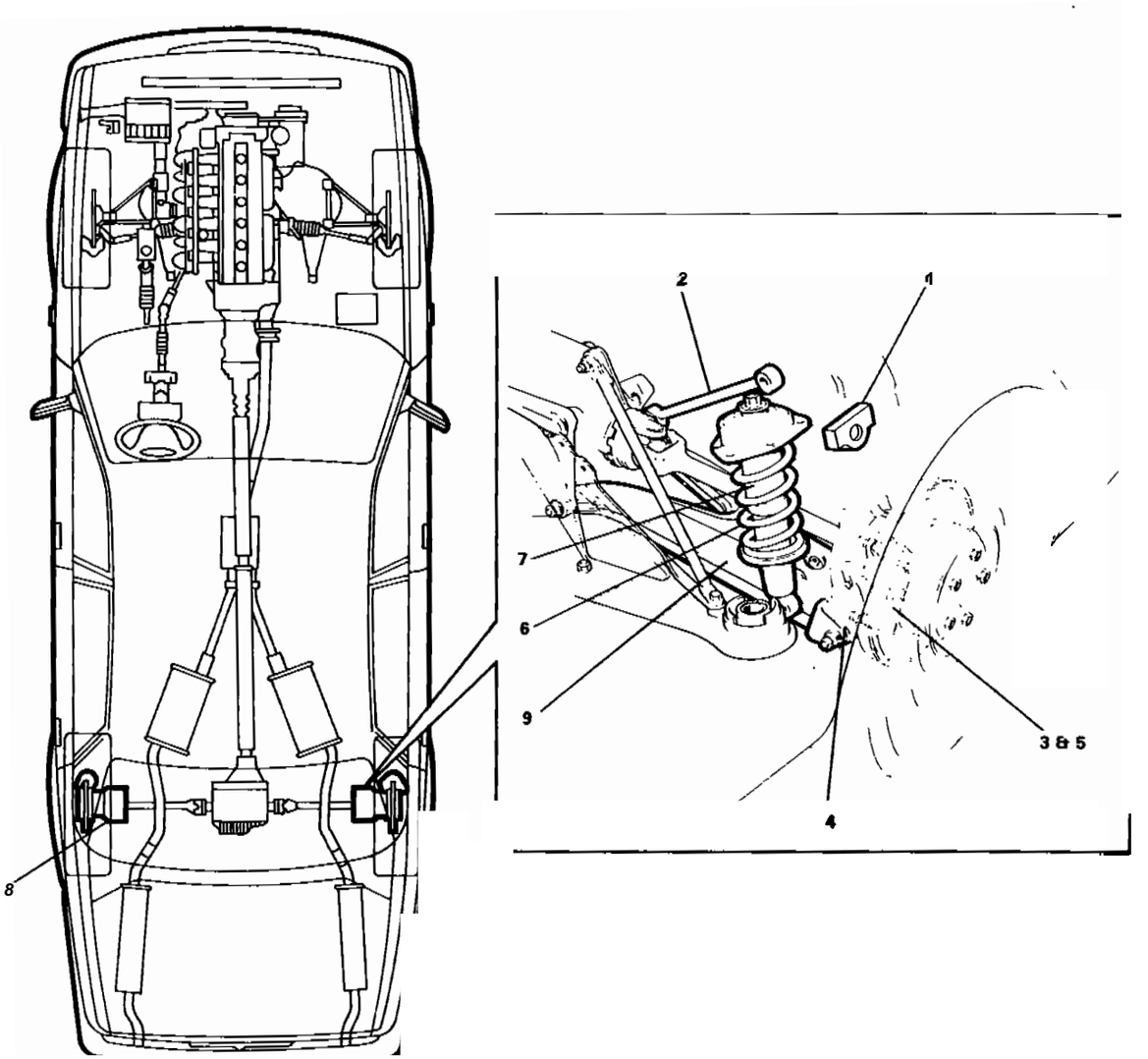
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ILLUSTRATED INDEX



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ILLUSTRATEDINDEX – KEY

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9	WISHBONE	64.35.15	64-07	4

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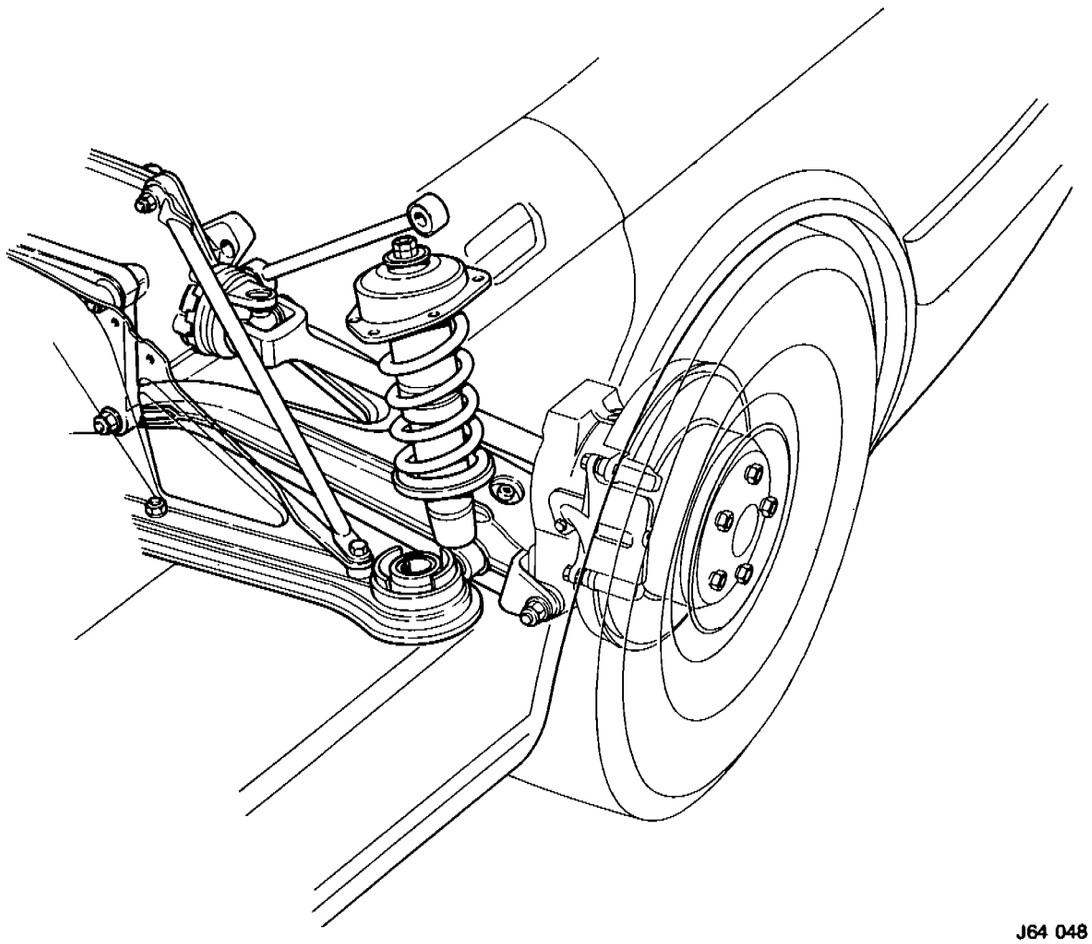
REAR SUSPENSION

DATA **64.00.00**

Camber Angle	0.5 to 1.0°
Wheel Alignment	Parallel to 1.6mm toe in (inclusive)

Measurements to be taken with halfshafts horizontal.

NOTE: Self-levelling rear suspension information is contained in Section 66 – Power Hydraulics.



J64 048

REAR SUSPENSION GENERAL ARRANGEMENT

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REAR ROAD SPRING

RENEW **64.20.01**

Remove the rear road wheel.
Remove the rear caliper lower securing bolt and pivot the caliper upwards for access to the brake pads.
Remove the outer pad, carefully displace the lockwire securing the pad carrier bolt.
Remove the remaining caliper bolt, reposition and secure the caliper assembly to one side.
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Remove the shock absorber lower securing nut and bolt (1 Fig 1).
Remove the shock absorber to body securing bolts (1 Fig 2) – front inner first.
Remove the shock absorber from the vehicle (2 Fig 2).
Using the rear road spring compressor Service tool JD 125, compress the spring sufficiently to enable the cotters to be removed.
Remove the cotters and release the tension on the spring.
Remove the lower collar and plastic spring seat.
Remove the spring and upper plastic spring seat.
Using new plastic spring Seats reverse the removal procedure to refit the replacement spring to the shock absorber.
Note: prior to releasing the tension on the spring ensure that the cotters are fully seated.
Align the caliper with the top bolt hole and secure with the bolt.
Fit the outer pad, reposition the lockwire, swing the caliper down over the pads and align the lower bolt hole.
Fit and tighten the securing bolt.
Tighten the upper securing bolt.
Refit the rear road wheel.

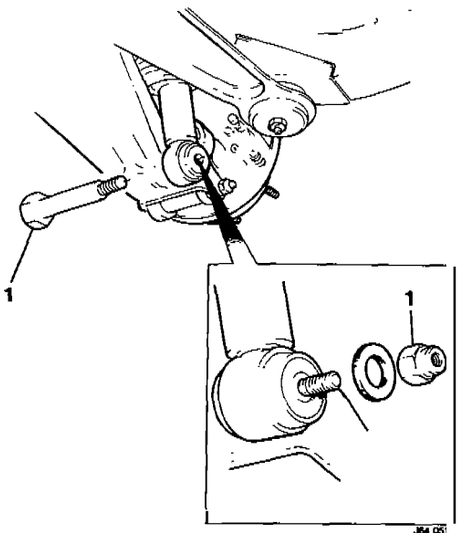


Fig 1

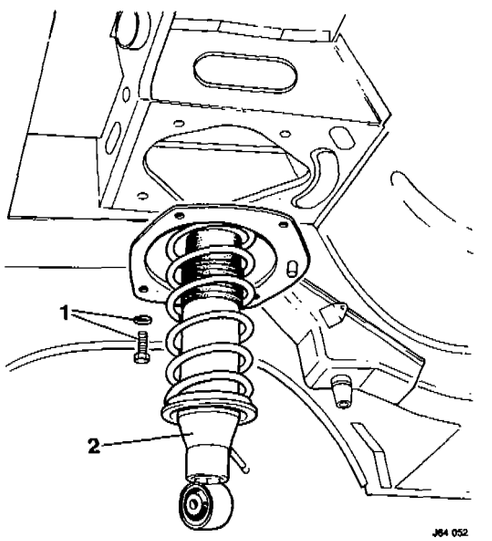


Fig 2

DATA

SERVICE TOOLS

Spring Compressor JD 125

TORQUE FIGURES

Caliper to carrier 31-40Nm
Shock absorber and spring to body 22-28Nm
Shock absorber and spring to wishbone 160-200Nm
Wheelnut to wheelstud (STEEL WHEEL) 65-85Nm
Wheelnut to wheelstud (ALLOY WHEEL) 88-102 Nm

SPANNER SIZES

13mm
17mm
22mm
24mm
30mm

OILS/GREASES

Caliper to carrier bolts/guide pins Molykote 111

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REAR SHOCK ABSORBER

RENEW **64.30.02**

Remove the rear road wheel.
Remove the caliper lower securing bolt and pivot the caliper upwards for access to the brake pads.
Remove the outer pad, carefully displace the lockwire securing the pad carrier bolt.
Remove the remaining caliper bolt, reposition and secure the caliper assembly to one side.
Taking all necessary safety precautions remove the brake dust from around the caliper area.
Remove the shock absorber lower securing nut (1 Fig 1) and bolt (1 Fig 1).
Remove the shock absorber to body securing bolts (1 Fig 2) – front inner first.
Remove the shock absorber from the vehicle.
Using the rear road spring compressor Service tool JD 125, compress the spring sufficiently to enable the cotters to be removed.
Remove the cotters and release the tension on the spring.
Remove the lower collar and plastic spring seat.
Remove the spring and upper plastic spring seat.
Remove the micron ring from the spring pan and the shock absorber to spring pan securing nuts.
Remove the micron buffers and spring pan.
Fit the micron buffers and spring pan to the replacement shock absorber, tighten the spring pan nuts, fit the micron ring to the spring pan.
Using new plastic spring seats reverse the removal procedure to refit the spring to the replacement shock absorber.
Note: prior to releasing the tension on the spring ensure that the cotters are fully seated.
Align the caliper with the top bolt hole and secure with the bolt.
Fit the outer pad, reposition the lockwire, swing the caliper down over the pads and align the lower bolt hole.
Fit and tighten the securing bolt.
Tighten the upper securing bolt.
Refit the road wheel.

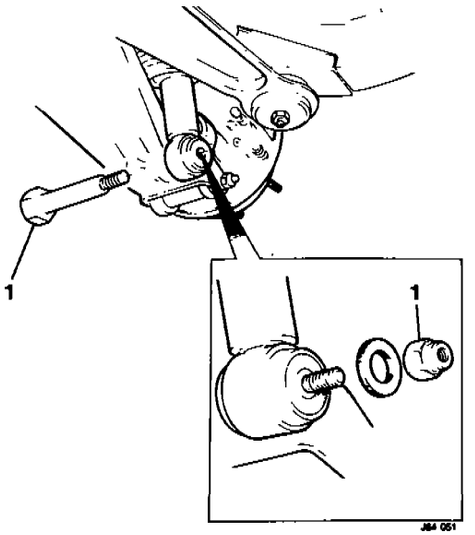


Fig 1

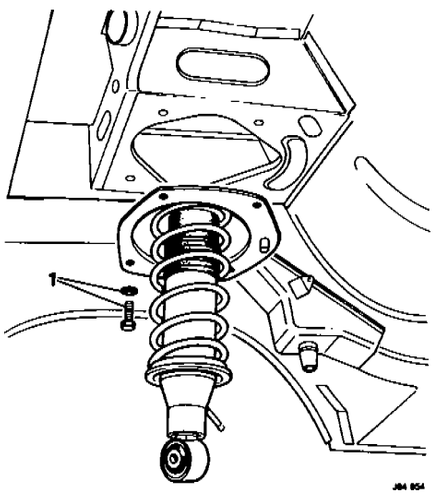


Fig 2

DATA

SERVICE TOOLS

*Spring Compressor JD **125***

TORQUE FIGURES

*Caliper to carrier **31-40Nm***
*Shock absorber and spring **to** body **22-28Nm***
*Shock absorber and spring **to** wishbone **160-200Nm***
*Wheel nut to wheelstud (STEEL WHEEL) 65-85 **Nm***
*Wheelnut **to** wheelstud (ALLOY WHEEL) **88-102Nm***

SPANNER SIZES

13mm
17mm
22mm
24mm
30mm

OILS/GREASES

*caliper to carrier bolts/guide pins **Molykote 111***

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WISHBONE

RENEW **64.35.15**

Remove the road wheel.
Remove the exhaust to the rear suspension mounting bracket securing bolts. Remove the hub carrier fulcrum shaft securing nut.
Displace and remove the fulcrum shaft.
Reposition the drive shaft/hub assembly upwards for access.
Remove the shock absorber lower securing nut/bolt (1 Fig 1).
Cut and remove the harness to the wishbone securing straps (Fig 2).
Take the weight of the suspension on the jack, remove the strut to upper mounting bracket securing bolts.
Lower the suspension to allow removal of the wishbone pivot bolt. Remove the wishbone pivot bolt nut and displace and remove the pivot bolt.
Remove the wishbone, spacer tube and washers. Clean the mating faces and washers toghether with the pivot bolt and fulcrum shaft. Place the new wishbone to the front and grease the pivot bolt. Fit the pivot bolt to the wishbone and enter about 4 .
Fit a washer to the pivot bolt. Fit the wishbone/bolt/washer assembly to the rear carrier, enter the bolt into the carrier bush. Fit the washer. Fit and align the spacer tube.
Reposition the pivot bolt into the spacer tube.
Fit the front washer between the wishbone and the front carrier bush.
Fully seat the pivot bolt. Fit and tighten the wishbone pivot bolt nut, raise the suspension into position. Align the strut bolt holes.
Fit and tighten the strut upper securing bolts. Align the lower shock absorber lower securing nut/bolt.
Grease the hub carrier fulcrum shaft. Release the drive shaft/hub carrier assembly from the secured position. Align the hub carrier fulcrum shaft hole with the wishbone.
Fit and seat the fulcrum shaft. Fit and tighten the fulcrum shaft securing nut and reposition the harness to the wishbone. Secure the harness with new ratchet straps and align the exhaust mounting bracket securing holes.
Fit and tighten the exhaust mounting bracket securing bolts. Refit the road wheel.
Carry out a rear suspension camber angle check.

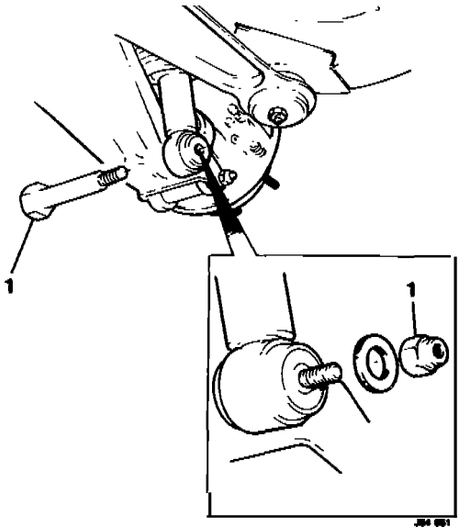
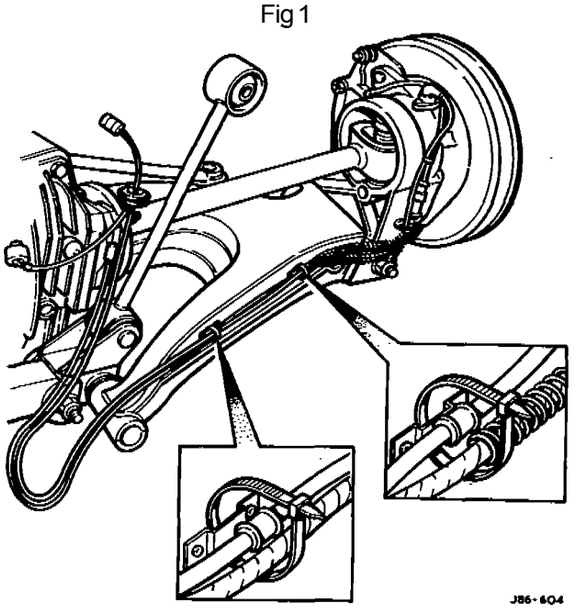


Fig 1


Fig 2

DATA

TORQUE FIGURES

Caliper to carrier ***55-62Nm***
Differential strut ***to*** *upper bracket* ***115-125Nm***
Rear hub ***to*** *half shaft* ***300-320Nm***
Spring and damper to wishbone ***160-200Nm***
Wishbone fulcrum assembly ***63-66Nm*** *(oiled)*
Wishbone to hub carrier pivot ***70-80Nm***

SPANNER SIZES

19mm
22mm
24mm
30mm

REAR HUB CARRIER FULCRUM BEARING

RENEW **64.15.24**

Remove the rear road wheel.
Slacken off but DO NOT REMOVE the drive shaft securing nut.
Displace and remove the handbrake cable to the expander securing clip.
Reposition the cable from the lever.
Cut and remove the caliper securing bolts locking wire.
Cut and remove the brake pad harness to the hub securing clips.
Remove the caliper securing bolts. Reposition the caliper from the disc and secure to the bump stop.
Reposition the disc access hole to the handbrake adjuster and release. Remove the disc securing screw.
Displace and remove the disc.
Remove the fulcrum shaft securing nut.
Finally, remove the drive shaft to the hub securing nut and displace and remove the cone.

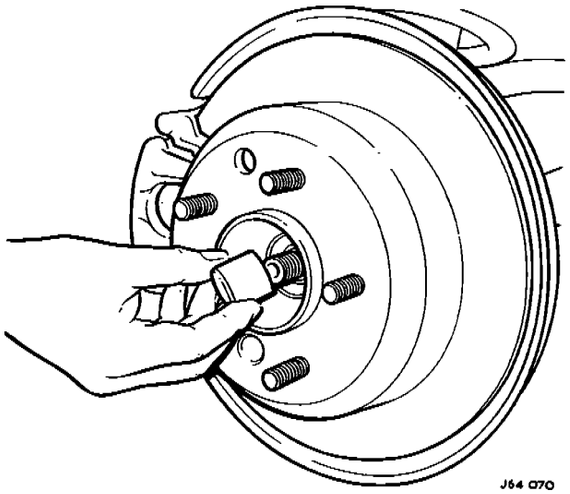


Fig 1

Slacken the tool centre bolt and fit the thread protector to the drive shaft (Fig 1).
Fit and align tool JD 1D to the hub (Fig 2). Fit and tighten the securing nuts. Carefully tighten the centre bolt to withdraw the hub from the drive shaft.
Remove the tool securing nuts. Remove tool JD ID.
Remove the thread protector.
Carefully displace and remove the fulcrum shaft and displace and remove the hub assembly.

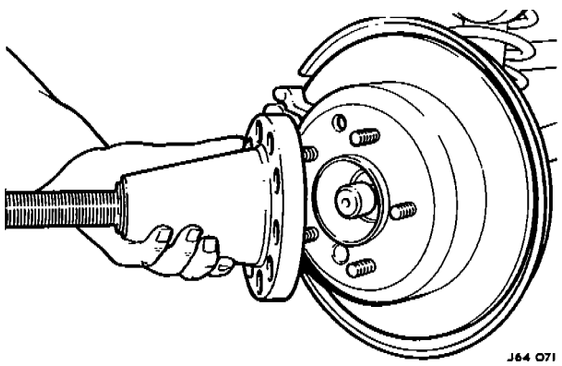


Fig 2

Fit and align the hub assembly to a vice.
Using a suitable drift, displace the fulcrum bearing tube.
Displace and remove the shim and bearing from the tube.
Displace and remove the remaining bearing and shim from the hub carrier.
Fit and align the extractor tool 18G 284 AAH (1 Fig 3) to the fulcrum bearing race.
Tighten the tool cross bolt, ensuring that the tool legs locate behind the bearing race.
Fit and tighten the slide hammer 18G 284 to the tool.
Using a slide hammer displace and remove the bearing race.
Slacken but DO NOT REMOVE the tool cross bolt. Place the bearing race aside.

Repeat the above procedure for the remaining bearing race.
Fit and align extractor tool 18G 284 AAH to the fulcrum bearing race.
Using a slide hammer displace and remove the bearing race.
Slacken but DO NOT REMOVE the tool cross bolt. Place the bearing race aside.
Remove the slide hammer from the tool, place slide hammer and tool aside and open the vice. Remove the hub assembly and clean hub carrier fulcrum bearing faces.
Clean the cross shaft and tube.
Position the hub assembly to the press.
Fit and seat the bearing race replacer tool JD 550-6 to 18G 134 handle.

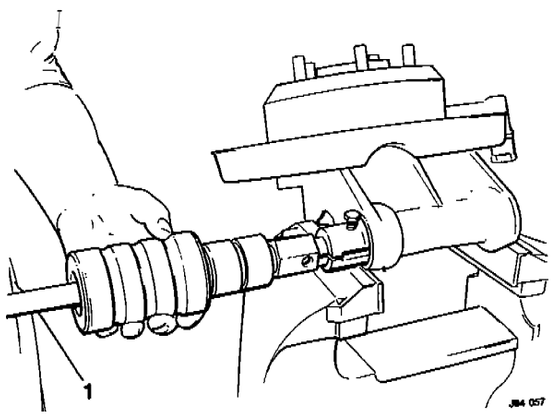


Fig 3

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Fit a new bearing race to the replacer tool. Fit and align the tool/race to the hub assembly and using a press fully seat bearing race to the hub (Fig 1). Remove the replacer tool. Reposition the hub assembly in the press.
Fit the new bearing race to the replacer tool. Fit and align the tool/race to the hub assembly. Using the press, fully seat the bearing race to the hub.
Fit and align the hub assembly to the vice and tighten.
Apply grease to the bearings and fit new bearing to the fulcrum tube.
Fit minimum thickness of shim to the fulcrum tube/bearing. Fit and align tube/bearing assembly to the hub carrier.
Fit and align the remaining bearing to the tube/hub. Fit and align the fulcrum shaft. Fit and fully seat the remaining shim to the tube. Fit a suitable piece of tube to seat onto the shim.
Fit and tighten the cross shaft securing nut to fully seat shim onto the cross tube. Remove the shaft securing nut. Remove the tube. Fit a suitable flat washer to the shaft, fit and tighten the shaft securing nut.
Using feelers, measure and note the gap between the shim and the washer. Remove the shaft securing nut. Remove the washer and displace the cross shaft.
Using suitable drift displace the cross tube from the shims. Retrieve shims and measure, placing aside.
Select new shims and measure. NOTE–equal size shims to be used to give 0.003 pre-load. Fit new shims to the cross tube. Fit and align the cross shaft. Fit and align suitable tube. Tighten the shaft securing nut to fully seat shims onto cross tube. Undo and remove the nut – remove tube. Carefully displace the cross shaft from the tube. Open the vice, removing the hub assembly. Reverse the remaining removal procedure to refit.

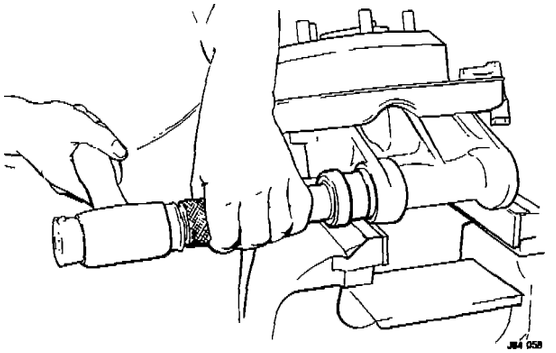


Fig 1

DATA

SERVICE TOOLS

JD 1D Hub remover
JD 550-6 Bearing race replacer
18G134 Driver handle
186284 Impulse extractor
18G284 AAH Bearing track remover

TORQUE FIGURES

Brake disc to hub 11-16Nm
Caliper to carrier 55-62Mm
Fulcrum shaft nut 70-80Nm
Half shaft to hub 300-320Nm
Wheelnut to wheelstud (STEEL WHEEL) 65-85Nm
Wheelnut to wheelstud (ALLOY WHEEL) 88-102 Nm

SPANNER SIZES

15mm
22mm
27mm

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REAR HUB OIL SEAL

RENEW **64.15.15**

Remove the rear road wheel.
Slacken off but DO NOT REMOVE the drive shaft securing nut.
Displace and remove the handbrake cable to the expander securing clip.
Reposition the cable from the lever.
Cut and remove the caliper securing bolts locking wire.
Cut and remove the brake pad harness to the hub securing clips (Fig 1).
Remove the caliper securing bolts. Reposition the caliper from the disc and secure to the **bump** stop.
Reposition the disc access hole to the handbrake adjuster and release.
Remove the disc securing screw. Displace and remove the disc.
Remove the fulcrum shaft securing nut.
Finally, remove the drive shaft to the hub securing nut and displace and remove the cone.

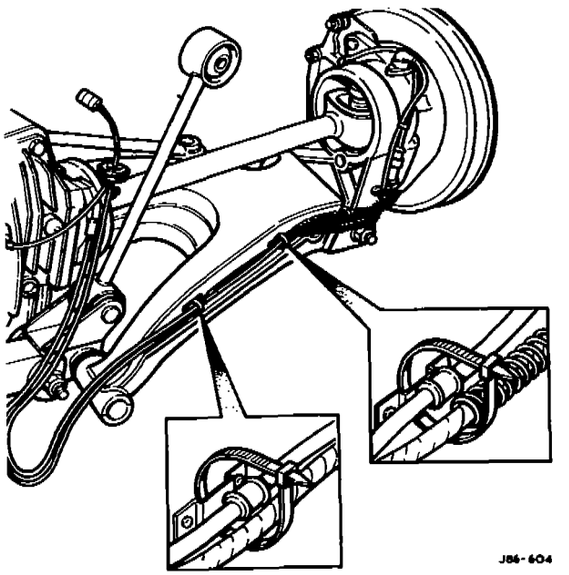


Fig 1

Slacken the tool centre bolt and fit the thread protector to the drive shaft (Fig 2).
Fit and align tool JD 1D to the hub (Fig 3). Fit and tighten the securing nuts.
Carefully tighten the centre bolt to withdraw the hub from the drive shaft.
Remove the tool securing nuts. Remove tool JD 1D.
Remove the thread protector.
Carefully displace and remove the fulcrum shaft and displace and remove the hub assembly.

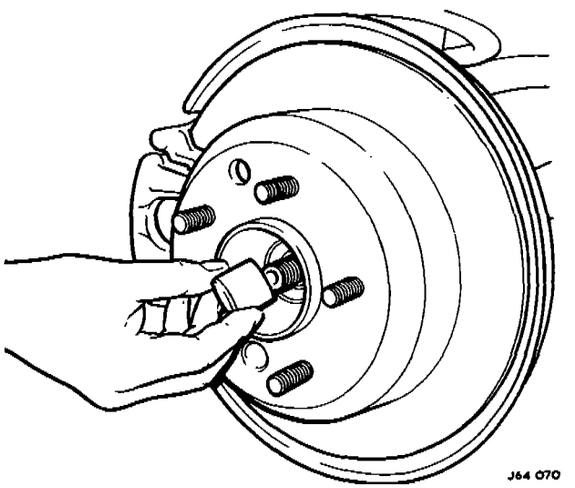


Fig 2

Clean the drive shaft spline and faces. Place hub tool JD 132-1 (I Fig 1 page 11) to the press. Fit and align the hub assembly to the tool/press, ensuring the hand brake expander locates into the tool cut out.
Fit and align the button JD 132-2 **(1** Fig 2 page **11)** to the hub assembly.
Using a press, displace and remove hub from the carrier.
Displace and remove the hub carrier, inner bearing and collar from the press. Displace and remove the tool button JD 132-2.
Remove the hub from the press/tool JD 132-1.
Place hub tool JD 132-1 aside, and using a suitable drift displace and remove outer hub seal and bearing.
Reposition the hub carrier on the bench. Using suitable drift, displace and remove inner bearing and seal.
Clean the hub carrier and bearings. Clean the hub.
Clean the collar and sleeve.

Lubricate the bearings with Shell Retinax 'A'
11.5 cc inner bearing cone.
9.0 cc outer bearing cone.
Fit and align the outer bearing to the hub assembly.
Fit and seat the new outer seal to the hub carrier. Fit and align the hub to the carrier assembly. Reposition the hub/carrier assembly on the bench.
Fit the inner sleeve. Fit and align the shim to the hub.

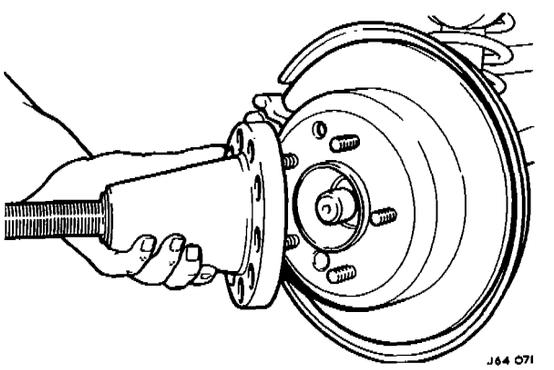


Fig 3

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Fit and align the outer bearing.
Fit and fully seat the new inner seal to the hub assembly.
Fit the collar to the hub. **Place** the **block** of wood to the press and fit and align the hub assembly to the press/ wood block. Ensure that the hub does not rest on the wheel studs. Using the **press,** fully seat the collar to the hub assembly. Fit **and** align the hub assembly to the vehicle lower wishbone.
Reverse the remaining removal procedure to refit.

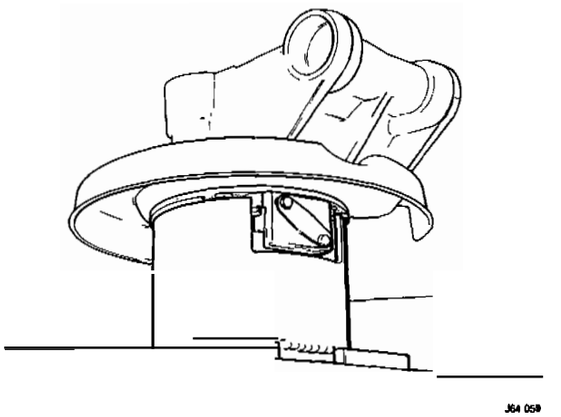


Fig 1

DATA

SERVICE TOOLS

JD 1D Hub remover
JD 132-1 Hub press tool
JD 132-1 Hub press tool button

TORQUE FIGURES

Brake disc to hub 11-16Nm
Caliper to carrier 55-62Nm
Fulcrum shaft nut 70-80Nm
Half shaft to hub 300-320Nm
Wheel nut to wheel stud (STEEL WHEEL) 65-85Nm
Wheel nut to wheelstud (ALLOY WHEEL) 88-102 Nm

SPANNER SIZES

15mm
22mm
27mm

OILS/GREASES/SEALANTS

Hub bearings Shell Retinax 'A'
11.5 cc inner bearing cone.
9.0cc outer bearing cone.

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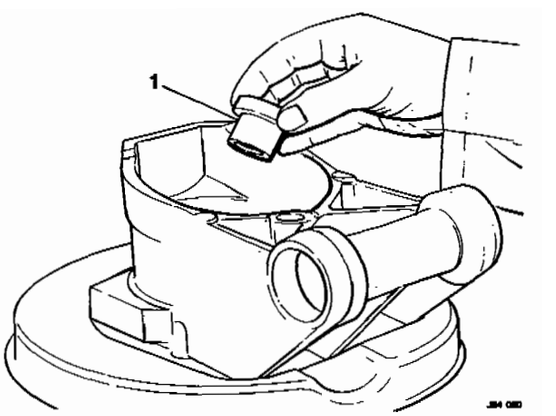
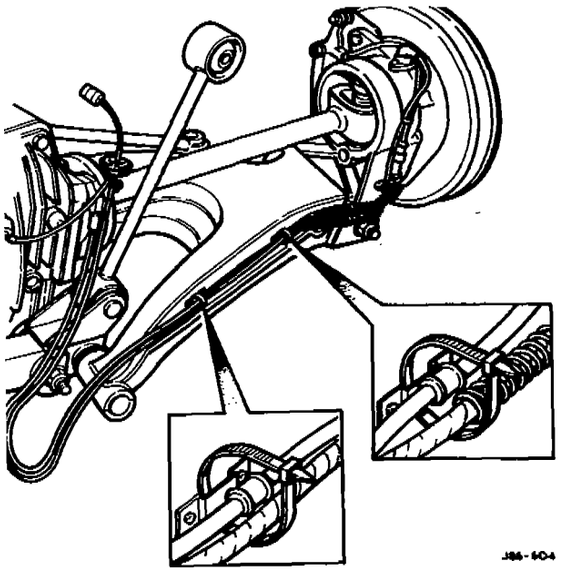


Fig 2

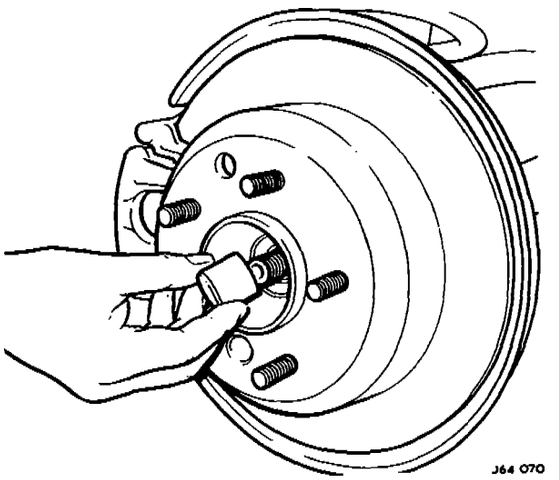
REAR HUB BEARING

RENEW 64.15.14

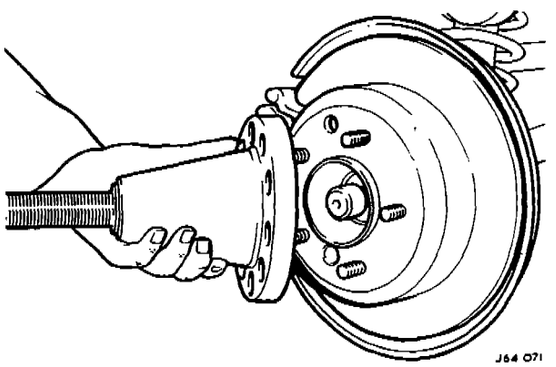
Remove the rear road wheel.
Slacken off but DO NOT REMOVE the drive shaft securing nut.
Displace and remove the handbrake cable to the expander securing clip.
Reposition the cable from the lever.
Cut and remove the caliper securing bolts locking wire.
Cut and remove the brake pad harness to the hub securing clips (Fig 1).
Remove the caliper securing bolts. Reposition the caliper from the disc and secure to the bump stop.
Reposition the disc access hole to the handbrake adjuster and release.
Remove the disc securing screw. Displace and remove the disc.
Remove the fulcrum shaft securing nut.
Finally, remove the drive shaft to the hub securing nut and displace and remove the cone.


Fig 1

Slacken the tool centre bolt and fit the thread protector to the drive shaft (Fig 2).
Fit and align tool JD 1D to the hub (Fig 3). Fit and tighten the securing nuts.
Carefully tighten the centre bolt to withdraw the hub from the drive shaft.
Remove the tool securing nuts. Remove tool JD 1D.
Remove the thread protector.
Carefully displace and remove the fulcrum shaft and displace and remove the hub assembly.


Fig 2

Clean the drive shaft spline and faces. Place hub tool JD 132-1 (1 Fig 1 page 13) to the press. Fit and align the hub assembly to the tool/press, ensuring the hand brake expander locates into the tool cut out.
Fit and align the button JD 132-2 (1 Fig 2 page 13) to the hub assembly.
Using a press, displace and remove hub from the carrier.
Displace and remove the hub carrier, inner bearing and collar from the press. Displace and remove the tool button JD 132-2.
Remove the hub from the press/tool JD 132-1.
Place hub tool JD 132-1 aside, and using a suitable drift displace and remove outer hub seal and bearing.
Reposition the hub carrier on the bench. Using suitable drift, displace and remove inner bearing and seal.
Using a suitable drift, displace and remove the inner and outer bearing races.
Clean all components.


Fig 3

Using Service Tool JD 550-4/2 and 18G 134, fit new races to the hub.
Fit and align the new outer bearing to the hub.
Fit the sleeve. Fit the largest shim (0.131") to the hub.
Fit and align the new inner bearing to the hub.
Fit and align the collar to the inner hub.
Check the hub end float, using JD 15 and JD 13A tool and gauge.
NOTE: JD 15 is used only as a measurement base, and does not need to be fitted to the vehicle.

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Dismantle the hub/bearing assembly. Lubricate the bearings with Shell Retinax 'A'
11.5 cc inner bearing cone.
9.0 cc outer bearing cone.
Fit and align the outer bearing to the hub assembly.
Fit and seat the new outer seal to the hub carrier. Fit and align the hub to the carrier assembly. Reposition the hub/carrier assembly on the bench.
Fit the inner sleeve. Fit and align the shim to the hub.

Fit and align the outer bearing.
Fit and fully seat the new inner seal to the hub assembly.
Fit the collar to the hub. Place the block of wood to the press and fit and align the hub assembly to the press/ wood block. Ensure that the hub does not rest on the wheel studs. Using the press, fully seat the collar to the hub assembly. Fit and align the hub assembly to the vehicle lower wishbone.
Reverse the remaining removal procedure to refit.

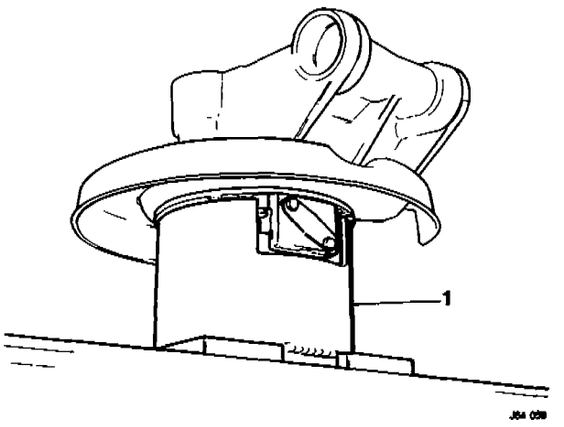


Fig 1

DATA

SERVICE TOOLS

JD 1D *Hub remover*
JD 132-1 *Hub press tool*
JD 132-1 *Hub pres tool button*

TORQUE FIGURES

Brake disc to hub I I - ***16Nm***
Caliper ***to*** *carrier 55-62Nm*
Fulcrum shaft nut ***70-80 ""***
Half shaft ***to*** *hub* ***300-320Nm***
Wheel nut to wheelstud (STEEL WHEEL) 65-85 ***Nm***
Wheel nut ***to*** *wheelstud (ALLOY WHEEL) 88-102* ***Nm***

SPANNER SIZES

15mm
22mm
27mm

OILS/GREASES/SEALANTS

Hub bearings Shell Retinax 'A'
I I. 5 cc inner bearing cone.
9.0 cc outer bearing cone.

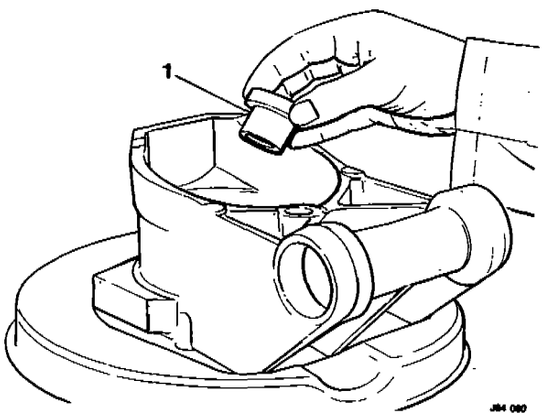


Fig 2

0191G

DIFFERENTIAL STRUT

RENEW 64.25.08

Remove the rear road wheel.
Remove the exhaust to rear suspension mounting bracket securing bolts.
Cut and remove the harness to the strut securing ratchet strap.
Take the weight of the suspension on the jack.
Remove the strut to upper mounting bracket securing bolt (Fig 1).
Remove the relevant strut lower securing nut (Fig 2).
Carefully lower the rear of the suspension to allow for removal of the strut lower securing bolt.
Finally remove the lower securing bolt, and displace and remove the strut.

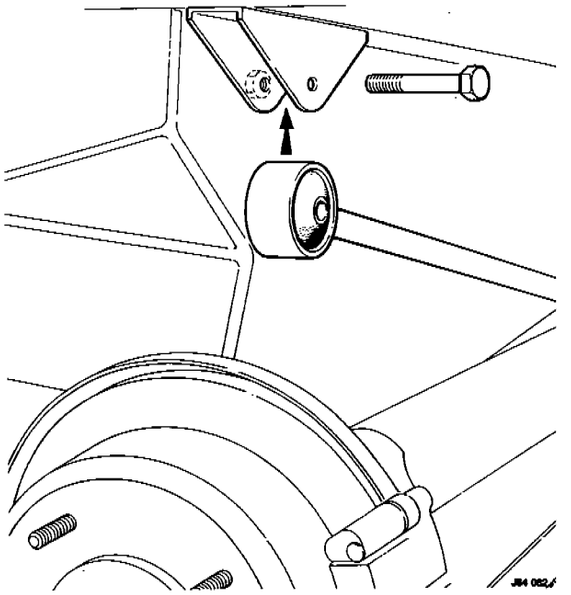


Fig 1

Fit and seat the new strut to the mounting position, fitting and seating lower bolt.
Raise the jack to align the upper strut securing bolt holes.
Aligh the strut upper securing bolt holes.
Fit and tighten the strut upper securing bolts.
Finally tighten the strut lower securing nut/bolt.
Lower and remove the jack from the suspension. Align the exhaust brackets to the rear suspension.
Fit and tighten the exhaust bracket securing bolts.
Reposition the harness to the strut. Secure the harness with the ratchet strap. Refit the road wheel.

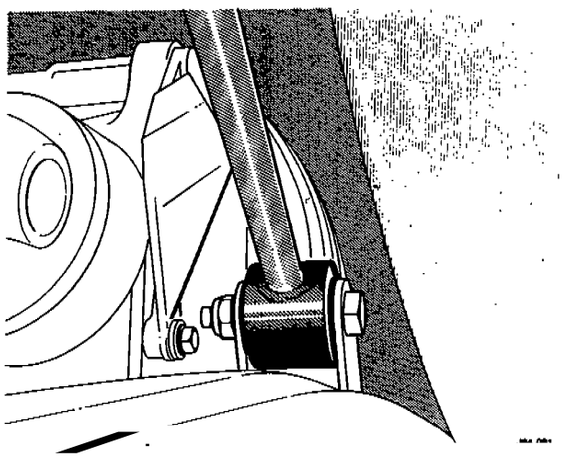


Fig 2

DATA

TORQUE FIGURES

Differential strut to lower mounting ***85-105Nm***
Differential strut to upper mounting ***115-125Nm***
Differential strut upper mounting to body ***45-55Nm***
Exhaust mounting to rear suspension ***22-28Nm***
Wheel nut to wheel stud (STEEL WHEEL) ***65-85Nm***
Wheel nut to wheel stud (ALLOY WHEEL) ***88-102Nm***

SPANNER SIZES

10mm
19mm
22mm

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BUMP STOP

RENEW 64.30.15

Remove the rear road wheel.
Remove the bump stop securing bolts (1 Fig 1). Displace and remove the bump stop (2 Fig 1).

Fit and align the new bump stop. Fit and tighten the securing bolts.
Refit the road wheel and lower the vehicle from the stand.

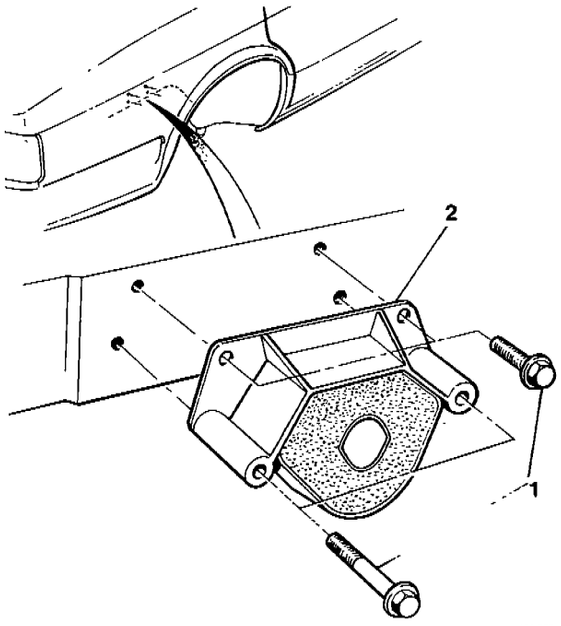


Fig 1

DATA

TORQUE FIGURES

Bump stop to body 27-33Nm
Wheel nut to wheel stud (STEEL WHEEL) 65-85 Nm
Wheel nut to wheel stud (ALLOY WHEEL) 88-102 Nm

SPANNER SIZES

13mm
22mm

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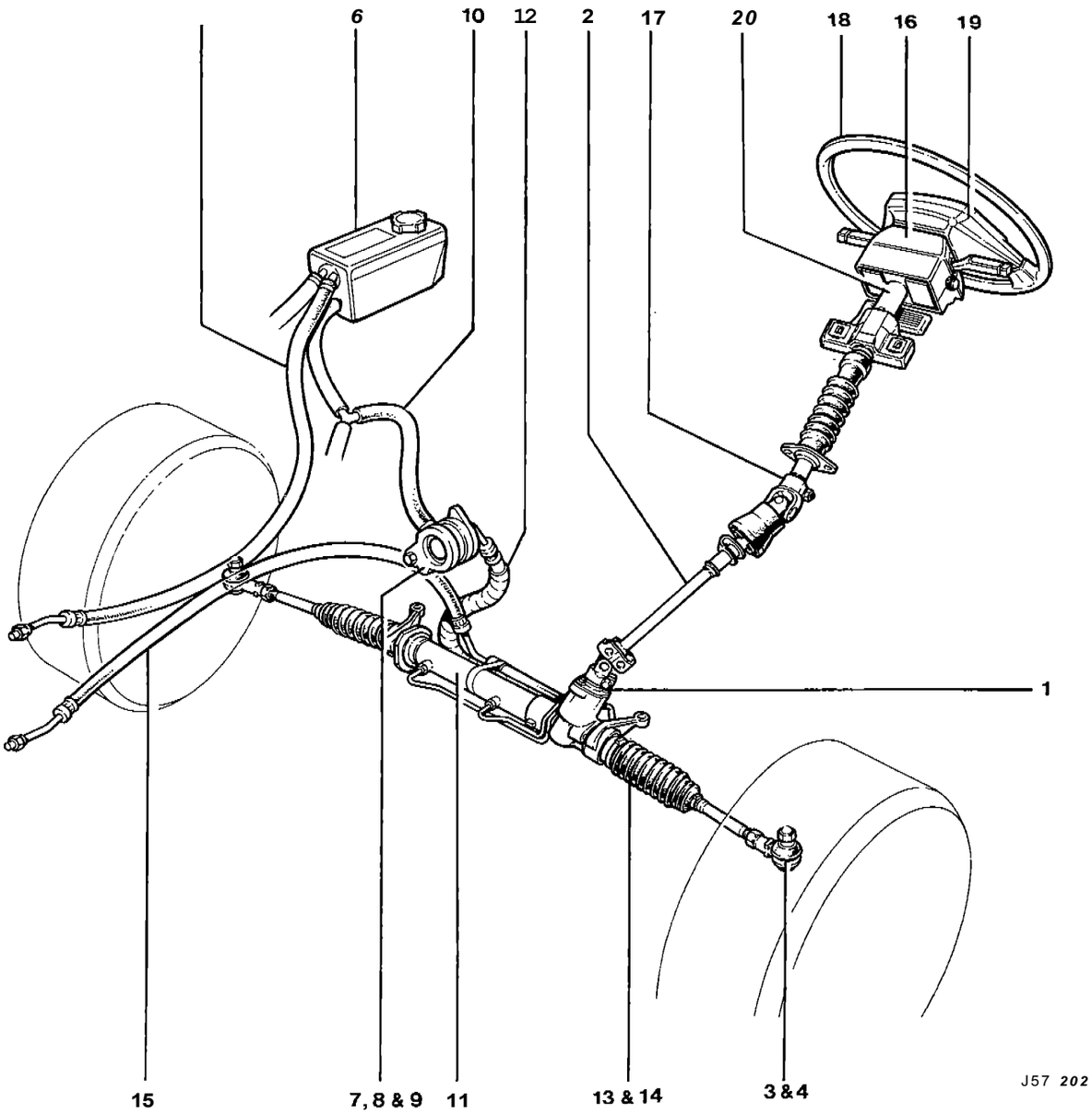
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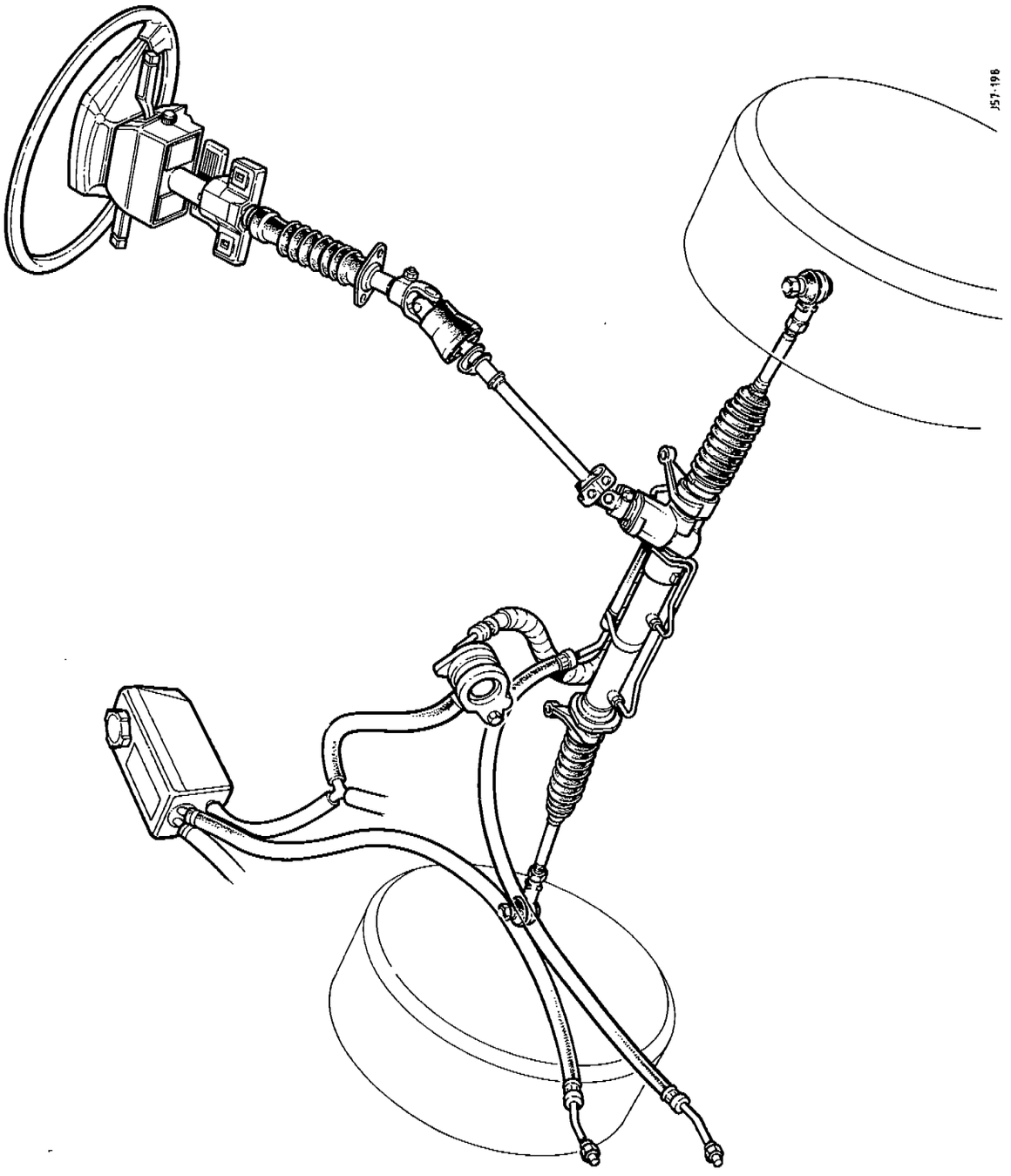
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STEERING ARRANGEMENT



J57-198

Fig 1

STEERING GEOMETRY

DATA **57.00.00**

CAMBER ANGLE **0 to 4.5"**

CASTOR ANGLE **3.5** to **4.5"**

WHEEL **ALIGNMENT** 0.8mm toe in +-0.8mm

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

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STEERING WHEEL

RENEW **57.60.01**

Open the doors.
Centralise the road wheels and remove the ignition key.
Remove the pad from the centre of the steering wheel.
Slacken the nut (1 Fig 1) securing the wheel to the shaft, do not fully remove.
Pull steering wheel (2 Fig 1) to release from the shaft, remove the securing nut and steering wheel.
Remove the cancelation boss securing screws and remove the boss.
Remove the split collars (3 Fig 1) from the steering column.
Apply grease to the split collars and fit to the steering shaft.
Ensuring that the steering wheel is in the straight ahead position fit to the shaft.
Fit and tighten the securing nut.
Refit the steering wheel pad.
Close the door.

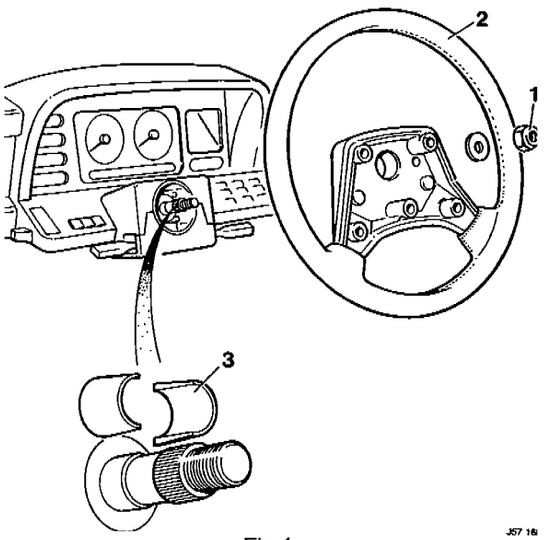


Fig 1

DATA

TORQUE FIGURES

Steering wheel to steering shaft 35-45Nm

SPANNER SIZES

24mm

OILS/GREASES

Split collars to shaft Castrol LM Grease.

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STEERING WHEEL PAD

RENEW *57.60.03*

Open the door.
Remove the steering wheel centre pad (**1** Fig **1**).
Remove the motif (2 Fig **1**) from the centre of the pad.
Discard the pad.
Fit the motif to the replacement pad.
Fit the pad assembly to the steering wheel.
Close the **door.**

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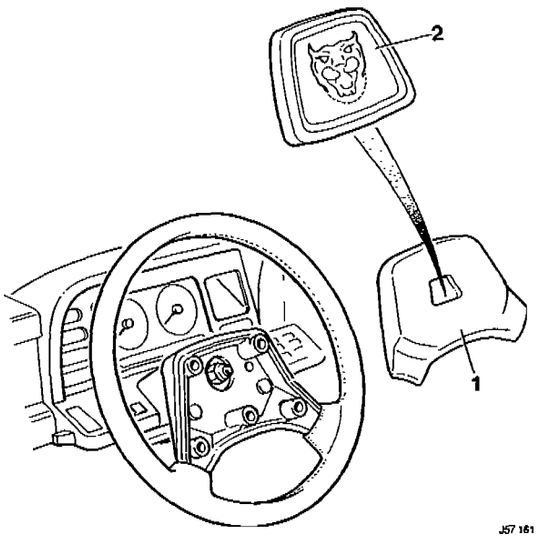


Fig **1**

UPPER STEERING COLUMN

RENEW **57.40.02**

Open the door.
Centralise the road wheels and remove the ignition key.
Remove the pad from the centre of the road wheel.
Slacken the nut securing the wheel to the shaft, **do** not fully remove.
Pull steering wheel to release from the shaft, remove the securing nut and steering wheel.
Remove the cancelation boss securing Screws and remove the boss.
Remove the screws securing the dash liner and release the liner securing clip.
Remove the dash liner.
Disconnect the steering column switch assembly **block** connector.
Remove the nut and **bolt** (1 Fig 2) securing the universal joint (2 Fig 2) to the upper column **(3** Fig 2).
Remove the bolts **(4** Fig 2) securing the steering column lower bearing (5 Fig 2) to the bracket (6 Fig **2).**
Remove the nuts (7 Fig 2) securing the steering column to the upper mounting *(8* Fig **2),** remove the safety bracket and carefully lower the column.
Note and collect the steering column spacing washers and remove the upper column from the vehicle.
Remove the instrument illumination rheostat knob and the screws securing the lower nacelle, remove the nacelle.
Remove the screws securing the upper nacelle and remove the nacelle.
Slacken the screw securing the self cancelling collar clamp and remove the clamp.
Using a suitable punch remove the steering column lock bolts and remove the column lock/switch assembly from the column.
Remove the nut securing the adjustment clamp and remove the clamp.
Remove the cam plate and locating bracket.

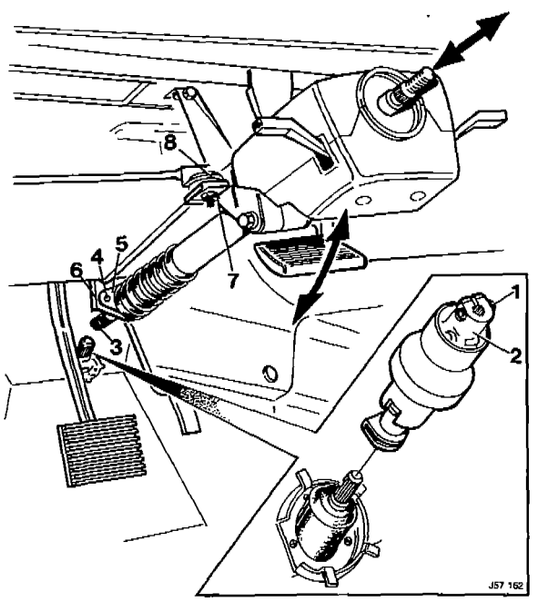


Fig 2

Reverse the removal procedure to reassemble the steering column ensuring that new steering lock securing bolts are fitted.
Lift the dash liner into position engage the clip and secure with the screws.
Note: align the footwell heater duct prior to securing the liner with the screws.
Ensuring that the steering wheel is in the straight ahead position fit to the shaft.
Fit and tighten the securing nut.
Refit the steering wheel pad.
Close the door.

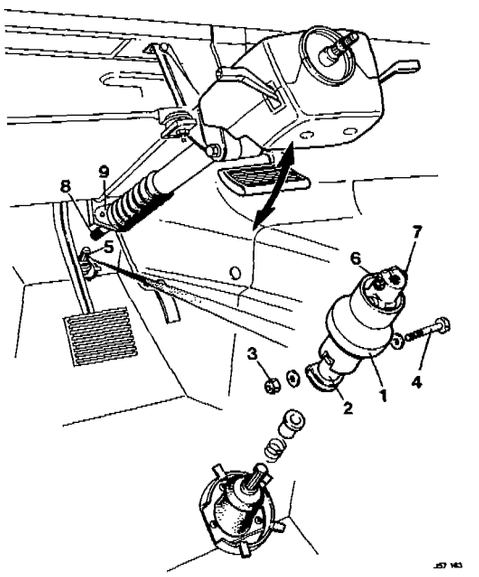


Fig 1

DATA

TORQUE FIGURES

Lower column to bracket 20-22Nm
Lower column to upper column 20-22Nm
Nacelle lower 2-3Nm
Nacelle upper 2-3Nm
Steering wheel to steering shaft 35-45Nm
Upper support bracket-upper mounting bracket 20-22Nm

SPANNER SIZES

13mm
24mm

0188G

STEERING COLUMN UNIVERSAL JOINT

RENEW **57.40.25**

Open the doors.
Centralise the steering wheel and remove the ignition key.
Slide the plastic shroud **(1** Fig **1)** back covering the lower universal joint (2 Fig **1)**.
Remove the nut (3 Fig 1) and **bolt (4** Fig 1) securing the universal joint to the lower column (5 Fig 1).
Remove the nut (6 Fig 1) and bolt (7 Fig **1)** securing the universal joint to the upper column ***(8*** Fig **1**).
Remove the bolts (9 Fig 1) securing the upper column lower bearing.
Reposition the inner column to disconnect it **from** the universal joint.
Remove the universal joint assembly.
Remove the shroud from the joint.
Fir the shroud to the replacement universal joint.
Fit and align the universal joint to the lower steering column.
Fit but do not tighten the securing bolt and nut.

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Fit the universal joint to the upper column and fit but do not tighten the securing bolt and nut.
Align the lower bearing to the bracket and fit the securing bolts.
Tighten the universal joint to the column nuts and bolts.
Slide the plastic shroud back over the universal joint and close the bonnet.

DATA

TORQUE FIGURES

Lower column to bracket 20-22Nm
lower ***column to universal joint 20-22Nm***

SPANNER SIZES

13mm

0188G

STEERING COLUMN LOCK

RENEW **57.40.28**

Open the door.
Centralise the road wheels and remove the ignition key.
Remove the pad from the centre of the road wheel.
Slacken the nut securing the wheel to the shaft, do not fully remove.
Pull steering wheel to release from the shaft, remove the securing nut and steering wheel.
Remove the cancelation boss securing screws and remove the boss.
Remove the instrument illumination rheostat knob (1 Fig 1) and the screws securing the lower nacelle (2 Fig 1), remove the nacelle.
Remove the screws securing the upper nacelle (3 Fig 1) and remove the nacelle.
Using a suitable punch remove the steering column lock bolts and remove the column lock/switch assembly from the column.
Release the ignition switch retaining tags.
Remove the ratchet strap securing the harness.

Disconnect the switch harness multi plug and discard the lock.
Reverse the removal procedure to reassemble/fit the steering lock assembly and steering column ensuring that new steering lock securing bolts are fitted.
Lift the dash liner into position engage the clip and secure with the screws.
Note: align the footwell heater duct prior to securing the liner with the screws.
Ensuring that the steering wheel is in the straight ahead position fit to the shaft.
Fit and tighten the securing nut.
Refit the steering wheel pad.
Close the door.

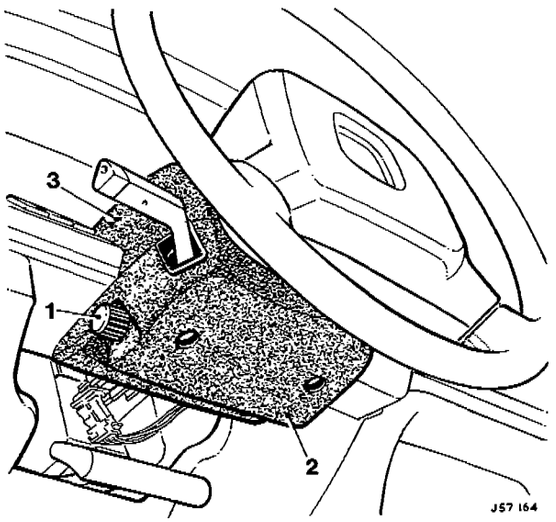


Fig 1

DATA

TORQUE FIGURES

Lower column to bracket 20-22Nm
Lower column to upper column 20-22Nm
Nacelle lower 2-3Nm
Nacelle upper 2-3Nm
Steering wheel to steering shaft 35-45Nm
Upper support bracket-upper mounting bracket 20-22Nm

SPANNER SIZES

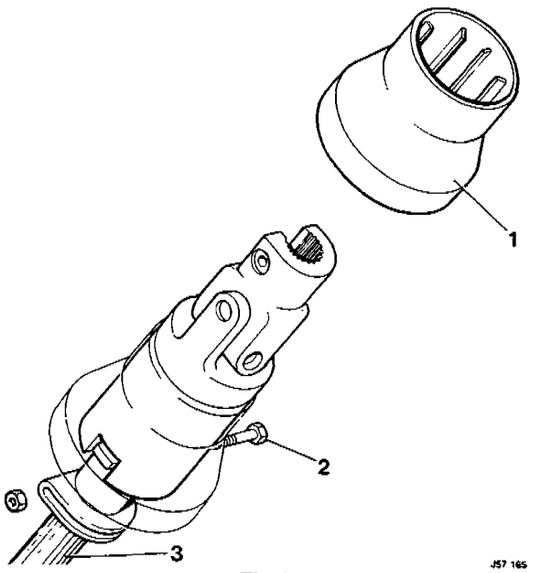
13mm
24mm

0308b

LOWER STEERING COLUMN

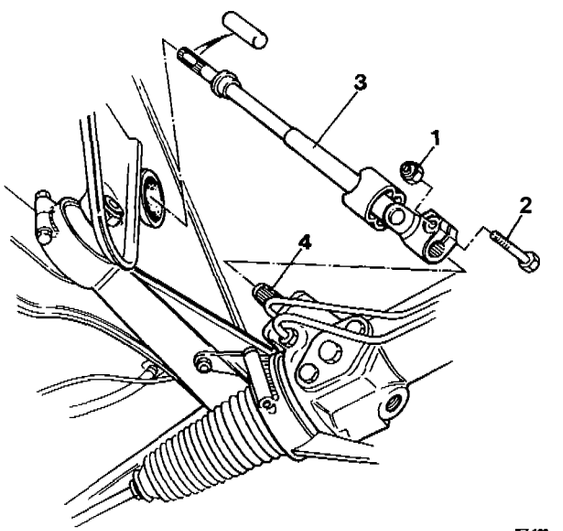
RENEW 57.40.05

Open the doors.
Centralise the steering wheel and remove the ignition key.
Slide the plastic shroud back (1 Fig 1) covering the lower universaljoint.
Remove the nut and bolt (2 Fig 1) securing the universal joint to the lower column (3 Fig 1).
Open the bonnet.
Remove the nut (1 Fig 2) and bolt (2 Fig 2) securing the lower column (3 Fig 2) to the steering rack pinion (4 Fig 2), note the position of the clamp hole and remove the lower column assembly.
Remove the plastic collar and recover the spring and further plastic collar from inside the vehicle.
Fit the plastic collar to the lower Steering column, position the assembly through the floor and then fit to the steering rack pinion, ensuring that the clamping bolt holes line up.



J57 165

Fig 1



J57 166

Fig 2

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Fit and tighten the nut and bolt securing the lower column to the steering rack pinion.
From inside the vehicle fit the spring and plastic collar to the lower shaft, Remove the bolts securing the upper column lower bearing.
Connect the universal joint to the lower column, fit the nut and bolt but do not tighten.
Align the lower bearing to the bracket and fit the securing bolts.
Tighten the universal joint to the lower column nut and bolt.
Slide the plastic shroud back over the universal joint, reposition the outer plastic collar and close the bonnet.

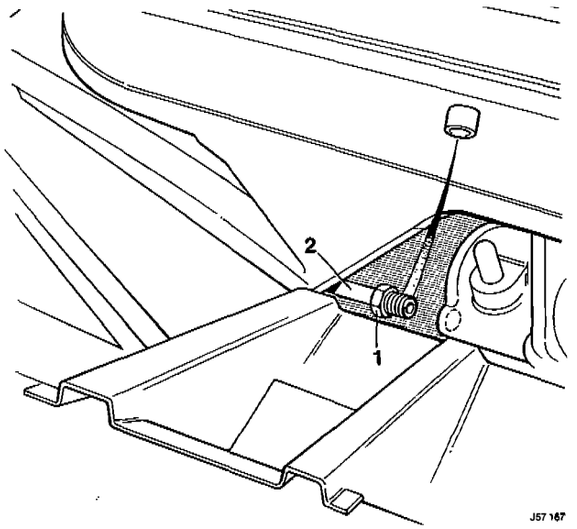


Fig 1

DATA

TORQUE FIGURES

Lower column to bracket 20-22Nm
Lower column to upper column 20-22Nm
Lower column to steering rack 19-24Nm

SPANNER SIZES

13mm

0188G

POWER STEERING PUMP

RENEW **57.20.14**

Open the bonnet.
Place a suitable drain tray in position and slacken the clip securing the reservoir hose to the pump.
Disconnect the hose from the pump.
Fit a plug to the hose.
Slacken the union (1 Fig 1) securing the rack feed hose (2 Fig 1) to the pump and disconnect the hose.

Allow the pump and hose to drain.
Discard the 'O' ring and fit a suitable plug to the hose.
Remove the bolts (1 Fig 2) securing the pump assembly to the engine and remove the pump assembly.
Remove the drive coupling (2 Fig 2) from the pump.
Fit Service Tool JD 119 to a vice.
Using Service Tool 18G 1445 fit but do not tighten the nut and bolt to JD 119 (nut hexagon under tool with body of nut through the tool).
Fit but do not tighten the clamp bolts to the drive dog, assemble the pump to the tool and engage the clamp bolts in the slots of Service Tool JD **119.**

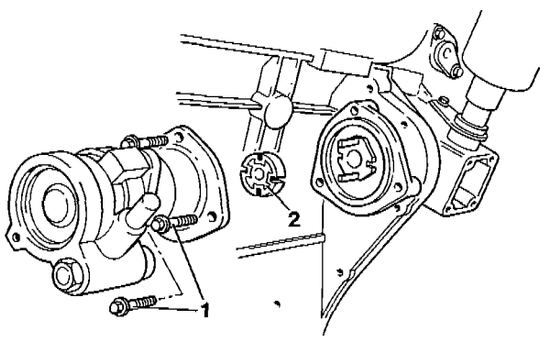


Fig 2

Finally tighten the clamp bolts and nuts.
Using the Service Tool press the pump from the drive dog.
Remove the assembly from the vice.
Remove the clamp bolts/nuts and the tool bolt from the pump.
Remove the drive dog from the tool.
Remove the bolts securing the pump to the mounting, and remove the casing from the pump.
Reverse the removal procedure to refit the pump.
Top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

DATA

SERVICE TOOLS

JD 119 Power steering pump drive dog remover/ adaptor.
18G 1445 Power steering pump drive dog remover/ replacer.

TORQUE FIGURES

Low pressure hose clip – oil reservoir to pump 2.5-3.5Nm
High pressure hose – hose to pump 14mm RHD. 19-23Nm
High pressure hose – hose to pump 14mm LHD. 19-23Nm
Power steering pump to power steering pump housing 49-54Nm
Power steering pump housing to adaptor plate 23-27Nm

OILS/GREASES

Power steering/ride levelling reservoir
***CAUTION:** Use only Castrol hydraulic systems mineral oil (HSMO) when filling the system.*

SPANNER SIZES

10mm
13mm
16mm
22mm

0188G

POWER STEERING PUMP CONTROL VALVE

RENEW 57.20.16

Open the bonnet.
Jack up the front of the vehicle and place on stands.
Place a drain tin beneath.
From above, slacken the union nut securing the hose to the pump, disconnect and remove the hose.
Discard the 'O' ring and fit a plug to the pump.
Fit a plug to the hose.
Remove the union securing the valve and discard the 'O' ring.

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Remove the control valve and spring.
Clean the components and check for wear.
Fit the spring to the control valve bore, lubricate the control valve and fit to the pump.
Fit a new 'O' ring to the union and fit to the pump.
Reverse the removal procedure to refit the hose ensuring that new 'O rings are fitted prior to assembly of the hose.
Lower the vehicle from the stands.
Remove the reservoir cap, top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

DATA

TORQUE FIGURES

High pressure hose – hose to pump 14mm RHD. 19-23Nm
High pressure hose – hose to pump 14mm LHD. 19-23Nm

OILS/GREASES

Power steering/ride levelling reservoir
CAUTION: Use only Castrol hydraulic systems mineral oil (HSMO) Control valve
CAUTION: Use only Castrol hydraulic systems mineral oil (HSMO)

SPANNER SIZES

16mm

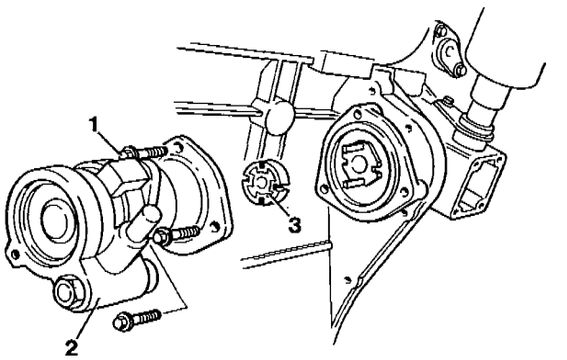
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POWER STEERING PUMP DRIVE COUPLING

RENEW **57.20.03**

Open the bonnet.
Remove the bolts (1 Fig 1) securing the power steering pump (2 Fig 1) to the engine.
Displace the pump from its mounted position and remove the drive coupling (3 Fig 1).
Fit the replacement coupling to the drive shaft dog, position the the pump and engage the drive dog onto the coupling, fit and tighten the securing bolts.
Close the bonnet.



J57 169

Fig 1

DATA

TORQUE FIGURES

Power steering pump to adaptor 49-54Nm

SPANNER SIZES

10mm

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POWER STEERING PUMP FEED HOSE

RENEW **57.15.20**

Open the bonnet.
Remove the reservoir cap, and place a drain tin in position below the hose.
Slacken the clip securing the hose to the pump, disconnect the hose from the pump, allow to drain and fit a plug to the pump.
Slacken the clip securing the hose to the reservoir, remove the clips and hose.
Reverse the removal procedure to refit the replacement hose.
Top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

DATA

TORQUE *FIGURES*

Low pressure hose clip – oil reservoir to pump ***2.5-3.5Nm***

OILS/GREASES

Power steering/ride levelling reservoir
CAUTION: Use only Castrol hydraulic systems mineral oil (HSMO)

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POWER STEERING OIL COOLER RETURN HOSE

RENEW **57.15.16**

Open the bonnet.
Remove the reservoir cap, and place a drain tin in position below the hose.
Unclip the hose from the chassis clip, slacken the union securing the hose to the oil cooler, disconnect the hose and allow to drain.
Discard the 'O' ring, fit a plug to the oil cooler, slacken the clip securing the hose to the reservoir and remove the hose.
Reverse the removal procedure to fit the replacement hose.
Top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

DATA

TORQUE FIGURES

Low pressure hose clip – hose to oil reservoir ***2.5-3.5Nm***
Low pressure hose – hose to oil cooler ***19-23Nm***

OILS/GREASES

Power steering/ride levelling reservoir
CAUTION: Use only Castrol hydraulic systems mineral oil (HSMO)

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POWER STEERING OIL RESERVOIR

RENEW **57.15.08**

Open the bonnet.
Remove the bolts securing the reservoir to the inner wing.
Remove the reservoir cap.
Place a suitable drain tin beneath and drain the reservoir.
Slacken the clips securing the hoses to the reservoir and remove the reservoir.
Fit suitable plugs to the hoses and discard the reservoir.
Reverse the removal procedure to fit the replacement reservoir.
Top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

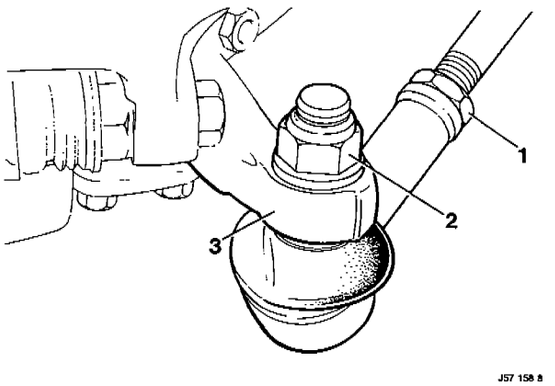


Fig 1

DATA

TORQUE FIGURES

Low pressure hoses clip – hoses to oil reservoir	*2.5-3.5Nm*
Oil reservoir to valance	*5-7Nm*

OILS/GREASES

Power steering/ride levelling reservoir	*CAUTION: Use only Castrol hydraulic* systems *mineral oil (HSMO)*

0188G

OUTER TRACK ROD BALL JOINT

RENEW *57.55.02*

Raise the vehicle on a ramp.
Slacken the track rod end to steering arm locknut (1 Fig 1).
Remove the nut securing the track rod end (2 Fig 1) to the steering arm (3 Fig 1).
Using Service Tool 18G 1063A (1 Fig 2) break the taper between the steering arm and the track rod end.

Remove the track rod end (2 Fig 2) from the steering arm (count the turns).
Fit the replacement track rod to the steering arm (the same amount of turns as the one removed).
Fit and tighten the nut securing the track rod to the steering arm.
Tighten the locknut.
Lower the ramp, check and adjust as necessary the front steering geometry.

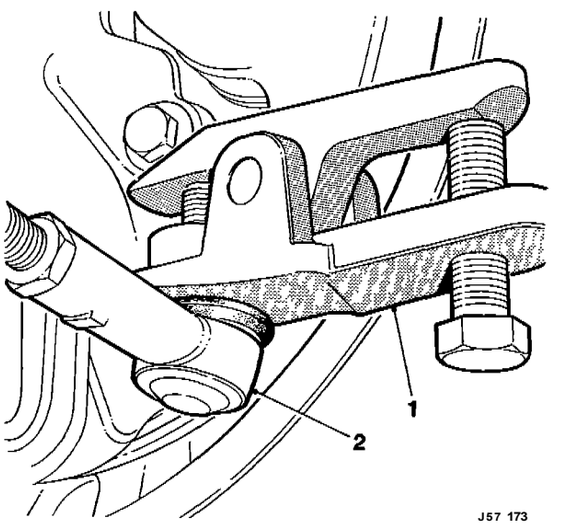


Fig 2

DATA

SERVICE TOOLS

JD 100 Balljoint separator

TORQUE FIGURES

Outer balljoint to steering arm 61-68Nm

STEERING GEOMETRY

CAMBER ANGLE	0 to –0.5°
CASTOR ANGLE	3.5 to 4.5"
WHEEL ALIGNMENT	0.8mm toe in +–0.8mm

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

SPANNER SIZES

19mm
22mm
24mm

0188G

OUTER TRACK ROD BALLJOINT-VEHICLE SET

RENEW **57.55.01**

Raise the vehicle on a ramp.
Slacken the track rod end to steering arm locknut.
Remove the nut securing the track rod end to the steering arm.
Using Service Tool 18G 1063A break the taper between the steering arm and the track rod end.
Remove the track rod end from the steering arm (count the turns).
Fit the replacement track rod to the steering arm (the same amount of turns as the one removed).
Fit and tighten the nut securing the track rod to the steering arm.
Tighten the locknut.
Repeat the procedure for the other track rod.
Lower the ramp, check and adjust as necessary the front steering geometry.

DATA

SERVICE TOOLS

JD 100 Balljoint separator

TORQUE FIGURES

Outer balljoint to steering arm 61-68Nm

STEERING GEOMETRY

CAMBER ANGLE	0 to –0.5°
CASTOR ANGLE	3.5 to 4.5"
WHEEL ALIGNMENT	0.8mm toe in +–0.8mm

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

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SPANNER SIZES

19mm
22mm
24mm

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POWER STEERING RACK

RENEW **57.10.01**

Open the door.
Centralise the steering wheel and remove the ignition key.
Close the door and raise the vehicle on a ramp.
Remove the nut securing the track rod end to the steering arm.
Using Service Tool JD 100 break the taper between the steering arm and the track rod end.
Remove the bolt (1 Fig 1) and nut (2 Fig 1) securing the lower column (3 Fig 1) to the steering rack pinion (4 Fig 1).

Place a suitable drain tray below the steering rack pinion.
Slacken the union securing the feed hose to the steering rack and disconnect the pipe.
Drain the steering system and fit suitable plugs to the pipes.
Slacken the union nut securing the return pipe to the steering rack and disconnect.
Allow the pipe to drain and fit a suitable plug to the pipe.
Slacken the nuts and bolts (1 Fig 2) securing the rack (2 Fig 2) to the front crossmember (3 Fig 2).

Disconnect the lower column from the rack pinion.
Remove the rack securing nuts and bolts.
Remove the rack and collect the spacing washers.
Remove the access plug in the replacement rack and fit service tool JD 100 (1 Fig 3), check that the rack is centralised, remove the tool and fit the plug.
Reverse the remaining removal procedure to fit the replacement rack.
Top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

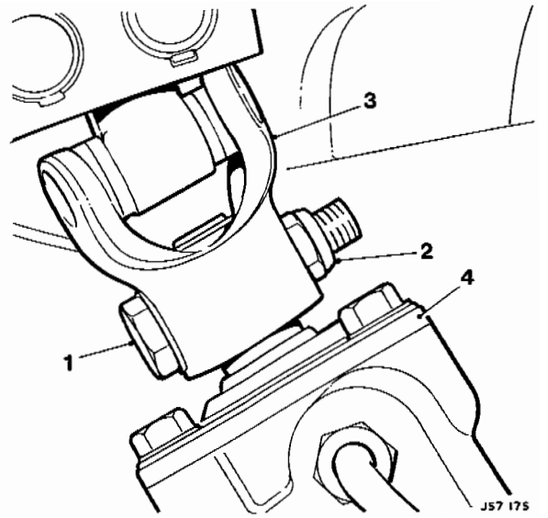


Fig 1

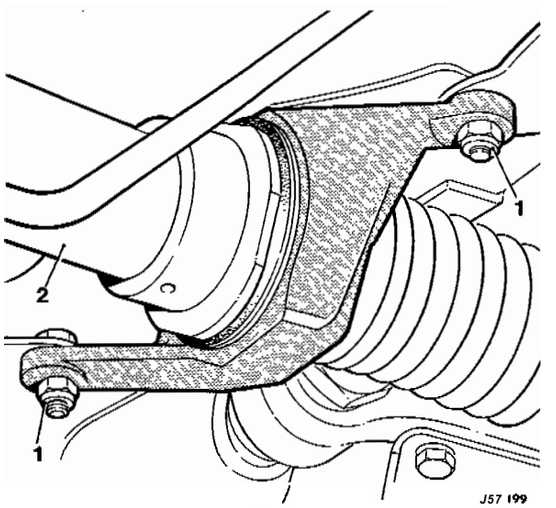


Fig 2

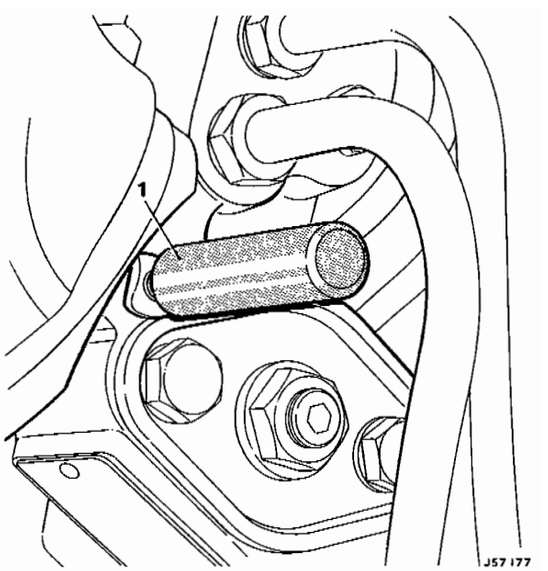


Fig 3

DATA

SERVICE TOOLS

JD 120 Steering rack alignment pin
JD 100 Balljoint separator

TORQUE FIGURES

High pressure hose – hose to rack ***16mm 19-23Nm***
Lower column to steering rack ***79-24Nm***
Low pressure hose rack to oil cooler ***19-23Nm***
Outer balljoint to steering arm ***61-68Nm***

Rack fixing bracket to crossbeam **26-29Nm**
Steering arm to track rod lock nut **60Nm**

STEERING GEOMETRY

CAMBER ANGLE	0 to –0.5°
CASTOR ANGLE	3.5 to 4.5°
WHEEL ALIGNMENT	0.8mm toe in +–0.8mm

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

OILS/GREASES

Power steering/ride levelling reservoir
CAUTION: Use only Castrol hydraulic systems mineral oil (HSMO)

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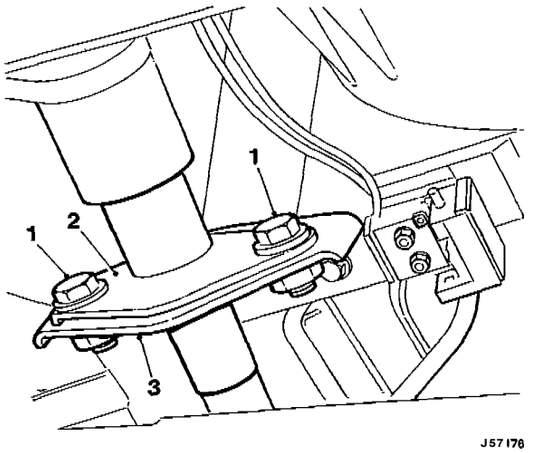


Fig 1

CONTROLVALVE AND PINION UPPER SEAL

RENEW **57.10.23**

Open the door.
Remove the bolts (1 Fig 1) securing the upper steering column lower bearing (2 Fig 1) to the bracket (3 Fig 1).
Open the bonnet.
Mark the relationship between the lower column and the pinion, remove the nut and bolt (1 Fig 2) securing the lower column (2 Fig 2) and pinion (3 Fig 2).
Disconnect the lower column from the pinion.
Remove the bolts (4 Fig 2) securing the pinion cover plate (5 Fig 2), remove the outer seal cover plate and shims.
Place a drain tray in position, remove and discard the seal 'O' ring and P.T.F.E. seal.

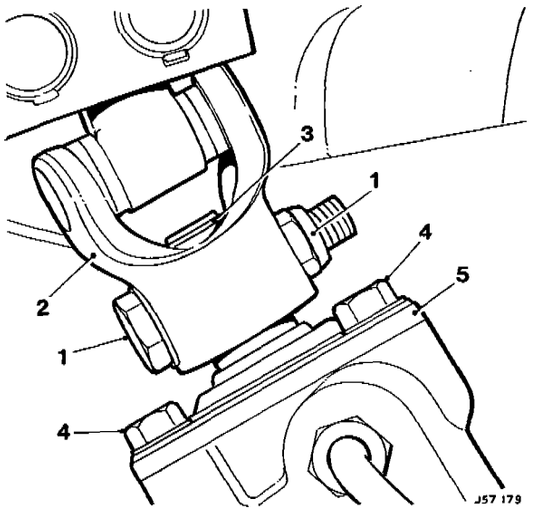


Fig 2

Fit the new 'O' ring and seal to the pinion (inner groove to rack).
Clean the shims cover plate and mating faces.
Align and fit the shims and cover plate, secure with the bolts.
Fit the outer seal to the pinion shaft.
Remove the drain tray and reconnect the lower column to the pinion.
Fit and tighten the securing nut and bolt.
Align the upper steering column lower bearing to the bracket and secure with the bolts.
Remove the reservoir cap, top up the reservoir and bleed the system,
Fit the reservoir cap.
Close the bonnet.

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DATA

TORQUE FIGURES

Lower column to universal joint ***19-24Nm***
Lower column to bracket ***19-24Nm***
Pinion cover plate ***10Nm***

OILS/GREASES

Power steering/ride levelling reservoir
CAUTION: *Use only* ***Castrol hydraulic systems mineral oil (HSMO)***

SPANNER SIZES

10mm
13mm

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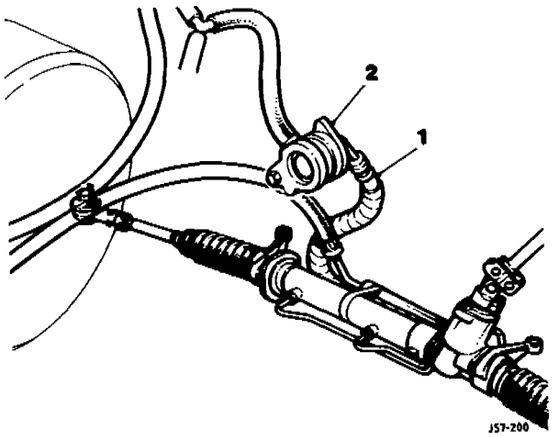


Fig 1

POWER STEERING RACK FEED HOSE

RENEW **57.15.21**

Open the bonnet.
Jack up the front of the vehicle and place on stands.
Place a drain tin beneath and slacken the union securing the feed hose to the steering rack.
Disconnect the hose (1 Fig 1) from the rack and allow to drain and discard the 'O' ring.
Fit plugs to the rack and the hose, move the drain tray.
Remove the screw securing the hose to the block clamp.
From above, slacken the union nut securing the hose to the pump (2 Fig 1), disconnect and remove the hose.

Discard the 'O' ring and fit a plug to the pump.
From below, remove the hose assembly and the hose clamp.
Reverse the removal procedure to refit the replacement hose ensuring that new 'O' rings are fitted prior to assembly of the hose.
Lower the vehicle from the stands.
Remove the reservoir cap, top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

DATA

TORQUE FIGURES

High pressure hose – hose to pump 14mm RHD. ***19-23Nm***
High pressure hose – hose to rack 16mm RHD. ***19-23Nm***
High pressure hose – hose to pump 14mm LHD. ***19-23Nm***
High pressure hose – hose to rack 16mm LHD. ***19-23Nm***

OILS/GREASES

Power steering/ride levelling reservoir
CAUTION:** Use only **Castrol hydraulic systems mineral oil (HSMO)

SPANNER SIZES

14mm
16mm

0188G

POWER STEERING RACK RETURN HOSE

RENEW **57.15.22**

Open the bonnet.
Jack up the front of the vehicle and place on stands.
Place a drain tin beneath and slacken the union securing the hose (1 Fig 1) to the steering rack (2 Fig 1).
Disconnect the hose from the rack and allow to drain and discard the 'O' ring.
Fit plugs to the rack and the hose, move the drain tray and slacken the union securing the hose to the oil cooler.
Disconnect the hose from the cooler and allow to drain.
Discard the 'O' ring and fit a plug to the oil cooler.
From above, unclip and remove the hose from the chassis.
Fit the replacement hose and secure to the chassis with the clip.

Fit a new 'O' ring to the hose. remove the plug from the cooler, connect the hose to the cooler and tighten the union.
Remove the plug from the steering rack, fit a new 'O' ring to the hose, connect the hose to the rack and tighten.
Lower the vehicle from the stands.
Remove the reservoir cap, top up the reservoir and bleed the system.
Fit the reservoir cap.
Close the bonnet.

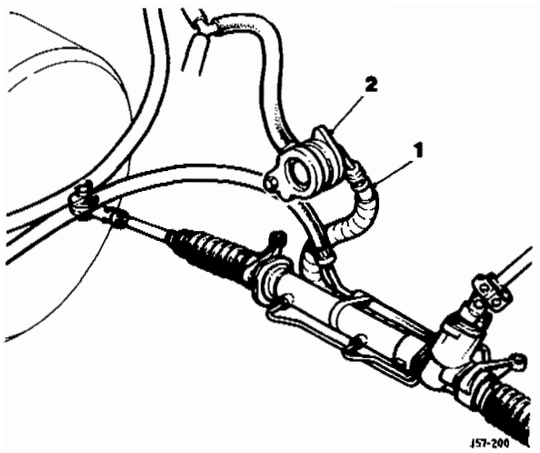


Fig 1

DATA

TORQUE FIGURES

*Low pressure hose rack **to** oil cooler **19-23Nm***
*Pipe clip **to** crush tube **3-4Nm***

OILS/GREASES

Power steering/ride levelling reservoir
CAUTION:** Use only **Castrol** hydraulic systems **mineral oil (HSMO)

OILS/GREASES

SPANNER SIZES

16mm
19mm

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POWER STEERING RACK GAITER

RENEW **57.10.29**

Raise the vehicle on a ramp.
Slacken the track rod end to steering arm locknut.
Remove the nut securing the track rod end to the steering arm.
Using Service Tool JD 100 (1 Fig 1) break the taper between the steering arm and the track rod end (2 Fig 1).

Remove the track rod end from the steering arm (count the turns).
Note the position and remove the track rod end locknut.
Place a suitable drain tray in position below gaiter, cut the 'Oetika' clips (1 Fig 2) securing the rack gaiter (2 Fig 2) and remove the gaiter from the rack.
Fit the replacement gaiter to the steering rack and secure the inner end of the gaiter with the new 'Oetika' clip.
Position the track rod end pointing upwards and using a suitable applicator fill the gaiter with oil (0.19 Litres +10%) and secure the outer end of the gaiter with an 'Oetika' clip.

Fit the track rod end lock nut to its noted position, fit the track rod to the steering arm (the same amount of turns as the one removed).
Fit and tighten the nut securing the track rod to the steering arm.
Tighten the locknut.
Lower the ramp, check and adjust as necessary the front steering geometry.

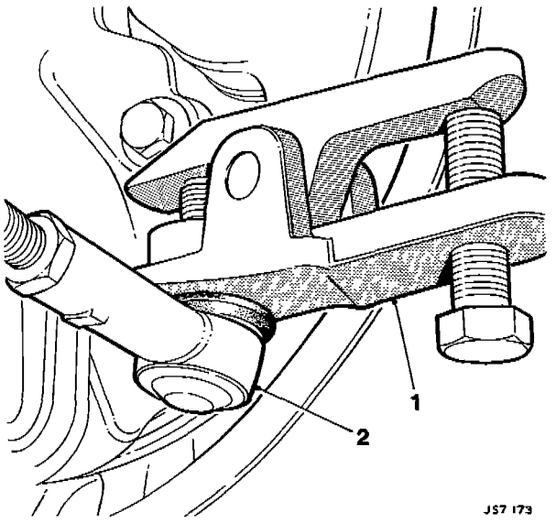


Fig 1

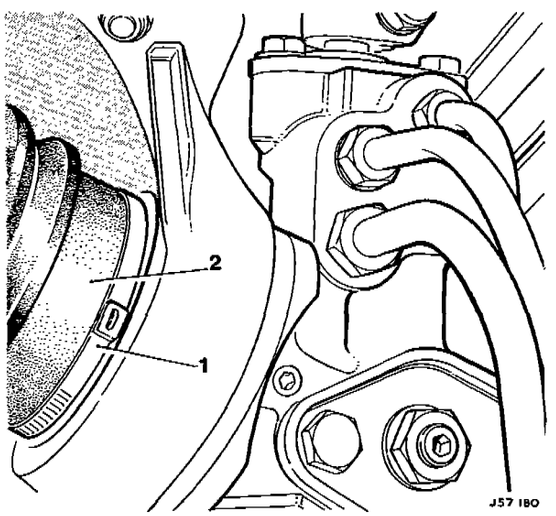


Fig 2

DATA

SERVICE TOOLS

Balljoint separator JD 100

TORQUE FIGURES

Outer balljoint to steering arm 61-68Nm
Steering arm to track rod lock nut 52-68 "

STEERING GEOMETRY

CAMBER ANGLE	0 to –0.5°
CASTOR ANGLE	3.5 to 4.5"
WHEEL ALIGNMENT	0.8mm toe in +–0.8mm

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

OILS/GREASES

Steering rack gaiter 0.19 litres + 10% oil to E.I.23 section 1D (s.a.e. 80W-90).

SPANNER SIZES

19mm
22mm
24mm

0188G

POWER STEERING RACK GAITER - VEHICLE SET

RENEW *57.10.27*

Raise the vehicle on a ramp.
Slacken the track rod end to steering arm locknut.
Remove the nut securing the track rod end to the steering arm.
Using Service Tool JD 100 (1 Fig 1) break the taper between the steering arm and the track rod end (2 Fig 1).
Remove the track rod end from the steering arm (count the turns).
Note the position and remove the track rod end locknut.

Place a suitable drain tray in position below gaiter, cut the 'Oetika' clips (1 Fig 2) securing the rack gaiter (2 Fig 2) and remove the gaiter from the rack.
Fit the replacement gaiter to the steering rack and secure the inner end of the gaiter with the new 'Oetika' clip.
Position the track rod end pointing upwards and using a suitable applicator fill the gaiter with oil (0.19 Litres +10%) and secure the outer end of the gaiter with an 'Oetika' clip.
Fit the track rod end lock nut to its noted position, fit the track rod to the steering arm (the same amount of turns as the one removed).

Fit and tighten the nut securing the track rod to the steering arm.
Tighten the locknut.
Repeat the procedure for the other gaiter.
Lower the ramp, check and adjust as necessary the front steering geometry.

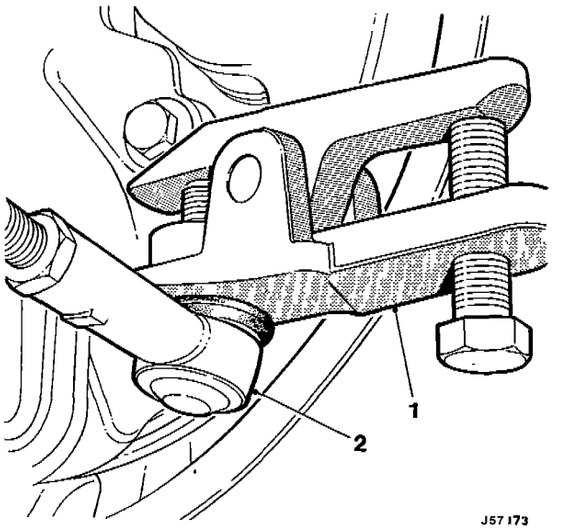


Fig 1

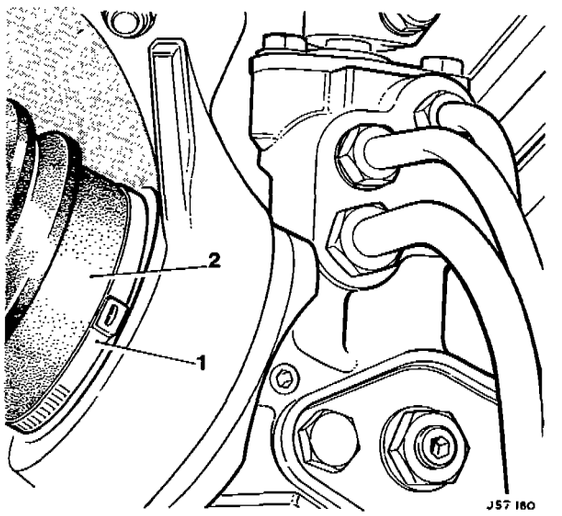


Fig 2

DATA

SERVICE TOOLS

Ball joint separator JD 100

TORQUE FIGURES

Outer ball joint to steering arm 61-68Nm
Steering arm to track rod lock nut 52-68Nm

STEERING GEOMETRY

CAMBER ANGLE	0 to –0.5°
CASTOR ANGLE	3.5 to 4.5"
WHEEL ALIGNMENT	0.8mm toe in +–0.8mm

Measurements to be taken with the underside of the front crossbeam 150.8mm above the ground.

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OILS/GREASES

Steering rack gaiter 0.19litres + 10%oil to E.I.23 section 1D (s.a.e. 80W-90).

SPANNER SIZES

19mm
22mm
24mm

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BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH II
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY ENGLAND

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SERVICE MANUAL

VOLUME 4

Contains Sections

74. WHEELS AND TYRES

76. BODY

77. BODY REPAIR

80. HEATING AND VENTILATION SYSTEM

82. AIR CONDITIONING

84. WINDSCREEN WIPERS AND WASHERS

86. ELECTRICAL

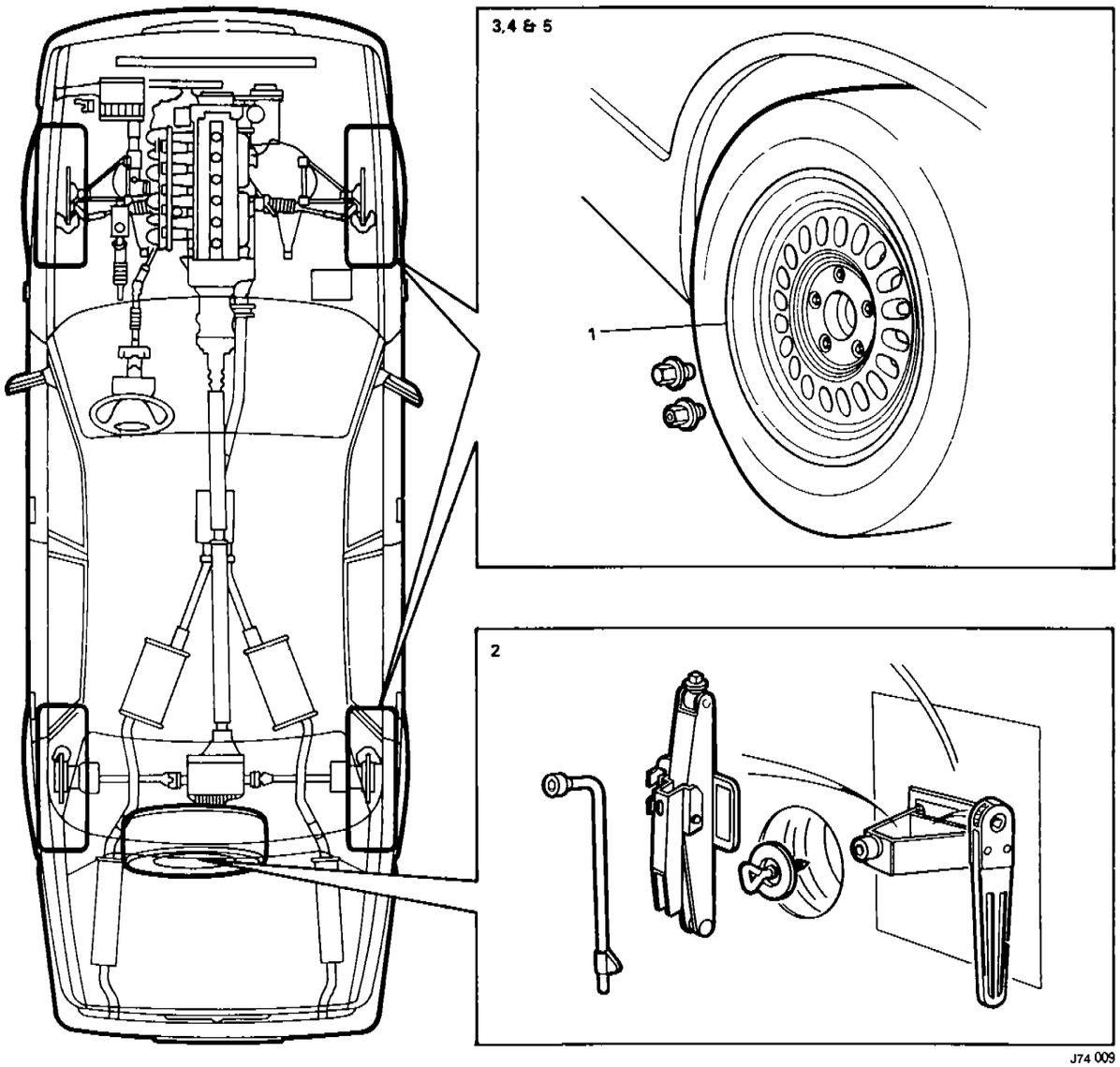
88. INSTRUMENTS

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Publication Part No JJM 10 04 05 / 40

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90MY TYRES

DATA/TYRE PRESSURES 74.00.00

North American Vehicles

Type/Size	Pirelli P5 205/70 VR 15 Cinturato (Tubeless)
Cold Inflation Pressure – Front	33 lbf/in^2 (2.32kgf/cm^2, 228kPa; 2.27bar)
– Rear	36 lbf/in^2 (2.53kgf/cm^2, 248kPa; 2.48bar)

Note: Pressures may be reduced by 6 lbf/in^2 (0.42kgf/cm^2, 41kPa, 0.41bar) on front and rear tyres to obtain maximum comfort, provided the speed does not exceed 100mph (160 km/h).

Rest of the World (ROW) Vehicles

Type/Size	Dunlop TD SP Super Sport D7, 220/65 VR 390 or Michelin TDXV 220/65 VR 390 (Tubeless)
Cold Inflation Pressure – Front	34lbf/in^2 (2.39kgf/cm^2, 235kPa, 2.35bar)
– Rear	34lbf/in^2 (2.39kgf/cm^2, 235kPa, 2.35bar)

Note: Pressures may be reduced by 8 lbf/in^2 (0.56kgf/cm^2, 55kPa, 0.55bar) on front and rear tyres to obtain maximum comfort, provided the speed does not exceed 100 mph (160 km/h).

Replacement tyres of different specifications and/or tread pattern, should not be fitted in mixed form.

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SNOW TYRES

North American Vehicles

Type/Size (complete sets only)	Pirelli M&S Winter 190 215/65 R 15 T
Cold Inflation Pressure (maximum speed 100mph (160km/h))	
- Front	27 lbf/in^2 (1.90kgf/cm^2, 186kPa, 1.86bar)
- Rear	30 lbf/in^2 (2.11kgf/cm^2, 207kPa, 2.07bar)
Cold Inflation Pressure (maximum speed 120mph (190km/h))	
- Front	33 lbf/in^2 (2.32kgf/cm^2, 228kPa, 2.28bar)
- Rear	36 lbf/in^2 (2.53kgf/cm^2, 248kPa, 2.48bar)

Rest of the World (ROW) Vehicles

Type/Size (complete sets only)	Dunlop TD SP 88 M&S (Tubeless)
Cold Inflation Pressure (maximum speed 100mph (160km/h))	
- Front	26 lbf/in^2 (1.83kgf/cm^2, 179kPa, 1.79bar)
- Rear	28 lbf/in^2 (1.97kgf/cm^2, 193kPa, 1.93bar)
Cold Inflation Pressure (maximum speed 120mph (190km/h))	
- Front	34 lbf/in^2 (2.39kgf/cm^2, 235kPa, 2.35bar)
- Rear	34 lbf/in^2 (2.39kgf/cm^2, 235kPa, 2.35bar)

Note: Snow chains may be fitted to rear wheels only. Use Jaguar snow chains available from the Jaguar accessory range (Champion 2612-SM or Shur-grip).

Maximum speed with snow chains 30mph(48km/h).

Tyres may be fitted with studs provided maximum speed does not exceed 90mph (145km/h). Studs must be of the parallel shank type, 10mm long, 8mm in diameter, single flange.

The use *of* studs is not permitted in certain countries. Check with local legislation.

91MY TYRES - STANDARD FIT AND OPTIONS

INTRODUCTION

Pirelli 225/65 VR 15 (225/65 R 15 99V) are standard fit tyres from 91MY for all models and markets except USA, which retains the Pirelli P5 Cinturato (Tubeless) 205/70 VR 15 as standard fit.

The Dunlop TD Super Sport D7 220/65 VR 390 tyres can still be supplied as an optional item for vehicles with alloy teardrop wheels. (See 90MY specification, page 74-04, for inflation pressures).

A new sports option wheel is available from 91MY and is fitted with a Pirelli 225/55 ZR 16 P600.

DATA/TYRE PRESSURES 74.00.00

Rest of the World (ROW) Vehicles

Type/Size	Pirelli 225/65 VR 15 (225/65 R 15 99V) Pirelli 225/55 ZR 16 P600.
Cold Inflation Pressure	
- Front	32 lbf/in^2 (2.24kgf/cm^2, 220kPa, 2.21 bar)
- Rear	34 lbf/in^2 (2.38kgf/cm^2, 234kPa, 2.34bar)

Note: Pressures may be reduced by 6 lbf/in^2, (0.42kgf/cm^2, 41kPa, 0.41 bar) on front and rear tyres to obtain maximum comfort, provided the speed does not exceed 100mph (160 km/h).

Replacement tyres *of* different specifications and/or tread pattern, should not be fitted in mixed form.

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TYRES - DESCRIPTION 74.00.00

General

Tyres of the correct type, dimensions and at the correct cold inflation pressures are an integral part of the vehicle's design. Regular maintenance of tyres is an essential contribution to road safety and correctly inflated tyres in good condition will assist in retaining optimum road-holding, steering and braking qualities.

Tyres of the same type and size have widely varying characteristics depending upon manufacturer. It is strongly recommended that only tyres of the same make and type are fitted to all wheels.

The radial ply tyres specified are designed to meet the high speed performance of which this car is capable.

Pressure

The tyre inflation pressures specified provide optimum ride and handling characteristics for all normal conditions.

Tyre pressures should be checked and, if necessary, adjusted weekly with the tyres cold i.e. not immediately following use as pressure increases with temperature due to road friction. 'Bleeding' a warm tyre to the recommended pressure will result in under-inflation which can be both dangerous and depreciate tyre life. Pressure loss with time is normal, but a thorough investigation should be performed if a pressure loss in excess of 2 lbf/in^2 (0.14kgf/cm^2, 14kPa, 014 bar) is encountered during a period of one week or less.

It is an offence in the UK to use a vehicle on public roads with tyres improperly inflated. Furthermore, incorrect inflation accelerates wear and causes excessive heating which can result in tyre failure due to blow out.

CAUTION: When inflating a tyre. it is important to ensure that a pressure of 40 lbf/in^2 (2.8 kgf/cm^2, 310kPa, 3.1 bar) is not exceeded otherwise serious tyre damage may result.

Wear

All tyres fitted as standard have a tread wear indicator (Fig. 1) moulded into their tread pattern to provide indication when the tread depth remaining is 1.6 mm (0.063 in). Each indicator appears on the tread surface as bars which connect the tread pattern across the full width *of* the tyre.

It is illegal in the UK and certain other countries to continue using tyres after the tread has worn to less than 1mm (0.039 in) over three quarters of the tread width around the entire circumference of the tyre.

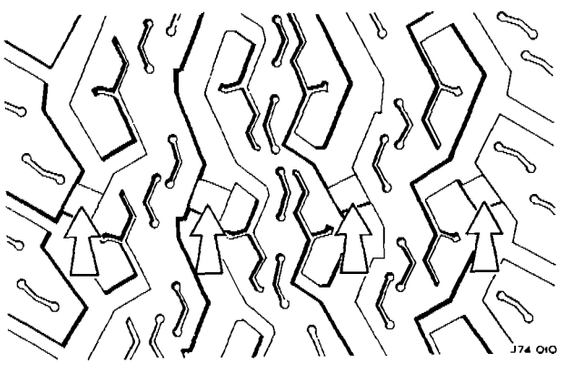


Fig. 1

The properties of many tyres alter progressively with wear. In particular, 'wet grip' and aquaplaning resistance properties are gradually, but substantially, reduced. Extra care and speed restriction should therefore be exercised on wet roads as the effective tread depth diminishes.

When replacement of tyres is necessary it is preferable to fit a complete vehicle set. Should either front or rear tyres only, show excessive wear, new tyres must be fitted to replace worn ones. Under no circumstances interchange tyres from side to side, front to rear or vice versa as individual tyre wear produces unique characteristics depending upon their position. If the position is changed after wear has occurred, the performance of the tyre will be adversely affected.

Damage

Excessive localised distortion, sometimes caused by severe contact with kerbs or stones can cause the tyre casing to fracture and may lead to premature tyre failure. Tyres should, therefore, be periodically examined and any tyre having distortion, cracks and/or cuts should be replaced. In addition, all tread imbedded objects, such as stones and glass, should be withdrawn and all contamination, i.e. oil and grease removed using a suitable solvent.

CAUTION: **Paraffin** (kerosene) must not be **used as a cleansing agent on tyres.**

Heat

Tyres should not be subjected to excessive heat such as that inherent *of* paint drying/baking ovens. It is recommended therefore, that all wheels be removed or at least the tyres be relieved *of* vehicle **body** weight.

Repairs

It is recommended that damaged tyres are renewed and not repaired in view of the high performance capability of the vehicle.

Valves

When a new tubeless tyre is fitted, the valve should be renewed.

Tyre **Use After** Vehicle **Storage**

After a long period of vehicle standing, tyres may become locally distorted with a flat area. This will cause an uneven ride for a few miles until the tyres have warmed up and the 'flat' rounds off.

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'WINTER (SNOW) TYRES

The tyres fitted as original equipment are designed with a rubber mixture, tread pattern and width specially suited for high speeds in normal road conditions, but they are less suitable for winter conditions. The use of winter tyres will considerably improve the vehicle's handling.

Winter tyres must be used in vehicle sets, i.e. fitted on all four wheels. When fitted with winter tread tyres, the vehicle should not be driven at speeds in excess of the tyre speed category symbol as moulded on the tyre.

SNOW CHAINS

Snow chains may be fitted to rear wheels only.

Remove the snow chains immediately upon the road being clear of snow.

Maximum speed with snow chains fitted - 30mph (48km/h).

Tyres may be fitted with studs provided maximum speed does not exceed 90mph (145km/h). Studs must be of the parallel type, 10mm long, 8mm diameter single flange; the use of studs is not permitted in certain countries, check local legislation.

Snow chains must **only be** used with the recommended winter tyres.

USA GRADINGS

The following information relates to the tyre grading system developed by the national Highway Traffic Safety Administration which grades tyres by tread wear, traction and temperature performance.

Treadwear

The treadwear grade is a comparative rating based on the wear rate of the tyre when tested under controlled conditions on a specified government test course. For example, a tyre graded 150 would wear one and a half times less on the government course than a tyre graded 100. The relative performance of the tyres depends upon the actual conditions of their use and may depart significantly from normal due to variations in driving habits, service practices and differences in road characteristics and climate.

Traction - A, B, C

The tractions grades, from highest *to* lowest, are **A,** B and C and they represent the tyres ability to stop in wet conditions measured on specified government test surfaces of asphalt and concrete.

WARNING: THE TRACTION GRADE IS BASED ON BRAKING (STRAIGHT AHEAD) TRACTION TESTS AND DOES NOT INCLUDE CORNERING (TURNING) TRACTION.

Temperature - A, B, C

The temperature grades are **A** (the highest), B and C, and they represent the tyre's resistance to the generation of wear and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tyre *to* degenerate and reduce tyre life, and excessive temperature can lead to sudden tyre failure. Grade C corresponds to a level of performance which all passenger car tyres must meet under Federal Motor Vehicle Safety Standard No. 109. Grades B and **A** represent higher levels of performance on the laboratory test wheel than the minimum required by law.

WARNING: THE TEMPERATURE GRADE IS ESTABLISHED FOR A TYRE THAT IS PROPERLY INFLATED AND NOT OVERLOADED. EXCESSIVE SPEED, UNDERINFLATION, OR EXCESSIVE LOADING, WHETHER SEPARATELY OR IN COMBINATION. CAN CAUSE HEAT BUILD UP AND POSSIBLE TYRE FAILURE.

THE TD TYRE (where fitted)

DESCRIPTION 74.00.00

The TD tyre offers the benefits of the radial assembly with the added safety and security *of* limited run-on capability in the event of a deflation.

This can assist in the control of the vehicle to the nearest point where the wheel can be fitted in safety.

As an essential preliminary a new international standard of rim dimensions has been developed and adopted by the European Tyre and Rim Technical Organisation (STRTO). The rim sizes covered are 290, 315, 340, 365, 390, 415mm diameter rims incorporating the Denloc groove allowing fitment of TD tyres.

How it works

The TD wheel incorporates two grooves running circumferentially around the bead seats. The tyres have specially extended bead toes which fit into these grooves. In the event of deflation, the reinforced bead toes are held firmly in place by these grooves, thereby helping to prevent the tyre from leaving the rim.

Both tyre and road wheel are made to metric dimensions, in section width and wheel diameter. This is a safety precaution to prevent the fitting of a conventional tyre to the TD wheel and conversely of a TD tyre to a conventional wheel.

It should be noted that a TD tyre cannot be fitted to a normal wheel.

In a conventional radial tyre, the bead is designed to fit inside a vertical rim flange; the casing cords are forced to curve outwards above the flange before curving inwards again, thus forming an unnatural 'S' shape. The secret of the TD principle lies in both the unique radial construction and the rim contour which allow the casing cords to follow a natural 'C' shaped flexing curve. The rim flange is inclined outwards at an angle parallel to the natural line of the casing cords.

The advantages of the new TD tyres stem from their unique construction which distributes the stresses evenly around the casing. The natural flexing curve permits the use of low aspect ratios without the usual penalty of ride harshness.

The TD Tyres are manufactured to the very high quality standards expected from all tyres and give the following benefits:

Superb grip and performance

The very wide and distinctive tread patterns put a large area of rubber on the road for maximum grip. Because of the unique construction, a very bold tread pattern with wide channels can be used without causing rapid and uneven wear often associated with this type of pattern. Water clearance is excellent, giving safe, sure grip in the wet.

Precise handling

The whole TD range with its low, wide profile gives improved stability and precise steering control.

Even Wear

The equalized stresses resulting from the natural flexing curve, allied to the TD low profile casing, result in remarkably even tread wear giving high mileage.

Low rolling resistance and fuel economy

Extensive research has proved that the combination of the TD construction with its low aspect ratio on the special rim, provides the optimum in rolling resistance, a vital factor in fuel economy.

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FITTING AND REMOVAL

General *Notes*

The TD is fitted and removed in the conventional way using the standard fitting machinery. The following procedures should be used as a guide only. TD tyres must be fitted to the appropriate size of TD rim.

Removal

Deflate the tyre by removing the valve core.

Unseat, in turn, both tyre beads with a pneumatic unseating tool fitted with a broad blade. Ensure that the edge of the blade is free from any rough edges.

Keep the blade close to the wheel flange.

Apply a suitable lubrication to the rim flanges and tyre bead area on both sides *of* the assembly.

Clamp the wheel to the fitting machine and roll off the tyre beads in turn, following the machine manufacturer's operating instructions. Take care not to damage the tyre bead location 'toe' during this process.

Fitting

Confirm that a suitable valve and core are correctly fitted to the wheel rim.

Apply a suitable lubricant to both bead and flange areas of the wheel, and both beads of the tyre.

Clamp the wheel to the fitting machine and roll on each bead in turn, following the machine manufacturer's operating instructions. Take care not to damage the tyre bead location 'toe' during this process.

The TD tyre can only be fitted tubeless. No suitable design of tube is available or foreseen.

As with other modern rim designs incorporating bead retention safety features (humps, for example), it is strongly recommended that a fitting machine is used for all fitting and removal. Use of hand levers for removal is NOT recommended.

Unclamp the wheel and inflate the tyre to 50 lbf/in^2 (3.5 bar; 350kPa), ensuring that the beads remain parallel to the rim groove. Should difficulty be experienced in securing location of the beads, remove the valve *core.* Re-inflate the tyre, replacing the valve core when the beads *of* the tyre have located against the wheel flanges. Check this by confirming that the tyre fitting line is concentric with the wheel flange. Finally, reset the tyre pressure to the recommended specification and remove any excess tyre lubricant.

TORQUE FIGURES

*Screw clamp to **spare** wheel **13-16Nm***
*Jack to mounting bracket **7-14Nm***
Spare** wheel **fixing** bracket to body **22-28Nm
*Valve **to** wheel **3.5-4.5Nm***
*Wheel nut to wheel **stud** (steel wheel) **65-85Nm***
*Wheel nut to wheel **stud** (alloy wheel) **88-102 Nm***

SPANNER SIZES

13mm
22mm

2000C

WHEELS

91MY Standard Fit and Options

STEEL WHEEL



Size	7" x 15"
Tyre Type/Size	Pirelli 225/65 VR 15 (225/65 R 15 99 V)

The 91MY steel wheel is manufactured by Dunlop and incorporates a one piece wheel trim. The wheel is held on with wheel nuts and the wheel trim clips over the top. This differs from the 90MY steel wheel manufactured by Michelin, which has the wheel trim held on by the wheel nuts and is of a different style.

The steel wheel is standard fit for the basic model XJ6 for all markets except **USA.**

The wheel trim can be removed using the screwdriver provided in the vehicle toolbox as a lever, or similar instrument. To refit the wheel trim, position the wheel trim on the wheel with the location peg on the **back** of the wheel trim inserted into the hole adjacent to the tyre valve. Push the wheel trim firmly into position.

TEARDROP ALLOY WHEEL



Size	7" x 15"
Tyre Type/Size	Pirelli 225/65 VR 15 (225/65 **R 15** 99 V) Pirelli 205/70 **VR** 15 - **USA**

The Teardrop alloy wheel is standard fit for the XJ6-Sovereign in all markets, and an optional fit for the XJ6 in all markets except North America. The alloy wheel is standard fit for the basic **XJ6** in the **USA.**

There are two types of wheel nut cover for the Teardrop alloy style wheels, a perforated wheel nut cover and a flush wheel nut cover. The wheel nut cover can be removed using the screwdriver provided in the vehicle toolbox, or similar instrument. To refit the perforated style wheelnut cover, align the holes with the wheel nuts, then push the cover firmly into position on the **wheel.** To refit the flush style wheel nut cover, push the cover firmly into position on the wheel.

The cast alloy road wheels are covered with a protective coating. **To** prevent corrosion, it is essential that this coating is not damaged. To clean the wheels use warm soapy water; stubborn stains can be removed using a soft brush or by using a proprietary alloy wheel cleaner.

When removing or fitting tyres, only equipment utilizing spigot **or** stud hole clamping must be used. The equipment must not have any moving parts which contact the wheel, and tyre levers must not be used.

TEARDROP ALLOY WHEEL (TD TYPE)

Size	189mm x 390mm
Tyre Type/Size	Dunlop TD **SP** Super Sport D7, 220/65 **VR** 390 TD or Michelin TDXV, 220/65 VR 390

The TD Teardrop Alloy wheel is an optional item after 91MY for all models and markets except North America.

Both tyre and road wheel are made to metric dimensions, in section width and wheel diameter. This is a safety precaution to prevent the fitting of a conventional tyre to the TD road wheel and conversely *of* a TD tyre to a conventional wheel.

It should be noted that a TD tyre cannot be fitted to a normal wheel or a normal tyre to a TD wheel.

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ROULETTE ALLOY WHEEL

Size	7" x 15"
Tyre Type/Size	Pirelli 225/65 VR 15 (225/65 R 15 99 V)
	Pirelli 205/70 VR 15 - **USA**



The Roulette style alloy wheel is a standard fit item for XJ6-Daimler and Vanden Plas derivations in all markets from 91MY.

The Roulette wheel incorporates a diecast hubcap with a rubber O-ring type seal round the outside to ensure an optimum fit. The hubcap clips into the wheel recess on one side using the hooks shown on the back of the hubcap in Fig. 1, and is locked into position using a bright chrome finished **Allen** type socket head locking screw (1 Fig.2).

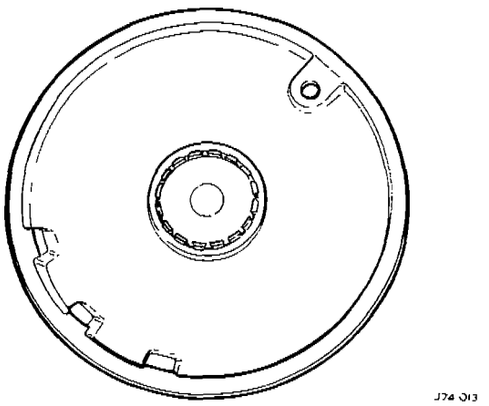


Fig 1

To remove the hubcap, unscrew the captivated bolt (1 Fig. 2) securing the diecast hubcap (2 Fig. 2) using the 6mm Allen key which is clipped to the spare wheel mounting bracket in the luggage compartment. Firmly hold the captivated bolt and pull outwards to remove the hubcap from the wheel.

To replace the hubcap, ensure that the rubber O-ring type seal is correctly located around the diecast hubcap. Position the hubcap on the wheel with the hook located in the slots adjacent to the tyre valve and ensure that the captivated screw is aligned with the threaded hole. Push the hubcap into position and secure with the captivated screw, using the 6mm Allen key to tighten. Replace the Allen key in the clip on the spare wheel mounting bracket after use.

The locking screw is part of the hubcap assembly and is held captive by a circlip.

Note: The 6mm Allen key to remove the **hubcap** locking screw is attached to the jack in the luggage compartment by means of a spring clip. If the vehicle is supplied with a toolkit, it is recommended that the key be kept in the toolkit for convenience.

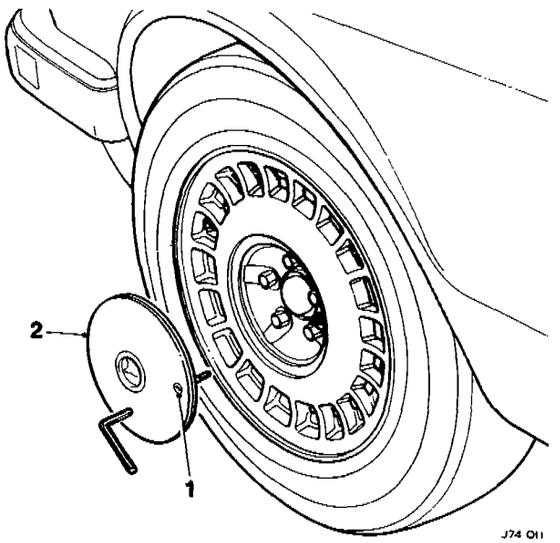


Fig 2

Replacement hubcaps are supplied without the centre badge. Two different types of centre badge are available (fig. 1) and must be correctly aligned before push fitting into the centre of the hubcap.

The cast alloy road wheels are covered with a protective coating. To prevent corrosion it is essential that this coating is not damaged. To clean the wheels use warm soapy water, stubborn stains can be removed using a soft brush or by using a proprietary alloy wheel cleaner.

When removing or fitting tyres, only equipment utilizing spigot or stud hole clamping must be used. The equipment must not have any moving parts which contact the wheel, and tyre levers must not be used.

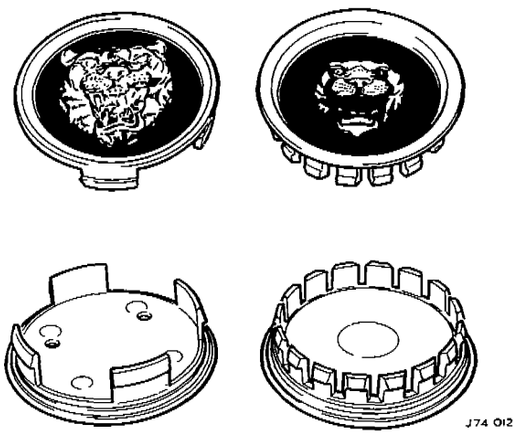


Fig 1

LATTICE (SPORTS) ALLOY WHEEL



Size 8" x 16"
Tyre Type/Size Pirelli 225/55 ZR 16 P600

The Lattice (Sports) wheel is available from 91MY as part of the Sports suspension package, it is an option for all models and markets except North America. It is a forged wheel with lattice design fitted with the Pirelli 225/55 ZR 16 P600 8" x 16" tyre.

When changing the sports road wheels, the centre badge must be transferred to the replacement wheel. After removing the road wheel, carefully remove the badge and press fit to the replacement wheel.

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MISALIGNMENT AND ROAD CAMBER EFFECTS

It is important that correct wheel alignment be maintained. Misalignment causes tyre tread to be scrubbed off laterally because the natural direction of the wheel differs from that of the car.

A sharp 'fin' protrusion on the edge of each pattern rib is a sure sign of misalignment and it is possible to determine from the position of the 'fins' whether the wheels are toeing in or toeing out.

'Fins' on the inside edges of the pattern ribs, particularly on the nearside tyre, indicate toe-in. 'Fins' on the outside edges, particularly on the offside tyre, indicate toe-out.

With minor misalignment, the evidence is less noticeable and sharp pattern edges may be caused by road camber even when the wheel alignment is correct. In such cases it is better to make sure by checking with an alignment gauge. Road camber affects the direction of the car by imposing a side thrust and, if left to follow it's natural course, the car will drift towards it's nearside. This is instinctively corrected by a steering towards the road centre and, as a result, the car runs crabwise as illustrated in an exaggerated form in (Fig. 1). The diagram shows why nearside tyres are very sensitive to too much toe-in and offside tyres to toe-out.

It also shows why sharp 'fins' appear on one tyre but not on the other, and why the direction of misalignment can be determined by noting the position of the 'fins'. Severe misalignment produces clear evidence on both tyres.

The front wheels on a moving car should be parallel. Tyre wear can be affected noticeably by quite small variations from this condition. It will be noted from the diagram that even with parallel wheels, the car is still out of line with its direction of movement, but there is less tendency for the wear to be concentrated on one tyre.

The near front tyre sometimes persists in wearing faster and more unevenly than the other tyres, even when the mechanical condition of the car and tyre maintenance are satisfactory. The more severe the average road camber, the more marked this tendency will be.

Fig. 2 shows the wheels 'toed-out' in motion. The RH front tyre will wear faster.

Fig. 3 shows the wheels 'toed-in' in motion. The LH front tyre will wear faster.

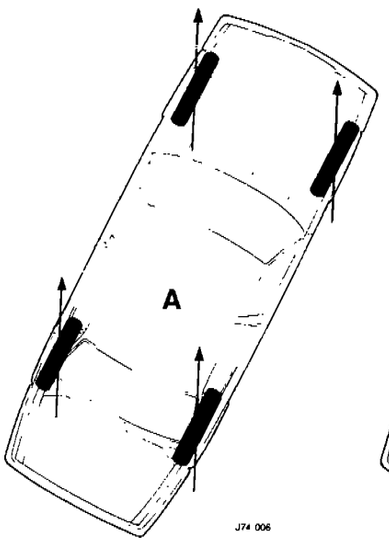


Fig 1

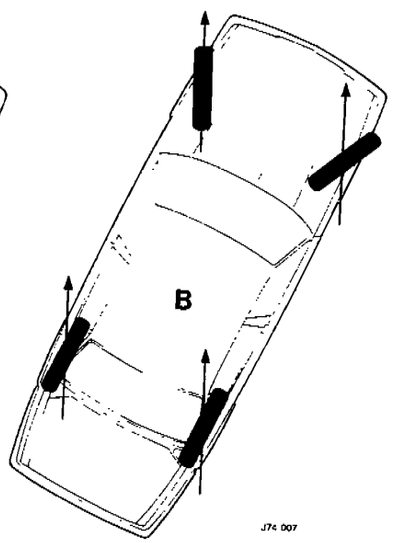


Fig 2

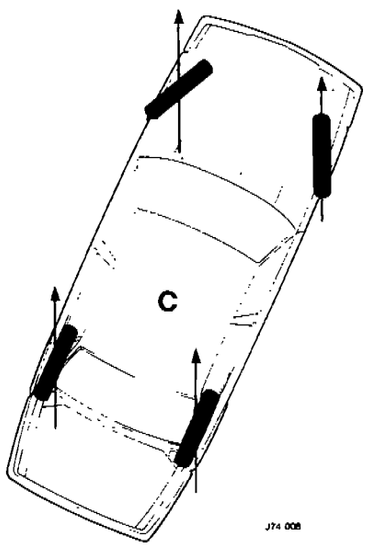


Fig 3

ALIGNMENT PRECAUTIONS

Wheels and tyres vary laterally within their manufacturing tolerances, or as a result of service, and alignment figures obtained without moving the car are unreliable. The following precautions should, therefore, be observed:

1. The car should have come to rest from a forward movement. This ensures, as far as possible, that the wheels are in natural running positions.

2. It is preferable for alignment to be checked with the car laden.

3. With a conventional base bar tyre alignment gauge, measurements should be taken in front of and behind the wheel centres at the same position on the tyre and rim flanges. This is achieved by marking the tyres where the first reading is taken and moving the car forwards approximately half a road wheel revolution before taking the second reading at the same points. With an optical gauge, two or three readings should be taken with the car moved forwards to different positions - 180° road wheel turn for two readings and 120° for three readings. An average figure should then be calculated.

TYRE AND WHEEL BALANCE

Static Balance

For smooth riding, precise steering and the avoidance of high speed 'tramp' or 'wheel hop', all tyres are balance checked to predetermined limits. To ensure the best degree of tyre balance, the covers are marked with white spots on one bead and these indicate the highest part of the cover.

Some tyres are slightly outside standard balance limits and are corrected before issue by attaching special patches to the inside covers at the crown. The patches contain no fabric and do not affect the local stiffness of the tyre and should not be mistaken for repair patches. They are embossed 'Balance Adjustment Rubber'.

The original degree of balance is not necessarily maintained and it may be affected by uneven tread wear, cover and tube repair, tyre removal or refitting, or by wheel damage or eccentricity. The car may also become sensitive to unbalance due to normal wear of moving parts. If roughness or high speed steering troubles develop and mechanical investigation fails to disclose a possible cause, wheel and tyre balance should be suspected.

WARNING: IF BALANCING EQUIPMENT IS USED TO DYNAMICALLY BALANCE THE ROAD WHEELS, ALWAYS JACK BOTH REAR WHEELS OFF THE GROUND WHEN REAR WHEEL BALANCING, OTHERWISE DAMAGE MAY BE CAUSED TO THE DIFFERENTIAL. THIS IS DOUBLY IMPORTANT IN THE CASE OF CARS FITTED WITH A 'POWR-LOK' DIFFERENTIAL, AS IN ADDITION TO POSSIBLE DAMAGE TO THE DIFFERENTIAL, THE CAR MAY DRIVE ITSELF OFF THE JACK OR STAND.

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Dynamic Balance

Static unbalance can be measured when the tyre and wheel assembly is stationary. There is another form known as dynamic unbalance which can be detected only when the assembly is revolving.

There may be no heavy spot, i.e. there is no natural tendency for the assembly to rotate about its centre due to gravity, but the weight may be unevenly distributed each side of the centre tyre line. Laterally, the eccentric wheels give the same effect. During rotation, the offset weight distribution sets up a rotating couple which tends to steer the wheel to the right and left alternatively.

Dynamic unbalance of the tyre and wheel assemblies can be measured on suitable tyre balancing equipment, and corrections implemented. Where it is clear that a damaged wheel is the primary cause of severe unbalance, it is advisable for the wheel to be replaced.

TORQUE FIGURES

Clamp screw clamp** to **spare wheel 13-16Nm
Jack** to **mounting bracket 7-14Nm
Spare wheel fixing bracket** to **body 22-28Nm
*Valve to **wheel 3.5-4.5Nm***

SPANNER SIZES

13mm

IRREGULAR WEAR AND TYRE DAMAGE

Incorrect Tyre Pressure

Under-inflation (A Fig. 1) is a frequent cause of severe tyre damage, resulting from the excessive flexing of the tyre. Under inflation builds up internal heat which eventually weakens the casing. It also causes rapid and irregular tread wear.

Over-inflation (C Fig. 1) leads to shortened tyre life with tread wear concentrated on the centre section in contact with the road. The cushioning effect of the tyre is impaired, resulting in a hard and uncomfortable ride. The tyre is also susceptible to impact fracture and casing damage. Correctly inflated tyres are shown in (B Fig. 1).

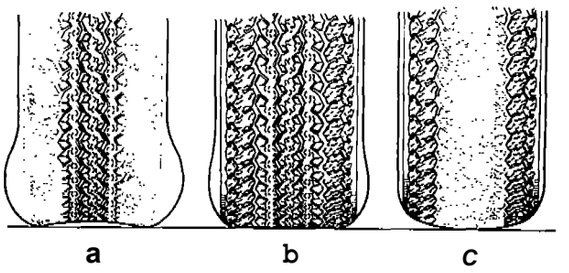


Fig 1

Misalignment Wear

Rasped and feathered tread condition is caused by wheel misalignment and results in very rapid tread wear (Fig. 2).

'Fins' on the inside edges of the pattern ribs, Particularly on the nearside tyre, indicate toe-in. 'Fins' on the outside edges, particularly on the offside tyre, indicate toe-out.

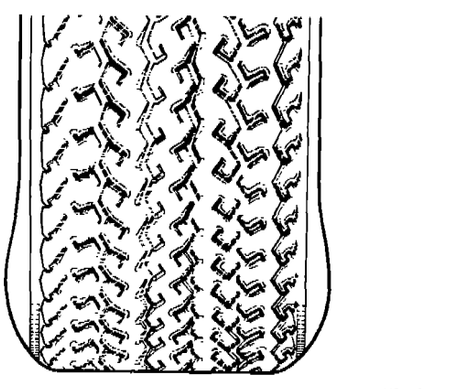
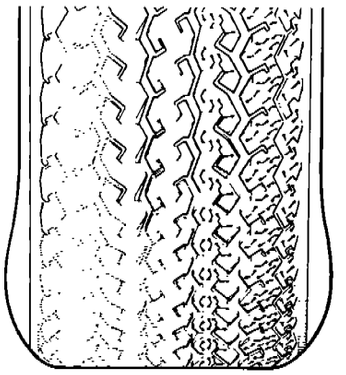


Fig 2

Camber Wear

One shoulder more severely worn than the other (Fig. 1). This type of wear is accentuated by mechanical irregularities of steering or suspension, or by high speed cornering.



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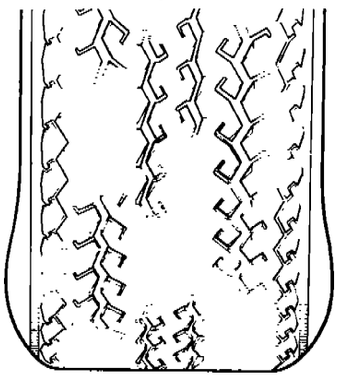
Fig 1

Neglected Cut

Damage through accidental cuts or penetrations will extend in use due to continued flexing and/or ingress of moisture and road matter.

Irregular Wear

Caused by mechanical irregularity of the vehicle (Fig. 2) as, for example, worn bearings, steering joints or badly adjusted brakes.



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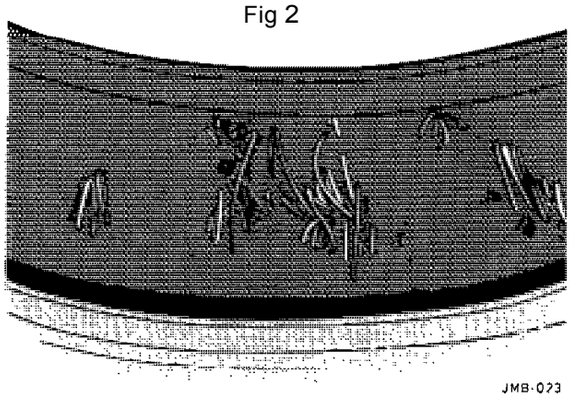
Fig 2

Age Deterioration

Cracking and crazing of the tread and sidewall rubber, sometimes accompanied by carcase deformation. An indication that the tyres have been in service for a very long time.

Deflation Damage

Breakdown of the tyre casing structure which can arise from under-inflation, overloading or running on a flat tyre (Fig 3).



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Fig 3

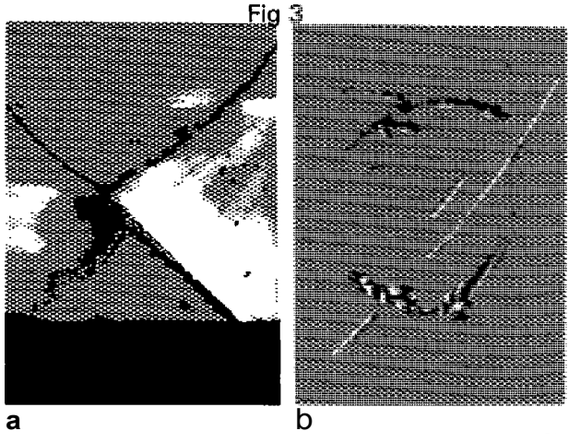
Impact Fracture

Resultant damage from impact fractures (Fig. 4) is not always visible externally and, therefore, as a safety precaution the tyre should be removed and examined.

(a) Casing fracture caused by severe localised impact through driving over kerbs, hitting pot-holes and/or objects in the road.

(b) A double fracture caused by crushing the sidewall of the tyre between an object and the rim flange.

Note: In both instances, such damage can lead to sudden and dangerous tyre deflation some time after the impact occurred.



a b

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Fig 4

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ROAD WHEEL - ONE

REMOVE AND REFIT 74.20.01

Remove hubcap.

Slacken the road wheel nuts ¼ of a turn each.

Jack up the vehicle and place on one stand.

Remove one road wheel securing nut (1 Fig. 1), mark the road wheel relative to a stud and remove the remaining nuts.

Remove the road wheel and tyre assembly (2 Fig. 1).

Lift the replacement road wheel and tyre assembly up to the hub, align the wheel with the marked stud and secure with the nuts.

Take the weight of the vehicle with a jack, remove the axle stand, lower the vehicle and recheck the torque of the wheel nuts.

CAUTION: Do not exceed a torque of 85Nm (63 lbf.ft) where steel wheels are fitted or 102Nm (75 lbf.ft) where alloy wheels are fitted.

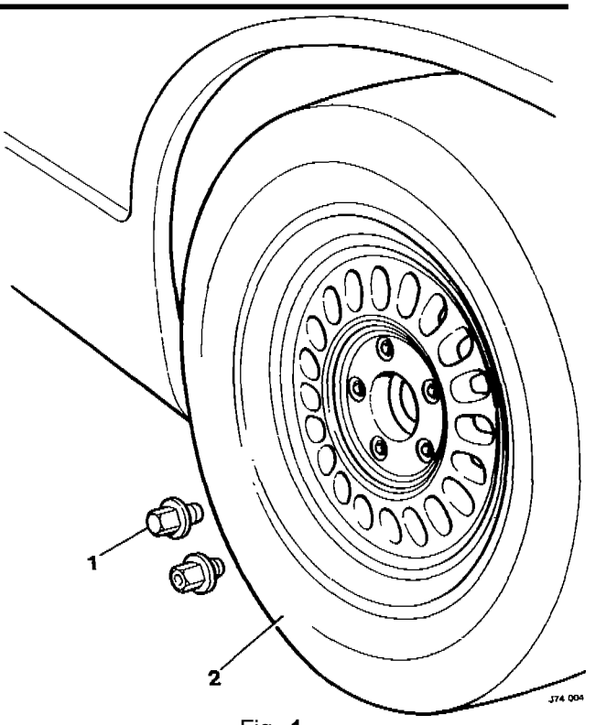


Fig. 1

DATA

TORQUE FIGURES

Wheel nut to wheel stud (steel wheel) ***65-85 Nm (48-63 lbf.ft)***

Wheel nut ***to wheel stud (alloy wheel) 88-102 Nm (65-75 lbf.ft)***

SPANNER SIZES

22 mm

SPARE WHEEL AND TOOL KIT

STOWAGE 74.20.04

The spare wheel, jack and tools are stowed in the luggage compartment as illustrated (Fig. 1). The jack and wheel changing tools are located behind the spare wheel.

To remove the spare wheel, remove the carpet cover and unscrew the bolt retaining the spare wheel. Lift out the wheel. Ensure that the ratchet *and* wheel brace are correctly positioned in the securing clips prior to positioning *and* securing of the spare wheel and its cover.

The tool box (where fitted) is located at the top of the luggage Compartment adjacent to the spare wheel. It contains a selection of tools and spare bulbs.

To remove, hold down the retaining catch (below the tool box) and slide the tool box rearwards. To replace, slide the tool box back into its container until the retaining catch locks.

Note: For Daimler/Vanden Plas derivatives a 6mm Allen key is clipped to the jack bracket, which is used for removing the hubcap.

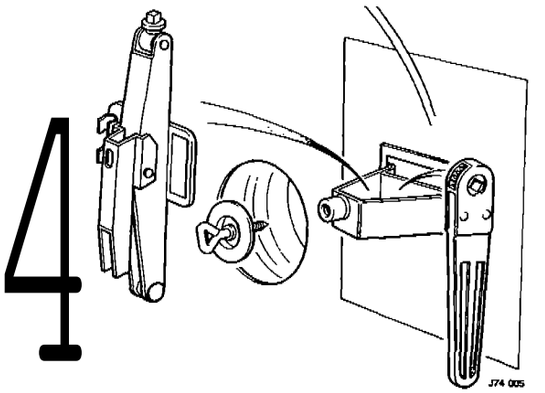


Fig. 1

DATA

TORQUE FIGURES

Spare wheel/tool stowage bracket to body 22-28Nm.

SPANNER SIZES

13mm

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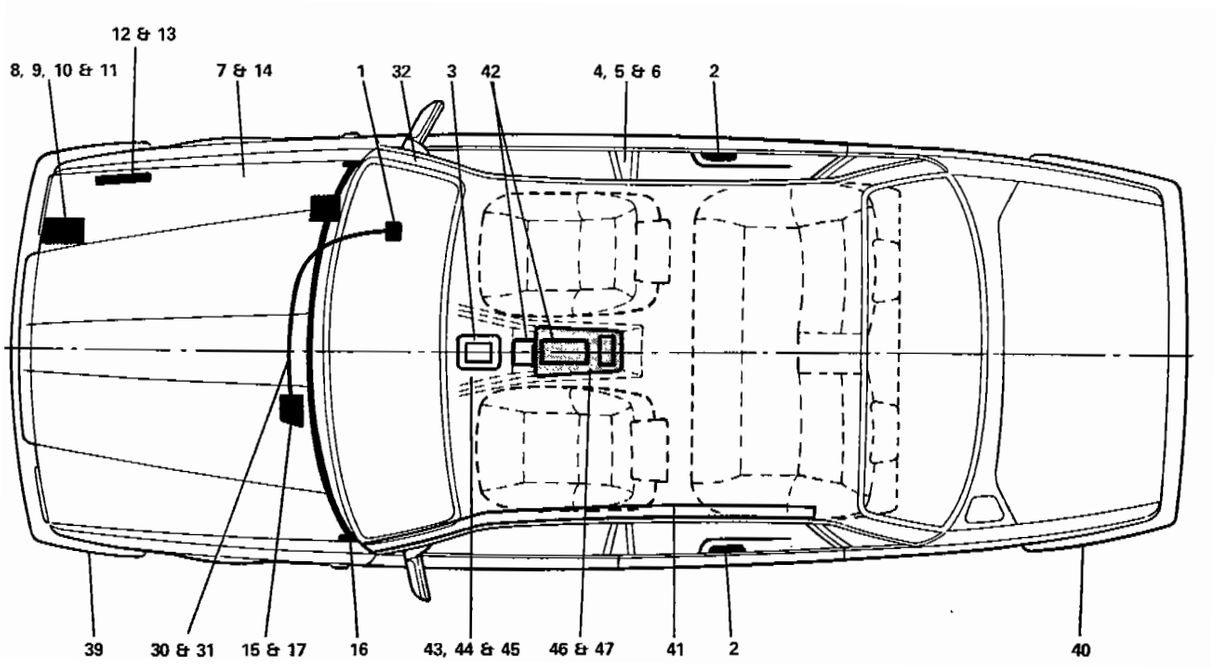
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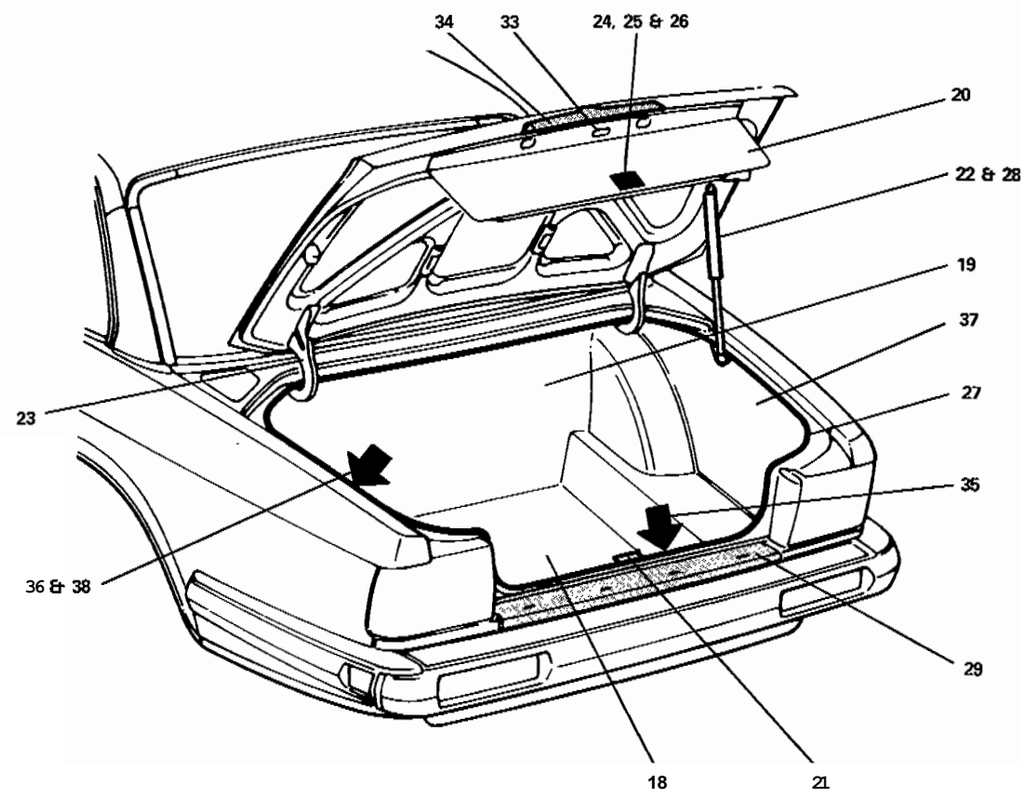
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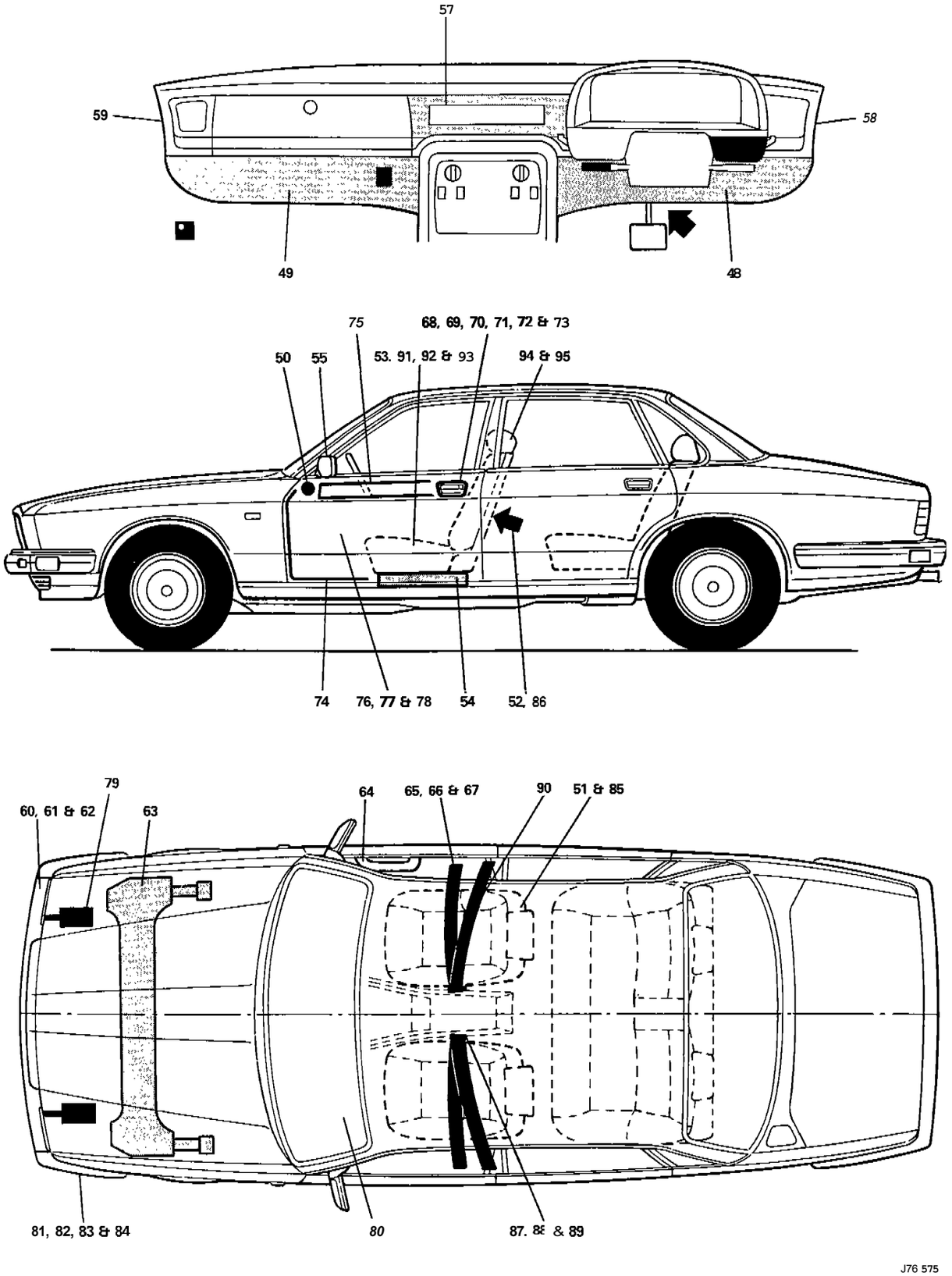
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45	CONSOLE FINISHER – MANUAL	76.25.19	76-83	4
46	CONSOLE GLOVEBOX	76.25.16	76-82	4
47	CONSOLE GLOVEBOX LID	76.25.18	76-82	4

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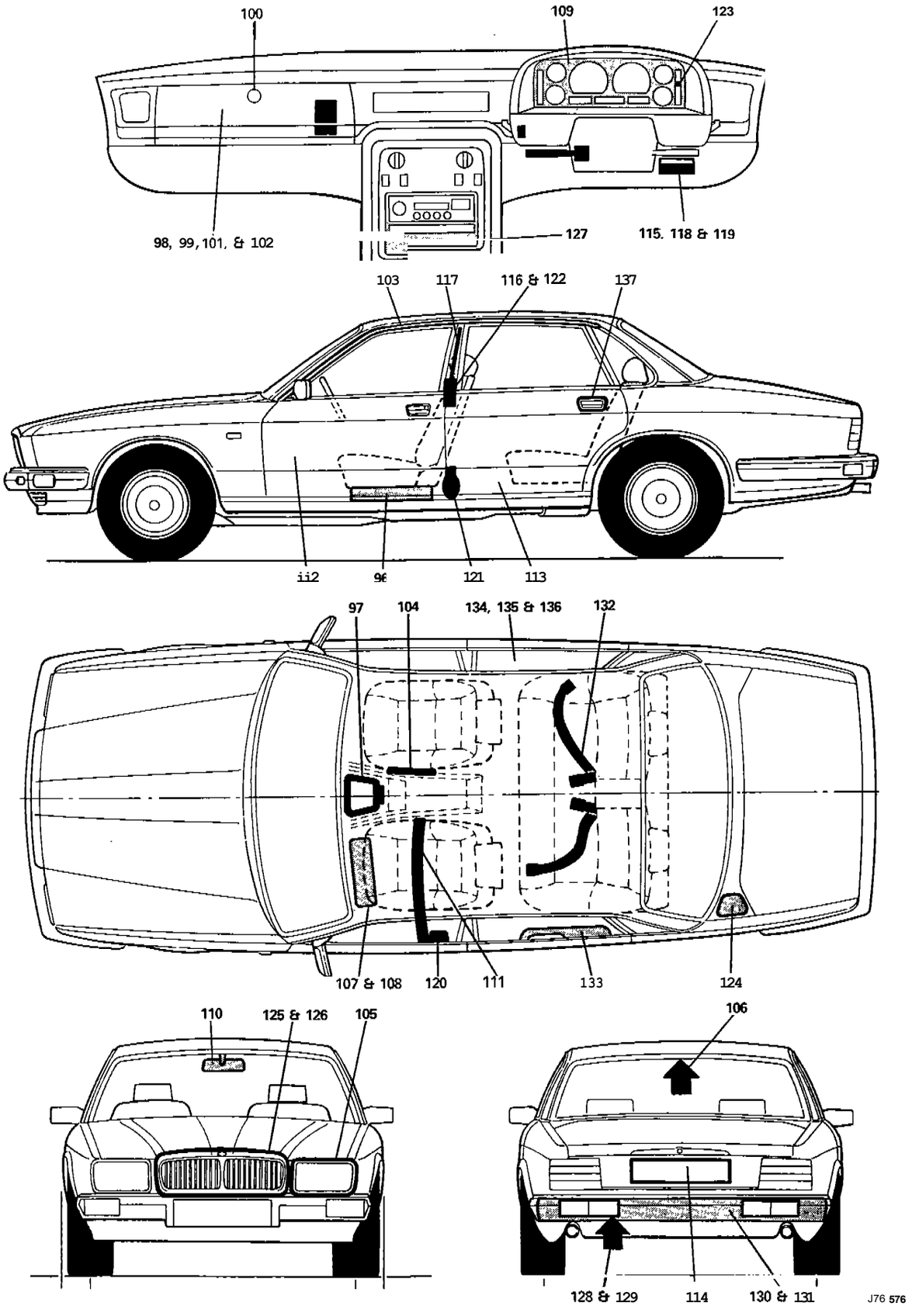


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49	DASH LINER PASSENGERS SIDE	76.46.15	76-83	4
50	DOOR AIR VENT GROMMET	76.00.00	76-83	4
51	ELECTRICALLY OPERATED FRONT SEAT	76.70.10	76-70	4
52	ELECTRICALLY **OPERATED** FRONT SEAT BACK FINISHER	76.70.09	76-71	4
53	ELECTRICALLY OPERATED FRONT SEAT CUSHION	76.70.11	76-69	4
54	ELECTRICALLY OPERATED FRONT SEAT – RUNNER AND MOTOR	76.70.08	76-70	4
55	EXTERIOR MIRROR	76.10.52	76-52	4
56	FASCIA BOARD	76.46.01	76-84	**4**
57	FASCIA CENTRE VENEER PANEL	76.47.06	76-86	**4**
58	FASCIA CLOSING PANEL – DRIVERS SIDE	76.46.28	76-86	4
59	FASCIA CLOSING PANEL – PASSENGERS SIDE	76.46.27	76-86	4
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62	FRONT BEAM COVER	76.22.28	76-94	4
63	FRONT CROSSMEMBER	76.10.05	76-18	4
64	FRONT DOOR ARMREST	76.34.22	76-30	4
65	FRONT DOOR GLASS	76.31.01	76-31	4
66	FRONT DOOR GLASS CHANNEL RUBBER	76.31.13	76-32	4
67	FRONT DOOR GLASS FRAME	76.31.51	76-33	4
68	FRONT DOOR HANDLE	76.58.01	76-33	4
69	FRONT DOOR INSIDE HANDLE	76.58.20	76-34	4
70	FRONT DOOR LOCK	76.37.12	76-35	4
71	FRONT DOOR LOCK STRIKER	76.37.23	76-37	**4**
72	FRONT DOOR OUTER HANDLE OPERATING ROD	76.37.10	76-98	**4**
73	FRONT DOOR REMOTE CONTROL OPERATING CABLE	76.37.67	76-26	4
74	FRONT DOOR SEAL	76.40.01	76-38	4
75	FRONT DOOR TRIM PAD VENEER PANEL	76.47.11	76-36	4
76	FRONT DOOR UPPER TRIM PAD	76.34.02	76-38	4
77	FRONT DOOR LOWER TRIM PAD	76.34.03	76-36	4
78	FRONT DOOR WAIST RAIL MOULDING	76.43.04	76-37	4
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84	FRONT QUARTER BUMPER MOUNTING RUBBER	76.22.19	76-22	4
85	FRONT SEAT	76.70.01	76-72	4
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89	FRONT SEAT BELT LEFT HAND	76.73.10	76-73,	4
90	FRONT SEAT BELT RIGHT HAND	76.73.21	76-74	4
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93	FRONT SEAT CUSHION SUPPORT CENTRE	76.70.19	76-75	4
94	FRONT SEAT HEADREST	76.70.30	76-75	4
95	FRONT SEAT HEAD REST – ELECTRICALLY OPERATED SEAT	76.70.14	76-71	4

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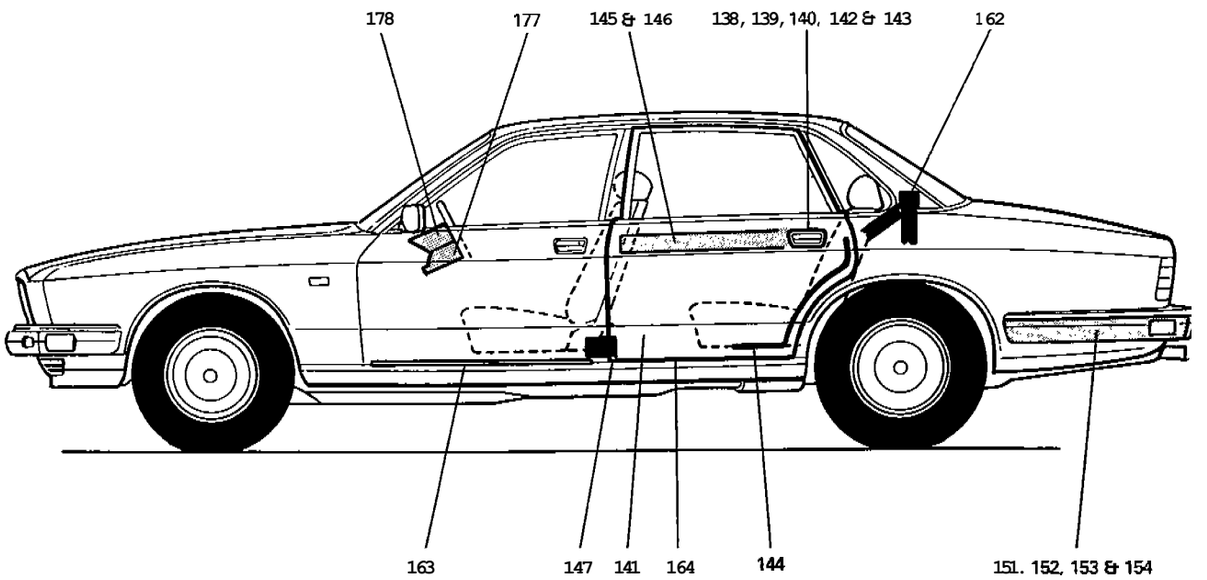


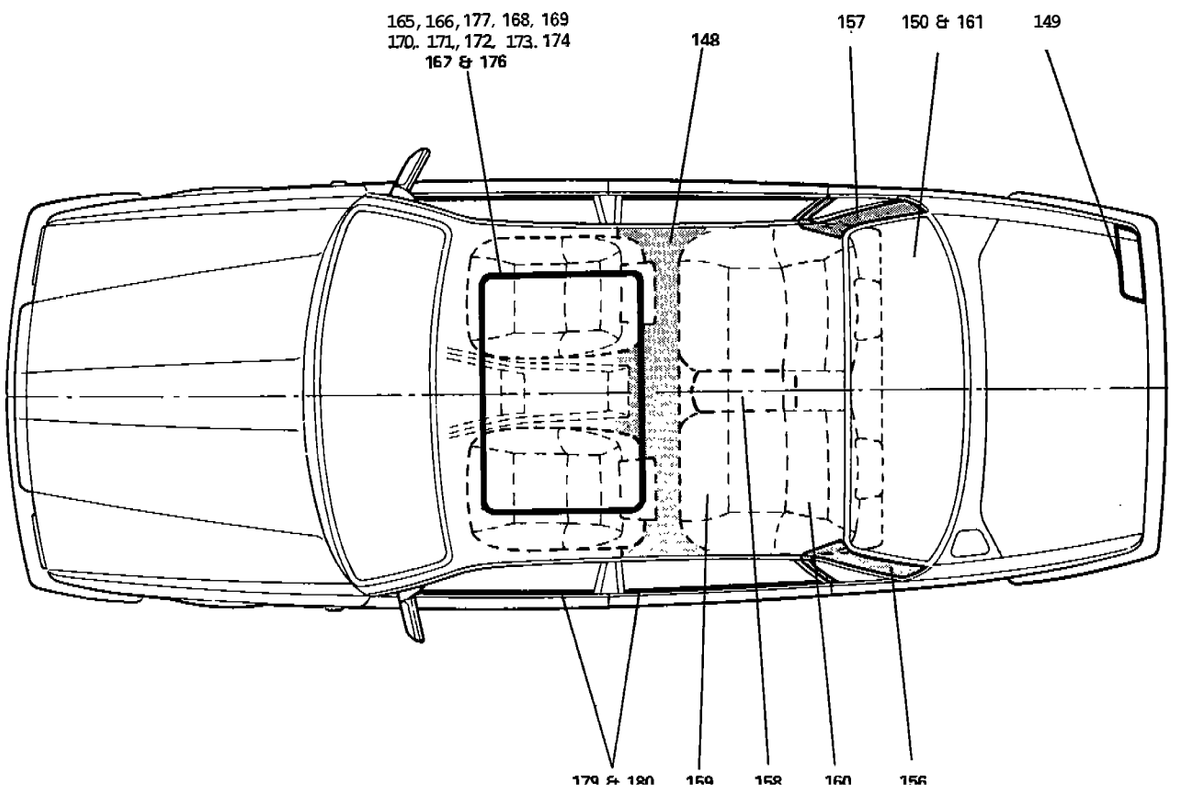
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98	GLOVE BOX	76.52.03	76-87	4
99	GLOVEBOX LID	76.52.02	76-87	4
100	GLOVEBOX LID LOCK	76.52.08	76-88	4
101	GLOVEBOX LID VENEER PANEL	76.47.21	76-88	4
102	GLOVEBOX MIRROR ASSEMBLY	76.52.05	76-89	4
103	GUTTER FINISHER	76.43.11	76-53	**4**
104	HANDBRAKE LEVER TRIM	76.13.63	76-89	4
105	HEADLAMP TRIM FINISHER	76.40.01	76-24	4
106	HEADLINING REAR FINISHER	76.64.12	76-89	**4**
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114	NUMBER PLATE TRIM	76.43.22	76-53	4
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116	PASSIVE RESTRAINT	76.73.00	76-102	4
116	PASSIVE RESTRAINT	76.73.00	76-112	4
116	PASSIVE RESTRAINT	76.73.00	76-109	**4**
117	PASSIVE RESTRAINT GUIDE RAIL	76.73.33	76-114	**4**
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130	REAR BUMPER CENTRE BLADE	76.22.12	76-51	**4**
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135	REAR DOOR GLASS CHANNEL RUBBER	76.31.14	76-40	4
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141	REAR DOOR LOWER TRIM PAD	76.34.06	76-44	4
142	REAR DOOR OUTER HANDLE OPERATING ROD	76.37.11	76-97	4
143	REAR DOOR REMOTE CONTROL OPERATING CABLE	76.37.68	76-43	4
144	REAR DOOR SEAL	76.40.02	76-46	4
145	REAR DOOR TRIM PAD VENEER PANEL	76.47.12	76-45	4
146	REAR DOOR UPPER TRIM PAD	76.34.05	76-45	4
147	REAR DOOR WAIST RAIL MOULDING	76.43.05	76-45	4
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149	REAR LAMP ASSEMBLY INTERIOR TRIM FINISHER	76.19.20	76-90	4
150	REAR PARCEL TRAY	76.67.06	76-90	4
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152	REAR QUARTER BUMPER BLADE	76.25.75	76-50	4
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154	REAR QUARTER BUMPER MOUNTING RUBBER	76.22.21	76-49	4
156	REAR QUARTER UPPER TRIM PAD LEFT HAND	76.13.13	76-91	4
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158	REAR SEAT ASSEMBLY	76.70.39	76-77	4
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161	REAR SHELF FINISHER	76.67.06	76-78	4
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163	SILL TREAD PLATE – FRONT	76.76.01	76-55	4
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165	SLIDING ROOF ASSEMBLY	76.82.01	76-55	4
166	SLIDING ROOF FLANGE FINISHER	76.82.23	76-56	4
167	SLIDING ROOF MOTOR DRIVE GEAR	76.82.44	76-57	4
168	SLIDING ROOF PANEL	76.82.05	76-57	4
169	SLIDING ROOF PANEL LIFTING BLOCK	76.82.27	76-57	4
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171	SLIDING ROOF PANEL SEAL	76.82.15	76-58	4
172	SLIDING ROOF PANEL TRIM	76.82.19	76-58	4
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174	SLIDING ROOF RACK	76.82.42	76-59	4
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177	STEERING COLUMN LOWER COWL	76.46.03	76-92	4
178	STEERING COLUMN UPPER COWL	76.46.02	76-91	4
179	WEATHER STRIP	76.43.22	76-61	4
180	WEATHER STRIP CHANNEL	76.43.25	76-62	4

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RESERVED FOR DIMENSIONS OF VEHICLE

4.0L 2.9

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FRONT BUMPER

RENEW 76.22.08

Remove the side marker lamps and the front side **lamp** assemblies.
Remove the two bumper securing bolts, pull the bumper forward, disconnect the horn feed wires and remove the screw securing the horn earth to the front bumper.
Remove the bumper assembly (**1** Fig **1**).
Lift the replacement bumper assembly into position.
Reconnect the horn feed and earth wires.
Align, fit arid tighten the two securing bolts, ensuring that the two quarter bumpers are engaged in the wing side fixings.
Refit the side marker lamps and front side lamp assemblies.

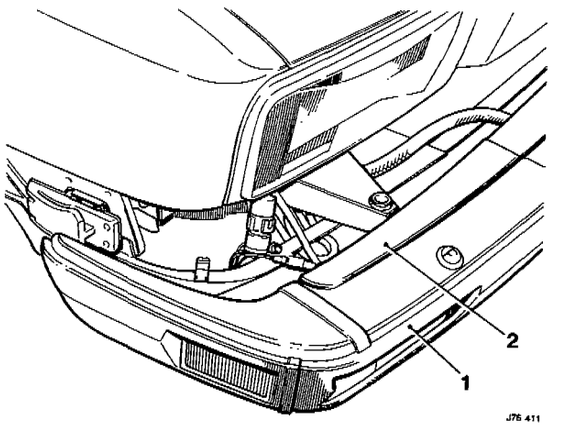


Fig **1**

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) 23-27Nm
Bumper mounting struts to body (Federal) 23-27Nm
Bumper to bumper bracket (Non Federal) 40-50Nm
Bumper to bumper strut (Federal) 40-50Nm
Guide block to mounting bracket 3.5-4.75Nm
Horns to bracket 22-28Nm
Mounting bracket guide block to body 7.5-10Nm

SPANNER SIZES

8mm
10mm
13mm
19mm
No 20 Torx

0384b

FRONT BUMPER ASSEMBLY

OVERHAUL 76.22.09

Remove the front side and marker lamp assemblies and remove the two bumper securing bolts.
Pull the bumper assembly forward and disconnect the horn **feed** and earth **wires.**
Remove the bumper assembly complete from the vehicle.
Remove the centre **blade** trim finisher (**1** Fig 2), remove the centre blade to bumper securing screws (2 Fig 2) and remove the blade (3 Fig 2).

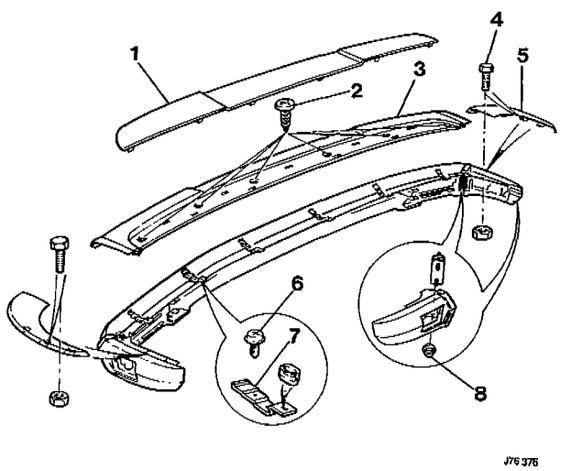


Fig 2

Remove both quarter bumper securing bolts (4 Fig 2 page 15) and remove the quarter bumper blades (5 Fig 2 page 15).
Remove the rubber bumper upper cover securing screws (3 Fig 2 page 15).
Remove the centre blade bracket/cover retaining clip securing screws (4 **Fig** 2 page 15) and remove the bracket (5 fig 2 page 15).
Remove the nuts securing the quarter bumper to the rubbers.
Remove the cover to bumper lower securing screws and remove the cover, remove the horn bracket securing screw and remove the bracket from the bumper beam.
Replace any damaged component and reverse the removal procedure to reassemble and fit to the vehicle.

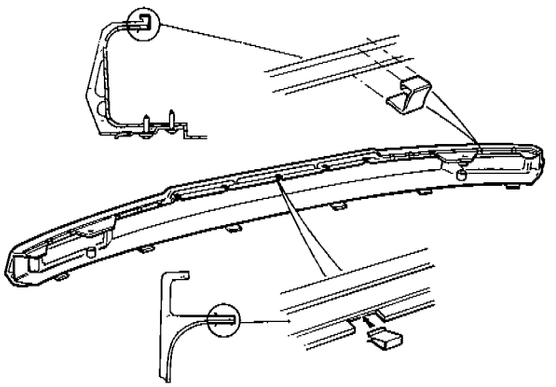


Fig **1**

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper front ***blade*** *to beam* ***5-7Nm***
Bumper side blade ***to*** *beam* ***5-7Nm***
Bumper side to mounting block ***5-7Nm***
Bumper to bumper bracket (Non Federal) ***40-50Nm***
Bumper to bumper strut (Federal) ***40-50Nm***
Flexible mounting block to beam ***5-7Nm***
Guide block ***to*** *mounting bracket* ***3.5-4.75Nm***
Horns to bracket ***22-28Nm***
Mounting bracket guide block to body ***7.5-10Nm***

SPANNER SIZES

8mm
10mm
13mm
19mm
No *20 Torx*

0392b

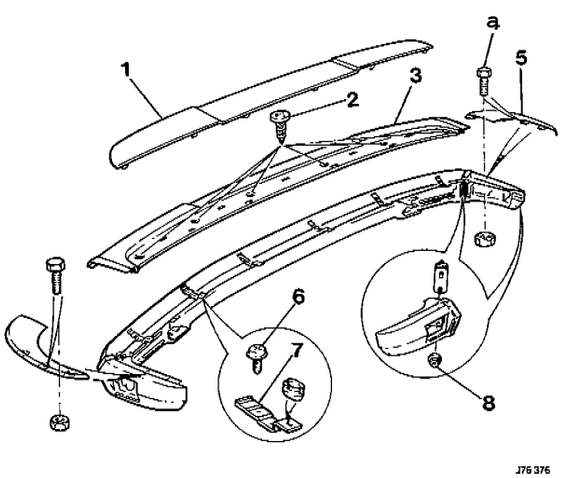


Fig 2

FRONT BUMPER CENTRE BLADE

RENEW **76.22.37**

Remove the trim finisher from its locating **lugs.**
Remove the centre section securing screws (2 Fig 2), manoeuvre the blade (1 Fig 2) clear of its locating clips and remove the centre section (3 Fig 2).
Fit the replacement blade to the retaining clips and align the fixing holes, fit and tighten the securing screws and refit the finisher to the centre blade.

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DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper to bumper bracket (Non Federal) ***40-50Nm***
Bumper ***to*** *bumper strut (Federal)* ***40-50Nm***
Guide block to mounting bracket ***3.5-4.75Nm***
Horns to bracket ***22-28Nm***
Mounting bracket guide block to body ***7.5-10Nm***

SPANNER SIZES

8mm
I Omm
13mm
19mm
No 20 Torx

0386b

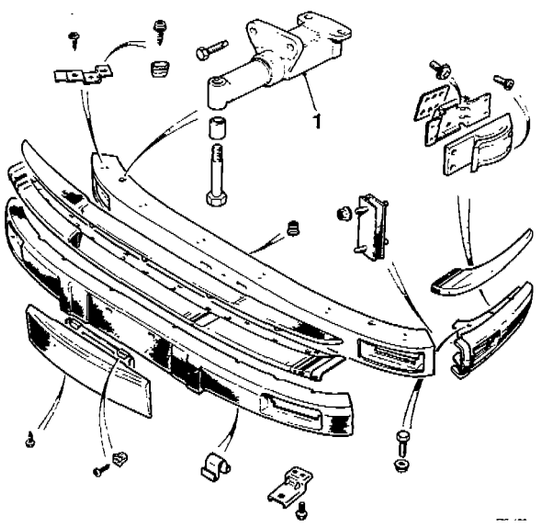


Fig 1

FRONT ENERGY ABSORBING STRUT

RENEW 76.22.31

Remove the side marker lamps and the front side lamp assemblies.
Remove the two bumper securing bolts, pull the bumper forward, disconnect the horn feed wires and remove the screw securing the horn earth to the front bumper.
Remove the bumper assembly.
Cut the ratchet strap securing the block connector to the strut mounting bracket.
Remove the bolt securing the strut (1 Fig 1), and remove the strut assembly.
Secure the strut in a vice.
Remove the locknut securing the bracket to the strut.
Note the number of threads protruding from the bracket and remove the strut.
Reverse the removal procedure to refit the replacement strut to the vehicle.
Lift the replacement bumper assembly into position and connect up the horn feed and earth wires.
Align, fit and tighten the two securing bolts, ensuring that the two quarter bumpers are engaged in the wing side fixings.
Refit the side marker lamps and front side lamp assemblies.

DATA

TORQUE FIGURES

Bumper mounting brackets to body ***(Non*** *Federal)* ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper ***to*** *bumper bracket (Non Federal)* ***40-50Nm***
Bumper to bumper strut (Federal) ***40-50Nm***
Guide block to mounting bracket ***3.5-4.75Nm***
Horns to bracket ***22-28Nm***
Mounting bracket guide block ***to*** *body* ***7.5-10Nm***

DATA

SPANNER SIZES

8mm
I Omm
13mm
19mm
No 20 Torx

1669B/77

FRONT CROSSMEMBER

RENEW *76.10.05*

Jack up the front of the vehicle.
Fit camber tie-down bars (Service Tool JD 133) to the road spring pans.
NOTE: If, for any reason, the front crossmember is being stripped down, Service Tool JD 115 must be used in place of JD 133, and the coil springs must be removed prior to crossmember removal (operation 60.20.01). JD 133 is for operations where the crossmember is being removed for access only.
Lower the vehicle and settle the suspension.
Open the bonnet.
Engage the camber tie-down bars in the suspension turrets.
Remove the front shock absorber upper securing nuts, washers and buffers (Fig 1).
Slacken off the road wheel nuts 1/4 of a turn each.
Jack up the front of the vehicle. Support with axle stands.
Mark the wheel to stud relationship, and remove the front road wheels.
Disconnect the left hand brake pad wear sensor block connector.
Remove the lower guide pin bolt from the left hand caliper, and pivot the caliper upwards to gain access to the brake pads (Fig 2).
NOTE: Use an open-ended spanner to hold the guide pin during removal. This will prevent damage to the rubber dust cover,
Remove the brake pads.
Remove the upper guide pin bolt, remove the caliper, and re-position the caliper away from the suspension area.
Disconnect the right hand brake pad wear sensor block connector.
Remove the right hand brake pads and caliper.
Turn the steering to the straight ahead position. Remove the ignition key.
Remove the lower column (3 Fig 3) to steering rack securing bolt/nut (1,2, Fig 3).

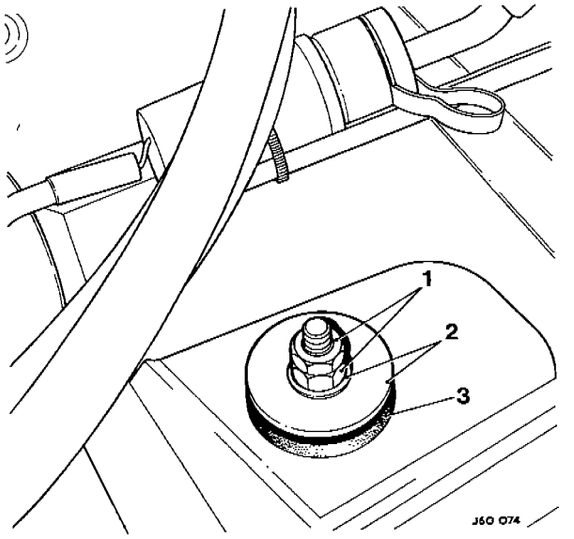


fig 1

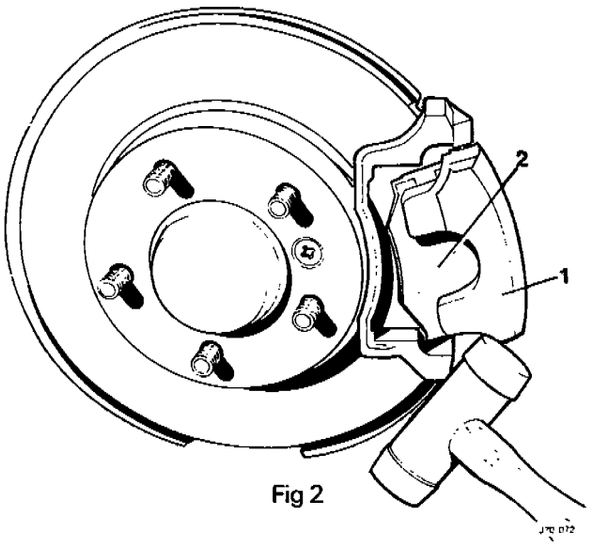


Fig 2

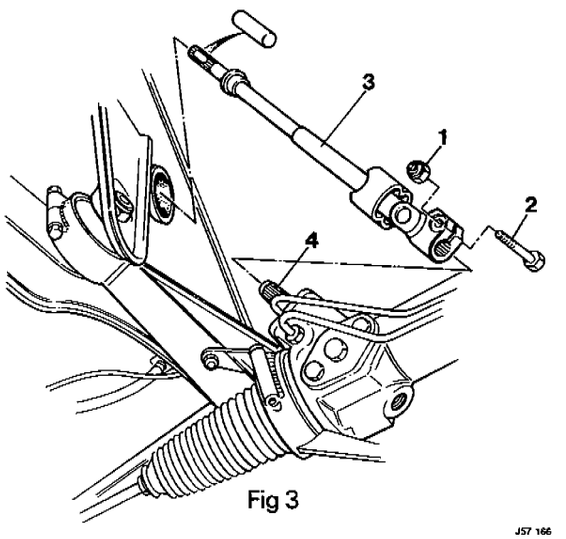


Fig 3

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Disengage the splines from the rack pinion (4 Fig 3 page 18).
NOTE: At this point, the lower column cannot be completely disconnected from the pinion.
Remove the P.A.S. pipe to crossmember retaining clamps and spacing washers.
Position a drain tray under the front of the vehicle.
Disconnect the steering rack return pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Disconnect the steering rack feed pipe, and drain the system.
Fit blanking plugs to the pipe and rack.
Re-position the pipes away from the suspension area.
Remove the drain tray.
Remove the engine mounting securing nuts.

Attach JD 124 rear engine lifting eye, fit and align Service Tool MS 53B engine support bracket (Fig 1). Engage the hook to the lifting eye (2.9 ENGINE **ONLY).**

Disconnect Nos. 1 and 2 plug leads.
Attach 18G 1465 rear engine lifting eye, fit and align Service Tool MS 536 engine support bracket (Fig 2). Engage the hook to the lifting eye (3.6 ENGINE **ONLY).**

Tighten the hook nut to take the weight of the engine.
Slacken off the crossmember rear mounting bolts/nuts.
Remove the nuts. Do not remove the bolts at this stage.
Slacken off the mounting clamp plate securing bolts (Fig 3).
Take the weight of the crossmember assembly on the jack.
Finally, remove the rear mounting bolts and spacers.
Remove the crossmember front mounting to chassis securing nuts (Fig 4).
NOTE: The bolts nuts remain captive.
Carefully lower the assembly from the vehicle. Ensure that the calipers, pipes and lower column do not foul during removal.
Change over all ancilliary components to the new crossmember.
Position the crossmember assembly on the jack under the vehicle,
Raise the assembly into position and align the shock absorbers.
Align the engine mountings, P.A.S. pipes, lower column and rear mountings.
Align the front crossmember mounting securing bolt holes.
Fit and tighten the front mounting securing bolts (Fig 4).
Using a second jack, align the left hand rear mounting (Fig 3).

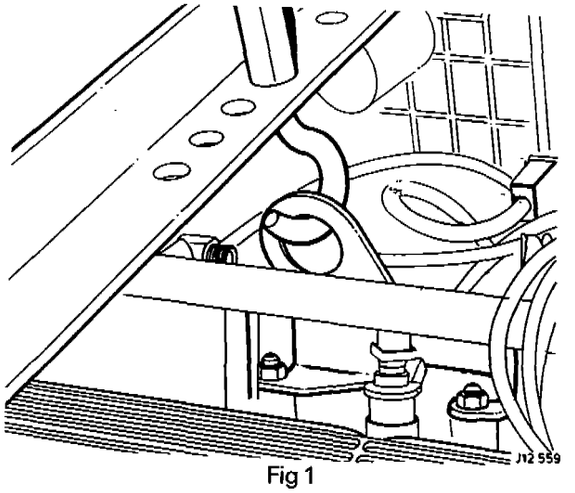


Fig 1

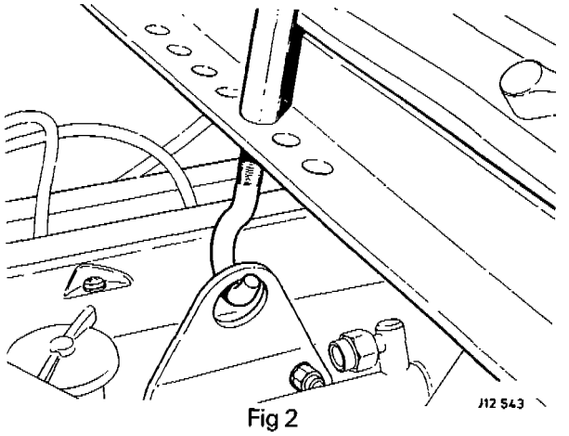


Fig 2

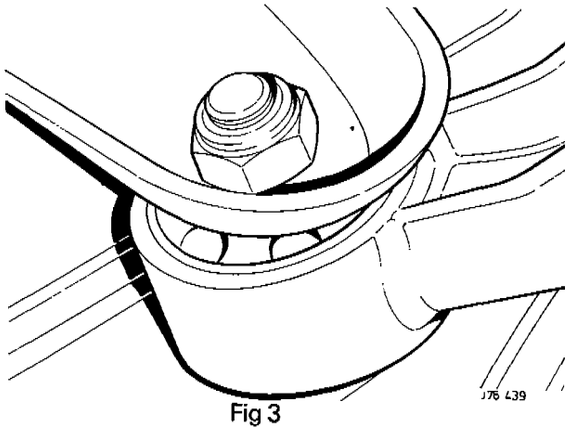
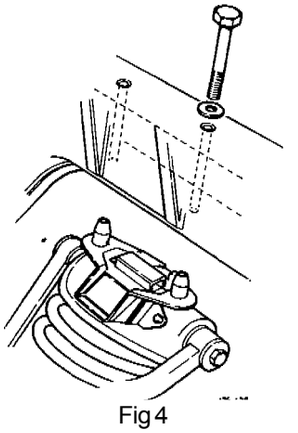


Fig 3


Fig 4

Fit and align the outer spacer.
Fit the bolt through the chassis, the outer spacer and the mounting.
Fit the inner spacer.
Push the bolt fully home, fit but do not tighten the nut.
Lower and remove the jack from under the mounting.
Repeat the above procedure for the right hand rear mounting.
Lower and remove the jack from under the crossmember.
Finally tighten the rear mounting securing bolts/nuts.
Tighten the rear mounting clamp plate securing bolts.
Ensure the steering wheel and rack are in the straight ahead position.
Re-position the lower column on to the pinion and align the clamp slot.
Fit and tighten the clamp bolt/nut.
Remove the blanking plugs from the **P.A.S.** pipes and rack.
Fit new **'O'** rings to the pipes. Connect the pipes to the rack. Tighten the union nuts.
Refit the **P.A.S.** pipe clamps.
Slacken off the MS 536 hook nut. Remove the hook. Remove Service **Tool MS 53B.**
Remove the lifting eye.
Fit and tighten the engine mounting securing nuts.
Refit the calipers. Refit the brake pads.
Refit the road wheels.
Lower the vehicle from the axle stands. Settle the suspension.
Refit the shock absorber upper buffers, washers, and securing nuts.
Release the tie-down bars from the suspension.
Raise the vehicle. Remove the tie-down bars from the road spring pans. Lower the vehicle.
Bleed the **P.A.S.** system as follows:
Top up the **P.A.S.** reservoir.
Start the engine.
Turn the steering wheel **to** full left hand lock.
Turn the steering wheel to full right hand lock.
Top up the reservoir. Fit the reservoir cap.
Close the bonnet.

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DATA

SERVICE TOOLS

JD 133 Tie-down bars
JD 124 Rear lifting eye (2.9 ENGINE)
18G 1465 Rear lifting eye (3.6 ENGINE)
MS 53B Engine support bracket

TORQUE FIGURES

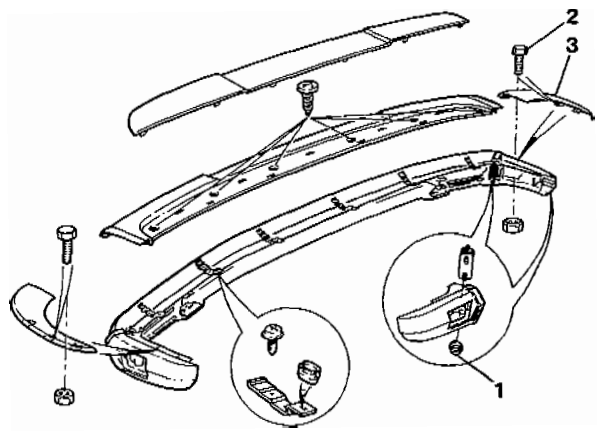
Caliper to carrier 31-40Nm
Wheel nut to wheel stud (steel wheel) 65-85"
Wheel nut to wheel stud (alloy wheel) 88-102Nm
Shock absorber to upper mounting 35-43Nm
P.A.S. feed pipe to rack 19-23Nm
P.A.S. return pipe to rack 19-23Nm

SPANNER SIZES

13mm
14mm
16mm
17mm
19mm
22mm
15/16A F

OILS/GREASES/SEALANTS

P.A.S. reservoir DEXRON 2D or Type G (M2C 33G)



J76 377

Fig *1*

0051G

FRONT QUARTER BUMPER

RENEW 76.22.16

Remove the front beam 76.22.26.
Remove the quarter bumper assembly to mounting rubber securing nuts (1 Fig 1).
Remove the quarter bumper assembly.
Remove the reflector, remove the quarter bumper blade securing nuts and bolts (2 Fig 1) and remove the quarter bumper blade (3 Fig 1).
Reverse the removal procedure to refit the replacement bumper.

DATA

TORQUE FIGURES

Bumper quarter blade to quarter bumper 5-7Nm
Bumper side to flexible mounting block 5-7Nm

SPANNER SIZES

8mm
10mm

1669B

FRONT QUARTER BUMPER MOUNTING RUBBER

RENEW **76.22.19**

Remove the front beam 76.22.26.
Remove the front quarter bumper 76.22.16
Remove the nuts (1 Fig 1) securing the beam to the flexible mounting rubber and remove the mounting from the beam.
Reverse the removal procedure to fit the replacement rubber.

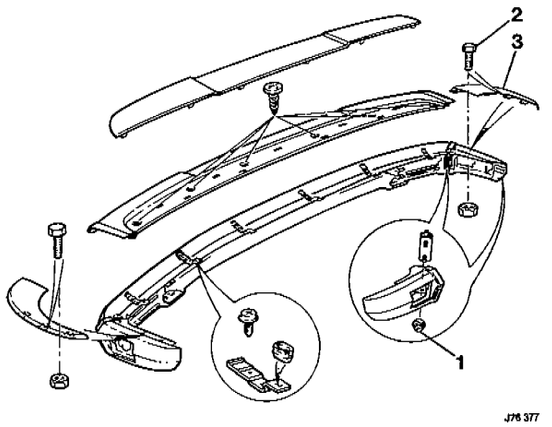


Fig 1

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper to bumper bracket (Non Federal) ***40-50Nm***
Bumper to bumper strut (Federal) ***40-50Nm***
Guide block to mounting bracket ***3.5-4.75Nm***
Horns to bracket ***22-28Nm***
Mounting bracket guide block to body ***7.5-10Nm***

SPANNER SIZES

8mm
10mm
13mm
19mm
No 20 Torx

1669B/66

FRONT QUARTER BUMPER LOCATING BRACKET

RENEW **76.22.20**

Remove the front beam 76.22.26
Slacken and remove the screws securing the locating bracket to the body and remove the bracket (1 Fig 2).
Reverse the removal procedure to refit the replacement bracket.

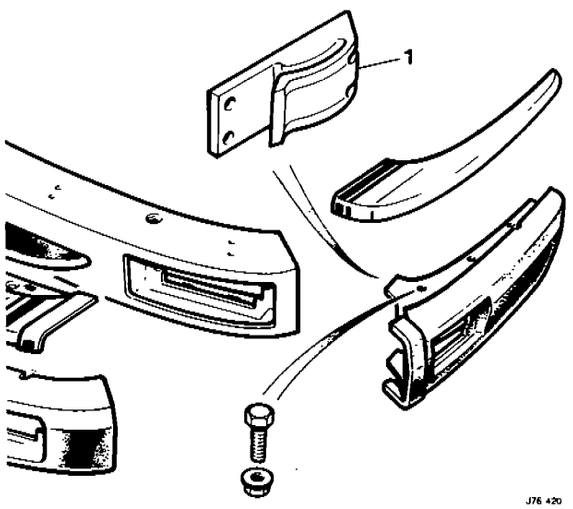


Fig 2

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper to bumper bracket (Non Federal) ***40-50Nm***
Bumper to bumper strut (Federal) ***40-50Nm***
Guide block to mounting bracket ***3.5-4.75Nm***

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DATA

TORQUE FIGURES

Horns to bracket ***22-28Nm***
Mounting bracket guide block to body 7.5- ***10Nm***

SPANNE'RSIZES

8mm
10mm
13mm
19mm
No 20 Torx

1669B/66

FRONTQUARTER BUMPER BLADE

RENEW **76.22.73**

Remove the front beam 76.22.26
Remove the nuts and bolts (1 Fig 1) securing the blade (2 Fig 1) to the bumper.
Remove and discard the blade.
Reverse the removal procedure to refit the replacement blade.

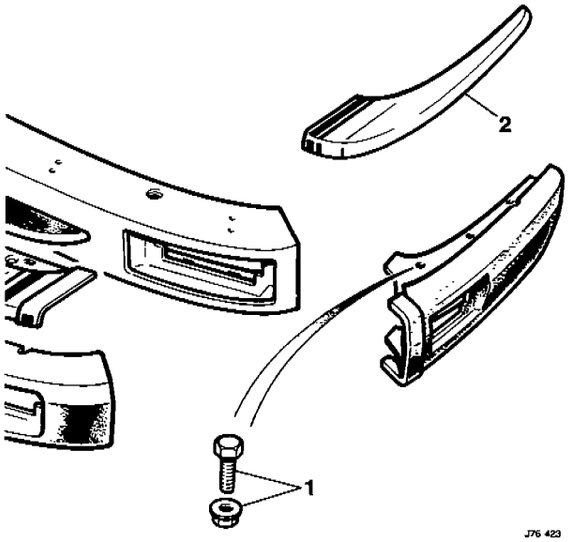


Fig 1

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper front blade to beam ***5-7Nm***
Bumper side blade to beam ***5-7Nm***
Bumper side ***to*** *mounting block* ***5-7Nm***
Bumper to bumper bracket (Non Federal) ***40-50Nm***
Bumper to bumper strut (Federal) ***40-50Nm***
Flexible mounting ***block*** *to beam* ***5-7Nm***
Guide ***block*** *to mounting bracket* ***3.5-4.75Nm***
Horns to bracket ***22-28Nm***
Mounting bracket guide block ***to*** *body* ***7.5-10Nm***

SPANNER SIZES

8mm
10mm
13mm
19mm
No 20 Torx

1669B

HEADLAMPTRIM FINISHER

RENEW **76.40.01**

Remove the radiator grille 76.55.07.
Remove the headlamp assembly 86.40.06/7.
Remove the four screws (1 Fig 1) securing the trim to the headlamp unit.
Reverse the removal procedure to refit the finisher.

0379b

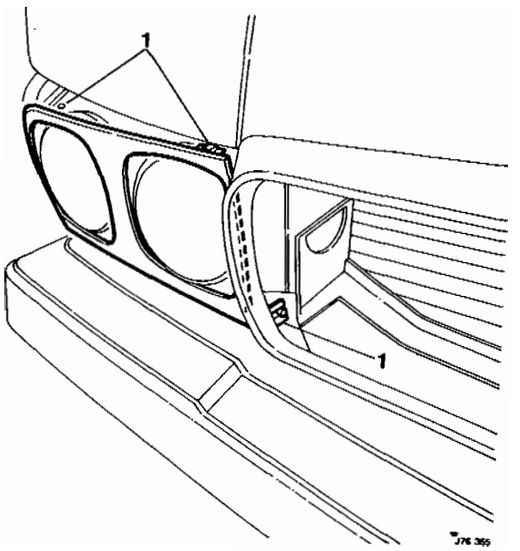


Fig 1

BONNET

RENEW **76.16.01**

Open the bonnet.
Remove the right hand insulation pad securing screws and remove the pad.
Disconnect the bonnet illumination lamp multi plugs.
Apply tape to the forward edge of the bonnet behind the grille surround.
Slacken the bonnet securing bolts (1 Fig 2) and disconnect the bonnet support struts (2 Fig 2).
Remove the bonnet securing bolts and remove the bonnet.
Remove the trim pad securing screws and remove the trim pad.
Remove the bonnet lamp securing screws, remove the tape securing the lamp harness to the bonnet and remove the lamps.
Remove the bonnet lock spring assemblies, remove the bonnet catch securing bolts and remove the catch.
Remove the bonnet support pivots and place the bonnet aside.
Reverse the removal procedure to refit, ensuring that the bonnet is aligned before the bonnet securing bolts are finally tightened.

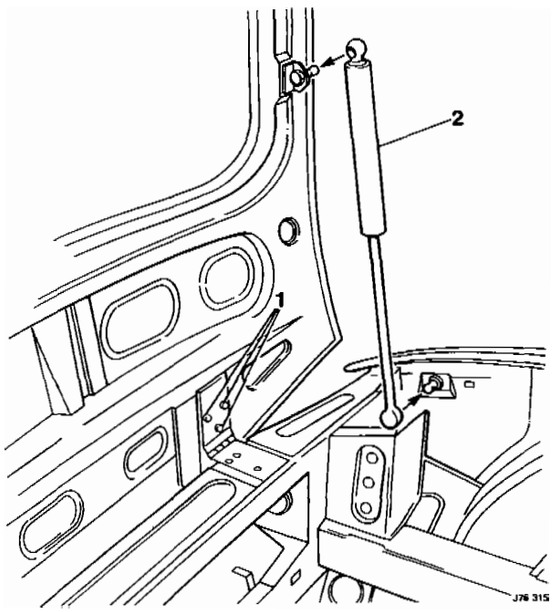


Fig. 2

DATA

SPANNER SIZES

13mm

0010b

BONNET INSULATION PAD

RENEW **76.16.06**

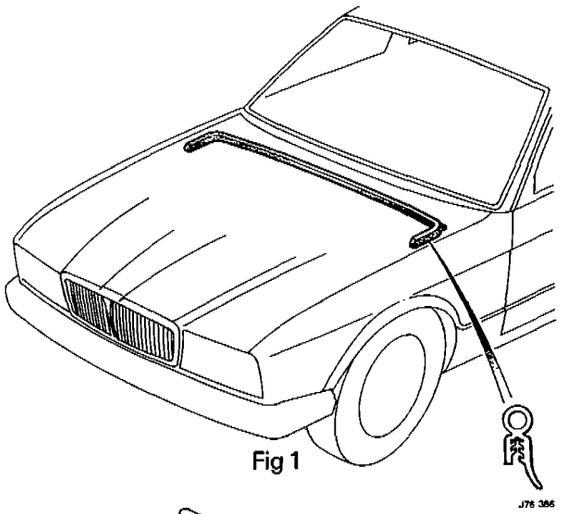
Open the bonnet and remove the ten self tapping screws and plain washers securing the insulation to the bonnet.
Hold the replacement insulation pad in position and secure with the ten screws and plain washer. Close the bonnet.

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BONNETSEALING RUBBER REAR

RENEW **76.16.04**

Open the bonnet.
Starting from one side of the vehicle, prise the rubber seal (Fig 1) from the bulkhead/ inner wings. Discard the old seal.
Starting from the centre of the vehicle, fit the replacement seal to the bulkhead/inner wings, gradually working outwards.
Ensure the seal is firmly pressed down onto the channel edge.
Cut the outer edge of the seal as shown (Fig 1).
Press the remainder of the trim firmly down on each inner wing and trim off until they are of equal length.
Close the bonnet.


Fig 1

0394b

BONNET STRIKER ASSEMBLY

RENEW **76.16.24**

Open the bonnet, slacken the locknut (1 Fig 2) and unscrew the striker (2 Fig 2).
Replace any damaged components and reassemble.
A distance of 62 mm (1 Fig 3) from the end of the striker to the locknut is an advisable length to set the assembly to, prior to fitment to the vehicle.
Adjust the assembly until the bonnet is flush with the wing and the bulkhead.
Close the bonnet.

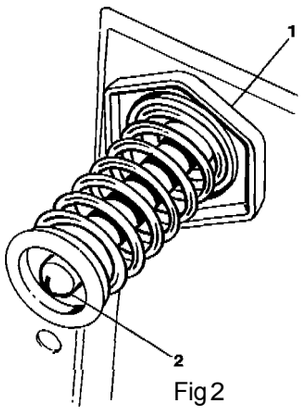


Fig 2

0388b

BONNET LOCK

RENEW ***76.00.00***

Open the bonnet and disconnect the lock operating cable (4 Fig 4) from the lock.
Remove the bolts securing the lock (5 Fig 4) to the body and remove the lock.
Reverse the removal procedure to refit the replacement lock ensuring that, prior to tightening, the lock is aligned with the striker.

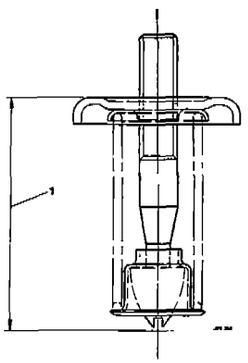


Fig 3

DATA

TORQUE FIGURES

Bonnet lock to body 7.5-10.25Nm

SPANNER SIZES

8mm
10mm

1669B/8

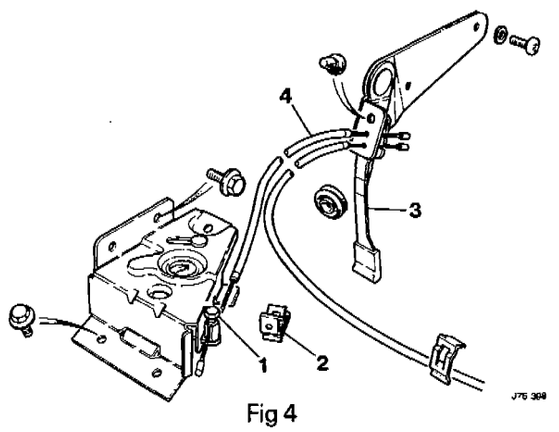


Fig 4

BONNETGAS STRUT

RENE **76.16.15**
Open the bonnet.

Fit a suitable bonnet support.
Displace the upper strut pivot (1 Fig 1) from the pivot bolt.
Repeat for the lower.
Remove and discard the strut (2 Fig 1).
Reverse the removal procedure to refit the replacement strut.

1669B/71

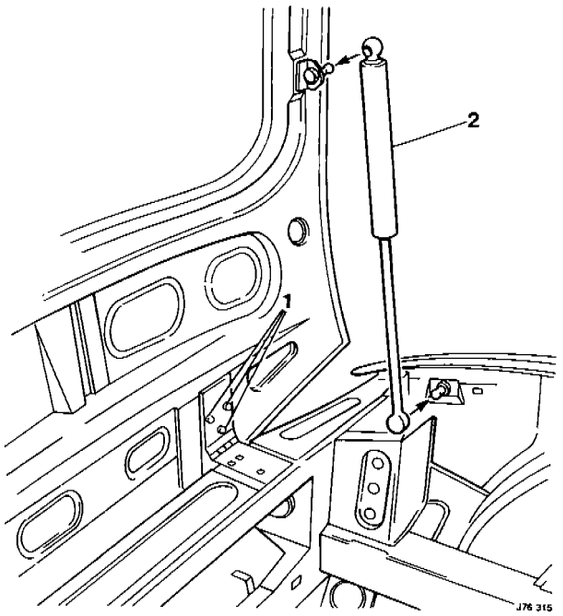


Fig 1

BONNET GAS STRUT-VEHICLE SET

RENEW **76.16.16**

Open the bonnet.
Fit a suitable bonnet support.
Displace the upper strut pivot (1 Fig 1) from the pivot bolt.
Repeat for the lower.
Remove and discard the strut (2 Fig 1).
Repeat the procedure for the other strut.
Reverse the removal procedure to refit the replacement struts.

1669B/72

BONNET LOCK CONTROL CABLE

RENEW **76.16.29**

Open the bonnet.
Slacken the clamp bolt (1 Fig 2) securing the cable (4 Fig 2) to the lock actuator.
Disconnect the cable from the lock and from the mounting clip (2 Fig 2).
Displace the cable from the bulkhead mounting clips and remove the ratchet straps securing the cable to the pipes and harnesses.
Displace the cable from the remaining large ratchet straps.
Open the front door.
Remove the dash liner.
Pull the release handle and disconnect the cable (1 Fig 3) from the release handle and bracket.
Pull the cable through the bulkhead grommet and discard.
Reverse the removal procedure to fit the replacement cable.

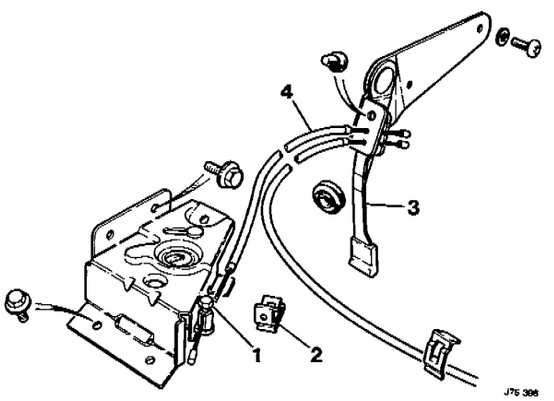


Fig 2

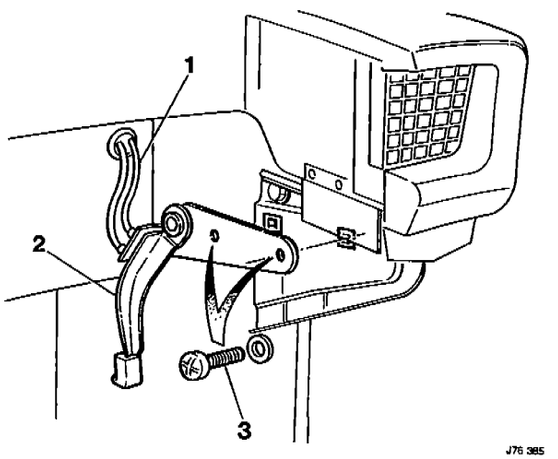


Fig 3

DATA

SPANNER SIZES

8mm
1 Omm

1669B/72

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BONNET LOCK CONTROLCABLE ASSE MBLY-VEHICLE SET

RENEW **76.16.35**

Open the bonnet.
Slacken the clamp bolt (1 Fig 1) securing the cable (4 Fig 1) to the lock actuator.
Disconnect the cable from the lock and from the mounting clip (2 Fig 1).
Displace the cable from the bulkhead mounting clips and removethe cable securing ratchetstraps.
Displace the cable from the remaining large ratchet straps.
Open the driving side door.
Removethe dash liner.
Pull the release handle and disconnect the cable (1 Fig 2) from the release handle (2 Fig 2) and bracket.
Pull the cable through the bulkhead grommet and discard.
Repeatthe procedure for the remainingcable.
Reverse the removal procedure to fit the replacement cables.

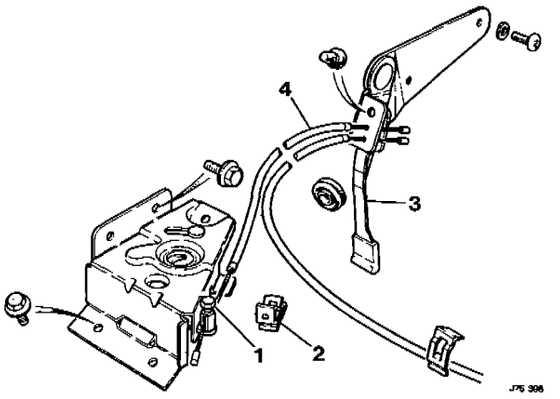


Fig 1

DATA

SPANNER SIZES

8mm
10mm

1669B/72

BONNET LOCK RELEASE HANDLE

RENEW **76.16.30**

Openthe bonnet.
Slacken the clamp bolt securing the cable to the lock actuator.
Repeatthe procedurefor the other side.
Openthe driving side door.
Removethe dash liner.
Disconnect the inner cables (1 Fig 2) from the bonnet release handle (2 Fig 2).
Removethe bolts securing the bonnet release handle (3 Fig 2) to the body, remove the cables from the handle and removefrom the vehicle.
Reverse the removal procedure to fit the replacement handle.

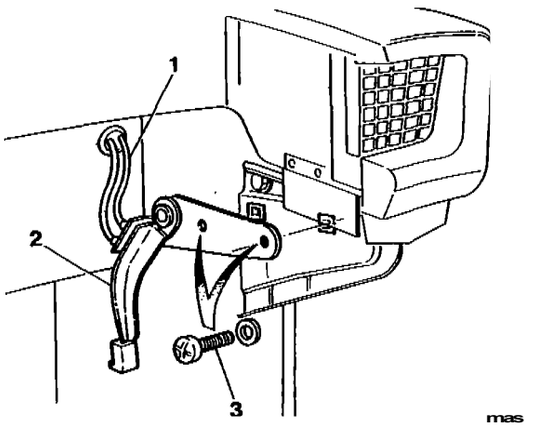


Fig2

DATA

TORQUE FIGURES

Bonnetlock release handle to body 7- 10Nm

SPANNER SIZES

8mm
10mm

BONNET HINGE (NON FEDERAL)

RENEW **76.16.11**

Remove the screw (situated at the top) securing the front grille and remove the grille (Fig 1).
Open the bonnet.
Secure the bonnet with a suitable support.
Remove the bonnet hinge securing nuts and bolts (Fig 2).
Remove and discard the hinge.
Position the replacement hinge on the front panel locating the studs in the holes.
Open the hinge and align with the securing holes in the bonnet.
Fit and tighten the hinge to bonnet securing bolts.
Fit but do not fully tighten the the hing securing nuts.
Remove the bonnet support and carefully lower the the bonnet to check the alignment, open the bonnet slacken the hinge securing nuts and position the bonnet as required.
Fully tighten the securing nuts.
Close the bonnet and check the alignment.
Refit the radiator grille and close the bonnet.

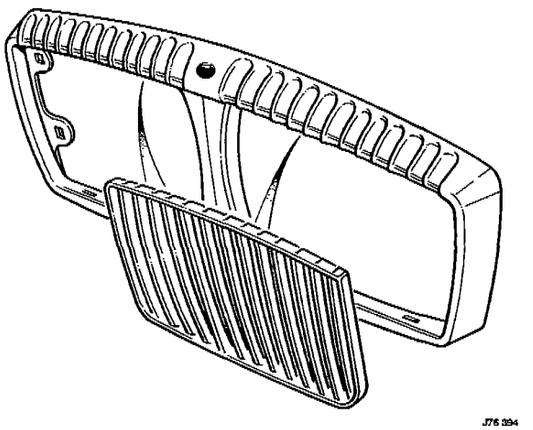


Fig 1

DATA

SPANNER SIZES

13mm

1669B/83

BONNET HINGE VEHICLE SET (NON FEDERAL)

RENEW **76.16.12**

Remove the two screws (situated at the top) securing each front grille and remove the grille (Fig 1).
Open the bonnet.
Secure the bonnet with a suitable support.
Remove the bonnet hinge securing nuts and bolts (Fig 2).
Remove and discard the hinge.
Position the replacement hinge on the front panel locating the studs in the holes.
Open the hinge and align with the securing holes in the bonnet.
Fit and tighten the hinge to bonnet securing bolts.
Fit but do not fully tighten the the hinge securing nuts.
Remove the bonnet support and carefully lower the the bonnet to check the alignment.

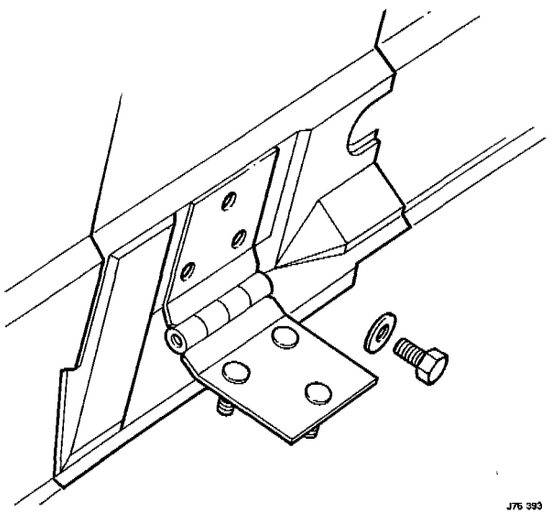


Fig 2

www.JagDocs.com

Open the bonnet, slacken the hinge securing nuts and position the bonnet as required.
Fully tighten the securing nuts.
Close the bonnet and check the alignment.
Repeat the procedure for the other hinge.
Refit the radiator grille and close the bonnet.

DATA

SPANNER SIZES

13mm

1669B/83

BONNET HINGE (FEDERAL)

RENEW **76.16.11**

Remove the screw (situated at the top) securing the front grille and remove the grille (Fig 1).
Remove the two bolts each side securing the grille support brackets to the body.
Remove the grille assembly and remove the grille support brackets and four plastic thread inserts (Fig 2).
Open the bonnet.
Secure the bonnet with a suitable support.
Remove the bonnet hinge securing nuts and bolts
Remove and discard the hinge.
Position the replacement hinge on the front panel locating the studs in the holes.
Open the hinge and align with the securing holes in the bonnet.
Fit and tighten the hinge to bonnet securing bolts.
Fit but do not fully tighten the the hinge securing nuts.
Remove the bonnet support and carefully lower the the bonnet to check the alignment.
Open the bonnet, slacken the hinge securing nuts and position the bonnet as required.
Fully tighten the securing nuts.
Close the bonnet and check the alignment.
Refit the radiator grille and surround.
Close the bonnet.

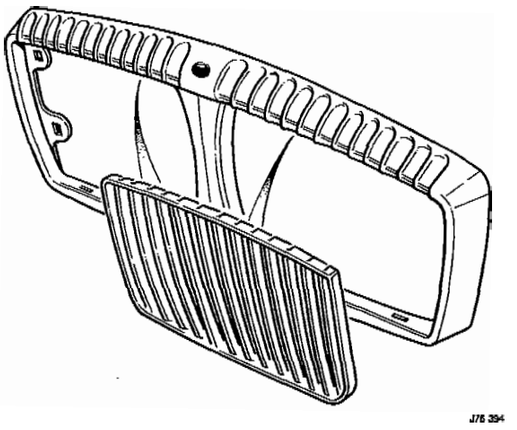


Fig 1

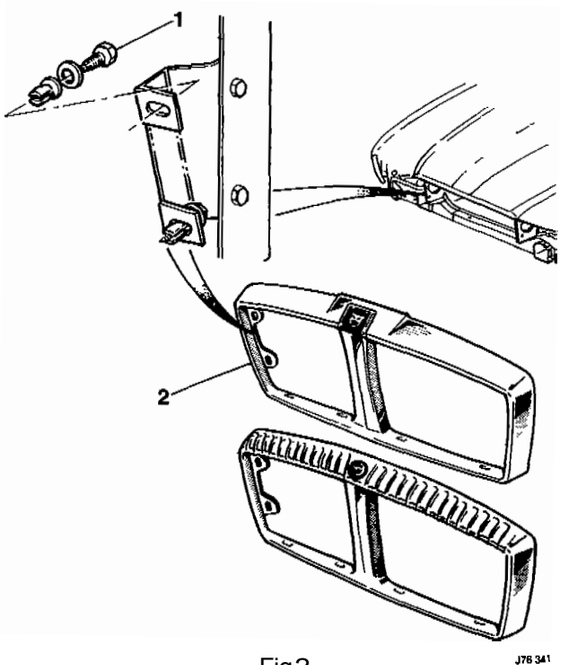


Fig 2

DATA

SPANNER SIZES

10mm
13mm

1669B/84

BONNET HINGEVEHICLE SET (FEDERAL)

RENEW **76.16.12**

Remove the two screws (situated at the top) securing each front grille and remove the grille (Fig 1).
Remove the two bolts each side securing the grille support brackets to the body.
Remove the grille assembly and remove the grille support brackets and four plastic thread inserts (Fig 2).
Open the bonnet.
Secure the bonnet with a suitable support.
Remove the bonnet hinge securing nuts and bolts (Fig 3).
Remove and discard the hinge.
Position the replacement hinge on the front panel locating the studs in the holes.
Open the hinge and align with the securing holes in the bonnet.
Fit and tighten the hinge to bonnet securing bolts.
Fit but do not fully tighten the the hinge securing nuts.
Remove the bonnet support and carefully lower the the bonnet to check the alignment, open the bonnet slacken the hinge securing nuts and position the bonnet as required.
Fully tighten the securing nuts.
Close the bonnet and check the alignment.
Repeat the procedure for the other hinge.
Refit the radiator grille and surround.
Close the bonnet.

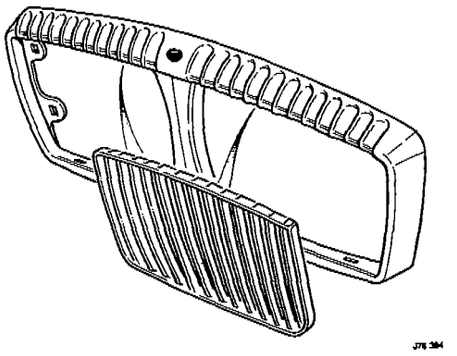


Fig 1

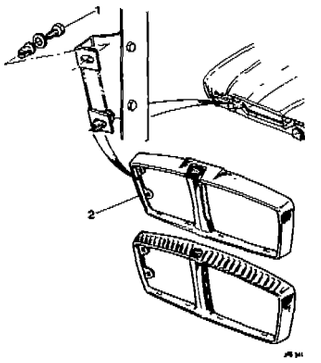


Fig 2

DATA

SPANNER SIZES

1 Ornrn
13mm

1669B/85

FRONT DOOR ARMREST

RENEW **76.34.22**

Open the door.
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the screws securing the armrest to the trim pad (Fig 4). disconnect the speaker block connector (Fig 4) and remove the armrest from the trim pad.

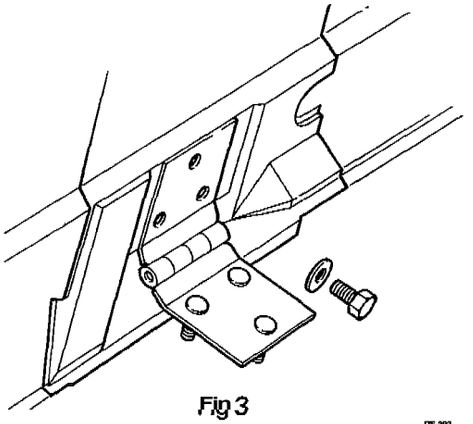


Fig 3

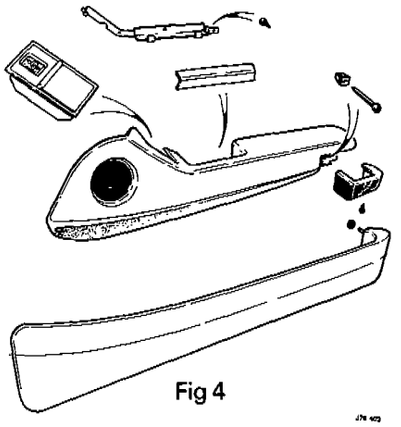


Fig 4

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Remove the screws (Fig 4 page 30) securing the switch panel support bracket (Fig 4 page 30) to the armrest (Fig 4 page 30) and remove the bracket.
Displace the switch panel/ashtray (for access).
Disconnect the puddle lamp feed wires and the securing screws, remove the lamp assembly.
Remove the switch and harness assembly from the armrest and discard the armrest.
Reverse the removal procedure to refit the replacement armrest.

DATA

SPANNER SIZES

No 4 Pozi

FRONT DOOR GLASS

RENEW **76.31.01**

Open the door.
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Fit tape (1 Fig 1) over the door glass (2 Fig 1) and frame (3 Fig 1) to secure the glass.
Remove the screws securing the window lift motor to the door frame.
Remove the screws securing the window regulator lift guide.
Disconnect the exterior mirror and regulator multi plug connectors.
Disconnect the window lift mechanism from the door glass.
Lower the window lift motor to the bottom of the door and displace the channel rubber from the front channel for access to the securing screw.
Remove the screw (Fig 2) securing the door glass frame to the front mounting bracket
Remove the screws (Fig 2) securing the door glass frame to the door, remove the spacer plate and remove the door glass and frame assembly, remove the tape from the glass and remove the glass from the frame.
Reverse the removal procedure to refit the replacement glass.

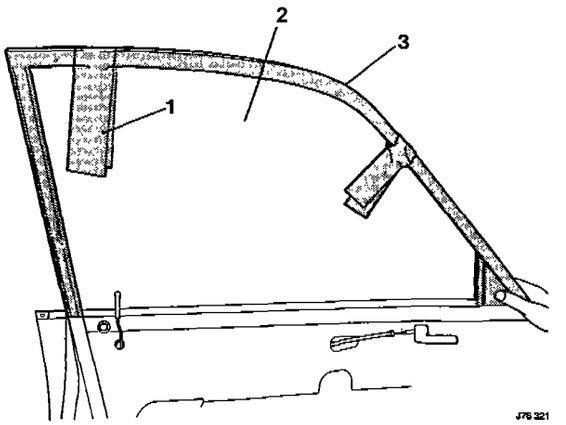


Fig 1

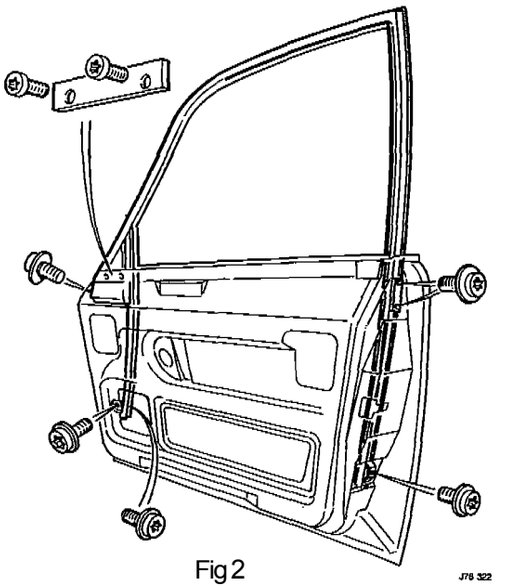


Fig 2

DATA

TORQUE FIGURES

Door glass clamping strip to door **7- 10Nm**
Door *glass regulator and* **slide** *channel to door* **7-10Nm**
Setscrew front lower frame fixing to door **7-10Nm**
Setscrew front upper frame fixing to door **7- 10Nm**
Setscrew rear lower frame fixing to door **7- 10Nm**
Set screw rear upper frame fixing to door **7-10Nm**

SPANNER SIZES

1Omm
Torx bit No 30

0016b

FRONT DOOR GLASS CHANNEL RUBBER

RENEW **76.31.13**

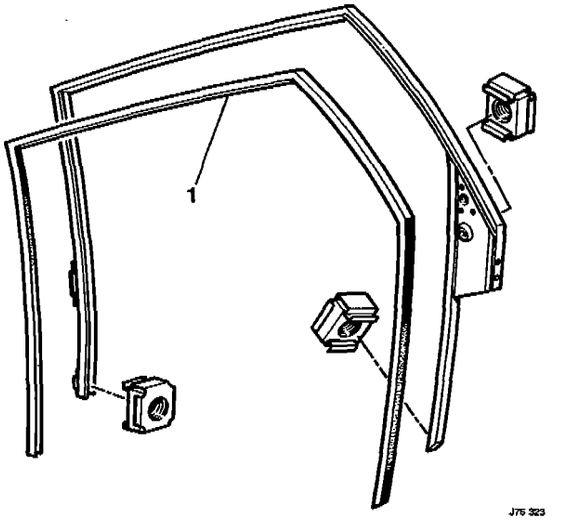


Fig 1

Open the door.
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the exterior mirror 76.10.52.
Remove the front door waist rail moulding 76.43.04.
Remove the front door glass 76.31.01
Remove the glass channel rubber (1 Fig 1).
Refit the replacement rubber to the channel in frame, engage corners and then fully seat the remainder of the rubber and reverse the remaining removal procedure to refit.

DATA

TORQUE FIGURES

Door glass clamping strip to door **7-10Nm**
Door glass regulator and slide channel to door **7-10Nm**
Set screw front lower frame fixing to door **7- 10Nm**
Set screw front upper frame fixing to door **7- 10Nm**
Set *screw rear lower frame fixing to door* **7- 10Nm**
Set screw rear upper frame fixing to door **7- 10Nm**

SPANNER SIZES

1Omm

Torx bit No 30

www.JagDocs.com

FRONT DOOR GLASS FRAME

RENEW **76.31.51**

Open the door
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the exterior mirror 76.10.52.
Remove the front door waist rail moulding 76.43.04.
Remove the front door glass 76.31.01
Remove the front door glass channel rubber 76.31.13.
Remove the upper frame seal from the frame and place the frame aside.
Apply soft soap to the frame apeture and starting with the rear of the seal at the front of the frame slide the seal into position.
Reverse the removal procedure to refit.

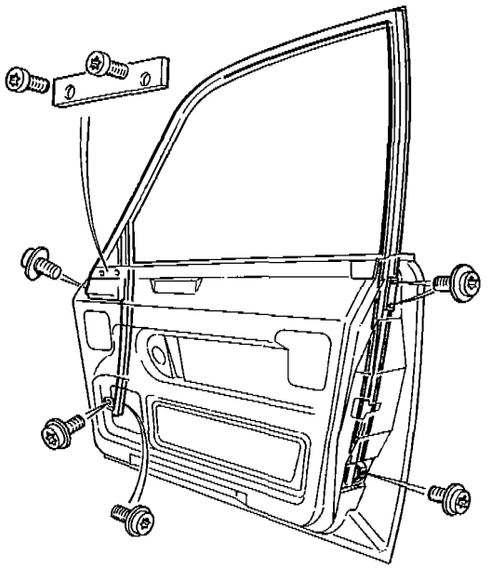


Fig 1 J76 325

DATA

TORQUE FIGURES

Door glass clamping strip to door 7-10Nm
Door glass regulator and slide channel to door 7-10Nm
Set screw front lower frame fixing to door 7-10Nm
Set screw front upper frame fixing to door 7-10Nm
Set screw rear lower frame fixing to door 7-10Nm
Set screw rear upper frame fixing to door 7-10Nm

SPANNER SIZES

10mm

Torx bit No 30

0020b

FRONT DOOR HANDLE

RENEW **76.58.01**

Open the door
Remove the front door trim pad veneer panel 76.47.11
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.

Remove the door aperture closing plate.
Displace the weather shield and remove the door handle to linkage to lock mechanism retaining clip.
Disconnect the door handle linkage.
Cut and remove the ratchet strap securing the switch harness.
Disconnect the switch harness multi plug and reposition away from the door locating tangs.
Remove the door handle assembly securing nuts and remove the clamp (Fig 1).
Displace the door handle from the door to provide access to the private lock operating rod.
Disconnect the operating rod from the plastic cam and remove the door handle.
Remove the operating rod.
Remove the screws securing the central locking micro switch and discard the tape securing the harness to the handle body.
Remove the micro switch assembly.
Remove the handle clamp securing studs.
Discard the handle.
Reverse the removal procedure to fit the replacement door handle.

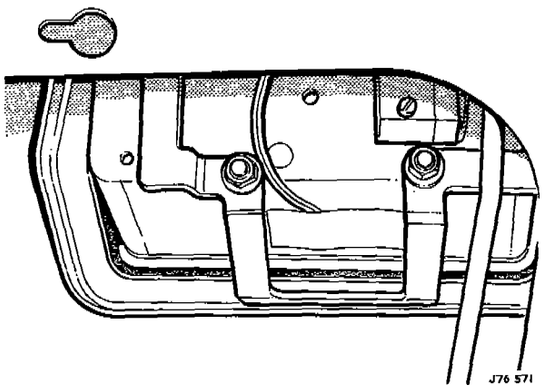


Fig 1

DATA

TORQUE FIGURES

Door handle to door 3.5-4.5Nm

SPANNER SIZES

8mm

0058b

FRONT DOOR INSIDE HANDLE

RENEW **76.58.20**

Open the door.
Remove the front door trim panel veneer panel 76.47.11
Reposition the inner cable (1 Fig 2) from the door handle, disconnect the outer handle assembly securing sleeve and disconnect the cable from the handle.
Operate the handle for access, remove the screw (2 Fig 2) and bolt (2 Fig 2) securing the handle assembly.
Remove the handle and discard.
Reverse the removal procedure to refit the replacement handle.

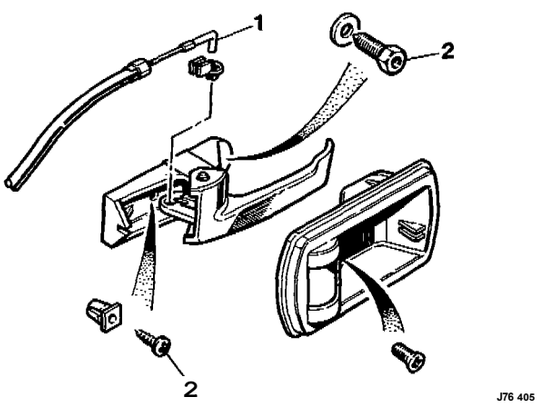


Fig 2

DATA

TORQUE FIGURES

Inner handle to door 4-5.4Nm

SPANNER SIZES

10mm

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FRONT DOOR LOCK

RENEW **76.37.12**

Open the door
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the front door glass 76.31.01
Displace the inner lock control rod securing clip and remove the rod/knob assembly.
Remove the remote cable to bracket retaining clip and reposition the cable from the bracket.
Reposition the inner cable from the lock release arm and remove the outer handle operating rod retaining clip.
Reposition the rod from the retaining clip and displace the rod from the private lock.
Cut and remove the door lock harness to door panel ratchet straps and disconnect the multi plugs.
Remove the lock securing screws and remove the lock assembly.
Remove the linkage rod.
Remove the motor securing screws and remove the motor.
Discard the lock assembly.
Reverse the removal procedure to refit the lock,

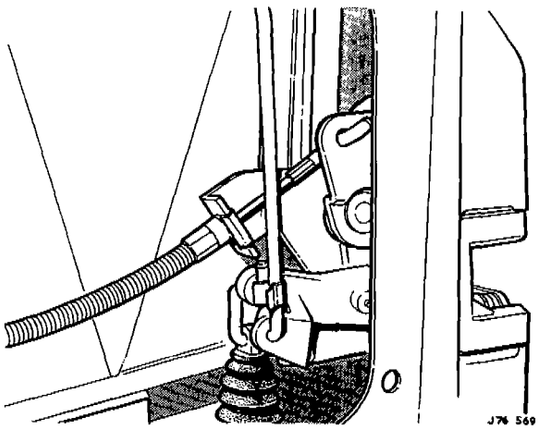


Fig 1

DATA

TORQUE FIGURES

Door lock to door 7-10Nm

SPANNER SIZES

8mm
10mm

No 30 Torx

0029b

FRONT DOOR REMOTE CONTROL OPERATING CABLE

RENEW **76.37.67**

Open the door
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the **clip** securing the inner cable to the door lock and disconnect the cable from the lock assembly.
Remove the clip (2 Fig 1) securing the outer cable (3 Fig 1) to the door lock assembly, disconnect the cable from the bracket (4 Fig 1) and the inner cable from the interior door handle securing sleeve.
Disconnect the cable from the interior handle assembly, remove the securing sleeve from from the cable.
Remove and discard the cable.
Reverse the removal procedure to refit the replacement cable.

0031b

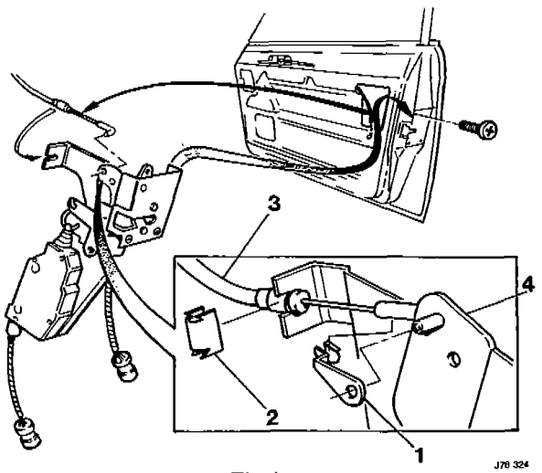


Fig 1

FRONT DOOR TRIM PAD VENEER PANEL

RENEW **76.47.11**

Open the door.
Position the inner door handle in the open position and remove the inner handle escutcheon plate blank (1 Fig 2).
Remove the screw (2 Fig 2) securing the escutcheon plate (3 Fig 2), remove the plate and gasket.
Carefully pull the veneer panel (4 Fig 2) to **release** the retaining clips.
Remove the screws securing the retaining clip and remove the retaining clip assemblies.
Discard the veneer panel.
Reverse the removal procedure to fit the replacement veneer.

0041b

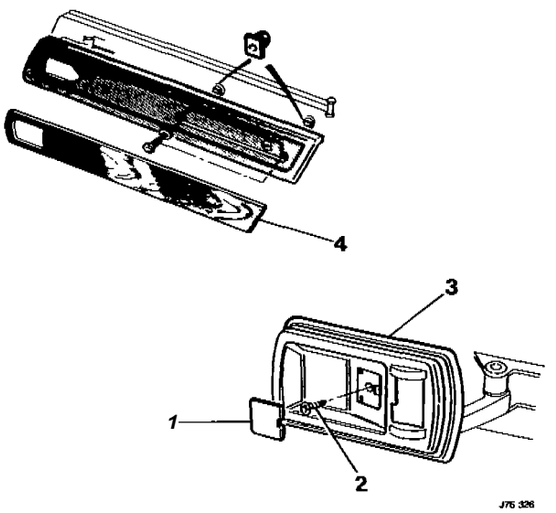


Fig 2

FRONT DOOR LOWER TRIM PAD

RENEW **76.34.03**

Open the door.
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the lower trim pad securing screw, remove the puddle lamp lens and remove the screw securing the lower trim pad/puddle lamp.

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Displace the trim pad from the retaining clips and disconnectthe door harness block connectors.
Removethe lower trim pad assembly.
Removethe frontdoor armrest 76.34.22
Remove the door speaker securing nuts and remove the speaker.
Remove the door pocket to trim pad securing screws (Fig 1) and removethe door pocket,
Remove the locating bracket securing screws and remove the bracket.
Discardthe trim pad.
Fit the locating bracket to the replacement trim and reversethe remaining procedureto refitthe trim pad.

0024b

FRONT DOOR WAIST RAIL MOULDING

RENEW **76.43.04**

Openthe door
Removethe front door trim pad veneer panel 76.47.1 **1.**
Removethe front door upper trim pad 76.34.02.
Removethe front door lower trim pad 76.34.03.
Carefully removethe mouldingfrom the front door.
Using a suitable block to prevent damage to the moulding, carefully fit and seat the replacement mouldingto the **door.**
Reverse the remaining procedure to fit the replacement moulding.

0033b

FRONT DOOR LOCK STRIKER

RENEW **76.37.23**

Open the door and slacken the pin (**1** Fig 2), removethe pin from the 'B'post and collect the washer.
Reverse the removal procedure to fit a replacement striker pin.

DATA

TORQUE FIGURES

Strikerpin to 'B' post 24-30"

SPANNER SIZES

17mm

1669B/53

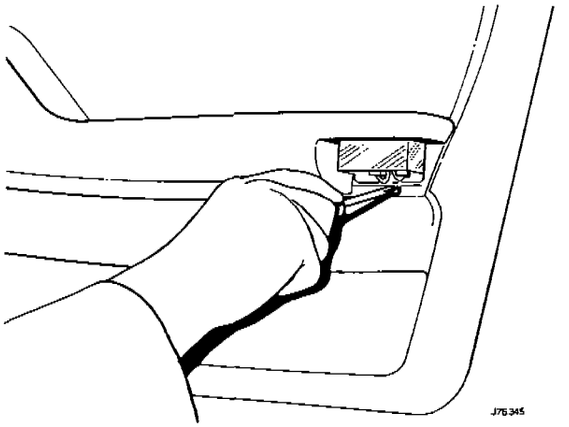


Fig 1

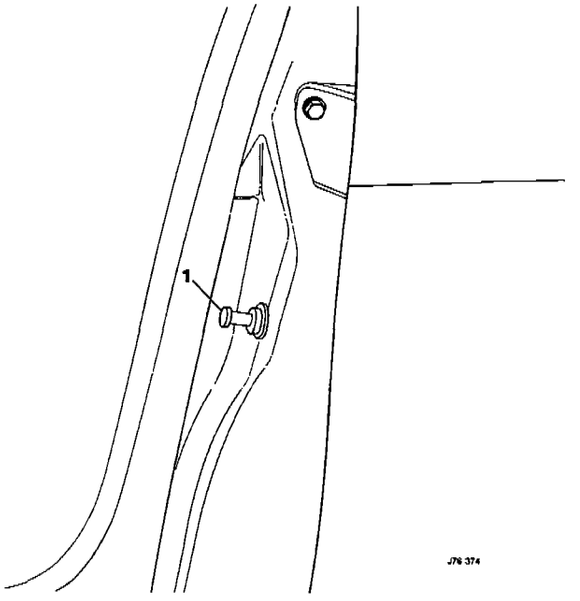


Fig 2

FRONT DOOR SEAL

RENEW **76.40.01**

Open the door.
Remove the end panel finishers and pull the top finisher clear of the tread plate.
Remove the five tread plate securing screws and remove the tread plate.
Remove the seal and clean the channel (Fig 1).
Apply Kent clear sealer to the 'C' channel butt joints and Solumin to the section of the seal above the sill section.
Position the replacement seal and locate in the upper corners, secure with tape and using soft soap seat the door seal in the channel.
Remove the tape and slide the front lower edge and corner of the seal into position.
Clean off all soft soap and refit the sill tread plate.

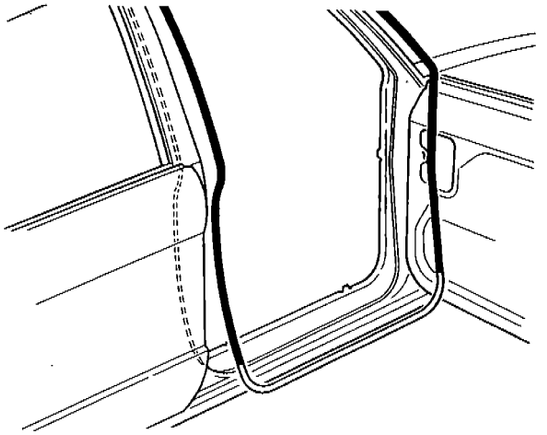


Fig 1

DATA

OILS/SEALANTS/LUBRICANTS

Two 'C' channel butt joints Kent clear sealer
Seal (above sill section) Solumin

1669B/69

FRONT DOOR UPPER TRIM PAD

RENEW **76.34.02**

Open the door.
Remove the front door trim pad veneer panel 76.47.11
Remove the upper trim pad securing clip (Fig 2) and screws (Fig 2).
Lift the trim pad to release from the door, remove the inner waist rail seal.
Reverse the removal procedure to refit the replacement upper trim pad.

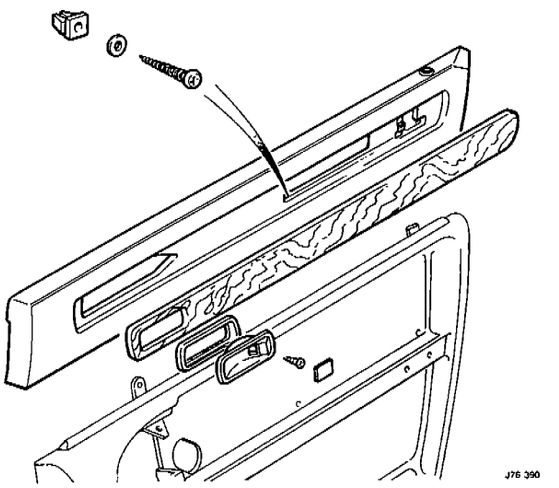


Fig 2

0023b

REAR DOOR GLASS

RENEW **76.31.02**

Open the door.
Remove the rear door trim pad veneer panel 76.47.12.
Remove the rear door upper trim pad 76.34.05.
Remove the rear door lower trim pad 76.34.06.

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Remove the door aperture plastic closing panels.
Fit adhesive tape (1 Fig 1) over the door frame to secure the glass.
Remove the screws and nuts (2 Fig 1) securing the window lift motor to the door glass.
Remove the screws securing the window lift guide to the door and carefully displace the mechanism (3 Fig 1) from the door glass and position in the bottom of the door.
Remove the grommet to gain access to the rear frame upper securing screws and remove the screws securing the glass frame to the door.
Lift the glass and frame assembly from the door, remove the adhesive tape securing the glass to the door frame and remove the glass.
Reverse the removal procedure to refit the replacement glass.

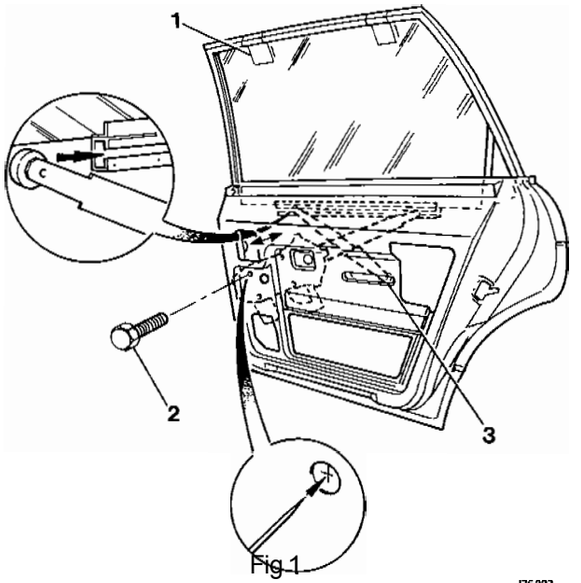


Fig 1

J76327

DATA

TORQUE FIGURES

Door glass clamping strip to door 7-10Nm
Door glass regulator and slide channel to door 8-10Nm
Setscrew front lower frame fixing to door 7-10Nm
Set screw frcnt upper frame fixing to door 7-10Nm
Set screw rear inboard frame fixing to door 7-10Nm
Setscrew rear lower frame fixing to door 7-10Nm
Setscrew rear upper frame fixing to door 7-10Nm

SPANNER SIZES

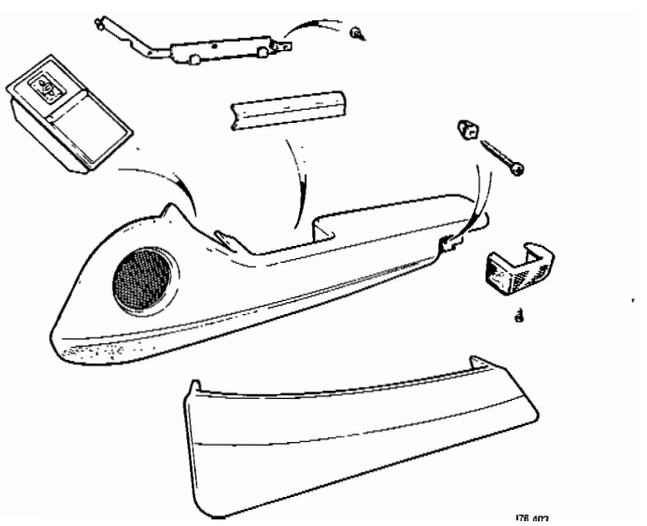
10mm
Torx bit No 30

0017b

REAR DOOR ARMREST

RENEW 76.34.23

Open the door
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the screws securing the armrest to the trim pad (Fig 2).
Disconnect the speaker block connector and remove the armrest from the trim pad.


Fig 2

Remove the screws securing the switch panel support bracket to the armrest and remove the bracket.
Displace the switch panel/ashtray for access and disconnect the puddle lamp feed wires.
Remove the puddle lamp securing screws and remove the lamp assembiy.
Remove the switch and harness assembly and discard the armrest.
Reverse the removal procedure to refit.

0028b

REAR DOOR GLASS CHANNEL RUBBER

RENEW **76.31.14**

Open the door.
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the rear door waist rail moulding 76.43.05.
Remove the rear door glass 76.31.02.
Remove the plastic finisher screw and plastic finisher.
Remove the glass channel rubber (Fig 1).
Place the replacement rubber in the frame and fit the upper corners of the rubber to the frame first and fully seat the remaining rubber in the frame.
Reverse the remaining procedure to refit.

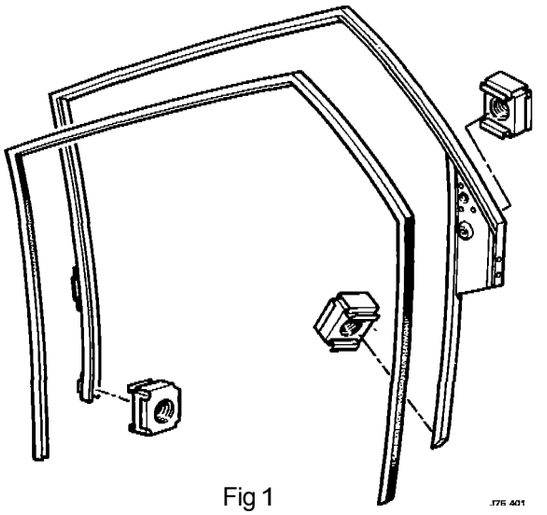


Fig 1 .775 401

DATA

TORQUE FIGURES

Door glass clamping strip to door 7-10Nm
Door glass regulator and slide channel to door 8-10Nm
Set screw front lower frame fixing to door 7-10Nm
Set screw front upper frame fixing to door 7-10Nm
Set screw rear inboard frame fixing to door 7-10Nm
Set screw rear lower frame fixing to door 7-10Nm
Set screw rear upper frame fixing to door 7-10Nm

SPANNER SIZES

10mm

Torx bit No 30

0019b

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REAR DOOR GLASS FRAME

RENEW **76.31.61**

Open the door.
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the rear door waist rail moulding 76.43.05.
Remove the rear door glass 76.31.02.
Remove the rear door glass channel rubber 76.31.14.
Remove the outer finisher securing screw and remove the outer finisher.
Remove the upper seal from the frame.
Apply soft soap to the upper seal fitment area of the replacement frame.
Starting with the front of the seal at the rear of the frame, slide the seal into position.
Reverse the remaining removal procedure to refit the replacement frame.

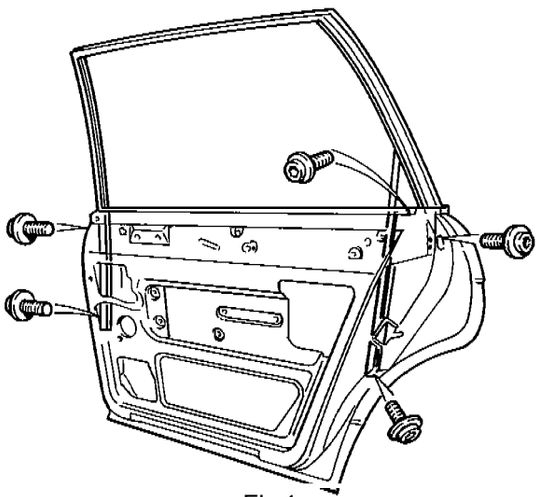


Fig 1 J76 34B

DATA

TORQUE FIGURES

Door glass clamping strip to door ***7-10Nm***
Door glass regulator and slide channel to door ***8-10Nm***
Setscrew front lower frame fixing to door ***7-10Nm***
Setscrew front ***upper*** *frame fixing to door* ***7-10Nm***
Setscrew rear inboard frame fixing to door ***7-10Nm***
Setscrew rear lower frame fixing to door ***7-10Nm***
Set screw rear upper frame fixing to door ***7-10Nm***

SPANNER SIZES

10mm
Torx bit No 30

0022b

REAR DOOR HANDLE

RENEW **76.58.02**

Open the door.
Remove the rear door trim pad veneer panel 76.47.11
Remove the rear door upper trim pad 76.34.05.
Remove the rear door lower trim pad 76.34.06.

Remove the door aperture plastic closing panel.
Carefully displace the door weather shield for access.
Remove the door handle operating rod to lock retaining clip peg and reposition the rod from the retaining clip.
Remove the front nut securing the handle clamp bracket (1 Fig 1) and slacken but do not remove the rear securing bolt and remove the clamp bracket.
Remove the handle assembly and remove the securing stud and bolt.
Discard the handle.
Reverse the removal procedure to refit the replacement handle.

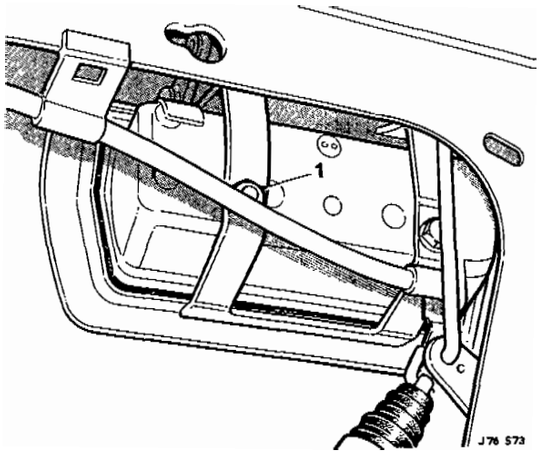


Fig 1

DATA

TORQUE FIGURES

Door handle to door ***3.5-4.5Nm***

SPANNER SIZES

8mm

0059b

REAR DOOR INSIDE HANDLE

RENEW **76.58.19**

Open the door.
Remove the rear door trim pad veneer panel. 76.47.12
Disconnect the inner cable (Fig 2) from the door handle and displace the outer cable to handle assembly securing sleeve.
Disconnect the cable from the handle assembly, operate the handle for access, remove the screw and bolt securing the handle assembly, remove and discard the handle.
Reverse the removal procedure to refit the repiacewment handle.

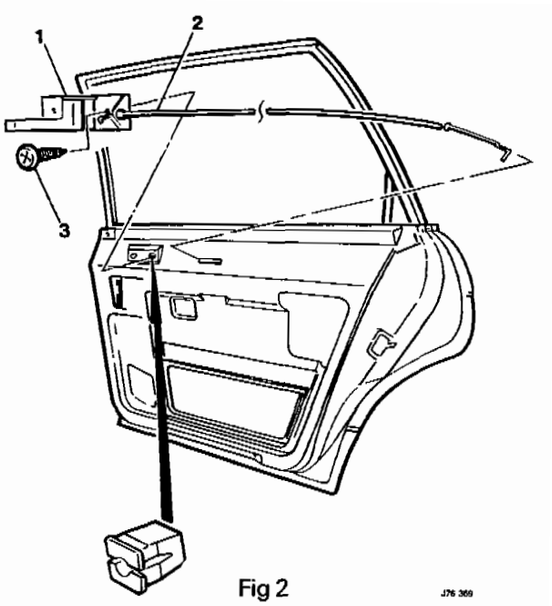


Fig 2

DATA

TORQUE FIGURES

Door inside handle to door ***4-5.4Nm***

SPANNER SIZES

10mm

0060b

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REAR DOOR LOCK

RENEW **76.37.13**

Open the door
Remove the front door trim pad veneer panel 76.47.11.
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.
Remove the rear door glass 76.31.02
Displace the inner lock control rod securing clip and remove the rod/knob assembly.
Remove the remote cable to bracket retaining clip and reposition the cable from the bracket.
Reposition the inner cable from the lock release arm and remove the outer handle operating rod retaining clip.
Repposition the rod from the retaining clip and displace the rod from the private lock.
Cut and remove the door lock harness to door panel ratchet straps and disconnect the multi plugs.
Remove the lock securing screws (1 Fig 1) and remove the lock assembly.
Remove the linkage rod.
Remove the motor securing screws and remove the motor.
Discard the lock assembly.
Reverse the removal procedure to refit the replacement lock.

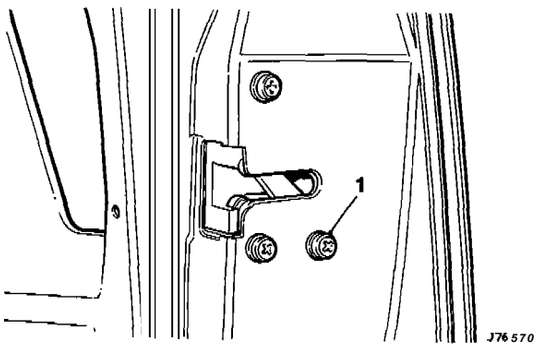


Fig 1

DATA

TORQUE FIGURES

Door lock to door 7-10Nm

SPANNER SIZES

8mm
10mm

No 30 Torx

0030b

REAR DOOR REMOTE CONTROL OPERATING CABLE

RENEW ***76.37.68***

Open the door
Remove the front door trim pad veneer panel 76.47.11
Remove the front door upper trim pad 76.34.02.
Remove the front door lower trim pad 76.34.03.

Disconnect the cable from the centre support bracket and remove the clip securing the interior locking rod to the linkage, remove the locking rod.
Release and remove the clip securing the operating rod to the cable and disconnect the cable from the lock.
Remove the clip securing the outer cable to the lock bracket, disconnect the cable from the bracket.
Reposition the inner cable to the interior handle assembly locking sleeve, disconnect the inner cable from the interior handle and reposition the cable.
Remove the securing sleeve from the cable and remove the cable.
Reverse the removal procedure to refit the cable to the door.

0032b

REAR DOOR LOWER TRIM PAD

RENEW **76.34.06**

Open the door.
Remove the front door trim pad veneer panel **76.47.11**.
Remove the front door upper trim pad **76.34.02.**
Remove the rear door trim finisher, remove the trim pad centre securing screw.
Remove the puddle lamp lens and the lower trim pad securing screw.
Displace the trim pad from the retaining clips, disconnect the door block harness connectors and remove the trim pad assembly.
Remove the rear door armrest and the nuts securing the speaker.
Remove the speaker.
Remove the screws securing the door pocket to the trim pad and remove the door pocket.
Discard the trim pad.
Reverse the removal procedure to refit the trim pad.

0026b

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REAR DOOR TRIM PAD VENEER PANEL

RENEW **76.47.12**

Open the door.
Position the inner door handle in the open position and remove the inner handle escutcheon plate blank (1 Fig 1).
Remove the screw (2 Fig 1) securing the escutcheon plate (3 Fig 1), remove the plate and gasket.
Carefully pull the veneer panel (4 Fig 1) to relaese the retaining clips.
Remove the Screws securing the retaining clip and remove the retaining clip assemblies.
Discard the veneer panel.
Reverse the removal procedure to fit the replacement veneer.

0043b

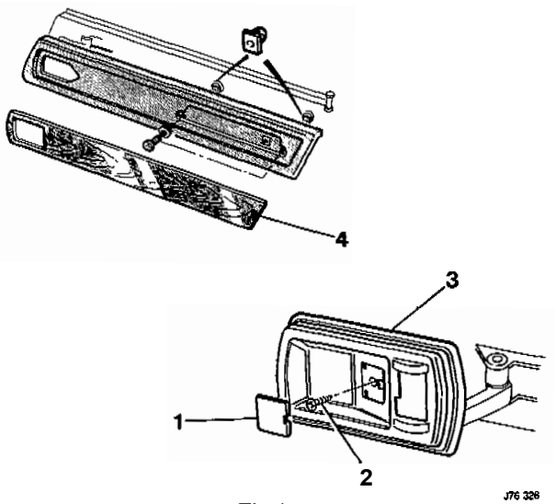


Fig 1

REAR DOOR UPPER TRIM PAD

RENEW **76.34.05**

Open the door.
Remove the rear door trim pad veneer panel 76.47.12.
Remove the upper trim panel securing screws, lift the panel to remove from the door mounting and remove the panel.
Remove the top channel securing nuts and remove the top channel assembly.
Discard the upper trim pad.
Reverse the removal procedure to refit the replacement panel.

0025b

REAR DOOR WAIST RAIL MOULDING

RENEW **76.43.05**

Open the door.
Carefully unclip the moulding (1 Fig 2) from the door flange.
Discard the moulding.
Using a suitable block to protect the moulding carefully fit the replacement moulding to the door.
Close the door.

0034b

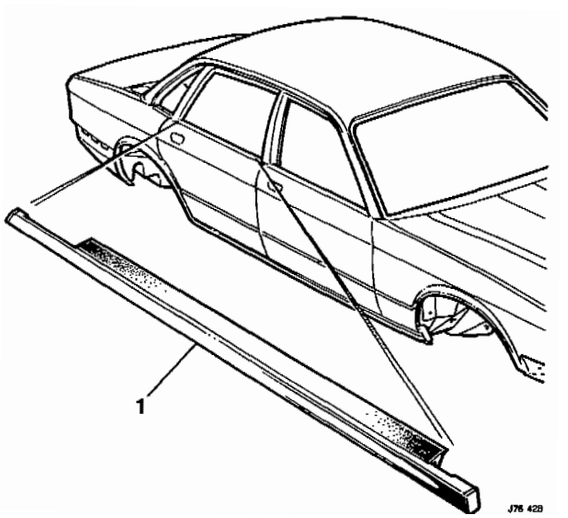


fig 2

REAR DOOR LOCK STRIKER

RENEW **76.37.24**

Open the door and slacken the pin (1 Fig 1), remove the pin from the 'D' post and collect the washer.
Reverse the removal procedure to fit a replacement striker pin.

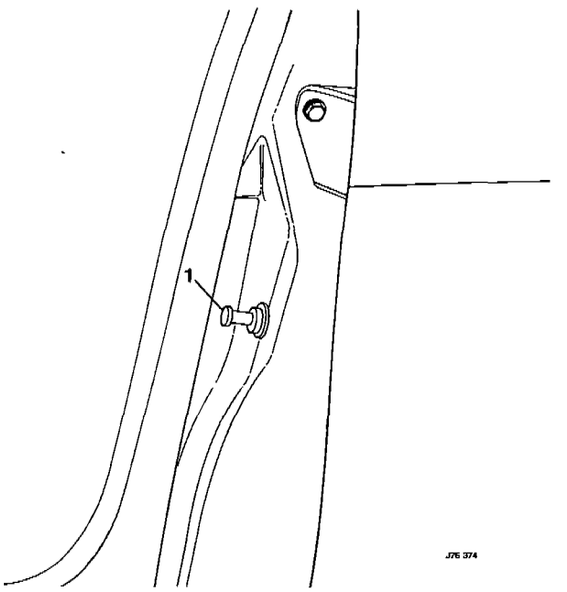


Fig 1

DATA

TORQUE FIGURES

Striker pin to 'D' post 24-30Nm

SPANNER SIZES

17mm

1669B/61

REAR DOOR SEAL

RENEW **76.40.02**

Open the door.
Remove the end panel finishers and pull the top finisher clear of the tread plate.
Remove the five tread plate securing screws and remove the tread plate.
Remove the seal (Fig 2) and clean the channel.
Apply Kent clear sealer to the ' C channel butt joints and Solumin to the section of the seal above the sill section.
Position the replacement seal and locate in the upper corners, secure with tape and using soft soap Seat **the** door seal in the channel.
Remove the tape and slide the front lower edge and corner of the seal into position.
Clean off all soft soap and refit the sill tread plate.

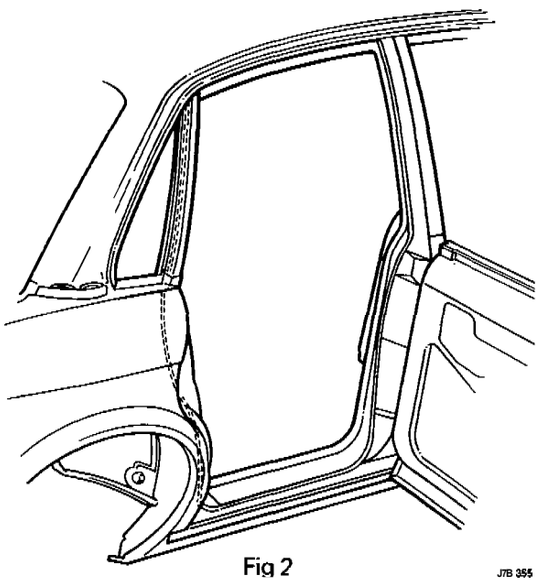


Fig 2

DATA

OILS/SEALANTS/LUBRICANTS

Three 'C' channel butt joints Kent clear sealer
Seal** (above **sill section) Solumin

1669B/70

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REAR BUMPER ASSEMBLY

RENEW 76.22.15

Remove both rear fog lamp assemblies and rear side marker lamps (where fitted).
Remove the bumper securing bolts and collect the spacers and remove the rear bumper assembly (Fig 1).
Guide the replacement bumper onto the guides at the sides of the vehicle and fit the securing bolts.
Tighten the bolts and refit the rear fog and marker lamps (where fitted).

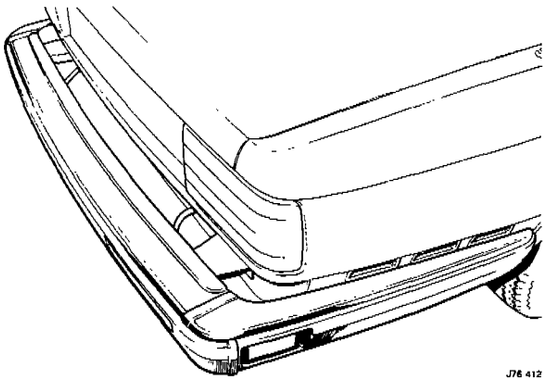

J76 412

Fig 1

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper ***to*** *bumper bracket (Non Federal)* ***40-50Nm***
Bumper to body inner (Federal) ***23-27Nm***
Bumper to ***fixings*** *bumper beam (Federal)* ***39-50Nm***
Bumper to body inner (Non Federal) ***23-27Nm***
Bumper to ***fixings bumper*** *beam (Non Federal)* ***39-50Nm***
Guide ***block*** *to mounting bracket* ***3.5-4.75Nm***
Mounting bracket ***guide*** *block* ***to*** *body* ***7.5-10Nm***

SPANNER SIZES

8mm
10mm
13mm
17mm
19mm

No *20 Torx*

0375b

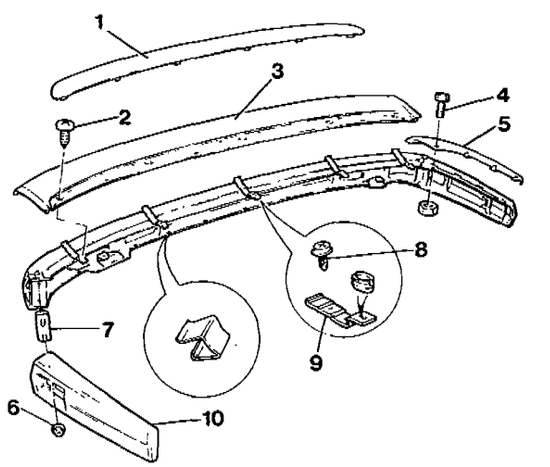


Fig 2

J76 350

REAR BUMPER ASSEMBLY

OVERHAUL 76.22.18

Remove the rear fog guard and marker lamps (where fitted).
Remove the rear bumper securing bolts **and** remove the rear bumper assembly.
Remove the central plastic finisher (1 Fig 2), remove the centre blade rubber securing screws (2 Fig 2) **and** remove the rubber.
Remove the quarter bumper securing nuts and bolts (6 Fig 2) and remove the rear quarter bumper (10 Fig 2).

Remove the bumper cover blade retaining clip securing screws and remove the clips.
Reverse the removal procedure to reassemble ensuring that any damged components are replaced.
Refit the bumper assembly to the vehicle.

DATA

TORQUE FIGURES

Bumper front blade to beam 5-7Nm
Bumper mounting brackets to body (Non Federal) 23-27Nm
Bumper mounting struts to body (Federal) 23-27Nm
Bumper side to flexible mounting block 5-7Nm
Bumper side blades to beam 5-7Nm
Bumper to bumper bracket (Non Federal) 40-50Nm
Bumper to body inner (Federal) 23-27Nm
Bumper to fixings bumper beam (Federal) 39-50Nm
Bumper to body inner (Non Federal) 23-27Nm
Bumper to fixings bumper beam (Non Federal) 39-50Nm
Flexible mounting block to beam 5-7Nm
Guide black to mounting bracket 3.5-4.75Nm
Mounting bracket guide block to body 7.5-10Nm

SPANNER SIZES

8mm
10mm
13mm
17mm
19mm
No 20 Torx

0377b

REAR QUARTER BUMPER

RENEW 76.22.17

Open the boot.
Move the rear boot carpet for access to the rear fog guard lamp harness and position approximately 3" of harness 'slack' through the grommet for each lamp.
Remove the beam securing bolts and spacers and carefully move the beam assembly rearwards for access to the rear quarter bumper mountings.
Remove the reflector from the quarter bumper.

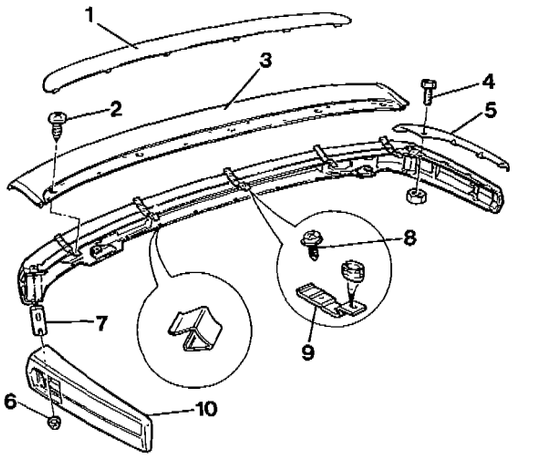
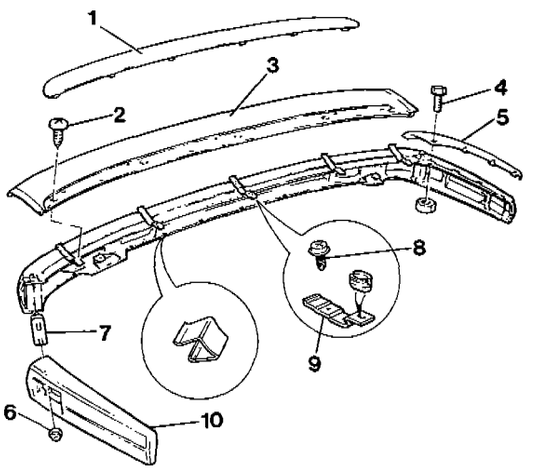


Fig 1

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Remove the nuts (Fig 1) securing the bumper (Fig 1) to the mounting rubber.
Carefully reposition the quarter bumper from the studs and remove the quarter bumper assembly.
Reposition the beam onto the strut and remove the quarter blade to quarter bumper securing nuts and bolts.
Remove the blade from the bumper and place aside.
Reverse the removal procedure to refit the replacement bumper.



J76 350

Fig 1

DATA

TORQUE FIGURES

Bumper beam to bumper bracket (Non Federal) ***40-50Nm***
Bumper beam ***to*** *bumper strut (Federal)* ***39-50Nm***
Bumper quarter blade to quarter bumper ***5-7Nm***
Bumper side to flexible mounting block ***5-7Nm***

SPANNER SIZES

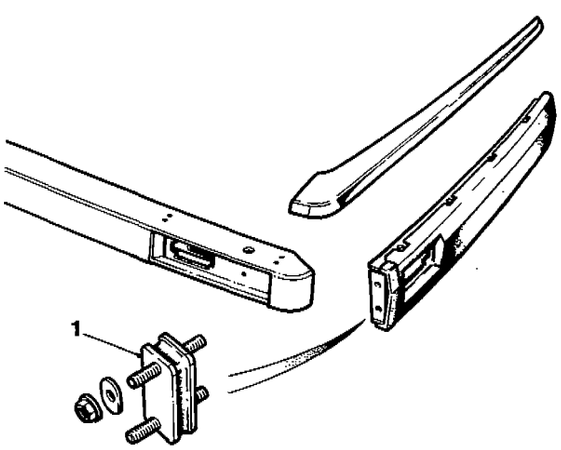
8mm
10mm
19mm

1669B/63

REAR QUARTER BUMPER MOUNTING RUBBER

RENEW **76.22.21**

Open the boot.
Remove the rear quarter bumper 76.22.17.
Remove the nuts securing the mounting rubber (1 Fig 2) to the beam and remove the mounting rubber.
Reverse the removal procedure to refit the replacement rubber.



J76 421

Fig 2

DATA

TORQUE FIGURES

Bumper beam ***to*** *bumper bracket (Non Federal)* ***40-50Nm***
Bumper beam ***to*** *bumper strut (Federal)* ***39-50Nm***
Bumper quarter blade to quarter bumper ***5-7Nm***
Bumper side ***to*** *flexible mounting block* ***5-7Nm***

SPANNER SIZES

8mm
10mm
19mm

REAR QUARTER BUMPER LOCATING BRACKET

RENEW 76.22.22

Open the boot.
Remove the rear quarter bumper 76.22.17.
Slacken and remove the screws securing the locating bracket (1 Fig 1) to the body.
Remove the locating bracket.
Reverse the removal procedure to refit the replacement bracket.

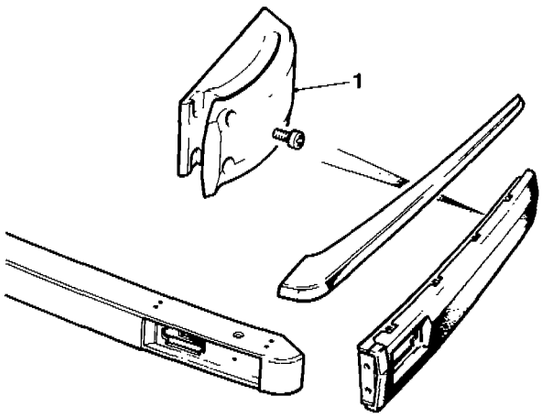


Fig 1

DATA

TORQUE FIGURES

Bumper beam to bumper bracket (Non Federal) ***40-50Nm***
Bumper beam to bumper strut (Federal) ***39-50Nm***
Bumper quarter blade to quarter bumper ***5-7Nm***
Bumper side to flexible mounting ***block 5-7Nm***

SPANNER SIZES

8mm
10mm
19mm

1669B/67

REAR QUARTER BUMPER BLADE

RENEW *76.22.75*

Open the boot.
Move the rear boot carpet for access to **the** rear fog guard lamp harness and position approximately 3" of harness '**slack** through the grommet **for** each lamp.
Remove the beam securing bolts and spacers and carefully move the beam assembly rearwards for access to the rear quarter bumper mountings.
Remove the reflector from the quarter bumper.
Remove the nuts securing the bumper to the mounting rubber.
Carefully reposition the quarter bumper from the studs and remove the quarter bumper assembly.
Reposition the beam .onto the strut and remove the quarter blade to quarter bumper securing nuts and bolts (1 Fig 2).
Remove the blade from the bumper and place aside (2 Fig 2).
Reverse the removal procedure to refit the replacement bumper blade.

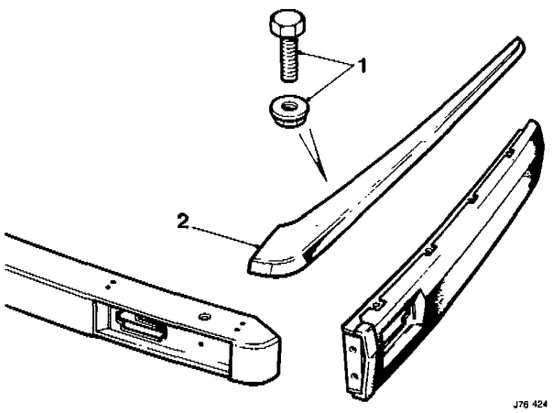


Fig 2

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DATA

TORQUE FIGURES

Bumper beam to bumper bracket (Non Federal) ***40-50Nm***
Bumper beam to bumper strut (Federal) ***39-5ONm***
Bumper quarter blade to quarter bumper 5- ***7Nm***
Bumper side to flexible mounting block ***5-7Nm***

SPANNER SIZES

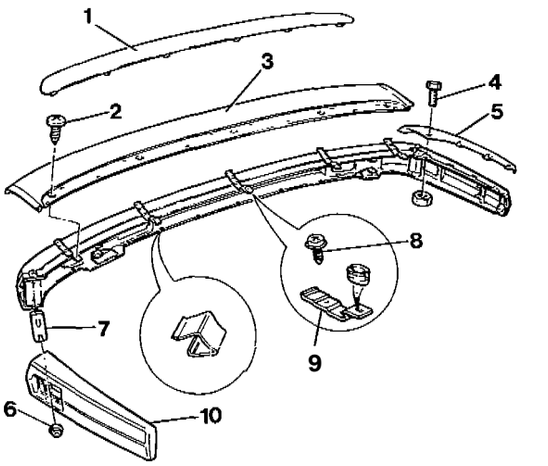
8mm
10mm
19mm

1669B/69

REAR BUMPER CENTRE BLADE

RENEW **76.22.12**

Prise off the black plastic trim finisher (1 Fig 1), remove the five screws (2 Fig 1) securing the blade (3 Fig 1), release the blade from the securing clips and remove the bumper blade.
Fit the replacement centre blade to the retaining clips, fit and tighten the five securing screws and refit the trim finisher.



J78 350

Fig 1

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper to bumper bracket (Non Federal) ***40-50Nm***
Bumper to ***body*** *inner (Federal)* ***23-27Nm***
Bumper to fixings bumper beam (Federal) ***39-50Nm***
Bumper to body inner (Non Federal) ***23-27Nm***
Bumper to fixings bumper beam (Non Federal) ***39-50Nm***
Guide block ***to*** *mounting bracket* ***3.5-4.75Nm***
Mounting bracket guide block to body ***7.5-10Nm***

SPANNER SIZES

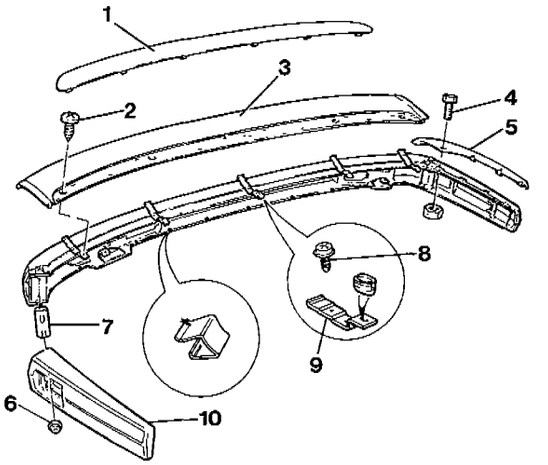
8mm
I Omm
13mm
17mm
19mm
No 20 Torx

0374b

REAR BUMPER CENTRE BLADETRIM FINISHER

RENEW **76.22.14**

Open the boot.
Move the carpet to gain access to the rear fog guard lamp harnesses.
Reposition approximately 3" of slack through the grommets for each *fog* guard lamp.
Remove the bolts securing the rear beam.
Remove the spacers.
Carefully position the beam assembly rearwards to gain access to the trim finisher.
Unclip and remove the trim finisher **(1** Fig **1)** taking care not to dislodge the beam assembly from the struts.
Reverse the removal procedure to refit the trim finisher.



J76 350

Fig **1**

DATA

TORQUE FIGURES

Bumper mounting brackets to ***body*** *(Non Federal)* ***23-27Nm***
Bumper mounting struts ***to*** *body (Federal)* ***23-27Nm***
Bumper ***to*** *bumper bracket* ***(Non*** *Federal)* ***40-50Nm***
Bumper ***to*** *bumper strut (Federal)* ***40-50Nm***

SPANNER SIZES

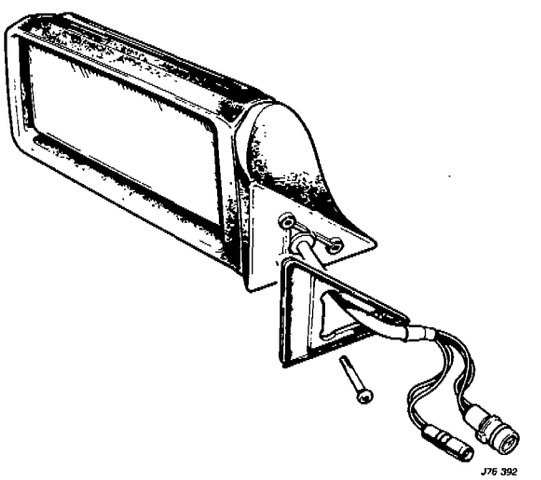
8mm
10mm
13mm
19mm

1669B/78

EXTERIOR MIRROR

RENEW **76.10.52**

Open the front door.
Remove the door trim pad veneer panel and the upper trim pad.
Remove the screws securing the mirror attachment plate and remove the plate (Fig 2).
Cut the ratchet strap securing the **mirror** harness.
Disconnect the mirror harness **block** connectors, remove the mirror securing screws and remove the mirror assembly.
Reverse the removal procedure to refit.



J76 392

Fig 2

0003b

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GUTTER FINISHER

RENEW **76.43.11**

Open the front and rear doors (one side), remove the four screws and remove the B post capping.
Remove the drip moulding securing screws (1 Fig 1) and remove the moulding to six light trim finisher and remove the drip moulding (2 Fig 1).
Fit the replacement drip moulding into position and align to the body fixing holes.
Fit and tighten the fixing screws.
Fit the six light to moulding finisher, position and tighten the four screws.
Close the doors.

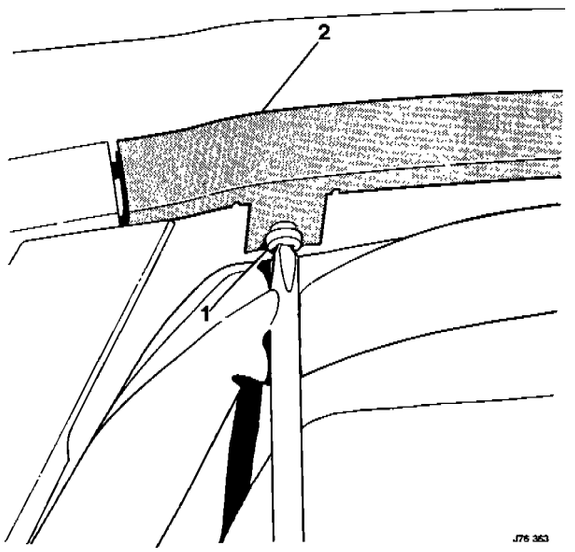


Fig 1

DATA

TORQUE FIGURES

Drip** moulding **to** body **2-4Nm

0398b

NUMBER PLATETRIM (WHERE FITTED)

RENEW **76.43.22**

Open the boot lid, remove the three self tapping screws and prise the trim , starting at the upper side edge and work round and release the eight locating plugs from the lower boot panel and remove the trim.
Reverse the removal procedure to refit the trim after new sealant has been applied to the trim.

0361b

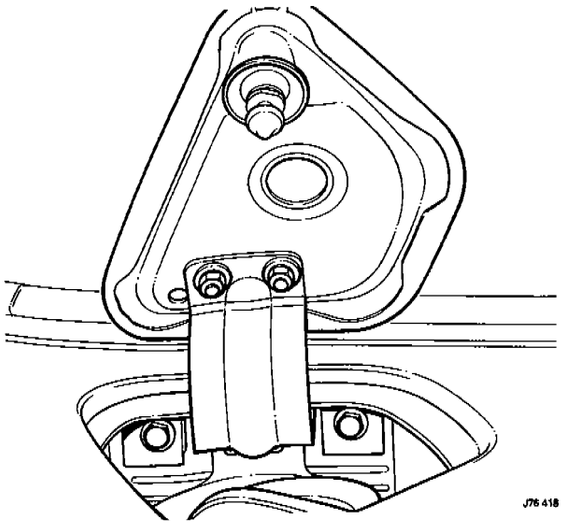


Fig 2

PETROL FILLER FLAP

RENEW **76.10.25**

Depress flap and list as shown and lift the corner. Open flap and remove the two nuts, spring and plain washers and remove the flap (Fig 2).
Slacken the locknut securing the locking pin and remove the locking pin.
Reverse the removal procedure to refit the flap ensuring that the locking pin is adjusted to ensure that the flap shuts flush with the wing top.

DATA

TORQUE FIGURES

Latch fixing nut to latching bolt ***2-3Nm***

SPANNER SIZES

8mm
10mm

OILS/SEALANTS LUBRICANTS

Filler flap hinge leaf ***Shell Retinax 'A'***

0363b

RADIATOR GRILLE VEHICLE SET

RENEW ***76.55.07***

Remove the two screws **(1 Fig 1)** securing each front grille (2 Fig **1**) and remove the grille.
Refit the replacement grilles by engaging the lower tag of each grille into its locating slot and securing at the top with the screw.

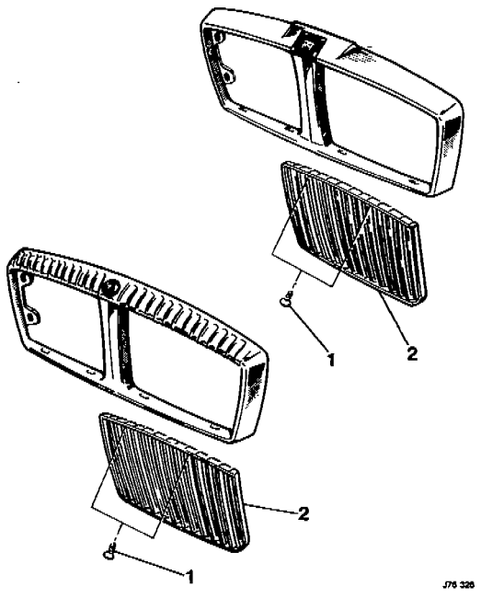


Fig 1

0383b

RADIATOR GRILLE SURROUND

RENEW ***76.55.15***

Remove the two front grilles and remove the two bolts **(1** Fig 2) each side securing the grille support brackets to the body.
Remove the grille assembly and remove the grille support brackets and the four thread inserts.
Fit the brackets and thread inserts to the replacement grille surround and secure the surround to the body with the four bolts.
Refit the two front grilles.

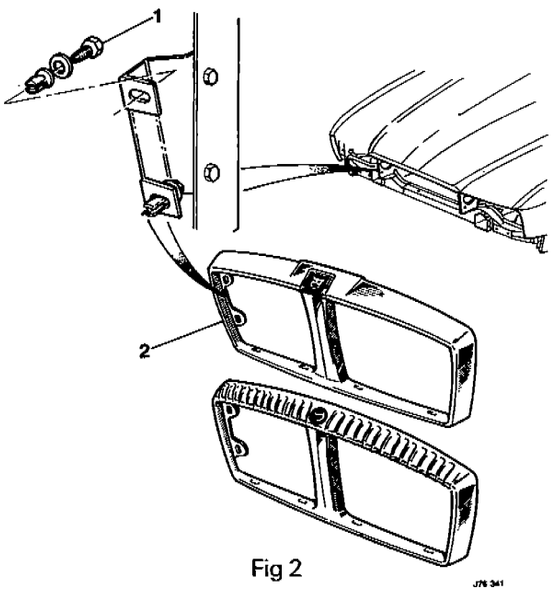


Fig 2

DATA

SPANNER SIZES

10mm

0382b

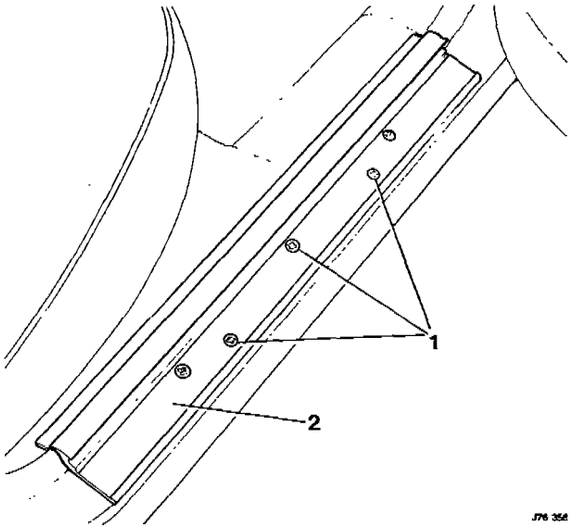
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SILLTREAD PLATE – REAR

RENEW *76.76.02*

Open the door.
Remove the end panel finishers and pull the top finisher clear of the tread plate.
Remove the five tread plate securing screws (1 Fig 1) and remove the tread plate (2 Fig 1).
Fit the replacement tread plate into position and secure with the fixing screws.
fit the new sill finisher and push in the end panel finishers.
Close the door.

1669B/56



J76 356

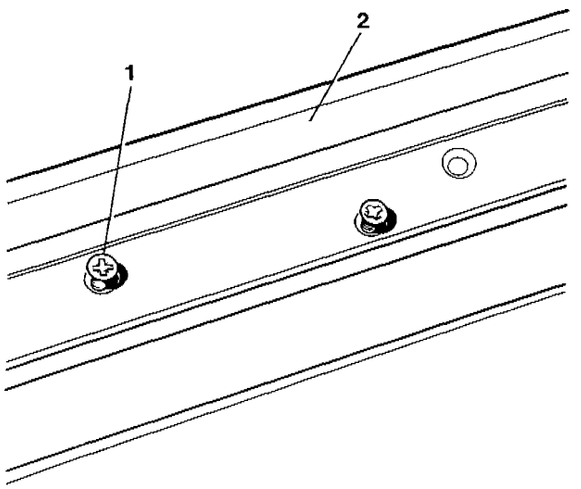
Fig 1

SILL TREAD PLATE–FRONT

RENEW **76.76.01**

Open the door.
Remove the end panel finishers and pull the top finisher clear of the tread plate.
Remove the five tread plate securing screws (1 Fig 2) and remove the tread plate (2 Fig 2).
Fit the replacement tread plate into position and secure with the fixing screws.
Fit the new sill finisher and push in the end panel finishers.
Close the door.

0399b



J76 362

Fig 2

SLIDING ROOF ASSEMBLY

RENEW **76.82.01**

Open the doors.
Remove the sliding roof panel 76.82.05
Release the clip securing the interior lamp.
Displace the panel assembly from its mounting position and disconnect the block connectors.
Place the panel to one side.
Remove the cantrail crash roll left and right hand 76.13.10.
Remove the headlining rear finisher 76.64.12.
Remove the rear quarter upper trim pad right hand 76.13.43.
Remove the rear quarter upper trim pad left hand 76.13.43.
Remove the sun visor vehicle set 76.10.17.
Remove the sliding roof flange finisher 76.82.23.
Remove the headlining to sliding roof aperture securing clips (1 Fig 3).

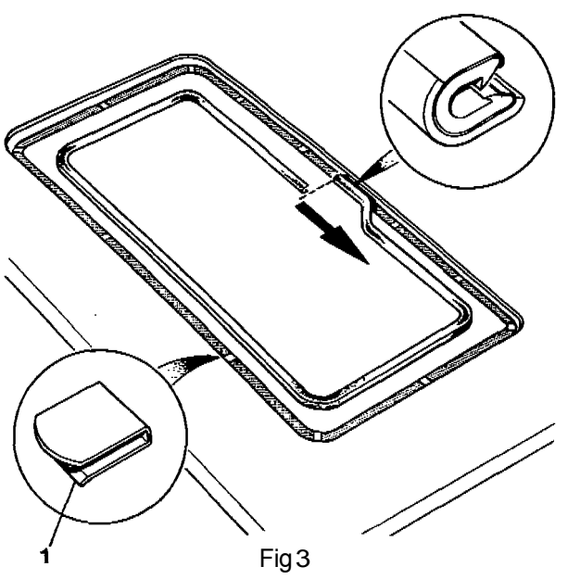


Fig 3

J76 357

Recline the seats fully for access and release the left hand rear headlining clip (1 Fig 2), reposition the headlining onto the rear parcel shelf for access.
Disconnect the sliding roof motor block connector.
Cut and remove the drain tube to roof assembly securing ratchet straps.
Disconnect the drain tubes from the sliding roof assembly.
Remove the bolts securing the support bracket (1 Fig 1) to the sliding roof.
Remove the bolts securing the left and right hand support bracket (Fig 1) to the roof.
Remove the right hand support brackets and lower the roof assembly from the left hand support brackets and remove from the vehicle via the front passenger door.
Remove the spacers and place the roof aside.
Reverse the removal procedure ensuring that prior to final tightening of the securing bolts that the roof is centralised with an even 4mm gap all round the aperture.

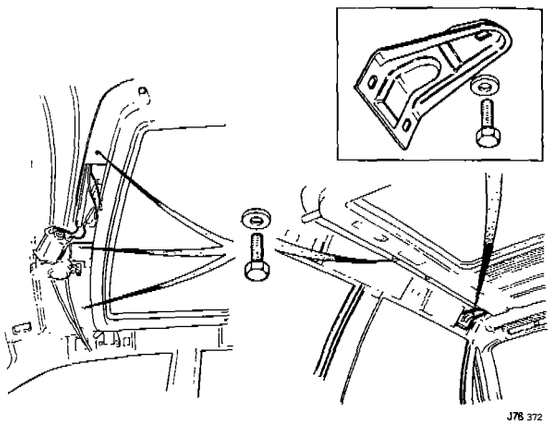


Fig 1

DATA

TORQUE FIGURES

Outer seal retainer **2-3Nm**
Plate and lifting block to bracket **2.3-3.4Nm**

SPANNER SIZES

13mm

0080b

SLIDING ROOF FLANGE FINISHER

RENEW **76.82.23**

Open the door.
Open the sliding roof.
Carefully remove the sliding roof aperture finisher (Fig 2) from the aperture ensuring that the headlining trim edges are not damaged.
Reverse the removal procedure to refit the finisher.

0085b

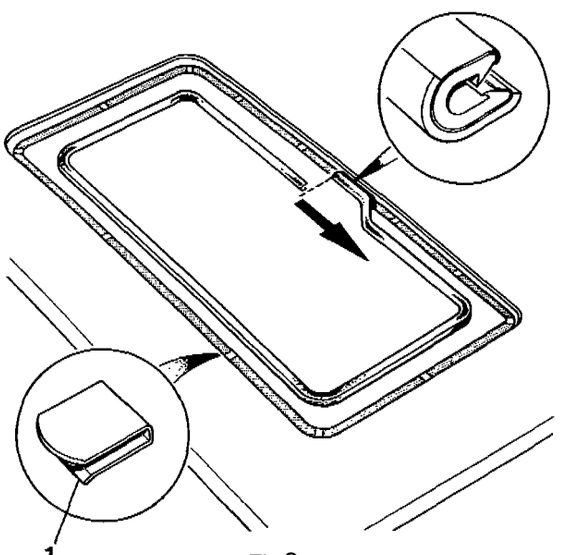


Fig 2

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SLIDING ROOF MOTOR DRIVE GEAR

RENEW **76.82.44**

Open the doors.
Remove the sliding roof flange finisher 76.82.23.
Remove the sun visor vehicle set 76.10.17.
Remove the cantrail crash roll left and right hand 76.13.10.
Remove the sliding roof motor 86.76.01
Remove the drive gear from the sliding roof motor.
Reverse the removal procedure to fit the replacement gear ensuring that prior to assembly the gear is coated with grease.

0090b

SLIDING ROOF PANEL

RENEW ***76.82.05***

Open the door.
Open the sliding roof.
Remove the sliding roof panel securing screws and partially close the roof.
Remove the sliding roof panel assembly.
Remove the lifting **block** securing nuts and screws and (1 Fig 2) remove the lifting blocks (2 Fig 2) and plates (3 Fig 2).
Remove the screws **(1** Fig 1) and drill out the 'pop' rivets (2 Fig 1) securing the roof panel seal front and rear retaining plate.
Remove the retaining plates.
Remove the seal.
Discard the roof panel.
Reverse the removal procedure ensuring that prior to final tightening of the securing screws that the roof *is* centralised with an 'even' 4mm **gap** all round the aperture.

0081b

SLIDING ROOF PANEL LIFTING BLOCK

RENEW **76.82.27**

Open the door.
Open the sliding roof.
Remove the nuts (1 Fig 2) securing the lifting **blocks** (2 Fig 2) and remove.
Reverse the removal procedure to refit the replacement lifting block ensuring that prior to final tightening of the securing nuts, the roof panel alignment is checked.

0086b

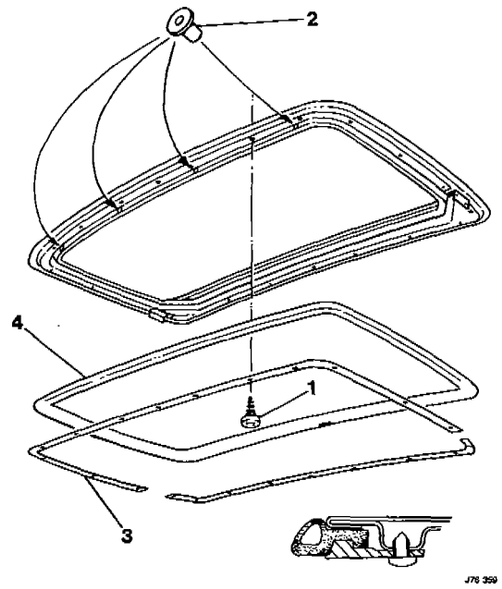


Fig 1

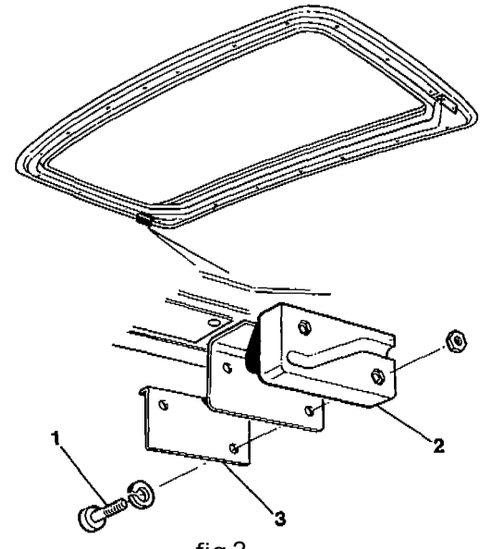


fig 2

SLIDING ROOF PANEL LIFTING BLOCK VEHICLE SET

ADJUST *76.82.38*

Open the door.
Open the sliding roof.
Slacken the nuts (Fig 1) securing the lifting blocks (2 Fig 1) and reposition as required.
Tighten the securing nuts and carefully slide the panel shut to check the alignment with the roof.

0087b

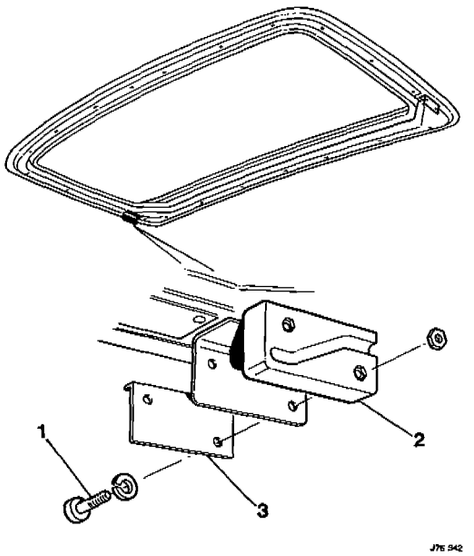


Fig 1

SLIDING ROOF PANEL SEAL

RENEW **76.82.15**

Open the door.
Open the sliding roof.
Remove the sliding roof panel securing screws and partially close the roof.
Remove the sliding roof panel assembly.
Remove the lifting block securing nuts and screws and remove the lifting blocks and plates.
Remove the screws (1 Fig 2) and drill out the 'pop' rivits (Fig 2) securing the roof panel seal front and rear retaining plate.
Remove the retaining plates (3 Fig 2).
Remove the seal (4 Fig 2).
Discard the roof panel.
Reverse the removal procedure ensuring that prior to final tightening of the securing screws that the roof is centralised with an 'even' 4mm gap all round the aperture.

0083b

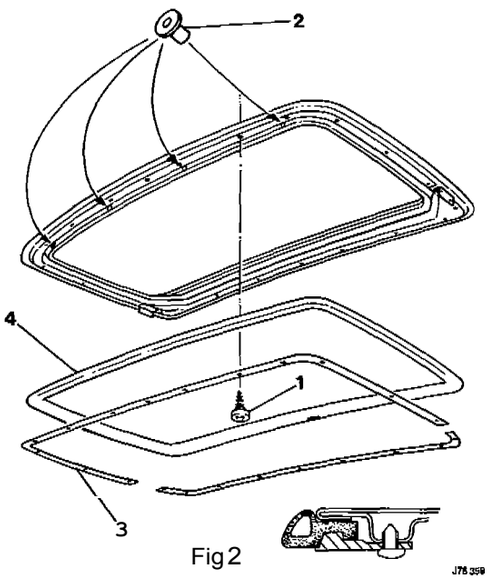


Fig 2

SLIDING ROOF PANEL TRIM ASSEMBLY

RENEW **76.82.19**

Open the door.
Remove the sliding roof panel 76.82.05
Fully close the sliding roof, remove the trim panel securing clips, partially open the sliding roof, remove the screws securing the front bridge plate and collect the bridge plate.
Remove the trim panel and clean the rubbers.
Reverse the removal procedure to fit the replacement trim.

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SLIDING ROOF PANEL WIND DEFLECTOR

ADJUST 76.82.39

Open the door.
Open the sliding roof.
Slacken the screws securing the wind deflector (Fig 1), adjust as required and tighten the deflector securing screws.
Carefully slide the panel shut to check the alignment with the roof.

0089b

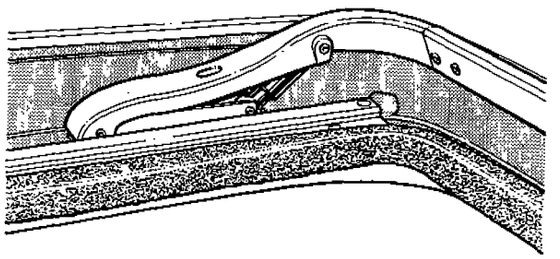

J76 519

Fig 1

SLIDING ROOF RACK

RENEW 76.82.42

Open the doors.
Remove the sliding roof panel 76.82.05
Remove the sliding roof flange finisher 76.82.23.
Remove the sun visor vehicle set 76.10.17.
Remove the cantrail crash roll left and right hand 76.13.10.
Remove the sliding roof motor 86.76.01
Release the interior lamp panel securing clip and release the panel assembly from its mounted position.
Disconnect the block connectors (Fig 2) and place the panel aside.
Remove the sliding roof motor 86.76.01
Remove the tape and cut the ratchet straps securing the rack tubes together and taking care to ensure that the headlining is not soiled by the rack, remove the rack end tube sections.
Manually slide the roof panel rearwards and remove the relevent mounting bracket securing bolts.
Remove the bracket.
Remove the screws securing the rack tube clamp to the sliding roof, manually close the roof and remove the rack to roof panel carrier securing nut.
Displace the rack tube assembly from its guide, open up and reposition the tube clamp over the rear tube and rack bracket.
Holding the rear tube in position, disconnect the front rack tube from the rear rack tube.
Release the rack from the rear tube and carefully remove the rack.
Grease the replacement rack, fit the rack to the front rack tube, reposition the rack into the rear rack tube approximately 12 in. ensuring that the clamp is not displaced along the tube.

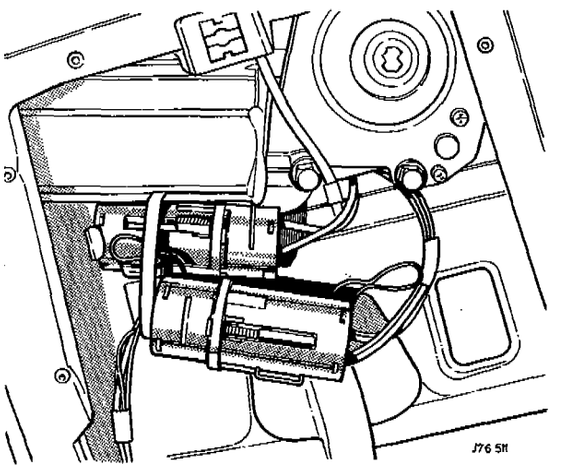

J76 511

Fig 2

Reposition the front rack tube and connect to the rear rack tube, ensure that the rack tube to sliding roof assembly rubber is correctly positioned.
Position the clamp over the union and connect the rack to the carrier.
Tighten the rack securing nut and manually slide the roof fully rearwards.
Position the rack tube into the guide, close the clamp and align the mounting bracket, fit and tighten the clamp securing screws.
Position the rack tube end sections and secure the tube with ratchet straps and tape.
Position the rack tubes for fitting the motor, manually close the roof, ensure that the carriers are fully forward, refit the roof motor and reverse the remaining removal procedure to refit.

0091b

SLIDING ROOF RACK VEHICLE SET

RENEW **76.82.43**

Open the doors.
Remove the sliding roof panel 76.82.05
Remove the sliding roof flange finisher 76.82.23.
Remove the sun visor vehicle set 76.10.17.
Remove the cantrail crash roll left and right hand 76.13.10.
Remove the sliding roof motor 86.76.01
Release the interior lamp panel securing clip and release the panel assembly from its mounted position.
Disconnect the block connectors (Fig 1) and place the panel aside.
Remove the sliding roof motor 86.76.01
Remove the tape and cut the ratchet straps securing the rack tubes together and taking care to ensure that the headlining is not soiled by the rack, remove the rack end tube sections.
Manually slide the roof panel rearwards and remove the relevent mounting bracket securing bolts.
Remove the bracket.
Remove the screws securing the rack tube clamp to the sliding roof, repeat the procedure for the second side, manually close the roof and remove the rack to roof panel carrier securing nut.
Displace the rack tube assembly from its guide, open up and reposition the tube clamp over the rear tube and rack bracket.
Holding the rear tube in position, disconnect the front rack tube from the rear rack tube.

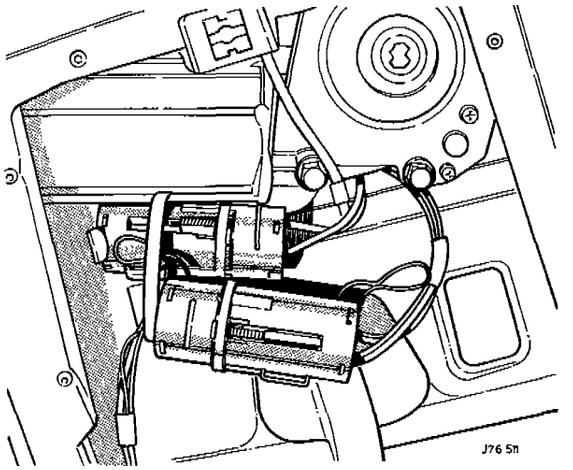


Fig 1

www.JagDocs.com

Release the rack from the rear tube and carefully remove the rack.
Repeat the procedure for the second side.
Grease the replacement racks, fit the rack to the front rack tube, reposition the rack into the rear rack tube approximately 12 in. ensuring that the clamp is not displaced along the tube.
Reposition the front rack tube and connect to the rear rack tube, ensure that the rack tube to sliding roof assembly rubber is correctly positioned.
Position the clamp over the union and connect the rack to the carrier.
Tighten the rack securing nut and repeat the procedure for the second side.
Manually slide the roof fully rearwards.
Position the rack tube into the guide, close the clamp and align the mounting bracket, fit and tighten the clamp securing screws.
Repeat the procedure for the second side.
Position the rack tube end sections and secure the tubes with ratchet straps and tape.
Position the rack tubes for fitting the motor, manually close the roof, ensure that the carriers are fully forward, refit the roof motor and reverse the remaining removal procedure to refit.

0092b

SLIDING ROOF WIND DEFLECTOR

RENEW ***76.82.07***

Open the door.
Open the sliding roof.
Remove the screws securing the wind deflector (Fig 1) and remove the deflector assembly.
Remove and discard the deflector gaskets.
Place the deflector to one side.
Reverse the removal procedure to refit the deflector ensuring that prior to tightening of the securing screws the sliding roof is carefully closed to check the alignment of the deflector.

0082b

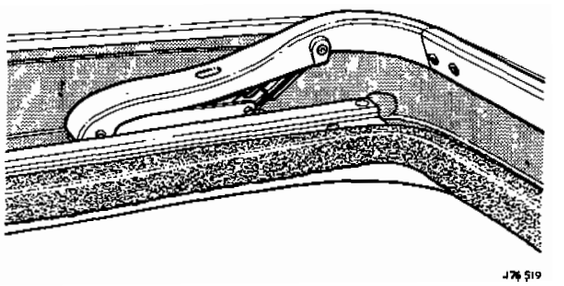


Fig 1

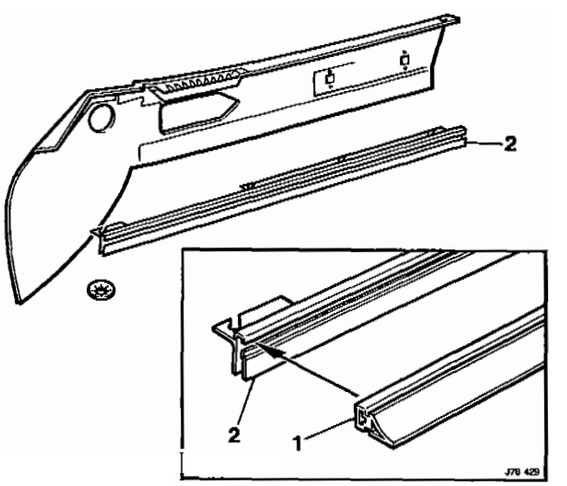


Fig 2

WEATHER STRIP

RENEW **76.43.22**

Remove the door upper trim pad and slide the weather strip (1 Fig 2) from the channel (2 Fig 2).
Reverse the removal procedure to refit.

0357b

WEATHER STRIP CHANNEL

RENEW **76.43.25**

Remove the door upper trim pad.
Remove the heater vent plenum chamber securing screws, and pull the chamber clear of upper trim, remove the nuts and springs washers (1 Fig 1) and remove the channel (2 Fig 1).
Reverse the removal procedure to refit the channel.

0356b

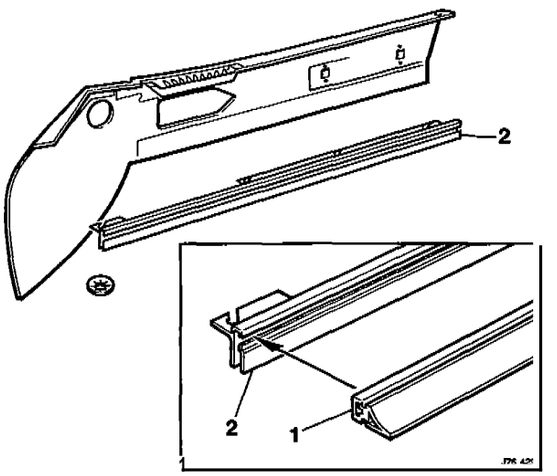


Fig 1

WINDSCREEN GLASS – LOWER FINISHER

RENEW **76.43.41**

Using a suitable implement under one corner of the seal, lift out of its aperture and peel back across the vehicle.
Coat the replacement seal with a liquid soap solution and starting at one end of the aperture, press the seal into position working across the vehicle, cut the seal to length and finally seat.

0395b

BOOT LID STRIKER

ADJUST **76.19.04**

Open the boot and remove the rear finisher screws and remove the finisher.
Slacken the stricker plate securing bolts (I Fig 2). adjust the striker to ensure the boot lid lines up with both rear wings, and tighten the securing bolts.
Fit the rear finisher and secure with the screws.
Close the boot.

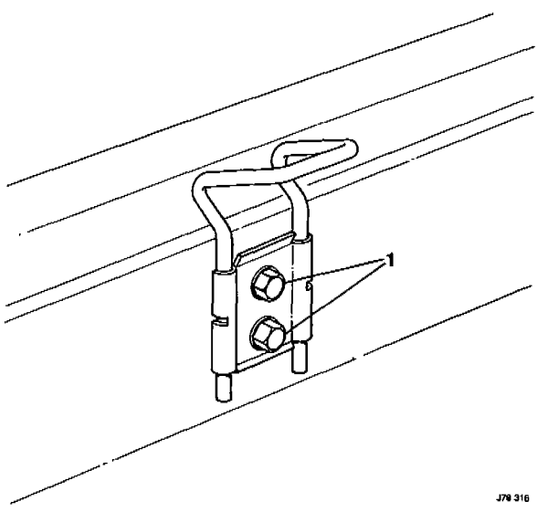


Fig 2

DATA

SPANNER SIZES

10mm
13mm

0381b

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BOOT LID

RENEW **76.19.01**

Open the bonnet and disconnect the battery. open the boot, cut the clips securing the harness to the boot lid.
Disconnect the boot lamp and boot lock multi-plugs and disconnect the number plate lamp feed wires.
Remove the hinge to boot lid securing bolts (Fig 1), hold the boot open using a suitable prop.
Disconnect the gas struts from the boot lid pivots and remove the boot lid.
Remove the two number plate lamp units, two screws each, and the boot illumination lamp. Remove the boot lid lock and remove the boot lock finisher and collect the finisher gasket.
Glue the gasket to the boot lock finisher, fit the finisher to the boot lid and secure with the two plain washers and nuts.
Refit the number plate lamps and the boot illumination lamp, refit the boot lock mechanism. lift the boot lid back into position, and fit but do not tighten the securing bolts and connect the struts to the boot lid pivot bolts.
Carefully shut the boot to align with the rear wings, open the boot and tighten the four securing bolts.
Secure the harness to the boot lid with harness straps and boot lid clips.
Connect the boot lamp and lock multi-plugs and connect the number plate light feed wires.
Close the boot.
Reconnect the battery and close the bonnet.

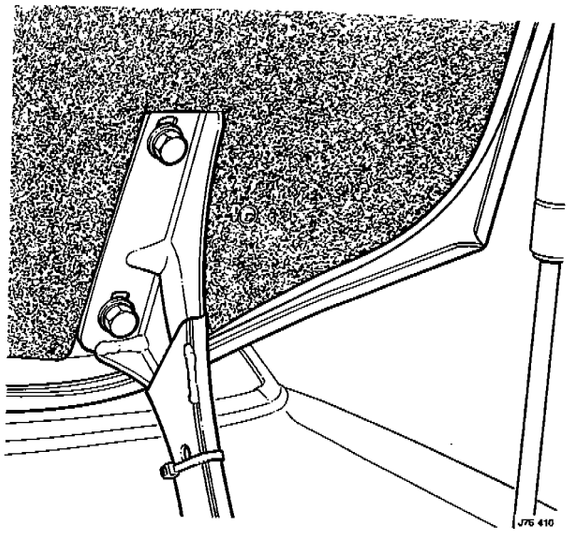


Fig 1

DATA

SPANNER SIZES

13mm

0367b

BOOT LID SEAL

RENEW **76.19.06**

Open the boot and remove the rear trim panel securing screws and remove the rear trim panel, and remove the seal from the boot flange.
Clean the seal mounting flange, fit the new seal in position (1 Fig 2), start at the lock striker and work back.

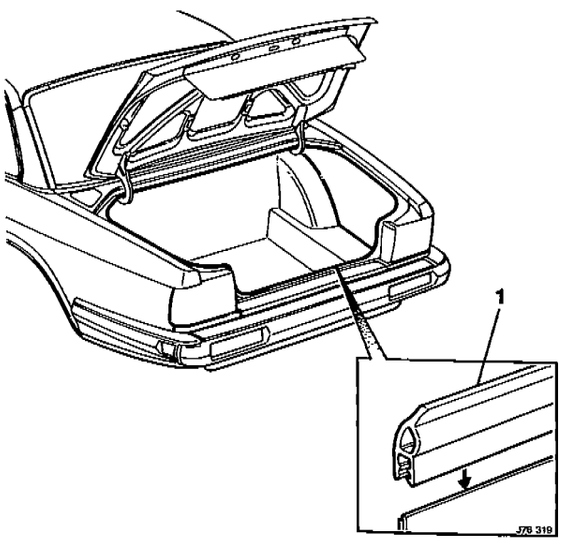


Fig 2

Cut the seal to the correct length and finally fit the seal to the flange.
Refit the rear trim finisher and secure with the screws.
Close the boot lid.

0366b

BOOT LID GAS STRUT

RENEW **76.19.27**

Open the boot.
Insert screwdriver and remove **the** strut (Fig **1**) from the top pivot and repeat the operation for the lower pivot.
Fit the strut to the lower pivot first to aid reassembly.
Reverse the removal procedure to refit the replacement strut.
NOTE: Change only one strut at once.

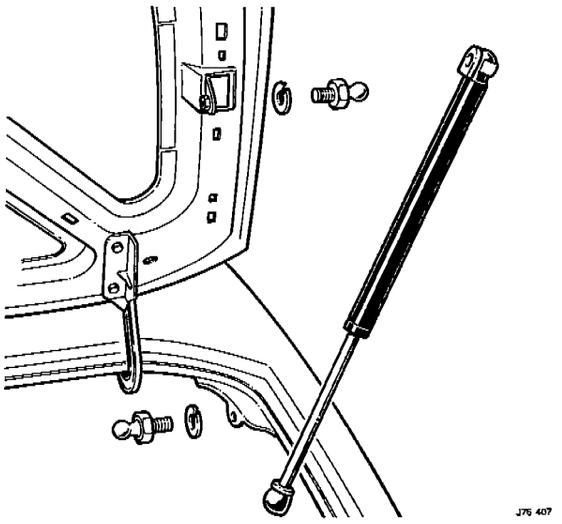


Fig **1**

0370b

BOOT LID STRUT PIVOT BOLTS

RENEW **76.00.00**

Open the boot.
Remove the strut **(Fig 1)**, slacken and remove the upper pivot bolt (Fig **1**), collect the **spring** washer (Fig **1)**.
Repeat the operation for the lower bolt.
Reverse the removal procedure to refit the bolts.
Close the boot lid.

DATA

0369b

BOOT LID LOCK MECHANISM

RENEW **76.19.25**

Open the boot, disconnect the operating rod from the remote linkage (spring clip).
Remove the **two** lock assembly securing bolts (2 Fig 2). remove the lock from the boot lid, disconnect the multi-plug (4 Fig 2) and remove the assembly from the vehicle.
Reverse the removal procedure to refit.

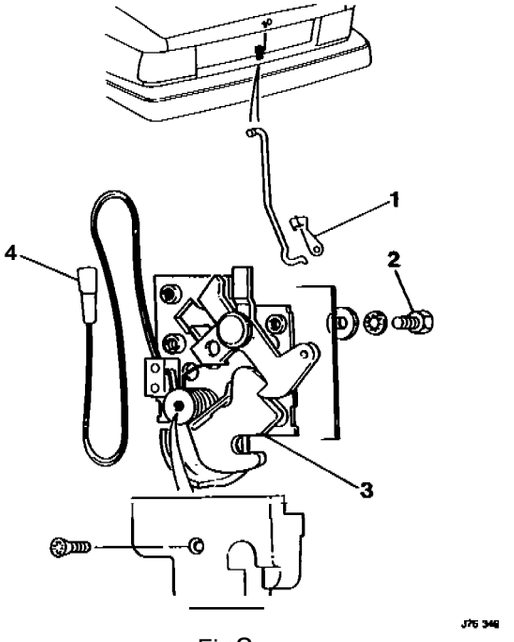


Fig 2

DATA

TORQUE FIGURES

Latch ***to boot*** *lid* ***7-10Nm***
Lock to boot *lid* ***5-7Nm***

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DATA

SPANNER SIZES

8mm

1/2"AF

OILS/SEALANTS/LUBRICANTS

Lock moving parts ValvoleneTectyl 4008

0371b

BOOT LOCK RELEASE TRIGGER HANDLE

RENEW **76.19.15**

Remove the boot lock assembly, remove the roll pin and remove the lever.
Refit the replacement and reverse the removal procedure.

0373b

BOOT LOCK FINSIHER

RENEW **76.43.31**

Open the boot, disconnect the number plate lamp connections, and remove the lens assemblies.
Remove the two nuts (1 Fig 1) and plain washers securing the finisher, remove the finisher and gasket.
Glue the gasket (2 Fig 1) to the replacement finisher (3 Fig 1), fit to the boot lid and secure with the nuts and plain washer.
Refit the number plate lamp assemblies and connections.
Close the boot annd reconnect the battery.

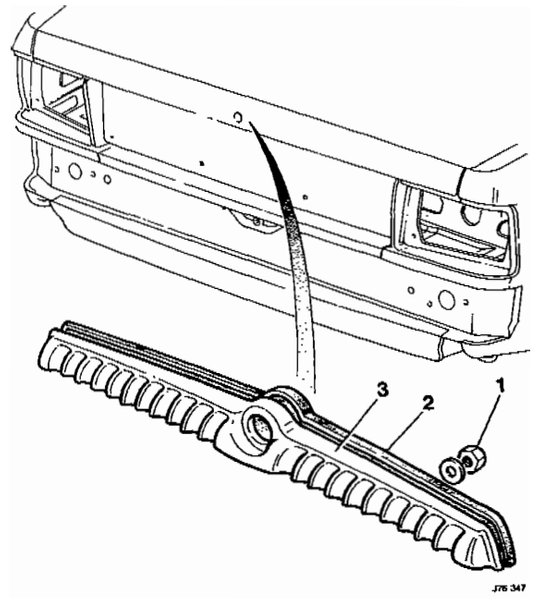


Fig 1

DATA

TORQUE FIGURES

Finisher to boot lid 5-7Nm

SPANNER SIZES

8mm

0368b

BOOT LID LOCK BARREL

RENEW **76.19.19**

Remove the boot'lock assembly, remove the four screws and separate the front plate from the operating assembly. Remove the locking pin and spring (1 Fig 1) and push the barrel (2 Fig 1) out from inside.
Reverse the procedure to refit the replacement, ensuring that the locating hole lines up with the holes in the housing.

0372b

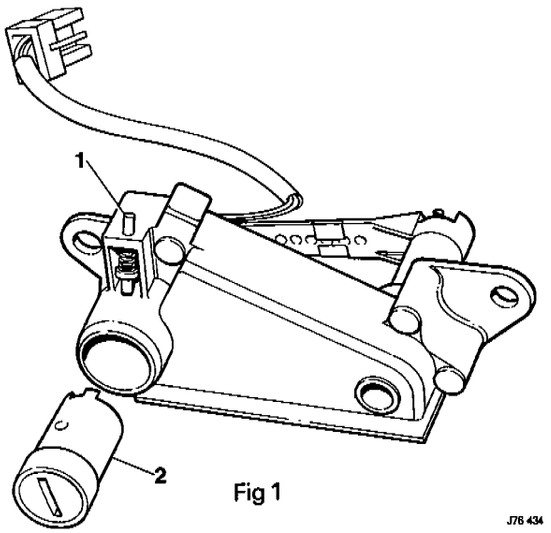


Fig 1

J76 434

BOOT LID LOCK STRIKER

RENEW **76.19.12**

Open the boot, remove the 4 screws (1 Fig 2) securing the boot trim and remove the trim and carpet.
Remove the 2 bolts (2 Fig 2) and spring washers and remove the striker plate (3 Fig 2).
Reverse the removal procedure and adjust the striker plate until the boot lid is flush wirh the rear wings when closed.

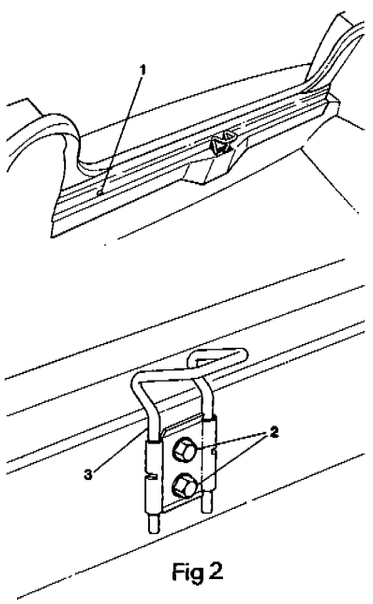


Fig 2

DATA

TORQUE FIGURES

Striker to rear trunk panel 7-10Nm

SPANNER SIZES

10mm

0365b

BOOT VENTILATOR OUTLET

RENEW **80.15.66**

Remove the boot side trims and remove the 2 bolts and plain washers (4 Fig 3) securing the boxes (5 Fig 3) to the boot floor in either side.
Reverse the removal procedure to refit the boxes, ensuring that the two earth wire eyelets are refitted to each rear securing bolt and that the exhaust grommets are aligned with the apetures in the body side vents.

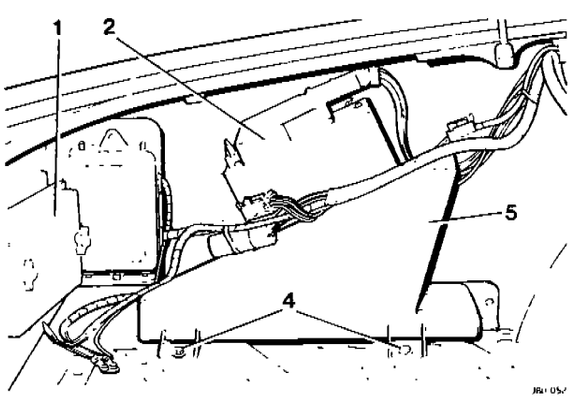


Fig 3

DATA

TORQUE FIGURES

Ventilator box to boot floor 6-8Nm

SPANNER SIZES

10mm

0362b

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BOOT LID HINGE VEHICLE SET

RENEW **76.19.28**

Open the boot, cut and remove the boot harness straps and move the harness away from the hinge, remove the upper hinge securing bolts (1 Fig 1), disconnect the boot illimination switch wire, (left hand side) remove the two lower hinge securing bolts and remove the hinge (2 Fig 1).
Reverse the removal procedure to refit the replacement hinge and repeat for the right hand boot hinge.
Adjust the alignment of the boot relative to the wings and tighten the securing bolts.

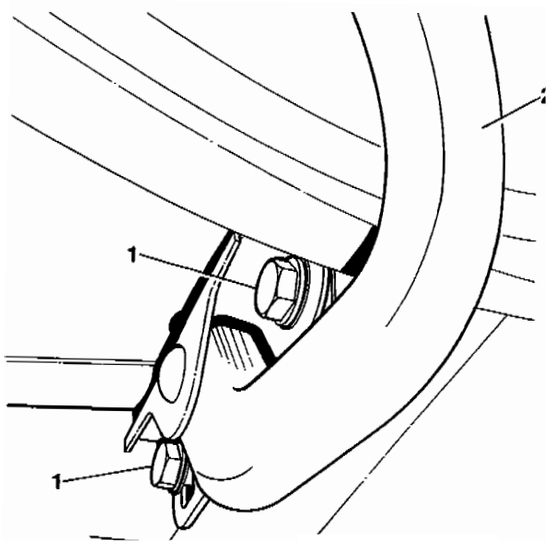


Fig 1

DATA

TORQUE FIGURES

SPANNER SIZES

13mm

0378b

BOOT LID SEALTREAD PLATE

RENEW **76.19.09**

Open the boot.
Slacken and remove the screws (1 Fig 2) securing the tread plate (2 Fig 2) to the body.
Remove the tread plate.
Reverse the removal procedure to refit the replacement tread plate.

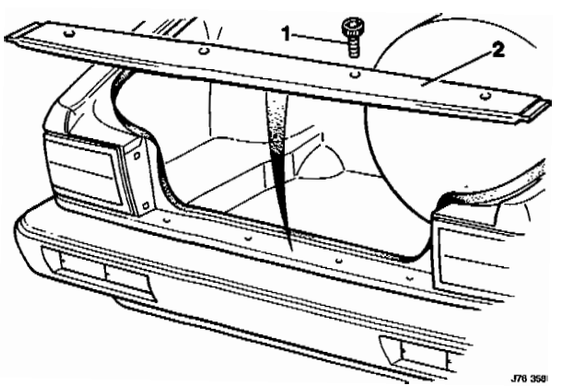


Fig 2

1669B/74

BOOT REAR LINER

RENEW **76.19.32**

Open the boot.
Peel back the floor carpet and sound insulation for access.
Remove the tread plate securing screws and remove the tread plate.
Remove the boot rear liner.
Reverse the procedure to fit the replacement liner.

1669B/74

BOOT FLOOR CARPET

RENEW **76.19.30**

Open the boot.
Move the spare wheel access flap and remove the bolt securing the spare wheel in position.
Lift out the spare wheel.
Remove the floor carpet (Fig 1).
Reverse the removal procedure to refit the replacement floor carpet.

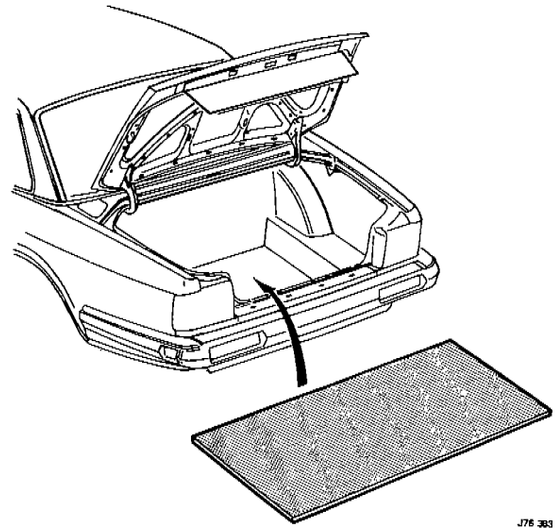


Fig 1

DATA

TORQUE FIGURES

Clamp screw clamp to spare wheel 13-16Nm

16698

BOOT FRONT LINER

RENEW **76.19.31**

Open the boot.
Move the spare wheel access flap and remove the bolt securing the spare wheel in position.
Lift out the spare wheel.
Remove the floor carpet.
Release the tension from the vehicle jack and remove the jack assembly.
Remove the front liner (Fig 2).
Reverse the removal procedure to refit the replacement front liner.

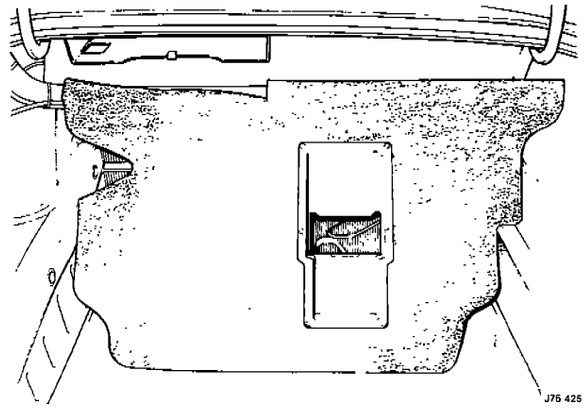


Fig 2

DATA

TORQUE FIGURES

Clamp screw clamp to spare wheel 13-16Nm
Jack to mounting bracket 7-14Nm

1669B/75

BOOT SIDE LINER-LEFT HAND

RENEW **76.19.22**

Open the boot.
Move the spare wheel access flap and remove the bolt securing the spare wheel in position.
Lift out the spare wheel.
Remove the floor carpet.
Release the tension from the vehicle jack and remove the jack assembly.
Remove the front liner (Fig 3).

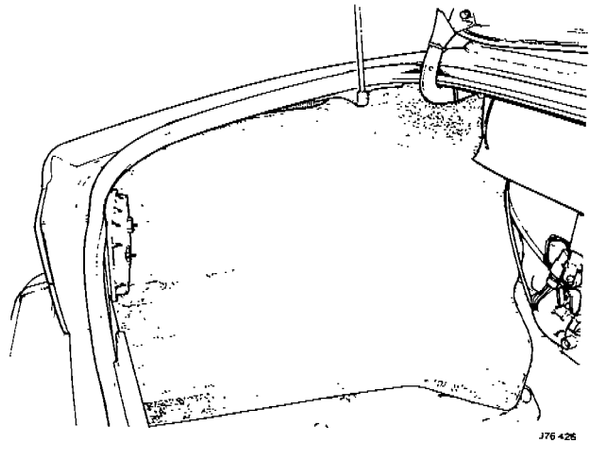


Fig 3

www.JagDocs.com

Remove the nuts securing the rear lamp assembly inner cover.
Remove the inner cover.
Remove the screw securing the upper portion of the side liner and remove the liner.
Reverse the removal procedure to refit the replacement side liner.

DATA

TORQUE FIGURES

Clamp screw clamp to spare wheel **13-16Nm**
Jack to mounting bracket **7-14Nm**

1669B/75

BOOT SIDE LINER-RIGHT HAND

RENEW **76.19.23**

Open the boot.
Move the spare wheel access flap and remove the bolt securing the spare wheel in position.
Lift out the spare wheel.
Remove the floor carpet.
Release the tension from the vehicle jack and remove the jack assembly.
Remove the front liner.
Remove the nuts securing the rear lamp assembly inner cover.
Remove the inner cover.
Remove the screw securing the upper portion of the side liner and remove the liner (Fig 1).
Reverse the removal procedure to refit the replacement side liner.

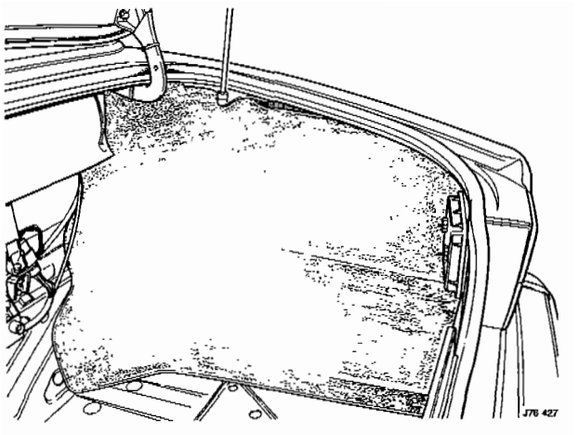


Fig 1

DATA

TORQUE FIGURES

Clamp screw clamp to spare wheel **13-16Nm**
Jack to mounting bracket **7-14Nm**

1669B/75

ELECTRICALLY OPERATED FRONT SEAT CUSHION

RENEW **76.70.11**

Open the door.
Remove the bolt securing the seat cushion.
Remove the cushion retaining plate.
Reposition the cushion (Fig 2) for access to the block connectors.
Disconnect the block connectors and remove the seat cushion assembly.
Displace the seat entry switch harness multiplug from the retaining clip.
Disconnect the seat entry switch harness multi plug.
remove the seat cushion assy and the seat entry switch.
Remove the switch bezel and discard the cushion.
Reverse the removal procedure to refit the seat cushion.

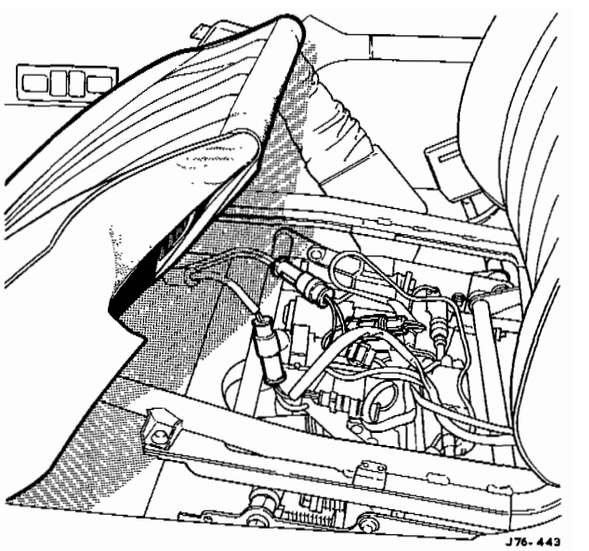


Fig 2

1669B

ELECTRICALLY OPERATED FRONT SEAT

RENEW **76.70.10**

Open the front door.
Remove the bolt securing the seat cushion.
Remove the cushion retaining plate.
Reposition the cushion for access to the block connector.
Disconnect the block connector and remove the seat cushion assembly.
Cut and remove the harness securing straps.
Disconnect the reading lamp and recline block connectors.
Reposition the harness away from the seat runners.
Remove the screws (Fig 1) securing the seat to the seat runners.
Open the rear door.
Remove the seat to seat runner securing screws and remove the front seat through the front door.
Reverse the removal procedure to refit the front seat.

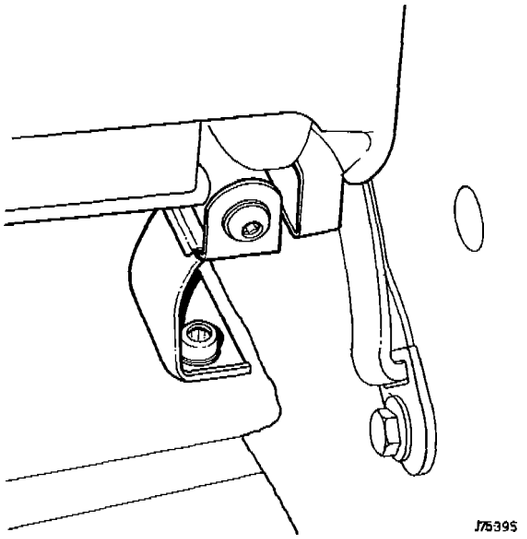


Fig 1

1669B/81

ELECTRICALLY OPERATED FRONT SEAT-RUNNER AND MOTOR

RENEW **76.70.08**

Open the front door.
Remove the bolt securing the seat cushion.
Remove the cushion retaining plate.
Reposition the cushion for access to the block connector.
Disconnect the block connector and remove the seat cushion assembly.
Cut and remove the harness securing straps.
Disconnect the reading lamp and recline block connectors.
Reposition the harness away from the seat runners.
Remove the screws securing the seat to the seat runners.
Open the rear door.
Remove the seat to seat runner securing screws and remove the front seat through the front door.
Remove the bolts (Fig 2) securing the rear motor assembly.
Motor the seat to the fully rearward position and remove the front securing bolts,
Remove the front securing bolts and reposition the motor assembly for access.
Reposition the sound deadening material and remove the cable clamp securing nuts.
Remove the clamp.
Disconnect the seat multi plugs.
Remove the runner and motor **assembly.**

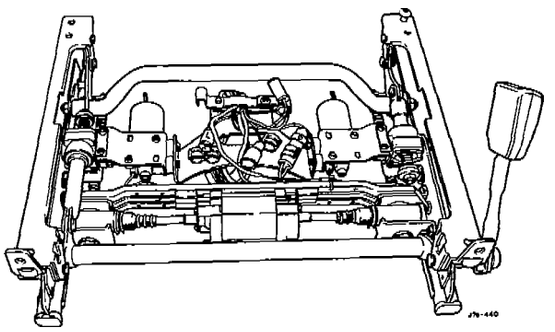


Fig 2

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Remove the spacer washers from the the seat mountings and discard the assembly.
Reverse the removal procedure to refit the replacement runner and motor assembly.

1669B/81

ELECTRICALLY OPERATED FRONT SEAT BACK FINISHER

RENEW **76.70.09**

Open the door.
Switch on the ignition.
Move the seat forward to give access to the outer securing screws.
Switch off the ignition and open the rear door.
Remove the finishers and screws securing the back finisher.
Remove the securing screw aperture finisher.
Remove and discard the seat back finisher.
Reverse the removal procedure to refit the replacement finisher.

1669B/82

FRONT SEAT HEAD REST - ELECTRICALLY OPERATED SEAT

RENEW **76.70.14**

Open the door.
Switch on the ignition.
Move the seat forward to give access to the outer securing screws.
Switch **off** the ignition and open the rear door.
Remove the finishers and screws securing the back finisher.
Remove the securing screw aperture finisher.
Remove and discard the seat back finisher.
Displace the rear reading lamp from the front seat headrest.
Note the position of and disconnect the reading lamp feed wires.
Place the lamp aside.
Remove the reading lamp finisher securing screws and remove the lamp finisher.
Remove the grommet from the headrest harness.
Position the harness into the headrest tube.
Displace the headrest retaining clip (Fig 1) and the headrest from its mounted position.
Remove the headrest retaining clip from the headrest tube.

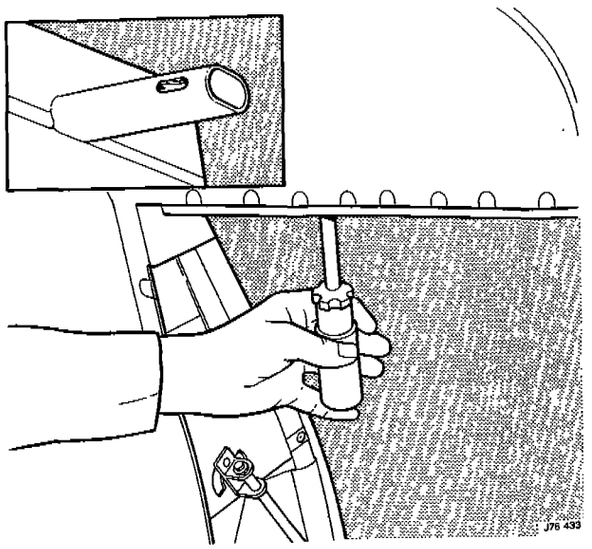


Fig 1

Remove the harness from the headrest and discard the headrest.
Reverse the removal procedure to fit a replacement headrest.

1669B/82

FRONT FLOOR CARPET

RENEW **76.49.02**

Open the door.
Lift out the carpet (Fig 1).
Fit and align the replacement carpet in position.
Close the door.

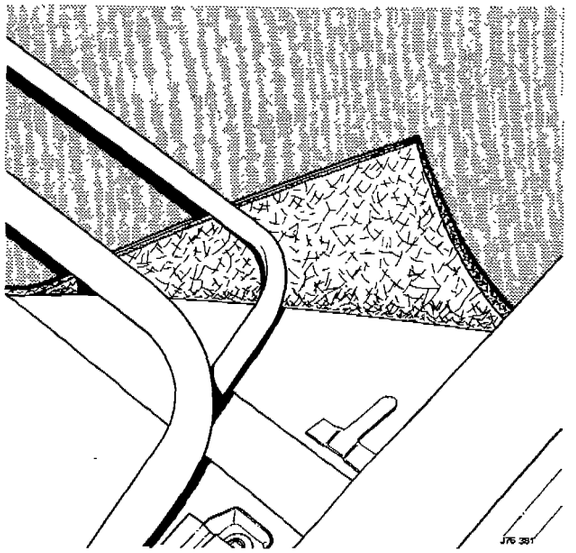


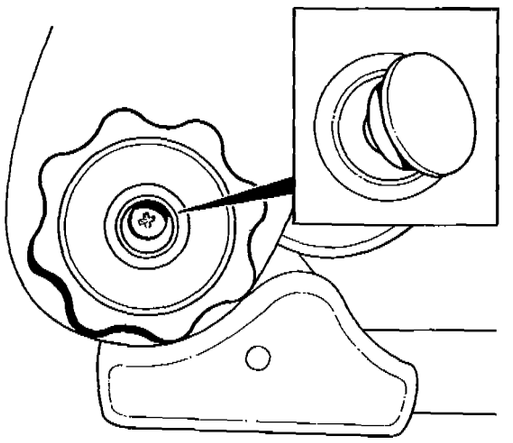
Fig 1

1669B/70

FRONT SEAT

RENEW **76.70.01**

Open the door.
Remove the front seat cushion 76.70.02
Disconnect the reading lamp **block** connector and move the seat fully forward.
Remove the seat runner to floor securing **screws,** move the seat fully rearward and open the rear door.
Remove the remaining seat runner to floor securing screws, disconnect the springs from the floor brackets and remove the seat assembly from the vehicle.
Remove the seat runner assister springs, operate the seat runners for access to **the** rear securing bolts and remove the seat runner to seat securing bolts.
Remove the seat runner and discard seat.
Reverse the removal procedure to refit the replacement seat.



J7B 331

Fig 2

0065b

FRONT SEAT BACK FINISHER

RENEW **76.70.03**

Open the doors.
Remove the front seat cushion 76.70.02.
Remove the front seat 76.70.01.
Remove the **back** finisher and recline handle finishers (Fig 2) and securing screw.
Remove the recline handle and the outer finishers.
Displace the top finisher from the headrest area and remove the back finisher from the spring retainers in an upward direction.

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Discard the seat back.
Reverse the removal procedure to fit the replacement seat back.

0069b

FRONTSEAT BELT BUCKLE UNIT

RENEW **76.73.02**

Disconnect the electrical block connector (Fig 1) feeding the buckle unit (3 Fig 1) located under the seat cushion.
Remove the front seat and buckle unit securing bolt cover.
Remove the bolt (1 **Fig 1**).
Refit to fit the cover the replacement buckle unit to the seat frame with the securing bolt.
Refit the seat to the vehicle and reconnect the block connector.

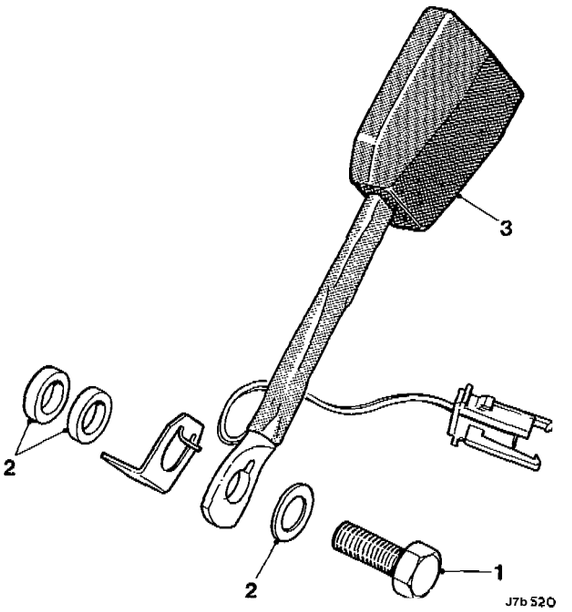


Fig 1

DATA

TORQUE FIGURES

Seat buckle to seat frame 27.1 Nm

SPANNER SIZES

17mm

0393b

FRONT SEAT BELT LEFT HAND

RENEW **76.73.10**

Open the door.
Remove the 'B' post lower trim pad 76.13.29
Remove the seat belt upper anchor securing nut cover and nut.
Reposition the seat belt for access, remove the spacer and wavey washer and disconnect the block connector.
Unclip the **'B'** post upper trim pad.
Displace the upper trim pad from ist mounted position.
Pass the seat belt through the trim pad and remove the upper trim pad.
Remove the seat belt finisher from the **'B'** post aperture and reposition the seat belt through the **'B'** post.
Remove the seat belt reel securing bolt and remove the seat belt reel.
Renew the seat cushion 76.70.02
Cut and remove the seat belt buckle block connector securing strap and disconnect the seat belt buckle block connector.
Remove the seat belt buckle mounting bracket to seat assembly securing bolt and remove the belt buckle assembly from the seat.
Reverse the removal procedure to refit the replacement belt.

0075b

FRONT SEAT BELT RIGHT HAND

RENEW **76.73.21**

Open the door.
Remove the 'B' post lower trim pad 76.13.29
Remove the seat belt upper anchor securing nut cover and nut.
Reposition the seat belt for access, remove the spacer and wavey washer and disconnect the block connector.
Unclip the 'B' post upper trim pad.
Displace the upper trim pad from ist mounted position.
Pass the seat belt through the trim pad and remove the upper trim pad.
Remove the seat belt finisher from the 'B' post aperture and reposition the seat belt through the 'B' post.
Remove the seat belt reel securing bolt and remove the seat belt reel.
Renew the seat cushion. 76.70.32
Cut and remove the seat belt buckle block connector securing strap and disconnect the seat belt buckle block connector.
Remove the seat belt buckle mounting bracket to seat assembly securing bolt and remove the belt buckle assembly from the seat.
Reverse the removal procedure to refit the replacement belt.

0078b

FRONT SEAT CUSHION

RENEW **76.70.02**

Open the door.
Remove the bolt securing the seat cushion and remove the cushion retaining plate.
Lift cushion for access to the block connector situated below the cushion and disconnect the seat belt pad block connector.
Cut and remove the harness securing ratchet strap.
Remove the seat cushion.
Reverse the removal procedure to refit the replacement seat cushion.

0243b

CUSHION COVER – FRONT SEAT

RENEW **76.70.14**

Disconnect the electrical block connectors beneath the seat cushion, remove the front securing screw and lift out the cushion.
Remove all the clips (Fig 1) securing the cushion cover in position and remove the cover.

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Place the replacement cushion cover in the approximate position over the seat frame and secure one side of the cover to the frame with the clips.
Tension the cover with hand pressure and secure the side opposite that which is already clipped and repeat for the remaining two sides.
Ensure that the clips are in the position illustrated (Fig 1) and fit the cushion back in the seat frame, refit the fixing screw and reconnect the electrical block connections.

0390b

FRONT SEAT CUSHION SUPPORT CENTRE

RENEW **76.70.19**

Disconnect the electrical block connectors below the rear of the seat cushion and lift out the cushion.
Turn the cushion over and using pliers or suitable implement, release the support from the wire clips.
Place the replacement support in position and secure with the wire clips.
Fit the seat back in position in the front seat frame and reconnect the electrical block connectors.

0391b

FRONT SEAT HEADREST

RENEW **76.70.30**

Open the door.
Remove the:
- Front seat cushion 76.70.02
- Front seat 76.70.01
- Front seat back finisher 76.70.03

Pull the rear reading lamp clear of the headrest assembly, disconnect the feed wires and place the lamp aside.
Cut the ratchet straps securing the lamp harness to the seat frame.
Remove the bolt (Fig 2) securing the headrest and carefully pull the headrest from its mounted position.
Remove the screws and the 'fir tree' clips securing the housing to the headrest.
Displace the grommet from the feed wires/headrest and remove the headrest.
Remove the housing.
Reverse the removal procedure to fit the replacement headrest.

0071b

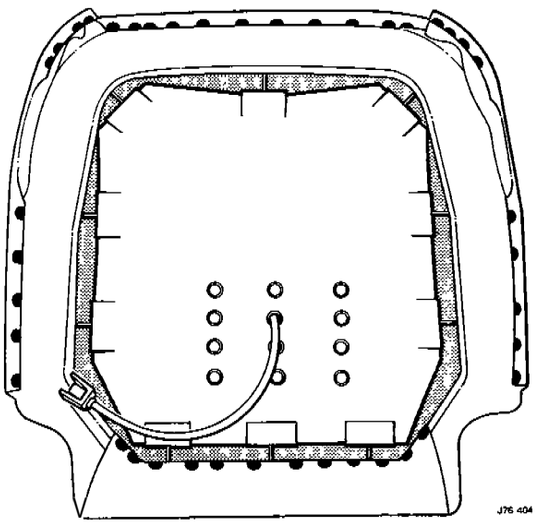


Fig 1

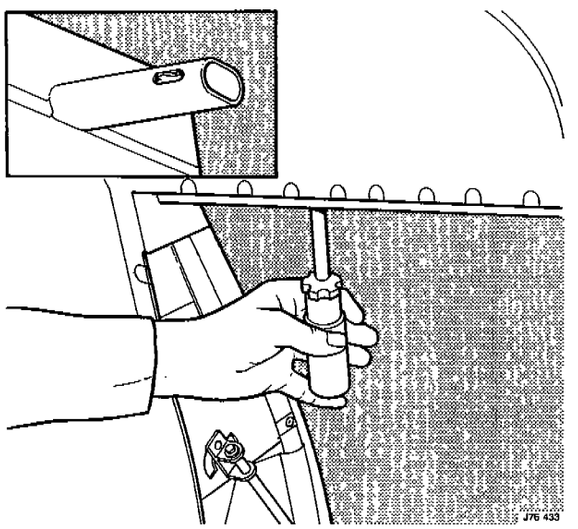
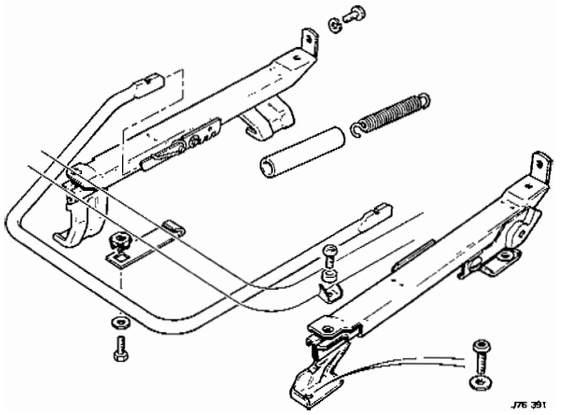


Fig 2

FRONT SEAT RUNNERS AND ADJUSTER ASSEMBLY

RENEW **76.70.24**

Open the door
Remove the:
front seat cushion 76.70.02
Front **seat** 76.70.01
Remove the seat belt buckle securing bolt cover and bolt.
Remove the buckle assembly.
Operate the runner for access to the rear securing screws (Fig 1) and remove the screws securing the runner/adjuster to the seat.
Remove the runner/adjuster assembly and discard.
Reverse the removal procedure to refit the replacement runner/adjuster.


Fig 1

DATA

TORQUE FIGURES

Seat runners to floor 36.5Nm

SPANNER SIZES

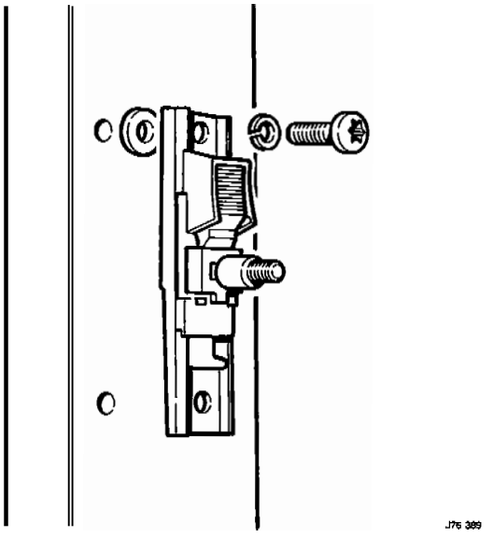
No 50 Torx

0070b

FRONT SEAT BELT ADJUSTER

RENEW **76.73.12**

Ooen the doors.
Remove the 'B' **post** upper trim pad and remove the finisher plate.
Reposition the adjuster to gain access to the lower securing screw, remove the screws (Fig 2).
Remove the adjuster and spacers.
Reverse the removal procedure to refit the replacement adjuster.


Fig 2

0076b

REAR CENTRE SEAT BELT-STATIC

RENEW **76.73.31**

Open the **door.**
Remove the rear seat cushion 76.70.37
Remove the seat belt buckle securing **bolt** and remove the buckle assembly.

Remove the four star washers, the two spacers and the side seat belt buckle.

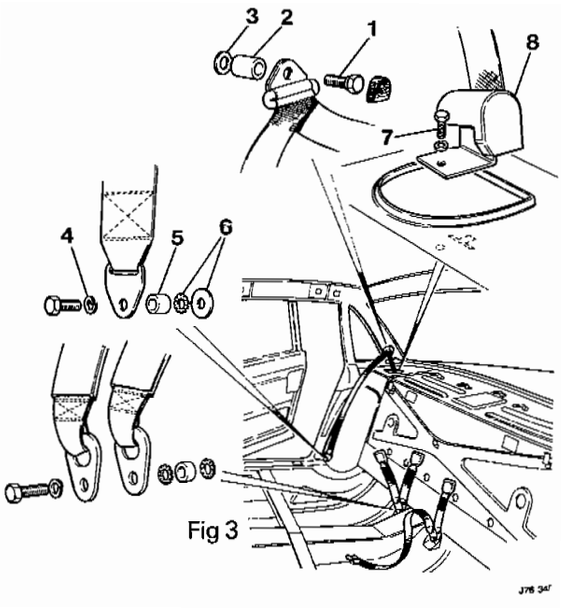


Fig 3

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Remove the centre lap strap buckle and the seat belt strap securing bolt.
Remove the strap and buckle assembly.
Remove the four star washers, the two spacers and the side seat belt buckle.
Reverse the removal procedure to fit the replacement static seat belt.

0079b

REAR SEAT ARMREST

RENEW **76.70.39**

Open the door.
Remove the:
Rear seat cushion 76.70.37
Rear seat squab 76.70.38
Remove the staples and clips securing the rear armrest cover and reposition the cover for access to the armrest securing bolts.
Remove the armrest hinge securing bolts (1 Fig 1).and remove the squab securing brackets

Reposition the squab and the armrest for access and displace the cover from the seat, remove the armrest through the rear of the seat squab and remove the hinge to armrest securing screws, remove the hinge.
Discard the armrest.
Reverse the removal procedure to fit the replacement armrest.

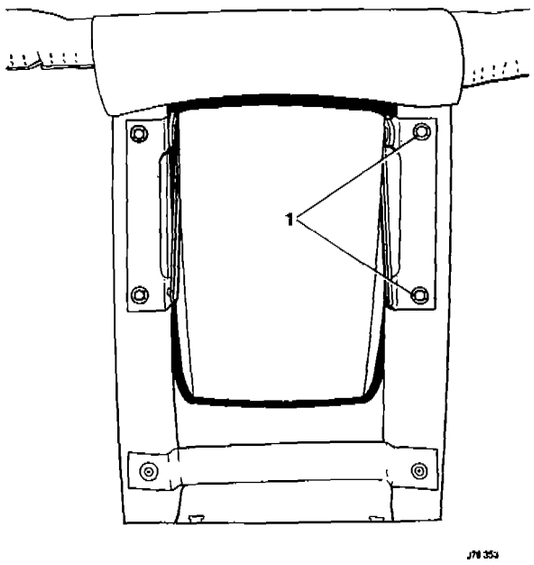


Fig 1

0074b

REAR SEAT CUSHION

RENEW ***76.70.37***

Open the door.
Remove the seat cushion securing screws lift and remove the rear seat cushion. Reverse the removal procedure to refit the replacement cushion.

0072b

REAR SEAT SQUAB

RENEW ***76.70.38***

Open the door.
Remove the rear seat cushion 76.70.37
Remove the screws (1 Fig 1) securing the rear squab and lift the squab to release the rear retaining clips.
Reposition the rear seat belts and remove the squab assembly from the vehicle.
Remove the staples and clips securing the rear armrest cover and reposition the cover for access to the armrest securing bolts.
Remove the armrest hinge securing bolts **(1** Fig 2) and remove the squab securing brackets.
Reposition the squab and the armrest for access and displace the cover from the **seat,** remove the armrest through the rear of the seat squab and remove the cover from the seat.
Discard the seat squab.
Reverse the removal procedure to fit the replacement seat squab.

0073b

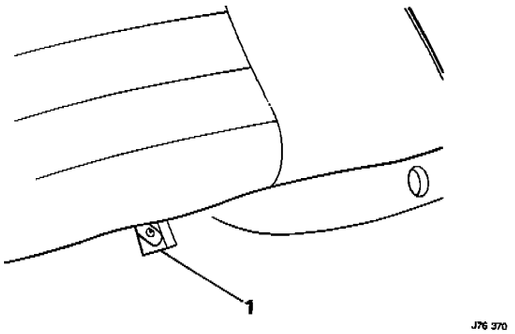


Fig 1

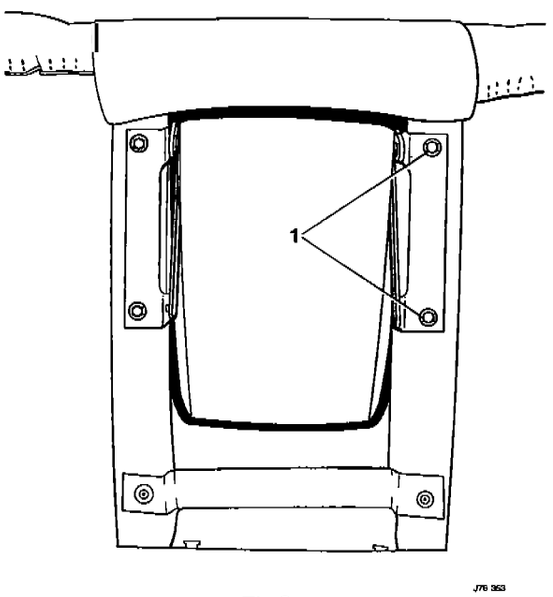


Fig **2**

REAR SHELF FINISHER

RENEW ***76.67.06***

Open the rear door and remove the rear seat cushion and squab.
Slacken and remove the rear shelf securing screws (1 Fig 3) and pull the trim material from the rear body panel and remove the rear shelf finisher (2 Fig 3), and remove the extraction vents from the retaining clips.
Remove the rear seat belt blanking plugs where fitted and refit to the replacement finisher.
Fit the air extraction vents to the finisher, place the finisher in position and secure with the screws.
Refit the rear seat squab and cushion and close the door.

0396b

REAR SIDE SEAT BELT

RENEW **76.73.18**

Open the door.
Remove the:
Rear seat cushion 76.70.37
Rear seat squab 76.70.38
Rear parcel tray 76.67.06

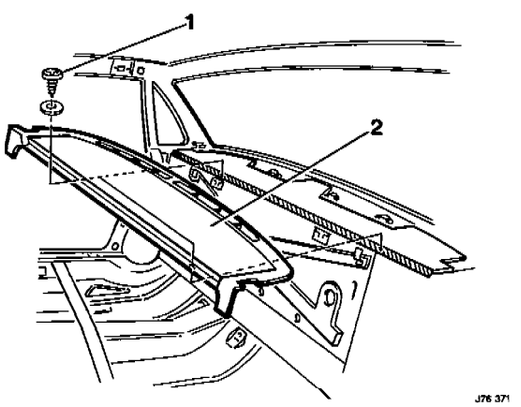


Fig 3

www.JagDocs.com

Remove the foam pad from the rear shelf and remove the seat belt buckle securing bolt (Fig 1).
Remove the buckle assembly and collect the two star washers and spacers (5 Fig 1).
Remove the side seat belt buckle and the lower anchorage bolt.
Displace the belt and collect the upper spacer.
Remove the seat belt reel securing bolt (7 Fig 1) and remove the reel (8 Fig 1).
Remove the seat belt reel to securing bracket nut and bolt, discard the reel and belt assembly.
Reverse the removal procedure to refit the replacement belt assembly.

0077b

REAR FLOOR CARPET

RENEW **76.49.03**

Open the front door.
Move the front seat fully forward.
Open the rear door.
Remove the screws securing the rear of the seat runners to the floor.
Carefully ease the rear of the front seat upwards to allow removal of the rear carpet.
Remove the carpet (Fig 2). lower the seat and collect the spacers.
Reverse the removal procedure to refit the replacement carpet.

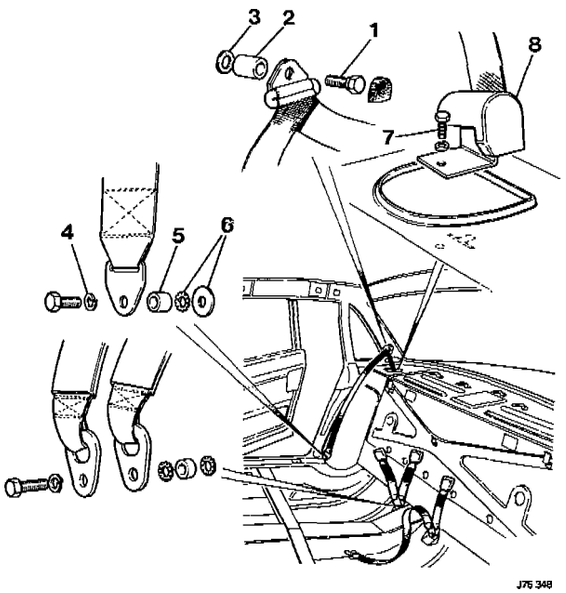


Fig 1

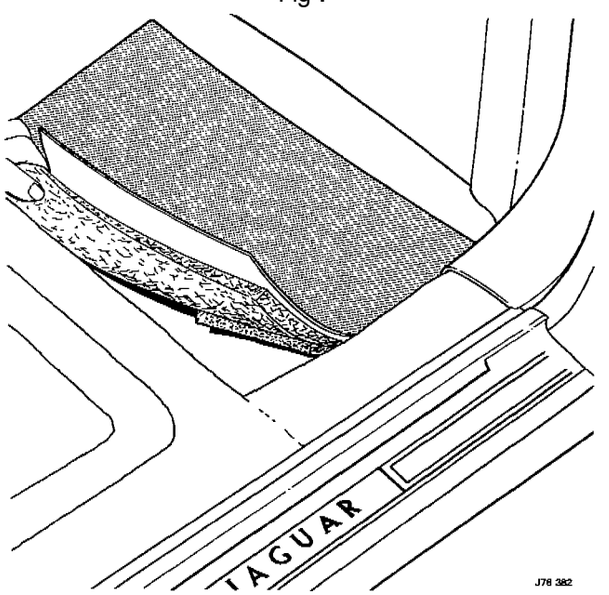


Fig 2

DATA

TORQUE FIGURES

Seat runners to floor 36.5Nm

SPANNER SIZES

No 50 Torx

1669B/70

A POST LOWER TRIM PAD

RENEW **76.13.30**

Open the door.
Displace the draught welting from the lower 'A post area.
Remove the trim pad securing screw and remove the trim pad.
Turn the fuse label cover retaining peg and remove the fuse label cover.
Discard the trim.
Reverse the removal procedure to refit the replacement trim.

16698

B-C POST CAPPING

RENEW **76.43.34**

Open the doors.
Remove the four B post capping screws (1 Fig 1) and remove the trim (2 Fig 1).
Remove the lower finisher from the trim.
Glue the lower finisher (Fig 2) to the replacement trim, position the trim over the B post and secure with the fixing screws.
Close the doors.

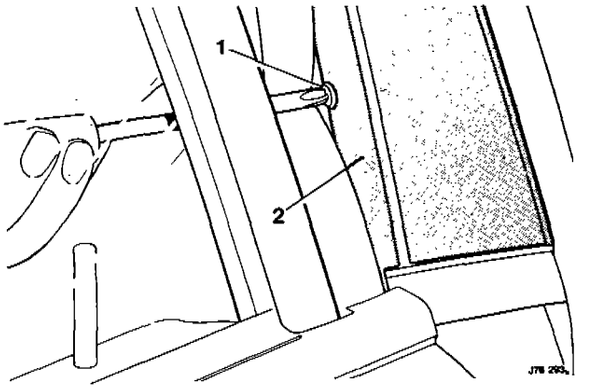


Fig 1

DATA

TORQUE FIGURES

'B' post securing screws 2-4Nm

0397b

B POST, LOWER TRIM PAD

RENEW **76.13.29**

Open the front door and remove the front seat cushion.
Move the seat fully rearward.
Remove the B post lower trim pad front securing clip and move the seat fully forward.
Open the rear door and remove the B post lower trim pad rear securing clip.
Move the seat belt for access, remove trim pad, release the trim pad from under the upper trim pad and slide up the B post to remove.
Fit and align the replacement trim pad and reverse the remaining removal procedure to refit.

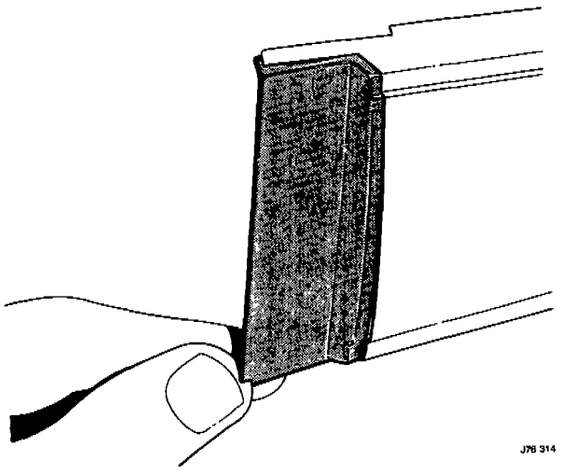


Fig 2

0007b

B POST UPPER TRIM PAD

RENEW **76.13.28**

Open the doors.
Remove the seat belt bolt lower anchor bolt finisher and remove the bolt (1 Fig 3).
Collect the wavy washer (4 Fig 3), spacer (5 Fig 3) and bracket.
Displace the draught welting from the upper trim pad, release the trim pad flaps from the B post and remove the trim pad.
Reverse the removal procedure to refit the replacement trim.

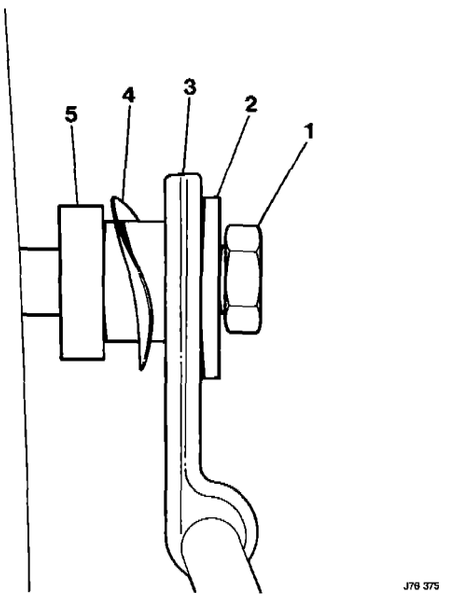


Fig 3

0006b

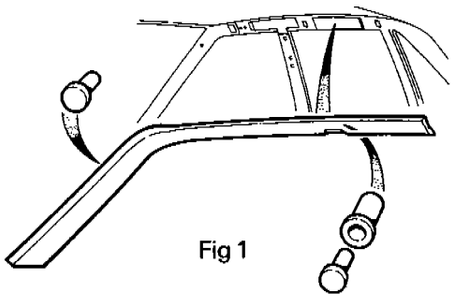
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CANTRAIL CRASH ROLL

RENEW **76.13.10**

Open the doors.
Unclip the crash **roll** (Fig 1) from the cantrail.
Remove the crash roll.
Note the position of the clips and transfer to the replacement roll.
Align the crash roll clips with the holes in the cantrail and press home.
Close the doors.

0004b


Fig 1

CONSOLE ASHTRAY

RENEW **76.67.18**

Open the door.
Open the centre console glovebox lid and remove the ashtray assembly securing screws (1 Fig **2) .**
Release the rear of the console finisher for access and remove the ashtray assembly (2 Fig 2).
'Open the ashtray lid, remove the inner ashtray and discard the assembly.
Reverse the removal procedure to refit the replacement ashtray assembly.

0064b

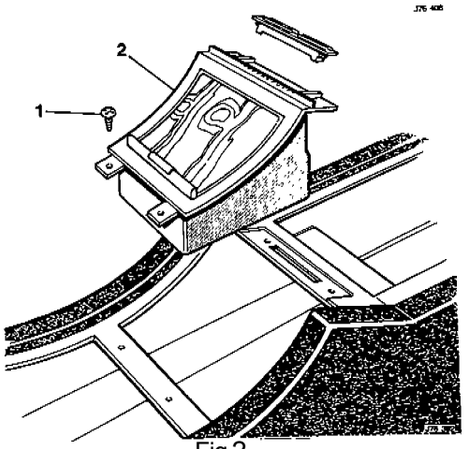


Fig 2

CONSOLE ASSEMBLY

RENEW **76.25.01**

Open the door.
Remove the console ashtray **76.67.18.**
Remove the console finisher **76.25.19.**
Remove the radio console **76.25.15.**
Remove the console glovebox securing screws (I Fig 3) and the fuse box to glove box securing screws.
Remove the console glove box assembly (2Fig 3).
Remove the centre veneer panel assembly 76.47.06
Remove the centre vent assembly.
Remove the upper console securing screw (1 Fig **4)** and carefully displace the console rearwards, Note: retain the air box in position.
Close the glovebox lid.
Remove the console assembly.
Remove the spire **clips.**
Remove the glove box **lid** securing screws, remove the lid.
Remove the rear control knob.
Untape the rear ducts from the console.
Remove the air direction box/duct assembly.

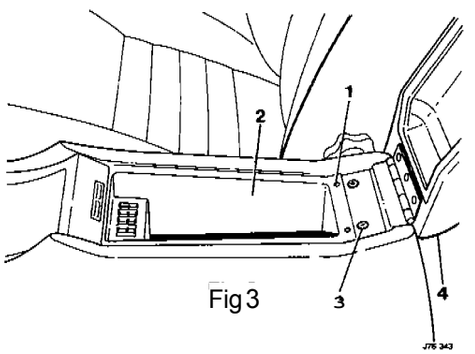


Fig 3

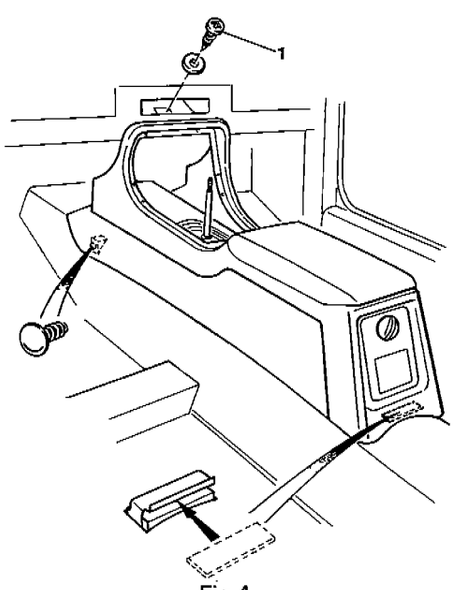


Fig 4

Displace the rear heater outlet retaining tangs.
Remove the outlet **assembly.**
Place the console assembly aside.
Fit and seat the rear heater outlet to the replacement console assembly.
Reverse the remaining removal procedure to refit the replacement console assembly.

0011b

CONSOLE FINISHER – AUTOMATIC

RENEW **76.25.19**

Open the door.
Remove the console ashtray 76.67.1*8*
Using **a** screwdriver, release the gearshift rubber surround locating clips and carefully remove the finisher.
Move the selector lever to the rearward position, remove the wingnuts securing the rear of the veneer, and carefully remove the finisher (Fig 1).
Reverse the removal procedure to refit.

0015b

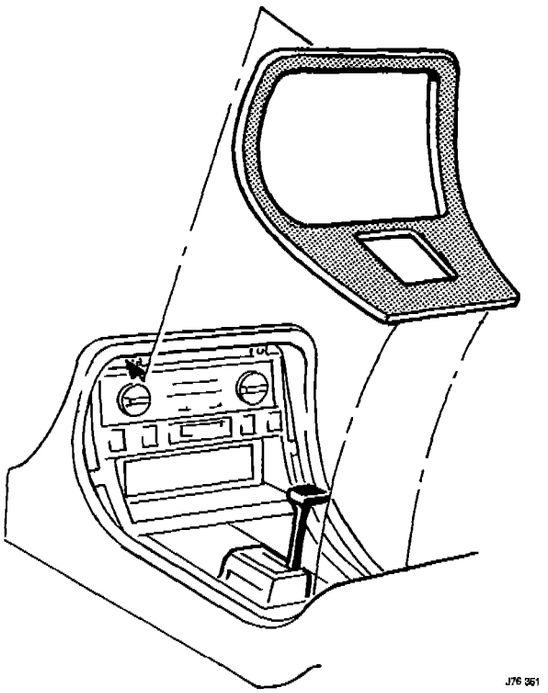


Fig 1

CONSOLE GLOVEBOX

RENEW **76.25.16**

Open the door and remove the console ashtray 76.67.18
Remove the **glovebox** securing screws (1 Fig 2) and the fuse **box** to glove box securing screws.
Remove the glovebox (2 Fig 2).
Reverse the removal procedure to refit the glovebox.

0013b

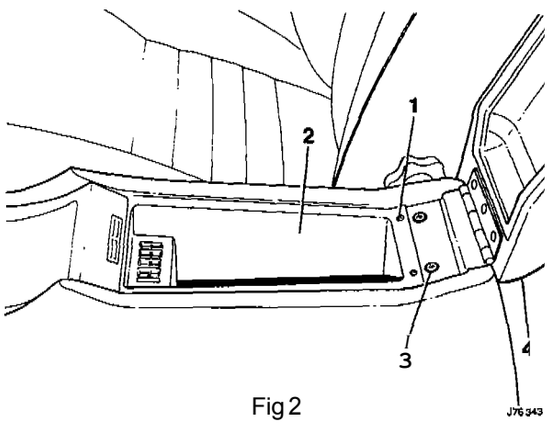


Fig 2

CONSOLE GLOVEBOX LID

RENEW **76.25.18**

Open the door.
Open the glovebox lid **(4** Fig 2) and remove the securing screws (3 Fig 2).
Remove the lid assembly.
Reverse the removal procedure to refit the lid noting to align the lid with the console prior to finally tightening the lid securing screws.

0014b

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DASH LINER-DRIVERS SIDE

RENEW **76.46.11**

Open the door.
Remove the screws securing the dash liner (Fig 1) and release the liner securing clip.
Remove the dash liner.
Reverse the removal procedure to refit the replacement liner.
Note: align the footwell heater duct prior to securing the liner with the screws.

0036b

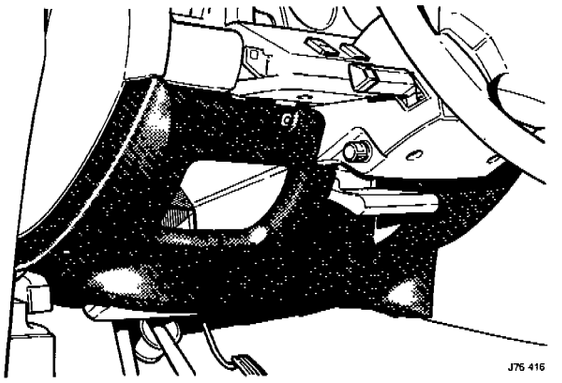


Fig 1

DASH LINER-PASSENGERS SIDE

RENEW **76.46.15**

Open the door.
Remove the screws securing the dash liner (Fig 2) and release the liner securing clip.
Remove the dash liner.
Reverse the removal procedure to refit the replacement liner.

0037b

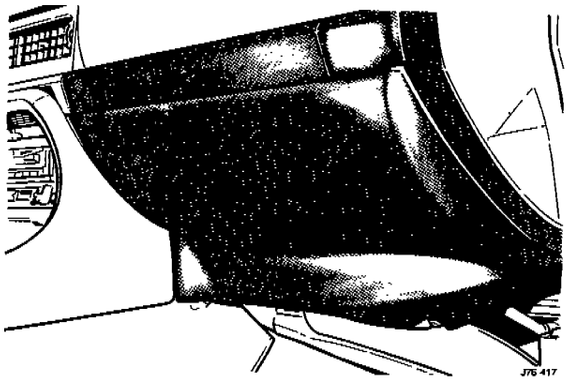


Fig 2

DOOR AIR VENT GROMMET

RENEW **80.00.00**

Open the door.
Carefully depress the grommet (Fig 3) and remove.
Reverse the removal procedure to refit.

0359b

CONSOLE FINISHER -MANUAL

RENEW **76.25.19**

Open the door.
Remove the console ashtray 76.67.18
Slacken the gear lever locknut, remove the gear lever knob and locknut, dissengage the retaining clips from the upper console area and remove the finisher.
Reverse the removal procedure to refit.

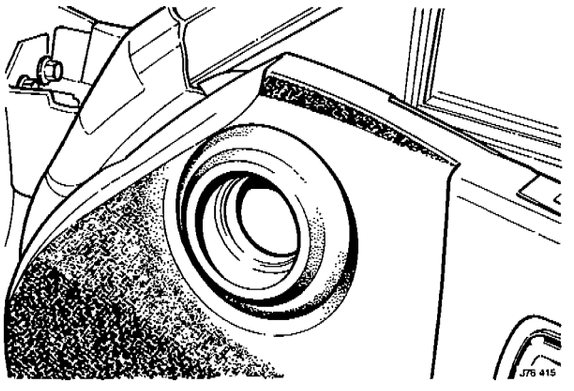


Fig 3

DATA

SPANNER SIZES

16mm

0015b

FASCIA BOARD

RENEW 76.46.01

Open the door.
Remove the:

Dash liner drivers side 76.46.11
Dash liner passenger side 76.46.15
Fascia closing panel drivers side 76.46.28
Fascia closing panel passengers side 76.46.27
Fascia centre veneer panel 76.47.06
Steering the wheel 57.60.01

Remove the screws securing the instrument housing and disconnect the instrument block connectors.
Remove the instrument housing.
Remove the centre console upper securing screw (1 Fig 1), carefully manoeuvre the console rearwards for access to the fascia tie bar securing nuts. Ensure that the rear heater outlet and control are not disturbed.
Remove the fascia tie bar securing nuts and move the tie bar away from the fascia.
Remove the passenger footwell duct and remove the screws securing the relay panel to the glove box and position the panel in the footwell.
Remove the bolts securing the fascia outer body bracket to the fascia, remove the fascia centre securing bolt, access to this bolt is through the instrument housing apeture.
Remove the fascia outer lower securing bolts, disconnect the trip computer and lighting module block connectors, remove the screws securing the trip computer/lighting module and remove the module from the fascia.
Manoeuvre the fascia rearwards for access, disconnect the solar sensor block connector, note the position and disconnect the vacuum hoses, disconnect the glove box lamp block connector and remove the fascia assembly.
Remove the screws securing the glovebox lid and remove the lid.
Remove the screws securing the glovebox lid striker, remove the striker and collect the spacer.

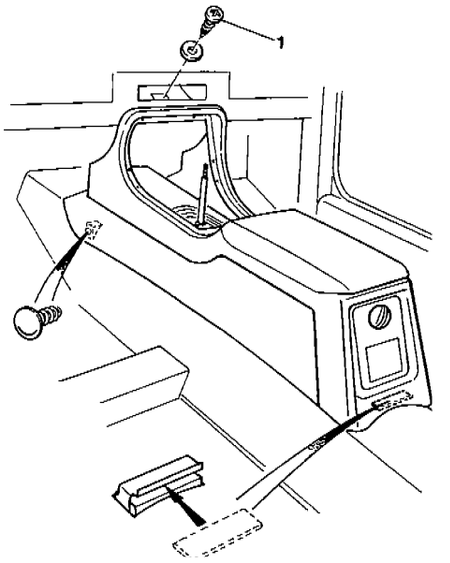


Fig 1

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Remove the glovebox inner and outer securing screws, manoeuvre the glovebox from the fascia (Fig 1).
Remove the screws securing the glovebox frame and remove the frame.
Remove the frame upper spacing washers.
Disconnect and reposition the centre vacuum hose through the grommet.
Remove the screws securing the centre vent and remove the vent assembly.
Remove the screws securing the instrument housing locating bracket and remove the bracket.
Remove the solar sensor panel from its mounting position (Fig 2).
Remove the screws securing the defrost outlet duct and remove the ducts.
Remove the screws securing the defrost vent, disconnect the vacuum hose and remove the vent assembly.
Carefully displace the solar sensor harness from its position, cut the ratchet strap securing the harness and vacuum hoses to the fascia.
Remove the grommet from the fascia and the harness/ vacuum hose assembly.
Remove the outer ventilator assemblies and the spire nuts from the fascia.
Discard the fascia.
Reverse the removal procedure to refit the replacement fascia.

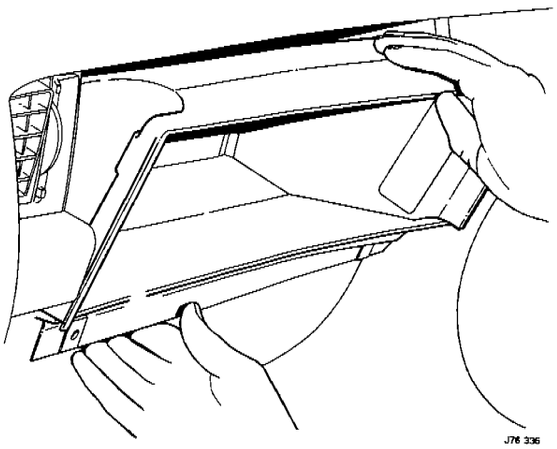


Fig 1

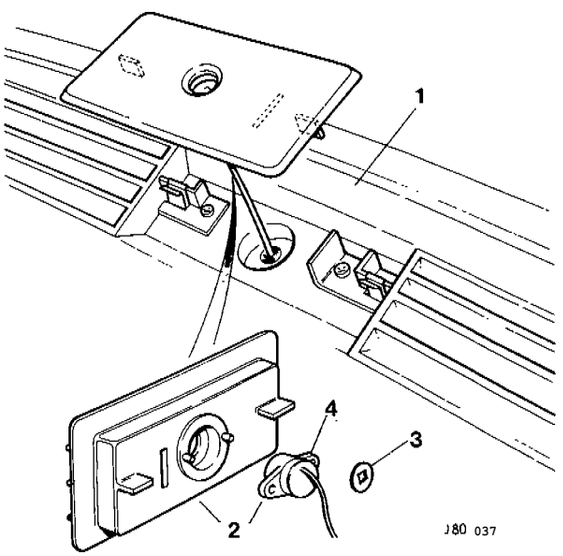


Fig 2

DATA

TORQUE FIGURES

Fascia bracket screw **7-10Nm**
Fascia centre to air conditioning unit strut **22-28Nm**
Fascia **support** *bracket to 'A' post* **22-28Nm**
Fascia to side bracket **15-18Nm**
Steering wheel to steering shaft **35-45Nm**
Strut **to** *centre fascia fixing* **5-7Nm**
Strut to fascia end **7-10Nm**

SPANNER SIZES

8mm
10mm
13mm
24mm

OILS/GREASES/SEALANTS

Split collars to shaft **Castrol LM Grease.**

0035b

FASCIA CLOSING PANEL DRIVERS SIDE

RENEW **76.46.28**

Open the door.
Remove the screw securing the dash liner to the closing panel.
Remove the screws securing the closing panel and displace the dash liner from the the spring retaining clips.
Remove the lower screw spacing washers and spire clip.
Remove and discard the closing panel (Fig 1).
Reverse the removal procedure to fit the replacement closing panel.

0039b

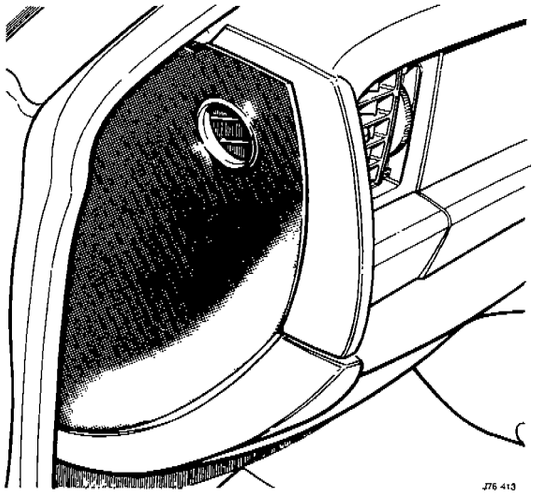


Fig 1

FASCIA CLOSING PANEL PASSENGER SIDE

RENEW **76.46.27**

Open the door.
Remove the screw securing the dash liner to the closing panel.
Remove the screws securing the closing panel and displace the dash liner from the the spring retaining clips.
Remove the lower screw spacing washers and spire clip.
Remove and discard the closing panel (Fig 2).
Reverse the removal procedure to fit the replacement closing panel.

0038b

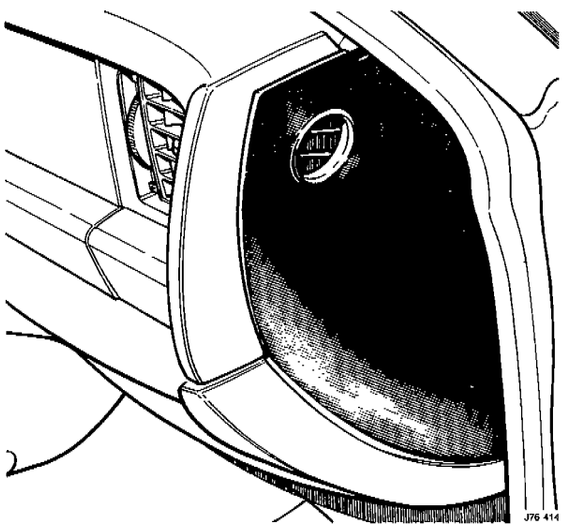


Fig 2

FASCIA CENTREVENEER PANEL

RENEW **76.47.06**

Open the door.
Open the glovebox lid.
Carefully release the veneer panel (Fig 3) from the retaining clips and remove the panel.
Remove the retaining clip securing screws and remove the clips.
Remove the centre vent and discard the veneer panel.
Reverse the removal procedure to fit the replacement veneer panel.

0040b

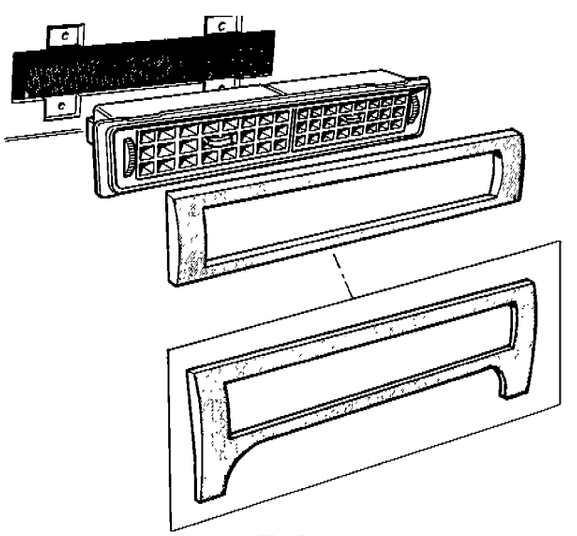


Fig 3

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GLOVE BOX

RENEW **76.52.03**

Open the door.
Remove the dash liner passenger side 76.46.15
Remove the screws (1 Fig 1) securing the the glove box lid, lift the lid to disengage the guides and remove the lid assembly.
Remove the upper screws securing the interior of the glovebox.
Remove the glovebox striker securing screws (3 Fig 1) and collect the plate and striker.
Remove the screws securing the glove box to the fascia rail.
Displace the relay mounting panel to glovebox rear securing screws and slacken the front securing screws.
Displace the relay mounting panel and glovebox for access.
Disconnect the glove box lamp **block** connector and boot release switch harness multi plug.
Remove the glove box assembly (Fig 2).
Displace the glove box lamp from its mounted position, cut and remove the lamp harness securing ratchet strap.
Displace the harness from the self adhesive strip and disconnect the switch **feed** wires and remove *the* lamp and harness assembly.
Release the lamp switch retaining lugs and remove the switch.
Remove the screws securing the boot release switch mounting to the glove box.
Remove the switch and harness assembly.
Remove the spire clips and remove the lid rubber buffers.
Discard the **g**love **box.**
Reverse the removal procedure to refit the replacement glovebox.

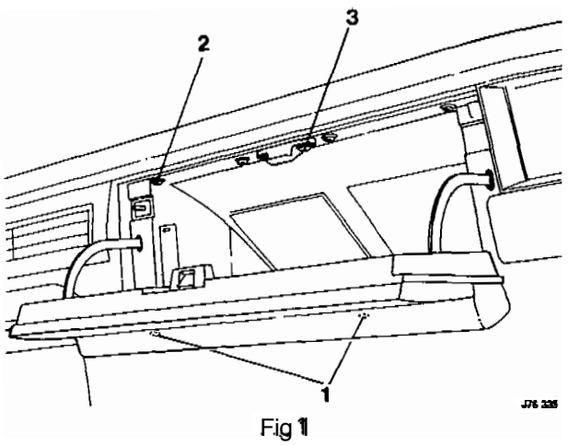


Fig 1

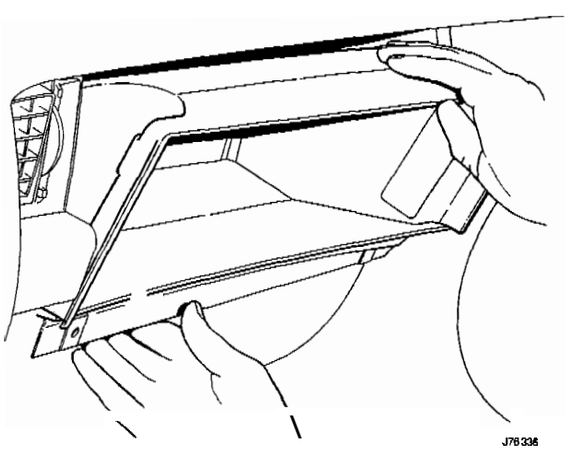


Fig 2

DATA

TORQUE FIGURES

Cruise control module to glove ***box*** *mounting plate* ***2.7-6.8Nm***
Glove box mounting plate to glovebox ***2-4Nm***

0055b

GLOVEBOX LID

RENEW **76.52.02**

Open the door.
Remove the passenger side dash liner 76.46.15
Remove the screws securing the glovebox lid, lift the lid upwards to disengage the guides and remove the lid assembly.

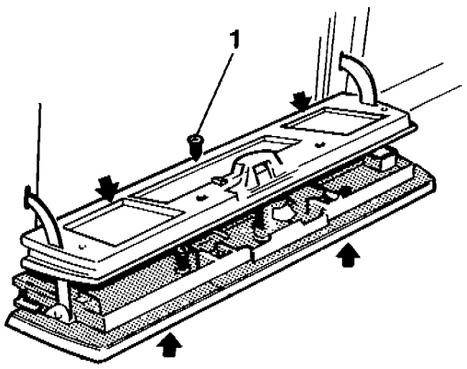
Remove the screws (1 Fig **1**) securing the mirror/tray assembly and remove.
Remove the lid guide clevis pin spire clips (1 Fig 2) and remove the clevis pins (2 Fig 2).
Remove the guides, remove the veneer panel securing screws and remove the veneer panel.
Slacken the the glovebox lock securing nut (**1** Fig 3), turn lock for access, remove the nut and plate and remove the lock assembly (2 Fig 3).
Remove the spire clips and discard the lid.
Reverse the removal procedure to fit the replacement lid ensuring that the lid is aligned with the apeture prior to final tightening of the lid securing screws.

DATA

SPANNER SIZES

24mm

0045b



J76 337

Fig 1

GLOVEBOX LID LOCK

RENEW ***76.52.0S***

Open the door
Open the glovebox lid and remove the screws securing the mirror and tray assembly.
Lift the mirror assembly for access, slacken the lock securing nut (**1** Fig 3) (the nut remains captive) turn the lock, finally remove the securing nut and mounting plate and remove **the** lock from the lid (2 Fig 3).
Reverse the removal procedure **to** refit the replacement lock.

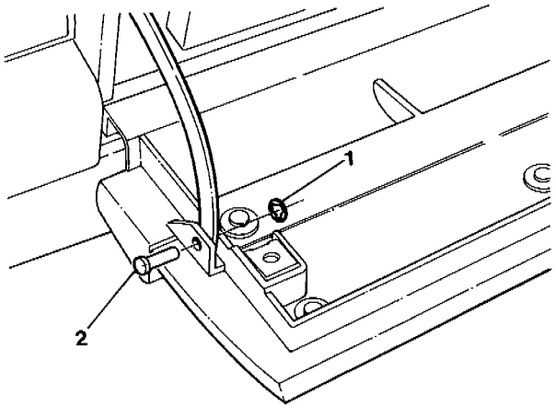


Fig 2

J76 338

DATA

SPANNER SIZES

24mm

0057b

GLOVEBOX LID VENEER PANEL

RENEW **76.47.21**

Open the door.
Open the glovebox.
Remove the screws. securing the mirror and tray assembly.
Reposition the mirror and tray assembly to gain **access** to the screws securing the veneer.

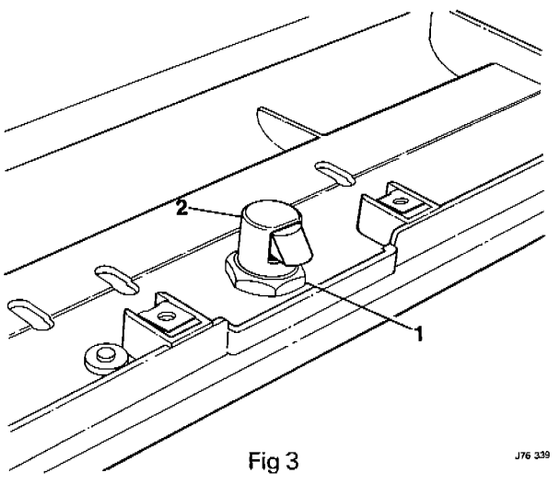


Fig 3

J76 339

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Remove the screws securing the veneer panel, remove the panel and discard.
Reverse the removal procedure to refit the replacement panel.

0044b

GLOVEBOX MIRROR ASSEMBLY

RENEW ***76.52.05***

Open the door
Open the glovebox lid and remove the screws (1 Fig 1) securing the mirror and tray assembly.
Lift the mirror assembly (1 Fig 2) and remove the mirror catch spire clip (2 Fig 2) and washer and remove the catch.
Remove the mirror spring (4 Fig 2), displace the mirror securing clip and remove and discard the mirror.
Reverse the removal procedure to refit the replacement mirror.

0056b

HANDBRAKE LEVER TRIM

RENEW **76.13.63**

Open the door.
Release the trim assembly upper clip (Fig 3) and remove the trim from the handbrake lever.
Reverse the removal procedure to fit the replacement trim,

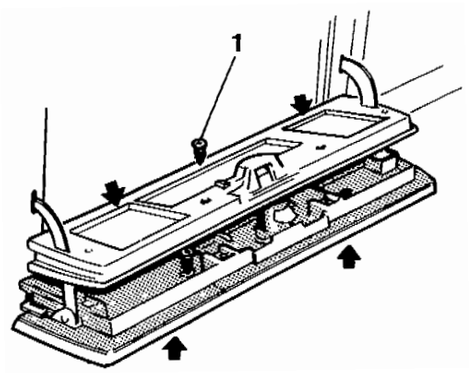
0009b

HEADLINING REAR FINISHER

RENEW **76.64.12**

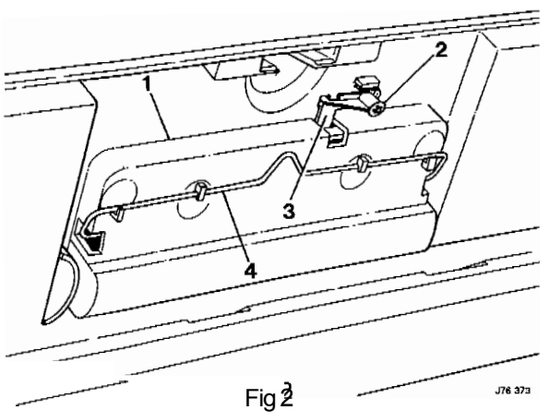
Open the door.
Release the trim finisher retaining **clips.**
Remove the trim finisher (1 Fig **4)** and making a note of the position of the retaining clips remove.
Discard the finisher,
Reverse the removal procedure to refit ensuring that the clips are fitted in the exact position on the replacement trim to the one discarded.

0062b



J76 337

Fig 1



J76 373

Fig 2

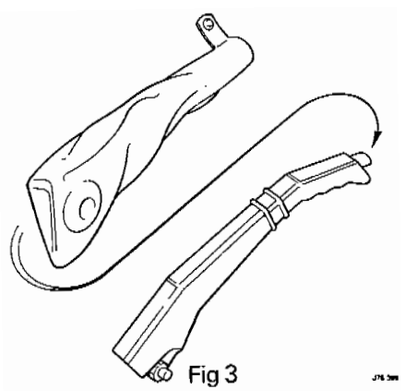
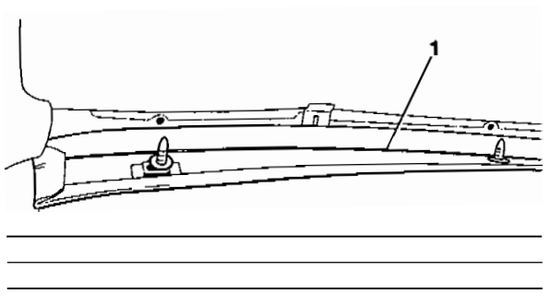


Fig 3



J76 364

Fig 4

INTERIOR MIRROR

RENEW **76.10.51**

Open the door.
Release the fastner securing the interior lamp and lower the panel for access.
Pull to remove the mirror assembly (Fig 1) from its mounting plate.
Remove the mounting plate securing screws and remove the plate.
Reverse the removal procedure to refit the replacement mirror.

1669B/71

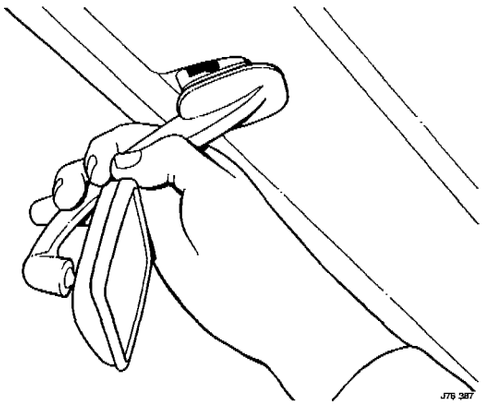


Fig 1

REAR LAMP ASSEMBLY INTERIOR TRIM FINISHER

RENEW **76.19.20**

Open the boot.
Remove the nuts securing the finisher **to** the lamp units.
Remove the finisher
Reverse the removal procedure to fit the replacement finisher.

1669B/74

REAR PARCEL TRAY

RENEW **76.67.06**

Open the door.
Remove the seat cushion securing screws lift and remove the rear seat cushion.
Remove the screws securing the rear squab and lift the Squab to release the rear retaining clips.
Reposition the rear seat belts and remove the squab assembly from the vehicle.
Remove the staples and clips securing the rear armrest Cover and reposition the cover for access to the armrest Securing bolts.
Remove the armrest hinge securing bolts and remove the Squab securing brackets.
Reposition the squab and the armrest for access and displace the cover from the seat, remove the armrest through the rear of the seat squab and remove the cover from the seat.
Remove the rear shelf securing screws (**1 Fig** 2), reposition the rear seat belts (where fitted).
Remove the rear parcel tray (**2** Fig 2).
Unclip and remove the air extraction vents from the tray.
Discard the tray.
Reverse the removal procedure to refit the tray.

1669B/80

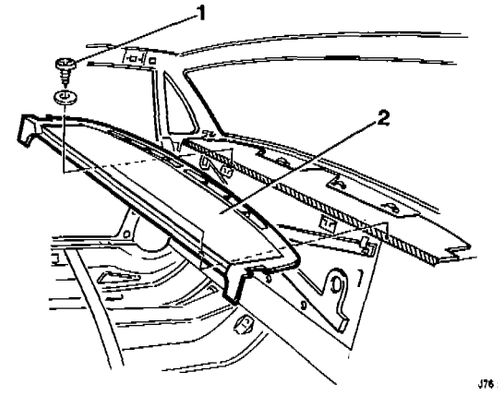


Fig 2

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REAR QUARTER UPPER TRIM PAD LEFT HAND

RENEW **76.13.13**

Open the door.
Remove the rear seat belt upper anchorage bolt cover and bolt.
Displace the upper portion of the seat belt and collect the spacer.
Remove the trim pad securing screw and coat hanger hook.
Slacken but do not remove the dowager strap securing screws.
Unclip the rear quarter trim pad (Fig 1) and remove.
Reverse the removal procedure to refit.

0005b

REAR QUARTER UPPER TRIM PAD RIGHT HAND

RENEW **76.13.43**

Open the door.
Remove the rear seat belt upper anchorage bolt cover and bolt.
Displace the upper portion of the seat belt and collect the spacer.
Remove the trim pad securing screw and coat hanger hook.
Slacken but do not remove the dowager strap securing screws.
Unclip the rear quarter trim pad and remove.
Reverse the removal procedure to refit.

0008b

STEERING COLUMN UPPER COWL

RENEW **76.46.02**

Open the door.
Centralise the road wheels and remove the ignition key.
Remove the pad from the centre of the steering wheel.
Slacken the nut (1 Fig 2) securing the wheel (2 Fig 2) to the shaft, do not fully remove.
Pull steering wheel to release from the shaft, remove the securing nut and steering wheel.
Release the steering column adjuster bar and raise the column to its uppermost position.
Remove the screws securing the upper cowl (4 Fig 2) and remove.
Position the cowl and secure with the screws.
Apply grease to the split collars and fit to the steering shaft.
Ensuring that the steering wheel is in the straight ahead position fit to the shaft.
Fit and tighten the securing nut.
Refit the steering wheel pad.
Close the door.

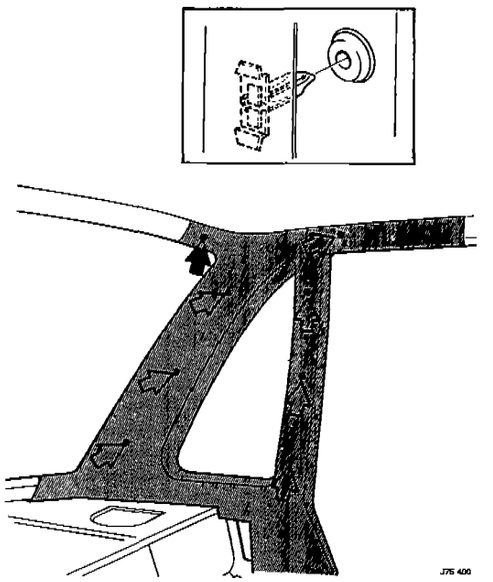


Fig 1

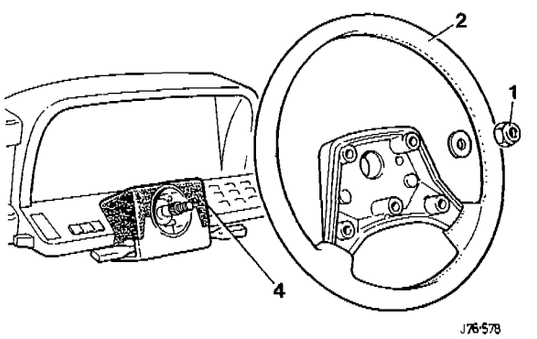


Fig 2

TORQUE FIGURES

Steering wheel to steering shaft ***35-45Nm***

OILS/GREASES

Split *collars to shaft* ***Castrol L M Grease.***

SPANNER SIZES

24mm

1669B/78

STEERING COLUMN LOWER COWL

RENEW **76.46.03**

Open the door.
Centralise the road wheels and remove the ignition key.
Remove the pad from the centre **of** the road wheel.
Slacken the nut (**1** Fig **1**) securing the wheel (2 Fig **1**) to the shaft, do not fully remove.
Pull steering wheel to release from the shaft, remove the securing nut and steering wheel.
Remove the dimmer knob control.
Remove the screws securing the lower cowl (4 Fig 1), remove the cowl.
Refit the replacement cowl and secure with the screws.
Refit the dimmer control knob.
Remove the screws securing the upper cowl and remove.
Position the cowl and secure with the screws.
Apply grease to the split collars and fit to the steering shaft.
Ensuring that the steering wheel is in the straight ahead position fit to the shaft.
Fit and tighten the securing nut.
Refit the steering wheel pad.
Close the door.

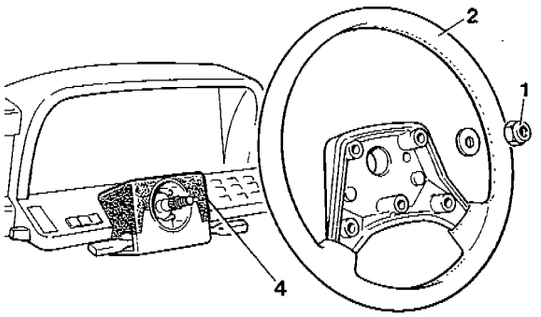


Fig 1

TORQUE FIGURES

Steering wheel ***to*** *steering* ***shaft*** 35-45 ''

OILS/GREASES

Split collars ***to*** *shaft* ***Castrol LM Grease.***

1669B/78

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ILLUMINATED SUNVISOR MIRROR ASSY

RENEW **76.10.50**

Open the bonnet and disconnect the battery.
Lower the sunvisor.
Raise the sunvisor cover and remove the lenses.
Remove the screws securing the mirror to the sunvisor and discard the mirror.
Reverse the removal procedure to fit the replacement mirror.

0051G

ILLUMINATED SUNVISOR ASSY

RENEW **76.10.48**

Open the bonnet and disconnect the battery.
Lower the sunvisor.
Remove the screws (Fig 1) securing the sunvisor retaining block.

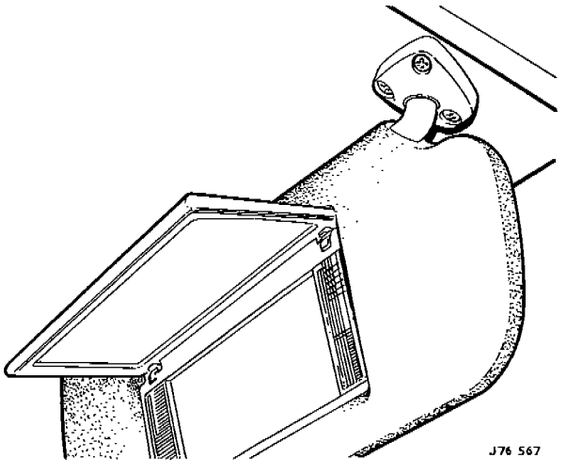


Fig 1

Carefully displace the connector from behind the headlining and disconnect.
Remove the screws securing the retaining block and remove the block.
Reverse the removal procedure to refit the replacement visor.

0051G

ASHTRAY

RENEW **76.67.13**

Open the door, press the flap to open the ashtray.
Lift out the ash receptacle, replace the receptacle, close the lid and shut the door.

0380b

RADIO CONSOLE

RENEW **76.25.15**

Open the door.
Remove the console ashtray 76.67.18
Remove the console finisher 76.25.19
Remove the radio console to centre console securing screws and carefully remove the radio fascia plate.
Reposition the radio console from its mounted position, disconnect the block connectors and remove the radio console assembly.
Remove the air conditioning switch control module 86.80.15
Remove the console switch and clock module 86.80.13 and place the housing aside.
Reverse the removal procedure to refit the console.

0012b

FRONT BEAM COVER

RENEW **76.22.28**

Remove the front bumper centre section and remove the indicator lamp assemblies.
Remove the rubber cover securing screws, remove the lower cover securing screws and remove the cover.
Fit the replacement cover to the centre blade and align the lower fixing holes.
Fit but do not tighten the lower securing screws, align the cover to centre blade securing bracket holes and fit and tighten the upper securing screws.
Tighten the lower securing screws.
Refit the centre blade and indicator lamp assemblies.

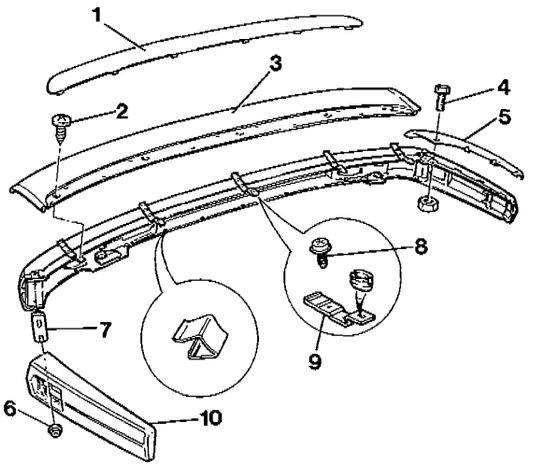


Fig 1 J76 350

DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) 23-27Nm
Bumper mounting struts to body (Federal) 23-27Nm
Bumper to bumper bracket (Non Federal) 40-50Nm
Bumper to bumperstrut (Federal) 40-50Nm
Guide block to mounting bracket 3.5-4.75Nm
Horns to bracket 22-28Nm
Mounting bracket guide block to body 7.5-10Nm

SPANNER SIZES

8mm
10mm
13mm
19mm
No 20 Torx

0385b

REAR BEAM COVER

RENEW **76.22.29**

Remove the rear fog and rear marker lamps (where fitted) from the rear bumper and remove the rear bumper complete.
Remove the quarter blade securing bolts and nuts (both sides) (4 Fig 1) and remove the quarter blades (5 Fig 1).
Remove the rubber cover securing screws and remove the cover (Fig 2).
Fit the replacement cover to the bumper and secure with the screws.
Refit the quarter blades and secure with the bolts and nuts, refit the rear bumper to the vehicle complete and refit the rear fog and marker lamps (where fitted).

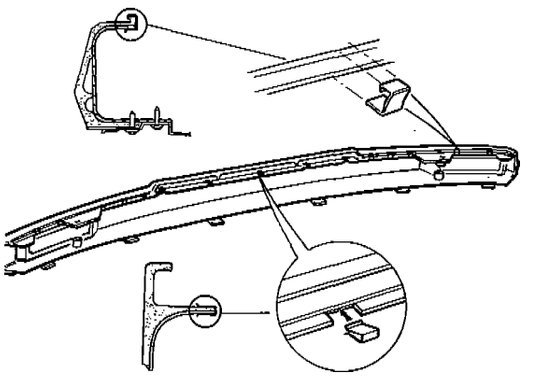


Fig 2 J76 379

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DATA

TORQUE FIGURES

Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper mounting struts to body (Federal) ***23-27Nm***
Bumper ***to*** *bumper bracket (Non Federal)* ***40-50Nm***
Bumper to body inner (Federal) ***23-27Nm***
Bumper to fixings bumper beam (Federal) ***39-50Nm***
Bumper to body inner (Non Federal) ***23-27Nm***
Bumper to fixings bumper beam ***(Non*** *Federal)* ***39-50Nm***
Guide block ***to*** *mounting bracket* ***3.5-4.75Nm***
Mounting bracket guide ***block*** *to body* ***7.5-10Nm***

SPANNER SIZES

8mm
10mm
13mm
17mm
19mm

No *20 Torx*

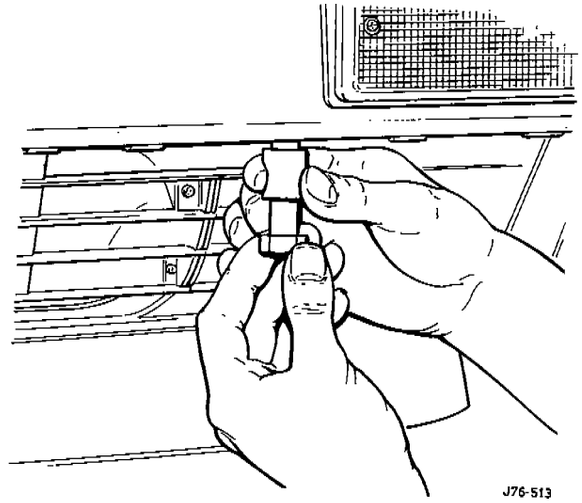


Fig 1

0376b

FRONT BEAM

RENEW 76.22.26

Remove the front beam securing bolts (Fig 1).
Remove the spacers.
Displace the beam assembly for access to the lamp assembly block connectors.
Disconnect the block connectors (Fig 2).
Remove the beam assembly.
Remove the blade trim finishers.
Remove the blade securing screws.
Remove the blade.
Remove the blade mounting brackets.
Remove the side lamp assemblies.
Remove the quarter bumper assemblies.
Remove the beam cover securing clips.
Remove the beam cover.

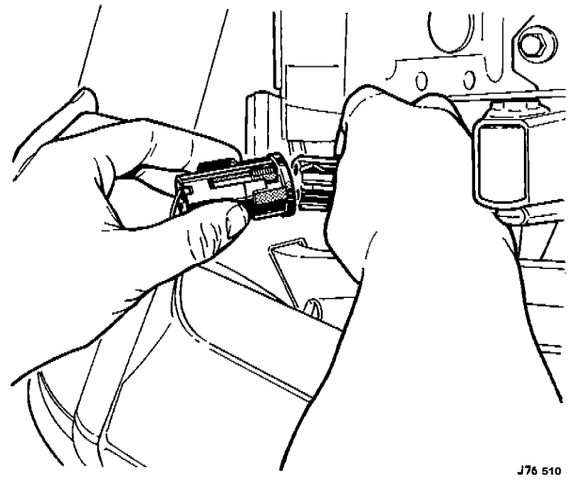


Fig 2

Fit the beam cover to the replacement beam.
Fit and seat the beam cover securing clips.
Refit the quarter bumpers.
Refit the side lamp assemblies.
Refit the bumper blade mounting brackets.
Refit the bumper blade, fit and align the screws, and finally tighten all the screws.
Refit the blade trim finisher.
Fit the beam assembly to the mounting struts.
Reconnect the block connectors.
Fit and tighten the beam assembly securing bolts.

DATA

TORQUE FIGURES

Bumper front blade to beam ***5-7Nm***
Bumper mounting brackets ***to*** *body (Non Federal)* ***23-27Nm***
Bumper ***to*** *bumper bracket (Non Federal)* ***40-50Nm***
Bumper *to* ***bumper strut*** *(Federal)* ***40-50Nm***
Mounting bracket guide block ***to*** *body* ***7.5-10Nm***
Bumper to fixings bumper beam ***39-5ONm***

SPANNER SIZES

8mm
I Omm
13mm
No 20 Torx

REAR BEAM

RENEW 76.22.27

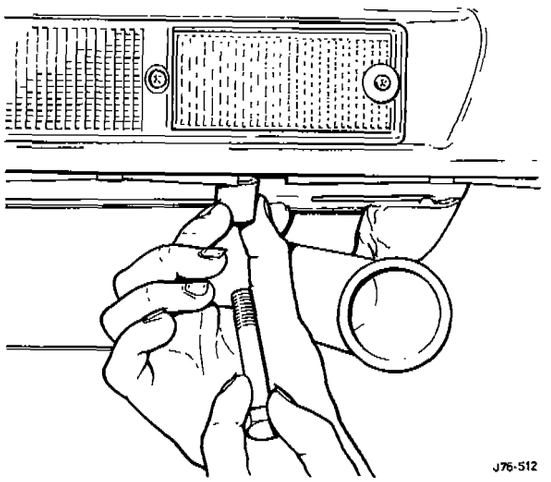


Fig 1

Open the boot.
Remove the rear fog guard lamps.
Remove the rear beam securing bolts (Fig 1).
Remove the **spacers** (Fig 1).
Remove the beam assembly.
Remove the blade trim finishers.
Remove the blade securing screws.
Remove the blade.
Remove the blade mounting brackets.
Remove the quarter bumper assemblies.
Remove the beam cover securing clips.
Remove the beam cover.

Fit the beam cover to the replacement beam.
Fit and seat the beam cover securing clips.
Refit the quarter bumpers.
Refit the bumper blade mounting brackets.
Refit the bumper blade, fit and align **the** screws, **and** finally tighten all the screws.
Refit the blade trim finisher.
Fit the beam assembly to the mounting struts.
Fit and tighten the beam assembly securing bolts.
Refit the rear ***fog*** guard lamps.
Close the boot.

DATA

TORQUE FIGURES

Bumper blade to beam ***5-7Nm***
Bumper mounting brackets to body (Non Federal) ***23-27Nm***
Bumper ***to*** *bumper bracket (Non Federal)* ***40-50Nm***
Bumper to bumper strut (Federal) ***40-50Nm***
Mounting bracket guide block to body ***7.5-10Nm***
Bumper to fixings bumper beam ***39-50Nm***

SPANNER SIZES

8mm
10mm
13mm
No *20 Torx*

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REAR BLIND

RENEW **76.10.19**

Open both rear doors.
Remove the rear seat cushion 76.70.37.
Remove the rear seat squab 76.70.38.
Remove the rear parcel tray 76.67.06.
Remove the nuts securing the rear sunblind to the parcel shelf and discard the blind.
Reverse the removal procedure to refit the replacement rear blind.

0051G

AUTOMATIC GEARBOX SELECTOR TRIM FINISHER

RENEW **76.25.07**

Remove the gearbox sport mode switch 86.65.84.
Remove the gearbox sport mode switch finisher 76.25.09.

Displace and remove the trim finisher (Fig 1).
Reverse the removal procedure to refit the replacement trim finisher.

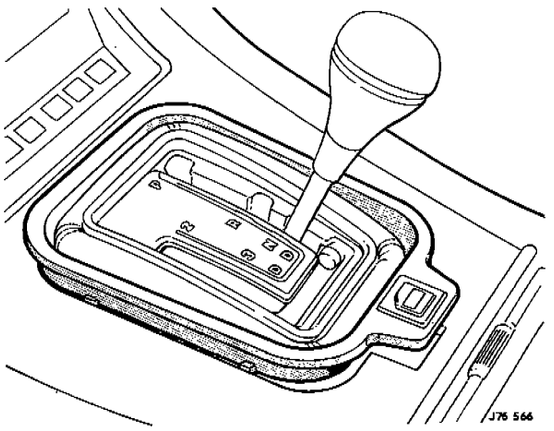


Fig 1

0051G

GEARBOX SPORT MODE SWITCH FINISHER

RENEW **76.25.09**

Remove the gearbox sport mode switch 86.65.84
Carefully displace and remove the finisher.

Reverse the removal procedure to fit the replacement finisher.

0051G

REAR DOOR OUTER HANDLE OPERATING ROD

ADJUST **76.37.11**

Remove the rear door trim panel veneer panel 76.47.12
Remove the door upper trim pad 76.34.05
Remove the rear door lower trim pad 76.34.06

Remove the plastic moulding.
Reposition the plastic waether shield for access and remove the outer handle operating rod adjuster peg retaining peg and reposition the rod from the retaining clip.
Depress the latch lever until the release hammer just contacts the release peg, reposition the operating rod into the retaining clip whilst still holding the latch lever down.
Fit and seat the retaining clip peg and close the door.
Check the operation of the lock and outer handle.
Open the door.
Align and fit the plastic moulding and reverse the remaining removal procedure to assemble the door.

0051G

FRONT DOOR OUTER HANDLE OPERATING ROD

ADJUST **76.37.10**

Remove the rear door trim panel veneer panel 76.47.11
Remove the door upper trim pad 76.34.02
Remove the front door lower trim pad 76.34.03
Remove the plastic moulding.
Reposition the plastic waether shield for access and remove the outer handle operating rod adjuster peg retaining peg and reposition the rod **from** the retaining clip.
Depress the latch lever until the release hammer just contacts the release peg, reposition the operating **rod** into the retaining clip whilst **still** holding the latch lever down.
Fit and seat the retaining clip peg and close the door.
Check the operation of the lock and outer handle.
Open the door.
Align and fit the plastic moulding **and** reverse the remaining removal procedure to assemble the door.

0051G

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INSTRUMENT PANEL VENEER PANEL

RENEW 76.47.24

Disconnect the battery.
Remove the drivers side dash liner 76.46.11
Remove the instrument housing 88.20.13
Place suitable protection on a bench and position the instrument panel face down on the protection.
Release the retaining clips securing the rear half of the instrument pack and pivot down for access.
Remove the warning lamp bulbs adjacent to the instrument pack hinges for access to the screws.
Carefully reposition the flexible circuit board for access to the upper veneer panel securing screws.
Remove the upper screws securing the veneer panel.
Disconnect the flexible circuit board connector from the LCD unit.
Remove the screws securing the veneer panel to the LCD unit.
Remove the remaining screws securing the veneer panel to the instrument pack.
Remove the clips securing the panel lens to the instrument pack and remove the lens.
.Carefully remove the veneer panel from the instrument pack.
NOTE: Do not lay the insrtument pack on the gauge faces.
Reverse the removal procedure to refit the replacement veneer panel.

0051G

PASSIVE RESTRAINT SYSTEM (USA ONLY)

DESCRIPTION *76.73.00*

The passive restraint system is similar in design to the type fitted to the **XJS.** The passive belt is a single diagonal belt, fed from an inertia reel assembly mounted on the seat slide (centre console side) to a motorised runner slotted in a guide rail, attached to the cantrail. A quick release buckle for emergency use is located at the cantrail end of the belt.

An independent second belt (inertia reel lap type) to be used in conjunction with the passive belt is fitted, and must be manually secured by the occupant.

The Passive belt is driven by a motor and winch assembly mounted in the BC post – one to the **LH** side and one to the RH side of the vehicle. The system is controlled by an ECU mounted above the driver's side dash liner.

The seat belt warning on the VCM and a separate warning light located on the fascia below the hazard warning switch indicate that the driver's passive belt is not located in the restraining position. Also in operation is a six second audible warning.

OPERATION

The system is actuated when the **doors** are closed and the ignition is turned to position II. Both seat belt warning lights will remain illuminated until the driver's passive (automatic) belt is located in the restraining position; the audible warning, once started, will continue for six seconds.

Both driver and passenger belt should operate simultaneously even when the passenger seat is unoccupied. This will ensure that the passenger door mirror is not obscured by the belt.

The passive belt deploys automatically to the unrestraining position when the ignition key is turned to position **I or** OFF, or when the adjacent door is opened. However, with reverse gear selected, should the driver's door **be** opened (to aid driver vision) the belt is prevented from travelling to the unrestraining position, thereby avoiding the possibility of entangling the leaning driver.

A further safety feature of the system is its connection with the inertia switch. If the inertia switch is tripped with the ignition ON, no movement of the passive belt will occur. In addition, the doors will be unlocked.

To prevent the occupant from being trapped in the vehicle in the event of a road accident, the buckle at the shoulder end **of** the belt can be released by operating the red button marked 'PRESS'.
WARNING: **IF** THE BELT **IS** RELEASED FOR ANY REASON, IT **MUST** BE RECONNECTED **BEFORE** THE VEHICLE **IS** DRIVEN AGAIN.

In the unlikely event of a malfunction of the deployment system, two emergency tongues with protective covers are stored in the glovebox to allow temporary use of the vehicle.

The tongues are right and left handed and marked RH TOP and LH TOP respectively. Insert the correct tongue into the trim finisher channel on the **B** post, sliding it down until it engages with the assembly anchorage at the end of the runner rail. Release the diagonal seat belt buckle from the runner/tongue assembly by operating the red 'PRESS' button, and manually attach the buckle to the emergency tongue. Fit the protective cover to the exposed runner/tongue assembly.

Due to the sensitivity of the belt inertia reels, rapid or jerky seat adjustment may cause them to **lock,** preventing the system from deploying completely. It is preferable to adjust the seat after the belt has deployed to the restraining position. If the inertia reel mechanism is locked, slowly adjust the seat forwards and ease the belt from the inertia reel or use the emergency release. Ensure the belt is re-connected before the vehicle is driven. Labels refering to the above are attached to the sunvisor and belt webbing.

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OPTIONS FOR USE ON EARLY VEHICLES

Incorporation of the passive restraint system necessitates modification at the body-in-white stage of construction. Fitment of the passive restraint system will not be possible therefore, to vehicles manufactured before 1st June 1988. Additionally the front seat slides have been made narrower to accommodate the passive restraint reels, and consequently seat slides are not interchangeable with the preceding type.

MAIN MECHANICAL COMPONENTS

Component	Location
Rail and seal	A post and cantrail
Motor, cable and anchorage	B-C post
Kit, emergency tongue	Convenient place e.g. glove box
Passive belt reel and buckle	Seat slides
Lap belt and buckle (matched pair)	Seat slides

MAIN ELECTRICAL/ELECTRONIC COMPONENTS

Component	Location
Electronic control unit with a PM4 and PMHD conector	Behind drivers dash liner
Reverse inhibit relay (green)	Behind driver's dash liner attached to blower casing
Warning light	Instrument pack, LHS
Rear dock and proximity switch	B-C post, fitted to anchorage
Front (limit) dock switch	In motor drive assembly in BC post
Motor and drive connector (PM4)	Bottom of BC post
Door pillar switch	On A post combined with courtesy light switch
Power pick-up points: two 20 A fuses	LH and RH fusebox – Fuse 9

FAULT DIAGNOSIS AND MAINTENANCE CHECKS 76.73.00

WARNING: SHOULD THE SEAT OR SEAT SLIDES BE REMOVED FOR ANY REASON, UPON REASSEMBLY CHECK FOR CORRECTSEAT BELTOPERATION

MECHANICALSYSTEM

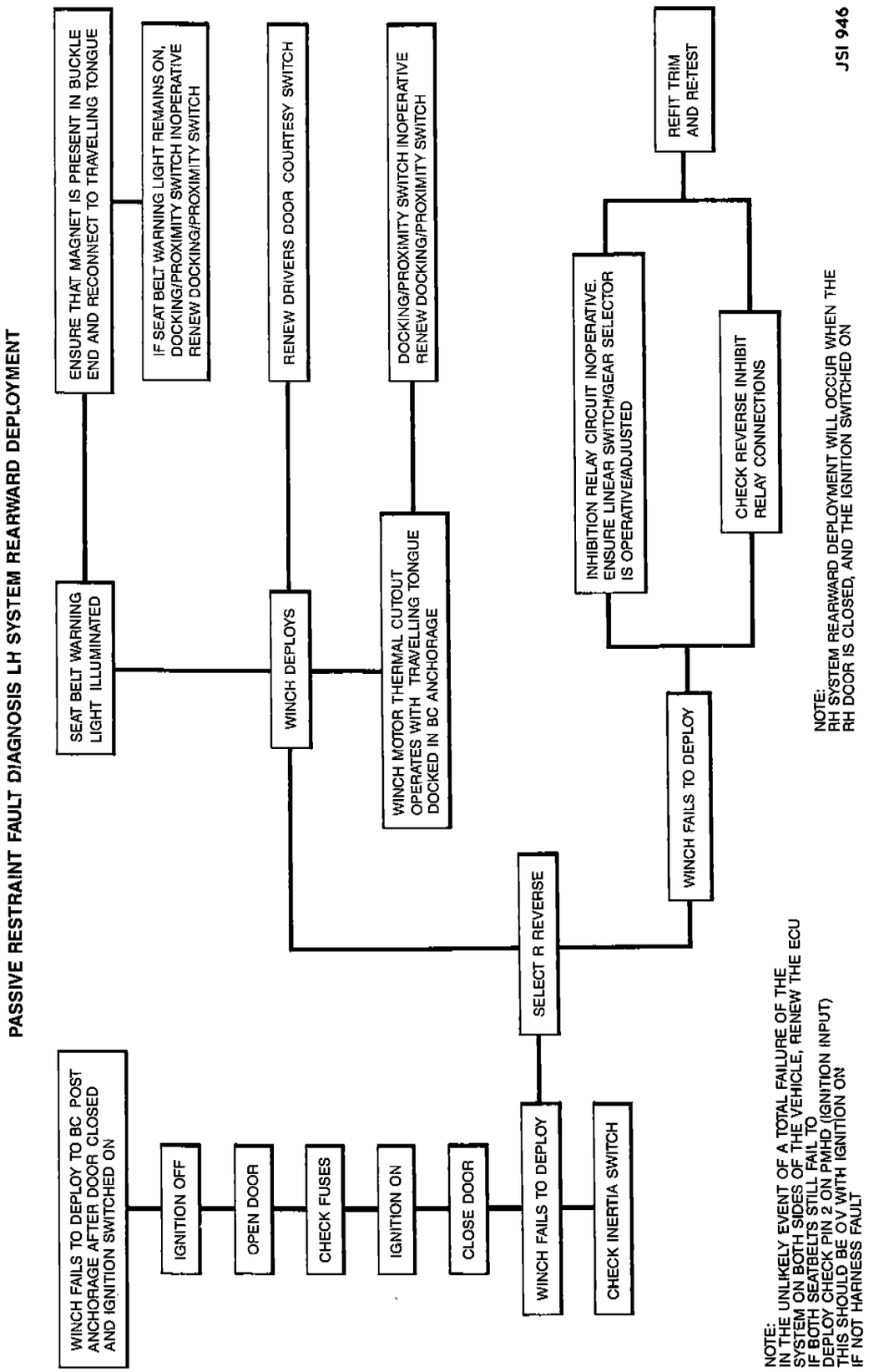
Fault	Cause	Action
Seat belt Installation		
Belt inoperative	Damageto reels Loose reel bolt Inadequatekick plate	Renew reels Check security of all bolts/kick plates retention
Faulty belt operation	Foulingof webbing on carpet/cross member/ rnounting bracket Incorrectreel/slide/ buckle assy	Check routing of belt Check/renew components
Webbing wear/fray	Foulingof webbing on carpet/cross member/ mounting bracket Incorrectreel/slide/ buckle assy or damage to webbing guide	Check routing of bett Check/renew components Check/renew webbing guide
Unableto assemble seats into car	Bucklefouling cushion, buckle crankedtoo far over towards centre line of car	Check/adjust position of buckle Check dimensions of bucklesupportarm
Motor Anchorage		
Failureof motor – system inoperative	Worn motor casings Motor casing damaged or boltfailure	Check/renew casings and bolts
Rattles – customer annoyance	Inadequatebolt retention or failure	Check security of all bolts/kick plates/ fixings
B-C post anchorage unit		
Warning light inoperative	Electrical cable severed	Repair/renew cable
Proximity switch inoperative	Electrical cable severed	Repair/renew cable
System inoperative	Broken drive cable Drivecable kinked or excessive cable length	Renewmotor/winch assy
Anchorage loose	Anchorage bolts loose	Check security of all bolts/fixings
Rail **(cantrail)** to **A post**		
Seal **sags,** gap between rail and body	**Loose** fixing screws and seal fixings	Check security of all fixings
System inoperative/ travelling tongue jammed	Bend radiustoo tight at BC post	Adjust/reposition rail, renew if necessary

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Fault	Cause	Action
BC post finisher		
System inoperative	Loose finisher, fouls travelling tongue	Check security of finisher fixings
Brushes, inner and outer		
Eventual failure	Excess friction – incorrect assy of system, dust ingress	Assemble system correctly Clean out system
	Inadequate retention of brush strip carrier	Check security of fixings
Fouls travelling tongue	Brushes adrift from BC post	Check security of fixings
A post/cantrail finisher		
System inoperative	Structural failure or deformation	Renew finisher
Fouls travelling tongue	Trim lifting from moulding	Repair/renew finisher
Dash Liner		
Brackets loose	Bracket fixings	Inadequate retention
Armature falls off, rattles	Armature fixings	Service loads in excess of design loads
Inadequate retention		

ELECTRICAL SYSTEM

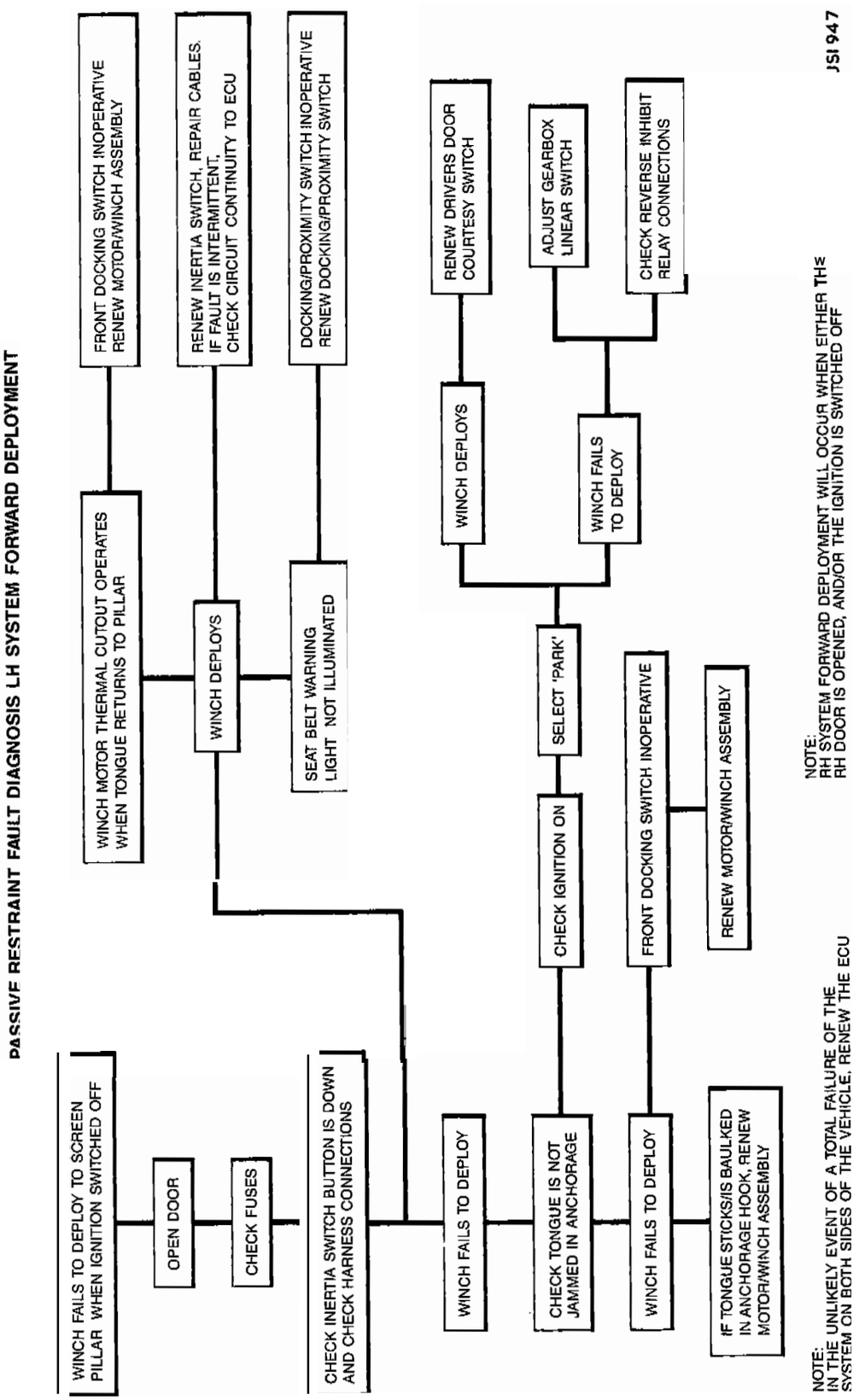
FAULT DIAGNOSIS LH SYSTEM REARWARD DEPLOYMENT



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ELECTRICAL SYSTEM

FAULT DIAGNOSIS LH SYSTEM FORWARD DEPLOYMENT



PASSIVE RESTRAINT ECU OPERATIONAL TEST *76.73.00*

The following procedure is designed to test the operation of the passive restraint ECU. Carry out each test in sequence in the order given below. If the system does not function in the manner described, refer to Jaguar Diagnostic System to locate the fault.

1 Enter car (drivers seat). Close and lock both front doors. Operate inertia switch. Doors will remain locked.

2 Insert key into ignition. Seatbelt will remain at A post.

3 Turn ignition on (position 2). Seatbelt will remain at A post.

4 Turn ignition off (position 0). Reset inertia switch. Turn ignition on (position 2). Both seatbelts will deploy to B post. 'Seatbelt not fitted' warning will activate until drivers seatbelt latches in B post.

5 Open drivers door. Drivers seatbelt will retract to A post.

6 Open passenger door. Passenger seatbelt will retract to A post.

7 Close drivers door. Drivers seatbelt will deploy to B post.

8 Close passenger door. Passenger seatbelt will deploy to B post.

9 Turn ignition *off* (position 0). Both seatbelts will retract to A post.

10 Turn ignition on (position 2). Both seatbelts will deploy to B post. Lock doors. Operate inertia switch. Doors will unlock. NOTE: It is necessary to detect the logic output from pin 1 LB86. Output should be logic 0.

11 Open drivers door. Drivers seatbelt will remain at B post.

12 Open passenger door. Passenger seatbelt will remain at B post.

13 Close both doors. Turn ignition off (position 0). Seatbelts will remain at B post.

14 Reset inertia switch. Seatbelts will retract to A post.

15 Turn ignition on (position 2). Detach drivers seatbelt from guide rail carrier. Seatbelt warning will activate.

16 Re-connect seatbelt to carrier. Seatbelt warning will de-activate.

17 End of test.

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PASSIVE RESTRAINT ECU LOGIC 76.73.00

Truth tables have been provided for information and to aid diagnostic work. The following notes are **also** relevant.

1 With ignition on (position 2) and reverse gear selected, the drivers door switch input is inhibited.

2 The ECU must be capable of detecting an inertia switch operation with ignition 'on' **AND** 'off.

3 The **ECU** must be capable of discriminating between an inertia switch operation and 'ignition off.

4 Where'indicated thus '*' logic input can be either 'logic **1**' or 'logic 0'; i.e. the output state described is not dependant upon that particular input.

– This combination of logic can only occur under fault conditions.

SEATBELT WARNING TRUTH TABLE

L.H CHANNEL R H CHANNEL	SKT 4 SKT 15	SKT 8 SKT 13	SKT 7 SKT 14	SKT 6	SKT 10	SKT2	SKT 3
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN. SWITCH	OUTPUT LOGIC
	●	0	★	*	0	0	LOW
	●	0	★	*	0	1	HIGH
	★	0	★	*	1	0	LOW
	*	0	●	★	1	1	HIGH
	●	1	★	*	0	0	LOW
	★	1	*	★	0	1	HIGH
	*	1	*	●	1	0	HIGH
	●	1	★	*	1	1	HIGH

RUN TO FRONT TRUTH TABLE

L.H. CHANNEL R H. CHANNEL	SKT 4 SKT 15	SKT 8 SKT 13	SKT 7 SKT 14	SKT6	SKT 10	SKT 2	PIN 2 PIN 5	PIN 3 PIN 6
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN. SWITCH	OUTPUT VOLTAGE	
	0	*	0	0	★	0	0V	12V
	0	*	0	0	*	1	0V	12V
	0	●	0	1	*	0	0V	0V
	0	●	0	1	★	1	0V	0V
	0	*	1	0	★	0	0V	0V
	0	●	1	0	★	1	0V	0V
	0	*	1	1	*	0	0V	0V
	0	*	1	1	★	1	0V	0V
	1	●	0	0	★	0	0V	0V
	1	★	0	0	★	1	0V	12v
	1	*	0	1	★	0	0V	0V
	1	*	0	1	★	1	0V	0V
	1	*	1	0	★	0	0V	0V
	1	*	1	0	★	1	0V	0V
	1	●	1	1	★	0	0V	0V
	1	★	1	1	★	1	0V	0V

RUN TO REAR TRUTH TABLE

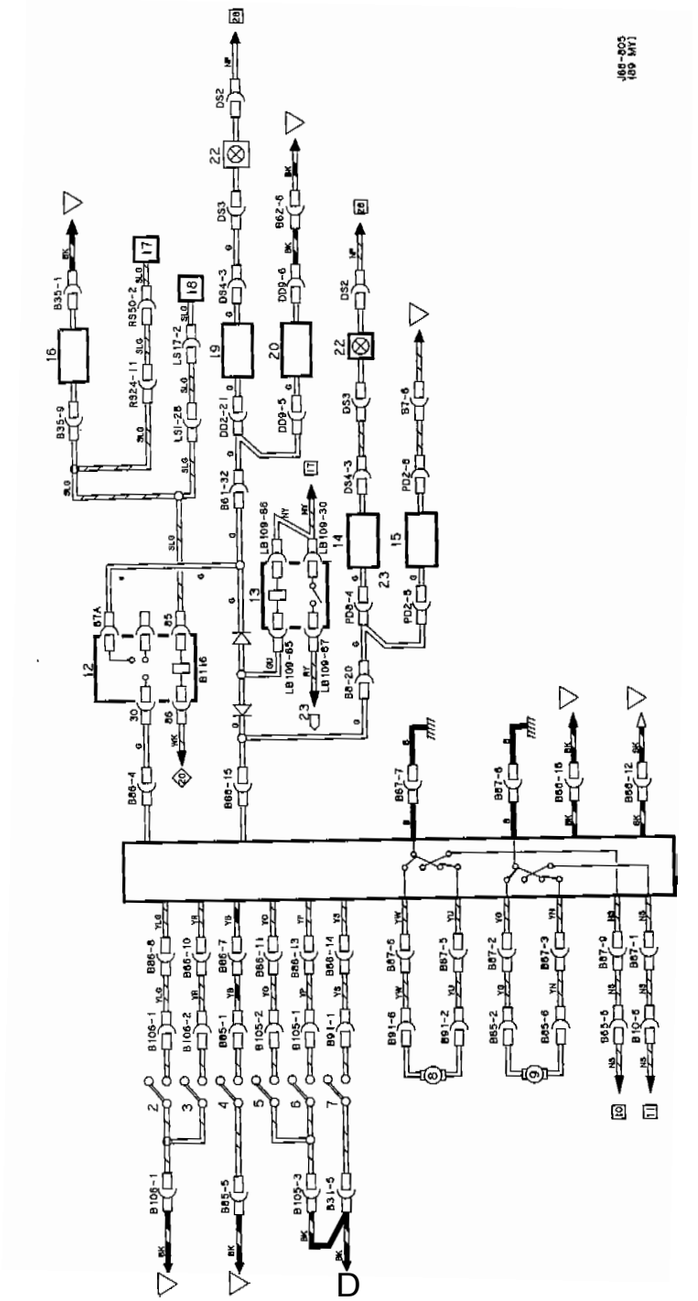
L.H. CHANNEL R.H. CHANNEL	SKT 4 SKT 15	SKT 8 SKT 13	SKT 7 SKT 14	SKT 6	SKT 10	SKT 2	PIN 2 PIN 5	PIN 3 PIN 6
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN. SWITCH	OUTPUT VOLTAGE	
	0	0	★	0	★	0	0V	0V
≠	0	0	★	0	★	1	0V	0V
	0	0	★	1	★	0	0V	0V
	0	0	★	1	★	1	0V	0V
	0	1	★	0	★	0	0V	0V
≠	0	1	★	0	★	1	0V	0V
	0	1	★	1	★	0	0V	0V
	0	1	★	1	★	1	0V	0V
	1	0	★	0	★	0	12V	0V
≠	1	0	★	0	★	1	0V	0V
	1	0	★	1	★	0	0V	0V
	1	0	★	1	★	1	0V	0V
	1	1	★	0	★	0	0V	0V
≠	1	1	★	0	★	1	0V	0V
	1	1	★	1	★	0	0V	0V
	1	1	★	1	★	1	0V	0V

CENTRAL LOCKING TRUTH TABLE

L H CHANNEL R H CHANNEL	SKT 4 SKT 15	SKT 8 SKT 13	SKT 7 SKT 14	SKT 6	SKT 10	SKT 2	SKT 1
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN SWITCH	OUTPUT LOGIC
	★	★	★	0	★	0	HIGH
	★	★	★	0	★	1	HIGH
	★	★	★	1	★	0	LOW
	★	★	★	1	★	1	HIGH

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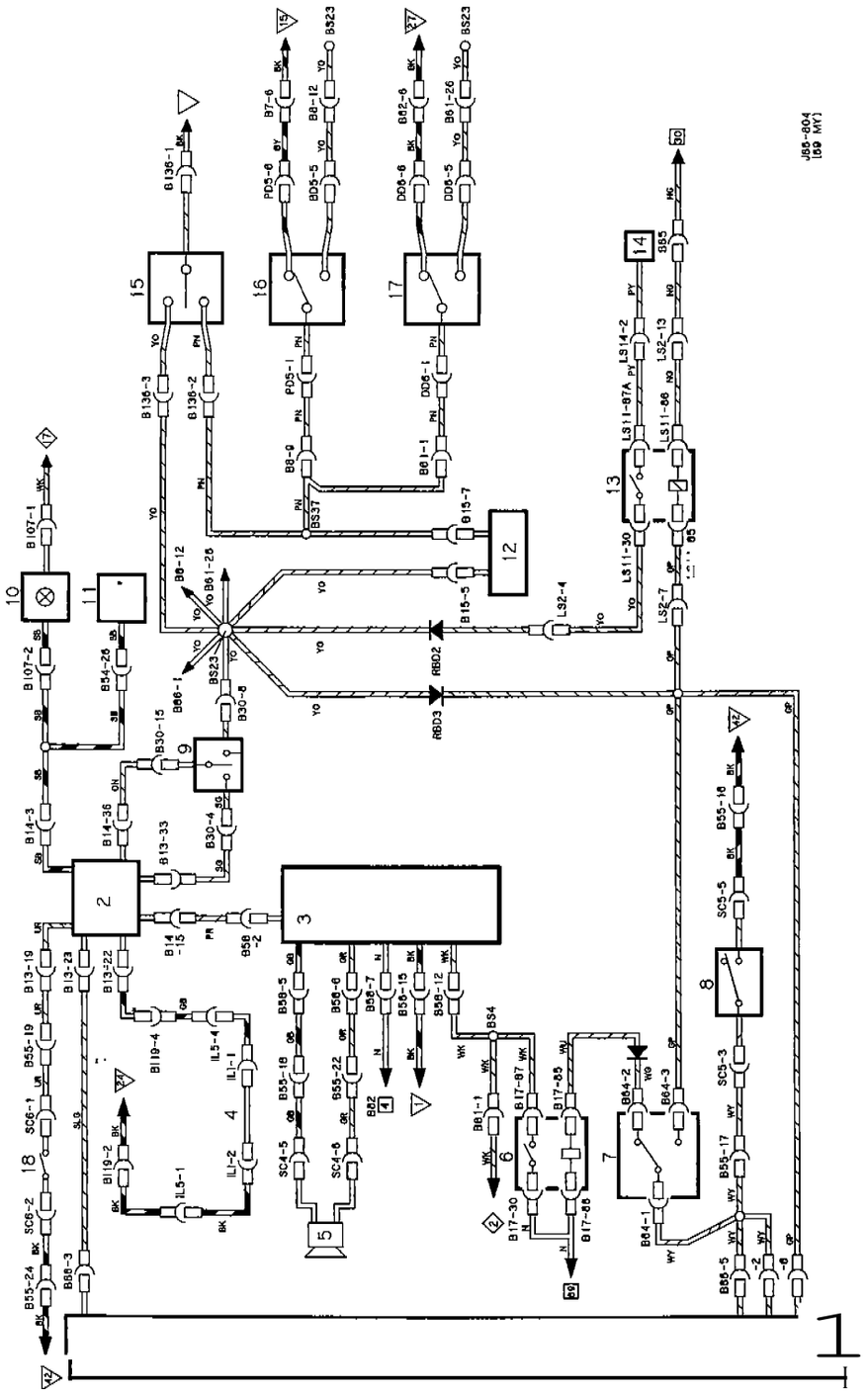
PASSIVE RESTRAINTWIRING DIAGRAM



Keyto diagram

1 Passive ECU
2 LH Rear dock switch
3 LH Belt proximity switch
4 LH Front dock switch
5 RH Belt proximity switch
6 RH Rear dock switch
7 RH Front dock switch
8 RH Motor
9 LH Motor
10 RH Fuseboxfuse 9
11 LH Fuseboxfuse 9
12 Reverse light inhibit relay
13 Seat adjust relay
14 Passenger door panel
15 Front passenger door switch
16 Auto gear select switch
17 RH rear bulb fail module
18 LH rear bulb fail module
19 Drivers door panel
20 Drivers door switch
21 Passenger door light
22 Drivers door light
23 To Drivers seat relay

PASSIVE RESTRAINT WARNING CIRCUIT WIRING DIAGRAM



Key to Diagram

1 Passive ECU
2 CPU
3 Audible warning module
4 Drivers seat pad switch
5 Audible warning buzzer
6 Ignition on relay
7 Inertia switch
8 Ignition switch
9 Centre console
10 Seat belt warning light
11 Instrument pack
12 Door lock unit
13 Fuel filler relay
14 Fuel flap intetface
15 Manual lock/unlock switch
16 Passenger door switch
17 Drivers door switch
18 Key insert switch

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PASSIVE ECU CONNECTORS 76.73.00

The two ECU connectors, one PM4, the other PMHD are identified with their pin numbers in Fig 1.

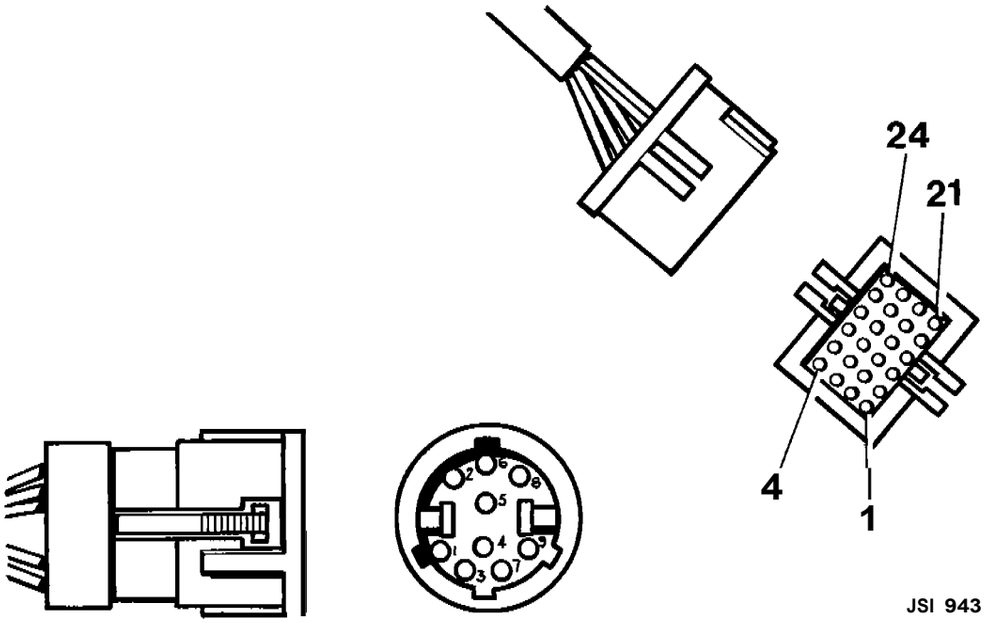


Fig 1

8-WAY PM4 CONNECTOR

Pin	Cable		Pin	Cable	
1	NS	LH system +12V	6	YU	RH motor positive to front
2	YG	LH motor positive to rear	7	6	Earth negative
3	YN	LH motor positive to front	8	B	Earth negative
4	—	Blanked off	9	NS	RH system +12V
5	YU	RH motor positive to rear			

24-WAY PMHD CONNECTOR

Pin	Cable		Pin	Cable	
1	RO	Central locking O/P	10	YR	LH belt proximity
2	KB	ignition (negative)	11	YO	RH belt proximity
3	SLG	LH belt warning	12	—	
4	S	LH door switch I/P	13	YP	RH rear dock switch
5	UR	—	14	YS	RH overtravel switch
6	GP	Inertia switch I/P	15	O	RH door switch
7	YB	LH overtravel switch	16	BK/SB	Logic earth
8	YLG	LH rear dock switch	17	SU	
9	GB	—			

PASSIVE RESTRAINT SERVICE CHECKS 76.73.00

The following checks must be carried out at every 15 000 miles (24km) service interval (the period between services must not exceed six months).

INERTIA SWITCH

The inertia switch is located in the driver's footwell. Ensure all doors except for the driver's are closed. Sit in the driving position and ensure the gear selctor lever is not in the reverse ('R') postion. Close and lock the driver's door by pressing the door locking button dawn; this will also lock the other doors.

Switch the ignition ON (position II), the automatic diagonal seat belts should move to the restaining position. Raise the test/rest button, which protrudes through the top of the inertia switch cover. Observe that the doors unlock, the automatic diagonal seatbelts remain in the restraining position and the instrument display is switched OFF.

Open the front doors, the automatic diagonal belts should not move from the restraining position. Leave the front doors open and reset the inertia switch by depressing the button. Observe that the instrument display is illuminated and that the diagonal seat belts move to the unrestraining (parked) position.

Lock and unlock the doors to ensure the central locking system still functions. Switch the ignition OFF.

SEAT BELT WARNINGS

Sit in the driving postion, close the drivers door and turn the ignition to position II; the automatic diagonal seat belt should deploy to the restaining position (rear dock). The seat belt warning light located on the left-hand side of the fascia below the hazard warning switch and the seat belt symbol on the vehicle condition monitor (VCM) display should be illuminated until the diagonal belt is located in the restraining position.

Release the seat belt buckle from the travelling mechanism by operating the red 'PRESS button. The seat belt warning light and VCM seat belt symbol should illuminate. Re-attach the seat belt buckle to the runner/tongue assembly with the red 'PRESS' button facing inboard. Switch the ignition OFF to release the seat belt.

During these checks the audible warning (continuous low pitched tone) should operate for approximately six seconds when the driver's diagonal belt is not in the restaining position.

REVERSE GEAR INHIBIT SWITCH

Sit in the driving position, close the driver's door and turn the ignition key to position II; the automatic diagonal seat belt should deploy to the restraining position (rear dock) thus extinguishing the seat belt warning lights.

Select reverse gear (position 'R') and open the driver's door. The diagonal belt should remain in the restraining position. Ensuring that body or limbs are not in the path of the deploying seat belt, disengage reverse gear. The diagonal seat belt should deploy to the unrestraining position (front dock).

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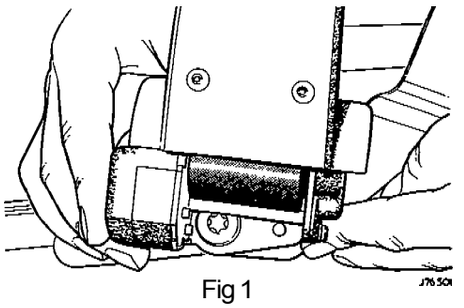
PASSIVE RESTRAINT MOTOR/DRIVE AND INERTIA REEL ASSEMBLIES

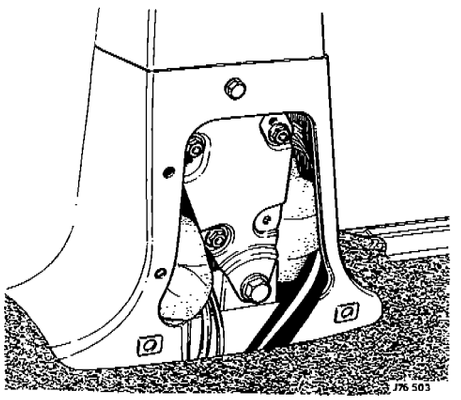
RENEW *76.73.27*

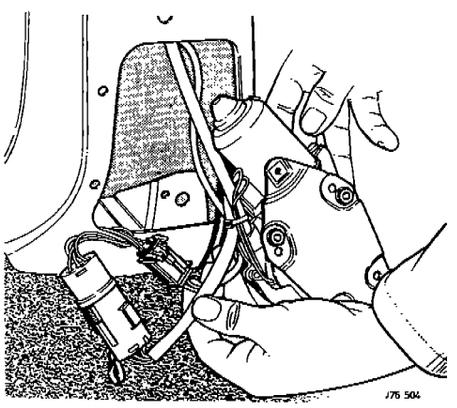
Remove the front seat 76.70.10.
Remove the seat runner to floor securing bolts.
Lift up the inertia reel side of the runner for access. Use a suitable block for support.
Remove the inertia reel securing bolt (Fig 1), remove the reel assembly.
Remove the B post upper and lower trim pads.
Remove the cant rail crash roll.
Remove the guide rail securing screws and dock assembly securing bolts. Displace the B post upper trim pad mounting bracket.
Displace and remove the guide rail from the dock assembly.
Move the dock assembly adjustment knob to its lowest position.
Fit suitable tape to the dock assembly plastic face and B post aperture lower edge for protection (Fig 4).
Remove the anti-rattle foam blocks from the B post (Fig 2).
Disconnect the motor/harness multi plugs (Fig 3).
Remove the passive motor mounting bracket securing bolts (Fig 2) and displace the motor from the B post.
Turn the dock assembly to face inwards. Position the dock assembly into the B post as far as possible. Tilt the dock assembly upwards to ease removal. Displace and remove the motor/dock assembly (Fig 4).

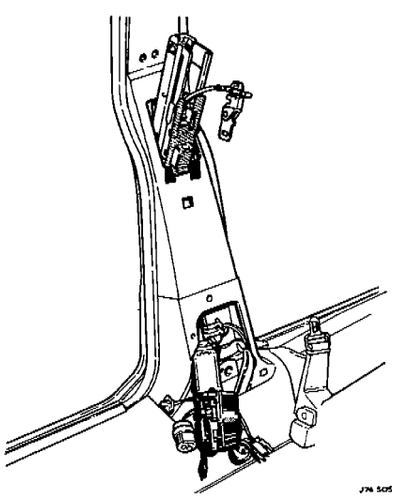
Fit suitable tape to the dock assembly plastic face for protection during installation.
Fit and align the motor/dock assembly to the B post, taking care not to damage the adjustment plate plastic face.

Reconnect the motor/harness multi plugs.
Position the motor to the B post, fit and tighten the securing bolts.
Fit the foam anti-rattle blocks into the B post.
Remove the tape from the B post aperture and adjustment plate plastic face.
Reposition the dock assembly adjustment knob.
Refit the guide rail and cant rail crash roll.
Refit the B post upper and lower trim pads.
Refit the inertia reel assembly to the seat runner, ensure that the reel bracket locates on the peg.
Fit and tighten the securing bolt.
Remove the support block, reposition the seat runner, fit and tighten the securing bolts.
Refit the front seat.


Fig 1


Fig 2


Fig 3


Fig 4

DATA

TORQUE FIGURES

Seat runner bolts 35 Nm

PASSIVE RESTRAINT INERTIA REEL

RENEW 76.73.23

Remove the front seat 76.70.10.
Remove the seat runner to floor securing bolts.
Lift up the inertia reel side of the runner for access. Use a suitable block for support.
Remove the inertia reel securing bolt (Fig 1), remove the reel assembly.

Fit the new reel assembly to the seat runner, ensure that the reel bracket locates on the peg.
Fit and tighten the securing bolt.
Remove the support block, reposition the seat runner, fit and tighten the securing bolts.
Refit the front seat.

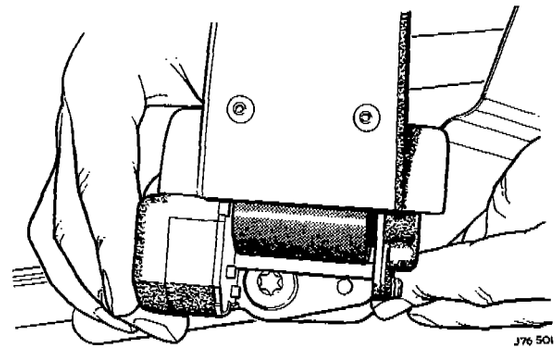


Fig 1

DATA

TORQUE FIGURES

Seat runner bolts **35*Nm***

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PASSIVE RESTRAINT GUIDE RAIL

RENEW 76.73.33

Remove the B post upper trim pad.
Remove the cant rail crash roll.
Remove the guide rail securing screws and dock assembly securing bolts. Displace the B post upper trim pad mounting bracket.
Displace and remove the guide rail from the dock assembly (Fig 2).
Carefully remove the seal from the guide rail.

Fit and align the seal to the new guide rail.
Position the guide rail to the dock assembly.
Position the runner tongue into the guide rail.
Fully seat the guide rail into the dock assembly.
Fit the guide rail to the cant rail, fit but do not fully tighten the securing screws.
Fit and align the mounting bracket to the dock assembly, fit and tighten the securing bolts.
Fully tighten the guide rail screws. Refit the cant rail crash roll and upper trim pad.

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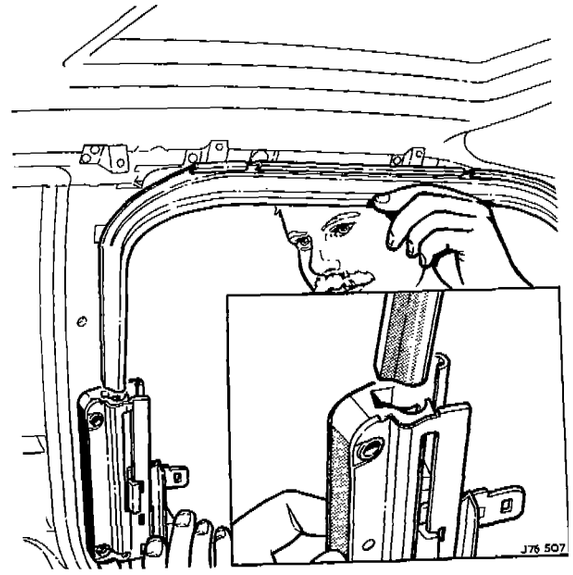


Fig 2

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LAP BELT INERTIA REEL

RENEW *76.73.22*

Remove the front seat 76.70.10.
Remove the seat runner to floor securing bolts.
Lift up the passive inertia reel side of the runner for access. Use a suitable block for support.
Remove the passive inertia reel securing bolt (Fig 1), remove the reel assembly. Displace and remove the lap belt buckle.

Fit and align a new buckle to the seat runner. Fit the passive inertia reel assembly to the seat runner, ensure that the reel bracket locates on the peg.
Fit and tighten the securing bolt.

Reposition the seat runner on the block for access to the lap belt inertia reel. Remove the lap belt reel securing bolt, remove the reel assembly (Fig 2).

Fit the new reel assembly to the seat runner, fit and tighten the securing bolt.
Remove the support block, reposition the seat runner, fit and tighten the securing bolts.
Refit the front seat.

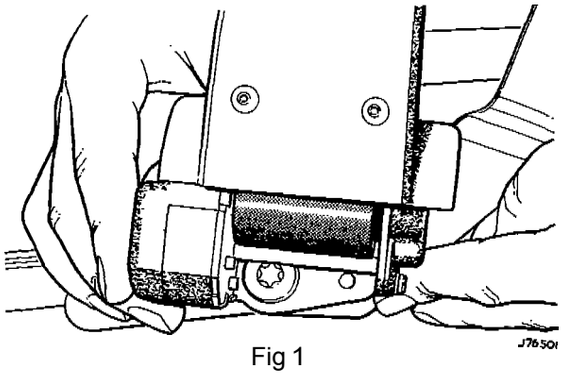


Fig 1

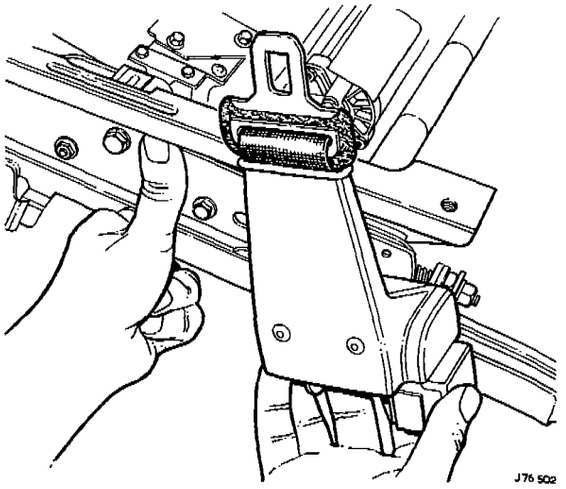


Fig 2

DATA

TORQUE FIGURES

Seat runner bolts *35 Nm*

0051G

1991 MODEL YEAR MODIFICATIONS

FRONT SEAT BELTS

RENEW **76.73.00**

Front seat belt units incorporating a web locker actuation are fitted in place of the pawl and ratchet system. Motion and attitude sensors trigger the retractor and cause engagement of two wedged sets of teeth to clamp the belt webbing.
Once the wedges have locked onto the webbing, the webbing around the spool retains its original tightness therefore no more webbing is released. This reduces travel or spool out during impact. Web lockers are fitted to the front compartment only.
The web locker is larger and heavier than the conventional unit and has a higher centre of gravity above the mounting hole.

The unit is secured to the BC post with a 7/16 UNF bolt at the base and a screw fitted into a nylon locking socket at the top.

Withdraw sufficient length of webbing up through the inside of the BC post between the trim panel and body and pass through the aperture in the trim panel. Secure the belt upper anchorage point. Secure the unit at the lower sill anchorage point.

FUEL FILLER CAP RETENTION MAGNET

RENEW **76.10.27**

Open the fuel filler cap.
Using a flat bladed screwdriver displace and remove the magnet assembly from the filler flap.
Exercise care to ensure the surrounding paintwork is not damaged.

Using a flat bladed screwdriver fit and seat the new magnet assembly to the new filler flap - note correct orientation.
Close fuel filler flap.

FUEL FILLER FLAP LATCH POST

RENEW **76.10.28**

Open the fuel filler flap.
Displace the latch post retaining tag.
Exercise care to ensure the surrounding paintwork is not damaged.
Remove the latch post.

Fit the replacement latch post and secure with the retaining tag.
Close the fuel filler flap.

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SIXTH LIGHT

RENEW **76.81.13**

Open the rear door.
Remove the trim pad securing screw and the coat hanger hook.
Slacken but do not remove the dowager strap securing screws.
Remove the rear seat belt upper anchorage bolt cover and bolt.
Displace the upper portion of the seat belt and collect the spacer.
Undo and remove the rear quarter trim pad lower securing screw.
Unclip the rear quarter trim pad and remove.
Displace the weather seal from the 'D' post channel.
Undo and remove the sixth light finisher securing screws (Fig. 1).
Affix four layers of suitable protective tape on to the 'E' post paintwork and under the sixth light finisher.
Carefully cut through the Betaseal securing sixth light into body aperture using suitable hand cutting tools (Fig. 2).

Note: Release of the bottom and 'D' post edge first gives easier access to top corner and 'E' post edge.

Place a suitable wooden chock between partially released sixth light and aperture for easier access (Fig. 3).
Remove the sixth light from the vehicle.
Remove the cured Betaseal from the aperture.
'Touch up' the paintwork around the aperture.
Wipe Betaseal degreasing agent on to the aperture.
Apply Betaseal primer on to the aperture.
Carefully remove excess cured Betaseal from the removed glass.
Wipe Betaseal degreasing agent on to the sixth light glass edge.
Carefully apply Betaseal glass primer on to the glass ensuring that the primer does not smear the glass edge 'fading'.
Apply a continuous bead of Betaseal to the glass periphery keeping clear of the glass 'fading'.
Carefully fit and fully seat the glass assembly into Position in the body aperture.
Adjust the sixth light position for general fit and alignment of screw holes and upper trim joiner.
Fit and tighten the screws to secure the finisher to the 'D' post.

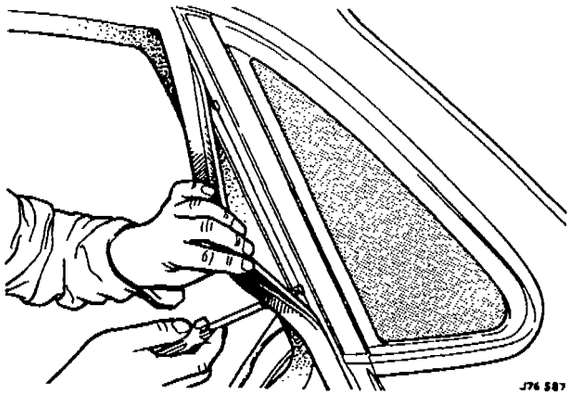


Fig. 1

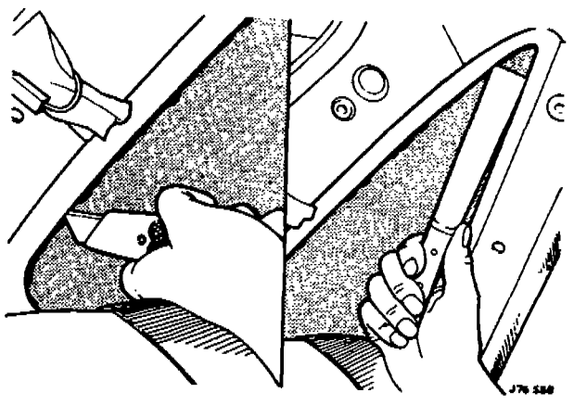


Fig. 2

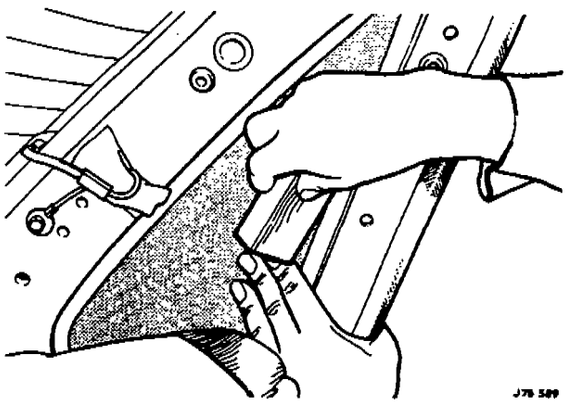


Fig. 3

Fully seat the weather seal in to the 'D' post channel.
Remove the protective tape lamination from the 'E' post.
Place the rear quarter trim pad in position ensuring that the leading edge engages behind the dowager strap mounting.
Align and secure the trim pad.
Fit and tighten the rear quarter trim pad.
Tighten the dowager strap securing screws.
Refit the coat hanger hook.
Refit the seat belt spacer.
Reposition and align the seat belt to the upper anchor point.

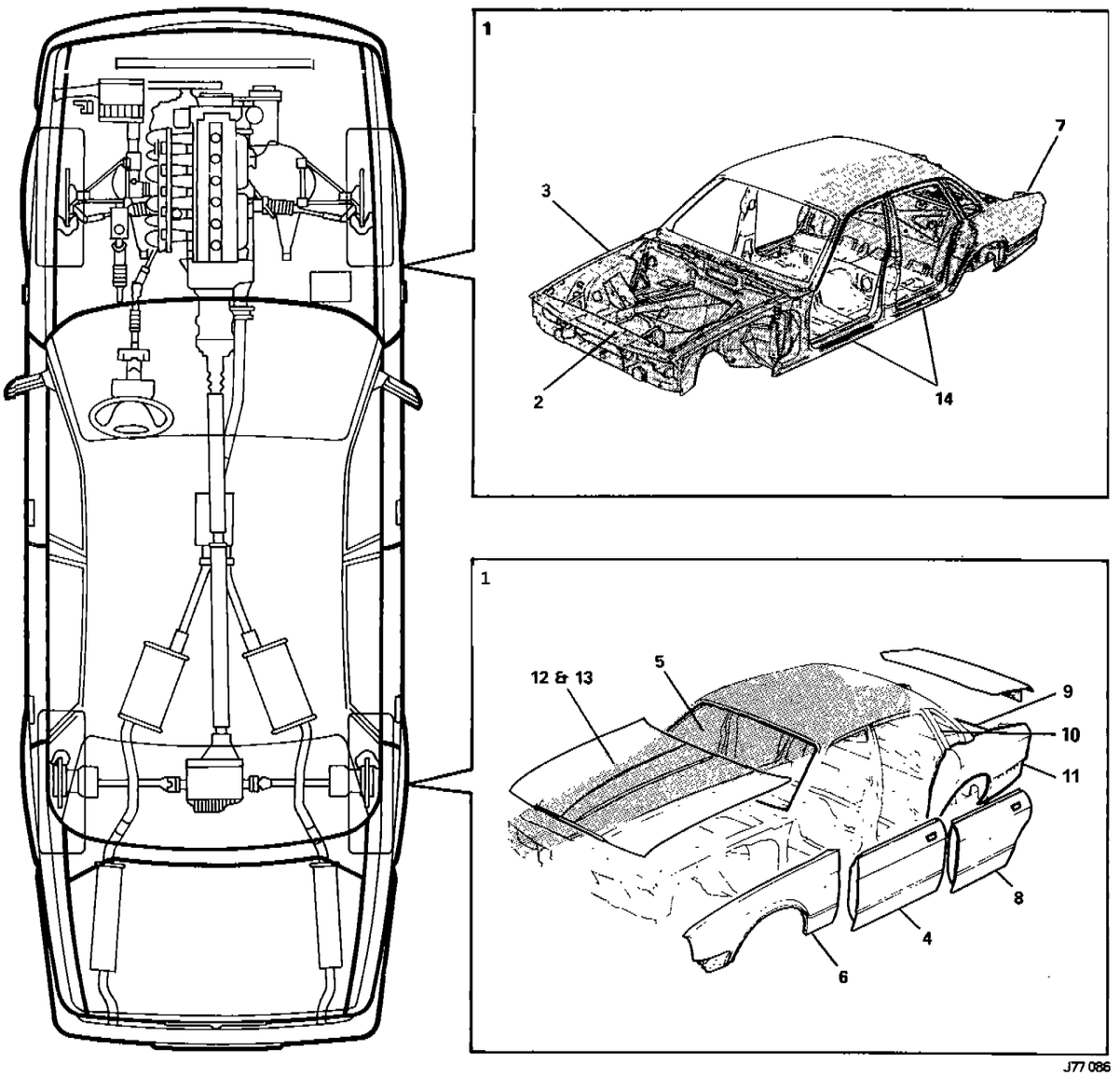
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0032K

HEALTH AND SAFETY

The Health and Safety at Work Act (1974) places a duty on employers to ensure (whenever practicable) safe working conditions and the absence or risks to health in connection with the use, handling, storage and transport of articles and substances. With the introduction in recent years of new materials in the manufacture of vehicles it is important that the risks are highlighted and the precautions made known.

PAINT:

Most paints contain organic solvents, these can cause damage to the liver and kidenys if inhaled over long periods.
Servere solvent inhalation can cause dizziness or loss of consciousness.
Splashes of solvents, paint activators and additives can cause damage to the eyes.
Solvent to the skin can cause dermatitis.
Spray dust and sanding may cause lung damage.
Peroxide and acid catalysts may cause burns.
Isocynates may cause lung sensitisation and development of asthma-like symptons will follow on subsequent exposure to very low concentrations of isocyanates.
Inhaling paint may cause severe irriation of the mouth, throat and digestive tracts.

THE FOLLOWING PRECAUTIONS WILL ELIMINATE **MOST RISKS.**

The inhalation of fumes, dust or sprays, either during the application of paint or during sanding processers should always be avoided by ensuring there is efficient general ventilation at all times and where appropriate efficient local ventilation. Spraying should be confined as far as possible to spray booths. Personnel with a history of asthma should not be engaged in any process which invloves the use of isocynates. Whenever an operator, whether involved in spraying or not has to work inside a spray booth where isocyanate material is normally used, then compressed airline breathing apparatus must be used. Supply to the breathing apparatus should be fitted with an efficient oil/water and fume filter to provide breathable air. Operators involved in handling, mixing or spraying should wear protective clothing and gloves to avoid skin contact and goggles or a full face visor to avoid splashes in the eyes. A particle mask or canister type respirator should be worn when sanding.

PANEL REPLACEMENT:

The increased use of expanded foam for sound insulation, the introduction of special materials in corrosion protection, the use of specialised adhesives, sealing compounds, trim and seat materials in vehicle manufacture, paints containing isocyanates can all give off toxic and dangerous fumes when subjected to heat. Polyurethane based paints could, at a temperature of 300" liberate small quantites of the parent isocyanate. This has been established by the Fire Research Station. The burning of expanded foams will also liberate toxic fumes. All kinds of nitrogen containing chemicals can be liberated as breakdown products, these chemicals will contain isocyanates, oxides of nitrogen and hydrogen cyanide. Fumes and gases are produced by welding, for example a large volume of ozone gas is created when MIG welding. They may be potentially toxic or asphyxiant (causing a lack of air by build up of gas in confined spaces).

PRECAUTIONS:

Operators engaged in accident repair work should wear face masks/fresh air masks when carrying out such operations as sanding, flatting body solder or fillers. A mask and/or fume extractor should be used when welding as well as wearing flameproof protective clothing. *Safety* goggles should be worn when sanding, drilling, chiselling, flatting or resistance spot welding, or any other risk which may be identified by the operator.

The Health and Safety at Work Act (1974) places upon the operator a responsibility to co-operate in reducing the risk to health.

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ASBESTOS PRECAUTIONS

In line with U.K. Government policy to reduce the use of asbestos, JAGUAR CARS are progressively eliminating their use of this material in vehicle manufacture. However, body underseal (asbestos embedded in black mastic material) contains small amounts of permitted white asbestos (Chrysotile).
WARNING: IF IT IS NECESSARY TO REMOVE UNDERSEAL, USE A SOLVENT OR 'HOT KNIFE'. DO NOT BURN OFF.

GENERAL REPAIR NOTES.

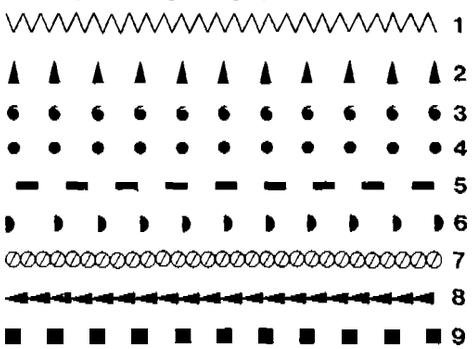
During repair, all old and new panel surfaces to be resistance spot welded together have the primer removed and are then treated with weld-through primer to provide corrosion protection in the weld area.
The weld nugget produced by the resistance spot welding equipment available to the motor vehicle repair trade is smaller than that produced by production equipment. In the welding tables, the expression 'single row of resistance spot welds' is used. This means that resistance spot welds should be spaced 5/8" (16mm) to 1" (25mm) apart which will usually mean that more resistance spot welds will be replaced in the repair joint than were removed from the factory joint.

To remove resistance spot welds, a resistance spot weld cutter should be used. If the new joint is to be MIG Plug welded, the old resistance spot welds should be cut from the panel that is to be retained, whenever possible and these holes used for plug welding. Alternatively, if necessary, holes may be punched or drilled for this purpose.

It must be emphasised that all safety precautions must be observed and protective equipment used when carrying out welding and grinding operations, etc.

CUTTING AND WELDING SYMBOLS USED IN THIS SECTION (Referring to Fig 1)

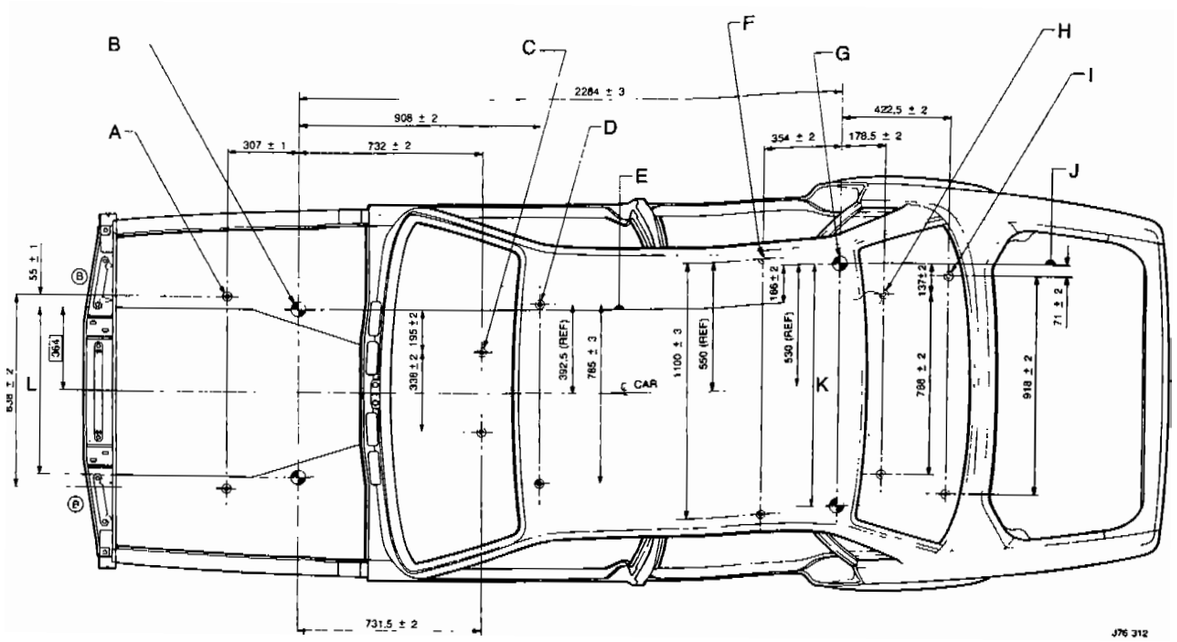
1. Saw Cut
2. Chiesel Cut
3. Cut Out Spot Weld.
4. Resistance Spot Weld
5. Mig Tack Weld
6. Mig Seam/Butt Weld
7. Braze
8. Gas Weld
9. Mig Plug Weld

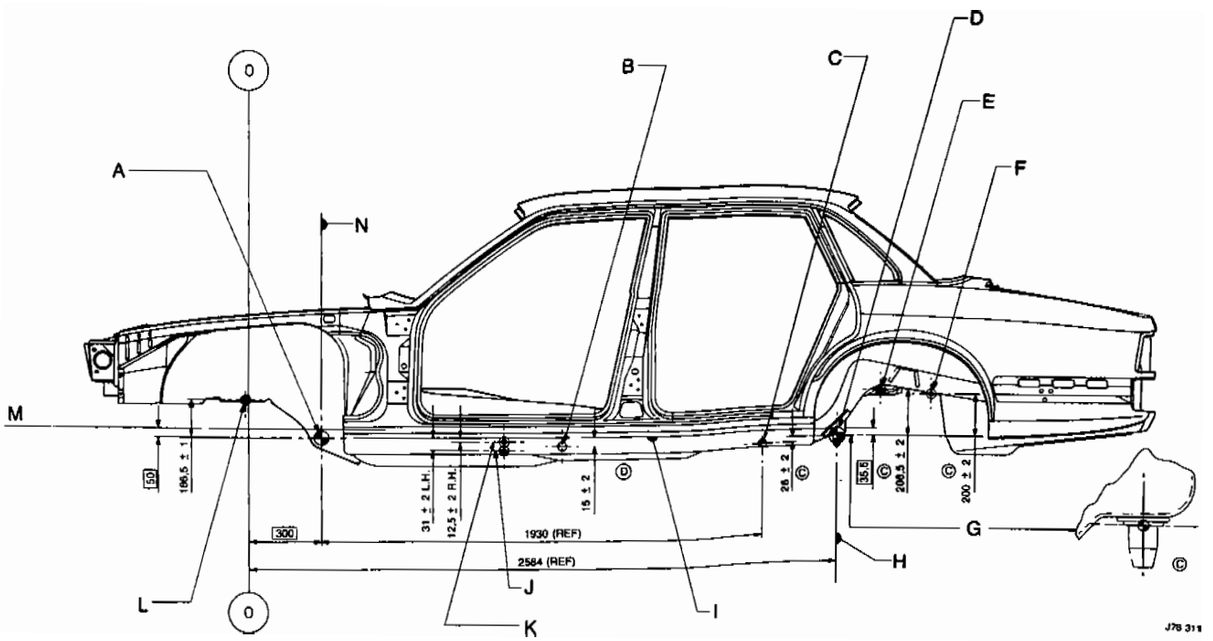


JT7 014

Fig 1

DIMENSIONS





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PAINTS, SEALANTS AND TRIM (PLASTIC) 77.00.00

PAINT

The Jaguar XJ6 2.9-4.0 range is available and finished in the following colours:

Alpine Green Metallic	HES(709)
Arctic Blue Metallic	JFE(337)
Bordeaux Red Metallic	CEK(340)
Crimson Metallic	CEV(714)
Dorchester Grey Metallic	LDP(342)
Grenadier Red	CEH(332)
Jaguar Racing Green	HEN(701)
Jet Black	PDH(333)
Moorland Green Metallic	HET(717)
Nimbus White	NOJ (700)
Satin Beige Metallic	AVF(711)
Silver Birch Metallic	MDJ(716)
Solent Blue Metallic	JEW(715)
Sovereign Gold Metallic	GDF(341)
Talisman Silver Metallic	MDF(336)
Tungsten Metallic	JEX(718)
Westminster Blue	JFG(712)

NOTE: 1. Numbers shown in brackets denote BLVC/JBC codings.
2. The paint code is to be found at the base of the LH 'B' post.

PAINT MANUFACTURERS AND SYSTEMS

MANUFACTURERS	SYSTEM: BASECOAT	SYSTEM: CLEARCOAT
Ault & Wiborg	Aultragem	Two-pack 24375
Berger	2K Standocryl Metallic Basislack	Two-pack Klarjack Two-pack Klarjack
CIL	2K Basecoat	2000-6000 Clear
Dulux	Dulux 354 2K Acran Enamel	2K Clearcoat 455-30900
Dupont (USA)	Lucite Cronar	580S Cronar Clear
Glasurit	Glassomax 54 Glassodur 21	Glassodur MS Top Clear 923-985
ICI	P422 2K Basecoat P420 2K Acrylic	Two-pack P190-435 One-pack P190-390 (Local repair only)
Inmont	Dia-mont	Diamontop
PPG	Acryline	Two-pack Acryline
Rinshed-Mason	Miracryl 2	MC1000 Clear
Sikkens (Europe, Canada, USA)	Autobase Autocryl	Two-pack Clear Two-pack Clear
Spartan	Eurobase 131 Eurocryl	Eurobase Clear 124-2468

CORROSION PROTECTION

In production, the vehicle is given an under body protection. Stone chip primer is also used on the sill panels while hot wax injection is applied to all box sections and closed members.
Materials are supplied under the following descriptions:

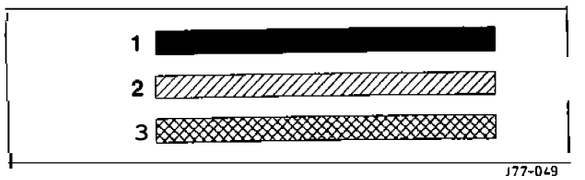
UNIPART PENETRANT

UNIPART SEALANT

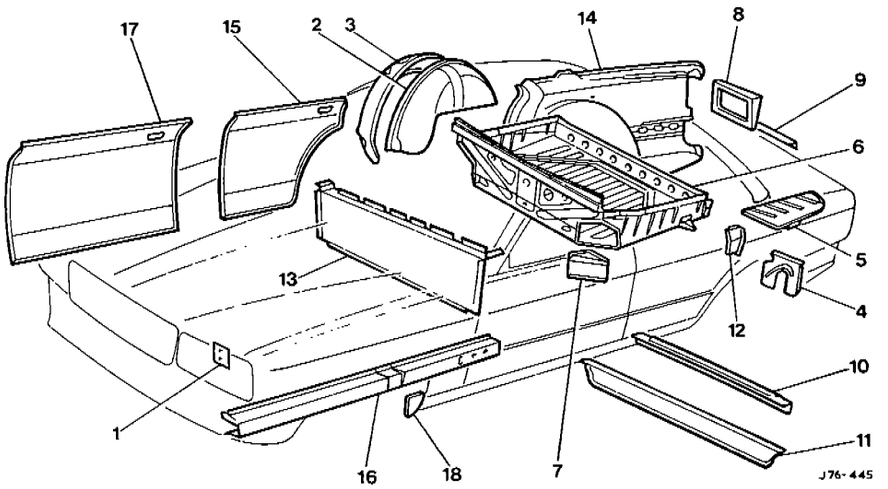
A sealing diagram showing the types and locations of sealed joints used is also included, where applicable, in each method description section. A key explaining the symbols in the sealing diagrams is shown below.

SEALING DIAGRAM

1. VISIBLE SEALANT
2. HIDDEN SEALANT
3. BOLTED PANEL SEALER



In addition, certain body panels are zinc electro-coated, locations are shown below.



1	Bonnet hinge shim hinge RH and LH"""	10	Rear panel upper reinforcement*
2	Inner rear wheelarch RH and LH"	11	Rear panel lower reinforcement'
3	Outer rear wheelarch RH and LH*	12	Rear panel lower corner gusset RH and LH***
4	Rear wheelarch lower extension RH and LH"""	13	Boot lid lower panel'
5	Boot floor side extension RH and LH***	14	Rear wing RH and LH*
6	Boot floor	15	Rear doorskin RH and LH*
7	Boot floor corner gusset RH and LH"'	16	Inner sill RH and LH**
8	Tail lamp panel RH and LH""	17	Front doorskin RH and LH'
9	Tail lamp panel lower gusset RH and LH	18	Sill front end capping RH and LH***

* Inner surface only
** Outer surface only
*** Both surfaces

Electro coat thickness 0.008mm on all treated surfaces.

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PLASTIC EXTERIOR TRIM

Plastic materials are used for certain exterior trim components, the locations of which are shown below.

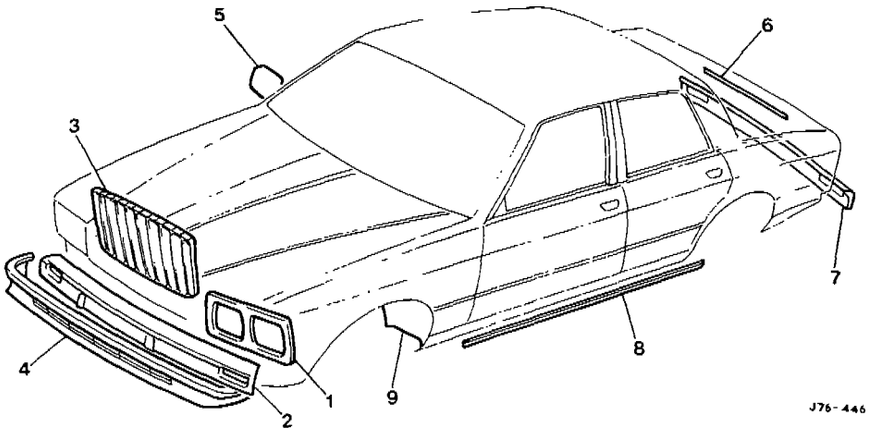


Fig 1

1	Headlamp surround RH and LH – ABS (painted)
2	Front bumper cladding – EPDM
3	Front grille slat inserts – ABS (chromed)
4	Front spoiler – Thermoplastic elastomer vistaflex 215B (painted)
5	Door mirror shell RH and LH – Polyamid nylon
6	Boot lid lower moulding – ABS (painted)
7	Rear bumper cladding – EPDM
8	Sill moulding RH and LH – Glass-filled polyurethane RRIM (painted)
9	Front wheelarch splashguard and baffle RH and LH – HDPP polypropylene co-polymer

PANEL REPLACEMENT

INTRODUCTION *77.10.00*

The following information is designed to explain the basic panel removal and replacement methods. The following panel replacement operations have been standardised and kept as simple as possible. The main criteria in removing and replacement of body panels is that the manufacturers original standard is maintained as far as possible.

Through experience gained over a period of time a standard method of removal and replacement for a welded panel has been devised placing emphasis on ease of repair by eliminating unnecessary work. The replacement details all the operations that may need to be carried out by an operator, together with details of the tools used. All repairs should be carried out to a professional standard. Provided this standard is maintained, all repairs including part panels, will result in the same standards of strength and operational safety being maintained as that of a new vehicle.

Reference should always be made to the welding diagrams and tables in the procedure. The criteria should be that the repairs carried out should restore as near as possible the original standard of manufacture.

ANTI-THEFT LABELS ON REPLACEMENT PARTS

Jaguar replacement Parts – panels, etc. are supplied to the USA in electrocoat primer fitted with anti-theft labels CBC 4149 (Fig 1) in specific locations. A protective mask is used to prevent the label from being damaged or obscured by paint and rustproofing material.

The wording on the protective mask is as follows;

"TO COMPLY **WITH U.S. FEDERAL LAW, REMOVE THIS AFTER PAINT HAS DRIED."**



Fig. 1

The following procedures/precautions **must** be observed with anti-theft labels when fitting **replacement** parts to vehicles.

1. The protective mask on the anti-theft label must not be removed until **all** preparation, painting and rustproofing work has been carried out.

2. The protective mask **must be** removed from the anti-theft label prior to vehicle handover to the customer.

NOTE: It cannot be stressed too highly that Federal law requires dealers to remove paint masks from anti-theft labels after performing painting and rustproofing operations. Failure to comply renders manufacturer and dealer liable for violations of the law (listed below).

Federal Motor Vehicle Theft – 51 FR **8831,** at **8835,** March 14 **1986** Prevention Standard

Motor Vehicle Information – 15 U.S.C. 2027(a)(4)(B) and and Cost Savings Act 2027(b), sections 607(a)(4)(B) and 607(b).

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PANEL/S

RENEW **77.10.01**

Jack up vehicle and place on axle stands.
Remove toadwheels.
Prepare equipment: ensuring that all tools required in the removal sequence of operations are available and to hand.
Protect vehicle, use an asbestos blanket to protect the interior, and a protective cloth for the exterior.

ASSOCIATED PANELS:

RENEW **77.10.02**

This may involve for example the removal of a front wing to provide access to the front panel.

Expose resistance spot welds. For those spot welds which are not obviously visible, use a rotary wire brush fitted to an airdrill or a hand held wire brush (Fig 1).

NOTE: In wheelarch areas it may be necessary to remove underseal, prior to exposing spot welds. Use a solvent or 'hot knife'. DO NOT BURN THE SEALANT OFF.

Centre punch spot welds ensuring that an adequate centre punch is made to give good centering, then cut out the welds using a Zipcutter or Roto-Bor (Fig 2) set to the correct depth of cut.

At this point it may be necessary to cut out the bulk of the panel using a pneumatic-saw (Fig 3).

NOTE: On some panels, before removing bulk of panel with pneumatic saw, brazes and MIG seam welds should be removed.

Separate spot welded joints and remove panel remnants, using hammer, bolster chisel and pincers (Fig 4).

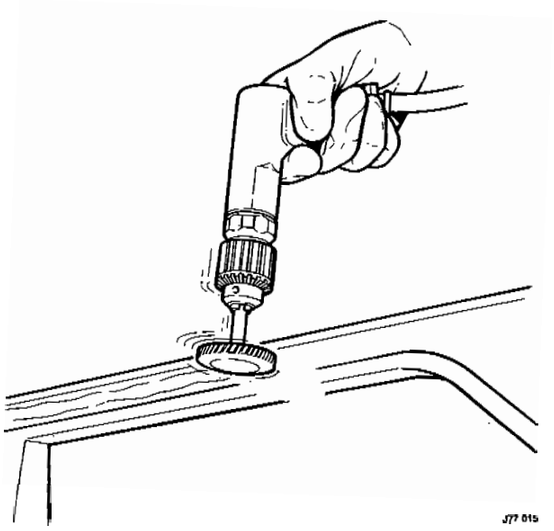


Fig 1

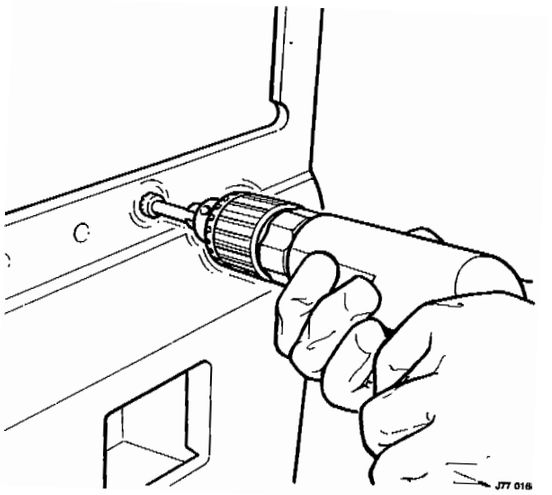


Fig 2

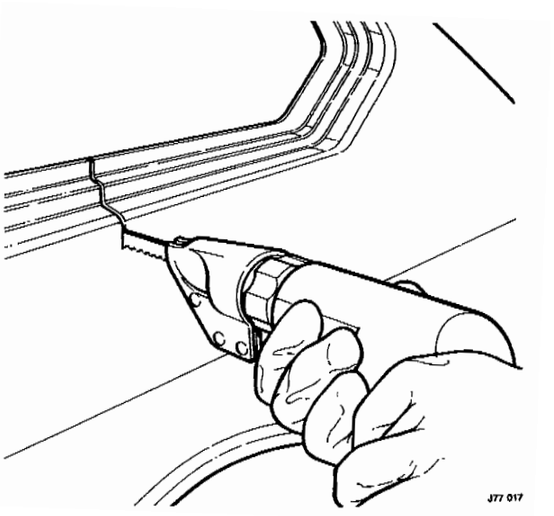


Fig 3

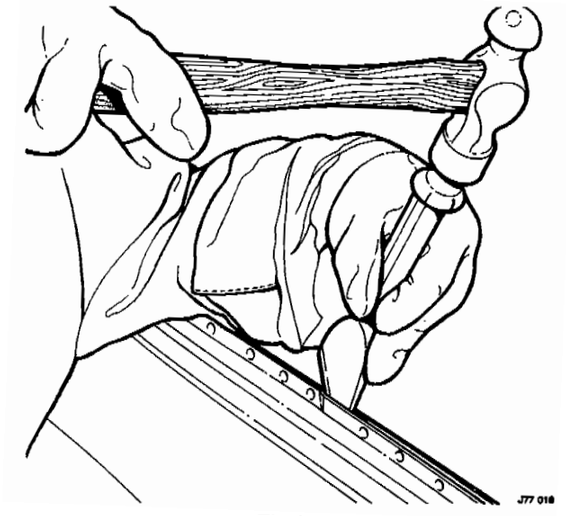


Fig 4

OLD SURFACES

PREPARE **77.10.03**

NOTE: In wheelarch areas it may be necessary to remove underseal, prior to exposing spot welds. Use a solvent or 'hot knife'. DO NOT BURN THE SEALANT OFF.
During welding/cutting, ensure that a mask is worn and fume extraction equipment is correctly positioned.
Remove weld nuggets with a sander, 36 grit disc.
Clean all flange edges to a bright smooth finish, using a grinder if necessary (Fig 1).
Straighten existing panel joint edges with a Dollyblock and hammer.

NEW SURFACES

PREPARE **77.10.04**

Mark off the area of new panel and cut to size leaving approx 2" overlap over the existing panel.
Offer up new panel/section, align with associated panels, i.e. new rear wing aligned with door boot lid/tail gate. Clamp into position (Fig 2).
Where necessary cut new and original panels to form a butt joint (Fig 3).
Remove all clamps and new panel.
Prepare new panel joint edges for welding by cleaning to bright metal (Fig 4). This includes interior and exterior edges.
Apply weld-through primer to all surfaces to be resistance spot welded.

Apply metal-to-metal adhesive or sealer in accordance with the car manufacturer's instructions.

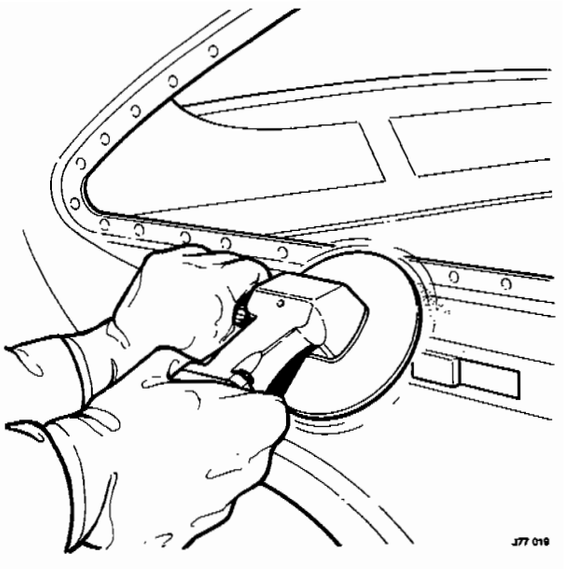


Fig 1

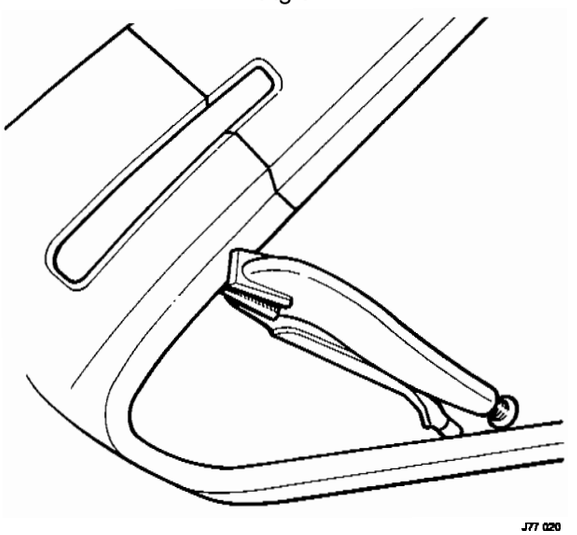


Fig 2

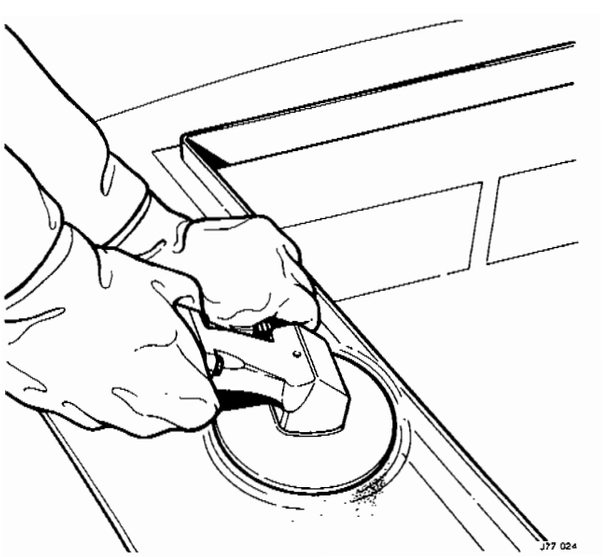


Fig 4

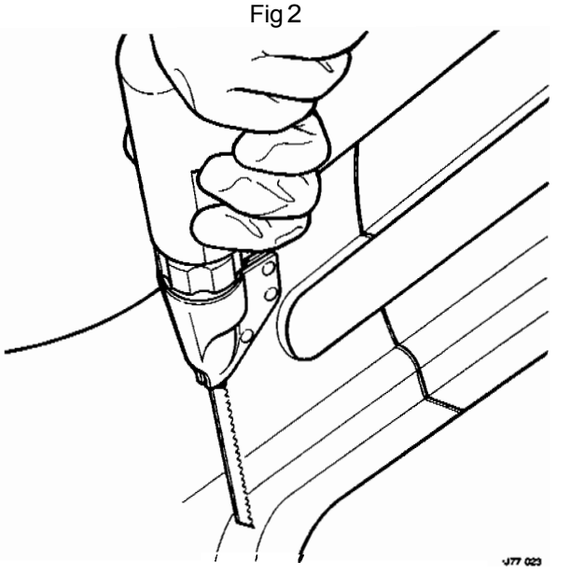


Fig 3

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PANEL/S

OFFER UP AND ALIGN *77.10.05*

Offer up new panel section and re-align with associated panels, clamp into position using welding clamps or mole grips. With certain panels it may be necessary to fix the panel with tack welds or PK screws.

PANEL/S

WELD *77.10.06*

MIG tack butt joint/s (Fig 1), re-checking alignment and panel contours as necessary.
Select arms for resistance spot welding and clean tips using the tip trimmer.
It is recommended that arms of not more than 12 inches in length are used (Fig 2).
Fit spot welding arms and test equipment for satisfactory operation, using test coupons (Fig 3).
In the absence of monitoring equipment a satisfactory weld can be verified by the pulling of a weld 'slug' on separation of the test coupons.
Resistance spot weld where necessary (Fig 4).
Dress MIG tack welds with a sander, 36 grit disc.

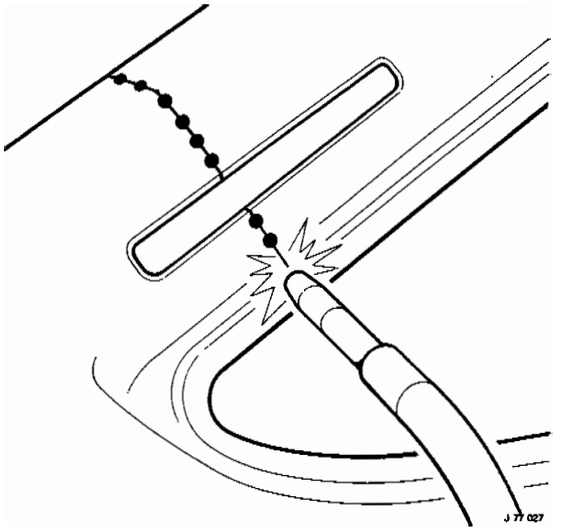


Fig 1

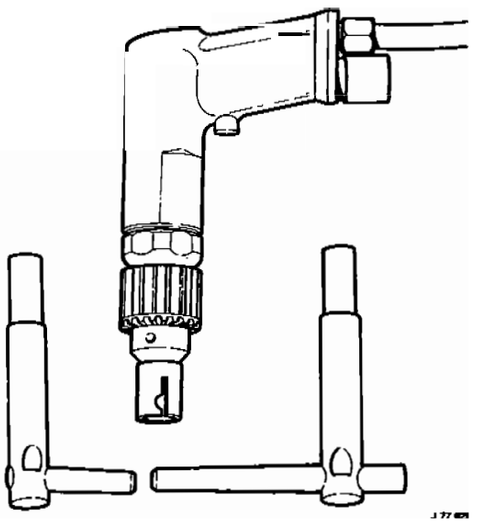


Fig 2

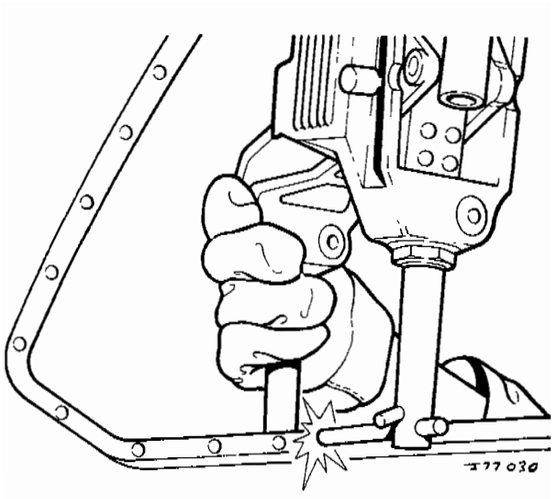


Fig 4

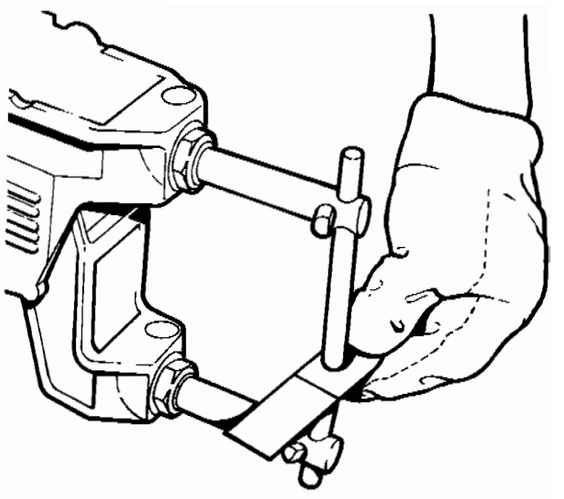


Fig 3

MIG seam weld butt joints (Fig 1).
Dress all welds using a sander, 36 grit disc.
NOTE: Any brazing required must be done at this point.

PANEL/S

SOLDER 77.10.07

Prepare areas to be soldered by cleaning with a rotary wire brush/sander, 80 grit disc.
Tin areas to be soldered by applying solder paint, and heating with a propane gas torch (Fig 2).
Wipe joint area clean with cloth.
Apply solder.

Shape solder to joint using a gas torch, hardwood block and tallow (Fig 3). The solder should be carefully and evenly spread over the whole joint area, to achieve as smooth a finish as possible.
Shape and dress soldered areas using body files (Fig 4), 80 grit production paper, and a random orbit sander.
Neutralise the solder by cleaning and wiping the finished area with an ammonia soaked cloth.
NOTE: **Health and safety regulations require that on completion of solder dressing the dress must be removed from the work area. At the end of soldering, operators must wash their hands.**
Apply highlight oil to determine final quality of panel shape.
Remove protective covers and clean the car interior.
Seal all joints with 3M 'Drip-Chek' automotive joint seam sealer, and apply underseal where necessary. Anti-drum pads can now be fitted.
The panel replacement is now complete so the road wheels can be replaced and the vehicle lowered to the ground.

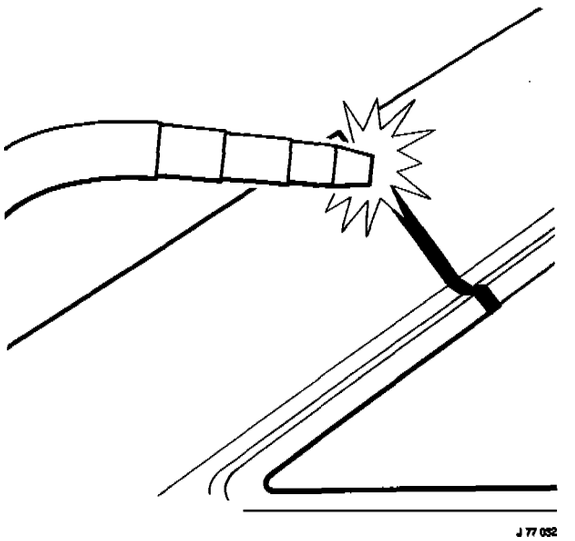


Fig 1

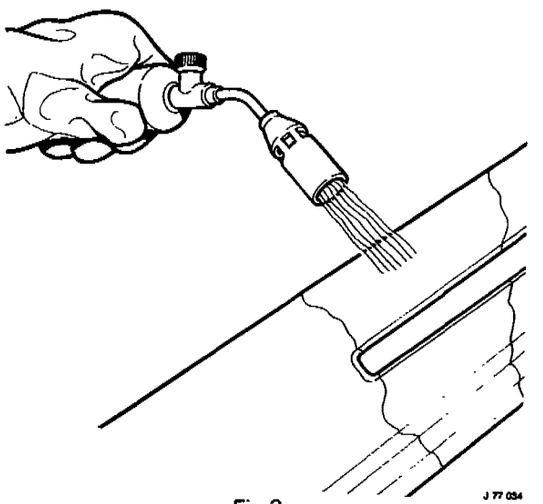


Fig 2

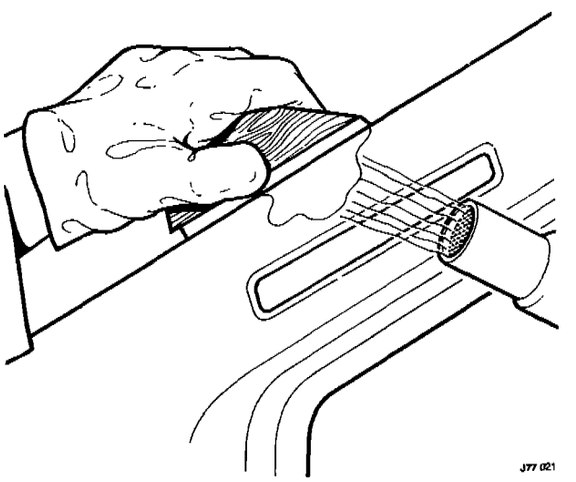


Fig 3

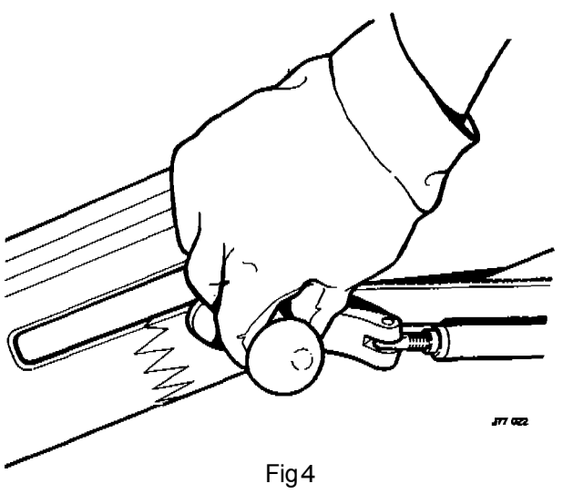


Fig 4

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BONNET MOUNTING PANEL

RENEW **77.15.02**

Welding **Table**

No.	Location	Remove Factory Joint	Replace Repair Joint
1	Corner gusset to mounting panel RH and LH	10 resistance spot welds each side	10 MIG plug welds each side
2	To headlamp panel rear flange RH and LH	9 resistance spot welds each side	Single row of resistance spot welds each side ARO arms or equivalent
3	To headlamp panel upper flanae RH and LH	6 resistance spot welds each side	Single row of resistance spot welds ARO arms 242A or eauivalent

Disconnect battery and alternator.
Remove:
Front bumper assembly with flasher lamp unit RH and LH.
Disconnect horns.
Remove:
Grille, front screenwasher bottle filler neck mounting bracket, headlamp unit RH and LH.
Jack up front of vehicle and place on axle stands.
Drain the radiator.
Remove:
Radiator mounting panel, disconnect expansion tank hose, upper hose at thermostat housing, lower hose, power steering hose at reservoir and radiator.
Drain power steering system.
Remove radiator with shroud.
Disconnect air conditioning pump, lay aside refridgerant unit, remove cooling fan, bonnet front edge weatherseal, courtesy lamp switch and 1 front wing mounting bolt RH and LH (for access only).
Associated Panel:
Remove the bonnet 77.15.01.
Panel Replacement:
Panel removal and replacement is to the method detailed in Section 77.10.01-07 with the following variations:
During removal, the panel is cut at point (1 Fig 1) to gain access with a resistance spot weld cutter at (2 Fig 2).
In replacement, the new panel is welded at (2, 3 Fig 2).
Holes are then punched in the corner gussets for plug welding at (1 Fig 2) as there is no access for a resistance spot welder at these points.

Painting: See Section 77.00.00.

Associated Panel:
Refit/replace bonnet 77.15.01.

Replace Parts: Replace parts in reverse order of removal.
Reconnect battery and alternator, test those electrical items that have been removed and replaced. Align headlamps.

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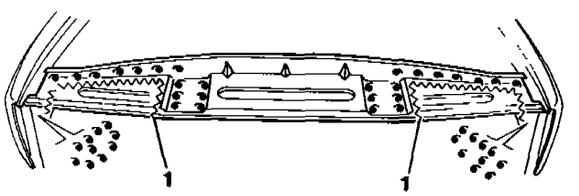


Fig 1

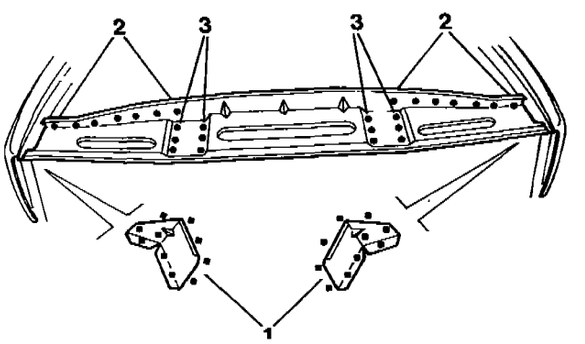


Fig 2

FRONTWING

RENEW **77.25.01**

Disconnect battery and side/flasher lamp unit RH and LH.
Remove:
Front bumper assembly with flasher lamp units.
Disconnect horns (Fig 1).

Remove:
Grille, front screen-washer bottle filler neck bracket, headlamp unit, front wheelarch splashguard main section and front section, battery (LHD only), radiator expansion tank (LHD only), flasher repeater lamp unit, front spoiler, headlamp/front screenwasher bottle (RHD only) and bumper side mounting.
Lay aside bonnet front edge weather-seal and scuttle weatherseal.
Remove 13 mounting bolts to body and remove panel from vehicle.
Offer Up Panel: Offer up new panel, check alignment and remove for painting.
Painting: See Section 77.00.00.

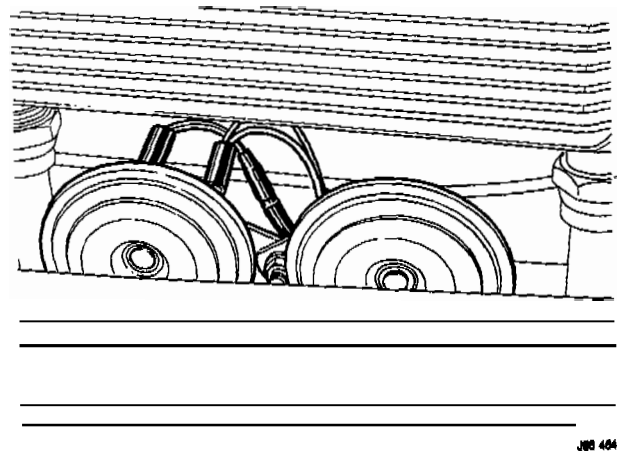


Fig 1

Refit Panel: Offer up new panel, replace mounting bolts to body, check alignment and tighten bolts.
Replace Parts: Replace parts in reverse order of removal.
Reconnect battery, test those electrical items that have been removed and replaced.
Align headlamp.

FRONT DOOR SKIN

RENEW **77.20.02**

Remove:
Front door.

Panel Replacement: Panel removal and replacement is to the method detailed in Section 77.10.01-07 with the following variations: In replacement the window aperture reinforcement position is marked on the new panel and adhesive is applied to the outer flanges prior to offering up to the frame (1 Fig 2). A new anti-drum pad is fitted to the new panel before painting.

Painting: See Section 77.00.00.

Refit/replace the Door.
Refit/replace Parts.

0055G

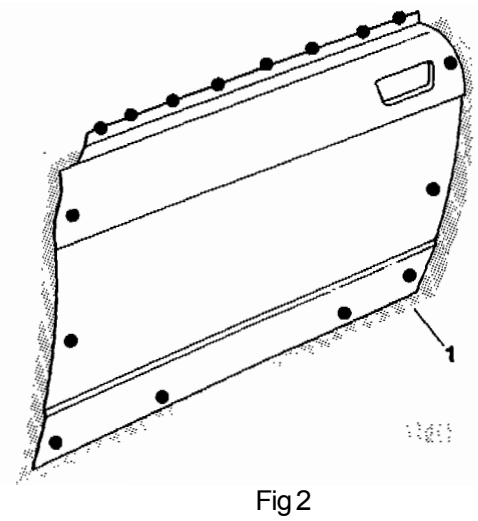


Fig 2

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REAR DOORSKIN

RENEW 77.20.04

Remove:
Rear door.
Upper and lower hingesfrom door.

Panel Replacement: Panel removal and replacement is to the method detailed in Section 77.10.01-07 with the following variations: In replacement, the window aperture reinforcement position is marked on the new panel and adhesive is applied to the outer flanges prior to offering up to the frame (Fig 1). A new anti-drum pad is fitted to the new panel before painting.
Painting: See Section 77.00.00.
Refit/replace rear door 77.20.03.
Refit upper and lower hinges to door.
Replace Parts: See rear door method.

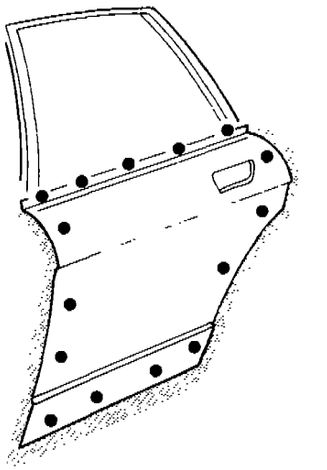


Fig 1

SILL PANELSECTION

RENEW 77.40.02

WELDING TABLE

No.	Location	Remove Factory Joint	Replace Repair Joint
1	To existing panel at rear end		1X270mm MIG seam weld
2	To inner sill upper flange at rear door aperture	15 resistance spot welds	Single row of resistance spot welds ARO arms 242A or equivalent
3	To existing panel at 'B' post		1X380mm MIG seam weld
4	To 'B' post closing panel	6 resistance spot welds	3 MIG plug welds
5	To inner sill upper flange at front door aperture	11 resistance spot welds	Single row of resistance spot welds ARO arms 242A or equivalent
6	To existing panel at front end		1X270mm MIG seam weld
7	To inner sill at lower flange	34 resistance spot welds	Single row of resistance spot welds ARO arms 242A or eauivalent
8	Weatherseal retainer to rear of 'B' post	3 resistance spot welds	4 MIG plug welds
9	Weatherseal retainer to front of 'E' post	3 resistance spot welds	4 MIG plug welds
10	Weatherseal retainer	4 resistance spot welds	4 MIG plug welds

Disconnect battery and alternator.
Remove:
Front door release lever escutchion upper capping, upper and lower door trim sections, front seat, 'A post and 'B' post lower trim sections and front sill treadplate.
Lay aside front carpet section, front door aperture beading and weatherseal.
Remove rear seat cushion and backrest, rear seat cushion insulation and rear sill treadplate.
Lay aside rear door aperture beading and rear door weatherseal.
Remove seatbelt assembly, disconnect rear door wiring and lay aside rear carpet section.

Associated Panel:
Remove rear door section 77.20.03.

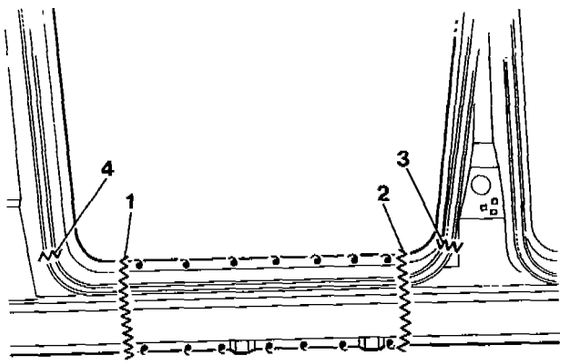
Panel Replacement: Panel removal and replacement is to the method detailed in Section 77.10.01-07 with the following varations:
During removal, the panel is cut at points (1 Fig 1) and (2 Fig 1).
The weatherseal retainers (3 Fig 1), (4 Fig 1) are then cut out.
The seal welds at (2 Fig 2) and (4 Fig 2) are dressed and the new weatherseal retainer channel sections then trimmed to fit at (5 Fig 2). The sections are then plug welded into position (1,3 Fig 2) as there is no access for a resistance spot welder at these points.

Painting: See Section 77.00.00.

Associated Panel:
Replace rear door 77.20.03.

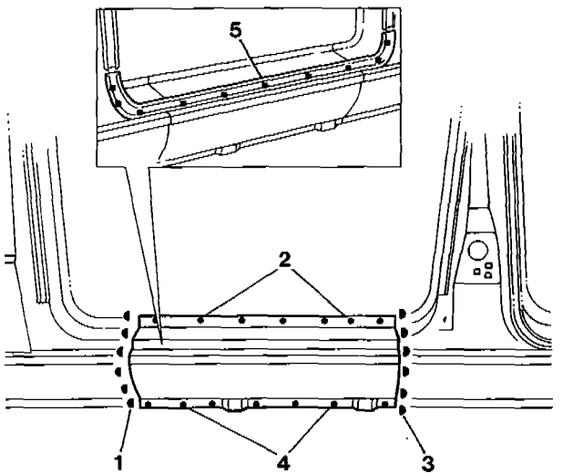
Replace Parts: Replace parts in reverse order of removal.
Reconnect battery and alternator, test those electrical items and mechanisms that have been removed and replaced.

0055G



J 77 039

Fig 1



J 77 040

Fig 2

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REAR WING

RENEW

77.25.02

Welding Table

No.	Location	Remove Factory Joint	Replace Repair Joint
1	To rear panel	19 resistance spot welds (see notes) 1X mm Braze	Single row of resistance spot welds ARO arms **264A** or equivalent
2	To rear panel lower corner	2 resistance spot welds	3 resistance spot welds ARO arms 264A or equivalent 1 MIG plug weld
3	To boot floor side extension	15 resistance spot welds	Single row of resistance spot welds **ARO** arms **264A** or equivalent
4	To wheelarch	35 resistance spot welds (see notes)	Single row of resistance spot welds ARO arms 105010 or equivalent. 1X mm MIG seam weld
5	To dogleg and sill	30 resistance spot welds	Single row of resistance spot welds ARO arms 264A or equivalent 4 **MIG** plug welds 1X mm MIG seam weld
6	To rear screen panel and upper quarter	24 resistance spot welds 1X mm braze	Single row of resistance spot welds ARO arms 264A or equivalent 1X mm **MIG** seam weld 1X mm braze

Disconnect battery and alternator.
Remove:
Spare wheel and jack, boot mat, petrol tank cover, rear panel section and carpet, tail lamp cover and rear wing carpet section.
Lay aside boot aperture weatherseal.
Remove:
Rear bumper assembly with rear foglamp unit RH and LH, bumper iron, boot aperture, mouldings, and tail lamp unit.
Jack up rear of vehicle and place on axle stands.
Remove:
Exhaust rear section, radio aerial assembly **(RH** only), aerial sealing grommet (RH only), rear wing extractor vent box, bumper side mounting, rear seat cushion and backrest, rear seat insulation at cushion and backrest, rear parcel shelf, upper quarter trim section and rear sill treadplate.
Lay aside rear door aperture weatherseal and beading.
Remove rear door striker, quarterlight inner weatherseal, quarterlight glass, upper quarter moulding, petrol filler flap (LH only).
Lay aside rear wiring loom, boot lid wiring loom (RH only), aerial wiring (RH only), petrol filler flap wiring (LH only), braking system microprocessor wiring (LH only) and petrol tank wiring (RH only).

Remove the petrol tank.

Panel Replacement: Panel removal and replacement is to the method detailed in Section 77.10.01-07 with the following variations:

During removal, the panel is cut at points (1 Fig 1) and (2 Fig 1) in the welding diagram and the bulk removed.

The resistance spot welds at the inturned flange beneath the rear screen panel may then be cut out and the metal remnant removed. It is necessary to use a body chisel and pincers when removing the remnant at the wheel-arch as adhesive is used in this area which creates difficulties in removal.

When removing the resistance spot welds at (1 Fig 2) it is necessary to cut out the welds on the outer face and bend the flange upwards as shown in (1 Fig 3), in order to gain access to the second row of resistance spot welds beneath.

During replacement, holes are punched in the new panel for plug welding at (1 Fig 2) and (5 Fig 2) as there is no access for a resistance spot welder at these points.

Plug welds are also made at (3,4,6 Fig 2) using the holes left by the resistance spot weld cutter.

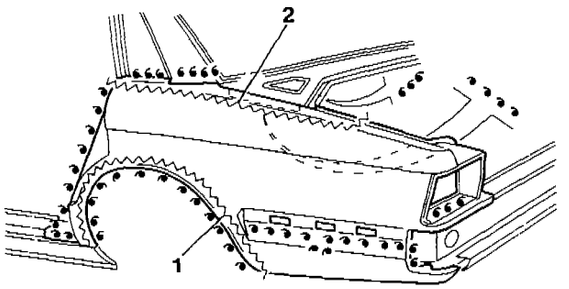
Adhesive is applied to the area shown in the welding diagram before offering the panel up to the vehicle (see page 77-04 for sealants chart).

Painting: See Section 77.00.00.

Replace Parts: Replace parts in reverse order of removal.

Reconnect battery and alternator, test those electrical items and mechanisms that have been removed and replaced.

0055G



J 77 041

Fig 1

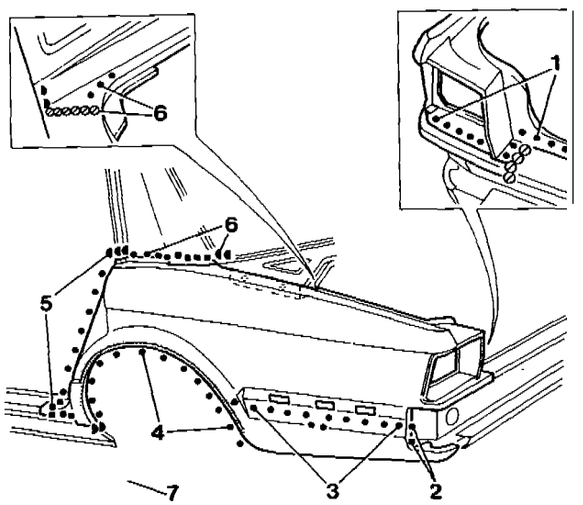
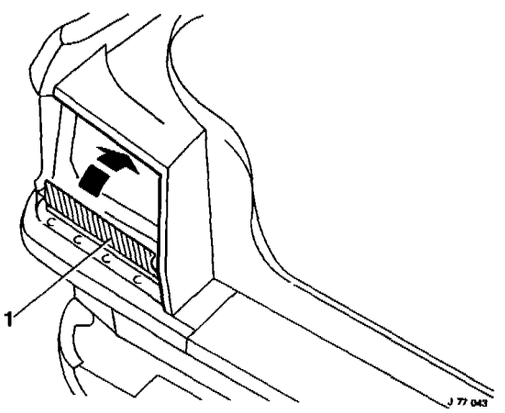


Fig 2

J 77 042



J 77 043

Fig 3

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REAR PANEL ASSEMBLY

RENEW **77.35.01**

Welding Table

No.	Location	Remove Factory Joint	Replace Repair Joint
1	To inner reinforcement lower flange	20 resistance spot welds	20 MIG plug welds
2	To boot floor rear edge and side extension	50 resistance spot welds	Single row of resistance spot welds ARO arms 264A or equivalent.
3	To rear wing at side of tail lamp aperture RH and LH	11 resistance spot welds 2X mm brazes each side	11 MIG plug welds 2X mm brazes each side
4	Tail lamp panel RH and LH to rear panels at lower edge	10 resistance spot welds each side	Single row of resistance spot welds each side ARO arms 242A or equivalent
5	Tail lamp panel RH and LH to rear panel at vertical gusset	8 resistance spot welds each side	Single row of resistance spot welds each side ARO arms 242A or equivalent
6	Rear panel to drain channel RH and LH	5 resistance spot welds 1X100mm braze each side	Single row of resistance spot welds ARO arms 242A or equivalent 1X100mm braze each side
7	Tail lamp panel to corner gusset RH and LH	10 resistance spot welds 1X35mm MIG seam weld each side	10 MIG plug welds 1X35mm MIG seam weld each side
8	To rear wing at drain channel RH and LH	1X60mm MIG seam weld 1X60mm braze each side	1X60mm MIG seam weld 1X60mm braze each side
9	Corner gusset to rear wing RH and LH	5 resistance spot welds each side	5 MIG plug welds each side

Disconnect battery and alternator.
Remove:
Spare wheel and jack, boot mat, petrol tank cover, rear panel trim section and carpet, tail lamp cover RH and LH, rear wing carpet section RH and LH, tail lamp unit RH and LH.
Jack up vehicle, and place on axle stands.
Remove exhaust rear section RH and LH.
Panel Replacement: Panel removal and replacement is to the method detailed in Section 77.10.01-07 with the following variations:
During removal, the panel is cut at points (1 Fig 1) and the tail lamp panels removed. The rear wings are then moved outwards to assist with removing the bulk of the panel. In replacement, holes are made in the new assembly for plug welding at (3 Fig 2) and (7 Fig 2). as there is no access for a resistance spot welder. Plug welds are also made at (3 Fig 2) and (9 Fig 2) using the holes left by the resistance spot weld cutter. Metal-to-metal adhesive is applied at the areas shown in the diagram before offering up (10 Fig 2).
Painting: See Section 77.00.00.
Replace Parts: Replace parts in reverse order of removal.

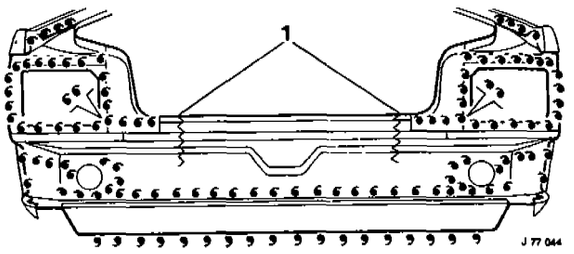


Fig 1

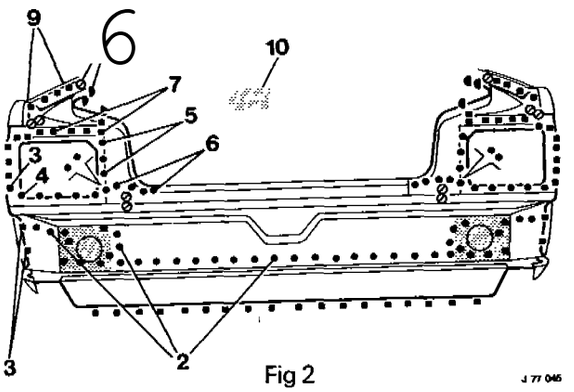


Fig 2

FRONT SCREEN

RENEW **77.45.02**

Open the bonnet and both front doors.
Remove both wiper arms.
Remove the plenum chamber finisher.
Displace and remove both screen finishers.
Release the screen seal at both A posts. Displace and remove the seal.
Protect the paint around the windscreen aperture using suitable masking tape.
From inside the car, displace the flange dam, noting that the dam remains captive along the lower edge.
To release the screen from the aperture, cut through the 'Betaseal' as follows:
Carefully pierce an access hole through the 'Betaseal' at the top of the A post.
Fit a length of cheese wire through the hole. Secure both ends of the cheese wire to a suitable pair of handles, and carefully cut the screen from the aperture (Fig 1).
CAUTION:' DO NOT 'CRANK THE SCREEN FORWARD TO GAIN ACCESS TO THE BETASEAL AT THE LOWER EDGE OF THE APERTURE FLANGE. THE FLANGE WILL DISTORT, CAUSING THE SCREEN TO FOUL THE WIPER ARM SPRING.
NOTE: Extra care must be taken when cutting 'Betaseal' at the screen corners.
Alternatively, use a suitable vibro-knife bonded glass remover. DO NOT, however, use a 'hot knife', which can cause distortion, trim damage, etc.

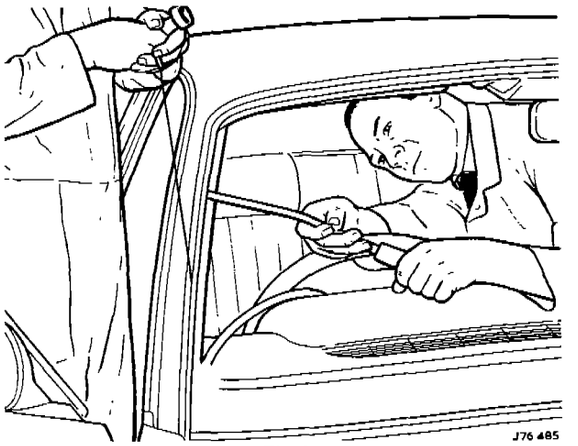


Fig 1

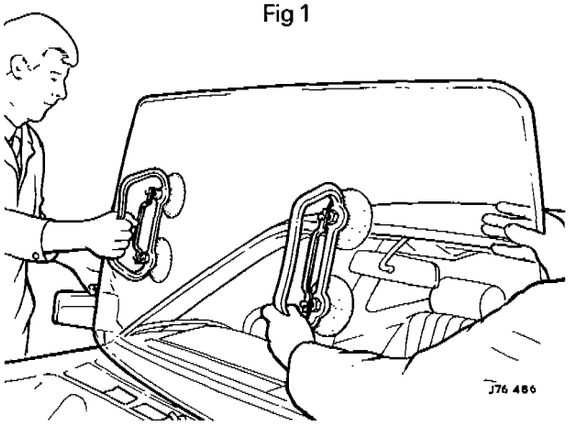


Fig 2

Fit and align lifting handles to the screen. Lower the bonnet. Displace and remove the screen (Fig 2).
Remove the flange dam.
Remove the lifting handles and discard the screen.

Clean the aperture flange with a sharp blade, taking care not to damage the paintwork.
NOTE: A thin layer of sealant may be left on the flange.

Clean the replacement screen edge and aperture flange with spirit wipe. Apply glass primer to the screen.
Apply screen body primer to the flange.
Fit the flange dam to the flange, note the flat side of the dam goes to the inside of the car (Fig 3).
Make two wooden support blocks 8mm thick. Position the blocks on to the flange (Fig 4).
Apply a bead of 'Betaseal' to the screen edge (Fig 1 page 23).
Attach the lifting handles to the screen, carefully fit and align the screen to the aperture, using the wooden blocks as support.
NOTE: Ensure that the gap between screen and A post is equal both sides.
Fully seat the screen to the aperture flange.
Open the bonnet. Remove the masking tape from the aperture.

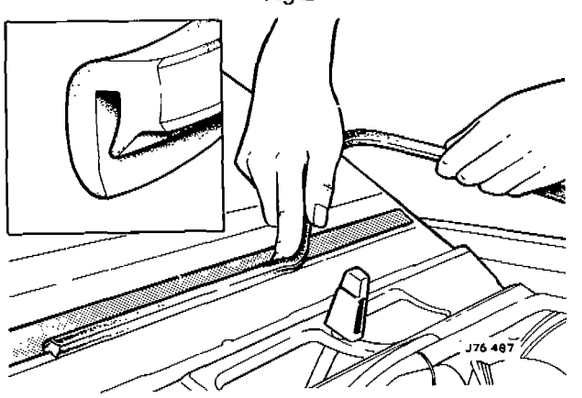


Fig 3

Apply 'Solumin' solution to the screen seal, a suggested method is shown in Fig 2 page 23.
Fit and fully seat the seal to the screen/body (during the Operation, remove the wooden support blocks).

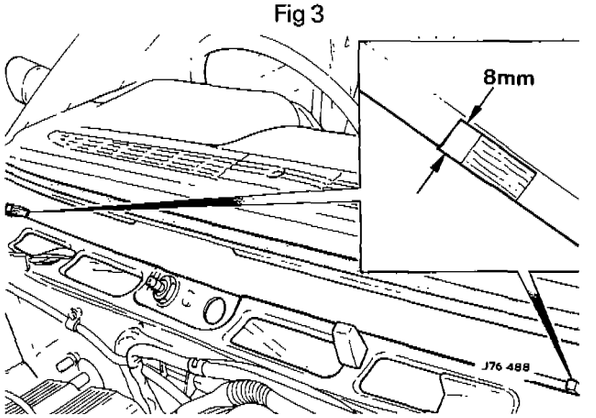


Fig 4

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Clean and remove all moisture from between the seal and the glass.
Apply 'Alphaseal 121' between the screen seal and the screen, DOWN THE A POSTS ONLY.
Apply 'Solumin' solution to the screen seal outer face and, starting at the top of the A post, slide the finishers down into the seal (Fig 3). Seat the top of the finisher with a glazing hook. Fit the finisher clip at the top of the screen (Fig 4).
Remove all excess sealant/solution from the screen. Secure/support the screen with tape.
After the screen has bonded (approximately 2 hours), remove the tape and clean the screen and surrounding area.
Refit the plenum chamber finisher.
Refit the wiper arms. Close the bonnet.

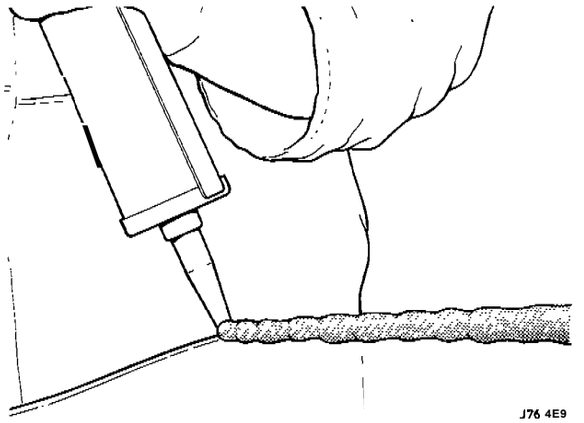


Fig 1



Fig 2

DATA

TORQUE FIGURES

Wiper arm securing nut 17-19Nm

SPANNER SIZES

17mm

SEALANTS/LUBRICANTS

Alphaseal 121
Betaseal
Screen body primer
Screen glass primer
Solumin
White Spirit

REAR SCREEN

RENEW **77.45.03**

Displace and remove the screen finishers.
Release the screen seal at the E **posts.** Displace and remove the seal.
Protect the paint around the screen aperture using suitable masking rape.
Disconnect the heated screen electrical connections.
To release the screen from the aperture, cut through the 'Betaseal' as follows:
CAUTION: IF USING CHEESE WIRE, FIRST REMOVE THE REAR QUARTER UPPER TRIM PADS AND PARCEL SHELF.
Carefully pierce an access hole through the 'Betaseal' at the top of the A post.
Fit a length of cheese wire through the hole. Secure both ends of the cheese wire to a suitable pair of handles, and carefully cut the screen from the aperture.
NOTE: Extra care must be taken when cutting 'Betaseal' at the screen corners.
Alternatively, use a suitable vibro-knife bonded glass remover. DO NOT, however, use a 'hot knife', which can cause distortion, trim damage, etc.
Fit and align lifting handles to the screen. Displace and remove the screen. Remove the flange dam. Remove the lifting handles and discard the screen.

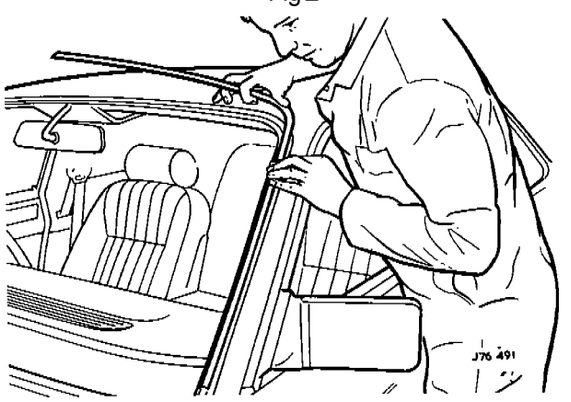


Fig 3

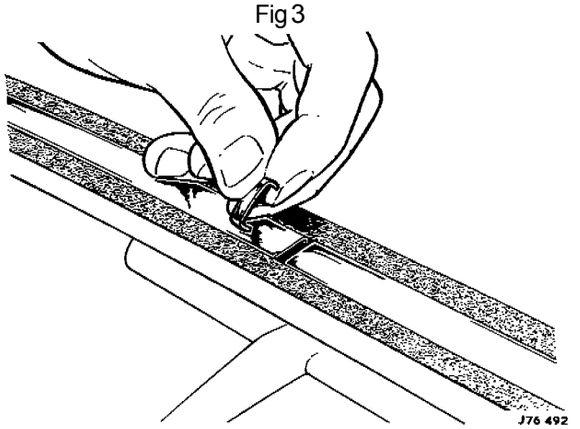


Fig 4

Clean the aperture flange with a sharp blade, taking care not to damage the paintwork.
NOTE: A thin layer of sealant may be left on the flange.
Clean the replacement screen edge and aperture flange with spirit wipe. Apply glass primer to the screen.
Apply screen body primer to the flange.
Fit the flange dam, note the flat side of the dam goes to the inside of the car.
Make two wooden support blocks 8mm thick. Position the blocks on to the flange.
Apply a bead of 'Betaseal' to the screen edge (Fig 1).
Attach the lifting handles to the screen, carefully fit and align the screen to the aperture, using the wooden blocks as support.
NOTE: Ensure that the gap between screen and E post is equal both sides.
Fully seat the screen to the aperture flange.
Remove the masking tape from the aperture.
Apply 'Solumin' solution to the screen seal, a suggested method is shown in Fig 2.
Fit and fully seat the seal to the screen/body (during the operation, remove the wooden support blocks). Clean and remove all moisture from between the seal and the glass.
Apply 'Alphaseal 121' between the screen seal and the screen, DOWN THE E POSTS ONLY.
Apply 'Solumin' solution to the screen seal outer face and slide the finisher down into the seal. Fit the lower edge finisher. Fit the finisher clips.
Remove all excess sealant/solution from the screen. Secure/support the screen with tape.
Refit the trim panels (if removed).
Reconnect the heated rear screen connections.
After the screen has bonded (approximately 2 hours), remove the tape and clean the screen and surrounding area.

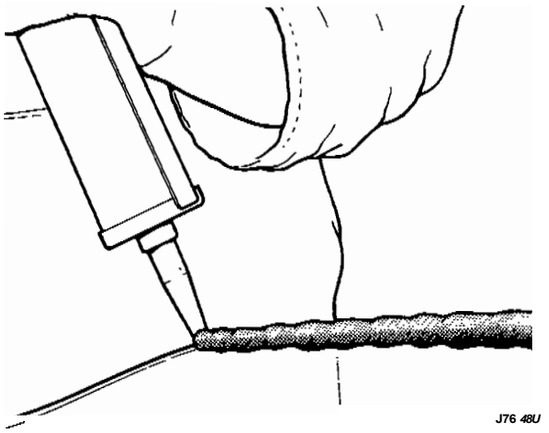


Fig 1

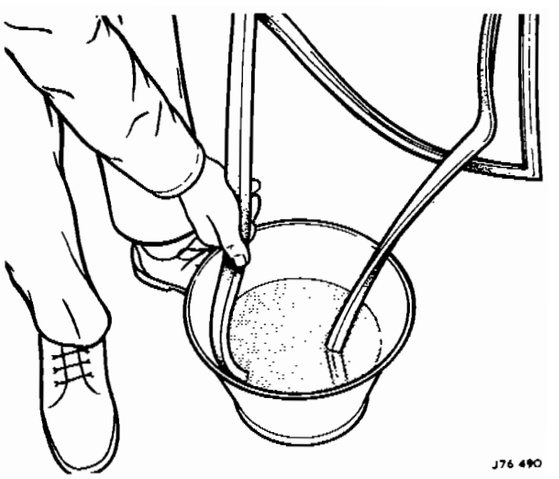


Fig 2

SEALANTS/LUBRICANTS

Alphaseal 121
Betaseal
Screen body primer
Screen glass primer
Solumin
White Spirit

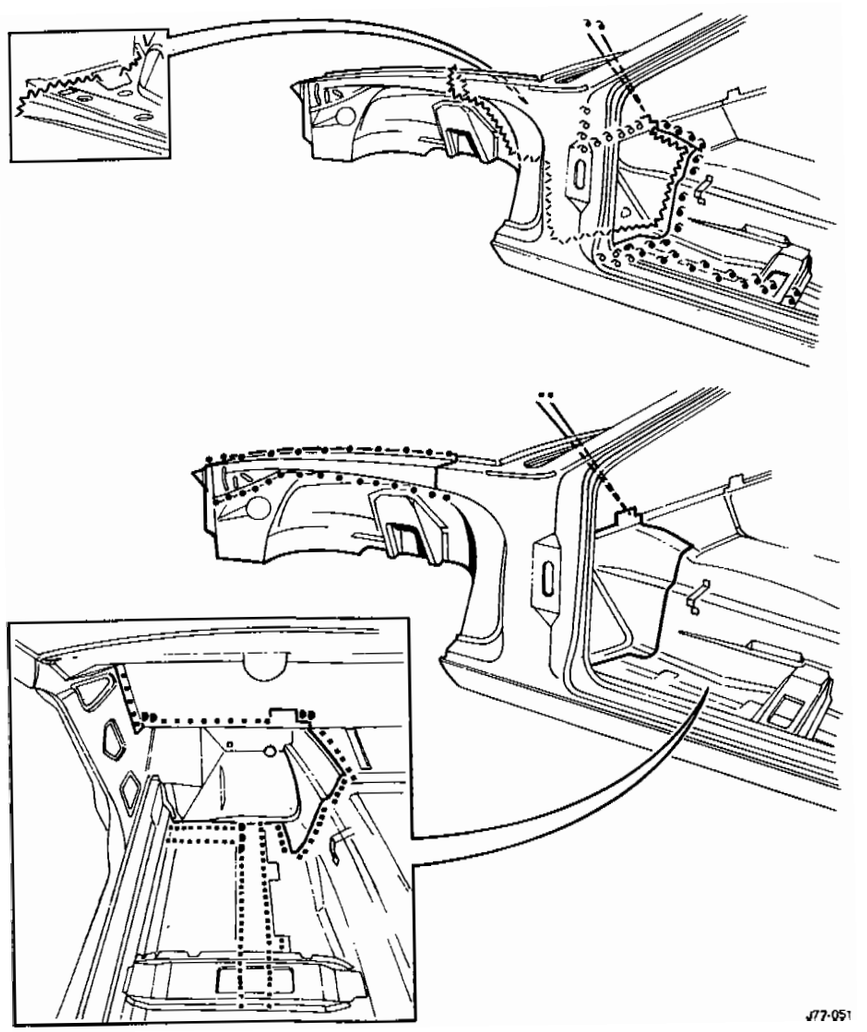
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FRONT END REPAIRS–COMBINATION 2

77.50.04

RENEW

WELDING DIAGRAM



WELDING TABLE

No.	Location	Remove Factory Joint	Replace Repair Joint
1	Chassis leg and out-rigger to floor pan	66 resistance spot welds 3 MIG seam welds	20 MIG plug welds 3 MIG seam welds
2	Flitch assembly to transmission tunnel	15 resistance spot welds	15 MIG plug welds
3	Flitch assembly to bulkhead	22 resistance spot welds 2 MIG seam welds	22 MIG plug welds 2 MIG seam welds
4	Flitch reinforcement to flitch assembly	Removed with panel bulkhead	Single row of resistance spot welds ARO arms 242A and 245A or equivalent

Remove the bonnet assembly 76.16.01.
Remove:
Engine/gearbox assembly 12.41.01/2/20.
Radiator and oil cooler, expansion tank and PAS reservoir.
Front crossmember 76.10.05.
PAS rack 57.10.01.
Steering column 57.40.02/5.
Front to rear fuel and brake pipes.
Brake pipes across the bulkhead.
PAS and air ducting brackets.

Disconnect:
Steering column lower joint (1-3 Fig 1).
Shock absorbers and flexible brake **hoses.**

Remove:
Steering column bracket and UJ assembly (1-4 Fig 2).
Brake/throttle/clutch pedal assemblies.
Remove:
Bonnet catches, locks and control cable assemblies, weatherseals and gas struts.
Front bumper/mounting assembly, radiator grille and surrounds, LH and RH wheel-arch shields, lower front spoiler and washer reservoir.
Front seats, lower 'A and 'B' post trims, front door beading and weatherstrip, rear seat cushion and insulation, and front seat belt assembly.
Battery and battery tray, vacuum bottle assembly, driver's well insulation, scuttle panel and jets, all blanking grommets in bonnet/engine bay area.

Lay aside:
Rear carpets, wiring at upper 'A post and wiring at transmission tunnel.
Remove:
Bonnet lamps and wiring, horns and wiring, LH and RH headlamps, LH and RH repeater flashers, electric fan, and bonnet lamp switch.
LH and RH dash trimboard, instrument panel and housing 88.20.01/13, centre air vents and fascia board 76.46.01.
Processor units, heater blower unit, LH and RH headlamp relay module, centre console, heater box and all bulkhead insulation.
Wiper motor assembly with jets, fascia board brackets, 'A post bracket, positive earth terminal at bulkhead, tunnel carpet and insulation and tunnel wiring loom.

Lay aside:
LH wiring loom to interior, RH wiring loom to interior.
Remove panels:
RH and LH front wings.
Radiator support panel.
Headlamp support panel RH.
Bonnet hinge panel.
Crossmember/closing panel.
Chassis leg mounting RH.
Chassis leg (RH sectioned).
Flitch assembly LH.
Flitch closing panel RH.
Flitch extension panel RH.
Flitch reinforcement panel RH and LH.

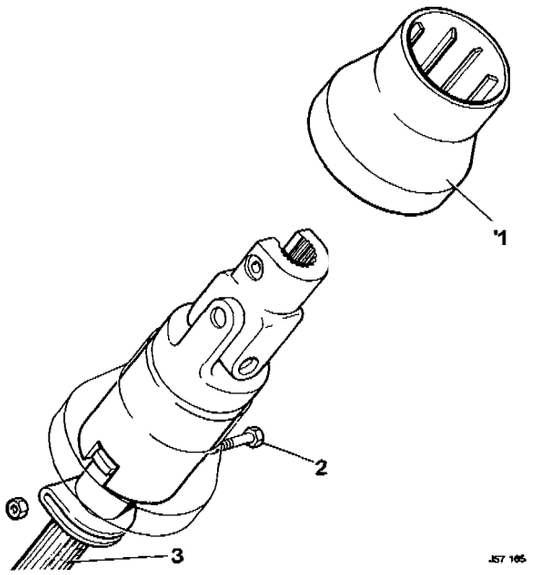


Fig 1

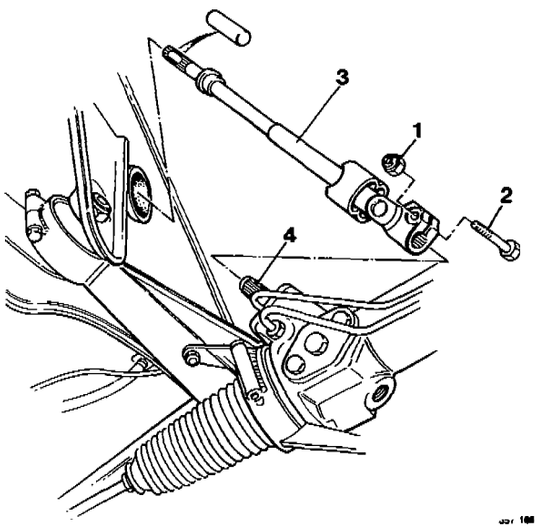
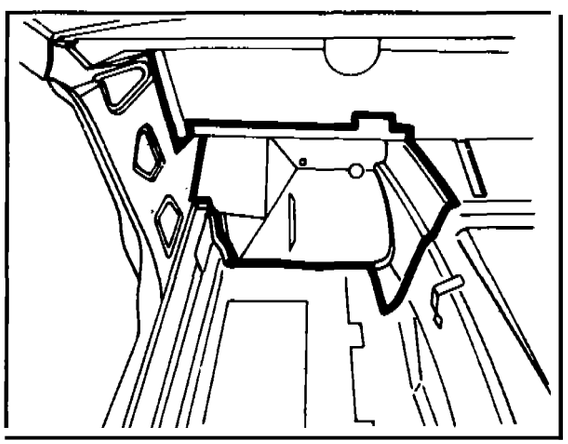


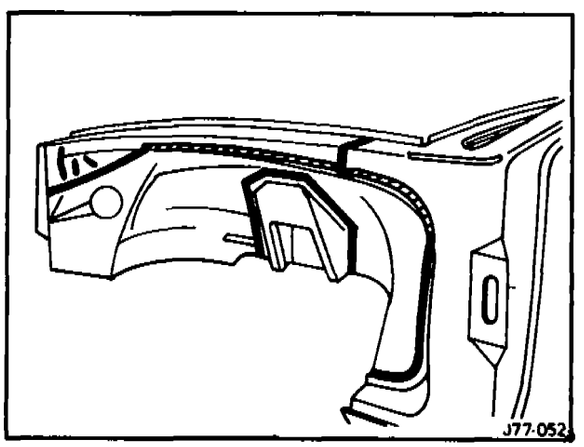
fig 2

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Panel Replacement:
Panel removal and replacement is to the method detailed in Section 77.10.01**-07.**

SEALING DIAGRAMS





Painting: See Section 77.00.00.

Replace Parts: Replace parts in reverse order of removal.
Reconnect battery and alternator, test those electrical items that have been removed and replaced.
Bleed the brakes 70.25.02.
Check/adjust the front wheel **alignment 57.65.01.**
Align headlamps.

0055G

SIDE REPAIRS – COMBINATION 1

RENEW **77.50.01**

Disconnect the battery, alternator and injection wiring loom to the engine.

Jack up the vehicle and support with axle stands.
Remove:
Road wheels.
Steering column and bracket 57.40.02/5.
Brake/throttle/clutch pedal assemblies.

Disconnect:
Heater hose through the bulkhead.

Remove:
Radiator expansion tank 26.15.01 (Fig 1).
Bonnet weatherseals, front bumper/mounting assembly, radiator grille and surrounds.
Wheel-arch shield, lower front spoiler and washer reservoir.
Front seats, lower 'A and 'B' post trims, front door beading and weatherstrip.
Front sill treadplate (1,2 Fig 2), and front seat belt assembly.

Battery and battery tray,
Vacuum bottle assembly, driver's well insulation, scuttle panel and jets.
Gutter moulding and retainers.
Front screen and mouldings.
'B' post outer finisher and front door trim.

Lay aside:
Carpeting.

Remove:
Headlamp, repeater flasher and dash trimboard.
Instrument panel and housing 88.20.01/13.
Centre air vents and fascia board 76.46.01.
Processor units, heater blower unit and all bulkhead insulation.
Wiper arm, fascia and fascia relay bracket,

Lay aside:
Wiring loom to vehicle interior.

Remove panels:
Front wing.
Front door.
Weatherseal panel.
Inner 'A post.
Sill closing panel.
Inner sill (sectioned).
Bodyside (sectioned).

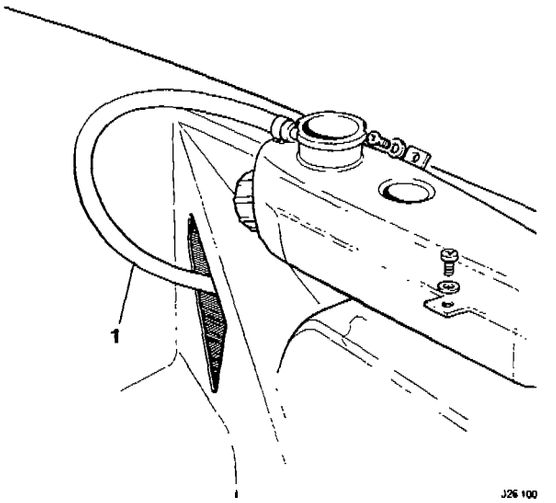


Fig 1

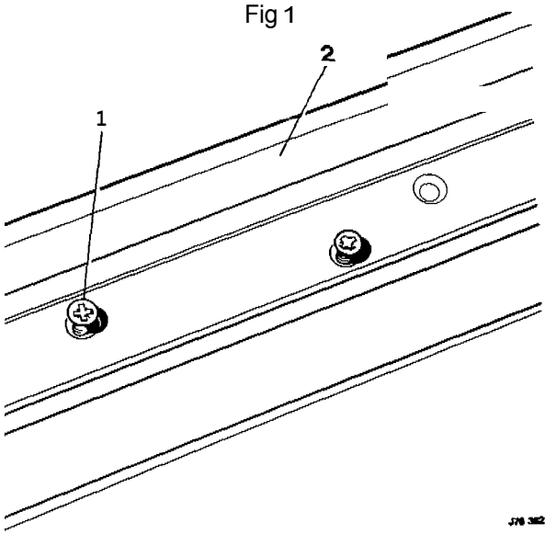
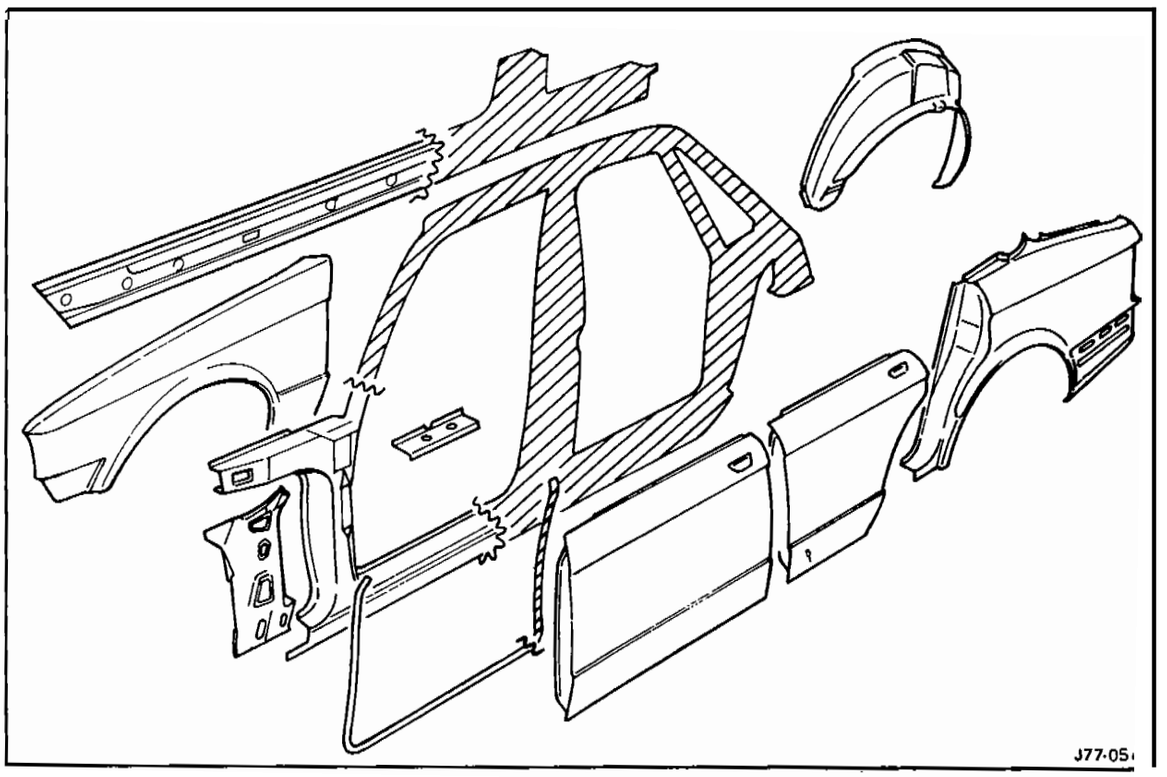


Fig 2

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Panel Replacement:
Panel removal and replacement is to the method detailed in Section 77.10.01-07.

Painting: See Section 77.00.00.

Replace Parts:
Replace parts in reverse order of removal.
Reconnect battery and alternator, test those electrical items that have been removed and replaced.
Bleed the brakes 70.25.02.
Check/adjust the front wheel alignment 57.65.01.
Align headlamps.

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SIDE REPAIRS – COMBINATION 2

RENEW **77.50.02**

Disconnect the battery.
Jack up the vehicle and support with axle stands.
Remove:
Exhaust rear section, rear lamp cluster, rear lamp relay module and electric aerial.
Petrol tank 19.55.01.
Rear screen and mouldings.
Lay aside:
Rear screen wiring, and rear carpeting.
Wiring loom to vehicle interior.
Remove:
Rear seat cushion, seat back and insulation.
Rear sill treadplate (1,2 Fig 1), rear door beading and weatherseal, spare wheel and jack.
Boot mat (Fig 2), petrol tank cover, rear panel trim, rear wing carpet and boot lid weatherseal.
Rear bumper assembly, rear wing vent box, all insulation, rear parcel shelf, upper rear wing trim and rear door striker.
Upper quarter finisher, upper seat belt mounting, rear inertia reel assembly and rear door trim.
Remove panels:
Outer whee-arch.
Rear wing.
Rear door.
Panel Replacement:
Panel removal and replacement is to the method detailed in Section 77.10.01-07.
Painting: See Section 77.00.00.
Replace Parts:
Replace parts in reverse order of removal.
Reconnect battery and alternator, test those electrical items that have been removed and replaced.

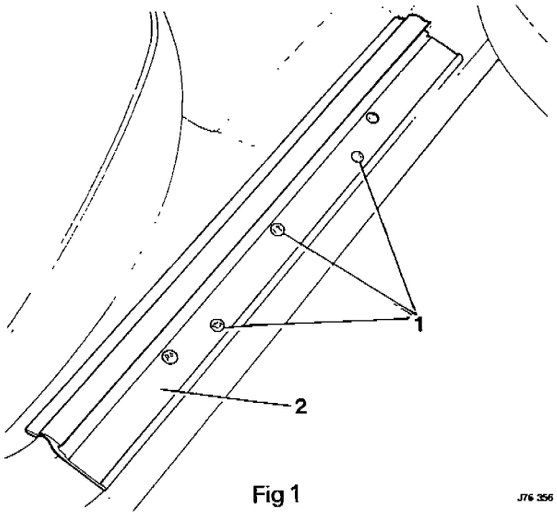
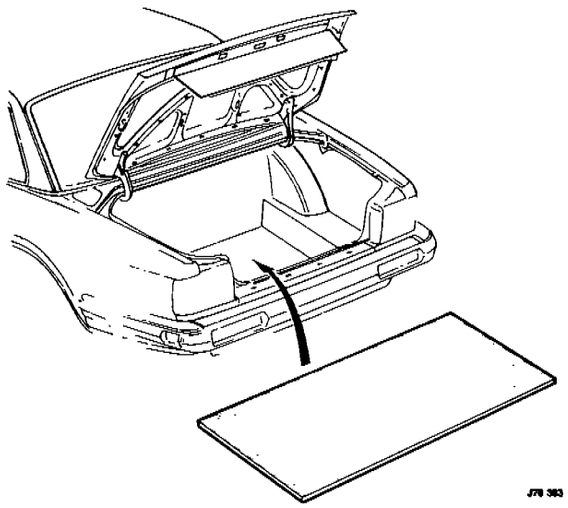
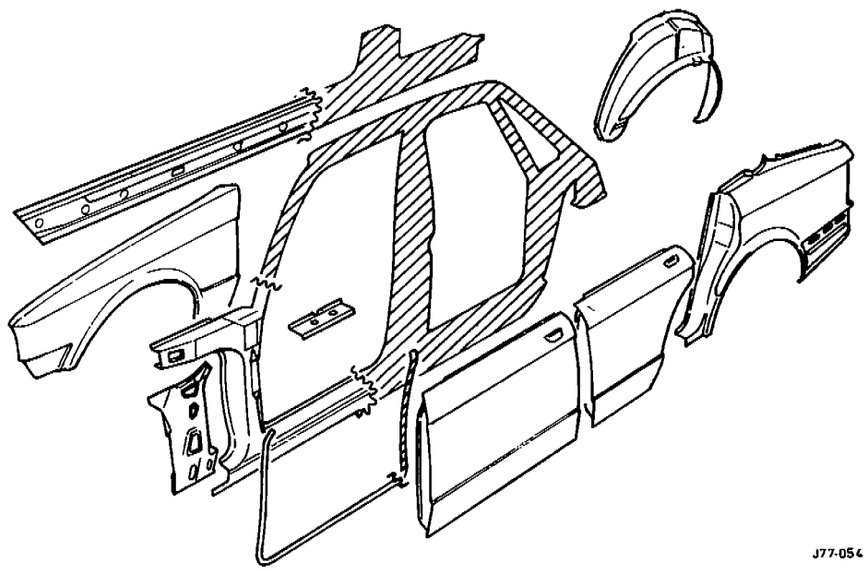


Fig 1 J76 356


Fig 2


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REAR END REPAIRS – COMBINATION 1

RENEW *77.50.05*

Disconnect the battery, alternator and petrol tank wiring.
Jack up the vehicle and support with axle stands.
Remove:
Exhaust rear and middle sections.
Handbrake cable 70.35.16.
Rear axle assembly 51.25.13.
Rear seat heat shield and boot floor heat shield.
Rear shock absorbers, bump stops and petrol tank 19.55.01.
Rear flexible brake hoses.
Lay aside:
Front to rear fuel pipes and pump.
Rear lamp cluster, rear lamp relay module, RH and LH number plate lamps and electric aerial.
Rear screen and mouldings.

Lay aside:
Rear screen wiring.
Rear carpeting.
Wiring loom to vehicle interior.

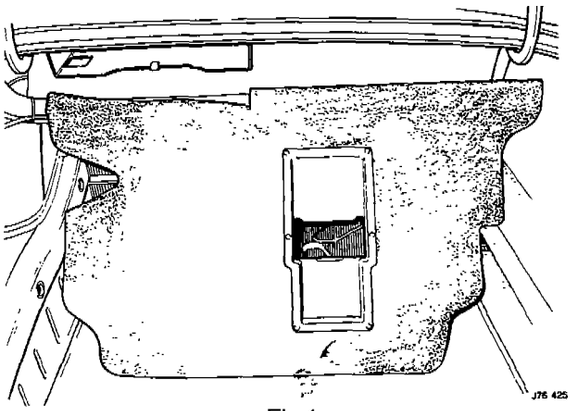


Fig 1

Remove:
Rear seat cushion, seat back and insulation.
Rear sill treadplate.
Rear seat cushion, seat back and insulation.
Rear sill treadplate, rear door beading and weatherseal, spare wheel and jack.
Boot mat, petrol tank cover, rear panel trim (Fig 1), rear wing carpet (Fig 2) and boot lid weatherseal.
Rear bumper assembly, boot lip finishers, rear wing vent box, all insulation, rear parcel shelf, upper rear wing trim and rear door striker.

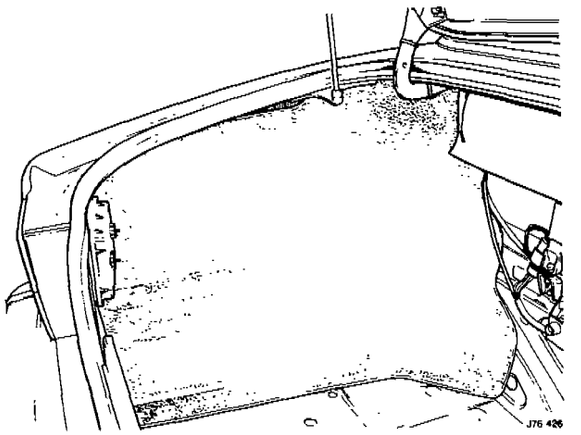


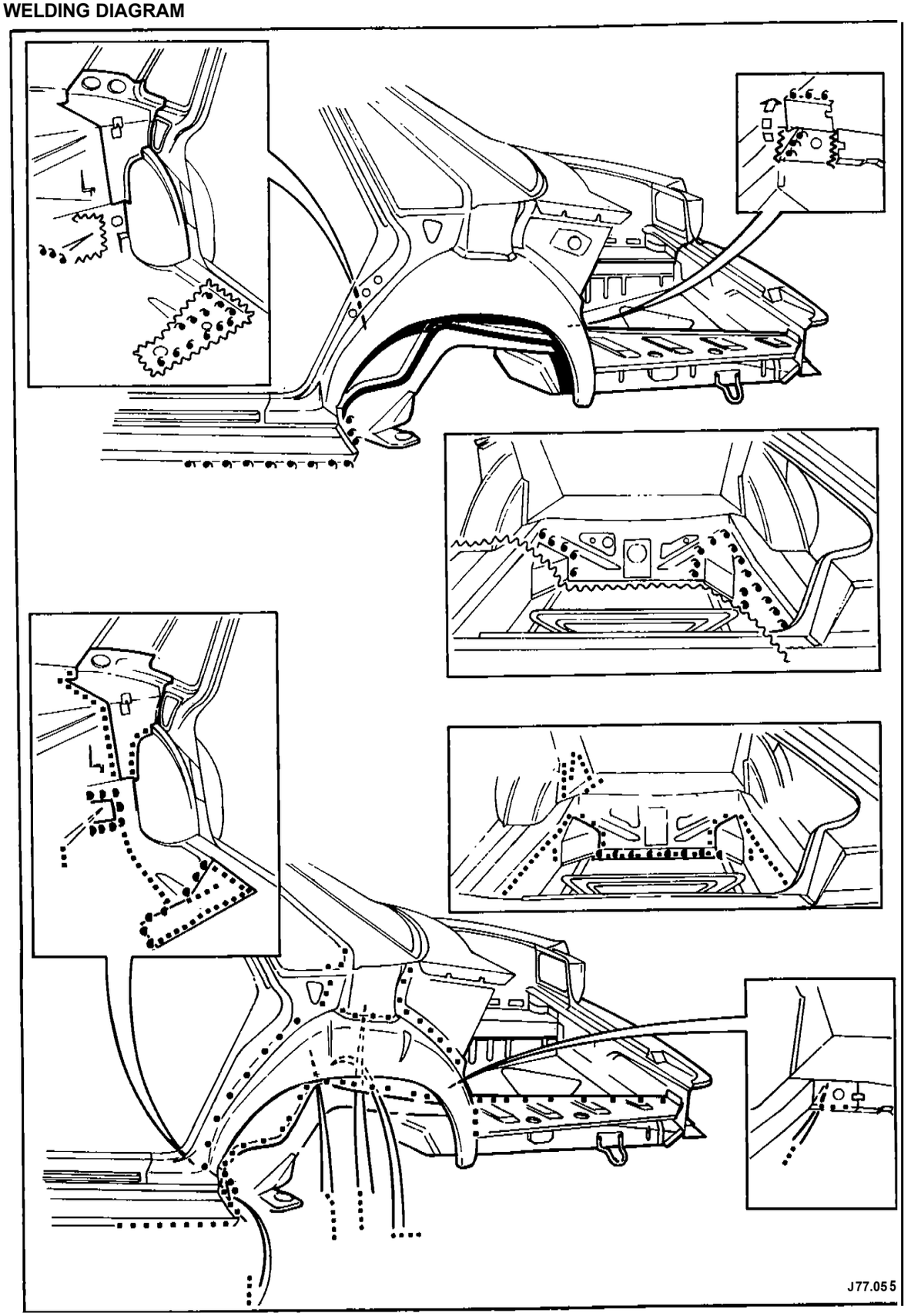
Fig 2

Remove:
Rear wing chrome finisher, rear seat belt locks and mountings, boot lid damper ball joint and boot lid striker.
Headlining rear finisher, petrol tank and wheel-arch insulation, boot and rear floor grommets and boot lid trim.

Lay aside:
RH and LH wiring looms to vehicle interior, boot lid wiring loom and rear screen wiring.
Rear carpeting.

Remove panels:
Boot lid.
Rear wing.
Wheel-arch including top box and gusset.
Rear panel.
Boot floor extension panel.
Boot floor sectioned).
Chassis leg.

WELDING DIAGRAM



NOTE: For rear wing and rear panel welding diagrams, see 77.25.02 and 77.35.01.

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WELDING TABLE

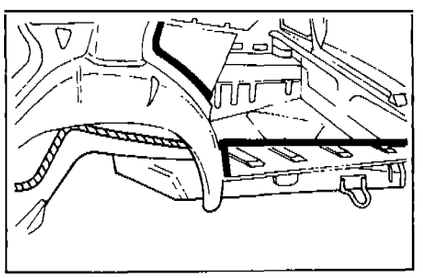
No.	Location	Remove Factory Joint	Replace Repair Joint
1	Rear wheelarch assy and chassis leg to floorpan and heelbaard	Removedwith panel bulk	47 **MIG** plug welds
2	Rear wheelarch assy to heelboard interior	3 MIG plug welds	3 **MIG** plug welds **1 X MIG** seam welds
3	Rear chassis leg to floor and rear seat crossmember		20 **MIG** plug welds 2 X **MIG** seam welds
4	Rear chassis leg to sill lower flange	9 resistancespotwelds	9 MIG plug welds
5	Rear wheelarch assy to inner wing at vertical gusset	Removedwith panel bulk	Single row of resistancespotwelds ARO arms 242A or equivalent 34 **MIG** plug welds
6	Rear chassis leg to inner sill rear flange	3 resistancespot welds	3 resistance spot welds **ARO** arms 242A or equivalent
7	Rear wheelarch to chassis leg	Removed with panel bulk	22 **MIG** plugwelds
8	Bootfloor side extension to chassis leg	Removedwith panel bulk	12 MIG plug welds
9	Bootfloor section to chassis leg RH and LH	29 resistancespot welds each side	**25 MIG** plug welds each side
10	Bootfloor section to rear bulkhead at end section RH and LH	10 resistance spot welds each side	10 **MIG** plug welds each side
11	Bootfloor section existing panel at rear bulkhead lower flange		30 **MIG** plugwelds 10 MIG tackwelds
12	Rear wheelarch assy to boot side reinforcement	Removedwith panel bulk	16 MIG plug welds
13	Rear wheelarch assy to boot floor crossmember	3 **MIG** plug welds	**6 MIG** plug welds

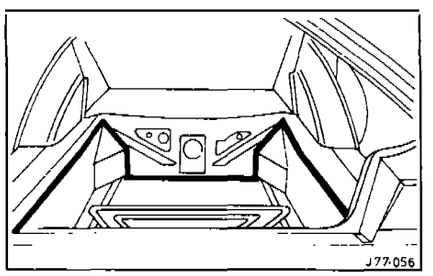
Panel Replacement:
Panel removal and replacement is to the method detailed in Section 77.10.01-07.
Sealing diagrams are shown below.

Painting: See Section 77.00.00.

Replace Parts:
Replace parts in reverse order of removal.
Reconnect battery and alternator, test those electrical items that have been removed and replaced.
Bleed the brakes 70.25.02.

SEALING DIAGRAMS





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CENTRE FASCIA VENT OUTLET	RENEW	80.15.48	80-17
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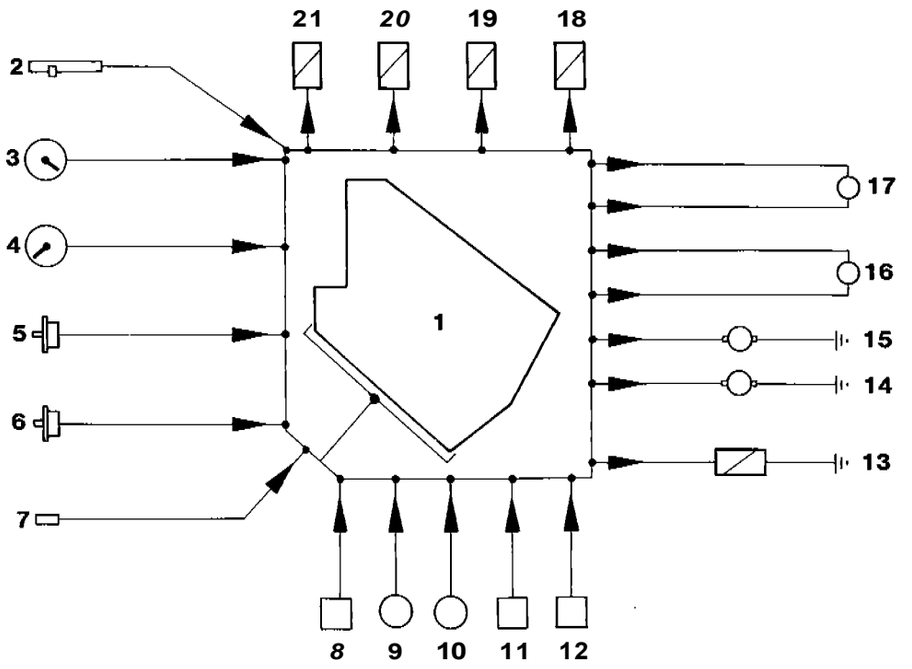
HEATING AND VENTILATION

DESCRIPTION 80.00.00

Electronic Control Module

The electronic control module is located on the right hand side of the heater box assembly.
At the heart of the electronic control module is a digital micro-processor which receives data signals from driver controlled switches, then by comparing this data with the signals received from the various temperature sensors and feedback devices it calculates the output voltages needed to operate the blower motors at the required speed, the flap servo motors to the required positions, and the vacuum solenoids to acheive the temperature requirements above ambient selected by the driver for the vehicle.
Although the control module cannot be be repaired in service, a complete set of test pins are accessible for testing the system. Great care must be exercised when connecting the test equipment. The control module will be irreparably damaged should any of the test pins be momentary shorted together.

Key to Diagram
1 Control module
2 Differential temperature control
3 Temperature control
4 Blower motor switch
5 Ambient temperature sensor
6 In-car temperature control
7 Solar sensor
8 Coolant temperature switch
9 Flap feedback potentiometer
10 Flap feedback potentiometer
11 Blower motor feedback
12 Blower motor feedback
13 High speed relay
14 Blower motor
15 Blower motor
16 Flap servo motor
17 Flap servo motor
18 Defrost vacuum solenoid
19 Recirculation vacuum solenoid
20 Centre vent vacuum solenoid
21 Water valve vacuum solenoid



Temperature Distribution

The heating and ventilation unit case (Fig 1) consists of three parts, the rear of which in air conditioning systems would contain an evaporator. The front contains the heater matrix and is in two parts to enable the rotary flaps to be inserted. **Foot** outlet boxes are moulded in plastic and are removable for access.

Air into the unit either passes through the heater matrix, bypasses the matrix completely, or **a** combination of both to achieve the air temperature required above ambient.

The system employs **two** flaps that are driven to the required position (determined by the control system) by servo motors and gear-box assemblies.

The motors can rotate in either **a** clockwise or anti-clockwise direction depending on the direction of current flow through the motor.

The flap positions are monitored by feedback potentiometers located on the opposite side of the heater case to the servo motors, which supplies **a** voltage signal to the control module indicating the flap position.

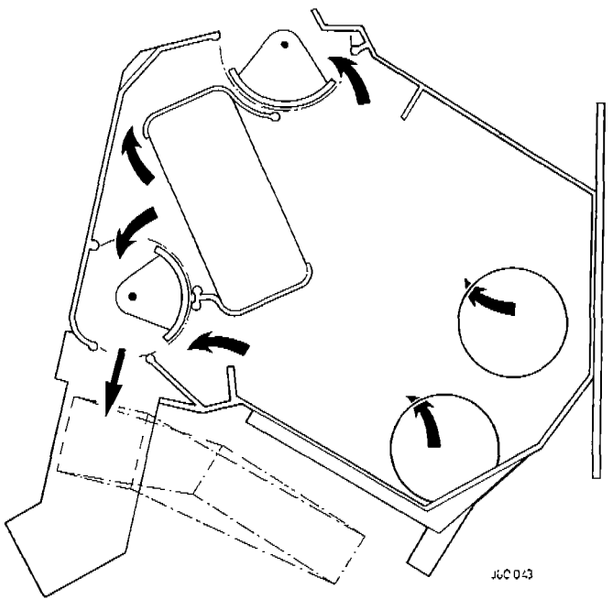


Fig 1

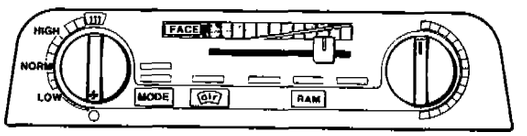


Fig 2

Control Panel

The switch control panel (Fig 2) contains a blower motor control rotary switch, auto/manual mode switch, air switch, ram switch, temperature differential selector and **a** in-car temperature selector. The control panel produces digital outputs which are supplied to and used by the electronic control module.

The airflow from the blower motors is controlled by the rotary switch located **on** the left hand side of the control panel. The switch has five positions:- OFF, LOW, MED, HIGH, and DEFROST.

In the **OFF** position the system is not operational. Power to the electronic control module **(E.C.M.)** and to the control potentiometers is removed, but a signal is Sent to the **E.C.M.** this is to ensure the flaps are closed preventing outside air from entering the system.

In the LOW, MED and HIGH positions, information regarding the range of fan speed selected is received by the control module from the control switch. Signals are also received by the **E.C.M** from the temperature selector, feedback circuits and the various sensors. The fan speed is then electronically controlled by the **E.C.M. So by** selecting LOW, MED or HIGH a level of speed in the range selected is received dependent on requirements. There are no distinct steps between the fan speeds, but a gradual increase or decrease of speed.

When **DEFROST** is selected the fans are electronically controlled to operate at maximum speed, the screen vents open, maximum heating is obtained and the lower flaps fully close (it can take up to a maximum period of 30 seconds to complete this function).

The temperature control located on the right hand side of the control panel is turned fully clockwise to obtain maximum heating.

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When the mode button is set to auto the word **'AUTO' will** appear. **The** control system uses all the sensors to maintain the temperature selected. The system automatically adjust the flaps to achieve the disired results.
When the button is set in the manual mode the word 'MAN' will appear. The system overrides the sensors and gives the option of maintaining the selected temperature output air at or above ambient, regardless of ambient and in-car conditions.
The 'MODE' button will not function when 'RAM' is selected.
The air button (demist) when pressed will open the defrost flaps and increase the amount **of** air to the screen.
When the 'RAM' button is pressed, the word 'MAN' will appear above the mode button together with 'RAM' above the **'RAM'** button. The system autumatically goes into the 'MAN' mode.
Air **is** supplied by the foreward movement of the vehicle and the force **of** the air is dependent on the vehicle's speed.
The blower motors are disengaged except when 'DEFROST is selected.
Pressing the button again restores the system to the previous selected position on the **'MODE'** button.
The slide control (Air Differential Control) is used to alter the air temperature being distributed through the face level vents. To increase the air temperature being delivered through the vents, the slide control is moved to the right and to decrease the temperature the control **is** moved to the left.
Pressing the 'AIR' button increases the amount of air distributed to the windscreen and improves demisting. **It** is most effective under normal operation of the heater unit.
The centre vent is controlled automatically and only opens when the system is switched to full cooling to **supply** air at ambient temperature.
The vents at the end of the fascia supply ambient or heated air.

Temperature Sensors
There are two temperature sensors fitted into the system, the ambient and the in-car temperature sensors.
An input voltage is supplied to the sensors from AC4-13 of the control module. The temperature sensing signal from the sensor is transmitted into the control module via **AC4-4** and **AC2-4** respectively. The sensors are semi-conductor devices which are accurate over a wide temperature range. The semi-conductor **is** similar to **a** zenor diode in as much as it allows current to flow in reverse bias, but the current flow varies with temperature. The sensor assemblies have built in potentiometers which are preset and must not be adjusted.

Solar Sensor

A solar sensor (Fig 1) is fitted to reduce the temperature demand. This has the effect of stabilising the in-car temperature whilst reducing air outlet temperatures to compensate for increased solar load. This sensor is constructed round a photo transistor whose sensing voltage will vary with the ambient light level. An input is supplied to the sensor from **AC4-13** of the control module. The sensing voltage from the sensor is then fed back into the control module via **AC4-6.**

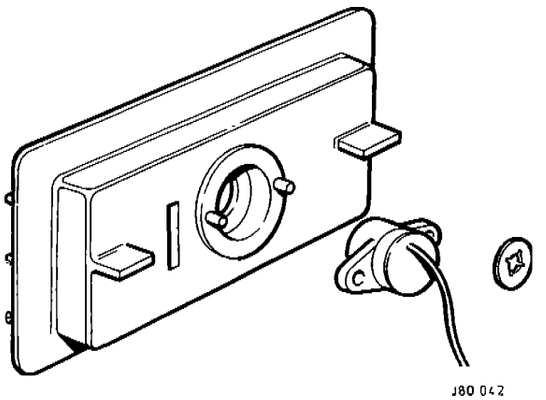


Fig 1

Coolant Temperature Switch

A coolant temperature switch (Fig 2) is fitted to the lower side of the heater matrix inlet pipe. Its contacts are open at temperatures below **40°C,** this will prevent the fans from operating when heat is required until relatively hot coolant is flowing through the system.

Blower Motor Speed Control

Mounted in the outlet of the blower motor units are heatsink assemblies each of which consists of an interferancesuppressor diode, a feedback isolation diode and a power transistor, The unit is supplied with battery power via an ignition switch controlled fuse and an isolation relay mounted within the blower motor assembly.

On all fan speed except high speed the negative circuit for the fan motor is via the power transistor and the control module. The feedback diode enables the control module to sense the voltage at the negative terminal of the fan motor and so calculate the speed of the blower motor. With the fan motor switched to high speed the high speed relay is energised closing the relay contacts giving the fan motor negative circuit a direct path to earth via the relay contacts, bypassing the transistor and the control module.

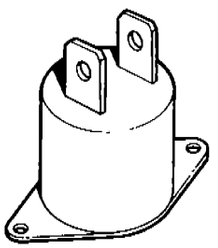


Fig 2

Vacuum System

The vacuum supply to four solenoids in the system is from the engine manifold via a reservior located under the battery and a non return valve.

The vacuum solenoids (Fig 3) are located on brackets beneath the heater assembly.

Components operated by the solenoids are:

1 Defrost/Demist flaps which are held **closed** by vacuum is identified by a green vacuum supply tube.
2 Recirculation/Fresh air flaps which are held closed by vacuum is identified by a blue vacuum supply tube.
3 Centre vent, which is opened by vacuum is identified by a black vacuum supply tube.
4 Coolant valve which is closed by vacuum and is identified by a red vacuum supply tube.

The vacuum supply to the centre vent and recirculation/ fresh air flaps have built restrictors so that the operation of these flaps are slowed down to avoid the risk of the system hunting. The recirculationflaps can take up to 30 seconds to change state.

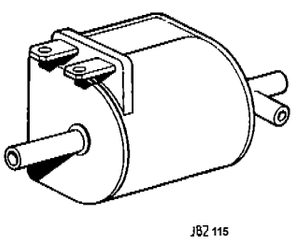


Fig 3

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HEATER SWITCH CONTROL MODULE

RENEW **86.80.14**

Disconnectthe batteryearth lead.
Removethe gear lever knob.
Removethe console finisher.
Remove the screws securing the upper console assembly and displacethe console assemblyfor access.
Slackenthe screws securingthe control module (Fig 1).
Disconnectthe cable harness block connector.
Removethe control module.

Fitting a new control module is the reversal of the removal procedure.

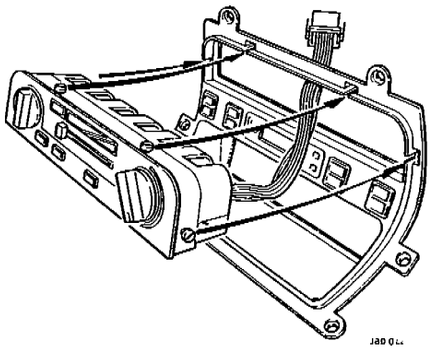


Fig 1

0209G

ELECTRONIC CONTROL MODULE (ECM)

RENEW **80.10.52**

Disconnectthe batteryearth lead.
Removethe passengerdash liner.
Removethe screws securingthe control module (Fig 2).
Displacethe modulefrom its location.
Disconnectthe earth lead.
Noteand disconnectthe multi-plug connectors.
Removethe control module.

Fitting a new control module is the reversal of the removal procedure ensuring the multi-plugs are secure and tight.

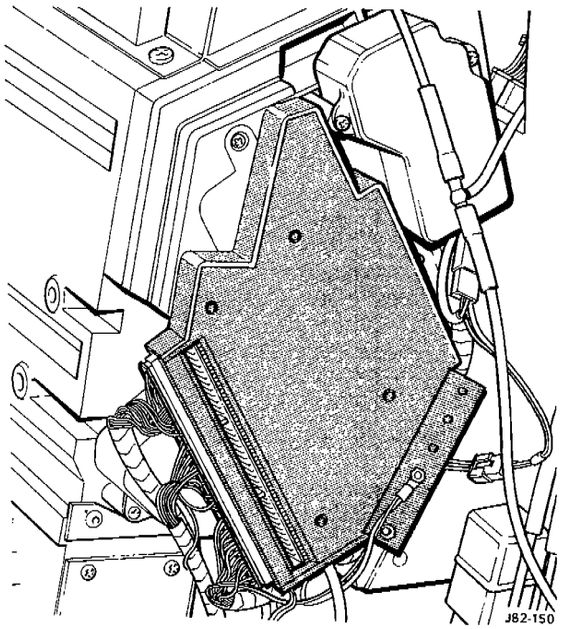


Fig 2

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HEATER MATRIX

RENEW **80.20.29**

Disconnectthe batteryearth lead.
Drainthe coolant.
Removethe driver and passenger side dash liners.
Removethe glove box lid and glove box.
Removethe matrix pipe gaskets.
Remove the screws securing the electronic control moduleand displacethe modulefor access (Fig 2).
Remove the screws securing the matrix housing and removethe housing halves.
Removethe matrix (Fig 3).
Removethe foam strip from the matrix.

Fitting a new matrix is the reversal of the removal procedure

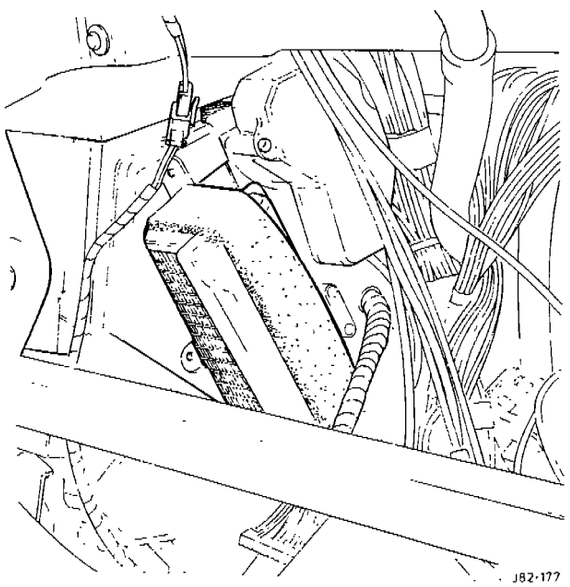


Fig 3

0209G

HEATER MATRIX PIPE GASKET

RENEW **80.20.04**

Disconnect the battery earth lead.
Drain the coolant.
Remove the passenger dash liner.
Remove the glove box lid and glove box.
Disconnect the coolant temperature switch supply cables (1 Fig 1).
Remove the screws securing the heater matrix pipe housing (2 Fig 1).
Remove the housing halves.
Displace the foam pad.
Remove the screws securing the pipes.
Displace the pipes for access (3 Fig 1).
Remove the gaskets.
Clean the surface of the matrix.
Fitting new gaskets is the reversal of the removal procedure.

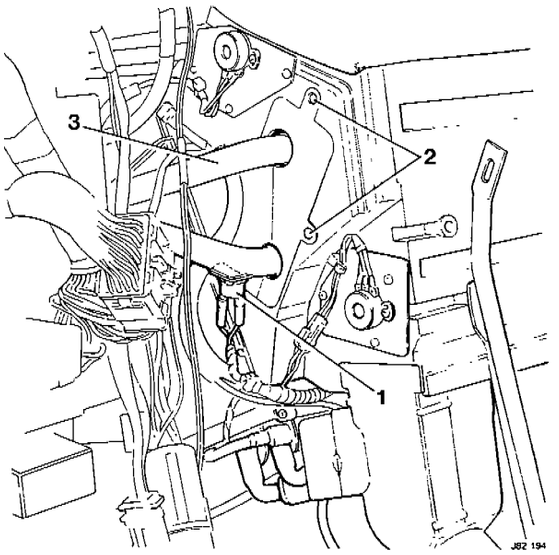


Fig 1

HEATER COOLANT VALVE

RENEW **80.10.16**

Drain the coolant.
Slacken the coolant hose to valve securing clip and disconnect the hose (3 Fig 2).
Slacken the valve to heater feed pipe hose clip (2 Fig 2).
Disconnect the vacuum hose elbow (1 Fig 2).
Remove the valve assembly (4 Fig 2).
Slacken the hose clip and remove the hose.
Fitting a new coolant valve is the reversal of the removal procedure.

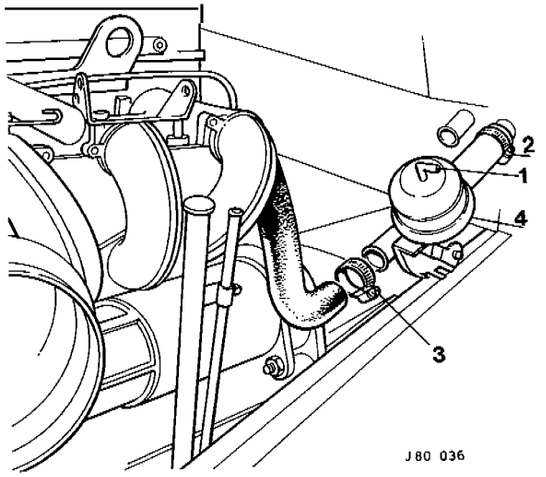


Fig 2

BLOWER MOTOR ASSEMBLY (DRIVER SIDE)

RENEW **80.20.11**

Disconnect the battery earth lead.
Remove the drivers dash liner.
Remove the clip retaining the pliable trunking to the heater unit.
Displace the pliable trunking from the heater unit.
Remove the bolts securing the motor assembly.
Disconnect the cable harness multi-plug.
Cut and remove rachet strap securing the brake switch cable harness.
Disconnect the vacuum pipe from the servo.
Remove the blower assembly (Fig 3).
Remove the gasket and trunking from the blower motor assembly.
Secure the trunking and new gasket to the new blower motor assembly.
Smear the gasket with glue and fit the assembly in position.
Fit but do not tighten the securing bolts.
Connect the vacuum hose to the servo.
Connect the cable harness multi-plug connectors.
Connect and secure with retaining clip the trunking to the heater unit.
Tighten the blower motor securing bolts.
Refit the dash liner.

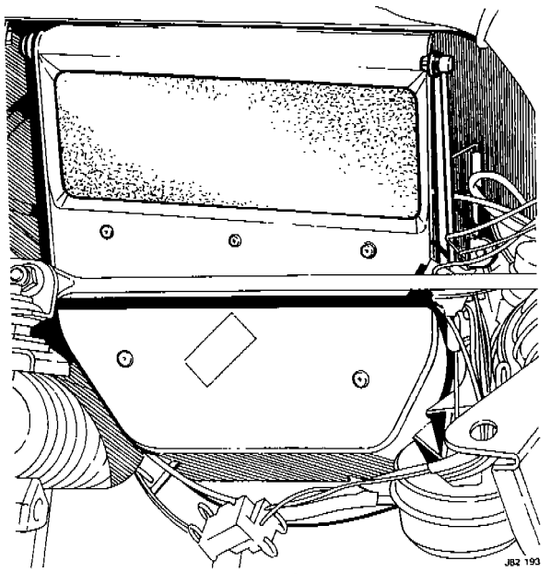


Fig 3

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BLOWER MOTOR ASSEMBLY (PASSENGER SIDE)

RENEW **80.20.12**

Disconnectthe battery earth lead.
Removethe passenger dash liner.
Removethe glove box lid and glove box.
Remove the lower screws securing the central processor.
Displacethe earth lead and remove the spacers.
Slacken the upper screws securing the processor.
Raise the processor to disengage from the upper screws and place downwards.
Remove the screws and bolts securing the processor mounting bracket.
Removethe bracket.
Removethe bolts securing the blower motor assembly.
Disconnectthe cable harness multi-plug connector.
Disconnect the in-car sensor hose from the pliable trunking.
Disconnectthe vacuum pipe from the servo.
Remove the clip retaining the pliable trunking to the heater unit.
Displace the pliable trunking from the heater unit.
Removethe blower assembly (Fig 1).
Remove the gasket and trunking from the blower motor assembly.

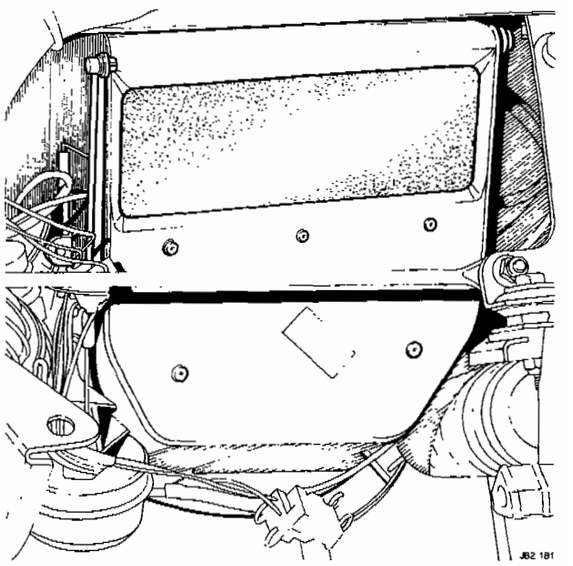


Fig 1

Secure the trunking and new gasket to the new blower motor assembly.
Smear the gasket with glue and fit the assembly in position.
Fit but do not tighten the securing bolts.
Connect the vacuum hose to the servo.
Connect the cable harness multi-plug connectors.
Connect the in-car sensor to the trunking.
Connect and **secure** with retaining clip the trunking to the heater unit.
Tighten the blower motor securing bolts.
Fit the central processor in the reverse order of the removal procedure.
Fit the dash liner.

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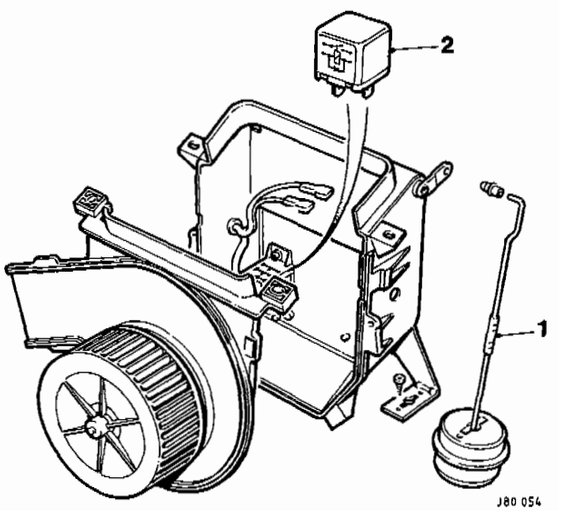


Fig 2

BLOWER MOTOR ISOLATION RELAY (DRIVER SIDE)

RENEW **80.10.42**

Disconnectthe battery earth lead.
Remove the drivers side dash liner.
Remove the blower motor assembly 80.20.11 page 09.
With the blower motor assembly on a work bench disconnect the vacuum servo to flap link arm (1 Fig 2).
Open the flap.
Displace the cable harness for access.
Remove the relay (2 Fig 2).

Fitting a new relay is the reversal of the removal procedure.

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BLOWER MOTOR ISOLATION RELAY (Passenger Side)

RENEW **80.10.41**

Disconnect the battery earth lead.
Remove the passenger dash liner.
Remove the glove box lid and glove box.
Remove the blower motor assembly 80.20.12 page 10.
With the blower motor assembly on a work bench disconnect the vacuum servo to flap link arm (1 Fig 1).
Open the flap.
Displace the cable harness for access.
Remove the relay (2 Fig 1).

Fitting a new relay is the reversal of the removal procedure.

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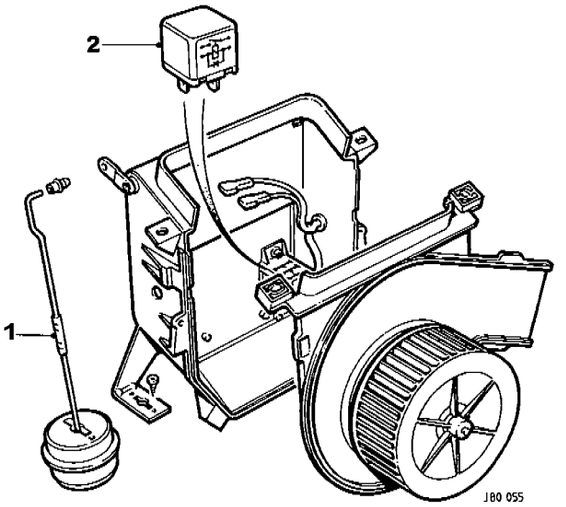


Fig 1

BLOWER MOTOR HIGH SPEED RELAY

RENEW **80.10.39**

Disconnect the battery earth lead.
Remove the relevant dash liner.
Disconnect the servo to blower flap link arm (1 Fig 2).
Open the flap.
Displace and remove the relay (2 Fig 2).

Fitting a new relay is the reversal of the removal procedure.

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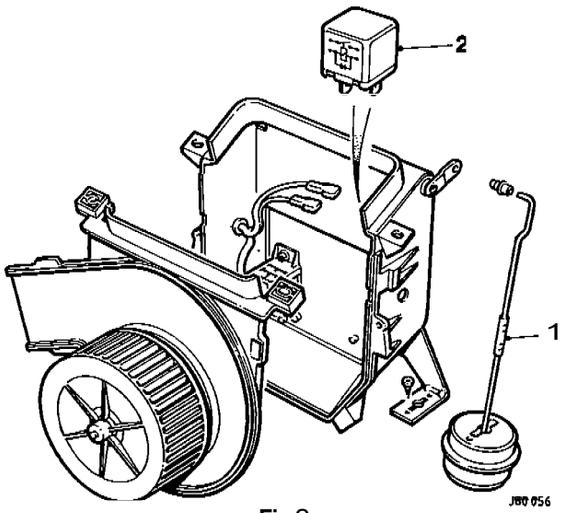


Fig 2

UPPER FLAP SERVO MOTOR & GEARBOX

RENEW **80.10.45**

Disconnect the battery earth lead.
Remove the driver side dash liner.
Remove the screws securing the electronic control module (1 Fig 3).
Displace the module for access.
Remove the screws securing the motor assembly (2 Fig 3).
Displace the assembly for access.
Disconnect the cable harness multi-plug connector.
Remove the motor assembly.

Fitting a new motor assembly is the reversal of the removal procedure.

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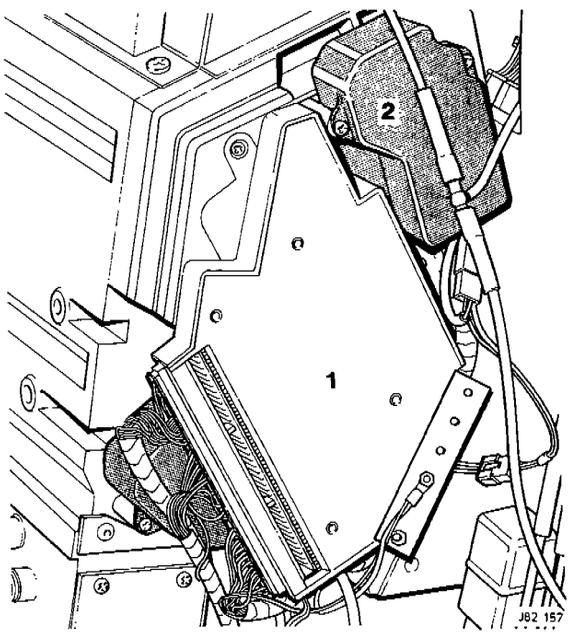


Fig 3

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UPPER SERVO MOTOR FEEDBACK POTENTIOMETER

RENEW **80.10.44**

Disconnect the battery earth lead.
Remove the passenger dash liner.
Remove the screws (Fig 1) securing the potentiometer mounting plate.
Displace the potentiometer from the flap drive shaft.
Disconnect the multi-plug connector.
Remove the potiometer assembly.

Fitting a new potentiometer is the reversal of the removal procedure.

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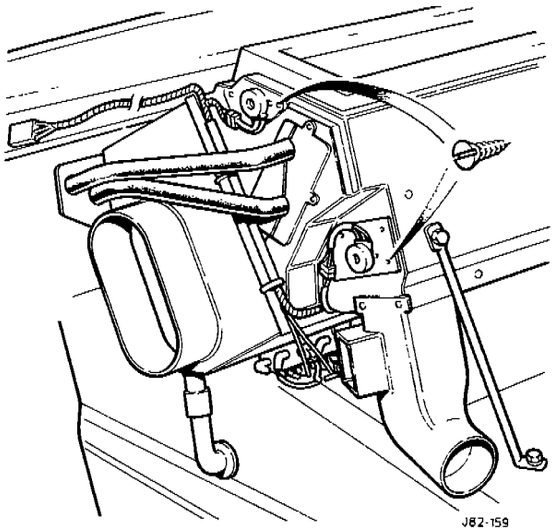


Fig 1

LOWER FLAP SERVO MOTOR & GEARBOX

RENEW **80.10.46**

Disconnect the battery earth lead.
Remove the drivers dash liner.
Remove the screws securing the electronic control module (1 Fig 2).
Displace the module for access.
Remove the screws securing the motor assembly.
Displace the assembly for access.
Disconnect the cable harness multi-plug connector.
Remove the motor assembly (2 Fig 2).

Fitting a new motor assembly is the reversal of the removal procedure.

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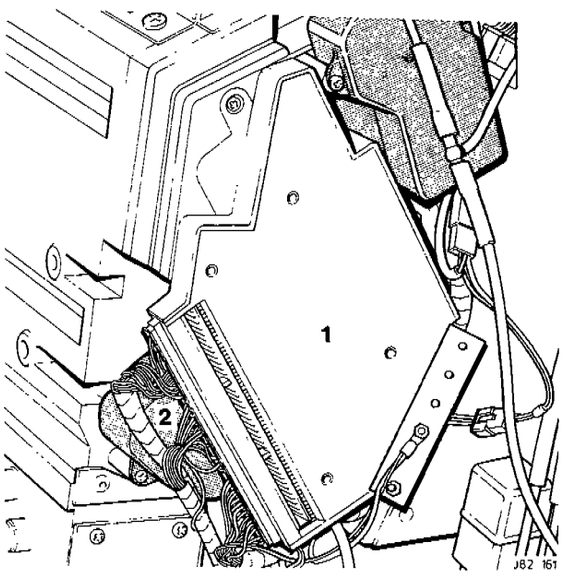


Fig 2

LOWER SERVO MOTOR FEEDBACK POTENTIOMETER

RENEW **80.10.43**

Disconnect the battery earth lead.
Remove the passenger dash liner.
Remove the screws securing the potentiometer mounting plate (Fig 1).
Displace the potentiometer from the flap drive shaft.
Disconnect the multi-plug connector.
Remove the potiometer assembly.

Fitting a new potentiometer is the reversal of the removal procedure.

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CENTRE FASCIA VENTILATOR FLAP SERVO

RENEW **80.15.51**

Disconnect the battery earth lead.
Remove the driver and passenger side dash liners.
Remove the driver and passenger side closing panels.
Remove the steering wheel.
Remove the glove box lid and glove box.
Remove the fascia centre panel.
Remove the fascia centre vent outlet.
Remove the fascia board and centre vent.
Remove the screws securing the servo.
Remove the nut/bolt securing the servo to vent.
Disconnect the vacuum pipe from the servo.
Remove the spire clips.
Remove the servo (Fig 1).

Fitting a new ventilator flap servo is the reversal of the removal procedure

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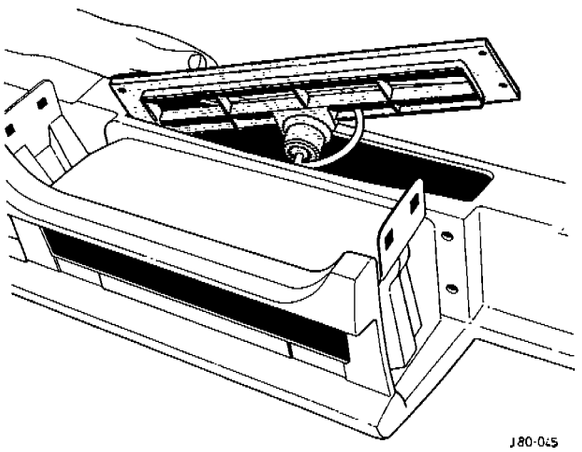


Fig 1

DEMISTER FLAP SERVO

RENEW **80.15.52**

Disconnect the battery earth lead.
Remove the driver and passenger side dash liners.
Remove the driver and passenger side closing panels.
Remove the steering wheel.
Remove the glove box lid and glove box.
Remove the fascia centre panel.
Remove the fascia centre vent outlet.
Remove the fascia board and demister outlet duct.
Remove the screws securing the demist vent.
Invert the fascia for access.
Disconnect the vacuum pipe from the servo.
Remove the spire clips.
Remove the servo (Fig 2).

Fitting a new demister flap servo is the reversal of the removal procedure

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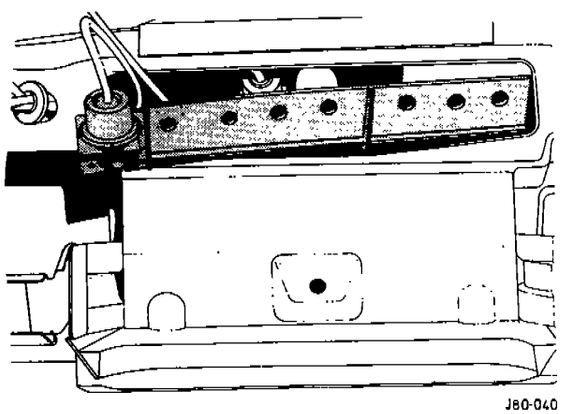


Fig 2

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CENTRE VENT VACUUM SOLENOID

RENEW **80.10.47**

Disconnect the battery earth lead.
Remove the drivers dash liner.
Remove the footwell outlet duct.
Displace the cable harness.
Remove the bolts securing the vacuum solenoid mounting plate.
Displace the solenoid (Fig 1).
Note and disconnect the vacuum hoses.
Note and disconnect the supply cables.
remove the solenoid.

Fitting a new vacuum solenoid is the reversal of the removal procedure.

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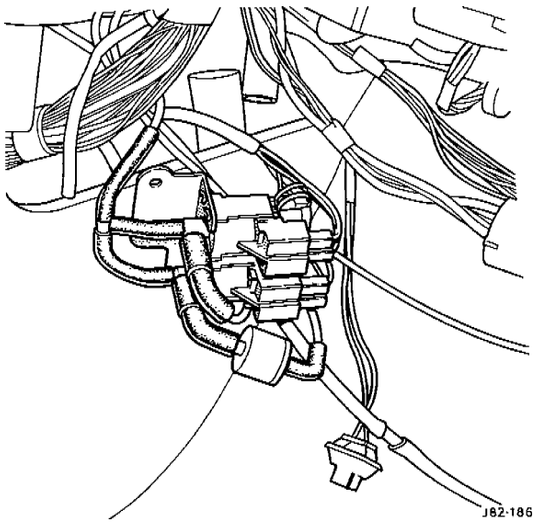


Fig 1

RE-CIRCULATION VACUUM SOLENOID

RENEW **80.10.48**

Disconnect the battery earth lead.
Remove the driver and passenger side dash liners.
Remove the console finisher.
Remove the console ashtray.
Remove the fascia panel and radio console.
Remove the console assembly.
Release the clips retaining the left hand air distribution box and remove the box.
Displace the solenoid from its mounting bracket (Fig 2).
Note and disconnect the vacuum hoses.
Note and disconnect the supply cables
Remove the solenoid

Fitting a new vacuum solenoid is the reversal of the removal procedure.

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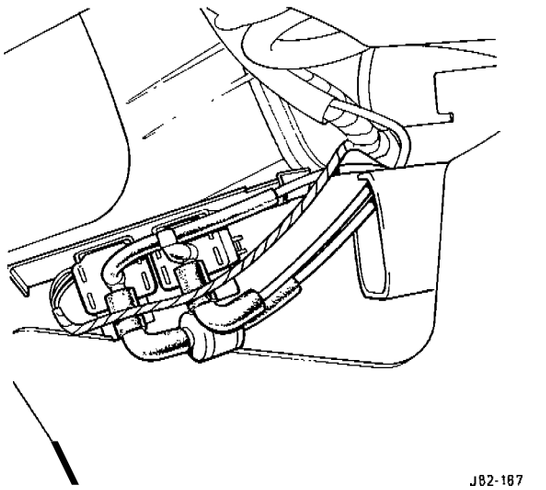


Fig 2

DE-FROST VACUUM SOLENOID

RENEW **80.10.49**

Disconnect the battery earth lead.
Remove the drivers dash liner.
Remove the footwell outlet duct.
Displace the cable harness.
Remove the **bolts** securing the vacuum solenoid mounting plate.
Displace the solenoid.
Note and disconnect the vacuum hoses.
Note and disconnect the supply cables.
Remove the solenoid (Fig 3).

Fitting a new vacuum solenoid is the reversal of the removal procedure.

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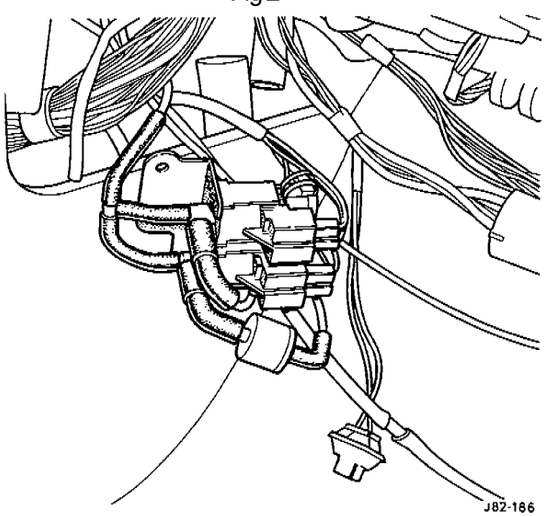


Fig 3

COOLANT VALVE VACUUM SOLENOID

RENEW **80.10.50**

Disconnect the battery earth lead.
Remove the driver and passenger side dash liners.
Remove the console finisher.
Remove the console ashtray.
Remove the fascia panel.
Remove the radio console.
Remove the console assembly.
Release the clips retaining the **left** hand air distribution box and remove the box.
Displace the solenoid from its mounting bracket (Fig 1).
Note and disconnect the vacuum hoses.
Note and disconnect the supply cables.
Remove the solenoid.

Fitting a new vacuum solenoid is the reversal of the removal procedure.

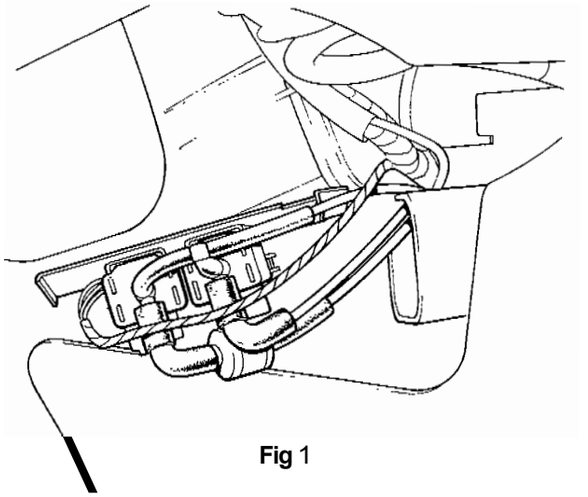


Fig 1

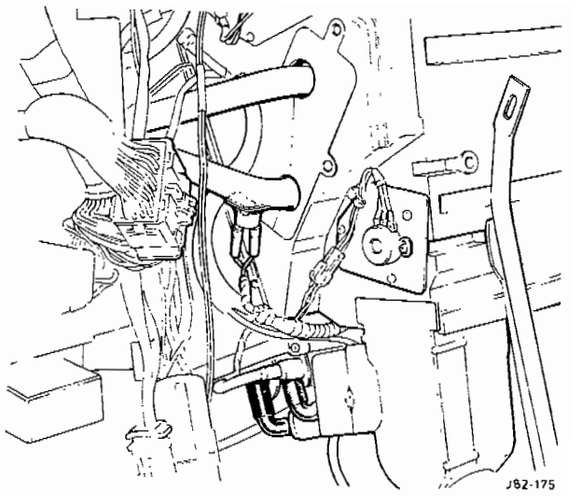
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COOLANT TEMPERATURE SWITCH

RENEW **80.10.51**

Open the bonnet and disconnect the battery earth lead.
Remove the passenger dash liner.
Disconnect the switch supply cables (Fig 2).
Remove the screws securing the switch **to** pipe bracket.
Remove the switch.
Fitting a new switch is the reversal **of** the removal procedure.



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Fig 2

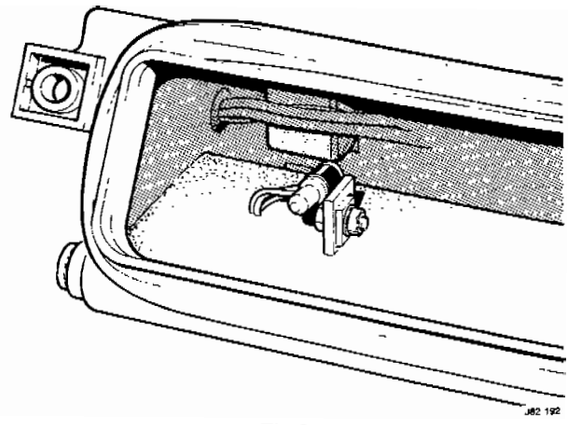
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AMBIENT TEMPERATURE SENSOR

RENEW **80.10.53**

Open the bonnet and disconnect the **battery** earth lead.
Remove the right side dash liner.
NOTE: On LHD vehicles remove the glove box lid and **g**love box.
Remove the right hand blower motor assembly 80.20.1**1**
Remove the screws securing the ambient temperature sensor.
Disconnect the cable harness multi-plug connector.
Slacken the nut/bolt securing the sensor probe retaining clip to flap.
Displace the sensor probe from the retaining clip and remove the sensor (Fig 3).

Fitting a new sensor is the reversal of the removal procedure.



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Fig 3

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IN-CAR TEMPERATURE SENSOR

RENEW **80.10.54**

Open the bonnet and disconnect the battery earth lead.
Remove the passenger dash liner.
Remove the glove box lid and glove box.
Remove the screws securing the sensor (3 Fig 1).
Disconnect the cable harness multi-plug connector (1 Fig 1).
Remove the sensor from the hose (2 Fig 1).

Fitting a new sensor is the reversal of the removal procedure.

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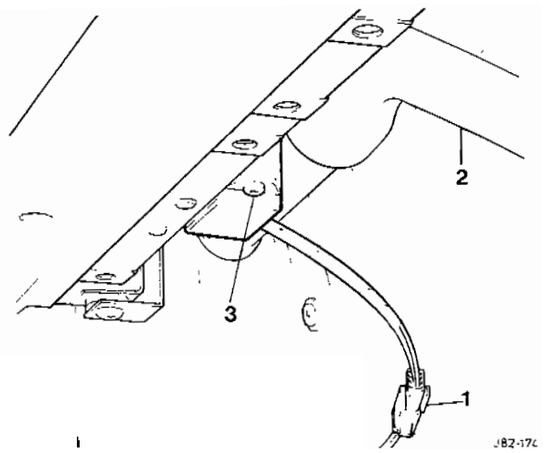


Fig 1

SOLAR SENSOR

RENEW **80.10.55**

Open the car door and carefully prise the solar sensor mounting panel from the fascia (1 Fig 2).
Disconnect the sensor multi-plug connector.
Remove the complete solar assembly.
Remove the spire clips (3 Fig 2) securing the sensor to the mounting panel (2 Fig 2).
Remove the sensor.

Fitting a new sensor is the reversal of the removal procedure.

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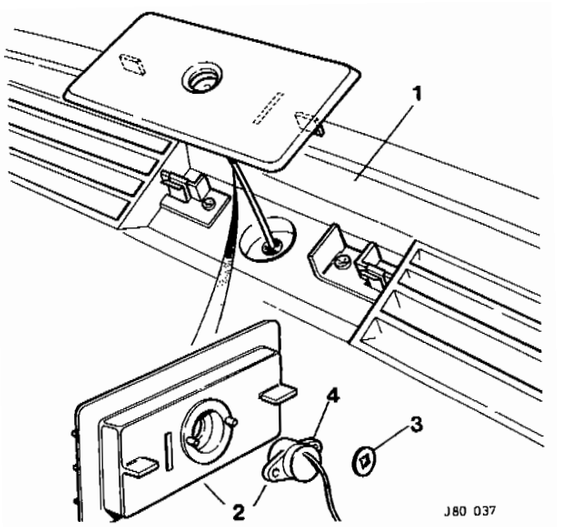


Fig 2

DEMISTER DUCT

RENEW **80.15.02**

Open the bonnet and disconnect the battery earth lead.
Remove both dash liners.
Remove both closing panels.
Remove the fascia veneer centre panel and centre vent outlet.
Remove the steering wheel.
Remove both demister duct outlets (1 Fig 3).
Remove the fascia board.
Remove the screws securing the demister duct (2 Fig 3).
Invert the fascia.
Disconnect the vacuum pipe.
Remove the demister duct (3 Fig 3).

Fitting a new demister duct is the reversal of the removal procedure.

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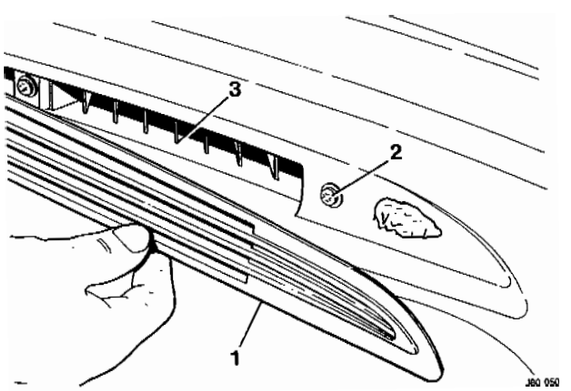


Fig 3

CENTRE VENTILATOR

RENEW **80.15.24**

Open the bonnet and disconnect the battery earth lead.
Remove both dash liners.
Remove both closing panels.
Remove the fascia veneer centre panel and centre vent outlet.
Remove the steering wheel.
Remove both demister duct outlets.
Remove the fascia board.
Remove the screws securing the glove box lid and remove the lid.
Remove the screws securing glove box striker and remove the striker and spacer.
Remove the inner and outer securing screws.
Remove the glove box assembly from the fascia.
Remove the screws securing the centre vent.
Reposition the fascia and displace the vent assembly.
Note and disconnect the vacuum pipes.
Manouvre the vent assembly from the fascia (Fig 1).

Fitting a new centre ventilator is the reversal of the removal procedure.

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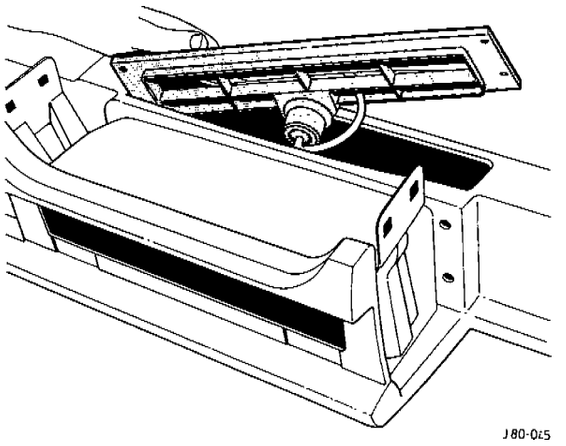


Fig 1

CENTRE FASCIA VENTILATOR OUTLET

RENEW **80.15.48**

Open the car door and remove the fascia centre veneer pane.
Displace and remove the ventilator outlet (Fig 2).

Fitting a new centre ventilator outlet is the reversal of the removal procedure.

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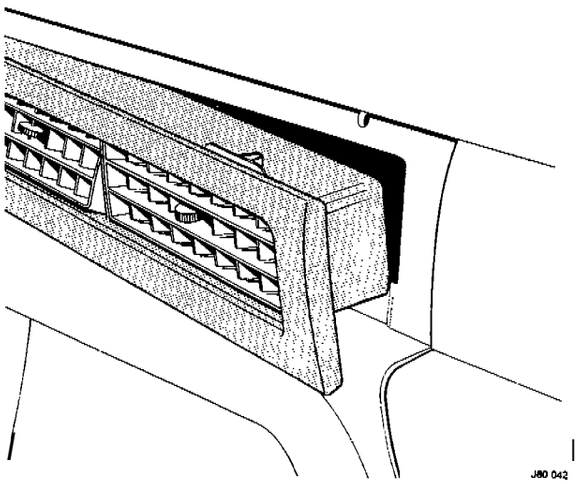


Fig 2

DRIVER SIDE VENTILATOR OUTLET

RENEW **80.15.49**

Open the car door and remove the ventilator outlet direction vent.
Release the outlet retaining clips.
Remove the vent outlet (Fig 3).

Fitting a new ventilation outlet is the reversal of the removal procedure

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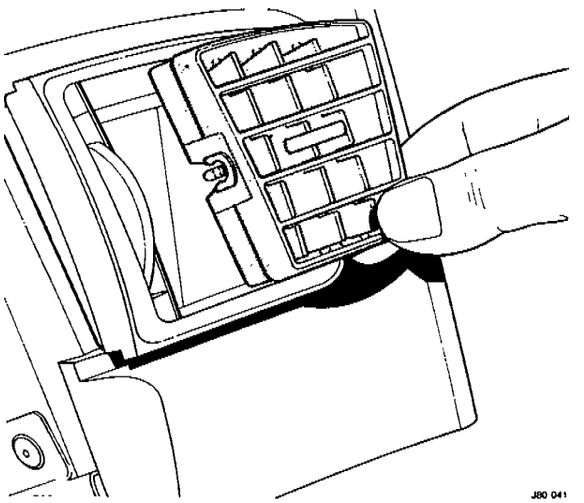


Fig 3

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PASSENGER SIDE VENTILATOR OUTLET

RENEW **80.15.50**

Open the car door. Open the glove box lid.
Remove the ventilator outlet direction vent.
Release the outlet retaining clips.
Remove the vent outlet. (Fig 1).

Fitting a new ventilation outlet is the reversal of the removal procedure

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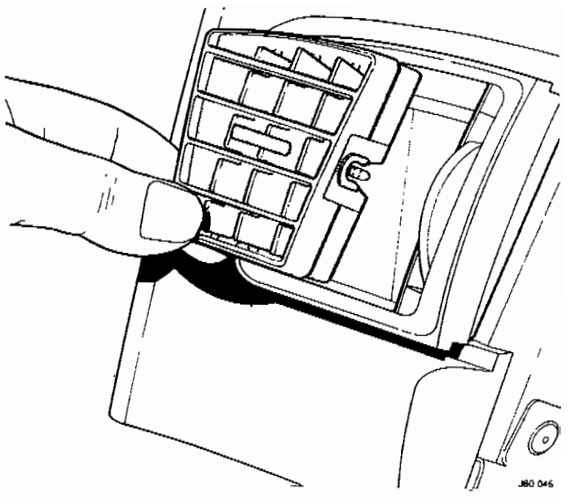


Fig 1

DEMISTER DUCT OUTLET

RENEW **80.15.53**

Open the car door.
Carefully prise the solar sensor housing from its position.
Remove the screws securing the vent outlet (1 Fig 2).
Remove the vent from the retaining clip (2 Fig 2).

Fitting a new demister duct outlet is the reversal of the removal procedure

0209G

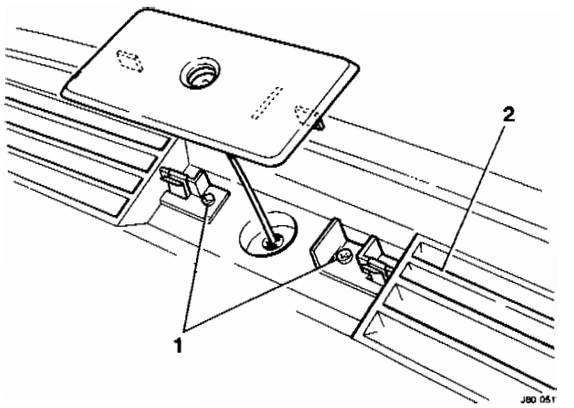


Fig 2

BOOT VENTILATOR OUTLET

RENEW **80.15.66**

Open the boot.
Remove the rear quarter bumper.
Remove the nuts securing the rear lamp interior finisher and remove the finisher (1 Fig 3).
Remove the screw securing the side liner.
Carefully displace the side liner for access to the ventilator outlet.
Displace the ABS control unit from the outlet (2 Fig 3).
Cut and remove the ratchet straps securing the cable harness.
Remove the bolts securing the outlet (4 Fig 3).
Remove the outlet assembly (5 Fig 3).

Fitting a new boot ventilator outlet is the reversal of the removal procedure.

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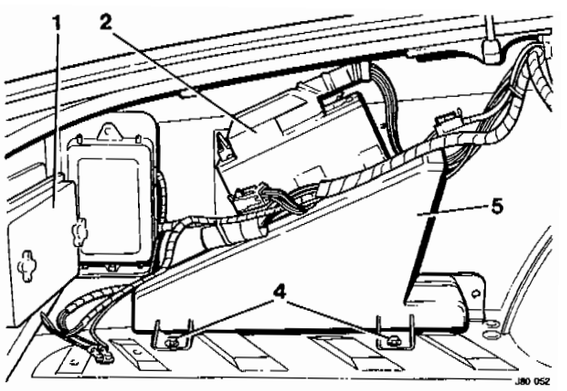


Fig 3

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ELECTRONIC CONTROL SYSTEM

DESCRIPTION 82.00.00

At the heart of the air conditioning control module is a digital micro-processor which receives data signals from driver controlled switches, then by comparing this data with the signals received from the various temperature sensors and the feedback devices it calculates the output voltages needed to operate the blower motors at the required speed, the flap servo motors to the required positions, also the compressor and the vacuum solenoids to acheive the temperature requirements selected for the vehicle.
Although the control module cannot be repaired in service, a complete set of test pins are accessible for testing the system. Great care must be exercised when connecting the test equipment for the control module will be irreparably damaged should any of the test pins be momentary shorted together.

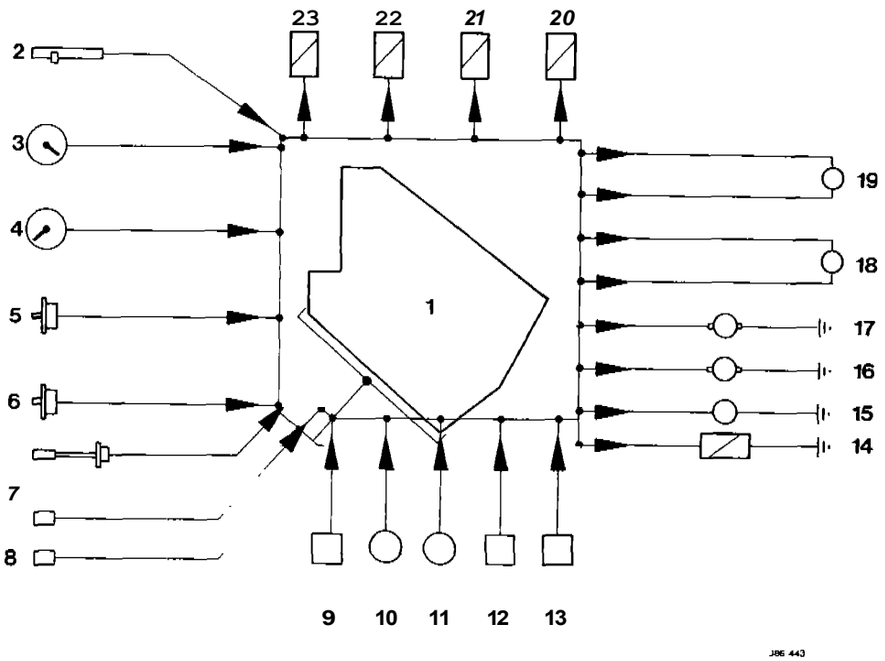


Fig 1

Key to Diagram

1 Control module
2 Differential temperature control
3 Temperature control
4 Blower motor switch
5 Ambient temperature sensor
6 In-car temperature control
7 Evaporator temperature switch
8 Solar sensor
9 Coolant temperature switch
10 Flap feedback potentiometer
11 Flap feedback potentiometer
12 Blower motor feedback
13 Blower motor feedback
14 High speed relay
15 Compressor clutch
16 Blower motor
17 Blower motor
18 Flap servo motor
19 Flap servo motor
20 Defrost vacuum solenoid
21 Recirculation vacuum solenoid
22 Centre vent vacuum solenoid
23 Water valve vacuum solenoid

TEMPERATURE DISTRIBUTION SYSTEM

DESCRIPTION 82.00.00

The air conditioning unit case consists of three parts, the rear of which carries the evaporator, the front is then split in two to enable the rotary flaps to be inserted. Foot outlet boxes are moulded in plastic and are removable for access.

The method used to achieve the required air temperature is known as a series parallel system. All the air into the unit passes through the evaporator, then depending on the position of the flaps either passes through the heater matrix to be heated, or bypasses the heater matrix completely, or a combination of both to achieve the air temperature required (see illustrations).

The system employs two flaps that are driven to the required position (determined by the control system) by servo motors and gear-box assemblies.

The motors can rotate in either a clockwise or anti-clockwise direction depending on the direction of current flow through the motor.

The flap positions are monitored by feedback potentiometers which supplies a voltage signal to the control module indicating the flap position.

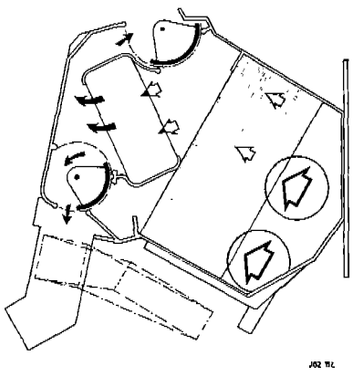


Fig 1

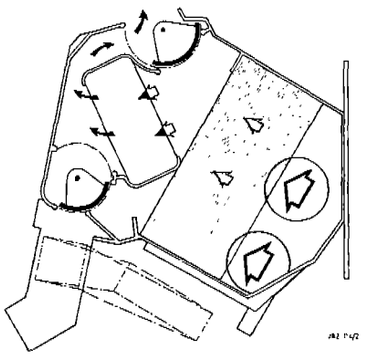


Fig 3

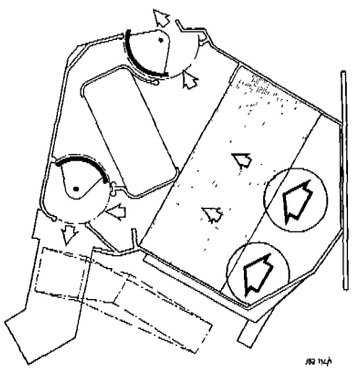


Fig 2

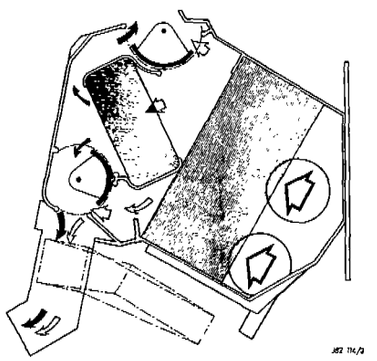


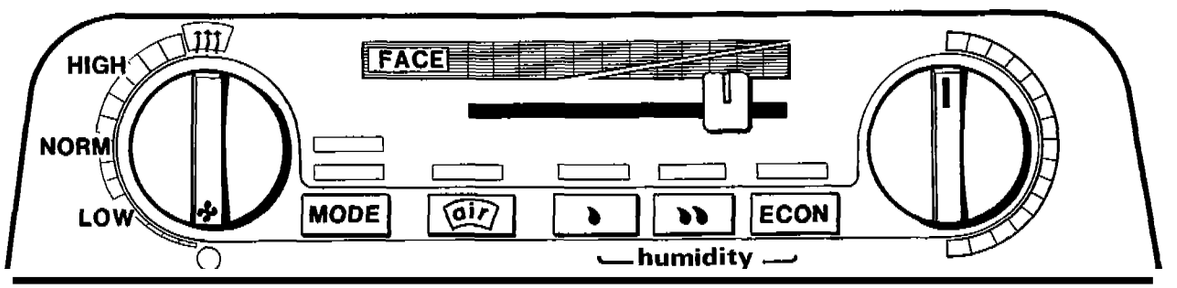
Fig 4

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AIR CONDITIONING SWITCH CONTROL PANEL

DESCRIPTION 86.00.00

The switch control panel contains a blower motor control rotary switch, auto/manual mode switch, air switch, humidity control switches, temperature differential selector and a in-car temperature selector. The control panel producesdigital outputs which are suppliedto and used by the electronic control module.
The airflow of the system from the blower motors is controlled by the rotary switch located on the left hand side of the control panel. The switch has five positions:- OFF, LOW, NORM, HIGH, and DEFROST.
In the OFF position the system is not operational. Power to the electronic control module (E.C.M.) and to the control potentiometers is removed, but a signal is sent to the E.C.M. to ensure the flaps are closed preventing outside air from entering the system.
In the LOW, NORMAL and HIGH positions, information regarding the range of fan speed selected is received by the control module from the control switch. Signals are also received by the E.C.M from the temperature selector, feedback circuits and the various sensors. The fan speed is then electronically controlled by the E.C.M. So by selecting LOW, NORM or HIGH a level of speed in the range selected is received dependent on the vehicle requirements. Should a low fan speed be selected the control module will maintain the speed of the fan motors within a range of low speeds depending on the temperature requirement of the vehicle. There are no distinct steps between the fan speeds, but a gradual increase or decrease of speed.
When DEFROST is selected the fans are electronically controlled to operate at maximum speed, the screen vents open, maximum heating is obtained and the lower flaps fully close (it can take up to a maximum period of 30 seconds to complete this operation).
The control situated on the right hand side of the control panel is the temperature demand control. The temperature requirements of the vehicle within the range of 19 to 29°C can be selected by the setting of this control. With the control turned to the fully anti-clockwise position maximum cooling is obtained, and to obtain maximum heating turn the control fully clockwise.
When the mode button is set in the auto mode the control system use all the temperature sensors in relation to the temperature selected by the temperature demand control. The system then automatically adjust the flaps for heating or cooling modes to achieve the disired results. Blower fan speeds are also selected to increase or decrease the volumn of air flow, depending upon the differences between the various temperature sensors and the selected temperature.
When the button is set in the manual mode it overrides the temperature sensors and the system will obtain the temperature selected.
The air button (demist) when pressed will cause the defrost flaps to the screen to open.
The maximum and minimum limits of the evaporator temperature are determined by the setting of the humidity controls. When the switch with one teardrop is selected the evaporator temperature is controlled between 3.9 to 4.15°C. When the switch with two teardrops is selected the evaporator temperature range is between 7.1 to 7.35°C. If neither of the two humidity buttons are selected, the evaporator temperature is controlled between 0 to 0.25°C.
With the application of the econ button, the compressor clutch is switched off and the compressor is disengaged rendering the air conditioning inoperative. A second application of this button gives maximum air conditioning with the evaporator temperature controlled between 0 to 0.25°C.
The slide control (Air Differential Control) is used to alter the temperature of air being distributed through the face level vents. To increase the temperature of air being delivered through the vents, the slide control is moved to the right and to decrease the temperature the control is moved to the left.



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Fig 1

TEMPERATURE SENSORS

DESCRIPTION *82.00.00*

There are three temperature sensors fitted into the system, the ambient temperature sensor, the in-car temperature sensor and the evaporator temperature sensor. All three sensors are electrically identical, but the evaporator temperature sensor is physically different and is not interchangeable with either the ambient or the in-car temperature sensors.
An input voltage is supplied to the sensors from pin 43 of the control module. The temperature sensing signal from the sensors is then fed back into the control module via pin 34 for the ambient temperature, pin 4 for the in-car temperature sensor and pin 5 for the evaporator temperature sensor. The sensors are semi-conductor devices which are accurate over a wide range. The semi-conductor is similar to a zenor diode in as much as it allows current to flow in reverse bias, but the current flow varies wth temperature. The sensor assembly has a built in potentiometer which is preset and must not be adjusted.

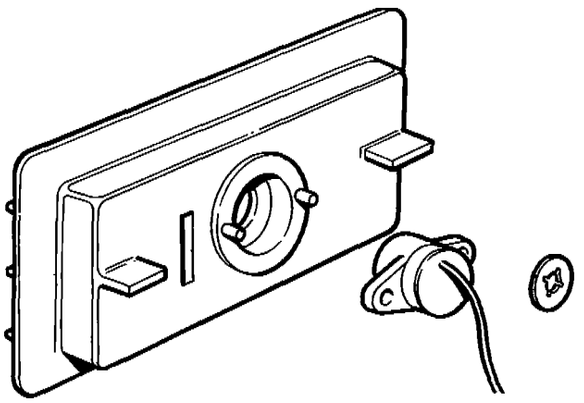


Fig 1

SOLAR SENSOR

DESCRIPTION *82.00.00*

A solar sensor (Fig 1) is fitted to reduce the temperature demand by a maximum of 2°C in direct sunlight. This has the effect of leaving the in-car temperature stable whilst reducing air outlet temperatures to compensate for increased solar load. This sensor is constructed round a photo transistor whose sensing voltage will vary with the ambient light level. An input of 5 volts is supplied to the sensor from pin 43 of the control module. The sensing voltage from the sensor is then fed back into the control module via pin 36.

COOLANT TEMPERATURE SWITCH.

DESCRIPTION 82.00.00

A water temperature switch (Fig 2) is fitted *to* the lower side of the heater matrix inlet pipe. Its contacts are open at temperatures below 40°C, this will prevent the fans from operating when heat is required until relatively hot coolant is flowing through the system.

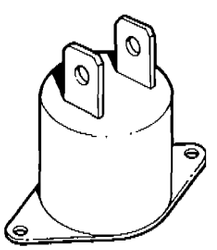


Fig 2

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BLOWER MOTOR SPEED CONTROL

DESCRIPTION 82.00.00

Mounted in the outlet of the blower motor units are heatsink assemblies each of which consists of an interferencesuppressor diode, a feedback isolation diode and a power transistor, The unit is supplied with positive battery voltage via an ignition switch controlled fuse. On all fan speed except high speed the negative circuit for the fan motor is via the power transistor and the control module. The feedback diode enables the control module to sense the voltage at the negative terminal of the fan motor and so calculate the speed of the blower motor. With the fan motor switched to high speed the high speed relay is energised thus closing the relay contacts giving the fan motor negative circuit a direct path to earth via the relay contacts, so bypassing the transistor and the control module.

COMPRESSOR CLUTCH CONTROL

DESCRIPTION 82.00.00

The output from pin 20 of the control module is used to energise the compressor clutch relay which will result in the relay contacts closing allowing battery voltage to the clutch winding via a thermal fuse, and to the cooling fan relay coil to allow the cooling fan to operate when the air conditioning clutch is engaged.

SUPERHEAT SWITCH AND THERMAL FUSE

DESCRIPTION 82.00.00

A superheat swich is included in the compressor clutch circuit to provide a compressor protection system. The superheat switch and thermal fuse guards against a low refrigerant charge or blockages causing extreme superheated refrigerant vapour conditions resulting in compressor damage. The thermal fuse is a sealed unit containing a heater and a meltable fuse. The superheat switch is located in the rear of the compressor in contact with the suction side refrigerant vapour. With a low refrigerant charge or a blockage the pressure drops and the temperature rises. This condition closes the superheat switch contacts which completes the thermal fuse heater circuit, melts the fuse, disconnects the battery supply to the compressor clutch winding and the thermal fuse heater. The compressor ceases to operate and damage from insufficient lubrication will be avoided.

The thermal fuse melts at 157 to 182°C.

Time taken	2.0 minutes	14V
	5.5 minutes	11.5V

The heater resistance, cold 8 to 10 ohms.

CAUTION: After a thermal fuse melt, establish and rectify the cause before replacing the thermal fuse unit complete.

VACUUM SYSTEM

DESCRIPTION *82.00.00*

The vacuum supply to four solenoids (Fig 1) in the system is from the engine manifold via a reservior and a non return valve.
The reservior is located under the battery. The components operated by the solenoids are:–

1 Defrost/Demist flaps which are held closed by vacuum is identified by a green vacuum supply tube.
2 Recirculation/Fresh air flaps which are held closed by vacuum is identified by a blue vacuum supply tube.
3 Centre vent, which is opened by vacuum is identified by a black vacuum supply tube.
4 Water valve which is closed by vacuum and is identified by a red vacuum supply tube.

The vacuum supply to the centre vent and recirculation/ fresh air flaps have built restrictors so that the operation of these flaps is slowed down to avoid the risk of the system hunting. The recirculation flaps can take up to 30 seconds to change state.

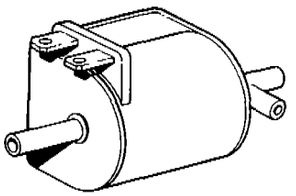


Fig 1

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COMPRESSOR

DESCRIPTION 82.00.00

The Sanden709 compressor contains seven cylinders.
The magnetic clutch is engineered with the compressor as a complete assembly resulting in a relatively small unit which is of lightweight construction.
The compressor may be operated in either a clockwise or anticlock wise rotation and can be mounted up to 90 degrees from its upright position.
The compressor incorporates a lubrication system which reduces the oil circulation ratio to a level of less than 2% at 1800 rpm.
An oil deflector and positive pressure differential lubrication system promotes oiling to the cylinder wall, piston rod assemblies, main bearings and shaft seal.
Oil circulation to the refrigeration circuit is kept to a minimum.
The compressor is charged with 4.6 fluid ounces (135 cc) of Sunico No 5GS oil at the factory. Only this oil or the equivalent. oils Texaco Capella E or Virginia Chemicals 500 viscosity should be used when adding or changing oil.
Refrigerant 12 is the only refrigerant that can be used in the Sanden compressor. Certain refrigerants, such as methyl and chloride deteriorate aluminum. Others are not compatible with the proper operating temperature and pressures.
Since many of the compressor parts are made of aluminum alloys, exercise great care not to damage machine surfaces.

Adhere to the torque specifications inserting cap screws to "finger-tight" Then use a suitable torque wrench.

Compressor Oils

Sunico No 5GS
Texaco Capella E
Virginia Chemicals 500 Viscosity

TORQUE SPECIFICATIONS (Do not exceed the upper limit)		
Item	ft/lbs	Kg/m
Clutch retaining nut	25-30	3.4-4.2
Cylinder head cap screws	22-25	3.0-3.4
Service port "O" ring	9-12	1.2-1.7
Oil filler plug	6-9	0.8-1.2
High pressure hose	18-22	2.5-3.0
Low pressure hose	22-25	3.0-3.4
Drive belt (new)	100	13.8
Drive belt (after run in)	80-90	11-12.5
Clutch wire clamp screw	26-46	22-38
Field coil cap screws	17-23	15-20
Charge valve cap	48-68	40-60

Key to Illustration

1 Service port
2 Cylinder head
3 Hose connection
4 Anti-rotation gear
5 Oil filler plug
6 Planet plate
7 Clutch bearing
8 Electromatic clutch
9 Valve plate assembly
10 Cylinder & valve plate gasket
11 Cylinder block
12 Piston
13 Cam rotor
14 Needle thrust bearing
15 Front housing & "O" ring
16 Shaft seal

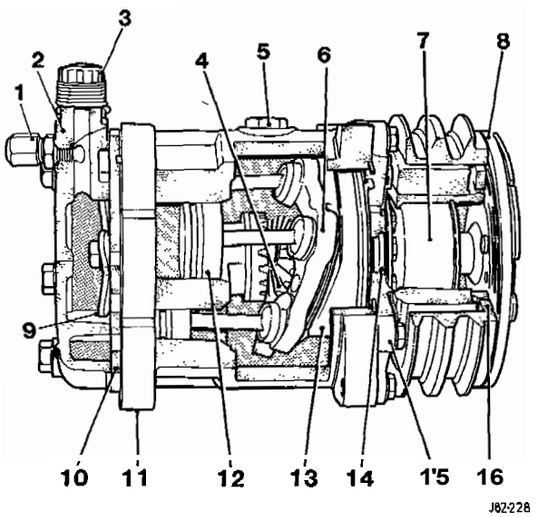


Fig 1

CONDENSER

DESCRIPTION 82.00.00

The condenser (Fig 1) consists of a refrigerant coil mounted in a series of thin cooling fins to provide a maximum of heat transfer in the minimum amount of space. It is usually mounted directly in front of the car radiator so that it receives the full flow of RAM AIR. Ram air is the air flow induced by the forward motion of the car and the suction of the cooling fan. The condenser receives heat laden high pressure refrigerant vapour from the compressor. The refrigerant enters the inlet at the top of the condenser as a high pressure very hot vapour, and as the vapour passes down through the condenser coils. Heat will follow its natural tendency and move from hot refrigerant vapour into the cooler ram air as it flows across the condenser coil fins. When refrigerant vapour reaches the temperature and pressure that will induce a change of state a large quantity of heat will be transferred to the outside air and the refrigerant will change from high pressure hot vapour to a high pressure warm liquid.

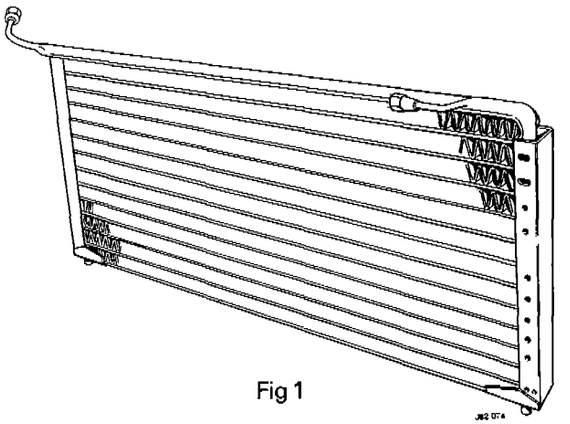


Fig 1

DRIER BOTTLE

DESCRIPTION 82.00.00

The drier bottle (Fig 2) has two separate functions. First it is a storage tank, since the amount of refrigerant required by the evaporator varies under different operating conditions. It receives the high pressure warm refrigerant liquid from the condenser through its inlet line and delivers the refrigerant to an expansion valve through its outlet line. Secondly it contains a filter and desiccant to remove and retain foreign particles as well as moisture from the refrigerant which would be harmful to the system if allowed to circulate with the system.

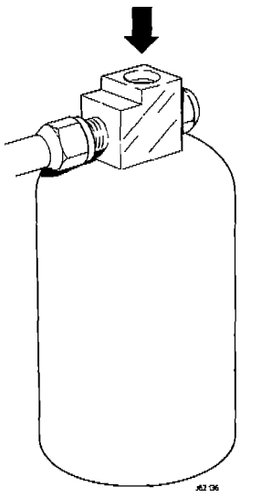


Fig 2

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SIGHTGLASS

DESCRIPTION 82.00.00

A sight glass (Fig 1) is located on the output side of the drier bottle through which the refrigerant flows is used to indicate the condition of the refrigerant charge. A clear sight glass normally indicates the system has a correct charge of refrigerant. It may also indicate the system has a complete lack of refrigerant, this will be accompanied by a lack of any cooling action by the evaporator. Also the system may be overcharged, this must be verified with test gauge readings.

Foam or a constant stream of bubbles indicates the system does not contain sufficient refrigerant. Occasional bubbles when the system is first started is normal.

Foam or a heavy stream of bubbles indicates the refrigerant is very low. Oil streaks on the sight glass indicates a complete lack of refrigerant. A cloudy sight glass indicates that the desiccant contained in the receiver/drier has broken down and is being circulated through the system.

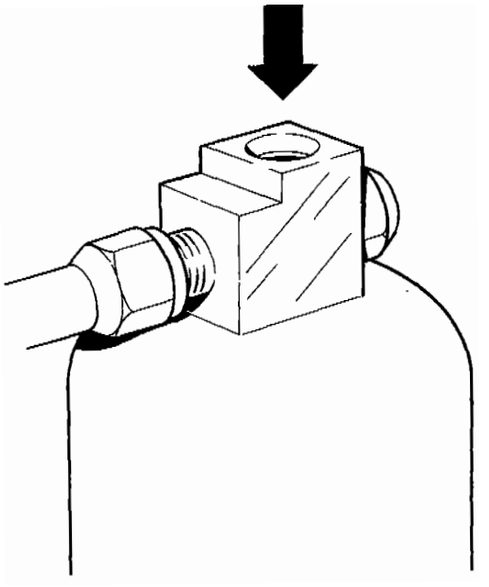


Fig 1

EVAPORATOR

DESCRIPTION 82.00.00

The evaporator (Fig 2) consists of a refrigerant coil mounted in a series of thin fins to provide a maximum amount of heat transfer in a minimum amount of space. It is mounted in a housing where warm air from the vehicle interior is blown across the coils and fins.

The evaporator receives refrigerant from the expansion valve as a low pressure cold atomized liquid. As this cold liquid refigerant passes through the evaporator coils, heat will follow its natural tendency and move from the warm air into the cooler refrigerant.

When the liquid refrigerant reaches a temperature and pressure that will induce a change of state a large quantity of heat will move from the air into the refrigerant and the refrigerant will change from a low pressure cold atomized liquid to a low pressure cold vapour.

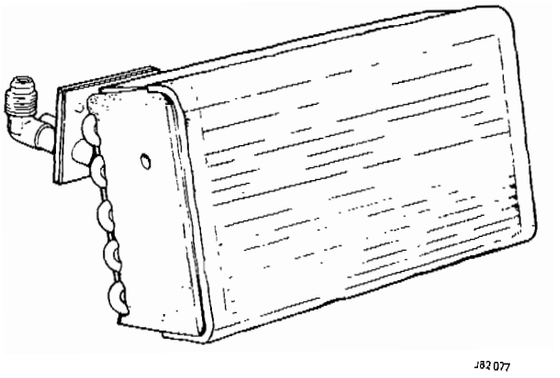


Fig 2

EXPANSION VALVE

DESCRIPTION 82.00.00

The expansion valve is the dividing point between the high and low pressure sides of the system, and automatically meters the high pressure, high temperature liquid refrigerant through a small orifice, controlled by a metering valve into the low pressure, cold temperature side of the evaporator matrix. The refrigerant must be controlled to obtain the maximum cooling while assuring complete evaporation of the liquid refrigerant within the evaporator. To do this, the valve senses the outlet pipe temperature, the inlet pipe pressure, and increases or decreases the flow of refrigerant liquid to maintain the outlet temperature constant.

The expansion valve continually meters the exact amount of refrigerant required to supply some liquid refrigerant throughout the evaporator coil while ensuring that all of the refrigerant will be vapourized at the evaporator outlet. The refrigerant vapour then returns to the low (suction) side of the compressor.

REFRIGERATION CYCLE

DESCRIPTION 82.00.00

The belt-driven compressor draws in the refrigerant vapour at low pressure and compresses it. The pressurized refrigerant is then forced into the condenser located in front of the engine cooling radiator so that it receives the full flow of ram air.

The refrigerant enters the condenser as a high pressure very hot vapour. As this hot vapour passes through the condenser coils heat will follow its natural tendency and move from the hot refrigerant vapour into the cooler ram air as it flows across the condenser coils.

When the refrigerant vapour reaches the temperature and pressure that will induce a change of state a large quantity of heat will be transfered to the outside air. The refrigerant then changes from a high pressure vapour to a high pressure warm liquid. This high pressure warm liquid flows from the outlet of the condenser to the drier bottle.

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The drier bottle is a storage tank which receives the high pressure warm refrigerant liquid from the condenser, filters and retains any foreign particles or moisture from the refrigerant which would be harmful to the system if allowed to circulate with the refrigerant. The clean refrigerant passes through to the expansion valve via the sight glass.

The refrigerant flow to the evaporator must be controlled to obtain maximum cooling while assuring complete evaporization of the liquid refrigerant within the evaporator. This is accomplished by the expansion valve which is a metering device which changes the pressure of the liquid refrigerant from a high pressure to a low pressure liquid. As the refrigerant passes through the metering orifice in the valve, the pressure and the temperature of the refrigerant is reduced so the refrigerant leaves the expansion valve as a low pressure, cold atomized liquid. The temperature of the refrigerant is then lower than the temperature of the air in the vehicle so that a heat exchange from the warm air to the refrigerant can take place in the evaporator.

As this cold atomized liquid refrigerant passes through the evaporator coils, heat will follow its natural tendency and move from the warm air into the cooler refrigerant. When the refrigerant reaches a temperature and pressure that will induce a change of state, a large quantity of heat will move from the air into the refrigerant. The refrigerant will then change from a low pressure cold liquid to a low pressure cold vapour. The refrigerant vapour then returns to the low (suction) side of the compressor.

SAFETY

PRECAUTIONS 82.00.00

The air conditioning system is designed to use only Refrigerant 12 (dichlorodifluoromethane). Extreme care must be taken **NOT** to use a methylchloride refrigerant. The chemical reaction between methylchloride and the aluminium parts of the compressor will result in the formation of products which will burn spontaneously on exposure to air, or decompose with violence in the presence of moisture. The suitable refrigerant is supplied under the following trade names.

FREON 12. **ARCTON 12. ISCEON 12.**

Or any refrigerant with a specification of 12.

WARNING: GOGGLES AND GLOVES MUST BE WORN **WHILE WORKING WITH REFRIGERANT. EXTREME CARE SHOULD BE EXERCISED IN HANDLING REFRIGERANT. LIQUID REFRIGERANT** AT **ATMOSPHERIC PRESSURE BOILS AT** 29°C. **SERIOUS DAMAGE** OR **BLINDNESS MAY OCCUR IF REFRIGERANT IS ALLOWED TO COME INTO CONTACT** WITH **THE EYES.**

FIRST AID: If refrigerant should come into contact with the eyes or skin, splash the eyes or afected area with cold water for several minutes. DO NOT RUB. As soon as possible thereafter, obtain treatment from a Doctor or an eye specialist.

GOOD PRACTICE.

1 Protective sealing plugs must be fitted to all disconnected pipes and units.
2 The protective sealing plugs must remain in position on all replacement components and pipes until immediately before assembly.
3 Any part arriving for assembly without sealing plugs in position must be returned to the supplier as defective.
4 It is essential that a second backing spanner is always used when tightening or loosening all joints. This minimises distortion or strain on components or connecting hoses.
5 Components must not be lifted by connecting pipes, hoses or capillary tubes.
6 Care must be taken not to damage fins on the condenser or evaporator matrices. Any damage must be rectified by the use of fin combs.
7 Before assembly of tube and hose joints, use a small amount of clean new refrigerant oil on the sealing seat.
8 Refrigerant oil for any purpose must be kept very clean and capped at all times. This will prevent the oil absorbing moisture.
9 Before assembly the condition of joints and flares must be examined. Dirt and even minor damage can cause leaks at the high pressure points encountered in the system.
10 Dirty end fitting can only be cleaned using a cloth wetted with alcohol.
11 After removing sealing plugs and immediately before assembly, visually check the bore of pipes and components. Where any dirt or moisture is discovered, the part must be rejected.
12 All components must be allowed to reach room temperature before sealing plugs are removed. This prevents condensation should the component be cold initially.
13 Before finally tightening hose connections ensure that the hose lies in the correct position, is not kinked or twisted and will not be trapped by subsequence operations, e.g. refitting or closing bonnet.
14 Check that hoses are correctly fitted in clips or straps.
15 The compressor must be stored horizontally with the sump down. It must not be rotated before fitting and charging. Do not remove the shipping plate until immediately before assembly. Always use new "O" ring seals in those joints that incorporate them.
16 Components or hoses removed must be sealed immediately after removal.
17 After the system has been opened the receiver/drier must be renewed.
18 Before testing, run the engine until normal running temperature is reached. This ensures that sufficient vacuum is available for test. For cooling tests the engine must be running for the compressor clutch to operate.

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MANIFOLD GAUGE SET

DESCRIPTION 82.00.00

The manifold gauge set (Fig 1) is used to determine the systems high and low pressures, the correct refrigerant charge, system diagnosis and operating efficiency. It is designed to read both high and low pressures at the same time, because these pressures must be compared to determine correct system operation.
Referring to the illustration, a vertical line drawn through the centre of the centre service hose will divide the manifold set into its LOW and HIGH side.

The manifold gauge set consists of a charging manifold fitted with two stop hand valves, a compound gauge and a high pressure gauge. The compound gauge which should be connected to the suction or low pressure side of the system registers both vacuum and pressure. The high pressure gauge is connected to the delivery or high pressure side of the system.

WARNING: FOR SAFETY REASONS THE ACCURACY OF BOTH GAUGES MUST BE CHECKED AT FREQUENT INTERVALS.

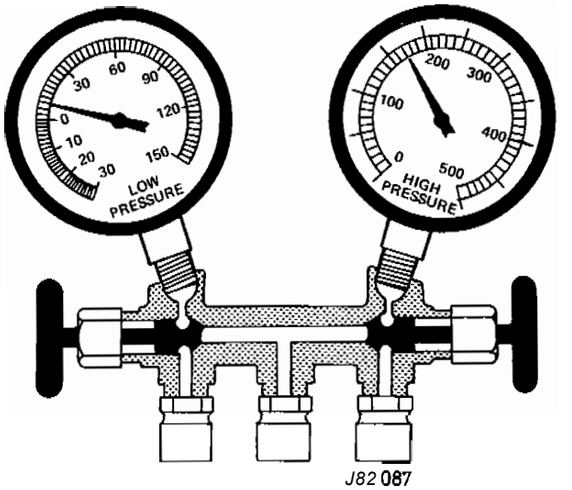


Fig 1

Gauge Manifold

The manifold is designed to control refrigerant flow when connected into the system, pressure is registered on both gauges at all times. During tests both the high and low side hand valves are in a closed position (turned inward until the valve is seated).
Refrigerant will flow around the valve stems to the gauges and register the system low and high pressures on the respective gauges. The hand valves isolate the low and the high sides from the central portion of the manifold.

Low Pressure Side Gauge

This gauge has a dial reading from 0 to 150 lbf/in^2 (pressure scale) in a clockwise direction and a 0 to 30 inches of mercury (vacuum scale) in counter clockwise direction. This low pressure gauge is called a compound gauge, it has a dual purpose which is to register both pressure and vacuum. This gauge is used to measure the evaporator outlet pressure.

High Pressure Side Gauge

This gauge has a dail reading from 0 to 500 lbf/in^2 in a clockwise direction and is a pressure gauge only.

Connecting The Gauge Set

A test hose connected to the fitting directly under the low side gauge is used to connect the low side of the test manifold into the low side of the system, and a similar connection is found on the high side.
When connecting the gauge manifold set to the air conditioning system an access valve core removing tool is available for connecting the test hoses to the high and low sides of the system.
By using the valve removing tool it will enable the valve core to be removed and held back inside the tool eliminating restrictions thereby providing a full flow of refrigerant.

WARNING: UNDER NO CIRCUMSTANCES OPEN THE HIGH SIDE HAND VALVE WHILE THE AIR CONDITIONING SYSTEM IS IN OPERATION. IF THE HIGH SIDE HAND VALVE SHOULD BE OPENED WHILE THE SYSTEM IS OPERATING, HIGH PRESSURE REFRIGERANT WILL BE FORCED THROUGH THE HIGH SIDE GAUGE AND TO THE REFRIGERANT CONTAINER IF IT IS ATTACHED. THIS HIGH PRESSURE MAY RUPTURE THE CONTAINER OR POSSIBLY BURST THE FITTING AT THE SAFETY CONTAINER VALVE, RESULTING IN MUCH DAMAGE INCLUDING PERSONAL PHYSICAL INJURY.

With the engine switched off, remove the protective caps from the schraeder valves.
Fit the access valve removal tool to the schraeder valves.
Ensure that both the manifold hand valves are in the closed position.
Connect the high pressure manifold gauge hose to the high pressure side of the air conditioning side of the system (high side will always be the line from the compressor to the condenser).
Connect the low pressure or compound gauge hose to the low pressure side of the air conditioning system.
Using the access valve removal tool loosen and screw out the valve cores.

Purging The Test Hoses

With the manifold test set attached to the system.
Purge the high pressure test hose by cracking open the high pressure side hand valve on the manifold gauge set for 3 to 5 seconds. This will allow the system refrigerant to purge the air from the test hose and discharge through the manifold centre test hose. Immediately close the high pressure side hand valve.
Purge the low pressure test hose in the same manner by cracking open the low pressure side hand valve manifold gauge set for 3 to 5 seconds, then close the hand valve.

Stabilizing The System

The manifold gauge set is now attached to the system and the test hoses purged of air. With both hand valves closed, the system must be operated for a few minutes to stabilize all pressures and temperatures throughout the system in order to obtain accurate test gauge readings.
Proceed as follows

1. Place all test hoses, gauge set and other equipment away from all engine moving parts. Also keep the hoses from touching the hot engine manifold.
2. Start the engine and adjust engine speed to fast idle
3. Turn on the air conditioning and set for maximum cooling with blower fans on high speed
4. Open the car doors and/or windows (to quickly eliminate car interior heat)
5. Operate the system under these conditions for 5 to 10 minutes, the system will be stabilized and ready for testing.
6. Check the system for full refrigerant by noting the sight glass indications. Some refrigerant loss will occur over a period of time, replacing this refrigerant loss will constitute much of the service required on the air conditioning system.

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Adding Refrigerant

The air conditioning system must contain a full refrigerant charge before an accurate system check can be made. An insufficient charge is indicated in the sight glass by a stream of bubbles or foam.

Connect the manifold test set to the air conditioning system as described on page 82-14.
Connect the centre hose of the manifold test set to a supply of refrigerant, open the refrigerant supply valve, purge the centre hose by momentarily cracking the connection at the manifold block retighten the connection.
Start the engine and operate the air conditioning. With the system operating, slowly open the low side manifold hand valve to allow refrigerant to enter the system.

NOTE: The low side of the system is the suction side and the compressor will pull refrigerant from the container into the system.

CAUTION: THE HIGH **SIDE MANIFOLD** HAND **VALVE** MUST **NEVER BE OPENED WHILE** THE SYSTEM IS **OPERATING.** THIS WOULD **RESULT** IN **REFRIGERANT** BEING PUMPED **BACK** INTO THE **CONTAINER** WHICH COULD **CAUSE** IT TO BURST.

With the refrigerant container in an upright vapour/position, add refrigerant until the sight glass clears or the gauge readings are normal.

CAUTION: Never turn the container into a position where liquid refrigerant will flow into the system.

Close the low side manifold hand valve and refrigerant container valve.
Continue to stabilize the system and check for normal charge.

Leak Test

A high proportion of all air conditioning work will consist of locating and repairing leaks. Many leaks will be located at connections and are caused by vibration. They may only require the retightening of a connection or clamp. Occasionally a hose will rub on a structural part of the vehicle and create a leak, or a hose will deteriorate which will require a replacement. The specified maximum leakage rate at each fitting is 0.5 kg of R12 in 40 years and a leak detector capable of operating to this accuracy must be provided. To check place the leak detector probe at the lowest point of each joint, pause for two seconds. Do not wave the probe about as refrigerant is heavier than air and will flow to the lowest point. If a leak is greater than 0.5 kg in forty years is detected identify the leak point for rectification.
Check that the leaking fitting has been tightened to the correct torque. If the torque is low, rectify and repeat leak test. If the torque is satisfactory, depressurise the system, dismantle the leaking connection and check the quality of the fitting.
If the fitting is satisfactory, clean and reassemble after applying a thin film of refrigerant to the seat of a flare fitting, or a new oiled "O" ring to an "O" ring fitting. Tighten to the correct torque.
Charge the system with *200* g of R12 and leak test the rectified system. If the system is satisfactory, depressurise, evacuate and recharge the system.
If the system is unsatisfactory, i e leakage greater than 0.5 kg in forty years, depressurise and replace the leaking assembly.

pressureTemperature Relationship

Note: Pressures shown are under exact conditions (see test conditions) and are not necessarily true for every car checked.
Ambient Temperature is given as the air surrounding the condenser and is taken 5 cms in front of the condenser.

Test Conditions

1 Use a large fan to substitute for normal ram air through the condenser.

2 Engine adjusted to fast idle speed.

3 All conditions equivalent to 30 mph or 48 kmh.

Ambient Temp °C	High Pressure Gauge Reading lbf/in^2	Low pressure Gauge reading lbf/in^2	Evaporator Temp °C
16	95-115	10	–16
18	105-125	12	–14
21	115-125	14	–12
24	130-150	16	–10
27	150-170	18	-8
29	165-185	20	–6
32	175-195	22	–5
35	185-205	24	–4
38	210-230	26	–3
41	230-250	28	–1
43	250-270	30	0
46	265-285	35	2
49	280-310	40	5
		45	9
		50	11
		55	14
		60	17
		65	19
		70	21

Normal operating ambient temperature range is: – 24 to 43°C.
Normal operating evaporator temperature range is: – –12 to 0°C.

Under normal running conditions system pressure should be as follows: –

Low side: –	– 1.05 to 2.10 kgf/cm^2 15 to 30 lbf/in^2	103.42 to 206.84 kN/m^2
High side: –	13.00 to 14.40 kgf/cm^2 185 to 205 lbf/in^2	1275.50 to 1434.10 kN/m^2

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FAULT FINDING WITH MANIFOLD GAUGE SET

Refrigerant Slightly Low.

Complaint.

Little or no cooling.

Condition.

1 The low side gauge reading is too low.
2 The high side gauge reading is too low.
3 A stream of bubbles evident in the sight glass.
4 The discharge air from the evaporator only slightly cool.

Diagnosis.

The system low on refrigerant. Due to slight leak.

Correction.

1 Test the system for leaks.
2 Depressurize the system.
3 Repair the leaks, and if necessary renew hoses or units.
4 Check the compressor oil level. The system may have lost oil due to leakage.
5 Evacuate the system using a vacuum pump.
6 Recharge the system with new refrigerant.
7 Operate the system and check the performance.

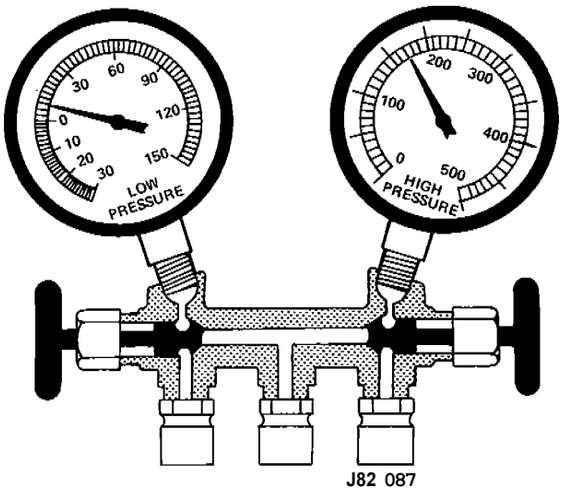


Fig 1

Refrigerant Excessively Low.

Complaint.

Cooling is not adequate.

Condition.

1 The low side gauge is reading very low.
2 The high side gauge is reading very low.
3 No bubbles or liquid evident in the sight glass.
4 The discharge air from the evaporator is warm.

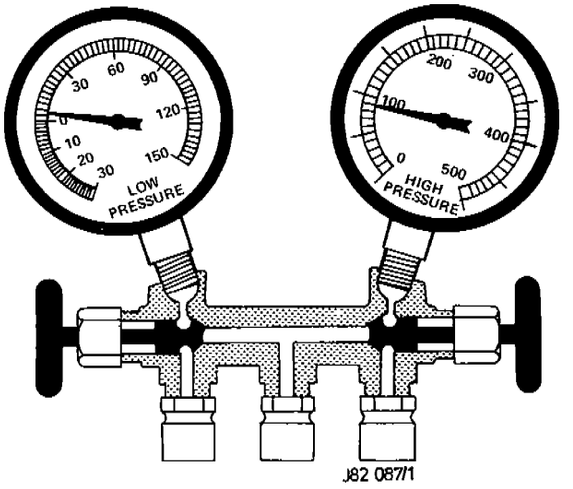


Fig 2

Diagnosis.

The system is excessively low of refrigerant a serious leak is indicated.

Correction.

1 Test the system for leaks.

NOTE: Partially recharge the system before testing the system for leaks to ensure that leak detection is obtained,

2 Depressurize the system.
3 Repair the leaks, and if necessary renew hoses or units.
4 Check the compressor oil level. the system may have lost oil due to leakage.
5 Evacuate the system using a vacuum pump.
6 Recharge the system with new refrigerant.
7 Operate the system and check the performance.

Air In The System.

Complaint.

Cooling is not adequate.

Condition.

1 The low side gauge reading is constant and does not drop. The pressure should drop until the compressor cycles (thermostat control)
2 The high side gauge reading is slightly high (or slightly lower especially if a large fan is used to substitute ram air).
3 The sight glass is free of bubbles or only shows an occasional bubble.
4 The discharge air from the evaporator is only slightly cool.

Diagnosis.

Non condensables present in the system.
Air or moisture present instead of a full refrigerant charge.

Correction.

1 Test the system for leaks. Test the compressor seal area very carefully.
2 Depressurize the system.
3 Repair the leaks, and if necessary renew hoses or units.
4 Renew the drier bottle, it is probably saturated with moisture.
5 Check the compressor oil level.
6 Evacuate the system using a vacuum pump.
7 Recharge the system with new refrigerant.
8 Operate the system and check the performance.

Compressor Malfunction.

Complaint.

Cooling is not adequate.

1 The low side gauge reading is too high.

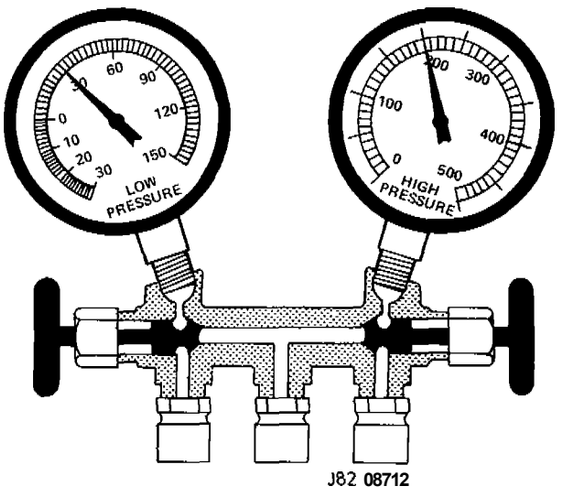


Fig 1

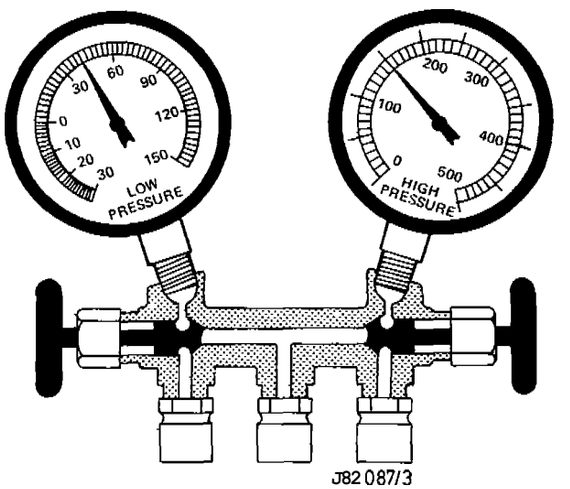


Fig 2

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2 The high gauge reading is too low.
3 The sight glass is free of bubbles and the system is fully charged.
4 The discharge air from the evaporator is not sufficiently cool.

Diagnosis.

Internal leak in the compressor.

Correction.

1 Depressurize the system.
2 Renew the compressor and the drier bottle.
3 Evacuate the system using a vacuum pump.
4 Charge the system with new refrigerant.
5 Operate the system and check the performance.

Condenser Malfunction Or System Overcharge

Complaint.

Little or no cooling. Overheating of the engine may also be noted.

Condition.

1 The low side gauge reading excessively high.
2 The high side gauge reading is also excessively high.
3 Bubbles may appear occasionally in the sight glass and the liquid line to the evaporator is very hot.
4 The discharge air from the evaporator is warm.

Diagnosis.

The condenser not operating correctly through lack of cooling caused by too high a high side pressure. The system may have either a normal or overcharge of refrigerant.

Correction.

1 Check the Compressor drive belt for correct tension.
2 Check the condenser for clogged air passages preventing air flow through the condenser.
3 Inspect the condenser mounting for correct radiator clearance.
4 Check the correct fan operation.
5 Check the coolant pressure cap for correct type and operation.

After making the above checks operate the system and check the performance.

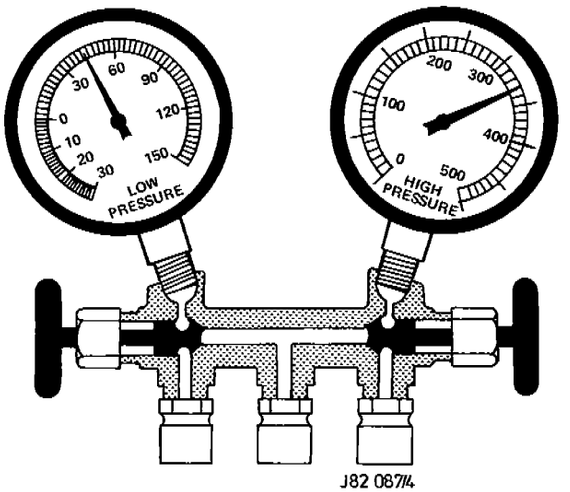


Fig 1

If the Condition is not rectified.

1 Inspect the system for overcharge of refrigerant and rectify as follows.

(A) Discharge the system, until a stream of bubbles appear in the sight glass and both gauge readings drop to below normal.

(B) Add new refrigerant until the bubbles disappear and the pressures are normal. Then add .25 to .5 lb of additional refrigerant.

2 Operate the system and check the performance.

If the gauge readings are still too high.

1 Depressurize the system.
2 Remove and inspect the condenser for oil clogging. Clean and flush the condenser to ensure the free passage refrigerant or renew the condenser.
3 Renew the receiver/drier.
4 Evacuate the system using a vacuum pump.
5 Recharge the system with new refrigerant.
6 Operate the system and check the performance

Moisture In The System.

Complaint.

Cooling is not adequate during the hot part of the day.

Note: Cooling may be satisfactory during the early morning or late evening but is not adequate during the hot part of the day.

Condition.

1 The low side gauge reading normal but may drop into vacuum during testing.
2 The high side gauge reading normal but will drop when the low side drops into vacuum.
3 The sight glass may show tiny bubbles.
4 The discharge air from the evaporator is cold but becomes warm when the low side gauge drops into vacuum.

Diagnosis.

Excessive moisture in the system. Desiccant agent saturated with moisture which is released during high temperatures. The moisture collects and freezes in the expansion valve which stops the refrigerant flow.

Correction.

1 Depressurize the system.
2 Renew the drier bottle.
3 Evacuate the system using a vacuum pump.
4 Recharge the system with new refrigerant.
5 Operate the system and check the performance.

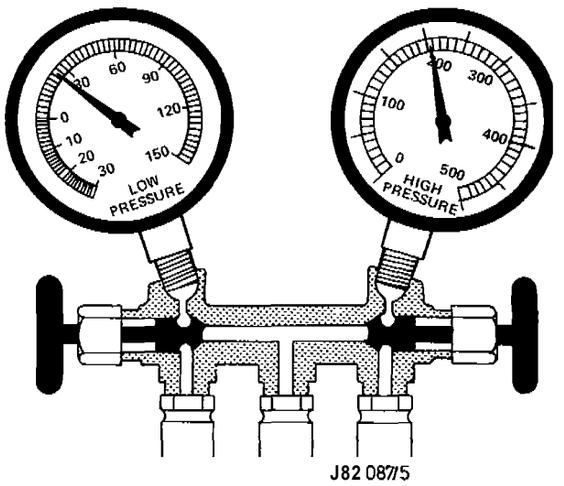


Fig 1

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A Large Amount Of Air In The System.

Complaint.

Little or no cooling.

Condition.

1 The low side gauge reading is too high.
2 The high side gauge reading is too high.
3 An occasional bubble in the sight glass.
4 The discharge air from the evaporator is not cool.

Diagnosis.

Air in the system. The refrigerant contaminated by non-condensables (air and/or moisture),

Correction.

1 Depressurize the system.
2 Renew the receiver/drier.
3 Evacuate the system using a vacuum pump.
4 Recharge the system with new refrigerant.
5 Operate the system and check the performance.

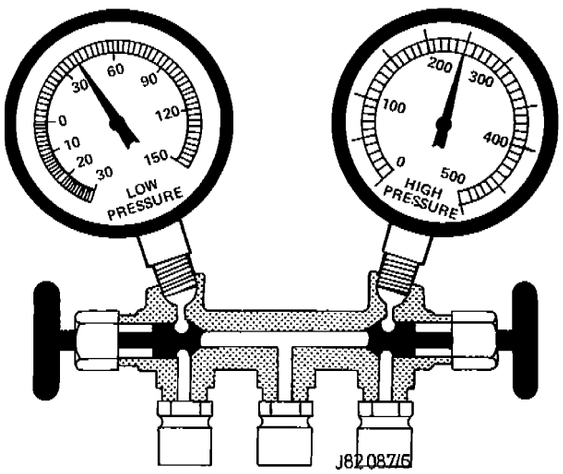


Fig 1

Expansion Valve Malfunction.

The valve stuck open.

Complaint.

Little or no cooling.

Condition.

1 The low side gauge reading is too high.
2 The high side gauge reading is normal or slightly low.
3 The discharge air from the evaporator is warm.
4 The suction hose and the evaporator show signs of heavy sweating.

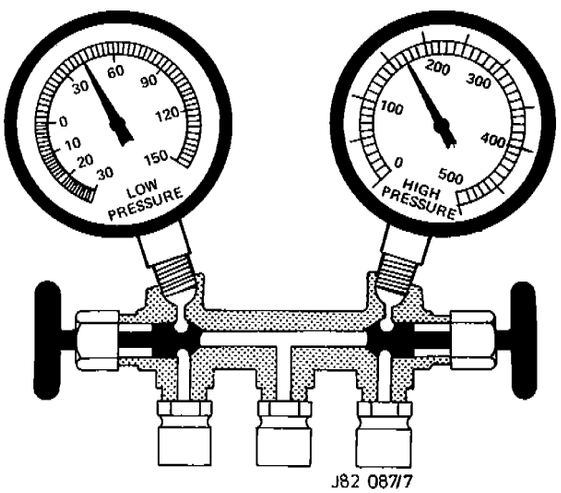


Fig 2

Diagnosis.

The expansion valve allowing excessive flow of refrigerant through the evaporator coils causing flooding of the coils.

Correction.

1 Depressurize the system.
2 Renew the expansion valve.
3 Renew the drier bottle.
4 Evacuate the system using a vacuum pump.
5 Recharge the system with new refrigerant.
6 Operate the system and check the performance.

Expansion Valve Malfunction.

The valve stuck closed.

Complaint.

Cooling is not adequate.

Condition.

1 The low gauge reading is too low (0 or a vacuum).
2 The high side gauge reading is too low.
3 The discharge air from the evaporator only slightly cool.
4 The expansion valve shows signs of heavy sweating or frost.

Diagnosis.

The expansion valve restricting the refrigerant flow.

Correction.

1 Depressurize the system.
2 Renew the expansion valve.
3 Renew the drier bottle.
4 Evacuate the system using a vacuum pump.
5 Recharge the system with new refrigerant.
6 Operate the system and check the performance.

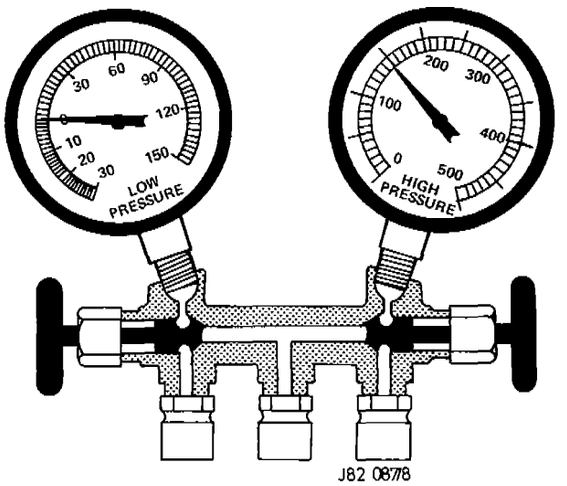


Fig 1

Restriction in the High Pressure Side.

Complaint.

Cooling is not adequate.

Condition.

1 The low side gauge reading is low.
2 The high side gauge reading will build up to an excessively high reading.
3 The discharge air only slightly cool.
4 The high pressurure liquid hose from the drier bottle to the evaporator is cool to the touch or shows signs of heavy sweating or frost.

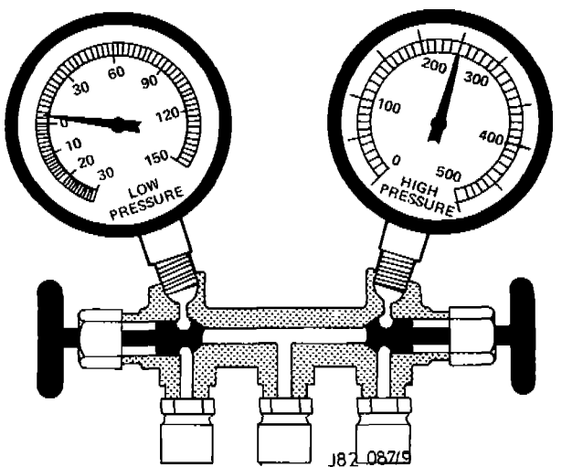


Fig 2

Diagnosis.

A restriction in the receiver/drier or the high pressure liquid hose from the drier bottle results in the compressor removing refrigerant from the evaporator faster than it can enter. This results in a starved evaporator.
Correction.

1 Depressurize the system.
2 Renew the drier bottle and/or the high pressure liquid hoses or other defective parts.
3 Evacuate the system using a vacuum pump.
4 Recharge the system with new refrigerant.
5 Operate the system and check the performance.

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AIR CONDITIONING HOSE CONNECTIONS

TORQUE FIGURES

82.00.00

Component	Position of Fixing	Nm	kgf/m	lbf/ft
Evaporator Hose	Expansion Valve	28-37	2.85-3.78	20.65-27.30
Evaporator Hose	Lower port Expansion Valve	20-27	2.04-2.76	14.75-20.00
Muffler Assembly	Upper port Compressor	40-50	4.08-5.09	29.50-36.87
Evaporator Hose	Muffler	28-37	2.85-3.78	20.65-27.87
Condenser Hose	Muffler	28-37	2.85-3.78	20.65-27.87
Muffler Hose	Condenser	28-37	2.85-3.78	20.65-27.87
Condenser Pipe	Drier Bottle	15-17	1.53-1.73	11.00-12.50
Evaporator Hose	Drier bottle	15-17	1.53-1.73	11.00-12.50
Evaporator Pipe	Expansion Valve	28-37	2.85-3.78	20.65-27.85
Evaporator Pipe	Inner Lower Port Expansion Valve Inner Upper Port	20-27	2.04-2.76	14.75-20.00

AIR CONDITIONING

DEPRESSURIZING 82.30.05

Note: Observe all safety precautions and do not smoke while carrying out the following procedures.
With the engine switched off, remove the protective caps from the schraeder valves. Ensure the manifold gauge set hand valves are in the closed position, then by using the access valve core remover connect the manifold gauge set to the system with the red hose to the high pressure side and the blue hose to the low pressure side. Screw out the valve core to allow the refrigerant to flow. Place the centre hose of the manifold set into a suitable container.
Slowly open the high or low side manifold hand valve and adjust the valve for a smooth refrigerant flow. Watch the refrigerant for any signs of escaping oil and adjust the hand valve to prevent any oil escaping. If oil is lost during the discharge, the compressor oil level will have to be checked and if necessary topped up. As the discharge rate slows down, open the other manifold hand valve so that refrigerant will flow from both high and low pressure sides of the system.
Constantly adjust the hand valves to ensure that oil does not flow.
When a zero reading is shown on both high and low pressure gauges the system is discharged. Close both manifold hand valves.

AIR CONDITIONING

FLUSHING 82.30.03

Flushing the system is an essential function which must be carried out if the system has: –

1 Suffered component or pipe rupture leading to a refrigerant discharge.
2 Suffered component failure leading to the possibility of swarf or other contamination of the system.
3 The system has been left in a uncapped condition for longer than eight hours.
4 If the system has remained open for more than eight hours, the drier bottle must be renewed and a 20 minutes evacuation must be carried out in addition to the flushing procedure.

WARNING: – IT IS VITAL THAT ADEQUATE VENTILATION IS PROVIDED DURING ALL FLUSHING AND ALL SAFETY PRECAUTIONS ARE TAKEN.

Refrigerant R11 should always be used as the flushing agent.
Depressurize the system.
Remove the drier bottle and the compressor.
Discard the drier bottle.

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The compressor oil level must be checked.
Stand the bottle of R11 in a container of warm water (approx 50°C) to raise it to its operating pressure.
Disconnect the two pipes from the expansion valve and connect a bridging pipe to the disconnected pipes to complete the circuit.
The filter fitted to the inlet port of the expansion valve must be carefully removed, washed in a solvent, blown dry with air and refitted to the expansion valve.
Renew any faulty components or pipes.
Connect a flexible hose to each of the of the two pipes normally fitted to the compressor and position the free ends in a large container.
Connect a flexible hose to the R11 bottle. Connect the other end of the hose to one of the hoses normally connected to the drier bottle.
With the R11 bottle positioned above the level of the engine and positioned to discharge liquid, open the R11 bottle stopcocks.
When R11 starts flowing into the container close the stopcock and allow flushing liquid to drain through the system for two or three minutes.
Disconnect the flexible hose from the R11 bottle and connect it to a bottle containing R12. Gently open the stopcock on this bottle and observe the R11 flowing into the container. When it stops, allow approximately 30 seconds then close the stopcock. Inspect the flushing liquid, if it dirty repeat the flushing precedure with the R11 bottle reconnected.
If it is clean repeat the flushing procedure with the flexible hose from the R11 bottle connected to the second of the pipes normally connected to the drier bottle.
On re-assembling the system fit a new drier bottle.
Check the compressor oil level.
Reconnect the expansion valve.
Ensure (where necessary) new "O" rings are fitted smeared with CAPELLA "E" oil.
Evacuate and recharge the system with new R12 refrigerant.

AIR CONDITIONING

EVACUATING 82.30.06

Once the system has been opened for repairs, it must be fully evacuated with a vacuum pump to remove all traces of moisture before being recharged with new refrigerant. Moisture may collect and freeze in the expansion valve which will block the refrigerant flow and prevent the cooling action. Moisture will also react with refrigerant 12 and cause corrosion of the small passages in the system.

The desiccant in the drier bottle can only absorb a limited amount of moisture before it becomes saturated, therefore it is most important to prevent moisture from entering the system, also to remove any moisture which inadvertently entered the system through a leak or an open connection.

The unwanted moisture or air are removed from the system by a vacuum pump.

Remove the protective cap from the low pressure connection on the air conditioning system. Check and oil the "O" ring in the low pressure hose (8 Fig 1) from the manifold of the charging station, and connect it to the low pressure side of the system.

Remove the protective cap from the high pressure side of the air conditioning system. Check and oil the "O" ring in the high pressure hose (9 Fig 1) from the manifold of the charging station, and connect it to the high pressure side of the system.

Check inlet valve (5 Fig 1) and vent valve (7 Fig 1) of the charge cylinder and are closed.

NOTE: If the charge cylinder contains refrigerant close the outlet valve (4 Fig 1).

Fully open the low pressure valve (1 Fig 1), the high pressure valve (2 Fig 1) and the vacuum valve (3 Fig 1).

Switch the vacuum pump on, note the low pressure gauge to make certain that a vacuum is being created in the system by the vacuum pump, continue to operate until a vacuum of 13 mmHg (17.50 mb) is obtained.

If this vacuum cannot be attained check the system for leaks.

From the time a vacuum of 13 mmHg (17.50 mb) is attained, run the vacuum pump for at least 6 minutes to be sure complete evacuation has been attained.

Close both gauge hand valves, switch off the vacuum pump, observe the low pressure side gauge reading. The gauge reading should remain stationary at the point where the pump was switched off. Should the gauge return towards zero a leak exists in the air conditioning system.

If the gauge needle remains stationary for 3 to 5 minutes, close both manifold hand valves and disconnect the hose from the vacuum pump.

The air conditioning system is now ready for charging.

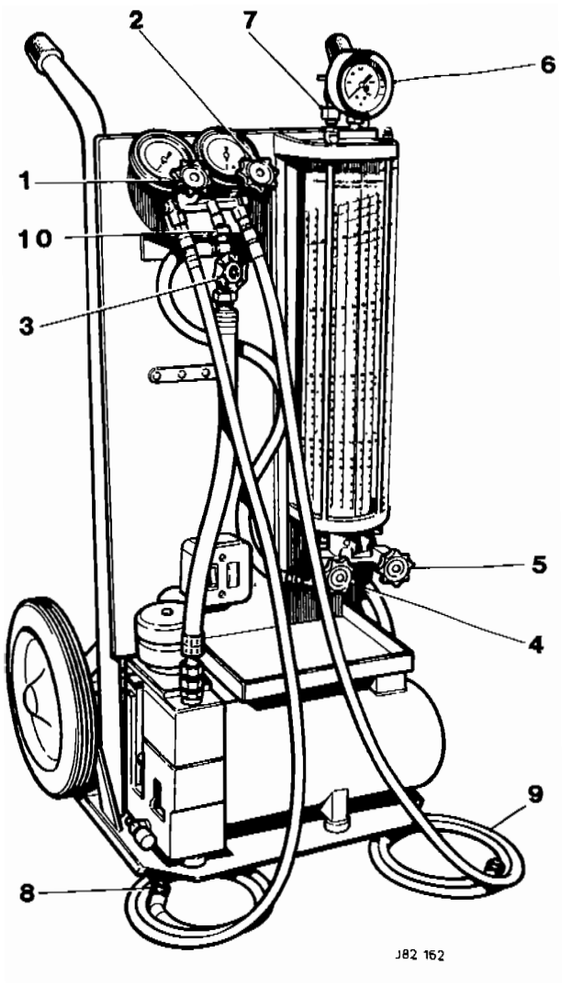


Fig 1

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AIR CONDITIONING

CHARGING 82.30.08

Before attempting the charging operation the system must be evacuated and if necessary flushed through immediately beforehand. No delay between evacuation and charging procedures is permissable. The equipment should be fitted with means of accurately weighing the refrigerant during the charging process.

Great care must be taken to charge correctly, as undercharging will result in very inefficient operation, and overcharging will result in very high pressures and possibly damage to components.

Evacuate the system as described previously.

The supply available in the charge cylinder must be at least 3.3 kg weight.

To fill the charge cylinder the charge cylinder inlet and outlet valves are closed (4 & 5 Fig **1**).

Disconnect the charge cylinder hose from the gauge manifold (10 Fig 1) and connect the charge cylinder hose to a refrigerant **R12** bottle.

Open the bottle **R12** stopcock.

Open the charge cylinder inlet valve (5 fig **1**) and observe the refrigerant in the charging cylinder sight glass.

When the refrigerant stops rising, carefully open the charge cylinder vent valve (7 Fig **1**) to release the pressure and allow the refrigerant level to continue rising until the desired level is achieved.

Close the vent valve (7 Fig **1**) and the charge cylinder inlet valve (5 Fig 1).

Switch on the heater and allow the refrigerant pressure to increase to 830 kPa 8.40 kgf/cm^2 120 lbf/in^2 on the charge cylinder pressure gauge (7 Fig 1).

Switch off the heater.

Rotate the plastic shroud on the refrigerant charge cylinder until the pressure reading corrseponding to the gauge pressure is in line with the refrigerant level. Note that readings must be taken within the R12 band on the shroud.

Close the **R12** stopcock and reconnect the charge cylinder (10 Fig 1) hose to the the gauge manifold.

Ensuring that the vacuum valve fully closed.

Open the charge cylinder valve (4 Fig 1).

As the pressure in the charging cylinder falls, rotate the plastic shroud on the refrigerant cylinder until the pressure reading corresponding to the gauge pressure (6 Fig 1) is in line with the refrigerant level.

When the correct charge has been dispensed.

Close the high and low pressure valves (1 & 2 Fig **1**).

Close the charge cylinder outlet valve (4 Fig **1**).

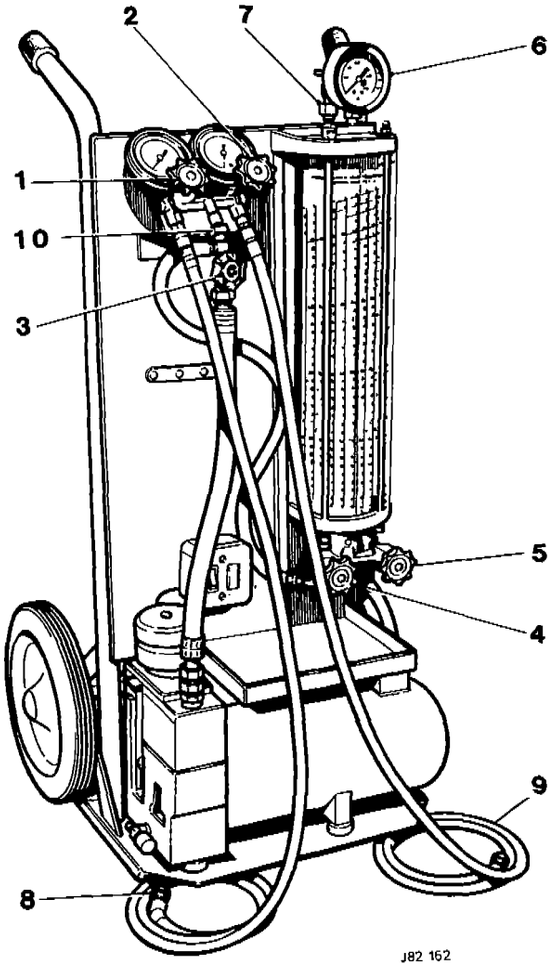


Fig **1**

AIR CONDITIONING

FULL CHARGE NOT ACCEPTED *82.00.00*

If the full charge is not accepted close the high and low pressure valves (1 & 2 Fig 1).
Start the engine and run at 1500 rev/min.
Set the air conditioning controls to maximum cooling and slowly open the low pressure valve (1 Fig 1) to bleed in the remaining refrigerant.

NOTE: This must be carried out Extremely slowly to prevent liquid refrigerant damaging the compressor.
Close the high and low pressure valves (1 8 2 Fig 1).
Close the charge cylinder outlet valve (4 Fig 1).
Switch off the engine.

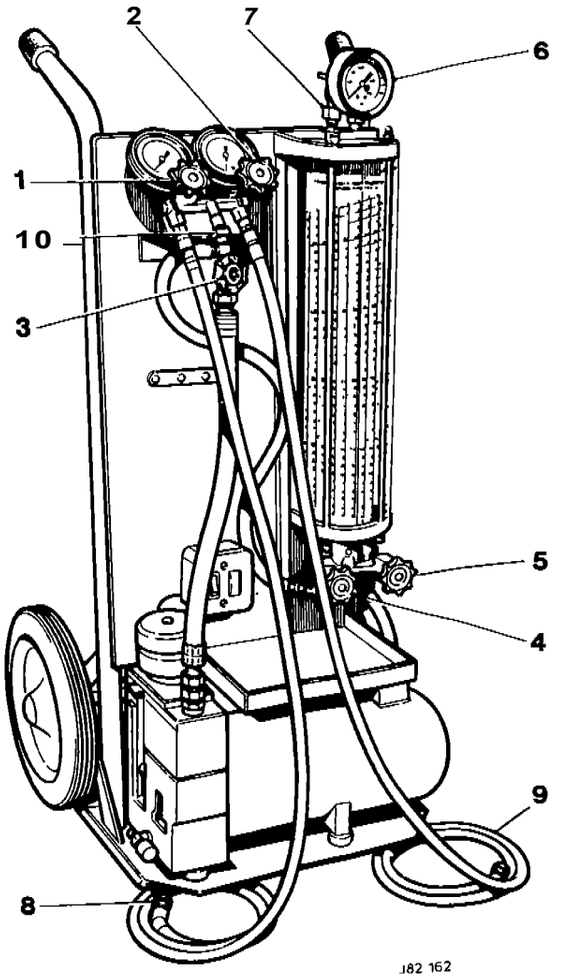


Fig 1

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COMPRESSOR.

RENEW 82.10.20

Open the bonnet and disconnect the *battery* earth lead.
Depressurize the air conditioning system.
Remove the bolt securing the muffler plate (1 Fig 1).
Remove the muffler securing **bolt** (2 Fig 1).
Remove the "O" ring seals and discard.
Fit protective caps to the disconnected hoses and a protection plate to the cornpressor.

Release the distributor cap retaining clips and displace the cap with the HT leads over the engine.
Loosen the compressor drive belt trunnion securing bolt (1 Fig 2) and the adjusting rod pivot bolt (2 Fig 2).
From below slacken the compressor front (3 Fig 2) and rear pivot bolts (3 Fig 1).
From above, adjust the compressor towards the engine until the drive belt can be removed.
Remove the drive belt trunnion securing nut and bolt (1 Fig 2).
Disconnect the compressor clutch multi-plug connector (4 Fig 2) and the superheat switch cable (4 Fig 1).

Remove the bolts securing the exhaust heat shield and remove the shield.
Remove the compressor rear pivot bolt and spacers (3 Fig 1).
Remove the compressor front pivot bolt (3 Fig 2).
Carefully remove the compressor with the rear end upwards to prevent oil loss.
Remove the bolts securing the support brackets and remove the brackets.
Remove the bolt securing the adjuster rod and remove the rod.

When fitting the new compressor do not fully tighten the securing **bolts** until the drive belt is adjusted to the correct belt tension of 3.3kg to give deflection of 4.4mm when applied at the mid-point of the belt.
Ensure that all the nuts and **bolts** are fully tightened when the belt has been correctly adjusted.
Ensure new "O" ring seals are fitted and the protective caps are not removed until the **last** possible moment before connecting the hoses.
Ensure all hose union nuts are tightened to the correct torque.
Fit new receiver/drier, evacuate and recharge the system.

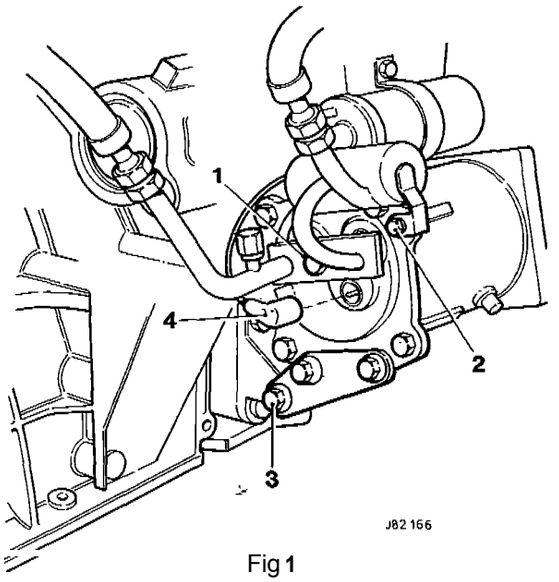


Fig 1

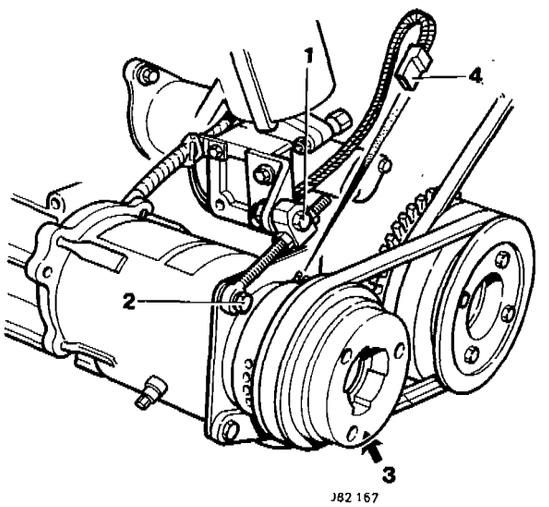


Fig 2

DATA

TORQUE FIGURES

Muffler bolt ***40-50Nm***
Muffler plate bolt ***32-37Nm***

COMPRESSOR DRIVE BELT

RENEW 82.10.02
ADJUST 82.10.01

Open the bonnet and disconnect the battery earth lead.
Slacken the compressor drive belt trunnion securing bolt (1 Fig 1).
Slacken the upper drive belt adjusting nut (2 Fig 1).
Slacken the adjusting rod pivot bolt (3 Fig 1).
From below slacken the compressor front and rear pivot bolts.
From above adjust the compressor towards the engine.
Displace and remove the drive belt (4 Fig 1).

When fitting the a new drive belt do not fully tighten the compressor securing bolts until the drive belt is adjusted to the correct belt tension of 3.3kg to give deflection of 4.4mm when applied at the mid-point of the belt.

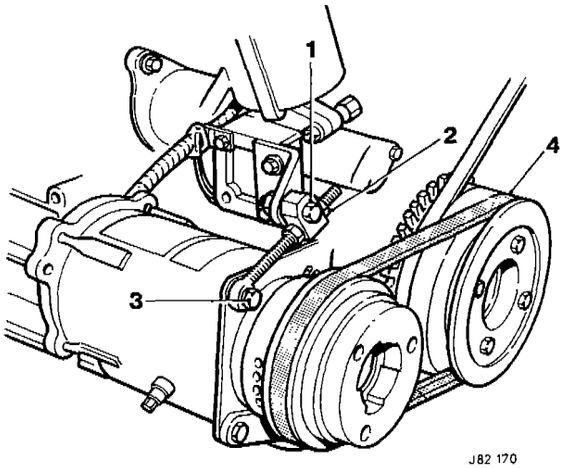


Fig 1

AIR CONDITIONING SUPERHEAT SWITCH

Testing

If the refrigerant level is satisfactory and there is not a blockage in air conditioning system but the thermal fuse persists in melting.
Carry out the following checks.

Test procedure A

For use with a cold engine and at ambient temperatures **below 30°C.**
Connect a test lamp in series with the superheat switch.
Note: With the test lamp connected in the circuit it will prevent the thermal fuse from operating as a safety device therefore great care must be taken when carrying out the test.
Connect a manifold gauge set to the air conditioning system.

Ensure a serviceable thermal fuse is fitted.
With the ignition and the air conditioning switched on.
Depressurize and evacuate the air conditioning system, then close the manifold hand valves (see page).
The test lamp SHOULD NOT LIGHT during this operation.

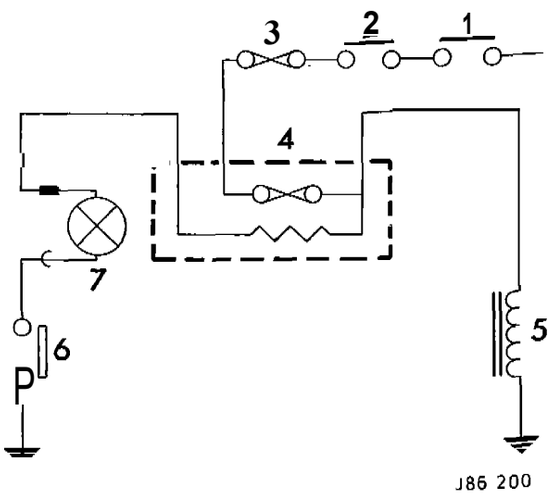


Fig 2

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NOTE: If the test lamp does light then follow test procedure (B).

Test procedure B

With test lamp not illuminated, connect the centre hose of the manifold gauge set to a refrigerant supply container. Start and run the engine at about 2000 rev/min. After a few minutes the lamp should light. As soon as the test lamp lights, carefully operate the low pressure hand valve to allow refrigerant **to** charge the system. As soon as the air conditioning system becomes charged the lamp should go out.
If the above lamp functions do not occurr, renew the superheat switch.
After checking remove the test lamp **from** the circuit and reconnect the switch lead onto the terminal.
Operate and check the air conditioning system.

SUPERHEAT SWITCH

RENEW **82.10.08**

Open the bonnet and disconnect the **battery** earth lead.
Depressurize the air conditioning system.
Remove the bolt securing the muffler plate to the compressor (1 Fig 1).
Remove the bolt securing the muffler **body** assembly to the compressor (2 Fig 1).
Remove and discard the "O" ring seals.
Fit protective caps to the compressor and hoses.
Disconnect the superheat switch cable connector (3 Fig 1).
With suitable circlip pliers remove the circlip retaining the superheat switch and remove the switch.

On fitting new switch, fit new "O" ring seals and receiver/drier.
Ensure **all** hose union nuts are tightened to the correct torque.
Evacuate and recharge the system.

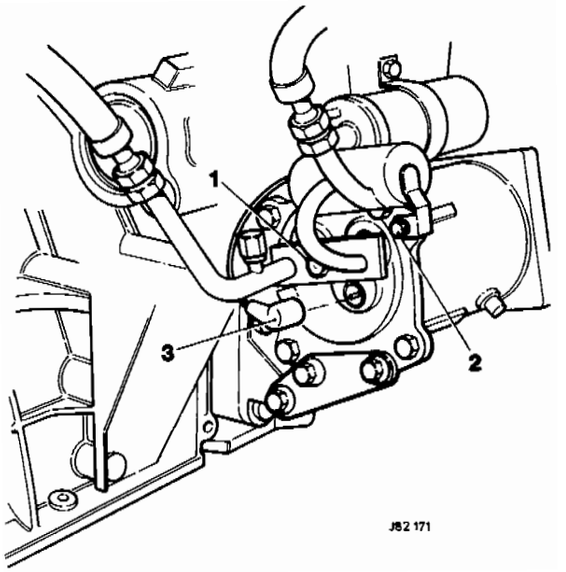


Fig 1

REAR AIR DISTRIBUTION BOX

RENEW **82.10.33**

Remove the centre console ashtray, glove box and finisher.
Remove the fascia centre veneer panel and ventilator.
Remove the driver and passengers side dash liners.
Remove the screws securing the centre console.
Displace the console rearward and upward.
Displace and remove the air box (Fig 1) from the air tubes.

Fitting a new air distribution box is the reversal of the above procedure.

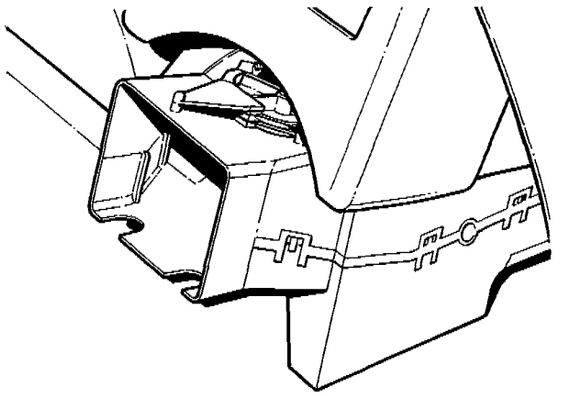


Fig 1

CONDENSER

RENEW **82.15.07**

Depressurize the air conditioning system.
Remove the clips securing the fan cowl.
Remove the bolts securing the radiator cross member and remove the cross member complete with the mounting rubbers.
With the aid of a backing spanner undo the union nut and disconnect the compressor hose from the condenser.
Remove and discard the "O" ring seal.
Fit a protective cap to the hose.
Undo the condenser to receiver/drier union nut.
Disconnect the condenser from the receiver/drier, remove and discard the "O" ring seal.
Fit a protective cap to the receiver/drier.
Remove the nuts securing the receiver/drier and displace the receiver/drier for access.
Remove the condenser complete (Fig 2) with the rubber mounting grommets.

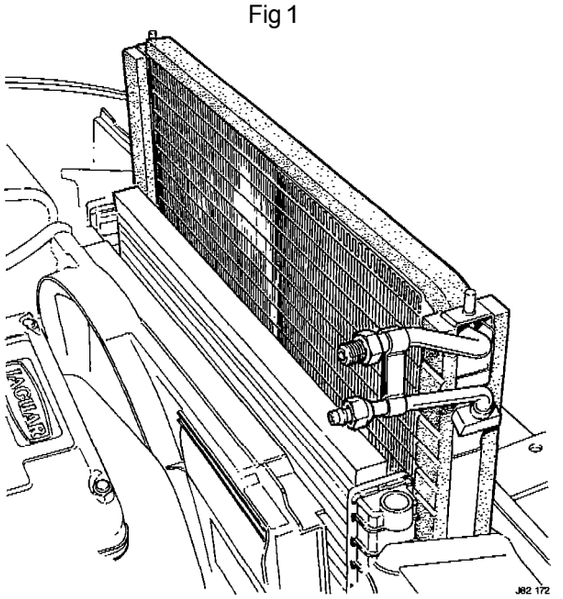


Fig 2

On fitting the new condenser, stick rubber foam to the top and sides.
Fit new mounting grommets and ensure the condenser is fully seated in the correct position.
Ensure all hose union nuts are tightened to the correct torque.
Flush the system, fit new receiver/drier, evacuate and recharge the system.

DATA

TORQUE FIGURES

Condensor** hose 3/4UNF **20-27Nm
Condensor** hose 7/8UNF **28-37Nm
Drier** to condenser **15-17Nm

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DRIER BOTTLE

RENEW **82.17.01**

Depressurize the air conditioning system.
Undo the union nut and disconnect the expansion valve hose from the drier bottle (1 .Fig 1).
Remove and discard the "O" ring seal.
Fit a protective cap to the hose.
Remove the nuts washers securing the drier bottle (2 Fig 1).
With the aid of a backing spanner undo the condenser pipe union nut (3 Fig 1).
Disconnect the drier bottle from the condenser.
Remove, discard the "O" ring seal and fit a protective cap to the condenser outlet.
Remove the drier bottle.

On fitting new drier bottle ensure new "O" rings are fitted.
Ensure the union nuts are tightened to the correct torque
Flush, evacuate and recharge the system.

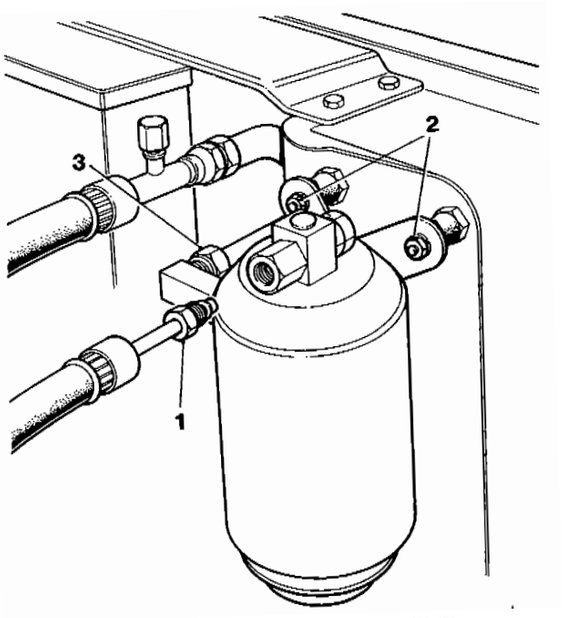


Fig 1

DATA

TORQUE FIGURES

Drier securing nuts 7-10Nm

0206G

LOWER FEEDBACK POTENTIOMETER

RENEW ***82.20.60***

NOTE: The potentiometer is supplied preset on a mounting plate and must not be disturbed.
Open the bonnet and disconnect the battery earth lead.
Remove the left hand dash liner.
Remove the three screws (Fig 2) securing the potentiometer plate.

Disconnect the cable connector.
Withdraw the potentiometer complete with plate from its location.

Fitting a new potentiometer assembly is the reversal of the removal procedure.

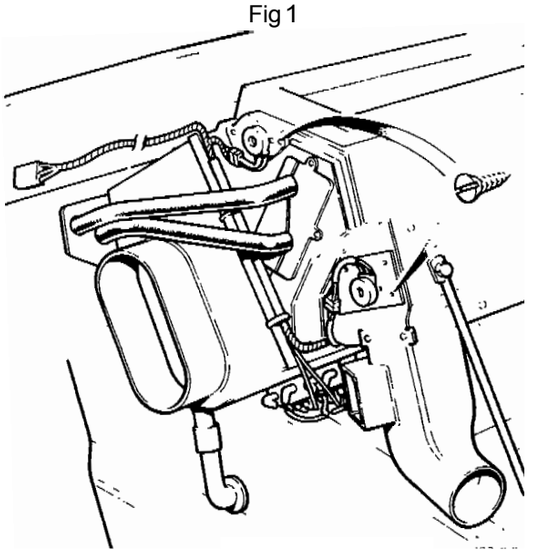


Fig 2

UPPER FEEDBACK POTENTIOMETER

RENEW **82.20.61**

NOTE: The potentiometer is supplied preset on the mounting plate and must not be disturbed.
Open the bonnet and disconnect the battery earth lead.
Remove the left hand dash liner.
If the vehicle is right hand drive remove the glove **box.**
Remove the three screws (Fig **1**) securing potentiometer fixing plate.

Disconnect the cable connector.
Withdraw the potentiometer complete with plate **from** its location.
Fitting **a** new potentiometer is the reversal of the removal procedure.

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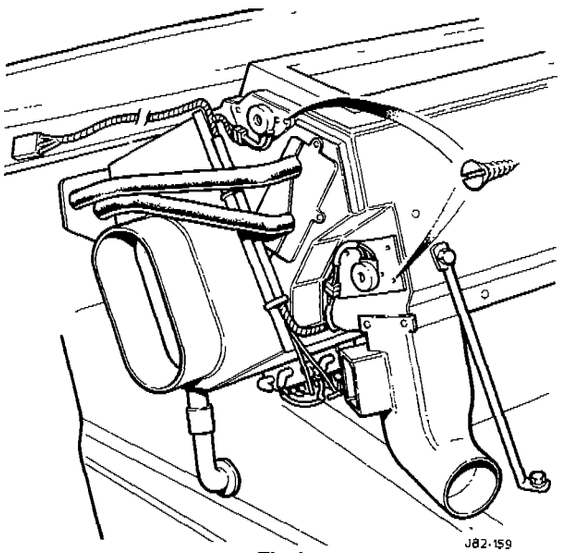


Fig 1

IN CAR TEMPERATURE SENSOR.

RENEW **82.20.03**

Open the bonnet and disconnect the battery earth lead.
Open the glove **box** and remove the plate from inside the glove **box.**
Disconnect the temperature sensor cable harness multi-plug connector (1 **Fig** 2).
Disconnect the rubber tube from the sensor assembly (2 Fig 2).
Remove the screws securing the sensor assembly and remove the assembly (**3** Fig 2).

Remove the screws securing the sensor to the sensor housing and remove the sensor.

Fitting a new sensor is the reversal of the above procedure.

0206G

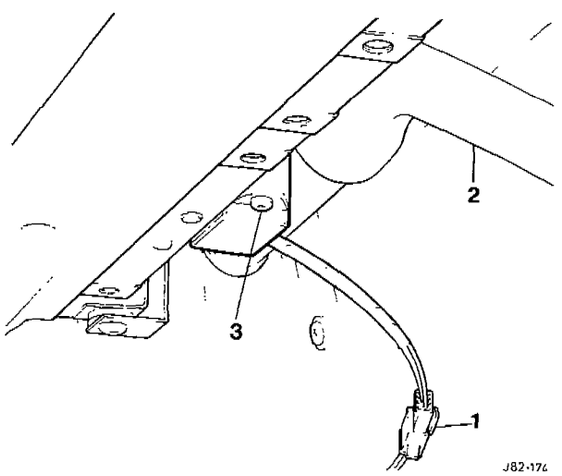


Fig 2

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AMBIENT TEMPERATURE SENSOR

RENEW ***82.20.02***

Open the bonnet and disconnect the battery earth lead.
Remove the drivers side dash liner.
Displace the pliable trunking from the air conditioning unit.
Remove the bolts securing the blower motor assembly.
.Disconnect the multi-plug cable harness connectors.
On right hand drive vehicles disconnect the in-car sensor hose from the pliable trunking.
Disconnect the vacuum hose from the blower motor assembly servo unit.
Displace and remove the blower motor assembly.
Remove the two screws securing the ambient sensor and remove the sensor.
On left hand drive vehicles the sensor is accessible through the removable plate in the glove box (1 Fig 1).

Fitting a new sensor is the reversal of the removal procedure.

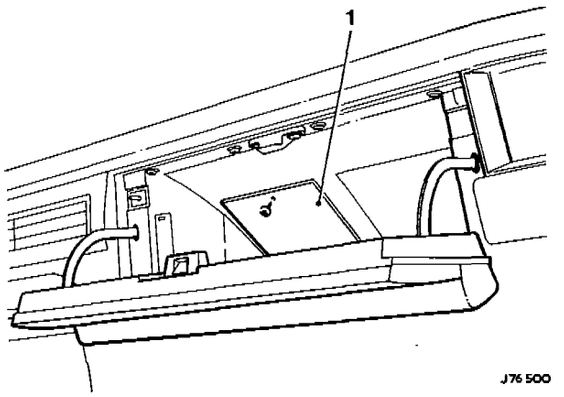


Fig 1

0206G

BLOWER MOTOR ASSEMBLY (Right hand side)

RENEW 82.25.14

Open the bonnet and disconnect the battery earth lead.
Remove the right hand side dash liner (Fig 2).

If the vehicle is left hand drive remove the glove box and lid.
Remove the lower screw securing the central processor, displace the earth lead and remove the spacers.
Loosen the upper screw securing the processor, raise and disengage the processor from the securing screw.
Displace the processor downwards for access.
Remove the screws securing the processor mounting bracket and remove the bracket.
Displace the pliable trunking from the air conditioning unit.
Remove the bolts securing the blower motor assembly.
Disconnect the multi-plug cable harness connectors.
Disconnect the in-car sensor hose from the pliable trunking.
Disconnect the vacuum hose from the blower motor assembly servo unit.
Displace and remove the blower motor assembly.

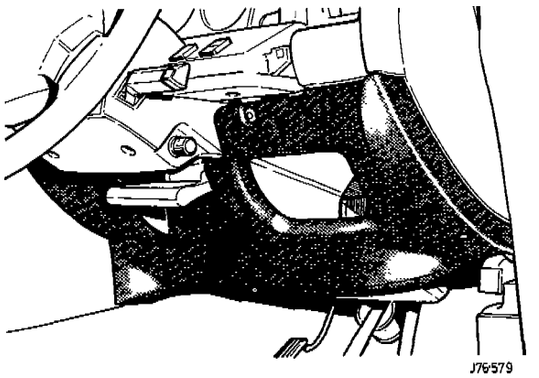


Fig 2

Disconnect the ambient temperature sensor.
Remove the rubber gasket from the assembly.
Remove the tape securing the trunking to the blower motor assembly and remove the trunking.

Fitting a new blower motor assembly is the reversal of the above procedure.

0206G

BLOWER MOTOR ASSEMBLY (Left hand side)

RENEW **82.25.13**

Open the bonnet and disconnect the battery earth lead.
Remove the left hand side dash liner.
If the vehicle is right hand drive remove the glove box and lid.
Remove the lower screw securing the central processor, displace the earth lead and remove the spacers.
Loosen the upper screw securing the processor, raise and disengage the processor from the securing screw.
Displace the processor downwards for access.
Remove the screws securing the processor mounting bracket and remove the bracket.
Remove the screws securing the blower motor assembly.
Disconnect the multi-plug cable connectors.
Disconnect the vacuum hose from the blower motor assembly servo unit.
Disconnect the pliable trunking from the air conditioning unit.
Displace and remove the blower motor assembly (Fig 1).

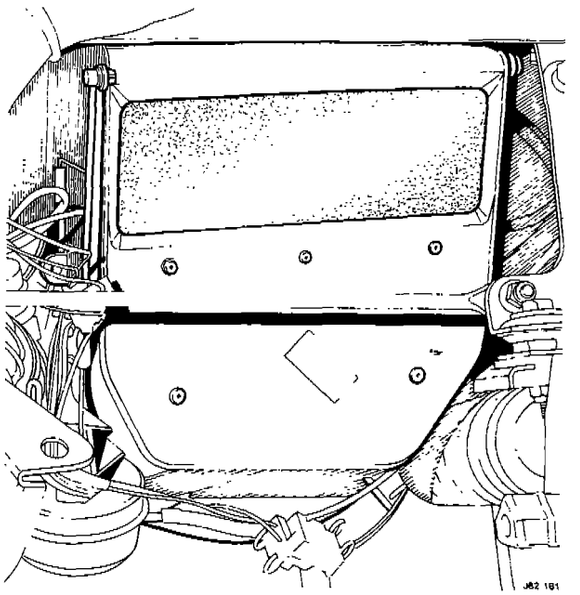


Fig 1

Remove the rubber gasket from the assembly.
If the vehicle is left hand drive remove the screws securing the ambient temperature sensor and remove the sensor.

Fitting a new blower motor assembly is the reversal of the above procedure.

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SOLAR SENSOR

RENEW **82.20.20**

Open the bonnet and disconnect the battery earth lead.
Carefully prise the solar sensor panel from the top of the fascia (1 Fig 1).
Disconnect the multi-pin cable harness connector.
Remove the complete solar sensor assembly (2 Fig 1).
Remove the spire clips (3 Fig **1)** securing the sensor **to** the assembly and remove the sensor (4 Fig **1).**

Fitting a new sensor and spire clips is the reversal of the above procedure.

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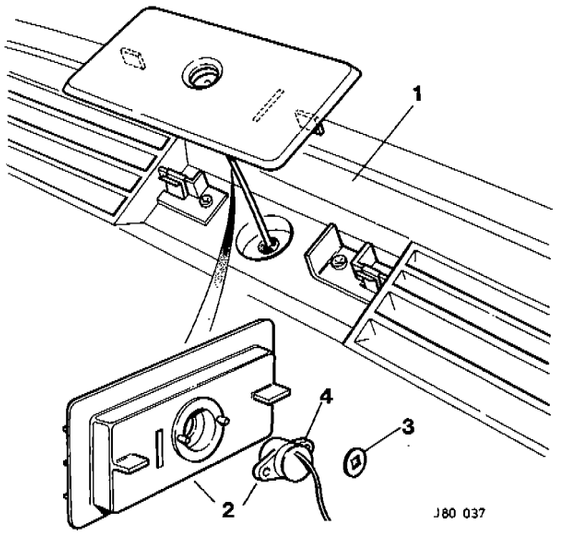


Fig **1**

WATER VALVE

RENEW **82.20.33**

Open the bonnet and drain the engine coolant into a suitable container.
Disconnect the water valve vacuum pipe **(1** Fig 2).
Loosen the heater hose securing clip and remove the hose **from** the heater matrix pipe (2 **Fig** 2).
Reposition the water valve for access.
Loosen the heater to water valve hose clip and remove the hose assembly.
Loosen the water valve to cylinder head hose clip (3 Fig 2) and remove the water valve assembly (4 Fig 2).

Fit the new water valve assembly **in** the reverse order to the above procedure.
Refil the engine with coolant.

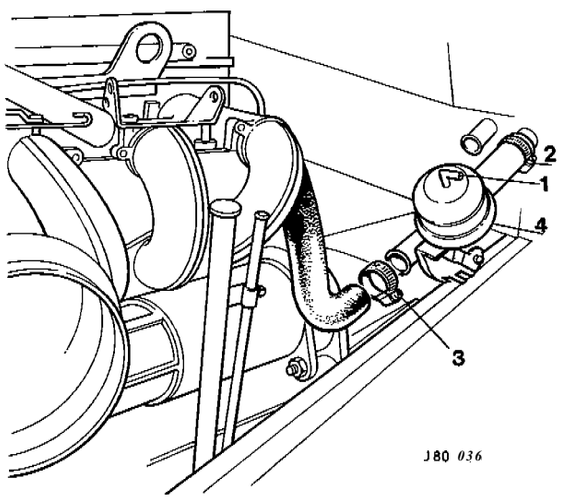


Fig 2

VENTILATOR OUTLETS (Right or left hand).

RENEW 82.20.39
82.20.40

Open the car door.
Carefully prise the appropriate ventilator outlet direction vent from the housing.
Release the housing retaining clips and remove the ventilator from the fascia (Fig **1**).

To fit the new ventilator reverse the above procedure.

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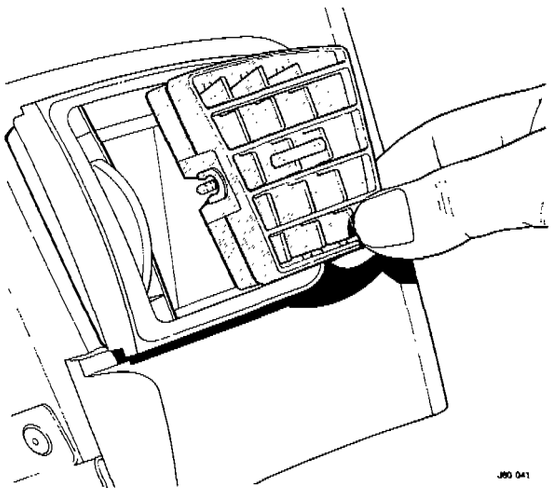


Fig 1

VENTILATOR CENTRE FLAP SERVO

RENEW **82.20.41**

Open the bonnet and disconnect the battery earth lead.
Open the car door and remove the steering wheel.
Remove the dash liners.
Remove the screws securing the instrument pack.
Disconnect the instrument pack cable harness multi-plug connectors and remove the pack assembly.
Remove the glove **box.**
Remove the centre fascia veneer panel and the centre ventilator.
Remove the fascia board assembly.
Disconnect the vacuum hose from the solenoid and reposition the vent assembly from the fascia assembly.
Remove the spire clips and rubber sealing strips.
Remove the servo (Fig 2) and place aside.

Reverse the above procedure when fitting the new servo.

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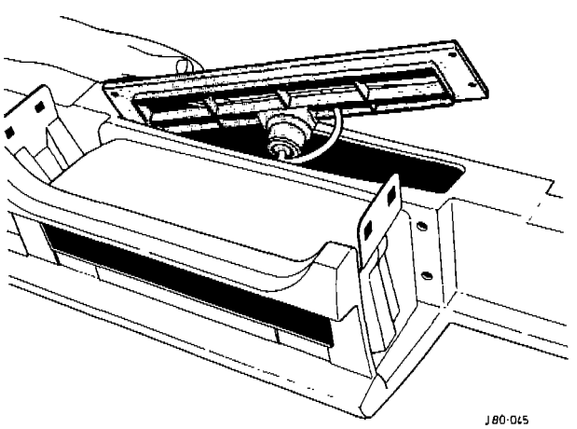


Fig **2**

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DEMISTER FLAP SERVO

RENEW 82.20.42

Open the bonnet and disconnect the battery earth lead.
Open the car door and remove the steering wheel.
Remove the screws securing the dash liners and remove the dash liners.
Remove the screws securing the instrument pack.
Disconnect the instrument pack cable harness multi-plug connectors and remove the pack assembly.
Remove the centre veneer panel and the centre ventilator.
Remove the fascia board assembly. Remove and disconnect the solar sensor.
Remove the fascia ventilator grille trim panel.
Remove the screws securing the defrost vent.
Reposition the fascia for access and disconnect the solenoid vacuum tube.
Remove the vent assembly.
Remove the spire clips securing the servo and remove the servo (Fig 1).

Reverse the above procedure when fitting the new servo.

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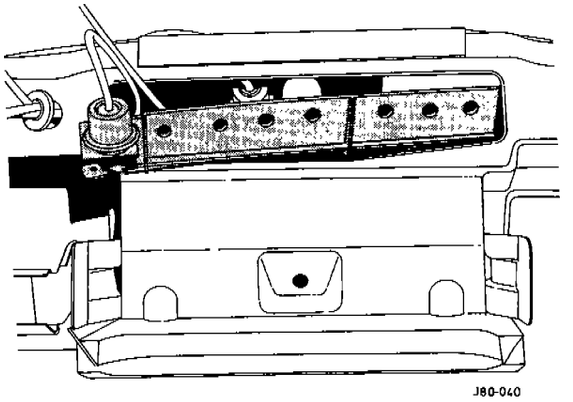


Fig 1

FLAP MOTOR /GEARBOX ASSEMBLY (Upper)

RENEW ***82.20.62***

Open the bonnet and disconnect the battery earth lead.
Remove the glove box on left hand drive cars and displace the relay mounting bracket.
Remove the right hand side dash liner.
Remove the screws securing the electronic control module (1 Fig 1) to the air conditioning unit and reposition the module to one side for access.
Remove the screws securing the flap motor assembly, displace the assembly and disconnect the multi-plug connector.
Remove the flap motor assembly (2 Fig 1).

Fitting a new assembly is the reversal of the above procedure.

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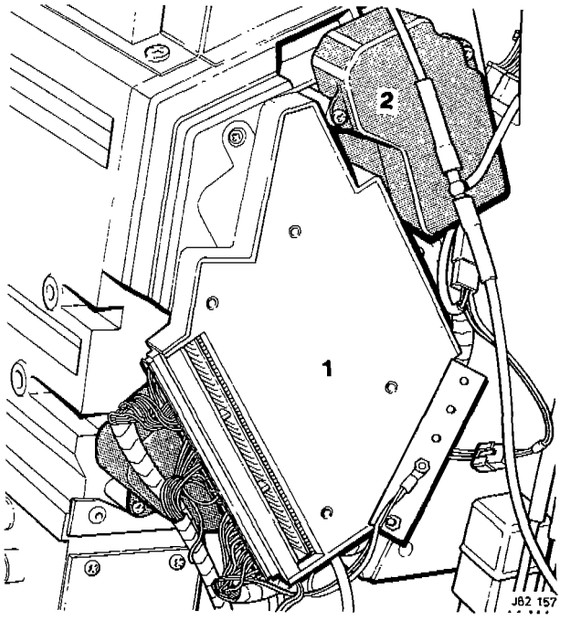


Fig 1

FLAP MOTOR/GEARBOX ASSEMBLY (Lower)

RENEW **82.20.63**

Open the bonnet and disconnect the battery earth lead.
On left hand drive cars, remove the glove box and relay mounting bracket.
Remove the left hand side dash liner.
Remove the screws sucuring the electronic control module (1 Fig 2) to the air conditioning unit and reposition the module for access.
Remove the screws securing lower motor assembly, displace the assembly and disconnect the multi-plug connector.
Remove the flap motor assembly.

Fitting a new assembly is the reversal of the above procedure.

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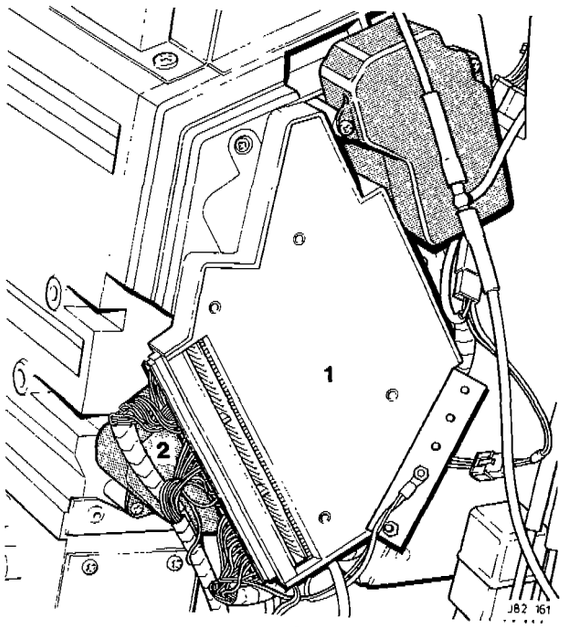


Fig 2

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ELECTRONIC CONTROL MODULE (E.C.M.)

RENEW ***82.20.65***

Open the bonnet and disconnect the battery earth lead.
Open the car door and remove the right hand dash liner.
On left hand drive vehicles remove the glove box assembly.
Remove the screws securing the control module and displace the module from its location.
Disconnect the earth lead and the multi-plug harness connectors.
Remove the module (Fig **1**).

Fitting **a** new module is the reversal **of** the above procedure.
Ensure that all connection are secure and clean.

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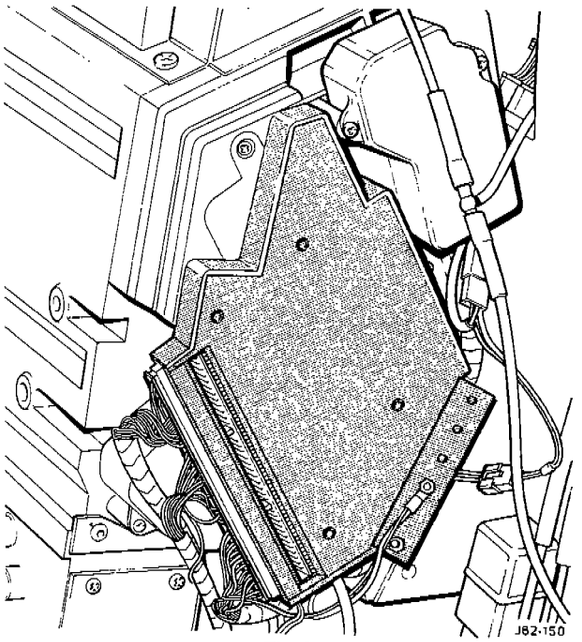


Fig 1

WATER TEMPERATURE SWITCH

RENEW **82.20.71**

Open the bonnet and disconnect the battery earth lead.
Open the car door and remove the left hand side dash liner.
Note and disconnect the switch supply cables.
Remove the screws securing the switch and remove the switch (Fig 2).

Fitting a new switch is the reversal **of** the above procedure ensuring all connection are secure and clean.

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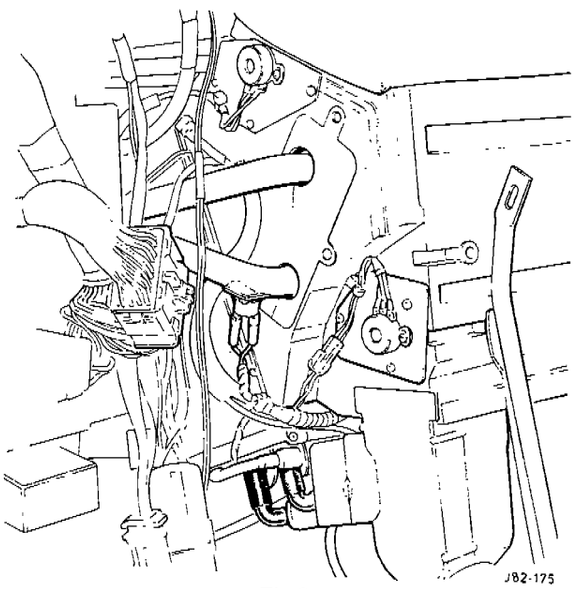


Fig 2

SWITCH CONTROL MODULE

RENEW *82.20.72*

Open the bonnet and disconnect the battery earth lead.
Open the car door and remove the centre console ashtray.
Remove the centre console finisher.
Remove the screws securing the radio console and remove the console.
Loosen the screws securing the switch control module.
Displace the control module and disconnect the cable harness multi-plug connector.
Remove the switch module from the console (Fig 1).

Fitting a new switch control module is the reversal of the above procedure

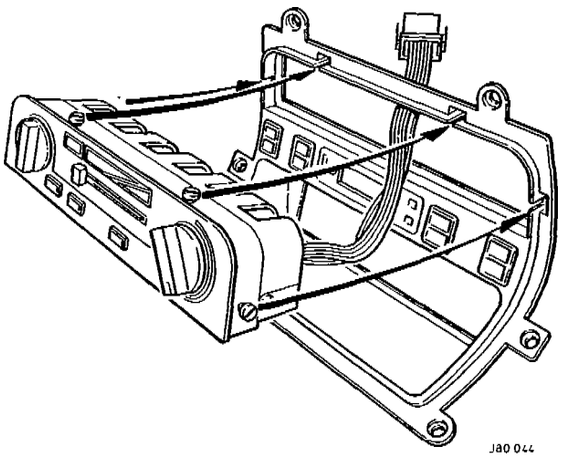


Fig 1

SWITCH CONTROL MODULE ILLUMINATION BULB

RENEW **86.46.07**

Open the.bonnet and disconnect the battery earth lead.
Open the car door and remove the centre console ashtray.
Remove the centre console finisher.
Remove the screws securing the radio console and remove the console.
Loosen the screws securing the switch control module.
Displace the control module and disconnect the cable harness multi-plug connector.
Remove the switch module from the console (Fig 1).
Prise the face level knob from its lever.
Remove the control knobs.
Remove the fascia plate retaining nuts and the screws securing the control panel.
Remove the fascia plate and the lens.
Remove the appropriate bulb.

Fitting a new bulb is the reversal of the above procedure.

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EXPANSION VALVE

RENEW 82.25.01

Depressurize the air conditioning system.
On left-hand drive vehicles remove the battery for access.
Remove the clamp securing the receiver/drier to expansion valve pipe.
Undo the top pipe union nut and disconnect the pipe from the expansion valve (1 Fig 1).
Fit a protective cap to the pipe.
Undo the lower hose union nut and disconnect the hose from the expansion valve (2 Fig 1).
Fit a protective cap to the hose.
Remove the "O" ring seals and discard.
Undo the union nuts on the evaporator stub pipes (3 Fig 1).
Remove the expansion valve, remove and discard the "O" ring seals.
Fit protective caps to the evaporator stub pipes.

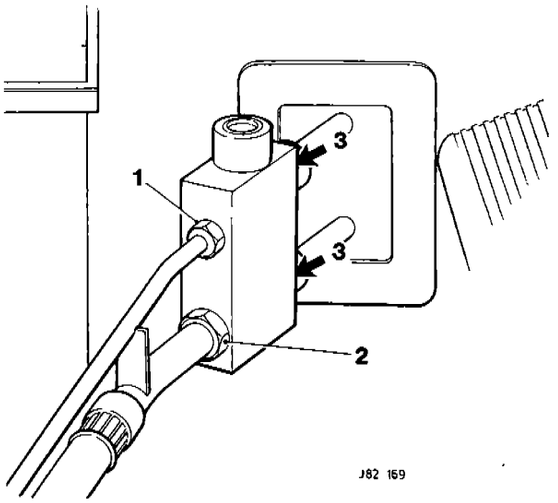


Fig 1

On fitting new expansion valve ensure new "O" rings are fitted.
Ensure the union nuts are tightened to the correct torque as detailed below.
Flush the system, fit new receiver/drier, evacuate and recharge the system.

DATA

TORQUE FIGURES

Evaporator stub pipe union 3/4UNC 20-27Nm
Evaporator stub pipe union 7/8UNC 28-37Nm

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EVAPORATOR TO COMPRESSOR HOSE

RENEW **82.25.02**

NOTE: It is essential that a second backing spanner is always used when loosening or tightening **all** hose joints. This will rninirnisedistortion or strain on pipes.
Before renewing any hose or component ensure that suitable clean, dry, sealing plugs are to hand.
The protective sealing plugs or caps must remain on all replacement components until immediately before making connection.
The drier bottle must be renewed whenever the system has been opened.

Depressurize the air conditioning system.
If the vehicle is left hand drive remove the battery.
Undo the union nut securing the lower hose to the expansion valve and disconnect the hose (1 Fig 1).
Fit a protective cap to the expansion valve orifice.
Remove and discard the "O" ring seal.
Undo the union nut connecting the evaporator hose to the compressor inlet pipe and disconnect the hose (2 Fig 1).
Remove and discard the "O" seal.
Fit a protective cap the compressor inlet pipe.

Fitting a new hose is the reversal of the above procedure.
Ensure that new "O" rigs are fitted and the protective caps are not removed until the last possible moment before the new hose is connected.
Ensure the union nuts are tightened to the correct torque.
Flush the system, fit new drier bottle, evacuate and recharge the system.

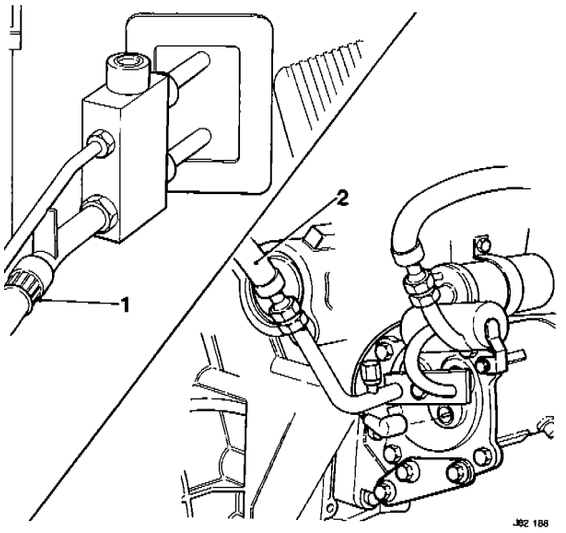


Fig 1

DATA

TORQUE FIGURES

Hose union-evaporator 28-37Mm
Hose union-condenser 28-37Nm

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DRIER BOTTLE TO EVAPORATOR HOSE

RENEW **82.25.03**

Depressurize the air conditioning system.
Undo the union nut and disconnect the hose from the drier bottle (1 Fig 1).
Remove and discard the "O" ring seal.
Fit protective caps to the hose and to the drier bottle.
Remove the screw securing the pipe clip to the inner wing valance and remove the clip.
Undo the upper union nut from the expansion valve and disconnect the pipe (2 Fig 1).
Remove and discard the "O" ring seal.
Fit a protective cap to the expansion valve and remove pipe.

Fitting a new hose is the reversal of the above procedure.
Ensure that new "O" rings are fitted and the protective caps are not removed until the last possible moment before connecting the new hose.
Ensure the union nuts are tightened to the correct torque.
Flush the system, fit new receiver/drier, evacuate and recharge the system.

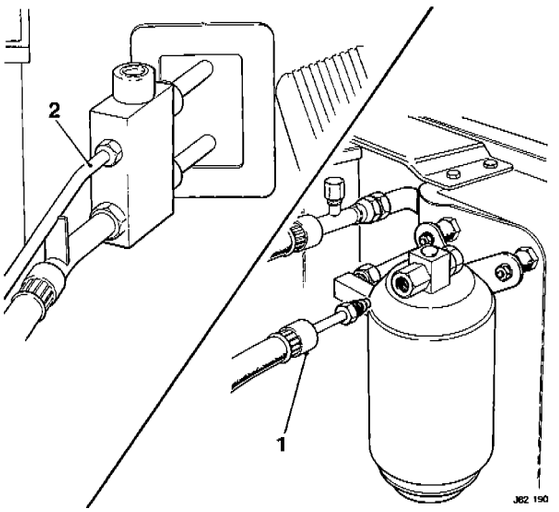


Fig 1

DATA

TORQUE FIGURES

Hose union-drier 15-17Nm
Hose ***union-evaporator 15-17Nm***
Pipe ***clip 7-10Nm***

0206G

COMPRESSOR TO CONDENSER HOSE

RENEW **82.25.49**

Depressurize the air conditioning system.
Undo the union nut from the condenser stub pipe and remove the hose.
Remove and discard the "O" ring seal.
Fit a protective cap to the condenser outlet.
Undo the union nut connecting the hose to the muffler and disconnect the hose.
Remove and discard the "O" ring seal.
Fit a protective cap to the muffler outlet pipe and remove the hose (Fig 2).

Fitting a new hose is the reversal of the above procedure.

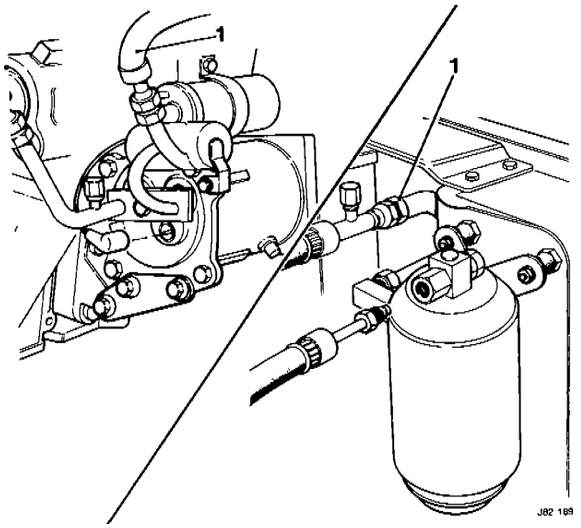


Fig 2

Ensure that new "O" rings are fitted and the protective caps are not removed until the last possible moment before connecting the new hose.
Ensure the union nuts are tightened to the correct torque.
Flush the system, fit new drier bottle. Evacuate and recharge the system.

DATA

TORQUE FIGURES

Hose union - drier ***15-17Nm***
Pipe clip ***7-10Nm***

0206G

HEATER MATRIX

RENEW 82.25.19

Open the bonnet, ensure the engine is cold, drain the engine coolant into a suitable container.
Disconnect the battery earth lead.
Open the car door and remove the dash liners and the steering wheel.
Remove the screws securing the instrument pack.
Disconnect the instrument pack cable harness multi-plug connectors and remove the **pack** assembly.
Remove the glove box and the glove **box** lid.
Remove the screws securing the heater matrix pipe housing and remove the pipe housing halves.
Remove the foam pad from the pipes.
Remove the screws securing the pipes, reposition the pipes and remove the pipe gaskets.
Remove the screws securing the electronic control module and reposition the module for access to the screws securing the matrix housing.
Remove the screws securing the heater matrix housing and remove the housing.
Displace and remove the matrix **(Fig 1)**.
Remove the foam strip from the matrix.

Fitting the new matrix is the reversal of the above procedure.
Ensure all electrical connection are clean and secure.
Refill the engine cooling system with specified coolant.

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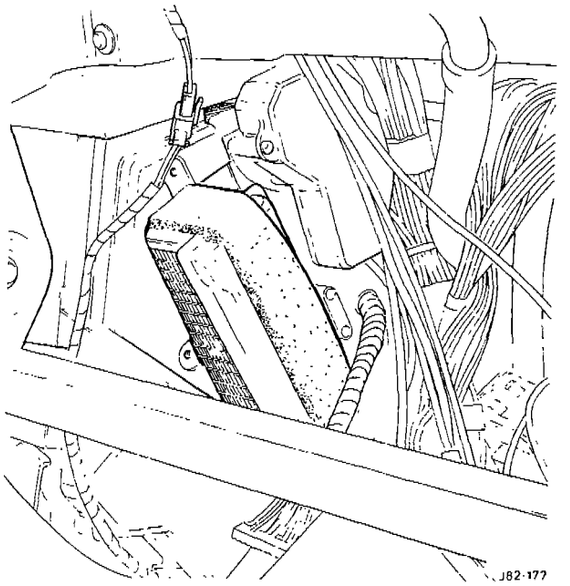


Fig **1**

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HEATER/COOLER UNIT EVAPORATOR

RENEW **82.25.20**
82.25.21

Open the bonnet and disconnect the battery earth lead.
Depressurize the air conditioning system.
Partially drain the engine coolant into a suitable container.
Open the car door.
Remove the right and left hand dash liners.
Remove the steering wheel.
Remove the instrument module and control panel assembly.
Remove the glove box lid.
Remove the right and left hand fascia end panels.
Remove the centre veneer panel and ventilator.
Remove the centre console finisher, ashtray, radio console, rear ventilator outlet and glove box.
Remove the centre console assembly.
Remove the fascia assembly.
On left hand drive cars remove the battery.
Disconnect the evaporator pipes from the expansion valve.
Remove and discard "O" ring seals.
Fit protective caps to the expansion valve outlets and to the disconnected pipes.
Disconnect the coolant hoses from the heater matrix inlet and outlet pipes.
From the engine compartment remove the nuts securing the air conditioning unit.
Loosen the upper screw securing the central processor unit and remove the lower screw.
Displace the earth lead, lift and disengage the central processor from its mounting bracket.
Remove the screw securing the mounting bracket and remove the bracket complete with spacers.
Displace the pliable trunking from the air conditioning unit.
Remove the nut and bolt securing the evaporator outlet pipe guide to the bulkhead.
Disconnect the condensate drain tubes.
Disconnect the recirculation vent vacuum tubes at the left hand " T piece and re-route to one side for access.
Disconnect the left and right hand blower motor cable harness multi-plug connectors.
Note and disconnect the vacuum hoses.
Disconnect the air conditioning unit main harness multi-plug connector.
Disconnect the left hand blower motor pliable trunking.
Remove the bolts securing the air conditioning unit support bracket and remove the bracket.
Displace and remove the air conditioning unit (Fig 1).

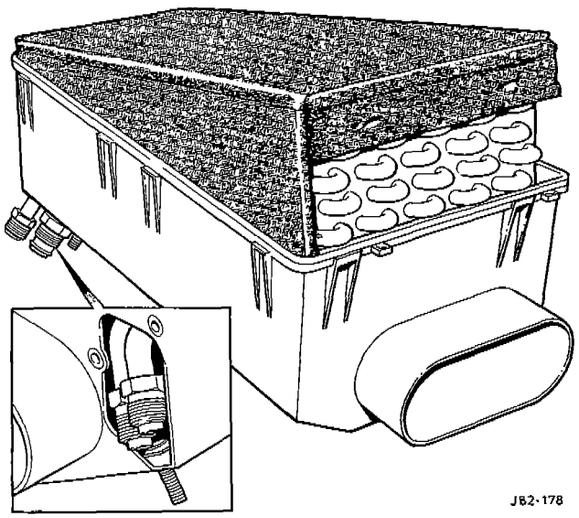


Fig 1

With the unit face down on a workbench cut and remove the cable harness securing straps.
Remove the screws securing the evaporator temperature sensor and carefully remove the sensor.
Remove the right and left hand vacuum solenoid assemblies.
Remove the screws securing the earth lead and displace the lead for access.
Remove the screws securing the heater matrix pipes guide plate and remove the plate.
Remove the clips securing the evaporator housing assembly and carefully remove the evaporator assembly (Fig 1).

Remove the foam pad from the evaporator outlet pipes.
Remove the evaporator pipe bracket.
Remove the screws securing the evaporator to the casing and carefully remove the casing.
Clean the sealant from the casing.

Fitting new evaporator or a new heater/cooler assembly is the reversal of the above procedure.
Ensure all the electrical connections are clean and tight.
Ensure the union nuts on the air conditioning pipes are tightened to the correct torque.
Flush and fit a new receiver/drier. Evacuate and recharge the system.
Refill the cooling system with coolant.

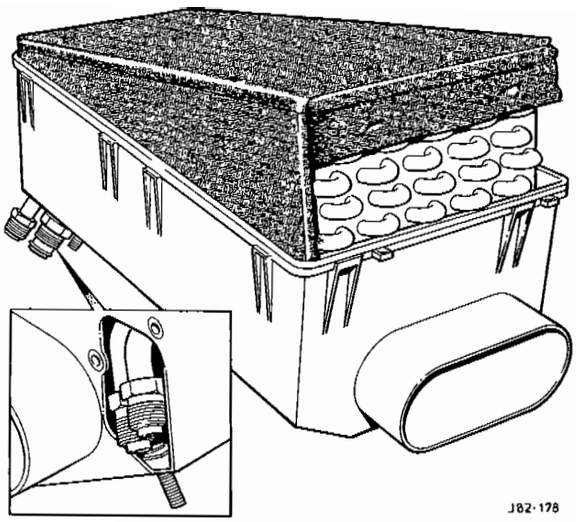


Fig 1

DEFROST/DE MIST VACUUM SOLENOID

RENEW **82.25.45**

Open the bonnet and disconnect the battery earth lead.
Open the car door, remove the right hand side dash liner and the footwell outlet duct.
Remove the two screws securing the solenoid mounting panel and displace the panel for access.
Note then disconnect the vacuum hoses and the supply cables.
Remove the solenoid assembly (Fig 2).

Remove the vacuum elbow tube and the green vacuum tube.
Release the solenoid mounting clip and remove the solenoid.
Fitting new solenoids is the reversal of the removal procedure.

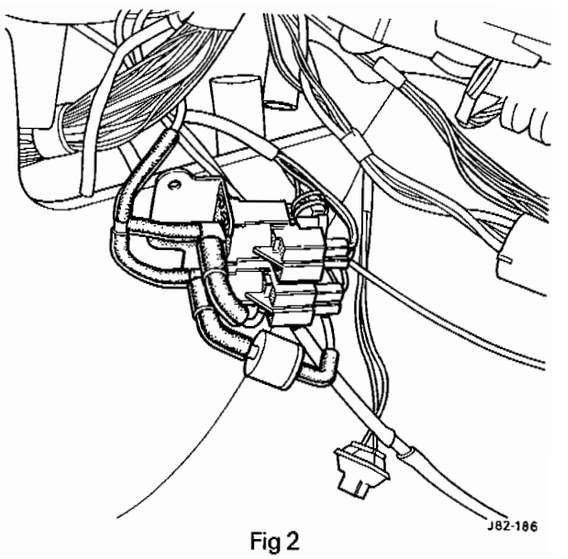


Fig 2

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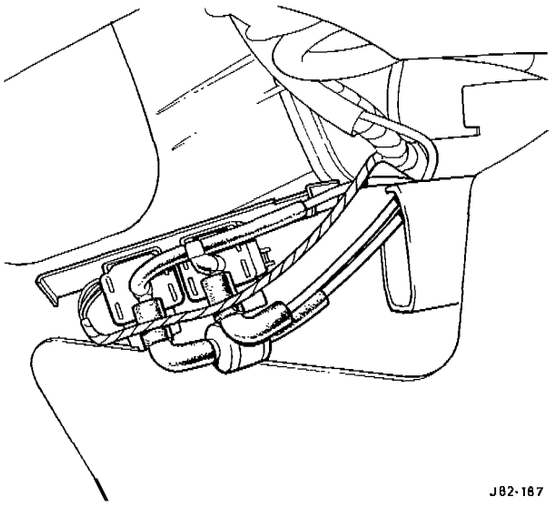
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CENTRE VENT VACUUM SOLENOID

RENEW **82.25.46**

Open the bonnet and disconnect the battery earth lead.
Open the car door and remove the right hand side dash liner and the footwell outlet duct.
Remove the two screws securing the solenoid mounting panel and displace the panel for access.
Note then disconnect the vacuum hoses and supply cables.
Remove the solenoid assembly.
Remove the vacuum elbow tube and the black vacuum tube.
Release the solenoid mounting clips and remove the centre vent solenoid.
Fitting new solenoid is the reversal **of** the removal procedure.

0206G



J82-187

Fig **1**

RECIRCULATION/FRESH AIR VACUUM SOLENOID

RENEW **82.25.47**

Open the bonnet and disconnect the battery earth lead.
Qpen the car door and remove the left hand side dash liner and the footwell outlet duct.
Remove the screws securing the solenoid mounting panel and displace the panel for access.
Note then disconnect the vacuum hoses and the supply cables.
Remove the vacuum solenoid assembly (Fig **1**).
Remove the screw securing the solenoid to the mounting plate.
Disconnect the blue vacuum hose and remove the solenoid.

Fitting a new solenoid is the reversal **of** the removal procedure.

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WATER VALVE VACUUM SOLENOID

RENEW ***82.25.48***

Open the bonnet and disconnect the battery earth lead.
Open the car door, remove the left hand side dash liner and the footwell outlet duct.
Remove the screws securing the solenoid mounting panel and reposition the panel for access.
Note then disconnect the vacuum hose and supply cables.
Remove the screws securing the solenoid mounting plate.
Disconnect the red vacuum hose and remove the solenoid.

Fitting new solenoid **is** the reversal of the removal procedure.

EVAPORATOR TEMPERATURE SENSOR

RENEW **82.20.64**

Open the bonnet and disconnect the battery earth lead.
Remove the right hand dash liner.
Displace the wiring harness for access.
Remove the screws securing the sensor.
Disconnect the sensor multi-plug connector.
Carefully withdraw the sensor from its location (Fig 1).
Remove and discard the gasket.

On fitting new sensor ensure a new gasket is fitted.
Carefully, with the aid of service tool No JD 122 insert the sensor probe into the evaporator.

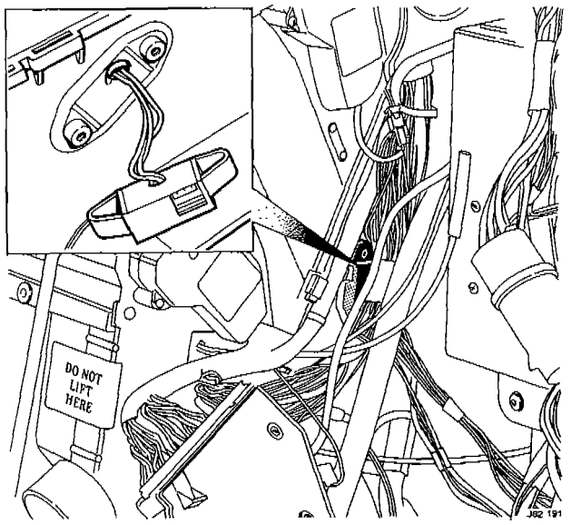


Fig 1

DATA

SERVICE TOOL

Installer Air Conditioning Sensor JD 122

0206G

CHARGING VALVE CORE

RENEW **82.30.12**

A possible reason for leakage of refrigerant from the system may be a damaged or bent schraeder valve. To ensure that the valve core is the cause of leakage use soap solution, if the valve core is leaking replace it by the following procedure. Ensure replacement clean dry valve is to hand before commencing the operation.
Depressurize the system, with a schraeder valve removing tool remove the valve core (Fig 2).

NOTE: When fitting a new valve core ensure it is not overtightened.
Evacuate and recharge the system.

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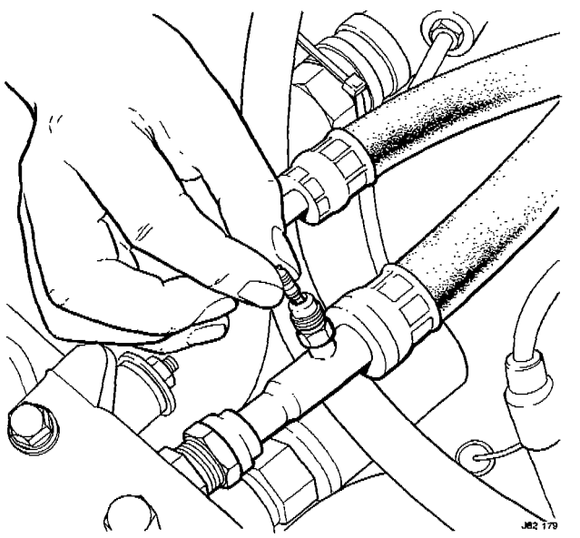


Fig 2

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COMPRESSOR

OIL CHECK 82.00.00

Whenever a component has been replaced in the refrigerant system or there is an obvious oil leak, the following procedures should be carried out.

1 Determine the angle the compressor is mounted.

2 Remove the oil filler plug. look through the oil filler plug hole and rotate the clutch front plate to position the internal components as shown in Fig 1.
Centre the components as they are moving to the rear of the compressor (the discharge stroke). This is necessary to allow the dipstick to penetrate fully.

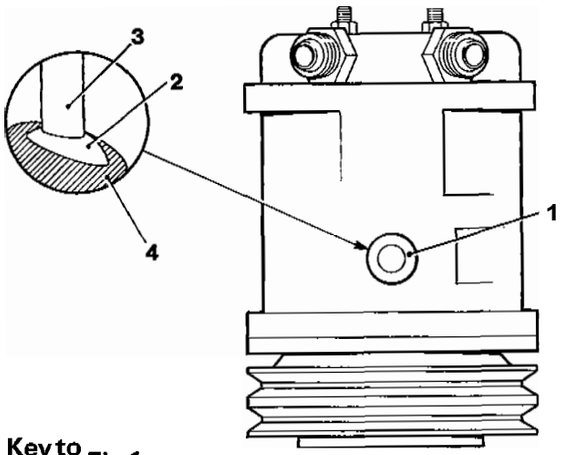
3 Insert the dipstick to its stop position (the stop is the angle near the top of the dipstick 3 fig 2). The point of the angle must be towards the engine with the bottom surface of the angle flush with surface of the filler hole (fig 2).

4 See chart below for correct oil level for the mounting angle of the compressor.

5 If the increment indication on the dipstick do not match the table, add or subtract oil to the mid point value.

6 Refit the oil filler plug checking that the "O" ring seal is not twisted. Ensure "O" ring seal and the seat are clean.
Torque the plug to 6 – 9 ft/lbs (0.8 – 1.2 kg/m. Do not over tighten the plug to stop a leak. Remove the plug and fit a new "O" ring seal.

Mounting Angle Degrees	Acceptable Oil Level In Increments
0	2-4
10	**4-5**
20	**5-6**
30	6-7
40	**7-9**
50	**9-10**
60	**10-12**
90	**12-13**

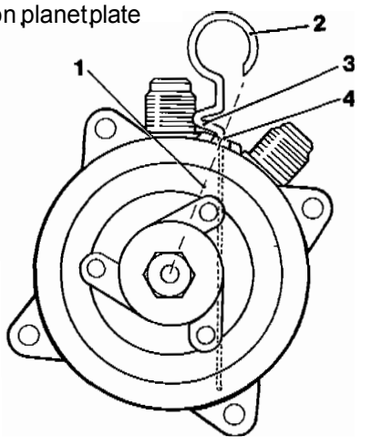


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Key to Fig 1

1 Oil filler hole
2 Rod ball
3 Piston rod
4 Ball socket on planet plate

Fig 1



J82-226

Key to Fig 2

1 The mounting angle
2 Dipstick
3 The stop
4 Oil filler hole

Fig 2

It is not necessary to check the oil level as a routine maintenance. However, should there be a good reason to suspect an incorrect oil level because of leaks carry out the following procedure.

1 Run the engine for approximately 10 minutes.

2 Discharge the system being careful not to lose oil.

3 Follow the procedure described on the previous page.

NEW COMPRESSOR OIL LEVEL CHECK

When replacing a Sanden compressor containing uncontaminated oil with a new compressor, use the following procedure.

1 Drain the oil from the new compressor.
2 Drain and measure the oil from the old compressor.
3 Measure the new oil equal to the amount drained from the old compressor and add one fluid ounce (30 cc) of new to this amount. Use it to refill the compressor.

FLUSHING

The system must be flushed when a new fitted or becomes contaminated.
When flushing the system with R11, do not allow the R11 to enter the compressor.

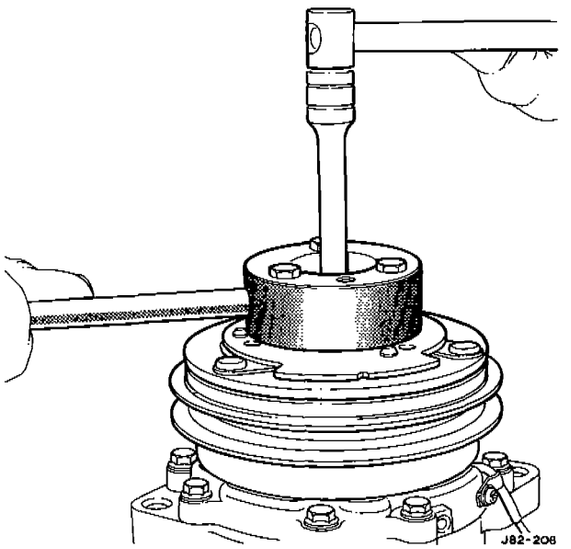


Fig 1

CLUTCH

REMOVE **82.00.00**

All the clutch service operations must be performed on a bench and the following procedures strictly adhered to.
The clutch includes a counter-weight on the front plate to improve dynamic balance.
Fit service tool JD 146 to the clutch front plate (Fig 1).

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Fit the centre bolt assembly, and position the holding shaft into the centre bolt assembly locating hole (Fig 1).

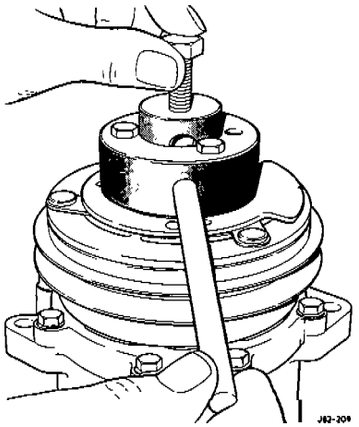


Fig 1

Align the puller centre bolt to the compressor shaft. Finger tighten the three puller bolts into the threaded holes.
Turn the centre bolt clockwise until the front plate is loosened (Fig 2). Remove the plate. Remove the shaft key.

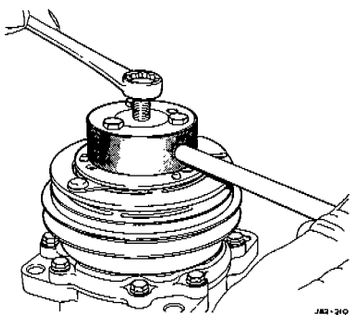


Fig 2

Remove the internal bearing circlip by using pinch type of circlip pliers only (Fig 3).

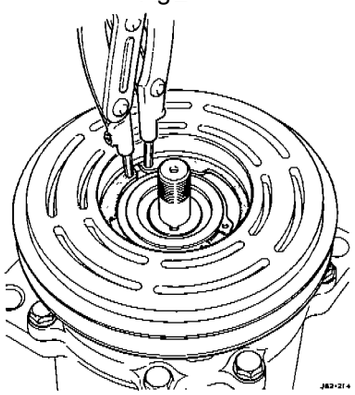


Fig 3

Remove the front housing circlip by using spread type of circlip pliers (Fig 4).

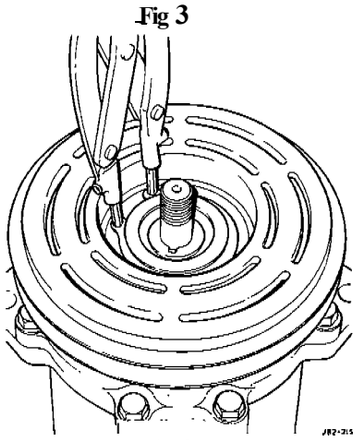


Fig 4

Insert the lip of the puller jaws into the circlip groove (Fig 3).

Place the rotor shaft protector over the exposed shaft (Fig 1).

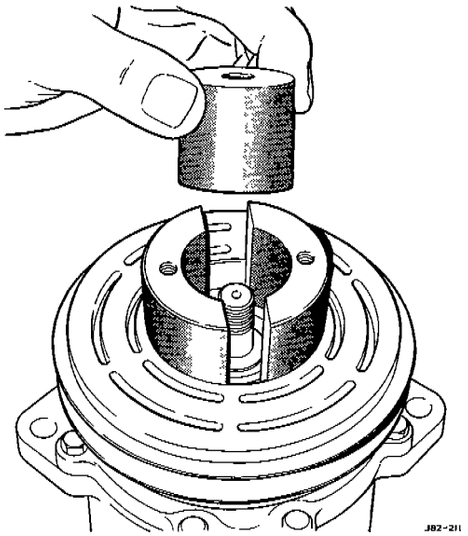


Fig 1

Align the thumb bolts to the puller jaws (Fig 2).

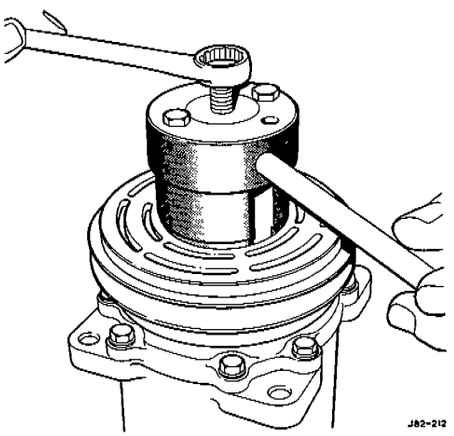


Fig 2

Turn the puller centre bolt (fig 3) until the rotor puller is free.

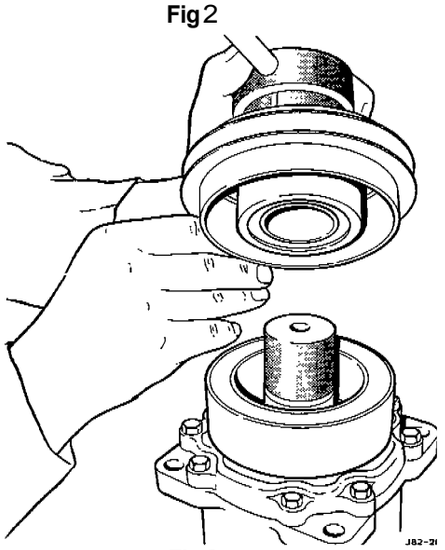
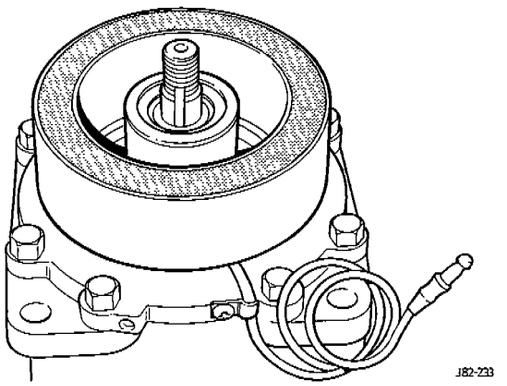


Fig 3

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Loosen the field coil lead from its clip on top of the compressor (Fig 1).



Using spread type of circlip pliers remove the circlip and field coil (Fig 2).

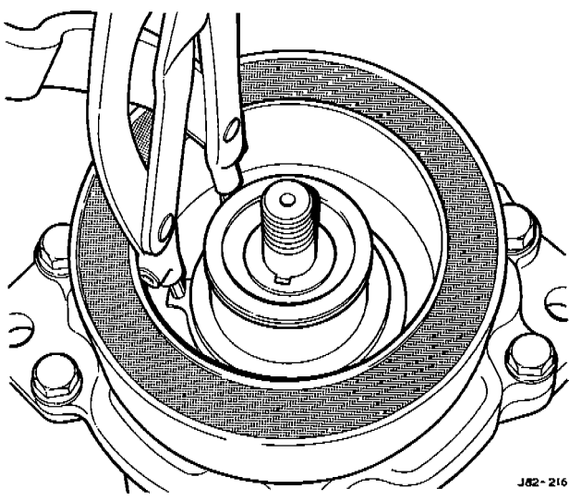


Fig 2

Refit the field coil in the reverse order to the removal procedure previously described.
The coil flange protrusion must match the hole in front of housing to prevent coil movement.
Correctly locate the field coil lead.
Support the compressor on the four mounting ears at the rear of the compressor. If using a vice, clamp on the mounting ears NOT ON THE COMPRESSOR BODY.
Align the rotor assembly squarely on the front housing hub.

Using the rotor installer set, place the ring part of the set into the bearing cavity. Make certain the outer edge rests firmly on the rotor bearing outer race.
Place the tool set driver into the ring (Fig 3)

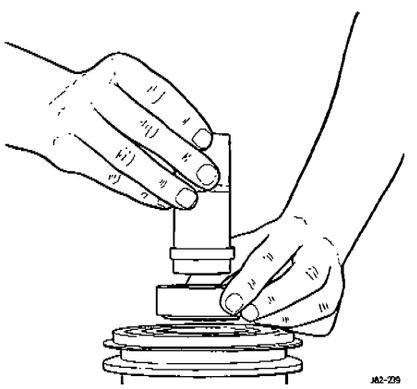


Fig 3

With a hammer, tap the end of the driver while guiding the rotor to prevent binding. Tap until the rotor bottoms against the compressor front housing hub. Listen for a distinct change of sound during the tapping process (Fig 1).
Refit the internal bearing circlip using pinch type of circlip pliers.
Refit the external front housing circlip using spread type of circlip pliers.
Check that the original clutch shims are in place on the compressor shaft.
Replace the compressor shaft key.
Align the front plate to compressor shaft key.

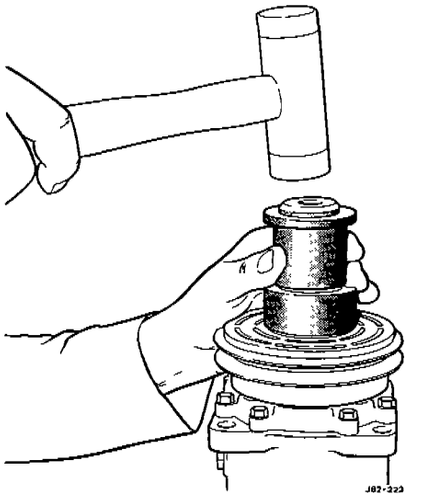


Fig 1

Using a shaft protector, tap the front plate to shaft it has bottomed to the clutch shims. Note distinct change of sound.

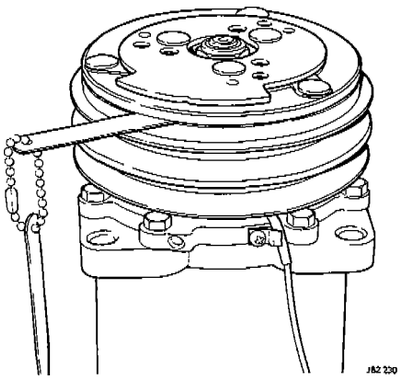


Fig 2

Refit the shaft nut and torque to 23-30 ft.lbf (3.4-4.2 kgf.m).
Check the air gap with a 0.016 to 0.031 inch feeler gauge (Fig 2).
If the gap is not consistant around the circumference, lightly tap down at the maximum gap and gently prise up at the minimum gap.
NOTE: The air gap is determined by the spacer shims. When fitting a new clutch assembly, try the original shims first. Add or subtract shims if the air gap does not meet the above specifications.

SHAFT SEAL

RENEW ***82.00.00***

Remove the clutch as previously described.
Using circlip pliers, insert the points into the **two** holes of the felt ring metal retainer and lift out the felt ring (fig 3).

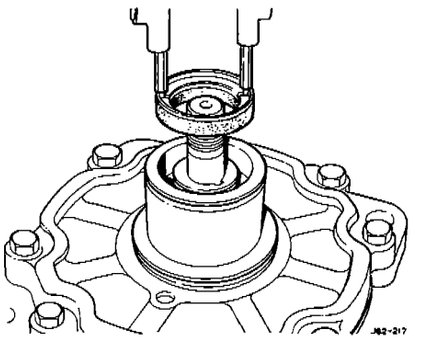


Fig 3

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Remove the clutch shims. Use "O" ring hook and **a** small screwdriver (Fig 1) to prevent shims from binding on the shaft.

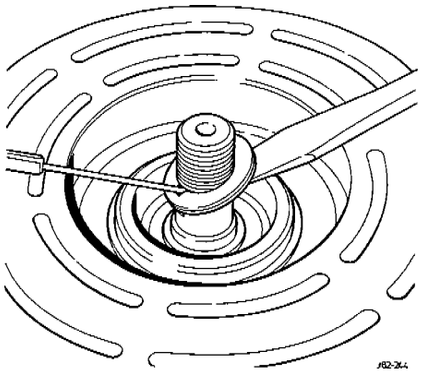


Fig **1**

Remove the shaft seal seat retaining circlip using pinch type circlip pliers (Fig 2).

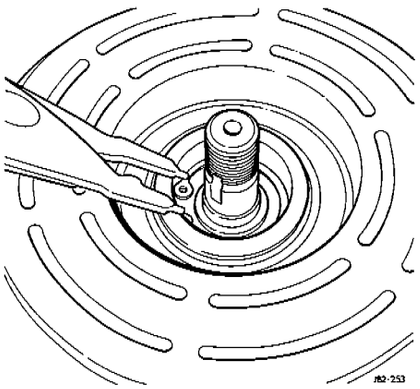
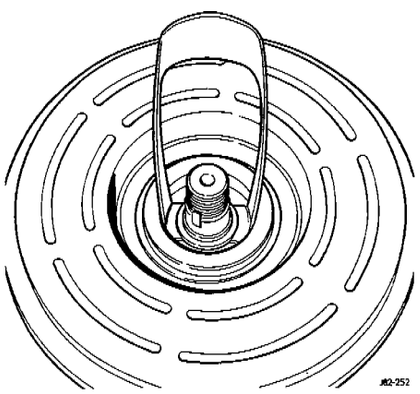


Fig *2*

Remove the shaft seal seat **by** using the tongs **(Fig** 3)



Use the "O" ring hook to remove the **shaft** seal "O" ring. Take care not to damage the groove (Fig 4).

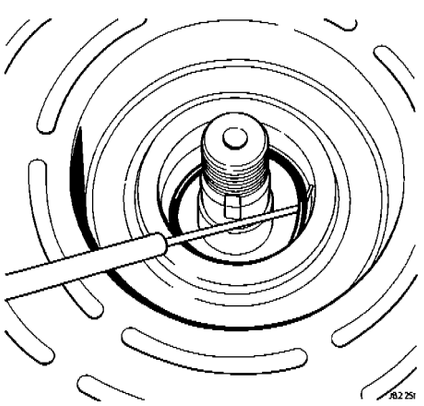


Fig 4

Insert the seal remover and installer tool against against the seal assembly. Press down against the seal spring and twist the tool until feeling it engage in the slots of the seal cage. Lift out the seal assembly (Fig **1**).

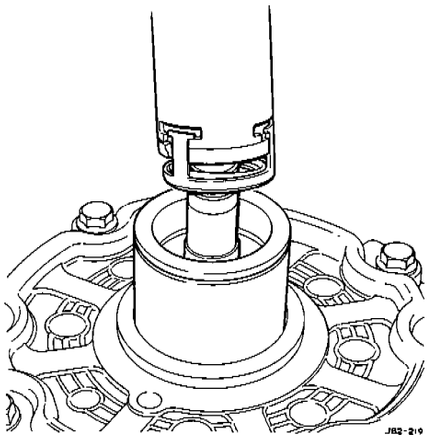


Fig 1

Clean the seal cavity thoroughly with **R11** or **R12.** Blow out with dry pressurized vapour. Clean thoroughly with "lint-free" or synthetic cloth and clean refrigerant oil. Then blow out with dry pressurized vapour.
Make sure all foreign substances are completely removed.
Insert the seal sleeve protector over the compressor shaft (Fig 2).
Do not touch the new seal lapping surface. Dip the mating surface in a clean refrigerant oil before proceeding.

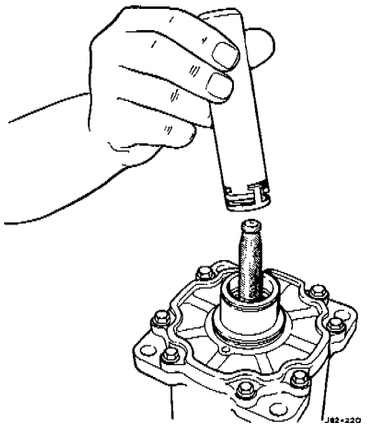


Fig 2

Engage the slots of the seal remover and installer to the new seal cage. Insert the seal assembly firmly into place in the compressor seal cavity. Twist the tool in the opposite direction to disengage the tool from the seal cage (Fig 3).
Remove the tool.

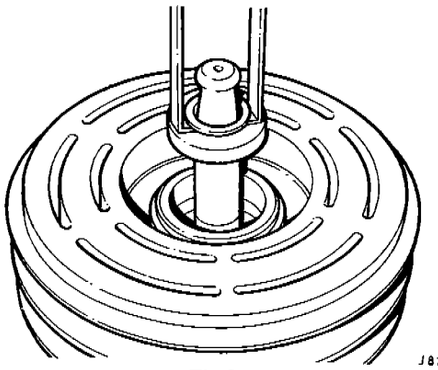


Fig 3

Coat the new "O" ring with clean refrigerant oil.
Carefully place in the seal groove with the **"O"** ring hook (Fig 4). Do not scratch the suface.

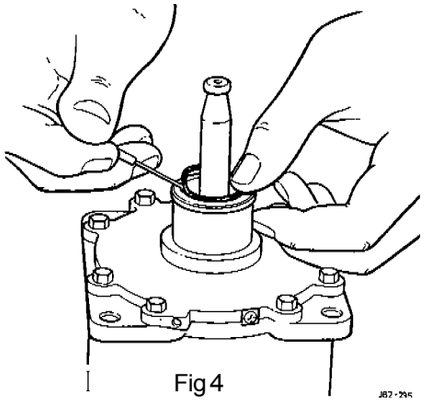


Fig 4

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Coat the seal retainer with clean refrigerant oil. Use the tongs and press the retainer lightly against the seal (Fig 1).

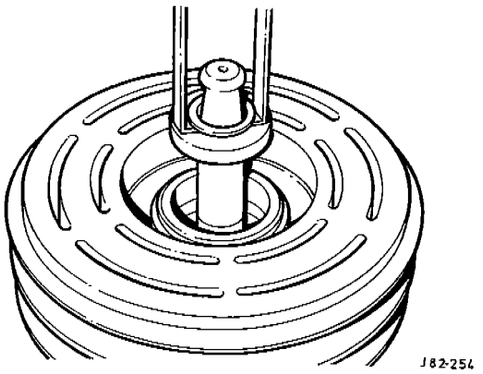


Fig 1

Refit the circlip with the beveled edge outward away from the compressor. Flat side towards the compressor (Fig 2). It may be necessary to lightly tap the circlip to securely position it in its groove.
Replacethe clutch spacer shims.

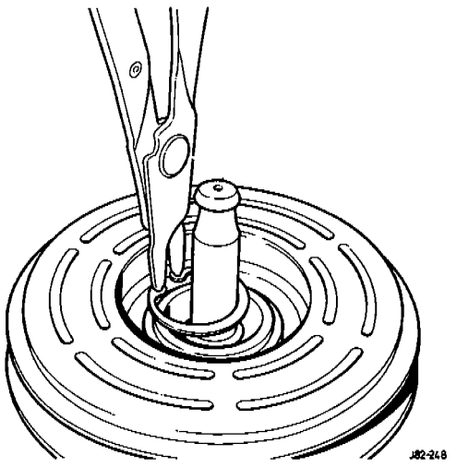


Fig 2

Tap a new felt ring into place (Fig 3).
Refitfront clutch plate.

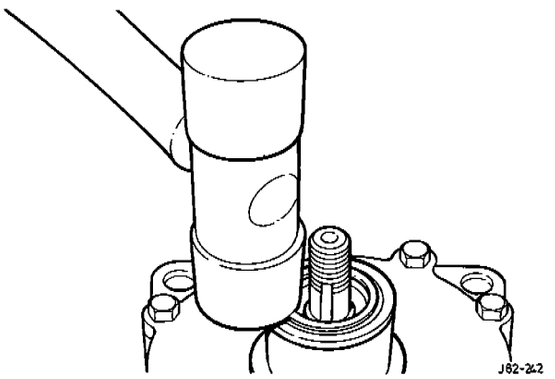


Fig 3

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AIR CONDITIONING

FUNCTIONAL TEST

82.00.00

Start and run engine until normal operating temperature is reached.
Open the fascia and the rear vents.
Switch the left hand control to low fan speed.
Select the mid position of the face level control.
Turn the right hand control to the fully cold position.
Select manual by pressing the **mode** switch until 'MAN' is illuminated.
Ensure the 'AIR' button is not illuminated.
Ensure all humidity button lights are not illuminated to give full air conditioning.

Check that the recirculation flaps are open.
Press the 'ECON' button and ensure the compressor clutch disengages (the engine revs change and there is an audible click).
Press the 'ECON' button and ensure the compressor clutch re-engages (the engine revs change).
Switch the left hand control to normal fan speed and check that the fan speed increases.
Switch the left hand control to high fan speed and check that the fan speed increases.
Switch the left hand control to defrost and check that all the air is to the windscreen and no air at the footwell.
Switch the left hand control to high fan speed, ensure that there is no air to the windscreen but air to the footwell.
Press the 'air' button, ensure that air is to the screen and at the footwell also ensure the 'air' button light illuminates.

Press the 'air' button, ensure that there is no air to the windscreen and the 'air' button light does not illuminate.
Switch the left hand control to normal fan speed, check for very cold air from the centre vent and rear compartment vent.
Turn the right hand control to full heating.
Ensure the engine is running at normal operating temperature.
Ensure the centre vent closes, there is warm air from side, footwell and rear compartment vents.
Turn the right hand control to the minimum red position.
Ensure cool air bleed from the centre vent.
Turn the right hand control to the full cold position.
Ensure the centre vent fully opens with cold air.
Select auto by pressing the mode switch until 'AUTO' is illuminated.
Turn the right hand control to the mid point position.
Run the vehicle and allow the system to stabilise.
Apply heat to the in-car sensor using a lamp.
Ensure the temperature drops at the side vents and the centre vent **opens.**

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COMPRESSOR DRIVE CLUTCH

RENEW 82.10.08

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system, refer to 82.30.05.
Remove the bolt securing the muffler plate.
Remove the muffler securing bolt.
Remove and discard the 'O' ring seals.
Fit protective caps to the disconnected hoses and a protection plate to the compressor.
Place the compressor in a vice, tighten the vice onto the body lugs.
Fit tool JD166-1 (1 Fig 1) to the compressor, fit and tighten the securing screws (2 Fig 1). Fit tommy bar (3 Fig 1) to JD166-1 and remove the drive clutch securing nut.
Fit tool JD166-3 (1 Fig 2) to JD166-1 and reposition the tommy bar to engage JD166-3.
Tighten the tool centre bolt (2 Fig 2) to remove the drive clutch.
Remove the drive clutch complete with the tool attached from the compressor.
Set the tool centre bolt to its original position for future use.
Remove the screws (2 Fig 1) securing tool JD166-1 to the drive clutch and remove the tool.
Remove the drive clutch air gap adjustment shims from the compressor shaft.
Remove the woodruff key from the shaft.

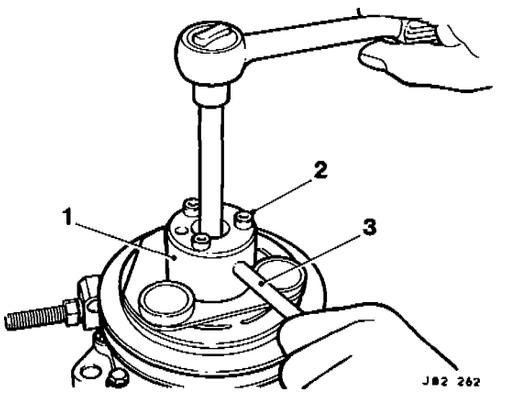


Fig 1

Fit the woodruff key to the shaft.
Fit the drive clutch air gap adjustment shims on the shaft.
Align the drive clutch keyway with the woodruff key and then using a suitable piece of tubing push the drive clutch fully home on the compressor shaft.
Fit tool JD166-1 (1 Fig 1) to the drive clutch, fit and tighten the securing bolts.
Fit tommy bar JD166-2 (3 Fig. 1) to JD166-1 and then fit and tighten the drive clutch securing nut.
Remove the screws (2 Fig 1) securing the tool to the drive clutch and detach the tool.
Check the air gap.
Remove the compressor from the vice and refit it to the vehicle.
Remove the wing cover and close the bonnet.

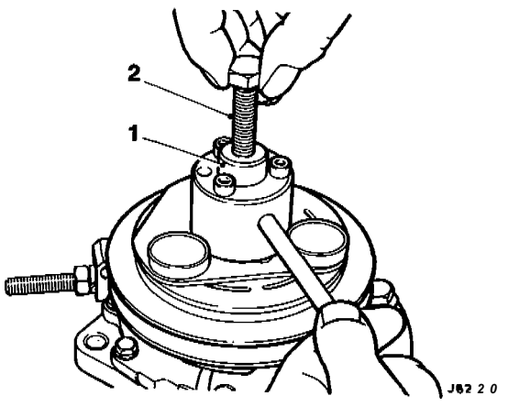


Fig 2

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COMPRESSOR PULLEY BEARING

RENEW **82.10.10**

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system.
Remove the compressor refer to 82.10.20.
Remove the compressor drive clutch, refer to 82.10.08.
Displace and remove the snap ring retaining the pulley assembly on the compressor.
Fit thread protection tool JD166-5 (5 Fig 1) on the compressor shaft. This will aid collet to pulley engagement in the following operation.
Engage the collets (1 Fig 2) of tool JD 166-5 (2 Fig 2) with the recess in the pulley internal diameter.
Assemble tool JD166-1 (1 Fig 1) to tool collets JD166-5 (6 Fig 1), fit and tighten the securing screws (2 Fig 1).
Fit tool JD166-3 (3 Fig 1) to tool JD166-1 (1 Fig 1), fit tommy bar JD166-2 (4 Fig 1) through tools JD 166-1 and JD 166-3
Tighten the centre bolt of tool JD166-1 to remove the pulley assembly.
Remove the pulley complete with the tool from the compressor.
Remove the collets from the pulley and the thread protection tool from the compressor shaft.
Place the pulley on a bench with the pulley uppermost, remove the snap ring securing the bearing in the pulley.
Invert the pulley and fit tool JD166-7 (1 Fig 3) to abut the bearing face.
Using a soft face mallet remove the bearing from the pulley.
Remove tool JD166-7 from the pulley and discard the bearing,

Place the pulley on a bench and fit the bearing. Place tool JD166-7 (1 Fig 3) on the bearing and then using a soft face mallet drive the bearing fully home.
Remove tool JD166-7 from the pulley/bearing assembly and fit the bearing to pulley snap ring.
Fit the pulley to the compressor. Position tool JD166-7 so that it abuts the inner race face of the bearing.
Using a soft face mallet drive the pulley/bearing assembly fully home.
Fit the pulley to compressor retaining snap ring.
Fit the drive clutch, refer to 82.10.08.
Fit the compressor to the vehicle.
Recharge the air conditioning system with refrigerant.
Remove the wing cover and close the bonnet,

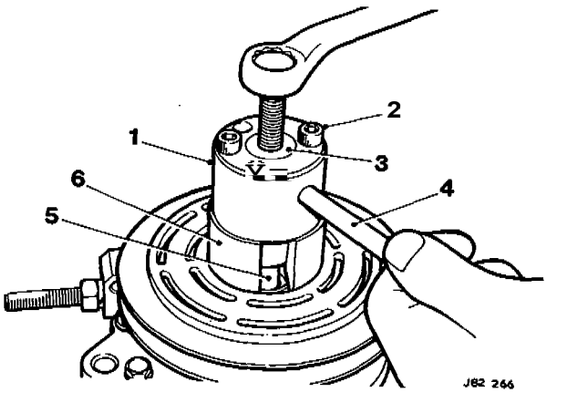


Fig 1

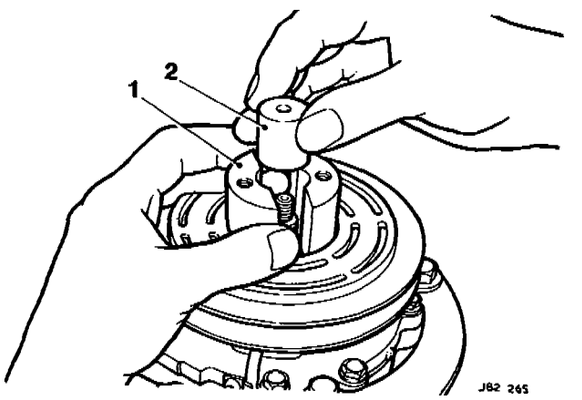


Fig 2

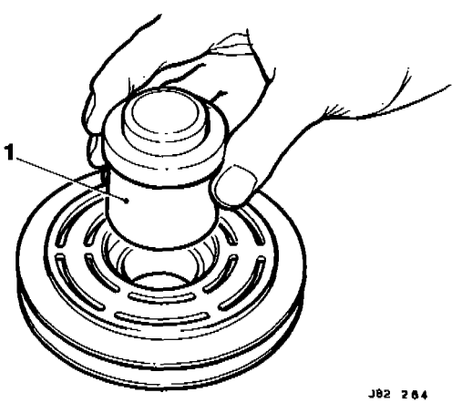


Fig 3

COMPRESSOR FRONT OIL SEAL

RENEW **82.10.11**

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system, refer to 82.30.05.
Remove the compressor, refer to 82.10.20.
Remove the compressor drive clutch, refer to 82.10.08.
Remove the woodruff key, felt seal and seal seat retaining snap ring from the compressor shaft.
Fit tool JD167 (1 Fig.1) to the seal seat (2 Fig.1), ensure that the tangs of the tool engage the groove of the seal seat.
Remove the seal seat from the compressor and detach the tool from the seal seat.
Remove the seal seat 'O' ring.
Fit tool JD168 (1 Fig.2) to the front seal, ensure that the tangs of the tool engage those on the seal.
Remove the seal from the compressor using a twisting action.
Remove the seal from the tool.
Fit thread protector tool (2 Fig.3) on the compressor shaft.
Smear the **new** front seal with clean refrigerant oil and fit the **seal** in tool JD168 (1 Fig.2).
fit the new **seal** on the compressor shaft using **a** twisting action, disengage and remove the tool from the front seal.
Remove the seal protector tool from the compressor **shaft.**
Apply clean refrigerant oil **to** the seal seat 'O' ring, fit the 'O' ring to the seal seat.
Fit tool JD167 to seal seat (1 Fig.1), ensure that the tangs of the tool engage the groove in the seal seat.
Fit the seal seat to the compressor ensuring that it is **fully** seated.
Remove tool JD167 from the seal seat.
Fit the seal seat retaining **snap** ring **and** ensure that it **is** fully seated.
Fit the felt ring and the woodruff key.
Refit the compressor and compressor drive clutch.

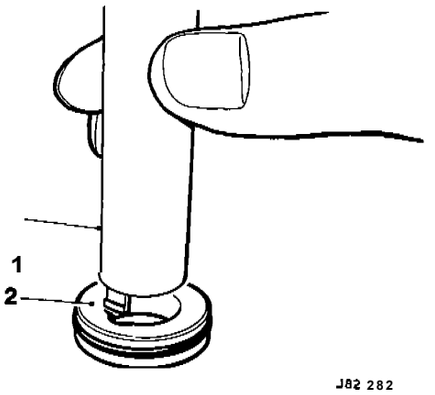


Fig 1

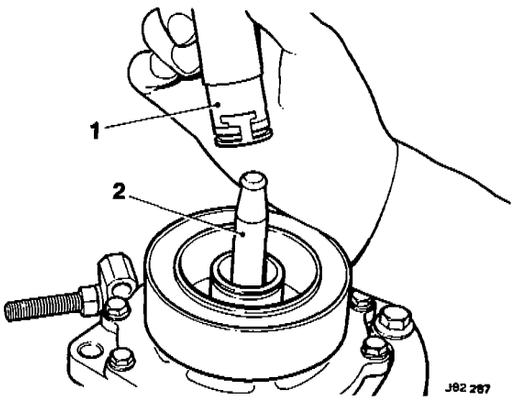


Fig 2

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COMPRESSOR ASSEMBLY LESS CLUTCH - SANDEN 500 AND 700 SERIES

RENEW **82.10.19**

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system.
Remove the compressor outlet port retaining plate securing bolt, detach the plate.
Disconnect the compressor hose, remove and discard the 'O' ring seal.
Fit a blanking plug to the compressor outlet port.
Remove the compressor pivot bolt securing nut.
Carefully separate the muffler from the compressor, remove and discard the 'O' ring seal.
Fit a blanking plug to the muffler and a blanking plate to the compressor, fit and tighten the blanking plate securing bolt.
Raise the vehicle to working height on a ramp.
Slacken the compressor drive belt adjuster rod and adjuster plate securing nuts and bolts (4,5,6 and 7 Fig.1)
Slacken adjuster nut (5 Fig.1).
Remove the nut and bolt (4 and 5 Fig.1) from adjuster plate (3 Fig.1).
Slacken trunnion nut and bolt (9 and 2 Fig.1) and remove the adjuster rod (1 Fig.1).
Disconnect the compressor multi-plug.
Remove the compressor drive belt.
Pivot the compressor away from engine, support the compressor and remove the top pivot bolt and lift the compressor clear of the vehicle.
Remove the mounting brackets from the compressor.
Remove the compressor pulley from the compressor shaft refer to 82.10.10.
Remove the drive clutch from the compressor refer to 82.10.08.
Remove the field coil from the compressor refer to 82.10.25.
Remove the woodruff key from the compressor shaft.

Position the mounting brackets on the compressor, fit and tighten the securing bolts and nuts.
Fit the woodruff key to the compressor drive shaft.
Fit the field coil to the compressor, refer to 82.10.25.
Fit the pulley to the compressor shaft, refer to 82.10.10
Fit the drive clutch to the compressor, refer to 82.10.08.
Lift the compressor up to the engine and fit the top pivot bolt from above.
Loosely attach adjustment rod (1 Fig.1) to the compressor with nut and bolt (6 and 7 Fig.1).
Loosely attach adjustment plate (3 Fig.1) to the compressor with nut and bolt (4 and 5 Fig.1).
Fit bolt (2 Fig.1) through trunnion (6 Fig.1) and fit nut (9 Fig.1) to the bolt.
Fit the drive belt over the pulley, move the compressor away from the engine to tension the drive belt and lightly tighten the bolts and nuts.
To obtain the correct tension on the drive belt tighten adjuster nuts (7 Fig.1). The belt is correctly tensioned when a load of 59 - 63.6 kg (130 - 140 lb) applied at the centre deflects the belt 4mm.

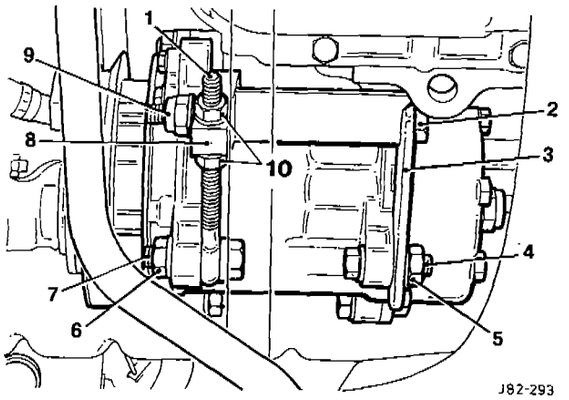


Fig 1

Ensure that all securing bolts and nuts are fully tightened.
Lower the vehicle to the ground.
Remove the blanking plate and the blanking plugs from the compressor.
Fit new 'O' ring seals to the muffler and attach it to the compressor.
Fit a new 'O'ring seal to the evaporator hose and connect it to the compressor. Fit the retaining plate, fit and tighten the screw.
Fit and tighten the compressor upper pivot bolt securing nut.
Charge the air conditioning system, refer to 82.30.08.
Remove the wing cover and close the bonnet.

MUFFLER

RENEW **82.10.24**

Open the bonnet and fit a wing cover.
Unscrew the muffler to hose union nut and disconnect the hose from the muffler.
Remove and discard the 'O' ring seal.
Fit a blanking plug to the hose union nut.

Remove the muffler to evaporator/ compressor hose securing bolt.
Remove the compressor pivot bolt securing nut.
Remove the compressor outlet port retaining plate securing bolt.
Disconnect the muffler from the compressor, remove and discard the 'O' ring seal and fit a blanking plug to the compressor connection.

Remove the blanking plug from the muffler
Position the muffler on the compressor, fit the pivot bolt and securing nut, do not tighten the nut.
Remove the blanking plug from the compressor connection, fit a new 'O' ring seal to the connection.
Connect the muffler to the compressor, ensure that the 'O' ring seal is correctly positioned to prevent distortion.
Position the compressor outlet port retaining plate, fit and tighten the retaining plate securing bolt.
Tighten the compressor pivot bolt securing nut
Fit and tighten the muffler to evaporator/compressor securing bolt.
Remove the blanking plug from condenser hose and fit a new 'O' ring seal.
Connect the condenser hose to the muffler, tighten the union nut ensuring that the charging valve is upright.
Remove the wing cover and close the bonnet.

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FIELD COIL

RENEW **82.10.25**

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system.
Remove the compressor, refer to 82.10.20.
Remove the compressor drive clutch, refer to 82.10.08.
Remove the compressor pulley, refer to 82.10.10.
Slacken the field coil wire clamp screw (Fig.1) and release the wire from the clamp.
Remove the field coil retaining snap ring and detach the field coil.
Clean the mating face of the compressor with a cloth moistened with an approved cleaning fluid.
Position the new field coil on the compressor and fit the retaining snap ring.
Route the wire to the compressor and fit the wire clamp, tighten the securing screw.
Fit the compressor pulley, refer to 82.10.10.
Fit the compressor drive clutch, refer to 82.10.08.
Fit the compressor, refer to 82.10.20.
Recharge the air conditioning system, refer to 82.30.08.
Remove the wing cover and close the bonnet.

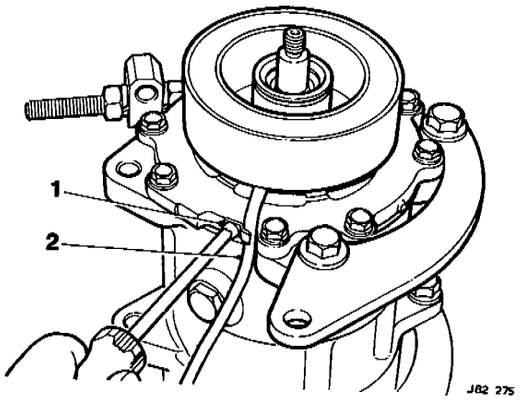


Fig 1

GASKET KIT

RENEW **82.10.26**

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system, refer to 82.30.05.
Remove the compressor, refer to 82.10.20.
Position the compressor in a vice, tighten the vice onto the compressor body lugs.
Remove the outlet port blanking plate securing bolt and detach the plate.
Remove and discard the 'O' ring seals from the outlet port.
Remove the compressor cylinder head securing bolts, detach the cylinder head.
Detach the valve plate from the compressor.
Remove the gaskets from the compressor.

Remove all traces of gasket material from the mating surfaces of the cylinder head, valve plate and cylinder block.

Position new gaskets (1 and 3 Fig.2) on the valve plate (2 Fig.2) and then place it on the cylinder block.
Position the cylinder head (1 Fig.3) on the cylinder block (2 Fig.3), fit and tighten the securing bolts in the sequence shown in Fig 4.
Fit new 'O' ring seals in the compressor outlet port, position the outlet port blanking plate and fit and tighten the securing bolt.
Refit the compressor refer to 82.10.20.
Recharge the air conditioning system, refer to 82.30.08.

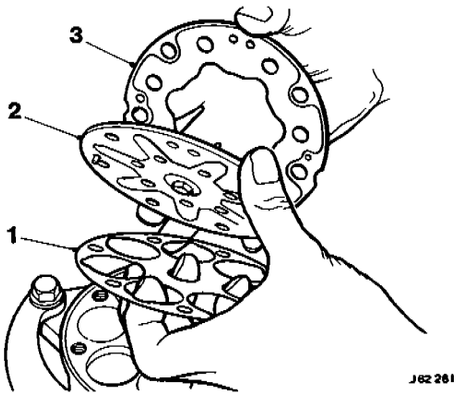


Fig 2

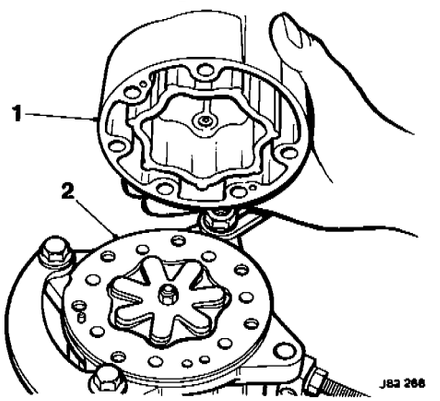


Fig 3

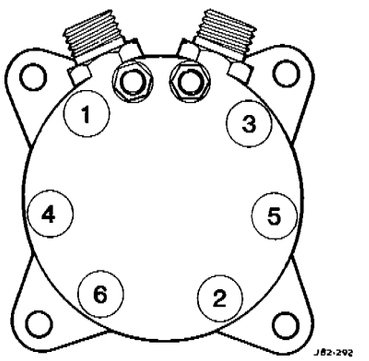


Fig 4

DATA

TORQUE FIGURES
Cylinder head bolts 29.83 to 33.9 Nm

VALVE PLATE

RENEW **82.10.27**

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system, refer to 82.30.05.
Remove the compressor, refer to 82.10.20.
Position the compressor in a vice, tighten the vice onto the compressor body lugs.
Remove the outlet port blanking plate securing bolt and detach the plate.
Remove the 'O' ring seals from the compressor outlet port.
Remove the cylinder head securing bolts and detach the cylinder head (1 Fig.1) from the cylinder block.
Remove valve plate (2 Fig.1) from the compressor.
Remove all traces of gasket material from the mating surfaces of the cylinder head and compressor.
Apply clean refrigerant oil to the gaskets and then position them on the valve plate.
Position valve plate and gaskets (1 and 3 Fig.2) on the compressor and fit the cylinder head.
Tighten the cylinder head securing bolts in the order shown in Fig 3.
Fit new 'O' rings to the outlet port blanking plate, position the plate on the compressor and fit and tighten the securing bolt.
Refit the compressor, refer to 82.10.20.
Remove the wing mat and close the bonnet

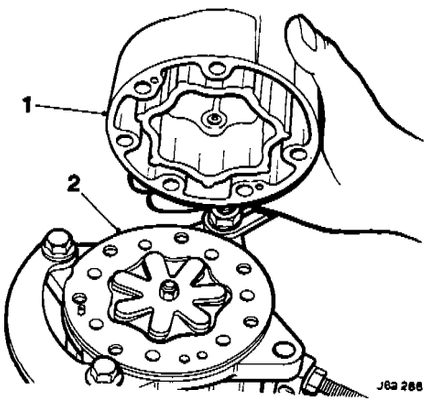


Fig 1

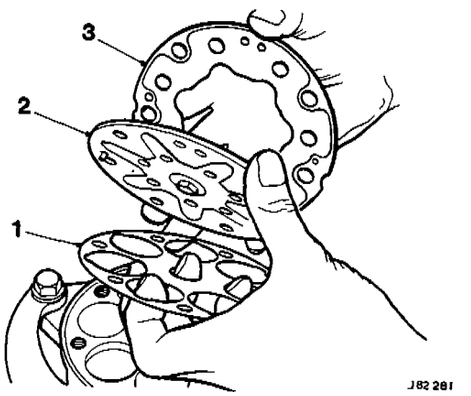


Fig 2

DATA

TORQUE FIGURES

Cylinder head ***bolts 29.83- 33.9 Nrn***

HOSE-COMPRESSOR TO EVAPORATOR

RENEW **82.25.02**

Open the bonnet and fit a wing cover.
Depressurize the air conditioning system, refer to 82.30.05.
Slacken the hose to evaporator valve union nut, disconnect the hose from the valve, remove and discard the 'O' ring seal.
Fit a blanking plug to the evaporator valve.
Remove the muffler to compressor/evaporator hose securing bolt.
Remove the compressor outlet port retaining bolt.
Disconnect the hose from the compressor, discard the hose complete with 'O' ring seals.
Fit a blanking plug to the compressor connection.
Remove the blanking plugs from the compressor and the evaporator valve,
Connect the hose to the evaporator valve, tighten the union nut ensuring that the charging valve is upright
Route the hose to the compressor, fit a new 'O' ring seal and connect it to the compressor.
Position the outlet port retaining plate on the compressor, fit and tighten the securing bolt.
Fit and tighten the muffler to compressor/ evaporator hose securing bolt.
Charge the air conditioning system, refer to 82.30.08.
Remove the wing cover and close the bonnet.

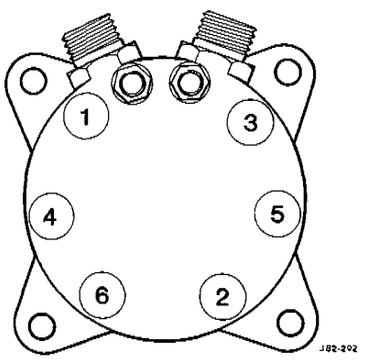


Fig 3

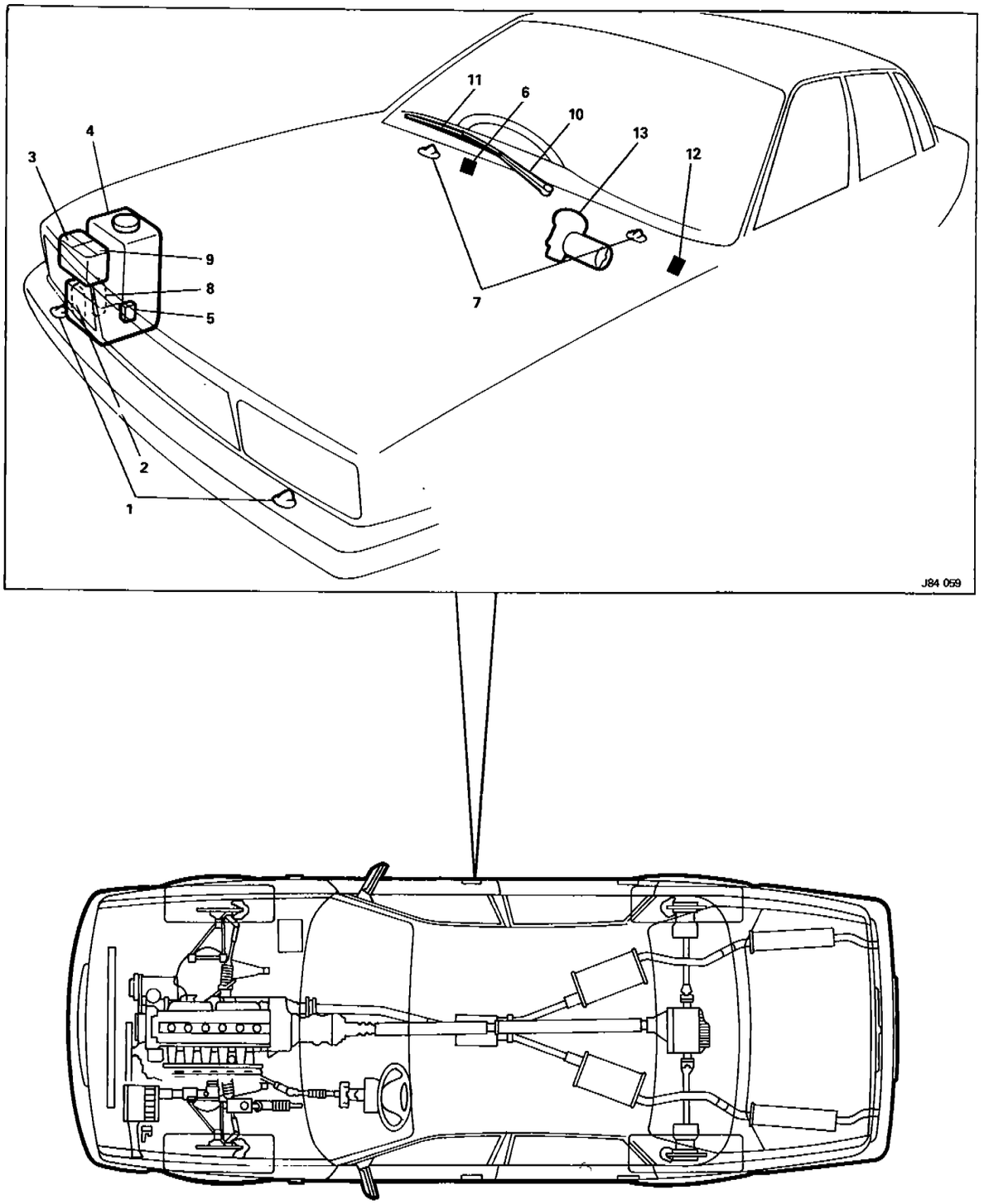
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0032K

WINDSCREEN WIPER AND WASHERS

INTRODUCTION *84.00.00*

The windscreen wiper motor operates at slow or fast speed, and drives, via a rack assembly, a single arm and blade. The wiper is supplemented by washers, which spray jets of fluid into the path of the wiper blade as it moves across the screen. Intermittent/Flick Wipe operations are both at slow speed and are controlled by the **ECU.** The **ECU** also controls headlamp washer operation (which is permitted only with the headlights switched ON).

Windscreen Wiper and Washer Switch
The switch only operates when ignition is 'ON' and has the following positions:

1 Wiper switched 'OFF' and parked. Normal speed operation of the wiper, obtained by pushing the switch lever up one position.
2 High speed operation of the wiper, obtained by pushing the switch lever fully up.
3 Intermittent operation of the wiper, obtained by pushing the switch lever down against spring pressure and releasing. To cancel the function push the switch down again and release.

To obtain a single sweep of the wiper blade, pull the lever towards the steering wheel and release.
To operate the windscreen washers, press the end of the switch lever.
NOTE: This switch also controls the Headlamp Powerwash.

WINDSCREEN WIPER AND WASHERS

OPERATION **84.00.00**

When the washer/wiper switch is in either the slow or fast position, a circuit to earth is completed for slow or fast speed relays located in a wiper logic module. Provided that the ignition switch is ON, the appropriate relay is energised and battery power is applied to fast or slow speed windings of the wiper motor. Inputs and outputs of the logic module are as follows:
1 Slow: a logic earth input at B60-3 results in battery power being applied to the wiper motor through **B59-4.**
2 Fast: a logic earth input at **B60-1** results in battery power being supplied to the wiper motor through **B59-2.**

For intermittent wiper operation a logic earth is applied to connector **B13-4** of the ECU which responds by energising the slow speed relay for periods of half a second at five second intervals. The relay is energised by connector B60-2. Wiper operation in intermittent mode continues until cancelled by either a second application of the wiper switch or by selecting another mode.

For flick wipe operation a logic earth is applied to connector B12-5 of the ECU which again responds by energising the slow speed relay through connector B60-2. The relay is energised for a single period of half a second and wiper motor control is then undertaken by a self parking mechanism which causes the wiper arm to complete one sweep of the screen and then park.

The self parking mechanism is installed within the wiper motor assembly and comprises brushes which engage inner and outer slip rings. The slip rings are arranged so that the outer supplies battery power to the slow speed circuit until the park position is reached and the inner supplies an earth to the motor circuit at the park position to provide dynamic braking. These inputs are applied to the slow speed circuit through connector **B59-5** of the logic module, battery power being supplied to the outer slip ring via B59-6.

When windscreen/headlamp wash is selected, windscreen and headlamp wash relays are energised which connect battery power to respective pumps. The windscreen wash relay is energised direct, but the headlamp relay is energised through the CPU which permits headlamp wash functions only when the headlights are ON.

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WASHER RESERVOIR

RENEW **84.10.03**

Open the bonnet and disconnect the battery earth lead.
Jack up and place the vehicle on two stands.
Remove the nuts, bolts, screws and washers securing the inner wing valance.
Displace and remove the inner wing valance.
Remove the brake disc cooling duct.
Disconnect the washer pump and the reservoir level sensor multi-plug connectors (1 Fig 1).
Disconnect the washer pump tubing from the pump (2 Fig 1).
Remove the bolt and washers securing the reservoir (3 Fig 1).
Remove the reservoir from the filler neck.
Drain the water from the reservoir.
Remove the bolt securing the washer motor clamp plate, remove the plate and remove the pump from the grommet (4 Fig 1).
Displace and remove the fluid level sensor (5 Fig 1).
Remove the clamp nut/grommet assembly.

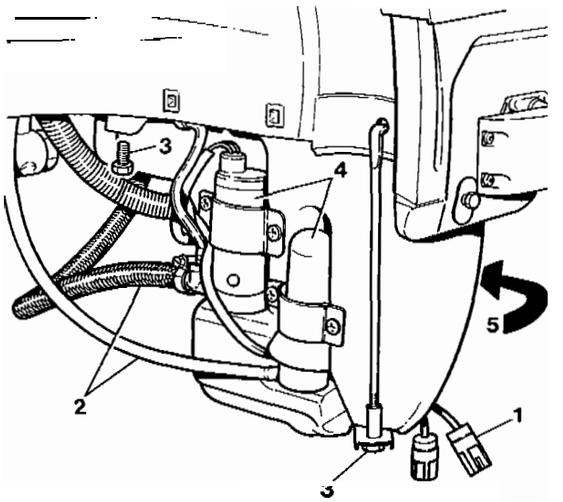


Fig 1

Fitting a new reservoir is the reversal of the removal procedure.

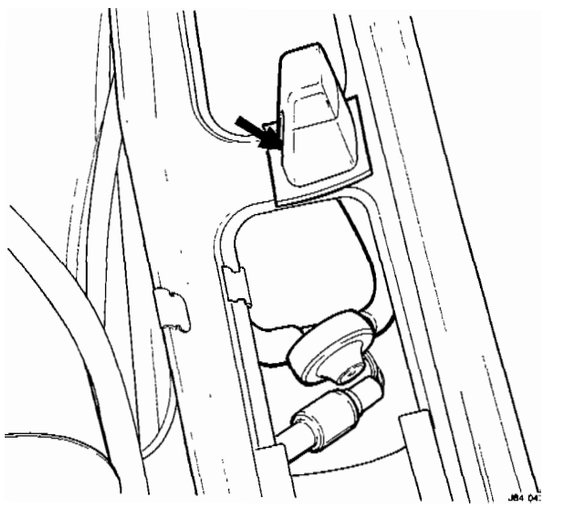
NOTE: To minimise the formation of deposits which affect the operation of the system, it is recommended that the reservoir is filled with a solution of soft water and a proprietary cleaning fluid mixed in accordance with the manufacturer's specification.

0196G

WINDSCREEN WASHER JETS

RENEW **84.10.08**

Open the bonnet and disconnect the battery earth lead.
Remove the wiper arm and blade.
Displace and remove the windscreen lower seal.
Displace and remove the bonnet rear seal.
Remove the front scuttle securing screws and remove the finisher.
Remove the screw securing the washer jet and reposition the jet upwards.
Disconnect the tube from the jet.
Disconnect the multi-plug connector.
Remove the jet assembly (Fig 2).


Fig 2

Fitting a new jet is the reversal of the removal procedure.

0196G

WASHER RESERVOIR SENSOR

RENEW **84.10.17**

Open the bonnet and disconnect the battery earth lead.
Jack up and place the vehicle on two stands.
Remove the nuts, bolts, screws and washers securing the inner wing valance.
Displace and remove the inner wing valance.
Remove the brake disc cooling duct.
Disconnect the washer pump and the reservoir level sensor multi-plug connectors (1 Fig 1).
Disconnect the washer pump tubing from the pump (2 Fig 1).
Remove the bolts and washers securing the reservoir (3 Fig 1).
Remove the reservoir from the filler neck.
Drain the water from the reservoir.
Remove the bolt securing the washer motor clamp plate, remove the plate and remove the pump from the grommet (4 Fig I).
Displace and remove the fluid level sensor.
Remove the clamp nut/grommet assembly.
Fitting a new reservoir sensor is the reversal of the removal procedure.

0196G

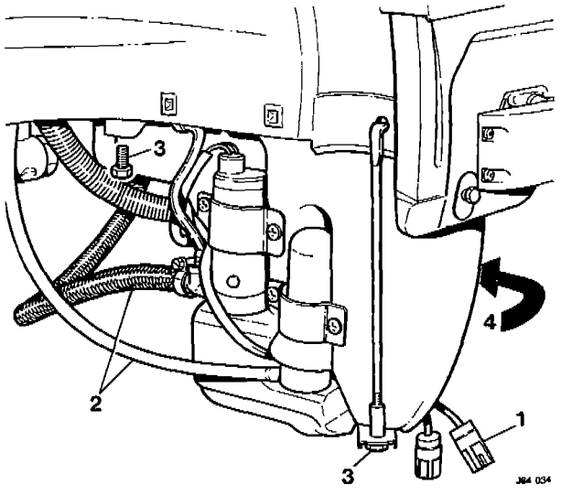


Fig 1

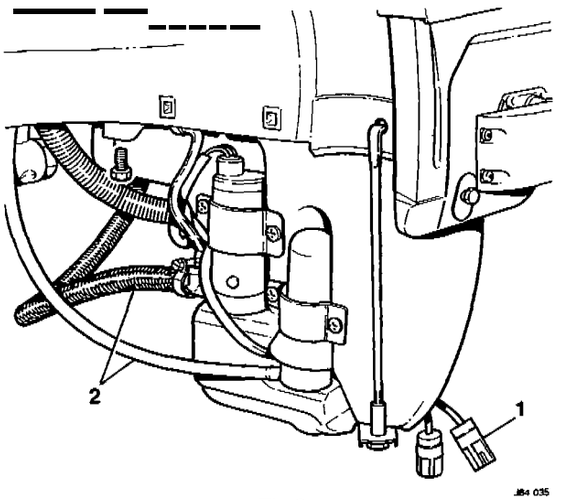


Fig 2

WINDSCREEN WASHER PUMP

RENEW **84.10.21**

Open the bonnet and disconnect the battery earth lead.
Turn the front road wheels to the full lock position for access.
Remove the nuts, bolts and screws securing the inner wing valance.
Remove the valance and the brake disc cooling duct.
Disconnect the pump multi-plug connectors and the washer pump tube (1.2 Fig 2).
Place a suitable container in position.
Remove the bolt securing the pump clamp, remove the clamp and the pump.
Remove the cover from the pump.
Fitting a new pump is the reversal of the removal procedure.

0196G

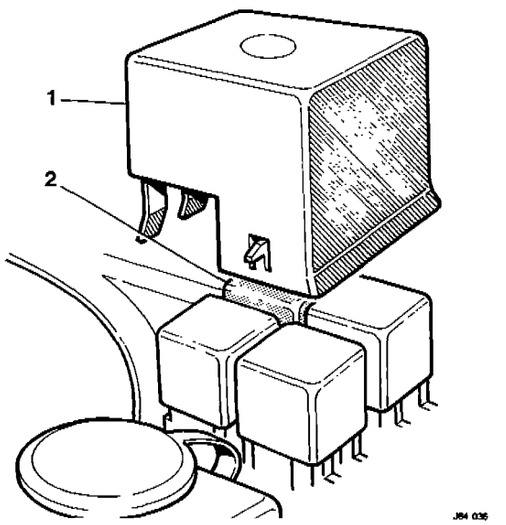


Fig 3

WINDSCREEN WASHER PUMP RELAY

RENEW **86.55.82**

Open the bonnet and disconnect the battery earth lead.
Remove the relay cover (1 Fig 3).
Locate and withdraw the relay from the yellow cable connector block (2 Fig 3).
Fitting a new relay is the reversal of the removal procedure.

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WIPER ARM

RENEW **84.15.01**

Open the vehicle bonnet.
Displace the wiper arm securing nufcover (1 Fig 1).
Remove the nut securing the wiper arm (2 Fig 1).
Position the arm from the screen (3 Fig 1).
Displace and remove the wiper arm.
Fitting a new arm is the reversal of the removal procedure.

0196G

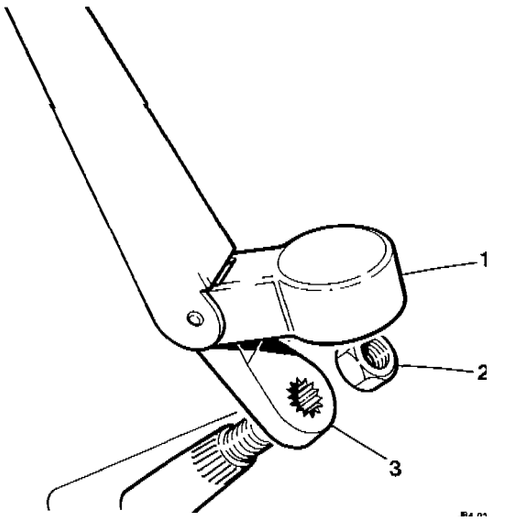


Fig 1

WIPER BLADE

RENEW **84.15.05**

Lift the wiper arm from the windscreen.
Disengage the wiper blade retaining clip (1 Fig 2).
Remove the wiper blade (2 Fig 2).
Fitting a new blade is the reversal of the removal procedure.

0196G

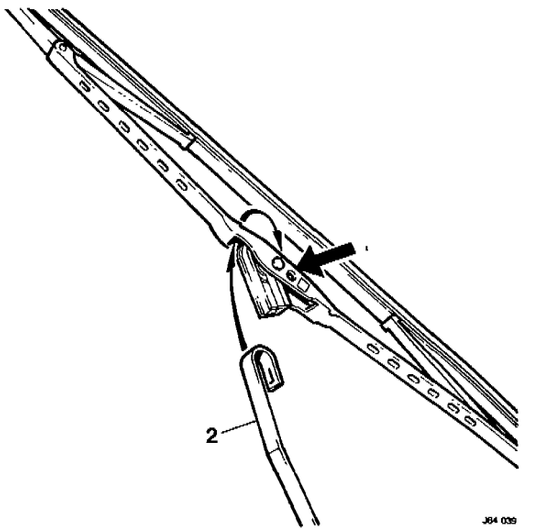


Fig 2

WIPER MOTOR ASSEMBLY

RENEW **84.15.12**

Open the bonnet and disconnect the battery earth lead.
Remove the wiper arm and blade.
Remove the engine compartment rubber seal.
Remove the windscreen rubber lower finisher.
Remove the screws securing the valance and reposition the valance for access.
Remove the wiper drive spindle securing nut and spacer (1 Fig 3).
Disconnect the wiper motor multi-plug connector (2 Fig 3).
Remove the bolt securing the earth lead and disconnect the lead.
Remove the bolts securing the wiper motor assembly (3 Fig 3) and release the assembly lower securng clips.
Carefully manoeuvere the wiper motor assembly clear of its location (4 Fig 3).

Fitting a new motor is the reversal to the removal procedure.
Ensure that all connections including the earth connection are clean and secure.

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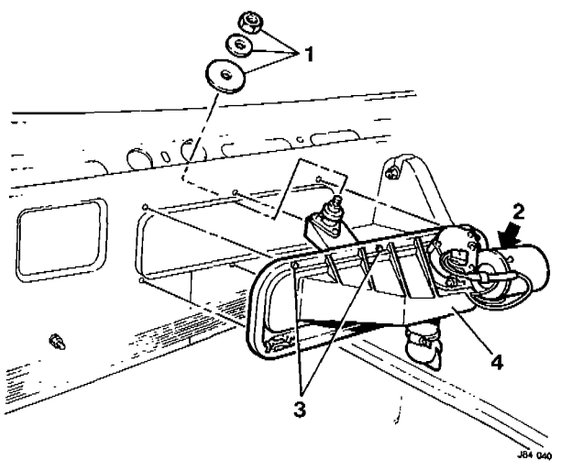


Fig 3

WASHER/WIPER SWITCH

RENEW **84.15.34**

Open the bonnet and disconnect the battery earth lead.
Open the car door, remove the screws securing the steering column cowl and remove the cowl (Fig 1).
Disconnect the washer/wiper switch multi-plug connector.
Release the switch retaining clips.
Remove the switch complete with guide wires and connector from the upper column.

Fitting a new switch is the reversal of the removal procedure.

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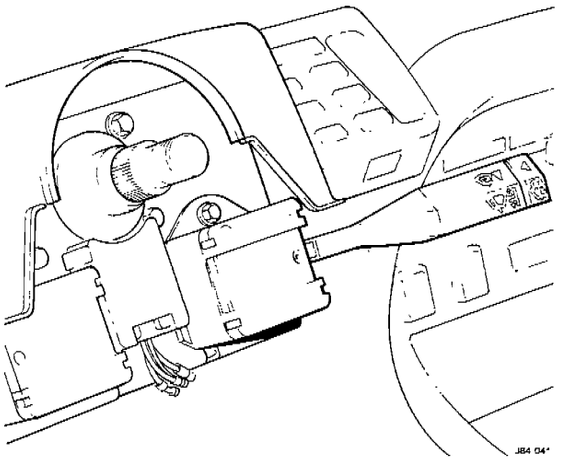


Fig 1

WIPER LOGIC MODULE

RENEW **86.80.11**

Open the bonnet and disconnect the battery earth lead.
Open the passenger door.
Remove the screws securing the passenger dash liner and remove the liner.
Remove the screws securing the module and displace the module (1 Fig 2).
Note and disconnect the cable harness multi-plug connector.
Remove the module.

Fitting a new module is the reversal of the removal procedure.

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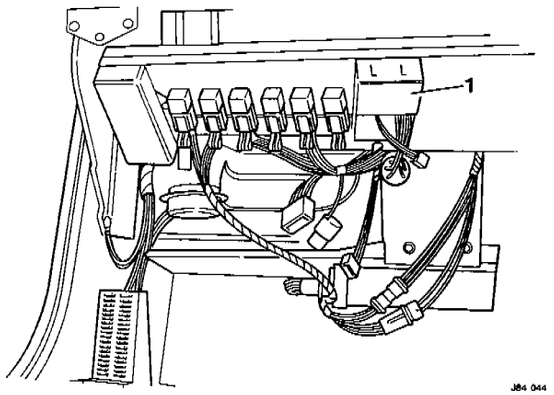


Fig 2

HEADLAMP WASHER JETS

RENEW **84.20.08**

With a suitable implement turn the jet cover anti-clockwise to release (1 Fig 3).
Displace the jet and disconnect the tube from the jet assembly (2 Fig 3).
Disconnect the cable harness multi-plug connector.
Remove the jet.

Fitting a new jet is the reversal of the removal procedure.

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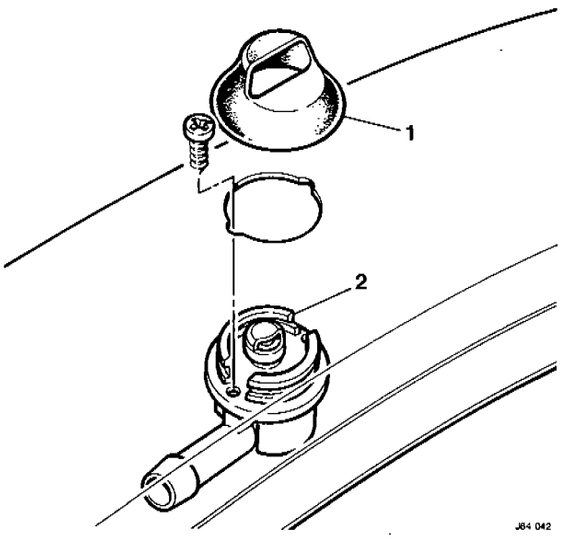


Fig 3

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HEADLAMP WASHER PUMP

RENEW **84.20.21**

Open the bonnet and disconnect the battery earth lead.
Turn the front road wheels to the full lock position for access.
Remove the nuts, bolts and screws securing the inner wing valance.
Remove the valance and the brake disc cooling duct.
Disconnect the pump multi-plug connector and the washer pump tube (1.2 Fig 1).
Place a suitable container in position.
Drain the washer fliud into the container.
Remove the bolt securing the pump clamp, Remove the clamp and the pump.
Remove the cover from the pump.

Fitting a new pump is the reversal of the removal procedure.

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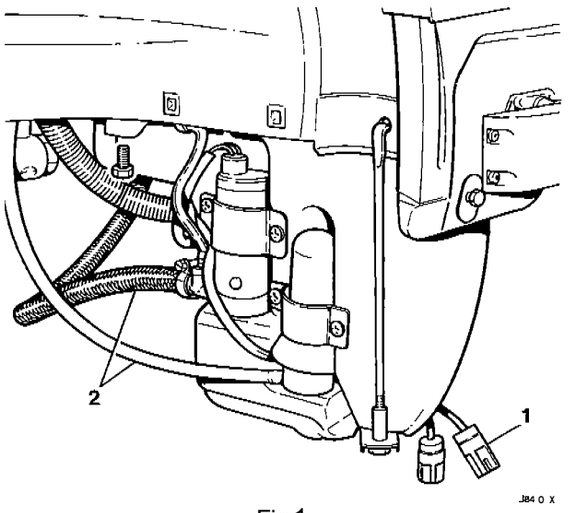


Fig 1

HEADLAMP WASHER PUMP RELAY

RENEW **86.55.83**

Open the bonnet and disconnect the battery earth lead.
Remove the relay cover (1 Fig 2).
Locate and withdraw the relay from the red cable connector block (2 Fig 2).

Fitting a new relay is the reversal of the removal procedure.

0196G

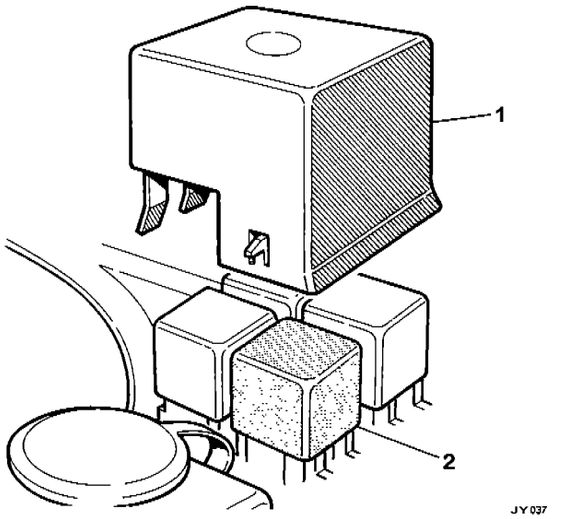


Fig 2

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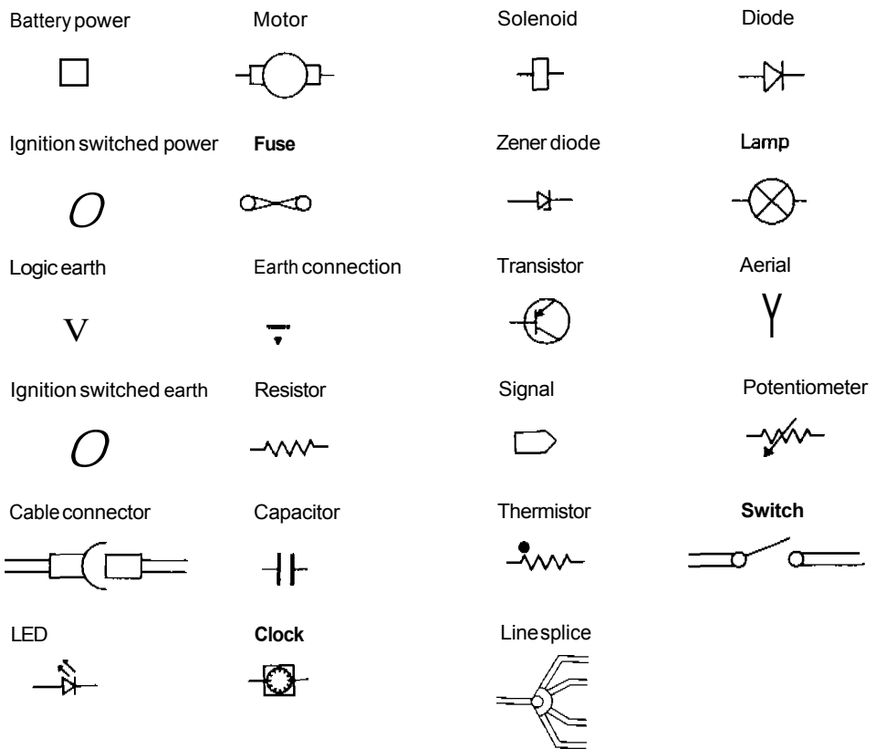
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BULB CHART

DESCRIPTION	CAPACITY	TYPE	PART NO
HEADLAMP FRANCE ONLY INNER	12V 55w	HALOGEN YELLOW 476	JLM9599
FRANCE ONLY OUTER	12V 60/55W	HALOGEN YELLOW 476	JLM9599
USA AND CANADA INNER	12V 50W	SEALED BEAM	
USA AND CANADA OUTER	12V 35/35	SEALED BEAM	
JAPAN ONLY INNER	12v 5ow	SEALED BEAM	
JAPAN ONLY OUTER	12V*/60W	SEALED BEAM	
R.O.W INNER	12w 55w	HALOGEN 472	JLM9598
R.O.W OUTER	12V 60/55W	HALOGEN 472	LLM9598
FRONT FLASHER & SIDE LAMP CANADA AND USA	12V 5/21W	DOUBLE FILAMENT 380	JLM9598
R.O.W SIDE LAMP	12V 5W	REGULAR 207	JLM9587
R.O.W FLASHER LAMP	12V 21W	REGULAR 382	C9126
FOG LAMPS FRONT	12v 55w	HALOGEN 479	
REAR	12V 21W	REGULAR 382	C9126
UNDERBONNET LAMP	12V 5W	REGULAR 989	JLM9601
SIDEMARKER LAMP USA AND CANADA	12V 4W	REGULAR 233	JLM9589
SIDE REPEATER LAMP	12V 4W	REGULAR 233	JLM9589
DOOR HAZARD LAMP	12V 5W	FESTOON 239	JLM9590
INSTRUMENT ILLUMINATION	12v 2.2W	CAPLESS	JLM646
GEAR SELECTOR ILLUMINATION	12V 1.2W	CAPLESS 286	C38966
CUBBY BOX LAMP	12V 5W	FESTOON 239	JLM9590
CIGAR LIGHTER ILLUMINATION	12V 1.2W	CAPLESS 286	C3896
ROOF CONSOLE MAP LAMP	12V 5W	HALOGEN	
ROOF CONSOLE COURTESY LAMP	12V 10W	FESTOON	
INTERIOR LAMP SEAT HEADREST	12V 5W	FESTOON 286	JLM9590
REAR QUARTER LAMP	12V 4W	REGULAR 233	JLM9589
HIGH MOUNTED STOP LAMP	12v 5W	CAPLESS 501	JLM9600
LUGGAGE COMPARTMENT LAMP	12V 5W	FESTOON 239	JLM959
STOP LAMP	12V 21W	REGULAR 382	C9126
REVERSE LAMP	12V 21W	REGULAR 382	C9126
REAR FLASHER LAMP	12V 21W	REGULAR 382	c912
TAIL LAMP	12V 5W	REGULAR 207	JLM9587
NUMBER PLATE LAMP JAPAN	12V 10W	FESTOON 265	JLM9591
NUMBER PLATE LAMP R.O.W	12v 5W	FESTOON 239	JLM9590

0229d

SYMBOLS



LOGIC EARTH DISTRIBUTION

Logic earths are distributed from power earth point B78 located close to the CPU.

IGNITION SWITCHED EARTH DISTRIBUTION

Ignition switched earths are distributed from the ignition and inertia switches. The ignition switch distributes the earths .in all switch position except OFF, and the inertia switch distributes the earths when tripped with the ignition ON.

3001B

WARNING

The battery emits combustible gas (Hydrogen) particularly when charging. Avoid sparks and short circuits by switching off the charging current before making or breaking the terminal connections. When disconnecting the battery connections, always disconnect the earth terminal first and reconnect it last.

Avoid contact with the battery acid which is both poisonous and corrosive. Acid will cause burns to the skin as well as to the eyes. In the event of skin or eye contamination, drench the effected area with water and seek urgent medical attention when eye contact has occured.

Fuel is extremely flamable. All fire precautions must be observed, therefore, when working on the fuel devices of the Engine Management system.

CAUTION

Never reverse the battery terminal connections and always disconnect both terminals before battery charging or using arc welding equipment on the vehicle.

3001B

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CONTROL SYSTEM

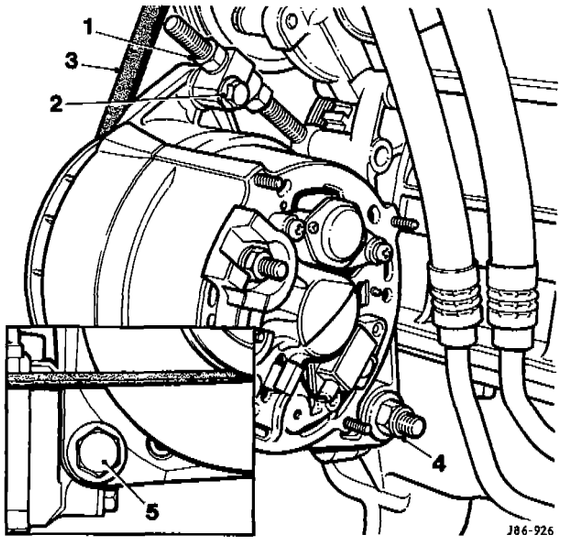
DESCRIPTION 86.80.00

The Control System contains a Central Processing Unit (CPU) which processes data on switched input lines to provide control of the following functions:

Direction and hazard indication.
Windscreen wash/wipe.
Headlamp wash.
Interior lights.
Instrument lights
Seat heaters (Where fitted)
Rear backlight and door mirror heaters.
Centralised locking.
Aerial extend/retract.
Audible warnings.

The CPU is of modular construction and is attached to the bulkhead on the passenger side.

ALTERNATOR



RENEW 86.10.02

Open the bonnet and disconnect the battery earth lead.
Remove the air cleaner element for access.
Undo the alternator link arm adjusting nut (1 Fig 1).
Loosen but do not remove the alternator link arm trunnion bolt (2 Fig 1).
Loosen the link arm pivot bolt and pivot the alternator towards the engine.
Remove the drive belt (3 Fig 1) from the alternator pulley.
Remove the trunnion bolt.
From beneath the vehicle displace the rubber boots from the alternator cable connectors.
Note and disconnect the cables from the alternator.
Remove the alternator pivot nut (4 Fig 1) and bolt (5 Fig 1).
Displace the alternator from the bracket and remove the spacer washer.
From above lift and remove the alternator from its location.

On refitting ensure that the drive belt is adjusted to the correct tension. A load of **1.5 kg** must **give** a total belt deflection of **4.5** mm when applied at the mid point of the belt.

DATA

SPECIFICATION

Type	Bosch N1 14V A0/115
Voltage	12volts
Maximum rev/min	**17500**
Maximum output	115 amps
Regulated voltage	**13.6-14.4**

TORQUE FIGURES

Through bolts 4.5 – 6.2 Nm
Pulley shaft nut ***27.2 – 35.0 Nm***
Rectifer bolts 3.4 – 3.96 Nm
Bearing plate screws 4.7 – 5.7 Nm
Main terminal nut 3.96 – 5.08 Nm

3001 B

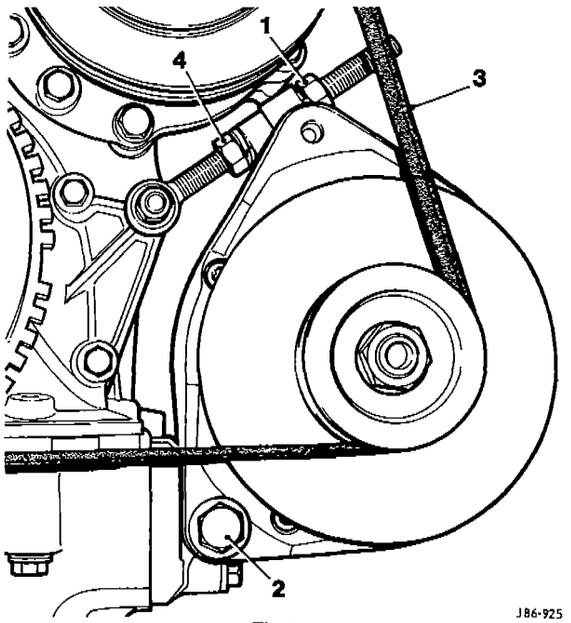
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ALTERNATOR DRIVE BELT

RENEW AND ADJUST 86.10.03

Loosen the pivot bolts securing the air conditioning compressor.
Loosen the adjusting link securing bolt and trunnion block bolt.
Loosen the adjusting link locknut (1 Fig 1) and adjust the compressor towards the engine until compressor drive belt (3 Fig 1) can be removed.
Loosen the alternator pivot nut and bolt (2 Fig 1).
Loosen the adjusting link pivot bolt and the trunnion block bolt.
Loosen the adjusting link locknut (4 Fig 1) and adjust the alternator towards the engine by means of the adjusting nut
Remove the trunnion block bolt and push the alternator towards the engine until the drive belt can be removed from the pullies.

On fitting the new belt ensure that the drive belt is adjusted to the correct tension. A load of 1.5 kg must give a total belt deflection of 4.5 mm when applied at the mid point of the belt.



J86-925
Fig 1

30018

ALTERNATOR DUMP MODULE

RENEW 86.10.06

Open the bonnet and disconnect the battery earth lead.
Remove the air cleaner assembly.
Remove the screws, nuts and washers securing the module.
Disconnect the cable to the alternator, the earth lead and the multi-plug cable connector.
Remove the module.

Fitting a new module is the reversal of the above procedure ensuring all the electrical connections are clean and secure.

3001B

BATTERY

DESCRIPTION 86.15.00

The declaration of the battery capacity in ampere hours by battery manufacturers is now optional and a more realistic method of declaring the characteristics of a battery is by quoting the RAPID DISCHARGE CURRENT and the RESERVE CAPACITY. A battery user will find information about how long a battery will sustain the maximum electrical load in the event of an alternator failure, and about the battery's cold start performance is of much greater use than details of battery capacity at the 10 or 20 hour rate.

Cranking Performance:

This is the assessed performance of the battery under simulated load conditions. The cranking current is the current the battery will deliver at the initial temperature of minus 18°C which enables a minimum voltage of 7.2 volts to be obtained at the battery terminals for 30 seconds. (SAE standard).

Reserve Capacity:

This is the period during which the battery can supply a constant current of 25 amps down to a voltage of 1.75 volts per cell at a temperature of 25°C. The current is based on a typical total electrical load of a vehicle such as would be carried by the battery under adverse driving conditions in the event of the failure of the vehicle charging system. The time is usually stated in minutes.
Topping-up should be carried out when the electrolyte falls below the top of the separators.
The vent covers should be left in position at all times, except during the topping-up procedure.
When battery charging is carried out, the vent covers should be left in position to allow gas to escape or flooding of electrolyte may result. Also it is advisable to disconnect the battery from the vehicle.

440 Series Battery.

The rapid discharge current = 420 amps at -18°C.
The reserve capacity time = 75 minutes at 25 amps.
The rapid discharge voltage = 9.0 volts.

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HEALTH AND SAFETY PRECAUTIONS

No smoking.
Avoid sparks, short circuits or other sources of ignition.
Hydrogen, which is highly explosive, is emitted particularly during charging.
Switch off current before making or breaking electrical connections.
Always disconnect the earth terminal first and reconnect it last.
Charge the battery in a well ventilated area.

Avoid contact with battery acid
Battery acid is poisonous and corrosive, it will cause burns to the skin as well as to the eyes.
In the event of skin or eye contact drench the effected area with water and in the case of eye contact seek urgent medical attention.

3001B

BATTERY HEAVY DISCHARGE

TEST 86.15.02

This test ensures that the battery is capable of supplying the heavy currents required by the starter motor at the moment of starting the engine
A heavy discharge tester should be applied to the battery terminals with the red lead to the positive terminal and the black lead to the negative terminal.
The tester should be set for the ammeter to indicate a discharge of approximately 300 amps (New Battery) 210 amps (Service Battery) for 15 seconds. Observe the voltmeter during the battery discharge. If the voltmeter reading is 9.6 volts or above the battery can be considered serviceable.
Should the voltage fall below the specified 9.6 volts recharge the battery and retest.

OPEN CIRCUIT VOLTAGE	NEW BATTERY TEST CURRENT	SERVICE BATTERY
12.60 and above	260 amps	180 amps
12.45 to 12.59	210 amps	130 amps
12.21 to 12.44	110 amps	85 amps
12.20 and below	The battery must be charged before being tested.	

DEGREES C	DEGREES F	MINIMUM ACCEPTANCE VOLTAGE
21	70 and above	9.6
15	60	9.5
10	50	9.4
4	40	9.3
0	30	9.1
–7	20	8.9
–12	10	8.7
–18	0	8.5

If the voltage is 9.6 or above at room temperature ie. 20°C or above throughout the 15 second test period then the battery is serviceable.

3001B

If the electrolyte is observed to boil in one of the cells during the discharge period the battery can be considered unserviceable as shorting is taking place between the cell separator plates.
Sulphation is a condition which occurs when a battery remains in a discharged state for a period of time. It is not readily distinquishable from a battery which has been recently discharged. Charging may or may not recover the battery, but the test procedure will determine whether it is serviceable or not.

Specific Gravity Test
The electrolyte consists of a mixture of sulphuric acid and water in given proportions.
The electrolyte becomes weaker as the cell discharges and this weakening effect is directly proportional to the amount of electricity given up by the cell. Therefore the specific gravity of the electrolyte gives a direct indication of the condition of the battery.
When a tube of a hydrometer is inserted into the electrolyte and the rubber bulb is pressed and released a small quantity of electrolyte is drawn up into the hydrometer. The specific gravity of the electrolyte determines the level of the float in the liquid. With the float in a high position the specific gravity is high. If the specific gravity is low the float sinks to a lower position.
The specific gravity readings are taken when the liquid level crosses the scale on the float and this gives an accurate indication of the state of charge of the battery.
The volume of electrolyte and hence its specific gravity varies with temperature

Electrolyte Temperature Correction

For every 10°C below 15°C subtract 0.007 from the hydrometer reading and for every 10°C above 15°C add 0.007 to the hydrometer reading.

Specific Gravity

Specific gravity	F°	C°
1.2595	104	40
I.263	95	35
1.2675	86	30
1.270	78	25
1.2735	68	20
1.277	59	15
1.2805	50	10
1.284	41	5
1.2875	32	0

Example

Specific gravity reading = 1.250
The temperature = 5°C
The equivalent specific gravity at 15°C
= 1.250 - 0.007 = 1.243

3001B

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BATTERY

RENEW **86.15.01**

Health and Safety precautions

No smoking
Avoid sparks, short circuits or other sources of ignition.
Hydrogen, which is highly explosive, is emitted particularly during charging.
Switch off current before making or breaking electrical connections.
Always disconnect the earth terminal first and reconnect it last.
Charge the battery in a well ventilated area.

Avoid contact with battery acid
Battery acid is poisonous and corrosive, it will cause burns to the skin as well as to the eyes.
In the event of skin or eye contact drench the effected area with water and in the case of eye contact seek urgent medical attention.

Open the car bonnet
Displace the cover from the negative terminal and loosen the bolt securing the terminal.
Disconnect the terminal from the battery terminal post.
Displace the cover from the positive terminal and loosen the bolt securing the terminal.
Disconnect the terminal from the battery terminal post.
Remove the bolts securing the battery clamp plate.
Remove the clamp plate.
Ensure the battery is kept in an upright position as it is being removed.

Fitting a new battery is the reversal of the above procedure.
Ensure the terminals are clean and tight.
Connect the positive terminal then connect the negative terminal ensuring correct connection are made.
Ensure the battery clamp is not over tightened.

3001 B

BATTERY NEGATIVE LEAD

RENEW **86.15.19**
86.15.17

Note:- Should the positive lead only need renewing always disconnect the negative terminal first.

Displace the cover from the negative terminal and loosen the nut securing the terminal
Remove the terminal from the battery terminal post.
Remove the nut securing the cable clamp and remove the clamp.
From beneath the vehicle remove the bolt securing the lead to the bell housing and remove the lead.

Displace the cover from the positive terminal and loosen the nut securing the terminal
Remove the terminal from the battery terminal post.
Reposition the rubber boot cover from the body terminal stud, remove the nut securing the lead to the stud and remove the lead.

Fitting the new leads is the reversal of the above procedure.

3001B

BATTERY

POWER DISTRIBUTION 86.15.00

Fused and unfused battery power is distributed from the " A post fuseblocks and terminal posts located behind the console on the right and left sides of the engine compartment bulkhead.
Each 'A post fuseblock contains two vertical banks of seven fuses, each bank being identified 1 to 7 and 8 to 14 in descending order on the left and right respectively. Fuse ratings and the circuits are detailed at the front of this Section.

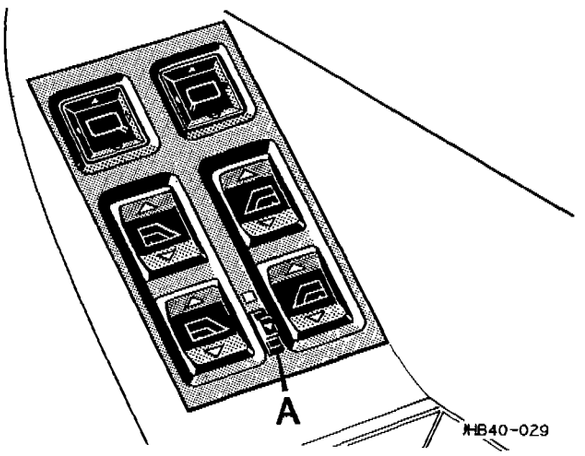


Fig 1

0022C

SUNROOF AND WINDOWS

DESCRIPTION 86.25.00

The sunroof (if fitted) and windows are driven by motors actuated, via relays, by two-way rocker switches located on door (Fig 1) and sunroof (A,B Fig 2) switch panels. Each window can be raised and lowered independantly from its respective switch panel or from the driver switch panel which also contains passenger window override and isolate switches (A Fig 1). A central locking function also raises each window and closes the sunroof in response to front door key and central locking switches.
The sunroof is operational at all times that the battery is connected, but window operation is permitted only when the ignition switch is set to ON or AUXILIARY.

The sunroof and each window circuit contains two relays; one relay for the open function, and the other for the close function. Each relay is supplied with battery power which is routed to the motor when the relay is energised, the other relay completing the motor circuit to earth.

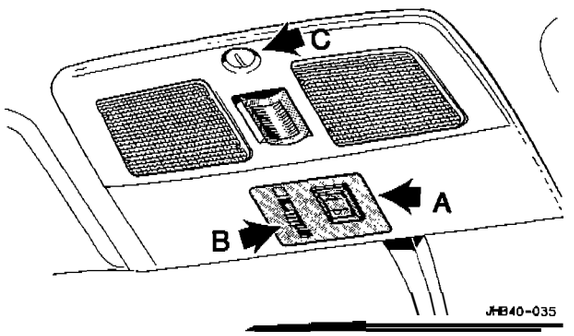


Fig 2

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The sunroof circuit also contains a limit override switch which permits sunroof travel to the fully open position when its contacts are closed. When the override switch contacts are open, sunroof travel is limited to a position determined by a reed switch attached to the sunroof transport.

FRONT DOOR WINDOW SWITCH (DRIVERS SIDE)

RENEW **86.25.03**

Open the bonnet and disconnect the battery earth lead.
Open the car door
Remove the veneer trim pad 76.47.11
Remove the upper trim pad 76.34.02
Remove the lower trim pad 76.34.03
Remove the front armrest 76.34.22
Remove the screws securing the switch retaining bracket and remove the bracket (1 Fig 1).
Disconnect the door guard block connectors.
Remove the switch assembly (Fig 2).

Fitting a new switch is the reversal of the removal proecedure.

3001B

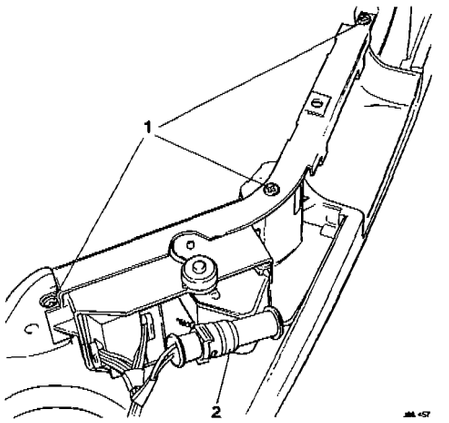
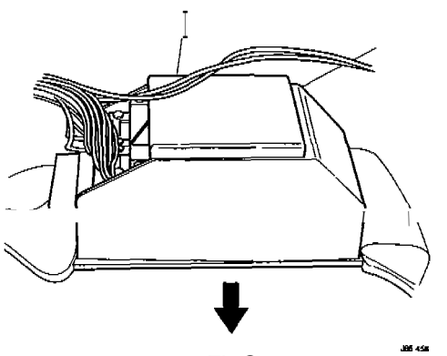


Fig 1


Fig 2

FRONT DOOR WINDOW LIFT MOTOR

RENEW **86.25.04**

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel 76.47.11
Remove the upper trim pad 76.34.02
Remove the lower trim pad 76.34.03
Fit tape over the door glass and frame to secure the glass (Fig 3).
Remove the screws securing the window lift motor assembly to the door panel.
Remove the rubber cover from the window lift guide securing screws and remove the screws.
Displace the block connector blanking plate from the door for access.
Cut and remove the ratchet strap securing the block connector.
Disconnect the cable harness block connector.
Displace the window lift motor from the glass and lower the window lift motor assembly into the bottom of the door.
Remove the window lift motor assembly from the door (Fig 4).

Fitting a new motor assembly is the reversal of the removal procedure.

3001B

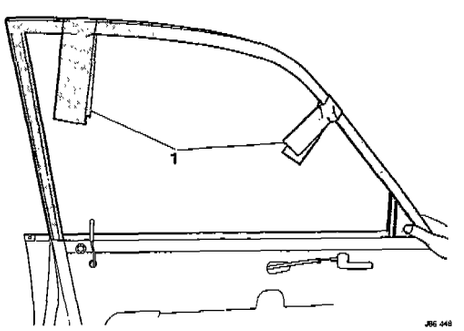
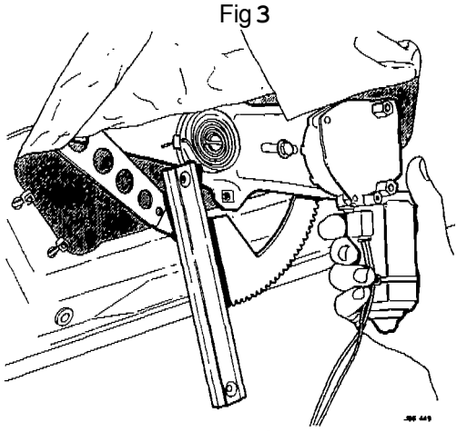


Fig 3


Fig 4

FRONT DOOR WINDOW LIFT SWITCH

RENEW **86.25.06**

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel 76.47.11
Remove the upper trim pad 76.34.02
Remove the lower trim pad 76.34.03
Remove the armrest 76.34.22
Remove the screws securing the switch retaining bracket and remove the bracket.
Disconnect the door guard block connectors.
Remove the switch/ashtray assembly.
Displace the switch asemmbly from the housing and carefully release the locking tabs to remove the switch.

Fitting a new switch is the reversal of the. removal procedure. Ensure all the electrical connections are clean and tight.

3001B

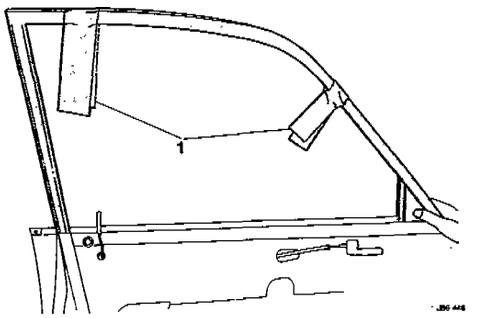


Fig 1

REAR WINDOW LIFT MOTOR

RENEW **86.25.09**

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel 76.47.12
Remove the upper trim pad 76.34.05
Remove the lower trim pad 76.34.06
Fit tape over the door glass and frame (Fig 1) to secure the glass.
Cut and remove the ratchet strap securing the block connector.
Disconnect the cable harness block connector.
Remove the screws securing the window lift motor assembly to the door panel.
Remove the rubber cover from the window lift guide securing screws and remove the screws.
Remove the rubber cover from the window lift guide securing screws and remove the screws.
Displace the window lift motor from the glass and lower the window lift motor assembly into the bottom of the door.
Remove the window lift motor (Fig 2) assembly from the door.

Fitting a new motor assembly is the reversal of the removal procedure.

3001B

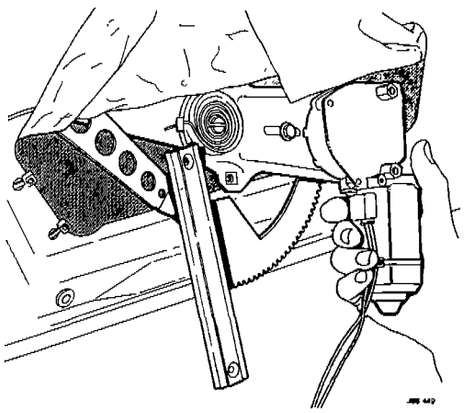


Fig 2

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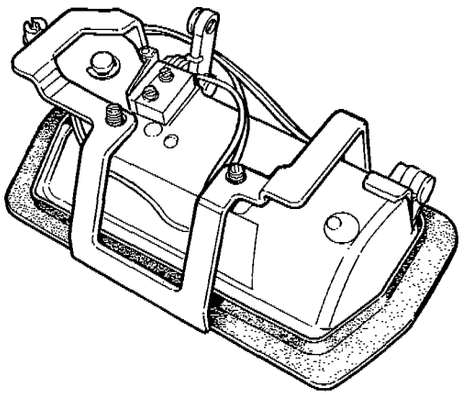
REAR DOOR WINDOW LIFT SWITCH

RENEW **86.25.10**

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel 76.47.12
Remove the upper trim pad 76.34.05
Remove the lower trim pad 76.34.06
Remove rhe arm rest 76.34.23
Remove the screws securing the switch retaining bracket and remove the bracket.
Disconnect the door guard block connectors.
Remove the switch/ashtray assembly.
Displace the switch assembly from the housing and carefully release the locking tabs to remove the switch.

Fitting a new switch is the reversal of the removal procedure.

3001B



J86 921

Fig 1

DOOR LOCK SOLENOID MICRO-SWITCH

RENEW **86.25.44**

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel 76.47.11
Remove the upper trim **pad** 76.34.02
Remove the lower trim pad 76.34.03
Remove the door handle 76.58.01
Remove the cable harness tapes.
Remove the screws (Fig 1) securing the switch.
Remove the roller bracket.
Remove the switch complete with harness.

Fitting a new switch is the reversal of the removal procedure

3001B

DOOR, BOOT AND FUEL FILLER LOCKS

DESCRIPTION **86.25.00**

Two methods of door and boot lock operation exist: mechanical operation by means of a plunger located on each door sill, and electrical operation by means of motors installed in the doors and boot. Mechanical operation of the boot lock is by means of a key operated mechanism also incorporated at both the driver and front passenger doors.

Each door plunger is connected to its respective lock mechanism by a linkage which sets the mechanism to the desired condition. The front door plungers can be operated with the doors open or closed, but in the open position the external door handle must first be raised. Driver and front passenger door plunger movement also operates a microswitch which, via a door lock module, operates the boot and remaining door locks.
A safety feature, operated by the inertia switch, unlocks all the doors and locks the boot and fuel filler should the vehicle be involved in a front or rear collision.
Each lock can also be locked, via the door lock module, by a central locking function under CPU control, it is operated by front door key or central locking switches.

3001B

DRIVERS DOOR LOCK MOTOR

RENEW **86.25.45**

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel 76.47.11
Remove the upper trim pad 76.34.02
Remove the lower trim pad 76.34.03
Remove the door lock 76.37.12
Cut and remove the rachet strap securing the lock harness to switch harness.
Remove the screws securing the lock motor to the door lock (1 Fig 1).
Remove the lock motor from the lock assembly (2 Fig 1).
Fitting a new lock motor is the reversal of the removal procedure

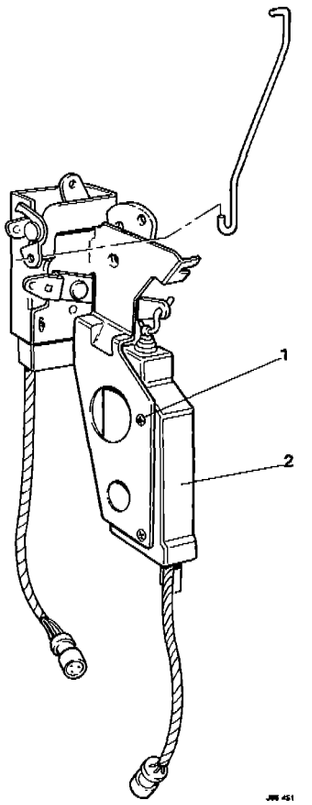


Fig 1

3001B

REAR DOOR LOCK MOTOR

RENEW **86.25.47**

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel 76.47.12
Remove the upper trim pad 76.34.05
Remove the lower trim pad 76.34.06
Remove the door handle 76.37.02
Remove the door lock 76.37.13
Cut and remove the rachet strap securing the lock harness to switch harness.
Remove the screws securing the lock motor to the door lock.
Remove the lock motor from the lock assembly

Fitting a new lock motor is the reversal of the removal procedure

3001B

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LUGGAGE COMPARTMENT LOCK MOTOR

RENEW 86.25.49

Open the bonnet and disconnect the battery earth lead.
Open the luggage compartment.
Remove the bolts securing the lock mechanism.
Displace the lock linkage retaining clip and disconnect the linkage (2 Fig 1).
Displace the lock mechanism.
Disconnect the cable harness black connector (3 Fig 1).
Remove the assembly.
Displace the peg (4 Fig 1) retaining the lock barrel and remove the barrel.

Fitting a new lock assembly is the reversal of the removal procedure.

3001B

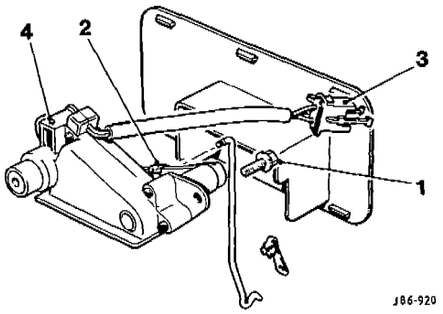


fig 1

HORNS

DESCRIPTION 86.30.00

Twin horns are fitted, mounted on the front lower cross-member behind the front bumper.
The horns are operational when the battery is connected, power being supplied to a horn relay which is energised by a logic earth when the horn push is pressed. When energised, battery power is applied to the horns through the relay contacts.

30018

HORNS

RENEW 86.30.09

Open the bonnet and disconnect the battery earth lead.
Remove the radiator grilles 76.55.07.
Remove the screws securing the horn bracket.
Disconnect the electrical cables and remove the horns..
Fitting new horns is the reversal of the removal procedure.

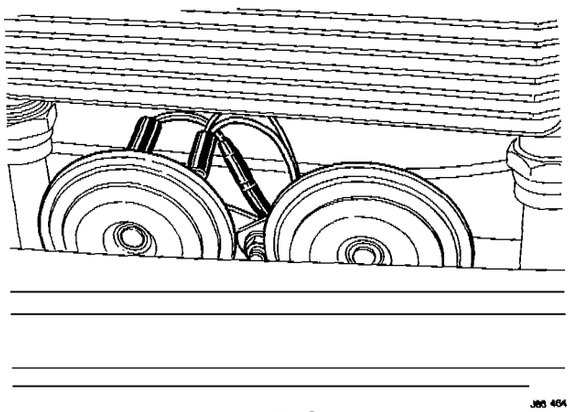


Fig 2

30018

EXTERIOR LIGHTS

DESCRPTION 86.40.00

All exterior lights are operated via relays within bulb fail modules. These relays, which are wire linked to suit the vehicle in which the module is installed, are controlled via a lighting logic module which implements functions selected on master, fog and main/dip beam lighting switches.
Circuits within the logic module perform the following control functions:

Headlight operation only when the ignition is switched is ON.
Initiate headlight operation in dip beam mode.
Select main/dip beam switch mode of operation, i.e. headlight flash or main/dip beam select, dependent on the position of the master lighting switch.
provide inputs to both the CPU and the instrument pack to facilitate headlamp wash and main beam indicator operation.
Headlight operation is by switching the master lighting switch to HEADLIGHTS. This applies a logic earth to the lighting logic module which, via B49-11 and 5, energises relays that route battery power through the bulb fail modules to the dip beam filaments. A signal is also applied, to the CPU which permits headlamp wash operation.
Upward movement of the main/dip beam stalk, applies a logic earth to the lighting logic module. The logic module responds to this input as follows:
Energises, through, relays within the bulb fail modules which route battery power to the main beam filaments. This occurs each time the stalk is operated with the master lighting switch set to OFF or SIDELIGHT.
Energises, through, either main or dip beam relays within the bulb fail modules which route battery power to the lamp assembly main or dip beam filaments. Main and dip selection occurs on alternate stalk operations with the master lighting switch set to HEADLIGHT.
Initiates, main beam indicator illumination by applying a logic earth to the instrument pack each time the main beam relays are energised.

3001B

HEADLAMP ASSEMBLY (Lefthand)

RENEW **86.40.06**

Open the bonnet and disconnect the battery earth lead.
Remove the radiator grilles 76.55.07.
Remove the nuts and washers securing the rear of headlamp assembly.
Remove the lower bolt securing the headlamp assembly and earth leads.
Remove the earth leads from the bolt,
Disconnect the headlamp multi-plug cable connectors and remove the headlamp assembly (Fig 1).

Fitting a new headlamp assembly is the reversal of the removal procedure.

3001E

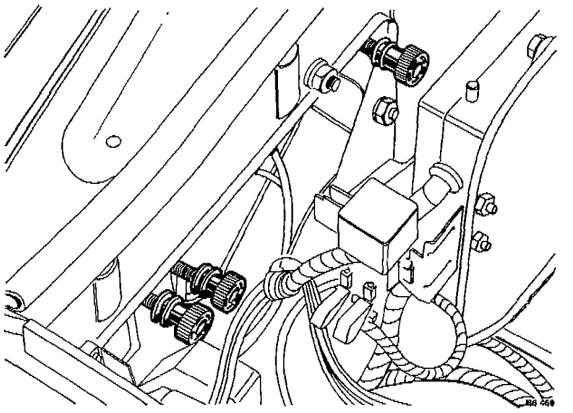


Fig 1

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HEADLAMP ASSEMBLY (Righthand)

RENEW **86.40.07**

Open the bonnet and disconnect the battery earth lead.
Remove the radiator grilles 76.55.07.
Displace the relays from the mounting brackets.
Remove the headlamp securing nuts.
Remove the lower securing bolt and remove the earth leads from the bolt.
Reposition the headlamp forward and disconnect the multi-plug cable connectors then remove the headlamp assembly.
Fitting a new headlamp assembly is the reversal of the removal procedure.

3001B

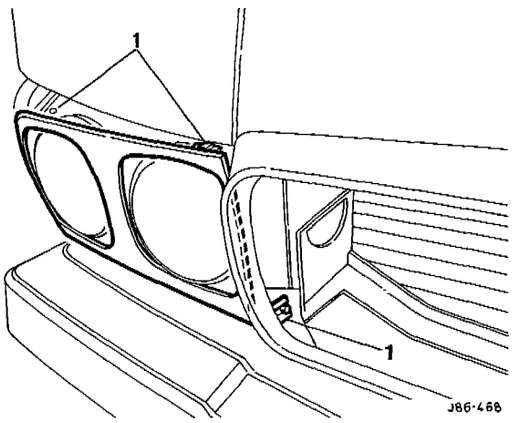


Fig 1

HEADLAMP LIGHT UNIT

RENEW **86.41.26**

Open the bonnet and disconnect the battery earth lead.
Remove the screws securing the radiator grille and remove the grille.
Loosen the nuts securing the radiator grille surround and displace the surround outwards.
Remove the screws securing the headlamp rim finisher and remove the finisher (1 Fig 1).
Slacken the light unit rim securing screws (1 Fig 2).
Turn and remove the rim (2 Fig 2).
Displace the light unit.
Disconnect the block connector and remove the light unit.

Fitting a new unit is the reversal to the above procedure.

30018

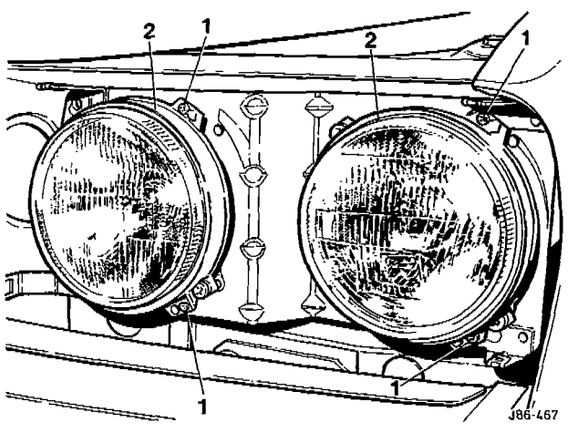


Fig 2

DIRECTION AND HAZARD INDICATION

DESCRIPTION 86.40.00

The direction indicators are operational with the ignition on and movement of the direction indicator stalk, located on the left-hand side of the steering column.
The indicators, under CPU control operate at a flash rate of 80 per minute, with a visible and audible warning in time with the indicator flash rate. Should an indicator bulb fail the visible and audible warning frequency will increase to 160 per minute whilst the external flash frequency will remain at 80 per minute.
Cancelling is achieved automically by turning the steering wheel or moving the stalk in the opposite direction to that selected.

Hazard warning is operational with the ignition switched off or on by depressing the hazard warning switch located on the left hand side of the steering column. This will cause all the direction indicators, the warning lamp in the switch and the audible warning to operate in unison.
Should an indicator bulb fail the visible and audble warning frequency will increase to 160 per minute whilst the external flash frequency will remain at 80 per minute but only if the ignition is switched "ON".
Operation of the direction indicator stalk applies a logic earth, to the CPU which energises relays within the relay/bulb fail modules. The relays are energised for periods of 1.5 seconds at 1.5 second intervals and both visible and audible warnings are in unison with the relay operation provided that the bulbs on the selected side are intact. The visible warning signals are applied to the instrument pack and the audible warning signal is applied to an audible warning module.
In the event of a bulb failure, the associated lamp relay/bulb fail module generates a "DI bulb fail" signal which is applied to the CPU. On receiving the "DI bulb fail" signal, the CPU increases the frequency of both visible and audible warning signals to 160 outputs per minute and initiates a "DI bulb fail" indication on the instrument pack through RB/LB14-14.
Operation of the hazard warning switch applies a logic earth, via RB/LB49-15, to the CPU which responds in a similar manner to that of the direction indicator function previously described.

3001E

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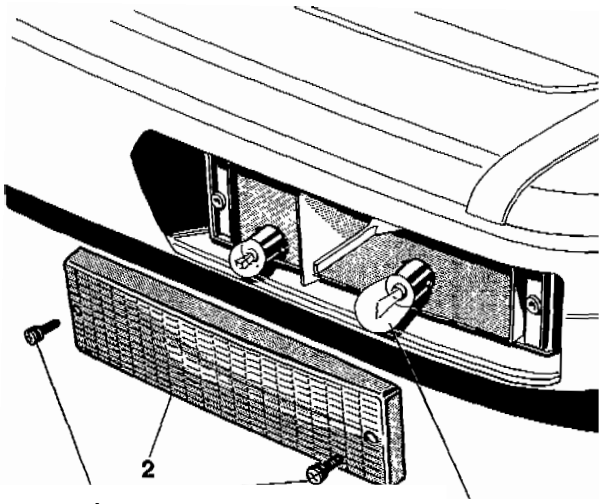
FRONT FLASHER LAMP

RENEW **86.40.39**

Open the bonnet and disconnect the battery earth lead.
Carefully displace the lamp assembly from its retaining clips.
Disconnect the multi-plug cable connector and remove the lamp assembly.

Fitting a new lamp is the reversal of the removal precedure.

30018



J86 470

Fig 1

FRONT FLASHER LAMP LENS

RENEW **86.40.40**

Open the bonnet and disconnect the battery earth lead.
Remove the screws (1 Fig 1) securing the flasher lamp lens and remove the lens (2 **Fig** 1).

Fitting a new lens is the reversal of the removal procedure.

30018

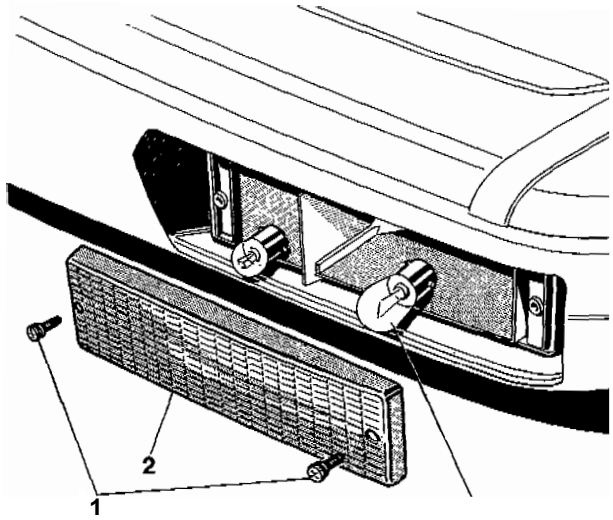
FRONT FLASHER LAMP BULB

RENEW **86.40.41**

Open the bonnet and disconnect the battery earth lead.
Remove the screws (1 **Fig** 2) securing the flasher lamp lens (2 **Fig** 2) and remove the lens (3 Fig 2).
Press, turn and remove the bulb.

Fitting a new bulb is the reversal of the removal procedure.

3001B



J86 470

Fig 2

FRONT REPEATER LAMP ASSEMBLY

RENEW **86.40.53**

Open the bonnet and disconnect the battery earth lead.
Disconnect the repeater lamp cable harness multi-plug connector.
Displace the body grommet into the inner wing.
Remove the road wheel.
Remove the screws securing the inner wing arch liner and remove the liner.
Peel back the repeater lamp insulator sleeve.
Remove the repeater lamp from the wing.
Carefully displace the adhesive pad and withdraw the cable harness.

Fitting a new lamp is the reversal of the removal procedure ensuring the wing aperture is clean.

0030d

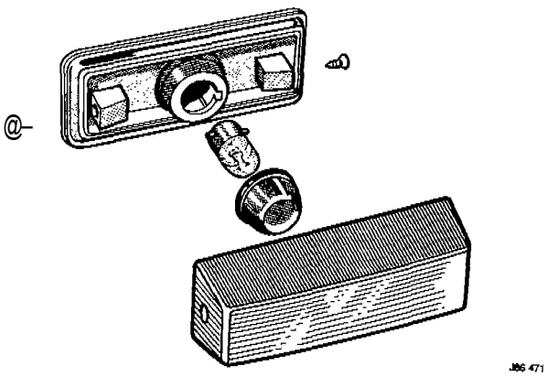


Fig 1

REPEATER LAMP LENS AND BULB

RENEW **86.40.51**

Remove the screws securing the lens and remove the lens (Fig 1).
Remove the bulb filter cover from the retaining clips and remove the bulb.

To fit a new bulb or a new lens reverse the above procedure.

30016

REAR SIDE MARKER LAMP

RENEW **86.40.64**

Open the bonnet and remove the battery earth lead.
Open the luggage compartment.
Remove the spare wheel 74.20.00
Remove the fuel tank trim panel.
Remove the rear lamp trim panel.
Remove the side trim panel.
Disconnect the cable harness multi-plug connector at the bulb failure module.
Displace the carpet and displace the the body grommet.
Release the spring clips securing the marker lamp and remove the lamp complete with cable.

Fitting a new lamp is the reversal of the removal procedure.

30016

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REAR SIDE MARKER LAMP BULB.

RENEW **86.40.62**

Remove the screws securing the marker lamp lens and remove the lens.
Remove the bulb.

Fit a new bulb and refit the lens.

3001B

SIDE, STOP, REVERSE AND NUMBER PLATE LAMPS

DESCRIPTION **86.40.00**

The vehicle side and number plate lamps are operated with the ignition switched off, through an auxiliary sidelamp relay. The stop and reverse lamps, however, are operated by footbrake and gear selector switches which energise stop and reverse relays in the rear bulb fail modules.

3001B

SIDE, STOP, REVERSE AND NUMBER PLATE LAMPS

OPERATION **86.40.00**

Sidelamp operation is selected by setting the master lighting switch to SIDELIGHTS.
This connects a logic earth to the lighting logic module which energises the auxiliary sidelight relay and sends a signal to the CPU. Side, tail, number plate and side marker relays are also energised, which route battery power to respective lamp filaments through the bulb fail modules. The "SideLAMP" signal is used to control the instrument illumination intensity.
Operation of the vehicle footbrake actuates the footbrake switch which, energises stop relays which route battery power through the rear bulb fail modules to the stop lamp filaments. Similarly, movement of the gear selector to reverse actuates the reverse switch which, energises relays which route battery power to the reverse lamp filaments.

3001E

TAIL, STOP, FLASHER AND REVERSE LAMP BULB HOLDER

RENEW **86.40.67**

Open the bonnet and remove the battery earth lead.
Open the luggage compartment.
Remove the lamp interior trim finisher (Fig 1).
Remove the nuts securing the bulb holders.
Displace the holders from the lens.
Disconnect the cable harness block connector.
Remove the bulbs ftom holders (Fig 2).

Fitting a new bulb holders is the reversal of the removal procedure.

0037d

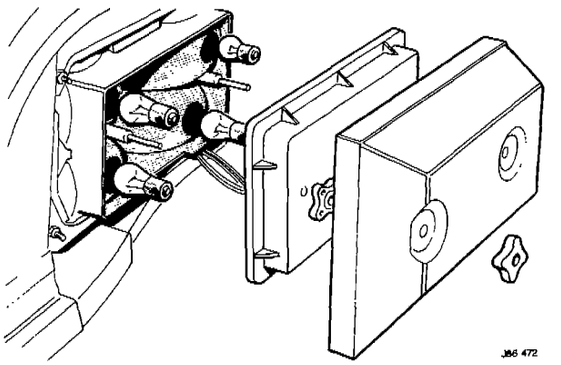


Fig 1

TAIL, STOP, FLASHER, AND REVERSE LAMP LENS

RENEW **86.40.72**

Open the luggage compartment.
Remove the rear lamp interior trim finisher (Fig 1).
Displace the side liner.
Remove the bolt securing the bulb faiure module bracket.
Displace the module from the bracket.
Remove the nuts securing the bulb holders.
Displace the holders forward.
Remove the nuts securing the lens.
Remove the bulb failure bracket.
Remove the lens assembly.

Fitting a new lens is the reversal of the removal procedure.

3001B

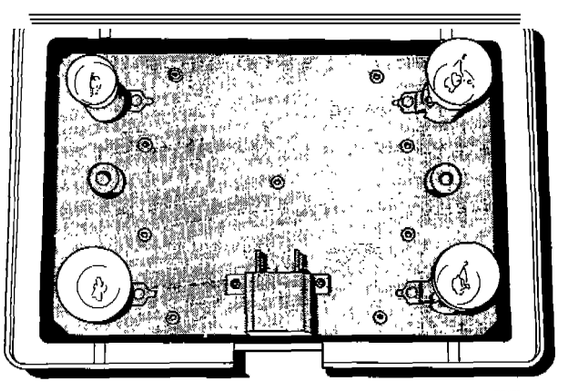


Fig 2

TAIL, STOP, FLASHER AND REVERSE LAMP BULB

RENEW **86.40.73**

Open the luggage copartment.
Remove lamp assembly interior trim finisher (Fig 1).
Remove the nuts securing the bulb holders.
Displace the bulb hoders forward.
Remove the appropriate bulb (Fig 2).

Fitting a new bulb is the reversal of the removal procedure.

3001B

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NUMBER PLATE LAMP AND BULB

RENEW 86.40.84

Open the bonnet and remove the battery earth lead.
Open the luggage compartment.
Remove the screws securing the number plate lamp.
Displace the lamp from aperture.
Disconnect the electrical supply cables at the lamp lucar connectors.
Remove the lamp complete with the gasket (Fig 1).
Remove the bulb.

Fitting a new lamp or bulb is the reversal of the removal procedure.

3001B

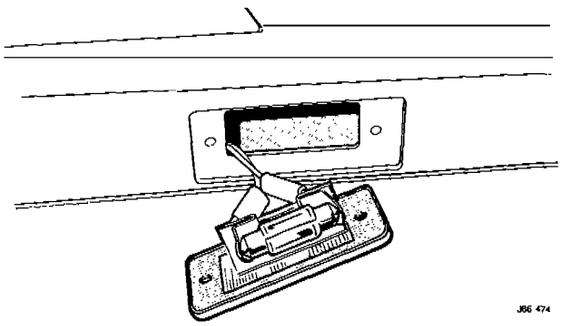


Fig 1

FOGLIGHTS

DESCRIPTION 86.40.00

Rear foglamps and front (if fitted) are controlled, via the lighting logic module and the bulb fail modules, from switches which are located on the left-hand side of the fascia switch panel. The logic module, which actuates relays in the modules, contains circuits which allow front foglamps (if fitted) to operate, provided that the sidelamps are switched on, or the rear foglamps to operate provided that side or headlamps are switched on.
With the rear or front fog lamps switched on a logic earth is connected to the lighting logic module which, energises relays that route battery power through the bulb fail modules to the respective foglarnp filaments.

30018

REAR FOG LAMP BULB

RENEW **86.41.20**

Remove the screws (Fig 1) securing the lamp lens.
Remove the lens
Remove the bulb

Reverse the order to fit a new bulb or new lens.

30018

REAR FOG LAMP ASSEMBLY

RENEW **86.41.15**

Open the bonnet and disconnect the battery earth lead.
Open the luggage Compartment.
Displace the floor carpet forward.
Remove the rear lamp assembly interior trim finisher.
Displace the side liner for access.
Displace the rear liner for access.
Cut and remove the rachet strap securing the fog lamp lead.
Disconnect the cable harness block connector.
Displace the foglamp from bumper.
Displace the cable harness body grommet.
Remove the lamp assembly (Fig 1).

Fitting a new lamp is the reversal of the removal procedure.

3001a

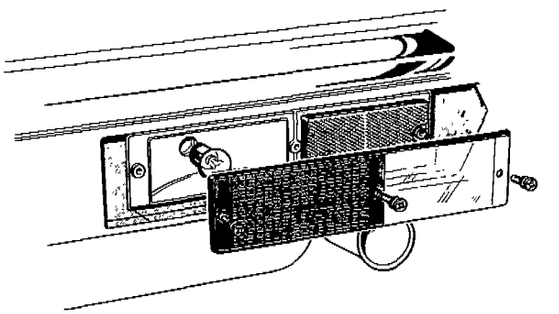


Fig 1

INTERIOR LAMPS

DESCRIPTION **86.45.00**

The interior lights operate either direct from switches or by the CPU from interior, map and door switch inputs. Interior lamps include the following:

Two lamp assemblies which form an integral part of the roof console.
A map lamp installed between the two interior lamp assemblies on roof console.
Door guard lamps located in each door.
Bonnet lamps secured to the underside of the vehicle bonnet.
Luggage compartment lamp secured to the underside of the luggage compartment lid.
Reading lamps located in the front seat head restraints.
Glove box lamp located within the cubby box.

3001B

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GLOVE BOX LAMP BULB

RENEW **86.45.07**

Open the bonnet and disconnect the battery earth lead.
Open the car door and the glove box lid.
Depress the glove box lamp upper retaining clip.
Reposition the lamp for access and remove the bulb.

Fit new bulb by reversing the order of the removal procedure.

3001B

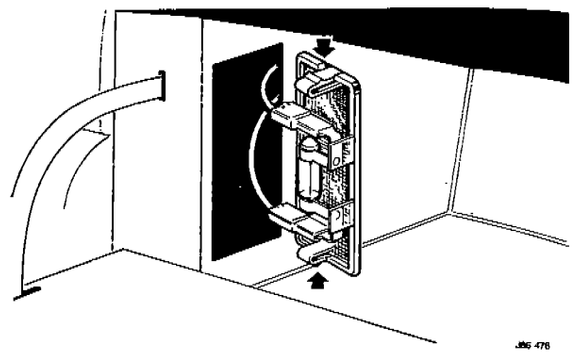


Fig 1

GLOVE BOX LAMP

RENEW **86.45.08**

Open the bonnet and remove the battery earth lead.
Open the door and the glove box lid.
Depress the glove box lamp upper retaining clip and displace the lamp from its mounted position (Fig 1).
Note and disconnect the lamp electric supply cables.
Remove the lamp assembly.

Fitting a new lamp is the reversal of the removal procedure.

3001B

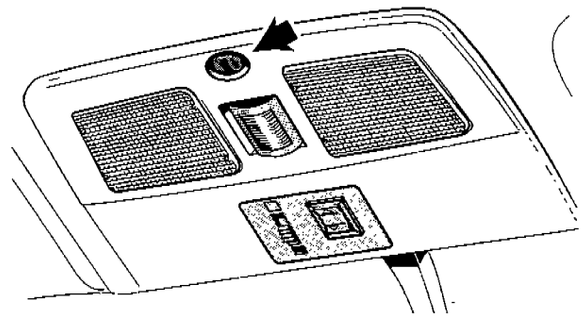


Fig 2

MAP LAMP BULB

RENEW **86.45.09**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Release the roof console retaining catch (Fig 2).
Lower the console for access.
Release the map lamp contact and remove the bulb (Fig 3).

Fitting the new bulb is reversal of the removal procedure.

30018

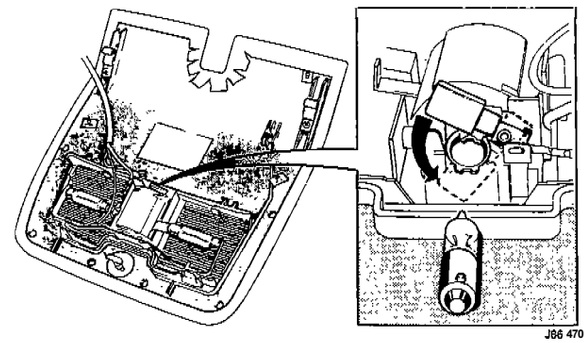


Fig 3

INTERIOR LAMP LENS,

RENEW **86.45.11**

Open the car door, turn and release the roof console retaining catch.
Lower the console for access.
Release the catches retaining the lens.
Displace and remove the lens.

Fit a new lens in the reverse order..

3001B

INTERIOR LAMP BULB

RENEW **86.45.12**

Open the car door, turn and release the roof console retaining catch.
Lower the console for access.
Release the spring contact to the bulb.
Displace and remove the bulb (Fig 1).

Fitting a new bulb is the reversal of the removal procedure.

3001B

INTERIOR LAMP ASSEMBLY

RENEW **86.45.13**

Open the bonnet and disconnect the battery earth lead.
Open the car door, turn and release the roof console retaining catch.
Lower the panel for access.
Disconnect the interior lamp cable harness multi-plug connector.
Remove the panel catch retaining washer and remove the panel catch.
Displace the lamp assembly retaining spring clips and remove the assembly.

Fitting a new lamp is the reversal of the removal Procedure.

3001B

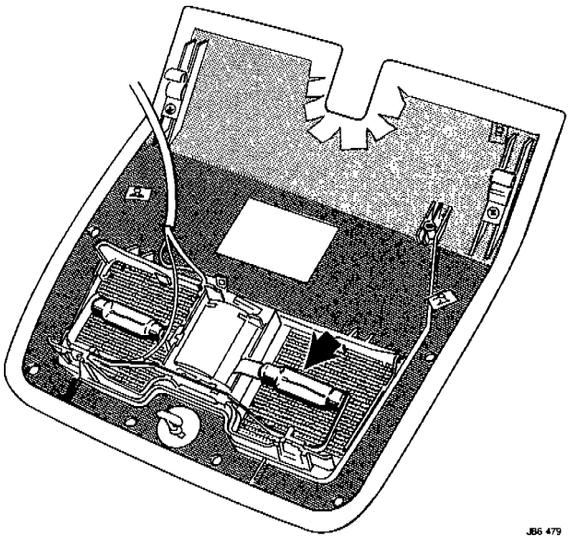


Fig 1

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LUGGAGE COMPARTMENT LAMP BULB

RENEW **86.45.15**

Open the luggage Compartment.
Depress the luggage compartment lamp lens spring clip.
Displace the lens and remove the bulb.
Fit new bulb and refit the lens.

30018

LUGGAGE COMPARTMENT LAMP ASSEMBLY

RENEW **86.45.16**

Open the bonnet and disconnect the battery earth lead.
Open the luggage compartment, depress the spring clips and displace the lamp lens.
Remove the bulb.
Remove the screws securing the lamp.
Disconnect the multi-plug cable harness connector.
Remove the lamp assembly (Fig 1).

Fitting a new lamp is the reversal of the removal procedure.

3001B

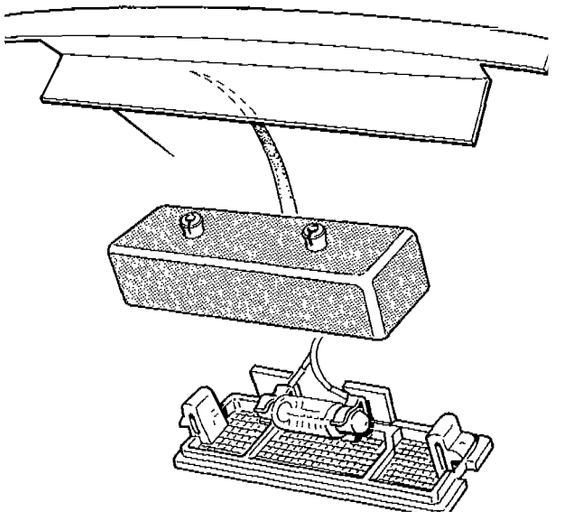


Fig 1 J86 480

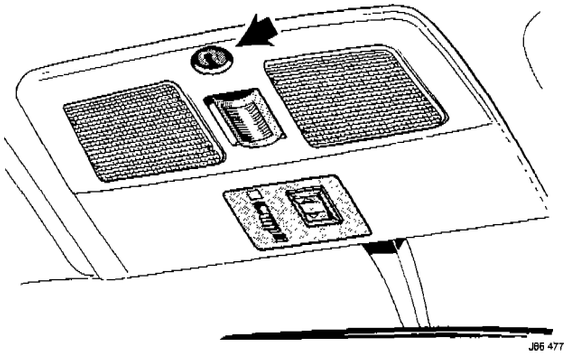
MAP LIGHT LENS

RENEW **86.45.18**

Open the bonnet and disconnect the **battery** earth lead.
Open the car door, turn and release the roof **console** retaining catch (Fig 2).
Lower the console **for** access.
Remove the map light bulb.
Note and disconnect **the** cable harness lucar connectors.
Remove the interior lamp bulbs.
Remove the map light contact plate from the housing.
Carefully displace and remove the **map light** lens.

Fitting a new lens is the reversal of the removal procedure.

3001B



J86 477

Fig 2

TRIP COMPUTER PANEL ILLUMINATION BULB

RENEW **86.45.21**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the screw securing the switch undertray.
Remove the undertray (Fig 1).
Remove the **bulb** holder.
Remove the bulb from the holder.

Reverse the removal procedure to fit a new bulb.

30018

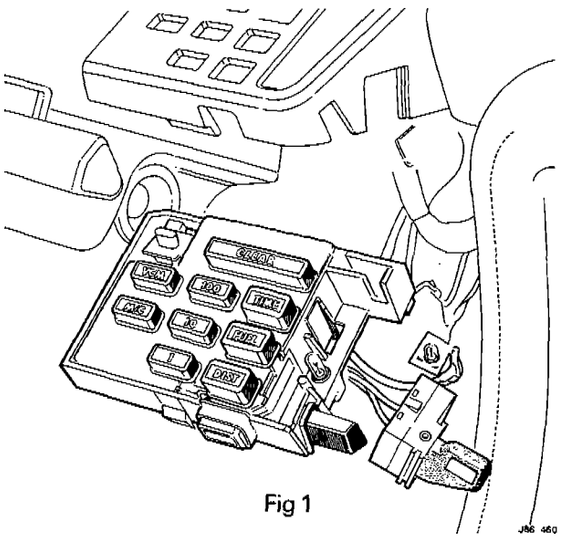


Fig 1

BONNET LAMP BULB AND LENS

RENEW **86.45.23**

Open the bonnet and disconnect the battery earth lead.
Remove the screws securing the lamp to the bonnet.
Remove the lens.
Remove the bulb (Fig 2).

To **fit** a new **bulb** or lens reverse the above procedure.

3001B

BONNET LAMP ASSEMBLY.

RENEW **86.45.24**

Open the bonnet and disconnect the battery earth **lead.**
Remove the screws and retaining clips securing the bonnet trim.
Displace the trim for access.
Disconnect the cable harness **multi-plug** connector.
Remove the screws securing the bonnet **lamp** and remove the lamp.

Reverse the above operation to fit a new lamp.

3001B

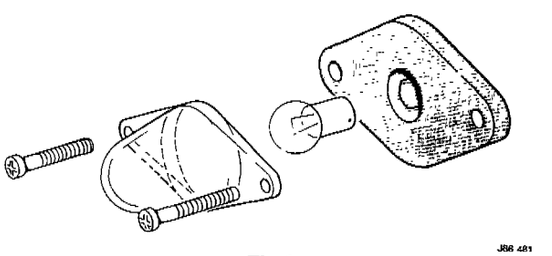


Fig 2

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BONNET LAMP SWITCH

RENEW **86.65.23**

Open the bonnet and disconnect the battery earth lead.
Disconnect the switch lucar cable connector.
Remove the screws securing the switch and remove the switch (Fig **1**).

Reverse the above operations to fit **a** new switch.

30018

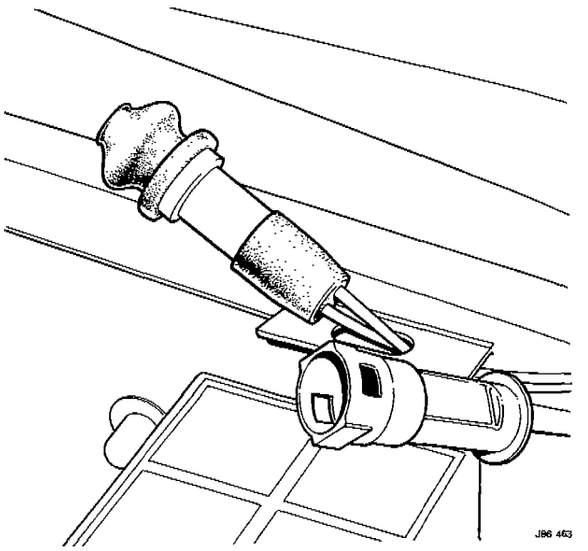


Fig **1**

SWITCH PANEL ILLUMINATION BULB

RENEW **86.45.36**

Open the bonnet and disconnect the battery earth lead.
Open the car **door.**
Remove the screw securing the switch cover **from** beneath the lighting **logic** board.
Remove the bulb holder from the switch panel then remove the bulb.

Reverse the above operations to **fit** a new bulb,

3001B

INSTRUMENT ILLUMINATION BULB

RENEW **86.45.48**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver **side dash** liner.
Displace the steering colomn fully rearward.
Remove the screws securing the instrument pack.
Displace the instrument pack upwards **for access.**
Turn and remove the bulb holder.
Remove the bulb from the holder **(Fig** 2).

Fit a new bulb by reversing the removal procedure.

3001B

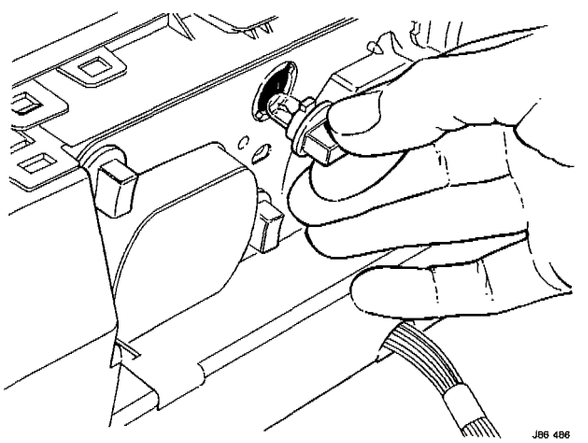


Fig 2

SPEEDOMETER ILLUMINATION BULB

RENEW **86.45.49**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side **dash** liner.
Remove the screws securing the instrument **pack.**
Remove the instrument pack **88.20.01.**
Release the electronics pack retaining **clips.**
Pivot the electronics **pack** upwards for access to the bulb.
Remove the bulb from the holder.

Fit a **new** bulb by reversing the removal procedure.

30015

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TACHOMETER ILLUMINATION BULB

RENEW **86.45.53**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards **for** access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

REAR COURTESY LAMP

RENEW **86.46.03**

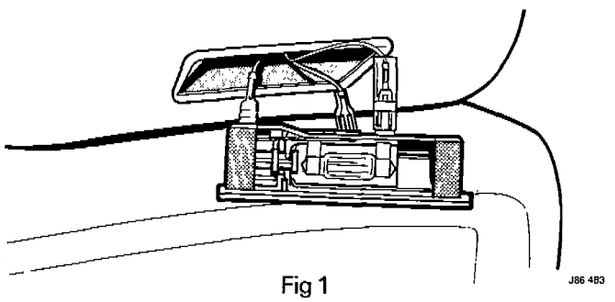


Fig 1

Open the bonnet and disconnect the battery earth lead.
Open the car door and carefully prise the lamp assembly from the rear *of* the front seat head rest.
Note the position ***of*** the electrical supply cable connections.
Disconnect the cables.
Remove the lamp assembly (Fig **1**).

Fitting a new lamp is the reversal of the removal procedure.

3001B

HEATER INDICATOR PANEL BULB

RENEW **86.45.73**

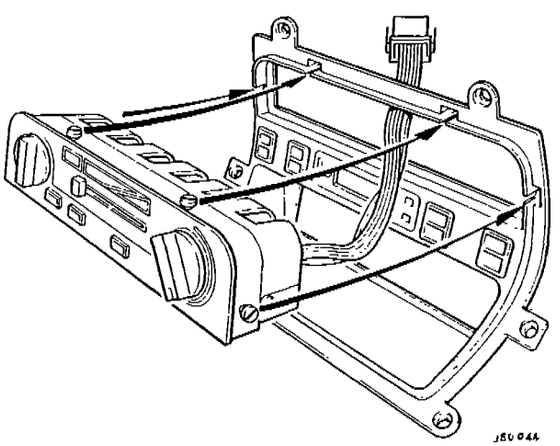


Fig **2**

Open the bonnet and disconnect the battery earth lead.
Remove the gear lever knob 37.1**6.11**
Remove the console finisher 76.25.19
Remove the screws securing the upper console assembly.
Displace the assembly for access (Fig 2).
Remove the contron panel rear cover securing screws.
Remove the rear cover.
Turn and remove bulb.

Fit a new bulb is the reversal of the removal procedure.

30018

OIL GAUGE ILLUMINATION BULB

RENEW **86.45.50**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

30018

TEMPERATURE GAUGE ILLUMINATION BULB

RENEW **86.45.51**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

30016

FUEL GAUGE ILLUMINATION BULB

RENEW **86.45.52**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

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BATTERY CONDITION INDICATOR ILLUMINATION BULB

RENEW **86.45.56**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

L.C.D. ILLUMINATION BULB

RENEW **86.45.57**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

FLASHER INDICATOR BULB

RENEW **86.45.63**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

IGNITION INDICATOR BULB

RENEW **86.45.64**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

30016

HEADLAMP HIGH BEAM INDICATOR BULB

RENEW **86.45.65**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

30018

OIL PRESSURE INDICATOR BULB

RENEW **86.45.66**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (2 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

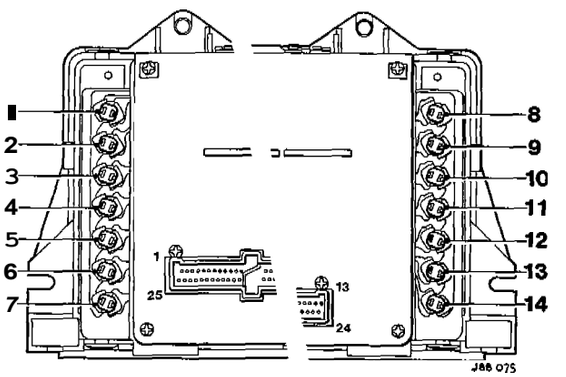


Fig 1

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BRAKE WARNING INDICATOR BULB

RENEW **86.45.69**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

30018

FUEL WARNING INDICATOR BULB

RENEW **86.45.70**

Open the bonnet and disconnect the battery earth lead.
Open the car **door.**
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (**1**3 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

LOW COOLANT WARNING INDICATOR BULB

RENEW **86.45.74**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (7 Fig **1**) from the holder.

Fit a new **bulb by** reversing the removal procedure.

3001B

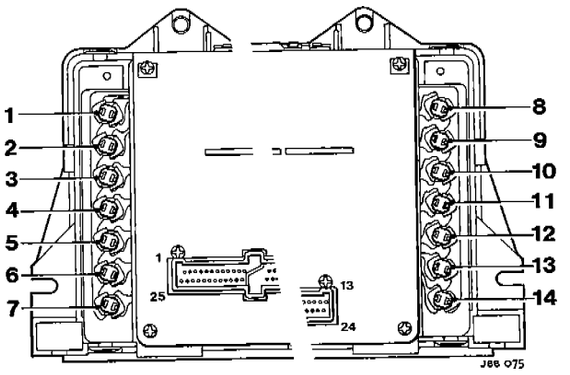


Fig 1

SEAT BELT WARNING INDICATOR BULB

RENEW **86.45.75**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (3 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

BULB FAILURE WARNING INDICATOR BULB

RENEW **86.45.77**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (10 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

CARAVAN WARNING INDICATOR BULB

RENEW **86.45.78**

Open the bonnet and disconnect the battery earth **lead.**
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

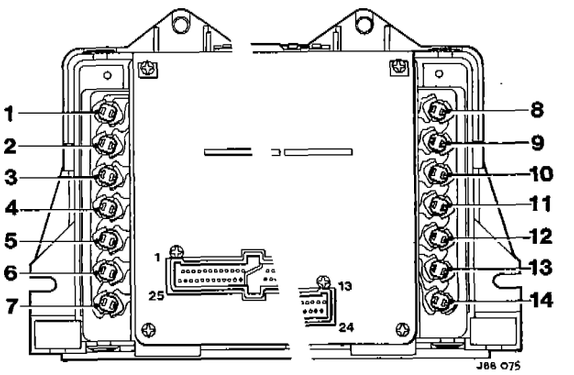


Fig 1

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PARKING LAMP INDICATOR BULB

RENEW **86.45.78**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

30018

EXHAUST TEMPERATURE WARNING INDICATOR BULB

RENEW **86.45.80**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (1 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

WIPE/WASH WARNING INDICATOR BULB

RENEW **86.45.86**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder.

Fit a new bulb by reversing the removal procedure.

30018

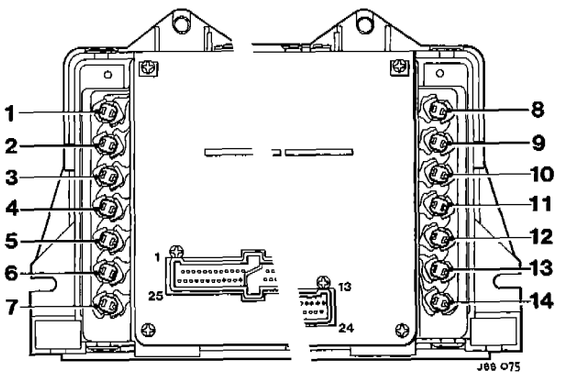


Fig 1

BOOT OPEN WARNING INDICATOR BULB

RENEW **86.45.87**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (4 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

30018

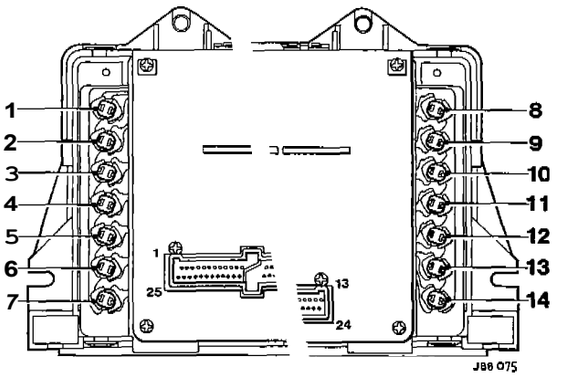


Fig 1

DOOR OPEN WARNING INDICATOR BULB

RENEW **86.45.88**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (5 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

HIGH COOLANT TEMPERATURE WARNING INDICATOR BULB

RENEW **86.45.89**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (6 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

30018

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SPORT MODE INDICATOR BULB

RENEW **86.45.90**

Open the bonnet **and** disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb from the holder. Fitting a new bulb by reversing the removal procedure.

30018

CHECK ENGINE WARNING INDICATOR BULB

RENEW **86.45.91**

Open the bonnet and disconnect the battery **earth lead.**
Open the car door.
Remove the driver side **dash** liner.
Remove the screws securing the instrument pack.
Remove **the** instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards **for access to** the bulb.
Remove the bulb **(14** Fig 1) from the holder.

Fitting a new bulb **by** reversing the removal procedure.

3001B

ANTI LOCK BRAKE WARNING INDICATOR BULB

RENEW **86.45.92**

Open the bonnet and disconnect the battery earth lead.
Open the car **door.**
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards **for** access to the bulb.
Remove the bulb (12 Fig 1) from the holder.

Fitting **a** new bulb by reversing the removal procedure.

3001B

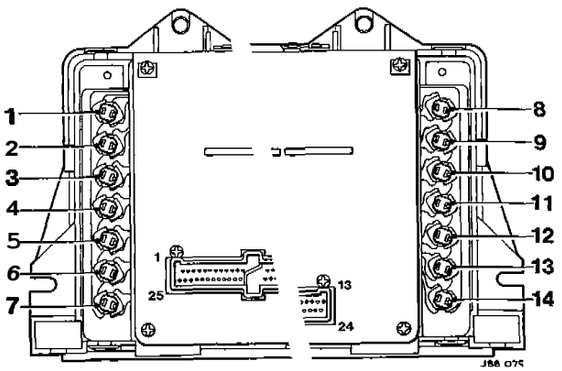


Fig 1

CIRCUIT FAIL WARNING INDICATOR BULB

RENEW **86.45.93**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner.
Remove the screws securing the instrument pack.
Remove the instrument pack 88.20.01.
Release the electronics pack retaining clips.
Pivot the electronics pack upwards for access to the bulb.
Remove the bulb (I 1 Fig 1) from the holder.

Fit a new bulb by reversing the removal procedure.

3001B

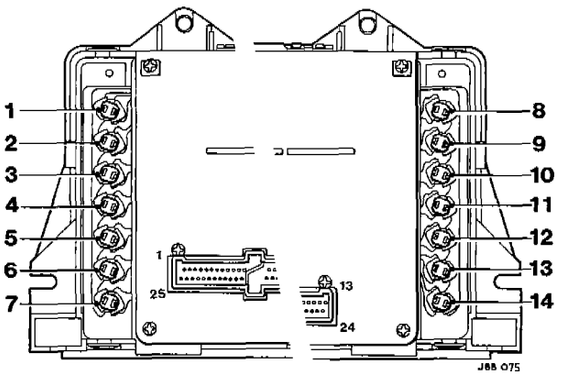


Fig 1

REAR BULB FAILURE MODULE

RENEW ***86.55.70***

Open the bonnet and disconnect the battery earth lead.
Open the luggage compartment.
Remove the rear lamp interior trim finisher.
Displace the side liner for access.
Remove the module earth bolt and displace the earth lead from the bolt.
Disconnect the fog lamp cable harness block connector.
Disconnect the module cable harness block connectors.
Remove the upper bolt securing the module.
Remove the module from the bracket.

Fitting the new module is reversal of the removal procedure.

30010

FRONT BULB FAILURE MODULE

RENEW **86.55.71**

Open the bonnet and disconnect the battery earth lead.
Remove the relay cover.
Remove relays from retaining brackets.
Disconnect the headlamp block connector.
Cut and remove the rachet straps securing the cable harness connectors.
Disconnect the cable harness connectors.
Remove the module earth bolt.
Remove the bolt securing the module to mounting bracket (2 Fig 2).
Remove the module (3 Fig 2).

Fitting the new module is reversal of the removal procedure.

30010

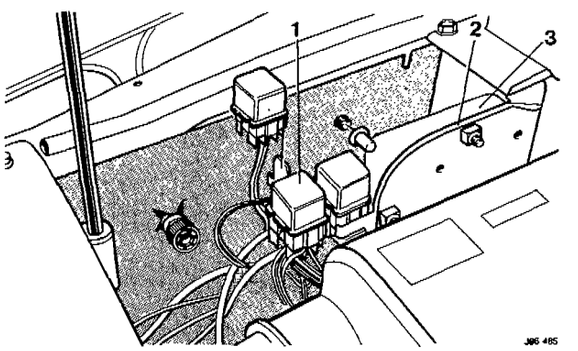


Fig 2

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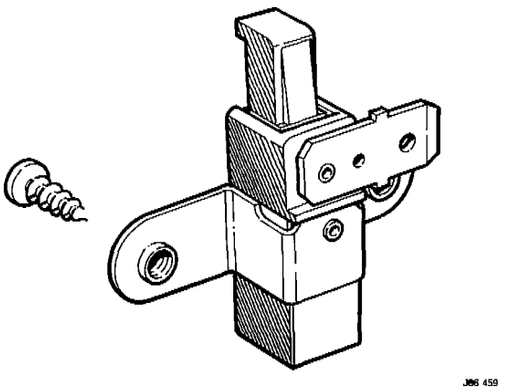
LUGGAGE COMPARTMENT LIGHT SWITCH

RENEW **86.65.22**

Open the bonnet and disconnect the battery earth lead.
Open the luggage compartment.
Remove the nut securing the sound deadening pad and displace the pad for access.
Remove the screws securing the switch.
Disconnect the leads from the switch.
Remove the switch (Fig 1).

Fitting a new switch is the reversal of the removal procedure.

3001B



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Fig 1

GLOVE BOX SWITCH

RENEW **86.65.77**

Open the bonnet and disconnect the battery earth lead.
Open the passenger door and glove box lid
Carefully prise the switch assembly from its mounting.
Disconnect the lucar connectors.
Remove the switch.

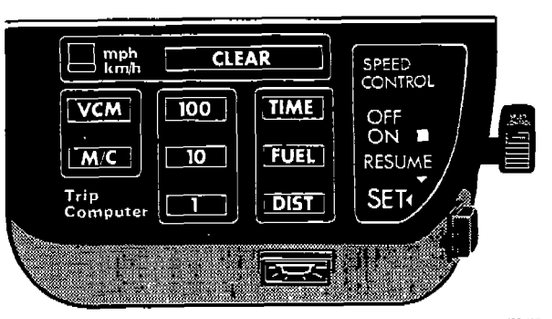
Fitting a new switch is the reversal of the removal procedure

3001B

TRIP COMPUTER

DESCRIPTION **86.80.00**

Trip computer functions are operated by a microprocessor in the instrument pack (Fig 2). The functions, which are selected on the trip computer keyboard, provide journey information which is indicated below the VCM:



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Fig 2

AV SPEED: average speed for the distance travelled since last reset.
TIME TAKEN: elapsed time since last reset.
TIME TO GO: time to journey completion, assuming the same average speed is maintained.
RANGE: distance the vehicle can travel on the fuel remaining in the tank, assuming that the average speed and fuel consumption remain constant.
DISTTRAV: distance travelled since last reset.
DIST TO GO: distance to journey completion calculated from the distance travelled and the distance entered at journey commencement.
AV FUEL: average fuel consumption since last reset.
FUEL USED: quantity of fuel used since last reset.
INST FUEL: instantaneous fuel consumption calculated over a two second period.

Trip computer functions can be divided into three categories, i.e. time, fuel and distance, each category having three functions which are selected in the following sequence by multiple operation of TIME, FUEL and DIST push-buttons:

TIME:
Average speed, Time taken and Time to go.
FUEL:
Average fuel, Fuel used and Instantaneous fuel.
DIST:
Range, Distance travelled and Distance to go.

Other controls on the trip computer keyboard are as follows:

MPH/KPH: a two-position switch which permits the information presented to be displayed in either imperial or metric values.
CLEAR: a push-button which permits fault condition messages to be erased thus allowing trip computer information to be presented. This facility is revoked when another fault condition occures.
VCM: a push-button which, provided that no fault condition exists (park brake and seatbelt excepted), permits automatic display sequencing of predetermined ISO symbols. At the end of the sequence, normal system operation is resumed.
M/C: a push-button which clears (resets) the trip computer memory so that new journey information can be entered. To perform the reset function, the push-button must be held depressed for a period in excess of five seconds.
100: a push-button which permits the hundreds digit of the display to be set to the desired value.
10: a push-button which permits the tens digit of the display to be set to the desired value.
1: a push-button which permits the units digit of the display to be set to the desired value.

3001B

TRIP COMPUTER AND LOGIC MODULE

RENEW **86.80.01**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the screw securing the trip computer undertray and remove the undertray.
Displace the on/off switch (Fig 1).
Displace the trip computer and release the retaining clips.
Disconnect the cable harness block connector.
Remove the trip computer assembly

Fitting a new assembly is the reversal of the removal procedure.

3001B

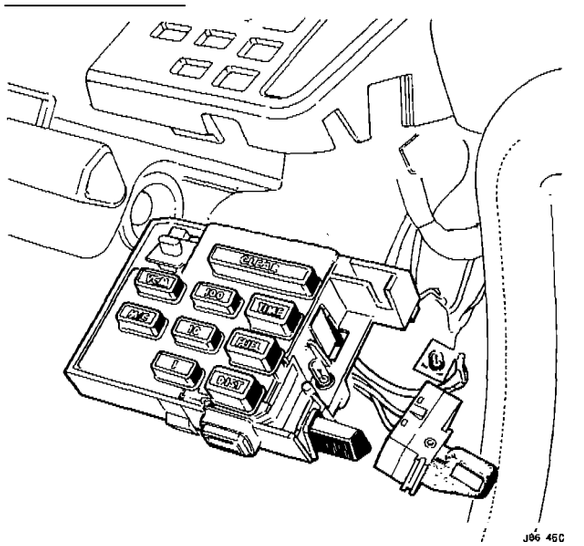


Fig 1

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DOOR LOCK CONTROL MODULE

RENEW **86.80.03**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the passenger side dash liner.
Remove the screws securing the module.
Disconnect the cable harness block connector.
Remove the module (1 Fig 1).

Fitting a new module is the reversal of the removal procedure.

3001B

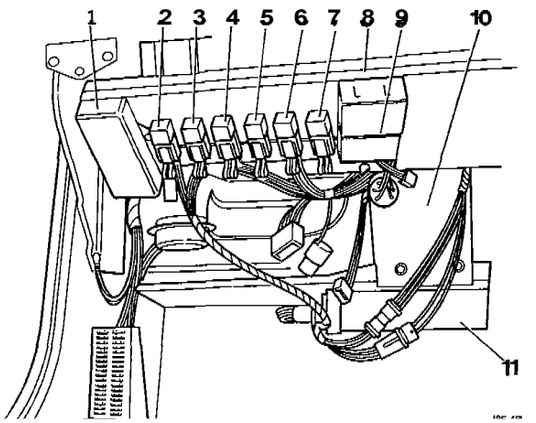


Fig 1

CENTRE CONSOLE SWITCH AND CLOCK MODULE

RENEW **86.80.13**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the gear lever knob 37.16.11.
Remove the console finisher 76.25.19.
Remove the screws securing the upper console assembly (1 Fig 2).
Displace the assembly from its location.
Disconnect the cable harness block connector (2 Fig 2).
Remove the screws securing the harness clamp.
Remove the module.

Fitting a new module is the reversal of the removal procedure.

3001B

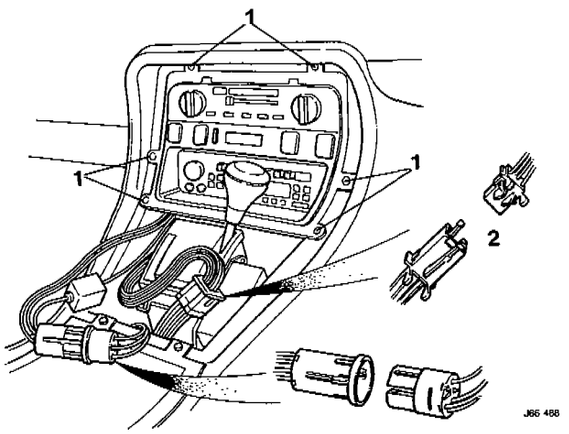


Fig 2

LIGHTING LOGIC AND SWITCH MODULE

RENEW **86.80.05**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove drivers dash liner 76.46.11.
Remove the screw securing the lighting logic undertray and remove the undertray (Fig 3).
Displace the master lighting switch.
Release the clips retaining the logic board.
Remove the logic board from the fascia.
Disconnect the green cable harness block connector.
Remove the logic board.

Fitting a new logic board is the reversal of the removal procedure.

30018

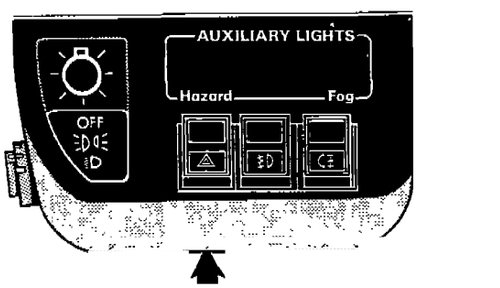


Fig 3

WIPER LOGIC MODULE

RENEW **86.80.11**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the passenger side dash liner.
Remove the screws securing the module.
Displace the module from retaining clip.
Disconnect the cable harness block connector.
Remove the module (*8* Fig 1).

Fitting a new module is the reversal of the removal procedure.

3001B

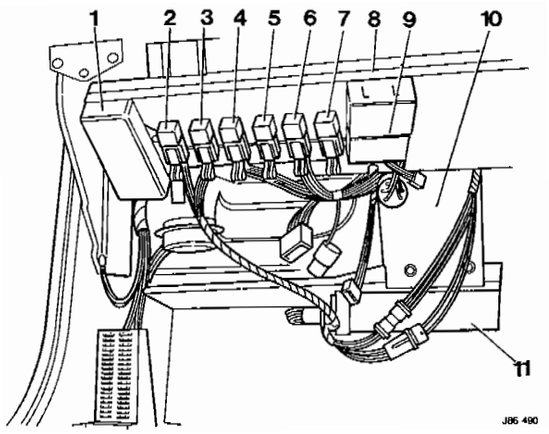


Fig 1

HEATER SWITCH CONTROL MODULE

RENEW **86.80.14**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the gear lever knob 37.16.11.
Remove the console finisher 76.25.19.
Remove the screws securing the upper console assembly (1 Fig 2).
Displace the upper console assembly for access.
Slacken the screws securing the control module.
Disconnect the cable harness block connector (2 Fig 2).
Remove the module.

Fitting a new module is the reversal **of** the removal procedure.

3001B

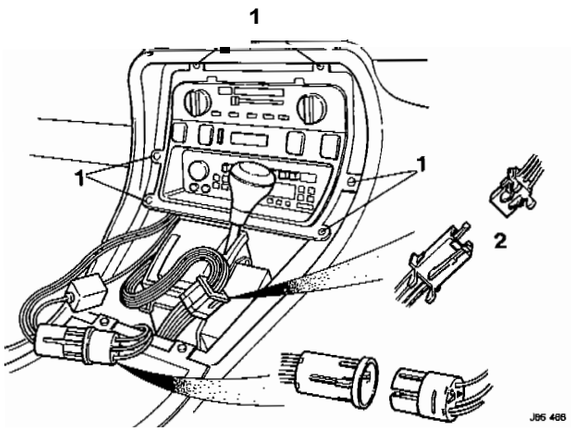


Fig 2

CENTRAL PROCESSOR UNIT

RENEW **86.80.17**

Open the bonnet and disconnect the battery earth lead
Open the car door and remove the passenger side dash liner 76.46.15
Remove the lower screws securing the processor and remove the spacers.
Displace the processor upwards to disengage the keyhole slot.
Disconnect the cable harness block connectors.
Remove the screw securing the earth lead.
Remove the processor unit (10 Fig 3).

Fitting a new central processor is the reversal of the removal procedure.

3001B

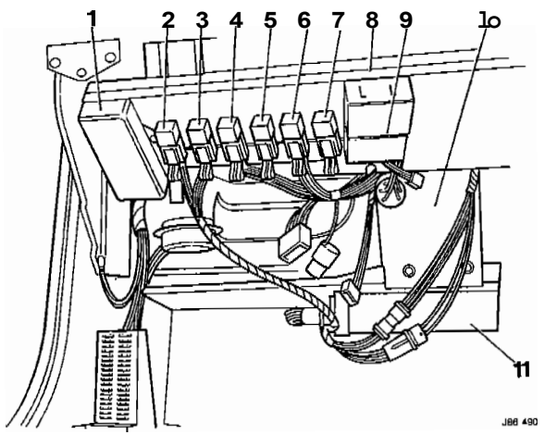


Fig 3

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INSTRUMENT ILLUMINATION DIMMER MODULE

RENEW **86.80.18**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the steering wheel 57.60.01.
Remove lower steering column cowl 76.46.03.
Remove upper steering column cowl 76.46.02.
Remove the nut securing the dimmer switch.
Displace the switch from the mounting bracket.
Slide the module upwards to disengage the retaining pegs.
Disconnect the black block connector.
Remove the dimmer module (Fig 1).

Fitting a new module is the reversal of the removal procedure.

3001B

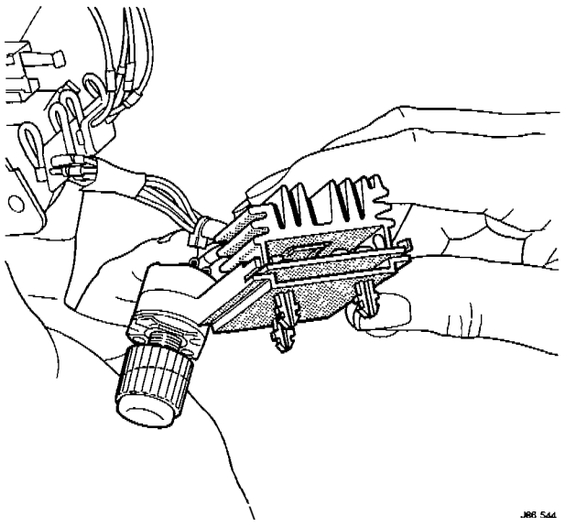


Fig 1

FLASHER CANCELLATION MECHANISM

RENEW **86.65.85**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the steering wheel 57.60.01.
Remove the rheostat control knob and remove the screws securing the lower nacelle securing screws.
Remove the nacelle.
Remove the retaining ring securing the steering wheel collets.
Remove the bolts securing the cancellation mechanism.
Remove and discard the mechanism.

Fitting a new module is the reversal of the removal procedure.

3001B

AUDIBLE WARNING SPEAKER

RENEW **86.80.20**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the steering wheel 57.60.01
Remove lower steering column cowl 76.46.03
Remove upper steering column cowl 76.46.02
Remove w/wiper/washer switch 86.65.41
Displace the direction indicator cancellation module from its mounting bracket.
Remove the nut/bolt securing the speaker harness clamp.
Displace the speaker.
Remove the speaker grille.
Disconnect the brown cable harness block connector.
Remove the speaker/cancellation module assembly (Fig 1).

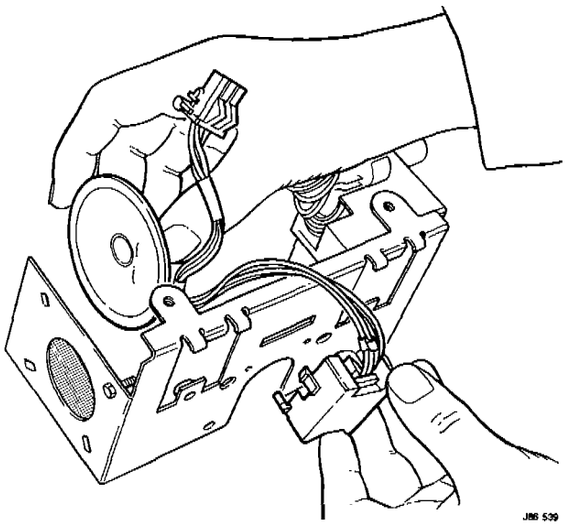


Fig 1

Fitting a new audible warning speaker is the reversal of the removal procedure.

3001B

SLIDING ROOF MOTOR

RENEW **86.76.01**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Release the fastener securing the roof console.
Lower the console for access
Disconnect the interior lamp cable harness multi-plug connector.
Remove the roof console assembly.
Disconnect the roof motor cable harness block connector.
Undo the rear bolt securing the motor (the bolt will remain in its position).
Remove the bolt securing the front of the motor.
Remove the motor assembly from its roof position and remove the rear securing bolt.

Fitting a new sliding roof motor is the reversal of the removal procedure having first fitted the rear securing bolt to the motor assembly.

3001B

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SLIDING ROOF MOTOR SWITCH

RENEW **86.76.05**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Release the fastener securing the roof console.
Lower the console for access.
Disconnect the cable harness multi-plug block connectors.
Remove the roof console assembly.
Release the tags securing the roof motor switch.
Remove the switch/harness **assembly from** the roof console.

Fitting a new sliding roof motor switch is the reversal of the removal procedure.

30016

SLIDING ROOF MOTOR LIMIT SWITCH

RENEW ***86.76.06***

Open the bonnet and disconnect the battery earth **lead.**
Open the car door.
Remove the sliding roof flange finisher 76.82.23
Remove the sun visors 76.10.17
Remove **the** crash roll cantrail **76.13.1**0
Release the fastener securing the roof console.
Lower the console for access.
Disconnect the cable harness multi-plug connectors.
Remove the roof console assembly.
Disconnect the roof motor cable harness block connector.
Carefully release the headlining from the front clips for access.
Mark the position of the limit switch using pieces of tape.
Cut and **remove** the ratchet **straps** securing the limit switch.
Remove the switch magnet assembly.
Remove the switch/harness assembly.

Fitting a new sliding roof motor limit switch is the reversal of the removal procedure usiing the marker tape to align the switch magnet.

30018

ELECTRICALLY OPERATED AERIAL

DESCRIPTION 86.50.00

An electric aerial (Fig 1) is fitted as standard.
Radio cassette player operation is with the ignition switched to ON or AUXILIARY. In these positions the ignition switch energises a radio relay which connects battery power to the radio cassette player. When the radio is switched ON, a signal is applied to the CPU which activates a 15 second timer. This timer in turn energises aerial up relay which connects battery power to the aerial motor, the earth return path for the motor being through aerial down relay.
When the radio cassette player or the ignition is switched OFF, the signal applied to the CPU is removed and a second timer is activated. This timer energises the aerial down relay for a period of 15 seconds after a delay of 10 seconds.

3001B

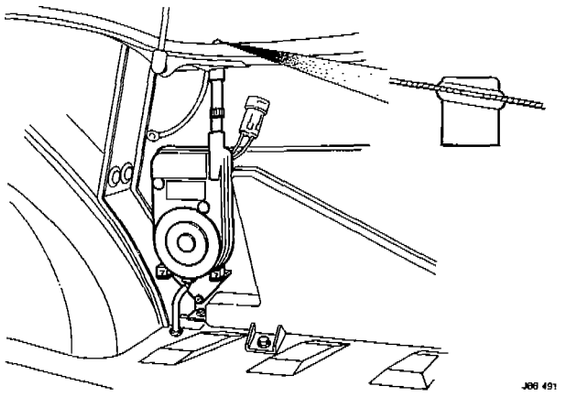


Fig 1

FRONT DOOR SPEAKER

RENEW 86.50.13

Open the bonnet and disconnect the battery earth lead.
Remove the veneer panel. 76.47.1 1
Remove the upper trim pad. 76.34.02
Remove the lower trim pad. 76.34.03
Remove the armrest. 76.34.22
Disconnect the speaker rnulti-plug connector.
Remove the nuts securing the speaker and Remove the speaker (Fig 2).

Fitting a new speaker is the reversal of the removal procedure.

3001B

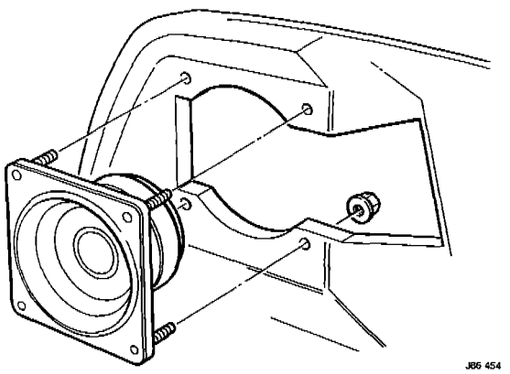


Fig 2

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REAR DOOR SPEAKER

RENEW **86.50.14**

Open the bonnet and disconnect the battery earth lead.
Open the car door
Remove the veneer panel 76.47.12
Remove the upper trim pad 76.34.05
Remove the lower trim pad 76.34.06
Remove rear door arm rest 72.34.23
Disconnect the speaker multi-plug connector.
Remove the nuts securing the speaker and remove the speaker (Fig 1).

Fitting a new speaker is the reversal of the removal procedure.

3001B

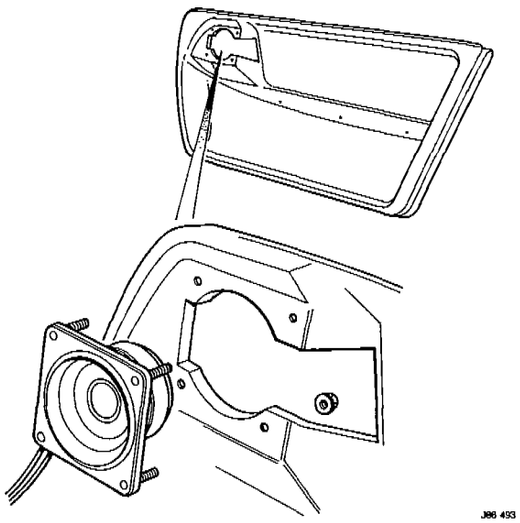


Fig 1

ELECTRIC AERIAL

RENEW **86.50.21**

Open the bonnet and disconnect the battery earth lead.
Open the luggage compartment.
Remove the floor carpet 76.19.30
Remove the front liner 76.19.31
Remove the right hand side liner 76.19.23
Remove the bolt seciring the earth strap and disconnect the earth lead.
Undo the nut securing the aerial lead and disconnect the lead.
Cut and remove the rachet strap securing the aerial block connector (1 Fig 2).
Disconnect the black cable block connector (2 Fig 2).
Slacken the lower nuts/bolts securing the aerial assembly (3 Fig 2).
Disconnect the drain tube (4 Fig 2).
Remove the aerial assembly.

Fitting a new electric aerial is the reversal of the removal procedure.

3001E

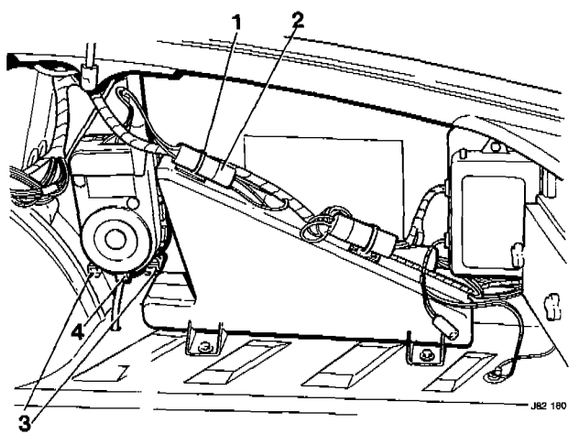


Fig 2

ELECTRIC AERIAL MAST

RENEW **86.50.29**

Undo the aerial to mast retaining nut.
Switch the ignition and the radio on.
Allow the aerial motor to stop at the fully up position.
Displace and withdraw the mast (note the position of the teeth on cable) (Fig **1**).
Switch the ignition off.
During the 15 seconds delay period before the aerial motor operates **to** retract the mast, prepare the mast and insert the mast flexible cable into aerial motor assembly.
Whilst the aerial motor **is** operating engage the flexible mast cable with the drive gear and allow the mast to seat into aerial (Fig 2).
Tighten the the mast retaining nut.
Switch ignition **on** and allow the mast **to** fully extend.
Switch radio and ignition off.

3001B

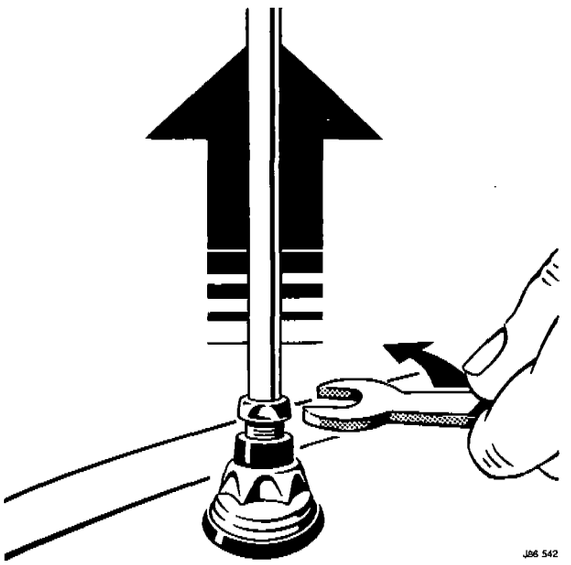


Fig **1**

IGNITION SWITCHED POWER DISTRIBUTION

DESCRIPTION **86.65.00**

Fused and unfused ignition switched power is distributed from the centre fusebox and line splices in the bulkhead harness.
The line splices are supplied, via contacts of the ignition 'on' relay, when the vehicle ignition switch is **ON.** In this position a power earth is connected to each fuse monitoring circuit and, via the inertia switch and a reverse polarity protection diode, to **a** contact of the ignition **'on'** relay coil.

The centre fuseblock contains a bank of six fuses identified **1** to 6 from **left** to right. Fuse ratings and the circuit(s) supplied are detailed under **a** relevant heading of this Section.

3001B

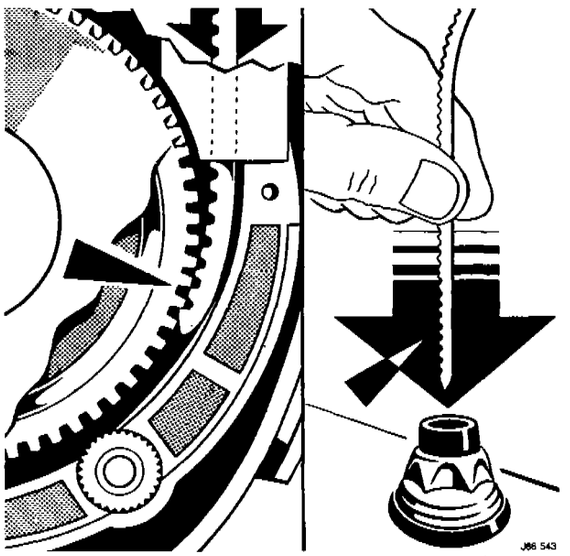


Fig 2

LOGIC EARTH DISTRIBUTION

DESCRIPTION **86.00.00**

Logic earths are distributed from power earth point located close to the **CPU.**

3001E

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IGNITION SWITCHED EARTH DISTRIBUTION

DESCRIPTION 86.65.00

Ignition switched earths are distributed from the ignition and inertia switches. The ignition switch distributes the earths in all switch position except OFF, and the inertia switch distributes the earths when tripped with the ignition ON.

3001B

IGNITION SWITCH

RENEW 86.65.03

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the steering wheel 57.60.01.
Remove the instrument illumination rheostat control knob.
Remove the screws securing the lower nacelle and remove the nacelle.
Remove the screws securing the upper nacelle and remove the nacelle.
Using a suitable punch remove the shear bolts securing the ignition switch.
Displace the switch.
Release the ignition switch retaining tags and displace the switch from the lock assembly.
Disconnect the cable harness block connector.
Discard the switch.

Fitting a new switch is the reversal of the removal procedure.

30018

POWERED SEATS

DESCRIPTION *86.75.00*

The driver and front passenger seats are adjusted electrically by means of four rocker type switches located on the powered seat switch assemblies. Each seat contains four motors which enable seat movement as follows:

Foreward or back.
Cushion front raise or lower.
Cushion rear raise or lower.
Squab raise or recline.
Driver and front passenger seat movement is with the ignition switched ON, the power being applied to relays which route battery power to the switch assemblies when energised.

Each seat motor is connected to the moving contact of its associated switch which is spring biased in the **OFF** position. Two poles of each switch are supplied with battery power, while the other **two** are connected to earth. The switches are wired so that each motor can operate in either direction, depending on the requirement of the operator.

DRIVERS SEAT MOTOR SWITCH

RENEW **86.75.03**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the console finisher 76.25.1 9
Displace the cables from the rear **of** the switch pack for access.
Disconnect the cable harness block connector.
Remove the nuts securing the switch pack.
Remove the switch pack (Fig 1).

Fitting a new switch **pack** is the reversal **of** the removal procedure.

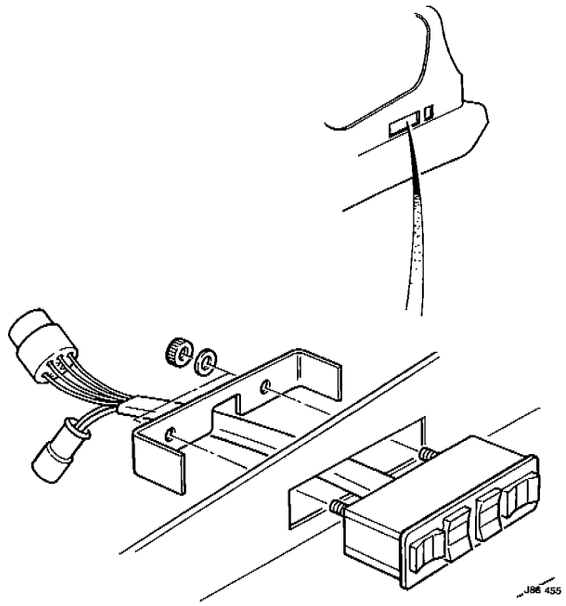


Fig 1

30018

PASSENGER SEAT MOTOR SWITCH

RENEW **86.75.05**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the console finisher 76.25.1 **9**
Displace the cables from the rear of the switch pack for access.
Disconnect the cable harness block connector.
Remove the nuts securing the switch pack.
Remove the switch pack.

Fitting a new switch pack **is** the reversal of the removal procedure.

3001B

STARTER CIRCUIT

DESCRIPTION **86.60.00**

The starter circuit supplies **battery** power to the starter motor when the ignition switch is set to START. The circuit comprises a starter solenoid and relay. On vehicles fitted with automatic transmission, a start inhibit relay is also incorporated.

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An ignition switched earth energises the starter relay, when the ignition switch is set to START. On vehicles with automatic transmission, this occurs when the start inhibit relay is energised through either neutral or park switches of the linear gearbox selector switch. When energised, the starter relay connects battery power to the starter solenoid containing pull-in and hold-on coils. The pull-in coil is earthed through the starter motor windings and the electrical current passing through the motor is sufficient to start the armature turning. When closed, the solenoid contacts connect full battery power to the motor and the armature rotates at full power.

3001B

STARTER MOTOR

RENEW **86.60.01**

Open the bonnet and disconnect the battery earth lead.
Remove the bolt securing the dip stick the **the** engine manifold.
Remove the dip stick assembly.
Raise the vehicle **on** a ramp.
From below:- Remove the bolt securing the front suspension rear mounting inner bracket.
Disconnect the engine earth strap.
Remove the rear mounting nut and remove the mounting bracket.
From below:- Remove the upper starter securing bolt.
Remove the lower starter securing bolt.
Displace the starter motor downwards for access.
Remove the starter terminal securing nut and disconnect the lead from the terminal.
Disconnect the cable harness **block** connector.
Remove the starter motor (Fig **1**).

Fitting **a** new starter motor is the reversal of the removal procedure.

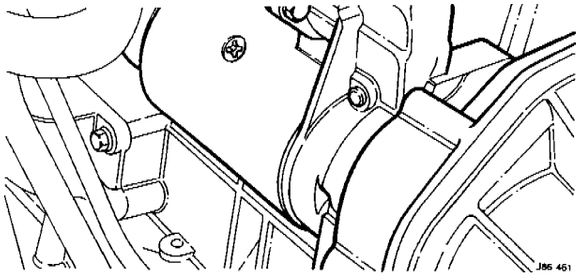


Fig **1**

30018

GEAR BOX LINEAR SWITCH

RENEW **44.15.12**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the gear lever knob 37.16.11
Remove the console finisher 76.25.19
Remove the screws (1 Fig 2) securing the linear switch (2 Fig 2).

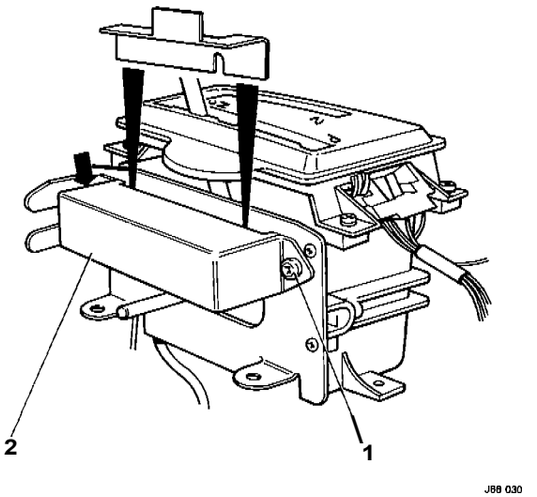


Fig 2

Displace the switch for access.
Disconnect the cable harness block connectors
Remove the switch assemble.

On fitting new switch select **"N"** neutral.
Fit the new (2 **Fig 1**) switch in position.
Fit but do not tighten the securing screws (1 Fig 1).
Position the setting gauge (JD 127) (Fig **1**) between the linear switch and side plate.
Ensure the slot of the setting gauge is fully located onto the pin of the linear switch.
Tighten the securing screws.
Remove the setting gauge.
Check that the vehicle starts in "PARK and **NEUTRAL** but does not start in other positions.
Check the bar graph **on** the instrument pack indicates the correct position of the gear selector.

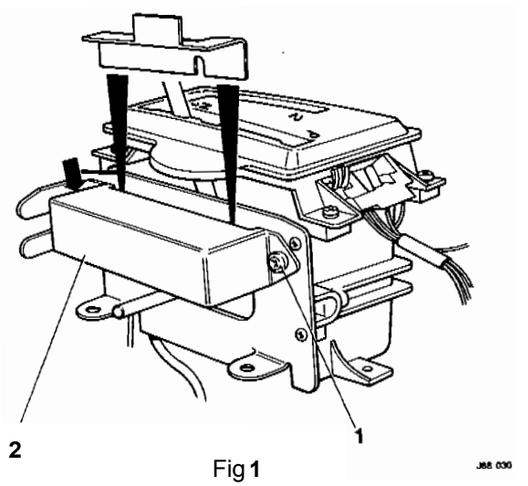


Fig **1**

DATA

SERVICE TOOL.

JD 127 Linear Switch Setting Gauge

3001B

STOP LAMP SWITCH

RENEW **86.65.51**

Open the bonnet and disconnect the battery earth lead.
Remove the drivers side dash liner 76.46.11
Remove the stop lamp harness ratchet strap.
Disconnect the cable harness block connector.
Remove the nuts securing the switch to the pedal box.
Remove the pedal **box** grommet **for** access to the switch.
Remove the switch assembly (Fig **2).**

Fitting a new switch is the reversal of the removal procedure.

30018

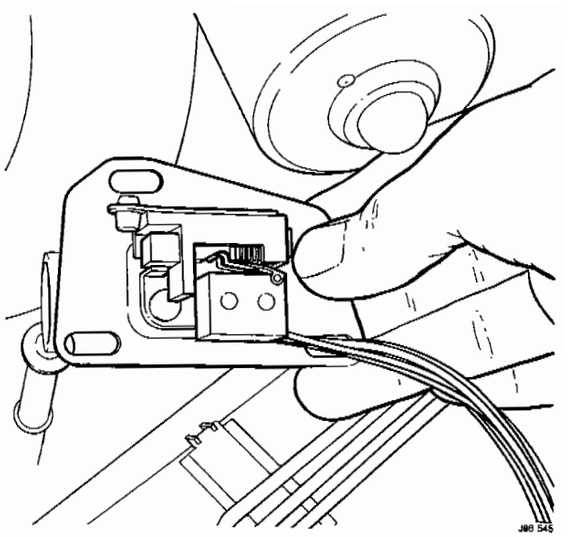


Fig 2

HANDBRAKE WARNING SWITCH

RENEW **86.65.45**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the front seat cushion 76.70.02
Release the clip securing the handbrake gaiter and displace the gaiter.
Remove the top screw securing the switch **(1** Fig 1).
Slacken the **bottom** securing screw.
Disconnect the supply cables from the switch.
Remove the switch.

Fitting a new switch is the reversal **of** the removal procedure

30018

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SEAT PAD SWITCH

RENEW **86.57.21**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the front seat cushion 76.70.02
Displace the accessible diaphragm hooks from the frame and reposition the diaphragm for access.
Cut and remove the ratchet strap securing the cable harness.
Remove the seat belt switch pad (Fig 2).

Fitting a new switch is the reversal of the removal procedure

3001B

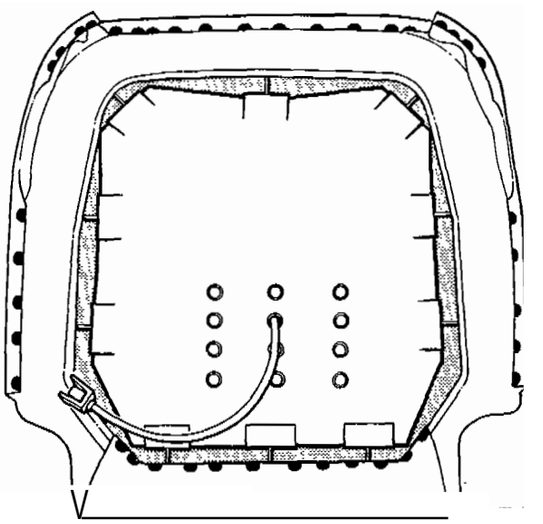


Fig 1

SEAT BELT BUCKLE SWITCH

RENEW **86.57.25**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the "B" post lower trim pad 76.13.29
Remove the seat belt upper anchor securing nut cover.
Remove the upper anchor securing nut.
Displace the seat belt.
Remove the wavy washer and spacer.
Unclip the "B" post upper trim pad and displace the pad from its mounted position.
Reposition the belt through the trim pad and remove the pad.
Remove the finisher from the "B" post aperture.
Reposition the seat belt through the the "B" post.
Remove the nut securing the seat belt reel.
Remove the reel.
Disconnect the cable harness block connector.
Remove the seat belt buckle securing nut cover (1 Fig 3).
Remove the bolt (2 Fig 3) securing the seat belt buckle.
Remove the seat belt buckle.
Note the position of and remove the buckle spacers.

Fitting a new assembly is the reversal of the removal procedure.

3001B

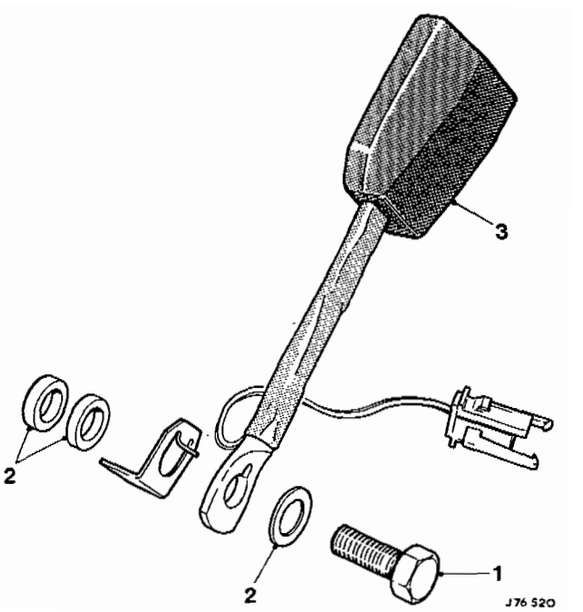


Fig 2

ILLUMINATED SUN VISOR BULB

RENEW **86.45.95**

Open the bonnet and disconnect the battery.
Open the door.
Position the sunvisor downwards.
Lift the sunvisor cover.
Remove the mirror illumination lens and remove the bulb.

Refitting a replacement bulb is the reversal of the removal procedure.

30018

GEARBOX POWER RELAY

RENEW **86.55.89**

Open the bonnet and disconnect the battery.
Open the door and remove the passengers side dash liner 76.45.15
Slacken the screws securing the relay front mounting panel.
Remove the screws securing the mounting panel.
Displace the relay mounting panel and disengage the mounting panel slots from the slackend front screws.
Remove the relay (Violet).

Reverse the removal procedure to refit the replacement relay.

3001B

BOOT RELEASE SWITCH

RENEW **86.65.25**

Open the bonnet and disconnect the battery.
Remove the passenger side dash liner 76.45.15.
Open the glove box lid and remove the glovebox light lens.
Disconnect one connector from the lamp, remove the lamp and disconnect the remaining connector.
Disconnect the boot switch harness multi plug and cut the ratchet strap securing the harness to the gearbox.
Reposition the harness from the self adhesive clip, tie a suitable draw string to the harness.
Displace the switch from the mounting bracket and withdraw the harness/draw string.
Detach the string from the harness and discard the switch.

Reverse the removal procedure to refit the replacement switch.

3001B

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HARNESSES

DESCRIPTION 86.70.00

All connections between the various electrical devices are made through cable harnesses terminated by connectors of which there are two main types; Positive Mate Mk4 (PM4) which are cylindrical and contain up to 9 contacts, and Positive Mate High Density (PMHD) which are rectangular and contain up to 36 contacts.
Each connector type housing is injection moulded in one of a range of insulation material colours to permit rapid connector location in vehicle positions where groups of similar connector type and size exist. In addition, each connector is allocated an identification number prefixed by letters to identify the harness of which the connector forms part.

30018

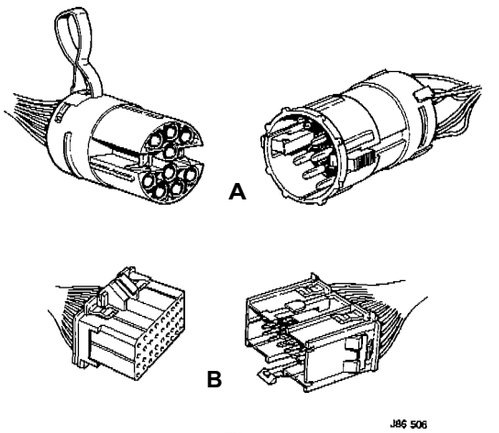


Fig 1

HARNESS CONNECTORS

DESCRIPTION 86.70.00

PM4 (Fig 1) and PMHD (Fig 2) connectors contain polarising, positive mate latching and secondary locking features. PM4 connectors also have rubber seals which protect the terminals in exterior locations where severe environmental conditions exist.
The polarising feature comprises a tongue and groove arrangement which must be aligned correctly for the connectors to be united. The positive mate locking feature, comprising latching arms and dead locking ramps, prevents connector separation which is permitted only when the arms are depressed sufficiently to pass below the ramps as the connectors are parted. The secondary locking feature comprises a locking cover which prevents individual terminals emerging from the rear of the connector should the terminal locking lance fail.

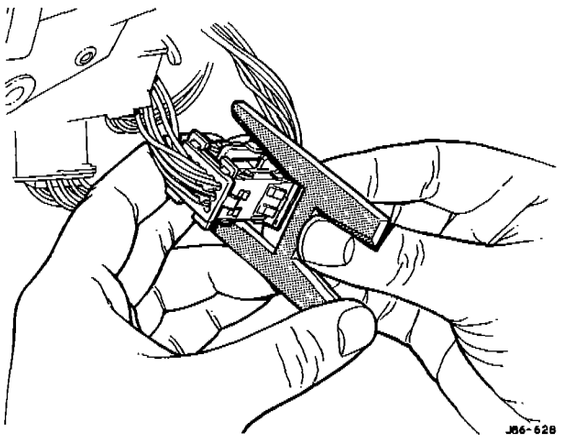


Fig 2

CONNECTOR SEPARATION AND UNION

Both PM4 and PMHD type connectors are separated by depressing their latching arms sufficient for the dead locking ramps to be cleared as the connectors are parted. The latching arms of PMHD connectors can be depressed either by hand or by using a separating tool which also commences the parting process. Use Service tool JD 121 to separate the connectors (Fig 3).
Uniting both PM4 and PMHD connectors is simply a matter of aligning the tongues wiyh thw corresponding grooves and gently pushing the two halves together until the latching arms travel up and over the dead locking ramps.

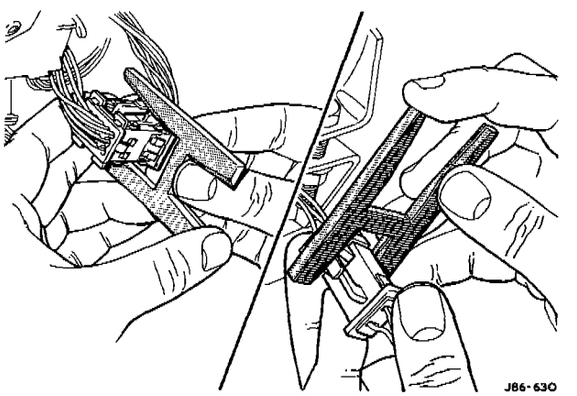


Fig 3

PM4 TERMINAL EXTRACTION PROCEDURE

Tools and materials required:

1 Terminal extraction tool.
2 Terminal extraction aid.
3 Silicone oil.

Release the secondary locking cover from the connector housing.
If a rubber cable seal is fitted, lubricate the wires with silicone oil, dislodge the seal from the housing and slide it up the wires.
Whilst applying pressure to the terminal , fit the terminal extraction tool (Fig 1) over the terminal until the tool abuts the housing and withdraw the terminal from the housing via the cable entry end. If any resistance is encountered when withdrawing the terminal, ensure that the terminal extraction tool is fitted correctly and repeat the operation.
Lubricate the angled end of the extraction aid with silicone oil then insert the aid into the hole containing the wire to be removed.
Withdraw the wire and terminal through the extraction aid and remove the aid.

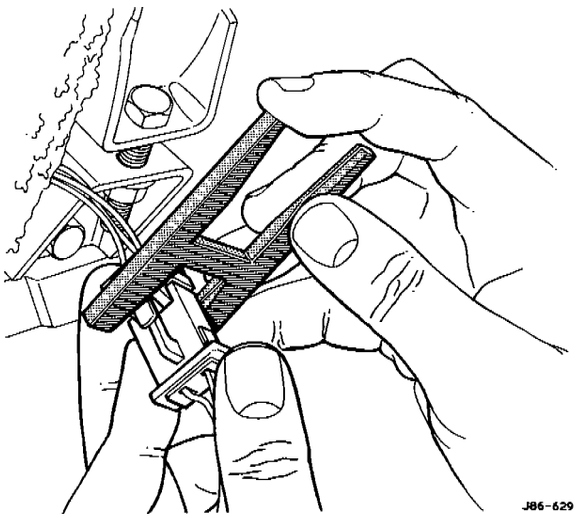


Fig 1

PM4 TERMINAL INSERTION PROCEDURE

Tools and materials required:

1 Terminal insertion aid.
2 Silicone oil.

If necessary release the secondary locking cover and slide the cable seal back along the wires as described in the first two steps of the PM4 terminal extraction proceedure.
Ensure the wire passes through the secondary locking cover and, after lubricating the cable seal with silicone oil, insert the aid into the appropriate hole in the seal until its open end is just proud of the surface.
Install the end of the terminated wire in the insertion aid then pass the loaded aid through the seal and remove the aid.
Insert the terminal into its location in the connector housing ensuring that the terminal is fully home and the locking lance engaged.
Slide the cable seal along the wires and locate it in the connector housing.
Install the secondary locking cover in the connector housing.

PMHD TERMINAL EXTRACTION PROCEDURE

Tools and materials required:

1 Terminal extraction tool.
2 Terminal extraction aid.
3 Silicone oil.

Release the secondary locking cover from the connector housing using a suitable instrument, e.g. a screwdriver, and set the cover in the cable assembly mode, i.e. the cover fully extended on its four locking arms.

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Whilst applying pressure *to* the terminal, fit the terminal extraction **tool** (Fig **1**) over the terminal until the **tool** abuts **the** housing and withdraw the terminal from the housing via the cable entry end. **If** any resistance is encountered when withdrawing the terminal from the housing, repeat the operation.

PMHD TERMINAL INSERTION PROCEDURE

Insert the terminal through the secondary locking cover into its location in the connector housing ensuring that the terminal is fully home and its locking lance engaged. Fit the secondary locking cover to the connector housing.

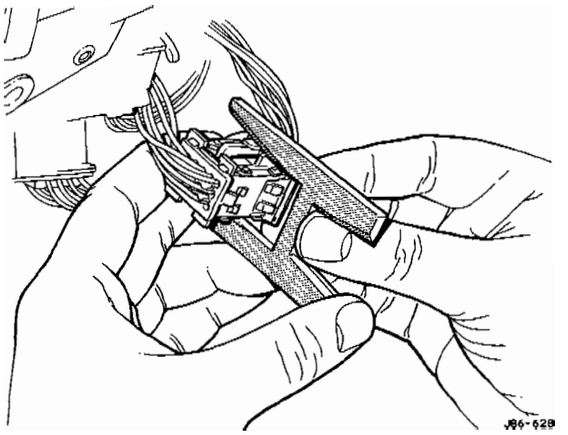


Fig **1**

HARNESS FAULTS

Harness faults fall into two distinct categories; open circuit faults in which either power or earth cannot reach **a** device, and short circuit faults in which an unwanted connection is made between one part of a circuit and either another circuit or **ground.** Ground short circuits invariably cause either a fuse to blow or device control to be lost.

OPEN CIRCUIT FAULTS

Open circuit faults are normally attributed to dirty or badly/non united connectors and these conditions should, therefore, be checked and eliminated first. An open circuit due to a broken wire or terminal locking lance is remote, but instances **of** such are repaired as follows:

1 Locate the broken wire using either the **JDS** or **by** performing a continuity check between the terminals of the harness connectors (Fig **1**).
2 Examine the connector faces for indented terminals associated with terminal locking lance failure, and renew any offending terminal as detailed in the relevant terminal insertion/extraction procedure.
3 Examine the faulty harness covering for signs of physical damage, i.e. chaffing and/or cuts, and both investigate and correct the cause if damage is evident.
4 Remove the harness covering to expose the broken section in **the** wire and remake the connection by installing an in-line connector as shown in (Fig **2).**
5 Electrically check the repaired wire to ensure the repair is good and re-cover the harness using insulating tape.

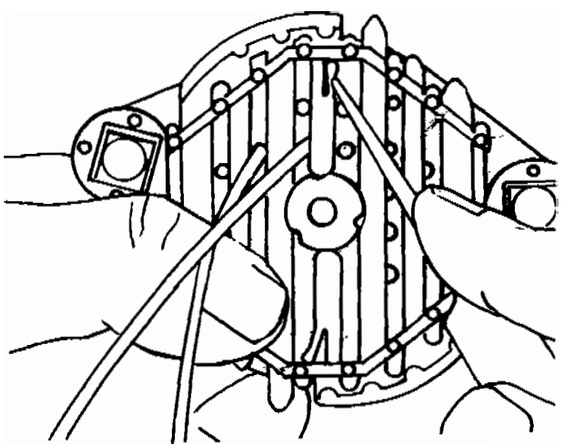


Fig 2

J86 527

SHORT CIRCUIT FAULTS

Short circuit faults may be attributed to connector contamination or damaged wire insulation. If no connector contamination is evident, proceed **as** follows:

1 Locate the shorted wire using either the ATE or by performing a continuity check between the terminals **of** the harness connectors.

2 Examine the faulty harness covering for signs of physical damage, i.e. chaffing and/or cuts, and **both** investigate and correct the cause if damage is evident.
3 Remove the harness covering to expose the shorted section in the wire and tape over the shorted section if minor insulation damage is the cause. **If** insulation damage is extensive, remove the damaged section and remake the connections by installing in-line connectors (Fig **1**).
4 Electrically check the repaired wire to ensure the repair is **good** and re-cover the harness using insulating tape.

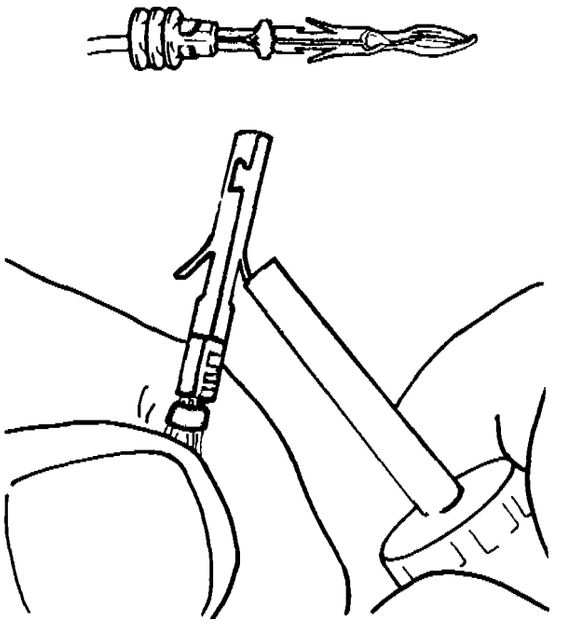


Fig 1 J86-531

ELECTRICAL REPAIRS

This section provides instruction in the following repairs:

- Typical Electrical Repairs
- Splicing Copper Wire
- Splicing Aluminum Wire
- Splicing Twisted/Shielded Cable

TYPICAL ELECTRICAL REPAIRS

An open circuit is an incomplete circuit. Power cannot reach the load or reach ground. If a curcuit **is** open, active components do not energize. **A** short circuit is an unwanted connection between one part of the circuit and either ground or another part of the circuit. **A** short circuit causes **a** fuse to blow or a circuit breaker to open.

Short: Circuits Caused by Damaged Wire Insulation

- Locate the damaged wire.
- Find and correct the cause of the wire insulation damage
- For minor damage, tape over the wire. **If** damage is more extensive, replace the faulty segment of the wire. (Refer **to** the **splicing** instructions for **copper,** aluminum, **or** shielded cable for the correct splicing procedure).

SPLICING COPPER WIRE

Open the Harness

If the harness is taped, remove the tape. To avoid wire insulation damage, use a sewing "seam ripper" to cut open the harness (available from sewing supply stores). If the harness has a plastic conduit, simply pull out the desired wire.

Cut the Wire

Begin by cutting as little wire off the harness as possible, You may need the extra length of wire later if you decide to cut more wire off to change the location of a splice. You may have to adjust splice locations to make certain that each splice is at least 40mm (1.1/2") away from other splices, harness branches, or connectors.

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Strip the Insulation (Fig 1)

If the wire size is unknown, start with the largest opening in the wire stripper and work down until a clean strip of the insulation is achieved. Avoid nicking or cutting any of the wires.
The splice should be at least 40mm (1.1/2") away from any other splices, harness branches, or connectors.
Check the stripped wire for nicks or cut strands. If the wire is damaged, repeat the procedure on a new section or wire. The two stripped wire ends should be equal in length.

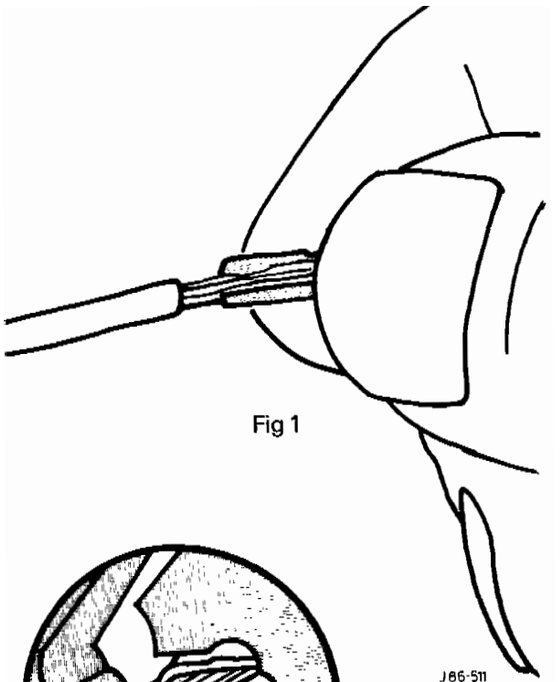


Fig 1

Crimp the wires (Fig 2)

Select the proper clip to secure the splice. To determine the proper clip size for the wire being spliced, following the directions included with your clips. Select the correct anvil on the crimper. (On most crimpers the choice is limited to either a small or large anvil). Overlap the two stripped wire ends and hold them between thumb and forefinger as shown. Then center the splice clip under the stripped wires and hold it in place.

- Open the crimping tool to its full width and rest one handle on a firm flat surface.
- Centre the back of the splice clip on the proper anvil and close the crimping tool to the point where the former touches the wings of the clip.
- Ensure that the clip and wires are still in the correct position. Then, apply steady pressure until the crimping tool closes.

Before crimping the ends of the clip, be sure that

- The wires extend beyond the clip in each direction,
- No strands of wire are cut loose, and
- No insulation is caught under the clip.

Crimp the splice clip again, once on each end. Do not let the crimping tool extend beyond the edge of the clip or you may damage or nick the wire.

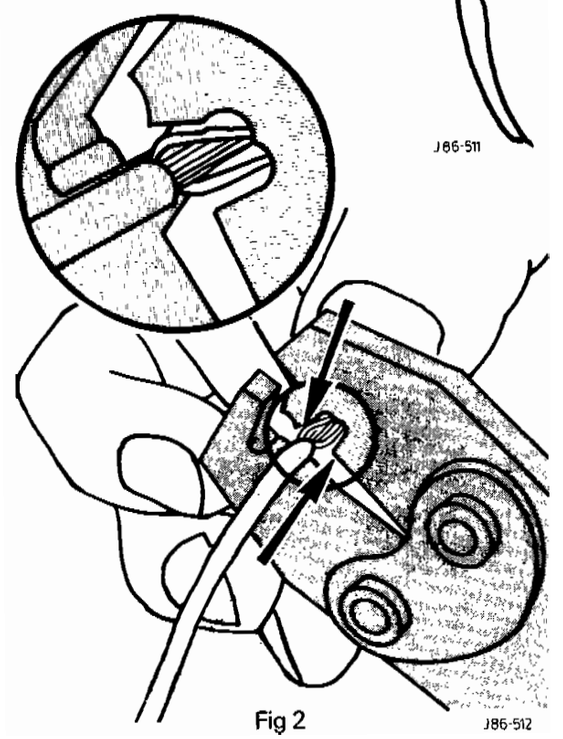


Fig 2

Solder (Fig 3).

Apply 50/50 rosin core solder to the opening in the back of the clip as shown. Following the manufacturer's instructions for the solder equipment you are using.

Tape the Splice

Centre and roll the splicing tape. The tape should cover the entire splice. Roll on enough tape to duplicate the thickness of the insulation on the existing wires. Do not flag the tape. Flagged tape may not provide enough insulation, and the flagged ends will tangle with the other wires in the harness.

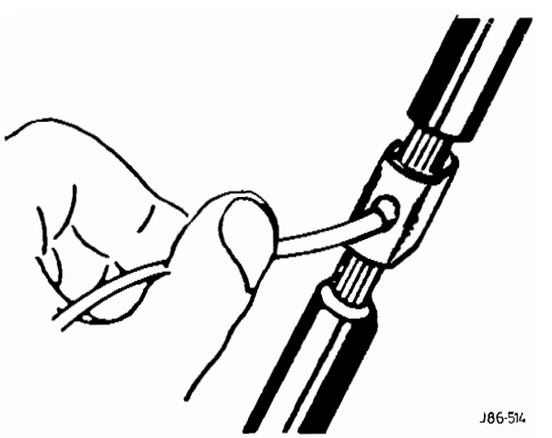


Fig 3

If the wire does not belong in a conduit or other harness covering, tape the wire again. Use a winding motion to cover the first piece of tape.

SPLICING TWISTED/SHIELDED CABLE

Twisted/shielded cable is sometimes used to protect wiring from electrical noise (stray signals).

Remove Outer Cover

Remove the outer jacket and discard it. Be careful to avoid cutting into the drain wire or the mylar tape.

Unwrap the Tape (Fig 1)

Unwrap the tape, but do not remove it. The tape will be used to rewrap the twisted conductors after the splices have been made.

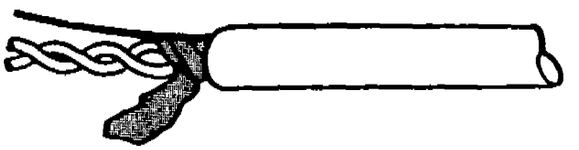


Fig 1

J86-521

Prepare the Splice

Untwist the conductors. Then, prepare the splice by following the splicing instructions for copper wire presented earlier. Remember to stagger splices to avoid shorts.

Re-Assemble the Cable

After you have spliced and taped each wire, rewrap the conductors with the mylar tape. Be careful to avoid wrapping the drain wire in the tape.

Next, splice the drain wire following the splicing instructions for copper wire. Then, wrap the drain wire aound the conductors and mylar tape.

Tape the Cable (Fig 2)

Tape over the entire cable using a winding motion. This tape will replace the section of the jacket you removed to make the repair.



Fig 2

J86-526

TERMINATED CABLES

Terminated cables are now available for repairing electrical wiring connectors. When used in conjuction with a proprietary crimp tool and heat gun, component/ harness replacement can be greatly reduced where termination damage occurs. The full range of terminated cables are listed over the page.

Repair procedure

Locate the faulty harness connector using JDS.
Remove the faulty terminal from the harness cable and bare the cable end.
Insert the bared cable end in to the crimp connector on the terminated cable (1 Fig 3). Secure the cable with a crimp tool (2 Fig 3).
Shrink the insulation sleeve with the heat gun (3 Fig 3).
Insert the new terminal into the connector block and remake the connection.

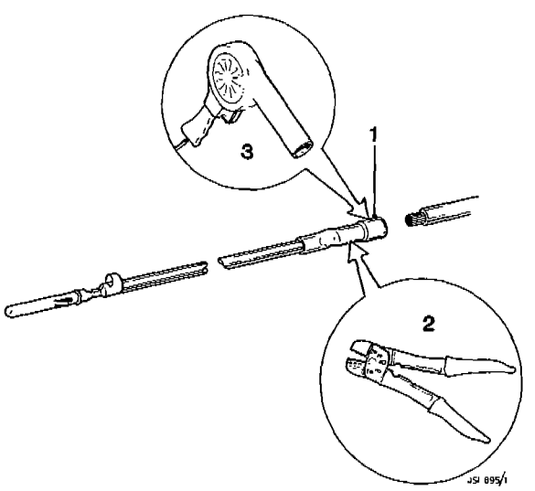


Fig 3

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AVAILABLE TERMINATED CABLES

PART NUMBER	CABLE COLOUR	SIZE	TERMI-NATION	CONNECTOR APPLICATION
DBC 3551	White	0.5	Pin	Amp Econoseal Series E
DBC 3552	White	0.5	Socket	Amp Econoseal Series E
DBC 3553	Yellow	2.0	Pin	Amp Econoseal Series E
DBC 3554	Yellow	2.0	Socket	Amp Econoseal Series E
DBC 3557	White	0.5	Socket	Amp Econoseal Series J
DBC 3558	Yellow	2.0	Socket	Amp Econoseal Series J
DBC 3561	White	0.5	Pin	PMHD Connector
DBC 3562	White	0.5	Socket	PMHD Connector
DBC 3565	White	0.5	Pin	PM4 Connector
DBC 3566	White	0.5	Socket	PM4 Connector
DBC 3567	Blue	1.0	Pin	PM4 Connector
DBC 3568	Blue	1.0	Socket	PM4 Connector
DBC 3569	Yellow	2.0	Pin	PM4 Connector
DBC 3570	Yellow	2.0	Socket	PM4 Connector
DBC 3571	Green	3.0	Pin	PM4 Connector
DBC 3572	Green	3.0	Socket	PM4 Connector
DBC 3575	White	0.5	Socket	Amp (Timer)
DBC 3576	Yellow	2.0	Socket	Amp (Timer)
DBC 3579	White	0.5	Lucar	Relay Base
DBC 3580	Yellow	2.0	Lucar	Relay Base
DBC 3581	Green	3.0	Lucar	Relay Base
DBC 3594	White	0.5	Lucar (Brass)	187 Blade Receptable
DBC 3595	White	0.5	Fastin-Faston	250 Fastin-Faston Receptable
DBC 3596	White	0.5	Lucar	187 Blade Receptable
DBC 3597	White	0.5	Lucar	250 Blade Receptable
DBC 3598	White	0.5	Fastin-Faston	250 Fastin-Faston Receptable
DBC 3599	White	0.5	Socket	Mic 5 Way
DBC 3600	White	0.5	Socket	Mic 5 Way
DBC 3601	White	0.5	Socket	Bosch 25 Way Connector
DBC 3602	White	0.5	Flag	Amp Connector
DBC 3603	White	0.5	Flag	Amp Connector
DBC 3604	Yellow	2.0	Socket	Bosch 25 Way Connector
DBC 3605	Yellow	2.0	Lucar (Chrome)	187 Blade Receptable
DBC 3606	Yellow	2.0	Fastin-Faston	250 Fastin-Faston Receptable
DBC 3607	Yellow	2.0	Socket	Amp Timer
DBC 3608	Yellow	2.0	Socket	Mic 5 Way
DBC 3612	White	0.5	Socket	TTS Socket
DBC 3613	Yellow	2.0	Socket	TTS Socket
DBC 3614	Green	3.0	Socket	TTS Socket
DBC 3617	White	0.5	Socket	Bosch Connector
DBC 3618	Yellow	2.0	Socket	Bosch Connector
DBC 3621	White	0.5	Flag	Kiekert
DBC 3622	Yellow	2.0	Flag	Kiekert
DBC 3645	White	0.5	Pin	Packard Connector
JLM 1451	–	–	–	ITT/Cannon – 2-Way – Male
JLM 1452	–	–	–	ITT/Cannon – 2-Way – Female
JLM 1453	–	–	–	ITT/Cannon – 4-Way – Male
JLM 1454	–	–	–	ITT/Cannon – 4-Way – Female

BULKHEAD CABLE HARNESS

RENEW **86.70.09**

Open the bonnet and disconnect the battery earth lead.
Open the car door.
Remove the driver side dash liner 76.46.11.
Remove passenger dash liner 76.46.15
Remove passenger fascia closing panel 76.46.27.
Remove drivers fascia closing panel 76.46.28.
Remove the centre veneer panel 76.47.06.
Remove the centre vent outlet 76.15.48.
Remove the fascia board 76.46.01.
Remove the right and left hand **"A"** post lower trim pads 76.13.30.
Remove the sun visor 76.10.47.
Remove the interior lamp assembly 86.45.12.
Displace the roof lining for access to the cable harness.
Displace the cable harness from the roof and " A post.
Disconnect the block connectors at the base of the " A post.
Remove the " A post earth bolt and disconnect the earth lead.

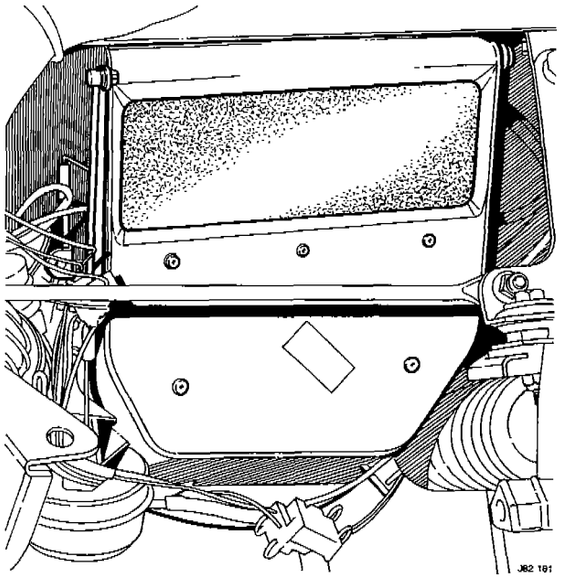


Fig 1

Remove the cover of the " A post aperture.
Withdraw and disconnect the door cable harness block connectors.
Disconnect the cable harness block connector from the footwell fusebox.
Displace the harness from the footwell.
Cut and remove the harness to bulkhead retaining strap.
Undo the bolts securing the steering column to bulkhead support bracket.
Displace the bracket from the bulkhead.
Displace the harness from the bracket.
Disconnect the brake switch block connector.
Displace the harness from the bracket.
Disconnect the blower motor block connector (Fig 1).
Displace the blower to heater unit trunking for access.
Remove the nut securing the earth terminal and disconnect the earth lead.
Displace the harness from the blower motor area.
Disconnect the **C.P.U.** cable harness block connectors.
Remove the screw securing the C.P.U. earth lead and disconnect the earth lead.
Remove the harness to bulkhead earth bolt and disconnect the earth lead.
Remove the harness to **"A"** post earth bolt and disconnect the earth lead.
Cut and remove the rachet straps securing the harness to the " A post.
Remove the " A post blanking plug.
Disconnect the door harness block connectors.
Displace the relays from the footwell mounting.
Disconnect cable harness block connector from the footwell fuse block,
Displace the harness from the footwell.
Displace the terminal post rubber boot.
Remove the nut securing the earth lead and remove the lead.
Remove the footwell vent from the heater unit.
Remove the gear lever surround finisher (Fig 2).

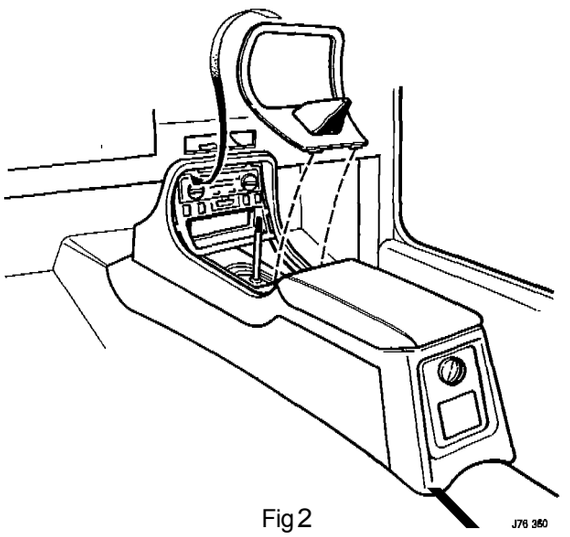


Fig 2

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Remove the console finisher 76.25.19
Remove the screws securing the console ashtray and displace the ashtray for access.
Disconnect the cigar lighter cable harness block connector.
Remove the ashtray assembly.
Remove the centre console switch and clock module 86.80.13
Remove the console assembly 76.25.01.
Align the cable harness on the transmission tunnel.
Displace the seat relay bases from their mountings.
Disconnect the gear selector cable harness block connector.
Disconnect the gear linear switch cable harness block connector.
Remove the bolt securing the earth lead and disconnect the lead.
Cut and remove the rachet straps securing the cable harness to tunnel.
Peel back the carpet at the seat belt anchorages.
Disconnect the seat belt cable harness block connectors.
Remove both the front seat cushions 76.70.02.
Disconnect the seat heater and interior lamp cable harness block connectors.
Cut and remove the cable harness securing rachet straps.
Disconnect the handbrake switch cable harnes block connector.
Route the harness from the tunnel area under the heater unit into the passenger footwell.
Remove the screws securing the central processor and disconnect the earth lead.
Slacken the upper screw securing the processor, displace and remove the processor.
Remove the bolts securing the processor mounting bracket and remove the bracket.
Disconnect the blower motor cable harness block connector.
Remove the bulkhead earth terminal nut and disconnect the earth lead.
Cut and remove the harness to bulkhead rachet securing straps.
Displace and remove the cable harness.

Fitting the new harness

Fit and align the new harness to the vehicle bulkhead.
Secure the harness with rachet straps.
Route the harness under the heater unit to the tunnel area.
Route the seat heater and interior light harnesses and connect the block connectors.
Refit the seat cushions.
Secure the harness to tunnel with rachet straps.
Connect the tunnel earth leads and tighten the securing bolt.
Route the harness to the tunnel and secure with rachet straps.
Locate the powered seat relay bases to the support brackets.
Connect the gearbox linear switch block connector.
Connect the gearbox block connector.
Connect the earth leads, fit and tighten the securing bolt.
Connect the passenger blower motor block connector.
Connect the earth lead to bulkhead, fit and tighten the securing nut.

Fit the CPU bracket.
fit the CPU to the bracket and connect the block connectors.
Route the harness to the " A post area.
Connect leads to the terminal post.
Tighten the securing nut and position rubber boot over the terminal post.
Connect the passenger door harness block connectors.
Position the door harness block connectors into the -- A post and fit the " A post finisher.
Connect the side harness block connectors.
Connect the " A post earth lead.
Route the harness to the passenger side fuse box and connect the fuse box block connector.
Connect the relay bases to mountings.
Secure the harness to the " A post with rachet straps.
Connect the engine management ECU block connectors.
Connect the earth lead to the CPU mounting bolt.
Route the harness around the steering column support bracket to the blower motor.
Connect the earth leads to the terminal.
Connect the drivers side blower motor block connector.
Route the harness through the bracket and secure the harness to the bulkhead with rachet strap.
Tighten the bracket securing bolts.
Connect the brake light switch block connector.
Route the harness to the roof console via the " A post.
Connect the "A" post block connectors.
Connect the door harness block connectors.
Route the block connectors into the " A post and fit the " A post finisher.
Route the lower harness to the fuse box.
Connect the fuse box block connector.
Connect the inertia switch block connector.
Connect the " A post earth lead.
Connect the interior light block connector and refit the roof console.
Refit the " A post lower trim pads, fascia, console, switch panel, ventilator, veneer panel, fascia closing panels and dash liners.
Reconnect the battery earth lead and test the operation of the electrical system of the vehicle.

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ENGINE HARNESS

RENEW **86.70.21**

Open the bonnet and disconnect the battery earth lead.
Cut and remove the strap securing the multi-plug to the power brake hose.
Disconnect the multi-plug (1 Fig 1).
Disconnect the ignition amplifier multi-plug.
Disconnect the distributor to HT coil king lead.
Displace the rubber boot from the HT coil LT connectors.
Disconnect the LT leads from the HT coil.
Remove the bolts securing the Ht coil and displace the coil.
Disconnect the earth lead from the coil.
Remove the screw securing the earth lead to the crush tube.
Cut and remove strap securing the crankshaft sensor harness to the engine harness.
Disconnect the multi-plug connector.
Cut and remove the strap securing harness to the cam shaft cover.
Disconnect the water temperature sensor (Fig 2).
Remove the front nut securing the harness support bracket and disconnect the earth lead.
Remove the strap securing the harness to the manifold.
Remove the strap securing the supplementary air valve multi-plug.
Disconnect the supplementary air valve multi-plug.
Disconnect the throttle potentiometer multi-plug.
Remove the nut securing the air flow meter earth lead and disconnect the lead.
Disconnect the air flow meter multi-plug connector.
Route the harness under the air flow meter.
Remove the air pump relay multi-plug rachet strap. Disconnect the multi-plug.
Displace the harness over the engine.
Slacken the engine breather pipe to cam cover securing clip.
Disconnect the breather pipe.
Remove the strap securing the breather heater multi-plug lead. Route the harness to the engine.
Cut and remove the harness to harness carrier securing straps (Fig 3).
Disconnect the starter motor multi-plug.
Disconnect the idle speed actuator connector.
Disconnect the injector leads (Fig 4).
Displace the harness from the harness carrier.
Remove the Battery 86.15.01.
Remove the nut securing the earth lead and disconnect the leads.
Remove the bolts securing the battery tray and remove the tray.
Remove the vacuum reservoir tank.
Cut and remove the securing the harness to the bulhead.
Disconnect the earth leads
Displace the rubber boot from the positive terminal post and remove the **tape.**
Disconnect the leads from terminal post.
Open the door and remove the passenger side dash liner.
Remove the main relay from the red socket and the pump relay from the yellow socket.
Displace the relay bases from the mounting panel.

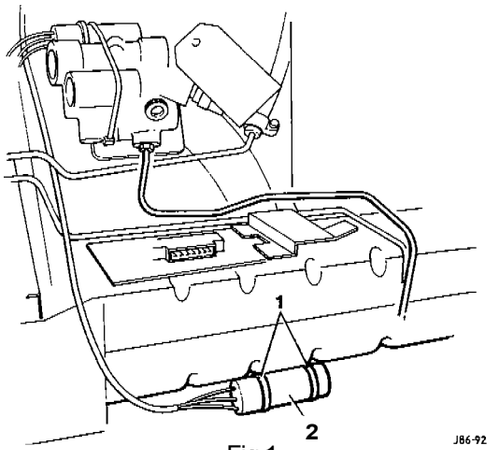


Fig 1

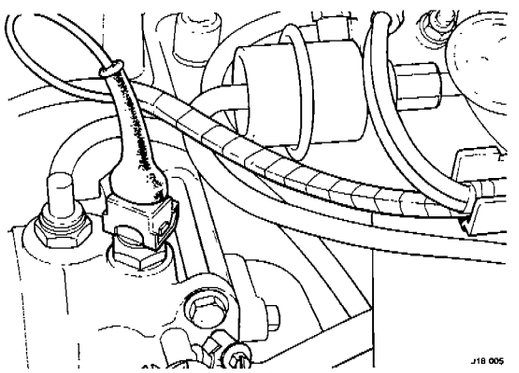


Fig 2

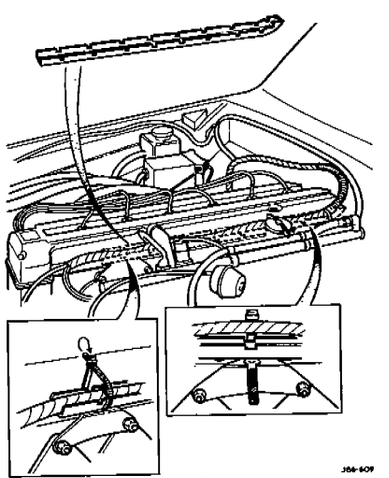


Fig 3

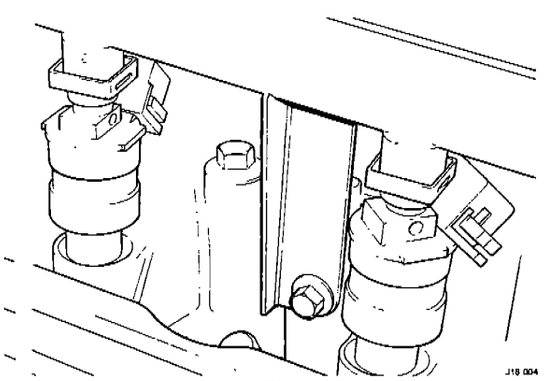


Fig 4

Disconnect the yellow multi-plug connectors (LB28/ LB27).
Cut and remove the strap securing the harness to body.
Disconnect the engine management block connectors from the ECU.
From the engine bay displace bulkhead cable harness grommet and remove the cable harness.
Fit the new harness to the vehicle and route the harness through the bukhead.
Connect the engine management block connectors.
Connect the yellow multi-plug block connectors.
Fit the relay bases to the mounting panel and refit the relays.
Secure the harness with rachet straps.
Refit the dash liner.
From the engine bay:- Fully seat the harness grommet to the bulkhead aperture.
Refit the vacuum reservoir and the battery tray.
Connect the positive lead, fit tape to the terminal post and fully seat the rubber boot.
Position the harness to the battery tray.
Connect the earth leads to the negative terminal.
Fit the negative battery lead to the terminal, fit and tighten the securing nut.
Refit the battery.
Route the harness over the engine.
Connect the starter motor multi-plug connector.
Secure the harness to the bulkhead with rachet straps (Fig **1**).
Route and secure the harness to the harness carrier with rachet straps.
Secure the carrier to brackets with rachet straps.
Route the breather heater connector to its position and secure with rachet strap.
Connect the injector leads.
Connect the coolant temperature sensor lead.
Connect the engine breather hose to the cam cover. Position and tighten the clip.
Connect the idle speed actuator multi-plug.
Connect the earth leads to the harness support bracket. Fit and tighten the securing nut.
Route the harness to the air flow meter and connect the multi-plug.
Connect the throttle potentiometer multi-plug.
Connect the supplementary air valve multi-plug.
Secure the multi-plug and harness to the manifold with a rachet straps.
Connect the air pump relay multi-plug at the oil cooler pipe and secure with a rachet strap.
Route the harness to the front of the cam cover and secure with a rachet strap.
Connect the crankshaft sensor and secure with a rachet strap.
Route the harness to the **HT** coil.
Connect the ignition amplifier multi-plug.
Connect the earth lead under the coil.
Fit and tighten the securing screw.
Fully seat coil to its mounting, position the capacitor to the coil, fit and tighten the securing screws.
Connect the LT leads to to the HT coil, Fit and tighten the securing nuts.
Connect the black and the yellow multi-plugs.
Secure the multi-plugs to the power brake hose with a rachet strap.
Connect the king lead to the HT coil.
Reconnect the battery, check the operation of all the relevent components and the engine performance.

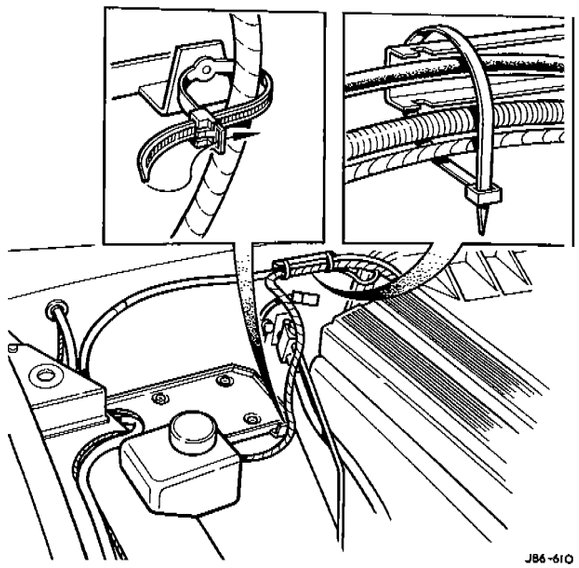


Fig **1**

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DRIVERS DOOR HARNESS

RENEW ***86.70.07***

Open the bonnet and disconnect the battery earth lead.
Open the drivers door.
Remove the veneer trim panel 76.47.11.
Remove the upper door trim pad 76.34.02.
Remove the lower door trim pad 76.34.03.
Remove the " A post lower trim pad 76.13.30.
Remove drivers side dash liner 76.46.11.
Cut and remove the strap securing the door harness multi-plug.
Remove the multi-plug housing.
Cut and remove the strap securing the door harness to the lower door frame (Fig 1).
Disconnect the harness multi-plugs LB/RB 61 and LB/RB 62.
From inside the vehicle remove the " A post inner blanking plug.
Manouvre the blak multi-plugs into the vehicle from the " A post aperture.
Disconnect the multi-plugs.
Displace the door to " A post protection sleeve into the door.
Remove the harness tie strap at the door hinge.
Disconnect the door mirror multi-plugs and remove the door harness.
Fitting a new harness is the reversal of the removal procedure.

30016.

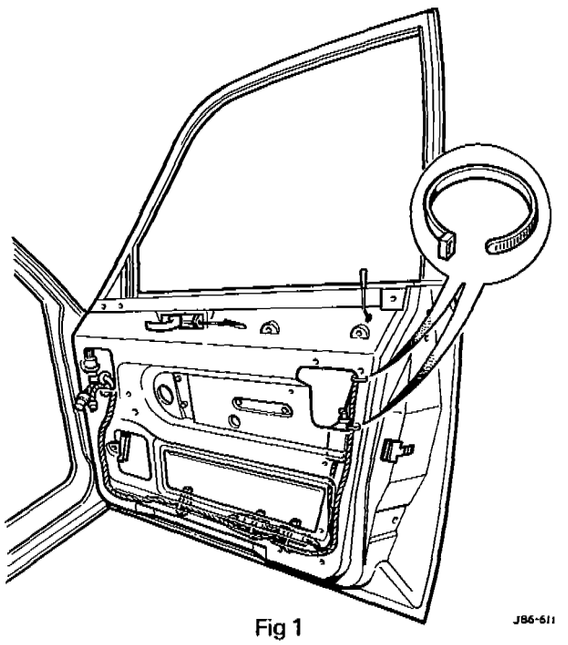


Fig 1 J86-611

PASSENGER DOOR HARNESS

RENEW ***86.70.08***

Open the bonnet and disconnect the battery earth lead.
Open the drivers door.
Remove the veneer trim panel 76.47.11.
Remove the upper door trim pad 76.34.02.
Remove the lower door trim pad 76.34.03.
Remove the " A post lower trim pad 76.13.30.
Remove drivers side dash liner 76.46.11.
Cut and remove the strap securing the door harness multi-plug.
Remove the multi-plug housing.
Cut and remove the strap securing the door harness to the lower door frame (Fig 2).
Disconnect the harness multi-plugs LB/RB 61 and LB/RB 62.
From inside the vehicle remove the "A" post inner blanking plug.
Manouvre the blak multi-plugs into the vehicle from the "A" post aperture.
Disconnect the multi-plugs.
Displace the door to " A post protection sleeve into the door.
Remove the harness tie strap at the door hinge.
Disconnect the door mirror multi-plugs and remove the door harness.
Fitting a new harness is the reversal of the removal procedure.

30016

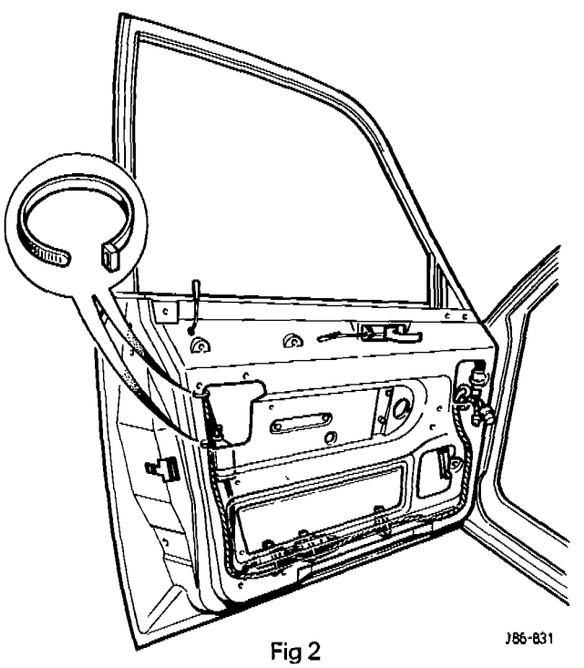


Fig 2 J86-631

REAR DOOR HARNESS

RENEW **86.70.47**

Open the bonnet and disconnect the battery earth lead.
Open the rear door.
Remove the veneer trim panel 76.47.12.
Remove the upper door trim pad 76.34.05.
Remove the lower door trim pad 76.34.06.
Move and recline the front seat fully forward.
Turn and release the clip securing the "B" post lower trim pad and displace the pad from its position.
Undo the seat belt reel lower securing bolt and displace the reel for access.
Remove the screws securing the "B" post inner harness guard and remove the guard.
Displace the harness from the "B" post.
Disconnect the multi-plugs.
Open the front door and close the rear door.
Displace the harness protection sleeve from the "B" post.
Displace the harness from the "B" post.
Displace the harness protection sleeve and harness into the rear door.
Open the rear door.
Displace the water curtain.
Remove the harness to door hinge bolts guide.
Remove the door upper harness finisher.
Cut and remove the harness to lower door securing straps (Fig 1).
Disconnect the black, yellow, green and blue multi-plug connectors.
Cut and remove the upper harness securing straps.
Remove the harness from the door.
Fit the new harness to the rear door.
Route the harness protector to the door aperture, thread the harness into the "B" post and fully seat the protector.
Connect the multi-plugs.
Fit the harness inner guard.
Fit and tighten the securing screws.
Position the seat belt reel.
Fit and tighten the securing bolt.
Fit the bolt finisher.
Position the "B" post lower trim pad and engage the securing clips.
Recline the seat to its original position and reposition the seat.
Route the upper door harness connectors.
Fit the harness finisher.
Route the harness to the lower hinge guide.
Fit and secure the guide.
Route the harness to the bottem of the door.
Connect the multi-plug connectors.
Secure the harness with rachet straps.
Reposition the water curtain.
Fit the lower and upper trim pads.
Fit the veneer panel.
Reconnect the battery earth lead.
Check operation of the relevent components.

3001B

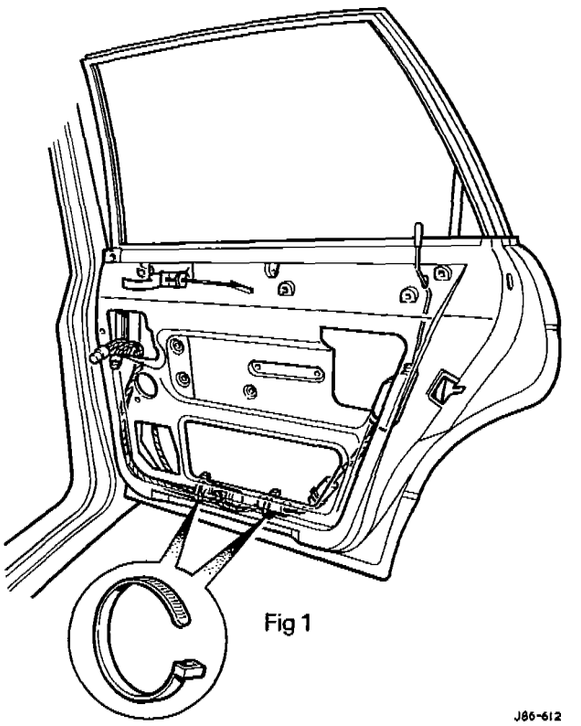


Fig 1

J86-612

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POWERED SEAT LINK LEAD

RENEW **86-70-12**

Open the front doors and switch 'on' the ignition.
Motor front sears fully forward.
Switch 'off the ignition.
Console assembly – renew 76.25.01.
Front seat cushion – renew 76.70.02.
Reposition rear footwell carpet and insulation from below the drivers seat for access (Fig 1).
Disconnect the powered seat link lead multi-plug purple P.M.4.
Cut and remove the ratchet straps securing the link lead to the floor/transmission tunnel.
Reposition the link lead from below the drivers seat.
Reposition the rear footwell carpet and insulation from below passenger seat for access to the harness multi-plug.
Cut and remove the ratchet straps securing the harness.
Reposition the link lead from below the passenger seat.
Displace and remove the link lead from the vehicle.
Fit and align the new harness to transmission tunnel.
Reposition the lead below the passenger seat (Fig 2).
Connect the mutti-plug to the passenger seat harness.
Secure the harness to the floor/transmission tunnel with the ratchet straps.
Reposition the rear footwell carpet.
Reposition the link lead below the drivers seat.
Connect the drivers seat multi-plug.
Secure the harness to the floor/transmission tunnel with the ratchet straps.
Reposition the rear footwell carpet.
Refit the front seat cushions.
Refit the console assembly.
Switch 'on' the ignition and motor seats rearward.
Switch 'off the ignition and close the doors.

3001B

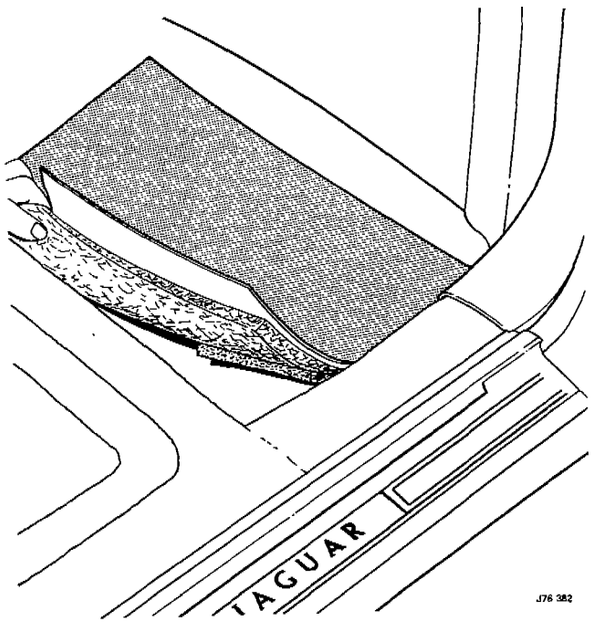


Fig 1

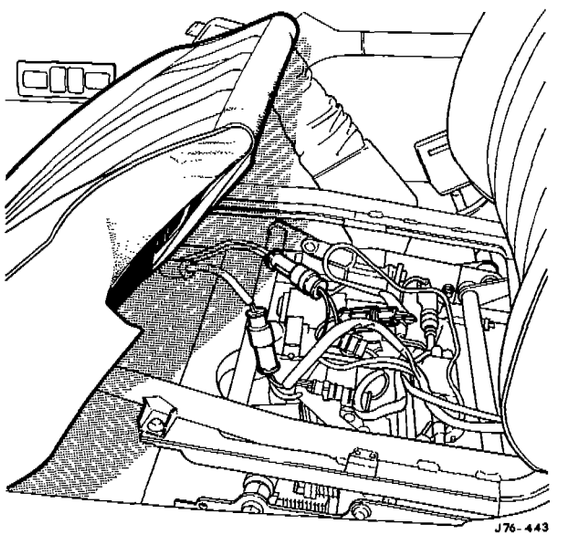


Fig 2

POWERED SEAT HARNESS

RENEW **86.70.11**

Remove the front seat cushion 76.70.02
Position the seat fully forward.
Open the bonnet and disconnect the battery earth lead.
Reposition the rear footwell carpet and insulation for access to the harness connection.
Remove the harness to floor retaining caps
Remove the retaining plate.
Disconnect the seat harness to link harness purple, red and black multi-plugs.
Remove the harness to seat bracket securing screw.
Reposition the harness from the retain clip.
Reposition the harness multi-plugs from the retaining clips.
Note and disconnect the multi-plugs.
Note and disconnect the red and blue wires from the front rise and fall motor.
Note and disconnect the yellow and white wires from the rear rise and fall motor.

Cut and remove the rachet strap securing the seat belt cable to the seat frame.
Disconnect and remove the harness from the seat belt multi-plug.
Fitting the new harness is thr reversal of the removal procedure.

3001B

INTERIOR READING LAMP LINK HARNESS(SEAT)

RENEW **86.70.23**

Open the front and rear doors.
Front seat cushion – renew 76.70.02.
Front seat back finisher – renew 76.70.03.
Cut and remove ratchet straps securing the harness to the seat frame.
Disconnect the harness multi-plug (black Econoseal).
Reposition the harness to the rear of the seat.
Front seat headrest – Renew
Displace and remove the harness from the seat.
Position the new harness through the head rest mounting hole.
Reposition the harness to the seat frame and through the lower access hole.
Secure seat harness to frame with the ratchet straps.
Reposition the harness to seat motors.
Connect the harness multi-plug.
Reposition the multi-plug to retaining clip.
Reposition the harness to the lower frame.
Secure the harness with ratchet straps.
Refit the head rest.
Refit the seat back finisher.
Refit the seat cushion and close the doors.

3001B

FRONT AXLE HARNESS

RENEW **86.70.15**

Open the bonnet and disconnect the battery earth lead.
Cut and remove the rachet strap securing the front axle harness multi-plug to the side harness.
Disconnect the harness to side harness black multi-plug.
Jack up the vehicle and place on **1** stand.
Remove the road wheel **74.20.01**
Cut and remove the rachet strap securing the harness to the brake hose **(Fig 1)**.
Displace the harness from the retaining clip.
Disconnect **and** remove the front axle harness from the brake pad warning multi-plug
Fitting **a** new harness is the reversal *of* the removal procedure

3001B

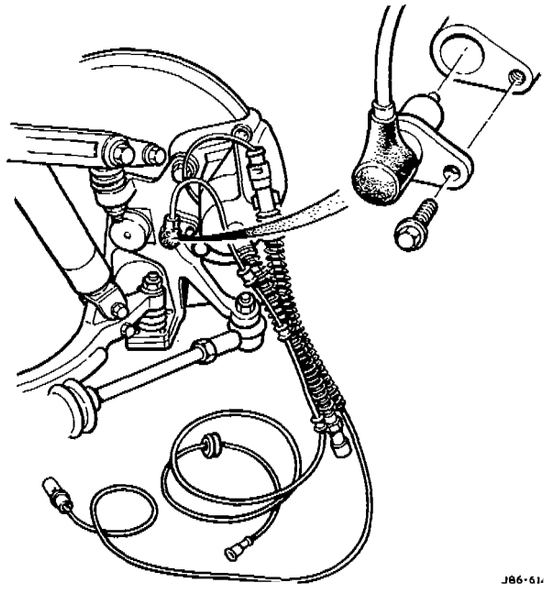


Fig **1**

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REAR AXLE HARNESS (Right Hand)

RENEW **86.70.16**

Open the bonnet and disconnect the battery earth lead.
Open the luggage compartment and remove the spare wheel.
Remove the jack and racet handle.
Remove the luggage compartment front liner.
Cut and remove the ratchet strap securing the multi-plug to the fuel tank strap (Fig 1).
Disconnect the right hand black multi-plug.
Displace the grommet through the body to the axle area.
Reposition the harness and multi-plug through the body.
Jack up and place the vehicle on two stands.
From below disconnect the harness to brake pad multi-plug connector (Fig 2).
Cut and remove the rachet strap securing the harness to the lower wishbone.
Displace the cover from the ride height sensor.
Disconnect the multi-plug connector.
Cut and remove the rachet strap securing the ride height sensor harness to suspension arm.
Displace and remove the harness.
Fitting the new harness is the reversal of the removal procedure.

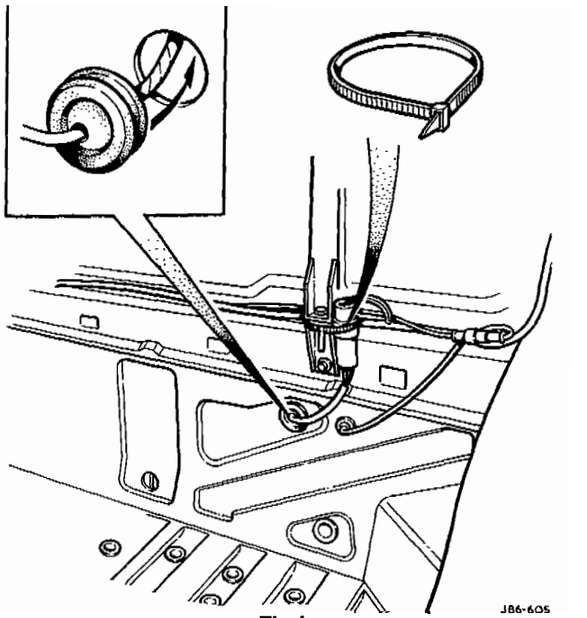


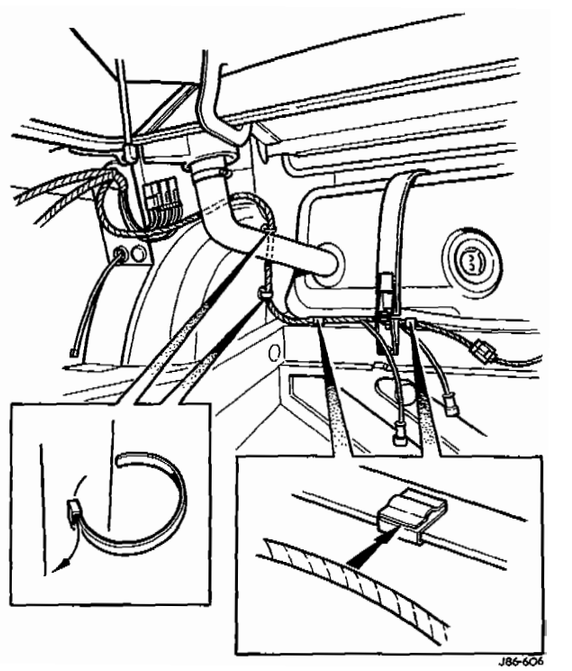
Fig 1

3001B

REAR AXLE HARNESS (Left Hand)

RENEW **86.70.17**

Open the bonnet and disconnect the battery earth cable.
Open thee luggage compartment and remove the spare wheel.
Remove the jack and rachet handle.
Cut and remove the rachet strap securing the multi-plug to the fuel tank strap.
Disconnect the black econoseal multi-plug connector.
Displace the grommet through to the axle area.
Reposition the harness and mylti-plug through the body.
Jack up and place the vehicle on two stands.
From below Disconnect the harness to brake pad multi-plug connector.
Cut and remove the rachet strap securing the harness to the suspension assembly.
Displace and remove the harness.
Fitting the new harness is the reversal of the removal procedure.



3001B

MANUAL TRANSMISSION SWITCH LINK HARNESS

RENEW **86.70.19**

Jack up the vehicle and place on 2 stands.
Reposition the link harness from behind foam pad for access.
Note, and disconnect the gearbox switch multi-plugs (red and yellow Econoseal) red male to yellow female. Yellow male to black female.
Tie a suitable draw string to the harness link lead.
Open the door.
Undo and remove the gear lever knob and locking nut.
Displace and remove the gear lever surround veneer panel.
Displace the gearbox link harness grommet.
Disconnect the link harness multi-plug (green P.M.D.H.)
Reposition the harness/draw string into the vehicle from the gearbox area.
Cut the draw string from the harness.
Place the harness aside.
Position and tie the new harness to draw string.
Reposition the link harness multi-plug through the gearbox panel.
From below draw the harness behind the gearbox pad into position.
Cut and remove the draw string.
Connect the harness multi-plugs.
Reposition the multi-plugs behind the foam.
Lower the vehicle from the stands.
Fit and fully seat the link harness grommet.
Connect the link harness multi-plug.
Fit and fully seat surround veneer panel.
Fit and tighten the gear lever knob and lock nut.
Close the door.

3001B

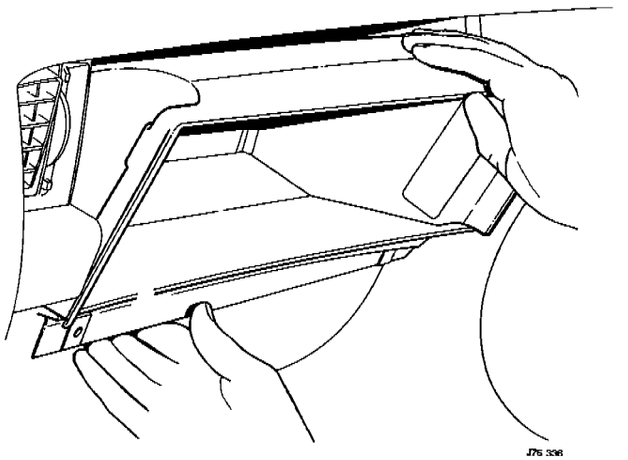


Fig 1

GLOVE BOX LAMP HARNESS

RENEW **86-70-24**

Open the door
Glove box – renew 76.52.03.
Note, and disconnect the glove box lamp and switch Lucar connectors.
Undo and remove harness to the glove box 'P clip securing nut/bolt.
Cut and remove the harness to glove box ratchet strap.
Place the harness aside.
Fit and align the new harness to the glove box.
Fit and tighten the 'P' clip securing nut/bolt.
Connect the harness to the lamp/switch lucars.
Secure the harness to glove box with ratchet strap.
Refit the glove box assembly (Fig 1) and close the door.

3001B

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BONNET LAMP LINK HARNESS

RENEW ***86-70-26***

Open the door
Undo but do not fully remove the bonnet lamp securing screws.
Displacethe bonnet lamp assemblies for access.
Undo and remove the bonnet insulation pad lower securing screws.
Repositionthe padfor access.
Disconnect both the bonnet lamp multi-plugs (black Econoseal).
Cut and removethe harnessto the bonnet ratchet strap.
Repositionthe harness from behind the bonnet pad.
Cut and remove the ratchet straps securing the harness and multi-plug to front closing panel.
Disconnectthe multi-plug (red Econoseal).
Displacethe grommetfrom the panel.
Reposition the harness/multi plug through the body panel and remove.
Position the new harness/multi-plug through the body panel.
Fully seat the grommetto the panel.
Secure the harness and multi-plug with the ratchet straps.
Repositionthe harness behind the bonnet pad.
Connectthe harnessto the bonnet lamp multi-plugs.
Secure the harnessto the bonnet with ratchetstrap.
Repositionthe bonnet pad.
Fit and tighten the padsecuring clips.
Position and seat lights to the bonnet
Tighten the lightsecuring screws and close the bonnet.

3001B

STARTER MOTOR LINK LEAD

RENEW **86.70.31**

Open the bonnet
Starter motor – renew 86.60.01.
Undo and remove the link lead to the starter solenoid securing screws.
Place link lead aside.
Fit and align the new link leadto the starter solenoid
Fit andtighten the securing screws
Refitthe starter motor
Close bonnet.

3001B

HEATED BACK LIGHT EARTH LEAD

RENEW *86-70-32*

Open the rear door
Rear quarter upper trim pad-left hand – renew 76.13.13.
Displace and remove the tape securing earth lead to the body panel.
Disconnect the earth lead to the heated back light lucar
Undo and remove the earth lead securing screw (Fig 1).
Displace and remove the earth lead.
Fit and align the new earth lead.
Fit and tighten the securing screw.
Connect the earth lead to heated back light lucar.
Secure the lead with tape.
Refit the rear quarter trim and close the door.

30018

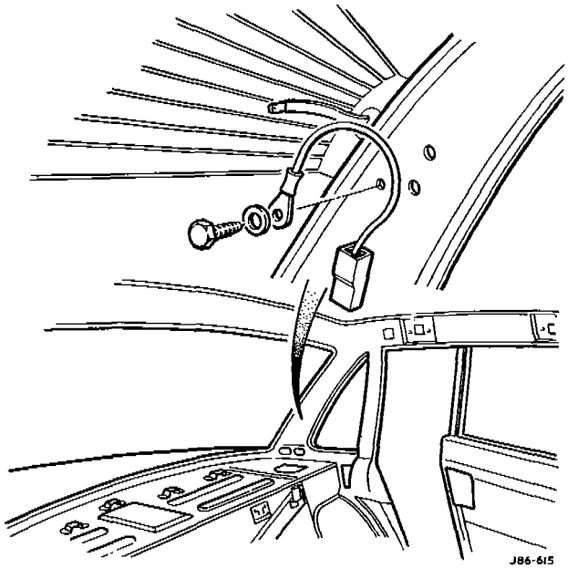


Fig 1

STEERING COLUMN HARNESS

RENEW 86.70.34

Open the bonnet and disconnect the battery earth lead.
.Open the car door.
Remove the steering wheel 57.60.01.
Remove the driver side dash liner 76.46.11.
Remove upper steering column cowl 76.46.02.
Remove lower steering column cowl 76.46.03.
Remove the screw securing the steering column harness carrier.
Displace the carrier for access.
Disconnect the block connector d.
Disconnect the main cable harness block connector.
Remove the harness from the vehicle.
Remove the clips (Fig 2) retaining the harness to the bracket.
Remove the bolt securing the "P" clip securing the harness the bracket.
Remove the "P" clip.
Remove the bracket from the harness.

Fitting a new steering column harness is the reversal of the removal procedure.
Reconnect the battery earth lead and check operation of all relevant components.

30018

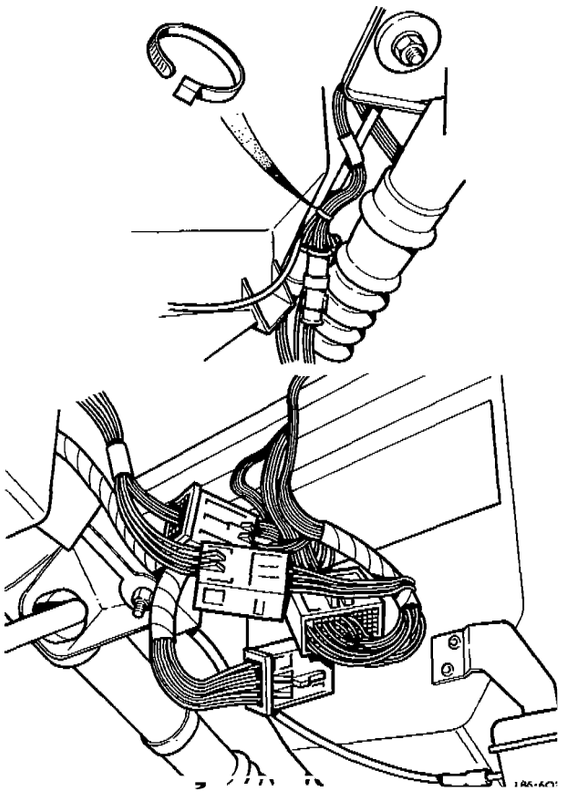


Fig 2

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STARTER TO ALTERNATOR LINK LEAD

RENEW **86.70.36**

Open the bonnet and disconnect the battery earth lead.
Remove the air pump 17.25.07
Remove the link lead to starter motor securing nut (Fig 1).
Reposition the lead from the starter motor terminal.
Remove the link lead to alternator securing nut.
Displace and remove the harness from the engine compartment.
Fitting the new harness is the reversal of the removal procedure.

30018

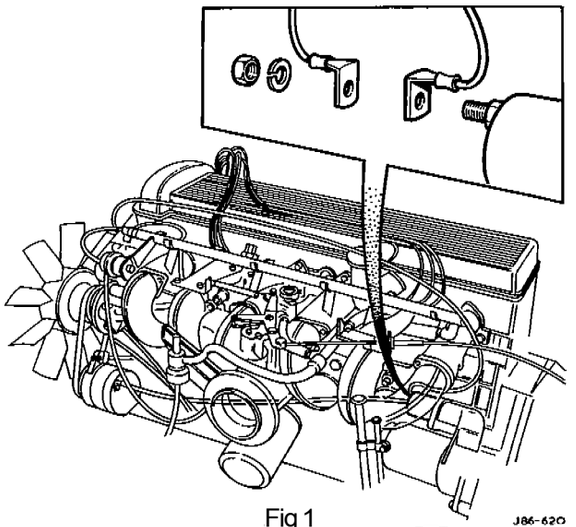


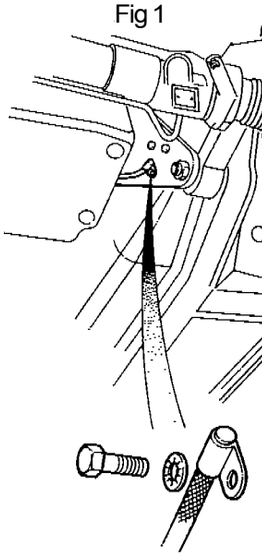
Fig 1 J86-620

ENGINE EARTH LEAD

RENEW ***86.70.38***

Open the bonnet and disconnect the battery earth lead.
Jack up and place the front of the vehicle on two stands.
From below remove the bell housing nut securing the earth lead.
Remove the rear mounting bolt securing the earth lead to the front cross member.
Displace and remove the earth lead (Fig 2).
Fitting the new earth lead is the reversal of the removal procedure.

3001B



J86-600

Fig 2

A.B.S. EARTH LEAD

RENEW ***86.70.39***

Open the bonnet and disconnect the battery earth lead.
Remove the A.B.S. modulator earth lead securing nut (Fig 3).
Reposition the lead from the modulator stud.
Remove the earth lead to mounting bracket securing bolt.
Displace and remove the earth lead.
Fitting the new earth lead is the reversal of the removal procedure.

3001B

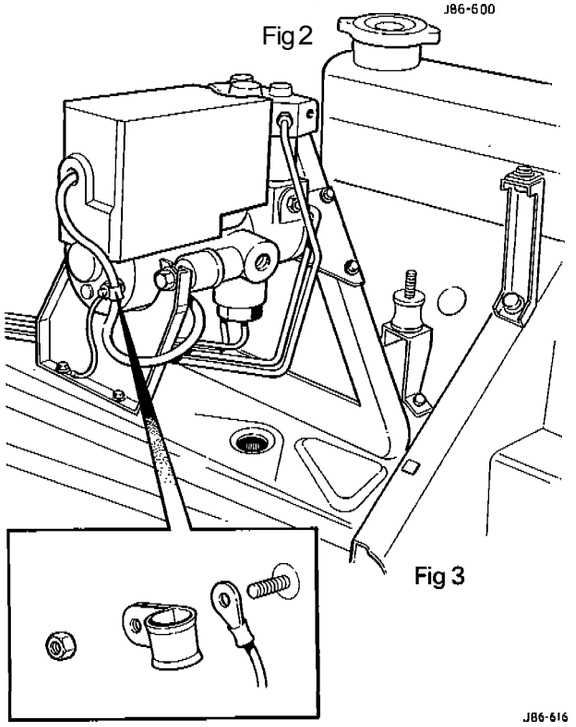


Fig 3

J86-616

FUEL PUMP LINK HARNESS

RENEW **86.70.20**

Open the bonnet and disconnect the battery earth lead.
Jack up left hand rear of vehicle and place on a stand.
Remove the left hand rear road wheel.
From the wheel arch displace the insulation boots from the fuel pump terminals.
Remove the fuel pump terminal nuts and reposition the harness wires from the fuel pump terminals.
Open the rear door and remove the rear seat cushion 76.70.37.
Reposition the seat cushion insulation pad for access to the fuel pump harness multi-plug connector.
Remove the foam pad (grommet).
Cut and remove harness to side harness ratchet strap.
Displace the harness to body grommet.
Reposition the harness through the body.
Disconnect the fuel pump harness black multi-plug connector.
Displace and remove the harness.
Fitting the new harness is the reversal of the removal procedure.

30018

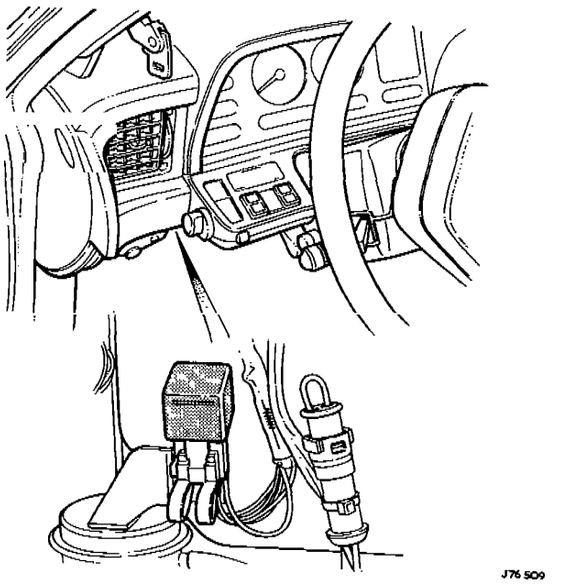


Fig 1

REVERSE INHIBIT RELAY – PASSIVE RESTRAINT

RENEW **86.55.84**

Open the drivers door.
Remove the drivers side dash liner.
Displace the relay/multi plug assembly from the mounting bracket (Fig 1).
Remove and discard the relay.
Fit a new relay to the multi plug. Fit the assembly to the mounting bracket.
Refit the dash liner. Close the door.

3001B

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CENTRAL PROCESSOR UNIT – PASSIVE RESTRAINT

RENEW **86.55.85**

Open the drivers door. Remove the drivers side dash liner.
Cut and remove the harness ratchet strap. Disconnect the unit multi plugs. Remove the unit/bracket securing bolts, remove and discard the unit (Fig 1).
Fit a new unit to the instrument pack mounting bracket. Fit and tighten the securing bolts.
Connect the multi plugs. Secure the harness with a new ratchet strap.
Refit the dash liner. Close the door.

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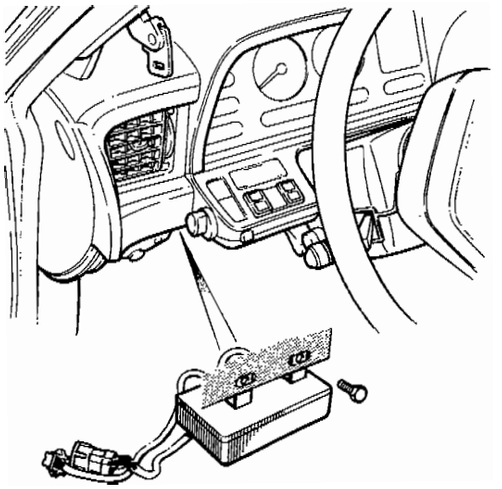


fig 1

INFRA-RED DOOR LOCKING RECEIVER

RENEW **86.55.35**

Remove the interior light console.
Displace the infra-red receiver (Fig 2). Disconnect the multi plug. Remove the receiver.

Fit the new receiver to position, connect the multi plug, and secure the receiver.
Refit the light console.

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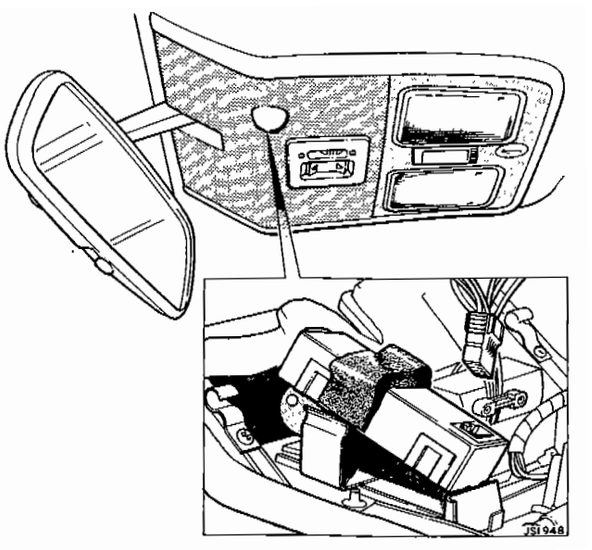


Fig 2

SEAT ENTRY SWITCH LINK HARNESS

RENEW *86.70.48*

Open the door.
Switch the ignition on and motor the seat fully forward.
Switch the ignition off.
Open the rear door and remove the bolts securing the seat.
Remove the carpet and the rear footwell front soud deadening insulation pad.
Displace the seat harness clamp retaining plate.
Switch on the ignition and motor the seat rearwards.
Switch off the ignition.
Remove the seat cushion 76.70.1 1
Displace the forward and reverse harness multi plugs from the securing clips.
Disconnect the rnulti plugs (Black Econoseal).
Remove the screw securing the rnulti plug clip.
Remove the retaining clip.
Reposition the main harness retaining clamp plate.
Remove the bolt/nut securing the lower retaining plate.
Reposition the plate for access to the harness.
Carefully cut the tape securing the seat entry harness to the main harness.
Reposition the seat entry harness under the seat.
Disconnect the multi plug and discard the harness.
Reverse the removal procedure to refit the replacement harness.

3001B

BOOT LID RELEASE MOTOR

RENEW **86.25.54**

Open the boot lid.
Remove the release motor securing bolts.
Reposition the release motor from the boot lid for access.
Disconnect the motor harness motor multi plug.
Remove the motor from the link rod.
Remove the motor mounting securing screws and discard the motor.
Reverse the removal procedure to fit a replacement motor.

3001B

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COMBINATION SWITCH

RENEW **86.65.55**

Open the door.
Release the steering column adjustment lever.
Position the column in its fully extended condition.
Lock the column in this position with the lever.
Remove the steering wheel 57.60.01.
Remove the rheostat switch knob and remove the screws securing the column lower nacelle.
Remove the lower nacelle.
Remove the screws securing the upper nacelle and remove the nacelle.
Remove the screws securing the left hand connector mounting plate.
Reposition the plate for access to the flasher switch harness multi plug.
Disconnect the multi plug.
Remove the bolt securing the switch and remove the switch.

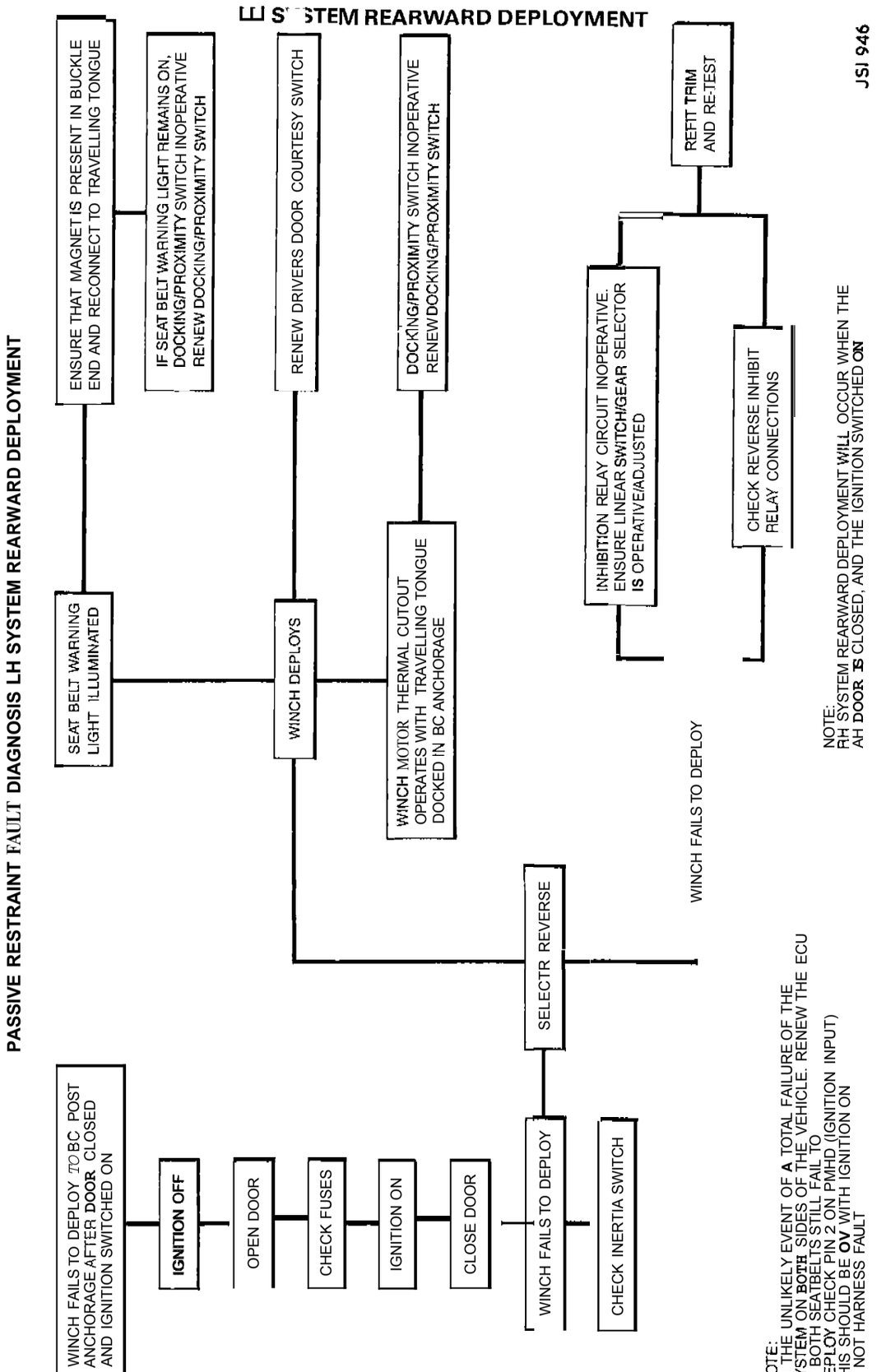
Reverse the removal procedure to fit a replacement switch.

3001B

PASSIVE RESTRAINT SYSTEM

FAULT DIAGNOSIS

86.55.00

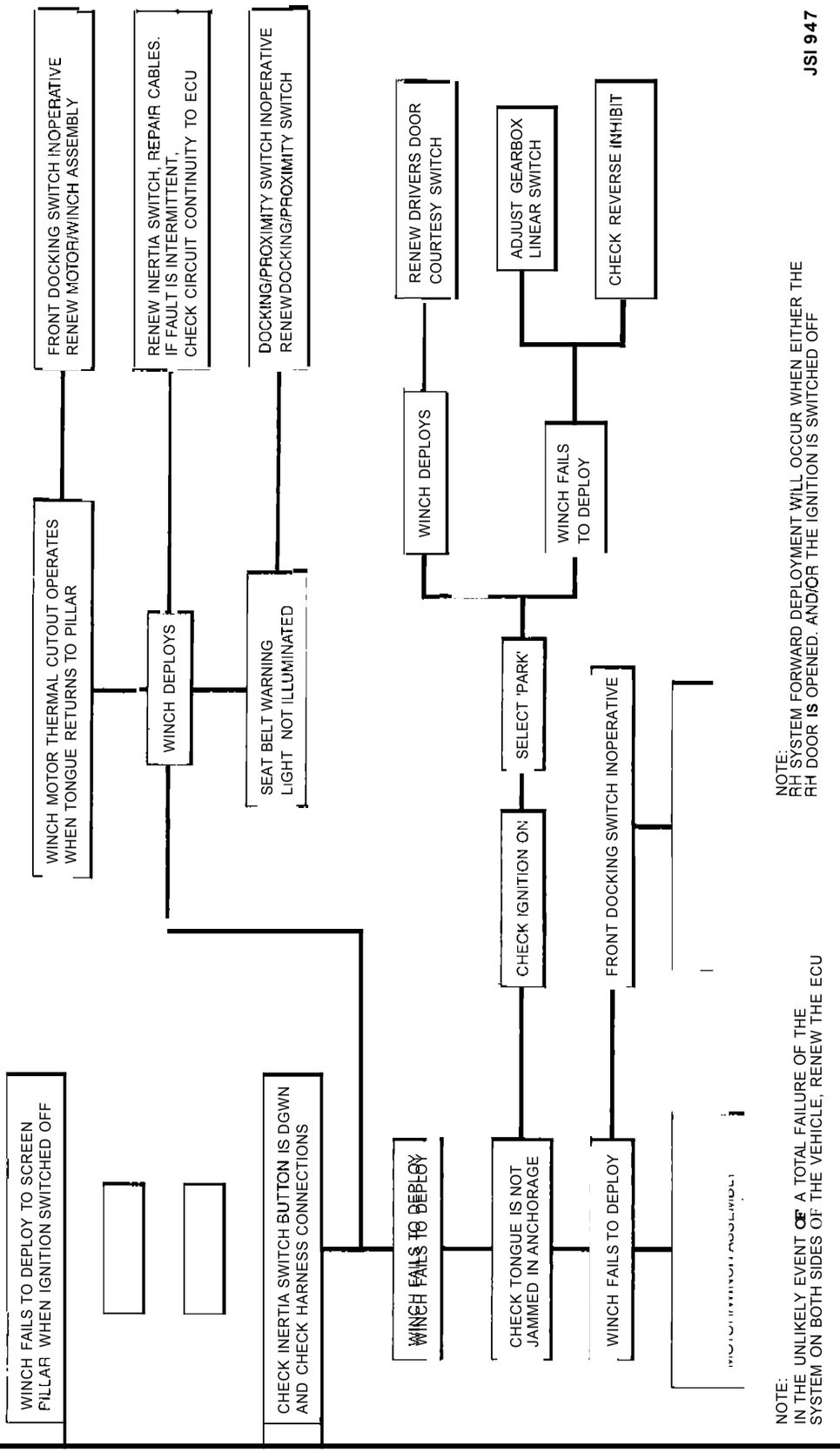


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PASSIVE RESTRAINT SYSTEM

FAULT DIAGNOSIS — **LH SYSTEM FORWARD DEPLOYMENT** — **86.55.00**

PASSIVE RESTRAINT FAULT DIAGNOSIS LH SYSTEM FORWARD DEPLOYMENT



JSI 947

PASSIVE RESTRAINT ECU OPERATIONAL TEST

The following procedure is designed to test the operation of the passive restraint ECU. Carry out each test in sequence in the order given below. If the system does not function in the manner described, refer to Jaguar Diagnostic System to locate the fault.

1 Enter car (drivers seat). Close and lock both front doors. Operate inertia switch. Doors will remain locked.

2 Insert key into ignition. Seatbelt will remain at A post.

3 Turn ignition on (position 2). Seatbelt will remain at A post.

4 Turn ignition off (position 0). Reset inertia switch. Turn ignition on (position 2). Both seatbelts will deploy to B post. 'Seatbelt not fitted' warning will activate until drivers seatbelt latches in B post.

5 Open drivers door. Drivers seatbelt will retract to A post.

6 Open passenger door. Passenger seatbelt will retract to A post.

7 Close drivers door. Drivers seatbelt will deploy to B post.

8 Close passenger door. Passenger seatbelt will deploy to B post.

9 Turn ignition off (position 0). Both seatbelts will retract to A post.

10 Turn ignition on (position 2). Both seatbelts will deploy to B post. Lock doors. Operate inertia switch. Doors will unlock. NOTE: It is necessary to detect the logic output from pin 1 LB86. Output should be logic 0.

11 Open drivers door. Drivers seatbelt will remain at B post.

12 Open passenger door. Passenger seatbelt will remain at B post.

13 Close both doors. Turn ignition off (position 0). Seatbelts will remain at B post.

14 Reset inertia switch. Seatbelts will retract to A post.

15 Turn ignition on (position 2). Detach drivers seatbelt from guide rail carrier. Seatbelt warning will activate.

16 Reconnect seatbelt to carrier. Seatbelt warning will de-activate.

17 End of test.

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PASSIVE RESTRAINT ECU LOGIC

Truth tables have been provided for information and to aid diagnostic work. The following notes are also relevant.

1 With ignition on (position 2) and reverse gear selected, the drivers door switch input is inhibited.

2 The ECU must be capable of detecting an inertia switch operation with ignition 'on' AND 'off.

3 The ECU must be capable of discriminating **between** an inertia switch operation and 'ignition off.

4 Where indicated thus '*' logic input can be either 'logic 1' or 'logic 0; i.e. the output state described is not dependant upon that particular input.

– This combination of logic can only occur under fault conditions.

SEATBELT WARNING TRUTH TABLE

L.H. CHANNEL R.H. CHANNEL	SKT4 SKT 15	SKT8 SKT 13	SKT 7 SKT 14	SKT 6	SKT 10	SKT 2	SKT3
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN. SWITCH	OUTPUT LOGIC
	★	0	★	★	0	0	LOW
	★	0	★	★	0	1	HIGH
			★	★	1	0	LOW
			★	★	1	1	HIGH
			★	★	0	0	LOW
			★	★	0	1	HIGH
	★		★	★	1	0	HIGH
	★	1	★	★	1	1	HIGH

RUN TO FRONT TRUTH TABLE

L.H. CHANNEL R.H. CHANNEL	SKT4 SKT 15	SKT 8 SKT 13	SKT 7 SKT 14	SKT 6	SKT 10	SKT2	PIN2 PIN 5	PIN3 PIN 6
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN. SWITCH	OUTPUT VOLTAGE	
	0	★	0	0	*	0	0V	12v
≠	0	★	0	0	★	1	0V	12V
	0	*	0	1	*	0	0V	0V
	0	★	0	1	*	1	0V	0V
	0	★	1	0	*	0	0V	0V
≠	0	★	1	0		1	0V	0V
	0	★	1	1	★	0	0V	0V
	0	★	1	1	★	1	0V	0V
	1	★	0	0	★	0	0V	0V
≠	1	★	0	0	★	1	0V	12V
	1	★	0	1	★	0	0V	0V
	1	★	0	1	★	1	0V	0V
	1	★	1	0	★	0	0V	0V
≠	1	★	1	0	★	1	0V	0V
	1	★	1	1	★	0	0V	0V
	1	*	1	1	★	1	0V	0V

RUN TO REAR TRUTH TABLE

L.H. CHANNEL R.H. CHANNEL	SKT 4 SKT 15	SKT 8 SKT 13	SKT 7 SKT 14	SKT 6	SKT 10	SKT 2	PIN 2 PIN 5	PIN 3 PIN 6
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN. SWITCH	OUTPUT VOLTAGE	
	0	0	★	0	★	0	0V	0V
≠	0	0	★	0	★	1	0V	0V
	0	0	★	1	★	0	0V	0V
	0	0	★	1	★	1	0V	0V
	0	1	★	0	★	0	0V	0V
≠	0	1	★	0	★	1	0V	0V
	0	1	★	1	★	0	0V	0V
	0	1	★	1	★	1	0V	0V
	1	0	★	0	★	0	12V	0V
≠	1	0	★	0	★	1	0V	0V
	1	0	★	1	★	0	0V	0V
	1	0	★	1	★	1	0V	0V
	1	1	★	0	★	0	0V	0V
≠	1	1	★	0	★	1	0V	0V
	1	1	★	1	★	0	0V	0V
	1	1	★	1	★	1	0V	0V

CENTRAL LOCKING TRUTH TABLE

L.H. CHANNEL R.H. CHANNEL	SKT 4 SKT 15	SKT 8 SKT 13	SKT 7 SKT 14	SKT 6	SKT 10	SKT 2	SKT 1
FUNCTION	DOOR SWITCH	REAR DOCK	FRONT DOCK	INERTIA SWITCH	BELT PROX	IGN. SWITCH	OUTPUT LOGIC
	★	★	★	0	★	0	HIGH
≠	★	★	★	0	★	1	HIGH
	★	★	★	1	★	0	LOW
	★	★	★	1	★	1	HIGH

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PASSIVE RESTRAINT ECU CONNECTORS

The two ECU connectors, one PM4, the other PMHD are identified with their pin numbers in Fig 1.

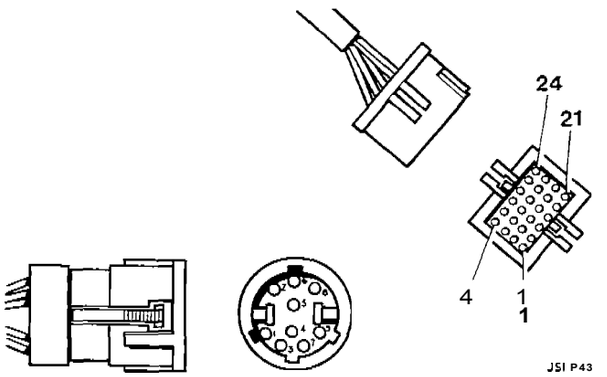


Fig 1

8-WAY PM4 CONNECTOR

Pin	Cable
1	NS LH system + 12V
2	YG LH motor positive to rear
3	YN LH motor positive to front
4	– Blanked off
5	YU RH motor positive to rear
6	YU RH motor positive to front
7	B Earth negative
8	B Earth negative
9	NS RH system + 12V

24-WAY PMHD CONNECTOR

Pin	Cable
1	RO Central locking O/P
2	KB Ignition (negative)
3	SLG LH belt warning
4	S LH door switch I/P
5	UR –
6	GP Inertia switch I/P
7	YB LH overtravel switch
8	YLG LH rear dock switch
9	GB –
10	YR LH belt proximity
11	YO RH belt proximity
12	–
13	YP RH rear dock switch
14	YS RH overtravel switch
15	O RH door switch
16	BK/SB Logic earth
17	SU

BULB FAIL MODULE – FRONT

CONNECTORS **86.55.00**

PIN	COLOUR	DIA.	FUNCTION
CONNECTOR PM49-WAY SOCKET (Fig **1**)			
1	Red/Orange	0.5	Fog
2	Blue/Pink	0.5	Dip
3	Blue/Slate	0.5	Main
4	Red	0.5	Side
6	White/Pink	0.5	Ignition
7	Brown/Orange	2.0	Main +
8	Brown/Pink	2.0	Fog/Dip +
9	Brown/Green	2.0	D.I/Side +
CONNECTOR PM49-WAY PLUG (Fig 2)			
1	Red/Orange	2.0	Fog
2	Red	0.5	Side
3	Green	0.5	D.I.
4	Yellow/Slate	0.5	D.I.
5	–	–	–
6	Yellow/Pink	0.5	Side Repeater
7	Pink	0.5	D.I. Fail
8	Pink/Slate	0.5	General Fail
9	Pink/Blue	0.5	Disconnect Earth Loop
S/BEAM AND H4 3WAY CONNECTOR (Fig 3)			
1	Blue/Slate	2.0	Main Beam
2	–	–	–
3	Black	2.0	Earth
S/BEAM AND H4 3 WAY CONNECTOR (Fig 4)			
1	Blue/White	2.0	Main Beam
2	Blue/Pink	2.0	Dip Beam
3	Black	2.0	Earth
EYELET RWC 51100351 (Fig *5*)			
1	**Black**	2.0	Earth
2	Black	2.0	Earth

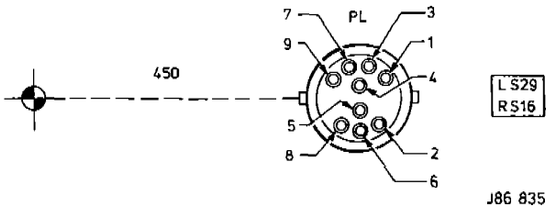


Fig 1

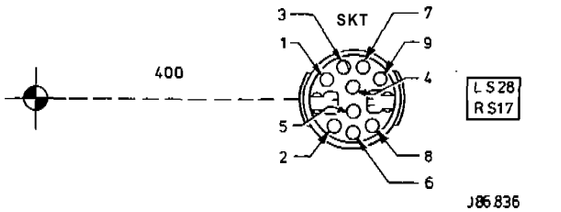


Fig 2

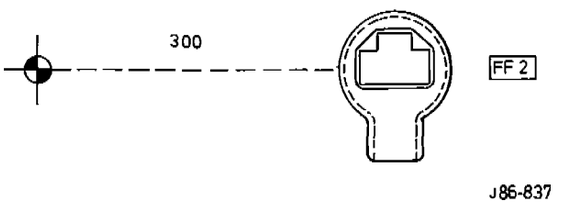


Fig 3

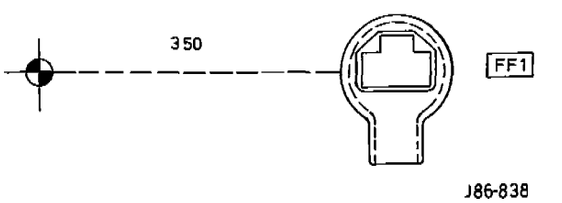


Fig 4

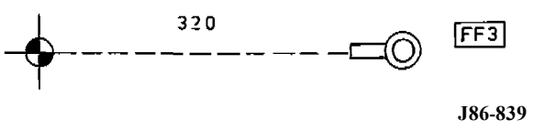


Fig 5

NOTES:

1 Cable lengths indicated on diagrams are from breakout point to connector mating face.

2 All module relays have a resistor/diode protection network (item 19 on wiring diagram). Diode value = 600V 1A. Resistor value = 82ohm 0.25W.

3 Bulb ratings are shown on the module cover.

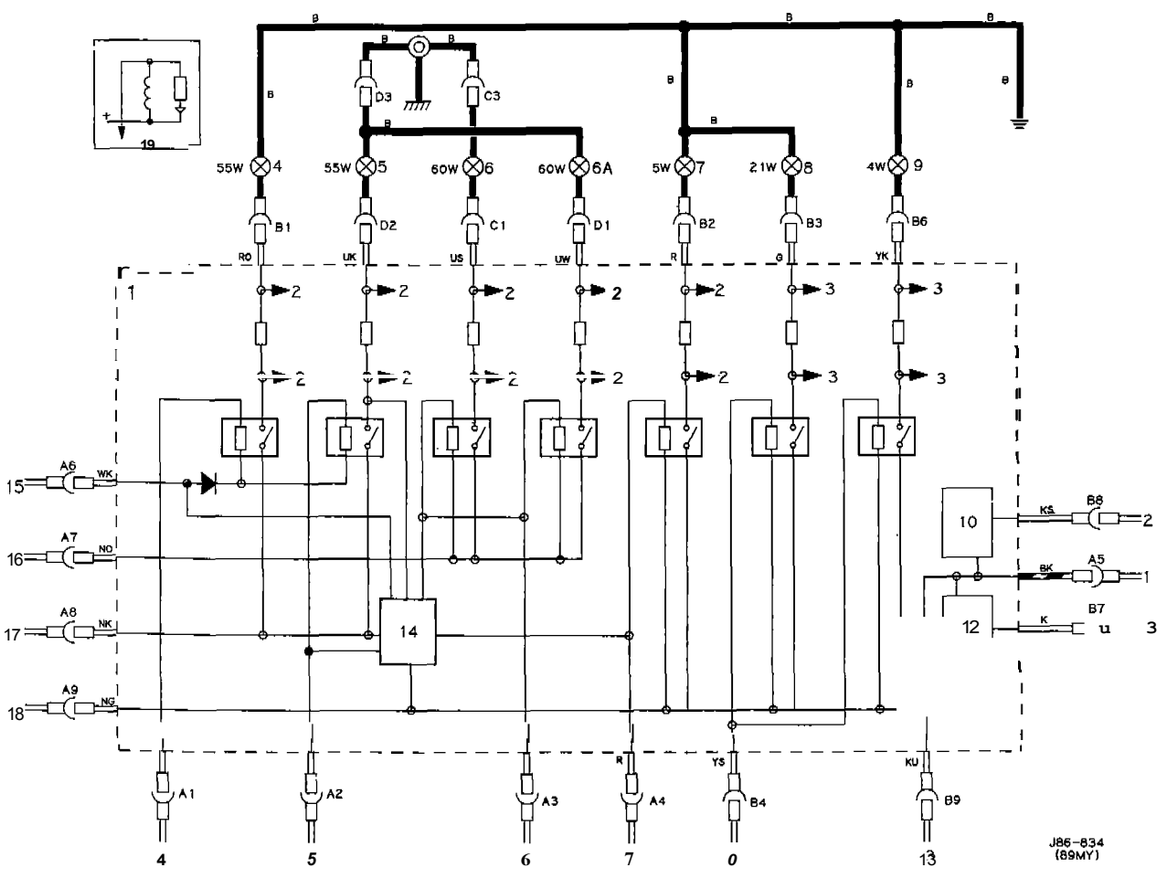
4 DIM/DIP FUNCTION (UK ONLY): With the ignition and sidelights 'ON' dip beam headlights will be energised, but will only give a maximum of 10% light output. This value is maintained over the entire operating voltage range. The module senses correct operation of main beam headlamps without affecting circuit resistance used for bulb failure monitoring. When main beam is activated, the low power feed to dip beam is shut off.

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BULB FAIL MODULE–FRONT

DIAGRAM **86.55.00**

Key to diagram
1 Module
2 General Fail
3 Direction Indicator Fail
4 Fog
5 Dip/
6 Main
6A Main/
7 Side
8 Direction Indicator
9 Direction Indicator Repeater
10 General Fail
11 Logic '0'
12 Direction Indicator Fail
13 Disconnect Earth Loop
14 Dim/Dip Pulse Width Modulator (UK ONLY)
15 Ignition
16 Main +
17 Fog/Dip +
18 Side/Direction Indicator +
19 Protection Network (Arrow goes to Switch)



BULB FAIL MODULE – REAR

CONNECTORS *86.55.00*

PIN	COLOUR	DIA.	FUNCTION
CONNECTOR PMHD 15-WAY SOCKET (Fig 1)			
1	Red/Blue	0.5	Fog
2	Slate/Lt Green	0.5	Reverse
3	Purple/Blue	0.5	stop
4	Red	0.5	Number Plate/Tail
5	Yellow/Slate	0.5	D.I.
6	Pink/Slate	0.5	General Fail
7	Pink	0.5	D.I. Fail
8	Black/Pink	0.5	Logic '0'
9	Green/Brown	0.5	Reverse
10	Green/Purple	0.5	stop
11	Red/Green	0.5	Tail
12	Yellow	0.5	D.I.
13	Red/Black	0.5	Number Plate
14	Pink/Blue	0.5	Disconnect Earth Loop
15	–	–	–
CONNECTOR PM4 4 WAY PLUG (Fig 2)			
1	Brown/Lt Green	2.0	Number Plate/Tail/ Side Marker (USA + CANADA ONLY)
2	White/Pink	0.5	Ignition +
3	–	–	–
4	–	–	–
5	Brown/Red	2.0	Reverse/Stop/D.I. /Fog +
6	Pink/Blue	0.5	Disconnect Earth Loop
CONNECTOR ECONOSEAL 2 WAY SOCKET (Fig 3)			
1	–	–	–
2	Black	0.5	Earth
3	Red/Black	0.5	Sidemarker (USA + CANADA ONLY)
CONNECTOR ECONOSEAL 3 WAY SOCKET (Fig 4)			
1	–	–	–
2	Black	0.5	Earth
3	Red/Yellow	0.5	Fog

NOTE: This connector has yellow self-adhesive tape. around the body.

EYELET RWC 51100327 (Fig 5)			
1	Black	0.5	Earth
2	Black	0.5	Earth

NOTES:

1 Cable lengths indicated on diagrams are from br kout p int to connector mating face.

2 All module relays have a resistor/diode protection network (item 23 on wiring diagram). Diode value = 600V 1A. Resistor value = 82ohm 0.25W.

3 Bulb ratings are shown on the module cover.

4 CONTROL LOGIC FUNCTION (USA AND CANADA ONLY):
1 Stop on/D.I. off – Both bulbs on.
11 Stop off/D.I. on – Dl flash both bulbs on
111 Stop/D.I on – Flash D.I./both bulbs.

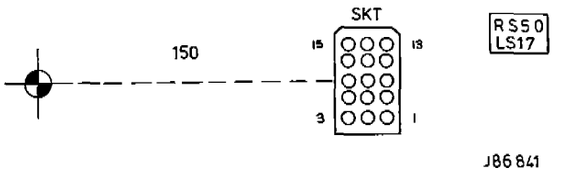


Fig 1

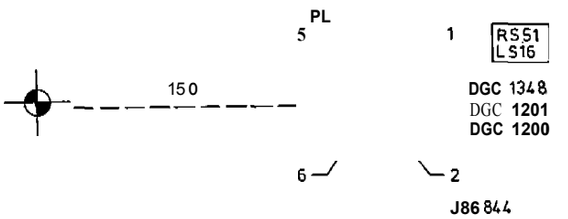


Fig 2

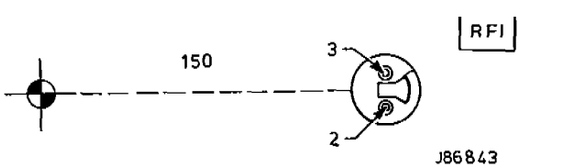


Fig 3

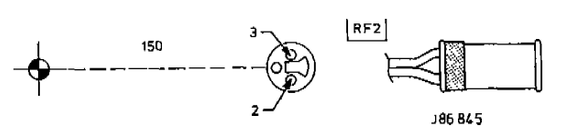


Fig 4

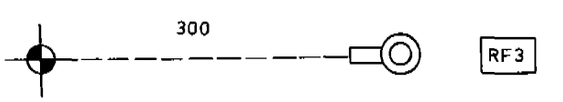


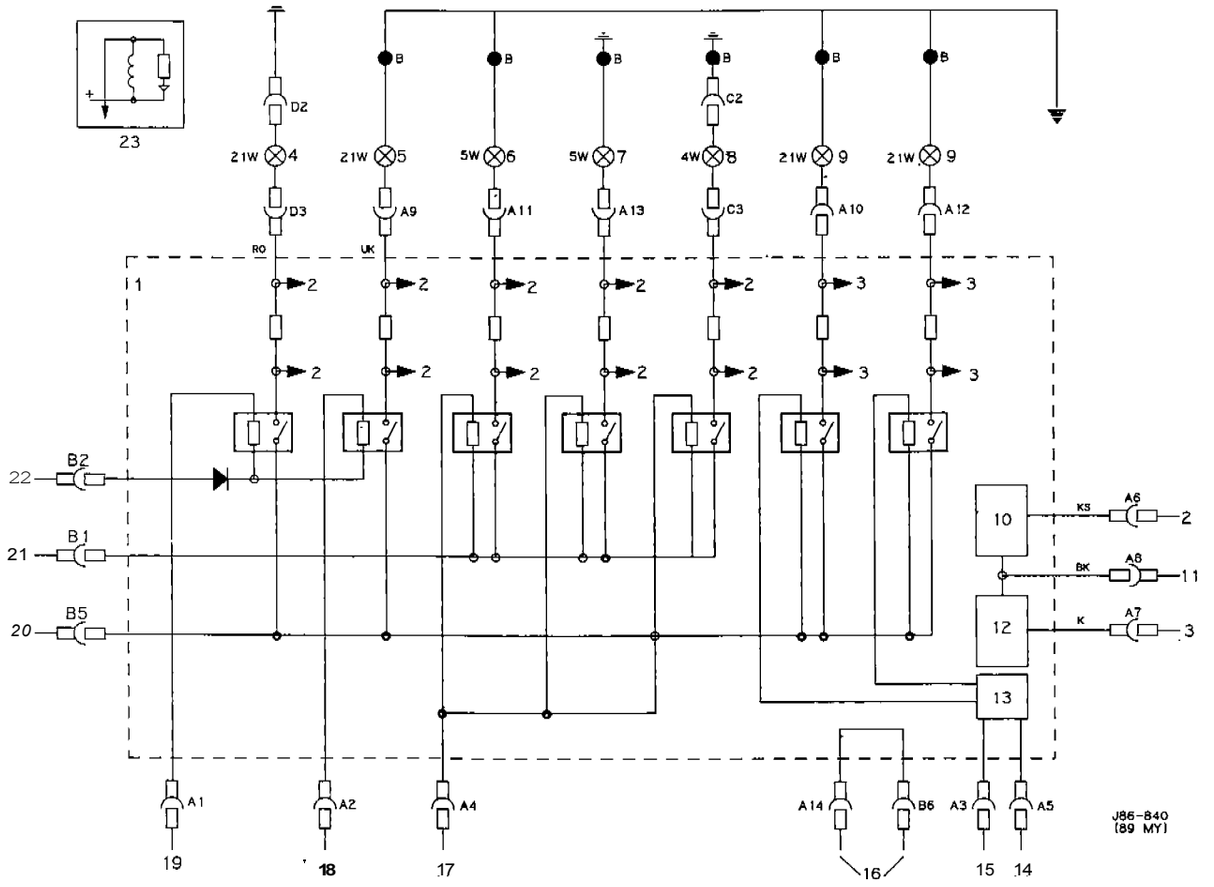
Fig 5

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BULB FAIL MODULE – REAR

DIAGRAM **86.55.00**

Key to diagram
1 Module
2 General Fail
3 Direction Indicator Fail
4 Rear Fog Lamp
5 Reverse Lamp
6 Tail Lamp
7 Number Plate Lamp
8 Side Marker Lamp (USAAND CANADAONLY)
9 Stop/Direction Indicator Lamp
10 General Fail
11 Logic '0'
12 Direction Indicator Fail
13 Control Logic and Timer
14 Rear Direction Indicator
15 stop
16 Disconnect Earth Loop
17 Number Plate/Side Marker/Tail Lamp
18 Reverse Lamp
19 Rear Fog Lamp
20 Reverse/Stop/D.I./Fog +
21 Number Plate/Tail/Side Marker +
22 Ignition
23 Protection Network (Arrow goes to Switch)



RIGHT HAND SIDE FUSE BOX

Fuse No	Fuse Colour Code	Value	Circuit
A 1	Grey	2 A	Ride levelling
A 2	Yellow	20 A	Right-hand air conditioning fan (where fitted) heater fan.
A 3	Yellow	20 A	Front and rear cigar lighters
A 4	Yellow	20 A	Spare position *
A 5	Light blue	15 A	Cooling fans and air conditioning clutch (where fitted)
A 6	Natural (White)	25 A	Headlamp power wash (where fitted).
A 7	Yellow	20 A	Heated rear screen
A 8	Red	10 A	Caravan/Trailer
B 1	Tan	5 A	Luggage compartment remote release
B 2	Light blue	15 A	Right-hand front door window lift and mirror motors if driver's door
B 3	Violet	3 A	Spare position *
6 4	Light blue	15 A	Doors, luggage compartment and fuel filler locks
B 5	Light blue	15 A	Right-hand rear door window lift
B 6	Tan	5 A	Windscreen washer
B 7	Red	10 A	Right-hand rear lamps (stop, reverse, direction indicators and fog ½where fitted]) and high mounted stop lamp (where fitted)
B 8	Light blue	15A	Right-hand main beam headlamp
C 1	Red	10 A	Radio
c2	Brown	7.5 A	Interior, luggage compartment, under bonnet and door guard lamps
c 3	Violet	3 A	Right-hand rear lamps (tail, number plate and side marker ½where fitted]).
c4	Violet	3 A	Instrument illumination dimmer and auxiliary side light relay.
c5	Tan	5 A	Right-hand front lamps (side, side marker [where fitted] direction indicators and repeater).
C 6	Violet	3 A	Aerial
c7	Red	10 A	Right-hand dip beam headlamp, right-hand front fog lamp (where fitted).
C 8	Tan	5 A	Door mirror heaters.

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LEFT HAND SIDE FUSE BOX

Fuse No	Fuse Colour Code	Value	Circuit
A 1	Light green	30 A	Left-hand front seat motors (where fitted) and seat heater (where fitted)
A 2	Yellow	20 A	Left-hand air conditioning fan (where fitted)/heater fan
A 3	Violet	3 A	Spare position *
A 4	Yellow	20 A	Spare position *
A 5	Red	10 A	Horns.
A 6	Natural (White)	25 A	Accessory fuse box (where fitted).
A 7	Red	10 A	Left-hand rear lamps (stop, reverse, indicators and fog [where fitted])
A 8	Violet	3 A	Spare position *
B 1	Light green	30 A	Right-hand front seat motors (where fitted) and seat heater (where fitted)
B 2	Light blue	15 A	Left-hand front door window lift and mirror motors if driver's door
B 3	Tan	5 A	Instrument pack
B 4	Yellow	20 A	Sunroof
B 5	Light blue	15 A	Left-hand rear window lift and fuel filler flap interface
B 6	Tan	5 A	Left-hand front lamps (side, side marker [where fitted] direction indicators and repeater)
B 7	Light blue	15 A	Windscreen wiper
B 8	Light blue	15 A	Left-hand main beam headlamp
C 1	Violet	3 A	Spare position *
c2	Grey	2 A	Diagnostic memory – automatic transmission (XJ6 4.0 litre)
c3	Red	10 A	Main fuse – automatic transmission (XJ6 4.0 litre).
c4	Violet	3 A	Spare position *
c5	Violet	3 A	Left-hand rear lamps (tail, number plate and side marker [where fitted]).
C6	Violet	3 A	Breather heater.
c 7	Red	10 A	Left-hand dip beam headlamp, left-hand front fog lamp (where fitted)
C 8	Violet	3 A	Spare position *

* NOTE: Although not used, positions marked * need to have fuses present to avoid a false fuse failure warning being displayed.

CENTRE FUSE BOX

Fuse No	Fuse Colour Code	Value	Circuit
1	Violet	**3 A**	Lamp modules right-hand rear and left-hand front and alternator control
2	Violet	3 A	Lamp modules right-hand front and left-hand rear and radio illumination
3	Tan	5 A	Speed control (where fitted)
4	Violet	3 A	Ride levelling (where fitted)
5	Violet	3 A	Cooling fan relay, heated windscreen washer jets and breather pipe heater relay
6	Tan	5 A	Instrument pack
7	Violet	3 A	Anti-lock braking system **(ABS)** main relay
8	Violet	3 A	Spare position *
9	Violet	**3 A**	Spare position *

* NOTE: Although not used, positions marked * need to have fuses present to avoid a false fuse failure warning being displayed.

IN-LINE FUSES

Protected Circuit	Location	Colour Code	Fuse Value
Wiper logic unit	Adjacent to wiper logic module below the glove compartment	Brown	7.5 A
Anti-lock braking system (ABS) ECU	Behind the front door pillar fuse box on the driver's side	Light green	**30 A**
Anti-lock braking system **(ABS)** pump motor	Behind the front door pillar fuse box on the driver's side	Light green	**30 A**
Radio where fitted)	Below centre console.	–	**10 A**
Radio memory	Below centre console.	–	**1 A**

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91MY CHANGES

CONTENTS

DESCRIPTION	OPERATION	OPERATION No	PAGE No
BULB FAILURE MODULE FRONT - 91MY	DESCRIPTION	86.00.00	86-112
BULB FAILURE MODULE REAR - 91MY	DESCRIPTION	86.00.00	86-112
CENTRE CONSOLE PANEL - 91MY	DESCRIPTION	86.00.00	86-112
CIGAR LIGHTER	DESCRIPTION	86.00.00	86-107
DIMMER MODULE	DESCRIPTION	86.00.00	86-107
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DIMMER MODULE

DESCRIPTION 86.50.00

A new split output dimmer has been introduced so that the interior lighting will go off, and the instrument pack remain illuminated if the ignition is switched off with the sidelights still switched on.

An audible warning sounds if the door is opened.

Switching off the sidelights extinguishes the instrument pack illumination and ends the audible warning.

When the ignition is off and the sidelights are switched on, the instrument pack illurnination can be dimmed using the manual dimmer knob, but the display cannot be completely extinguished.

There is an extra connector (SC7) on the 91MY dimmer module, SC7-2 (WN) is the auxiliary earth connection and SC7-1 (RO) is the output to the instrument pack bulb feed supply. There are also different pin numbers assigned to the steering column connector.

SIDELIGHTS ON POWER RELAY

DESCRIPTION 86.00.00

The 'Radio Illumination Relay' is replaced by the 'Sidelights On Power Relay', which also supplies the cigar lighter illumination.

CIGAR LIGHTER

DESCRIPTION 86.00.00

The cigar lighter receptacle/glow ring assembly has 3 Lucar type connectors which plug directly into the bulkhead harness.
The rear cigar lighter is connected into the circuit via a link lead.

The cigar lighter illumination is now supplied from the sidelights ON relay.

FUEL FILLER FLAP SOLENOID

DESCRIPTION 86.00.00

The fuel filler flap solenoid is operated from the central locking system and is electrically slaved to the left hand rear door lock.

In the event of failure of the electrical flap release, the flap can be opened by a mechanical override lever which is located behind the carpet trim in the left hand side of the boot.

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FUEL FILLER FLAP SOLENOID

RENEW *86 55 77*

WARNING: OPERATIONS INVOLVING THE FUEL SYSTEM RESULT IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS HIGHLY FLAMMABLE, GREAT CARE MUST BE TAKEN WHEN WORKING ON THE FUEL SYSTEM.

THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.
2 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3 A CO_2 FIRE EXTINGUISHER MUST **BE CLOSE** AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUEL SPILLAGE.
5 EMPTY THE FUEL FROM THE TANK INTO AN AUTHORISED EXPLOSION PROOF CONTAINER USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORK AREA MUST BE WELL VENTILATED.
8 THE BATTERY MUST BE DISCONNECTED BEFORE CARRYING OUT WORK ON THE FUEL SYSTEM.
9 THE OLD TANK MUST NOT BE **DISPOSED** OF UNTIL **IT** IS RENDERED SAFE FROM EXPLOSION.
10 MAINTENANCE PERSONNEL SHOULD HAVE UNDERTAKEN SPECIALIST TRAINING BEFORE BEING ALLOWED TO REPAIR COMPONENTS ASSOCIATED WITH THE FUEL SYSTEM.

Open the bonnet.
Disconnect the battery.
Open the boot.
Remove spare wheel and jack.
Remove the boot floor carpet, front liner, and **left** hand side liner.
Slacken and remove the fuel tank retaining strap to lower bracket clamping nuts and bolts (1 Fig 1).
Cut and remove the ratchet strap securing the filler housing solenoid block connector to the harness.
Disconnect the block connector (1 Fig 2).
Reposition the aperture seal to drain tube securing clip (2 Fig 2).
Disconnect the drain tube (3 Fig 2)from the aperture seal.
Open the fuel filler flap (1 Fig 3), and remove the filler cap (2 Fig 3).
Remove the aperture seal to filler neck garter spring (3 Fig 3).

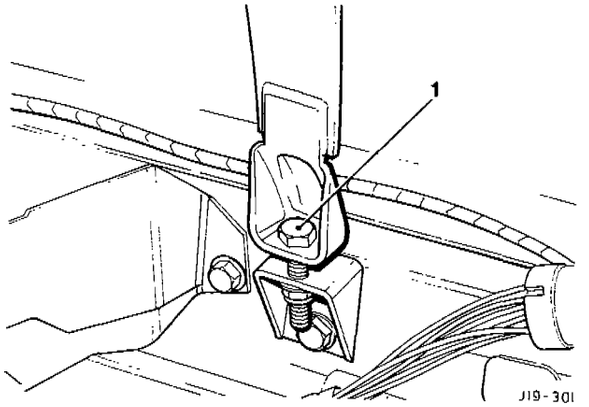


Fig 1

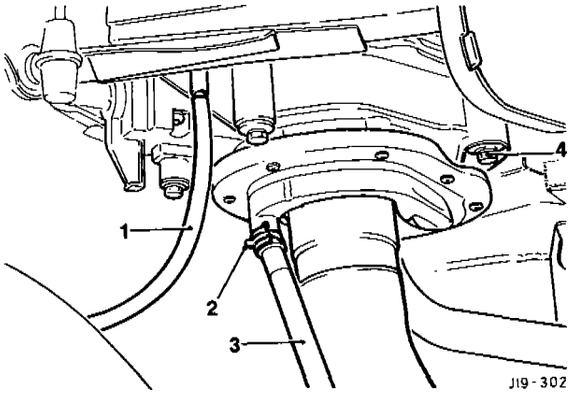


Fig 2

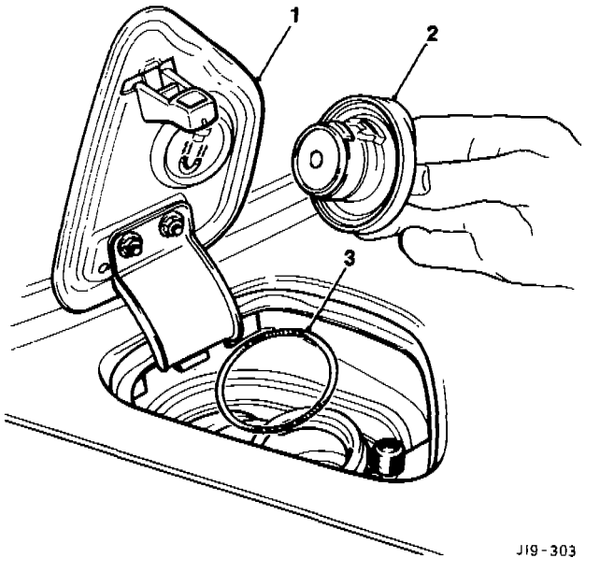


Fig 3

Undo and remove the filler housing to body securing bolts (4 Fig 1).
Displace the filler housing from the body filler flap aperture (remains captive on the filler neck).
Replace the aperture seal over the filler neck.
Reposition the fuel tank filler neck rearwards to assist removal of filler housing/solenoid assembly.
Move the filler housing front left hand corner upwards through the body aperture (Fig 2).
Reposition the fuel tank filler neck forwards.
Remove the filler housing assembly.

Note: The fuel filler flap solenoid is an integral part of the filler housing assembly, it cannot be replaced as a discrete item; the complete filler housing assembly must be replaced.

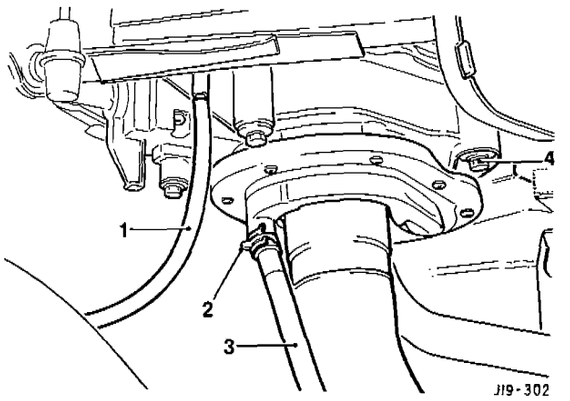


Fig 1

Remove and discard the filler housing gasket.
Clean the filler housing gasket faces.
Place the new filler aperture housing to front.
Remove the backing from the gasket,
Fit the new gasket to the filler housing flange.
From inside the boot, fit the filler housing to position the front left hand corner through the body aperture.
Reposition the fuel tank filler neck rearwards and fit the aperture seal over the filler neck.
Move the fuel tank filler neck and filler housing to align with the body aperture.
Fit and tighten the filler housing to the body securing bolts.
Fit and seat the aperture seal to the filler neck garter spring.
Connect the drain tube to the aperture seal (3 Fig 1).
Reposition and seat the drain tube to aperture seal securing clip (2 Fig 1).
Fit the fuel filler cap.
Connect the filler housing solenoid harness block connector.
Secure the block connector to the harness with a ratchet strap.

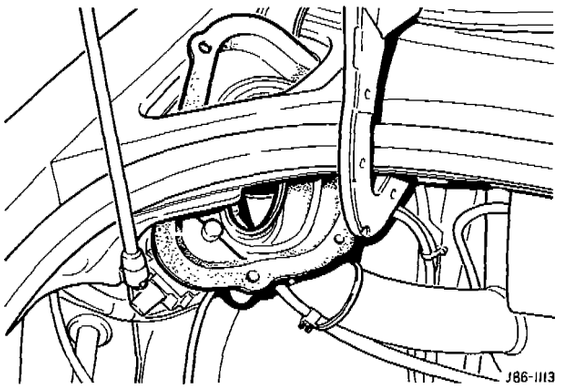


Fig 2

Reposition the fuel tank retaining strap lower brackets to the body bolt holes, then fit and tighten the body securing bolts.
Tighten the fuel tank retaining strap to the lower bracket clamping nuts and bolts, ensuring that no cables and pipes have been trapped.
Close the filler flap to check the alignment with the body.
Open the filler **flap.**
Remove the rubber stop from the adjustment screw.
Adjust the screw up or down as required.
Refit the rubber stop.
Close the filler flap.
Refit the boot front liner, left hand side liner and boot floor carpet.
Replace spare wheel and jack.
Close the boot.
Connect the battery.
Close the bonnet.

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FUEL PUMP LINK HARNESS

RENEW *86.70.20*

Open the bonnet.
Disconnect the battery.
Open the boot.
Remove spare wheel and jack.
Remove the boot front liner and floor carpet.
Disconnect the fuel pump link harness to side harness block connector.
Cut and remove the ratchet straps securing the link harnesses.
Reposition the link harness from behind the fuel tank left hand retaining strap.
Disconnect and remove the link harness from the fuel tank evaporative loss flange socket (1 Fig 1).
Connect the new link harness to the fuel tank evaporative loss flange socket.
Reposition the link harness behind the fuel tank left hand retaining strap.
Connect the link harness to the **side** harness block connector.
Secure the fuel pump link harness with ratchet straps.
Refit the boot front liner and floor carpet.
Replace the spare wheel and jack.
Close the. boot.
Connect the battery.
Close the bonnet.

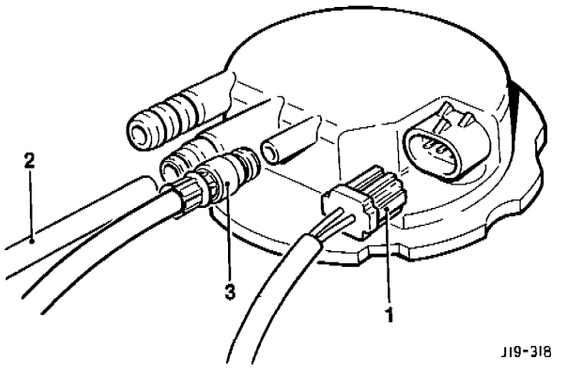


Fig 1

FUEL SYSTEM RELAY

DESCRIPTION **18.00.00**

The fuel pump relay has been re-positioned from under the passenger footwell to the underbonnet LHS forward of the bulkhead, and the colour of the relay base has changed from red to yellow.

FUEL SYSTEM RELAY

RENEW **18.30.30**

Open the bonnet and disconnect the battery.
The fuel pump relay is mounted adjacent to the brake pedal box.
Displace the relay cover and remove the relay from the yellow base connector.
Fit the new relay to the base connector and replace the relay cover.
Reconnect the battery and close the bonnet.

POWERED SEATS

DESCRIPTION *86.00.00*

The seat adjust relay used on 90MY vehicles is deleted at 91MY. Seat position control is now provided via the right and left seat relays which use earth switching instead of ignition positive and the earth switched 'door ajar' switch for control signals.

E POST LAMPS

DESCRIPTION **86.00.00**

E post lamps will only come on with the keyswitch in the auxiliary ignition position, and the 3 redundant wires that went to the passive ECU have been deleted.

SCREENWASH HEATER

DESCRIPTION ***86.00.00***

The screenwash heater element wires have been split *so* that the wire for the right hand heater element is fed from the right hand side and the left hand one from the left side, instead of feeding both from the right hand side.

LOAD DUMP MODULE

DESCRIPTION ***86.00.00***

The load dump module connector is changed to a PM5 type and is now earthed via pin 3 of this connector instead *of* direct to the body, also the fuses have been changed.

RADIATOR COOLING FAN MOTOR

DESCRIPTION **86.00.00**

Electrical connection to the radiator cooling fan motor is via a 2 way connector integral to the motor body, replacing the flying lead used at 90MY.

IGNITION SWITCH

DESCRIPTION **86.00.00**

The two 6 way PMHD column switchgear harness interface connectors SC5 and *SC6* are replaced by **one** 6 way PMHD connector, SC8 in **order to** rationalise the number **of** connectors in the column switchgear area.

GEAR SELECTION ILLUMINATION MODULE

DESCRIPTION ***86.00.00***

The gear selector illumination module connector is changed from **a** 15 way PMHD to a MULTILOCK connector.

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PASSIVE RESTRAINT

DESCRIPTION *86.00.00*

The following wires to the passive restraint ECU are deleted:-

Ignition ground	Connector LB86 Pin 5
Logic earth	Connector LB86 Pin 9
Logic earth	Connector LB86 Pin 12

These wires are spliced internally inside the ECU and are no longer needed.

CENTRE CONSOLE PANEL

DESCRIPTION 86.00.00

The centre console panel connector is changed from a 15 way PMHO to a 12 way Multilock connector. Although 13 wires are used, pins 12 and 15 on the previous connector go to the same PCB track on the clock.

BULB FAIL WARNING SYSTEM REAR
BULB FAIL WARNING SYSTEM FRONT

DESCRIPTION *86*.00.00

New bulb fail modules are completely interchangeable with the ones used at 90MY.

IN-CAR ENTERTAINMENT

DESCRIPTION

86.00.00

Changes are as follows:-

90 MY	91 MY
World Audio (Clarion) 3" door speakers 4" bass speakers Hirschmann aerial	AJ9100 Series (Alpine) 4" Co-axial speakers 5.25" bass speakers CD autochanger option Hirschmann aerial

Rewiring work will involve cutting and crimping to connect the 5.25' heelboard loudspeakers as purely bass speakers in parallel across each pair of door speakers for the standard four channel output.

All 91 MY cars will have a CD link lead taped to the left hand side harness; one end is fitted to the Head Unit and the other end is clipped behind the forward trim panel in the boot to be connected to the optional CD autochanger unit.

There is a new aerial lead taped to the right side harness.

The unit is now earthed by the earth braid only, instead of the earth braid and connector 833 in pin 3.

A splice is now taken from Radio relay Aux +ve feed (pin 87) to the accessory fusebox for radio telephone use etc.

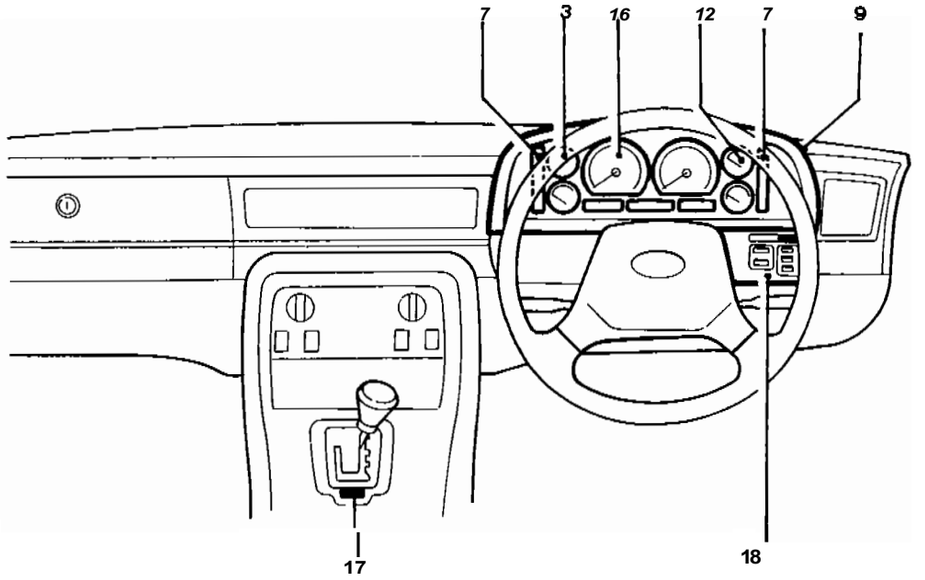
Battery +ve and Aux +ve feed in-line fuses are now replaced by thermal cut-out devices within the unit.

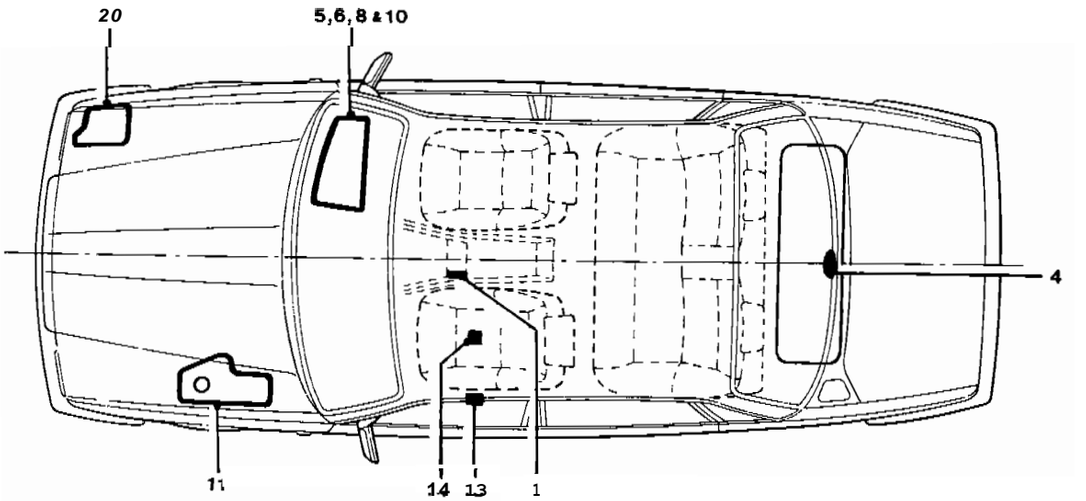
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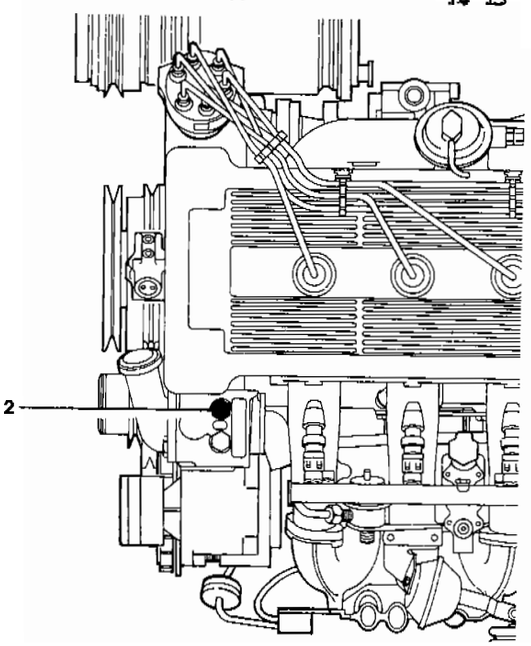
INSTRUMENTS

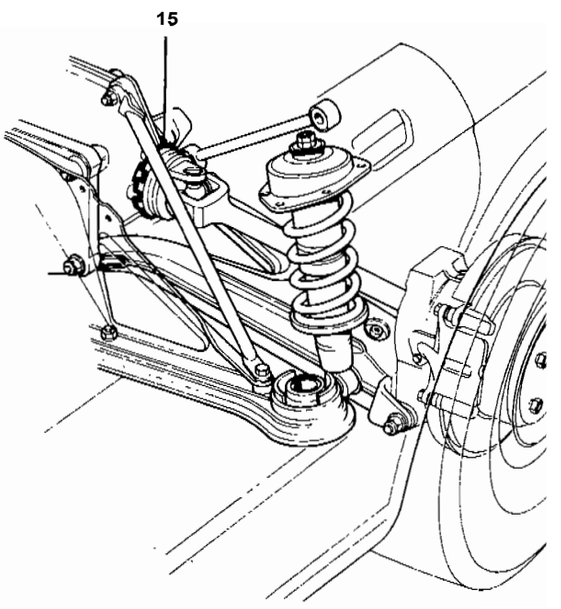
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INTRODUCTION 88.00.00

The Instrument Pack is a self-contained removeable unit that incorporates all the main display gauges and warning indicators that are used to present vehicle condition information. The primary function of the Instrument Display is to provide the driver with information usual to normal driving requirements. The secondary function is to display the results of trip computer calculations and information, in response to signals received from the trip computer keypad.

Information is received from sensors positioned at various locations about the vehicle via one of the two multi-pin sockets located at the rear of the Instrument Pack (Fig.1, Page 88-05).

Information concerning vehicle condition and operation is displayed in one of three ways:

1 Information necessary to confirm normal vehicle operation:
   road speed,
   engine speed,
   oil pressure,
   battery condition,
   fuel level,
   coolant temperature.
   This information is displayed using analogue gauges as shown in Fig. 1, Page 88-07.

2 Information indicating the presence of a hazard/fault condition (low oil pressure/door open etc.) or operational action (indicator flashing/headlamp full beam ON etc.). This information is provided by twenty two warning lamps/tell-tales, arranged in four groups, two groups of seven at the left and right sides of the instrument panel and two groups of four at the bottom of the instrument panel (Fig. 3, Page 88-07).

3 An LCD Display is located at the bottom-centre of the instrument pack and is normally used *to* display the odometer reading, but it can also be used to display vehicle condition messages associated with particular warning lamps and trip computer information such as vehicle speed, fuel usage and distance travelled.

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INSTRUMENT PACK CONNECTORS

PIN LOCATIONS 88.00.00

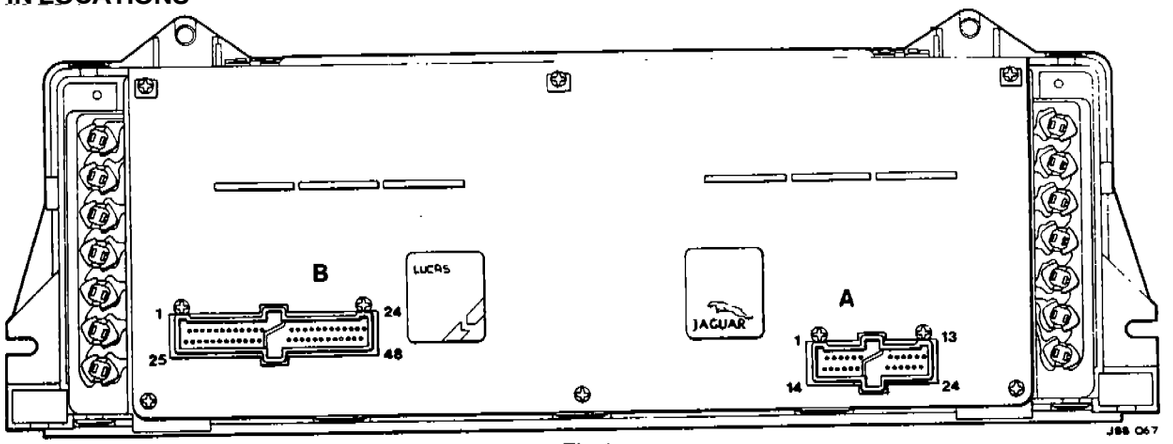


Fig 1

SOCKET A

Pin	Circuit Input
1	Fuel **Flow**
2	12v ignition feed
3	Ground
4	Ground
5	Battery feed
6	Spare
7	
8	-
9	
10	Illumination (bulb feed)
11	
12	-

Pin	Circuit Input
13	Serial output (1)
14	Serial input (2)
15	Speed sensor input
16	Speed sensor input (0v)
17	Speed sensor screen
18	Charge warning
19	Coolant temperature
20	Fuel level
21	Oil pressure
22	
23	
24	Tachometer input (-ve)

SOCKET B

Pin	Circuit Input
1	
2	Speed out
3	
4	
5	
6	
7	Brake pad feed
8	Fuse (4)
9	Low brake pressure
10	Brake fluid level
11	Brake lights
12	Fuse (3)
13	Wash fluid level
14	Sport mode
15	Seat belt
16	Boot open
17	Park brake (on)
18	D.I. bulb fail
19	Elec supply fail (controller)
20	Door open (LH rear)
21	Door open (RH rear)
22	Check engine (fuel fault)
23	Catalyst warning
24	Main beam

Pin	Circuit Input
25	Average speed
26	Average fuel
27	Fuel
28	Range
29	Clear
30	VCM
31	Inst. fuel
32	Distance
33	Ground keyboard
34	Brake pad sense
35	Fuse (1)
36	Fuse (2)
37	Coolant level
38	Side light (on)
39	Caravan (on)
40	Left D.I. (on)
41	Right D.I. (on)
42	Imp/Metric slide switch
43	General bulb fail
44	Gearbox fail
45	Elec supply fail (brakes)
46	Door open (LH front)
47	Door open (RH front)
48	Anti-lock fail

GAUGES

There are six analogue-style gauges contained in the instrument pack :

1 Speedometer.
2 Tachometer.
3 Battery condition.
4 Fuel Level.
5 Oil Pressure.
6 Coolant Temperature.

The speedometer and tachometer are true analogue gauges, in that the readings indicated are directly proportional to the parameters being measured. However, the four minor gauges (battery condition, fuel level, oil pressure and coolant temperature) each have their indication ranges resolved into 58 discrete steps. Slight gauge flicker may be discernable between individual steps.

Each gauge is contained in a sealed non-serviceable can, therefore complete replacement of the gauge/can is necessary in the event of a damaged or faulty gauge.

Extreme care should be exercised when replacing instrument pack components, to avoid damage to the delicate gauge indicator needles.

The coolant temperature gauge needle will move rapidly up the scale to 'N' when the thermostat opens. This is due to the sensitivity of the gauge and the close proximity of the sensor to the thermostat, ie when the thermostat opens, a rush of hot coolant from the cylinder block causes the sensor to react accordingly. It is perfectly normal, there is not a fault with the gauge.

BULBS

Guage and warning indicator illumination is controlled by a microprocessor located in the electronic instrument pack, there are no bulb relays. Bulbs are of the long life type. There are two different types of coloured bulb holder, cream and brown, the two types should not be interchanged and replacement bulbs should be of the same colour type.

The seven right-hand warning indicators are for primary warnings and illuminate RED. The seven left hand warning indicators are for secondary warnings and illuminate AMBER. The eight lower lamps are a mixture of status and warning lamps.

ODOMETER

Total distance travelled by the vehicle is displayed on an LCD display located centre-bottom of the Instrument Pack. The LCD is a single line, six digit, seven segment display.

The odometer shares the LCD display with Trip Computer and Vehicle Condition Monitor information. When the ignition is switched off, the odometer reading is permanently displayed. If the ignition is switched on and the odometer reading is not shown, it can be displayed by pressing the 'CLEAR' button located on the VCM keypad (Fig.2 Page 88-07) either once or twice.

Excessive heat in the vicinity of the LCD display will be automatically detected by a thermistor, and the backlight will be dimmed to prevent opaqueing of the LCD. This safety feature may be actioned if driving in hot countries with headlights on full beam for example.

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instrument Pack Displays and Keypad

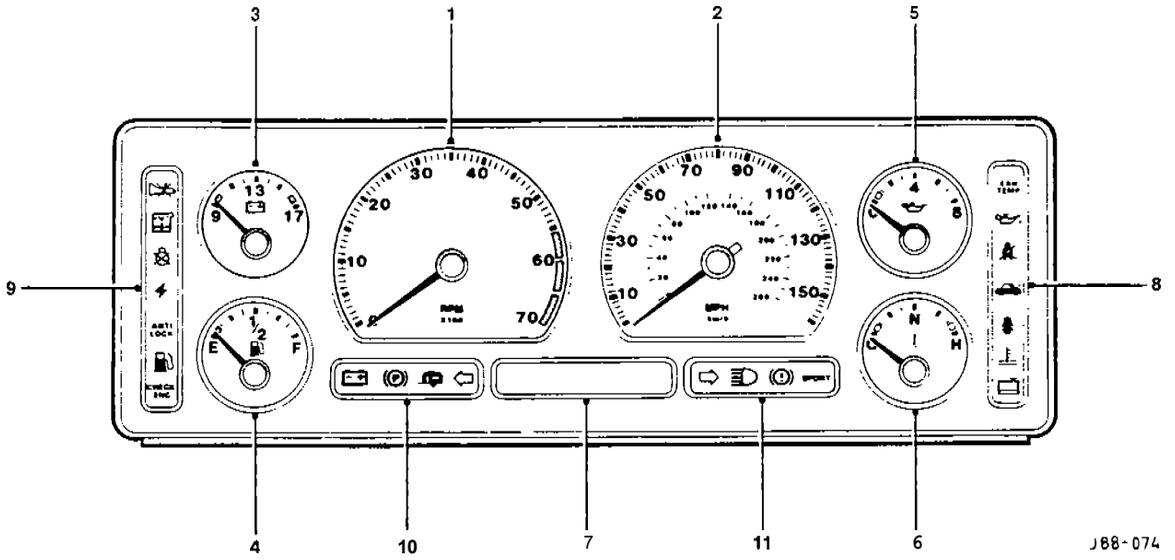


Fig 1

GAUGES (Fig 1 & 2)

1 Tachometer
2 Speedometer
3 Battery Condition
4 Fuel Gauge
5 Oil Pressure
6 Coolant Temperature
7 Odometer/VCM/Trip Computer Display
8 Primary Warning Indicators (RED)
9 Secondary Warning indicators (AMBER)
10 Status Warning Lights
11 Status Warning Lights
12 VCM/Trip Computer Keypad

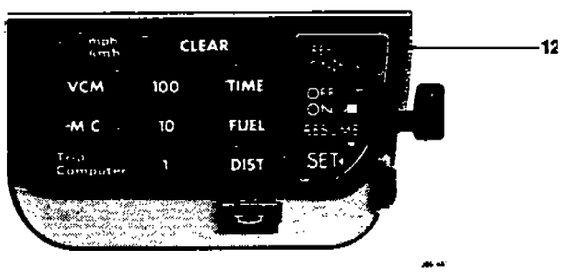


Fig 2

WARNING INDICATORS (Fig 3)

1 Automatic Transmission Failure
2 Low Windscreen Washer Reservoir Level
3 Bulb Failure
4 Circuit Failure
5 Anti-lock Braking System Failure
6 Low Fuel Level
7 Engine Management Fault
8 Ignition Light & Battery Alternator Fault
9 Handbrake ON
10 Caravan Indicator Fault
11 Direction Indicator
12 Direction Indicator
13 Headlamp Main Beam ON
14 Brake System Fault
15 Sport Mode
16 Low Coolant Level
17 High Coolant Temperature
18 Door Open
19 Boot Open
20 Seat Belt Not Fastened
21 Low Oil Pressure
22 Exhaust Temperature

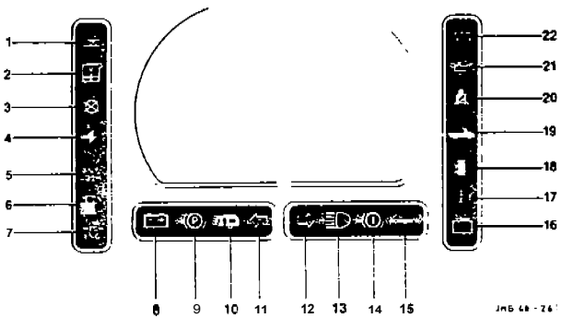


Fig 3

VEHICLE CONDITION MONITOR (VCM)

INTRODUCTION *88.00.00*

The Vehicle Condition Monitor information is displayed on the Odometer/VCM/Trip Computer display panel located below the tachometer and speedometer.

The condition of the vehicle is constantly monitored for operating faults which, if found, are highlighted by the illumination of certain warning lights. By pressing the VCM button located on the trip computer panel the relevant fault message will be displayed (Fig.1 & 2 Page 88-07) .
In the event that more than one fault has occurred, the display panel will cycle between messages, pausing for two seconds at each one.

To enable the trip computer information to be displayed, the button marked 'CLEAR' provides a means of extinguishing any VCM message present on the written display.
Pressing the VCM button when a fault exists will override any trip computer messages and re-display the relevant VCM fault symbol.

VEHICLE CONDITION MONITOR

FAULT CODES (CHECK ENGINE) 88.00.00

In the event of an engine management fault occurring the 'Check Engine' warning light will be illuminated. Additional information can be displayed by pressing the Vehicle Condition Monitor (VCM) button located on the trip computer panel.

When a fault has been signalled the likely area responsible for the malfunction can be indicated when the vehicle is stationary.
Switch off the ignition, wait at least 5 seconds, then turn the ignition switch to position 'II' (do not start the engine). Press the VCM button, this action will cause the VCM/trip computer display to illuminate the applicable fault code.

All fault codes are, when triggered, stored in the ECU memory. In addition, the 'check engine' lamp is illuminated. and will remain illuminated (when the ignition is switched on) until the fault is rectified and the ECU memory cleared by JDS or by grounding the relevent ECU pin (see notes for exceptions).

NOTES:

1 USA Specification: Fault codes 26 and 44 will not remain illuminated at each ignition on/off cycle. This is to prevent the check engine lamp becoming a nuisance if the vehicle runs out of fuel. Codes 26 and 44 will remain on only until the next ignition on/off cycle.
If the VCM function is used (while the lamp is illuminated), the code will be displayed. After the next ignition on/off cycle, the code will no longer be available to the driver. However, the code is still in the ECU memory and can be accessed by dealer personnel.

2 Non USA Catalyst Specification: Only the following fault codes will cause the check engine lamp to illuminate – 11, 12, 14, 16, 17, 18, 19, 68, 23, 26 and 44. The lamp will not remain illuminated after the next ignition on/off cycle.

3 Non Catalyst Specification: As Non USA Catalyst Specification except that codes 23, 26 and 44 are not active.

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CHECK ENGINE FAULT CODES

FAULT CODE	DESCRIPTION	IMPLICATION
11	Idle pot or associated wiring	Suspect idle trim pot out of normal operating range
12	Air flow meter or associated wiring	Suspect air flow meter signal out of normal operating range
14	Coolant thermistor or associated wiring	Suspect coolant thermistor resistance out of range or static during engine warm up
16	Air thermistor or associated wiring	Suspect air thermistor resistance out of range
17	Throttle pot or associated wiring	Suspect throttle pot resistance out of range
18	Throttle pot/air flow meter calibration	Suspect low throttle pot signal at high air flow
19	Throttle pot/airflow meter calibration	Suspect high throttle pot signal at low airflow
22	Fuel pump drive	Suspect ECU output signal to fuel pump relay
23	Fuel supply	Suspect poor feedback control in rich direction
24	Ignition drive	Suspect ECU output signal to ignition amplifier module
26	Air leak	Suspect poor feedback control in lean direction
29	ECU self check	Checks microprocessor function
33	Injector drive fault	Checks for ECU output to injectors
34	Injector drive and associated wiring	Looks for injector dribble
37	EGR drive	Looks for ECU output to EGR switch valve
39	EGR check sensor	Checks correct operation of EGR
44	Lambda sensor or associated wiring	Looks for feedback out of control rich or weak
46	Idle speed control coil 1 drive	Looks for ECU output to idle speed control stepper motor
47	Idle speed control coil 2 drive	Looks for ECU output to idle speed control stepper motor
48	Idle speed control motor or valve	Looks for stepper motor being wildly out of position with engine temperature hot and less than 86°F (30°C)
68	Road speed sensor or associated wiring	Looks for road speed indicating less than 5 km/h at high engine air flow
69	Drive/neutral switch or wiring	Looks for cranking in 'D' or high air flow in 'N'
89	Purge valve drive	Looks for ECU output to purge valve

INSTRUMENT PACK FLEXIBLE PRINTED CIRCUIT

RENEW **88.20.20**

Disconnect the battery.
Remove driver's side dash liner securing screws, release securing clip, and remove liner.
Release steering column clamp, fully extend steering wheel, and re-tighten clamp.
Remove instrument pack assembly securing screws.
Disconnect block connectors from rear of pack.
Displace and remove instrument pack assembly.
Remove instrument pack cowl-housing screws, and remove cowl-housing.
Place pack face down on bench, ensuring cowl/lens is protected with a suitable cloth or similar.

NOTE: To minimise risk of damage and contamination, all repairs conducted on the Instrument Pack should be performed in a non-static dust-free environment.

Remove the electronics pack cover securing screws, and remove the cover.
Carefully release the flexible printed circuit ribbon-ends from the edge-connectors, by squeezeing grips between thumb and forefinger while sliding out connector-latch (Fig.1).
Release the electronics pack retaining clips (Fig 2) and pivot the pack upwards.
Displace and remove the electronics pack from the instrument pack by lifting off from hinges.
Displace and remove all warning bulbs (bayonet fitting, twist 1/8th turn anti-clockwise to release– fig 3).

NOTE: There are two different types of coloured bulb holders, each type must be returned to the correct location.

Disconnect the flexible printed circuit to LCD multi-plug (Fig 4). DO NOT remove plug from the outer case of the Instrument Pack.
Remove the 7 veneer panel securing screws (Fig 1 Page 88-11), carefully peeling back top corners of the flexible printed circuit to gain access to 2 of the veneer panel securing screws.
With the gauges uppermost, release the cowl/lens securing clips and remove the cowl/lens assembly.

CAUTION: With the cowl/lens removed, DO NOT rest the pack face down. The gauge needles are extremely delicate and are easily damaged.
Also, take care not to scratch or damage the gauge faces, ensure cleanliness when handling the pack.

Displace and remove the veneer panel. The LCD module is attached to the veneer panel, and with caution may be removed as a complete, assembly. CAREFULLY, remove oil/water temperature gauge set, gently easing the pins out of the printed circuit crimps (Fig 2 Page 88-11). To prevent widening crimp connections, gauge pairs should be kept square to the Instrument Pack moulding whilst removing.

Repeat for the battery/fuel gauge set.
Repeat for the speedometer/tachometer gauge set.

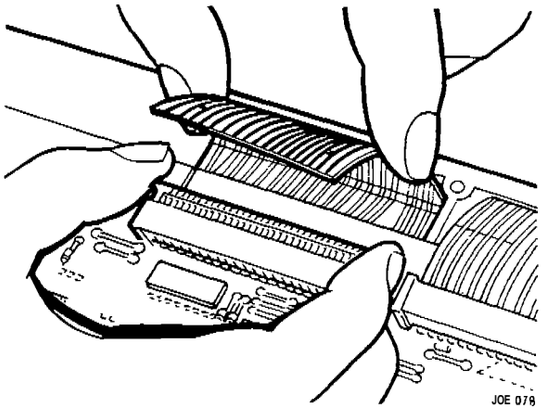


Fig 1

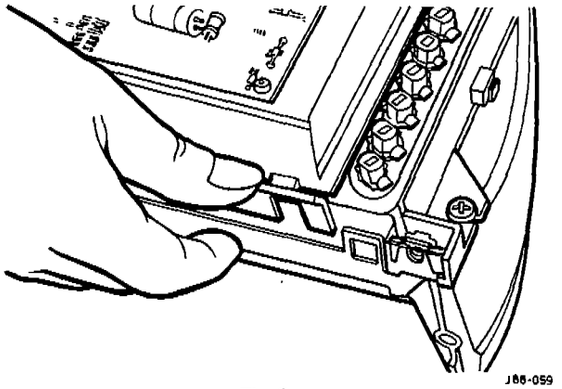


Fig 2

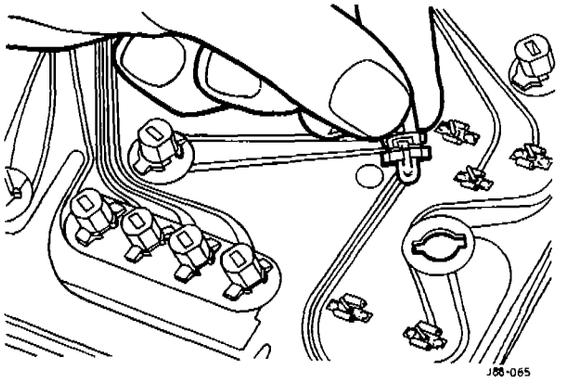


Fig 3

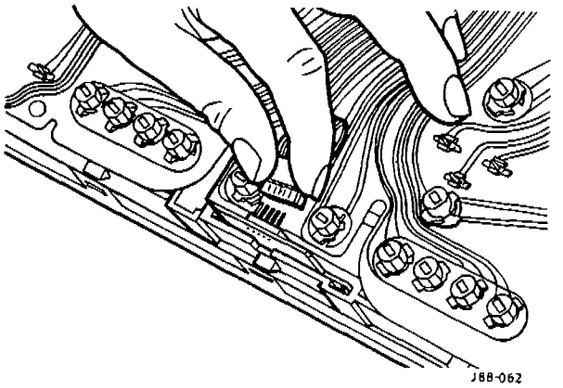


Fig 4

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Displace and remove the flexible printed circuit.

NOTE: Individual gauge movements CAN NOT be serviced, pointers and can location screws should not be removed. Gauges should not be placed face down.

Align new flexible printed circuit to instrument pack. Align and fit speedometer/tachometer gauge set to instrument pack. Take care not to damage gauge needles.
Ensure gauge set is inserted square to pack and flexible printed circuit and CAREFULLY push the gauge pins through the printed circuit. DO NOT press down on the crimps, distortion may occur. Press down on the flat tangs (set at right angles to the crimps) as shown in Fig 3

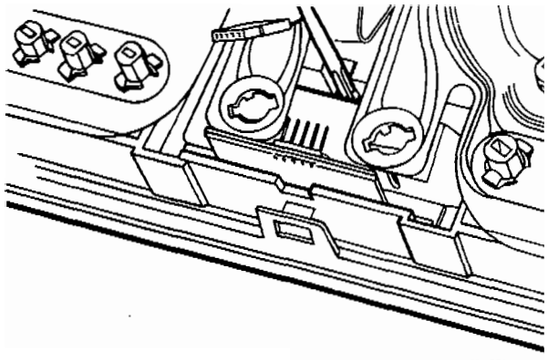


Fig 1

NOTE: Take care not to damage crimps or flexible printed circuit. If damage occurs or problems arise due to loose crimp connections, renew the flexible printed circuit.

Repeat for the battery/fuel gauge set.
Repeat for the oil/water temperature gauge set.

Before fitting veneer panel, carefully return all gauge needles to "STOP PIN" position.
Align and fit veneer panel/LCD module assembly. Fit and tighten centre securing screw.
Fit the cowl/lens assembly.
Fit and tighten the six remaining veneer panel securing screws.
Fit and fully seat warning bulbs, ensuring correct colour type is inserted at correct location (the 8 white bulb/holders are for gauge illumination, the remaining 24 are for warning indication only).
Connect the flexible printed circuit multi-plug to the LCD unit.
Carefully fit electronics pack over the flexible printed circuit connections and locate into hinges.
Pivot pack downwards and fit into securing clips.
Fit the flexible printed circuit to the edge-connectors, by positioning holes in flexible printed circuit membrane over the connector-latch locating pips and sliding latch to the fully closed position.
Align and fit the back cover to the electronics pack. Fit and tighten the securing screws.
Fit the cowl-housing to the pack. Fit and tighten the cowl-housing securing screws.

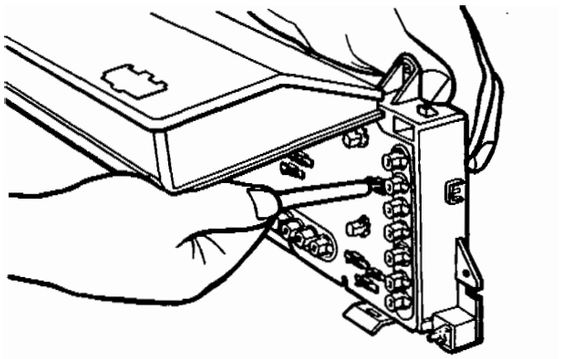
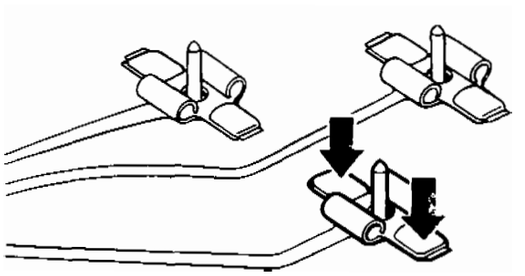


Fig 2

Fit instrument pack assembly into dashboard position, re-connect the block connectors.
Align assembly, fit and tighten the securing screws.
Return steering wheel to original position.
Refit the dash liner.
Reconnect the battery.



J88-06

Fig 3

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then be restored to the correct value.

INSTRUMENT PACK LENS/COWL

RENEW **88.20.17**

Disconnect the battery.
Remove driver's side dash liner securing screws, release the securing clip, and remove the liner.
Release the steering column clamp, fully extend the steering wheel, and re-tighten the clamp.

Remove the instrument pack assembly securing screws.
Disconnect block connectors from rear of pack.
Displace and remove the instrument pack assembly (Fig 1).

Release the cowl/lens securing clips and remove the cowl/lens assembly (1 Fig 2),

CAUTION: With the cowl/lens removed, DO NOT rest the pack face down. The gauge needles are extremely delicate and are easily damaged.
Also, take care not to scratch or damage the gauge faces, ensure cleanliness when handling the pack.

Fit the new cowl/lens assembly to the instrument pack.
Fit the instrument pack assembly into dashboard position, re-connect the block connectors.
Align the assembly, fit and tighten the securing screws.
Return the steering wheel to its original position. Refit the dash liner.
Reconnect the battery.

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then be restored to the correct value.

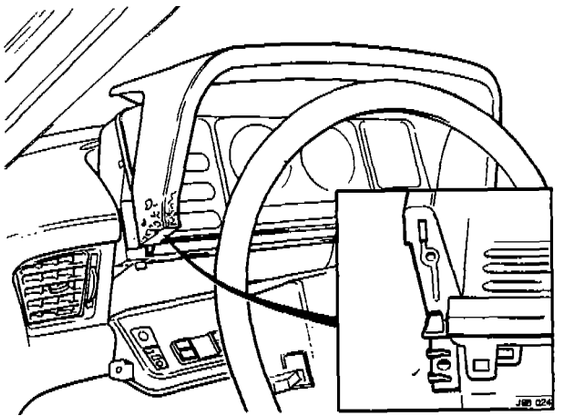


Fig 1

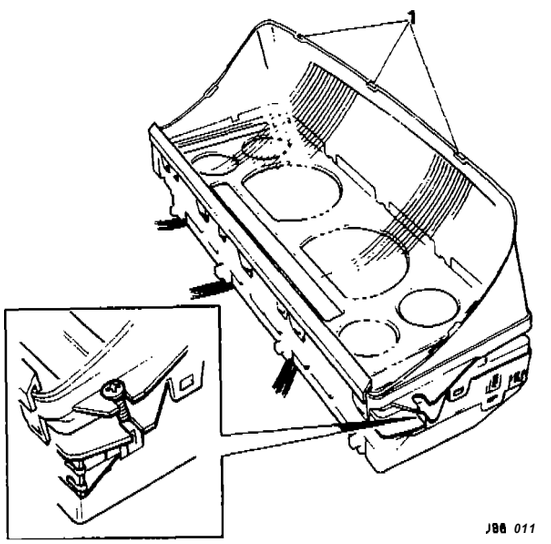


Fig 2

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INSTRUMENT ELECTRONICS PACK

RENEW **88.20.22**

Disconnect the battery.
Remove driver's side dash liner securing screws, release the securing clip, and remove the liner.
Release the steering column clamp, fully extend the steering wheel, and re-tighten the clamp.
Remove the instrument pack assembly securing screws.
Disconnect block connectors from rear of pack.
Displace and remove the instrument pack assembly.

Remove the instrument pack cowl-housing screws, and remove the cowl-housing.
Place the pack face down on the bench, ensuring that the case/lens is protected with a suitable cloth or similar.

NOTE: To minimise the risk of damage and contamination, all repairs conducted on the Instrument Pack should be performed in a non-static dust-free environment.

Remove the electronics pack cover securing screws, and remove the cover.
Carefully release the flexible printed circuit ribbon-ends from the edge-connectors, by squeezeing grips between thumb and forefinger while sliding out connector latch (Fig.1).
Release the electronics pack retaining clips (Fig 2) and pivot the pack upwards.
Displace and remove the electronics pack from the instrument pack by lifting off from hinges.

Carefully fit the new electronics pack over the printed circuit connections and locate into the hinges.
Pivot the pack downwards and fit into the securing clips.
Fit the flexible printed circuit to the edge-connectors, by positioning holes in flexible printed circuit membrane over the connector-latch locating pips and sliding latch to the fully closed position.
Align and fit the back cover to the electronics pack. Fit and tighten the securing screws.
Fit the cowl-housing to the pack. Fit and tighten the cowl-housing securing screws.

Fit the instrument pack assembly into dashboard position, re-connect the block connectors.
Align the assembly, fit and tighten the securing screws.
Return the steering wheel to its original position. Refit the dash liner.
Reconnect the battery.

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then be restored to the correct value.

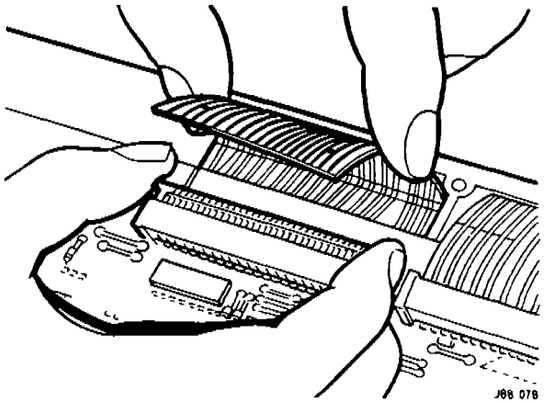


Fig 1

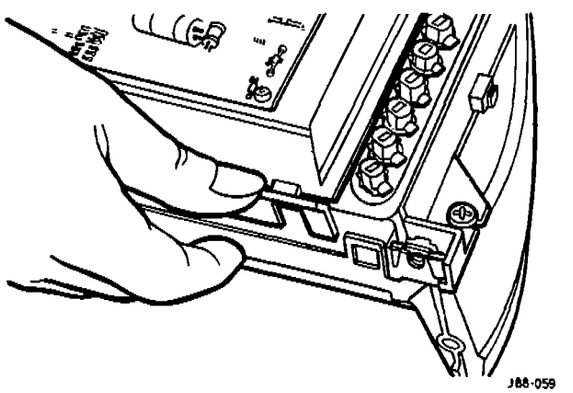


Fig 2

SPEEDOMETER/TACHOMETER GAUGE SET

RENEW **88.30.20**

Disconnect the battery.
Remove driver's side dash liner securing screws, release securing clip, and remove liner.
Release steering column clamp, fully extend steering wheel, and re-tighten the clamp.
Remove instrument pack assembly securing screws.
Disconnect block connectors from rear of pack.
Displace and remove instrument pack assembly.
Remove instrument pack cowl-housing screws, and remove cowl-housing.
Place pack face down on bench, ensuring cowl/lens is protected with suitable cloth or similar.

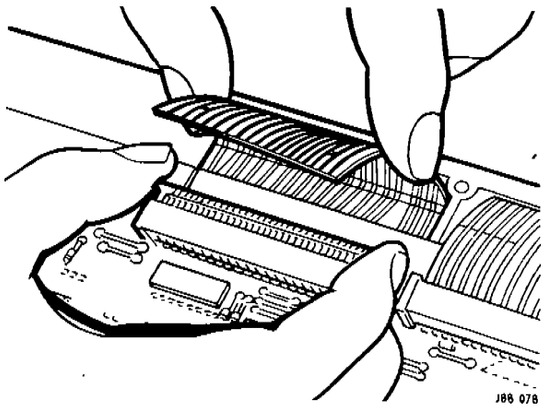


Fig 1

NOTE: To minimise the risk of damage and contamination, all repairs conducted on the Instrument Pack should be performed in a non-static dust-free environment.

Remove the electronics pack cover securing screws, and remove the cover.
Carefully release the flexible printed circuit ribbon-ends from the edge-connectors, by squeezeing grips between thumb and forefinger while sliding out connector latch (Fig.1).
Release electronics pack retaining clips (Fig 2) and pivot pack upwards.
Displace and remove electronics pack from the instrument pack by lifting off from hinges.
Displace and remove all warning bulbs (bayonet fitting, twist 1/8th turn anti-clockwise to release).

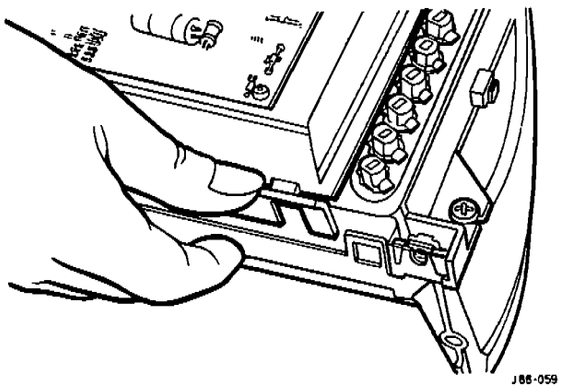
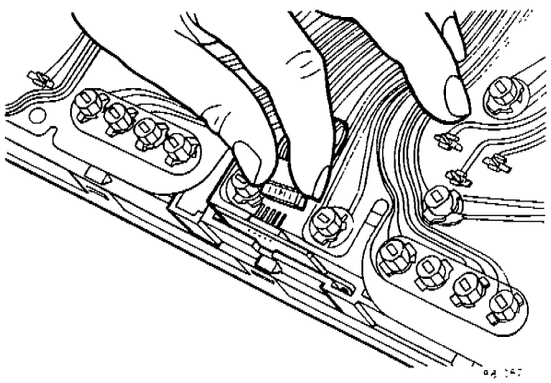


Fig 2

NOTE: There are **two** types of coloured bulb holders, each type must be returned to the correct location.

Disconnect the flexible printed circuit to LCD multi-plug (Fig 3). DO NOT remove plug from the outer case of the Instrument Pack.
Remove the 7 veneer panel securing screws, carefully peeling back top corners of the flexible printed circuit to gain access to 2 of the veneer panel securing screws.
With the gauges uppermost, release the cowl/lens securing clips and remove the cowl/lens assembly.


Fig 3

CAUTION: With cowl/lens removed, DO **NOT** rest pack face-down. The gauge needles are extremely delicate and are easily damaged. Also, take care not to scratch or damage the gauge faces, ensure cleanliness when handling the pack.

Displace and remove the veneer panel. The LCD module is attached to the veneer panel, but with caution may be removed as a complete, assembly.

CAREFULLY, remove speedometer/tachometer gauge set, gently easing the pins out of the printed circuit crimps (Fig 1 Page 88-15). To prevent widening crimp connections, gauge pairs should be kept square to the Instrument Pack moulding whilst removing.

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NOTE: Individual gauge movements CAN NOT be serviced, pointers and can location screws should not be removed.

Align and fit new speedometer/tachometer gauge set to the instrument pack (Fig 2). Take care not to damage the gauge needles.
CAREFULLY push the gauge pins through the flexible printed circuit. DO NOT press down on the crimps, distortion may occur. Press down on the flat tangs (set at right angles to the crimps) as shown in **Fig** 3.

NOTE: Take care not to damage crimps or flexible printed circuit. If damage occurs or problems arise due to **loose** crimp connections, renew the flexible printed circuit.

Before fitting veneer panel, carefully return all gauge needles to "STOP PIN" position.
Align and fit veneer panel and LCD module assembly. Fit and tighten centre securing screw.
Fit the cowl/lens assembly.
Fit and tighten the six remaining veneer panel securing screws.
Fit and fully seat the warning bulbs, ensuring the correct colour type is inserted at the correct location (the ***8*** white bulb/holders are for gauge illumination, the remaining **24** are for warning indication only).

Connect the flexible printed circuit multi-plug to the **LCD** unit.
Carefully fit electronics pack over flexible printed circuit connections and locate into the **hinges.**
Pivot pack downwards and fit into securing clips.
Fit the flexible printed circuit **to** the edge-connectors, **by** positioning holes in flexible printed circuit membrane over the connector-latch locating pips and sliding latch to the fully closed position.
Align and fit the back cover to the electronics pack. Fit and tighten the securing screws.
Fit the cowl-housing to the pack. Fit and tighten the cowl-housing securing screws.

Fit the instrument pack assembly into dashboard position, re-connect the block connectors.
Align assembly, fit and tighten securing screws.
Return steering wheel to original position.
Refit the dash liner.
Reconnect the battery.

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then **be** restored to the correct value.

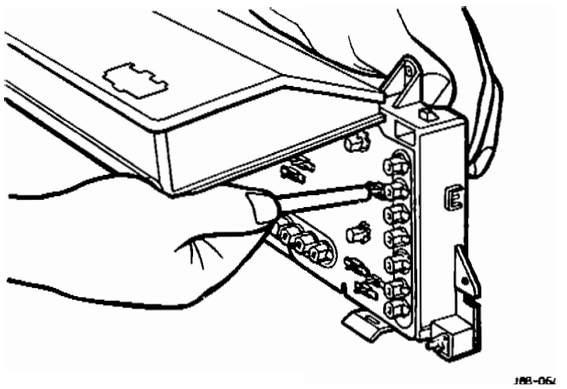


Fig **1**

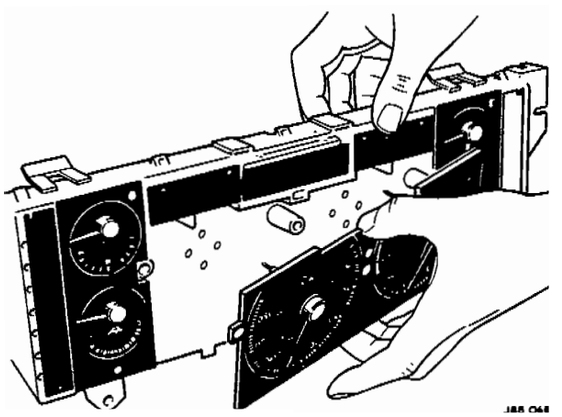
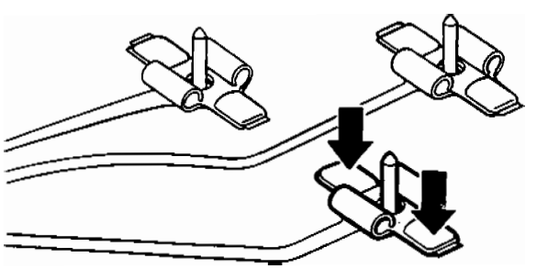


Fig 2



J88-066

Fig 3

OIL PRESSURE/COOLANT TEMPERATURE GAUGE SET

RENEW **88.25.09**

Disconnect the battery.
Remove driver's side dash liner securing screws, release securing clip, and remove liner.
Release steering column clamp, fully extend steering wheel, and re-tighten the clamp.
Remove instrument pack assembly securing screws.
Disconnect block connectors from rear of pack.
Displace and remove the instrument pack assembly.
Remove the instrument pack cowl-housing screws, and remove the cowl-housing.
Place pack face-down on bench, ensuring that cowl/lens is protected with a suitable cloth or similar.

NOTE: To minimise the risk of damage and contamination, all repairs conducted on the Instrument Pack should be performed in a non-static dust-free environment.

Remove the electronics pack cover securing screws, and remove the cover.
Carefully release the flexible printed circuit ribbon-ends from the edge-connectors, by squeezing grips between thumb and forefinger while sliding out connector latch (Fig.1).
Release electronics pack retaining clips and pivot pack upwards (Fig. 2)
Displace and remove electronics pack from instrument pack by lifting off from hinges.
Displace and remove all warning bulbs (bayonet fitting, twist 1/8th turn anti-clockwise to release) **Fig.** 3.

NOTE: There are two different types of coloured bulb holders, each type must be returned to the correct location.

Disconnect flexible printed circuit to LCD multi-plug (Fig.1 Page **88-17),** DO NOT remove plug from the outer case of the Instrument Pack.
Remove the 7 veneer panel securing screws, carefully peeling back top corners of the flexible printed circuit to gain access to 2 of the veneer panel securing screws.
With gauges uppermost, release cowl/lens securing clips and remove cowl/lens assembly.

CAUTION: With cowl/lens removed, **DO NOT** rest pack face-down. The gauge needles are extremely delicate and are easily damaged. **Also,** take care not to scratch or damage the gauge faces, ensure cleanliness when handling the pack.

Displace and remove the veneer panel. The LCD module is attached to the veneer panel, but with caution may be removed as a complets assembly.

CAREFULLY, remove oil pressure/coolant temperature gauge set, gently easing the pins out of the printed circuit crimps (Fig 2 Page **88-17).** To prevent widening of the crimp connections, gauge pairs should be kept square to the Instrument Pack moulding whilst removing.

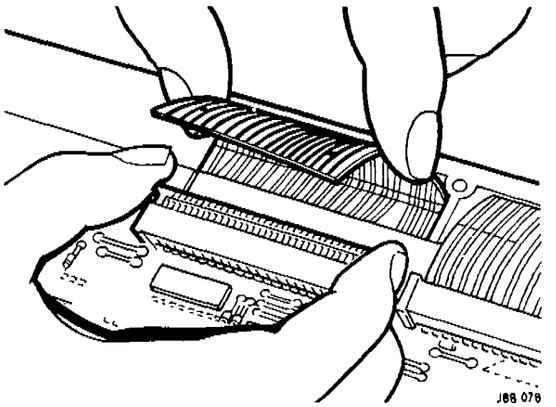


Fig 1

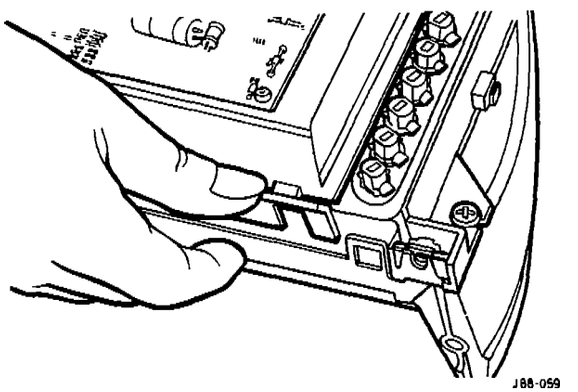


Fig 2

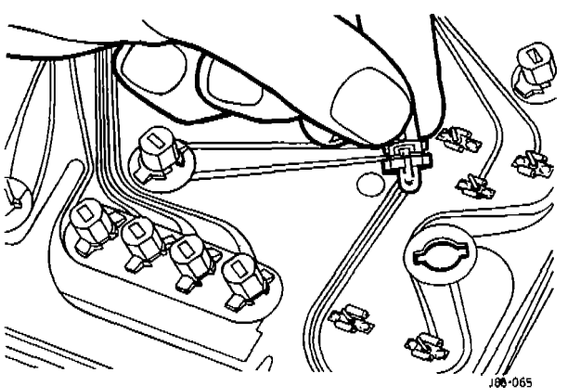


Fig 3

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NOTE: Individual gauge movements CAN NOT be serviced, pointers and can location screws should not be removed.

Align and fit the new oil pressure/coolant temperature gauge set to the instrument pack. Take great care not to damage the gauge needles.
CAREFULLY push the gauge pins through the flexible printed circuit. DO NOT press down on the crimps, distortion may occur. Press down on the flat tangs (set at right angles to the crimps) as shown in Fig 3.

NOTE: Take care not to damage crimps or flexible printed circuit. If damage occurs or problems arise due to loose crimp connections, renew the flexible printed circuit.

Before fitting veneer panel, carefully return all gauge needles to "STOP PIN" position.
Align and fit the veneer panel and LCD module assembly. Fit and tighten centre securing screw.
Fit the cowl/lens assembly.
Fit and tighten the six remaining veneer panel securing screws.
Fit and fully seat the warning bulbs, ensuring the correct colour type is inserted at the correct location (the 8 white bulb/holders are for gauge illumination, the remaining 24 are for warning indication only).

Connect the flexible printed circuit multi-plug to the LCD unit.
Carefully fit the electronics pack over the flexible printed circuit connections and locate into the hinges.
Pivot pack downwards and fit into securing clips.
Fit the flexible printed circuit to the edge-connectors, by positioning holes in flexible printed circuit membrane over the connector-latch locating pips and sliding latch to the fully closed position.
Align and fit the back cover to the electronics pack. Fit and tighten the securing screws.
Fit the cowl-housing to the pack. Fit and tighten the cowl-housing securing screws.

Fit the instrument pack assembly into dashboard position, re-connect the block connectors.
Align the assembly, fit and tighten the securing screws.
Return the steering wheel to its original position. Refit the dash liner.
Reconnect the battery.

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then be restored to the correct value.

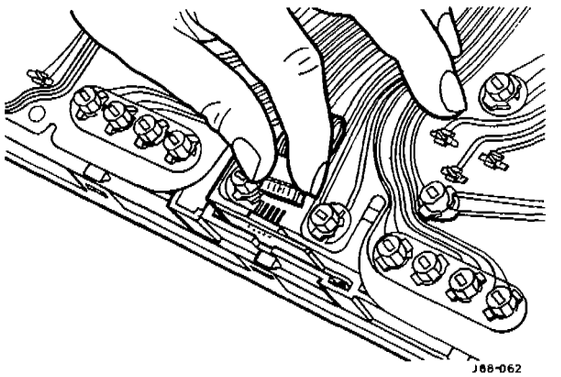


Fig 1

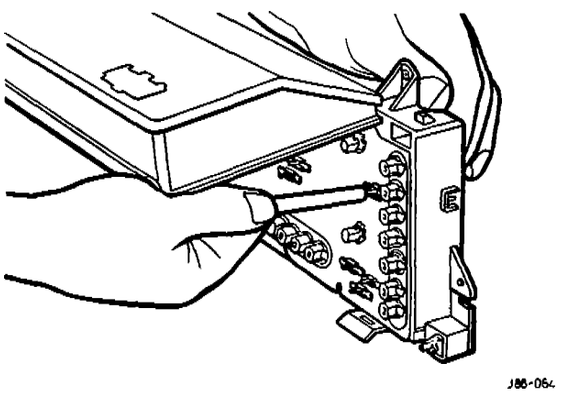


Fig 2

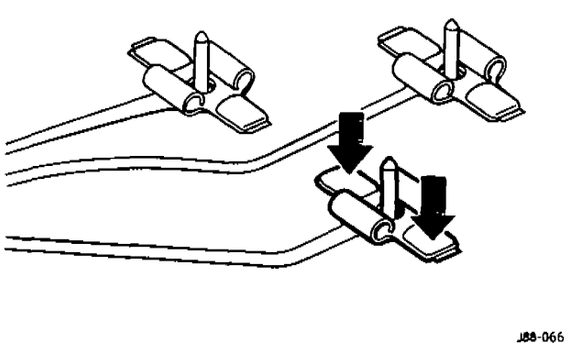


Fig 3

FUEL/BATTERY CONDITION GAUGE SET

RENEW **88.25.33**

Disconnect the battery.
Remove driver's side dash liner securing screws, release securing clip, and remove liner.
Release steering column clamp, fully extend steering wheel, and re-tighten the clamp.
Remove instrument pack assembly securing screws.
Disconnect block connectors from rear of pack.
Displace and remove the instrument pack assembly.
Remove the instrument pack cowl-housing screws, and remove the cowl-housing.
Place pack face-down on bench, ensuring that cowl/lens is protected with a suitable cloth or similar.

NOTE: To minimise the risk of damage and contamination, all repairs conducted on the Instrument Pack should be performed in a non-static dust-free environment.

Remove the electronics pack cover securing screws, and remove the cover.
Carefully release the flexible printed circuit ribbon-ends from the edge-connectors, by squeezeing grips between thumb and forefinger while sliding out connector-latch (Fig.1).
Release the electronics pack retaining clips and pivot the pack upwards (Fig. 2)
Displace and remove the electronics pack from the instrument pack by lifting off from hinges.
Displace and remove all warning bulbs (bayonet fitting, twist 1/8th turn anti-clockwise to release).

NOTE: There are two different types of coloured bulb holders, each type must be returned to the correct location.

Disconnect the flexible printed circuit to LCD multi-plug (Fig.3), DO NOT remove plug from the outer case of the Instrument Pack.
Remove the 7 veneer panel securing screws, carefully peeling back top corners of the flexible printed circuit to gain access to 2 of the veneer panel securing screws.
With gauges uppermost, release cowl/lens securing clips and remove cowl/lens assembly.

CAUTION: With cowl/lens removed, DO NOT rest pack face-down. The gauge needles are extremely delicate and are easily damaged. Also, take care not to scratch or damage the gauge faces, ensure cleanliness when handling the pack.

Displace and remove the veneer panel. The LCD module is attached to the veneer panel, but with caution may be removed as a complete, assembly.

CAREFULLY, remove oil pressure/coolant temperature gauge set, gently easing the pins out of the printed circuit crimps. To prevent widening of the crimp connections, gauge pairs should be kept square to the Instrument Pack moulding whilst removing.

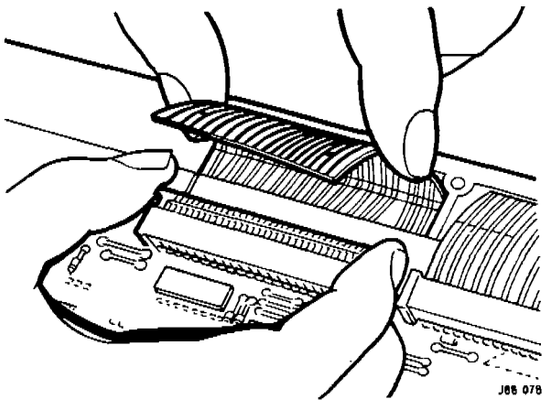


Fig 1

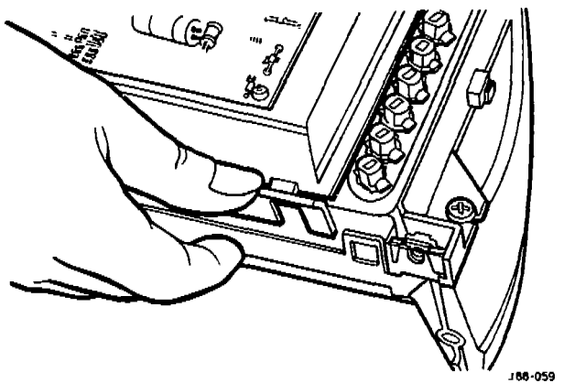


Fig 2

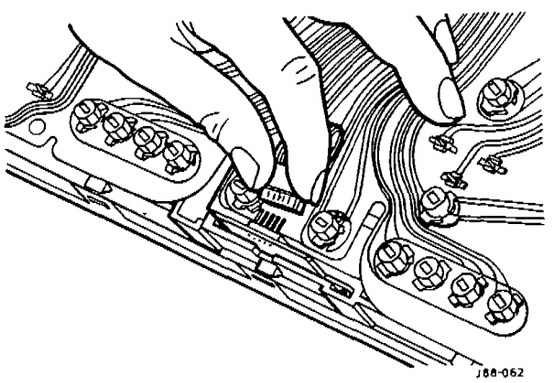


Fig 3

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NOTE: Individual **gauge** movements CAN NOT be serviced, pointers and can location screws should not be removed.

Align and fit new fuel/battery condition gauge set to Instrument **Pack** (Fig.2). Take care not to damage gauge needles. CAREFULLY push gauge pins through flexible printed circuit. DO NOT press down on the crimps. distortion may occur. Press down on the flat tangs (set at right angles to the crimps) as shown in Fig 3.

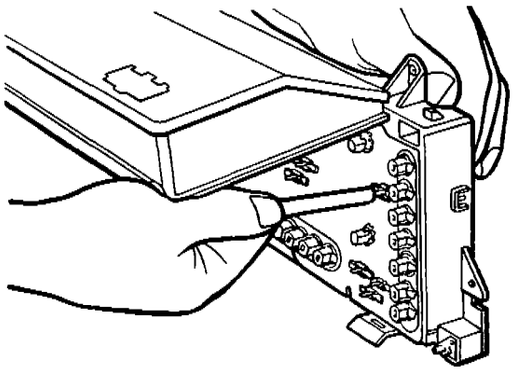
NOTE: Take care not to damage crimps or flexible printed circuit. If damage occurs or problems arise due to loose crimp connections, renew the flexible printed circuit.

Before fitting veneer panel, carefully return **All** gauge needles to **"STOP** PIN" position.
Align and fit veneer panel and LCD module assembly. Fit and tighten centre securing screw.
Fit the cowl/lens assembly.
Fit and tighten the six remaining veneer panel securing screws.
Fit and fully seat the warning bulbs, ensuring the correct colour type is inserted at the correct location (the ***8*** white bulb/holders are for gauge illumination, the remaining 24 are **for** warning indication **only).**

Connect the flexible printed circuit multi-plug to the LCD unit.
Carefully fit the electronics pack over the flexible printed circuit connections and locate into the hinges.
Pivot the pack downwards and **fit** into the securing clips.
Fit the flexible printed circuit to the edge-connectors, **by** positioning holes in flexible printed circuit membrane over the connector-latch locating pips and **sliding** latch to the fully closed position.
Align and fit the back cover to the electronics pack. **Fit** and tighten the securing screws.
Fit the cowl-housing to the pack. Fit and tighten the cowl-housing securing screws.

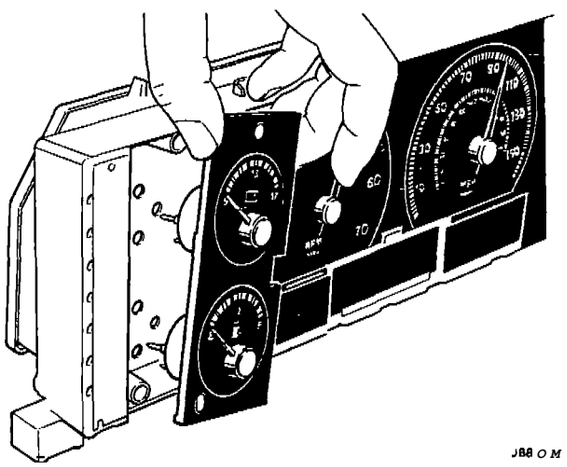
Fit the instrument pack assembly into dashboard position, re-connect the block connectors.
Align the assembly, fit and tighten the securing screws.
Return the steering wheel to its original position. Refit the dash liner.
Reconnect the battery.

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then be restored to the correct value.



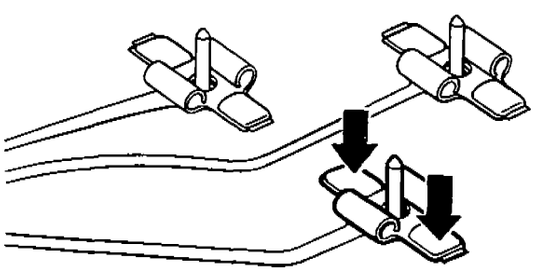
J88-064

Fig **1**



J88 O M

Fig 2



J88-066

Fig 3

INSTRUMENT PACK LCD MODULE

RENEW **88.20.23**

Disconnectthe battery.
Remove driver's side dash liner securing screws, release securing clip, and remove liner.
Release steering column clamp, fully extend steering wheel, and re-tighten the clamp.
Remove Instrument Pack assembly securing screws.
Disconnect block connectors from rear *of* pack.
Displace and remove Instrument Pack assembly.
Remove Instrument Pack cowl-housing screws and cowl-housing. Place pack face-down on bench, ensuring cowl/lens is protected with a suitable cloth or similar.

NOTE: To minimise risk of contamination and damage, repairs to Instrument Pack should be performed in a non-static dust-free environment. Avoid touching connector pins and pcb track/components, to minimise risk of static damage.

Remove electronics pack cover securing screws and remove the cover.
Carefully release the flexible printed circuit ribbon-ends from edge-connectors, by squeezeing grips between thumb and forefinger while sliding out connector-latch (Fig.1).
Release electronics pack retaining clips and pivot pack upwards (Fig. 2)
Displace and remove electronics pack from instrument pack by lifting off from hinges.
Displace and remove 6 warning bulbs, 2 both sides located adjacent to LCD module, and the 2 bulbs located in module itself (bayonet fitting, twist 1/8th turn anti-clockwise to release).
Disconnectthe flexible printed circuit to LCD multi-plug.
Remove LCD unit securing screws and unit (Fig.3).

Fit new LCD unit into position, fit and tighten LCD module securing screws.
Re-fit the warning bulbs into the empty sockets.
Reconnect the flexible printed circuit multi-plug to the LCD unit.
Carefully fit the electronics pack over flexible printed circuit connections and locate onto hinges.
Pivot pack downwards and fit into securing clips.
Fit flexible printed circuit to edge-connectors, by positioning holes in flexible printed circuit membrane over connector-latch locating pips and sliding latch to the fully closed position.
Align and fit back cover to the electronics pack. Fit and tighten the securing screws.
Fit the cowl-housing to the pack.
Fit and tighten the cowl-housing securing screws.

Fit the instrument pack assembly into dashboard position, re-connectthe block connectors.
Align assembly, fit and tighten the securing screws.
Return steering wheel to original position.
Refit the dash liner.
Reconnect the battery.

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then be restored to the correct value.

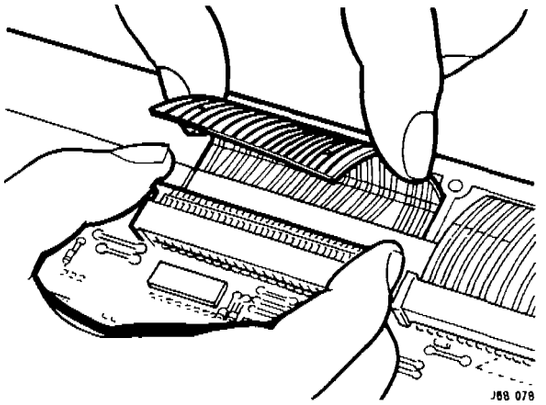


Fig 1

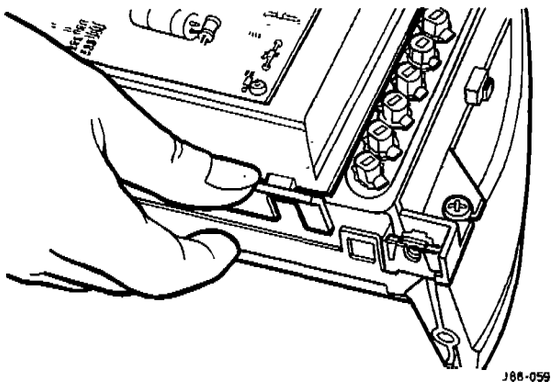


Fig 2

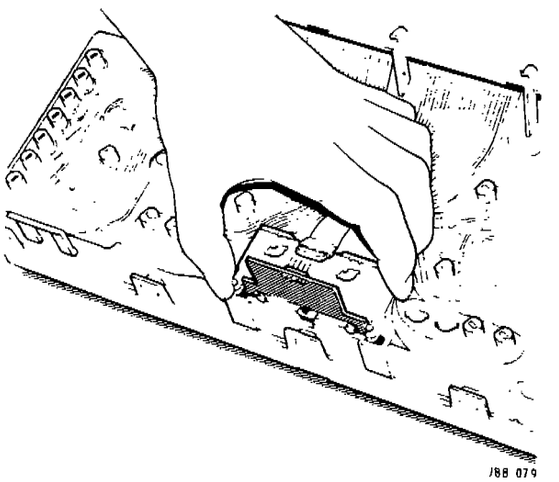


Fig 3

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INSTRUMENT PACK ILLUMINATION BULBS

RENEW **86.45.49**

NOTE: The following five instrument pack bulbs (located in the lower right hand corner area of the pack) are accessible without removing the pack:

1 Seat belt warning bulb.
2 Boot open warning bulb.
3 Door open warning bulb.
4 Coolant temperature warning bulb.
5 Low coolant warning bulb.

NOTE: There are 8 white bulb/holders for gauge illumination. the remaining 24 brown bulb/holders are for warning indication only, the two types are not inter-changeable).

All other warning bulbs, proceed as follows:

Disconnect the battery.
Remove the driver's side dash liner securing screws, release the securing clip, and remove the liner.
Release the steering column clamp, fully extend the steering wheel, and re-tighten the clamp.
Remove the instrument pack assembly securing screws.
Disconnect the block connectors from the rear of the pack.
Displace and remove the instrument pack assembly.

Place the pack face down on the bench, ensuring that the cowl/lens is protected with a suitable cloth or similar.

NOTE: To minimise the risk of damage and contamination, all repairs conducted on the Instrument Pack should be performed in a non-static dust-free environment.

Remove the appropriate bulb (Figs 1 & 2), check for damage/serviceability and replace as necessary (bayonet fitting, twist one eighth of a turn anti-clockwise to release).

NOTE: For access to the gauge and lower pack bulbs, release the electronics pack retaining clips and pivot the pack upwards (Fig 3).

Fit the instrument pack assembly into dashboard position, re-connect the block connectors.
Align the assembly, fit and tighten the securing screws.
Return the steering wheel to its original position. Refit the dash liner.
Reconnect the battery.

NOTE: On re-connection of the battery, it is important that the ignition is cycled and the bulb check is completed. The odometer reading will then be restored to the correct value.

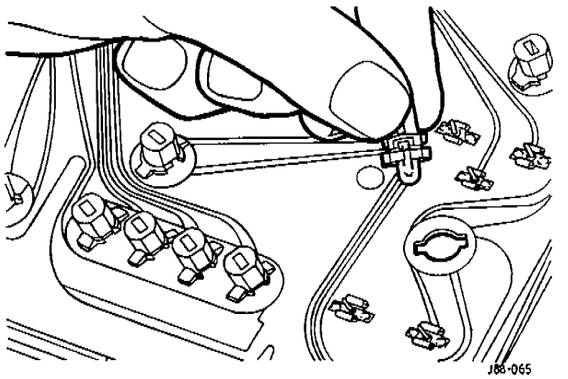


Fig 1

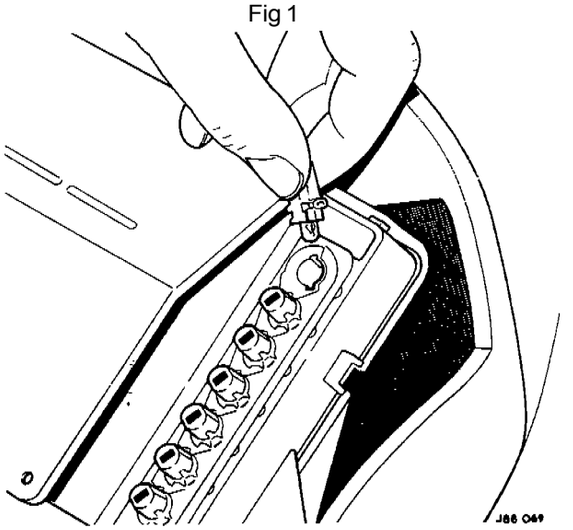


Fig 2

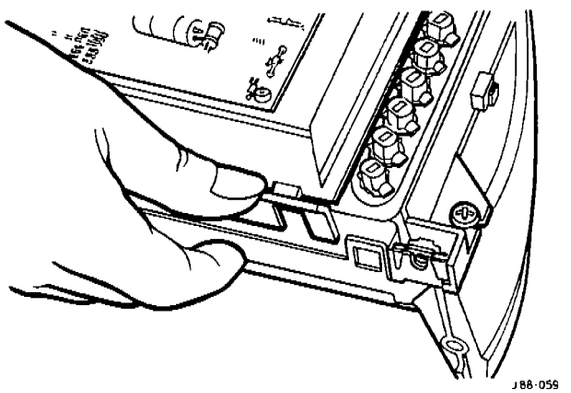


Fig 3

SPEED SENSOR

RENEW **88.30.03**

Drive vehicle onto ramp.
Open bonnet and disconnect battery earth lead.
Open luggage compartment and remove trim.
Disconnect speed sensor cable harness block connector.
Raise vehicle on the ramp.
Cut and remove cable straps.
Remove bolts securing the speed sensor.
Displace and remove the sensor (Fig 1).

On refitting new sensor ensure air gap between sensor probe and toothed wheel is 0.5 to 0.9 mm.
Fit and tighten the securing bolts.
Secure the harness with new cable straps.
Lower ramp.
Refit the harness block connector.
Refit the luggage Compartment trim.
Reconnect battery earth lead.

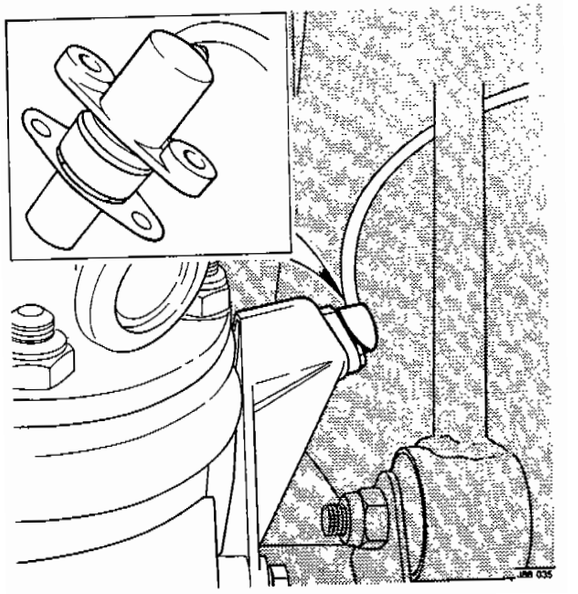


Fig 1

COOLANT TEMPERATURE TRANSMITTER

RENEW ***88.25.20***

NOTE: the procedure described below should only be carried out on a cold engine.
Open bonnet and disconnect battery earth lead.
Slacken coolant reservoir cap to remove any residual pressure. Tighten cap.
Disconnect the supply cable.
Undo and remove the transmitter (Fig 2).
Clean the housing.
Fit and tighten the new transmitter.
Reconnect supply cable.
Reconnect battery earth lead.

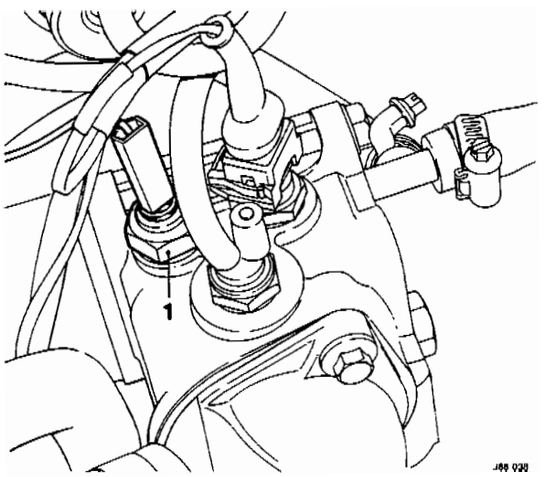


Fig 2

LOW COOLANT LEVEL PROBE

RENEW **26.40.11**

NOTE: The following procedure should only be carried out on a cold engine.
Open bonnet and disconnect battery earth lead.
Slacken off coolant reservoir cap to remove any residual pressure. Tighten cap.
Disconnect the harness multi-plug and release the harness securing clips.
Slacken off and remove the probe (using finger pressure, rotate the probe anti-clockwise 1/8th turn and remove), discard the O-ring (Fig 3).

Fit the new probe complete with new O-ring into position. Tighten by pressing down and rotating the probe clockwise 1/8th turn.
Reconnect harness, secure with retaining clips.
Reconnect battery earth lead.

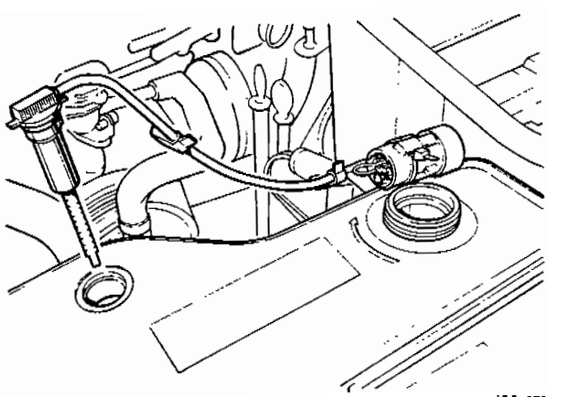


Fig 3

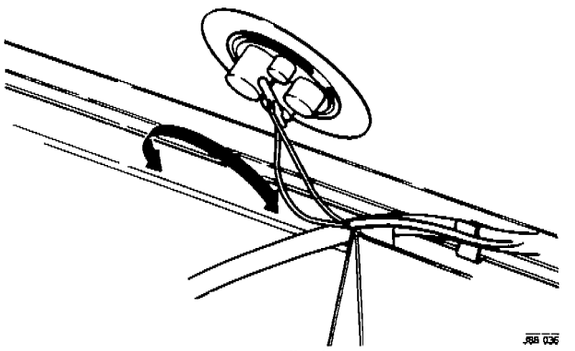
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FUELGAUGETANK UNIT

RENEW 88.25.32

WARNING: THIS OPERATION RESULTS IN FUEL AND FUEL VAPOUR BEING PRESENT IN THE ATMOSPHERE.
FUEL VAPOUR IS EXTREMELY FLAMMABLE, THEREFORE GREAT CARE MUST BE TAKEN WHEN WORK IS CARRIED OUT ON THE FUEL SYSTEM.
THE FOLLOWING PRECAUTIONS MUST BE STRICTLY ADHERED TO:

1 NO SMOKING IN THE WORK AREA.
2 'NO SMOKING' WARNING SIGNS MUST BE POSTED ROUND THE AREA.
3 A CO^2 FIRE EXTINGUISHER MUST BE CLOSE AT HAND.
4 DRY SAND MUST BE AVAILABLE TO SOAK UP ANY FUELSPILLAGE.
5 EMPTY THE FUEL FROM THE TANK USING SUITABLE FIREPROOF EQUIPMENT.
6 FUEL MUST NOT BE EMPTIED INTO A PIT.
7 THE WORKING AREA MUST BE WELL VENTILATED.
8 THE FUEL MUST BE EMPTIED INTO AN AUTHORISED EXPLOSION PROOF CONTAINER.


Fig 1

Open bonnet and disconnect battery earth lead.
Remove luggage compartment floor carpet.
Remove luggage compartment front liner.
Disconnect tank unit supply leads.
Rotate tank unit securing ring (Fig 1) using Service Tool 18G1001. Remove the securing ring.
Remove the tank unit.
Remove and discard the gasket.

Ensure new sealing gasket and new locking ring is fitted when replacement tank unit is fitted.
Tighten locking ring with Service Tool 18G 1001.
Reconnect the tank unit supply leads.
Refit luggage compartment front liner.
Refit luggage compartment floor carpet.
Reconnect battery earth lead.

DATA

SERVICE TOOLS

78G1001 Locking ring spanner

0467G

AUTOMATIC TRANSMISSION UNIT LINEAR SWITCH

RENEW **44.15.12**

Open bonnet and disconnect battery earth lead.
Open car door.
Remove gear lever knob and console finisher.
Remove screws securing linear switch (1 Fig 1).
Displace the switch for access.
Disconnect cable harness block connectors
Remove switch assembly (2 Fig 1).

On fitting new switch select 'N' neutral.
Fit new switch into position.
Fit but do not tighten the securing screws.
Position Service Tool setting gauge JD 127 (Fig 1) between linear switch and side plate.
Ensure slot of the setting gauge is fully located onto the pin of the linear switch.
Tighten the securing screws.
Remove the setting gauge.
Check that the vehicle starts in 'PARK and 'NEUTRAL' but does not start in other positions.
Check the bar graph on the instrument pack indicates the correct position of the gear selector.

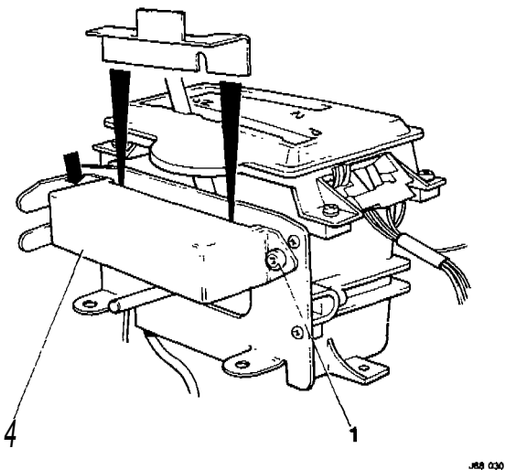


Fig 1

DATA

SERVICE TOOLS

***JD 127** Setting gauge*

0467G

SEAT PAD SWITCH

RENEW **86.57.21**

Open bonnet **and** disconnect battery earth lead.
Remove the front seat cushion.
Displace the accessible diaphragm hooks (1 Fig 2) from the frame and reposition the diaphragm for access.
Cut and remove the ratchet strap securing the cable harness.
Remove the seat belt switch pad.

Fit the new switch into position, fit a new ratchet strap to the harness.
Refit the diaphragm, fit the securing hooks.
Refit the seat cushion.
Reconnect the battery earth lead.

0467G

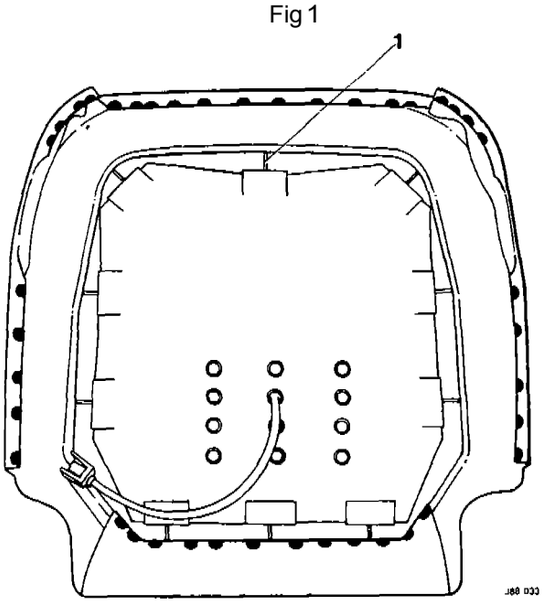


Fig 2

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SEAT BELT BUCKLE SWITCH

RENEW **86.57.25**

Open bonnet and disconnect battery earth lead.
Remove 'B' post lower trim pad,
Remove seat belt upper anchor securing nut cover.
Remove upper anchor securing nut.
Displace the seat belt.
Remove the wavy washer and spacer.
Unclip the B post upper trim pad and displace the pad from its mounted position.
Reposition belt through trim pad and remove pad.
Remove finisher from the 'B' post aperture.
Reposition seat belt through the 'B' post.
Remove nut securing seat belt reel.
Remove the reel.
Disconnect the cable harness block connector.
Remove the seat belt buckle securing nut cover (1 Fig 1).
Remove bolt securing seat belt buckle (2 Fig 1).
Remove the seat belt buckle (3 Fig 1).
Note position of and remove the buckle spacers.

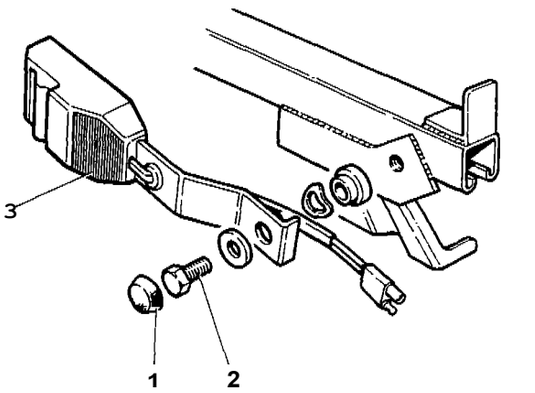


Fig 1

Fit new buckle assembly, ensure that spacers are correctly located.
Fit and tighten the buckle securing bolt. Fit the bolt cover.
Reconnect the harness. Refit the seat belt reel.
Fit and tighten the securing nut.
Locate the seat belt through the 'B' post. Fit the finisher.
Locate seat belt through the upper trim pad. Fit the pad to position.
Fit the seat belt upper anchor, fit and tighten the securing bolt.
Refit the 'B' post lower trim pad.
Reconnect the battery earth lead.

DATA

TORQUE FIGURES

Seat belt anchor bolts 27Nm

SPANNER SIZES

17mm

04670

WASHER RESERVOIR SENSOR

RENEW **84.10.17**

Open bonnet and disconnect battery earth lead.
Jack up front of vehicle and support on two axle stands.
Remove nuts, bolts, screws and washers securing inner wing valance.
Displace and remove inner wing valance.
Remove brake disc cooling duct.
Disconnect washer pump and reservoir level sensor multi-plug connectors (1 Fig 1).
Disconnect washer pump tubing from pump (2 Fig 1).
Remove bolts and washers securing reservoir (3 Fig 1).
Remove reservoir from the filler neck.
Drain the water from reservoir.
Remove bolt securing washer motor clamp plate, remove plate and remove pump from grommet (4 Fig 1).

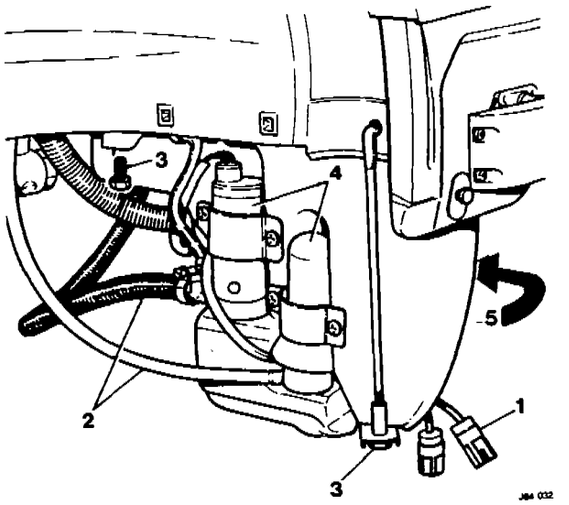


Fig 1

Displace and remove fluid level sensor (5 Fig 1).
Remove the clamp nut/grommet assembly.

Fit the new reservoir sensor into position.
Fit the clamp nut/grommet assembly.
Fit the reservoir to the filler neck.
Fit and tighten the reservoir securing bolts.
Reconnect the harness multi-plugs.
Refit the cooling duct and inner valance.
Remove the stands and lower the vehicle.

DATA

TORQUE FIGURES

Reservoir securing bolts** nuts **19-24Nm

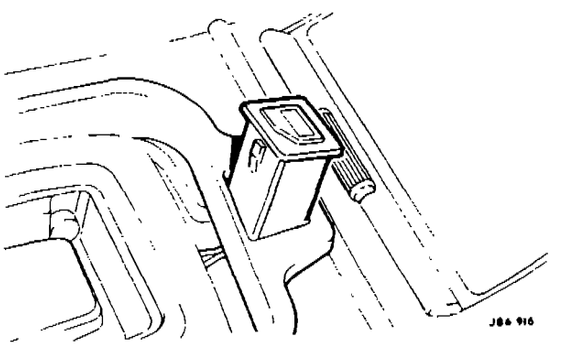
SPANNER SIZES

13mm
No 4 Pori

SPORT MODE SWITCH

RENEW **86.65.84**

Carefully displace sport mode switch (Fig 2) from the gear selector finisher.
Disconnect the harness multi-plug.


Fig 2

Connect the harness multi-plug to the new switch.
Fully seat the switch into the finisher.

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1991 MODEL YEAR MODIFICATIONS

WARNING LIGHTS *88.00.00*

The sport mode indicator and park brake warning light have changed position with one another on the instrument pack. This is only a visual position change, there is no change in operation or function.

The sport mode indicator is illuminated when the gearbox is in sport mode. It is wired through the instrument pack dimmer. Reducing the illumination at night will also dim the sport light to prevent distractions.

FUEL GAUGE UNIT *88.00.00*

The introduction of the in-tank fuel pump necessitates fitment of a revised tank sender unit. The original 90 model year sender unit causes a foul condition on the pump and must therefore not be used on 91 model year vehicles.
These alterations cause changes to the fuel tank calibration. The resistance of the sender unit has been changed to allow optimum accuracy and linearity of the fuel gauge.
The result of these modifications mean a 91 model year instrument pack cannot be used with a 90 model year sender. It is important to ensure the gauge and sender unit are compatible. Incompatible units will cause the gauge to show false information.
A 91 model year matched set, ie. gauge and sender unit can be fitted to a 90 model year vehicle as the physical changes to the sender cause no problems.

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH II
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY ENGLAND

BY APPOINTMENT TU
HER MAJESTY QUEEN ELIZABETH
THE QUEEN MOTHER
MANUFACTURERS OF DAIMLER AMP JAGUAR CARS
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XJ6

SERVICE MANUAL

VOLUME 5

Contains **Section**

90. ELECTRICAL HARNESSES COMPONENTS AND CIRCUITS

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INTRODUCTION

Volume 5 contains Section 90 which comprises -
harness diagrams,
harness schedules,
location & access lists,
and wiring schedules.

Harness repair/renewal procedures are in Volume 4 Section *86.*

Component and wiring diagrams are in Volume 6 Section 91

UK model year changes are included, and introduction Vehicle Identification Numbers (V.I.N.) are provided for each model year.

Note; Any 'running changes' are included in the model year immediately following the change.

LOGIC EARTH DISTRIBUTION

Logic earths are distributed from earth point E73 close to the CPU.

IGNITION SWITCHED EARTH DISTRIBUTION

Ignition switched earths are distributed from the ignition and inertia switches. The ignition switch distributes the earths in all switch positions except OFF, and the. inertia switch distributes the earths when tripped with the ignition **ON.**

WARNING: THE BATTERY EMITS COMBUSTIBLE GAS (HYDROGEN) PARTICULARLY WHEN CHARGING.

AVOID **SPARKS** AND SHORT CIRCUITS BY SWITCHING OFF THE CHARGING CURRENT BEFORE MAKING **OR** BREAKING THE TERMINAL CONNECTIONS.

WHEN DISCONNECTING EATTERY TERMINAL CONNECTIONS, ALWAYS DISCONNECT THE EARTH TERMINAL FIRST AND RECONNECT IT LAST.

AVOID CONTACT WITH THE BATTERY ACID WHICH IS BOTH POISONOUS AND CORROSIVE.

ACID WILL CAUSE BURNS TO THE SKIN AND EYES.

IN **THE EVENT** OF **SKIN OR** EYE CONTAMINATION, DRENCH THE AFFECTED AREA WITH WATER AND SEEK IMMEDIATE MEDICAL ATTENTION.

FUEL IS EXTREMELY FLAMMAELE. ALL FIRE PRECAUTIONS MUST BE OBSERVED **WHEN** WORKING ON THE FUEL DEVICES OF THE ENGINE MANAGEMENT SYSTEM.

CAUTION: NEVER - disconnect the battery while the **engine Is running**

NEVER - **reverse** the battery terminal connections

ALWAYS - disconnect both battery terminals (earth terminal **first)** before **any electrical maintenance** is commenced, before battery charging or before **using** any type of **electric** welding **equipment** on the vehicle.

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WIRING SCHEDULE 90.50.09/WS

From / Von / Da / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
GB11-1	RB11 1	US	0.5
GB11-2	RB-S82	NE	0.5
GB11-3	RB131-3	NG	2.0
LS1-1	RB-S30	US	V b
LS1 2	RB13-15	KR	*0 5*
LS1-3	RB49-11	UK	*0 5*
ls1.4	RE148	YS	0 b
LS1-5	RB-S83	RU	0.5
LS1-6	RS22-38	RS	*0 5*
LS1 7	RB-S11	WK	0.5
RS1-8	RB134 18	WLG	0 5
LS1-9	RB-S36	F	0.5
LS1 10	RS114-16	OC	*0 5*
LS1-11	RB SM4	RO	0.5
LS1-12	RB-S56	KG	0.5
LS1-13	RB-S27	R	0.5
LS1 14	RB33-13	RLG	0.5
LS1-15	RB33-12	BP	0.5
LS1-16	RB135 34	OS	V b
LS1-17	RR195.37	OP	0.5
LS1 18			
LS1-19			
LS1-20			
LS1 21			
LS1 22	RB136-20	SK	0.5
LS1-23			
151 24	RA-S10	PU	0.5
LS1 25	RU21-1	UG	0.5
LS1-26	RE21 0	UR	0 6
LS1-27			
LS1 28	RU-S82	SLG	0.5
LS1 29	RU-S1	UY	0.5
LS1-30	RB61 11	BO	0 6
LS1-31	RB61-12	GLG	0.5
LS1-32			
LS1 33			
LS1-34			
LS1-35			
LS1-36			
LS2-1	RB S78	RG	0 6
LS2-2	RB-S12	WY	0.5
LS2-3	RB33-9	RN	0.5
LS2-4	RUD2-U	GO	0.5
LE2 5	RB-S29	NW	0.5
LS2-6			
LS2-7			
LS2-8	RB55.10	GU	0.5
LS2-9			
LS2-10	RA-S18	PO	0.5
LS2 11	RU-S16	PK	0.5
LS2-12	RE S15	YW	0.5
LS2-13			
LS2-14			
LS2 15	RU13-20	KY	0.5
LS3-1	RB59 1	NB	3.0
LS3 2	RB72	G	2.0
LS3-3	RB59 2	R	2.0
LS3-4	RA-S81	WG	0.5
LS3 5	RU-S32	UR	1.0
LS3-E	RE S79	WP	0.5
LS3-7	RE59 4	U	2.0
LS3-8	RA-S37	BK	0 6
LS3 0	RU28-8	YG	2 0
LS84-1	RE59 5	RY	2 0
LS84-2	RB69-8	RS	2.0
LSH4.3			
LS84-4	RE59 3	BS	2.0
LS84-5	RA57-2	PG	2.0
LS84 6	RU21-4	UY	2.0
RS22-1	RB S85	US	0 6
HS22-2	RB134-17	BRAID	SCREEN
RS22-3	RA1S1-3	YO	0.5
RS22 4	RU134-15	R	INNER
RS22-5	RE S13	WN	0.5
HS22-6	RB149-3	WR	0.5
RS22-7	RU134-21	OS	0.5
RS22 8	RB134-19	OK	0.5
RS22-9	RB134 20	BW	0.5
RS22-10			
RS22-11	INHIBIT PLUG		
RS22-12	RE134 16	U	INNER
RS22-13	RA81-9	BG	0.5
RS22 14	RU61-10	RLG	0.5
RS22-15	RB48-5	UK	0.5
RS22-16	RB14-7	YK	0.5
RS22 17	RU-S43	LGO	0.5
RS22-18	RB135 21	LG	0.5
HS22-19	RB135-13	OR	0.5
RS22-20	RU-S15	VW	0.5
RS22 21	RB14-20	WG	0.5
RS22-22	RB14 21	WB	0.5
HS22-23			
RS22-24			
RS22 20	RU126-1	NK	0.5
RS22-26	RB151 4	RY	0.5
RS22-27	RB33-7	KO	0.U
RS22 28	RU30-8	KR	0.5
RS22-29	RB S38	UY	*0.5*
RS22-30	RB148 5	WS	0.5
RS22-31			
RS22-32	RE S10	PU	0.5
RS22-33	RB13-14	KG	0.5
RS22-34	RU-S19	M	0.5
RS22-35	RES16	PK	0.5
RS22-98	LB1-6	RS	0 3
RS87-1	R062-5	NV	0.5
	RB7-5	NY	0.5
RS87-2	RB-S81	WG	0.5
RS87-3	R080	B	2.0
RS87 4	RU-S4	BK	2.0
RS87-5			
RS87-8	RE.879	WP	0.5

From / Von / Da / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
RS114 1	RB135-7	O	0 5
RS114.2	RB135 10	BY	0 6
RS114-3	RB14-1	LGN	0.5
RS114 4	RB-S72	LGY	0 5
RS114 5	RB S36	P	0.5
RS114-6	RB134-24	RY	0.5
RS114 7	RB146-3	WU	0.5
RS114 8	RB S27	H	0 5
RS114-9	RB-S83	FU	0.5
RS114-10	RB-S84	FO	0.5
RS114-11	RB-S62	SLG	0.5
RS114 12	RB33-4	KY	0.5
RS114-13	RB-S29	NW	0 5
RS114-14	RB-S66	KS	0.5
RS114 15	RU13-27	KU	0.5
RS114-16	LB1 10	O	0 5
RS114-17	RB-S27	UG	0.5
RS114-18	RB135-38	KU	0.5
RS114 19	RB-S77	KLG	*0.5*
RS114.20			
RS114-21			
RS114-22	RB66-2	UB	0.5
RS114 23			
RS114.24	RB S11	WK	0.5
RS114-25	RB-S5	NF	0.U
RS114 26	RB136-8	BR	0.5
RS114 27	RB136 48	HU	0.5
RS114-28			
RS114.28			
RS114 30	RB127-4	OR	0.5
RS114.81			
RS114-32	RB135-45	NO	0.5
RS114-33	RB136-23	UR	0.5
RS114 34	RB129-3	NLG	*0.5*
RS114.35			
RS114-36			
RB6 1	RU-S29	NW	*0 5*
RB6-2	RB30 5	SU	0.5
RU6-3			
RB6-4	RB-S28	RLG	0.5
RB7-1	RE72	B	2.0
RB7-2	RB130.4	NP	2 0
RU7-3			
RB7 4			
RB7-5	RS87 1	NY	0.5
RU7-6	RB-S37	BK	0.5
RB8 1	RB S71	R	0 5
RB8-2	RB-S15	YW	0 6
RU8-3	RB81-7	BR	0.5
RB8 4	RU61-6	BP	0.5
RB8-5	BR S35	K	0.5
RD8-6	RB33 11	FW	V b
RU8-7	RB-S36	P	0.5
RB8 8	RU-S78	RG	0.5
RB8-9	RB S34	PN	0.5
RU8-10	RB-S19	PO	0.5
RB8-11	RD-S16	PK	0.5
RB8 12	RB-S9	YO	*0.5*
RB8-13	RB-S47	UO	0.5
RU8-14	RB81-22	OR	0.5
RB8 15	RU61-23	OG	*0 5*
RB8-16	RB61-24	OY	0.5
RB8-17	RB61 25	UP	0 5
RU8-18			
RB8-19			
RB8 20	RU135-47	OW	*0 5*
RB8-21	RB-S39	UY	0.5
RB8 22			
RB8-23			
RD8-24			
RE11 1	RU-S81	KR	*0 5*
RB11 2	RD-S37	RK	*0 5*
RB11-3	RE27 1	KU	0 5
RU11-4	RB-S32	UR	0.5
RB12 1			
RR12.2	RE71	N	2.0
RU12-3			
RB13 1	RU-S31	WK	0.5
RB13-2	RB-S71	R	0 6
RU13-3	RB-S72	LGY	0.5
RB13-4	RD65-2	LGG	0.5
RB13 5	RB-S70	LGR	0.5
RB13-6	RB49 15	YR	0.5
RU13-7	RB49-14	ULG	0.5
RB13 8	RU49-10	UY	*0 5*
RE13.9	RB65-7	YU	0.5
RU13-10	RB55-6	YN	0.5
RB13 11	RD65-3	YG	0.5
RB13-12	RB65-4	YLG	0.5
RU13-13	RB55-5	YB	0.5
RU13-14	RB22-38	KG	0 6
RB13 15	LS1-2	KR	0 5
RB13-16	RB30 14	NG	0 5
RB13-17	RB132 16	GO	0 5
RU13-18	RB-S36	P	0.5
RB13 19	RU-S76	UR	0 5
RB13-20	RB61 2	PW	0.5
RU13-21	RB-S75	RW	0.5
RB13-22	RU-S74	GB	0 5
RB13 23	RB S73	SLG	*0 5*
RB13-24	RB33 2	LGU	0.5
RB13-25	RD48-1	OW	0.5
RB13-26	RB38 1	KW	0.5
RU13-27	RS114-15	KU	0.5
RB13 28	LS2-15	KY	0.5
R013.29	RB38-13	US	0.5
RB13-30	INHIBIT PLUG		
RB13-31	RB30-2	SO	0.6
R013.32	RB30-3	SY	0.5
RB13-33	RB30-4	SG	0.5
RU13-34			
RB13-35	RB30-6	SK	*0.5*
RB13-36	RB-S37	BK	*0.5*

From / Von / Da / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
RB14 1	RB114-3	LGN	*0.5*
RB14-2	RB135 18	Y	*0.5*
RU14-3	RB135-15	SB	0.5
RR14.4	RE SO1	GU	*0.5*
RB14-5	RB61-13	BW	*0.5*
RB14-6	RB49 16	YP	*0.5*
RU14-7	RB22-16	YK	0.5
RB14 8	LS1 4	YS	0.5
RU14-9	RB135 41	UN	0.5
RE14 10	RB136-40	UW	*0.5*
RR14-11	RB133 3	YU	0.5
RB14-12	RB-S43	LGO	*0.5*
RB14-13	RE S28	RLG	0.5
RU14-14	RB58-1	UG	*0.5*
RB14-15	RB39 2	PR	0.5
RU14-16	RB58-3	PS	0.5
RE14 17			
RR14-18	RB58.13	LGS	0.5
RB14-19	RD-S35	K	*0.5*
RR14-20	RB22 21	WG	0 6
RU14-21	RB22-22	WE	0.5
RE1422	RB49-2	O	0.5
RU14-23	RB39-2	KO	0.5
RB14 24	RU132-17	GR	0.5
RU14-25	RB154-20	BY	0.5
RB14 26	RB66-5	S	0.5
RU14-27	RB61-28	BN	V.h
RB14 28	RU61-28	BU	0.5
RR14-29	RB55 9	PY	0.5
RB14 30			
RR14-31			
RU14-32			
RB14 33			
RR14-34	RB60 2	LGP	0.5
RE14 35	RU30-10	SN	0.5
RR14-36	RB30 15	UN	0.5
RB15 1	RE 540	NG	2.0
111115-2	RB30	B	211
RB15 3	RB-S19	PO	2.0
RR15-4	RB-S16	PR	2.0
RB15-5	RA-S8	YO	0.5
REIG 6	RU101-1	RO	*0.5*
RB15.7	RB S34	PN	0.5
RU15-8	RB-S81	GU	0.5
RR16-30	RE129 5	MY	1 0
RU16-05	NY	0.5	
REIG 85	RB07-U	U	0.5
RR16-A6	RB16-30	MY	0.5
RB16-97	RU32-2	LO0	1 0
RB66 3		LGU	0.5
RU16-87A	RB147-87	NW	0.5
RE17.30	RE82	N	3.0
RR17-85	RB05 U	WU	0 b
RB17-86	RU87	N	1 0
RR17-87	HE S31	WK	3.0
RB18 30	RU-S27	HG	2.0
RRD11-W	UG	U.6	
RU10-05	RA-S50	UO	0.5
RB18 80	RU-S38	NR	*0.5*
RR18-87	RB-S37	BK	0.5
RE19 *30*	RU71	N	3.0
RR19-85	RB04 U	WR	0 6
RU19-06	RB-S31	WK	0 6
RE19 87	RB26-5	W	3.0
RB20	RB-S30	U	0.5
RU21-1	LS1-25	UG	0.5
RB21 2	RU132-1	SR	0.5
RB21.3	RE132 2	SU	0.5
RU21-4	LS84-6	UY	2.0
RB21-5	RU-S80	HE	1.0
RB21 6	LS1-26	UR	0.5
RU21-7	RB-S10	PU	0 b
RE21 8	RD-S37	BK	0.5
RU2b-1	RA75	*0*	2.0
RB26 2	RU130-3	NU	2.0
R025.3			
RE26 1	RU-S27	UR	0.5
RB26-2	RBD8 W	W	0.5
RB27 1	RU11-3	KR	*0.5*
RR27-2	RE 691	KR	0 5
RB27-3	RB135-22	UG	*0.6*
RB27 4	RB35-5	RG	0.5
RU27-5	RB35-1	RU	0 6
RB27 6	RU-S30	U	0.5
RU28-1	RB-S26	WK	*2.0*
RB28 2	RU-S32	UR	*2.0*
RB28-3			
RU28-4	RE-BE2	NE	V b
RB28-5	RU19-87	W	*3.0*
RR28-6	LS3 3	YG	2.0
RB29-1	RB75	B	*2.0*
RU29-2	RE128.3	NU	2 0
RB29-3			
RB30 1	RD08-U	SR	0.5
RB30-2	RB13 31	SU	0.5
RB30-3	RU13-32	SY	*0.5*
RR30-4	RE1333	SG	0.5
RB30-5	RR8-2	SU	0.5
RB30-6	RE13-38	SK	0.5
RU30-7	RE-324	RG	0 5
RB30 *8*			
RB30-9			
RB30-10	RA-S13	WN	*0.6*
RB30-11	RB-S20	RK	0.5
RU30-12			

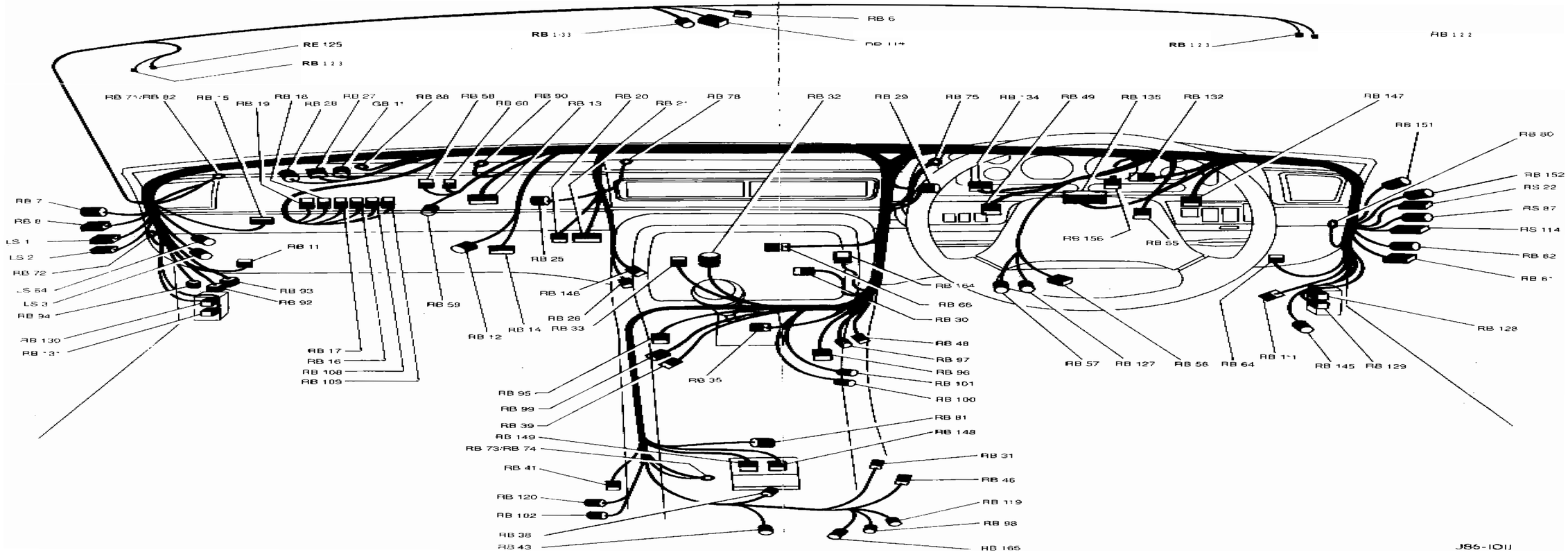
From / Von / Da / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
RB30-13	RR14-35	SN	*0.5*
RU30-14	RR13-16	NG	*0.5*
RU30-15	RR14-36	ON	0.5
RR31-1	RB135-17	OY	*0.5*
RR31-2	RB-S23	BK	U.5
RR32-1	RB-S53	NW	1.0
RB32-2	RB16 87	LGO	1.0
RB32 3	RB74	U	1 ,=I
RB33 1			
RB33-2	RU10-24	LGR	0.5
RB33-3	RU92-87	YU	*0.5*
RB33-4	RS114-12	KV	0.5
RB33-5	RB-S77	KLG	*0.5*
RB33-6	RR61-4	KW	*0.5*
RB33-7	RS22-27	KO	*0.5*
RB33-8	RS22 28	KR	0.5
RB33-9	LS2 3	RN	0.5
RB33-10	RB S78	RG	0.5
RB33 11	RB8 6	NW	n.5
RB33 12	LS1-16	RP	*0.5*
RB33-13	LS1-14	RLG	*0.5*
RB33-14	INHIBIT PLUG		
RB33-16			
RB36-1	RR-S23	BK	*0.5*
RB36-2	RB74	B	*0.5*
RB36-3	RR-S41	PW	*0.5*
RB35-4	RB135 44	S	0.5
RB35-5	RB27 4	RG	0.5
RB35-6	RB93 86	SU	0.5
RB35 7	RB136 14	GO	0 b
RB35 8	RB-S42	F	1.0
RB36 9	RU-S82	SLG	0.5
RB36 10	RB-S75	RW	0.5
RB36-11	RB04-W	WP	0.5
RB36-12	RB-S26	WK	G.5
RB36-13	RB13-29	US	0.5
RB36-14	RB40 2	RS	0.5
RB36-15	RB27-5	RU	0.5
RB38-1	RB73	*0*	2.0
RB38 2	RB S18	OB	2.0
RB38 3	RU-S20	RK	0.5
RB38-4	RD-S23	BK	*0.5*
RB39-1	RB13-28	KLV	0.5
RB39-2	RB14-23	KO	0.5
RU39-3	RB-S45	R	0.5
RU38-4	RB-S23	BK	0.5
RB38-5	RB39 6	*0*	0.5
RB38-6	RB39 5	O	0.5
RB41-1	RB120 4	GB	V b
RB41 2	RB S73	SLG	0 5
RB43 1	RU74	B	2.0
RU43-2	RD-S16	OB	2 0
RU43-3	RB-S20	RK	0 5
RU43-4	RR-S23	BK	2 0
RB46-1	RB-S75	SLG	0.5
RR46-2	RB-S74	GB	0 6
RB48-1	RB13 25	OW	0.5
RB48 2	RB14-22	O	0.5
RB48 3	RB-S48	H	0 5
RB48 4	RU-S23	BK	0.5
RB48-5	RU46-6	O	0.5
RU48-6	RD46-5	H	0.5
RB49-1	RD-S20	RK	0.5
RB48-2	RD35-14	RS	0.5
RB48-3	RD-S83	RU	0.5
RU49-4	AR-SR4	RO	0.5
RR49-5	R522 I ■	UK	0 6
RB49-6	RB S85	US	0.5
RB49-7	RE136.24	UP	0.6
RB49 8	RB55-14	PO	0.5
RB49-9	RU-S90	US	0.5
RB49-10	RB13-8	UY	0.5
RU49-11	LS1-3	UK	0.5
RU49-12	INHIBIT PLUG		
RB49-13	RB-S50	RG	*0.6*
RR49-14	RB13 7	ULG	0.5
RB49-15	RE13 6	YH	0.5
RB49-16	RB14-8	YP	0.5
RB49 17			
RB49 18	RU-S60	UO	0.5
RB49-19	RU56-90	RLG	*0.5*
RB49-20	RU-S4	BK	0.5
RB49-21	RB55-23	RY	0.5
RU49-22	RR-S11	WK	0.5
RU49-23			
RU49-24	RB71	N	0.5
RB55-1	RE-872	LGY	0.5
RB55-2	RE13 4	LGti	0.5
RB55-3	RE13 11	YG	0.5
RB55-4	RB13-12	YLG	0.5
RB55 5	RE13-13	YR	0.5
RB55-6	RU13-10	YN	0.5
RB55-7	RB13-5	YU	0.5
RB55-8	RB-S70	LGR	0.6
RB55-9	RU14-29	PY	0.5
RB56-10	LS2-8	GU	*0.0*
RU56-11	RB60-1	LGK	*0.0*
RB55-12	RB-S38	NR	0.5
RB55-13	RB-S20	RK	0.5
RU56-14	RB49-8	IPG	0.5
RR56-15	RR-S75	IRW	0.5
RB56-16	RB75	B	0.3
RB56-17	RB-S12	WY	0.0
RB56-18	RB58-5	GB	0.0
RB56-19	RR-S70	LR	0.0
RU56-20	RB49-19	RLG	0.5
RU56-21	RB-S13	WN	0.5
RU56-22	RB58-8	GR	0.5
RU56-23	RB49-21	RY	0.5
RU56-24	RB-S4	BK	0.5

BULKHEAD HARNESS RB (RHD)
HARNESS SCHEDULE 90.50.09/HS

Connector No	Description	Interface
GB11	Green PM4 3 way socket	Gear box harness
LS1	Eleck PMHD 38 way socket	Side harness interface
LS2	Yellow PMHD 15 wiry socket	Side harness interface
LS3	Black PM4 9 way socket	Side harness interface
LS64	Yellow PM4 6 way socket	Side harness interface
RS22	Black PMHD 38 way socket	RH aide harness interface
RS87	Black PM4 6 way socket	RH aide harness interface
RS114	Yellow PMHD 38 way socket	RH aide harness interface
RB6	Black PM4 4 way socket	Interior map light
RB7	Black PM4 4 way socket	Passenger door harness
RB8	Black PMHD 24 way plug	Passenger door harness
RB11	Yellow 4 way socket	PI interface unit
RB12	Black PM4 3 way socket	Central processor
RB13	Black PMHD 36 way socket	Central processor
RB14	Yellow PMHD 36 way plug	Central processor
RE15	9 way socket	Lock unit
RB16	Black relay base	Radio relay
RB17	Blue relay base	Ignition 'on' relay
RB18	Green relay base	Aux side lamp relay
RB19	Natural relay bast:	Starter relay
RB20	Single lucar connector	Speed control unit
RE21	8 way socket	Speed control unit
RB25	Black PM4 3 way socket	LH Air con blower motor
RB26	Black 2 way socket	Glove hnx lamp and switch
RB27	Yellow PMHD 8 way socket	PI harness
RE28	Yellow PM4 6 way plug	PI harness
RE29	slack PM4 3 way socket	RH Air con blower motor
RB30	Blue PMHD 15 way socket	Centre console
RB31	Yellow 2 way switch	Handbrake switch
RB32	Yellow PM4 3 way socket	Radio
RB33	Yellow PMHD 15 way socket	Radio & speakers
RB35	Green PMHD 15 way socket	Gear select switch
RB38	PM4 4 way svckct	Front cigar lighter
RB39	Black 6 way socket	Seat heater switch
RB41	Black 2 way socket	Seat belt switch
RB43	PM4 way socket	Rear cigar lighter
RB46	Black 2 way socket	Scat belt switch
RE48	Black 6 way socket	Seat heater switch
RB49	Green PMHD 74 way socket	Fascia switch panel
RE55	Black PMHD 74 way plug	Column switchgear
RB56	Yellow 2 way socket	Brake switch
RB57	Black 3 way plug	Brake switch
RB58	Black PMHD 15 way socket	Speed warning module
RB59	Black PM4 6 way socket	Wiper logic module
RB60	alack PMHD 4 way socket	Wiper logic module
RB61	Black PMHD 36 way plug	Drivers door harness interlace
RB62	alack PM4 6 way socket	Drivers door harness interface
RB64	3 way aocket	Inertia switch
RB66	Black PMHD 15 way socket	Air con control
RB71	Eyelets	Bulkhead battery terminal post
RB72	Eyelets	Earth terminals
RB73	Eyelets	Earth terminals
RB74	Eyelets	Earth terminals
RB75	Eyelets	Earth terminals
RE78	Eyelets	Earth terminals
RB80	Eyelets	Earth terminals
RB81	Black PM4 3 way socket	Centre fuse box
RB82	Eyelets	Bulkhead battery terminal post
RB88	Eyelet	Earth terminal
RB90	Eyelet	Earth terminal
RB92	Yellow relay base	Radio illumination relay
RB93	Red relay base	Auto speed control relay
RB94	Black 3 way plug	Manual speed control shorting plug
RB95	Natural relay base	LH seat relay
RB96	Black relay bsae	RH seat relay
RB97	Yellow 3 way socket	Seat switches
RB98	Red 3 way socket	Drivers seat heater
RB99	Yellow 3 way socket	Seat heater switch
RB100	Red 3 way socket	Seat switches
RB101	Red 3 way socket	Sest switches
RE102	Red 3 way socket	Passenger seat heater
RE108	Brown relay bare	Puddle lamp relay
RB109	Violet relay base	Seat adjust relay
RB111	7 way socket	Accelerator switch
RE114	8 way socket	Receiver module
RB119	Black 5 way socket	Interior light & seal switch
RE120	Black 5 way socket	Pass interior light & seat switch
RE122	Lucar socket	Right hand illuminated vanity mirror
RE123	Lucar socket	Right hand illuminated vanity mirror
RB124	Lucar socket	Left hand illuminated vanity mirror
RB125	Lucar socket	left hand illuminated vanity mirror
RB127	Black 5 way socket	Clutch switch
RB128	Natural 9 way socket	RH fuae box
RB129	Natural 5 way socket	RH fuse box
RB130	Natural 9 way socket 'A'	LH 'A' post fuse box
RB131	Natural 6 way socket 'C'	LH 'A' post fuse box
RB132	Brown 24 way socket	Fascia
RB133	3 way socket	Sunshine r o d
RB134	Black 24 way socket	Instrument pack
RB135	Black 48 way socket	Instrument pack
RB145	Brown PM4 6 way aocket	Diagnostic socket
RB146	Yellow 4 way aacket	Remote boot release
RE147	Black relay base	Lights an warning module
RE148	Natural 9 wry rocket 'A'	Centre fuse box
RE149	Natural 5 way socket 'B'	Centre fuse box
RB151	Black 5 way socket	Security connector
RB152	Black 5 way plug	Security connector
RB166	Black relay base	Cigar lighters relay
RB184	Green relay base	Sear entry switch relay
RB185	Black 3 way socket	Entry switch

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BULKHEAD HARNESS RB (RHD) ABS
CONNECTOR LOCATION 90.50.09/CL



WIRING SCHEDULE 90.50.09/WS

From / Von / De / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
LU68-1	LB14-14	JG	0.5
LB68.2	LB14 16	WH	0.5
LU68-3	IB14-15	PS	0.5
LB68-4	L075	R	0.5
LB68-5	LB55-18	GB	0.5
LB68-6	LU65-22	OR	0.5
LB68-7	LB82	N	0 b
LU68-8			
LB68 9			
LU68-10			
LB68.11			
LU68-12			
LB68 13	LB14 18	LGS	0 6
LB68-14	IB-S80	U	0.5
LB68 15	LU-S37	BK	0.5
LU69-1	LB3-1	NB	3.0
LB69 2	LB3 3	H	2 0
LU69-3	LB64.4	BS	2.0
LB69 4	LB3 7	U	2.0
LB69-5	LB64-1	RY	2.0
LB69-6	LB64-2	RS	2.0
LU60-1	LU66-11	LGK	0.5
LB60-2	LB14 34	LGF	0.5
LU60-3	LU-S90	LGR	0.5
LB60 4	LE 531	WK	0 b
LB61 1	LB 334	PN	0.5
LB61-2	IB 3-20	PW	0.5
LB61 3	LE 535	K	0 6
LU61-4	IB33-11	RW	0.5
LB61 5	LE 599	HG	0.5
LU61-6	IB-S15	YW	0.5
LB61 7	LB8 3	UH	0.5
LB61-8	LRd.4	BF	0.5
LB61-9	IR922-10	RO	0.5
LB61-10	RS22 14	BLG	0 6
LU61-11	LS1-30	BO	0.5
LRd1-12	LB1.31	GLG	0. ■
LB61-13	LU14-5	RW	0.1
LB61-14			
LB61-15	IB-S81	R	0.5
LB61-16	LU-S1	UY	n.a
LB61-17	LE613	WN	0. ■
LU61-10	LB-S17	PO	0.5
LB61 19	LE 516	PK	0 6
LB61-20			
LB61-21	LU-S47	UO	0.5
LB61-22	LB8 14	OR	0 b
LU61-23	IB8-15	OG	0.5
LB61 24	LB8-16	UY	0 5
LU61-25	IB8-17	OP	0.6
LB61 26	LB-S9	YO	0.5
LU61-27			
LB61-28	LB14-27	RN	0 5
LB61-29	LE14 211	mu	V b
LU61-30			
LB61 31			
LB61-32	LB 80	G	0.5
LU61-33			
LB61 34			
LU61-35			
LB61 36			
LU62-1	L079	B	2.0
LB62 2	LB130-4	NP	2.0
IR62-3			
LB62-4			
IR62-5	RS87-1	NY	0.6
LU62-6	LU-S4	BK	2.0
LB64-1	LB-S17	WY	0.5
LU64-2	L005-W	WG	0.5
LB64-3	LBD1 W	GP	0.6
LB66-1	LE523	BK	0.6
LU66-2	R524-22	UB	0.5
LB66-3	LU16-87	LGO	0.5
LB66-4	LE73	S	U.b
LU66-5	LR14-28	S	0.5
LBGG 6	LE520	RK	0.5
LU66-7	IB-S24	RG	0.3
LB66 8	INHIBIT PLUG		
LU66-9			
LB66 10			
LU66-11			
LEU0 12	LU-S31	WK	0.5
LB66-13			
LU66-14			
LB66 16			
LB71	LU17-30	N	3.n
	LE1786	N	0.b
LB72	LB3-2	O	9.0
	LB62.1	E	2.0
	LU-S3	B	2.0
LU73	IR95.85	B	0.5
	LU90-3	R	2.0
	LB100-8	U	2.0
	LB38-1	a	2.0
	LB66-4	D	0.6
LB74	LU102-3	B	2.0
	LR98-R5	E	0.5
	LB101-3	U	2.0
	LB43-1	R	2.0
	LE32 3	E	1.0
	LU36-2	B	0 5
LU76	LB29-1	B	2.0
	LB25 1	B	2.0
	IR58-4	B	D.5
	LB56-16	U	0 6
	LB111-2	B	0.5

From / Von / De / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
LB70	LB-S37	BK	3 0
	LB-S29	BK	3.0
	LB S4	BK	3 0
LB80	LU7-1	B	2.0
	LB15-2	B	2.0
	RS87 3	B	2.0
	LB166-86	U	0 5
LE81 1	LB-S26	WK	3.0
LB81 2	LB-S28	WK	3.0
LU81-3			
IR82	LE587	N	0.5
	LB49-24	N	0.5
	LU13-2	N	2.0
	LB19-30	N	3.u
LB88	LE00	U	2.0
LR90	LB88	B	2.0
LB92 30	LU-S99	WP	0.5
	IR92-R6	WP	0.6
IR92-R5	LE11 U	U	0.5
LB92 80	LB92-30	WP	0.5
LB92-87	LU34-3	YU	0.5
LB93-30	LB S42	R	2.0
LB93 80	LU36-6	SB	0.5
LB93-86	LB-S31	WK	0.5
LU93-87	IB-S41	PW	2.0
LB94 1			
LB94-2	LB-S41	PW	2.0
IB94-3	LB S42	P	2.v
LB95-30	LU-S21	NY	2.0
LU95-85	IB73	B	0.0
IB95-R6	LB S44	WO	0.5
LB95-87	LB600	NY	2.0
LU98-30	LB-S22	NY	2.0
LB98-85	LB74	B	0.b
LB98 80	LB-S44	WO	0.5
LU98-87	LB100-2	NY	2.0
LB97-1	LB S26	WK	0.b
LE37 2	LB-S21	NY	2.0
LU97-3	IB-S49	R	2.0
LB98-1			
LE38 2	LB S49	R	2.0
LB9B 8	LB73	B	0.5
LB99-1	LE S26	WR	0.5
LE99 2	LB-S22	NY	2.0
LU99-3	LB-S48	R	2.0
IR100-1			
LB100 2	LB86-87	NY	2.0
LB1w.3	LU73	B	2.0
LB101-1			
LB101 2	LB-S80	NY	2.0
LU101-3	IR74	B	2.0
LB102-1			
LB102 2	LU-S48	R	2.0
LU102-3	LB74	B	2.0
LB108 30	LB-S29	NW	0.5
LB108-85	LB-S28	RLG	0.5
LU100-86	IB-S29	NW	0.5
IR108-87	LB-S1	UY	0.5
	LB S39	UY	0.5
LU109-30	IB-S21	NY	0.5
IR108-85	LB S47	UO	0.b
LB109-86	LE512	NY	0.5
LB108 87	LUD13-U	RY	0.5
LB111-1	GB11-1	BS	0.5
LB111-2	LB75	B	0.5
LU114-1	Inis?-1	RO	0.5
IR114-2	LE1522	GU	0 b
LB114 7	LB-S40	NG	0.1
LE114-8	LB-S3	B	0.5
LB119-1	LB S19	NW	0.5
LE119 20	LB-S20	OK	0.5
LE118-3	LB-S28	RLG	0.5
LU119-4	LB-S14	GB	0.5
IR119-5			
LB120-1	LB-S19	NW	0.5
LU120-2P	LB-S23	OK	0.5
LB120 3	LB S28	RLG	0 5
LB120-4	LR41-1	GB	0.5
LB120-5			
LB122	LB-S3	B	0.5
LB123	LB-S29	NW	0.5
LB124	LB-S29	NW	0.1
LB125	LB-S3	a	0.1
LE127 1	LB-S42	V	2.0
LB127-2	LB-S9	NB	2.0
LB127-3	LB-S6	NP	0.5
LU127-4	IB2-9	GB	0.5
LB127-5			
LB128 1	RS22-25	NK	0.5
LB128 2	LB146-1	NY	0.5
LB128-3	L025-2	NU	2.0

From / Von / De / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
LB128 4	LU7-2	NP	2.0
LB128-5	LB150 30	NU	2.0
LU120-6			
LB128 7			
LB128-8	LB 540	NG	2 0
LU120-9	IB-S12	WY	0.5
LB120-1	LB130 35	RE	0.5
LU129-2	IR-S98	NR	0.5
LE129 3	R524-23	NLG	0.5
IR129-4	LB.629	NW	2.0
LB129 ■	LU16-30	NY	1.0
LU130-1	IR-S21	YY	1.0
LE130 2	LU-S22	NY	3.0
LB130.3	LB29 2	NU	2.0
LU130-4	I Rd2.2	NP	2.0
LE130 5			
IR130-6	LB 145.4	NR	0.5
LU130-7			
LB130 8	LB153 1	NW	2.0
IR130-9	LB-S12	WY	0.5
LB131-1	LB130 30	KB	0.b
LU131-2			
LE131 3	GB11-3	NG	2.0
LB131-4	LB S62	NB	3.0
LU131-5			
IR132-1	LB21.2	SR	3.0
LB132-2	LU21-3	SU	0.5
LB1.32-3	LB 520	RK	3.b
LU132-4	IR-S8		0.5
LB132 5	LB 54	UK	0.5
IR132-6	LB135-42	R	3.5
LE132-7	LU136-29	Y	0.5
LE132 8	LB130 30	O	0 b
IR132-9	LB111-26	U	3.5
LB132-10	LU136-27	P	0.5
LB132 11	LB136 31	R	0.b
LU132-12	IR135-25	UY	3.5
LB132-13	LB130 28	US	3.b
LU132-14	IR135-32	PG	3.5
LE132-15	LU136-33	RR	0.5
LB132 16	LB13 17	GO	0.b
LU132-17	IR14-24	GS	3.5
LE132 111			
IR132-19			
LB132-20			
LB132 21			
LU132-22			
LB132 23			
IR132-24			
IR133-1	LB130 8	NW	2.0
LB133-2	LU-S3	B	2.0
LB133 3	LE14 11	YB	0.6
LB134-1	LU-S71	KR	0.5
LE1342	LB148-1	WO	0.5
LU134-3	LB-S4	BK	0.5
LE1344	LU-S4	GK	0.1
LB134-5	LE145.4	NR	0.6
LE134-6			
L0134.7			
LU134-8			
LB134 9			
IR114-10	LE 520	RK	0.5
LU134-11			
LB134 12			
LU134-13	LB 145.5	O	0.5
LB134-14	IB 145-1	K	0.5
LB134 15	RS22-4	H	Inner
IR134-16	RS22 12	U	Inner
LU134-17	RS72-2	RRAID	Screen
LE134 18	LS1 E	WLG	0 5
LU134-19	RS22-3	OK	0.5
LB134-20	RS22-8	BW	0 5
LB134 21	RS22-7	OS	0 5
IR134-22			
LB134-23			
LB134 24	RS24-6	NY	0.5
LU135-1			
LB135 2	LU-S30	U	0.5
IR135-3			
LU135-4			
LE1355			
IR135-6			
LU135-7	RS24-1	O	0.5
LB135-8			
LE1353	LS1-27	BR	0.5
IR155-1n	LS1 20	BY	0.5
LU135-11	IR-S10	PU	0.5
LE135 12	LU14b-8	KR	0.5
IR185.13	RS22 19	OR	0.5
LU135-14	LB35-7	GB	0.5
LB135 16	LU14-3	SB	0.5
LB135-16	LB152 4	NY	0.5
LU135-17	LB31-1	OY	0.5
LB135-18	LU14-2	Y	0.5
LB135 19	LB-S5	NP	0.5
IR115.20	LS1 22	SK	0.5
LU135-21	RS22-18	LG	0.5
LB133-22	L027-3	UG	0.5
LB135-23	RS24 21	UR	0.5
IB135-24	LB49-7	U	0.5
LB135 25	LB132-12	UY	0.5
LB136-26	LB132-9	U	0.5
LE135 27	LU132-10	P	0.5
LU135-28	IB132-13	US	0.5
LE135 29	LB132-7	Y	0.5
LB135-30	LB132-8	a	0.5
LB135-31	LU132-11	K	0.5
LB135-32	LE132 14	PG	0 6
LU136-33	IB132-15	BR	0.5
LB130 a4	LS1-18	OS	0.5
IR135-35	LB129 1	RE	0.6
LB136-36	LU131-1	KR	0.5

From / Von / De / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
LB135 37	LS1 17	UP	0.b
LB135 38	LB S61	RG	0.b
LB135 38	RS24-18	KU	0.5
LB135-40	LB14-10	UW	0.5
LB136-41	LB14-9	UN	0.5
LB135-42	LB132-8		3.5
LU135-43	IR-S88	KS	3.5
LU135-44	LB35-4	S	3.5
IR135-45	LS1-32	NC	3.5
LB135-46	LB-S8	GO.5	
LB135-47	LB8 20	GW	0.5
LB135-48	LS1 23	RB	0.5
IR145-1	LB134-14	K	0.5
LB145 2			
LE145 3			
LE1454	LB130-6	NN	1.5
	LB134-b	NR	0.5
LB146-b	LB134-13	O	0.5
LB146-6	LU-S4	BK	0.5
LU146-1	IR128-2	NV	3.5
LU146-2	IR152-3	YO	3.5
IB146-3			
IB146-4			
IR147.90	LB-S95	UR	3.5
LB147-85	LB S50	UD	0.5
LB147-86	LB SG	G	0.5
LE147 E7	LB16 87A	NW	0.5
LE148 1	LB134-2	WO	3.5
LE148 2	LB166-86	WU	3.5
LE148 3	RS24-7	WU	3.5
LE148 4	LB-S12	WY	3.5
LE148 D	RS22-30	WG	0.5
LE148 G	LB135-12	KU	7.5
LB148-7	LU-S00	NR	1.0
LB148-8	LU-S61	WO	3.5
LU148-9	IR-S99	WP	3.5
LB149-1			
LB149-2			
LB148-3	IS2-14	WR	3.5
LB148-4			
IB148-5			
LB151 1	LB15 6	RO	0.5
LB151 2	LB 501	GU	0.5
LB151 3	RS22 8	YO	0.5
LE151 4	RS22 20	RY	0.5
LB151 5			
LB152-1	LB114-1	NO	3.5
LB152-2	LB114-2	GU	0.5
LB152-3	LB148-2	YO	3.5
LB152-4	LU135-16	RY	0.5
LB152-5			
LB166 30	LB129-5	NU	7.0
LB166-85	L000		0.5
LB166-86	IR148-2	WE	3.5
LU166-87	IB-S18	OB	2.0
IR164-30	LB165-1	K	2.0
IR164-85	LB165-3	EN	3.5
LB164-86	LB-S80	NY	2.5
IR164-87	LB-S80	NY	2.0
IR164-87A	LB165-2	KS	2.0
LB165-1	LB164 30	K	2.0
LB165 2	LB164 87A	KS	2.0
LB165 3	LB164 86	BN	0.5
LBD1 U	LB S8	YO	0.5
LBD1 W	LB64-3	GP	0.5
LBD2-U	LR19-85	WR	3.5
LBD2-W	LB35-11	WP	3.5
LBD3-U	LS2-4	ON	3.5
LBD3-W	LB-S8	YO	3.5
LUD6-U	LR17-85	WU	0. ■
LUD6-W	LB64-2	WG	0.5
LAD7-U	LB16-85	U	0.5
LAD7-W	LB-S13	WN	0.5
LAD8-U	LB-S29	NW	0.5
LAD8-W	LB28-2	W	0.6
LAD8-U	LB30-1	SR	0.6
LAD8-W	LB-S43	OOW	
LBD11 U	LB92 85	U	0 b
LBD11 W	LB18-30	UG	0.5
LBD12 U	LU-S26	WK	0.1
LBD12-W	LU-S44	OOW	
LBD13-U	L0109-87	RV	n.5
LBD13-W	LB-S44	OOW	
LB-S9	LB-S80	NE	1.0
LB-S19	LB-S29	NW	2.0
LU-S24	IR-S51	RG	0.5

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From / Von / Da / Vun / Da	To / Nach / A / Nuar / A	Colour / Farbe / Colore / Kleur / Colore	Size (mm²) / Querschnitt / Section / Maat / Diametro
Desde	Hacia	Color	Tamano
GR11-1	LR111-1	BS	0.5
GB11 2	LE582	NB	*0.5*
GB11-3	LB121-3	NG	*7.0*
LS1 1	LB49 0	US	0.5
LS1-2	LR13-15	KR	0.5
LS1 3	LE48 11	UK	0.5
LS1-4	LR14-8	VS	0.5
LS1-5	LB-S83	RU	0.5
LS1-6	RS22-36	RS	0.5
LS1-7	LB-S11	WK	0.b
LS1 8	LE134 18	WLG	0.5
LS1-9	LR-S38	P	0.5
LS1 10	RS24 16	OG	0.0
LS1-11	LB-S84	RO	0.5
LS1-12	LB-S66	KS	0.b
LS1 13	LE 627	R	0.5
LS1-14	LR33-13	RLG	0.5
LS1 15	LB33 12	RP	0.5
LS1-16	LR135-34	OS	*0.*■
LS1 17	LB135 37	OP	0.5
LS1-18			
LS1-19	LB-S6	NP	*0.5*
LS1.20	LB135. 10	BY	*0.5*
LS1-21			
LS1 22	LB135 20		*0.5*
LS1-23	LB135-48	RB	0.5
LS1-24	LB-S10	PU	0.b
LS1 25	LB21 7	UG	0.5
LS1-26	LR21-6	UR	0.b
LS1 27	LB135 9	BR	0.5
LS1-28	LB-S82	SLG	*0.5*
LS1-29	LB-S1	UY	0.6
LS1 30	LBG1 11	BO	0.5
LS1-31	LR61-12	GLG	0.b
LS1 a2	LB135 40	NO	0.5
LS1-33			
LS1-34			
LS1-35			
LS1-36			
LS2-1	LB-S98	RG	0.b
LS2 2	LB S13	WN	0.5
LS2-3	LB33-9	RN	n.■
LS2-4	LU03-U	GO	0.b
LS2 5	LE 629	NW	0.5
LS2-6			
LS2-7			
LS2-8	LB05 10	GU	0.5
LS2 9	LB127.4	GB	0.5
LS2-10	LR-S17	PO	0.5
LS2-11	LB-S16	PK	0.5
LS2-12	LB-S15	YW	0.■
LS2-13			
LS2-14	LB149-3	WR	*0.5*
LS2 15	LB13 28	KY	0.5
LS3-1	LU69-1	NB	3.0
LS3 2	LE72	B	*2.0*
LS3-3	LB59-2	0	2.0
LS3-4	LU-S91	WG	0.8
LS3 5	LE 632	UR	1.0
LS3-6	LR-S09	WP	0.5
LS3 7	LB59 4	U	2.0
LS3-8	LR-54	BK	3.0
LS3-9	LUZB-6	YG	1.0
LS64-1	LR58-5	RY	2.0
LS64-2	LB59-6	RS	2.0
LS64 3			
LS64-4	LB59-3	RS	2.0
LS64-5	LU67-2	PG	2.0
LS64 6	LE214	UY	2.0
RS22-1	LU18-6	US	0.5
F7622 2	LB134 17	BRAID	Screen
RS22-3	LR1SI-9	YO	3.5
RS22-4	LU134-10	R	nmr
F7522 5			
RS22-6			
RS22-7	LU134-21	OS	0.5
RS22 e	LB134. 10	OK	3.■
RS22-9	LR134-20	OW	0.b
RS22-10			
RS22-11			
RS22-12	LU134-16	U	nner
RS22 13	LBG1 9	Ba	1.5
F1323.14	LR61-10	GLG	J.6
RS22-15	LB48-6	UK	1.5
F1622 16	LB14-17	YK	0.5
RS22-17	LR-S43	LGO	0.b
RS22-18	LU135-21	LG	0.5
RS22 19	LB135 13	OR	1.5
F1523.20	LR-S15	YW	0.5
RS22-21	LB14 20	WG	1.5
RS22 22	LB14 21	WB	0.5
RS22-23			
RS22-24			
F1622 25	LB128 1	NK	0.5
RS22-26	LB151-4	KY	0.b
RS22-27	LB33-7	KO	0.5
RS22 2e	LB53-8	KR	0.5
RS22-29	LB-S39	UY	0.b
RS22-30	LU140-6	WS	0.5
RS22 91			
RS22-32	LB-S10	PU	0.5
F1622.33	LB13-14	KO	0.5
RS22-34	LU-S1 ■	PO	0.0
RS22 35	LB S16	PK	0.5
RS22-36	LSI-6	RS	0.b
RS24-1	LB135-7	O	1.5
RS24-2	LB-S12	WY	0.5
RS24-3	LB14 1	LGN	0.5
F1624 4	LB-S92	LGY	1.5
RS24-5	LB-S36	P	0.5
RS24 6	LB1a4 24	RY	0.5
RS24-7	LR148-3	WU	0.b

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Desde	Hacia	Color	Tamano
RS24-8	LR-S27	B	0.5
RS24 9	LB S83	RU	0.5
R524 10	LE S84	RO	0.5
RS24-11	LB-S82	SLG	0.5
RS24-12	LR33-4	KY	0.5
RS24-13	LU-S29	NW	0.5
3124 14	LB S65	KG	0.5
RS24-15	LB13.27	KU	0.5
RS24-16	LR1-10	OG	0.b
RS24-17	LB-S27	UR	V U
RS24 18	LB135 39	KU	0.5
RS24 19	LB-S07	KLG	0.5
RS24-20			
RS24-21	LU135-23	UR	4.b
RS24-22	LB66 2	UB	0.5
RS24 23	LB128 3	NLG	*0.5*
R324.24	LB-S81	WK	0.5
RS87-1	LU62 0	NY	0.5
	LE7 5	NY	*0.5*
RS87-2	LR-S81	WG	*0.5*
RS87-3	LU00	U	2.0
RS87 4	LE 637	BK	2.0
RS87-5			
RS87-6	LR-S89	WP	0.5
LE6 I	LE 62E	NW	0.5
LEG 2	LE30 5	SU	*0.5*
LB6-3			
LB6-4	LB-S20	RLG	0.b
LB7 1	LB30	B	2.0
LR7-2	LR128-4	NP	2.0
LB7-3			
LB7-4			
LB7 5	RS87 1	NY	0.5
LB7.6	LB-S37	BK	*2.0*
LB8-1	LB-S91	R	5.6
LB8 2	LB S15	YW	3.5
LR8-3	LR61-7	RR	0.5
LB0-4	LU61-8	UP	8.0
LB8 5	LB S35	K	0.5
LR8-6	LB33-6	KW	0.5
LU8-7	LB-S06	P	0.b
LB8-8	LB-S97	KLG	0.5
LB8 9	ILE-E34	PN	1.5
LR8-10	LR-317	PO	0.5
LUR-11	LU-S16	PK	0.5
LU8-12	LU-S9	YO	3.0
LB8 13	LB 647	UO	1.5
LB8-14	LB61-22	OM	1.5
LR8-15	LR61-23	NO	0.5
LU01-16	LU01-24	OY	1.6
LEE 17	LB61 25	OP	1.5
LEE-18			
LR8-19			
LU0-20	LU136-17	GW	2.b
LBU 21	LB S39	UY	2.5
LB8 22			
LR8-23			
LU0-24			
LB11-1	LB-S71	KR	0.5
LB11-2	LB-S37	BK	2.5
LB11 3	LB27 1	KB	1.22
tB11.4	LB-S32	UR	1.5
LB12-1			
LB12 2	LB82	N	1.0
LE12-3			
LU13-1	LU-S31	WK	3.5
LB13 2	LB 591	R	0.5
LE13.3	LB-S92	LGY	0.5
LR13-4	LR55-2	LGG	0.5
LU13-b	LU-S80	LGR	0.5
LB13 6	LB49 15	YR	1.5
LE13-7	LB49-14	ULG	0.5
LR13-8	LR49-10	UY	0.5
LU13-9	LU66-7	YU	0.5
LB13 10	LB56 6	VN	0.5
LB13-11	LB55-3	YG	0.5
LR13-12	LR55-4	YLG	0.5
LB13-13	LB66-5	YB	0.5
LB13 14	F1622.33	KG	0.5
LR13-15	LS1-9	KR	0.5
LB13-16	LB30-14	NG	0.5
LB13 17	LB132 16	GO	0.5
LB13-18	LB-S38	P	0.5
LU13-19	LU-S96	UR	0.5
LB13-20	LB61 2	PW	0.5
LB13 21	LB-S95	RW	0.5
LB13-22	LB-S14	GB	0.5
LR13-23	LB-S7	SLG	0.5
LU13-24	LB33 2	LGO	0.5
LB13 25	LB38.1	OW	0.5
LB13-26	LB48-1	KW	0.5
LU13-27	RS24-16	KU	0.5
LB13-28	Ls2.10	KY	0.5
LB13 29	LB35 13	US	0.5
LB13-30	INHIBIT PLUG		
LB13-31	LB30 2	SO	0.5
LB13 32	LE30 3	SY	0.5
LEI 3.33	LB30-4	SO	0.5
LU13-34			
LB13 35	LB30-6	SK	0.5
LR13-36	LR-S37	RK	0.5
LB14 1	RS24 3	LGN	0.5
LB14.2	LB135-18	Y	0.5
L014.3	LB135-15	SR	0.5
Lhid-A	LU-S61	GU	0.5
LU14-5	LU61-13	UW	0.5
LB14 6	LB48 16	YP	0.5
LB14 7	R1622 16	YK	0.5
LB14-8	LS1-4	YS	0.■
LR14-9	LR135-41	UN	0.5
LB14 10	LB135 40	UW	0.5

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Desde	Hacia	Color	Tamano
LR14-11	LU133-3	YR	0.5
LB14 12	LB S43	LGO	0.5
LR14-13	LU-S28	RLG	0.5
LB14 14	LB58 1	UG	0.5
LU14-15	LU59-3	PO	0.b
LE14 17			
LR14-18	LR58-13	LOS	0.5
LB14 19	LB S35	K	0.5
LU14-20	LB22-21	WG	0.b
LE14 21	RS22 22	WB	0.5
LB14-22	LB39-2	O	0.■
LU14-23	LU48-2	RO	0.0
LB14.24	LB132-17	GS	*0.5*
LU14-25			
LE14 26	LB66 5	S	*0.5*
LB14-27	LR61-26	RN	0.5
LU14-28	LU61-29	BU	0.5
LB14 29	LB55-9	PY	0.5
LU14-30			
LE1431			
L014.32			
LB14 33			
LB14-34	LR60-2	LGP	0.5
LB14 35	LB30 13	SN	0.5
LB14-36	LR30-15	ON	0.5
LB15 1	LB-S40	NG	2.0
LR15-2	LR60	B	2.0
LB15 3	LB S17	PO	2.0
LB15-4	LR-S16	PK	2.0
LU15-5	LB S8	YO	0.5
LB15-6	LB151-5	RO	0.5
LR15-7	LU-S34	PN	*0.6*
LB15 8	LB S61	GU	0.5
LU16-30	LB16 86	NY	0.5
	LB129-5	NY	1.0
LU16-86	LU07-U	U	*0.0*
LB16 80	LB16-30	VY	0.5
LU16-87	LU66-3	LGO	Y.0
	LB32-2	LGO	1.0
LR16-8/A	LU17-87	NW	0.5
LR17-30	LU71	N	3.0
LB17 85	LB05 U	WU	*0.5*
LU17-86	LR71	N	n.5
LU17-87	LB-S31	WK	3.0
LR18-30	LU011-W	UG	0.5
	LB S27	UG	2.0
LB18-85	LB-S50	UO	0.5
LU18-86	LB-S38	NR	0.5
LB18-87	LB-S37	BK	0.5
LB18 30	LB82	N	3.0
LB18-85	LR02-U	WR	0.5
LU18-86	LB-S31	WK	0.5
LB18-87	LB28-5	W	3.0
LE20 I	LB S30	U	0.5
LB21 I	LS1 25	UG	*0.5*
LR21-2	LU132-1	SN	0.b
LB21 3	LB132 2	SU	*0.5*
LR21-4	LS64-6	UY	2.0
LB21 5	LB S80	NB	1.0
LR21-6	LS1-28	UR	0.b
LB21 7	LB S10	PU	0.5
LB21-8	LR-S37	RK	11.5
LB25 1	LB75	B	*2.0*
LR25-2	LR198-3	NU	2.b
LB25 3			
LB26-1	LB S27	UG	0.5
LB26-2	LB06-W	W	0.5
LB27 1	LB11-3	KB	0.22
LR27-2	LR-S71	KR	0.b
LB27 a	LB135 22	UG	0.5
LB27-4	LR35-5	RO	0.5
LB27-5	LB35-16	RU	0.5
LB27-6	LB-S30	U	0.5
LB28-1	LB-S26	WK	*2.0*
L020-2	LB-S32	UR	2.0
LB28 3			
L020-4	LB-S62	NU	0.b
LB28 5	LB19-87	W	3.0
LR28-6	LS3-9	YG	1.0
LB29-1	LB75	B	2.0
LU28-2	LU130-3	NU	2.0
LB29-3			
LB30 1	LB09 U	SR	0.5
LR30-2	LR13-31	SO	0.5
LB30 3	LB13 32	SY	11.5
LB30-4	LB13-33	SG	0.5
L030-5	LU6-2	SU	0.5
LB30 6	LB13 35	SK	11.5
LR30-7	LU-S24	RG	0.5
LB30 8			
LB30-9			
LB30 10	LB S13	WN	11.5
L030-11	LB-S20	RK	0.5
LB30-12			
LB30-13	LB14-36	SN	0.5
LB30-14	LB13-18	NG	0.5
LB30-15	LB14-36	ON	11.5
LR31-1	LU136-17	GY	0.5
LB31 2	LB S23	BK	11.5
LB32-1	LB S19	NW	1.0
LB32-2	LR16-87	LGO	1.0
LE22 3	LB74	B	1.0

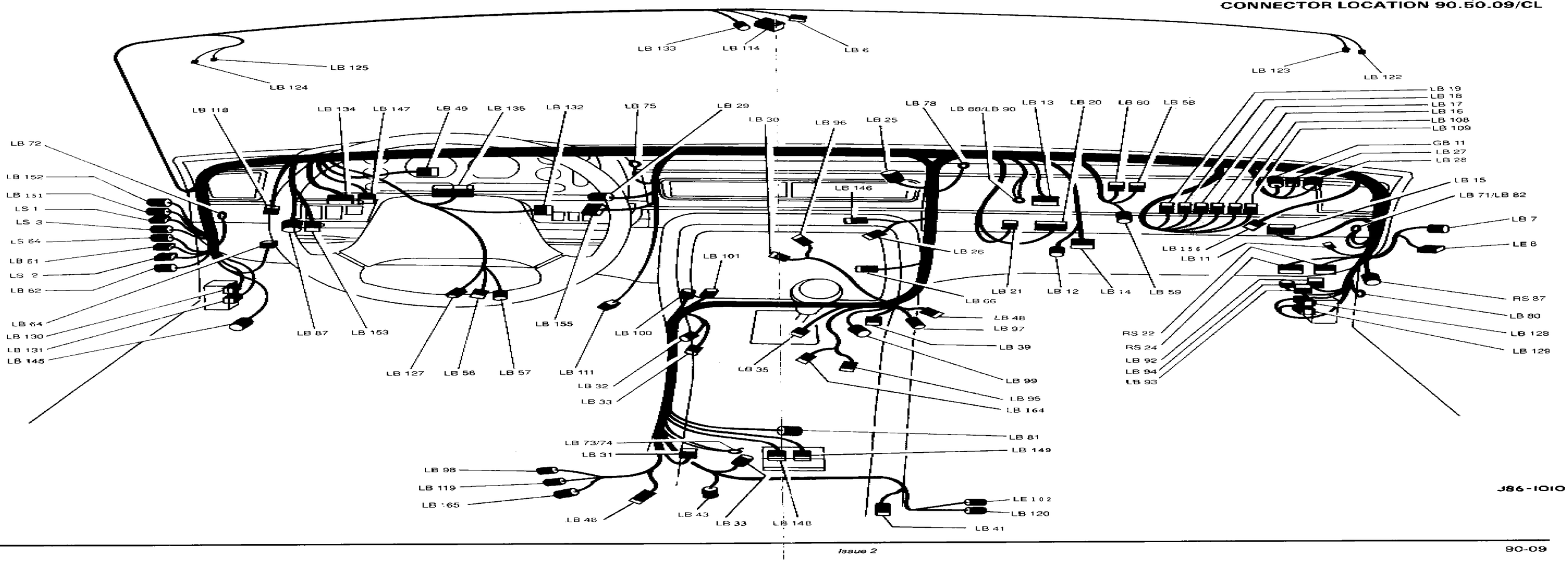
From / Von / Da / Vun / De	To / Nach / A / Nuar / A	Colour / Farbe / Colore / Kleur / Colore	Size (mm²) / Querschnitt / Section / Maat / Diametro
Desde	Hacia	Color	Tamano
LB33-1			
LR33-2	LU13-21	LGU	0.5
LB33-3	LU62-87	YU	0.5
LB33-4	RS24-19	KY	0.b
LB33.5	LB-S07	KLG	0.5
LB33 G	tB8.6	KW	fla
LB33 7	RS22 27	KO	0.5
LB33 8	RS22 28	KR	0.5
LU33 9	L52 3	RN	0.5
LU33-10	LB S98	RG	*0.5*
LU33-11	LU61-1	RW	0.5
LB33-12	LS1-15	UP	0.5
LR33-13	LS1-14	NLG	0.b
LB33-14	INHIBIT PLUG		
LB33 15			
LU35 1	LB 523	BK	0.5
LU35-2	LU74	B	0.5
LU35-3	LU-S41	PW	1.0
LU35-4	LU135-44	S	0.5
LR35-5	LU27-1	RG	0.0
LB35-6	LU83-86	SU	0.0
LB35-7	LR135-14	GU	0.0
LB35-8	LB-S49	P	1.0
LB35-8	LB-S62	SLG	0.b
LB35-10	LB-S05	RW	0.5
LB35 11	LB02 W	WP	0.5
LB30 12	LB S26	WK	*0.5*
LB35 13	LB13 20	US	0.5
LU35-14	LB49 2	RS	0.5
LU36-1b	LB27-6	RU	0.5
LB38-1	LB73	U	*2.0*
LB36-2	LB-S15	RR	2.0
LB38-3	LB-S90	RK	0.5
LB38 4	LB-S23	BK	0.■
LB39 1	LE13 25	OW	0.5
LU39-2	LE14 22	O	*0.5*
LU39-3	LB-S48	R	0.5
LU39-4	LU-S23	BK	0.5
LU39-5	LU39-6	O	0.5
LU39-6	LU39-5	O	0.5
LR41-1	LU120-4	GU	0.5
LR41-2	LB-S7	SLG	uO
LB43-1	LR74	R	/ O
LB43-2	LB-S18	OR	2.b
LB43 3	LB-S20	RK	0.5
LE43 4	LB 523	BK	0.5
LU46-1	LB-S14	GB	0.5
LR46-2	LU-S7	SLG	*0.5*
LB48-1	LR13-38	KW	0.b
LB48-2	LR14-23	KO	0.b
LB48-3	LB-S49	R	0.5
LB48 4	LB-S23	BK	0.5
LB48 5	LB48 G	O	3.5
LU48 6	LB48 6	O	3.5
LU48-1	LU-S20	RK	0.5
LR48-2	LU36-14	NS	0.5
LR48-3	LU-S83	NU	0.b
LR48-4	LU-S04	NU	0.b
LR40-5	RS22-15	VK	0.b
LR40-6	RS22-1	OS	0.5
LR40-7	LR135-24	UP	0.5
LR40-8	LR55-14	PK	0.5
LB40-9	LB1-1	UR	1.5
LB40-10	LB13-8	UY	1.5
LB49 11	LB1-3	UK	0.5
LE48 12	INHIBIT PLUG		
LU48-13	LU-S01	RG	0.5
LU49-14	LU13-7	ULG	1.5
LU49-1b	LU13-6	YR	0.5
LR49-16	LU14-8	YP	0.5
LB49-17			
LB49-18	LR-S50	NO	0.5
LB49-19	LB55-20	RLG	0.5
LB49 20	LB-54	BK	0.5
LB49 21	LB55 23	RY	1.5
LB48 22	LB S11	WK	1.5
LB49-23			
LU49-24	LB92	N	0.5
LB56-1	LB-S92	LGY	1.5
LR56-2	LU13-4	LGG	1.5
LR55-3	LU13-11	YG	0.b
LhSS.4	LR13-12	YLG	0.5
LB55-5	LB13-13	YR	1.5
LB55-6	LB13-10	YN	1.5
LB55-7	LB13-9	YU	1.5
LB55 8	LB B90	LGR	1.5
LB55 9	LB14 29	PY	1.5
LB55 10	LS2 8	GU	1.5
LU55-11	LB60 I	LGK	1.5
LU56-12	LB S38	NR	0.5
LU56-13	LB-S20	RK	0.5
LB55-14	LU49-9	PG	1.0
LR55-15	LB-S85	RW	0.5
LB55-16	LR75	R	0.5
LB55-17	LB-S12	WY	1.5
LB55-18	LB58-5	GB	0.5
LB55 19	LB-S96	UR	1.5
LB65 20	LB49 19	RLG	1.5
LB66-21	LB S13	WN	1.5
LU56-22	LB66-6	GR	0.5
LB65-23	LB49-21	RY	0.5
LB66 24	LB 14	BK	0.5
LB56 I	LB 6120	PU	0.5
LB56 2	LB 612	WY	0.5
LB57 1			
LB57-2	LB64-6	PG	0.0
LU57-3	LB-S41	PW	0.0

BULKHEAD HARNESS LB (LHD)
HARNESS SCHEDULE 90.50.09/HS

Connector No	Description	Interface
GB11	Green PM4 3 way socket	Gear box harness
LS1	Black PMHD 36 way socket	Side harness interface
LS2	Yellow PMHD 15 way socket	Side harness interface
LS3	Black PM4 9 way socket	Side harness interface
LS64	Yellow PM4 6 way socket	Side harness interface
RS22	Black PMHD 36 way socket	RH side harness interface
RS24	Yellow PMHD 24 way socket	RH side harness interface
RS87	Black PM4 8 way socket	RH side harness interface
LB6	Black PM4 4 way socket	Interior map light
LB7	Black PM4 4 way socket	Passenger door harness
LB8	Black PMHD 24 way plug	Passenger door harness
LB11	Yellow 4 way socket	PI interface unit
LB12	Black PM4 3 way socket	Central processor
LB13	Black PMHD 36 way socket	Central processor
LB14	Yellow PMHD 36 way plug	Central processor
LB15	9 way socket	Lock unit
LB16	Black relay base	Radio relay
LB17	Blue relay base	Ignition on relay
LB18	Green relay base	Aux side lamp relay
LB19	Natural relay base	Starter relay
LB20	Single lucar connector	Speed control unit
LB21	8 way socket	Speed control unit
LB25	Black PM4 3 way socket	LH Air con blower motor
LB26	Black 2 way socket	Glove box lamp and switch
LB27	Yellow PMHD 6 way socket	PI harness
LB28	Yellow PM4 6 way plug	PI harness
LB29	Black PM4 3 way socket	RH Air con blower motor
LB30	Blue PMHD 15 way socket	Centre console
LB31	Yellow 2 way switch	Handbrake switch
LB32	Yellow PM4 3 way socket	Radio
LB33	Yellow PMHD 15 way socket	Radio & speakers
LB35	Green PMHD 15 way socket	Gear select switch
LB38	PM4 4 way socket	Front cigar lighter
LB38	Black 6 way socket	Seat heater switch
LB41	Black 2 way socket	Seat belt switch
LB43	PM4 way socket	Rear cigar lighter
LB46	Black 2 way socket	Seat belt switch
LB48	Black 6 way socket	Seat heater switch
LB49	Green PMHD 24 way socket	Fascia switch panel
LB55	alack PMHD 24 way plug	Column switchgear
LB56	Yellow 2 way socket	Brake switch
LB57	Black 3 way plug	Brake switch
BR58	Black PMHD 15 way socket	Speed warning module
LB59	Black PM4 8 way socket	Wiper logic module
LB60	Black PMHD 4 way socket	Wiper logic module
LB61	Black PMHD 36 way plug	Drivers door harness interface
LB62	Black PM4 6 way socket	Drivers door harness interface
LB64	3 way socket	Inertia switch
LB66	slack PMHP 16 way socket	Air con control
LB71	Eyelets	Bulkhead battery terminal post
LB72	Eyelets	Earth terminals
LB73	Eyelets	Earth terminals
LB74	Eyelets	Earth terminals
LB75	Eyelets	Earth terminals
LB78	Eyelets	Earth terminals
LB80	Eyelets	Earth terminals
LB81	Black PM4 3 way socket	Centre fuse box
LB82	Eyelets	Bulkhead battery terminal post
LB88	Eyelet	Earth terminal
LB90	Eyelet	Earth terminal
LB92	Yellow relay base	Radio illumination relay
LB93	Red relay base	Auto speed control relay
LB94	Black 3 way plug	Manual speed control shorting plug
LB95	Natural relay base	LH seat relay
LB96	Black relay base	RH seat relay
LB97	Yellow 3 way socket	Seat switches
LB98	Red 3 way aocket	Drivers seat heater
LB99	Yellow 3 way socket	Seat heater switch
LB100	Red 3 way socket	Seat switches
LB101	Red 3 way socket	Seat switches
LB102	Red 3 way socket	Passenger seat heater
LE108	Brown relay base	Puddle lamp relay
LB109	Violet relay baas	Seat adjust relay
LB111	2 way socket	Accelerator switch
LB114	8 way socket	Receiver module
LB119	Black 5 way socket	Interior light & seat switch
LB120	Black 5 way aocket	Pass interior light & seat switch
LB122	Lucar socket	Right hand illuminated vanity mirror
LB123	Lucar socket	Right hand illuminated vanity mirror
LB124	Lucar socket	Left hand illuminated vanity mirror
LB125	Lucar socket	Left hand illuminated vanity mirror
LB127	Black 5 way socket	clutch switch
16128	Natural 4 way socket	RH fuse box
LB129	Natural 6 wily aocket	RH fuse box
LB130	Natural 9 way socket 'A'	LH 'A' post fuse box
LB131	Natural 5 way socket 'C'	LH 'A' post fuse box
LB132	Brown 24 way socket	Fascia
LB133	3 way socket	Sunshine roof
LB134	Black 24 way socket	Instrument pack
LB135	Black 48 way socket	Instrument pack
LB145	Brown PM4 8 way socket	Diagnostic socket
LB146	Yellow 4 way socket	Remote bnnt release
LB147	Black relay base	Lights on warning module
LB148	Natural 0 way socket 'A'	Centre fuse box
LE149	Natural 5 way socket 'B'	Centre fuse box
LB151	Black 5 way socket	Security connector
LB152	Black 5 way plug	Security connector
LB166	Black relay base	Cigar lighters relay
LB164	Green relay base	Seat entry switch relay
LB165	Black 3 wily socket	Seat entry switch

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BULKHEAD HARNESS LB (LHD) (ABS)
CONNECTOR LOCATION 90.50.09/CL



J86-1010

WIRING SCHEDULE 90.50.09/WS

From / Van / Du / Desde	To / Nach / A / Hasta	Colour / Farbe / Couleur / Color	Size (mm²) / Querschnitt / Section / Tamano
LU50-14	LB-S40	U	*0.0*
LU66-16	LU-S37	BK	*0.5*
LB53-1	LS3-1	NR	3.0
LB53-2	LS3-3	R	*2.0*
LB59-3	LS84-4	BS	*2.0*
LB59-4	LS3-7	LI	*2.0*
LB59 5	LS04-1	RY	*2.0*
LB59 6	LS04 2	RS	*2.0*
LB60-1	LB50 11	LGR	*0.5*
LU60-2	LB14-34	LGP	*0.6*
LU60-3	LB-S90	LGR	0.5
LU60-4	LB-S31	WK	0.5
LB61-1	LU-S34	PN	0.5
LB61-2	LU13-20	PW	0.5
LB61-3	LB-S35	K	0.5
LB61-4	LU33-11	RW	0.5
LB61-5	LU-S90	RG	0.5
LU61-6	LU-S15	YW	0.8
TRU1.7	LU8-3	BR	0.5
LB61-8	TRR4	BP	0.5
LB61-9	RS22-13	BG	*0.5*
LB61-10	RS22-14	BLG	*0.5*
LB61 11	L81.30	VV	*0.5*
LB61 12	LS1 31	GLG	*0.5*
LB61 13	LB14 5	BW	*0.5*
LB61 14			
LB61-15	LB-S91	R	0.5
LU61-16	LB-S1	UY	0.5
LU61-17	LU-S13	WN	0.5
LU61-18	LU-S17	PU	0.5
LU61-19	LU-S16	PK	0.5
IA61-20			
IA61-21	LB-S47	UO	0.5
LA61-22	IA6-14	OR	0.5
LB61-23	LB8-15	OO	0.5
LB61-24	LB8-16	OY	*0.5*
LB61-25	LB8-17	OP	*0.5*
LB61-26	LB-S8	YO	*0.5*
LB61-27			
IA61-28	LB14-27	RN	0.5
IA61-29	LB14-26	BU	0.5
LB61-10			
LB61-31			
LB61 32	LB-S6	G	*0.5*
LB01 33			
LB61-34			
LB61-35			
LB61-36			
LU62-1	LU72	U	2.U
LB02.2	LU130-4	NP	2.0
LB62-3			
LA62-4			
IB62-5	IS87-1	NY	0.5
IB62-6	LB-S4	RK	2.0
LB66-1	IA-S23	RK	0.5
LB66.2	R524.22	LB	*0.5*
LB66-3	LEI8.37	LGO	0.5
LB66-4	LE73	0	0.5
LB60-5	LE14.20	3	*0.5*
LB86.6	LB-S20	RK	*0.5*
LB66-7	LB-S24	RG	*0.5*
LB66-8	INHIBIT PLUG		
LB66 9			
LB66-10			
LB66-11			
LB66-12	LB-S31	WK	0.5
LB66-13			
LB66-14			
LB66-15			
LB71	LAI7-30	N	1.0
	LB17-88	N	*0.5*
LB72	LB3 2	3	2.0
	LB02 1	3	2.0
	LB 8a	3	2.0
LB73	LB86-85	3	0.8
	LB88-3	I	*2.0*
	LU100-3	I	*2.0*
	LB36-1	J	*2.0*
	LB66-4	J	0.5
LB74	LU102-3	S	2.0
	LB66-05	T	0.5
	LB101-3		2.0
	IR43-1	S	2.0
	LB32-5	S	1.0
	LB35-2	S	*0.5*
LB75	LB28 1	U	*2.0*
	LB20-1	U	2.0
	LB-S14	9	3.0
	LU68-4	9	0.5
	LU66-16	U	0 0
	LU111-2	U	0.5
LR7Q	LB-S37	BK	3.0
	LB-S23	BK	3.0
	LE-54	BK	3.0
LB80	LB7-1	3	*2.0*
	LB15.2	3	*2.0*
	RS87.3	3	*2.0*
	LB150 80	3	0.5
LB81-1	LB-S28	WK	3.0
LE81.2	LB-S28	WK	*3.0*
LB81 3			
LE02	LB68 7	V	0.5
	LB48-24	V	0.L
	LU12-2	V	2.0
	LU19-30	V	3.0
IA85-1	LU66-7	/U	0.5
IA85-2	LB67-2	/C	2.0
IA85-3			
IA85-4			

From / Van / Da / Desde	To / Naar / A / Hasta	Colour / Kleur / Colore / Color	Size (mm²) / Doorsnede / Section / Tamano
LB85 5	LB 84	BK	0.5
LB85-6	LB87-2	YN1	2.0
LB86-1	LB-S8	YO	0.5
IA86-2	IA-S12	WO	0.5
LB86-3	LB13-23	SLG	0.5
LB86-4	LB118-30	G	0.5
LB86-5	LB-S2	WY	0.5
LB86-6	LE-82	WY	0.5
LB86-7	LB85 1	YB	*0.5*
LB80 a	LE106 1	YLG	0.5
LB80 a	LE 54	BK	0.5
LE06 10	LB100 2	YR	0.5
LE06 11	LB100-2	YO	0.6
LB86-12	LU-S4	BK	0.6
LU06-13	LU106-1	YP	0.5
LU06-14	LU91-1	YS	0.5
LU06-15	LU-S15	GW	0.5
LU06-16	LU-S1	DK	0.5
LU06-17			
LU06-1b			
LU06-19			
IA86-20			
LB86-21			
LB86-22			
LB86-23			
LB86 24			
LB87 1	LB130 7	NS	*2.0*
LB87 2	LB86 2	YG	*2.0*
LB87 a	LB90-6	YN	*2.0*
LU07-4			
LU07-5	LU91-2	YU	2.6
LU07-6	LU91-5	YW	*2.0*
LB87-7	LB-S14	R	*2.0*
IA88	IA90	R	*3.0*
LB90	LB88	E	2.0
LB92-30	LB-S99	WP	*0.5*
	LB92-86	WP	*0.5*
LB92-85	LB11-U	U	*0.5*
IA92-86	LB92-30	WP	*0.5*
IA92-87	LB33-3	YU	*0.5*
LB93-30	LB.642	P	*2.0*
LB93 85	LB35 5	SB	*0.5*
LB93 86	LB 651	WR	0.8
LB93-87	LU-S41	PW	2.0
LB94-1			
LU94-2	LU-S41	PW	2.0
LU94-3	LU-S42	P	2.0
LB96-30	LB-S21	NV	7 0
LB96-85	LB73	R	0.5
IB96-86	LB-S44	WO	0.5
IA96-87	IAS60	NV	2.0
LB98-30	LB-S22	NY	2.0
LB98-85	LB74	*8*	*0.5*
LB98-86	LB-S44	WO	*0.5*
LE98-87	LB100.2	NY	*2.0*
LB97 1	LB-S26	WK	*0.5*
LB97-2	LB-S21	NY	*2.0*
LB97-3	LB-S49	R	*2.0*
LB88 I			
LE08 5	LB-S48	R	2.0
LU99-3	LU73	U	0.5
LU99-1	LB-S26	WK	0.6
IA99-2	IA-S22	NY	*2.0*
IB99-3	LB-S48	R	*2.0*
LB100-1			
LB100-2	LB98-87	NY	*2.0*
LB100-3	LE73	B	*2.0*
LB101 I			
LB101 2	LB-S50	NY	2.0
LB101 3	LE74	B	*2.0*
LB102-1			
LU1uz-2	LU-S40	H	2.v
LU102-3	LU74	B	2.0
LB100-30	LB-S29	NW	0.5
LB100-85	LB-S28	RLG	0.5
LB100-86	LB-S29	NW	0.5
LB108-87	IA-S1		0.5
	LB-S30		0.5
LB109-30	LB-S21	NY	3.5
LB109 85	LB 647	UO	0.5
LB108 86	LB-S22	NY	3.6
LB108-87	LBD13-U	RY	3.0
LB111.1	LU111-1	US	0.5
LB111-2	LU75	B	0.5
LB114-1	LB152-1	WO	0.5
LB114-2	LB153-3	GU	0.5
LB114-7	R-540	NG	*3.5*
LB114-8	LB-S3		*3.5*
LB119-1	LB-S19	NW	3.5
LB119-2D	LB-S25	BK	3.5
LB119 3	LB 620	RLG	3.5
LB1194	LB 614	GB	0.5
LB115-5			
LB120.1	LB-S10	NW	0.5
LB120-2P	LB-S29	BK	0.5
LB120-3	LB-S28	RLG	0.5
LB120 4	LB41.1	GB	0.5
LB120 5			
LE122	LB-S3	B	1.6
LB123	LB-S29	NW	1.6
LU124	LB-S29	NW	2.5
LU125	LB-S3	B	2.5
LU127-1	LB-S42	P	2.0
LU127-2	LB-S9	NB	2.0

From / Van / Da / Desde	To / Naar / A / Hasta	Colour / Kleur / Colore / Color	Size (mm²) / Doorsnede / Section / Tamano
LB127 3	LE 80	NP	*0.5*
LB127-4	LS2 E	GB	*0.5*
LU127-5			
IB128-1	RS20-25	NK	0.5
LB128-2	LB148-1	NY	0.5
LB128-3	LB25-2	NU	2.0
LB128.4	LB7-2	NP	*2.0*
LB128-5	LB156-30	NB	*2.0*
LB128-6			
LE128 7			
LB128 8	LB S40	NG	2.0
LB128 8	LB 512	WY	0.6
LU129-1	LU135-36	KU	0.5
LU126.2	LU-S30	NR	0.5
LU129-3	RS21-23	NLG	0.5
LU129-4	LU-S29	NW	1.V
LU129-5	LB16-30	NY	1.0
LU130-1	LU-S21	NY	3.0
IB130-2	IR-S??	NY	3.0
LB130-3	LB29-2	NU	2.0
LB130-4	LB82-2	NP	2.0
LE130.5			
LE1306	LB145 4	NR	*0.5*
LE1307			
LB130 8	LB133 1	NW	*2 0*
LB130 9	LB-S12	WY	0.5
LU131-1	LU135-36	KU	0.5
LU131-2			
LU131-3	GU11-3	NG	2 4
LB131-4	IA-S69	ND	0.5
LB131-5			
LB132-1	LB21-2	SR	*0.5*
LB132-2	LB21-3	SU	*0.5*
LB132-3	LE-820	RK	0.5
LB132-4	LB-80	NB	0.5
LB132-5	LB-S4	BK	0.5
IB132-6	LB135-42	R	0.5
LB132-7	LB135-29	Y	0.5
LB132-8	LB135-30	O	0.5
LB132 9	LB135 26	U	0.5
LE132 10	LE135 27	P	0.5
LB132 11	LB136-31	R	0.5
LU132-12	LU136-26	UY	u.0
LU132-13	LU136-28	US	0.5
LU132-14	LU136-32	PG	0.5
LU132-1b	LU136-33	LIR	3.5
LU132-16	LU136-17	GO	0.5
IA132-17	IR14-24	GS	0.5
IA132-18			
IA132-19			
IA132-20			
LB132-21			
LB132-22			
LB132-23			
LB132.24			
LB133-1	LB130 a	NW	*2.0*
LB133.2	LB 63	B	*2.0*
LB133 1	LB14 11	YB	*3.5*
LB134-1	LB 671	KR	3.5
LB134 2	LB148 1	WO	3.5
LB134 3	LB 64	BK	0.5
LB134-4	LB-S4	UK	3.6
LB134-5	LB146-4	NR	0.5
LU134-6			
LU134-7			
LB134-8			
LB134-9			
LRI94.10	LB-S20	RK	0.5
LB134-11			
LB134.12			
LB134 13	LB145 5	O	3.5
LB134 14	LB145 1	K	0.5
LB134 15	RS22 4	R	nner
LE134-16	RS22-12	U	nner
LB134-17	RS22-2	BRAID	screen
LB134-18	LS1-9	WLG	0.5
LU134-19	RS22-8	OK	0.5
LU134-20	RS22-9	UW	0.5
LU134-21	RS22-7	OS	0.5
LU134-22			
LU134-23			
LU134-24	RS24-6	RY	0.5
LB135-1			
LB135-2	LB-S30	U	0.5
LE135-3			
LE135-4			
LB135 L			
LO135-6			
LB135-7	RS24-1	U	0.5
LB135-8	LS1-27	BN	0.5
LU135-10	LS1-20	UY	0.5
LU135-11	LB-S10	PU	0.5
LU135-12	LB146-6	KG	0.5
LB135-13	RS22-19	OR	1.5
LB135-14	RS5-7	GB	1.5
LB135-15	LB14-2	SB	1.5
LB135-16	LB152-4	RY	1.5
LB135-17	LB31-1	OY	1.5
LB135-18	LB14-2	Y	1.5
LB135 13	LB 50	NP	1.6
LB135 20	LS1 22	SK	0.5
LB135-21	RS22-18	LG	0.5
LB135-22	LB27-3	UG	1.5
LB135-23	RS24-21	UR	1.5
LB135-24	LB45-7	U	1.5
LB135-25	LB132-12	UY	0.5
LB135-26	LB132 9	P	0.5
LB135 27	LB132 10	P	0.5
LB135-28	LB132-13	US	1.6
LB135-29	LB132-7	Y	1.0
LB135-30	LB132-8	O	0.5
LB135-31	LB132-11	K	0.5
LB135-32	LB132-14	PG	0.5
LB135-33	LB132-15	BR	0.5
LB135-34	LS1-18	OS	0.5

From / Van / Da / Desde	To / Naar / A / Hasta	Colour / Kleur / Colore / Color	Size (mm²) / Doorsnede / Section / Tamano
LB135.35	LB129-1	KB	*0.5*
LB135 36	LB131-1	KB	*0.5*
LB135-37	LS1-17	OP	*0.5*
LB135-38	LB-S61	RG	*0.5*
LB135-39	RS24-16	KU	0.1
IB135-40	LB14-10	UW	0.1
IB135-41	IB14-9	UN	*0.5*
LB135-42	IB132-8	R	0.5
LB135-41	LB-S66	KS	0.5
LE135.44	LB35-4	S	0.5
LE135.45	LS1-32	NO	0.5
LB135 45	LB 58	G	*0.5*
LE131 47	LB3.20	GW	*0.5*
LB135 48	LS1 23	RB	*0.5*
LB145-1	LB134 14	K	0.5
LB146-2			
LB145-3			
LB146.4	LB130 5	NR	0.5
	LB134 6	NR	0.5
LU145-5	LB134-13	G	0.L
LU146-6	LU-S4	BK	0.6
LB146-1	LB126-2	NY	0.5
LB146-2	LB152-3	YO	0.5
LB146-3			
LB146 4			
LU146-1	LU134-2	WO	0.5
LB146-2	LB166-86	WG	2.6
LB146-3	RS24-7	WU	2.1
IB146-4	IB-S12	WY	0.5
LB146-5	RS22-30	WS	0.5
LB146-6	LB135-12	KR	0.5
LB146-7	LB-S80	NR	1.0
IB146-8	IB-S81	WG	3.6
LB146-9	LB-S69	WP	0.5
LB149-1			
LB149-2			
LB149 3	LS2 14	WR	3.5
LB149 4			
LB148-5			
LB151-1	LB15-6	RO	0.5
LB151-2	LB-S91	GU	0.5
LB151-3	RS22-9	G	0.5
LB151-4	RS22-26	RY	0.5
LB151-5			
LB152-1	LB114-1	RO	0.5
LB152-2	LB114-2	GU	0.5
LB152-3	LB146-7	YO	0.5
LB152-4	IB135-18	OY	0.5
LB152-5			
LB156-30	LB128-5	NB	2.0
LB156-85	LB80	B	0.5
LB156-E6	LE148-2	WB	1.5
LB156-87	LB-S18	OB	2.0
LE103 1	LE-612	WO	0.5
LB103 2	LE 82	WY	1.5
LB103 3	LBD1 W	GP	1.5
LB164-30	LB165-1	K	*2.0*
LB164-85	LB165-3	BN	0.5
LB164-86	IB-S60	NY	0.5
.B164-87	IB-S60	NY	2.0
.B164-87A	LB165-2	KS	2.0
.LB165-1	LB164-30	K	2.0
.LB165 2	LB164-87A	KS	2.0
.LB165 3	LB164 85	BN	1.5
.BD1 U	LB 58	YO	1.5
.BD1 W	LE64 3	GP	1.5
.BD2-U	LB19-85	WR	1.5
.BD2-W	LB30-11	WP	1.6
.BD3-U	LB2-4	GU	0.5
.BD3-W	LB-S6	YO	0.5
.BDb-U	LU17-0b	WU	1.0
BD5-W	LB64-2	WG	0.5
.BD7-U	LB16-85	U	0.5
.BD7 W	LB S13	WN	0.5
.BD8-U	LU-S29	NW	2.6
.BD8-W	LU26-2	W	0.5
.BD9-U	LU30-1	SR	0.5
.BD9-W	LB-S43	OOW	
BD11-U	LB32-85	U	0.5
BD11-W	IB18-30	UG	0.5
.BD1211	LB-S28	WK	0.5
.BD12-W	LE-344	OOW	
.BD13 U	LE109 87	RY	1.5
.BD13 W	LE 844	OOW	
R-SI	IB-S80	NR	.0
.B-S19	IB-S29	NW	2.6
.B-S24	LB-S51	RG	0.5

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BULKHEAD HARNESS LB (LHD) PASSIVE SEATBELTS
HARNESS SCHEDULE 90.50.09/HS

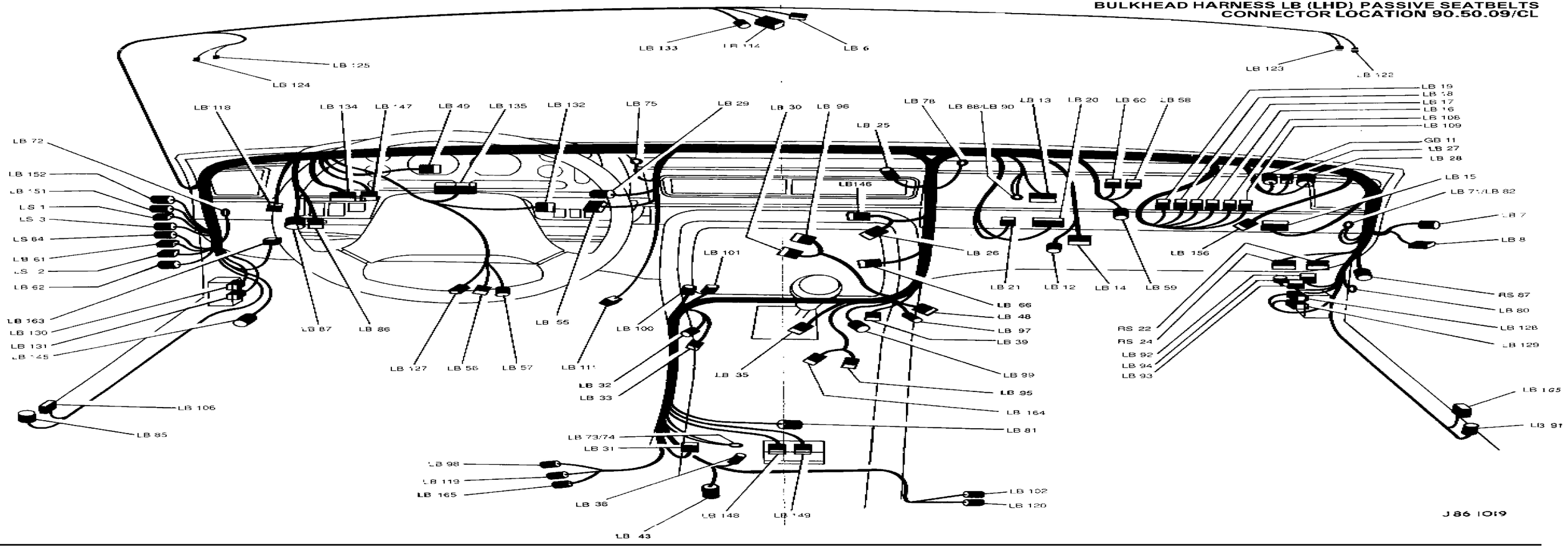
Connector No	Description	Interface
GB11	Green PM4 3 way socket	Gear box harness
LS1	Black PMHD 36 way socket	Side harness interface
LS2	Yellow PMHD 15 way socket	Side harness interface
LS3	Black PM4 9 way socket	Side harness interface
LS84	Yellow PM4 6 way socket	Side harnaas interface
RS22	Black PMHD 38 way socket	RH aide harness interface
RS24	Yellow PMIID 24 way socket	RH side harness interface
RS87	Black PM4 6 way socket	RH side harness interface
LB6	Black PM4 4 way socket	Interior map light
LB7	Black PM4 4 way socket	Passenger door harness
LB8	Black PMHD 24 way plug	Passenger door harness
LB11	Yellow 4 way socket	PI interface unit
LB12	Black PM4 3 way socket	Central processor
LB13	Black PMHU 36 way socket	Central processor
LB14	Yellow PMHD 36 way plug	Central processor
LB15	9 way socket	Lock unit
LB16	Black relay base	Radio relay
LE17	Blue relay base	Ignition on relay
LB18	Green relay base	Aux side lamp relay
LB19	Natural relay base	Starter relay
LB20	Single lucar connector	Speed control unit
LB21	8 way socket	Speed control unit
LB25	Black PM4 3 way socket	LH Air con blower motor
LE26	Black 2 way socket	Glove box lamp and switch
LB27	Yellow PMIID 8 way socket	PI harness
LB28	Yellow PM4 6 way plug	PI harness
LB29	Black PM4 3 way socket	RH Air con blower motor
LB30	Blue PMHO 15 way socket	Centre console
LB31	Yellow 2 way switch	Handbrake switch
LB32	Yellow PM4 3 way socket	Radia
LB33	Yellow PMMD 15 way sockat	Radio & speakers
LB35	Green PMHD 15 way socket	Gear select switch
LB38	PM4 4 way socket	Front cigar lighter
LB39	Black 0 way socket	Seat heater switch
LB43	PM4 way socket	Rear cigar lighter
LE48	Black 6 way socket	Scat heater switch
LB49	Green PMIID 24 way socket	Fascia switch panel
LB55	Black PMHD 24 way plug	Column switchgear
LB56	Yellow 2 way socket	Brake switch
LB57	Black 3 way plug	Brake switch
BR58	Black PMHD 15 way socket	Speed warning module
LB59	Black PM4 6 way socket	Wiper logic module
LB60	Black PMHD 4 way socket	Wiper logic module
L061	Black PMHO 36 way plug	Drivers door harness interface
LB62	Black PM4 6 way socket	Drivers door harness interface
LB68	Black PMHD 16way socket	Air can control
LB71	Eyelets	Bulkhead battery terminal post
LB72	Eyelets	Earth terminals
LB73	Eyelets	Earth terminals
LB74	Eyelets	Earth terminals
LB75	Eyelets	Earth terminals
LB78	Eyelets	Earth terminals
LB80	Eyelets	Earth terminals
LB81	Black PM4 3 way socket	Centre fusc box
LE02	Eyelets	Bulkhead battery terminal post
LB85	Black 6-way socket	Passive restraint motor (LH)
LB86	Black 24-way socket	Passive restraint ECU
LB87	Black 9-way socket	Passive restraint ECU
LB88	Eyelet	Earth terminal
LB90	Eyelet	Earth terminal
LB91	Black 6-way socket	Passive restraint motor (RH)
LB92	Yellow relay base	Radio illumination relay
LB93	Red relay base	Autu speed control relay
LB94	Black 3 way plug	Manual speed control shorting plug
LB95	Natural relay base	LH seat relay
LB96	Black relay base	RH scat relay
LB97	Yellow 3 way socket	Seat switches
LB98	Red 3 way socket	Drivers scat heater
LB99	Yellow 3 way socket	Scat heater switch
LB100	Red 3 way socket	Seat switches
LB101	Red 3 way socket	Seat switches
LB102	Red 3 way socket	Passenger seat heater
LB105	Black 4-way socket	Passive restraint motor (RH)
LB1a0	Black 4-way socket	Passive restraint motor (LHI
LB106	Brown relay base	Puddle lamp relay
LB109	Violet relay bake	Seat adjust relay
LB111	2 way socket	Accelerator switch
LE114	8 way socket	Receiver module
LB118	Green relay base	Reverse light inhibiting relay
LB119	Black 5 way socket	Interior light & seat switch
LB120	Black 5 way socket	Pass interim light & seat switch
LB122	Lucar socket	Right hand illuminated vanity mirror
LB123	Lucar socket	Right hand illuminated vanity mirror
LB124	Lucar socket	Left hand illuminated vanity mirror
LB125	Lucar socket	Left hand illuminated vanity mirror
LB127	Black 5 way socket	Clutch switch
LE128	Natural 9 way socket	RH fuse box
LB129	Natural 5 way socket	RH fuse box
LB130	Natural 9 way socket 'A'	LH 'A' post fuse box
LE131	Natural 5 way socknt 'C'	LH 'A' post fuse box
LB132	Brown 24 way socket	Fascia
LB133	3 way socket	Sunshine roof
LB134	Black 24 way socket	Instrument pack
LB135	Black 48 way socket	Instrument pack
LB145	Brown PM4 6 way socket	Diagnostic socket
LB146	Yellow 4 way socket	Remote boot release
LB147	Black relay base	Lights on warning module
LB148	Natural 9 way socket 'A'	Centre fuse box
LB149	Natural 5 way socket 'B'	Cantra fuse box
LB151	Black 6 way socket	Security connector
LB152	Black 6 way plug	Security connector
LB156	Black relay base	Cigar lighters relay
LB163	3 way socket	Inertia switch
LB164	Green relay base	Seat entry switch relay
LB165	Black 3 way aacket	Seat entry switch

WIRING SCHEDULE 90.50.09/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
GB11-1	LB111-1	BS	3. ■
GB11 2	LB-S52	NG	3.6
GB11-3	ILE131.9	NG	2.0
LS1-1	LB48 8	US	a.5
LS1-2	LB13-15	KR	3. ■
LS1 3	LB49-11	UK	0.5
191.4	LB14-8	YS	3.0
LS1-5	LB-S63	RU	3.5
LS1-6	RS22 30	RS	a.5
LS1-7	LB-S11	WK	3. ■
LB1.8	ILE134 10	WLG	0.5
LS1.9	LB-S30	P	3.5
LB1-10	IRS24 16	OG	0.5
LS1-11	LB-S84	RO	3. ■
LB1 12	ILE S66	KS	0.5
LS1-13	LB-S27	R	3.5
LS1-14	LB33-13	RLG	3.5
LS1-15	LB33-12	RP	3.5
LS1-16	ILB195.34	OS	3.G
LS1-17	LB135-37	OP	a.5
LS1-18			
LS1-19	IR-S5	NP	3.5
LS1 20	LB135-10	UY	3.5
LS1-21			
LS1-22	LB135-20	SK	3. ■
L51.23	LB135 48	RB	a.6
LS1-24	LB-S10	PU	3.5
LB1 25	LB21 I	UG	3.6
LS1-26	IB21-8	UR	3.5
LS1 27	LB135-9	GR	3.5
IS1-28	LB-87	SLG	3.5
LS1-29	LB-S1	UY	3.5
LS1-30	LB61-11	BO	2.6
LS1-31	LB61-12	GLG	3.5
LS1-32	LB135 45	NO	2.6
LS1-33			
IS1.34			
LS1 35			
LS1-36			
LS2-1	LB-S98	RG	0.5
LS2-2	LB-S13	WN	3.5
LS2 3	LB33-8	IIN	0.6
LS2.4	LB03 U	GO	0.5
LS2-5	LB-S29	NW	0.5
LS2-6			
LS2-7			
LS2 8	LB55-10	GU	0.6
LS2-9	LB127.4	GB	0.6
LS2-10	LB-S17	PO	*0.5*
LS2-11	LB S16	PK	0.5
LS2-12	LB-S15	YW	*0.5*
LS2-13			
LS2-14	LB149-3	WR	*0.5*
LE2 15	LEI3-29	KY	0.5
LE3 I	LB56-1	N0	3.0
LS3-2	LB72	B	*2.0*
LS3 3	LB69-2	N	3.0
LS3-4	LB-S81	WG	0.5
LS3 6	LD20-2	UR	1.0
LS3-8	LE.839	WP	0.5
LS3-7	LD69-1	IJ	2.0
LS3-8	LE S4	BK	2.0
LS3-9	LB28-6	YG	1.0
LS64-1	LB56 6	RY	2.0
LS64-2	IB59-8	RS	*2.0*
LS64 3			
LS64-4	LE59.3	BS	2.0
LS64-5	LD57-2	PG	*2.0*
LS64-6	LB21 4	UY	*7.0*
RS22-1	LB-18-8	US	0.5
RS22-2	LB1a4 17	BRAID	Screen
RS22-3	LB151-3	YG	0.5
RS22.4	LB134-15	B	Inner
RS22-5			
RS22-6			
RS22-7	LB134 21	OS	0.5
RS22-8	LB134-19	OK	*0.5*
RE22.9	LB134-20	GW	*0.5*
RS22-10			
RS22 11			
RS22-12	LB154 16	U	Inner
RS22-13	IB61-8	BG	*0.6*
RS22 14	LB61-10	BLG	0.5
RS22-15	LB48 5	UK	0 6
RS22-16	IB14-17	YK	0.6
RS22 17	LB-S43	LGO	*0.5*
RS22-18	LB135 21	LG	0.6
RS22-19	LB135-13	OR	0.5
RS22-20	LB S16	YW	0.5
RS22-21	LB14-20	WG	0.6
RS22 22	LB14-21	WB	0 5
RS22-23			
RS22-24			
RS22-25	LB12U-1	NK	0 5
RS22-26	LB151-4	RY	0.6
RS22 27	LD33-7	KO	0.5
RS22-28	LB33 8	KR	0.6
RS22-29	LB-S39	UY	0.0
RB22-30	LB149-5	WS	0.5
RS22-31			
RS22-32	LB-S10	PU	0.5
RS22-33	LB13-14	KG	*0.G*
R522.34	LE S17	PO	0.5
RS22-35	IB-S18	PK	Q.5
RS22 36	LS1-6	RS	0.5
RS24-1	LB135-7	O	0.0
RS24-2	LE 52	WY	0.5
RS24-3	IB14-1	LGN	0.6
RS24 4	LB-S92	LGY	0.5
RS24-5	LB-S38	P	0.5
RS24 6	LB134-24	RY	*0.5*
RS24-7	LB148-3	WU	0.5
IRS24 8	LB-S27	K	0.5
IRS24.9	LB-S83	IRU	0.0
IRS24-10	LB-S84	RO	0.5
RS24-11	LU-S62	SLG	0.5
IRS24 12	LE33 4	KY	0.B
IRS24-13	IB-S29	NW	*0.5*
RS24-14	LU-S66	KS	0.5
IRS24 15	LB13 27	IRU	0.5
RS24-16	LB1-10	OG	*0.5*
RS24-17	LU-S27	UG	0.5
IRS24 18	LE135-39	IRU	0.5
IRS24-19	IB-S97	KLG	*0.5*
IRS24 20			
IRS24.21			
IRS24-22	LB66-2	UB	0.5
IRS24 23	LB12B-3	INLG	0.5
IRS24-24	IB-S31	WK	*0.5*
IRS87-1	LB62-5	IMY	*0.5*
	LE7 5	NY	*0.b*
IRS87-2	LB-S81	WQ	*0.5*
RS87-3	LUW1	B	*2.0*
RS87 4	LE S37	BK	2.0
RS87-5			
RS87-6	L0-S99	WP	0.5
LB6-1	LE-829	INW	0.0
LU6-2	LB30-5	SU	0.5
LB6 a			
LBR-4	LE-828	IRLG	*0.6*
ILE7 1	LB8G	B	2.0
LB7-2	LB128-4	NP	*2.0*
LB7-3			
ILE7.4			
LB7-6	RS67-1	IMY	*0.5*
ILE7 G	LB-S37	UK	2.0
LB8 1	LU-S91	R	0.5
ILER-7	LE-511	YW	OB
LB8 a	LB61-7	BA	0.5
ILRR-4	LB61-8	BP	0.5
LB8-5	LU-S36	K	0.5
LB8 6	LB33-6	IRW	0.5
LB8-7	LB-S36	IP	Q.6
LB8-8	LB-S97	KLO	*0.5*
LB8 9	LE S34	PN	0.5
LB8-10	LE-517	PO	0.5
LB8-11	LU-s16	IPK	0.1
ILBS.12	LB-S8	YO	*0.6*
LU8-13	LB-S47	UO	*0.5*
LB8 14	LEU\-22	OH	0.6
LB8-15	LB61-23	OG	*0.5*
ILE8 15	LB61-24	OY	*0.5*
LB8-17	LB61-25	OP	*0.6*
LB8-111			
LB8-19			
LB0-20	LB-S45	GW	0.5
ILE8.21	LB S39	UY	0.6
LB8-22			
LB8-23			
LBO-21			
LE12 1			
LB12-2	LBR2	N	2.0
LB12-3			
LU13-1	IB-S31	WK	0.5
LE132	LU-S91	R	*0.5*
LB13-3	LB-S92	LGY	0.5
LU13-4	IB65-2	LGG	0.5
LE13 5	LB-S80	LGR	0.5
IB13-6	LB49-15	YR	0.0
LE13.7	LB49-14	ULG	0.5
LE138	LB49-10	UY	0.5
LB13.9	LEG5 7	YU	0.5
LB13-10	LB55-6	YN	0.0
LB13-11	LD66-3	YO	0.5
LE13.12	LEG54	YLG	0.5
LB13-13	LB55-5	YE	U.6
LB13-14	IRS22-33	KO	0.5
LB13-15	LB12	KR	*0.5*
LB13-16	LE30.14	NG	0.6
LB13-17	LB132-16	GO	0.5
LE13 18	LB-S36	P	*0.5*
LB13-19	LB-S80	UR	0.5
LU13-20	LB61-9	PW	*0.5*
LB13 21	LB-S95	RW	*0 5*
LB13-22	LE110 4	GB	0.5
LB13-23	LESE-3	SLG	0.5
LU13-24	IRR9.2	LGB	0.G
LB13 25	LU30-1	OW	0.5
LB13-26	LB48 1	KW	0.6
LU13-27	R924.15	KU	0.5
LB13-28	LS2-15	KY	0.5
LE13.29	LB35-13	US	0.1
LB13-30	INHIBIT PLUG		
LB13 a i	LU30-2	SO	*0.5*
LB13-32	LB30 3	SY	0.5
LB13-33	LB30-4	GG	*0 6*
LB13-34			
LB13-35	LB30-6	SK	0.5
LB13-36	LB-S37	BK	0.6
LB14-1	RS24-3	LGN	*0.5*
LB14-2	LB135-18	Y	*0.6*
LB14-3	LE135-16	SB	0.5
LB14-4	LB-S81	GU	0.6
LB14-5	LB61-13	BW	0.5
LB14-6	LB49-16	YP	0.5
LB14-7	RS22-18	YK	0.5
LB14-8	LS1-4	YS	0.5
LE14 9	LB135-41	UN	0.5
LB14-10	LB135 40	UW	0.6
LB14-11	LB133-3	YE	0.5
LE14 12	LB-S43	IGO	0.5
LB14-13	LE-828	RLG	0.6
LB14.14	LB68-1	UG	0.5
LB14.15	LB69-2	PR	0.5
IR14-16	LB58-3	PS	*0.5*
LU14-17			
LB14 18	LB69 10	LGS	0.5
LB14.19	LB-S35	K	0.0
LU14-20	IRS37.31	WG	*0.5*
LB14 21	RS22-22	WB	0.5
LB14.22	ILE38.2	O	0.0
LU14-23	IR48-2	KO	*0.5*
LB14-24	LU132-17	GS	b.6
LE14.25			
IB14-26	LB68-5	B	*0.5*
LB14-27	LB61-20	BN	0.5
IR14-28	LB61-29	BU	*0.5*
LB14-29	LU65-9	PY	0.5
LB14 30			
LB14.31			
LB14 32			
1014.33			
LB14 34	LB00 2	LGP	0.5
LB14-35	IR30-13	SN	0.5
LE14 36	LB30-16	ON	0.6
LB15-1	LB-S40	NG	*2.0*
LB1 6.2	LUW1	b	*2.0*
LB15.3	LB S17	PO	*2.0*
BB114	LB-S16	PK	*2.0*
LU16-5	LB-S8	YO	*0.5*
LB16-6	LE101 I	RO	0.5
LB15.7	LE-BS4	PN	*0.5*
LB16-9	LU-S61	GU	0.5
IR16-30	ILE16-38	NY	0.5
	LD129-5	MY	*1.0*
LB10.85	LEO7 U	U	0.5
LB16-86	IR16-30	NY	0.5
LE16 87	LB66-3	LGU	0.6
	LE32.2	LGO	1.0
LE16-87A	LU14 1-07	NW	0.6
LB17-30	LU71	N	3.0
IR17-85	LB05-U	WU	0.5
LE17-86	LU71	N	0.5
LE17-87	ILE S31	WK	*3.0*
LU10-30	LB011-W	UO	*0.5*
	LB-S27	UG	2.0
IR16-85	ILE-950	UO	0.5
LB16-86	LU-S30	NR	0.5
LB16-87	ILE S37	BK	2.u
LB19 30	LB92	N	3.0
LB19-85	LB02-U	WR	0.6
LU19-86	LB-S31	WK	0.5
LB19-87	LB28 G	W	3.Q
LE20 I	LE S30	U	0.6
LB21 1	LB1-26	UG	0.5
LB21-2	LE132.1	SR	0.6
LU21-3	LB132-9	SU	0.5
LB21-4	LB04-U	UY	2.0
LU21-5	LB-S80	NE	1.0
LE21-6	LB1.20	UR	U.8
LU21-7	IR-S10	PU	0.5
LE21 E	LB-S37	BK	2.0
LU25-1	LB76	B	*2.0*
LB25 2	LB128-3	NU	2.0
IB25-3			
LB26 I	LB-S27	UG	*0.5*
LB26-2	LB08-W	W	*0.5*
LE27 1			
LB27-2	LB134 1	KR	0.B
LU27-3	LB135-22	UG	0.5
LB27-4	LU35-5	RO	0.5
LB27-5	LB35-15	NU	0.5
IR27-6	LB-S30	U	U.5
LE28 1	LB-S26	WK	2.0
IR28-2	LB3-5	U	1 0
LB28 4	LB-S62	NR	0.5
IB28-5	LE1987	W	3.0
LU28-6	IB3-8	YG	1.0
LE28.1	LB76	B	2.0
IR21.2	LE130 3	NU	2.0
LU29-3			
LE30.1	LB09-U	SA	0.1
IR30-2	LB13.31	SO	0.5
LU30-3	IB13-32	SY	0.0
LB30 4	LU13-33	SG	*0.5*
LB30-5	LEU 2	GU	0.5
LB30-6	LB13.35	SK	0.5
LB30-7	LB-S24	RG	0.5
LE30 E			
IR30-9			
LU30-10	IB-S13	WN	*0.6*
LB30 11	LU-S20	RK	*0.5*
LB30-12			
LU30-13	LB14-35	SN	0.5
LB30-14	LD13-16	NG	*0.5*
IR30-15	LB14 36	ON	0.4
LB31-1	LB135-17	OY	0.5
LU31-2	LB-S23	BK	0.5
LB32-1	LB-S18	NW	1.0
LB32-2	LB16-87	LGO	1.0
LUXI-3	IR74	E	1.0
LE33 1			
LB33-2	LB13.24	LGB	0.6
LB33-3	LB92-87	YU	0.5
LB33.4	RS24-12	KY	0.5
LB33-5	LB-S37	KLG	0.5
LB33-6	LB6-8	KW	0.5
LE33 7	RS22.27	KO	*0.6*
LE32 0	RS22-20	KR	0.5
LB33-8	LS2-3	IRN	0.6
LU33-10	IR-S08	RO	0.5
IRR9.11	LB61-4	RW	0.5
LB33-12	L51.15	RP	0.5
LB33-13	LB1-14	RLG	0.5
LE33.14	INHIBIT PLUG		
LE33 15			
LB35-1	IR-S23	BK	*0.5*
1036.2	1074	R	*0.5*
LD35-3	LD-S41	PW	1.0
LD35-4	LB135-44	S	*0.5*
IB35-5	IR37-4	RO	*0.5*
IB35-6	IR93-85	SB	*0.5*
LB35-7	IR135-14	GB	*0.5*
LB36-8	LB-S42	P	1.0
LU36-9	LD-S62	SLG	0.5
LL136.10	LU-S95	RW	0.6
LU35-11	LUU2-W	WP	0.5
LU35.12	LD-S28	WK	0.6
L935-13	IR13-28	US	0.5
LB35-14	LB40-2	RS	0.5
LB35-15	LE27.6	RU	0.5
LE38 1	LB73	B	2.0
LB38-2	LU-S10	OU	2.0
LB38-3	LU-S20	RK	0.5
LU30-4	LU-S23	BK	0.6
LB39-1	LB13.25	OW	0.5
LB39-2	LB14.22	O	0.5
LB39-3	LE-845	R	0.5
LE38.4	LE-823	BK	0.5
LB33-5	LE39 *6*	*0*	0.5
LB33-8	LE39 0	*0*	*0.6*
LE43.1	LB74	E	2.0
LE43.2	LB-S18	OB	2.0
LB43-3	LE-820	RK	0.5
LB43-4	LE-823	BK	0.5
LB48-1	LB13.26	KW	*0.5*
LE48.2	LE14 23	KO	0.5
LE48 3	LE S48	R	0.u
LB48-4	LU-S29	BK	0.5
LB48-5	LU40-6	O	0.5
LU48-6	LU40-6	O	0.5
LU49-1	LB-S20	RK	0.5
LU49-2	LB35-14	RS	0.5
LU49-3	LB-S83	RU	0.5
IR49-4	LB-S84	RO	0.5
IR49-5	R522.15	UK	0.5
LB49-8	R522.1	US	0.5
IR41-7	LB135-24	UP	0.5
IR49-8	LB55.14	PG	0.5
LB49-9	LB1.1	US	0.5
LB49-10	LE13 8	UY	0.0
LB49-11	L61 3	UK	0.0
LB49-12	INHIBIT PLUG		
LB49-13	LB-S51	RG	0.5
LB49-14	LE13 7	ULG	*0.0*
LB49-15	LB13 6	VR	0.5
LB49-16	LE14 5	YP	*0.0*
LB49-17			
LB49-18	LE 660	UO	0.5
LB49 19	LB66-20	RLG	0.5
LB48 20	LU-S4	GK	0.5
LB49-21	LU66-23	RY	0.5
LU49-22	LB-S11	WK	0.5
LO4923			
LU49-24	LBR2	N	*0.5*
IB55-1	LB-S92	LGY	0.6
LB55-2	LB13 4	LGG	0.5
LB55-3	LB13-11	YG	0.5
LE55 4	LB13-12	YLG	0.5
LB665	LB13-13	YB	0.5
LEG5 0	LB13-10	YN	0.5
LB66-7	LB13-9	YU	*0.5*
LB66-8	LB-S80	LGR	*0.5*
LB66-9	LB14-29	PY	*0.5*
LB65-10	LS2-8	GU	0.5
LB55-11	LB60-1	LGK	*0.5*
LB66-12	IR-S38	NR	*0.5*
LB66-13	LB-S20	RK	*0.5*
LB66-14	IB49-8	PG	*0.5*
LB66-16	IB-S95	RW	0.5
IR66-16	LB75	B	*0.6*
LB65-17	LB-S12	WO	0.5
LB55-1E	LB66-5	GB	0.6
LB60 1B	LB-S96	UR	0.5
LEU66 20	LU49-19	RLG	*0.5*
LB65 21	LU-S13	WN	*0.5*
LB66-22	LD58-8	GR	*0.5*
LB562.3	LB49-21	RY	*0.5*
LU66-24	IR-34	BK	0.5
LB5A-1	LB-S120	PU	*0.0*
IB5A-2	LB-S12	WO	0.5
LE17.1			
LB57-2	LB64-6	PG	2.0
LB57-3	LB 541	PW	2.0
LB5B 1	LB14-14	UG	0.5
LB5B 2	LU14-15	PR	0.5
LEGE 3	LU14-16	PS	0.5
LB08 4	LU75	B	0.5
LB5B-5	LB58-18	GB	0.5
LB5A-6	LB60 22	GR	0.5
LB5B-7	LB62	N	*0.6*
LB5B-8			
LB5B-9			
LB5B-10			
LB08 11			
LB5B-12			
LB08 13	LU14-18	LGS	*0.5*

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BULKHEAD HARNESS LB (LHD) PASSIVE SEATBELTS
CONNECTOR LOCATION 90.50.09/CL



WIRING SCHEDULE 90.50.05/WS

From	To	Colour	Size (mm)
Van	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Dimens.
Desde	Hacia	Color	Tamano
LS-S12	LS1-4 — LS17-5 LS28-4	YS YS YS	0.5 0.5 0.5
LS-S13	LS1 13 LS17 4 LS28-4	R R R	0.5 0.5 0.5
LS-S14	LS1-12 LS20-8 LS17-6	KS KS KS	0.5 0.5 0.5
LS-S15	LS5-2 LS19-2 LS7-1	B B B	2.0 0.5 2.0
LS S16	LS2-14 LS89-53 LS75-86	WR WR WR	0.5 0.5 0.5
LS-S17	LS-S22 LS131-5 LS89-52	RB RB RB	0.5 0.5 0.5
LS-S18	LS86-30 LS85-1 LS72-8	NY NY NY	3.0 3.0 3.0
LS S19	LS14 1 LS7-2 LS72-9	NS NS NS	0.6 2.v 2.0
LS-S20	LS103-30 LSD10-W LS89-33	SY SY SY	0.5 0.5 0.5
LS-S21	LS76-4 LSD8-W LS104-3	WP OOW WP	0.5 0.5
LS-S22	LS1-23 LS-S17 LSD10 U	RB RB RB	0.5 3.5 3.3

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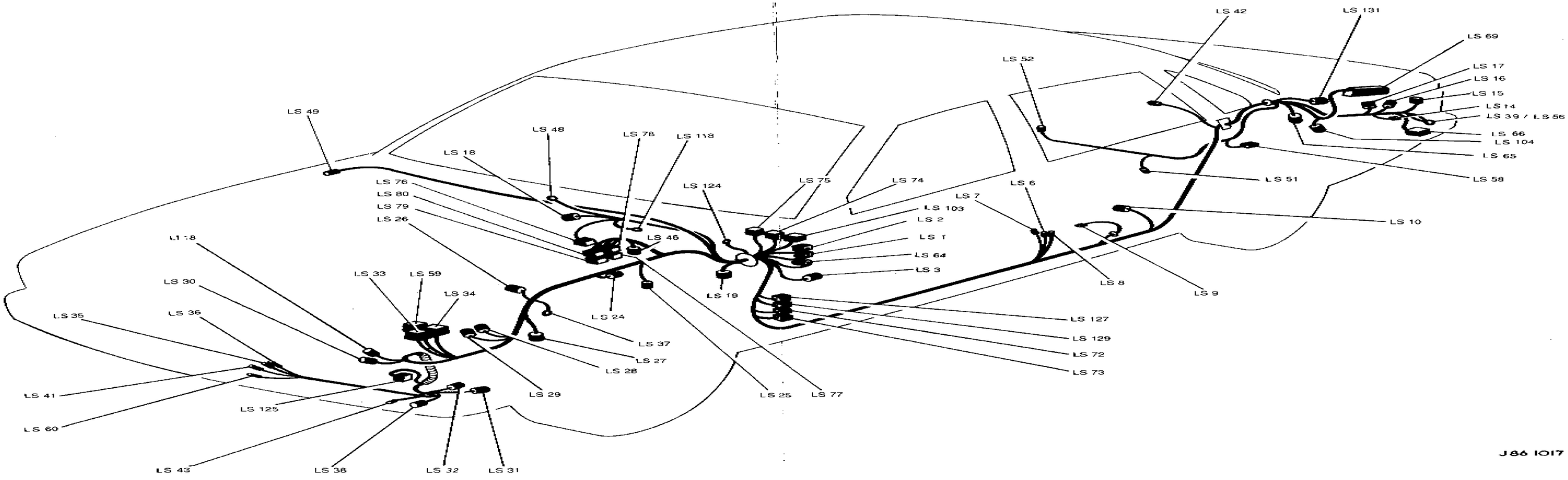
SIDE HARNESS LEFT HAND LS (ABS)
HARNESS SCHEDULE 90.50.05/HS

Connector No	Description	Interface
LI18	Yellow FM4 6 way plug	PI harness
LS1	Black PMHD 36 way plug	Bulkhead harness Interface
LS2	Yellow PMHD 15 way plug	Bulkhead harness Interface
LS3	Black PM4 9 way plug	Bulkhead harness 'A' post
LS6	Black PMHD 6 way eocket	LH rear passenger door harness
LS7	Black 3 way Socket	LH rear passenger door harness
LS8	Yellow PMHD 6 way eocket	LH rear passenger door harness
LS9	Black 2 way socket	Bass speaker
LS10	Black PM4 3 way socket	Fuel pump
LS14	Black 3 way socket	Petrol flap interface
LS15	Natural 5 way socket	Reer lamp cluster
LS16	Black PM4 6 way socket	Lamp reley & bulb fail module
LS17	Black PMHD 15 way plug	Lamp reley & bulb fail module
LS18	Black PM4 6 way socket	Wiper motor
LS19	Black 3 way socket	Side repeater
LS24	Black PM4 3 way socket	Low coolant sensor
LS25	Black PM4 3 way Socket	Brake pad sensor
LS26	Black 3 way socket	Pump and control valve
LS27	Black PM4 3 way socket	Dump valve
LS28	Yellow PM4 9 way plug	Lamp relay & bulb fail module
LS29	Black PM4 9 way socket	Lamp relay & bulb fail module
LS30	Blue PM4 3 way aocket	Alternator module
LS31	Green PM4 3 way socket	Side repeater
LS32	Yellow PM4 3 way eocket	Fog lamp
LS33	Green relay base	Air pump retay
LS34	Black relay base	Horn relay
LS35	Natural lucar socket	High note horn
LS36	Black lucar socket	High note horn
LS37	Eyelets	Earth
LS38	Black PM4 3 way socket	Side and DI lamps
LS39	Eyelet	Earth
LS41	Natural lucar socket	Iow note horn
LS42	Black 3 way socket	Interior lamp
LS43	Black 2 way socket	Power wash jet
LS46	Black 3 way plug	ABS LH front wheel sensor
LS47	Eyelet	Earth
LS48	Eyelet	Earth
LS49	Black 3 way plug	ABS RH front wheel sensor
LS51	Black 3 way plug	ABS LH rear wheel sensor
LS52	Black 3 way plug	ABS RH rear wheel sensor
LS56	Eyelet	ABS FCU earth
LS58	Black 2 way plug	Number plate lamp
LS59	Blue relay base	Breather heater relay
LS60	Black lucar socket	Low note horn
LS64	Yellow PM4 6 way plug	Bulkhead harness 'A' post
LS65	Yellow PM4 2 way socket	Accessory fuae box
LS68	Natural relay base	Ignition 'on' relay
LS69	55 way connector	ABS electronic control module
LS72	Black 9-way socket	LH 'A' post fuae box
LS73	Black 6-way socket	LH 'A' post fuae box
LS74	Yellow relay base	ABS pump relay
LS75	Black relay base	ABS main relay
LS76	Blue 5 way socket	ABS accumulator
LS77	Black 7 way socket	ABS valve block
LS78	Black 6 way socket	ABS fluid reservoir
LS79	Black 2 way socket	ABS main valve
LS80	Black 2 way socket	ABS pump
LS103	Blue relay base	ABS FCU relay
LS104	Red relay base	ABS pump test
LS116	Eyelet	ABS earth
LS124	Eyelet	Battery positive terminal pvst
LS125	Black 2 way socket	Purge valve
LS127	In-line fuse	ABS pump fuse
LS129	In line fuse	ABS main fuae
LS131	Brown PM4 6 way socket	ABS diagnostic connector

WIRING SCHEDULE 90.50.05/WS

From / Von / De / Van / De / Desde	To / Nach / A / Naar / A / Hasta	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
LS1 1	LS29-3	UB	0.5
LS1-2	LS-S11	KR	0.5
LS1-3	LS29-2	UK	0.5
LS1-4	LS-S12	YS	0.5
LS1-5	LS17 1	RU	0
LS1-6	LS S1	WS	0.5
LS1-7	LS66 86	WK	0.5
LS1-8	LS30-1	W G	0.5
LS1-9	LS6 4	P	0.5
LS1-10	LS25-2	OG	0.5
LS1 11	LS29-1	RO	0
LS1 12	LS-S14	KS	0
LS1 13	LS-S13	R	0
L51 14	LS9-2	R G	0
LS1 15	LS9-1	RP	0.5
L61 16	LS26-1	OS	0.5
LS1 17	LS24-2	OP	0.5
LS1-18			
LS1-19	LS-S7	NF	0.5
LS1-20	LS78-2	BY	0.5
LS1 21			
LE1 22	LS8-1	SK	0.5
LE1 23	LS-S22	RB	0.5
LS1 24	LS17-3	PU	0
L61 25	LS21-1	UG	0
LS1 26	LS26-3	UR	0
LS1 27	LS76-3	BR	0.5
LS1-28	LS17-2	SLG	0.5
LS1-29	LS8-4	UY	0.5
LS1-30	LS8-1	BO	0.5
LS1-31	LS8-2	GLG	0.5
LS1-32	LS-S10	NO	0.5
LS1-33			
L51 34			
LS1 38			
LS1 39			
LS2 1	LS6-6	RG	0.5
L62 2	LS76-1	WN	0.5
LS2 3	LS6-5	RN	0.5
LS2 4	LS14-2	GO	0.5
LS2 5	LS42-2	NW	0.5
LS2-6			
LS2-7			
LS9-6	LS34 86	GU	0.5
LS9-9	LS69 32	GB	0.5
LS9-10	LS8 2	PU	0.5
LS9-11	LS8 3	PK	0.5
LS9-12	LS6 3	YW	0.5
LS9-13			
LS9-14	LS S10	WR	0.5
LS9-15	LS10 6	KY	0.5
LS9-1	L572 3	NB	3.0
LS9-2	LS S15	U	3.0
LS9-3	LS18 6	H	3.0
LS9-4	L7.32	WG	0.5
LS9-5	L310.2	UR	1.0
LS9-6	LS18-2	WP	0.5
LS9-7	LS18-5	U	2.0
LS9-8	LS-64	BK	2.0
LS9-9	L3511 87	YG	1.0
LS6-1	L31.30	BO	0.5
LS6-2	L51.31	GLG	0.5
LS6-3	L12.12	YW	0.5
LS6-4	L51.9	P	0.5
LS6-5	LS9-3	RN	0.5
LS6 6	LS9-1	RG	0.5
L67 1	LS-S1	B	2.0
LS7 2	LS-S10	NS	2.0
L57 3	LS-S4	BK	0.5
LS8 1	L51-22	SK	0.5
LS8 2	LS7.10	PU	0.5
LS8 3	LS2-11	PK	0.5
L58.4	LS1-29	UY	0.5
LS8-5			
LS8-6			
LS9-1	LS1 1b	RF	0.5
LS9-2	LS1 14	RLG	0.5
LS10-1	LS39	B	2.0
LS10-2	LS3-6	UR	1.0
LS14-1	LS-S19	NS	0.5
LS14-2	LS2-4	GO	0.5
LS14-3	L139	B	0.5
LS15-1	LS17-8	GN	0.5
LS15-2	LS39	B	2.0
LS15-3	LS17-12	Y	0.5
LS15 4	LS17-10	GP	0.5
LS15 5	LS17-11	RG	0.5
LE16-1	LS73 4	NLB	2.0
LS16-2	LS3 6	WP	0.5
LS16-3			
LS16-4			
LS16-5	LS72 4	NR	2.0
LS16-6	LS2-15	KY	0.5
LS17-1	LS1 5	NU	0.5
LS17-2	LS1 28	SLG	0.5
LS17-3	LS1 24	PU	0.5
LS17-4	LS S13	R	0.5
LS17-5	LS S12	YS	0.5
1517.6	LS-S14	KS	1.5
LS17 7	LS-S11	KR	0.5
LS17 8	LS-S4	BK	0.5
LS17-9	LS10-1	GN	0.5
LS11-10	LS15 4	GP	0.5
LS17 11	LS15-5	RG	0.5
LS17 12	LS15-3	Y	0.5
LS17.13	LS58-1	NB	0.5
LS17-14	LS28-9	KY	0.5
LS17-15			
LS10-18	LS64 1	RY	2.0
LS10-2	LS64 2	RS	2.0
LS10-3			
LS10-4			
LS18-5	L53.7	U	2.0
LS18-6	L513.3	R	2.0
LS19-1			
LS19-2	LS S10	U	0.5
LS19 3	LS29-6	YS	0.5
LS24-1	LS-S4	BK	0.5
LS24-2	LS1-17	OP	0.5
LS24-3			
LS25-1	LS1-18	OS	0.5
LS25-2	LS11-10	OG	0.5
LS25-3			
LS26-1	LS64-6	UY	2.0
LS26-2	L31-28	UR	0.5
LS26-3	L3.83	PG	0.
LS27-1	LS1 25	UG	0.5
LS27-2	LS S3	PG	0.
LS27-3			
LS28-1	L732.2	RO	2.0
LS28-2	LS38.3	R	0.5
LS28-3	LS38.1	G	0.5
LS28-4	LS-S12	YS	0.5
LS28-5	LS31 1	RU	0.
LS28-6	LS15 3	YG	0.5
LS28-7	LS S11	KR	0.5
LS28-8	LS S14	KS	0.5
LS28-9	LS17-14	KY	0.
LS29-1	LS1 11	RO	0.5
LS29-2	LS1 3	UK	0.5
LS29-3	LS1 1	US	0.5
LS29-4	LS S13	R	0.5
LS29-5	LS S4	UK	0.5
LS29-6	LS S2	WG	0.5
LS29-7	L572 1	NO	3.0
LS29-8	L573 2	NK	3.0
LS29-9	L572 3	NG	3.0
LS30-1	LS1-8	WLG	0.5
LS30-2	LSD3-W	WY	0.5
LS30-3			
LS31-1	LS28-5	RB	0.5
LS31-2	L317	B	0.5
LS31-3			
LS32-1	L517	B	2.0
LS32-2	LS28-1	RO	3.0
LS32-3			
LS33-30	LI18-6	N	0.5
LS33-85	LI18-5	GU	0.5
LS33-86	LI18-2	WU	0.5
LS33-87	LI18-1	PY	0.5
	LSD1-W	PY	0.5
LS34-30	LS72-8	NP	3.0
	LS34 86	NP	0.5
LS34-85	LS2-8	GU	0.5
LS34-86	L334 30	NP	0.5
LS34-87	L541	Y	3.0
LS36	L9D2 W	Y	0.5
	L541	Y	1.0
LS36	L537	U	3.0
	LSD2-U	U	0.5
LS37	L541.1	U	0.5
	LSO4 U	U	0.5
	LS60	U	0.5
	LSD1 U	U	0.5
	LS36	U	2.0
	LS59 95	U	0.5
	LS32-1	U	2.0
	LS31-2	U	0.5
	LS36-2	U	0.5
LS38 1	LS28-6	G	0.5
LS38 2	L537	U	0.5
LS38 3	L598.2	R	0.5
LS39	L514.3	U	0.5
	LS42 3	U	0.5
	LS10 1	U	2.0
	LS15 2	U	2.0
	LS66 86	U	0.5
LS41	LS35	Y	1.0
	LS34 87	Y	2.0
LS42-1			
LS42-2	LS2-6	NW	0.5
LS42-3	LS39	B	0.5
LS43 1	L537	U	0.5
LS43 2	LS-S1	RS	0.5
LS46-1			
LS46-2	LS69-48	R Inner	1.0
LS46 3	LS69-30	BRAID	Screen
LS48	LS64-4	US	2.0
LS49 1			
LS49-2	LS68 47	G Inner	1.0
LS49-3	LS69-29	BRAID	Screen
LS51-1	LS69 4C	U Inner	1.0
LS51 2	LS69-28	BRAID	Screen
LS52-1			
LS52-2	LS69-45	Y Inner	1.0
LS52-3	LS69-27	BRAID	Screen
LS56	LS69-1	E	2.0
	LS69-19	B	2.0
	LS131 G	U	1.0
LS58 1	LS17-13	RU	0.5
LS58-2			
LS59 85	LI73-3	NU	1.0
LS59 86	LI-S1	RS	0.
LS59 87	LI10-3	YG	1.0
LS60	LI-87	B	1.0
LS64-1	LI18 1	RY	2.0
LS64-2	LI18 2	RS	2.0
LS64-3			
LS64-4	LI48	US	2.0
LI64.5	LI 53	PG	2.0
LS64-6	LI20-1	UY	2.0
LS65-1	L is11	NY	3.0
LS85.2	L166-87	WK	3.0
LS66 30	LI-S10	NY S.0	
LS66 85	LI38	B	0.
LS66 86	LI17	WK	0.
LS66 87	L166-2	WK	3.0
LS69 1	L166	B	2.0
LS69 2	L177-6	GY	0.
LS69-3	LI-S9	RY	0.
LS69 4			
LS69 5			
LS69 6			
LS69-7			
LS69-8	L178-1	WG	0.5
LS69-9			
LS69-10			
LS69-11			
LS69-12			
LS69-13			
LS69-14			
LS69-15			
LS69-16			
LS68.1 / LS68.10			
LS69-18	L 35R	B	2.0
LS69-20	L 177.6	GW	0.5
LS69-21	L 377.2	W	0.5
LS00 22			
LS69 23	LS131-2	NK	0.5
LS69 24			
LS68 25			
LS68 26			
LS69 27	L352-3	BRAID	Screen
LS69 28	L351-3	BRAID	Screen
LS69-29	L346-3	BRAID	Screen
LS69-30	L346-2	BRAID	Screen
LSUB-31			
LSUB-32	L12.8	GU	0.5
LCUB-33	L3.620	SY	0.5
LS69-34	L575-85	YG	0.5
LS69-35			
LS69-36	L377.4	GR	0.5
LS69-37			
LS69-38	L377. 1	WN	0.5
LS69-39	L379 2	US	1.0
LS69-40			
LS69-41			
LS68-42			
LS69-43			
LS69-44			
LS69-45	LS52 2	Y Inner	1.0
LS69-46	LS51 2	U Inner	1.0
LS69-47	LS49 2	G Inner	1.0
LS69-48	LS4G 2	R Inner	1.0
LS69-49			
LS69-50			
LS69-51	LS76-5	WU	0.5
LS69-52	LS-S17	RB	0.5
LSFin.53	LS-S19	WR	0.5
LS69-54	LS77-3	UG	0.5
LS69-55			
LS72-1	LS28-7	NO	2.5
LS72-2			
LS72-3	LS9 1	NB	3.0
LS72-4	LS10-5	NR	2.0
LS72-5	LS28-9	NG	2.0
LS72-6	LS-S16	NY	3.0
LS72-7			
LS72-8	LS34-30	NP	2.0
L572.9	LS-S19	NS	2.0
L573 1	LS125-2	NB	0.5
LS73 2	LS29-8	NK	2.0
LS73 3	LS59-30	NU	1.0
LS73 4	LS16-1	NLG	2.0
LS73 5			
LS74-00	LS-S10	NO	3.0
LS74-85	LS S5	PY	0.5
LS74-86	LS S10	ND	0.5
1574.87	LSD7-W LS56	ND NU	0.5 3.0
LS75.30	LS-S6	RY	3.0
LS75-85	LS69-34	YG	0.5
LS75-86	LS-S10	WR	0.5
LS75-87	LS-S7	NP	3.0
LS76-1	LS2-2	WN	0.5
LS76 2	LS1-27	BR	0.5
LS76 3	LS78-2	PG	0.5
LS76 4	LS-S21	WP	0.5
LS76-5	LS69 51	WU	0.5
LS77 1	LS69 38	WN	0.5
LS77-2	LS68-21	WR	0.5
LS77-3	LS69-54	UG	0.5
LS77-4	LS69-36	GR	0.5
LS77-5	LS68-2	GY	0.5
LS77-6	LS69-20	GW	0.5
LS77-7	LS S9	RY	2.0
LS78-1	LS69-8	WG	0.5
LS78-2	LS78-3	PG	0.5
LS78-3	LS118	B	0.5
LS78-4	LS1-20	BY	0.5
LS78-5			
LS78-1	LI8-86	RY	1.0
LS78-2	LS69 39	BS	1.0
LS80-1	LS S6	NU	3.0
LS80 2	LS118	B	3.0
LS103 30	LS-S20	SY	0.5
LS103 85	LS118	P	0.5
LS103-86	LS-S8	RY	0
LS103-87	LS-S	NP	0
LS103-87A	LS118	E	0
LS104-1			
LS104-2	LS-S6	NU	0.5
LS104-3	LS-S21	WP	0.5
LS118	LSD5-U	B	1.0
	LS103-85	B	0.5
	LS80-2	B	3.0
	LS78-3	B	0.5
	LS103-87A	B	0.5
LS124	L5127.2	N	3.0
	L5129 2	N	3.0
LS125-1	LI18 4	PG	0.5
LS125-2	LS73-1	NB	0.5
LS127 1	LS-S10	NO	3.0
LS127 2	LS124	N	3.0
LS1211 1	LS-S7	NP	3.0
LS125-2	LS124	M	3.0
LS1131.1	LS-S7	NP	1.0
LS1131 2	LS69-20	NK	0
LS1131.3			
LS1131 4			
LS1131 5	LS-S17	RB	0.5
L5131 8	LS56	B1	1.0
LI18-1	LS33-87	PY	0.5
LI18-2	LS33-86	WU	0.5
LI18-3			
LI'18.4	LS126-1	PG	0.5
LI18 5	LS33-85	GB	0.5
LI18 G	LS33-30	N	0.5
LSD1 U	L537	B	0.5
LSD1 W	LS66	PY	0.5
LSD2-U	LS36	B	0.5
LSD2-W	LS35	Y	0.5
LSD3-U	L332	WG	0.5
LSD3-W	LS30.2	WY	0.5
LSD4-U	LS37	UG	0.5
LSD4-W	LS04 W		0.5
LSD5-U	LS118	B	1.0
LSD5-W	LS S6	NU	1.0
LSD6-U	LS-S6		
LSD6-W	LS S21	now	
LSD7-U	LS S6	OOU	
Im 7 - w	LS74-80	ND	0.5
LSD10 U	LS-S22	RE	0.5
LSD10 W	LS-S20	SY	0.5
LS S1	LS43-2	RS	0.5
	LS58-86	RS	0.5
	LS1-8	RS	0.5
LS S2	LS3-4	WG	0.5
	LSD3-U	WG	0.5
	LS20-8	WG	0.5
LS S3	LS64-5	PG	2.0
	L527.2	PG	0.5
	L320.3	PG	0.5
	LSD4 W	PG	0.5
LS-S4	LS17 8	BK	0.5
	LS24 1	BK	0.5
	LS28-6	BK	0.5
	LS7-3	RK	0.5
	LS3-6	BK	2.0
LS-S5	LS74-85	PY	0.5
	LSD7-U	OOU	
	LS06-U	OOU	
LS-S6	LSD5 W	NU	1.0
	LS104-2	NU	0.5
	LS74-87	NU	3.0
	LS80-1	NU	3.0
LS-S7	LS129-1	NP	3.0
	LS75 87	NP	3.0
	LS131-1	NP	LO
	LS1 19	NP	0.5
	LS103-87	NP	0.5
LS-S8	LS-S9	RY	2.0
	LS75-30	RY	3.0
	LS103-86	RY	0.5
LS-S9	LS78-1	RY	1.0
	LS69-3	RY	0.5
	LS77-7	RY	2.0
	LS S8	RY	2.0
LS S10	LS74 85	NO	0.5
	LS1 32	NO	0.5
	LS127 1	NO	3.0
	L674 30	NO	3.0
LS-S11	LS1-2	KR	0.5
	LS17-7	KR	0.5
	LS28-7	KR	0.5

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LS 42
LS 131
LS 69
LS 52
LS 17
LS 16
LS 15
LS 14
LS 39 / LS 56
LS 66
LS 104
LS 65
LS 58
LS 51
LS 10
LS 49
LS 48
LS 78
LS 118
LS 18
LS 76
LS 80
LS 79
LS 26
LS 124
LS 75
LS 74
LS 6
LS 7
LS 103
LS 2
LS 1
LS 64
LS 3
LS 8
LS 9
LS 46
LS 19
LS 33
LS 59
LS 34
LS 24
LS 30
LS 35
LS 36
LS 37
LS 27
LS 28
LS 29
LS 127
LS 129
LS 72
LS 73
LS 25
LS 77
LS 41
LS 125
LS 60
LS 43
LS 38
LS 32
LS 31

J86 1017

SIDE HARNESS RIGHT HAND RS ABS
HARNESS SCHEDULE 90.50.04/HS

Connector No	Description	Interface
RS1	Red 3-way plug	Bonnet lamps
RS2	Green relay base	Air cvn clutch
RS3	Black relay base	Cooling fen
RS4	Red relay bake	Power wash
RS5	Yellow relay Bake	Screen wash
RS7	Yellow 9 way PM4 socket	Engine harness
RS8	Black 3 way PM4 socket	Power wash pump
RS9	Yellow 3 way PM4 plug	Screen wash pump
RS10	Blue 3 way PM4 socket	Thermostat
RS11	Gteen 3 way PM4 plug	Washer level
RS12	Black 3 way PM4 socket	Side & DI lamps
RS13	Green 3 way PM4 socket	Side marker
RS14	Yellow 3 way PM4 socket	Fog lamp
RS15	Brown 3 way PM4 socket	Heater jet sensor
RS16	Black 9 why PM4 socket	Lamp relay & bulb fail module
RS17	Yellow 9 why PM4 plug	Lamp relay & bulb fail module
RS19	Yellow 8 way PM4 socket	Rids leveling valves
RS22	Black PMHD 38 way plug	Bulkhead harness interface
RS26	3 way socket	Side repeater
RS29	Blue relay base	Rids level relay
RS30	Black 3 way socket	Rear door harness
RS31	Black 8 way socket	Rear door harness
RS32	Yellow PMHD 6 way plug	Rear door harness
RS33	Black 2 way socket	Bass speaker
RS34	Lucar connector	Fuel gauge transmitter
RS35	Black 9 way PM4 aocket	Rear axle
RS36	Red relay base	Heated rear screen relay
RS37	Green relay base	Aerial 'up' relay
RS38	Black relay base	Aerial 'down' relay
RS41	Yellow 2 way socket	Boot lamp
RS42	Lucar connector	Number plate lamp
RS43	Lucar connector	Number plate lamp
RS45	Lucar connector	Number plate lamp
RS46	Lucar connector	Number plate lamp
RS47	Lucar connector	Boot light switch
RS48	Black 3 way socket	Electrical aerial
RS49	Lucar connector	Heated rear window
RS50	Black PMHD 15 way plug	Lamp relay & bulb fail module
RS51	Black PM4 6 way socket	Lamp relay & bulb fail module
RS52	5 way socket	Rear lamp cluster
RS53	Eyelet	Earth
RS54	Black 3 way aocket	Bonnet lamp switch
RS55	Eyelet	Earth
RS58	Black 4 way socket	Speed sensor
LS58	Black 2 cay socket	Number plate lamp
RS64	3 way socket	Interior lamp
RS65	Yellow 3 way PM4 aocket	Trailer module
RS69	Black 3 way socket	Thermocouple
RS71	Red 3 way plug	High beam stop lamp
RS72	Lucar connector	Fuel gauge transmitter
RS74	Blue PM4 3 way socket	Cooling fan
RS76	Lucar connector	Air con cutout
RS77	Lucar connector	Air con cutout
RS78	Green 3 way PM4 socket	Air con clutch
RS79	Yellow relay base	High beam stop lamp relay
RS87	Black 5 way PM4 plug	Bulkhead harness Interface
RS88	Yellow 8 way socket	Catalyst harness interface
RS89	Grey 7 way socket	AB5 value block
RS90	Black 5 way socket	ABS fluid reservoir
RS91	Black 2 way socket	ABS main valve
RS92	Black 2 way socket	ABS pump
RS93	Black 3 way plug	ABS RH front wheel sensor
RS94	Blue 6 way socket	ABS accumulator
RS95	Black 3 way plug	ABS LH front wheel sensor
RS96	Yellow relay base	ABS pump motor relay
RS97	Natural relay base	ABS main relay
RS98	55 way connector	ABS ECU control module
RS99	Black 2 way socket	Power wash
RS101	Black 2 way plug	Screen wash
RS102	Black 2 way plug	Screen wash jet
RS103	Blue relay base	ABS ECU relay
RS104	Red 3-way socket	ABS pump test
RS105	Black fl way socket	RH 'A' post fuse box
RS106	Black 5 way socket	RH 'A' post fuse box
RS103	Brown 6 way PM4 socket	ABS diagnostic socket
RS103	Black 4 way socket	Boot open warning
RS114	Yellow PMHD 36 way plug	Bulkhead harness Interface
RS115	Black 3 way plug	ABS LH rear wheel sensor
RS116	Black 3 way plug	ABS RH rear wheel sensor
RS118	Eyelet	ABS control module earth
RS129	Eyelet	Battery bulkhead terminal post
RS132	Black 4 way socket	Boot lock/unlock
RS133	Brown 2 way plug	Boot release actuator
RS137	Lucar connector	ABS fuse
RS139	Lucar connector	ABS fuse
RS140	Eyelets	TLVES ABS earths

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WIRING SCHEDULE 90.50.04/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Diametro
Desde	Hacia	Color	Tamano
I35114.17	RS54-3	UG	0.5
RS114-10	RS65-2	KU	0.5
I35114.19	RS31-8R	KLG	0.5
RS114-20			
RS114-21			
I35114.22	RS2-88	UB	0.6
RS1 14.23			
RS1 14.24	RS S27	WK	0.6
RS1 14.25	RS S57	NP	0.6
RS114.26	RS94 2	BR	0.6
RS1 14 27	RS-S62	RU	0.6
RS1 14.28			
RS114-29			
RS114-30	RS98-32	GO	0.5
RS114-31			
IRS114.32	RS-S53	NO	0.5
RS114-33	RS8A-8	UR	0.5
RS114-34	RS51-1	NLG	0.5
RS114-35			
RS114-36			
RS115-1			
IR8115.2	RS9B 46	U Inner	1.0
RS115 3	RS9B 20	Braid	Screen
RS1 16 1			
RS116-2	RS9U-45	Y Inner	1.0
RS116-3	RS90-27	Braid	Screen
RS1 18	RS98-19	B	2.0
RS118	RS108-6	B	1.0
RS129	RS137-2	N	3.0
	RS139-2	N	3.0
RS132-1	RS-S20	PK	0.5
RS132-2	RS-S23	PO	0.5
RS132-3	RS22-3	YO	0.5
RS132-4	RS133 2	YK	0.5
RS133 1	RS-S25	U	0.5
RS133-2	RS132-1	YK	0.5
RS137-1	RS-S53	NO	3.0
RS137-2	RS129	N	3.0
RS138-1	RS-S57	NP	3.0
RS138-2	RS129	N	3.0
RS140	RSD12 U	B	1.0
	RS103 87A	B	0.5
	RS92 2	B	3.0
	RS90-3	B	0.5
	RS103-86	B	0.5
RS S1	RS106-8	NP	2.0
	RS2-30	NP	0.6
	RS3-30	NP	2.0
RS-S2	RS7-4	GN	0.5
	RS78-2	GN	0.5
	RS2-87	GN	0.5
RS-S3	RS15-2	RS	0.5
	RS88 2	RS	0.5
	RS S10	RS	0.5
RS S4	RS53	U	3.0
	RS9-1	U	0.5
	HSB-1	G	3.0
	RS3-86	R	0.5
	RS14-1	R	2.0
	RS13-2	R	0.5
	RS12-2		0.5
	RS74-1	B	2.0
	RB99-1	B	0.5
RS-S5	RS18 2	YLG	0.6
	RS19 4	YLG	0.5
	RS-S50	YLG	0.5
RS S6	RS-S11	WS	0.5
	RS19-3	WS	0.6
	RSN1-N	N	a.5
RS-S7	RS10-1	WU	0.5
	RSD1-W	OOW	0.5
	RSD2 W	OOW	0.6
RS S8	RS-S15	NK	0.5
	RS19-5	NK	0.6
	RSN2-N	N	0 5
RS-S9	RS19-6	YU	a.5
	RS35-6	YU	a.5
	RSN2-Y	Y	a.5
RS-S10	RS S3	RS	0.6
	RS101 1	RS	0.6
	RS102 1	RS	0.5
	RS22-36	RS	0.5
RS S11	RS18-1	WS	0.5
	RS-S8	WS	0.5
	RS28-86	WS	0.5
	RS35-2	WS	0.5
	RS22-30	WS	0.5
RS-S12	R822.33	KG	0.5
	RS60-7	KG	0.5
	RS17-7	KG	0.5
RS-S13	RS87 3	B	2.4
	RS102 2	B	0.6
	RS30 1R	B	2.0
	RS26 2	B	0.5
	RS101 2	B	0.5
	RS88 5	B	0.5
RS-S14	RB22-10	YK	0.5
	RB50-5	YK	0.5
	RS17 4	YK	0.5

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Diametro
Desde	Hacia	Color	Tamano
RS-S15	RS22 28	NK	0.5
	RS 58	NK	0.5
	RS35-1	NK	0.5
RS-S16	RS50-6	KS	0.5
	RS17-6	KS	0.5
	RS114-14	KS	0.5
RS-S17	RS114-8	R	0.5
	RS50-4	R	0.5
	RS1E-4	R	0.0
RS-S18	RS34	BK	0.6
	RS16-5	BK	0.6
	RS88 4	BK	0.5
	RS30-3	UK	0.5
	RS11-1	BK	0.5
	RS76	AK	0.5
	RS60-60	AK	0.5
	RS109-1	BK	0.5
	RS87-4	BK	2.0
RS-S19	RS114-13	NW	0.5
	RS84-2	NW	0.5
	RS41-1	NW	0.5
	RBD8-U	NW	0.6
RS-S20	RS22 36	PK	0.5
	RS32-3R	PK	0.6
	RS132-1	PK	0.6
RS-S21	RS47-87	NB	1.0
	RS37-86	NB	0.5
	RS36-87	NB	1.0
	RS36-86	NB	0.5
	RS106-3	NB	1.0
RS-S22	RS105-4	NY	3.0
	RS36-30	NY	2.11
	RS36-86	NY	0.5
RS-S23	RS22 34	PO	0.6
	RS32 2	PO	0.5
	RS132 2	PO	0.5
RS S24	RS55		3.0
	RS29-87		0.5
	RS71-3	B	0.5
	RS65-1	B	3.0
	RS37-87A	B	1.0
	RS38-87A	B	1.0
	RS84-3	B	0.5
	RS35-3	B	0.5
	RS-S25	B	0.6
RS-S25	RS24	B	0.6
	RS49	B	0.6
	RS43	B	0.5
	RS133 1	B	V U
RS S26	RS50-3	VU	0.5
	RS79-86	PU	0.5
	RS22-33	PU	0.5
RS-S27	RS5-86	WK	0.5
	RS88-2	WK	0.5
	RS1 14-24	WK	0.6
RS-S28	RS1 14.7	WU	0.6
	RSD1-U	OOU	0.5
	RS15 1	WU	0.5
RS-S29	RS84 4	WP	0.5
	RSD8-W	OOW	
	RS104-3	WP	0.6
RS-S30	RS4-86	NK	0.5
	RS4-30	NK	3.0
	RS105-8	NK	8.0
RS-S32	RS51-5	NR	2.0
	RS79-30	NR	0.6
	RS105-3	NR	2.0
RS S50	RS-S5	YLG	0.6
	RS29-30	YLG	0.5
	RSN1-Y	Y	0.5
RS-S51	RS22-8	WR	0.6
	RS88-53	WR	0.5
	RS97-86	WR	0.5
RS-S52	RS114 27	RE	0.5
	RS98 52	RE	0.3
	RSD10-U	RB	0.5
	RS108-5	RU	0.5
RS-S53	RS96-86	NO	0.1
	RS114-32	NO	0.5
	RS137-1	NO	3.0
	RS96-30	NO	3.0
RS-S54	RS103-30	BY	0.5
	RSD10-W	SY	0.5
	RS98-33	BY	0.6
RS-S55	RS-S56	RY	2.0
	RS87-30	RY	3.0
	RS103-86	TY	0.6
RS-S56	RS91-1	RY	1.0
	RS98-3	RY	1.0
	RS89-7	RY	2.0
	RS-S55	RY	2.0
RS-S57	RS130-1	NP	3.0
	RS97-87	NP	3.0
	RS104-1	NP	1.0
	RS114-26	NP	0.5
	RS103-87	NP	0.5
RS-S58	RS96-85	PY	0.5
	RSD7-U	OOU	
	RSD8-U	OOU	

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Diametro
Desde	Hacia	Color	Tamano
RS-S60	SD12-W	NU	1.0
	S104 2	NU	0.5
	S98 E7	NU	3.0
	S82 1	NU	3.0
RSD1 U	S-S28	OOU	0.5
RSD1 W	S-S7	OOW	0.5
RSD2-U	53-07	P	0.5
RSD2-W	S-S7	OOW	0.5
RSD3-U	S55	B	0.5
RSD3-W	S2-87	GN	0.5
RSD8-U	S-S19	NW	0.5
RSD8-W	E1 2	NP	0.5
RSD7 U	S S58	OOU	0.5
RSD7 W	S86-86	NO	0.5
RSD8-U	S-S58	OOU	0.5
RSD8-W	S-S29	OOW	0.5
RSD10-A	S-S27	RB	0.5
RSD10-C	S-S26	RY	0.5
RSD12-U	S140	B	1.0
RSD12-w	S-S80	NU	1.0
RSN1-N	8 S6	N	0.5
RSN1-Y	6 S50	Y	0.5
RSN2 N	S S8	N	0.5
RSN2 Y	S S8	Y	0.5

WIRING SCHEDULE 90.50.04/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Diametro
Desde	Hacia	Color	Tamano
RS1 1			
RS1 2	RSD6 W	NP	0.5
RS1 3	RS54 2	UY	0.5
RS2 30	R9-61	NP	0.5
RS2 85	R377	UY	0.5
RS2 86	RS114 22	UB	0.5
RS2 87	R5-62	GN	0.5
	RSD3 W	GN	0.5
RS3 30	RS-S1	NP	0
RS3 85	R3-34	B	...
RS3 86	RS10-2	W	0.5
RS3 87	RS74-2	P	2.0
	RSD2-U	P	0.5
RS4 30	RS-S30	NK	3.0
RS4 85	RS114-3	LGN	0.5
RS4 86	RS-S30	NK	0.5
RS4 87	RS8-2	YR	3.0
RS5 30	RS105-5	NG	0.5
RS5 85	RS114-4	LGY	0.5
RS5 86	RS sz7	WK	0.5
RS5 87	RS9 2	YG	0.5
RS7 1	RS22-7	OS	0.5
RS7 2	RS22-E	OK	0.5
RS7 3			
RS7 4	RS-S2	GN	0.
RS7 5	RS114-8	RY	0.5
RS7 6			
RS7 7			
RS7 8			
RS7 9			
RS8 1	RS S4	B	3.0
RS8 2	RS4 87	YR	3.0
RS8 3			
RS9 1	RS-S4	B	0.5
R99.2	RS5-87	YG	0.5
R39.3			
RS10-1	RS-S7	WU	0.5
RS10-2	RS3-86	W	0.5
RS10-3			
RS11-1	RS-S1R	WK	0.5
RS11-2	RS22-19	OR	0.5
RS11-3			
RS12-1	RS17-3	G	0.5
RE12 2	R6.64	B	2.5
RS12 3	RE17 2	R	2.5
RS13 1	RS17 5	RB	0.5
RS13-2	RS-S4	B	2.5
RS13-3			
RS14-1	RS-S4	B	2.0
RS14-2	RS17 1	RO	2.0
RS14-3			
RS15 1	RS S29	WU	0.5
RS15-2	RS S3	RS	0.5
RE15-3			
RS16 1	RS114-10	RO	0.5
RS16 2	RS22-15	UK	0.5
RS16 3	RS22-1	US	0.5
RS16-4	RS-S17	R	0.5
RS16-5	RS-S18	RK	0.5
RS16-6	RS87-6	WP	0.5
RS16-7	RS105-1	NO	2.0
RS16-8	RS106-2	NK	2.0
RS16-9	RS108-4	NG	3.0
RS17-1	RS14-2	RO	2.0
RS17-2	RS12-3	R	0.5
RS17-3	RS12-1	G	0.5
RS17-4	RS-S14	YK	0.5
RS17-5	RS13-1	RB	0.5
RS17-6	RS26-3	YS	0.5
RS17-7	RS-S12	KG	0.5
RS17-8	RS-S16	K9	0.5
RS17-9	RS51 6	KU	0.5
RS19 1	RS S11	WS	0.5
RS19 2	RS S8	YLG	0.6
RS19-3	RS S9	WS	0.6
RS19-4	RS S5	YLG	0.5
RS19-5	RS S6	NK	0.5
RS19-6	RS-S9	YU	0.0
RS20-1	RS114-1	UN	0.6
RS20-2	RS123-9	OG	0.6
RS20-3			
RS22-1	RS16-3	US	0.5
RS22-2	RS56-1	Braid	Screen
RS22-3	RS133-3	YO	0.5
RS22-4	RS56-4	B Inner	0.5
RS22-5	RS94-1	WN	0.5
RS22-6	RS-S51	WR	0.5
RS22-7	RS7-1	OS	0.5
RS22-8	RS7-2	OK	0.5
RS22-9	RS72	BW	0.5
RS22-10			
RS22 11	RS58-3	U Inner	0.5
RS22-12	RS31-1R	BG	0.5
RS22-13	RS31 2R	BLG	0.5
RS22-14	RS16-2	UK	0.5
RS22-15	RS-S14	YK	0.5
RS22-16	RS36-85	LGO	0.5
RS22-17	RS32-1	LG	0.5
RS22-18	RS11-2	OR	0.5
RS22-19	RS31-3R	YW	0.5
RS22 21	RS37-85	WG	0.5
RS22 22	RS38-85	WU	0.5
RS22 23			
RS22 24			
RS22 25	RS S15	NK	0.5
RS22 26	RS108-2	RY	0.5

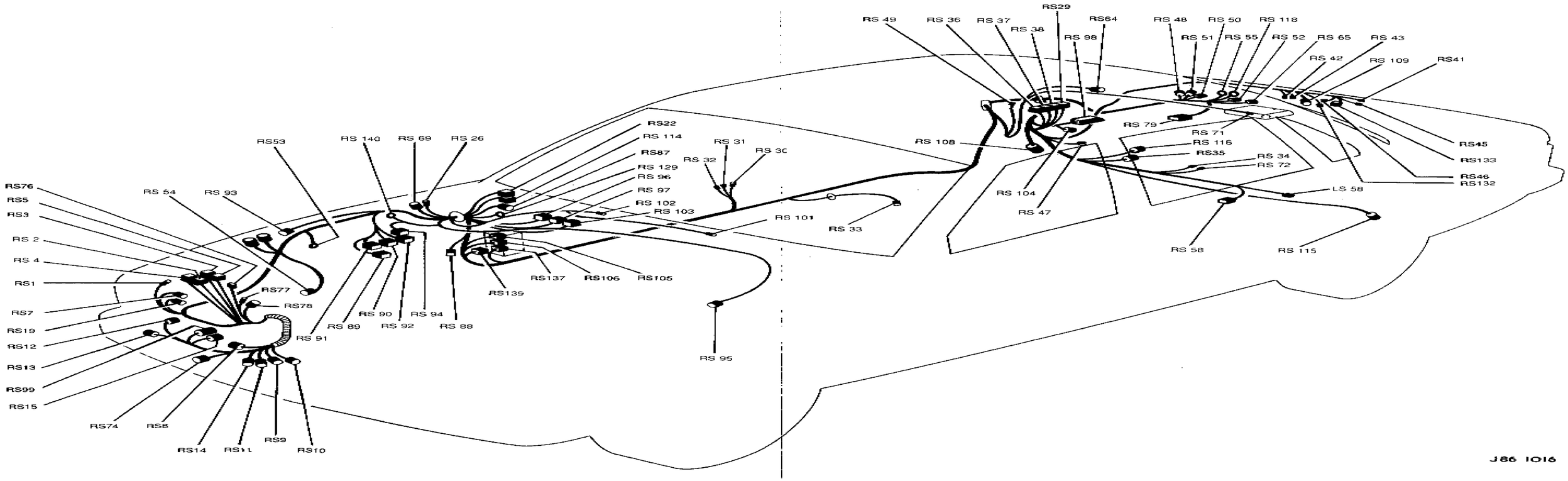
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Diametro
Desde	Hacia	Color	Tamano
RS22.27	RS93-1	KO	0.5
RS22.28	RS93-2	KR	0.5
RS 22 29	RS93-4R	UY	0.5
RS 22 30	RS-S11	WS	0.5
RS 22 31			
RS 22 32	RS-S28	PU	0.5
RS 22 33	RS-S12	KG	0.5
RS 22 34	RS-S29	PO	0.5
RS 22 35	RS-S20	PK	0.5
RS 22 36	RS-S10	RS	0.5
RS26 1			
RS26-2	RS-S13	E	0.5
RS26-3	RS17.6	YS	0.5
RS29-30	RS-S50	YLG	0.5
RS29-85	F636-b	YN	0.5
RS29-86	RS-S11	WG	0.5
RS29-87	F	E	0.5
RS30-1R	RS-S13	E	2.0
RS30-2R	RS105-9	NS	2.0
RS30-3	RS-S18	BK	0.5
RS31-1R	RS22-13	BG	0.5
RS31-2R	RS22-14	BLG	0.5
RS31-3R	RS22-20	VW	0.5
RS31-4R	RS114-5	P	0.5
RS31-5R	F116114.12	KY	0.5
RS31 6R	F1511419	KLO	0.5
RS32 1	RS22.18	LG	0.5
RS32 2	RS-S23	PO	0.5
RS32 3R	RS-S20	PK	0.5
RS332 4R	RS22.29	UY	0.5
RS32-5			
RS32-6			
RS33-1	RS22-27	KO	0.5
RS33-2	RS22-2R	KR	0.5
RS34	RS-S1R	BK	0.5
RS35-1	RS-S15	NK	0.5
RS35-2	RS-S11	WS	0.5
RS35-3	RS-S24	U	0.5
RS35-4			
RS35-5	RS29-85	YN	0.5
RS35-6	RS-S9	YU	0.5
RS35-7			
RS35-8	RS114-16	O	0.5
R535 8	RS114.1	OG	0.5
RS36 30	RS-S22	NY	2.0
RS36 85	RS22 17	LGO	0.5
RS36 86	RS.622	NY	0.5
RS36 87	R549	UY	2.0
RS37-30	RS48 2	GR	1.0
RS37-85	11322.21	WG	0.5
RS37 E0	RS-S21	NB	0.5
RS37 E7	RS-S21	NB	1.0
RS37 87	RS-S24	B	1.0
RS38 30	RS48-1	GU	1.0
F7638-06	RS22-27	WB	0.5
RS38-86	RS-S21	NB	0.5
RS38-87	RS-S21	NU	1.0
RS38-87A	RS-S24	U	1.0
RS41-1	RS-S19	NW	0.5
RS41-2	RS47	PR	0.5
R642	RS50-13	RB	0.5
R343	RS S25	E	0.5
RS45	RS58-1	RE	0.5
RS46	RS-S25	E	0.5
RS47	RS41-2	PR	0.5
RS48 1	RS38-30	GU	1.0
RS48 2	RS37-30	GR	1.0
RS49	RS36-87	UY	2.0
RS50 1	RS114-9	RU	0.5
RS50-2	RS114-11	SLG	0.5
RS50-3	RS S26	PU	0.5
RS50-4	RS S17	R	0.5
RS50-5	RS-S14	YK	0.5
RS50-6	RS-S18	KS	0.5
RS50-7	RS-S12	KG	0.5
RS50-8	RS-S18	RK	0.5
RS50-9	RS52-3	GN	0.5
RS50-10	RS52-5	GP	0.5
RS50-11	RS52 4	RG	0.5
RS50-12	RS52 1	Y	0.5
RS50-13	RS42	RB	0.5
RS50-14	RS114-15	KU	0.5
RS50 15			
RS51 1	RS114-34	NLG	0.5
RS51 2	RS67-2	WG	0.5
RS51 3			
RS51 4			
RS51 5	RS S32	NH	2.0
RS51-6	RS17-9	KU	0.5
RS52-1	RS60-12	Y	0
RS52-2	RS66	U	2.
RS52-3	RS60-3		0.
RS67-4	RS50-11		0.
RS52-5	RS50 10	GP	0.5
RS63	RS-S4	B	3.0
R563	RSD3-U	R	0.5
RS54-1			
RS54-2	RS1-3	UY	0.5
RS54 3	RS114-17	UG	0.5
RS55	RS52-2	B	2.0
RS55	RS-S24	B	3.0
RS58-1	RS22-2	Braid	Screen
RS58-2			
RS58-3	RS22-12	U	Inner

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Diametro
Desde	Hacia	Color	Tamano
RS58-4	RS22 4	B	Inner
LS58-1	RS46	RB	0.5
LS58-2			
RSR4-1			
RSh4-2	RS-S19	UW	0.5
RSh4-3	RS-S24	B	0.5
RS61.1	RS-S24	B	3.0
RSB5.2	RS114-18	KU	0.5
RS65-3	RS105-2	NU	5.0
RS69-1	RS90-3	U	0.22
RS69-2	RS90-1	N	0.22
RS69-3			
RS71-1			
RS71-2	RS79-87	PB	0.5
RS71.3	RS-S24	B	0.5
RS72	RS22-9	BW	0.5
RS74-1	RS-S4	E	2.0
RS74-2	RS3-87	P	2.0
RS74-3			
RS76	RS-S18	BK	0.5
RS77	RS2-65	UY	0.5
RS78-1			
RS78-2	RS-S2	GN	0.5
RS78-3			
RS79-30	RS-S32	NR	0.5
	Diode C	U	
RS79-85	RS S26	PU	0.5
	Resistor	Y	
RS79-86	Diode C	W	
	Diode A	N	
RS79-87	RS71 2	PB	0.6
RS87-1	RS106-1	NY	0.5
RS87-2	RS61-2	WG	0.5
RSU7-3	RS-S13	B	2.0
RS87-4	RS-S18	BK	2.0
RS87-5			
RS87-6	RS16-6	WP	0.5
RS88-1	RS89-2	N	0.22
RSEE 2	RS-S27	WK	0.5
RS88-3	RS69 1	U	0.22
RS88-4	R9-S18	BK	0.6
RS88-5	RS-S13	B	0.6
RS88-6	RS114-33	UR	0.6
RS89 1	RS98 20	GW	0.5
RS89 2	RS98 2	GY	0.5
RS89-3	RS98 34	UG	0.5
RS89-4	RS98-36	GR	0.5
RS89 5	RS98 21	WR	0.5
RS89-6	RS98 38	WN	0.5
RS89 7	RS-S56	RY	2.0
RS90-1	RS88-6	WG	0.5
RS90-2	RS94-3	PG	0.5
RS90-3	RS140	B	0.5
RS90-4	RS114-2	UY	0.5
RS90-5			
RS91-1	RS-S56	RY	1.0
RS91-2	RS98-39	GS	1.0
RS92-1	RS-S60	NU	3.0
RS92-2	RS140	U	3.0
RS93-1			
RS93-2	RS98-47	G Inner	1.0
RS93-3	RS98-29	Braid	Screen
RS94-1	RS22-5	WN	0.5
RS94-2	RS114-26	OR	0.5
RS94-3	RS90-2	PG	0.5
RS94-4	RS-S29	WP	0.5
RS94-5	RS98-51	WU	0.5
RS95-1	RS98 48	R Inner	1.0
RS95-2	RS98-30	Braid	Screen
RS95 3			
RS96-30	RS S63	NO	3.0
RS96-85	RS-S68	PY	0.5
RS96-86	RS-S53	NO	0.5
	RSD7-W	NO	0.5
RS96-87	RS-S80	NU	3.0
RS97-30	RS-S55	RY	3.0
RS97-85	RS98-34	YG	0.5
RS97-86	RS-S51	WR	0.5
RS97-87	RS-S57	NP	3.0
RS98-1			
RS98-2	RS89 2	GY	0.5
RS98-3	RS-S56	RY	1.0
RS98-4			
RS98-5			
RS98-6			
RS98-7			
RS98-8	RS90-1	WG	0.5
RS98-9			
RS98-10			
RS98-11			
RS98-12			
RS98-13			
RS98-14			
RS98-15			
RS98-16			
RS98-17			
RS98-18			
RS98-19	RS118	B	2.0
RS98-20	RS89 1	GW	0.5
RS98-21	RS89 5	WR	0.5
RS98-22			
RS98-23	RS108-2	NK	0.5
RS98-24			

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Colore	Diametro
Desde	Hacia	Color	Tamano
RS98 25			
RS98 26			
RS98-27	RS110 3	Braid	Screen
RS98-28	RS110 3	Braid	Screen
RS98-29	RS93 3	Braid	Screen
RS98-30	RS95-3	Braid	Screen
RS98-31			
RS98-32	RS 114-30	GB	0.5
RS98-33	RS-S54	GY	0.5
RS98-34	RS97-86	YG	0.5
RS98-35			
RS98-36	RS89-4	GR	0.5
RS98-37			
RS98-38	RS89-6	WN	0.5
RS98-39	RS91-2	BS	1.0
RS99-40			
RS99-41			
RS99-42			
RS98-43			
RS98-44			
RS98-45	RS116-2	Y Inner	1.0
RS98-46	RS116-2	U Inner	1.0
RS98-47	RS93-2	G Inner	1.0
RS98-48	RS95-2	R Inner	1.0
RS98-49			
RS98-50			
RS98-51	RS94-5	WU	0.5
RS98-52	RS-S52	RB	0.5
RS98-53	RS-S51	WR	0.5
RS98-54	RS89-3	UG	0.5
RS98-55			
RS99-1	RS-S4	B	0.5
RS99-2	RS-S3	RS	0.5
RS101-1	RS-S10	RS	0.5
RS101-2	RS-S13	B	0.5
RS102-1	RS-S10	RS	0.5
RS102-2	RS S13	B	0.5
RS103-30	RS-S54	GY	0.5
RS103 85	RS140	U	0.5
RS103 86	RS-S55	RY	0.5
RS103 E7	RS-S57	NS	0.5
RS103-87A	RS140	B	0.5
RS104-1			
RE104-2	RS-S60	NU	0.5
RS104-3	RS S29	WG	0.5
RS105 1	RS18-7	NO	2.0
RS105-2	RS98 8	NU	3.0
RS105-3	RS-S32	NR	2.0
RS105-4	RS S33	NW	3.0
RS105-5	RS S35	NO	0.8
R3105.6	RS S30	NK	3.0
RS105 7	RS-S1	NP	2.0
RS105-8	RS30-2R	NS	2.0
RS105-9			
RS106 1	RS87 1	NY	0.
RS106 2	RS16 8	NK	2.0
RS106-3	RS 621	NB	1.0
RS106-4	RS16-8	NG	3.0
RS106-5			
RS108-1	RS-S57	NP	0.5
RS108-2	RS98-23	NK	0.5
RS108-3			
RS108-4			
RS108-5	RS-S52	RB	0.5
RS108-6	RS118	B	1.0
RS109-1	RS-S18	BK	0.5
RS109-2	RS22-26	RY	0.5
RS109-3			
RS109-4			
RS109-5			
RS114 1	RS35 8	OG	0.5
RS114 2	RS90 4	BY	0.5
RS114 3	RS4 80	LGN	0.5
RS114 4	RS5 80	LGY	0.5
RS114 5	RS31-4R	P	0.5
A51146	R67 5	RY	0.5
RS114-7	RS S28	WU	0.5
RS114-8	RS-S17	R	0.5
RS114-9	RS50-1	RU	0.5
RS114-10	RS16-1	RO	0.5
RS114-11	RS50-2	SLG	0.5
RS114.12	RS31 6R	KY	0.5
RS114-13	RS-S1B	NW	0.5
RS114-14	RS-S15	NS	0.5
RS114-15	RS50-14	KU	0.5
RS114-16	RS36-8	O	0.5

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SIDE HARNESS RIGHT HAND RS ABS
CONNECTOR LOCATION 90.50.04/CL



J86 1016

SIDE HARNESS RIGHT HAND RS
HARNESS SCHEDULE 90.50.04/HS

Connector No	Description	Interface
RS1	Red 3-way plug	Bonnet lamps
RS2	Green relay base	Air con clutch
RS3	Black relay base	Cooling fan
RS4	Red relay base	Power wash
RS5	Yellow relay base	Screen waah
RS7	Yellow 9 way PM4 socket	Engine harneaa
RS8	Black 3 way PM4 socket	Power wash pump
RS9	Yellow 3 way PM4 plug	Screen wash pump
RS10	Blue 3 way PM4 socket	Thermostat
RS11	Green 3 way PM4 plug	Washer level
RS12	Black 3 way PM4 socket	Side & DI lamps
RS13	Green 3 way PM4 socket	Side marker
RS14	Yellow 3 way PM4 socket	Fog lamp
RS15	Brown 3 way PM4 socket	Heater Jetsensor
RS16	Black 9 way PM4 socket	Lamp relay & bulb fail module
RS17	Yellow 9 wry PM4 plug	tamp relay & bulb fail module
RS19	Yellow 6 way PM4 socket	Ride leveling valves
RS22	Black PMHD 36 way plug	Bulkhead harneaa interface
RS26	3 wby socket	Side repeater
RS29	Blue relay base	Ride level relay
RS30	Black 3 way Socket	Rear door harneaa
RS31	Black 0 way Socket	Rear door harneaa
RS32	Yellow PMHD 6 way plug	Rear door harness
RS33	Black 2 way socket	Bass speaker
RS34	Lucar connector	Fuel gauge transmitter
RS35	Black 9 way PM4 socket	Rear axle
RS36	Red relay base	Heated rear screen relay
RS37	Green relay base	Aerial 'up' relay
RS38	Black relay base	Aerial 'down' relay
RS41	Yellow 2 way socket	Boat lamp
RS42	Lucar connector	Number plate lamp
RS43	Lucar connector	Number plate lamp
RS45	Lucar connector	Number plate lamp
RS46	Lucar connector	Number plate lamp
RS47	Lucar connector	Boot light switch
RS48	Black 3 way socket	Electrical aerial
RS49	Lucar connector	Heated rear window
RS50	Black PMHD 15 way plug	Lamp relay & bulb fail module
RS51	Black PM4 6 way socket	Lamp relay & bulb fail module
RS52	5 way socket	Rear lamp cluster
RS53	Eyelet	Earth
RS54	Black 3 way socket	Bonnet lamp switch
RS55	Eyelet	Earth
RS58	Black 4 way socket	Speed sensor
LS58	Black 2 way socket	Number plate lamp
RS64	3 way socket	Interior lamp
RS65	Yellow 3 way PM4 socket	Trailer module
RS69	Black 3 way socket	Thermocouple
RS71	Red 3 way plug	High beam stop lamp
RS72	Lucar connector	Fuel gauge transmitter
AS74	Blue PM4 3 way socket	Cooling fan
RS76	Lucar connector	Air con cutout
RS77	Lucar connector	Air con cutout
RS78	Green 3 way PM4 socket	Air con clutch
RS79	Yellow relay base	High beam stop lamp relay
RS87	Black 6 way PM4 plug	Bulkhead harness interface
AS38	Yellow 0 way socket	Catalyst harness interface
RS99	Slack 2 way socket	Power wash
RS101	Black 2 way plug	Screen wash
RS102	Black 2 way plug	Screen wash jet
RS105	Black 9 way socket	RH 'A' post fuse box
RS106	Black 6 way socket	RH 'A' post fuse box
RS109	Black 4 way socket	Boat open warning
RS114	Yellow PMHD 36 way plug	Bulkhead harness interface
RS132	Black 4 way socket	Boat lock/unlock
RS133	Brown 2 way plug	Boat release actuator

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WIRING SCHEDULE 90.50.04/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
Da	A	Colore	Diametro
Desde	Hacia	Color	Diámetro
RS132-1	RS-S20	PK	0.5
RS132-2	RS S23	PO	0.5
RS132 3	RS22 3	YU	0.5
RS132 4	RS133-2	YK	0.5
RS133-1	RS-S25	R	1.5
RS133-2	RS132-4	VK	1.5
RS140	RSD12-U	E	1.0
	RS103 87A	E	0.5
	RS92 2	B	0.5
	RS90-3	U	1.5
	RS103-85	B	0.5
RS-S1	RS105-8	NP	2.0
	RS2-30	NP	1.5
	RS3 30	NP	2.0
RS-S2	RS7 4	GN	0.5
	RS78-2	GN	2.0
	RS2 87	GN	0.5
RS S3	RS15-2	HS	0.5
	RS89-2	HS	0.5
	HS-S10	RS	1.5
RS-S4	RS53	B	3.0
	RS9-1	B	1.5
	RS8-1	B	3.0
	RS3 85	B	1.0
	RS14 1	B	2.0
	RS13 2	B	0.5
	RS12-2	B	0.5
	RS74-1	B	2.0
	RS89-1	B	0.5
RS-S5	RS19-2	YLG	3.5
	RS19-4	YLG	3.5
	RS-S50	YLG	3.5
RS-S6	RS-S11	WS	0.5
	RS19 3	WS	0.5
	RSN1 N	DUN	
RS-S7	RS10 1	WU	0.5
	RSD1-W	UUW	
	RSD2-W	OOW	
HS-S8	RS-S15	MY	0.5
	RS19-5	NK	3.5
	RSN2-N	OON	
RS-S9	RS19-6	YU	3.5
	RS35-6	YU	3.6
	RSN2 Y	OOY	
RS S10	RS S3	RS	0.5
	RS102-1	HS	0.5
	RS101-1	HS	0.5
	RS22-36	RS	0.5
HS-S11	RS19-1	WS	0.5
	RS-S6	WS	0.5
	RS29-86	WS	0.5
	RS35 2	WS	D E
	RS22 30	WS	D E
RS-S12	RS22 33	KG	0.5
	RS60 7	KG	0.5
	RS17 7	KG	0.5
RS S13	RS87-3	U	2.0
	RS102-2	B	0.5
	RS29-87	A	0.5
	RS30-1		2.0
	RS28-2	E	0.5
	RS101 2	B	0.5
	RS88 7	E	0.0
RS S14	RS22-16	YK	0.5
	RS50-5	YK	0.5
	RS17-4	YK	0.5
HS-S15	RS22-25	NK	0.5
	RS-S8	NK	0.5
	RS35-1	NK	0.5
RS-S16	RS50 5	KS	0.0
	RS17 8	KS	0.5
	RS24 14	KS	0.5
RS-S17	RS24 9	R	0.5
	RS30 4	R	0.5
	RS16-4	R	0.5
RS-S18	HS34	AY	0.5
	RS18-5	SK	0.5
	RS88-4	SK	0.5
	RS30-3	SK	0.5
	RS11-1	SK	0.5
	RS76	SK	0.5
	RS87 4	SK	2.0
	RS50 8	SK	0.5
	RS108-1	SK	0.5
RS-S19	HS24-13	NW	0.5
	RS84-2	NW	0.5
	RS41-1	NW	0.5
	RSD8-U	NW	0.5
RS-S20	RS22 35	PK	0.5
	RS32-3	PK	0.5
	RS132-1	PK	0.5
RS-S21	RS37-87	NE	1.0
	RS37-86	NE	0.5
	RS36-87	NB	1.0
	RS36-86	YE	0.5
	RSD6 3	NE	1.0
RS S22	RS105 4	NY	3.0
	RS36-20	NY	2.0
	RS36-86	NY	0.5

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
Da	A	Colore	Diametro
Desde	Hacia	Color	Diámetro
RS-S23	RS22-34	PO	1.5
	F1532.2	PO	0.5
	RS132-2	PO	0.5
RS S24	RS55	U	1.0
	RS71-3	U	0.5
	RS55-1	U	1.0
	HS37-87A	B	1.0
	RS36-87A	B	1.0
	RS35-3	B	0.5
	F1864 3	B	0.5
	RS S25	B	0.5
RS S25	F1624	U	0.5
	RS48	U	1.5
	HS43	B	0.5
	RS133-1	B	0.5
HS-S26	RS22-32	PU	0.5
	RS78-85	PU	1.5
	F1550.3	PU	1.5
RS-S27	F1624 24	WK	0.5
	RS5 85	WK	0.5
	RS88-2	WK	1.5
RS-S28	HS24-7	WU	1.5
	HS15-1	WU	0.5
	RSD1-U	OOU	
HS-S30	RS4-88	NK	0.5
	RS4-30	NK	3.0
	RS105-6	NK	3.0
RS-S31	FIS 55	YLG	0.5
	RS29 30	YLG	0.5
	RSN1 Y	OOY	
RS-S32	HS51-5	NA	3.0
	HS79-30	NA	0.5
	RS105-3	NA	3.0
HSD1-U	RS-S28	clou	1.5
HSD1-W	F15-57	clow	
RSD2-U	F133.87	P	0.5
RSD2-W	RS 67	OOW	
RSD6 U	FIS S18	NW	0.5
RSD6 W	F151.2	NP	0.5
RSN1-N	HS-S6	OOY	
RSN1-Y	RS-S31	OOY	
HSN2-N	RS-S8	OON	
HSN2-Y	RS-S9	clOV	

WIRING SCHEDULE 90.50.04/WS

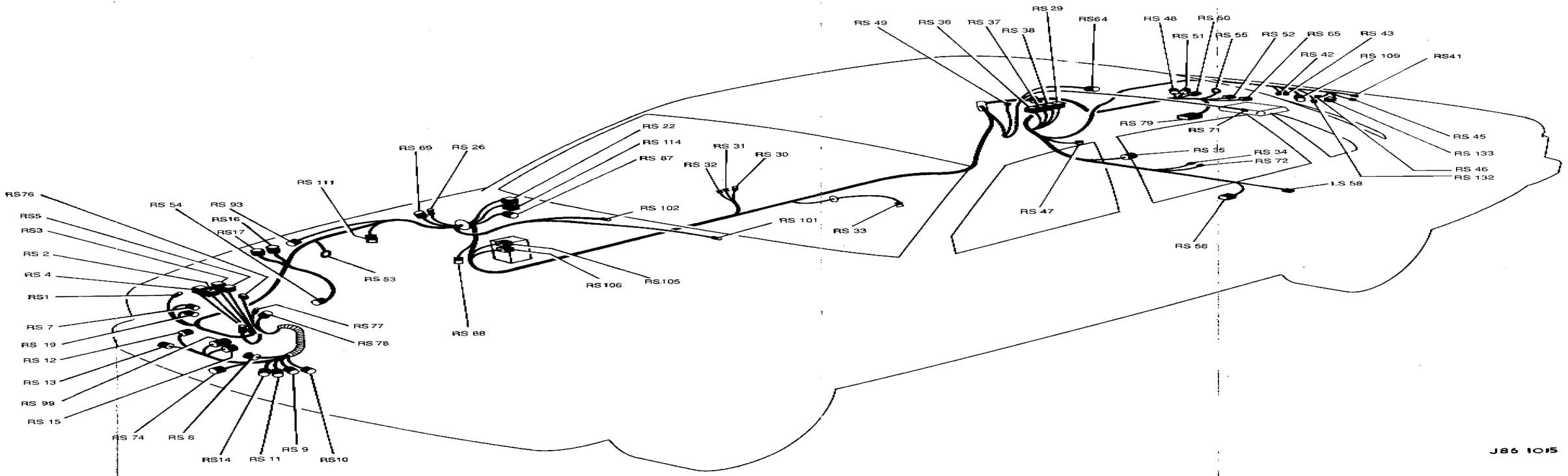
From / Von / Da / Van / Desde	To / Nach / A / Naar / Hacia	Colour / Farbe / Couleur / Kleur / Color	Size (mm) / Querschnitt / Section / Maat / Tamano
RS1-1			
RS1-2	RSD6-W	NP	0.5
RS1-3	RS54-2	UY	0.
R52-30	RS-S1	NP	0.
R52-85	RS77	UY	0.
R52-86	RS24 22	UB	0.5
R52-87	RS162	GN	0.5
	RSD3-W	GN	0.5
RS3-30	RS S1	NP	2.0
RS3-85	RS1-54	B	0.5
RS3-86	RS10-2	W	0.6
RS3 87	RS74-2	P	2.0
	RSD2-U	P	0.5
R184.30	RS-S30	NK	3.0
RS4-85	RS24-3	LGN	0.8
R154.86	RS-S30	NK	0.
RS4-87	RS8 2	YR	3.0
RS5-30	RS105 6	NG	0.
RS5-85	RS24 4	LGY	0.5
RS5-86	RS1627	WK	0.5
RS5-87	RS9-2	YG	0.5
RS7-1	RS22-7	OS	0.5
RS7 2	RS22-8	OK	0.5
RS7 3			
R157.4	RS-S2	GN	0.5
RS7-5	RS24-6	RY	0.6
RS7-6			
RS7-7			
RS7 8			
RS7-9			
RS8-1	RS-S4	B	3.0
RS8-2	R154.57	YR	3.0
RS8-3			
RS9-1	RS 64	B	0.5
RS9-2	R65-87	YG	0.5
RS9-3			
RS10 1	R3.57	WU	0.
RS10 2	RS3-86	W	0.
RS10 3			
R3511.1	RS-S18	BK	0 5
RS11-2	RS22-19	OR	0 5
RS11-3			
RS12-1	RS17-3	G	0.5
RS12-2	RS-S4	B	0.5
RS12-3	RS17-2	R	0.5
RS13-1	R317 5	RB	0.5
RS13 2	R5-94	B	0 5
RS13 3			
RS14-1	RS-S4	B	2.0
RS14-2	RS17-1	RO	2.0
RS14-3			
RS15-1	RS S20	WU	0 5
RS15-2	RS-S3	RS	0.5
RS15-3			
RS16 1	R324 10	RO	0.5
RS16 2	R1522.15	UK	0.5
RS16 3	RS22-1	US	0.5
RS16-4	RS-S17	R	0.
R518.5	RS-S19	BK	01.5
RS18-6	RS87-6	WP	0.5
RS18-7	RS105-1	NO	2.0
RS18-8	RS106-2	NK	21.0
RS18-9	RS106-4	NG	31.0
RS17-1	RS14-2	RO	2.0
RS17-2	RS1 23	R	01.5
RS17-3	RS12-1	G	01.5
RS17-4	RS-S14	YK	0.5
RS17-5	RS13-1	RB	01.5
RS17-6	RS28-3	YS	01.5
RS17 7	RS-S12	KG	0.5
RS17-8	RS-S16	KS	0.5
RS17 9	RS51-6	KU	0.5
RS19-1	RS-S11	WS	0.5
RS19 2	R35-85	YLG	01.5
RS19 3	RS-S6	WS	0.5
RS19 4	R35-66	YLG	0.5
RS19-5	RS-S8	NK	0.5
RS19-6	RS S9	YU	0.5
RS20-1	RS114-1	ON	3.5
RS20-2	RS123-9	OG	0.5
RS20-3			
RS22-1	RS16-3	US	0.5
RS22-2	RS58-1	Braid	Screen
RS22-3	RS132-3	RO	0.5
RS22-4	RS58-4	Inner	0.5
RS22-5			
RS22-6			
RS22-7	RS7-1	OS	0.5
RS22-8	RS7-2	OK	0.6
RS22-9	RS72	BW	0.5
RS22-10			
RS22-11			
RS22-12	RS58-3	U Inner	0.5
RS22-13	RS31-1	BG	0.5
RS22-14	RS31-2	BLG	0.5
RS22-15	RS16-2	UK	0.5
RS22-16	RS-S14	YK	0.5
RS22-17	RS36-85	LGO	0.5
RS22-18	RS32-1	LG	0.5
R622.18	RS11-2	OR	0.5
RS22-20	RS31-3	YW	0.5
RS22-21	RS37-86	WG	0.5
RS22-22	RS38-86	WE	0.5
Ra22.23			
RS22 24			
RE22 25	RS-S15	NC	0.5
RS22 26	RS108-2	RY	0.5

From / Von / Da / Van / Desde	To / Nach / A / Naar / Hacia	Colour / Farbe / Couleur / Kleur / Color	Size (mm) / Querschnitt / Section / Maat / Tamano
RS22-27	RS33-1	KU	0.5
RS22-28	RS33-2	KR	0.5
RS22-29	F1932.4	UY	0.5
RS22-30	F19-511	WS	0.
RS22-31			
RS22-32	F16.626	PU	0.5
RS22-33	RS-S12	KG	0.5
RS22-34	RS-S23	PU	0.5
RS22-35	RS-S20	PK	0.5
RS22-36	RS-S10	RF	0.
RS24-1	RS35-8	O	0.5
RS24-2	RS1 11	WY	0.5
RS24 3	RS4-85	LGN	0.5
RS24 4	RS6-85	LGY	0.
RS24 5	RS31-4	P	0.5
RS24-6	RS7-5	RY	0.5
RS24.7	RS-S28	WU	0.5
RS24-8	RS-S17	R	0.5
RS24-9	RS50-1	BU	0.5
RS24-10	RS16-1	RO	0.5
RS24-11	RS50-2	SLG	0.5
RS24-12	RS31-5	KY	0.5
RS24-13	RS S19	NW	0.5
RS24-14	RS S16	KS	0.5
RS24-15	RS50-14	KU	0.5
RS24-16	RS35 8	OG	0.5
RS24-17	RS54 3	UO	0.5
RS24-18	RS65 2	KU	0.5
RS24-19	RS31 6	KLG	0.
RS24-20			
RS24 21	RS58-8	UB	0.5
RS24-22	RS2-86	UB	0.5
RS24-23	RS51-1	NLG	0.5
RS24-24	RS-S27	WK	0.5
RS26-1			
RS26-2	R3.51 3	B	0.
RS26-3	RS1 7G	YS	0.
RS29-30	RS-S31	YLG	0.
RS29-85	RS35-5	YN	0.5
RS29-86	RS-S11	WS	0.5
RS29-87	RS-S13	B	0.5
RS30-1	RS-S13	B	2.0
RS30-2	RS105-9	NS	2.0
RS30-3	RS-S18	BK	0.5
RS31-1	RS22-13	BG	0.5
RS31-2	RS22-14	BLG	0.5
RS31-3	RS22-20	YW	0.5
RS31-4	RS24-5	P	0.5
RS31-5	RS24-12	KY	0.5
RS31-6	RS24-19	KLG	0.5
RS32-1	R622.18	LG	0.5
RS32-2	RS-S23	PO	0.5
RS32-3	RS-S20	P	0.
RS32-4	RS22 29	UY	0.
RS32-5			
RS32-6			
RS33-1	RS22-27	KO	0.5
RS33-2	RS22-28	KR	0.5
RS34	RS S18	BK0.5	
RS36-1	RS S16	NK	0.5
RS36-2	R6811	WS	0.5
RS36-3	RS 524	B	0.5
RS36-4			
RS36-6	RS29-86	YN	01.5
RS36-8	RS 59	YU	01.5
RS36-7			
RS36-8	RS24-1	O	0.5
RS36-9	RS24-10	OG	01.1
RS36-30	F16.622	NY	2.0
RS36-85	F1522.17	LGO	0.5
RS36-86	RS-S22	NY	0.5
RS36-87	RS49	UY	2.0
RS37-30	RS48-2	BR	1.0
RS37-85	RS22-21	WG	0.5
RS37-86	RS-S21	NE	0.5
RS37-87	RS-S21	NE	1.0
RS37-87A	RS-S24	3	1.0
RS38-30	RS48-1	GU	1.0
RS38-85	RS22-22	WG	01.5
RS38-86	RS-S21	NB	0.5
RS38-87	RS-S21	NR	1.0
RS38-87A	RS-S24	B	1.0
RS41 1	RS-S19	NW	0.5
RS41 2	I3347	PR	0.5
RS42	RS50-13	RE	0.5
RS43	RS-S25	B	3.1
RS45	RS58 1	RB	0.5
RS46	RS-S26	E	0.5
RS47	RS41-2	PR	0.5
RS48-1	RS38-30	GU	1.0
RS48-2	RS37-30	GR	1.0
RS49	RS36-87	UY	2.0
RS50-1	RS24-9	BU	0.5
RS50-2	RS24-11	SLG	0.5
RS50-3	RS-S26	PU	0.5
RS50-4	RS-S17	R	0.5
RS50-5	RS S14	YK	0.5
RS50-6	RS S15	KS	0.5
RS50-7	RE-612	KG	0.5
RS50-8	RS-S18	BK	0.5
RS50-9	RS52-3	GN	0.5
RS50 10	RS52-5	GP	0.5
RS50 11	RS52 4	RG	0.5
RS50-12	RS52-1	Y	0.5

From / Von / Da / Van / Desde	To / Nach / A / Naar / Hacia	Colour / Farbe / Couleur / Kleur / Color	Size (mm) / Querschnitt / Section / Maat / Tamano
RS50 13	RS42	RB	0.5
RS50 14	RS24-15	KU	0.5
RS50-15			
RS51-1	RS24-23	NLG	0.5
RS51-2	RS87-2	WG	0.5
RS51-3			
RS51-4			
RS51 5	RS-S32	NR	2.0
RS51-6	RS17-9	KU	0.5
RS52-1	RS50-12	Y	0.5
RS52-2	R555	B	2.0
RS52 3	RS60-9	GN	0.5
RS52 4	RS60-11	RO	0.5
RS52 5	RS60-10	GI	0.5
RS53	RS-S4	B	3.0
RS153	RSD3-U	B	0.5
RS154-1			
RS54-2	RS1-3	U	0.5
RS154.3	RS24-17	UG	0.5
RS55	RS52-2	B	2.0
R155	RS-S24	B	3.0
RS58-1	RS22-2	Braid	Screen
RS58-2			
RS58-3	RS22-12	U	Inner
RS58-4	RS22-4	R	Inner
LS58-1	RS45	RB	0.5
LS58-2			
R3e.l.l			
RS84-2	RS-S19	NW	0.5
RS384.3	RS-S24	B	0.5
RS85-1	RS-S24	B	3.0
RS85-2	RS24-18	KU	0.5
RS85-3	RS105-2	NU	3.0
RS89-1	RS88-3	U	0.5
RS89-2	RS88-1	N	0.5
RS89-3			
RS71-1			
R371.2	RS79-87	PB	01.5
RS71-3	RS-S24	B	0.5
RS72	RS22-9	BW	0.5
RS74-1	RS-S4	B	2.0
RS74-2	RS2-87	P	2.0
RS74-3			
RS76	RS-S19	BK	0.5
R677	R62 85	UY	0.5
RS78-1			
RS78-2	RS-S2	GN	2.0
RS78-3			
RS79-30	RS-S32	NR	0.5
RS79-85	RS-S28	PU	0.5
RS79-87	RS71-2	PB	0.5
RS87-1	RS106-1	NY	01.5
RS87-2	RS51-2	WG	0.5
RS87-3	RS-S15	B	2.0
RS87-4	RS-S18	BK	2.0
RS87-5			
RS87-6	RS18-6	WP	01.5
RS88-1	RS89-2	N	0.5
RS88-2	RS-S27	WK	0.5
RS88-3	RS89-1	U	0.5
RS88-4	RS-S15	BK	0.5
RS88-5	RS-S13	B	3.5
RS88-6	RS24-21	UR	0.5
RS99-1	RS-S4	B	0.5
I1591.2	RS-S3	RS	0.5
RE101-1	RS-S10	RS	3.5
116101-2	RS-S13	B	0.5
RS102-1	RS-S10	RS	0.5
RS102-2	RS S13	B	0.5
RS105-1	RS16-7	NO	2.0
RS105-2	RS66-3	WU	3.0
RS105-3	RS-S32	NR	2.0
RS105-4	RS-S22	NY	3.0
RS105-5	RS5-30	NG	0.0
RS105-6	RS-S30	NK	3.0
R5105.7			
RS105 E	RS-S1	NP	2.0
RS105 B	RS30 2	NS	2.0
RS106 1	RS87 1	NY	0.5
RS106-2	RS16 8	NK	2.0
RS106 3	RS-S21	NB	1.0
RS106 4	RS16 6	NG	3.0
RS106 6			
RS109-1	RS S10	BK	0.5
RS109-2	RS22-26	RY	0.5
RS109-3			
RS108-4			
RS109-5			
RS111	RS24-2	WY	0.5

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SIDE HARNESS RIGHT HAND RS
CONNECTOR LOCATION 90.50.04/CL



J86 1015

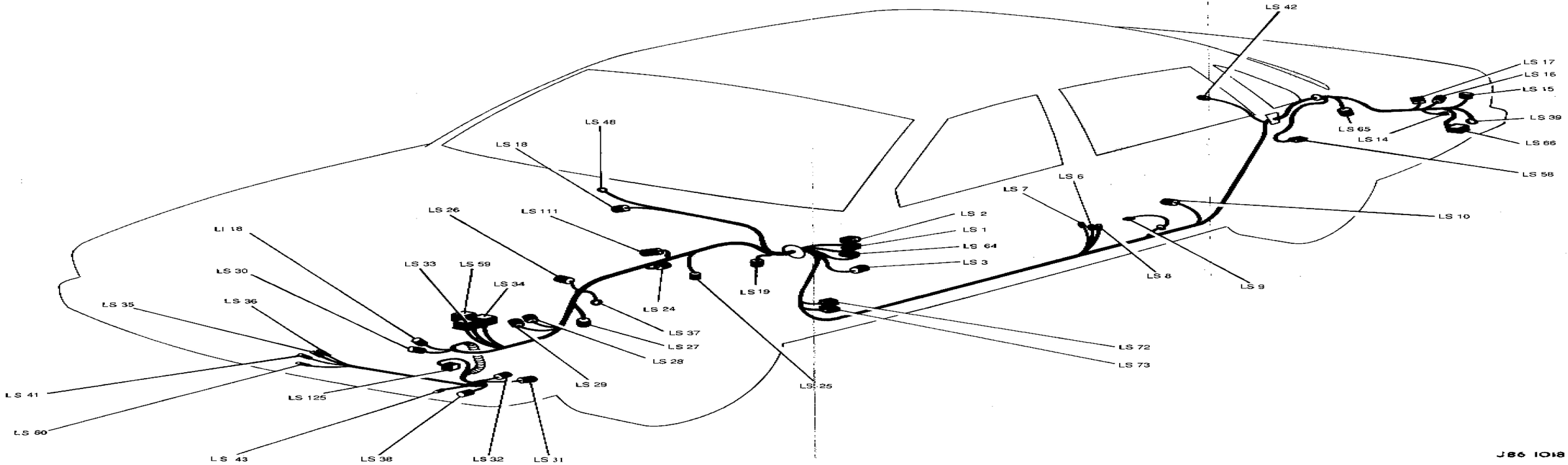
SIDE HARNESS LEFT HAND LS
HARNESS SCHEDULE 90.50.05/HS

Con —— or No	Description	Interface
LHS	Yellow PM4 6 way plug	PI harness
LS1	Black PMHD 38 way plug	Bulkhead harness interface
LS2	Yellow PMHD 16 way plug	Bulkhead harness interface
LS3	Black PM4 9 way plug	Bulkhead harness 'A' post
LS6	Black PMHD 6 way socket	LH rear passenger door harness
LS7	Black 3 way socket	LH rear passenger door harness
LS8	Yellow PMHD 6 way socket	LH rear passenger door harness
LS9	Blue 2 way socket	Rear speaker
LS10	Black PM4 3 way socket	Fuel pump
LS14	Black 3 way socket	Petrol flap interface
LS15	Natural 5 way socket	Rear lamp cluster
LS16	Black PM4 6 way socket	Lamp relay & bulb fail module
LS17	Black PMHD 15 way plug	Lamp relay & bulb fail module
LS18	Black PM4 6 way socket	Wiper motor
LS19	Black 3 way socket	Side repeater
LS24	Black PM4 3 way socket	Low coolant sensor
LS25	Black PM4 3 way socket	Brake pad sensor
LS26	Black 3 way socket	Pump and control valve
LS27	Black PM4 3 way socket	Dump valve
LS28	Yellow PM4 6 way plug	Lamp relay & bulb fail module
LS29	Black PM4 9 way socket	Lamp relay & bulb fail module
LS30	Blue PM4 3 way socket	Alternator module
LS31	Green PM4 3 way socket	Side repeater
LS32	Yellow PM4 3 way socket	Fog lamp
LS33	Green relay base	Air pump relay
LS34	Black relay base	Horn relay
LS35	Natural lucar sacker	
LS36	Black lucar socket	High note horn
LS37	Eyelets	Earth
LS38	Black PM4 3 way socket	Side and DI lamps
LS39	Eyelets	Earth
LS41	Natural lucar socket	Low note horn
LS42	Black 3 way socket	Interior lamp
LS43	Black 2 way socket	Power wash jet
LS47	Eyelet	Earth
LS48	Eyelet	Earth
LS58	Black 2 way plug	Number plate lamp
LS59	Blue relay base	Breather heater relay
LS60	Black lucar socket	Low note horn
LS64	Yellow PM4 9 way plug	Bulkhead harness 'A' post
LS65	Yellow PM4 2 way socket	Accessory fuse box
LS66	Natural relay base	Ignition 'on' relay
LS72	Black 9-way socket	LH 'A' post fuse box
LS73	Black 5-way socket	LH 'A post fuse box
LS124	Eyelet	Battery positive terminal post
LS125	Black 2 way socket	Purge valve

WIRING SCHEDULE 90.50.05/WS

From	To	Colour	Size (mm²)
Wire	Mech	Ferrule	Grommet
Dia	A	Colour	Section
Wire	Mech	Stud	Mast
Dia	A	Colour	Section
Guide	Horn	Stud	Tamens
LS1-6	LS3-3	R	3.0
LS1-7	LS28-4	R	3.0
LS1-8	LS7-7	R	3.0
LS1-9	LS64-5	R	3.0
LS1-10	LS65-1	R	3.0
LS1-11	LS66-3	R	3.0
LS1-12	LS72-3	R	3.0
LS1-13	LS73-4	R	3.0
LS1-14	LS73-7	R	3.0
LS1-15	LS73-8	R	3.0
LS1-16	LS73-9	R	3.0
LS1-17	LS73-10	R	3.0

SIDE HARNESS LEFT HAND LS
CONNECTOR LOCATION 90.50.05/CL



J86 1018

ENGINE MANAGEMENT AND AUTOMATIC GEARBOX HARNESS 4.0 LI (RHD) CATALYST
HARNESS SCHEDULE 90.50.21/HS

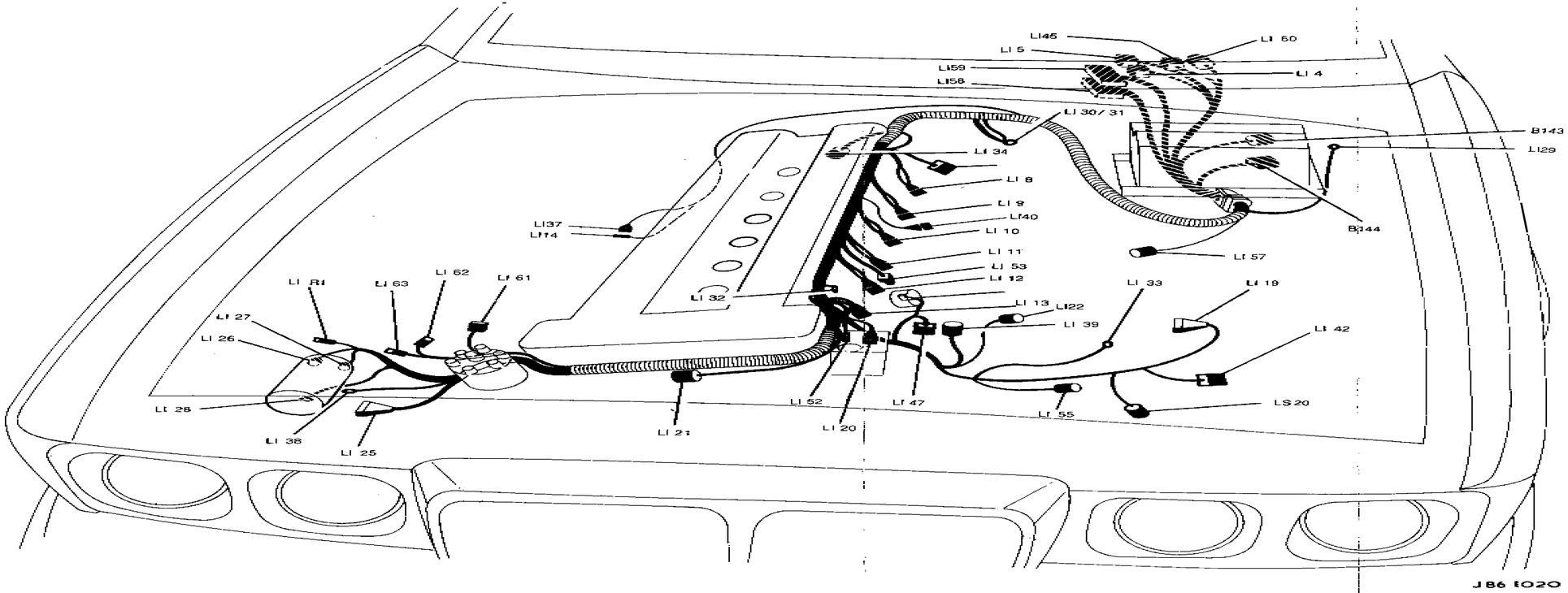
LOCATION & ACCESS 90.50.21/LA

Connector No	Description	Interface	Access
B143	Yellow PM4 8 way socket	Bulkhead harness	Front passenger dash liner
B144	Yellow 8 way plug	Bulkhead harness	Front passenger dash liner
LI4	Filed relay base socket	Main relay	Fuseblock cover
LI5	Yellow relay base socket	Fuel pump relay	Fuseblock cover
LI6	2-way socket	Injector No 6	Engine compartment, above
LI7	2-way socket	Injector No 5	Engine compartment, above
LI10	2-way socket	Injector No 4	Engine compartment, above
LI11	2-way socket	Injector No 3	Engine compartment, above
LI12	2-way socket	Injector No 2	Engine compartment, above
LI13	2-way socket	Injector No 1	Engine compartment, above
LI14	Spade connector	Lambda sensor	Engine compartment, above
LI19	Black 6 way connector	Air meter	Engine compartment, above
LI20	Brown 2 way socket	Water thermistor	Engine compartment, above
LI21	Black 3 way PM4 socket	Crankshaft sensor	Engine compartment, above
LI22	Black 3 way PM4 plug	Air pump clutch	Engine compartment, above
LI25	7 way socket	Ignition amplifier	Engine compartment, above
LI26	Eyelet	Ignition coil	Engine compartment, above
LI27	Eyelet	Ignition coil	Engine compartment, above
LI28	Eyelet	Ignition amplifier earth	Engine compartment, above
LI29	Eyelet	Battery feed	Engine compartment, above
LI30	Eyelet	Bulkhead earth	Engine compartment, above
LI31	Eyelet	Bulkhead earth	Engine compartment, above
LI32	Eyelet	Manifold earth	Engine compartment, above
LI33	Eyelet	Air meter earth	Engine compartment, above
LI34	Black PM4 3 way socket	Starter solenoid link lead	Engine compartment, above
LI37	2 way socket	Lambda heater	Engine compartment, above
LI38	Eyelet	Coil earth	Engine compartment, above
LI39	2 way socket	Air pump control solenoid valve	Engine compartment, above
LI40	2 way socket	Breather heater	Engine compartment, above
LI42	Black 2 way socket	Air thermistor	Engine compartment above
LI45	Green PM40 15 way socket	Gearbox harness	Front passenger dash liner
LI47	2 way socket	EGR check sensor	Engine compartment, above
LI48	2 way socket	EGR control valve	Engine compartment, above
LI52	Lucar socket	Coolant temperature sensor	Engine compartment, above
LI53	Lucar sock —	Oil pressure transducer	Engine compartment, above
LI55	Blue PM4 6 way socket	Throttle potentiometer	Engine compartment, above
LI56	4 way socket	Idle speed control	Engine compartment, above
LI57	Brown PM4 8 way socket	Diagnostic connector	Engine compartment, above
LI58	26 way socket	ECU high power module blue	Front passenger dash liner
LI59	26 way socket	ECU low power module yellow	Front passenger dash liner
LI60	3 way socket	Fuel fail reset	Front passenger dash liner
LI61	3 way socket	Air condition clutch	Engine compartment, below
LI62	Lucar connector	Air condition cut-out	Engine compartment, above
LI63	Lucar con — for	Air condition cut-out	Engine compartment, above
LS-20	Yellow 6-way socket	LH side harness	Below engine air filter

WIRING SCHEDULE 90.50.21/WS

From	To	Colour	Size (mm²)
Wire No	Node	Ferrule	Quench(Y/N)
Dia	A	Colour	Section
Type	Rear	Rear	Rear
Ref	A	Colour	Section
Deals	Node	Colour	Tamper
B143	LI59-20	WHT	2.5
B144	LI59-8	BLK	2.5
LI1	LI59-18	RED	0.5
LI2	B144-8	BLK	0.5
LI53	B144-7	GRY	0.5
LI55	LI59-22	BLU	0.5
LI56	LI59-19	BRN	0.5
LI57	LI59-21	BLK	0.5
LI58	LI59-23	BLU	0.5
LI59	LI59-24	YEL	0.5
LI4	LI59-17	Various	0.5
LI5	LI59-16	GRY	0.5
LI6	LI59-13	BLK/WHT	0.5
LI7	LI59-14	BRN/WHT	0.5
LI10	LI59-24	Various	0.5
LI11	LI59-23	BLU	0.5
LI12	LI59-22	BLU	0.5
LI13	LI59-21	BLK	0.5
LI14	LI59-20	BLK	0.5
LI19	LI59-18	BLK	0.5
LI20	LI59-19	BRN	0.5
LI21	LI59-17	Various	0.5
LI22	LI59-16	GRY	0.5
LI25	LI59-15	BLK	0.5
LI26	LI59-12	BLK	0.5
LI27	LI59-11	BLK	0.5
LI28	LI59-10	BLK	0.5
LI29	LI59-9	BLK	0.5
LI30	LI59-7	BLK	0.5
LI31	LI59-6	BLK	0.5
LI32	LI59-5	BLK	0.5
LI33	LI59-4	BLK	0.5
LI34-1	LI59-3	BLK	0.5
LI34-2	LI59-2	BLK	0.5
LI36	LI59-1	BLK	0.5
LI37-1	LI59-25	BLK	0.5
LI37-2	LI59-26	BLK	0.5
LI38	LI59-27	BLK	0.5
LI39-1	LI59-28	BLK	0.5
LI39-2	LI59-29	BLK	0.5
LI40-1	LI59-30	BLK	0.5
LI40-2	LI59-31	BLK	0.5
LI42-1	LI59-32	BLK	0.5
LI42-2	LI59-33	BLK	0.5
LI45	LI59-34	BLK	0.5
LI47	LI59-35	BLK	0.5
LI48	LI59-36	BLK	0.5
LI52	LI59-37	BLK	0.5
LI53	LI59-38	BLK	0.5
LI55	LI59-39	BLK	0.5
LI56	LI59-40	BLK	0.5
LI57	LI59-41	BLK	0.5
LI58	LI59-42	BLK	0.5
LI59	LI59-43	BLK	0.5
LI60	LI59-44	BLK	0.5
LI61	LI59-45	BLK	0.5
LI62	LI59-46	BLK	0.5
LI63	LI59-47	BLK	0.5
LS-20	LI59-48	BLK	0.5
LI4-1	LI59-49	BLK	0.5
LI4-2	LI59-50	BLK	0.5
LI4-3	LI59-51	BLK	0.5
LI4-4

ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 4.0LI RHD CATALYST
CONNECTOR LOCATION 90.50.21/CL



ENGINE MANAGEMENT & AUTOMATIC **GEARBOX** HARNESS 4.0 LI **(LHD)** CATALYST
HARNESS SCHEDULE **90.50.21/HS** — **LOCATION & ACCESS 90.50.21/LA**

Connector No	Description	Interface	Access
B143	Yellow PM4 6 way socket	Bulkhead harness	Front passenger dash liner
E144	Yellow 6 way plug	Bulkhead harness	Front passenger dash liner
LI4	Red relay base socket	Main relay	Fuseblock cover
LI5	Yell — relay base socket	fuel pump relay	Fuseblock cover
LI8	2-way socket	Injector No 6	Engine compartment, above
LI9	2-way socket	Injector No 5	Engine compartment, above
LI10	2-way socket	Injector No 4	Engine compartment, above
LI11	2-way socket	Injector No 3	Engine compartment, above
LI12	2-way socket	Injector No 2	Engine compartment, above
LI13	2-way socket	Injector No 1	Engine compartment, above
LI14	Spade connector	Lambda sensor	Engine compartment, above
LI19	Black 6 way connector	Air meter	Engine compartment, above
LI20	Brown 2 way socket	Water thermister	Engine compartment, above
LI21	Black 3 way PM4 socket	Crankshaft sensor	Engine compartment, above
LI22	Black 3 way PM4 plug	Air pump clutch	Engine compartment, above
LI26	7 way socket	Ignition amplifier	Engine compartment, above
LI27	Eyelet	Ignition coil	Engine compartment, above
LI28	Eyelet	Ignition coil	Engine compartment, above
LI29	Eyelet	Ignition amplifier earth	Engine compartment, above
LI30	Eyelet	Battery feed	Engine compartment, above
LI31	Eyelet	Bulkhead earth	Engine compartment, above
LI31-1	Eyelet	Bulkhead earth	Engine compartment, above
LI32	Eyelet	Manifold earth	Engine compartment, above
LI33	Eyelet	Air meter earth	Engine compartment, above
LI34	Black PM4 3 way socket	Starter solenoid link lead	Engine compartment, above
LI37	2 way socket	Lambda heater	Engine compartment, above
LI38	Eyelet	Coil earth	Engine compartment, above
LI39	2 way socket	Air pump control solenoid valve	Engine compartment, above
LI40	2 way socket	Breather heater	Engine compartment, above
LI42	Black 2 way socket	Air thermister	Engine compartment, above
LI45	Green PMHD 15 way socket	Gearbox harness	Front passenger dash liner
LI47	2 way socket	EGR check sensor	Engine compartment, above
LI48	2 way socket	EGR control valve	Engine compartment, above
LI52	Lucar socket	Coolant temperature sensor	Engine compartment, above
LI53	Lucar socket	Oil pressure transducer	Engine compartment, above
LI55	Blue PM4 6 way socket	Throttle potentiometer	Engine compartment, above
LI56	4 way socket	Idle speed control	Engine compartment, above
LI57	Brown PM4 6 way socket	Diagnostic connector	Engine compartment, above
LI58	25 way socket	ECU high power module blue	Front passenger dash liner
LI59	25 way socket	ECU low power module yellow	Front passenger dash liner
LI60	3 way socket	Fuel fail reset	Front passenger dash liner
LI61	3 way socket	Air wnaition clutch	Engine compartment, above
LI62	Lucar connector	Air condition cut-out	Engine compartment, above
LI63	Lucar connector	Air condition cut-out	Engine compartment, above
LS-20	Yellow 6-way socket	LH side harness	Below engine air filter

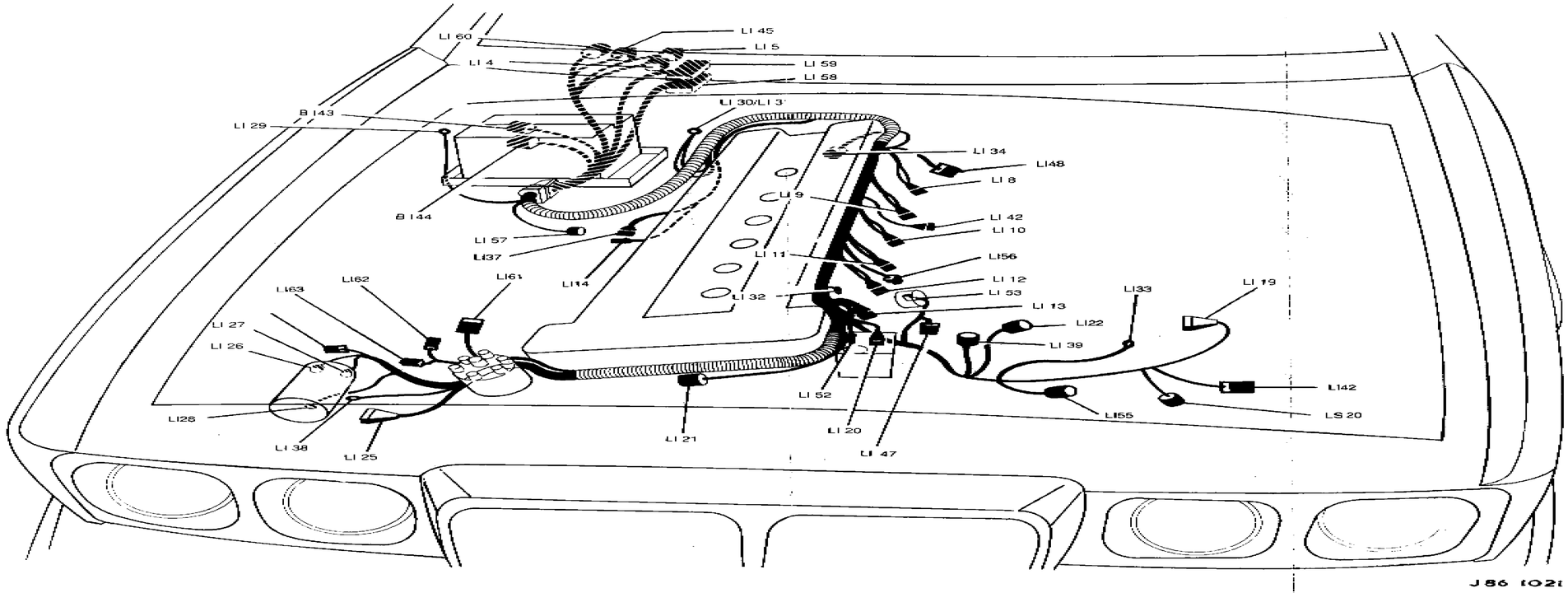
WIRING SCHEDULE 90.50.21/WS

From	To	Colour	Size mm²
Ver	Mach	Fette	Querschnitt
De	A	Couleur	Section
Ver	Rear	Farbe	Metl
De	A	Cou	Barrette
Desde	Hasta	Color	Terreno
B143-1	LI58-24	BN	0.5
B143-2	LI58-14	BN	0.5
B143-3	LI58-13	BN	0.5
B143-4	LI58-23	BN	0.5
E144-1	LI58-8	BU	0.5
E144-2	LI58-7	BU	0.5
E144-3	LI58-6	BU	0.5
E144-4	LI58-5	BU	0.5
E144-5	LI58-4	BU	0.5
E144-6	LI58-3	BU	0.5
E144-7	LI58-2	BU	0.5
E144-8	LI58-1	BU	0.5
E144-9	LI58-9	BU	0.5
E144-10	LI58-10	BU	0.5
E144-11	LI58-11	BU	0.5
E144-12	LI58-12	BU	0.5
E144-13	LI58-22	BU	0.5
LI47-1	LI65-5	GN	0.5
LI47-2	LI63-10	GN	0.5
LI48-1	LI58-21	WH	0.5
LI48-2	LI58-20	WH	0.5
LI52	B144-8	GK	0.5
LI53	B144-7	GS	0.5
LI55-1	LI59-22	KP	0.5
LI55-2			
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LI57-986			
LI57-987			
LI57-988			
LI57-989			
LI57-990			
LI57-991			
LI57-992			
LI57-993			
LI57-994			
LI57-995			
LI57-996			
LI57-997			
LI57-998			
LI57-999			
LI57-1000			

From	To	Colour	Size mm²
Ver	Mach	Farbe	Querschnitt
De	A	Couleur	Section
Ver	Rear	Rbm	Metl
De	A	Co ore	Seneno
Desde	Hasta	Color	Terreno
LI-S5	LI39-2	LI/R	0.5
	B143-2	BN	0.5
	B143-3	BN	0.5
LI-S4	LI20-1	BN	0.5
	LI39-1	BN	0.5
	LI39-2	BN	0.5
LI-S5	LI18-1	BR WH	0.5
	LI19-1	BR WH	0.5
LI-S6	LI15-16	WH/BN	0.5
	LI19-11	WH/BN	0.5
	LI21-11	WH/BN	0.5
LI-S7	LI58-17	WH/BN	0.5
	LI59-1	WH/BN	0.5
	LI59-9	WH/BN	0.5
LI-S8	LI58-16	WH/BN	0.5
	LI58-15	WH/BN	0.5
	LI59-8	WH/BN	0.5
LI-S9	LI58-18	WH/BN	0.5
	LI59-10	WH/BN	0.5
	LI59-12	WH/BN	0.5
LI-S10	E144-9	BU	0.5
	E144-10	BU	0.5
	E144-11	BU	0.5
	E144-12	BU	0.5
	E144-13	BU	0.5
LI-S11	LI58-19	WH/BN	0.5
	LI59-11	WH/BN	0.5
	LI59-13	WH/BN	0.5
LI-S12	LI58-20	WH/BN	0.5
	LI59-14	WH/BN	0.5
	LI59-16	WH/BN	0.5
LI-S13	LI58-21	WH/BN	0.5
	LI59-17	WH/BN	0.5
	LI59-19	WH/BN	0.5
LI-S14	LI58-22	WH/BN	0.5
	LI59-18	WH/BN	0.5
	LI59-20	WH/BN	0.5
LI-S15	LI58-23	WH/BN	0.5
	LI59-21	WH/BN	0.5
	LI59-23	WH/BN	0.5
LI-S16	B143-4	BN	0.5
	LI63-1	BN	0.5
	LI20-5	BN	0.5
LI-S 7	LI58-24	WH/BN	0.5
	B144-9	WH/BN	0.5
LI-S 8	LI58-14	WH/BN	0.5
	LI59-24	WH/BN	0.5
LI-S 9	LI58-13	WH/BN	0.5
	LI59-22	WH/BN	0.5
LI-S20	E144-8	BU	0.5
	LI58-8	BU	0.5
	LI59-9	BU	0.5

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ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 4.0 LI LHD CATALYST
CONNECTOR LOCATION 90.50.21/CL



J86 1021

ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 4.0 LI (RHD)

HARNESS SCHEDULE 90.50.21/HS — LOCATION & ACCESS 90.50.21/LA

Connector No	Description	Interface	Access
8143	Yellow PM4 6 way socket	Bulkhead harness	Front passenger dash liner
	Yellow 6 way plug	Bulkhead harness	Front passenger dash liner
LI4	Red relay base socket	Main relay	Fuseblock cover
LI5	Yellow relay base socket	Fuel pump relay	Fuseblock cover
LI3	2-way socket	Injector No 6	Engine compartment, above
LI9	2-way socket	Injector No 5	Engine compartment, above
LI10	2-way socket	Injector No 4	Engine compartment, above
LI11	2-way socket		Engine compartment, above
LI12	2-way socket	Injector No 2	Engine compartment, above
LI13	2-way socket	Injector No 1	Engine compartment, above
LI18	Black 6 way connector	Air meter	Engine compartment, above
LI20	Brown 2 way socket	Water thermistor	Engine compartment, above
LI21	Black 3 way PM4 socket	Crankshaft sensor	Engine compartment, above
LI25	7 way socket	Ignition amplifier	Engine compartment, above
LI24	Eyelet	Ignition coil	Engine compartment, above
LI27	Eyelet	Ignition coil	Engine compartment, above
LI28	Eyelet	Ignition amplifier earth	Engine compartment, above
LI29	Eyelet	Battery feed	Engine compartment, above
LI30	Eyelet	Bulkhead earth	Engine compartment, above
LI31	Eyelet	Bulkhead earth	Engine compartment, above
LI32	Eyelet	Manifold earth	Engine compartment, above
LI33	Eyelet	Air meter earth	Engine compartment, above
LI34	Black PM4 3 way socket	Starter solenoid link lead	Engine compartment, above
LI38	Eyelet	Coil earth	Engine compartment, above
LI39	2 way socket	Air pump control solenoid valve	Engine compartment, above
LI42	Black 2 way socket	Air thermistor	Engine compartment, above
LI45	Green PMHD 15 way socket	Gearbox harness	Front passenger dash liner
LI52	Lucar socket	Coolant temperature sensor	Engine compartment, above
LI53	Lucar socket	Oil pressure transducer	Engine compartment, above
LI55	Blue PM4 8 way socket	Throttle potentiometer	Engine compartment, above
LI56	4 way socket	Idle speed control	Engine compartment, above
LI57	Brown PM4 6 way socket	Diagnostic connector	Front passenger dash liner
LI58	25 way socket	ECU high power module blue	Front passenger dash liner
LI59	25 way socket	ECU low power module yellow	Front passenger dash liner
LI60	3 way socket	Fuel fail reset	Front passenger dash liner
LI61	3 way socket	Air condition clutch	Engine compartment, below
LI62	Lucar connector	Air condition cut-out	Engine compartment, above
LI63	Lucar connector	Air condition cut-out	Engine compartment, above
LS20	Yellow 6-way socket	LH side harness	Below engine air filter
LI-R1	Resistor		Engine compartment, above

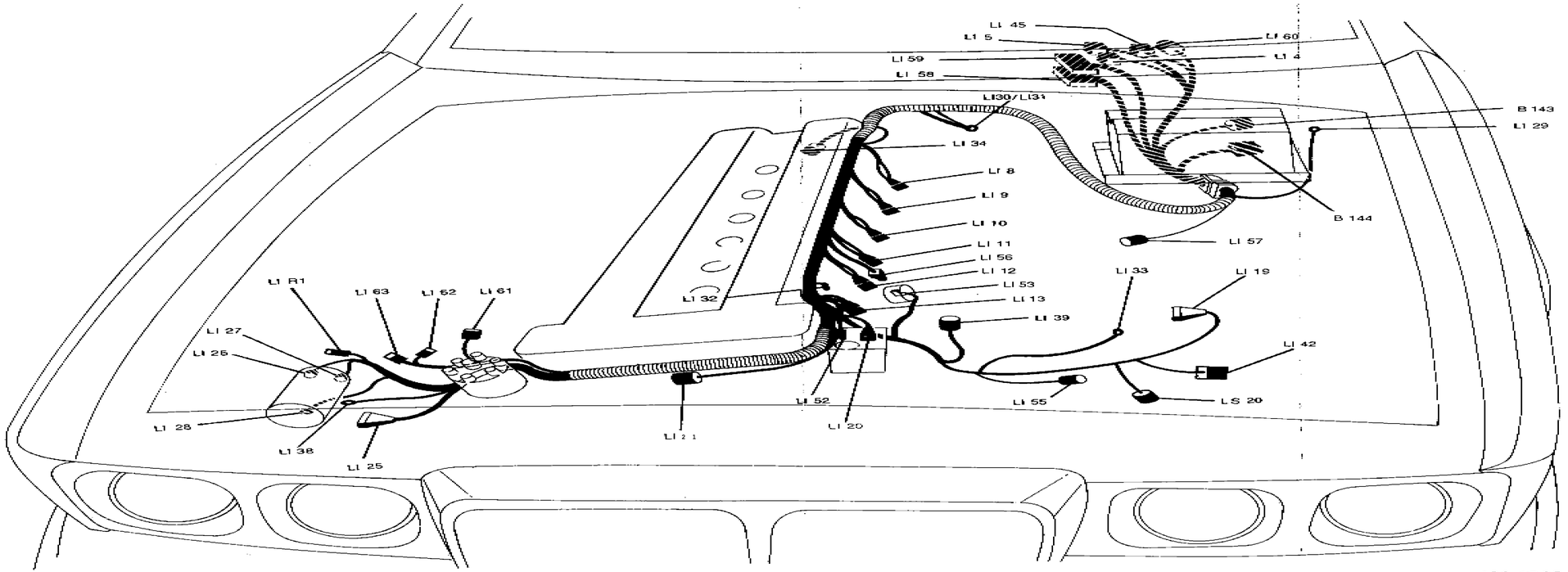
WIRING SCHEDULE 90.50.21/WS

From	To	Colour	Size mm²
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Naar	Maat
Da	A	Cobre	Diametro
Desde	Hasta	Color	Tamano
LI52	8144-8	OK	0.5
LI53	1144-7	OG	0.5
LI55-1	159-22	RP	2.5
LI55-2	130-10	BRY	2.5
LI56-1	144-14	BU	0.5
LI56-2	145-8	BU	0.5
LI58-1	145-3	BU	0.5
LI58-2	159-15	SW	0.5
LI59-1	LI59-15	SW	0.5
LI59-2	LI59-16	SW	0.5
LI60-1	LI59-8	GR	0.5
LI60-2	LI59-7	GR	0.5
LI61-1	8144-5	SW	0.5
LI61-2	8144-6	SW	0.5
LI62-1	LI59-5	SW	0.5
LI62-2	LI59-6	SW	0.5
LI63-1	LI59-3	SW	0.5
LI63-2	LI59-4	SW	0.5
LI-R1	LI59-9	SG	0.5
LI-R1	130	SG	0.5
LI-S1	LI2.5-7	SW	0.5
LI-S1	144-8	SW	0.5
LI-S1	1144-4	SW	0.5
LI-S2	LI2.5-8	BRN	0.5
LI-S2	144-9	BRN	0.5
LI-S2	1144-5	BRN	0.5
LI-S3	LI2.5-5	WS	0.5
LI-S3	144-11	WS	0.5
LI-S3	1144-6	WS	0.5
LI-S4	LI2.5-6	GN	0.5
LI-S4	144-12	GN	0.5
LI-S4	1144-7	GN	0.5
LI-S5	LI2.5-9	GE	0.5
LI-S5	144-13	GE	0.5
LI-S5	1144-8	GE	0.5
LI-S6	LI2.5-10	BL	0.5
LI-S6	144-14	BL	0.5
LI-S6	1144-9	BL	0.5
LI-S7	LI2.5-11	VI	0.5
LI-S7	144-15	VI	0.5
LI-S7	1144-10	VI	0.5
LI-S8	LI2.5-12	GR	0.5
LI-S8	144-16	GR	0.5
LI-S8	1144-11	GR	0.5
LI-S9	LI2.5-13	RS	0.5
LI-S9	144-17	RS	0.5
LI-S9	1144-12	RS	0.5
LI-S10	LI2.5-14	OR	0.5
LI-S10	144-18	OR	0.5
LI-S10	1144-13	OR	0.5
LI-S11	LI2.5-15	RP	0.5
LI-S11	144-19	RP	0.5
LI-S11	1144-14	RP	0.5
LI-S12	LI2.5-16	RW	0.5
LI-S12	144-20	RW	0.5
LI-S12	1144-15	RW	0.5
LI-S 3	LI2.5-17	WSW	0.5
LI-S 3	144-21	WSW	0.5
LI-S 3	1144-16	WSW	0.5
LI-S 4	LI2.5-18	GNW	0.5
LI-S 4	144-22	GNW	0.5
LI-S 4	1144-17	GNW	0.5
LI-S 5	LI2.5-19	GEW	0.5
LI-S 5	144-23	GEW	0.5
LI-S 5	1144-18	GEW	0.5
LI-S 6	LI2.5-20	BLW	0.5
LI-S 6	144-24	BLW	0.5
LI-S 6	1144-19	BLW	0.5
LI-S17	LI2.5-21	VIW	0.5
LI-S17	144-25	VIW	0.5
LI-S17	1144-20	VIW	0.5
LI-S18	LI2.5-22	RSW	0.5
LI-S18	144-26	RSW	0.5
LI-S18	1144-21	RSW	0.5
LI-S19	LI2.5-23	ORW	0.5
LI-S19	144-27	ORW	0.5
LI-S19	1144-22	ORW	0.5
LI-S20	LI2.5-24	RPW	0.5
LI-S20	144-28	RPW	0.5
LI-S20	1144-23	RPW	0.5
U30	LI2.5-25	RWW	0.5
U30	144-29	RWW	0.5
U30	1144-24	RWW	0.5
LI31	LI2.5-26	BRNW	0.5
LI31	144-30	BRNW	0.5
LI31	1144-25	BRNW	0.5
LI32	LI2.5-27	WSW	0.5
LI32	144-31	WSW	0.5
LI32	1144-26	WSW	0.5
LI33	LI2.5-28	GNW	0.5
LI33	144-32	GNW	0.5
LI33	1144-27	GNW	0.5
LI34	LI2.5-29	GEW	0.5
LI34	144-33	GEW	0.5
LI34	1144-28	GEW	0.5
LI38	LI2.5-30	BLW	0.5
LI38	144-34	BLW	0.5
LI38	1144-29	BLW	0.5
LI39	LI2.5-31	VIW	0.5
LI39	144-35	VIW	0.5
LI39	1144-30	VIW	0.5
LI42	LI2.5-32	RSW	0.5
LI42	144-36	RSW	0.5
LI42	1144-31	RSW	0.5
LI45	LI2.5-33	ORW	0.5
LI45	144-37	ORW	0.5
LI45	1144-32	ORW	0.5
LI52	LI2.5-34	RPW	0.5
LI52	144-38	RPW	0.5
LI52	1144-33	RPW	0.5
LI53	LI2.5-35	RWW	0.5
LI53	144-39	RWW	0.5
LI53	1144-34	RWW	0.5
LI55-1	LI2.5-36	BRNW	0.5
LI55-1	144-40	BRNW	0.5
LI55-1	1144-35	BRNW	0.5
LI55-2	LI2.5-37	WSW	0.5
LI55-2	144-41	WSW	0.5
LI55-2	1144-36	WSW	0.5
LI56-1	LI2.5-38	GNW	0.5
LI56-1	144-42	GNW	0.5
LI56-1	1144-37	GNW	0.5
LI56-2	LI2.5-39	GEW	0.5
LI56-2	144-43	GEW	0.5
LI56-2	1144-38	GEW	0.5
LI58-1	LI2.5-40	BLW	0.5
LI58-1	144-44	BLW	0.5
LI58-1	1144-39	BLW	0.5
LI58-2	LI2.5-41	VIW	0.5
LI58-2	144-45	VIW	0.5
LI58-2	1144-40	VIW	0.5
LI59-1	LI2.5-42	RSW	0.5
LI59-1	144-46	RSW	0.5
LI59-1	1144-41	RSW	0.5
LI59-2	LI2.5-43	ORW	0.5
LI59-2	144-47	ORW	0.5
LI59-2	1144-42	ORW	0.5
LI60-1	LI2.5-44	RPW	0.5
LI60-1	144-48	RPW	0.5
LI60-1	1144-43	RPW	0.5
LI60-2	LI2.5-45	RWW	0.5
LI60-2	144-49	RWW	0.5
LI60-2	1144-44	RWW	0.5
LI61-1	LI2.5-46	BRNW	0.5
LI61-1	144-50	BRNW	0.5
LI61-1	1144-45	BRNW	0.5
LI61-2	LI2.5-47	WSW	0.5
LI61-2	144-51	WSW	0.5
LI61-2	1144-46	WSW	0.5
LI62-1	LI2.5-48	GNW	0.5
LI62-1	144-52	GNW	0.5
LI62-1	1144-47	GNW	0.5
LI62-2	LI2.5-49	GEW	0.5
LI62-2	144-53	GEW	0.5
LI62-2	1144-48	GEW	0.5
LI63-1	LI2.5-50	BLW	0.5
LI63-1	144-54	BLW	0.5
LI63-1	1144-49	BLW	0.5
LI63-2	LI2.5-51	VIW	0.5
LI63-2	144-55	VIW	0.5
LI63-2	1144-50	VIW	0.5
LI-R1	LI2.5-52	RSW	0.5
LI-R1	144-56	RSW	0.5
LI-R1	1144-51	RSW	0.5
LI-S1	LI2.5-53	ORW	0.5
LI-S1	144-57	ORW	0.5
LI-S1	1144-52	ORW	0.5
LI-S2	LI2.5-54	RPW	0.5
LI-S2	144-58	RPW	0.5
LI-S2	1144-53	RPW	0.5
LI-S3	LI2.5-55	RWW	0.5
LI-S3	144-59	RWW	0.5
LI-S3	1144-54	RWW	0.5
LI-S4	LI2.5-56	BRNW	0.5
LI-S4	144-60	BRNW	0.5
LI-S4	1144-55	BRNW	0.5
LI-S5	LI2.5-57	WSW	0.5
LI-S5	144-61	WSW	0.5
LI-S5	1144-56	WSW	0.5
LI-S6	LI2.5-58	GNW	0.5
LI-S6	144-62	GNW	0.5
LI-S6	1144-57	GNW	0.5
LI-S7	LI2.5-59	GEW	0.5
LI-S7	144-63	GEW	0.5
LI-S7	1144-58	GEW	0.5
LI-S8	LI2.5-60	BLW	0.5
LI-S8	144-64	BLW	0.5
LI-S8	1144-59	BLW	0.5
LI-S9	LI2.5-61	VIW	0.5
LI-S9	144-65	VIW	0.5
LI-S9	1144-60	VIW	0.5
LI-S10	LI2.5-62	RSW	0.5
LI-S10	144-66	RSW	0.5
LI-S10	1144-61	RSW	0.5
LI-S11	LI2.5-63	ORW	0.5
LI-S11	144-67	ORW	0.5
LI-S11	1144-62	ORW	0.5
LI-S12	LI2.5-64	RPW	0.5
LI-S12	144-68	RPW	0.5
LI-S12	1144-63	RPW	0.5
LI-S13	LI2.5-65	RWW	0.5
LI-S13	144-69	RWW	0.5
LI-S13	1144-64	RWW	0.5
LI-S14	LI2.5-66	BRNW	0.5
LI-S14	144-70	BRNW	0.5
LI-S14	1144-65	BRNW	0.5
LI-S15	LI2.5-67	WSW	0.5
LI-S15	144-71	WSW	0.5
LI-S15	1144-66	WSW	0.5
LI-S16	LI2.5-68	GNW	0.5
LI-S16	144-72	GNW	0.5
LI-S16	1144-67	GNW	0.5
LI-S17	LI2.5-69	GEW	0.5
LI-S17	144-73	GEW	0.5
LI-S17	1144-68	GEW	0.5
LI-S18	LI2.5-70	BLW	0.5
LI-S18	144-74	BLW	0.5
LI-S18	1144-69	BLW	0.5
LI-S19	LI2.5-71	VIW	0.5
LI-S19	144-75	VIW	0.5
LI-S19	1144-70	VIW	0.5
LI-S20	LI2.5-72	RSW	0.5
LI-S20	144-76	RSW	0.5
LI-S20	1144-71	RSW	0.5

From	To	Colour	Size mm²
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
De	A	Cobre	Diametro
Desde	Hasta	Color	Tamano
LI-S8	LI2.5-1	RSW	0.5
LI-S8	LI2.5-26	RSW	0.5
LI-S8	LI2.5-1	RSW	0.5
LI-S8	LI2.5-1	RSW	0.5
LI-S8	LI58-7	RSW	0.5
LI-S8	LI2.5-2	RSW	0.5
LI-S8	LI2.5-2	RSW	0.5
LI-S10	LI2.5-30	ORW	0.5
LI-S10	LI2.5-14	ORW	0.5
LI-S10	LI2.5-14	ORW	0.5
LI-S11	3.4-21	RPW	0.5
LI-S11	144-20	RPW	0.5
LI-S11	1-51	RPW	0.5
LI-S12	LI58-1	RWW	0.5
LI-S12	LI58-10	RWW	0.5
LI-S12	LI2.5-4	RWW	0.5
LI-S12	LI2.5-13	RWW	0.5
I-S 3	LI13.E	WSW	0.5
I-S 3	LI13.E	WSW	0.5
I-S 3	LI2.5-12	WSW	0.5
LI-S 4	LI13.J	GNW	0.5
LI-S 4	LI13.J	BRAID	0.5 Green
LI-S 5	LI58.15	KR	0.5
LI-S 5	LI58.J	KR	0.5
LI-S 5	8144-2	KR	0.5
LI-S 6	E144-4	BLW	0.5
LI-S 6	LI58.4	BLW	0.5
LI-S 6	LI2.5-3	BLW	0.5
LI-S17	LI58-21	VIW	0.5
LI-S17	LI2.5-1	VIW	0.5
LI-S17	8144-9	VIW	0.5
LI-S18	LI58-2	RSW	0.5
LI-S18	LI2.5-3	RSW	0.5
LI-S18	LI45-10	RSW	0.5
LI-S19	LI58-19	ORW	0.5
LI-S19	LI2.5-6	ORW	0.5
LI-S19	LI45-12	ORW	0.5
LI-S20	E144-4	RPW	0.5
	LI58.8	RPW	0.5
	LI58.26	RPW	0.5

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ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 4.0 LI RHD
CONNECTOR LOCATION 90.50.21/CL



J86 1022

ENGINE MANAGEMENT & AUTOMATIC GEARBOX: HARNESS 4.0 LI (LHD)
HARNESS SCHEDULE 90.50.21/HS — LOCATION & ACCESS 90.50.21/LA

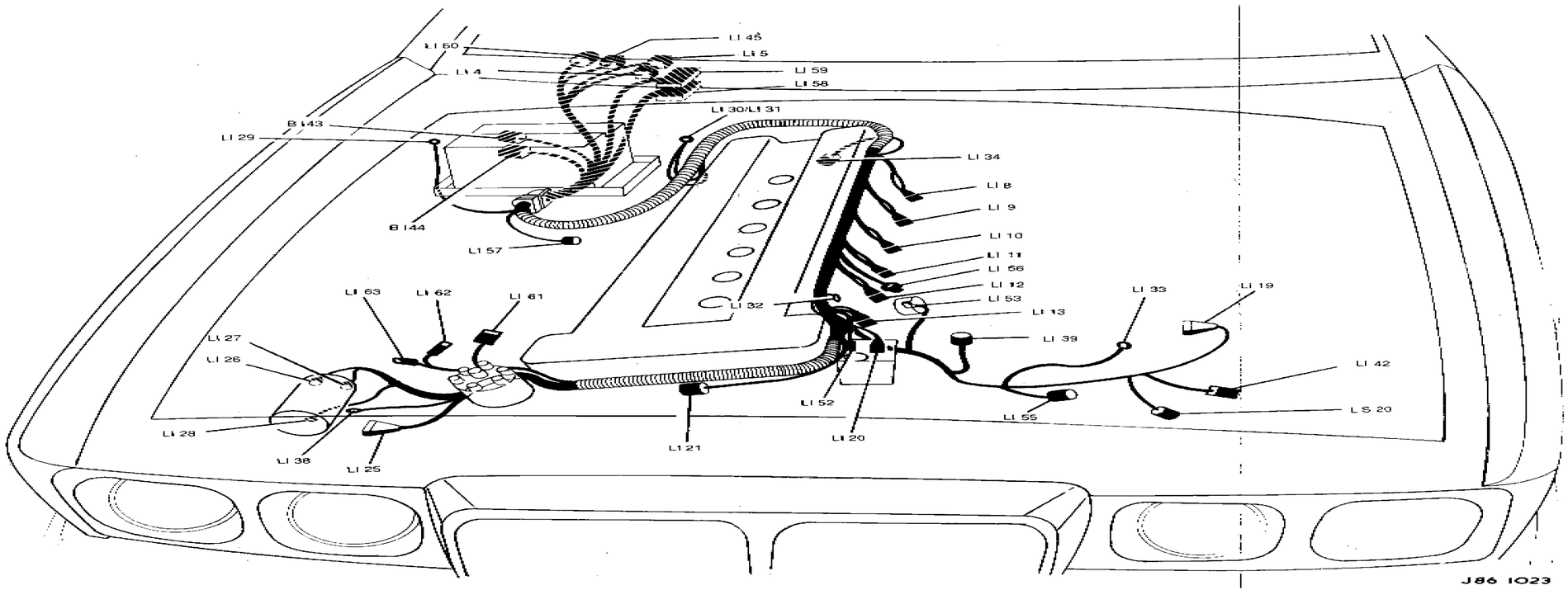
Connector No	Description	Interface	Access
B143	Yellow PM4 6 way socket	Bulkhead harness	Front passengar dash liner
B144	Yellow 6 way plug	Bulkhead harness	Front passenger dash liner
LI4	Red relay base socket	Main relay	Fuseblock cover
LI5	Yellow relay base socket	Fuel pump relay	Fuseblock cover
LI8	2-way socket	Injector No 6	Engine compartment, above
LI9	2-way socket	Injector No 5	Engine compartment, above
LI10	2-way socket	Injector No 4	Engine compartment, above
LI11	2-way socket	Injector No 3	Engine compartment, above
LI12	2-way socket	Injector No 2	Engine compartment, above
LI13	2-way socket	Injector No 1	Engine compartment, above
LI18	Black 6 way connector	Air meter	Engine compartment, above
LI20	Brown 2 way socket	Water thermistor	Engine compartment, above
LI21	Black 3 way PM4 socket	Crankshaft sensor	Engine compartment, above
LI24	3 way socket	Ignition amplifier	Engine compartment, above
LI25	Eyelet	Ignition coil	Engine compartment, above
LI27	Eyelet	Ignition coil	Engine compartment, above
LI28	Eyelet	Ignition amplifier earth	Engine compartment, above
LI29	Eyelet	Battery feed	Engine compartment, above
LI30	Eyelet	Bulkhead earth	Engine compartment, above
LI31	Eyelet	Bulkhead earth	Engine compartment, above
LI32	Eyelet	Manifold earth	Engine compartment, above
LI33	Eyelet	Air meter earth	Engine compartment, above
LI34	Black PM4 3 way socket	Rear solenoid link lead	Engine compartment, ab——
LI35	Eyelet		Engine compartment, ab——
LI39	2 way socket	Air pump control solenoid valve	Engine compartment, above
LI42	Black 2 way socket	Air thermistor	Engine compartment above
LI44	PM4 6 way socket	Side harness	Front passenger dash liner
LI45	Green PM4HD 1 5 way socket	Gearbox harness	Engine compartment, ab——
LI52	Lucar socket	Coolant temperature sensor	Engine compartment, above
LI53	Lucar socket	Oil pressure transducer	Engine compartment above
LI55	Blue PM4 6 way socket	Throttle potentiometer	Engine compartment, above
LI56	4 way socket	Idle speed control	Front passenger dash liner
LI57	Brown PM4 6 way socket	Diagnostic connector	Front passanger dash liner
LI58	2 8 way socket	ECU high power module blue	Front passanger dash liner
LI59	2 8 way socket	ECU low power module yellow	Engine compartment, below
LI60	3 way socket	Fuel tail reset	Engine compartment, above
LI61	3 way socket	Air condition clutch	Engine compartment, above
LI62	Lucar connector	Air condition cut-out	Engine compartment, above
LI63	Lucar connector	Air condition cut-nut	Engine compartment, ab——
LS 20	Yellow 6-way socket	LH side harness	Below engine air filter
LI-R1	Resistor		Engine compartment, abwe

WIRING SCHEDULE 90.50.21/WS

From	To	Colour	Section
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Markt
Da	A	Colore	Sezione
Desde	Hasta	Color	Tamano
LI52	B144-6	GN	0.5
LI54	B144-7	B	0.5
LI55	B144-1	U	0.5
LI56	B144-2	W	0.5
LI57	B144-3	R	0.5
LI58	B144-4	S	0.5
LI59	B144-5	K	0.5
LI60	B144-8	GR	0.5
LI61	B144-9	V	0.5
LI62	B144-10	O	0.5
LI63	B144-11	LG	0.5
LS 20	B144-12	SW	0.5
LI-R1	B144-13	N	0.5
LI S1	LI21-A	SW	0.5
LI-S2	LI21-B	SW	0.5
LI-S6	LI21-C	SW	0.5
LI-S6	LI21-D	SW	0.5
LI-S7	LI21-E	SW	0.5

From	To	Colour	Section
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Markt
Da	A	Colore	Sezione
Desde	Hasta	Color	Tamano
LI-S8	LI18-25KB	SW	2.0
LI-S8	LI18-1	SW	2.0
LI-S8	LI18-2	SW	2.0
LI-S8	LI18-3	SW	2.0
LI-S8	LI18-4	SW	2.0
LI-S8	LI18-5	SW	2.0
LI-S8	LI18-6	SW	2.0
LI-S8	LI18-7	SW	2.0
LI-S8	LI18-8	SW	2.0
LI-S8	LI18-9	SW	2.0
LI-S8	LI18-10	SW	2.0
LI-S8	LI18-11	SW	2.0
LI-S8	LI18-12	SW	2.0
LI-S8	LI18-13	SW	2.0
LI-S8	LI18-14	SW	2.0
LI-S8	LI18-15	SW	2.0
LI-S8	LI18-16	SW	2.0
LI-S8	LI18-17	SW	2.0
LI-S8	LI18-18	SW	2.0
LI-S8	LI18-19	SW	2.0
LI-S8	LI18-20	SW	2.0
LI-S8	LI18-21	SW	2.0
LI-S8	LI18-22	SW	2.0
LI-S8	LI18-23	SW	2.0
LI-S8	LI18-24	SW	2.0
LI S1	B144-13	SW	0.5
LI-S2	LI18-A	SW	0.5
LI-S6	LI18-B	SW	0.5
LI-S6	LI18-C	SW	0.5
LI-S7	LI18-D	SW	0.5
LI-S7	LI18-E	SW	0.5
LI S1	LI18-F	SW	0.5
LI-S2	LI18-G	SW	0.5
LI-S6	LI18-H	SW	0.5
LI-S6	LI18-J	SW	0.5
LI-S7	LI18-K	SW	0.5
LI-S7	LI18-L	SW	0.5
LI S1	LI18-M	SW	0.5
LI-S2	LI18-N	SW	0.5
LI-S6	LI18-P	SW	0.5
LI-S6	LI18-R	SW	0.5
LI-S7	LI18-S	SW	0.5
LI-S7	LI18-T	SW	0.5
LI S1	LI18-U	SW	0.5
LI-S2	LI18-V	SW	0.5
LI-S6	LI18-W	SW	0.5
LI-S6	LI18-X	SW	0.5
LI-S7	LI18-Y	SW	0.5
LI-S7	LI18-Z	SW	0.5
LI S1	LI18-1	SW	0.5
LI-S2	LI18-2	SW	0.5
LI-S6	LI18-3	SW	0.5
LI-S6	LI18-4	SW	0.5
LI-S7	LI18-5	SW	0.5
LI-S7	LI18-6	SW	0.5
LI S1	LI18-7	SW	0.5
LI-S2	LI18-8	SW	0.5
LI-S6	LI18-9	SW	0.5
LI-S6	LI18-10	SW	0.5
LI-S7	LI18-11	SW	0.5
LI-S7	LI18-12	SW	0.5
LI S1	LI18-13	SW	0.5
LI-S2	LI18-14	SW	0.5
LI-S6	LI18-15	SW	0.5
LI-S6	LI18-16	SW	0.5
LI-S7	LI18-17	SW	0.5
LI-S7	LI18-18	SW	0.5
LI S1	LI18-19	SW	0.5
LI-S2	LI18-20	SW	0.5
LI-S6	LI18-21	SW	0.5
LI-S6	LI18-22	SW	0.5
LI-S7	LI18-23	SW	0.5
LI-S7	LI18-24	SW	0.5
LI S1	LI18-25KB	SW	0.5
LI-S2	B144-1	SW	0.5
LI-S6	B144-2	SW	0.5
LI-S6	B144-3	SW	0.5
LI-S7	B144-4	SW	0.5
LI-S7	B144-5	SW	0.5
LI S1	B144-6	SW	0.5
LI-S2	B144-7	SW	0.5
LI-S6	B144-8	SW	0.5
LI-S6	B144-9	SW	0.5
LI-S7	B144-10	SW	0.5
LI-S7	B144-11	SW	0.5
LI S1	B144-12	SW	0.5
LI-S2	B144-13	SW	0.5
LI-S6	LI21-A	SW	0.5
LI-S6	LI21-B	SW	0.5
LI-S7	LI21-C	SW	0.5
LI-S7	LI21-D	SW	0.5
LI S1	LI21-E	SW	0.5
LI-S2	LI21-F	SW	0.5
LI-S6	LI21-G	SW	0.5
LI-S6	LI21-H	SW	0.5
LI-S7	LI21-J	SW	0.5
LI-S7	LI21-K	SW	0.5
LI S1	LI21-L	SW	0.5
LI-S2	LI21-M	SW	0.5
LI-S6	LI21-N	SW	0.5
LI-S6	LI21-P	SW	0.5
LI-S7	LI21-R	SW	0.5
LI-S7	LI21-S	SW	0.5
LI S1	LI21-T	SW	0.5
LI-S2	LI21-U	SW	0.5
LI-S6	LI21-V	SW	0.5
LI-S6	LI21-W	SW	0.5
LI-S7	LI21-X	SW	0.5
LI-S7	LI21-Y	SW	0.5
LI S1	LI21-Z	SW	0.5
LI-S2	LI21-1	SW	0.5
LI-S6	LI21-2	SW	0.5
LI-S6	LI21-3	SW	0.5
LI-S7	LI21-4	SW	0.5
LI-S7	LI21-5	SW	0.5
LI S1	LI21-6	SW	0.5
LI-S2	LI21-7	SW	0.5
LI-S6	LI21-8	SW	0.5
LI-S6	LI21-9	SW	0.5
LI-S7	LI21-10	SW	0.5
LI-S7	LI21-11	SW	0.5
LI S1	LI21-12	SW	0.5
LI-S2	LI21-13	SW	0.5
LI-S6	LI21-14	SW	0.5
LI-S6	LI21-15	SW	0.5
LI-S7	LI21-16	SW	0.5
LI-S7	LI21-17	SW	0.5
LI S1	LI21-18	SW	0.5
LI-S2	LI21-19	SW	0.5
LI-S6	LI21-20	SW	0.5
LI-S6	LI21-21	SW	0.5
LI-S7	LI21-22	SW	0.5
LI-S7	LI21-23	SW	0.5
LI S1	LI21-24	SW	0.5
LI-S2	LI21-25KB	SW	0.5
LI-S6	LI21-1	SW	0.5
LI-S6	LI21-2	SW	0.5
LI-S7	LI21-3	SW	0.5
LI-S7	LI21-4	SW	0.5
LI S1	LI21-5	SW	0.5
LI-S2	LI21-6	SW	0.5
LI-S6	LI21-7	SW	0.5
LI-S6	LI21-8	SW	0.5
LI-S7	LI21-9	SW	0.5
LI-S7	LI21-10	SW	0.5
LI S1	LI21-11	SW	0.5
LI-S2	LI21-12	SW	0.5
LI-S6	LI21-13	SW	0.5
LI-S6	LI21-14	SW	0.5
LI-S7	LI21-15	SW	0.5
LI-S7	LI21-16	SW	0.5
LI S1	LI21-17	SW	0.5
LI-S2	LI21-18	SW	0.5
LI-S6	LI21-19	SW	0.5
LI-S6	LI21-20	SW	0.5
LI-S7	LI21-21	SW	0.5
LI-S7	LI21-22	SW	0.5
LI S1	LI21-23	SW	0.5
LI-S2	LI21-24	SW	0.5
LI-S6	LI21-25KB	SW	0.5
LI-S6	B144-1	SW	0.5
LI-S7	B144-2	SW	0.5
LI-S7	B144-3	SW	0.5
LI S1	B144-4	SW	0.5
LI-S2	B144-5	SW	0.5
LI-S6	B144-6	SW	0.5
LI-S6	B144-7	SW	0.5
LI-S7	B144-8	SW	0.5
LI-S7	B144-9	SW	0.5
LI S1	B144-10	SW	0.5
LI-S2	B144-11	SW	0.5
LI-S6	B144-12	SW	0.5
LI-S6	B144-13	SW	0.5
LI-S7	LI21-A	SW	0.5
LI-S7	LI21-B	SW	0.5
LI S1	LI21-C	SW	0.5
LI-S2	LI21-D	SW	0.5
LI-S6	LI21-E	SW	0.5
LI-S6	LI21-F	SW	0.5
LI-S7	LI21-G	SW	0.5
LI-S7	LI21-H	SW	0.5
LI S1	LI21-J	SW	0.5
LI-S2	LI21-K	SW	0.5
LI-S6	LI21-L	SW	0.5
LI-S6	LI21-M	SW	0.5
LI-S7	LI21-N	SW	0.5
LI-S7	LI21-P	SW	0.5
LI S1	LI21-R	SW	0.5
LI-S2	LI21-S	SW	0.5
LI-S6	LI21-T	SW	0.5
LI-S6	LI21-U	SW	0.5
LI-S7	LI21-V	SW	0.5
LI-S7	LI21-W	SW	0.5
LI S1	LI21-X	SW	0.5
LI-S2	LI21-Y	SW	0.5
LI-S6	LI21-Z	SW	0.5
LI-S6	LI21-1	SW	0.5
LI-S7	LI21-2	SW	0.5
LI-S7	LI21-3	SW	0.5
LI S1	LI21-4	SW	0.5
LI-S2	LI21-5	SW	0.5
LI-S6	LI21-6	SW	0.5
LI-S6	LI21-7	SW	0.5
LI-S7	LI21-8	SW	0.5
LI-S7	LI21-9	SW	0.5
LI S1	LI21-10	SW	0.5
LI-S2	LI21-11	SW	0.5
LI-S6	LI21-12	SW	0.5
LI-S6	LI21-13	SW	0.5
LI-S7	LI21-14	SW	0.5
LI-S7	LI21-15	SW	0.5
LI S1	LI21-16	SW	0.5
LI-S2	LI21-17	SW	0.5
LI-S6	LI21-18	SW	0.5
LI-S6	LI21-19	SW	0.5
LI-S7	LI21-20	SW	0.5
LI-S7	LI21-21	SW	0.5
LI S1	LI21-22	SW	0.5
LI-S2	LI21-23	SW	0.5
LI-S6	LI21-24	SW	0.5
LI-S6	LI21-25KB	SW	0.5
LI-S7	B144-1	SW	0.5
LI-S7	B144-2	SW	0.5
LI S1	B144-3	SW	0.5
LI-S2	B144-4	SW	0.5
LI-S6	B144-5	SW	0.5
LI-S6	B144-6	SW	0.5
LI-S7	B144-7	SW	0.5
LI-S7	B144-8	SW	0.5
LI S1	B144-9	SW	0.5
LI-S2	B144-10	SW	0.5
LI-S6	B144-11	SW	0.5
LI-S6	B144-12	SW	0.5
LI-S7	B144-13	SW	0.5
LI-S7	LI21-A	SW	0.5
LI S1	LI21-B	SW	0.5
LI-S2	LI21-C	SW	0.5
LI-S6	LI21-D	SW	0.5
LI-S6	LI21-E	SW	0.5
LI-S7	LI21-F	SW	0.5
LI-S7	LI21-G	SW	0.5
LI S1	LI21-H	SW	0.5
LI-S2	LI21-J	SW	0.5
LI-S6	LI21-K	SW	0.5
LI-S6	LI21-L	SW	0.5
LI-S7	LI21-M	SW	0.5
LI-S7	LI21-N	SW	0.5
LI S1	LI21-P	SW	0.5
LI-S2	LI21-R	SW	0.5
LI-S6	LI21-S	SW	0.5
LI-S6	LI21-T	SW	0.5
LI-S7	LI21-U	SW	0.5
LI-S7	LI21-V	SW	0.5
LI S1	LI21-W	SW	0.5
LI-S2	LI21-X	SW	0.5
LI-S6	LI21-Y	SW	0.5
LI-S6	LI21-Z	SW	0.5
LI-S7	LI21-1	SW	0.5
LI-S7	LI21-2	SW	0.5
LI S1	LI21-3	SW	0.5
LI-S2	LI21-4	SW	0.5
LI-S6	LI21-5	SW	0.5
LI-S6	LI21-6	SW	0.5
LI-S7	LI21-7	SW	0.5
LI-S7	LI21-8	SW	0.5
LI S1	LI21-9	SW	0.5
LI-S2	LI21-10	SW	0.5
LI-S6	LI21-11	SW	0.5
LI-S6	LI21-12	SW	0.5
LI-S7	LI21-13	SW	0.5
LI-S7	LI21-14	SW	0.5
LI S1	LI21-15	SW	0.5
LI-S2	LI21-16	SW	0.5
LI-S6	LI21-17	SW	0.5
LI-S6	LI21-18	SW	0.5
LI-S7	LI21-19	SW	0.5
LI-S7	LI21-20	SW	0.5
LI S1	LI21-21	SW	0.5
LI-S2	LI21-22	SW	0.5
LI-S6	LI21-23	SW	0.5
LI-S6	LI21-24	SW	0.5
LI-S7	LI21-25KB	SW	0.5
LI-S7	B144-1	SW	0.5
LI S1	B144-2	SW	0.5
LI-S2	B144-3	SW	0.5
LI-S6	B144-4	SW	0.5
LI-S6	B144-5	SW	0.5
LI-S7	B144-6	SW	0.5
LI-S7	B144-7	SW	0.5
LI S1	B144-8	SW	0.5
LI-S2	B144-9	SW	0.5
LI-S6	B144-10	SW	0.5
LI-S6	B144-11	SW	0.5
LI-S7	B144-12	SW	0.5
LI-S7	B144-13	SW	0.5
LI S1	LI21-A	SW	0.5
LI-S2	LI21-B	SW	0.5
LI-S6	LI21-C	SW	0.5
LI-S6	LI21-D	SW	0.5
LI-S7	LI21-E	SW	0.5
LI-S7	LI21-F	SW	0.5
LI S1	LI21-G	SW	0.5
LI-S2	LI21-H	SW	0.5
LI-S6	LI21-J	SW	0.5
LI-S6	LI21-K	SW	0.5
LI-S7	LI21-L	SW	0.5
LI-S7	LI21-M	SW	0.5
LI S1	LI21-N	SW	0.5
LI-S2	LI21-P	SW	0.5
LI-S6	LI21-R	SW	0.5
LI-S6	LI21-S	SW	0.5
LI-S7	LI21-T	SW	0.5
LI-S7	LI21-U	SW	0.5
LI S1	LI21-V	SW	0.5
LI-S2	LI21-W	SW	0.5
LI-S6	LI21-X	SW	0.5
LI-S6	LI21-Y	SW	0.5
LI-S7	LI21-Z	SW	0.5
LI-S7	LI21-1	SW	0.5
LI S1	LI21-2	SW	0.5
LI-S2	LI21-3	SW	0.5
LI-S6	LI21-4	SW	0.5
LI-S6	LI21-5	SW	0.5
LI-S7	LI21-6	SW	0.5
LI-S7	LI21-7	SW	0.5
LI S1	LI21-8	SW	0.5
LI-S2	LI21-9	SW	0.5
LI-S6	LI21-10	SW	0.5
LI-S6	LI21-11	SW	0.5
LI-S7	LI21-12	SW	0.5
LI-S7	LI21-13	SW	0.5
LI S1	LI21-14	SW	0.5
LI-S2	LI21-15	SW	0.5
LI-S6	LI21-16	SW	0.5
LI-S6	LI21-17	SW	0.5
LI-S7	LI21-18	SW	0.5
LI-S7	LI21-19	SW	0.5
LI S1	LI21-20	SW	0.5
LI-S2	LI21-21	SW	0.5
LI-S6	LI21-22	SW	0.5
LI-S6	LI21-23	SW	0.5
LI-S7	LI21-24	SW	0.5
LI-S7	LI21-25KB	SW	0.5
LI S1	B144-1	SW	0.5
LI-S2	B144-2	SW	0.5
LI-S6	B144-3	SW	0.5
LI-S6	B144-4	SW	0.5
LI-S7	B144-5	SW	0.5
LI-S7	B144-6	SW	0.5
LI S1	B144-7	SW	0.5
LI-S2	B144-8	SW	0.5
LI-S6	B144-9	SW	0.5
LI-S6	B144-10	SW	0.5
LI-S7	B144-11	SW	0.5
LI-S7	B144-12	SW	0.5
LI S1	B144-13	SW	0.5
LI-S2	LI21-A	SW	0.5
LI-S6	LI21-B	SW	0.5
LI-S6	LI21-C	SW	0.5
LI-S7	LI21-D	SW	0.5
LI-S7	LI21-E	SW	0.5
LI S1	LI21-F	SW	0.5
LI-S2	LI21-G	SW	0.5
LI-S6	LI21-H	SW	0.5
LI-S6	LI21-J	SW	0.5
LI-S7	LI21-K	SW	0.5
LI-S7	LI21-L	SW	0.5
LI S1	LI21-M	SW	0.5
LI-S2	LI21-N	SW	0.5
LI-S6	LI21-P	SW	0.5
LI-S6	LI21-R	SW	0.5
LI-S7	LI21-S	SW	0.5
LI-S7	LI21-T	SW	0.5
LI S1	LI21-U	SW	0.5
LI-S2	LI21-V	SW	0.5
LI-S6	LI21-W	SW	0.5
LI-S6	LI21-X	SW	0.5
LI-S7	LI21-Y	SW	0.5
LI-S7	LI21-Z	SW	0.5
LI S1	LI21-1	SW	0.5
LI-S2	LI21-2	SW	0.5
LI-S6	LI21-3	SW	0.5
LI-S6	LI21-4	SW	0.5
LI-S7	LI21-5	SW	0.5
LI-S7	LI21-6	SW	0.5
LI S1	LI21-7	SW	0.5
LI-S2	LI21-8	SW	0.5
LI-S6	LI21-9	SW	0.5
LI-S6	LI21-10	SW	0.5
LI-S7	LI21-11	SW	0.5
LI-S7	LI21-12	SW	0.5
LI S1	LI21-13	SW	0.5
LI-S2	LI21-14	SW	0.5
LI-S6	LI21-15	SW	0.5
LI-S6	LI21-16	SW	0.5
LI-S7	LI21-17	SW	0.5
LI-S7	LI21-18	SW	0.5
LI S1	LI21-19	SW	0.5
LI-S2	LI21-20	SW	0.5
LI-S6	LI21-21	SW	0.5
LI-S6	LI21-22	SW	0.5
LI-S7	LI21-23	SW	0.5
LI-S7	LI21-24	SW	0.5
LI S1	LI21-25KB	SW	0.5
LI-S2	B144-1	SW	0.5
LI-S6	B144-2	SW	0.5
LI-S6	B144-3	SW	0.5
LI-S7	B144-4	SW	0.5
LI-S7	B144-5	SW	0.5
LI S1	B144-6	SW	0.5
LI-S2	B144-7	SW	0.5
LI-S6	B144-8	SW	0.5
LI-S6	B144-9	SW	0.5
LI-S7	B144-10	SW	0.5
LI-S7	B144-11	SW	0.5
LI S1	B144-12	SW	0.5
LI-S2	B144-13	SW	0.5
LI-S6	LI21-A	SW	0.5
LI-S6	LI21-B	SW	0.5
LI-S7	LI21-C	SW	0.5
LI-S7	LI21-D	SW	0.5
LI S1	LI21-E	SW	0.5
LI-S2	LI21-F	SW	0.5
LI-S6	LI21-G	SW	0.5
LI-S6	LI21-H	SW	0.5
LI-S7	LI21-J	SW	0.5
LI-S7	LI21-K	SW	0.5
LI S1	LI21-L	SW	0.5
LI-S2	LI21-M	SW	0.5
LI-S6	LI21-N	SW	0.5
LI-S6	LI21-P	SW	0.5
LI-S7	LI21-R	SW	0.5
LI-S7	LI21-S	SW	0.5
LI S1	LI21-T	SW	0.5
LI-S2	LI21-U	SW	0.5
LI-S6	LI21-V	SW	0.5
LI-S6	LI21-W	SW	0.5
LI-S7	LI21-X	SW	0.5
LI-S7	LI21-Y	SW	0.5
LI S1	LI21-Z	SW	0.5
LI-S2	LI21-1	SW	0.5
LI-S6	LI21-2	SW	0.5
LI-S6	LI21-3	SW	0.5
LI-S7	LI21-4	SW	0.5
LI-S7	LI21-5	SW	0.5
LI S1	LI21-6	SW	0.5
LI-S2	LI21-7	SW	0.5
LI-S6	LI21-8	SW	0.5
LI-S6	LI21-9	SW	0.5
LI-S7	LI21-10	SW	0.5
LI-S7	LI21-11	SW	0.5
LI S1	LI21-12	SW	0.5
LI-S2	LI21-13	SW	0.5
LI-S6	LI21-14	SW	0.5
LI-S6	LI21-15	SW	0.5
LI-S7	LI21-16	SW	0.5
LI-S7	LI21-17	SW	0.5
LI S1	LI21-18	SW	0.5
LI-S2	LI21-19	SW	0.5
LI-S6	LI21-20	SW	0.5
LI-S6	LI21-21	SW	0.5
LI-S7	LI21-22	SW	0.5
LI-S7	LI21-23	SW	0.5
LI S1	LI21-24	SW	0.5
LI-S2	LI21-25KB	SW	0.5
LI-S6	LI21-1	SW	0.5
LI-S6	LI21-2	SW	0.5
LI-S7	LI21-3	SW	0.5
LI-S7	LI21-4	SW	0.5
LI S1	LI21-5	SW	0.5
LI-S2	LI21-6	SW	0.5
LI-S6	LI21-7	SW	0.5
LI-S6	LI21-8	SW	0.5
LI-S7	LI21-9	SW	0.5
LI-S7	LI21-10	SW	0.5
LI S1	LI21-11	SW	0.5
LI-S2	LI21-12	SW	0.5
LI-S6	LI21-13	SW	0.5
LI-S6	LI21-14	SW	0.5
LI-S7	LI21-15	SW	0.5
LI-S7	LI21-16	SW	0.5
LI S1	LI21-17	SW	0.5
LI-S2	LI21-18	SW	0.5
LI-S6	LI21-19	SW	0.5
LI-S6	LI21-20	SW	0.5
LI-S7	LI21-21	SW	0.5
LI-S7	LI21-22	SW	0.5
LI S1	LI21-23	SW	0.5
LI-S2	LI21-24	SW	0.5
LI-S6	LI21-25KB	SW	0.5
LI-S6	B144-1	SW	0.5
LI-S7	B144-2	SW	0.5
LI-S7	B144-3	SW	0.5
LI S1	B144-4	SW	0.5
LI-S2	B144-5	SW	0.5
LI-S6	B144-6	SW	0.5
LI-S6	B144-7	SW	0.5
LI-S7	B144-8	SW	0.5
LI-S7	B144-9	SW	0.5
LI S1	B144-10	SW	0.5
LI-S2	B144-11	SW	0.5
LI-S6	B144-12	SW	0.5
LI-S6	B144-13	SW	0.5
LI-S7	LI21-A	SW	0.5
LI-S7	LI21-B	SW	0.5
LI S1	LI21-C	SW	0.5
LI-S2	LI21-D	SW	0.5
LI-S6	LI21-E	SW	0.5
LI-S6	LI21-F	SW	0.5
LI-S7	LI21-G	SW	0.5
LI-S7	LI21-H	SW	0.5
LI S1	LI21-J	SW	0.5
LI-S2	LI21-K	SW	0.5
LI-S6	LI21-L	SW	0.5
LI-S6	LI21-M	SW	0.5
LI-S7	LI21-N	SW	0.5
LI-S7	LI21-P	SW	0.5
LI S1	LI21-R	SW	0.5
LI-S2	LI21-S	SW	0.5
LI-S6	LI21-T	SW	0.5
LI-S6	LI21-U	SW	0.5
LI-S7	LI21-V	SW	0.5
LI-S7	LI21-W	SW	0.5
LI S1	LI21-X	SW	0.5
LI-S2	LI21-Y	SW	0.5
LI-S6	LI21-Z	SW	0.5
LI-S6	LI21-1	SW	0.5
LI-S7	LI21-2	SW	0.5
LI-S7	LI21-3	SW	0.5
LI S1	LI21-4	SW	0.5
LI-S2	LI21-5	SW	0.5
LI-S6	LI21-6	SW	0.5
LI-S6	LI21-7	SW	0.5
LI-S7	LI21-8	SW	0.5
LI-S7	LI21-9	SW	0.5
LI S1	LI21-10	SW	0.5
LI-S2	LI21-11	SW	0.5
LI-S6	LI21-12	SW	0.5
LI-S6	LI21-13	SW	0.5
LI-S7	LI21-14	SW	0.5
LI-S7	LI21-15	SW	0.5
LI S1	LI21-16	SW	0.5
LI-S2	LI21-17	SW	0.5
LI-S6	LI21-18	SW	0.5
LI-S6	LI21-19	SW	0.5
LI-S7	LI21-20	SW	0.5
LI-S7	LI21-21	SW	0.5
LI S1	LI21-22	SW	0.5
LI-S2	LI21-23	SW	0.5
LI-S6	LI21-24	SW	0.5
LI-S6	LI21-25KB	SW	0.5
LI-S7	B144-1	SW	0.5
LI-S7	B144-2	SW	0.5
LI S1	B144-3	SW	0.5
LI-S2	B144-4	SW	0.5
LI-S6	B144-5	SW	0.5
LI-S6	B144-6	SW	0.5
LI-S7	B144-7	SW	0.5
LI-S7	B144-8	SW	0.5
LI S1	B144-9	SW	0.5
LI-S2	B144-10	SW	0.5
LI-S6	B144-11	SW	0.5
LI-S6	B144-12	SW	0.5
LI-S7	B144-13	SW	0.5
LI-S7	LI21-A	SW	0.5
LI S1	LI21-B	SW	0.5
LI-S2	LI21-C	SW	0.5
LI-S6	LI21-D	SW	0.5
LI-S6	LI21-E	SW	0.5
LI-S7	LI21-F	SW

ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 4.0 LI LHD
CONNECTOR LOCATION 90.50.21/CL



ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS BOSCH BI (RHD) CATALYST
HARNESS SCHEDULE 90.50.21/HS LOCATION & ACCESS 90.50.21#LA

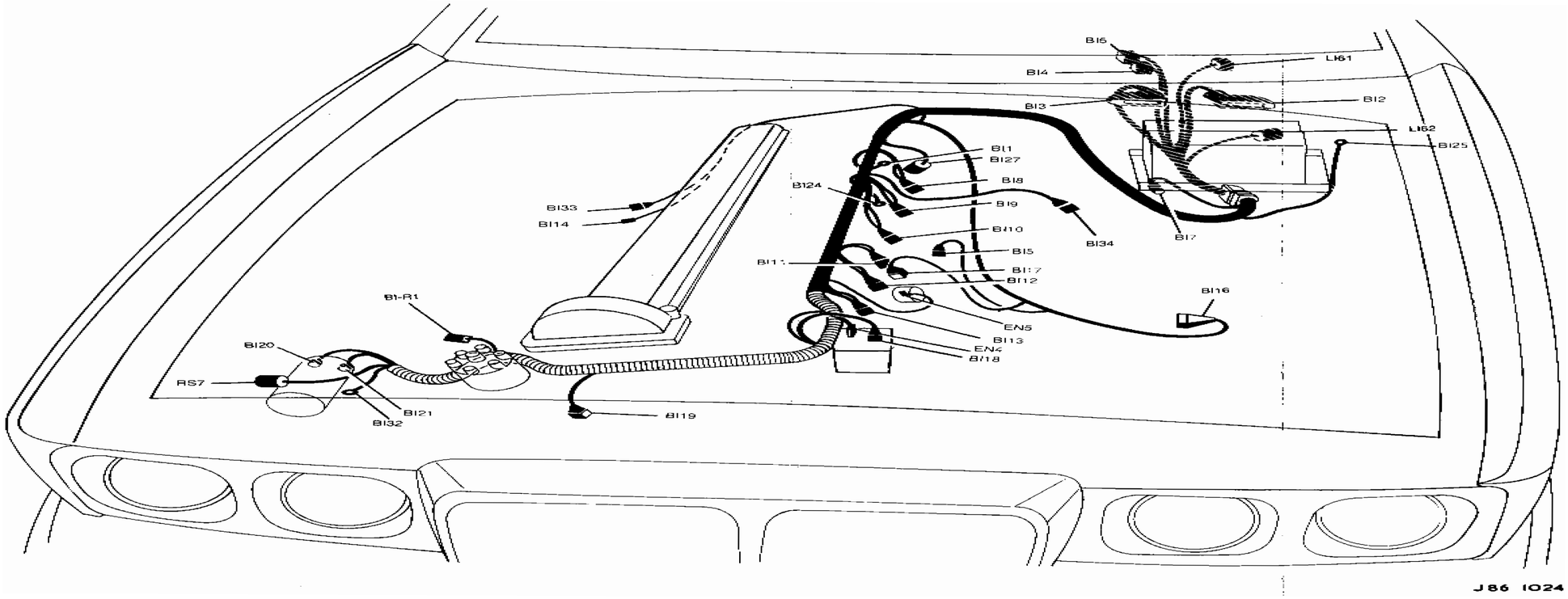
Connector No	Description	Interface	Location	Access
LLE1	Yellow 6-way PMHD plug	Harness LE	Front passenger footwell	Front passenger dash liner
LLE2	Yellow 6-way PM4 socket	Harness LE	Front passenger footwell	Front passenger dash liner
E11	Eyelet	Power earth	Engine, top	Engine compartment, above
BI2	Black 25-way Bosch socket	Ignition ECU	Front passenger footwell	Front passenger dash liner
BI3	Black 25-way Bosch socket	PI ECU	Front passenger footwell	Front passenger dash liner
BI4	Red relay base	Main relay	Front passenger footwell	Fusebloc k cover
BI5	Yellow relay base	Pump relay	Front passenger footwell	Fusebloc k cover
BI7	Black 3-way Bosch socket	Idle speed contro' test pin	Engine, LH side	Engine compartment, above
BI8	Yellow 2-way Bosch socket	Injector 6	Engine, top	Engine compartment, above
BI9	Yellow 2-way Bosch socket	Injector 5	Engine, top	Engine compartment, above
BI10	Yellow 2-way Bosch socket	Injector 4	Engine, top	Engine above
BI11	Yellow 2-way Bosch socket	Injector 3	Engine, top	Engine compartment, above
BI12	Yellow 2-way Bosch socket	Injector 2	Engine, top	Engine compartment, above
BI13	Yellow 2-way Bosch socket	Injector 1	Engine, top	Engine above
BI14	Spade (white)	Lambda sensor	Engine, RH side	Engine compartment, above
BI15	Black 3-way Bosch socket	Throttle switch	Engine, LH side	above
BI16	Black 6-way Bosch socket	Air mass flowmeter	Engine, LH side	Engi— compartment, above
BI17	Grey 3-way Bosch socket	Idle speed actuator	Engine, top	Engine compartment above
BI1D	Black 2-way Bosch socket	Coolant temperature sensor	Engine, top	Engine compartment, above
BI19	Black 3-way Bosch socket	Crankshaft sensor	Engine, front	Engine compartment, above
BI20	Eyelet	Ignition coil	Engine, RH side	Engine compartment, above
BI21	Eyelet	Ignition coil		Engine compartment, above
BI24	Eyelet	Power earth	Engine, top	Engine compartment, above
BI25	Eyelet	Battery terminal post	Engine compartment,	Engine compartment, above
BI27	Black 3-way PM4 socket	Link lead solenoid value	Bulkhead	Engine compartment, above
BI32	Eyelet	Power earth	Engine, RH side	Engine compartment, above
BI33	Black 2-way Bosch socket	Lambda sensor heater	Engine, RH side	Engine compartment, above
BI34	Black 2-way Bosch socket	Breather heater	Engine, LH side	Engine compartment, above
EN3	Yellow 9-way PM4 plug	Harness side	Engine, RH side	Engine compartment, above
EN4	Lucar (white)	Water temperature transmitter	Engine, top	Engine compartment, above
EN5	Lucar (white)	Oil pressure transmitter	Engine, LH side	Engine compartment, above
BI-R1	Resistor		Engine compartment above	Engine compartment, above

WIRING SCHEDULE 90.50.21/WS

From	To	Cover	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Colour	Section
Von	Vers	Cores	Area
De	A	Colors	Cerebro
Desde	Hasta	Color	Tamano
LLE1-1	B-51	KB	0.5
LLE1-2			
LLE1-3			
LLE1-4			
LLE1-5	BI3-15	RU	0.5
LLE2-1	31-58	WK	0.5
LLE2-2	BI-56	LB	0.5
LLE2-3			
LLE2-4			
LLE2-5	BI27-2	W	0.5
LLE2-6	BI34-2	YO	0.5
BI*	BI33-1	B	0.5
	BI33-2	B	0.5
	BI3-3	B	0.5
	BI3-4	B	0.5
	BI3-5	B	0.5
	BI3-11	GU	0.5
	61-54	G	2.0
	BI-58	RK	0.5
	EI19-1	U inner	0.5
	91	B	2.0
	BI24	B	2.0
	BI3-12	LS	0.5
	BI-9-3	B inner	0.5
	BI-9-3	BRAID	Screen
	BI18-2	UK	0.5
	BI-85	WK	2.0
	BI-84	B inner	0.5
	BI1841	RK	0.5
	BI-80	R	0.5
	BI-82	BRAID	Screen
	BI1	B	2.0
	BI-6-3	B	0.5
	BI-6-4	B	0.5
	BI-6-7	B	0.5
	BI-57	WK	0.5
	BI17-1	WK	0.5
	BI17-2	BRAID	Copper
	BI-82	B	0.5
	BI-83	B	0.5
	BI-13	B	0.5
	BI-14	B	0.5
	BI-15	B	0.5
	BI-16	B	0.5
	BI-17	B	0.5
	BI-18	B	0.5
	BI-19	B	0.5
	BI-20	B	0.5
	BI-86	B	0.5
	BI-56	WK	0.5
	BI-4	W inner	0.5
	BI-5	B	0.5
	BI17-3	B	0.5
	BI24	B	2.0
	BI26	B	0.5
	BI4-68	B	0.5
	BI3-31	B	0.5
	BI3-32	B	0.5
	BI3-33	B	0.5
	BI-57	WK	0.5
	BI-7	B	0.5
	BI-8	B	0.5
	BI-9	B	0.5
	BI-10	B	0.5
	BI-11	B	0.5
	BI-12	B	0.5
	BI-13	B	0.5
	BI-14	B	0.5
	BI-15	B	0.5
	BI-16	B	0.5
	BI-17	B	0.5
	BI-18	B	0.5
	BI-19	B	0.5
	BI-20	B	0.5
	BI-21	B	0.5
	BI-22	B	0.5
	BI-23	B	0.5
	BI-24	B	0.5
	BI-25	B	0.5
	BI-26	B	0.5
	BI-27	B	0.5
	BI-28	B	0.5
	BI-29	B	0.5
	BI-30	B	0.5
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	BI-33	B	0.5
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	BI-45	B	0.5
	BI-46	B	0.5
	BI-47	B	0.5
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	BI-50	B	0.5
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	BI-53	B	0.5
	BI-54	B	0.5
	BI-55	B	0.5
	BI-56	B	0.5
	BI-57	B	0.5
	BI-58	B	0.5
	BI-59	B	0.5
	BI-60	B	0.5
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	BI-62	B	0.5
	BI-63	B	0.5
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	BI-65	B	0.5
	BI-66	B	0.5
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	BI-69	B	0.5
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	BI-71	B	0.5
	BI-72	B	0.5
	BI-73	B	0.5
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	BI-75	B	0.5
	BI-76	B	0.5
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	BI-78	B	0.5
	BI-79	B	0.5
	BI-80	B	0.5
	BI-81	B	0.5
	BI-82	B	0.5
	BI-83	B	0.5
	BI-84	B	0.5
	BI-85	B	0.5
	BI-86	B	0.5
	BI-87	B	0.5
	BI-88	B	0.5
	BI-89	B	0.5
	BI-90	B	0.5
	BI-91	B	0.5
	BI-92	B	0.5
	BI-93	B	0.5
	BI-94	B	0.5
	BI-95	B	0.5
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	BI-97	B	0.5
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	BI-99	B	0.5
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	BI-101	B	0.5
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	BI-148	B	0.5
	BI-149	B	0.5
	BI-150	B	0.5
	BI-151	B	0.5
	BI-152	B	0.5
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	BI-162	B	0.5
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	BI-165	B	0.5
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	BI-168	B	0.5
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	BI-172	B	0.5
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	BI-174	B	0.5
	BI-175	B	0.5
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	BI-179	B	0.5
	BI-180	B	0.5
	BI-181	B	0.5
	BI-182	B	0.5
	BI-183	B	0.5
	BI-184	B	0.5
	BI-185	B	0.5
	BI-186	B	0.5
	BI-187	B	0.5
	BI-188	B	0.5
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	BI-190	B	0.5
	BI-191	B	0.5
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	BI-193	B	0.5
	BI-194	B	0.5
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	BI-240	B	0.5
	BI-241	B	0.5
	BI-242	B	0.5
	BI-243	B	0.5
	BI-244	B	0.5
	BI-245	B	0.5
	BI-246	B	0.5
	BI-247	B	0.5
	BI-248	B	0.5
	BI-249	B	0.5
	BI-250	B	0.5
	BI-251	B	0.5
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	BI-500	B	0.5

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ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 2.9 LI RHD CATALYST
CONNECTOR LOCATION 90.50.21/CL



ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 2.9 LI (LHD) CATALYST

HARNESS SCHEDULE 90.50.21/HS — LOCATION & ACCESS 90.50.21/LA

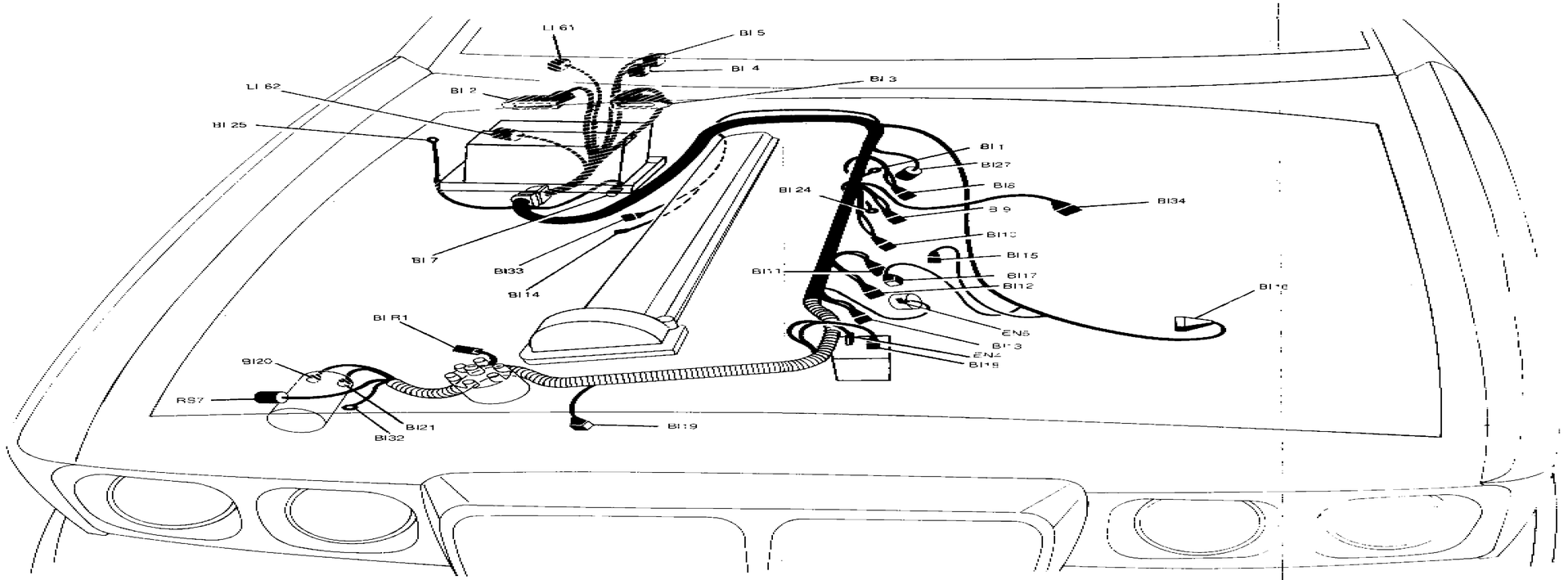
Connector No	Description	Interface	Location	Access
LH61	Yellow 6-way PMHD plug	Harness LE	Front passenger footwell	Front passenger dash liner
LH62	Yellow 6-way PM4 socket	Harness LE	Front passenger footwell	Front passenger dash liner
911	Eyelet	Power earth	Engine, top	Engine compartment, above
912	Black 25-way Bosch socket	Ignition ECU	Front passenger footwell	Front passenger dash liner
913	Black 25-way Bosch socket	PI ECU	Front passenger footwell	Front passenger dash liner
914	Red relay base	Main relay	Front passenger footwell	Fuseblock cover
915	Yellow relay base	Pump relay	Front passenger footwell	Fuseblock cover
917	Black 3-way Bosch socket	Idle speed control test pin	Engine, LH side	Engine compartment, above
918	Tellow 2-way Bosch socket	Injector 6	Engine, top	Engine compartment, above
919	Tellow 2-way Bosch socket	Injector 5	Engine, top	Engine compartment, above
9110	Yellow 2-way Bosch socket	Injector 4	Engine, top	Engine compartment, above
9111	Tellow 2-way Bosch socket	Injector 3	Engine, top	Engine compartment, above
9112	Tellow 2-way Bosch socket	Injector 2	Engine, top	Engine compartment, above
9113	Yellow 2-way Bosch socket	Injector 1	Engine, top	Engine compartment, above
9114	Spade (white)	Lambda sensor	Engine, RH side	Engine compartment, above
9115	Black 3-way Bosch socket	Throttle switch	Engine, LH side	Engine compartment, above
9116	Black 6-way Bosch socket	Air mass flowmeter	Engine, LH side	Engine compartment, above
9117	Grey 3-way Bosch socket	Idle speed actuator	Engine, top	Engine compartment, above
911E	Black 2-way Bosch socket	Coolant temp. sensor	Engine, top	Engine compartment, above
9119	Black 3-way Bosch socket	Crankshaft sensor	Engine, front	Engine compartment, above
9120	Eyelet	Ignition coil	Engine, RH side	Engine compartment, above
9121	Eyelet	Ignition coil	Engine, RH side	Engine compartment, above
9124	Eyelet	Power earth	Engine, top	Engine compartment, above
9126	Eyelet	Battery terminal post	Bulkhead	Engine compartment, above
9127	Black 3-way PM4 socket	Link lead solenoid valve	Bulkhead	Engine compartment, above
9132	Eyelet	Power earth	Engine, RH side	Engine compartment, above
9133	Black 2-way Bosch socket	Lambda sensor heater	Engine, RH side	Engine compartment, above
9134	Black 2-way Bosch socket	Breather heater	Engine, LH side	Engine compartment, above
RS7	Yellow 8-way PM4 plug	Harness side	Engine, RH side	Engine compartment, above
EN4	Lucar (white)	Water temp. transmitter	Engine, top	Engine compartment, above
EN5	Lucar (white)	Oil pressure transmitter	Engine, LH side	Engine compartment, above
BI-R1	Resistor		Engine compartment	Engine compartment above

WIRING SCHEDULE 90.50.21/WS

From	To	Colour	Electrical	From	To	Colour	Electrical
Unit	Main	Fuse	Connector	Unit	Main	Type	Connector
De	A	Diode	Section	De	A	Diode	Section
Wire	Wire	Core	Mark	Wire	Wire	Core	Mark
De	A	Cable	Remark	De	A	Cable	Remark
Diode	Name	Color	Terminal	Diode	Name	Color	Terminal
J61-1	BI-5 4	KB	0.5	BI-7 1	9[illegible]-10	BK	60 85
J61-2				BI-7 2	BI-92	UR	60 86
J61-3				BI-7 3	312-23	AM	0 85
J61-4				BI-7 4			
J61-5	BI3-1 5	RJ	0 5	BI-7 5	312-2	UK	0 86
J61-6				BI-7 6	312-23		
J61-7				BI-7 7			
J61-8	BI-85	GR	3.5	BI-7 8	BI2-7	LU inner	0 5
J61-9	BI-85	UR	3.5	BI-7 9	BI2-19	BRAID	screen
J61-10				BI-7 10	BI2-20		
J61-11	BI37 1	YS	3.5	BI20	BI-91-9	RS	60 85
J61-12	BI34 2	YB	3.5		BI-94	KT inner	0 30
J61-13				BI21	BI-85	WK	60 86
J61-14	BI29 1	BBBB	0.5		BI-91 W	PK	0 30
J61-15	BI29 2	BBBB	0.5	BI24	BI7-24		
J61-16	BI-87	BBBB	0.5		BI7-34		
J61-17	BI-92 4	BBBB	0.5		BI34-1		
J61-18	BI-N2-12	BBBB	0.5		BI3-1		
J61-19	BI-91-10	UB	0.5	BI25	BI3-36	W	60 85
BI2-1	31-54	B	2.0		BI5-36	W	60 86
BI2-10				BI27-1			
BI2-11	31-58	RK	0.3	BI27-3	LI62-5	W	3.0
BI2-12				BI27-8			
BI2-9	31-54	U Inner	0.5	BI32	BI-1	B	0.5
BI3-11				BI32-1			
BI3-12	31	B	2.0	BI32-2	BI-52	U-R	60 00
BI3-13	3124	B	2.0	BI34-1	BI-74	B	1.0
BI3-14				BI34-2	LI62-6	JG	1.0
BI3-15	BI3-13	UR	2.5	BS7-1	EN5	OR	0.5
BI3-16				BS7-2	EM1	OR	0.5
BI3-17	BI-92	B Inner	2.5	BS7-3			
BI3-18	31-95	BRAID	screen	BS7-4	BI-715	RS	60 00
BI3-19				BS7-5	EM1-A	RS	60 00
BI3-20				BS7-6			
BI3-21	BI-8 2	UK	2.5	BS7-7	BI7-8	RS	60 86
BI3-22				BS7-8	BI7-7	RS	60 86
BI3-23	BI-S6	WK	2.0	BS7-9			
BI3-24				EM4	RS7-2	OK	0.5
BI3-25	BI-S4	W Inner	2.5	EN5	RS7-1	OB	0.5
BI3-3	BI3-7	RK	3.5	BI-B1	BI-B2	BRAID	Screen
BI3-4	BI-89	RK	3.5	BI-B2	BI-B1	BRAID	Screen
BI3-5	BI-B2	BRAID	screen		BI3-11	BRAID	screen
BI3-6	BI-B1	BRAID	screen		BI3-6	BRAID	screen
BI3-7	BI16-8			BI-S1	BI2-13		
BI3-8	BI16-6				BI3-1		
BI3-9	BI16-7				BI3-7		
BI3-10	BI-87				BI3-8		
BI3-11	BI-91				BI7-1		
BI3-12	BI-B3	BRAID	screen		BI7-11		
	BI-B4				BI7-12		
BI3-13	BI-17				BI7-13		
BI3-14	BI-5				BI7-14		
BI3-15	BI-6				BI7-2		
BI3-16	BI51-2				BI7-3		
BI3-17	BI57-4			BI-S2	BI-S6		
BI3-18	BI-85	WK	0.5		BI2-1		
BI3-19	BI-S5				BI2-2		
BI3-2					BI2-3		
BI3-20	BI14	W Inner	0.5		BI2-4		
BI3-21	BI-95				BI2-5		
BI3-22	BI17-3	RN	0.5		BI3-2		
BI3-23					BI3-3		
BI3-24	BI24	B	2.0		BI3-4		
BI3-25					BI3-5		
BI3-3	BI25			BI-S5	BI2-1	UB	0.5
BI3-4	BI34-36				BI7-5	UB	0.5
BI3-5	BI34-35				BI15-3		
BI3-6	BI-36			BI-S4	BI2-		
BI3-7	BI-35				BI2-	W Inner	
BI3-8	BI-87				BI2-		
BI3-9	BI-85			BI-S5	BI2-7		
BI4-1	BI-87				BI2-8		
BI4-2	BI-85				BI2-9		
BI4-3	BI-87				BI2-10		
BI4-4	BI-85				BI2-5		
BI5-1	BI-92			BI-S6	BI5-2		
BI5-2	BI-93				BI5-4		
BI5-3	BI-92				BI5-2		
BI5-4	BI-93			EI-S7	BI-9		
BI6-1	BI-84				BI-8		
BI6-2	BI-83				BI-83		
BI6-3	BI-84				BI-9		
BI6-4	BI-83			BI-S8	BI-51		
BI7-1	BI-87				BI24		
BI7-2	BI-85				BI53		
BI7-3	BI-87						
BI7-4	BI-85			BI-S1 W	BI21	PK	60 85
BI7-5	BI-93			BI-S1 U			60 86
BI7-6				BI-R 4	BI20	RS	60 85
BI7-7	BI3-20	W Inner	0.5	BI-R 3	RS7-5		60 86
BI7-8							
BI8-1	BI-B4	BK	0.5				
BI8-2	BI-B3						
BI8-3	BI-B4	UB	0.5				
BI8-4	BI-B3						
BI8-5	BI-B3						
BI8-6	BI-B4						
BI8-7	BI-B3						
BI8-8	BI-B4						
BI9-1	BI-B3						
BI9-2	BI-B4						
BI9-3	BI-B3						
BI9-4	BI-B4						
BI9-5	BI-B3						
BI9-6	BI-B4						

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ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 2.9 LI LHD CATALYST
CONNECTOR LOCATION 90.50.21/CL



ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 2.9 LI (RHD)
HARNESS SCHEOULE 90.50.21/HS — LOCATION & ACCESS 90.50.21#LA

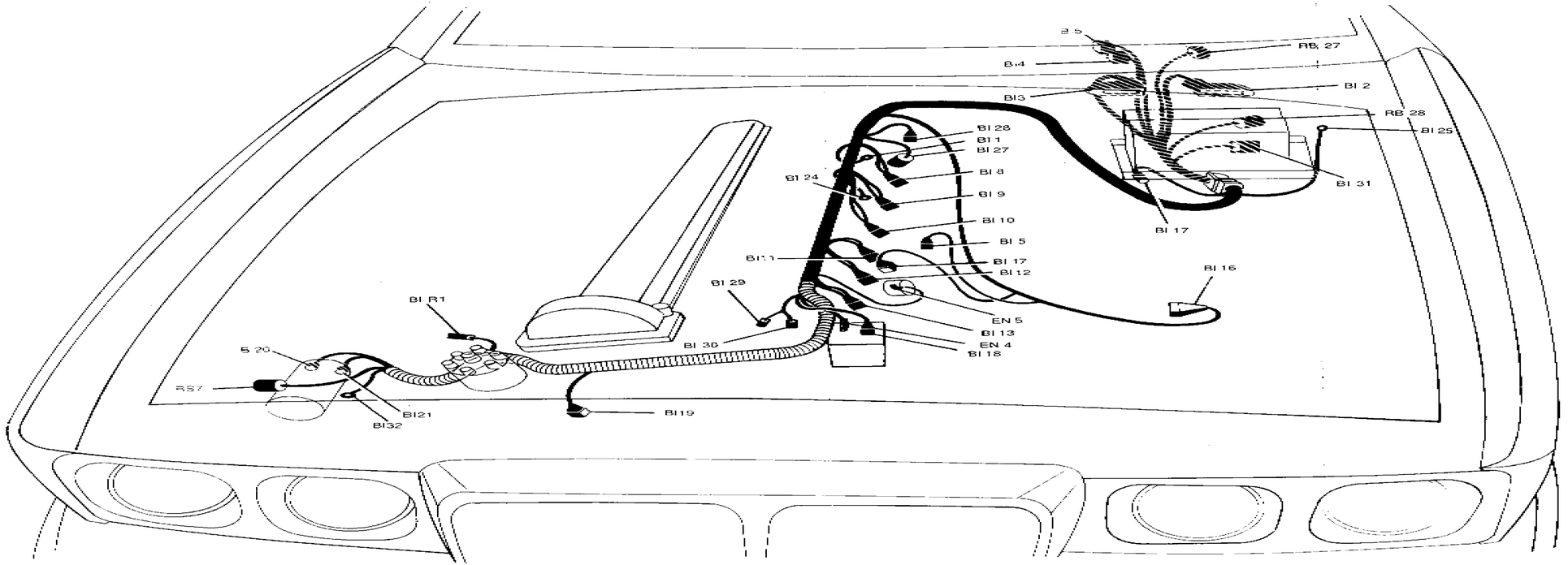
Connector No	Description	Interface	Location	Access
RB27	Yellow 6-way PMHD plug	Harness LB	Front passenger footwell	Front passenger dash liner
RB28	Yellow 6-way PM4 socket	Harness LB	Front passenger footwell	Front passenger dash liner
BI1	Eyelet Power earth	Engine, top		Engine compartment, above
BI2	Black 25-way Bosch socket	Ignition ECU	Front passenger footwell	Front passenger dash liner
BI3	Black 25-way Bosch socket	PI ECU	Front passenger footwell	Front passenger dash liner
BI4	Red relay base	Main relay	Front passenger footwell	Fuseblock cover
BI5	Yellow relay base	Pump relay	Front passenger footwell	Fuseblock cover
BI7	Black 3-way Bosch socket	Idle speed control test pin	Engine, LH side	Engine compartment, above
BI8	Yellow 2-way Bosch socket	Injector 6	Engine, top	Engine compartment, above
BI9	Yellow 2-way Bosch socket	Injector 5	Engine, top	Engine compartment, above
BI10	Yellow 2-way Bosch socket	Injector 4	Engine, top	Engine compartment, above
BI11	Yellow 2-way Bosch socket	Injector 3	Engine, top	Engine compartment, above
BI12	Yellow 2-way Bosch socket	Injector 2	Engine, top	Engine compartment, above
EI13	Yellow 2-way Bosch socket		Engine, LH side	Engine compartment, above
BI15	Black 3-way Bosch socket	Throttle switch	Engine, LH side	Engine compartment, above
BI16	Black 6-way Bosch socket	Air mass flowmeter	Engine, top	Engine compartment, above
BI17	Grey 3-way Bosch socket	Idle speed actuator		
BI18	Black 2-way Bosch socket	Coolant temperature sensor		
BI19	Black 3-way Bosch socket	Crankshaft sensor	Engine, top	Engine compartment, above
BI20	Eyelet	Ignition coil	Engine, front	Engine compartment, above
BI21	Eyelet	Ignition coil	Engine, RH side	Engine compartment, above
BI24	Eyelet	Power earth	Engine, RH side	Engine compartment, above
BI25	Eyelet	Battery terminal post	Engine, top	Engine compartment, above
BI27	Black 3-way PM4 socket	Link lead solenoid valve	Bulkhead	Engine compartment, above
BI28	Blue 2-way socket	Solenoid value	Bulkhead	Engine compartment, above
BI29	Angled lucar connector	Temperature switch		Engine compartment, above
BI30	Angled lucar connector	Temperature switch		Engine compartment, above
EI31	Black 4-way socket	Vacuum advance timer		Front passenger dash liner
BI32	Eyelet	Power earth	Engine, RH side	Engine compartment, above
RS7	Yellow 9-way PM4 plug	Harness side	Engine, RH side	Engine compartment, above
EN4	Lucar (white)	Water temperature transmitter	Engine, top	Engine compartment, above
EN5	Lucar (white)	Oil pressure transmitter	Engine, LH side	Engine compartment, above
BI-R1	Resistor		Engine compartment	Engine compartment above

WIRING SCHEDULE 90.50.21/WS

From	To	Colour	Size (mm²)
Wire No.	Mech.	Code	Querschnitt
Pin	A	Colour	Section
Wire No.	Mech.	Code	Querschnitt
Pin	A	Colour	Section
Circuit	Mech.	Color	Tamano

From	To	Colour	Size (mm²)
Wire No.	Mech.	Code	Querschnitt
Pin	A	Couleur	Section
Wire No.	Mech.	Code	Mesr.
Pin	A	Colore	Sezione
Circuit	Mech.	Color	Tamano

ENGINE MANAGEMENT & GEARBOX HARNESS 2.9 LI RHD
CONNECTOR LOCATION 90.50.21/CL



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ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 2.9 LI (LHD)

HARNESS SCHEDULE 90.50.21/HS

Connector No	Description	Interface
RB27	Yellow 8-way PM HD plug	Harness LE
RB28	Yellow 8-way PM4 socket	Harness LE
BI1	Eyelet	Power earth
BI2	Black 26-way Bosch socket	Ignition ECU
BI3	Black 25-way Bosch socket	PI ECU
BI4	Red relay base	Main relay
BI5	Yellow relay base	Pump relay
BI3	Black 3-way Bosch socket	compression test pin
BI6	Yellow 2-way Bosch socket	Injector 6
BI9	Yellow 2-way Bosch socket	Injector 5
BI10	Yellow 2-way Bosch socket	Injector 4
BI11	Yellow 2-way Bosch socket	Injector 3
BI12	Yellow 2-way Bosch socket	Injector 2
BI13	Yellow 2-way Bosch socket	Injector 1
BI15	Black 3-way Bosch socket	Throttle switch
BI16	Black 6-way Bosch socket	Air mass flowmeter
BI17	Gray 3-way Bosch socket	Idle speed actuator
BI16	Black 2-way Bosch socket	Coolant temp. sensor
BI19	Black 3-way Bosch socket	Crankshaft sensor
BI20	Eyelet	Ignition coil
BI21	Eyelet	Ignition coil
BI24	Eyelet	Power earth
BI25	Eyelet	Battery terminal post
BI27	Black 3-way PM4 socket	Link lead solenoid valve
BI28	Blue 2-way socket	Solenoid valve
BI29	Angled lucar connector	Temp. switch
BI30	Angled lucar connector	Temp. switch
BI31	Black 4-way socket	Vacuum advance timer
BI32	Eyelet Power earth	
BS7	Tallow 9-way PM4 plug	Harness si—
EN4	Lucar (white)	Water temp. transmitter
EN5	Lucar (white)	Oil pressure transmitter
BI-R1	Resistor	

LOCATION & ACCESS 90.50.21/LA

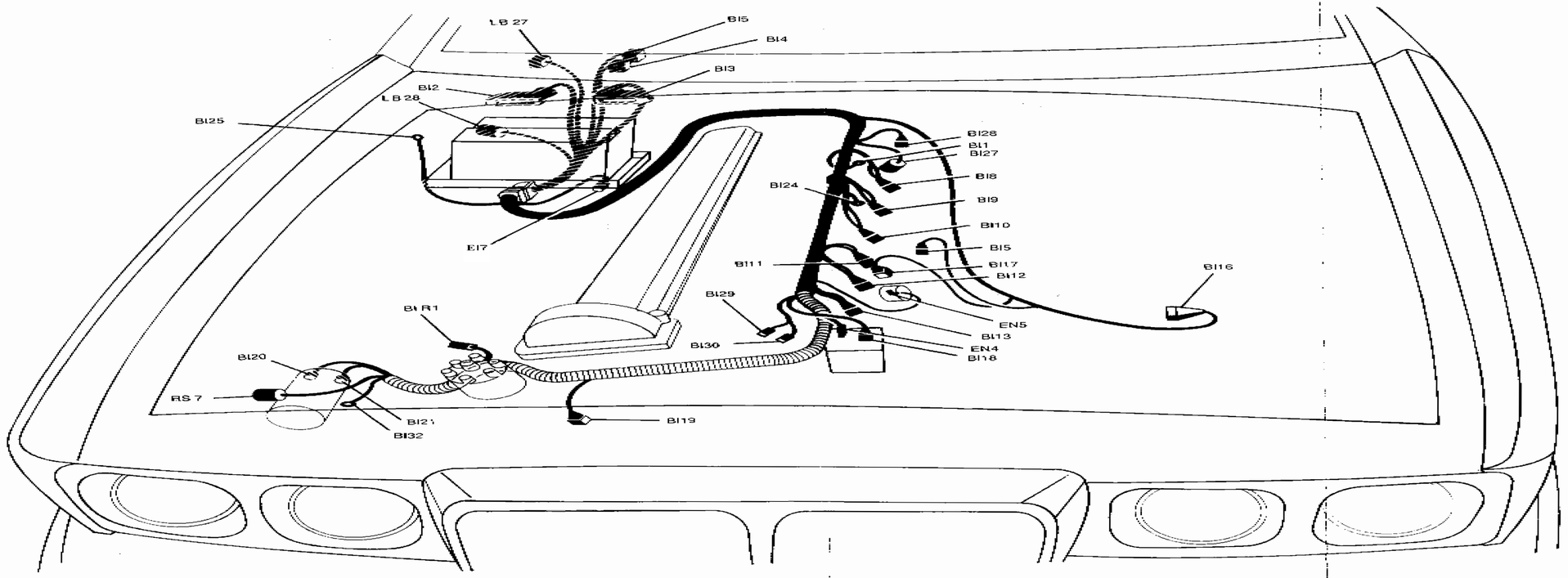
Location	Access
Front passenger footwell	Front passenger dash liner
Front passenger footwell	Front passenger dash liner
Engine, top	Engine compartment, above
Front passenger footwell	Front passenger dash liner
Front passenger footwell	Front passenger dash liner
Front passenger footwell	Fuseblock cover
	Fuseblock cover
Engine, LH side	Engine compartment, above
Engine, top	Engine compartment, above
Engine, top	Engine compartment,
Engine, top	Engine compartment, above
Engine, top	Engine compartment, above
Engine, top	Engine compartment, above
Engine, top	Engine compartment, above
Engine, LH side	Engine compartment, above
Engine. LH side	Engine compartment, above
Engine. top	Engine compartment, above
Engine. top	Engine compartment, above
Engine. front	Engine compartment, above
Engine, RH side	Engine compartment, above
Engine, RH side	Engine compartment, above
	Engine compartment, above
Bulkhead	Engine compartment, above
Bulkhead	Engine compartment, above
	Engine compartment, above
	Engine compartment, above
	Engine compartment, above
	Front passenger dash liner
Engine, RH side	Engine compartment, above
	Engine compartment, above
Engine. top	Engine compartment, above
Engine, LH side	Engine compartment, above
Engine compartment	Engine compartment, above

WIRING SCHEDULE 90.50.21/WS

Start	To	Cable	Section
Wire	Mark	Path	Guage mm
Pin	A	Colour	Socket
Wire	Mark	Wire	Mark
Pin	A	Colour	Socket
Datum	Point	Colour	Terminal
RB27-1	EI51	XB	0.5
RB27-2			
RB27-3			
RB27-4	BI3-16	BU	0.5
RB27-5			
RB27-6			
RB28-1	BI15	WK	2.0
RB28-2	BI15	GR	2.0
RB28-3			
RB28-4			
RB28-5			
RB28-6			
BI1	BI17-2	V	2.0
	BI21	B	6.0
	BI25-4	B	6.0
	BI24	B	6.0
	BI25-3	B	6.0
	BI25-1	B	6.0
	BI30-1	B	6.0
	BI31-3	B	6.0
BI2-1	31-54	G	2.0
BI2-2			
BI2-3	BI3-3	B	0.5
BI2-4			
BI2-5			
BI2-6			
BI2-7			
BI2-8			
BI2-9			
BI2-10			
BI2-11			
BI2-12			
BI2-13			
BI2-14			
BI2-15			
BI2-16			
BI2-17			
BI2-18			
BI2-19			
BI2-20			
BI2-21			
BI2-22			
BI2-23			
BI2-24			
BI2-25			
BI3-1	EI3-1	U Inner	0.5
BI3-2			
BI3-3			
BI3-4			
BI3-5			
BI3-6			
BI3-7			
BI3-8			
BI3-9			
BI3-10			
BI3-11			
BI3-12			
BI3-13			
BI3-14			
BI3-15			
BI3-16			
BI3-17			
BI3-18			
BI3-19			
BI3-20			
BI3-21			
BI3-22			
BI3-23			
BI3-24			
BI3-25			
BI4-1	BI1	B	2.0
BI4-2	BI24	B	2.0
BI4-3			
BI4-4			
BI4-5	BI3-2	US	0.5
BI5-1	BI18-2	BRAID	0.5
BI5-2	EI13-3	BRAID	0.5
BI5-3			
BI5-4			
BI5-5	BI18-2	UK	0.5
BI5-6	BI-S5	WK	2.0
BI5-7	BI3-24	SS Inner	0.5
BI5-8	BI16-1	SS	0.5
BI5-9	BI24	B	2.0
BI6-1	BI4-2	BRAID	0.5
BI6-2	BI1		
BI6-3	BI16-2		
BI6-4	BI16-1		
BI6-5	BI17-1		
BI6-6	BI17-2		
BI6-7	BI17-3		
BI6-8	BI4-5		
BI6-9	BI7-3		
BI6-10	BI7-4		
BI6-11	BI4-3		
BI6-12	BI4-4		
BI6-13			
BI6-14			
BI6-15			
BI6-16			
BI6-17			
BI6-18			
BI6-19			
BI6-20			
BI6-21			
BI6-22			
BI6-23			
BI6-24			
BI6-25			
BI7-1	BI4-5		
BI7-2	BI4-6		
BI7-3	BI4-7		
BI7-4	BI4-8		
BI7-5	BI4-9		
BI7-6	BI4-10		
BI7-7	BI4-11		
BI7-8	BI4-12		
BI7-9	BI4-13		
BI7-10	BI4-14		
BI7-11	BI4-15		
BI7-12	BI4-16		
BI7-13	BI4-17		
BI7-14	BI4-18		
BI7-15	BI4-19		
BI7-16	BI4-20		
BI7-17	BI4-21		
BI7-18	BI4-22		
BI7-19	BI4-23		
BI7-20	BI4-24		
BI7-21	BI4-25		
BI7-22	BI4-26		
BI7-23	BI4-27		
BI7-24	BI4-28		
BI7-25	BI4-29		
BI8-1	BI4-30		
BI8-2	BI4-31		
BI8-3	BI4-32		
BI8-4	BI4-33		
BI8-5	BI4-34		
BI8-6	BI4-35		
BI8-7	BI4-36		
BI8-8	BI4-37		
BI8-9	BI4-38		
BI8-10	BI4-39		
BI8-11	BI4-40		
BI8-12	BI4-41		
BI8-13	BI4-42		
BI8-14	BI4-43		
BI8-15	BI4-44		
BI8-16	BI4-45		
BI8-17	BI4-46		
BI8-18	BI4-47		
BI8-19	BI4-48		
BI8-20	BI4-49		
BI8-21	BI4-50		
BI8-22	BI4-51		
BI8-23	BI4-52		
BI8-24	BI4-53		
BI8-25	BI4-54		
BI9-1	BI4-55		
BI9-2	BI4-56		
BI9-3	BI4-57		
BI9-4	BI4-58		
BI9-5	BI4-59		
BI9-6	BI4-60		
BI9-7	BI4-61		
BI9-8	BI4-62		
BI9-9	BI4-63		
BI9-10	BI4-64		
BI9-11	BI4-65		
BI9-12	BI4-66		
BI9-13	BI4-67		
BI9-14	BI4-68		
BI9-15	BI4-69		
BI9-16	BI4-70		
BI9-17	BI4-71		
BI9-18	BI4-72		
BI9-19	BI4-73		
BI9-20	BI4-74		
BI9-21	BI4-75		
BI9-22	BI4-76		
BI9-23	BI4-77		
BI9-24	BI4-78		
BI9-25	BI4-79		
BI10-1	BI4-80		
BI10-2	BI4-81		
BI10-3	BI4-82		
BI10-4	BI4-83		
BI10-5	BI4-84		
BI10-6	BI4-85		
BI10-7	BI4-86		
BI10-8	BI4-87		
BI10-9	BI4-88		
BI10-10	BI4-89		
BI10-11	BI4-90		
BI10-12	BI4-91		
BI10-13	BI4-92		
BI10-14	BI4-93		
BI10-15	BI4-94		
BI10-16	BI4-95		
BI10-17	BI4-96		
BI10-18	BI4-97		
BI10-19	BI4-98		
BI10-20	BI4-99		
BI10-21	BI4-100		
BI10-22	BI4-101		
BI10-23	BI4-102		
BI10-24	BI4-103		
BI10-25	BI4-104		
BI11-1	BI4-105		
BI11-2	BI4-106		
BI11-3	BI4-107		
BI11-4	BI4-108		
BI11-5	BI4-109		
BI11-6	BI4-110		
BI11-7	BI4-111		
BI11-8	BI4-112		
BI11-9	BI4-113		
BI11-10	BI4-114		
BI11-11	BI4-115		
BI11-12	BI4-116		
BI11-13	BI4-117		
BI11-14	BI4-118		
BI11-15	BI4-119		
BI11-16	BI4-120		
BI11-17	BI4-121		
BI11-18	BI4-122		
BI11-19	BI4-123		
BI11-20	BI4-124		
BI11-21	BI4-125		
BI11-22	BI4-126		
BI11-23	BI4-127		
BI11-24	BI4-128		
BI11-25	BI4-129		
BI12-1	BI4-130		
BI12-2	BI4-131		
BI12-3	BI4-132		
BI12-4	BI4-133		
BI12-5	BI4-134		
BI12-6	BI4-135		
BI12-7	BI4-136		
BI12-8	BI4-137		
BI12-9	BI4-138		
BI12-10	BI4-139		
BI12-11	BI4-140		
BI12-12	BI4-141		
BI12-13	BI4-142		
BI12-14	BI4-143		
BI12-15	BI4-144		
BI12-16	BI4-145		
BI12-17	BI4-146		
BI12-18	BI4-147		
BI12-19	BI4-148		
BI12-20	BI4-149		
BI12-21	BI4-150		
BI12-22	BI4-151		
BI12-23	BI4-152		
BI12-24	BI4-153		
BI12-25	BI4-154		
BI13-1	BI4-155		
BI13-2	BI4-156		
BI13-3	BI4-157		
BI13-4	BI4-158		
BI13-5	BI4-159		
BI13-6	BI4-160		
BI13-7	BI4-161		
BI13-8	BI4-162		
BI13-9	BI4-163		
BI13-10	BI4-164		
BI13-11	BI4-165		
BI13-12	BI4-166		
BI13-13	BI4-167		
BI13-14	BI4-168		
BI13-15	BI4-169		
BI13-16	BI4-170		
BI13-17	BI4-171		
BI13-18	BI4-172		
BI13-19	BI4-173		
BI13-20	BI4-174		
BI13-21	BI4-175		
BI13-22	BI4-176		
BI13-23	BI4-177		
BI13-24	BI4-178		
BI13-25	BI4-179		
BI14-1	BI4-180		
BI14-2	BI4-181		
BI14-3	BI4-182		
BI14-4	BI4-183		
BI14-5	BI4-184		
BI14-6	BI4-185		
BI14-7	BI4-186		
BI14-8	BI4-187		
BI14-9	BI4-188		
BI14-10	BI4-189		
BI14-11	BI4-190		
BI14-12	BI4-191		
BI14-13	BI4-192		
BI14-14	BI4-193		
BI14-15	BI4-194		
BI14-16	BI4-195		
BI14-17	BI4-196		
BI14-18	BI4-197		
BI14-19	BI4-198		
BI14-20	BI4-199		
BI14-21	BI4-200		
BI14-22	BI4-201		
BI14-23	BI4-202		
BI14-24	BI4-203		
BI14-25	BI4-204		
BI15-1	BI4-205		
BI15-2	BI4-206		
BI15-3	BI4-207		
BI15-4	BI4-208		
BI15-5	BI4-209		
BI15-6	BI4-210		
BI15-7	BI4-211		
BI15-8	BI4-212		
BI15-9	BI4-213		
BI15-10	BI4-214		
BI15-11	BI4-215		
BI15-12	BI4-216		
BI15-13	BI4-217		
BI15-14	BI4-218		
BI15-15	BI4-219		
BI15-16	BI4-220		
BI15-17	BI4-221		
BI15-18	BI4-222		
BI15-19	BI4-223		
BI15-20	BI4-224		
BI15-21	BI4-225		
BI15-22	BI4-226		
BI15-23	BI4-227		
BI15-24	BI4-228		
BI15-25	BI4-229		
BI16-1	BI4-230		
BI16-2	BI4-231		
BI16-3	BI4-232		
BI16-4	BI4-233		
BI16-5	BI4-234		
BI16-6	BI4-235		
BI16-7	BI4-236		
BI16-8	BI4-237		
BI16-9	BI4-238		
BI16-10	BI4-239		
BI16-11	BI4-240		
BI16-12	BI4-241		
BI16-13	BI4-242		
BI16-14	BI4-243		
BI16-15	BI4-244		
BI16-16	BI4-245		
BI16-17	BI4-246		
BI16-18	BI4-247		
BI16-19	BI4-248		
BI16-20	BI4-249		
BI16-21	BI4-250		
BI16-22	BI4-251		
BI16-23	BI4-252		
BI16-24	BI4-253		
BI16-25	BI4-254		

Start	To	Cable	Section
Wire	Mark	Path	Guage mm
Pin	A	Colour	Socket
Wire	Mark	Wire	Mark
Pin	A	Colour	Socket
Datum	Point	Colour	Terminal
EI17-1	BI3-10	GN	0.5
EI17-2	BI3-11	BU	0.5
EI17-3	BI3-26	WH	0.5
BI18-1	BI3-3	YK	0.5
BI18-2	BI2-5		
BI19-1	BI2-7	Inner	0.5
BI19-2	BI3-18	Inner	0.5
BI19-3	BI3-30	BRAID	Screen
BI20	BI-S1-3	WK	2.0
	BI-S4-1	WK	2.0
BI21	BI-S6-1	YK	2.0
	BI-S1-W		
BI24	BI3-24	BRAID	Screen
	BI3-25		
	BI2-14		
	BI7-1		
BI25	BI4-30	W	2.0
	BI6-30	W	2.0
	RB26-6	W	2.0
	BI-S6-2	YK	2.0
	BI-S1-2	YK	2.0
BI29	BI3-4	UG	0.5
BI30	31*	B	0.5
BI31-1	BI-S5	YK	2.0
BI31-2	BI-S6-2	YK	2.0
BI31-4	BI29	UG	0.5
BI32	BI1	B	0.5
A/R-1	EN3	GR	0.5
A/R-2	EN4	BK	0.5
A/R-3			
A/R-4	BI-S6	YK	2.0
A/R-5	BI-S1-A	YK	2.0
RS7-1			
RS7-2	BI-S6-3	BK	2.0
RS7-3	BI-S6-4	BK	2.0
RS7-4	BI-S6-5	BK	2.0
RS7-5	BI-S1-4	BK	2.0
RS7-6	BI-S1-5	BK	2.0
RS7-7	BI-S1-6	BK	2.0
RS7-8	BI-S1-7	BK	2.0
EM4	RS7-2	BK	0.5
EM5	RS7-1	BK	0.5
BI-B1	e1-31	BRAID	Screen
BI-B2	BI3-1	BRAID	Screen
	BI-B2	BRAID	Screen
BI-E1	BI-S1-8	YK	2.0
	BI-S2-1	YK	2.0
	BI-S2-2	YK	2.0
	BI-S2-3	YK	2.0
	BI-S2-4	YK	2.0
	BI-S2-5	YK	2.0
	BI-S2-6	YK	2.0
	BI-S2-7	YK	2.0
	BI-S2-8	YK	2.0
BI-S2	BI-S2-9	YK	2.0
	BI-S2-10	YK	2.0
	BI-S2-11	YK	2.0
	BI-S2-12	YK	2.0
	BI-S2-13	YK	2.0
	BI-S2-14	YK	2.0
	BI-S2-15	YK	2.0
	BI-S2-16	YK	2.0
	BI-S2-17	YK	2.0
	BI-S2-18	YK	2.0
	BI-S2-19	YK	2.0
	BI-S2-20	YK	2.0
	BI-S2-21	YK	2.0
	BI-S2-22	YK	2.0
	BI-S2-23	YK	2.0
	BI-S2-24	YK	2.0
	BI-S2-25	YK	2.0
BI-S3	BI-S3-1	YK	2.0
	BI-S3-2	YK	2.0
	BI-S3-3	YK	2.0
	BI-S3-4	YK	2.0
	BI-S3-5	YK	2.0
BI-S4	BI-S4-2	YK	2.0
	BI-S4-3	YK	2.0
BI-S5	BI-S5-1	YK	2.0
	BI-S5-2	YK	2.0
	BI-S5-3	YK	2.0
	BI-S5-4	YK	2.0
	BI-S5-5	YK	2.0
	BI-S5-6	YK	2.0
	BI-S5-7	YK	2.0
BI-S6	BI-S6-1	YK	2.0
	BI-S6-2	YK	2.0
	BI-S6-3	YK	2.0
BI-S7	BI-S7-1	YK	2.0
	BI-S7-2	YK	2.0
	BI-S7-3	YK	2.0
	BI-S7-4	YK	2.0
	BI-S7-5	YK	2.0
BI-S1-U	BI-S1-1	YK	2.0
BI-S1-W	BI-S1-W	YK	2.0
BI-S1-A	BI-S1-A	YK	2.0
BI-S1-B	BI-S1-B	YK	2.0
	BI-S1-C	YK	2.0
	BI-S1-D	YK	2.0
	BI-S1-E	YK	2.0
	BI-S1-F	YK	2.0
	BI-S1-G	YK	2.0
	BI-S1-H	YK	2.0
	BI-S1-J	YK	2.0
	BI-S1-K	YK	2.0
	BI-S1-L	YK	2.0
	BI-S1-M	YK	2.0
	BI-S1-N	YK	2.0
	BI-S1-P	YK	2.0
	BI-S1-R	YK	2.0
	BI-S1-S	YK	2.0
	BI-S1-T	YK	2.0
	BI-S1-U	YK	2.0
	BI-S1-V	YK	2.0
	BI-S1-W	YK	2.0
	BI-S1-X	YK	2.0
	BI-S1-Y	YK	2.0
	BI-S1-Z	YK	2.0
	BI-S1-AA	YK	2.0
	BI-S1-AB	YK	2.0
	BI-S1-AC	YK	2.0
	BI-S1-AD	YK	2.0
	BI-S1-AE	YK	2.0
	BI-S1-AF	YK	2.0
	BI-S1-AG	YK	2.0
	BI-S1-AH	YK	2.0
	BI-S1-AJ	YK	2.0
	BI-S1-AK	YK	2.0
	BI-S1-AL	YK	2.0
	BI-S1-AM	YK	2.0
	BI-S1-AN	YK	2.0
	BI-S1-AP	YK	2.0
	BI-S1-AR	YK	2.0
	BI-S1-AS	YK	2.0
	BI-S1-AT	YK	2.0
	BI-S1-AU	YK	2.0
	BI-S1-AV	YK	2.0
	BI-S1-AW	YK	2.0
	BI-S1-AX	YK	2.0
	BI-S1-AY	YK	2.0
	BI-S1-AZ	YK	2.0
	BI-S1-BA	YK	2.0
	BI-S1-BB	YK	2.0
	BI-S1-BC	YK	2.0
	BI-S1-BD	YK	2.0
	BI-S1-BE	YK	2.0
	BI-S1-BF	YK	2.0
	BI-S1-BG	YK	2.0
	BI-S1-BH	YK	2.0
	BI-S1-BJ	YK	2.0
	BI-S1-BK	YK	2.0
	BI-S1-BL	YK	2.0
	BI-S1-BM	YK	2.0
	BI-S1-BN	YK	2.0
	BI-S1-BP	YK	2.0
	BI-S1-BR	YK	2.0
	BI-S1-BS	YK	2.0
	BI-S1-BT	YK	2.0
	BI-S1-BU	YK	2.0
	BI-S1-BV	YK	2.0
	BI-S1-BW	YK	2.0
	BI-S1-BX	YK	2.0
	BI-S1-BY	YK	2.0
	BI-S1-BZ	YK	2.0
	BI-S1-CA	YK	2.0
	BI-S1-CB	YK	2.0
	BI-S1-CC	YK	2.0
	BI-S1-CD	YK	2.0
	BI-S1-CE	YK	2.0
	BI-S1-CF	YK	2.0
	BI-S1-CG	YK	2.0
	BI-S1-CH	YK	2.0
	BI-S1-CJ	YK	2.0
	BI-S1-CK	YK	2.0
	BI-S1-CL	YK	2.0
	BI-S1-CM	YK	2.0
	BI-S1-CN	YK	2.0
	BI-S1-CP	YK	2.0
	BI-S1-CR	YK	2.0
	BI-S1-CS	YK	2.0
	BI-S1-CT	YK	2.0
	BI-S1-CU	YK	2.0
	BI-S1-CV	YK	2.0
	BI-S1-CW	YK	2.0
	BI-S1-CX	YK	2.0
	BI-S1-CY	YK	2.0
	BI-S1-CZ	YK	2.0
	BI-S1-DA	YK	2.0
	BI-S1-DB	YK	2.0
	BI-S1-DC	YK	2.0
	BI-S1-DD	YK	2.0
	BI-S1-DE	YK	2.0
	BI-S1-DF	YK	2.0
	BI-S1-DG	YK	2.0
	BI-S1-DH	YK	2.0
	BI-S1-DJ	YK	2.0
	BI-S1-DK	YK	2.0
	BI-S1-DL	YK	2.0
	BI-S1-DM	YK	2.0
	BI-S1-DN	YK	2.0
	BI-S1-DP	YK	2.0
	BI-S1-DR	YK	2.0
	BI-S1-DS	YK	2.0
	BI-S1-DT	YK	2.0
	BI-S1-DU	YK	2.0
	BI-S1-DV	YK	2.0
	BI-S1-DW	YK	2.0
	BI-S1-DX	YK	2.0
	BI-S1-DY	YK	2.0
	BI-S1-DZ	YK	2.0
	BI-S1-EA	YK	2.0
	BI-S1-EB	YK	2.0
	BI-S1-EC	YK	2.0
	BI-S1-ED	YK	2.0
	BI-S1-EE	YK	2.0
	BI-S1-EF	YK	2.0
	BI-S1-EG	YK	2.0
	BI-S1-EH	YK	2.0
	BI-S1-EJ	YK	2.0
	BI-S1-EK	YK	2.0
	BI-S1-EL	YK	2.0
	BI-S1-EM	YK	2.0
	BI-S1-EN	YK	2.0
	BI-S1-EP	YK	2.0
	BI-S1-ER	YK	2.0
	BI-S1-ES	YK	2.0
	BI-S1-ET	YK	2.0
	BI-S1-EU	YK	2.0
	BI-S1-EV	YK	2.0
	BI-S1-EW	YK	2.0
	BI-S1-EX	YK	2.0
	BI-S1-EY	YK	2.0
	BI-S1-EZ	YK	2.0
	BI-S1-FA	YK	2.0
	BI-S1-FB	YK	2.0
	BI-S1-FC	YK	2.0
	BI-S1-FD	YK	2.0
	BI-S1-FE	YK	2.0
	BI-S1-FF	YK	2.0
	BI-S1-FG	YK	2.0
	BI-S1-FH	YK	2.0
	BI-S1-FJ	YK	2.0
	BI-S1-FK	YK	2.0
	BI-S1-FL	YK	2.0
	BI-S1-FM	YK	2.0
	BI-S1-FN	YK	2.0
	BI-S1-FP	YK	2.0
	BI-S1-FR	YK	2.0
	BI-S1-FS	YK	2.0
	BI-S1-FT	YK	2.0
	BI-S1-FU	YK	2.0
	BI-S1-FV	YK	2.0
	BI-S1-FW	YK	2.0
	BI-S1-FX	YK	2.0
	BI-S1-FY	YK	2.0
	BI-S1-FZ	YK	2.0
	BI-S1-GA	YK	2.0
	BI-S1-GB	YK	2.0
	BI-S1-GC	YK	2.0
	BI-S1-GD	YK	2.0
	BI-S1-GE	YK	2.0
	BI-S1-GF	YK	2.0
	BI-S1-GG	YK	2.0
	BI-S1-GH	YK	2.0
	BI-S1-GJ	YK	2.0
	BI-S1-GK	YK	2.0
	BI-S1-GL	YK	2.0
	BI-S1-GM	YK	2.0
	BI-S1-GN	YK	2.0
	BI-S1-GP	YK	2.0
	BI-S1-GR	YK	2.0
	BI-S1-GS	YK	2.0
	BI-S1-GT	YK	2.0
	BI-S1-GU	YK	2.0
	BI-S1-GV	YK	2.0
	BI-S1-GW	YK	2.0
	BI-S1-GX	YK	2.0
	BI-S1-GY	YK	2.0
	BI-S1-GZ	YK	2.0
	BI-S1-HA	YK	2.0
	BI-S1-HB	YK	2.0
	BI-S1-HC	YK	2.0
	BI-S1-HD	YK	2.0
	BI-S1-HE	YK	2.0
	BI-S1-HF	YK	2.0
	BI-S1-HG	YK	2.0
	BI-S1-HH	YK	2.0
	BI-S1-HJ	YK	2.0
	BI-S1-HK	YK	2.0
	BI-S1-HL	YK	2.0
	BI-S1-HM	YK	2.0
	BI-S1-HN	YK	2.0
	BI-S1-HP	YK	2.0
	BI-S1-HR	YK	2.0
	BI-S1-HS	YK	2.0
	BI-S1-HT	YK	2.0
	BI-S1-HU	YK	2.0
	BI-S1-HV	YK	2.0
	BI-S1-HW	YK	2.0
	BI-S1-HX	YK	2.0
	BI-S1-HY	YK	2.0
	BI-S1-HZ	YK	2.0
	BI-S1-JA	YK	2.0
	BI-S1-JB	YK	2.0
	BI-S1-JC	YK	2.0
	BI-S1-JD	YK	2.0
	BI-S1-JE	YK	2.0
	BI-S1-JF	YK	2.0
	BI-S1-JG	YK	2.0
	BI-S1-JH	YK	2.0
	BI-S1-JJ	YK	2.0
	BI-S1-JK	YK	2.0
	BI-S1-JL	YK	2.0
	BI-S1-JM	YK	2.0
	BI-S1-JN	YK	2.0
	BI-S1-JP	YK	2.0
	BI-S1-JR	YK	2.0
	BI-S1-JS	YK	2.0
	BI-S1-JT	YK	2.0
	BI-S1-JU	YK	2.0
	BI-S1-JV	YK	2.0
	BI-S1-JW	YK	2.0
	BI-S1-JX	YK	2.0
	BI-S1-JY	YK	2.0
	BI-S1-JZ	YK	2.0
	BI-S1-KA	YK	2.0
	BI-S1-KB	YK	2.0
	BI-S1-KC	YK	2.0
	BI-S1-KD	YK	2.0
	BI-S1-KE	YK	2.0
	BI-S1-KF	YK	2.0
	BI-S1-KG	YK	2.0
	BI-S1-KH	YK	2.0
	BI-S1-KJ	YK	2.0
	BI-S1-KK	YK	2.0
	BI-S1-KL	YK	2.0
	BI-S1-KM	YK	2.0
	BI-S1-KN	YK	2.0
	BI-S1-KP	YK	2.0
	BI-S1-KR	YK	2.0
	BI-S1-KS	YK	2.0
	BI-S1-KT	YK	2.0
	BI-S1-KU	YK	2.0
	BI-S1-KV	YK	2.0
	BI-S1-KW	YK	2.0
	BI-S1-KX	YK	2.0
	BI-S1-KY	YK	2.0
	BI-S1-KZ	YK	2.0
	BI-S1-LA	YK	2.0
	BI-S1-LB	YK	2.0
	BI-S1-LC	YK	2.0
	BI-S1-LD	YK	2.0
	BI-S1-LE	YK	2.0
	BI-S1-LF	YK	2.0
	BI-S1-LG	YK	2.0
	BI-S1-LH	YK	2.0
	BI-S1-LJ	YK	2.0
	BI-S1-LK	YK	2.0
	BI-S1-LL	YK	2.0
	BI-S1-LM	YK	2.0
	BI-S1-LN	YK	2.0
	BI-S1-LP	YK	2.0
	BI-S1-LR	YK	2.0
	BI-S1-LS	YK	2.0
	BI-S1-LT	YK	2.0
	BI-S1-LU	YK	2.0
	BI-S1-LV	YK	2.0
	BI-S1-LW	YK	2.0
	BI-S1-LX	YK	2.0
	BI-S1-LY	YK	2.0
	BI-S1-LZ	YK	2.0
	BI-S1-MA	YK	2.0
	BI-S1-MB	YK	2.0
	BI-S1-MC	YK	2.0
	BI-S1-MD	YK	2.0
	BI-S1-ME	YK	2.0
	BI-S1-MF	YK	2

ENGINE MANAGEMENT & AUTOMATIC GEARBOX HARNESS 2.9 LI LHD
CONNECTOR LOCATION 90.50.21/CL



AUTOMATIC TRANSMISSION HARNESS BOSCH BI (RHD)
HARNESS SCHEDULE 90.50.00/HS

Connector No	Description	Interface
GB1	Yellow PMHD 24 way socket	Gearbox selector switch connector
GB2	Black PMHD 15 way socket	J-Gate illumination module
GB3	Natural 6 way socket	Mode switch
GB4	Violet relay base socket	Gearbox power relay
GB5	55 way plug	Gearbox control ECU
GB6	26 way plug	Decoder module
GB10	Eyelet	Power earth
GB11	Green PM43 way plug	Bulkhead harness
B142	Green PMHD 15 way plug	Bulkhead harness
L145	Green PMHD 15 way plug	Engine management

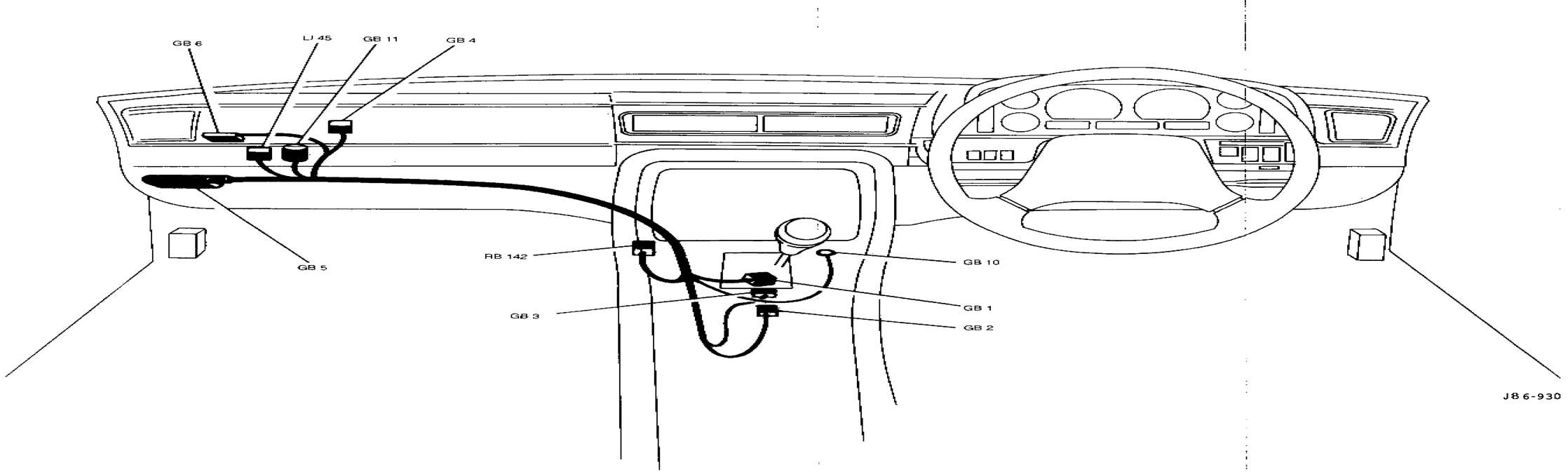
WIRING SCHEDULE 90.50.00/WS

From	To	Colour	Equipment
Von	Nach	Farbe	Ausrüstung
De	A	Couleur	Equipement
Van	Naar	Kleur	Materiaal
De	A	Colore	Materiale
Desde	Hasta	Color	Tenemo
GB1-1	GB1-W	BK	0.5
GB1-2	GB5-38	LGW	0.5
GB1-3	GB5-39	LGW	0.5
GB1-4	GB5-40	LGW	0.5
GB1-5	GB11-2-11	BRW	0.5
GB1-6	GB11-2-10	BRW	0.5
GB1-7	GB5-8	BK	0.5
GB1-8	GB5-7-8	BLG	0.5
GB1-9	GB5-7-9	VI	0.5
GB1-10	GB5-8	VI	1.0
GB1-11	GB5-34	VI	1.0
GB1-12	GB5-42	VI	1.0
GB1-13			
GB1-14	GEE-6	OG	0.5
GB1-15	GB5-28	R	0.5
GB1-16	GB6-2	VI	0.5
GB1-17			
GB1-18			
GB1-19	G3-6	LV	Inter
GB1-20			
GB1-21			
GB1-22			
GB1-23			
GB1-24			
GB2-1	GB-5	RS	0.5
GB2-2	Inhibit Plug		
GB2-3	GB6-1	SW	
GB2-4			
GB2-5	G3-6	WV	0.5
GB2-6	GB6-2	BU	0.5
GB2-7	GB-8	BR	0.5
GB2-8	GB6-5	BO	0.5
GB2-9			
GB2-10	GB6-15	SP	0.5
GB2-11			
GB2-12	GB6-3	BR	0.5
GB2-13	GB6-4	SR	0.5
GB2-14			
GB2-15	GB6-4	SY	0.5
GB3-1	GB5-43	BRN	BRN
GB3-2	GB-9	BS	BRN
GB3-3	GB-10	BB	0.5
GB3-4	GB-5	RS	0.5
GB3-5	Park Mode Indicator		
GB4-30	GB1-3	RS	0.5
GB4-86	GB-5	BK	0.5
GB4-87	B142-12	WK	0.5
GB4-87a	GB-6	NG	BRN 0.5
GB5-1	GB-5	BW	0.5
GB5-2	GB1-5	WU	0.5
GB5-3	GB1-6	PY	0.5
GB5-4	Brake Lamps	Test	
GB5-5	GB1-4	OS	0.5
GB5-6	GB-6	BU	0.5
GB5-7	L145-8	BU	0.5
GB5-8	L145-9	RS	0.5
GB5-9			
GB5-10	Process 3 Engine		
GB5-11			
GB5-12			
GB5-13	GB-8	LGP	0.5
GB5-14	L145-13	L	0.5
GB5-15	B142-4		0.5
GB5-16			
GB5-17	GB1-8	RW	2.5
GB5-18	GB-7	BW	Screen
GB5-19	L145-1	BW	0.5
GB5-20			
GB5-21	Fault Indicator		
GB5-22	GB1-11	VR	1.0
GB5-23	L145-2	VR	1.0
GB5-24	GB-5	B	1.0
GB5-25			
GB5-26			
GB5-27			
GB5-28			
GB5-29			
GB5-30			
GB5-31	L146-4	SU	0.5
GB5-32	GB-5	LGW	0.5
GB5-33			
GB5-34			
GB5-35			
GB5-36			
GB5-37	GB1-15	RG	0.5
GB5-38	GB11-2	RG	0.5
GB5-39			
GB5-40	GB11-1	SG	0.5
GB5-41	GB11-12	SW	0.5
GB5-42	GB1-1	SU	0.5
GB5-43	L145-3	WU	0.5
GB5-44			
GB5-45			
GB5-46			
GB5-47	GB-5	SB	0.5
GB5-48	GB-5	GO	0.5
GB5-49	L145-51	O	0.5
GB5-50			
GB5-51			
GB5-52			
GB6-1	GB2-3	BW	0.5
GB6-2	GB2-7	SU	0.5
GB6-3	GB2-13	RO	0.5
GB6-4	GB2-15	SR	0.5
GB6-5			
GB6-6			
GB6-7			
GB6-8	B142-13	US	0.5
GB6-9	GB5-6	WV	0.5
GB6-10	GB5-5	LGW	0.5
GB6-11	GB5-10	LGW	0.5
GB6-12	GB5-9	LGW	0.5
GB6-13	GB2-1	RS	0.5
GB6-14			

From	To	Colour	Equipment
Von	Nach	Farbe	Ausrüstung
De	A	Couleur	Equipement
Van	Naar	Kleur	Materiaal
De	A	Colore	Materiale
Desde	Hasta	Color	Tenemo
GB9-15	GB2-10	SP	0.5
GB9-16			
GB9-17			
GB9-18			
GB9-19			
GB9-20	GE-2	BK	0.5
GB9-21	GB-5	B	0.5
GB9-22			
GB9-23			
GB9-24			
GB9-25	B142-6	SB	0.5
GB9-26	L145-6	RG	0.5
GB10	GB-5	B	2.0
GB11-1	GB5-41	RR	0.5
GB11-2	GB5-38	NB	2.0
GB11-3	GB4-30	NG	2.0
B142-1	GB-5	BK	0.5
B142-2	Power ground Cruise control		
B142-3			
B142-4	GB2-15	SB	0.5
B142-5(2)	Interface		
B142-5(3)	GB5-25	SB	0.5
B142-7	GB-5	GB	0.5
B142-8	Cruise control		
B142-9	GB1-2	BLG	
B142-10	GB1-9	VWS	
B142-11	GB1-7	VWS	
B142-12	GB4-86	WK	
B142-13	GEE-3	LG	
B142-14	GE-3	RS	
	1st/2nd gear switch		
L145-1	GB5-7	BW	
L145-2	GB5-24	VR	
L145-3	GB5-41	WU	
L145-4	GB5-31	SU	
L145-5	GB5-42	VU	
L145-6	GB5-26	RG	
L145-8	GB5-3	PY	
L145-9			
L145-13	GB5-5	V	
L145-15	GB6-16		
L145-51			

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AUTOMATIC TRANSMISSION HARNESS BOSCH 8I (RHD)
CONNECTOR LOCATION 90.50.00/CL

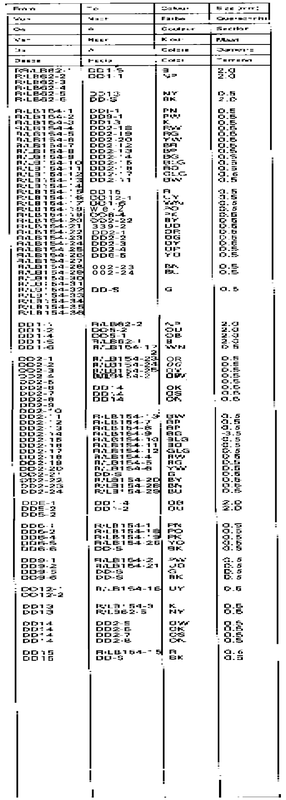


FRONT DOOR HARNESS DRIVER OD (RHD)
HARNESS SCHEDULE 90.50.07/HS

Connector No	Description			
RB/LB62	Black PM4 6 way plug	Bulkhead harness	'A' past, driver side	Driver dash liner
RB/LB154	Black PMHD 36 way sacker	Bulkhead harness	'A' post, driver side	Driver dash liner
DD1	Yellow PM4 8 way socket	Drivers door panel	Driver door	Door trim pad, lower
DD2	Yellow PMHD 24 way socket	Drivers door panel	Driver door	Door trim pad, lower
DD5	Black 3 way socket	Window lift motor	Driver door	Door trim pad, lower
DD6	Yellow PM4 6 way socket	Door lock actuator	Driver do—	Door trim pad, lower
DD9	Black PM4 6 way socket	Door switch		
DD12	Blue 2 way socket	Drivers door panel	Driver door	Door trim pad, lower
DD13	Blue 2 way plug	Door mirror	Driver door	Door trim pad, lower
DD	Yellow 4 way plug	Door mirror	Driver door	Door trim pad, lower
DD 5	Black 2 way socket	Door key switch	Driver door	Door trim pad, lower

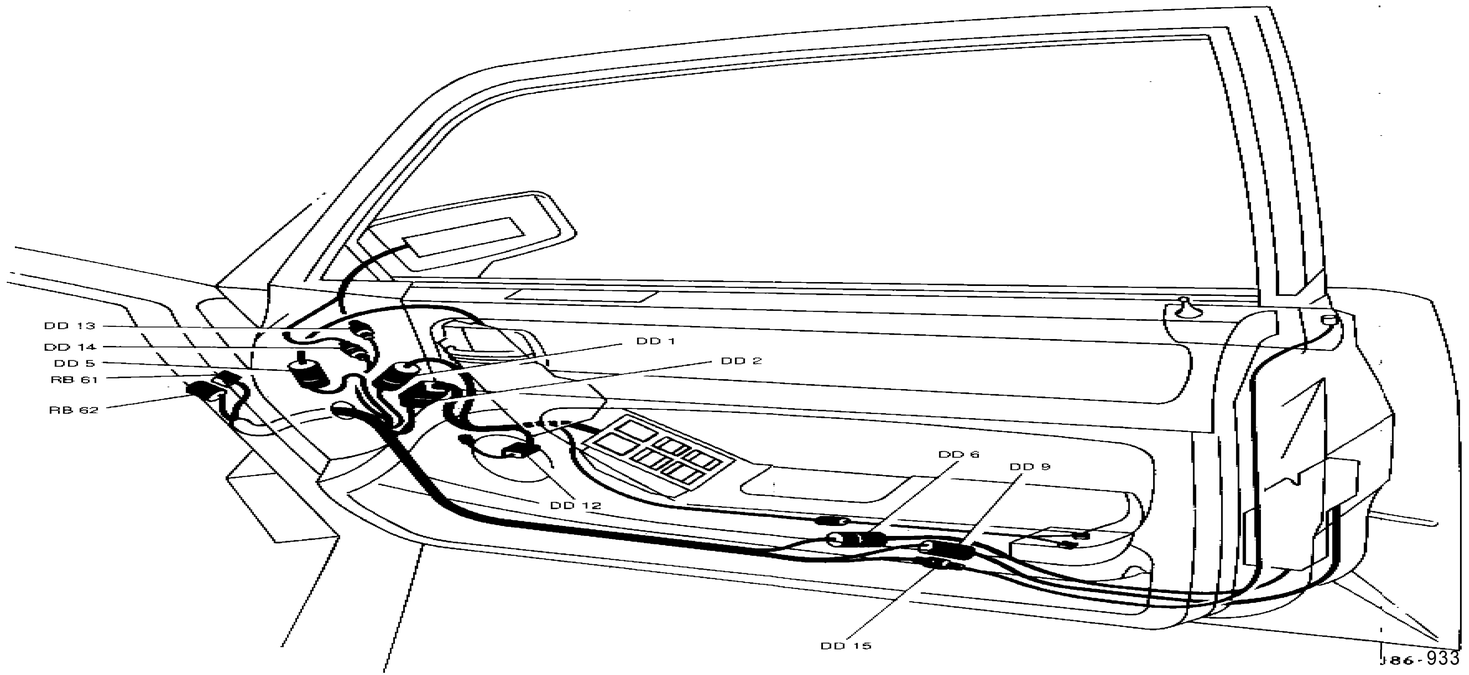
LOCATION & ACCESS 90.50.07/LA

WIRING SCHEDULE 90.50.07/WS



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FRONT DOOR HARNESS DRIVER DD (RHD)
CONNECTOR LOCATION 90.50.07/CL



FRONT DOOR HARNESS PASSENGER PD RHD
HARNESS SCHEDULE 90.50.08/HS

LOCATION & ACCESS 90.50.08/LA

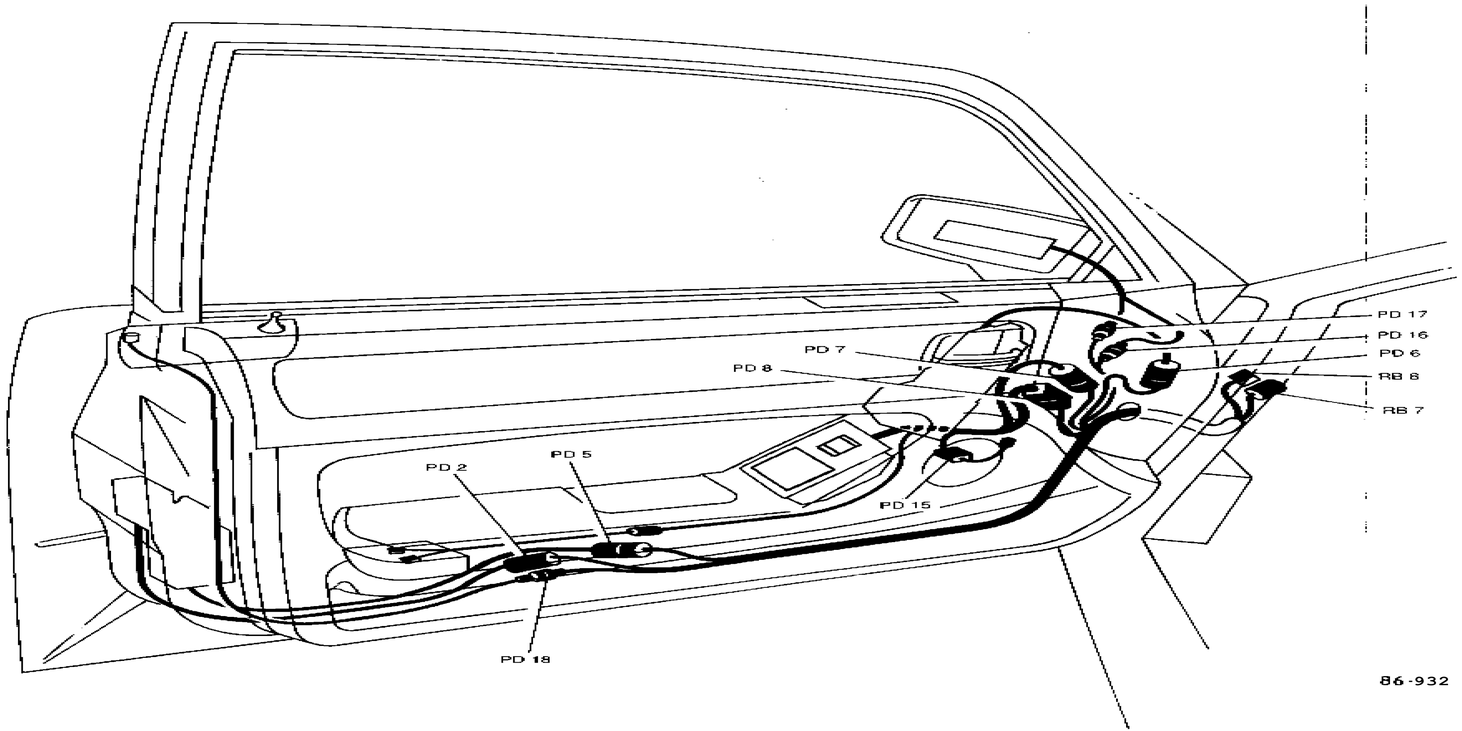
Connector No	Description	Interface	Location	Access
RB/LB7	Black PM4 6 way plug	Bulkhead h arness	Front passenger 'A' post	Front passenger dash li ner
R/LB8	Black PMHD 24 way socket	Bulkhead harness	Front passenger .A' post	Front passenger dash liner
PD2	Black PM4 6 way socket	Door switch	Front passenger do—	Door trim pad lower
PD5	Yellow PM4 6 way socket	Door lock actuator	Front passenger do—	Door trim pad lower
PD6	Black 3 way socket	Window lift motor	Front passenger door	Door trim pad lower
PD7	Yellow PM4 6 way socket	Door switch panel	Front passenger door	Door trim pad lower
PD8	Yellow PMHD 6 way socket	Door switch panel	Front passenger door	Door trim pad lower
PD15	Blue 2 way socket	Door switch panel	Front passenger door	Door trim pad lower
PD16	Blue 2 way plug	Door mirror	front passenger door	Door trim pad lower
PD17	Yellow 4 way plug	Door mirror	Front pas —ger door	Door trim pad lower
PD18	Black 2 way socket	Door key switch	Front passenger door	Door trim pad lower

WCRING SCHEDULE 90.50.08/WS

From	To	Colour	Size (mm²)
Wire	Mark	Spare	Current(A)
Ex	[illegible]	Gauge	Section
Wire	[illegible]	Wire	Wire
Ex	A	Colour	Remarks
Decode	Mark	Code	Tolerance
RALB7-1	PD7-6	BR	0.5
RALB7-2	PD7-1	NP	0.5
RALB7-3			
RALB7-4	PD7-6	NK	0.5
RALB7-5	PD8-5	BK	0.5
R/LB8-1	PD7-5	PK	0.5
R/LB8-2	PD8-3	BR	0.5
R/LB8-3	PD8-4	WHT	0.5
R/LB8-4	PD8-6	PK	0.5
R/LB8-5	PD8-2	PK	0.5
R/LB8-6	PD8-1	PK	0.5
R/LB8-7	PD15-1	PK	0.5
R/LB8-8	PD15-2	PK	0.5
R/LB8-9	PD16-2	PK	0.5
R/LB8-10	PD16-1	PK	0.5
R/LB8-11	PD18-2	PK	0.5
R/LB8-12	PD18-1	PK	0.5
R/LB8-13	PD17-4	PK	0.5
R/LB8-14	PD17-3	PK	0.5
R/LB8-15	PD17-2	PK	0.5
R/LB8-16	PD17-1	PK	0.5
R/LB8-17	PD2-5	GR	0.5
R/LB8-18	PD16-1	GY	0.5
R/LB8-19			
R/LB8-20			
R/LB8-21			
R/LB8-22			
R/LB8-23			
R/LB8-24			
PD2-1	R/LB8-7	PK	0.5
PD2-2	R/LB8-13	GW	0.5
PD2-3			
PD2-4			
PD2-5	PD-5	B	0.5
PD2-6	PD-8	BK	0.5
PD5-1	R/LB8-10	PK	0.5
PD5-2			
PD5-3			
PD5-4			
PD5-5			
PD5-6	R/LB8-11	PK	0.5
PD6-1	R/LB8-12	PK	0.5
PD6-2	PD-6	BK	0.5
PD6-3			
PD7-1	PD7-5	GR	0.5
PD7-2	PD7-2	GR	0.5
PD7-3			
PD7-4	R/LB7-2	PK	0.5
PD7-5	PD6-2	GR	0.5
PD7-6			
PD7-7	PD8-1	GR	0.5
PD7-8	R/LD7-1	B	0.5
PD8-1	R/LB8-3	YE	0.5
PD8-2	R/LB8-2	PK	0.5
PD8-3	R/LB8-4	WHT	0.5
PD8-4	PD-5	BK	0.5
PD8-5	R/LB8-6	PK	0.5
PD8-6	R/LD8-8	PK	0.5
PD15-1	R/LB8-5	K	0.5
PD15-2			
PD16-1	R/LB8-9	PK	0.5
PD16-2	R/LB7-5	PK	0.5
PD17-1	R/LB8-16	GR	0.5
PD17-2	R/LB8-15	GR	0.5
PD17-3	R/LB8-14	GR	0.5
PD17-4	R/LB8-19	GR	0.5

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FRONT DOOR HARNESS PASSENGER PD (RHD)
CONNECTOR LOCATION 90.50.08/CL

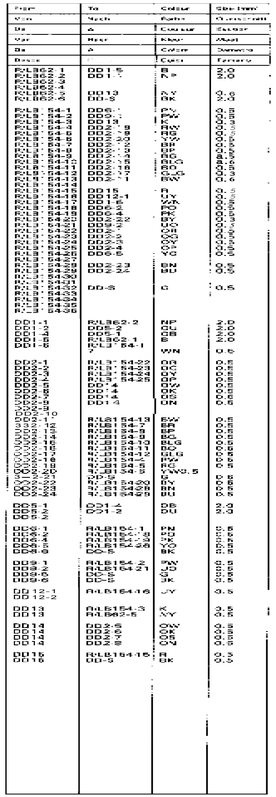


FRONT DOOR HARNESS DRIVER DD LHD
HARNESS SCHEDULE 90.50.07/HS

LOCATION & ACCESS 90.50.07/LA

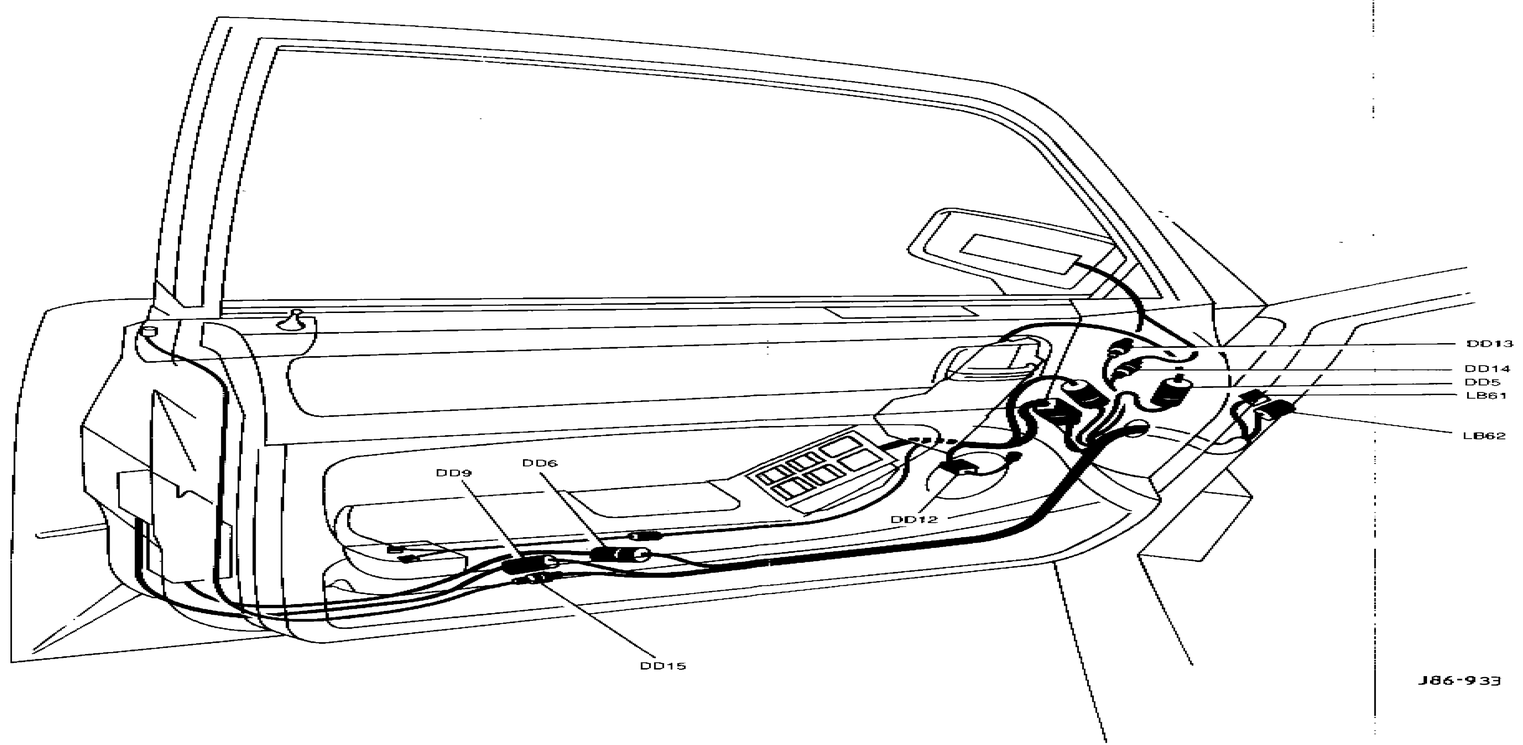
	Description	Interface	Location	Access
RB/LB62	Black PM4 6 way plug	Bulkhead harness	'A' post, driver side	Driver dash liner
RB/LB154	Black PMHD 36 way socket	Bulkhead harness	'A' post, driver side	Driver dash liner
DD1	Yellow PM4 6 way socket	Drivers door panel	Driver door	Door trim pad, lower
DD2	Yellow PMHD 24 way socket	Drivers door panel	Driver door	Door trim pad, lower
DD5	Black 3 way socket	Window lift motor	Driver door	Door trim pad, lower
DO6	Yellow PM4 6 way socket	Door lock actuator	Driver door	Door trim pad, lower
DD9	Black PM4 6 way socket	Door switch	Driver door	Door trim pad, lower
DD12	Blue 2 way socket	Drivers door panel	Driver door	Door trim pad, lower
DD13	Blue 2 way plug	Door mirror	Driver door	Door trim pad, lower
DD14	Yellow 4 way plug	Domr mirror	Driver door	Door trim pad, lower
DD15	Black 2 way socket	Door key switch	Driver door	Door trim pad, lower

WIRING SCHEDULE 90.50.07/WS



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FRONT DOOR HARNESS DRIVER DD LHD
CONNECTOR LOCATION 90.50.07/CL



FRONT DOOR HARNESS PASSENGER PD LHD
HARNESS SCHEDULE 90.50.08/HS

LOCATION & ACCESS 90.50.08/LA

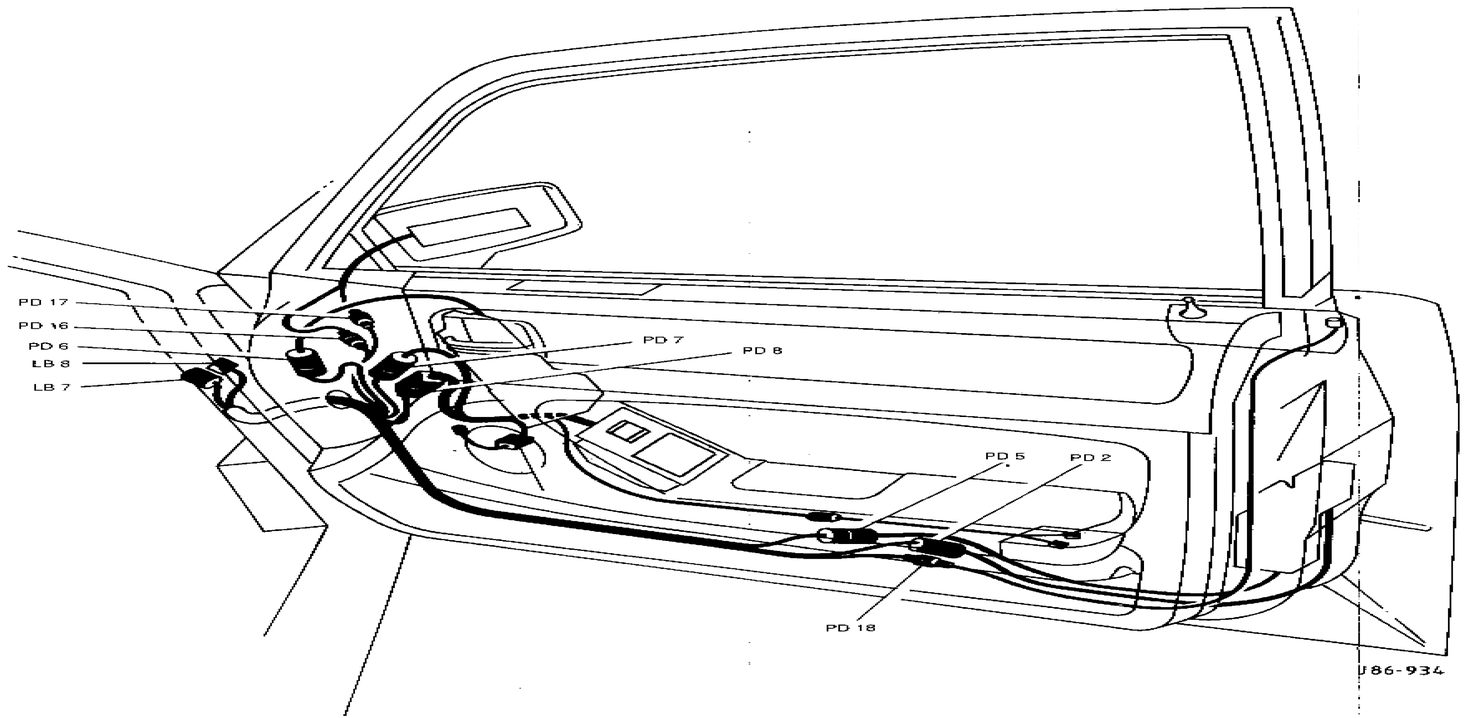
Connector No	Description	Interface	Location	Access
RB/LB7	Black PM4 6 way plug	Bulkhead harness	Front passenger 'A' post	Front passenger dash liner
RB/LB8	Black PMND 24 way socket	Bulkhead harness	Front passenger 'A' post	Front passenger dash liner
PD2	Black PM4 8 way socket	Door switch	Front passenger door	Door trim pad lower
PD5	Yellow PM4 8 way socket	Door lock actuator	Front passenger dear	Door trim pad lower
PD6	Black 3 way socket	Window lift motor	Front passenger door	Door trim pad lower
PD7	Yellow PM4 6 way socket	Door switch pane	Front passenger door	Door trim pad lower
PD8	Yellow PMHD 6 way socket	Door switch pane-	Front passenger door	Door trim pad lower
PD15	Blue 2 way socket	Door switch Wne:	Front passenger door	Door trim pad lower
PD16	Blue 2 way plug	Door mirror	Front passenger door	Door trim pad lower
PD 7	Yellow 4 way plug	Door mirror	Front passenger door	Dear trim pad lower
PD18	Black 2 way socket	Door key switch	Front passenger door	Door trim pad lower

WIRING SCHEDULE 90.50.08/WS

From	o	Colour	Approx
wo*	'82*	Felt	Length
Co	A	Color	Seal
Vin	Vac	Fuse	Mas
Ov	A	Conv	Service
Cards	Date	Cab*	Tar —
RB/LB7-1	PD7-8	R	W 2
RB/LB7-2	PD7-1	NP	W 2.5
RB/LB7-3			
RB/LB7-4			
RB/LB7-5	PD-5	NY	G 0.5
RB/LB7-6	PD-5	BK	W 0.5
RB/LB-1	PD8-6	R	W 0.5
RB/LB8-2	PD8-1	VW	W 0.5
RB/LB8-3	PD8-2	BN	W 0.5
RB/LB8-4	PD8-5	BR	W 0.5
RB/LB8-5	PD8-3	P	W 0.5
RB/LB8-6	PD8-4	RW	W 0.5
RB/LB8-7	PD8-7	K G	W 0.5
RB/LB8-8	PD8-8	PNU	W 0.5
RB/LB8-9	PD8-1	PU	W 0.5
RB/LB8-10	PD8-2	PU	W 0.5
RB/LB8-11	PD8-5	RK	W 0.5
RB/LB8-12	PD8-3	RW	W 0.5
RB/LB8-13	PD8-4	GW	W 0.5
RB/LB8-14	PD7-7	GR	W 0.5
RB/LB8-15	PD7-X	UG	W 0.5
RB/LB8-16	PD7-X	UG	W 0.5
RB/LB8-17	PD7-2	UP	W 0.5
RB/LB8-18			
RB/LB8-19			
RB/LB8-20	PD-5	G	G 0.5
RB/LB8-21	PD-5 1	UY	G 0.5
RB/LB8-22			
RB/LB8-23			
RB/LB8-24			
PD2-1	RB-8B-7	R	PD 0.5
PD2-2	RB-8B-12	GW	PD 0.5
PD2-3			
PD2-4			
PD2-5	PD-5	G	G 0.5
PD2-6	PD-5	BK	G 0.5
PD5-1	RB-8B-9	PN	PD 0.5
PD5-2	RB-8B-10	PU	PD 0.5
PD5-3			
PD5-4	RB-8B-11	PK	PD 0.5
PD5-5	RB-8B-12	RS	PD 0.5
PD5-6	PD-5	BK	PD 0.5
PD8-1	PD7-5	GB	W 0.5
PD8-4	PD7-3	GU	W 0.5
PD8-3			
PD7-1	RB-8B-2	NP	PD 0.5
PD7-2	PD6-2	UO	PD 0.5
PD7-3			
PD7-4			
PD7-5	PD6-1	OB	W 0.5
PD7-6	RB-8B-1	R	W 0.5
PD8-1	RB-8B-2	VW	G 0.5
PD8-2	RB-8B-3	BR	G 0.5
PD8-3	RB-8B-4	BP	G 0.5
PD8-4	PD-5	K	W 0.5
PD8-5	RB-8B-6	KW	W 0.5
PD8-6	RB-8B-8	KU	W 0.5
PD15-1	RB-8B-5	K	G 0.5
PD15-2			
PD16	RB-8B-5	K	G 0.5
PD18	LB7-5	NY	G 0.5
PD7	RB-8B-14	OR	G 0.5
PD7-X	RB-8B-16	OG	W 0.5
PD7-X	RB-8B-15	OY	W 0.5
PD7-2	RB-8B-17	OU	W 0.5

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FRONT DOOR HARNESS PASSENGER PD LHD
CONNECTOR LOCATION 90.50.08/CL



REAR DOOR HARNESS RD
HARNESS SCHEDULE 90.50.47/HS

Connector No	Description	Interface
RS30	Black PM4 3 way plug	Side harness
LS6	Black PMHD4 6 way plug	Side harness
RS31	Black PMHD4 6 way plug	Side harness
LS7	Black PM4 3 way plug	Side harness
A S 3 2	Yellow PMHD 6 way socket	Side harness
LS8	Yellow PMHD 6 way socket	Side harness
RD2	Blue PM4 6 w a y socket	Door switch
RD3	Green PM4 3 way socket	Door lock actuator
RD4	Black PM4 3 way socket	Window lift motor
RD5	Yellow PMHD 6 way socket	Door switch panel
RD 6	Yellow PM4 6 way socket	Door switch panel
RD7	Blue 2 way socket	Door switch panel

LOCATION & ACCESS 90.50.47/LA

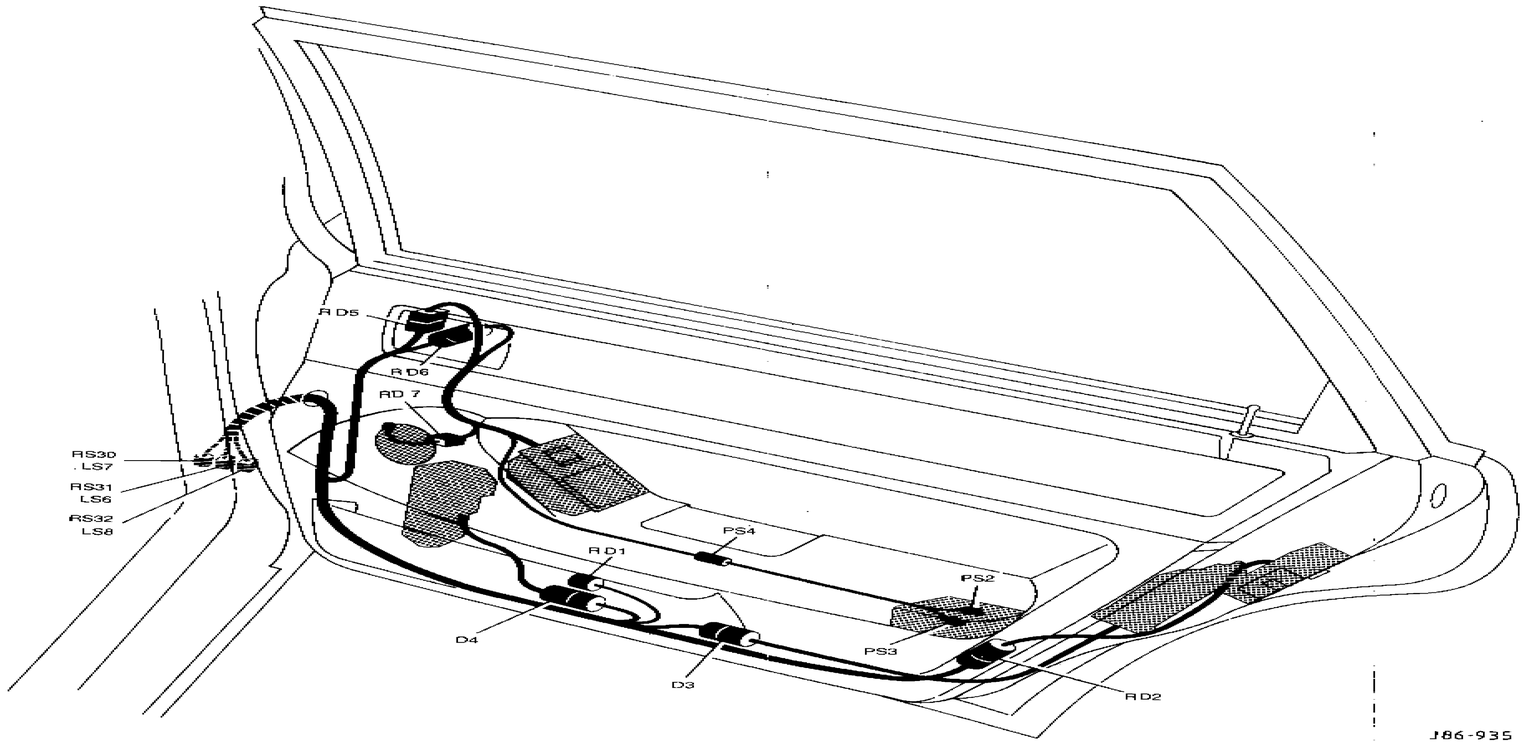
Location	Access
RH 'B/C' post	RH 'B/C' post liner
LH 'B/C' post	RH 'B/C' post liner
RH 'B/C' post	RH 'B/C' post liner
LH 'B/C' post	RH 'B/C' post liner
RH 'B/C' post	RH 'B/C' post liner
LH 'B/C' post	RH 'B/C' post liner
Rear passenger door	Door trim pad, lower
Rear passenger door	Door trim pad, lower
Rear passenger door	Door trim pad, lower
Rear passenger door	Door trim pad, lower
Rear passenger door	Door trim pad, lower
Rear passenger door	Door trim pad, lower

WIRING SCHEDULE 90.50.47/WS

From	To	Colour	Stripe
Wire	Hole	Fabric	Connector
Ex	A	Colour	Socket
Wire	Hole	Key	Mod
Ex	A	Colour	Sequence
Base	Plug	Cell	Terminal
RS30LS6-1	RD6-6	B	RW 0.5
RS30LS7-1	RD6-1	RB	RW 0.5
RS30LS7-3	RD2-1	BK	RW 0.5
RS30LS6-2	RD6-2	BU	GN 0.5
RS30LS6-3	RD6-3	GN	GN 0.5
RS30LS6-4	RD6-4	YE	GN 0.5
RS30LS6-5	RD6-5	RN	GN 0.5
RS30LS6-6	RD6-6	PK	GN 0.5
RS30LS8-1	RD3-1	WH	GN 0.5
RS30LS8-2	RD3-2	GY	GN 0.5
RS30LS8-3	RD3-3	VI	GN 0.5
RS30LS8-4	RD3-4	OR	GN 0.5
RS30LS8-5	RD3-5	TQ	GN 0.5
RS30LS8-6	RD3-6	LG	GN 0.5
RD2-1	RS31LS84-1	PK	RW 0.5
RD2-2	RS32LS84-1	BK	GN 0.5
RD2-3			
RD2-4	RS5-4	G	RW 0.5
RD2-5	RS30LS73	BK	GN 0.5
RD2-6			
RD3-1	RS32LS83	PK	RW 0.5
RD3-2	RS32LS83	PU	GN 0.5
RD3-3			
RD3-4			
RD3-5	RS3-3	OR	RW 0.5
RD3-6	RS5-2	OR	GN 0.5
RD4-1			
RD4-2			
RD4-3			
RD4-4	RS31LS83	PK	RW 0.5
RD4-5	RS31LS83	PU	GN 0.5
RD4-6	RS32LS82	PU	GN 0.5
RD5-1	RS5-5	G	RW 0.5
RD5-2	RS31LS82	PK	RW 0.5
RD5-3	RS31LS82	BK	GN 0.5
RD5-4	RS32LS82	PU	GN 0.5
RD5-5	RS30LS72	BK	GN 0.5
RD5-6	RD4-2	OR	RW 0.5
RD6-1			
RD6-2			
RD6-3			
RD6-4	RD4-1	OR	RW 0.5
RD6-5	RS30LS73	BK	GN 0.5
RD6-6			
RD7-1	RS32LS84	BK	GN 0.5
RD7-2			

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REAR DOOR HARNESS RD
CONNECTOR LOCATION 90.50.47/CL

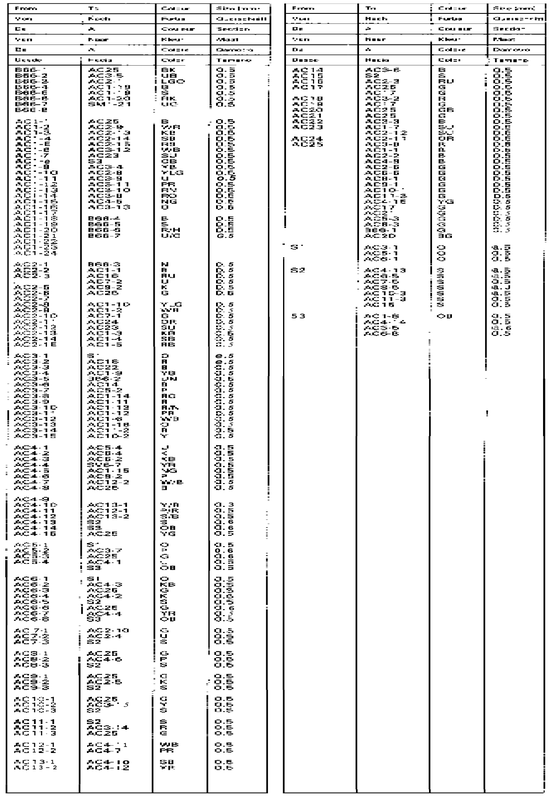


AIR CONDITIONING HARNESS AC
HARNESS SCHEDULE 90.50.33/HS

Connector No	Description	Interface	Location	Access
RB66	15-way PMHD plug (black)	Harness RB	Centre console	Console switch panel
LB66	15-way PMHD plug (black)	Harness LB	Centre console	Console- switch panel
AC1	24-way PMHD socket (yellow)	Control panel	Centre console	Console switch panel
AC2	15-way socket (white)	ECM	RH side of air conditioning unit	RH dash liner
AC3	15-way socket (white)	ECM	RH side of air conditioning unit	RH dash liner
AC4	15-way socket (white)	ECM	RH side of air conditioning unit	RH dash liner
AC5	5-way socket (black)	Blower, LH	LH side footwell (blower motor)	LH dash liner
AC6	8-way socket (black)	Ambient sensor and blower, RH	RH side footwell (blower motor)	RH dash liner
AC7	3-way socket (black)	In car sensor	Glove box (in car sensor)	Glove box
AC8	3-way socket (black)	Solar sensor	Centre fascia top (solar sensor)	Solar sensor assembly
AC9	3-way socket (black)	Evaporator temperature sensor	RH side of air conditioning unit	RH dash liner
AC10	3-way socket (black)	Upper feedback potentiometer	LH upper side of air conditioning unit	Glove box/instrument pack
AC11	3-way socket (black)	Lower feedback potentiometer	LH lower side of air conditioning unit	LH dash liner
AC12	2-way socket (black)	Lower servo	RH lower side of air conditioning unit	RH dash liner
AC13	2-way socket (black)	Upper servo	RH upper side of air conditioning unit	Glove box/instrument pack
AC14	Lucar	Coolant temperature switch	LH side of air conditioning unit	LH dash Liner
AC15	Lucar	Coolant temperature switch	LH side of air conditioning unit	LH dash liner
AC16	Lucar	Recirculation vacuum solenoid	Under LH side of air conditioning unit	LH dash Liner
AC17	Lucar	Recirculation vacuum solenoid	Under LH side of air conditioning unit	LH dash Liner
AC18	Lucar	Water valve vacuum solenoid	Under LH side of air conditioning unit	LH dash liner
AC19	Lucar	Water valve vacuum solenoid	Under LH side of air conditioning unit	LH dash liner
AC20	Lucar	Heatsink	LH side of air conditioning unit	LH blowermotorassembly
AC21	Lucar	Centre vent vacuum solenoid	Under RH side of air conditioning unit	RH dash liner
AC22	Lucar	Centre vent vacuum solenoid	Under RH side of air conditioning unit	RH dash liner
AC23	Lucar	Defrost vacuum solenoid	Under RH side of air conditioning unit	RH dash liner
AC24	Lucar	Defrost vacuum solenoid	Under RH side of air conditioning unit	RH dash liner
AC25	Lucar	Earth	Rear LH side of air conditioning unit	Air conditioning unit

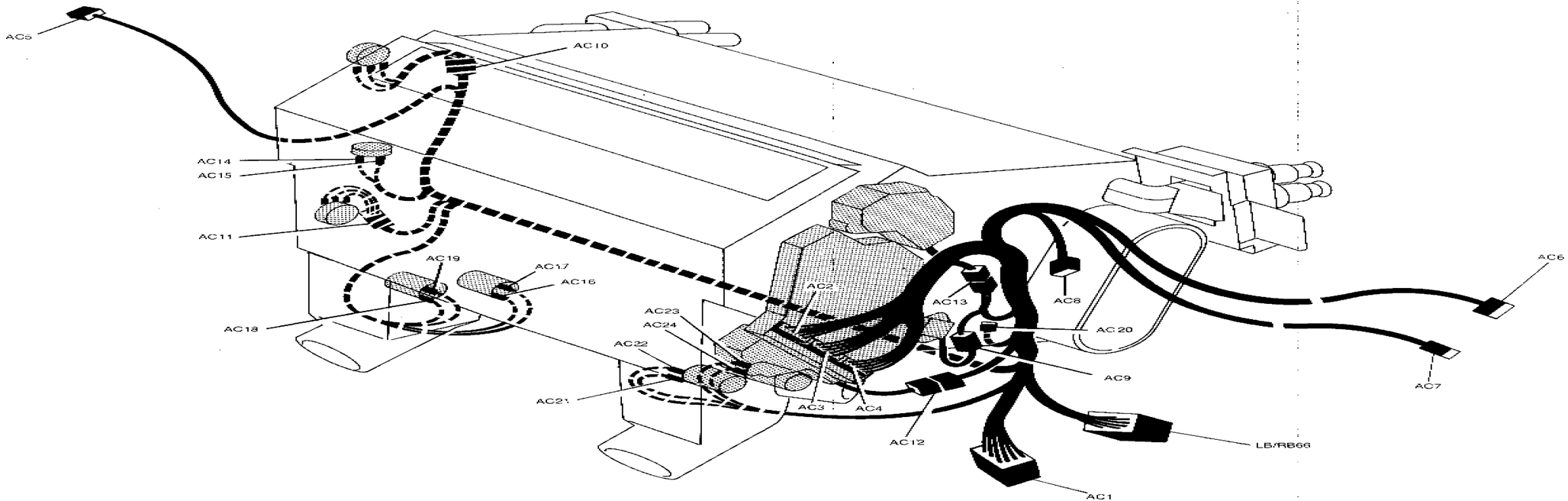
LOCATION & ACCESS 90.50.33/LA

WIRING SCHEDULE 90.50.33/WS



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AIR CONDITIONING HARNESS CONNECTOR LOCATION 90.50.33/CL



POWERED SEAT HARNESS SM
HARNESS SCHEDULE 90.50.11/HS

Connector No	Description	Interface	Location	Access
SS3	9-way PM4 plug (violet)	Link lead SS1 switch assy to seat	Left hand front seat	Seat cushion and rear carpet
SS4	9-way PM4 plug (violet)	Link lead SS2 switch assy to seat	Right hand fmnt seat	Seat cushion and rear carpet
SM2	2-way Econoseal socket (black)	Recline motor	Right or left front seat	Seat cushion
SM3	Positive lock terminal (red cover)	Front raise/lower motor	Right or left front seat	Seat cushion
SM4	Positive lock terminal	Front raise/lower motor	Right or left front seat	Seat cushion
SM5	2-way Econoseal socket (black)	Fore/aft motor	Right or left front seat	Seat cushion
SM7	Positive lock terminal	Rear raise/lower motor	Right or left front seat	Seat cushion
SM8	Positive lock terminal	Rear raise/lower motor	Right or left front seat	Seat cushion
HS1	2-way Econoseal (black)	Seat heaters	Right or left front seat	Seat cushion
IL5	4-way ITT/Cannon	Interior light and seat switch	Right or left front seat	Seat cushion
SB1	2-way ITT Cannon	Seat belt buckle switch	Right or left front seat	Seat cushion.
SQ1	2-way Econoseal (yellow)	Squab heater/cushion heater	Right or left front seat	Seat cushion
LB40	4-way ITT/Cannon	Interior light and seat switch	Passenger seat	Seat cushion, front of rear carpet
RB40	4-way ITT/Cannon	Interior light and seat switch	Passenger seat	Seat cushion, front of rear carpet
LB47	4-way ITT/Cannon	Interior light and seat switch	Drivers seat	Seat cushion, front of rear carpet
RB47	4-way ITT/Cannon	Interior light and seat switch	Drivers seat	Seat cushion, front of rear carpet
LB98	2-way Econoseal (red)	Seat heaters	Drivers seat	Seat cushion, front of rear carpet
RB98	2-way Econoseal (red)	Seat hearers	Drivers seat	Seat cushion, front of rear carpet
LB102	2-way Econoseal (red)	Seat heaters	Passenger seat	Seat cushion, front of rear carpet
RB102	2-way Econoseal (red)	Seat heaters	Passenger seat	Seat cushion, front of rear carpet
LB41	2-way PMHD (black)	Seat belt switch	Passenger seat	Seat cushion, front of rear carpet
RB41	2-way PMHD (black)	Seat belt switch	Passenger seat	Seat cushion, front of rear carpet
LB48	2-way PMHD (black)	Seat-belt switch	Drivers seat	Seat cushion, front of rear carpet
RB48	2-way PMHD (black)	Seat belt switch	Drivers seat	Seat cushion, front of rear carpet
SM11	3-way red connector	Seat entry switch	Right or left front seat	Seat cushion
B165	3-way black plug	Seat entry switch	Drivers seat	Seat cushion, front of rear carpet

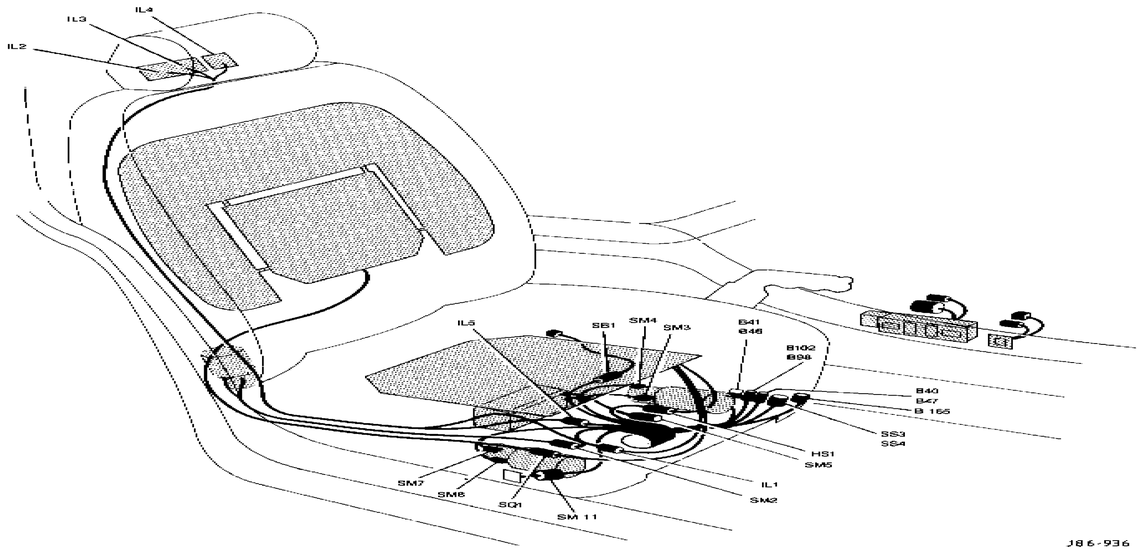
LOCATION & ACCESS 90.50.11/LA

WIRING SCHEDULE 90.50.11/WS

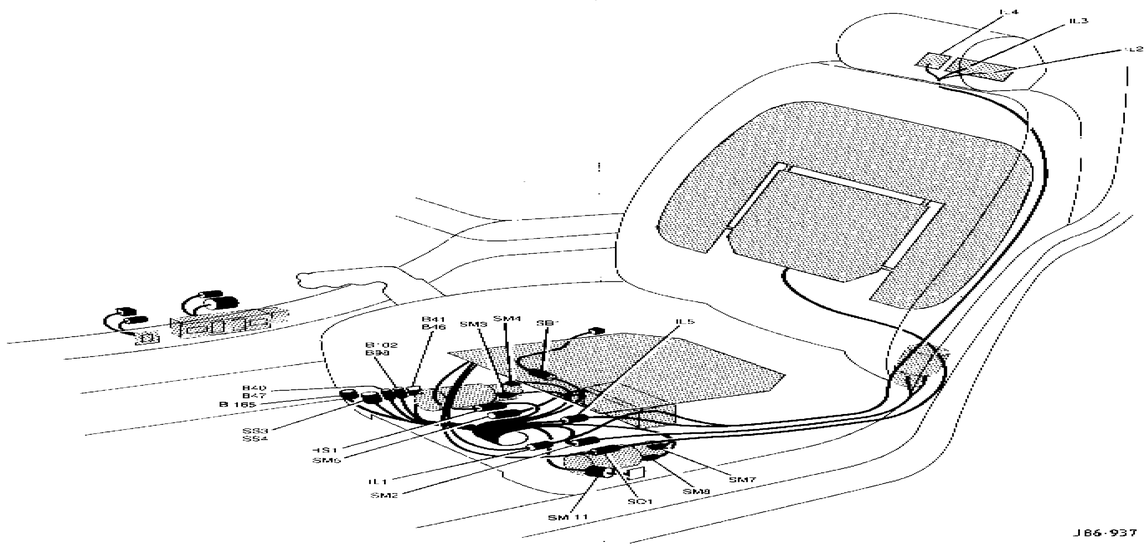
From	To	Colour	Size (mm)
Wire	Wire	Trace	Continuity
To	A	Cross	Socket
Via	Rear	Exit	Knee
By	A	Colour	Number
Base	Hole	Code	Terminal

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POWERED SEAT HARNESS SM
CONNECTOR LOCATION 90.50.11/CL



J86-936



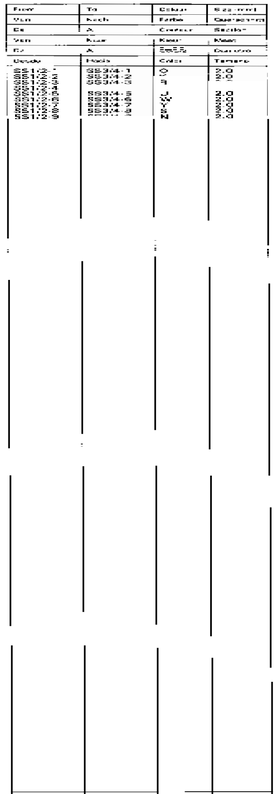
J86-937

POWERED SEAT LINK HARNESS SS
HARNESS SCHEDULE 90.50.12/HS

Connector No	Description	Interface	Location	Access
SS1	9-way PM4 plug (violet)	Seat switches	Centre console	Centre console, below
SS2	9-way PM4 plug (violet)	Seat switches	Centre console	Centre console, below
SS3	9-way PM4 plug (violet)	Harness SM	Harness SM	Seat cushion
SS4	9-way PM4 plug (violet)	Harness SM	Harness SM	Seat cushion

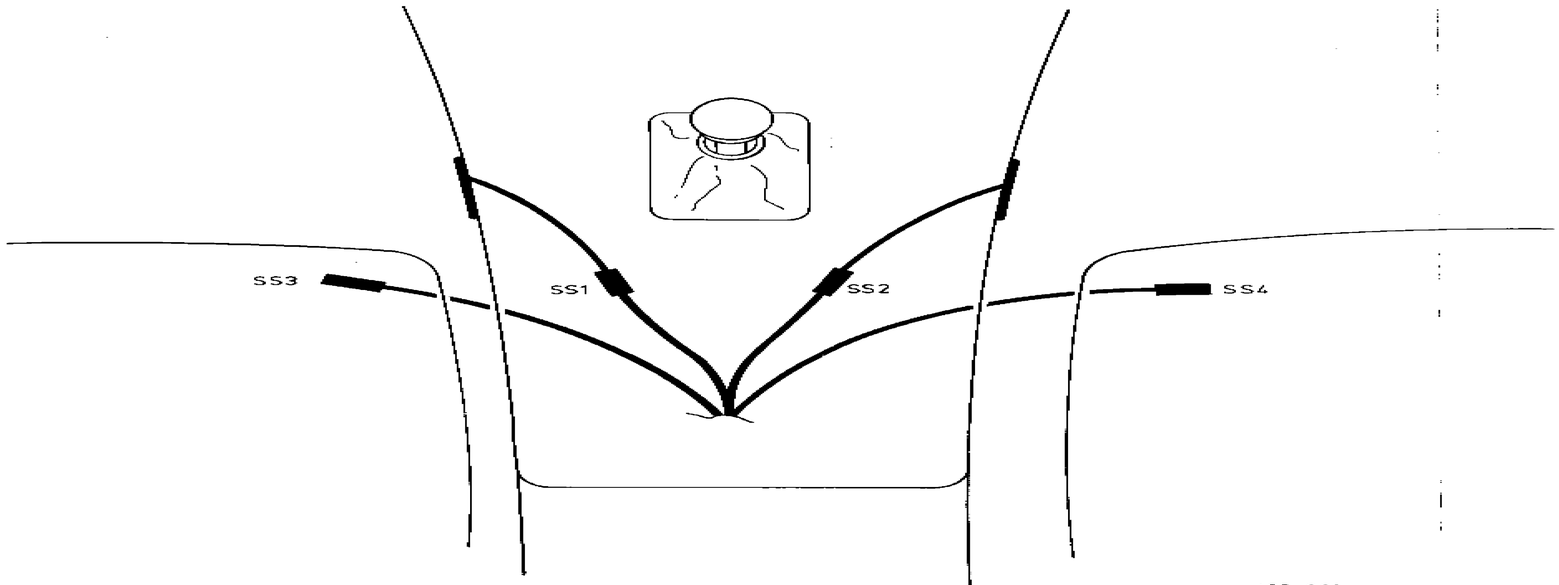
LOCATION & ACCESS 90.50.12/LA

WIRING SCHEDULE 90.50.12/WS



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POWERED SEAT LINK HARNESS SS
CONNECTOR LOCATION 90.50.12/CL



HEATED SEAT & INTERIOR LIGHT HARNESS HS
HARNESS SCHEDULE 90.50.14/HS

Connector No	Description	Interface
RB40	4-way ITT plug (black)	Harness RB
RB47	4-way ITT plug (black)	Harness RE
RB98	3-way Econoseal plug (black)	Harness RB
RB102	23-way Econoseal plug (black)	Harness RB
LB40	4-way ITT plug (black)	Harness LB
LB47	4-way ITT plug (black)	Harness LB
LB98	3-way Econoseal plug (black)	Harness LB
LB102	23-way Econoseal plug (black)	Harness LB
HS1	3-way Econoseal plug (black)	Seat heaters
IL5	4-way III-	Interior light and seat switch

LOCATION & ACCESS 90.50.14/LA

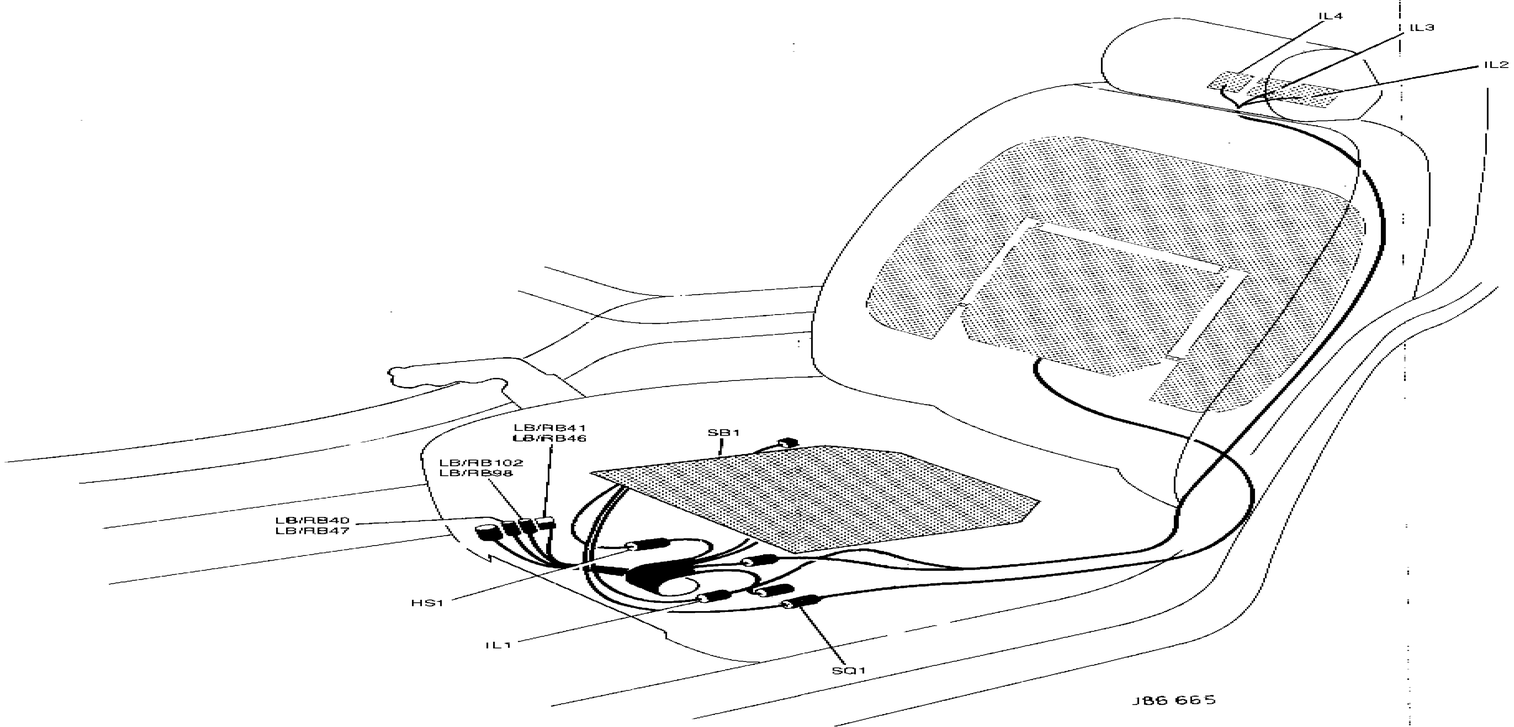
Location	Access
Passenger Seat	Seat Cushion, Front of Rear Carpet
Drivers Seat	Seat Cushion, Front of Rear Carpet
Drivers Seat	Seat Cushion, Front of Rear Carpet
Passenger Seat	Seat Cushion, Front of Rear Carpet
Passenger Seat	Seat Cushion, Front of Rear Carpet
Drivers Seat	Seat Cushion, Front of Rear Carpet
Drivers Seat	Seat Cushion, Front of Rear Carpet
Passenger Seat	Seat Cushion, Front of Rear Carpet
Right or Left Front Seat	Seat Cushion
Right or Left Front Seat	Seat Cushion

WIRING SCHEDULE 90.50.14/WS

From	To	Colour	Size (mm²)
Conn	Conn	Cable	Quantity
Pin	Pin	Colour	Status
Function	Function	Circuit	Wire No
Earth	Area	Circuit	Current
988-10[illegible]-1			
988-10[illegible]-2	HS1-2	R	
988-10[illegible]-3	HS1-3	B	
940-47-1	IL5-1	Bk	
940-47-2	IL5-2	R/O	
940-47-3	IL5-3	N/W	
940-47-4	IL5-4	G/S	
IL5-1	850-47-1	Bk	
IL5-2	850-47-2	R/O	
IL5-3	850-47-3	N/W	
IL5-4	850-47-4	G/S	
HS1-1			
HS1-2	988-10[illegible]-2	R	
HS1-3	988-10[illegible]-3	B	

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HEATED SEAT & INTERIOR LIGHT HARNESS HS
CONNECTOR LOCATION 90.50.14/CL



INTERIOR READING LAMP LINK HARNESS IL
HARNESS SCHEDULE 90.50.23/HS

Connector No	Description	Interface	Location	Access
IL1	2-way ITT;Cannon	Seat senser switch	Front seat. below	Rear passenger footwell
IL2	Positive lock receptable	Reading lamp and switch	Front seat headrest	Interior/reading light assembly
IL3	Positive lock terminal	Reading lamp	Front seat headrest	Interior/reading light assembly
IL4	6.35mm blade	Reading lamp switch earth	Front seat headrest	Interior/reading light assembly
IC5	4-way ITT;Cannon	Interior light and seat switch	Frnnt seat below	Rear passenger footwell

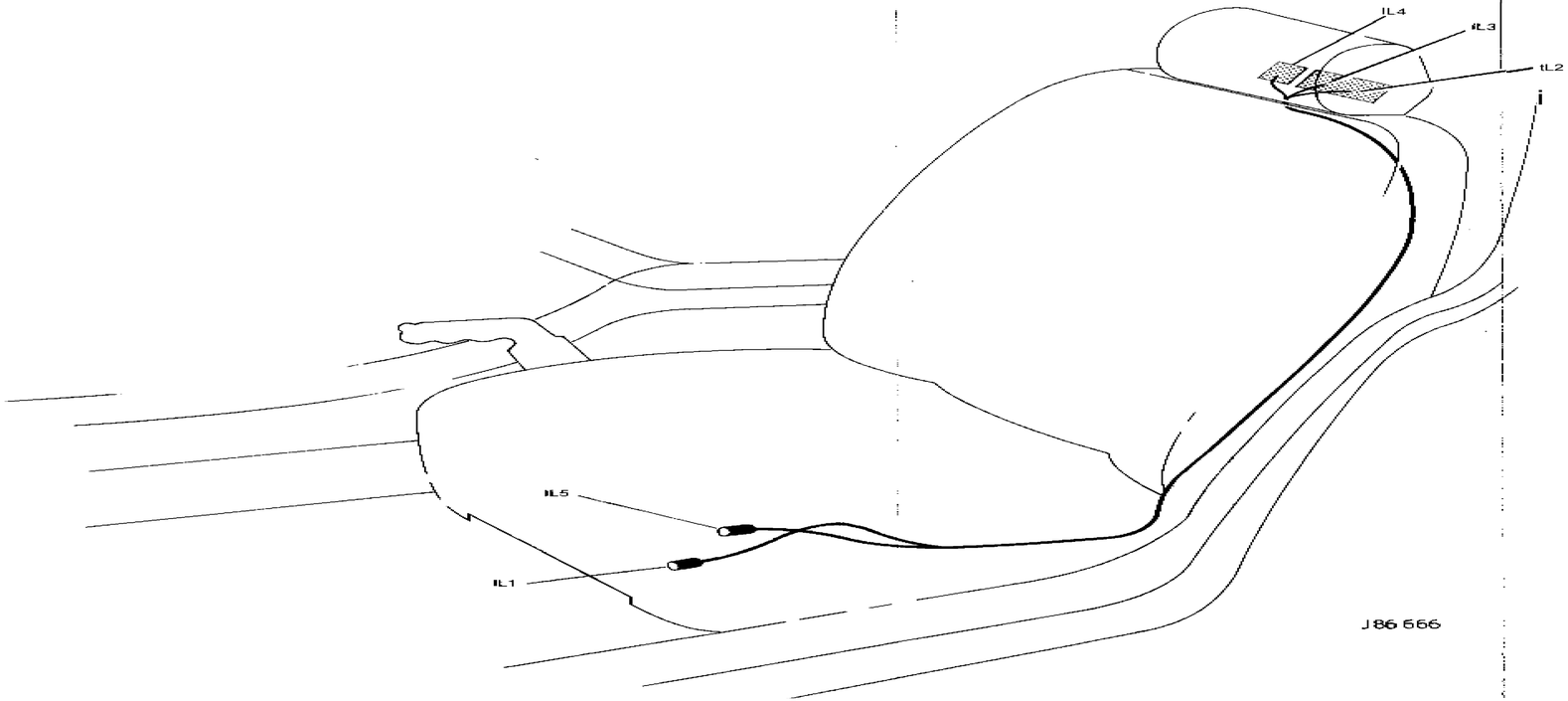
LOCATION & ACCESS 90.50.23/LA

WIRING SCHEDULE 90.50.23/WS

From	To	Colour	See Item
Wire	Switch	Fcbe	Quick-Filt
IL	A	Couleur	Boîtier
Wire	Nue	Kabel	Abel
De	A	Colore	Datenkabel
Earth	Hous	Color	Tenere
IL-1	S1	BK	
IL-2	B40-4	SB	
	B47-4	SB	
IL2	B40-2	RLG	
	B47-1	RLG	
IL3	B40-3	NW	
	B47-3	NW	
IL4	S1	BKG	
IL5-1	B40-47-1	DI	
IL5-2	B40-47-2	NW	
IL5-3	B40-47-3	NW	
IL5-4	B40-47-4	SB	
S1	B40-1	BK	
	B47-1	BK	
	IL4-1	BK	
	IL1-1	BK	

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INTERIOR READING LAMP LINK HARNESS IL
CONNECTOR LOCATION 90.50.23/CL



FRONT AXLE HARNESS FA
HARNESS SCHEDULE 90.50.15/HS

Connector No	Description	Interface
RS20	3-way PM4 plug (black)	Harness RS
LS25	3-way PM4 plug (black)	Harness LS
FA1	3-way (black)	Brake pads

LOCATION & ACCESS 90.50.15/LA

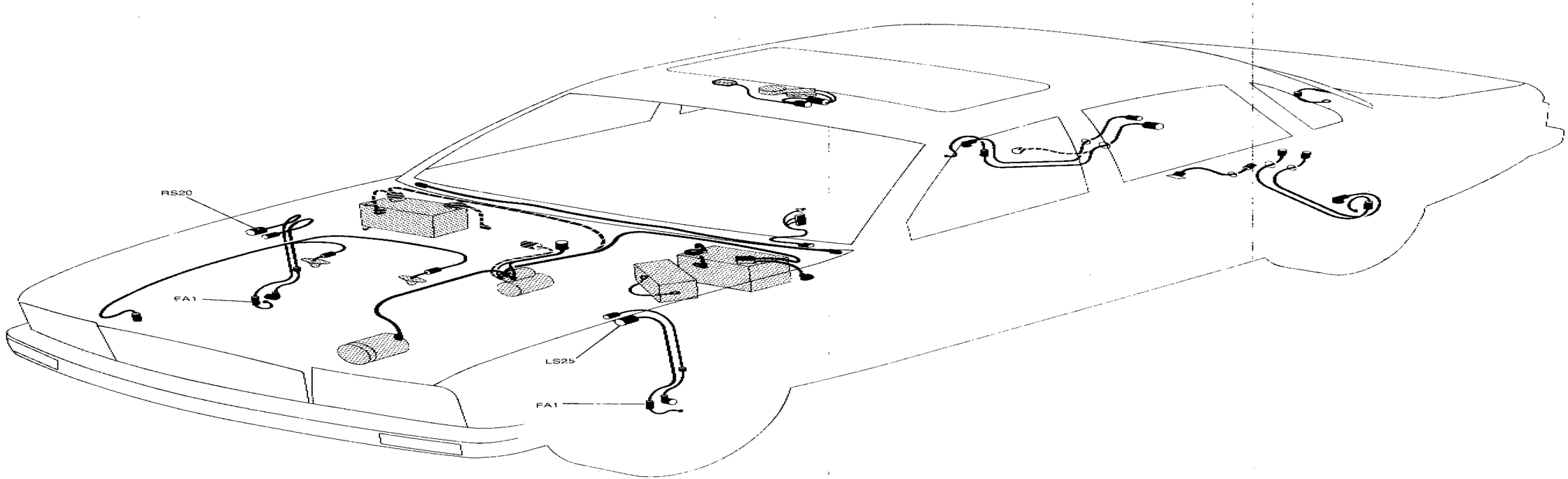
Location	Access
RH inner wing valance, centre	Engine compartment, above
LH inner wing valance, centre	Engine compartment, above
Front brake caliper	Engine compart — lt, below

WIRING SCHEDULE 90.50.15/WS

From	To	Colour	Section
Ser	Ser	Fette	Grün/rot
Ze	A	Gelb	Blau
Ser	Ser	Rose	Weiß
Ze	A	Cobre	Bericht
Beste	Nach	Color	Tamaño
RS20-1	FA1-3	68	2
RS20-2	FA1-2	68	1
RS20-3			
LS25-1	FA1-3	68	2
LS25-2	FA1-2	68	1
LS25-3			
FA1-1			
FA1-3	RS20-2	68	1
FA1-3	LS25-2	68	1
	RS20-1	68	2
	LS25-1	68	2

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FRONT AXLE HARNESS FA
CONNECTOR LOCATION 90.50.15/CL



J86 507

REAR AXLE HARNESS RIGHT HAND RA
HARNESS SCHEDULE 90.50.16/HS

Connector No	Description	Interface	Location	Access
RS35	9-way PM4 plug (black)	Harness RS	Luggage compartment bulkhead	Luggage compartment
RA2	3-way Econoseal (black)	Brake pads	RH rear hub carrier	Under body

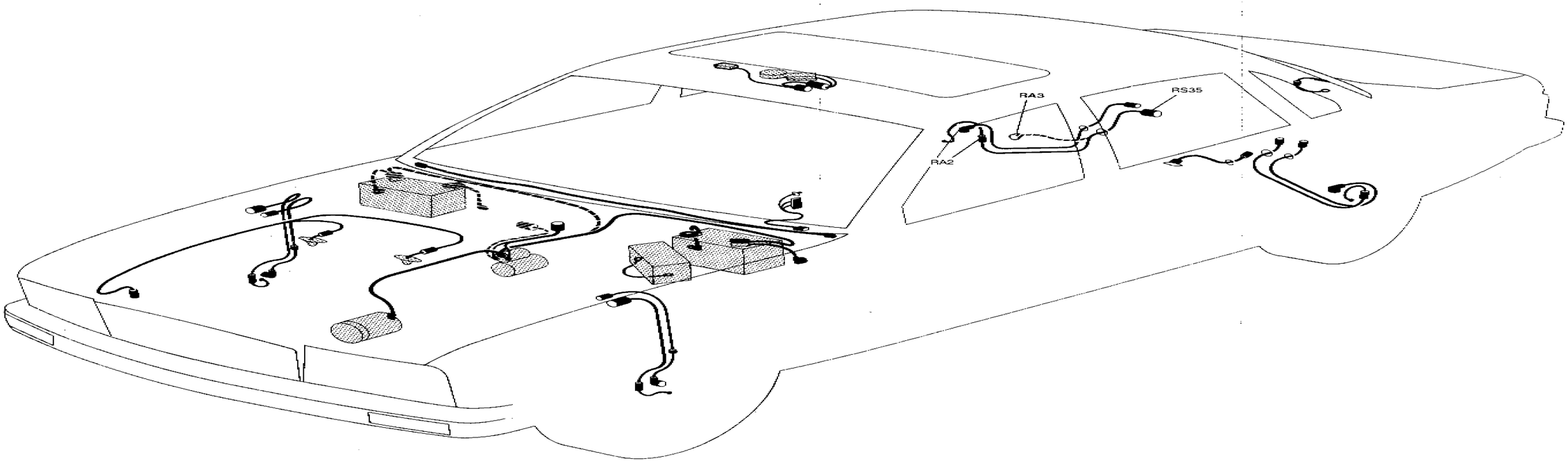
LOCATION & ACCESS 90.50.16/LA

WIRING SCHEDULE 90.50.16/WS

From	To	Colour	Size mm²
Ven	Fech	Ecru	Quinzième
Ce	A	Couleur	Seizième
Vin	Nez	Sien	Mari
Eu	A	Cable	Jamais
Deste	Nez	Cour	Femme
RS35-1			
RS35-2			
RS35-3			
RS35-4			
RS35-5			
RS35-7			
RS35-8	RA2-3	OG	2
RS35-9	RA2-2	OG	2
RA2-1			
RA2-2	RS35-9	OG	2
RA2-3	RS35-8	OG	2

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REAR HARNESS RIGHT HAND RA
CONNECTOR LOCATION 90.50.16/CL



J86 507 I

REAR HARNESS LEFT HAND LA HARNESS SCHEDULE 90.50.17/HS

Con —tar No	Description	Interface	Location	
LS13	3-way Econoseal plug (black)	Harness LS	Luggage compartment bulkhead	Luggage compartment
LA?	3-way Econoseal (black)	Brake pads	RH rear hub carrier	under body

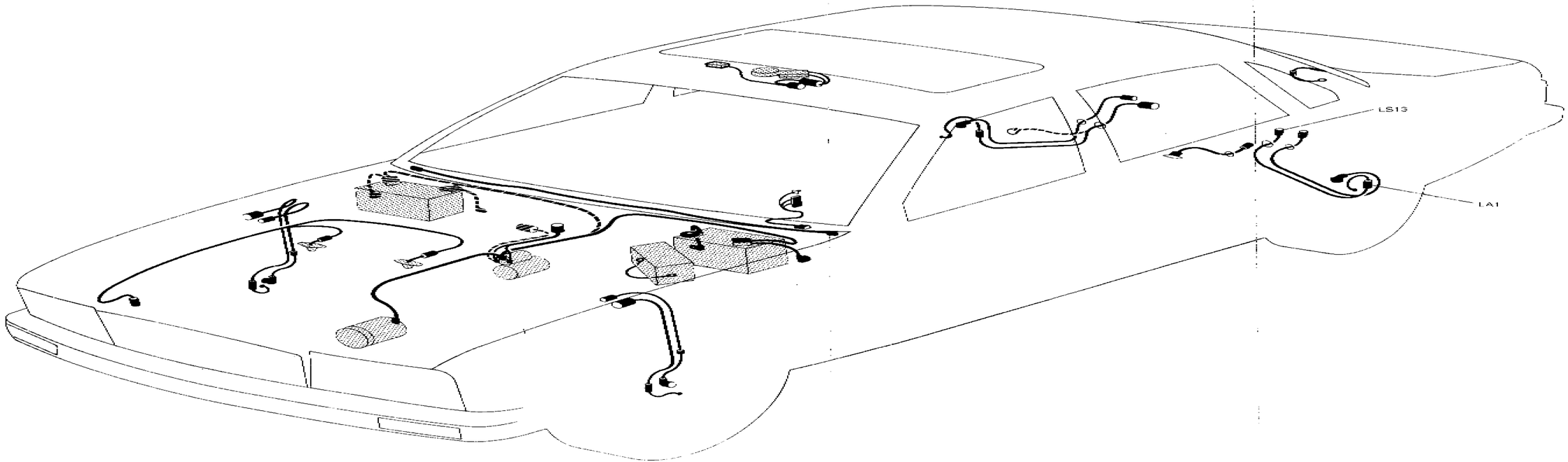
LOCATION & ACCESS 90.50.17/LA

WIRING SCHEDULE 90.50.17/WS

From	To	Colour	Section
Ver	Hich	Febe	Gas-ch-HD
Se	A	Gold	Section
Wa	Rear	Exar	Nest
24	A	Cobra	Service
Seats	Herb	Cdn	Tenant
LS13-1 LS13-2 LS13-3	LA-2 LA-3	G Cc.	1 2
LS13-1 LS13-2 LA13	LS13-3 LS13-3	G Cc.	1 2

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REAR AXLE HARNESS LEFT HAND LA
CONNECTOR LOCATION 90.50.17/CL



J86 507

MANUAL TRANSMISSION SWITCH LINK HARNESS LUCAS I T
HARNESS SCHEDULE 90.50.19/HS

Connector No	Description	Interface	Location	Access
RB42/LB42	15-way PMHD plug (green)	Harness RB/LB	Centre console	Console switch panel
LT1	3-way Econoseal socket (red)	Reverse switch	Transmission tunnel	Under body

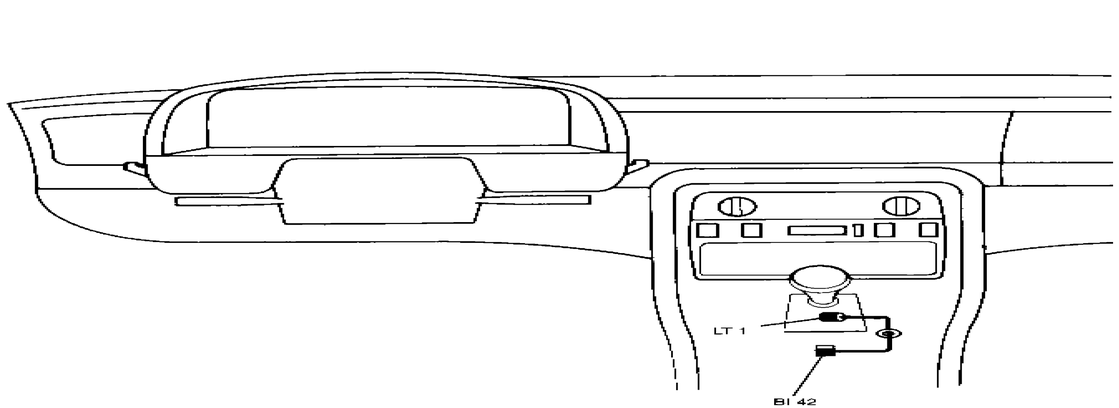
LOCATION & ACCESS 90.50.19/LA

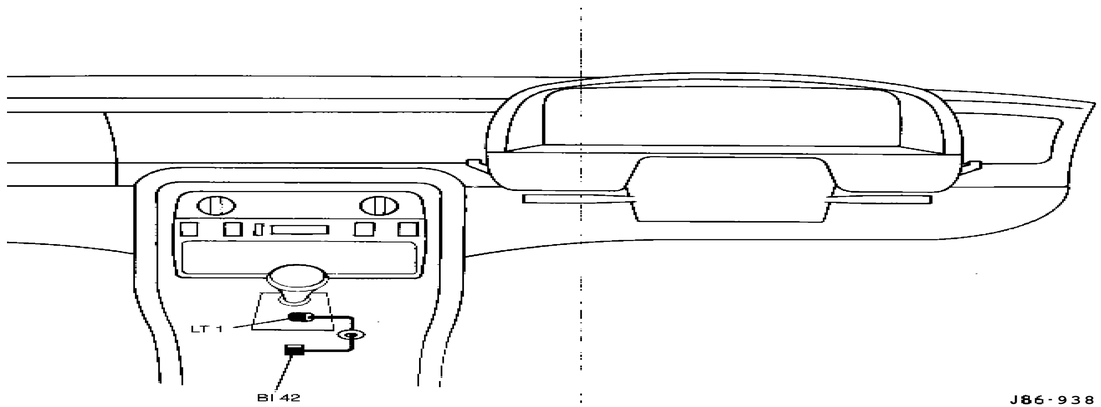
WIRING SCHEDULE 90.50.19/WS

[illegible]	To	Colour	Standard
[illegible]	Mech	Tails	Connector
Da	A	Grade	Section
Ma	Rear	Axle	Rear
Da	e	Cable	Details
[illegible]	Harn	Colo	Terms
E42-1	LT1-1	BK	3
	B36-8	BK	
E42-2			
E42-3			
E42-4			
E42-5			
E42-6			
E42-7			
E42-8	B36-13	BK	7
	B36-13	BK	5
E42-9	LT1-2	SLG	2
E42-10	B36-1J	WP	44
E42-11	B36-10	WP	44
E42-12			
E42-13	B36-8	BK	6
E42-14			
E42-15			
LT1-1			
LT1-2	B36-8	SLG	2
LT1-3	B36-1	BK	3

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MANUAL TRANSMISSION SWITCH LINK HARNESS LUCAS LT
CONNECTOR LOCATION 90.50.I9/CL





J86-938

MANUAL TRANSMISSION SWITCH LINK HARNESS BOSCH BT

HARNESS SCHEDULE 90.50.19/HS

LOCATION & ACCESS 90.50.19/LA

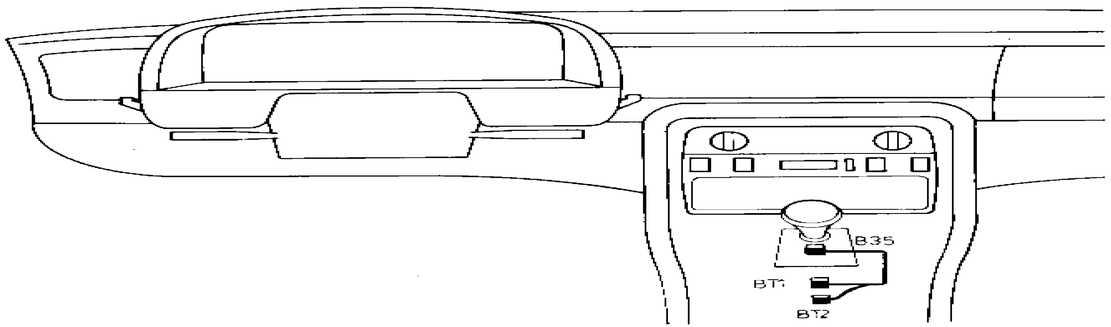
Connector No	Description	Interface	Location	Access
RE35	15-way PMHD plug (green)	Harness RB	Centre console	Console switch panel
LE35	15-way PMHD plug (green)	Harness LB	Centre console	Console switch panel
BT1	3-way Ecoroseal socket (red)	Reverse switch	Transmission tunnel	Under body
BT2	3-way Ecoroseal socket (yellow)	Gear switch	Transmission tunnel	Under body

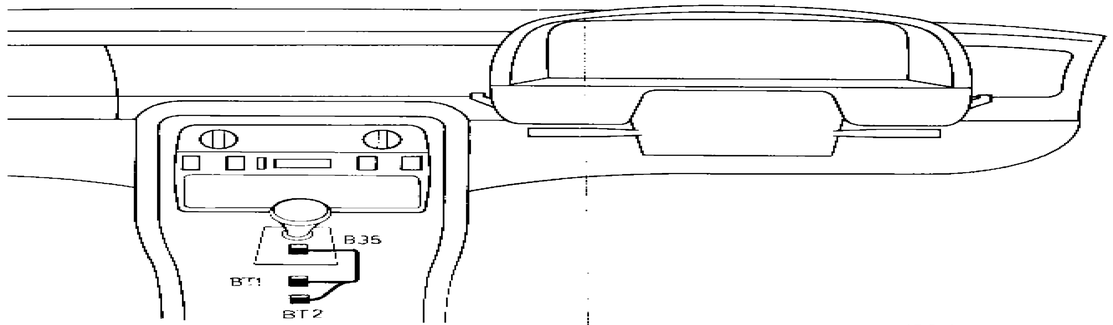
WIRING SCHEDULE 90.50.19/WS

From	To	Colour	Section
Ve	Name	Table	Gen/Hot
Je	A	Cond	Active
Vu	Nun	Exc	Wdt
Ja	A	Cdns	Dense
Total:	Bulb	Cdn	Tavern
BS35-1	S1	BK	
BS35-2			
BS35-3			
BS35-4			
BS35-5			
BS35-6			
BS35-7			
BS35-8			
BS35-9	BT-2	SLG	
BS35-10	E36-11	VIP	
BS35-11	E36-10	VIP	
BS35-12			
BS35-13	S1	BK	
BS35-14			
BS35-15	E72-1	RU	
BT1-1			
BT1-2	E36-9	SLG	
BT1-3	S1	BK	
BT2-1	E35-15	RU	
BT2-2			
BT2-3	S1	BK	
S1			
	E36-1	BK	
	E36-3	BK	
	BT2-3	BK	
	BT35-13	BK	

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MANUAL TRANSMISSION SWITCH LINK HARNESS BOSCH BT
CONNECTOR LOCATION 90.50.19/CL





J86 661

FUEL PUMP LINK HARNESS FP
HARMESS SCHEDULE 90.50.20/HS

Connector No	Description	Interface
LS1D	3-way PM4 plug (black)	Harness LS
FP1	Eyelet	Fuel pump
FP2	Eyelet	Fuel pump

LOCATION & ACCESS 90.50.20/LA

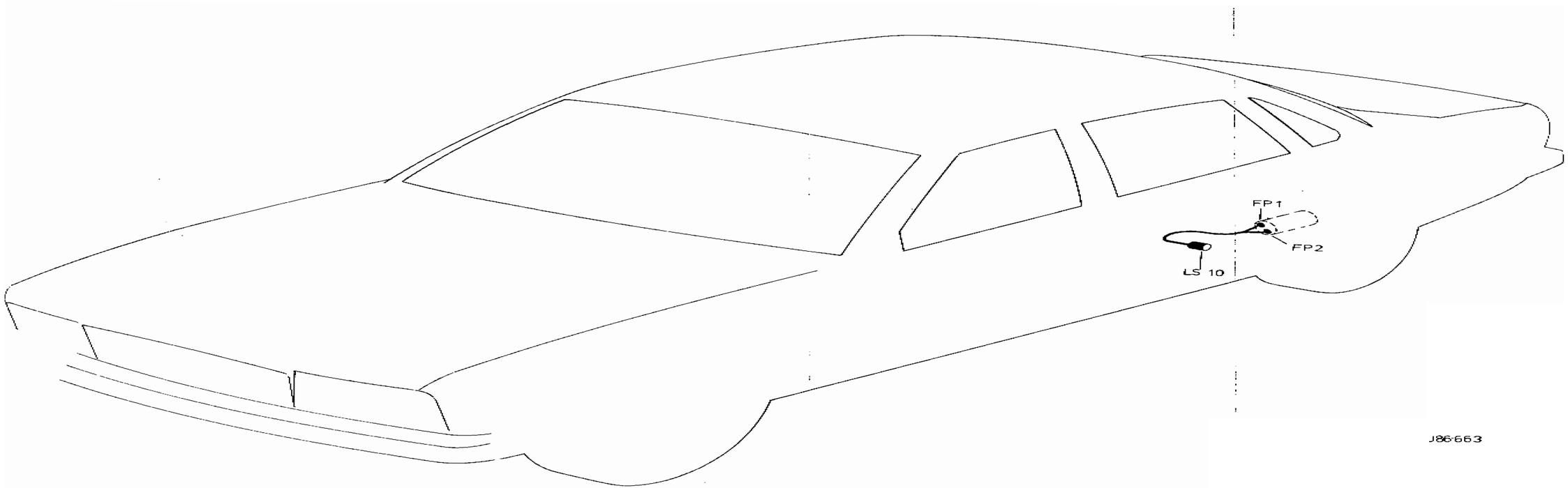
Location	Access
Rear Seat par. LH side	Seat Cushion
Rear Sub-Frame	Under Vehicle
Rear Sub-Frame	Under Vehicle

WIRING SCHEDULE 90.50.20/WS

From	To	Cable	Segment
LS1C-1	FP1	BR	
LS1C-2	FP2	BR	
LS1C-3		W	
FP1	LS1C-1		
FP2	LS1C-2		

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FUEL PUMP LINK HARNESS: FP
CONNECTOR LOCATION 90.50.20/CL



GLOVE BOX LAMP HARNESS CB
HARNESS SCHEDULE 90.50.24/HS

Connector No	Description	Interface	Location	Access
RB26	2-way PM HD plug (black)	Harness RE	Front passenger footwell	LH dash liner
LB26	2-way PM HD plug (black)	Harness LE	Front passenger footwell	LH dash liner
CB1	Slimlock terminal	Lamp	Glove box lamp	Glove box
C62	Slimlock terminal	Lamp	Glove box lamp	Glove box
CB3	Slimlock terminal	Switch	Glove box switch	Glove box
CE4	Slimlock terminal	Switch	Glove box switch	Glove box

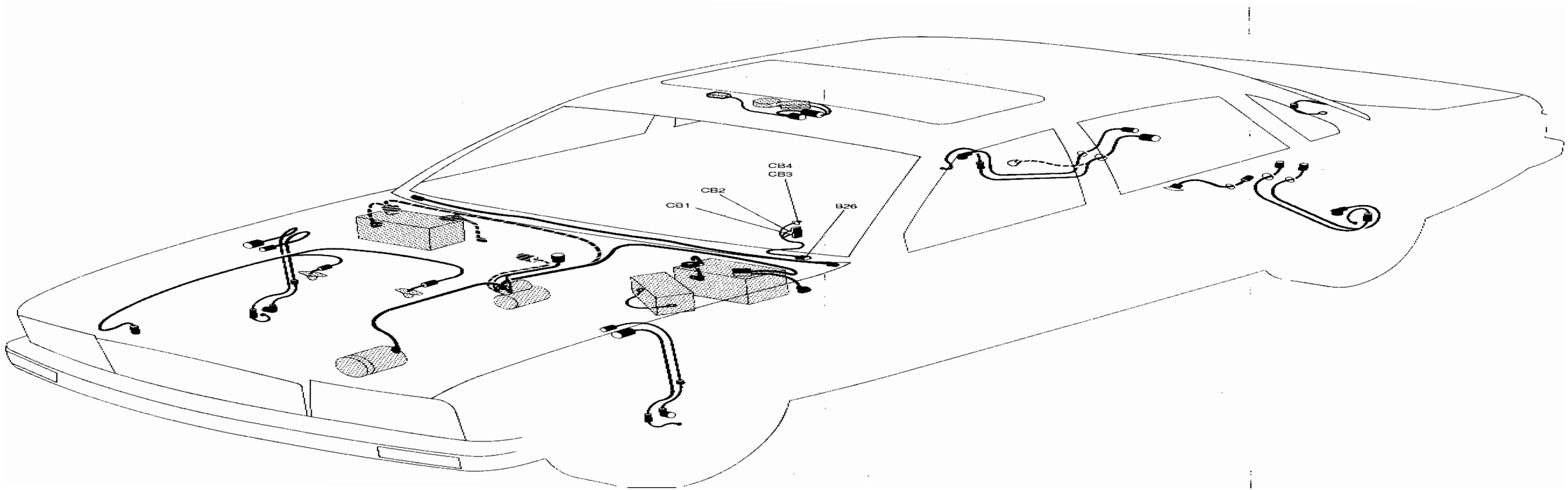
LOCATION & ACCESS 90.50.24/LA

WIRING SCHEDULE 90.50.24/WS

Wire	To	Colour	Stripe
Wire	Wire	Basic	Secondary
To	A	Colour	Stripe
Wire	Rear	Rear	Rear
To	A	Colour	Direction
From	Pada	Color	Tamaño
B26-1	CB3	LG	
B26-2	CB2	YW	
CB1	CB4	LG	
CB2	B26-3	YW	
CB3	B26-1	LG	
CB4	CB1	LG	

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GLOVE BOX LAMP HARNESS CB
CONNECTOR LOCATION 90.50.24/CL



J86 507 D

BONNET LAMPS LINK HARNESS BH
HARNESS SCHEDULE 90.50.26/HS

Connector No	Description	Interface	Location	Access
RS1	3-way Econoseal socket (red)	Harness RS	Radiator support bracket, RH	Engine compartment, above
BH1	3-way Econoseal socket (red)	Bonnet lamp	Bonnet sound deadener	Underbonnet
BH2	3-way Econoseal socket (red)	Bonnet lamp	Bonnet sound deadener	Underbonnet

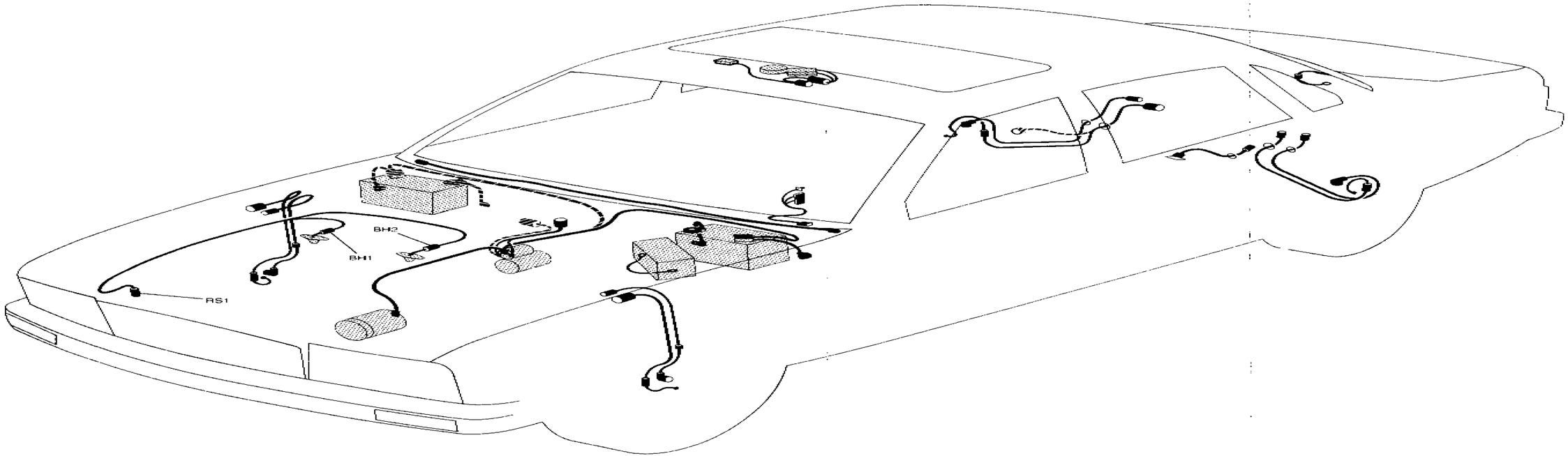
LOCATION & ACCESS 90.50.26/LA

WIRING SCHEDULE 90.50.26/WS

From	To	Colour	Stripe/mm
Ver	Ver	Table	Connector
To	A	Cable	Section
Ver	Rear	Fuse	Ways
Ve	A	Circ	Carrier
Base	Fuse	Cct	Terrain

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BONNET LAMPS LINK HARNESS B H
CONNECTOR LOCATION 90.50.26/CL



J86 507G

TWO STAGE SLIDING ROOF HARNESS SR
HARMESS SCHEDULE 90.50.35/HS

Connector No	Description	Interface	Location	Access
SR1	8-way PM4 plug (yellow)	Map/interior light panel	Roof, centre front	Interior light panel
SR2	3-way PM4 plug (blue)	Sunroof motor	Roof, centre front	Interior light panel

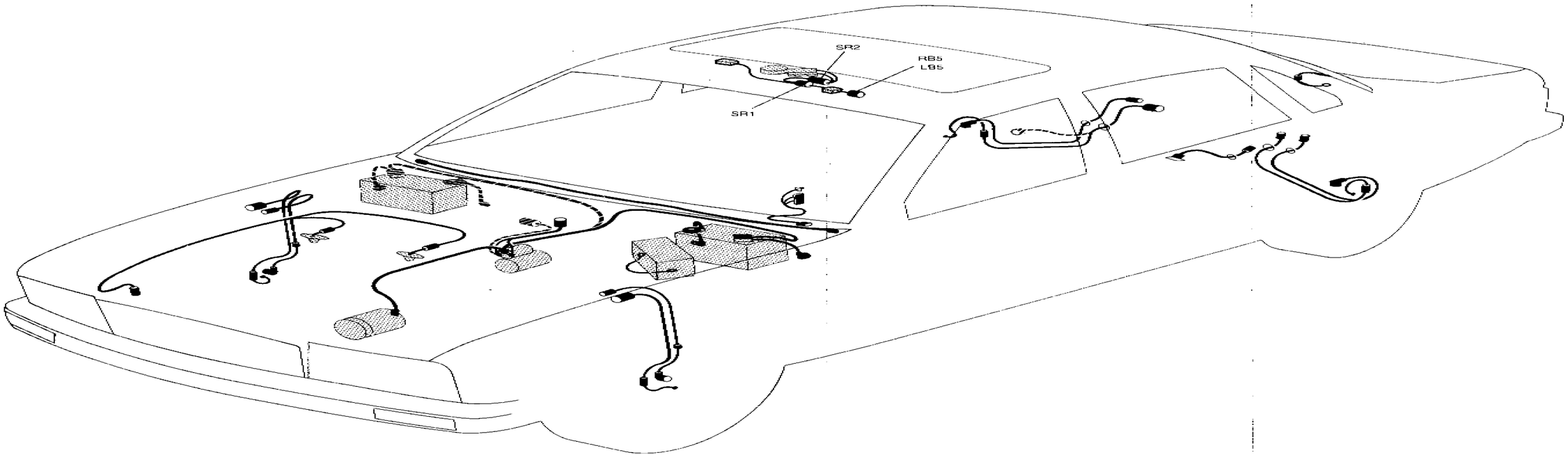
LOCATION & ACCESS 90.50.35/LA

WIRING SCHEDULE 90.50.35/WS

From	To	Colour	Size (sq. mm)
Ref.	Ref.	Cable	Section
Ref.	Ref.	Wire	Wire
No.	No.	Colour	Terminal
Circuit	Name	Code	Number
SR1:1	SR2:1	GU	2.5
SR1:2	SR2:2	GR	2.5
SR1:3			
SR1:4			
SR1:5	Limit Sw	33	3.5
SR1:6	Limit Sw	53	3.5
SR2:1	SR1:1	GU	2.5
SR2:2	SR1:2	GR	2.5
SR2:3			

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TWO STAGE SLIDING ROOF HARNESS SR
CONNECTOR LOCATION 90.50.35/CL



J86 507 H

STARTER SOLENOID LINK HARNESS LUCAS LL
HARNESS SCHEDULE 90.50.31/HS

LOCATION & ACCESS 90.50.31/LA

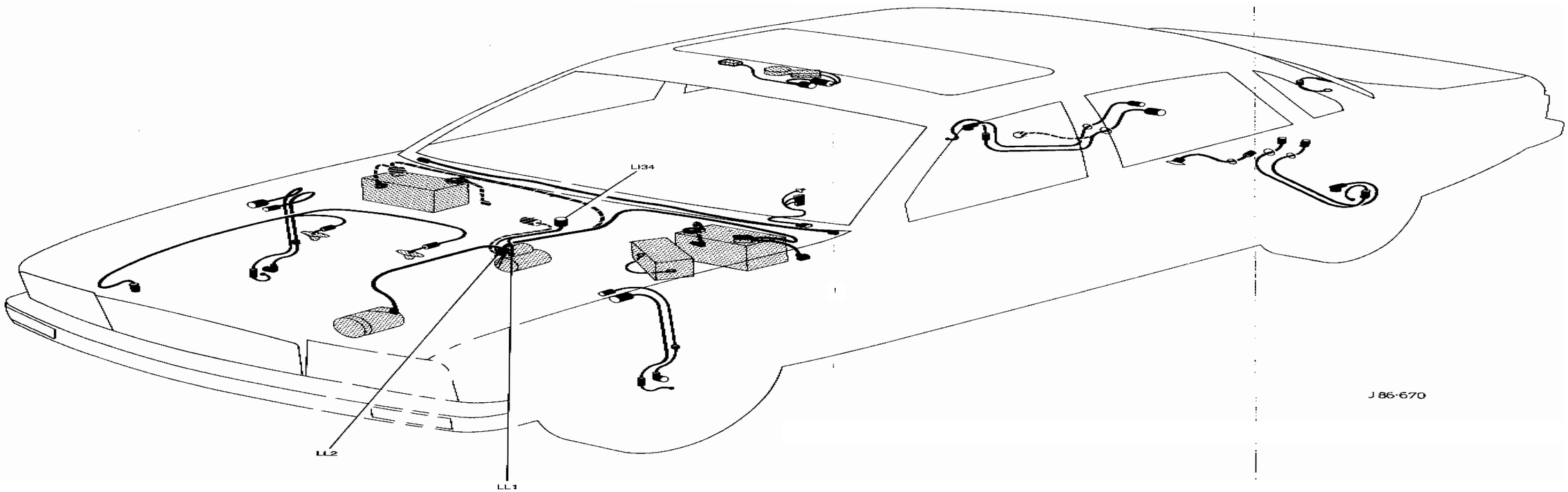
Connector No	Description	Interface	Location	Access
L*34	3-way PM4 plug (black)	Harness LI	Engine compartment	Engine compartment: above
L-1	Eyelet	Starter solenoid	Engine compartment	Engine compartment below
L-2	Eyelet	Starter solenoid	Engine compartment	Engine compartment below

WIRING SCHEDULE 90.50.31/WS

From	To	Colour	Size (mm²)
Wire	Wire	Terminal	Grommet
≡ =	A	Cable	Section
Wire	Wire	Wire	Wire
To	A	Colour	Size (mm²)
Destination	Wire	Colour	Terminal
-134-1	-L1	NY	
-134-2	-L2	W	
-134-3			
-L1	-134-1	NY	
-L2	-134-2	W	

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STARTER SOLENOID LINK HARNESS LUCAS LL
CONNECTOR LOCATION 90.50.31/CL



STARTER SOLENOID LINK HARNESS BOSCH BL
HARNESS SCHEDULE 90.50.31/HS

Connector No	Description	Interface	Location	Access
BL27	3-way PM4 plug (black)	Harness BI	Engine compartment	Engine compartment above
BL1	Eyelet	Starter solenoid	Engine compartment	Engine compartment below

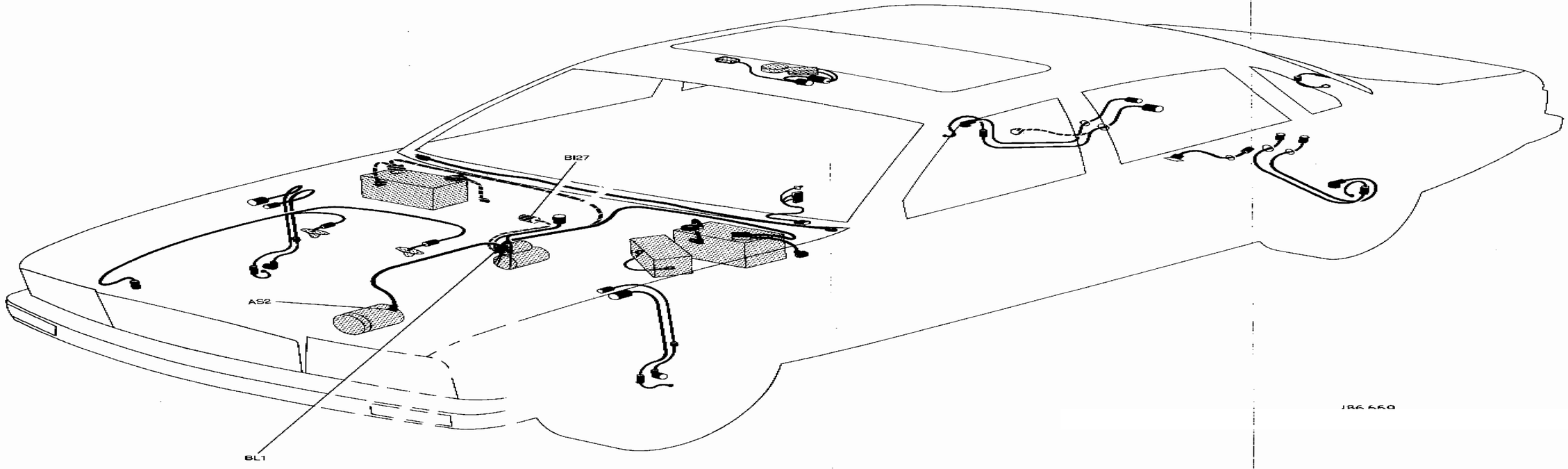
LOCATION & ACCESS 90.50.31/LA

WIRING SCHEDULE 90.50.31/WS

From	To	Colour	Size (mm)
Wire	Notch	Cable	Construction
Ref	A	Colour	Section
Wire	Nut	Key	Wire
Ref	A	Colour	Section
Basic	Finish	Color	Terms
BL27-1			
BL27-2	LL1	W	
BL27-3			
LL1	LL27-2	W	

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STARTER SOLENOID LINK HARNESS BOSCH BL
CONNECTOR LOCATION 90.50.31/CL



STARTER TO ALTERNATOR LINK LEAD AS HARNESS SCHEDULE 90.50.36/HS

Connector No	Description	Interface	Location	Access
AS1	Right-angled terminal	Starter motor	Engine compartment	Engine compartment below
AS2	Right angled terminal	Alternator	Engine compartment	Engine compartment below

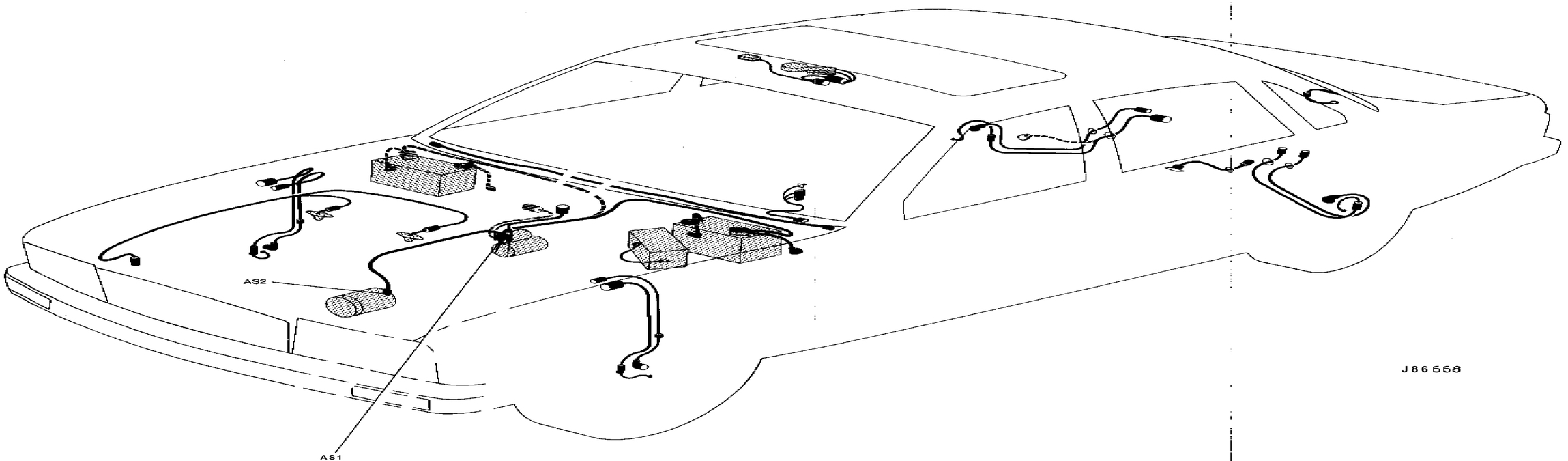
LOCATION & ACCESS 90.50.36/LA

WIRING SCHEDULE 90.50.36/WS

From	To	Colour	Size mm²
Con	Num	Fabr	Construction
Ex	A	Colour	Section
Con	Near	Near	Max
Ex	A	Core	Current
Desig	Near	Core	Terms
AS1	AS2	N	3.0
AS2	AS1	N	3.0

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STARTER TO ALTERNATOR LINK LEAD AS
CONNECTOR LOCATION 90.50.36/CL



TERMINAL POST TO TERMINAL POST LINK LEAD FL/FR
HARNESS SCHEDULE 90.50.37/HS LOCATION & ACCESS 90.50.37/LA

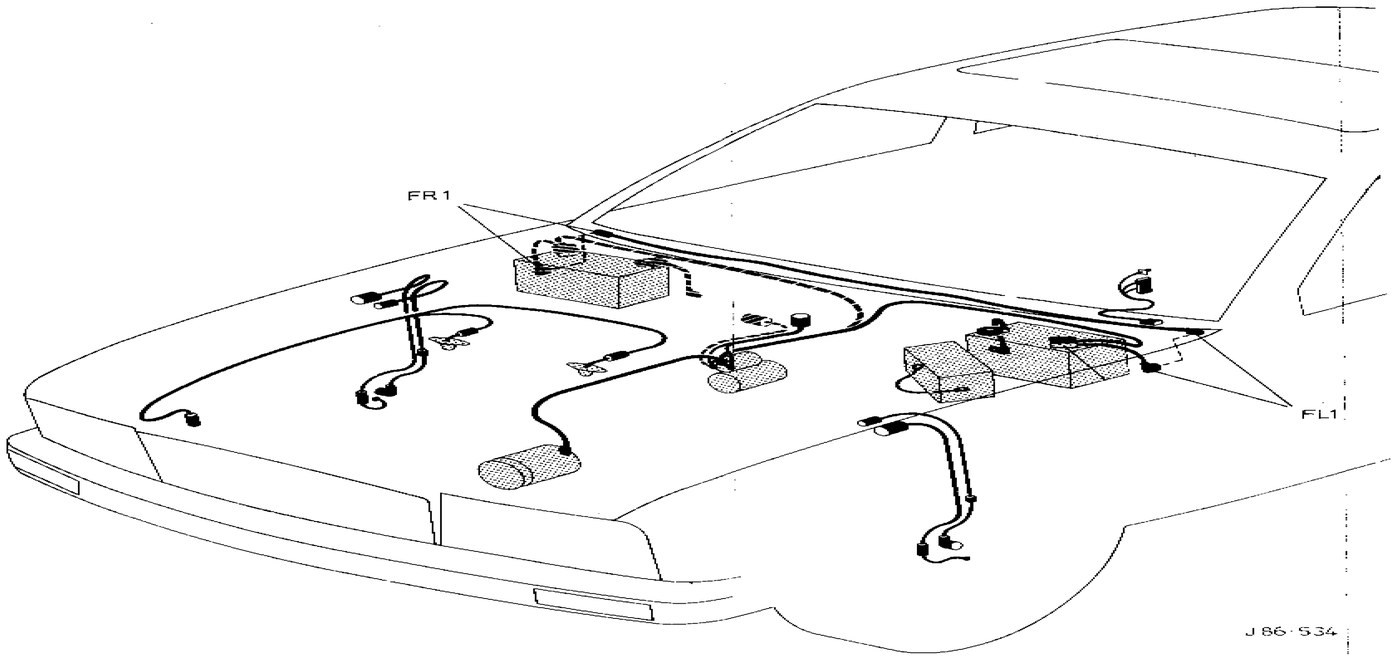
Connector No	Description	Interface	Location	Access
FL1	Eyelet	Battery terminal post, LH	Bulkhead	Fascia
FR1	Eyelet	Battery terminal post, RH	Bulkhead	Fascia

WIRING SCHEDULE 90.50.37/WS

From	To	Cable	Stripe
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
FL1	FR1	N	4.0
FR1	FL1	N	4.0

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TERMINAL POST TO TERMINAL POST LINK LEAD FL/FR
CONNECTOR LOCATION 90.50.37/CL



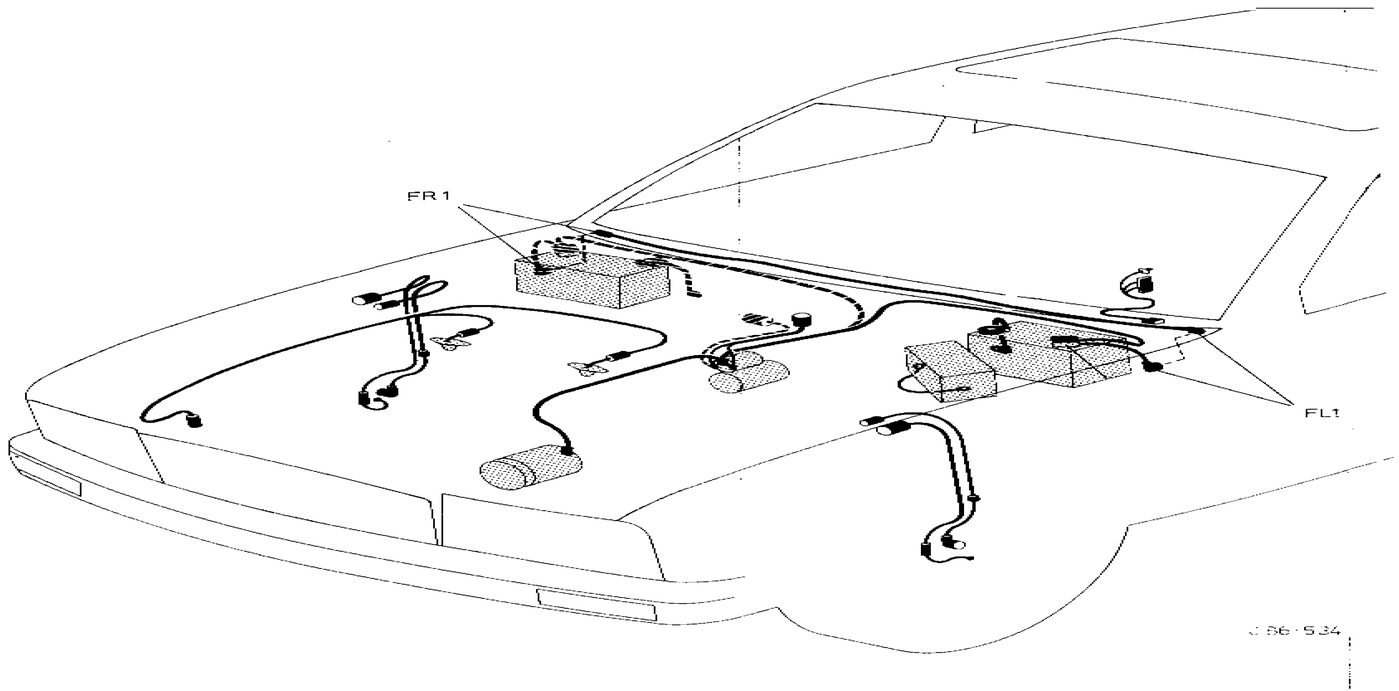
BATTERY POSITIVE LEAD PB
HARNESS SCHEDULE 90.50.49/HS

LOCATION & ACCESS 90.50.49/LA

Connector No	Description	Interface	Location	Access
PB1	Battery terminal	Battery	Engine compartment	Engine compartment, above
PB2	Eyelet	Battery terminal post	Engine compartment	Engine compartment, above
P63	Right-angled terminal	Starter motor	Engine compartment	Engine compartment, below

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BATTERY POSITIVE LEAD PB
CONNECTOR LOCATION 90.50.49/CL



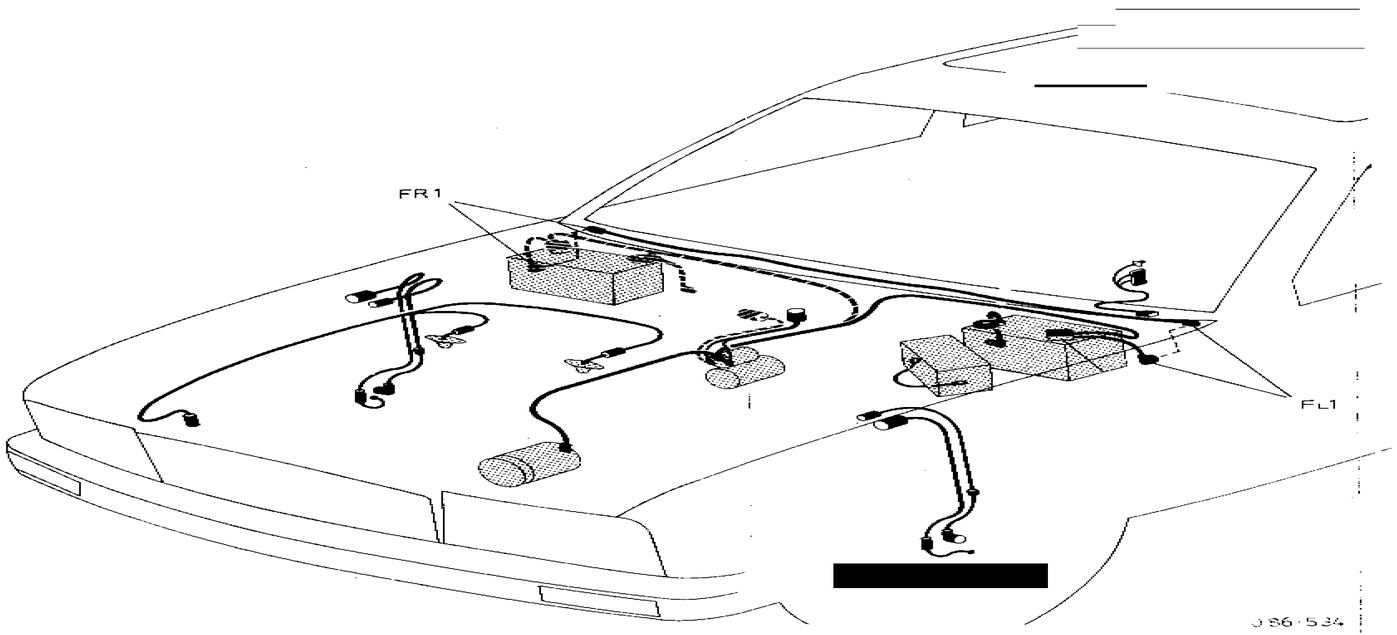
BATTERY EARTH LEAD BE
HARNESS SCHEDULE 90.50.48/HS

LOCATION & ACCESS 90.50.48/LA

Connector No	Description	Interface	Location	Access
BE1	Battery terminal	Battery	Engine compartment	Engine compartment above
BE2	Eyelet	Bulkhead	Engine compartment	Engine compartment above

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BATTERY EARTH LEAD BE
CONNECTOR LOCATION 90.50.08/CL



ABS MODULATOR EARTH LEAD ME HARNESS SCHEDULE 90.50.39/HS

Connector No	Description	Interface	Location	Access
ME1	Eyelet	ABS modulator	Engine compartment	Engine compartment above
ME2	Eyelet	Inner wing valance	Engine compartment	Engine compartment above

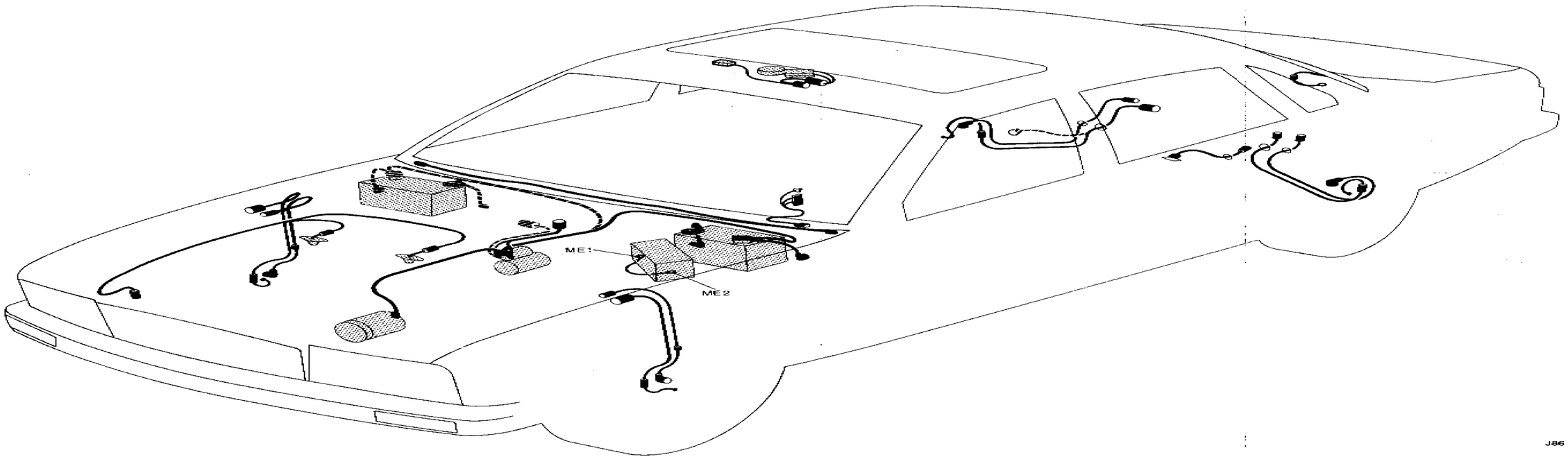
LOCATION & ACCESS 90.50.39/LA

WIRING SCHEDULE 90.50.39/WS

From	To	Colour	Comments
Wire	Mark	Cable	Connector
Bat	A	Colour	Splice
Wire	Mark	Core	Mark
Bat	A	Cable	Section
Description		Core	Terminal
ME1	ME2 ME1	Braided	

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ABS MODULATOR EARTH LEAD ME
CONNECTOR LOCATION 90.50.39/CL



HEATED BACKLIGHT EARTH LEAD HE
HARNESS SCHEDULE 90.50.32/HS

Connector No	Description	Interface	Location	Access
HB1	Lucar	Heated backlight	Heated backlight, LH side	Six light trim finisher
HB2	Eyelet	Chassis	Heated backlight, LH side	Six light trim finisher

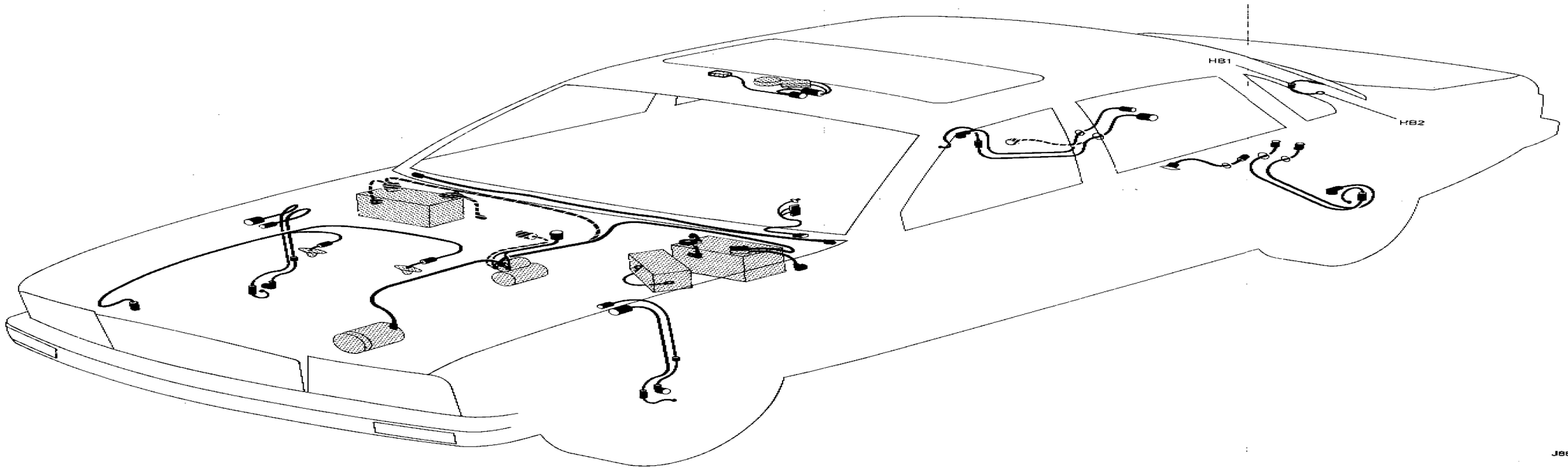
LOCATION & ACCESS 90.50.32/LA

WIRING SCHEDULE 90.50.32/WS

From	To	Circuit	Terminal
Ref	Ident	Cable	Number
No	2	Colour	Section
Ref	Ident	Cable	Mass
No	1	Colour	Section
Base	Light	Color	Terminal
HB1	HB2	BK	2.5
HB2	HB1	BL	2.5

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HEATED BACKLIGHT EARTH LEAD H3
CONNECTOR LOCATION 90.50.32/CL



ENGINE EARTH LEAD EE HARNESS SCHEDULE 90.50.50/HS

Connector No	Description	Interface	Location	Access
EE1	Eyelet	Bell housing	Engine compartment	Engine compartment below
EE2	Eyelet	Bulkhead	Engine compartment	Engine compartment below

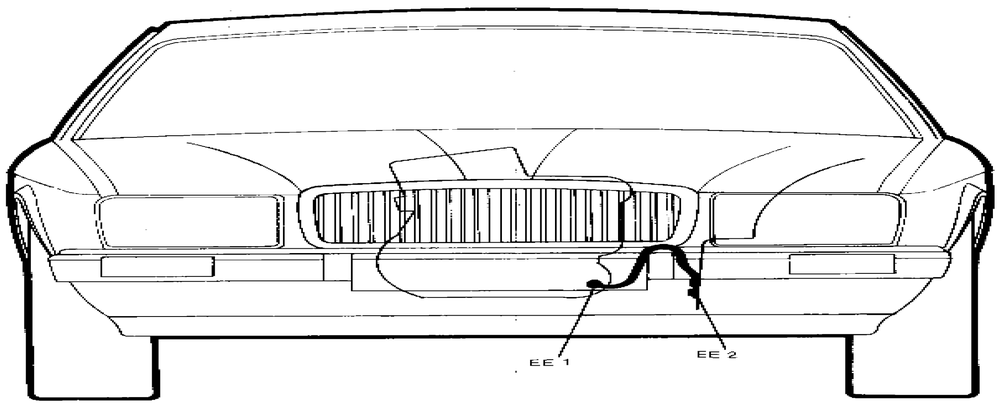
LOCATION & ACCESS 90.50.50/LA

WIRING SCHEDULE 90.50.50/WS

From	To	Colour	Size (mm²)
Wire	Notch	Eyelet	Copper/wire
Bo	A	Cover	Braid
Van	Kew	Kew	Kew
Ea	A	Cable	Duralu
Cable	Hous	Cast	Tenere
EE1	EE2	Braided	
EE2	EE1	Braided	

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ENGINE EARTH LEAD EE
CONNECTOR LOCATION 90.50.50/CL



J86.857

STEERING COLUMN HARNESS SC
HARNESS SCHEDULE 90.50.34/HS

Connector No	Description	Interface	Location	Access
RB55	24-way PM HD socket (black)	Harness RB	PM HD-24 way (black)	Bulkhead harness
LB55	24-way PM HD socket (black)	Harness LB	PM HD-24 way (black)	Bulkhead harness
SC1	8-way PMHD plug (black)	Dimmer	PMHD-8 way (black)	Dimmer module
SC2	6-way PMHD plug (yellow)	Wash/wipe switch	PMHD-6 way (yellow)	Wash/wipe switch
SC3	6-way PMHD plug (blue)	Direction indicator switch	PMHD-6 way (blue)	Horn/DI switch
SC4	6-way PMHD plug (brown)	Buzzer and cancellation switch	PMHD-6 way (brown)	DI cancellation switch
SC5	6-way PMHD plug (green)	Ignition switch	PMHD-6 way (green)	Ignition switch
SC6	6-way PMHD plug (violet)	Ignition key switch	PMHD-8 way (violet)	Ignition key switch

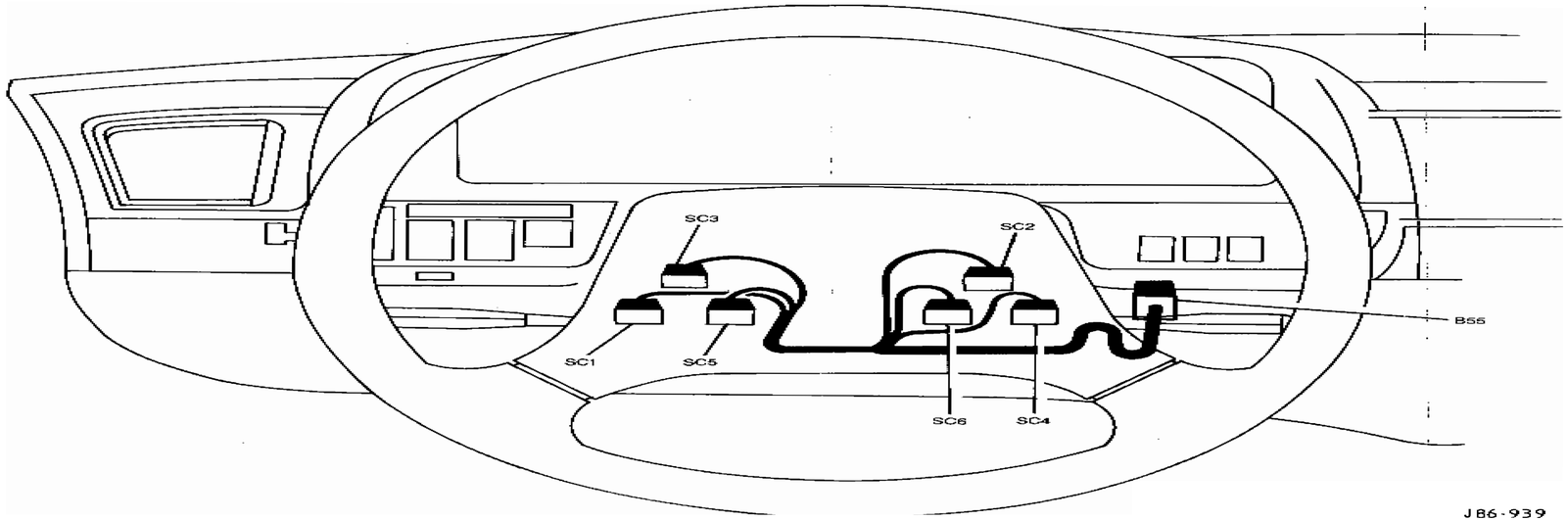
LOCATION & ACCESS 90.50.34/LA

WIRING SCHEDULE 90.50.34/WS

From	To	Colour	Section
Ref	Ref	Colour	Diameter
Ref	Ref	Colour	Section
Ref	Ref	Colour	Mass
Ref	Ref	Colour	Density
Code	Code	Code	Tension

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STEERING COLUMN HARNESS *SC*
CONNECTOR LOCATION 90.50.34/CL



J86-939

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH II
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY ENGLAND

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH
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HIS ROYAL HIGHNESS THE PRINCE OF WALES
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

XJ6

SERVICE MANUAL

VOLUME 6

1991 MODEL YEAR

Contains Section

90. ELECTRICAL HARNESSES COMPONENTS AND CIRCUITS

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INTRODUCTION

Volume 5 contains Section 90 which comprises -

harness diagrams,
harness schedules,
location & access lists,
and wiring schedules.

Harness repair/renewal procedures are in Volume 4 Section 86.

Component and wiring diagrams are in Volume *8* Section 91

UK model year changes are included, and introduction Vehicle Identification Numbers (V.I.N.) are provided for each model year.

Note: Any 'running changes' are included in the model year immediately following the change.

LOGIC EARTH DISTRIBUTION

Logic earths are distributed from earth point B78 close to the CPU.

IGNITION SWITCHED EARTH DISTRIBUTION

Ignition switched earths are distributed from the ignition and inertia switches. The ignition switch distributes the earths in all switch positions except **OFF,** and the inertia switch distributes the earths when tripped with the ignition ON.

WARNING

The battery emits combustible gas (Hydrogen) particularly when charging.
Avoid sparks and short circuits by switching off the charging current before making or breaking the terminal connections.
When disconnecting battery terminal connections, always disconnect the earth terminal first and reconnect it last.
Avoid contact with the battery acid which is both poisonous and corrosive.
Acid will cause burns to the skin and eyes.
In the event of skin or eye contamination, drench the affected area with water and seek immediate medical attention.
Fuel is extremely flammable. All fire precautions must be observed when working on the fuel devices of the engine management system.

CAUTION

NEVER-disconnect the battery while the engine is running
NEVER- reverse the battery terminal connections
ALWAYS- disconnect both battery terminals (earth terminal first) before any electrical maintenance is commenced, before battery charging or before using any type of electric welding equipment on the vehicle.

BULKHEAD HARNESS RB (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
GB11	PM5 3 way socket(green)	Gearbox harness	
LS1	PMHD 36 way socket(black)	Harness LS	LH 'A' post
LS2	PMHD 15 way socket(yellow)	Harness LS	LW'A' post
LS3	PM4 9 way socket (black)	Harness LS	LH A' post
LS64	PM4 6 way socket(yellow)	Harness LS	LH 'A' post
RS22	PMHD 36 way socket(black)	Harness RS	RH 'A' post
RS87	PM4 6 way socket(black)	Harness RS	RH 'A' post
RS114	PMHD 36 way socket(yellow)	Harness AS	RH 'A' post
RE6	PM4 4 way socket(black)	Interior map light	Roof centre front
RB7	PM4 6 way socket(black)	Pass. door harness	LH 'A' post
R08	PMHD 24 way plug(black)	Pass. door harness	
RB12	PM4 3 way socket(black)	CPU	Front passenger footwell
RB13	PMHD 36 way plug (yellow) Inhibit plug fitted at pin 30 position	CPU	Front passenger footwell
RE14	PMHD 36 way plug(yellow)	CPU	Front passenger footwell
RE15	Kiekert 9 way socket	Door lock ECU	Front passenger footwell
RB16	Relay base(green)	Radio relay	Front passenger footwell
RB17	Relay base (blue)	Ignition 'on' relay	Front passenger footwell
RB18	Relay baselblack)	Aux side lamp relay	Front passenger footwell
RB19	Relay base(yellow)	Starter relay	Front passenger footwell
RB20	Single lucar connector	Cruise control ECU	Front passenger footwell
RB21	MIC 8 way socket	Cruise control ECU	Front passenger footwell
RB25	PM5 3 way socket(black)	LH air con.blower motor	Front passenger footwell
RB26	PMHD 2 way socket(black)	Cubby box lamp harness CB	Front passenger footwell
RB27	PMHD 6 way socket (yellow)	Harness LI	Front passenger footwell
RB28	PM4 6 way plug (yellow)	Harness LI	Front passenger footwell
RB29	PM5 3 way socket (black)	RH air con blower motor	Driver footwell
RB30	PMHD 15 way socket (green)	Centre console switch panel	Centre console
RB31	PM5 3 way switch (yellow)	Handbrake switch	Driver seat
RB33	PMHD 15 way socket (white)	Radio and speakers	Centre console
RB35	PMHD 15 way socket (green)	Gearbox harness	Centre console
RB41	PMHD 2 way socket (black)	Passenger seat belt switch	Passenger seat
RB46	PMHD 4 way socket (black)	Driver seat belt switch	Driver seat
RB49	PMHD 24 way socket (green) Inhibit plug fitted at pin 12 position	Fascia switch panel	Driver footwell
RB55	PMHD 24 way plug (black)	Colutnn switchgear	Driver footwell
RE66	PM4 2 way socket (black)	Brake switch	Driver footwell
RB57	PM4 3 way plug (black)	Brake switch	
RB58	PMHD 15 way socket (black)	Speed warning module	Front passenger footwell
RB59	PM4 6 way socket (black)	Wiper logic module	Front passenger footwell
RB60	PMHD 4 way socket (black)	Wiper logic module	Front passenger. footwell
RB61	PMHD 36 way plug (black)	Harness DD	RH'A' post
RB62	PM4 6 way socket (black)	Harness DD	RH 'A' post
RB64	3 way socket	Inertia switch	Centre console
RB66	PMHD 15 way socket (black)	Air con control	
RB73	Eyelets	Earth terminals	Centre console
RB74	Eyelets	Earth terminals	Centre console
RB75	Eyelets	Earth terminals	Bulkhead driver side
RB78	Eyelets	Logic earth terminals	Bulkhead passenger side
RB80	Eyelets	Earth terminals	Centre console
RB81	PM4 3 way socket (black)	Centre fuse box	
RB82	Eyelets	Bulkhead battery terminal post LH	Bulkhead LH side
RB88	Eyelet	Earth terminal	Bulkhead passenger side
RB90	Eyelet	Earth terminal	Passenger footwell
RB92	Relay baselnatural)	Sidelights on power relay	Passenger footwell
RB93	Relay base(violet)	Auto speed control relay	Passenger footwell
RB94	PM4 3 way plug (black)	Manual speed control shorting plug	Passenger footwell
RB95	Relay base,(natural)	LH seat relay	Centre console
RB96	Relay baselblack)	RH seat relay	Centre console
RB97	PMHD 10 way socket (yellow)	Driver seat heater switch	Centre console
RB98	PM4 3 way socket (violet)	Driver seat heater	Driver seat
RB99	PMHD 3 way socket(white)	Passenger seat heater switch	Centre console
RB100	PM4 3 way socket (black)	Seat switches	Centre console
RB101	PM4 3 way socket lred)	Seat switches	Centre console
RB102	PM5 3 way socket(violet)	Passenger seat heater	Passenger seat
RB108	Relay base (brown)	Puddle lamp relay	Passenger footwell
RB111	PM5 3 way socket (violet)	Accelerator switch	Driver footwell
RB114	PMHD 8 way socket	IR receiver module	Roof centre front
RB119	PM4 5 way socket (black)	Driver's interior light and seat switch	Centre console driver side

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BULKHEAD HARNESS RB (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
RB120	PM4 5 way socket (black)	Pass interior light and seat switch	Centre conscle
RB122	Lucar sacket	Right hand illum. vanity mirror	passenger side Driver side roof
RE123	Lucar socket	Right hand illum. vanity mirror	Driver side roof
RE124	Lucar socket	Left hand illum. vanity mirror	Passenger side roof
RB125	Lucar socket	Left hand illum. vanity mirror	Passenger side roof
RB127	PM4 5 way socket (black)	Clutch switch	Driver footwell
RB128	TTS 9 way socket (natural)	RH fusebox	RH 'A' post
RE129	TTS 5 way socket (natural)	RH fusebox	RH 'A' post
RB130	TTS 9 way socket 'A' (natural)	LH fusebox	LH 'A' post
RB131	TTS 5 way socket 'C' (natural)	LH fusebox	LH 'A' post
RE132	PMHD 24 way socket(brown)	Fascia	Driver footwell
RB133	PM4 3 way socket	Sunshine roof	Roof centre front
RB134	PMHD 24 way socket (black)	Instrument pack	Driver footwell
RB135	PMHD 48 way socket (black)	Instrument pack	Driver footwell
RB145	PM4 6 way socket(brown)	Diagnostic socket	Driver footwell
RB146	PMHD 4 way socket (yellow)	Remote boot release	Glovebox
RB147	ReLay base.(black)	Lights on warning module	Driver footwell
RB148	TTS 9 way socket 'A' (natural)	Centre fusebox	Centre console
RE149	TTS 5 way socket 'B' (natural)	Centre fusebox	Centre console
RB151	PM4 5 way socket (black)	Security connector	RH 'A' post
RB152	PM4 5 way plug (black)	Security connector	RH 'A' post
RB156	Relay base (red)	Cigar lighters relay	Driver footwell
RB164	Relay base (green)	Driver seat entry switch relay	Driver footwell
RB165	PM4 3 way socket	Seat entry switch	Driver seat
RB180	Econoseal 2 way socket	Front cigar lighter	Centre console
RB181	Lucar single socket	Front cigar lighter	Centre console
RB184	Econoseal 3 way socket	Rear cigar lighter	Rear centre consc

BULKHEAD HARNESS RB (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
GB11	Passenger footwell	CH dash Liner
LS1	LH 'A' post	LH dash liner
LS2	LH 'A' post	LH dash liner
LS3	LH 'A' post	LH dash liner
LS64	LH 'A' post	LH dash liner
RS27	RH 'A' post	RH dash liner
RS874		RH dash liner
RB6	RH 'A' post Roof centre front	RH dash liner Map/interior light panel
RB7	LH 'A' post	LH dash liner
RB8	LH 'A' post	LH dash liner
RB12	Front passenger footwell	LH dash liner
RB13	Front passenger footwell	LH dash liner
RB14	Front passenger footwell	LH dash liner
RB15	Front passenger footwell	
RB16	Front footwell	LH dash liner
RB17	Front passenger footwell	
RB18	Front passenger footwell	LH dash liner
RB19	Front passenger footwell	
RB20	Front passenger footwell	LH dash liner
RB21	Front passenger footwell	LH dash liner
RB25	Front passenger footwell	LH dash liner
RB26	Front passenger footwell	
RB27	Front footwell	LH dash liner
RB28	Front passenger footwell	
RB29	Driver footwell	RH dash liner
RB30	Centre console	Console switch panel
RB31	Below handbrake lever	Beneath floor carpet
RB33	Centre console	Centre console switch panel
RB35	Centre console	Conse switch panel
RB41	Passenger seat	Passenger seat cushion
RB45	Driver footwell	Driver seat
RB49	Driver footwell	RH dash liner
RB55	Driver footwell	RH dash liner and steering column cowls
RB56	Driver footwell	
RB57	Driver footwell	
RB58	Front passenger footwel	LH dash liner
RB59	Front passenger footwel	LH dash liner
RB60	Front passenger footwel	LH dash liner
RB61	RH 'A' post	RH dash liner
RE62	RH 'A' post	RH dash liner
RE64	Driver footwell	
RB66	Centre console	Console switch panel
RB73	Centre console	Centre console ash tray
RE74	Centre console	Centre console ash tray
RE75	Bulkhead (driver side)	RH air blower duct
RB78	LH 'A' post	LH air blower duct
RB80	RH 'A' post	RH dash liner
RB81	Centre console	Console trim finisher
RB82	Bulkhead	
RB88	Bulkhead (passenger side)	
RB90	Passenger footwell	LH dash liner
RB92	Passenger footwell	LH dash liner
RB93	Passenger footwell	LH dash liner
RB94	Passenger footwell	LH dash liner
RB95	Centre console	Console switch pane
RB96	Centre console	Console switch pane
RB97	Centre console	Console trim finisher
RB98	Beneath driver seat	Driver seat cushion
RB99	Centre console	Console trim finisher
RB100	Centre console	Console trim finisher
RE101	Centre console	Console trim finisher
RB102	Below front passenger seat	Front passenger seat cushion
RB108	Passenger footwell	LH dash liner
RB111	Accelerator switch	
RB114	IR receiver	Map/interior light panel
RB119	Centre console	Centre console trim finisher
RB120	Centre console	Centre console trim finisher
RB122	Driver side roof	Vanity mirror unit and head liner
RB123	Driver side roof	Vanity mirror unit and head liner
RB124	Passenger side roof	Vanity mirror unit and head liner
RB125	Passenger side roof	Vanity mirror unit and head liner
RB127	Driver footwell	RH dash liner
RB128	RH 'A' post	
RB129	RH 'A' post	RH dash liner
RB130	LH 'A' post	LH dash liner
RB132	LH 'A' post Driver footwell	RH dash liner Map/interior light panel
RB133	Roof centre front	RH dash liner
RB134	Driver footwell	
RB135	Driver footwell	
RB145	Driver footwell	RH dash liner
RB146	Glovebox	

BULKHEAD HARNESS RB (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
RB147	Driver footwell	RH dash liner
RB148	Centre console	Centre console ash tray
RB149	Centre console	Centre console ash tray
RB151	RH 'A' post	RH dash liner
RB152	RH 'A' post	RH dash liner
RB156	Driver footwell	RH dash liner
RB164	Driver footwell	RH dash liner
RB165	Driver seat	Driver seat cushion
REI80	Centre console	Centre console front ash tray
RB181	Centre console	Centre console front ash tray
RBI84	Centre console	Centre console rear ash trav

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BULKHEAD HARNESS RB (RHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/HS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
GB11-1	REI11-1	BS	0.5
GB11-2	RBS62	NB	0.5
GB11-3	RB131-3	NS	2.0
LS1-1	RBS70	US	0 5
LS1-2	RB13-15	KR	0.5
LS1-3	RB49-11	UK	0 5
LS1-4	RB14-8	YS	0 5
LS1-5	RBS83	RU	0.5
LS1-6	RS22-36	PS	0.5
LS1-7	RBS25	WB	0.5
LS1-8	RB134-18	WLG	0.5
LS1-9	RBS36	P	0.5
LS1-10	RS114-16	OG	0.5
LS1-11	RBS84	RD	0.5
LS1-12	RBS66	KS	0.5
LS1-13	RBS27	R	0 5
LS1-14	RB33-5	RLE	0.5
LS1-15	RB33-6	RP	0 5
LS1-16	RB135-34	OS	0.5
LS1-17	RB135-37	P	0.5
LS1-18	RBS13	WN	0.5
LS1-22	RB135-20	SK	0.5
LS1-24	RBS10	PU	0.5
LS1-25	RB21-1	UG	0.5
LS1-26	RB21-6	UR	0.5
LS1-28	RBS82	SLG	0.5
LS1-29	RBS1	UY	0.5
LS1-30	RB61-11	BO	0.5
LS1-31	RB61-12	GLG	0.5
LS1-32	LB135-45	NO	0.5
LS2-1	RBS98	RG	0.5
LS2-2	RBS12	WY	0.5
LS2-3	RB33-2	RN	0.5
LS2-5	RB27-1	IKN	0.5
LS2-8	RB55-10	GU	0.5
LS2-10	RBS17	IPO	0.5
LS2-11	RBS16	IPK	0.5
LS2-12	RBS15	YW	0.5
LS2-15	RB13-28	IKY	0.5
LS3-1	RB59-1	NB	0.5
LS3-2	RB72	IB	0.5
LS3-3	RB59-4	R	0 5
LS3-4	RBS81	WG	0.5
LS3-5	RB28-2	UR	0.5
LS3-6	RBS99	WP	0.5
LS3-7	RB59-4	U	0.5
LS3-8	RBS37	I3K	0.5
LS3-9	RB28-6	I3G	0.5
LS64-1	RB59-5	RY	0.5
LS64-2	RB59-6	RS	0.5
LS64-3	RBS46	LGO	0.5
LS64-4	RB59-3	BS	0.5
LS64.5	RB57-2	PG	0.5
LS64-6	RB21-4	UY	2.0
RS22-1	RBS85	US	0.5
RS22-2	RB134-17	I3RD	0.5
RS22-3	RB151-3	YO	0.5
RS22-4	RB134-15	RIN	0.5
IRS22.5	RBS13	WN	0.5
RS22-6	RB149-3	WR	0.5
RS22-7	RB134-21	OS	0 5
RS22-8	RB134.1 9	I3K	0.5
RS22-9	RB134-20	I3W	0.5
RS22-12	RB134-16	UIN	0.5
RS22-13	RB61-9	I3G	0.5
RS22-14	RB61-10	I3LG	0.5
RS22-15	RB49-5	UK	0.5
RS22-16	RB14-7	YK	0.5
RS22-17	RBS43	LGO	0.5
RS22-18	RB135-21	LG	0.5
RS22-19	RB135-13	OR	0.5
RS22-20	RBS15	YW	0.5
RS22-21	RB14-20	\NG	0.5
I3522.22	RB14-21	WB	0.5
RS22-25	RB128-1	NK	0.5
RS22-26	RB151-4	RY	3.5
RS22-27	RB33-14	KO	3.5
RS22-28	RB33-13	KR	3.5
RS22-29	RBS39	UY	0.5
RS22-30	RB148-5	WS	3.5
RS22-32	RBS10	PU	3.5
RS22-33	RB13-14	KG	0.5
RS22-34	RBS17	PO	3.5
RS22-35	RBS16	PK	3.5
RS22-36	LS1-6	RS	3 5
RS87-1	RB62-5	NY	3.5
RS87-1	RB7-5	NY	3.5
RS87-2	RBS81	WG	3.5
RS87-3	RB80	B	0.5
RS87-4	RBS4	EIK	3.5
RS87-6	RBS99	WP	0.5

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RS114-1	RBI35-7	O	0.5
RS114-2	RB135.1 0	BY	0.5
RS114-3	RB14-1	LGN	0.5
RS114.4	RBS92	LGY	0.5
RS114-5	RBS36	P	0.5
RS114-6	RB134-24	RY	0.5
RS114-7	RB148-3	WU	0.5
RS114-8	RBS27	R	0.5
RS114-9	R5S83	RU	0.5
RS114-10	RBS84	RO	0.5
RS114-11	RBS82	SLG	0.5
RS114-12	RB33-8	KY	0.5
RS114.13	RBS29	NW	0.5
RS114-14	RBS66	KS	0.5
RS114-15	RB13-27	KU	0.5
RS114-16	LS1-10	OG	0.5
RS114-17	RBS27	UG	0 5
RS114-18	RB135-39	KU	0.5
RS114-19	RBS97	KLG	0.5
RS114-22	RB66-2	UB	0.5
RS114-24	RBS11	WB	0.5
RS114-25	RBS5	NP	0.5
RS114.26	IRBI35-9	BR	0.5
RS114-27	RB135-48	RB	0.5
RS114-30	IRBI27.4	GB	0.5
RS114-32	RB135-45	NO	0 5
RS114-33	RB135-23	UR	0.5
RS114-34	IRBI29-3	NLG	0 5
RB6-1	RBS29	NW	0.5
RB6-2	RB30-5	SU	0.5
RB6-4	RBS28	RLG	0.5
RB7-1	RB72	B	2.0
RB7-2	RB128-4	NP	2.0
RB7-5	RS87-1	NY	2.0
RB7-6	RBS37	BK	2.0
RB8-1	RBS91	O	0.5
RB8-2	RBS15	YW	0.5
RB8-3	RB61-7	BR	0.5
RB8-4	RB61-8	IBP	0.5
RB8-5	RBS35	K	0.5
RB8-6	RB37-7	IKW	0.5
RB8-7	RBS36	P	0.5
RB8-8	RBS97	IKLG	0.5
RB8-9	RBS34	IPN	0 5
RB8-10	RBS17	PO	0.5
RB8-11	RBS16	PK	0.5
RB8-12	RBS8	YO	0.5
RB8-13	RBS47	UO	0.5
RB8-14	RB61-22	GR	0.5
RB8-15	RB61-23	GG	0.5
RB8-16	RB61-24	GY	0.5
RB8-17	RB61-25	GP	0.5
RB8-20	RB135-47	PW	0.5
RB8-21	RBS39	UY	0.5
RB12.2	RB128-8	IUG	0.5
RB13-1	RBS25	WB	0 5
RBI3-2	RBS91	R	0.5
RB13-3	RBS92	LGY	0.5
RBI3-4	RB55-2	LGG	0.5
RB13-5	RBS90	LGR	0.5
IRBI3-6	RB49-15	YR	0.5
RB13-7	RB49-14	ULG	0.5
RB13-8	RB49-10	UY	0.5
RB13-9	RB55-7	YU	0.5
RB13-10	RB55-6	\N	0.5
RB13-14	RS22-33	KG	0.5
RB13-15	LS1-2	KR	0.5
RB13-16	RB30-11	RO	0.5
RB13-17	RB132-16	GO	0.5
RB13-18	RBS36	P	0.5
IRE13-19	RB147-30	UR	0.5
IRBI3-20	RB51-2	YO	0.5
RB13-21	RBS95	RW	0 5
RB13-22	RBS74	GB	0.5
RB13-23	RBS73	SLG	0.5
RB13-24	RB33-4	LGB	0.5
RB13-25	RB99-1	OW	0.5
RB13-26	RB97-1	KW	3.5
RB13-27	RS114-15	KU	3.5
RB13-28	LS2-15	KY	0.5
RB13-29	RB35-13	US	3.5
RB13-30			
RB13-31	RB30-2	SO	3.5
RB13-32	RB30-3	SY	3.5
RB13-33	RB30-4	SG	3.5
RB13-35	RB30-6	SK	0.5
RB13-36	RBS37	BK	0.5
RB14-1	RS114-3	LGN	3.5
RB14-2	RB135-18	Y	3.5
RB14-3	RB135-15	SB	3.5
RB14-4	RBS61	GU	1.5

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RB14-5	RB61-13	BW	0.5
RE14-6	RB49-16	YP	0.5
RB14-7	RS22-16	YK	0 5
RB14-8	LS1-4	YS	0.5
RBI4-9	RB135-41	UN	0 5
RB14-10	RBI35.40	UW	0.5
RB14-11	RBI33-3	YB	0.5
RB14-12	RBS43	LGO	0.5
RB14-13	RBS28	RLG	0.5
RE14-14	RB58-1	UG	0.5
RB14-15	RB58-2	PR	0.5
RB14-16	RB58-3	PS	0.5
RB14-18	RB58-13	LGS	0.5
RB14-19	RBS35	K	0.5
RBI4-20	RS22-21	WG	0.5
RB14-21	RS22-22	WB	0.5
RB14-22	RB99-2	O	0 5
RB14-23	RB97-2	KO	0.5
RB14-24	RB132-17	GS	0.5
RB14-26	RB66-5	5	0.5
RB14-27	RB61-28	BN	0.5
RBI4-28	RB61-29	BU	0.5
RB14-34	RB60-2	LGP	0.5
RB14-35	RB30-10	SN	0.5
RB14-36	RB30-12	ON	0.5
RBI5-1	RBS40	NG	2.0
RB15-2	RB80	B	2.0
RBI5-3	RBS17	PO	2.0
RB15-4	IRBSI6	PK	2.0
RBI5-5	RBS8	BO	0.5
RB15-6	RB151-1	RO	0.5
AB15-7	RBS34	PN	0.5
RBI5-8	RBS61	GU	0.5
RB16-30	RB16-85	NY	0.5
RBI6-30	RB129-5	NY	1 0
RE16-85	RBD7-ODU	U	0.5
RBI6-86	RB16-30	NY	0.5
RBI6-87	RBS46	LGO	1.0
RB16-87A	RB147-87	NW	0.5
RB17-30	RB71	IN	3.0
RB17-85	RBD5/DOU	WU	0.5
RBI7-86	RBS32	NB	0.5
RBI7-87	RBS26	NK	3.0
RB18-30	RBS27	UG	2.0
RB18-30	RBD11-OOW	UG	0.5
RB18-85	RBS50	UO	0.5
RB18-86	RBS38	NR	0.5
RBI8-87	RB78	BK	2.0
RBI9-30	RB128-6	NO	3 0
RB19-85	RBD2-OOU	WR	0.5
RB19-86	RBS11	WB	0.5
RB19-87	RB28-5	W	3.0
RB20	RBS30	U	0.5
RB21.1	LSI-25	UG	1.0
RB21-2	RB132-1	SR	0.5
RB21-3	RB132-2	SU	0 5
RB21-4	LS64-6	UY	2.0
RB21-5	RBS80	NB	1.0
RB21-6	LS1-26	UR	1.0
RB21-7	RBS10	PU	0.5
RBI 7-8	RBS37	I3K	2.0
RB25-1	RB75	I3	2.0
RB25-2	RB128-3	NU	2.0
RB26-1	RBS27	UG	0.5
RB26-2	RBD8-OOW	W	0.5
RB27-1	LS2-6	KN	0.5
RB27-2	RB134-1	KR	0.5
RB27-3	RB135-22	UG	0.5
RB27-4	RB35-5	RG	0.5
RB27-5	RBS32	NB	0.5
RB27-6	RBS30	U	0 5
RB28-1	RBS26	\NK	2.0
RB28-2	LS3-5	UR	0.5
RB28-3	RB131-5	NK	3.0
RB28-4	RBS62	NB	0.5
RB28-5	RB19-87	W	3.0
RB28-6	LS3-9	YG	1.0

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WIRING SCHEDULE 90.50.90/HS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
RB29-1	RB75	B	2.0
RB29-2	RBI18-2	NU	2.0
RB30-1	RBD9-ODU	SR	0.5
RB30-2	RB13-31	SO	0.5
RB30-3	RB13-32	SY	0.5
RB30-4	RBI3-33	SG	0.5
RB30-5	RB6-2	SU	0.5
RB30-6	RBI3-35	SK	0.5
RB30-7	RBS24	RG	0.5
RB30-8	RBS13	WN	0.5
RB30-9	RBS20	RK	0.5
RB30-10	RB14-35	SN	0.5
RB30-11	RB13-16	NG	0.5
RB30-12	RB14-36	ON	0.5
RB31-1	RB135-17	OY	*0.5*
RB31-2	RBS23	BK	3.0
RB33-1	RB61-4	RW	0.5
RB33-2	LS2-3	RN	0.5
RB33-3	RBS98	RG	0.5
RB33-4	RBI3-24	LGB	*0.5*
RB33-5	LS1-14	RLG	0.5
RB33-6	LS1-15	RP	0.5
RB33-7	RB8-6	KW	0.5
RB33-8	RS114.12	KY	0.5
RB33-9	RBS97	KLG	0.5
RB33-10	RBS16	LGO	1.0
RB33-11	RBS19	NW	1.0
RB33-12	RBS24	RG	0.5
RB33-13	RS22-28	KR	0.5
RB33-14	RS22-27	KO	0.5
RB35-1	RES23	BK	*0.5*
RB35-2	RB74	B	0.5
RB35-3	RBS41	PW	1.0
RB35-4	RB135-4	S	*0.5*
RB35-5	RB27-4	RG	0.5
RB35-6	RB93-85	SB	0.5
RB35-7	RB135-14	GB	0.5
RB35-8	RES42	P	1.0
RB35-9	RBS82	SLG	0.5
RB35-10	RBS95	RW	0.5
RB35-11	RBD2-00W	WP	0.5
RB35-12	RBS31	WR	0.5
RB35-13	RB13-29	US	0.5
RB35-14	RB49-2	RS	0/5
RB41-1P	RB120-4P	GB	0.5
RB41-2P	RBS73	SLG	0.5
RB46-1D	RBS73	SLG	0.5
RB46-2D	RBS74	GB	0.5
RB49-1	RES20	RK	0.5
RB49-2	RB35-14	RS	0.5
RB49-3	RBS83	RU	0.5
RB49-4	RBS-84	RO	0.5
RB49-5	RS22-15	UK	0.5
RB49-6	RBS85	US	0.5
RB49-7	RB135-24	UP	0.5
RB49-8	RB55-14	PG	0 5
RB49-9	RBS70	US	0.5
RB49-10	RB13-8	UY	0.5
RB49-11	LS1-3	UK	0.5
RB49-12			
RB49-13	RBS51	RG	0.5
RB49-14	RB13-7	ULG	0.5
RB49-15	RB13-6	YR	0.5
RB49-16	RB14-6	YP	0.5
RB49-18	RBS50	UO	0.5
RB49-19	RB55-20	RLG	0.5
RB49-20	RBS4	BK	0.5
RB49-21	RB55-23	RY	0.5
RB49-22	RBS25	WB	0.5
RB49-24	RBS32	NB	*0.5*
RB55-1	RBS92	LGY	0.5
RB55-2	RBI3-4	LGG	0.5
RB55-4	RB134-10	RO	0.5
RB55-5	RBS13	WN	0.5
RB55-6	RB13-10	YN	0.5
RB55-7	RB13-9	YU	0.5
RB55-8	RBS90	LGR	0.5
RB55-9	RBS50	UO	0.5
RB55-10	LS2-8	GU	0.5
RB55-11	RB60-1	LGK	0.5
RB55-12	RBS38	NR	0.5
RB55-13	RBS20	RK	0.5
RB55-14	RB49-8	PG	0.5
RB55-15	RBS95	RW	0.5
RB55-16	RB75	B	0.5
RB55-17	RBS12	WY	0.5
RB55-18	RB58-5	GB	0.5
RB55-20	RB49-19	RLG	0.5
RB55-21	RBS13	WN	0.5
RB55-22	RB58-6	GR	2.0
RB55-23	RB49-21	RY	0.5
RB55-24	RBS4	BK	0.5
RB56-1	RBS10	PU	0.5
RB56-2	RBS12	WY	0.5
RB57-2	LS64-5	PG	2.0
RB57-3	RBS41	PW	2.0
RB58-1	RB14-14	UG	0.5
RB58-2	RB14-15	PR	0.5
RB58-3	RB14-16	PS	0.5
RB58-4	RB75	B	0.5
RB58-5	RB55-18	GB	0.5
RB58-6	RB55-22	GR	0.5
RB58-7	RBS32	NB	0.5
RB58-13	RB14-18	U	0 5
RB58-14	RBS30	U	0.5
RB58-15	RBS37	BK	0 5
RB59-1	LS3-1	NE	3.0
RB59-2	LS-3	R	2.0
RB59-3	LS64-4	U	2.0
RB59-4	LS3-7	U	2.0
RB59-5	LS64-1	RY	2.0
RB59-6	LS64-2	RS	2.0
RB60-1	RB55-11	LGK	0.5
RB60-2	RB14-34	LGP	0.5
RB60-3	RBS90	LGR	0.5
RB60-4	RBS25	WB	0.5
RB61-1	RBS34	PN	0.5
RB61-2	RBI3-20	PW	0.5
RB61-3	RBS35	K	0.5
RB61-4	RB33-1	RW	0.5
RB61-5	RBS98	RG	0.5
RB61-6	RBS15	YW	0.5
RB61-7	RB8-3	BR	0.5
RB61-8	RB8-4	BP	0.5
RB61-9	RS22-13	BG	0.5
RB61-10	RS22-14	BLG	0.5
RB61-11	LS1-30	BO	0.5
RB61-12	LS1-31	GLG	0.5
RB61-13	RB14-5	BW	0.5
RB61-15	RBS91	R	0.5
RB61-16	RBS1	UY	0.5
RB61-17	RBS13	WN	0.5
RB61-18	RBS17	PO	0.5
RB61-19	RBS16	PK	0.5
RB61-21	RBS47	UO	0.5
RB61-22	RB8-14	OR	0.5
RB61-23	RB8-15	OG	0.5
RB61-24	RB8-16	OY	0.5
RB61-25	RB8-17	OP	0.5
RB61-26	RBS8	YO	0.5
RB61-28	RB14-27	BN	0.5
RB61-29	RB14-28	BU	0.5
RB61-32	RBS6	G	0.5
RB62-1	RB80	B	2.0
RB62-2	RB130-4	NP	2.0
RB62-5	RS87-1	NY	0.5
RB62-6	RBS4	Bk	2.0
RB64-1	RBS12	WY	0.5
RB64-2	RBS70	WG	0.5
RB64-3	RBD3-00W	GP	0.5
RB66-1	RBS23	BK	0.5
RB66-2	RS114-22	UB	0.5
RB66-3	RBS46	LGO	0.5
RB66-4	RB73	B	0.5
RB66-5	RB14-26	S	0.5
RB66-6	RBS20	RK	0.5
RB66-7	RBS24	RG	0.5
RB66-8			
RB66-12	RBS25	WB	0.5
RB72	LS3-2	B	2.0
RB72	RB7-1	B	2.0
RB72	RBS3	B	2.0
RB73	RB98-1	B	2.0
RB73	RB101-3	B	2.0
RB73	RB180-1	B	2.0
RB73	RB66-4	B	2.0
RB74	RB102-1	B	2.0
RB74	RB100-3	B	2.0
RB74	RB184-3	B	2.0
RB74	RB35-2	B	2.0
RB75	RB29-1	B	2.0
RB75	RB25-1	B	2.0
RB75	RB58-4	B	2.0
RB75	RB55-16	B	2.0
RB78	RBS37	BK	3.0
RB78	RBS23	BK	3.0
RB78	RBS4	BK	3.0
RB80	RB62-1	B	2.0
RB80	RB16-2	B	2.0
RB80	RB156-85	B	3.5
RB80	RS87-3	B	2 0
RB80	RB111-2	B	3.5
RB81-1	RBS26	WK	3.0
RB81-2	RBS26	WK	3.0
RB82	RB17-30	W	3.0
RB88	RB90	B	2.0
RB90	RB80	B	2.0
RB92-30	RBS38	WR	0.5
RB92-85	RBD11-ODU	W	3.5
RB92-86	RBS38	WR	0.5
RB92-87	RBS33	RB	3.5
RB93-30	RBS42		2.0
RB93-85	RB35-6	GB	3.5
RB93-86	RBS11	WB	3.5
RB93-87	RBS41	PW	*2.0*
RB94-2	RBS41	PW	2.0
RB94-3	RBS42	P	*2.0*
RB95-30	RBS22	WY	2.0
RB95-85	RBS47	WO	3.5
RB95-86	RBS22	WY	0.5
RB95-87	RB100-2	WK	2.0
RB96-30	RBS21	WY	2.0
RB96-85	RBS47	WO	3.5
RB96-86	RBS21	WY	0.5
RB96-87	RBS60	WK	*2.0*
RB97-1	RB13-26	GW	0.5
RB97-2	RB14-23	GO	5.5
RB97-3	RBS49	W	0.5
RB97-4	RBS23	BK	0.5
RB97-5	RB97-6	G	0.5
RB97-6	RB97-5	G	3.5
RB97-7	RBS31	WR	3.5
RB97-8	RBS21	WY	2.0
RB97-9	RBS49	W	2.0
RB98-1	RB73	W	*2.0*
RB98-2	RBS49	W	2.0
RB99-1	RB13-25	GW	3.5
RB99-2	RB14-22	W	3.5
RB99-3	RBS48	W	3.5
RB99-4	RBS23	BK	0.5
RB99-5	RB99-6	G	5.5
RB99-6	RB99-5	G	3.5
RB99-7	RBS31	WR	3.5
RB99-8	RBS22	WY	2 0
RB99-9	RBS48	W	2.0
RB100-2	RB95-87	WK	2.0
RB100-3	RB74	W	2.0
RB101-2	RBS60	WK	2.0
RB101-3	RB73	B	*2.0*
RB102-1	RB74	B	*2.0*
RB102-2	RBS48	W	2.0
RB108-30	RBS29	GW	3.5
RB108-85	RBS28	WLG	3.5
RB108-86	RBS29	GW	3.5
RB108-87	RBS1	GY	5.5
RB108-87	RBS39	GY	0.5
RB111-1	GB11-1	BS	3.5
RB111-2	RB80	B	3.5

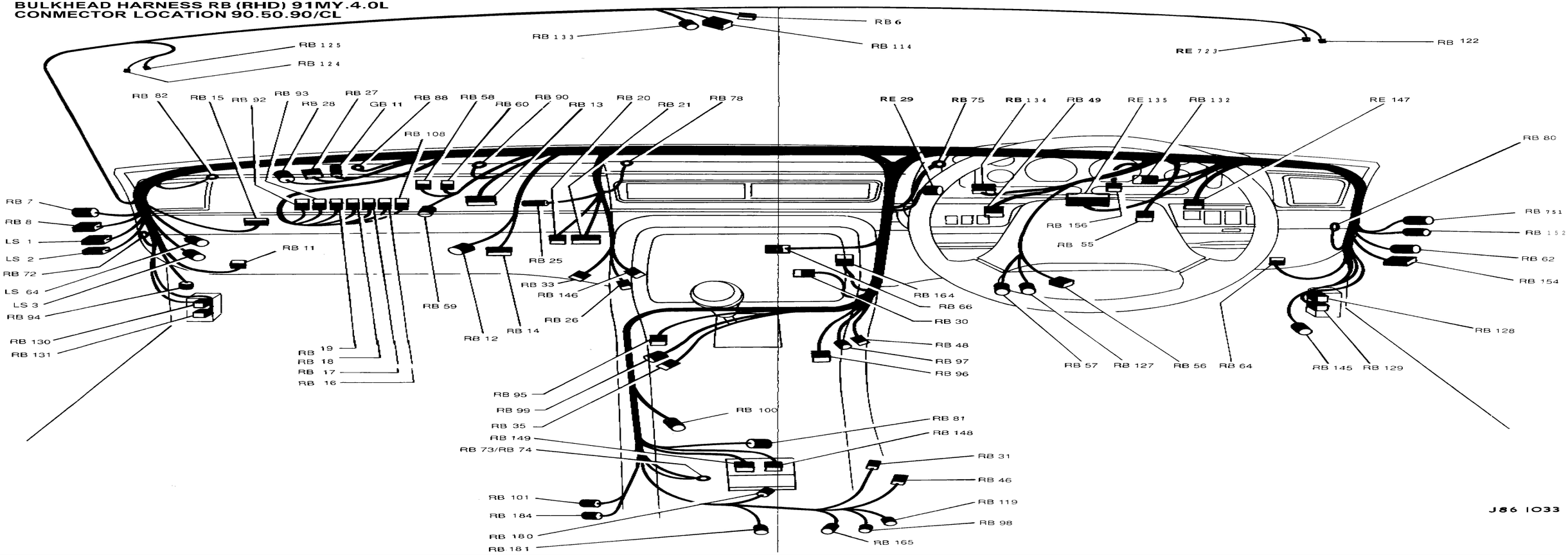
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BULKHEAD HARNESS RB (RHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	Tu / Nnch / 4 / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
RB114-1	RB152-1	RO	0.5
RBI14-2	RBI52-2	GU	0.5
RB114-7	RBS40	NG	0.5
RBI14-8	RBS3	B	0.5
RB119-1D	RBS19	NW	0.5
RBI19-2D	RBS23	BK	0.5
RB119-3D	RBS28	RLG	0.5
RBI10-4D	RBS74	GB	0.5
RB120-1P	RBS19	NW	0.5
RBI20-2P	RBS23	BK	0.5
RB120-3P	RBS28	RLG	0.5
RBI20-4P	RBI20-4P	GB	0.5
RB122	RES3	B	0.5
RB123	RBS29	NW	0.5
RBI24	RBS29	NW	0.5
RB125	RBS3	E	0.5
RB127-1	RBS42	P	2.0
RB127-2	RBS9	NB	2.0
RBI27-3	RBS5	NP	1.0
RE127-4	RS114-30	GB	1.0
RB128-1	RS22-25	NK	0.5
RB128-2	RB29-2	NU	2.0
RB128-3	RB25-2	NU	2.0
RB128-4	RB7-2	NP	2.0
RB128-5	RB156-30	NB	2.0
RB128-6	RB19-30	NO	3.0
RBI28-8	RB12-2	NE	2.0
RB128-9	RBS12	WY	0.5
RB129-1	RB135-35	KB	0.5
RBI29-2	RBS38	NR	0.5
RB129-3	RS114-34	NLG	0.5
RB129-4	RBS29	NW	2.0
RB129-5	RB16-30	NY	1.0
RB130-1	RBS22	NY	3.0
RBI30-2	RBS21	NY	3.0
RB130-3	RB146-1	NK	0.5
RB130-4	RB62-2	NP	2.0
RB130-5	RES32	NB	1.0
RB130-6	RBI34-5	NR	0.5
RB130-8	RB133-1	NW	0.5
RB130-9	RBS12	WY	0.5
RB131-1	RBI35-36	KB	0.5
RB131-2	RBS40	NG	2.0
RB131-3	GB11-3	NS	2.0
RB131-4	RBS62	NB	0.5
RB131-5	RB28-3	NK	3.0
RB132-1	RB21-2	SR	0.5
RB132-2	RB21-3	SU	0.5
RE132-3	RBS20	PK	0.5
RB132-4	RBS9	NB	0.5
RB132-5	RBS4	BK	0.5
RB132-6	RB135-42	R	0.5
RB132-7	RB135-29	Y	0.5
RB132-8	RB135-30	O	0.5
RB132-9	RB135-26	U	0.5
RB132-10	RB135-27	P	0.5
RB132-11	RBI35-31	K	0.5
RB132-12	RB135-25	UY	0.5
RB132-13	RB135 28	US	0.5
RB132-14	RB135-32	PG	0.5
RBI32-15	RB135-33	PG	0.5
RB132-16	RB13-17	GO	0.5
RB132-17	RBI4-24	GS	0.5
RB133-1	RB130-8	NW	2.0
RB133-2	RBS3	B	2.0
RBI33-3	RB14-11	YB	0.5
RB134-1	RB27-2	KR	0.5
RB134-2	RB148-1	WO	0.5
RB134-3	RBS4	BK	0.5
RB134-4	RBS4	BK	c.5
RBI34-5	RBI30-6	NR	0.5
RB134-10	RB55-4	RO	0.5
RBI34-13	RB145-5	O	0.5
RE134-14	RB145-1	K	0.5
RBI34-15	RS22-4	RIN	0.5
RB134-16	RS22-12	UIN	0.5
RBI34-17	RS22-2	BRD	STD
RB134-18	LS1-8	WLG	0.5
RBI34-19	RS22-8	OK	0.5
RB134-20	RS22-9	BW	0.5
RB134-21	RS22-7	OS	0.5
RB134-24	RS114-6	RY	0.5
RB135-2	RBS30	U	0.5
RBI35-4	RB35-4	S	0.5
RB135-7	RS114-1	O	0.5
RE135-9	RS114-26	BR	0.5
RBI35-10	RS114-2	BY	0.5
RB135-11	RBS10	PU	0.5

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
RB135-12	RB148-6	KB	0.5
RB135-13	RS22-19	OR	0.5
RB135-14	RB35-7	GB	0.5
RB135-15	RB14-3	SB	0.5
RBI35-16	RBI52-4	RY	0.5
RB135-17	RB31-1	OY	0.5
RBI35-18	RB14-2	Y	0.5
RB135-19	RBS5	NP	0.5
RB135-20	LS1-21	SK	0.5
RB135-21	RS22-18	LG	0.5
RB135-22	RB27-3	UG	0.5
RB135-23	RS114-33	UR	0.5
RB135-24	RB49-7	UP	0.5
RB135-25	RB132-12	UY	0.5
RB135-26	RB132-9	U	0.5
RB135-27	RB132-10	P	0.5
RBI35-28	RB132-13	US	0.5
RB135-29	RB132-7	Y	0.5
RB135-30	RB132-8	O	0.5
RB135-31	RB132-11	K	0.5
RBI35-32	RB132-14	PG	0.5
REI35-33	RBI32-15	BR	0.5
RB135-34	LS1-16	OS	0.5
RBI35-35	RB129-1	KB	0.5
RB135-36	RB131-1	KB	0.5
RBI35-37	LS1-17	OP	0.5
RB135-38	RBS51	RG	0.5
RBI35.39	RS114-18	KU	0.5
RB135-40	RBI4-10	UW	0.5
RBI35.41	RB14-9	UN	0.5
RBI35-42	RBI32-6	R	0.5
RBI32.43	RBS66	KS	0.5
RB135-45	RS114-32	NO	0.5
RBI35-46	RBS6	G	0.5
RB135-47	RB8-20	GW	0.5
RBI35-48	RS114-27	RB	0.5
RB145-1	RB134-14	K	0.5
RB145-4	RBS62	NB	0.5
RB145-5	RB134-13	O	0.5
RB145-6	RBS4	BK	0.5
RB146-1	RB130-3	NK	0.5
RB146-2	RBI52-3	YO	0.5
RB147-30	RB13-19	UR	0.5
RB147-85	RBS50	UO	0.5
RB147-86	RBS6	WN	0.5
RB147-87	RB16-87A	NW	0.5
RB148-1	RB134-2	WO	0.5
RB148-2	RBSI 1	WB	1.0
RB148-3	RS114-7	WU	0.5
RBI48-4	RBS12	WY	0.5
RB148-5	RS22-30	WS	0.5
RB148-6	RBI35-12	KB	0.5
RB148-7	RBS80	NB	1.0
RBI48-8	RBS81	WG	0.5
RBI48-9	RBS99	WP	0.5
RB149-3	RS22-6	WR	0.5
RBI49.4	RBS25	WB	1.0
RB149-5	RBS31	WR	1.0
RB151-1	RBI5-6	RO	0.5
RB151-2	RBS61	GU	0.5
RB151-3	RS22-3	YO	0.5
RB151-4	RS22-26	RY	0.5
RB152-1	RB114-1	RO	0.5
RB152-2	RBI14-2	GU	0.5
RBI52-3	RB146-2	YO	0.5
RB152-4	RBI35-16	RY	0.5
RB156-30	RBI28-5	NB	2.0
RB156-85	RB80	B	0.5
RBI56-86	RBSI 1	WB	0.5
RB156-87	RBS18	OB	2.0
RB164-30	RB135-1	K	2.0
RB164-85	RB165-3	BN	2.0
RB164-86	RBS60	YK	0.5
RB164-87	RBS60	YK	2.0
RB164-87A	RB165-2	KS	2.0
RB165-1	RBI64-30	K	2.0
RB165-2	RB164-87A	KS	2.0
RB165-3	RB164-85	BN	2.0
RB180-1	RB73	B	2.0
RB180-2	RBS18	OB	2.0
RB181	RBS33	RB	0.5
RB184-1	RBS33	RB	0.5
RB184-2	RBS18	OB	2.0
RBI84-3	RB74	B	2.0

BULKHEAD HARNESS RB (RHD) 91MY.4.0L
CONMECTOR LOCATION 90.50.90/CL



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BULKHEAD HARNESS LB (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

em	Description	Interface	Location
B11	PM5 3 way socket(green)	Gearbox harness	
S1	PMHD 36 way socketlblackl	LH side harness	_H A' post
S2	PMHD 15 way socket (yellowl	LH side harness	_H 'A' post
S3	PM4 9 way socket (black)	LH side harness	_H 'A' post
S64	PM4 6 way socket(yellow)	LH side harness	_H 'A' post
522	PMHD 36 way socket(black)	RH side harness	RH 'A' post
S24	PMHD,24 way socket (yellowl	RH side harness	RH 'A' post
587	PM4 6 way socketlblackl	RH side harness	RH 'A' post
36	PM4 4 way socket(black)	Interior map light	Roof centre front
37	PM4 4 way socket(black)	Pass.door harness	_H 'A' post
38	PMHD 24 way plug(black)	Pass.door harness	_H 'A' post
312	PM4 3 way socketlblackl	CPU	Front passenger footwell
313	PMHD 36 way socket (black)inhibit plug fitted at pin 30 position	CPU	Front passenger footwell
314	PMHD 36 way plug(yellow)	CPU	Front passenger footwell
315	Ktekert 9 way socket	Door lock ECU	Front passenger footwell
316	Relay base(green)	Radio relay	Front passenger footwell
317	Relay base (blue)	Ignition 'on' relay	Front passenger footwell
318	Relay base(black)	Aux side lamp relay	Front passenger footwell
319	Relay base(yellow)	Starter relay	Front passenger footwell
320	Single lucar connector	Cruise control ECU	Front passenger footwell
321	MIC 8 way socket	Cruise control ECU	Front passenger footwell
325	PM5 3 way socketlblackl	LH Air can blower motor	Front passenger footwell
326	PMHD 2 way socket(black)	Glove box harness	Front passenger footwell
327	PMHD 6 way socket (yellowl	PI harness	Front passenger footwell
328	PM4 6 way plug (yellow)	PI harness	Front passenger footwell
329	PM5 3 way socket (black)	AH Air con blower motor	Front passenger footwell
330	PMHD 15 way socket (green)	Centre console switch	Centre console panel
331	PM5 3 way switch (yellowl	Handbrake switch	Driver seat
333	PMHD 15 way socket (white)	Radio and speakers	Centre console
335	PMHD 15 way socket (green) socket (black)	Gearbox harness	Centre console
341	PMHD 2 way socket (black)	Seat belt switch	Front passenger seat
846	PMHD 4 way socket (black)	Seat belt switch	Driver seat
849	PMHD 24 way socket (green) inhibit plug fitted at pin 12 position	Fascia switch panel	Driver footwell
855	PMHD 24 way plug (black)	Column switchgear	Driver footwell
856	PM4 2 way socket (black)	Brake switch	Driver footwell
857	PM4 3 way plug (black)	Brake switch	Driver footwell
858	PMHD 15 way socket (black)	Speed warning module	Front pasenger footwell
B59	PM4 6 way socket (black)	Wiper logic module	Front passenger footwell
860	PMHD 4 way socket (black)	Wiper logic module	Front passenger footwell
B61	PMHD 36 way plug (black)	Drivers door harness	LH 'A' post
862	PM4 6 way socket (black)	Drivers door harness	LH 'A' post
864	3 way socket	Inertia switch	LH 'A' post
866	PMHD 15 way socket (black) inhibit plug fitted at pin 8 position	Air con control panel	Centre console
B71	Eyelet	Battery terminal post	Bulkhead LH side
872	Eyelet	Earth terminal	LH 'A' post
B73	Eyelet	Earth terminal	Centre console
874	Eyelet	Earth terminals	Centre console
B75	Eyelets	Earth terminals	Bulkhead LH side
878	Eyelets	Logic earth terminals Bulkhead centre	
880	Eyelets	Earth terminals	RH 'A' post
B81	PM4 3 way socket (black)	Centre fusebox	Centre console
B90	Eyelet	CPU earth terminal	Front passenger footwell
B92	Relay base(natural)	Sidelights on power relay	Front passenger footwell
B93	Relay base(violet)	Auto speed control relay	Front passenger footwell
B94	PM4 3 way plug (black)	Manual speed control shorting plug	Front passenger footwell
B95	Relay base,(natural)	LH seat relay	Centre console
B96	Relay base(black)	RH seat relay	Centre console
B97	PMHD 10 way socket (yellow)	Driver seat heater switch	

BULKHEAD HARNESS LB (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	location
LB98	PM5 3 way socket (violet)	Drivers seat hearer	Driver seat
LB99	PMHD 3 way socket(white)	Passenger seat heater switch	Centre console
LB100	PM4 3 way socket (black)	Passenger seat switches	Centre console
LB101	PM4 3 way socket (red)	Driver seat switches	Centre console
LB102	PM5 3 way socket(violet)	Pass.seat harness	Front passenger seat
LB108	Relay hase (brown)	Puddle lamp relay	Front passenger footwell
LB111	PM5 3 way socket (violet)	Accelerator switch	Driver footwell
LB114	PMHD 8 way socket	IR receiver module	Roof centre front
LB119	PM4 5 way socket (black)	Driver's interior light and seat switch	Roof centre front
LB120	PM4 5 way socket (black)	Pass interior light and seat switch	Roof centre front
LB122	Lucar socket	Right hand illurn. vanity mirror	Passenger side roof
LB123	Lucar socket	Right hand illum. vanity mirror	Passenger side roof
LB124	Lucar socket	Left hand illurn. vanity mirror	Driver side roof
LB125	Lucar socket	Left hand illum. vanity mirror	Driver side roof
LB127	PM4 5 way socket (black)	Clutch switch	Driver footwell
LB128	TTS 9 way socket (natural)	RH fusebox	RH 'A' post
LB129	TTS 5 way socket (natural)	RH fusebox	RH 'A' post
		RH fusebox	RH 'A' post
LEI30	TTS 9 way socket 'A' (natural)	LH fusebox	LH 'A' post
LB131	TTS 5 way socket 'C' (natural)	LH fusebox	LH 'A' post
LB132	PMHD 24 way socket(brown)	Fascia	Driver footwell
LB133	PM4 3 way socket	Sunshine roof	Roof centre front
LB134	PMHD 24 way socket (black)	Instrument pack	Driver footwell
LB135	PMHD 48 way socket (black)	Instrument pack	Driver footwell
LB145	PM4 6 way socket(brown)	Diagnostic socket	Driver footwell
LB146	PMHD 4 way socket (yellow)	Remote boot release	Glove box
LB147	Relay base,(black)	Lights on warning module	Driver footwell
LB148	TTS 9 way socket 'A' (natural)	Centre fuse box	Centre console
LB149	TTS 5 wav socket 'B' (natural)	Centre fuse box	Centre console
LB151	PM4 5 way socket (black)	Security connector	LH 'A' post
LB152	PM4 5 way plug (black)	Security connector	LH 'A' post
LB156	Relay base (red)	Cigar lighters relay	Front passenger footwell
LB164	Relay base (green)	Seat entry switch relay	Driver footwell
LB165	PM4 3 way socket	Seat entry switch	Driver seat
LB180	Econoseal series 'J'2 way plug	Front cigar lighter)	Centre console front ash tray
LB181	Lucar single socket	Front cigar lighter	
LB184	Econoseal series 'J' 3 way plug	Rear cigar lighter) Rear cigar lighter	Centre console rear ash tray

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BULKHEAD HARNESS LB (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
GB11	Passenger footwell	RH dash liner
LS1	LH 'A' post	LH dash liner
LS2	LH 'A' post	LH dash liner
LS3	LH 'A' post	LH dash liner
LS64	LH 'A' post	LH dash liner
RS22	RH 'A' post	RH dash liner
RS24	RH 'A' post	RH dash liner
RS87	RH 'A' post	RH dash liner
LB6	Roof centre front	Mapiinterior light panel
LB7	RH'A' post	RH dash liner
LB8	RH 'A' post	RH dash liner
LB12	Front passenger footwell	RH dash liner
LB13	Front passenger footwell	RH dash liner
LB14	Front passenger footwell	RH dash liner
LB15	Front passenger footwell	RH dash liner
LB16	Front passenger footwell	RH dash liner
LB17	Front passenger footwell	RH dash liner
LB18	Front passenger footwell	RH dash liner
LE19	Front passenger footwell	RH dash liner
LB20	Front passenger footwell	RH dash liner
LB21	Front passenger footwell	RH dash liner
LB25	Front passenger footwell	RH dash liner
LB26	Front passenger footwell	RH dash liner
LB27	Front passenger footwell	RH dash liner
LB28	Front passenger footwell	RH dash liner
LB29	Front passenger footwell	RH dash liner
LB30	Centre console	Console switch panel
LB31	Below handbrake lever	Beneath floor carpet
LB33	Centre console	Centre console switch panel
LB35	Centre console	Console switch panel
LB41	Passenger seat	Passenger seat cushion
LB46	Driver seat	Driver seat
LB49	Driver footwell	LH dash liner
LB55	Driver footwell	LH dash liner and steering column cowls
LB56	Driver footwell	
LB57	Driver footwell	
LE58	Front passenger footwell	RH dash liner
LB59	Front passenger footwell	RH dash liner
LB60	Front passenger footwell	RH dash liner
LB61	RH 'A' post	RH dash liner
LE62	RH 'A' post	RH dash liner
LB64	Driver footwell	
LB66	Centre console	Console switch panel
LB73	Centre console	Centre console ash tray
LB74	Centre console	Centre console ash tray
LB75	Bulkhead (passenger side)	RH air blower duct
LB78	Bulkhead (driver side)	LH air blower duct
LB80	RH 'A' post	RH dash liner
LB81	Centre console	Console trim finisher
LB82	Bulkhead	
LE90	Passenger footwell	RH dash liner
LB92	Passenger footwell	RH dash liner
LB93	Passenger footwell	RH dash liner
LB94	Passenger footwell	RH dash liner
LB95	Centre console	Console switch panel
LB96	Centre console	Console switch panel
LB97	Centre console	Console trim finisher
LB98	Beneath driver seat	Driver seat cushion
LB99	Centre console	Console trim finisher
LB100	Centre console	Console trim finisher
LB101	Centre console	Console trim finisher
LB102	Below front passenger seat	Front passenger seat cushion
LB108	Passenger footwell	RH dash liner
LB111	Accelerator switch	
LB114	IR receiver	Map/interior light panel
LB119	Centre console	Centre console trim finisher
LB120	Centre console	Centre console trim finisher
LB122	Driver side roof	Vanity mirror unit and head liner
LB123	Driver side roof	Vanity mirror unit and head liner
LB124	Passenger side roof	Vanity mirror unit and head liner
LB125	Passenger side roof	Vanity mirror unit and head liner
LE127	Driver footwell	
LB128	RH 'A' post	RH dash liner
LB129	RH 'A' post	RH dash liner
LB130	LH 'A' post	LH fash liner
LB131	LH 'A' post	LH dash liner
LB132	Driver footwell	LH dash liner
LB133	Roof centre front	Mapiinterior light panel
LB134	Driver footwell	LH dash liner
LE135	Driver footwell	LH dash liner
LB145	Driver footwell	LH dash liner

BULKHEAD HARNESS LB (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
LB146	Glovebox	
LB147	Driver footwell	LH dash liner
LB148	Centre console	Centre console ash tray
LB149	Centre console	Centre console ash tray
LB151	RH 'A' post	RH dash liner
LB152	RH 'A' post	AH dash liner
LB156	Passenger footwell	RH dash liner
LB164	Passenger footwell	RH dash liner
LB165	Driver seat	Driver seat cushion
LB180	Centre console	Centre console front ash tray
LB181	Centre console	Centre console front ash tray
LB184	Centre console	Centre console rear ash tray

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BULKHEAD HARNESS LB (LHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

om		Colour	ze (mm)
on	ach	Farbe	uerschnitt
		Couleur	ection
an	aar	Kleur	aat
a		Colore	ametro
esde	acia	Color	amano
iB11-1	B111-1	BS	.5
B11-2	BS62	UB	.5
iB11-3	B131-3	NS	.O
SI-1	BS70	S	.5
S1-2	813-15	R	5
S1-3	B49-11	K	.5
SI-4	B14-8	S	.5
S1-5	8583	U	5
SI-6	iS22-36	S	15
S1-7	BS25	/B	.5
SI-8	8134.18	ILG	.5
s1.9	BS36		15
S1-10	iS114-16	G	.5
S1-11	BS84	D	.5
S1-12	BS66	S	1.5
51-13	BS27		.5
SI-14	B33-5	LG	1.5
S1-15	833-6	P	.5
S1-16	B135-34	S	1.5
51-17	B135-37		.5
S1-18	BS13	/N	1.5
S1-22	B135.20	K	1.5
51-24	BS10	U	.5
S1-25	B21-1	G	1.5
SI-26	.B21-6	IR	.5
S1-28	BS82	LG	1.5
SI-29	.BS1	IY	.5
S1-30	B61-11	O	.5
S1-31	.B61-12	iLG	.5
S2-1	.BS98	G	.5
.S2-2	.BS12	WY	.5
.S2-3	.B33-2	N	.5
.S2-5	.B27-1	N	.5
.S2-8	.B55-10	iU	.5
.S2-10	.BS17	O	1.5
.S2-11	.BS16	'K	1.5
.S2-12	.BS15	W	.5
.S2-15	.B13-28	Y	1 5
.S3-1	.B59-1	/B	.5
.S3-2	.B72		1.5
.S3-3	.B59-4		.5
.S3-4	.BS81	VG	1.5
.S3-5	.B28-2	JR	.5
.S3-6	.BS99	VP	1.5
.S3-7	.B59-4	J	3.5
.S3-8	.BS37	IK	.5
s3-9	.B28-6	IG	3.5
.S64-1	LB59-5	IY	3.5
.S64-2	LB59-6	IS	.5
.S64-3	LBS46	GO	3.5
.S64-4	LB59-3	3S	3 5
.S64.5	LB57-2	'G	3.5
.S64-6	LB21-4	JY	2 0
RS22-1	LBS85	JS	3.5
RS22-2	LB134-17	3RD	3.5
RS22-3	LB151-3	/O	0.5
RS22-4	LB134-15	RIN	0.5
RS22-5	LBS13	/N	0.5
RS22-6	LB149-3	N	0.5
RS22-7	LB134-21	OS	0 5
RS22-8	LB134-19	OK	0.5
RS22-9	LB134-20	3W	0.5
RS22-12	LB134-16	JIN	0.5
RS22-13	LB61-9	3G	0.5
RS22-14	LB61-10	3LG	0.5
RS22-15	LB49-5	JK	0 5
RS22-16	LB14-7	YK	0.5
RS22-17	LBS43	.GO	0.5
RS22-18	LB135-21	_G	0.5
RS22-19	LB135-13	3R	0.5
RS22-20	LBS15	YW	0.5
RS22-21	LE14-20	WG	0.5
RS22-22	LB14-21	WB	0.5
RS22-25	LB128-1	NK	0.5
RS22-26	LB151-4	RY	0.5
RS22-27	LB33.14	KO	0.5
RS22-28	LB33-13	KR	0.5
RS22-29	LBS39	UY	0.5
RS22-30	LB148-5	WS	0.5
RS22-32	LBS10	PU	0.5
RS22-33	LB13-14	KG	0.5
RS22-34	LBS17	PO	0.5
RS22-35	LBS16	PK	0.5
RS22-36	LS1-6	RS	0.5
RS24-1	LB135-7	O	0.5
RS24-2	LB135-10	BY	0.5
RS24-3	LB14-1	LGN	0.5
RS24-4	LBS92	LGY	0.5
RS24-5	LBS36	P	0.5
RS24-6	LB134-24	RY	0.5

om		Colour	ze (mm)
on	ach	Farbe	uerschnitt
		Couleur	ection
an	aar	Kleur	aat
a		Colore	metro
esde	acia	Color	amano
S24-7	B148-3	/U	.5
S24-8	b527		.5
S24-9	b583	U	.5
S24-10	BS84	O	.5
S24-12	B33-8	Y	.5
S24-13	BS29	W	.5
S24-14	BS66	S	.5
S24-15	B13-27	U	.5
S24-16	S1-10	G	.5
S24-17	BS27	G	5
S24-18	B135-39	U	.5
S24-19	BS97	LG	.5
S24-21	B129-3	R	.5
S24-22	B66-2	B	.5
S24-23	B129-3	LG	.5
S24-24	BS11	/B	.5
iS87-1	B62-5	Y	.5
iS87-1	B7-5	Y	1.5
iS87-2	BS81	/G	1.5
iS87-3	B80		.5
iS87-4	b54	K	.5
iS87-6	BS99	/P	.5
B6-1	BS29	W	.5
B6-2	B30-5	U	.5
B6-4	BS28	LG	.5
B7-1	B80		.O
B7-2	.B128-4	IP	.O
B7-5	iS87-1	Y	.O
B7-6	.BS37	K	.O
B8-1	BS91		.5
.B8-2	.BS15	W	.5
.B8-3	.B61-7	R	1 5
.B8-4	.B61-8	P	.5
.B8-5	.BS35		1 5
.B8-6	.B33-7	W	1.5
.B8-7	.BS36		.5
.B8-8	.BS97	LG	1.5
.B8-9	.BS34	N	1.5
.B8-10	.BS17	'O	.5
.B8-11	.BS16	'K	1.5
.B8-12	.BS8	'O	.5
.B8-13	.BS47	JO	1.5
.B8-14	.B61-22	)R	1 5
.B8-15	.B61-23	)G	3.5
.B8-16	.B61-24	)Y	.5
.B8-17	.B61-25	)P	3.5
.B8-20	.BS45	'W	3.5
.B8-21	.BS39	JY	3 5
.B12-2	LB128-8	/G	.5
.B13-1	LBS25	/B	.5
.B13-2	LBS91	1	3.5
.B13-3	LBS92	.GY	3 5
.B13-4	LB55-2	GG	3.5
LB13-5	LBS90	.GR	3.5
LB13-6	LB49-15	/R	3.5
LB13.7	LB49-14	JLG	0.5
LB13-8	LB49-10	JY	0.5
LB13-9	LB55-7	/U	0.5
LB13-10	LB55-6	/N	0.5
LB13-14	RS22-33	KG	0.5
LB13-15	LS1-2	KR	0.5
LB13-16	LB30-11	70	0.5
LB13-17	LB132-16	GO	0.5
LB13-18	LBS36		0.5
LB13-19	LB147-30	JR	0.5
LB13-20	LB51-2	YO	0.5
LB13-21	LBS95	RW	0.5
LB13-22	LBS74	GB	0.5
LB13.23	LB86-3	SLG	0.5
LB13-24	LB33-4	_GB	0.5
LB13-25	LB99-1	OW	0.5
LB13-26	LB97-1	KW	0.5
LB13-27	RS114-15	KU	0.5
LB13-28	LS2-15	KY	0.5
LB13-29	LB35-13	US	0.5
LB13-30			
LB13-31	LB30-2	SO	0.5
LB13-32	LB30-3	SY	0.5
LB13.33	LB30-4	SG	0.5
LB13-35	LB30-6	SK	0.5
LB13-36	LBS37	BK	0.5
LB14-1	RS114-3	LGN	0.5
LE14-2	LB135-18	Y	0.5
LB14-3	LB135-15	SB	0.5
LB14-4	LBS61	GU	0.5
LB14-5	LB61-13	BW	0.5
LB14-6	LB49-16	YP	0.5
LB14-7	RS22-16	YK	0.5
LB14-8	LS1-4	YS	0.5

om		Colour	ze (mm)
on	lach	Farbe	uerschnitt
e	\	Couleur	ection
an	laar	Kleur	aat
a	\	Colore	ametro
esde	lacia	Color	amano
B14-9	3135-41	JN	.5
B14-10	3135.40	JW	.5
B14-11	3133-3	YB	.5
814.12	3S43	.GO	.5
B14-13	3S28	RLG	5
B14-14	358-1	JG	.5
B14-15	358-2	R	.5
B14-16	358-3	S	.5
B14-18	358-13	GS	.5
B14-19	3S35		.5
B14-20	522-21	/G	.5
B14-21	S22-22	/B	.5
B14-22	399-2		.5
B14-23	397-2	O	.5
B14-24	3132-17	S	.5
B14-26	366-5		1.5
B14-27	361-28	N	.5
B14-28	B61-29	U	1.5
B14-34	360-2	GP	.5
B14-35	B30-10	N	1.5
B14-36	330-12	/N	1.5
B15-1	BS40	G	.O
B15-2	380		.O
B15-3	BS17	O	1.0
B15-4	BS16	K	.O
B15-5	b58	O	1.5
B15-6	B151-1	O	.5
B15-7	BS34	N	.5
B15-8	BS61	iU	.5
B16-30	B16-85	IY	.5
B16-30	B129-5	IY	.O
B16-85	BD7-ODU	I	.5
B16-86	B16-30	IY	.5
.B16-87	BS46	GO	.O
B16-87A	B147-87	IW	1.5
B17-30	B71	I	3.0
B17-85	BD5/DOU	WU	1.5
.B17-86	8532	IB	.5
817-87	BS26	IK	3.0
.B18-30	b527	IG	2.0
.B18-30	BD11-OOW	/G	1.5
.B18-85	BS50	IO	.5
.B18-86	BS38	JR	1.5
.B18-87	B78	IK	1.0
.B19-30	B128-6	10	3.0
.B19-85	BD2-OOU	VR	.5
.B19-86	BS11	VB	3.5
.B19-87	B28-5	V	3 0
_B20	.BS30	J	.5
_B21-1	51-25	JG	1.0
_B21-2	B132-1	3R	3.5
_B21-3	B132-2	3U	3.5
_B21-4	S64-6	JY	2.0
_B21-5	.BS80	JB	1.0
LB21-6	.S1-26	JR	1.0
LB21-7	.BS10	PU	0.5
LB17.8	.BS37	3K	2 0
LB25-1	.B75	3	2.0
LB25-2	.B128-3	WU	2.0
LB26-1	.BS27	JG	0.5
LB26-2	.BD8-OOW	W	0.5
LB27-1	.S2-6	KN	0 5
LB27-2	.B134-1	KR	0.5
LB27-3	.B135-22	JG	0 5
LB27-4	.B35-5	RG	0.5
LB27-5	.BS32	UB	0.5
LB27-6	.BS30	J	0.5
LB28-1	LBS26	INK	2.0
LB28-2	LS3-5	UR	0.5
LB28-3	LB131-5	NK	3.0
LB28-4	LBS62	NB	0.5
LB28-5	LB19-87	W	3.0
LB28-6	LS3-9	YG	1.0
LB29-1	1b75	B	2.0
LB29-2	LB118-2	NU	2 0

BULKHEAD HARNESS LB (LHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / P / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
LB30-1	LBD9-ODU	SR	0 5
LB30-2	LB13-31	SO	0.5
LB30-3	LB13-32	SY	0 5
LB30-4	LB13-33	SG	0.5
LB30-5	LB6-2	SU	0.5
LB30-6	LB13-35	SK	0.5
LB30-7	LBS24	RG	0.5
LB30-8	LBS13	WN	0.5
LB30-9	LBS20	RK	0.5
LB30-10	LB14-35	SN	0.5
LB30-11	LB13-16	NG	0.5
LB30-12	LB14-36	ON	0.5
LB31-1	LB135-17	OY	0.5
LB31-2	LBS23	BK	3.0
LB33-1	LB61-4	RW	0.5
LB33-2	LS2-3	RN	0.5
LB33-3	LBS98	RG	0.5
LB33-4	LB13-24	LGB	0.5
LB33-5	LS1-14	RLG	0.5
LB33-6	LS1-15	RP	0 5
LB33-7	LB8-6	KW	0.5
LB33-8	RS114-12	KY	0 5
LB33-9	LBS97	KLG	***0.5***
LB33-10	LBS16	LGO	1.0
LB33-11	LBS19	NW	1.0
LB33-12	LBS24	RG	0.5
LB33-13	RS22 28	KR	0.5
LB33-14	RS22-27	KO	0.5
LB35 1	LBS23	BK	0.5
LB35-2	LB74	B	0.5
LB35 3	LBS41	PW	1.0
LB35-4	LB135-4	S	0 5
LB35-5	LB27-4	RG	0.5
LB35-6	LB93-85	SB	0 5
LB35-7	LB135-14	GB	0.5
LB35-8	LBS42	P	1.0
LB35-9	LBS82	SLG	0.5
LB35-10	LBS95	RW	0 5
LB35-11	LBD2-OOW	WP	0.5
LB35-12	LBS31	WR	0.5
LB35-13	LB13-29	US	0.5
LB35-14	LB49-2	RS	015
LB41-1P	LB120-4P	GB	0.5
LB41-2P	LBS73	SLG	0.5
LB46-1D	LBS73	SLG	0.5
LB46-2D	LBS74	GB	0.5
LB49-1	LBS20	RK	0.5
LB49-2	LB35-14	RS	0.5
LB49-3	LBS83	RU	0.5
LB49-4	LBS-84	RO	0.5
LB49-5	RS22-15	UK	0.5
LB49-6	LBS85	US	0 5
LB49-7	LB135-24	UP	0.5
LB49-8	LB55-14	PG	0 5
LB49-9	LBS70	US	0.5
LB49-10	LB13-8	UY	0.5
LB49-11	LS1-3	UK	0 5
LB49-12			
LB49-13	LBS51	RG	0.5
LB49-14	LB13-7	ULG	0.5
LB49-15	LE13-6	YR	0.5
LB49-16	LB14-6	YP	0.5
LB49-18	LBS50	UO	0.5
LB49-19	LB55-20	RLG	0.5
LB49-20	LBS4	BK	***0.5***
LB49-21	LB55-23	RY	0.5
LB49-22	LBS25	WB	0.5
LB49-24	LBS32	NB	0.5
LB55-1	LBS92	LGY	0.5
LB55-2	LB13-4	LGG	0.5
LB55-4	LB134-10	RO	0.5
LB55-5	LBS13	WN	0.5
LB55-6	LB13-10	YN	0 5
LB55-7	LB13.9	YU	0.5
LB55-8	LBS90	LGR	0.5
LB55-9	LBS50	UO	0.5
LB55-10	LS2-8	GU	0.5
LB55-11	LB60-1	LGK	0.5
LB55-12	LBS38	NR	0.5
LB55-13	LBS20	RK	0.5
LB55-14	LB49-8	PG	0.5
LB55-15	LBS95	RW	0.5
LB55-16	LB75	B	***0.5***
LB55-17	LBS12	WY	0.5
LB55-18	LB58-5	GB	0.5
LB55-20	LB49-19	RLG	0.5
LB55-21	LBS13	WN	0 5
LB55-22	LB58-6	GR	2.0
LB55-23	LB49-21	RY	0.5

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size Immi / Querschnitt / Section / Maat / Dametro / Tamano
LB55-24	LBS4	BK	0.5
LB56-1	LBS10	PU	0 5
LB56-2	LBS12	WY	0.5
LB57-2	LS64-5	PG	2.0
LB57-3	LBS41	PW	2 0
LB58-1	LB14-14	UG	0 5
LB58-2	LB14-15	PR	***0.5***
LB58-3	LB14-16	PS	0.5
LB58-4	LB75	B	0 5
LB58-5	LB55-18	GB	***0.5***
LB58-6	LB55-22	GR	0 5
LB58-7	LBS32	NB	0.5
LB58-13	LB14-1a	U	0.5
LB58-14	LBS30	U	0.5
LB58-15	LBS37	BK	0.5
LB59-1	LS3-1	NB	3.0
LB59 2	LS-3	R	2.0
LB59-3	LS64-4	U	2.0
LB59 4	LS3-7	U	2.0
LB59-5	LS64-1	RY	2.0
LB59-6	LS64-2	RS	2.0
LB60-1	LB55-11	LGK	0.5
LB60-2	LB14-34	LGP	0.5
LB60-3	LBS90	LGR	0.5
LB60-4	LBS25	WB	0.5
LB61-1	LBS34	PN	0.5
LB61-2	LB13.20	PW	0.5
LB61-3	LBS35	K	0.5
LB61-4	LB33-1	RW	0.5
LB61-5	LBS98	RG	***0.5***
LB61-6	LBS15	YW	0 5
LB61-7	LB8-3	BR	0.5
LB61-8	LB8-4	BP	0.5
LB61-9	RS22-13	BG	0.5
LB61-10	RS22-14	BLG	0 5
LB61-11	LS1-30	BO	0.5
LB61-12	LS1-31	GLG	0 5
LB61-13	LB14-5	BW	0.5
LB61-15	LBS91	R	0.5
LB61-16	LBS1	UY	0.5
LB61-17	LBS13	WN	***0.5***
LB61-18	LBS17	PO	0.5
LB61-19	LBS16	PK	0.5
LB61-21	LBS47	UO	0.5
LB61-22	LB8-14	OR	0.5
LB61 23	LB8-15	OG	0 5
LB61-24	LB8-16	OY	0.5
LB61-25	LB8-17	OP	0 5
LB61-26	LBS8	YO	0.5
LB61-28	LB14-27	BN	0.5
LE61-29	LB14-28	BU	0.5
LB61-32	LBS6	G	0 5
LB62.1	LB80	B	2.0
LB62-2	LE130-4	NP	2.0
LB62-5	RS87-1	NY	0 5
LB62-6	LBS4	Bk	2.0
LB64-1	LBS12	WY	0.5
LB64-2	LBS70	WG	0.5
LB64-3	LBD3-OOW	GP	0.5
LB66-1	LBS23	BK	0.5
LB66-2	RS114.22	UB	0.5
LB66-3	LBS46	LGO	0.5
LB66-4	LB73	B	0.5
LB66-5	LB14-26	S	0.5
LB66-6	LBS20	RK	0.5
LB66-7	LBS24	RG	0.5
LB66-8			
LB66-12	LBS25	WB	0 5
LE71	LE17-30	N	3.0
LB72	LS3-2	B	2.0
LB72	LB7-1	B	2.0
LB72	LBS3	B	2.0
LB73	LB98-1	B	2.0
LB73	LB101-3	B	2.0
LB73	LB180-1	B	2.0
LB73	LB66-4	B	2.0
LB74	LB102-1	B	2 0
LB74	LB100-3	B	2.0
LB74	LB184-3	B	2.0
LB74	LB35-2	B	2.0
LB75	LB29-1	B	2.0
LB75	LB25-1	B	2.0

From / Von / De / Van / Da / Desde	To / Ndch / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size Immi / Querschnitt / Section / Maat / Dametro / Tamano
LB75	LBS14	B	3 0
LB75	LB58-4	B	0.5
LB75	LB55-16	B	0.5
LB75	LB111-2	B	0.5
LB78	LBS37	BK	3.0
LB78	LBS23	BK	3.0
LB78	LBS4	BK	3.0
LB80	LB62-1	B	2.0
LB80	LB16-2	B	2.0
LB80	LB156-85	B	0.5
LB80	RS87-3	B	2.0
LB80	LB90	B	2.5
LB81-1	LBS26	WK	3.0
LB81-2	LBS26	WK	3.0
LB80	LB15-2	B	2.0
LB82	LB17.30	N	3.0
LB85-1	LB86-7	YB	***0.5***
LB85-2	LB87-2	YG	2.0
LB85-5	LBS4	BK	0.5
LB85-6	LB87-3	YN	2 0
LB86-1	LBS8	YO	0.5
LB86-2	LBS12	WO	0.5
LB86-3	LB13-23	SLG	0.5
LB86-4	LB118-30	G	0.5
LB86-6	LB134-14	WY	***0.5***
LB86-7	LB85-1	YB	0.5
LB86-8	LB106-1	YLG	0.5
LB86-10	LB106-2	YR	0.5
LB86-11	LB105-2	YO	0.5
LB86-13	LB105-1	YP	0.5
LB86-14	LB91-1	YS	0.5
LB86-15	LBS45	GW	0.5
LB86-16	LBS4	BK	0.5
LB87-1	LB130-7	NS	2.0
LB87-2	LB85-2	YG	2.0
LB87 3	LB85-6	YN	2.0
LB87-5	LB91-2	YU	2 0
LB87 6	LB91-6	YW	2.0
LB87-7	LBS14	B	2.0
LB87-8	LBS14	B	2.0
LB87-9	LB128-7	NS	2.0
LR88	LB90	B	2.0
LB90	LE80	E	2.0
LB91-1	LB86-14	YS	0.5
LB91.2	LB87-5	YU	2.0
LB91-5	LB105-3	BK	0.5
LB91-5	LBS4	BK	0.5
LB91-6	LB87-6	YW	2 0
LBB92-30	LBS38	NR	0.5
LB92-85	LBD11-ODU	U	***0.5***
LB92-86	LBS38	NA	0.5
LB92-87	LBS33	LE	0.5
LB93-30	LBS42	P	2.0
LB93-85	LB35-6	SB	0.5
LB93-86	LBS11	WB	0.5
LB93-87	LBS41	PW	2.0
LB94-2	LBS41	PW	2.0
LB94-3	LBS42	P	2.0
LB95-30	LBS22	NY	2.0
LB95-85	LBS47	UO	0.5
LB95-86	LBS22	NY	0.5
LB95-87	LB100-2	YK	2.0
LB96-30	LBS21	NY	2 0
LB96-85	LBS47	UO	0.5
LB96-86	LBS21	NY	0.5
LB96-87	LBS60	YK	2 0

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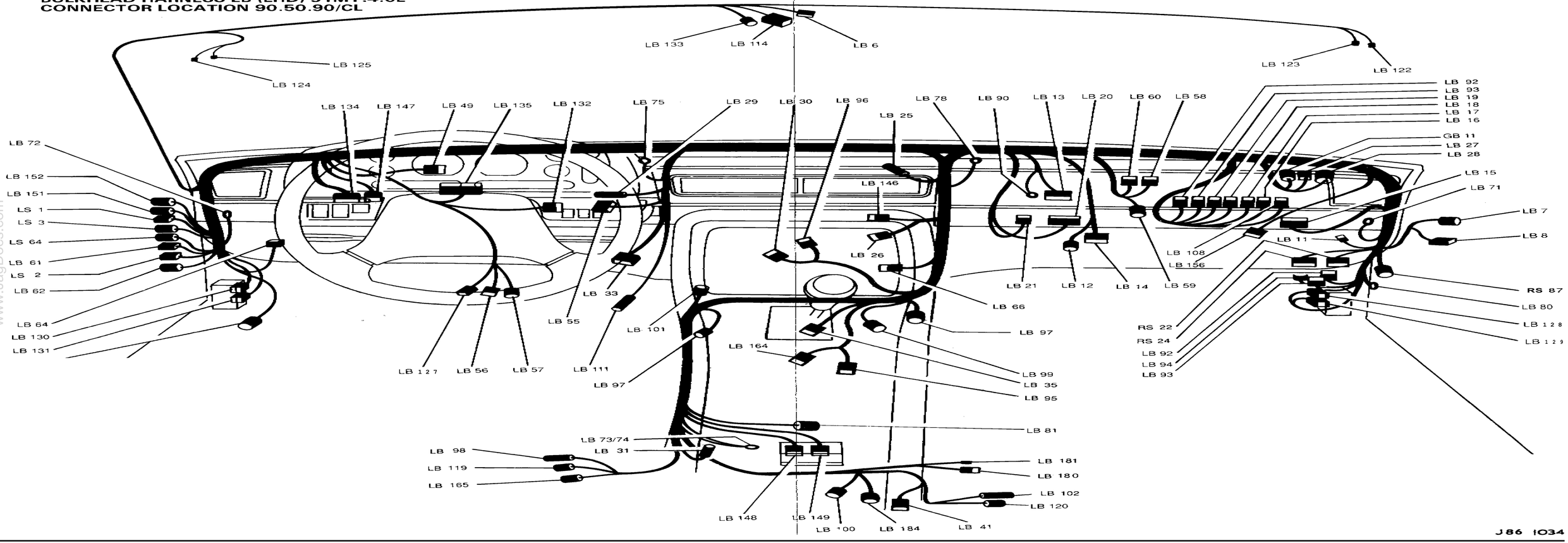
BULKHEAD HARNESS LB (LHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size Imml / Querschnitt / Section / Maat / Dametro / Tamano
LB97-1	LB13-26	KW	0.5
LB97-2	LB14-23	KO	0.5
LB97-3	LBS49	R	0.5
LB97-4	LBS23	BK	0.5
LB97-5	LB97-6	O	0.5
LB97-6	LB97-5	O	0.5
LB97-7	LBS31	WR	0.5
LB97-8	LBS21	NY	2.0
LB97-9	LBS49	R	2.0
LB98-1	LB73	B	2.0
LB98-2	LBS49	R	2.0
LB99-1	LB13-25	OW	0.5
LB99-2	LB14-22	O	0.5
LB99-3	LBS48	R	0.5
LB99-4	LBS23	BK	0.5
LB99-5	LB99-6	O	0.5
LB99-6	LB99-5	O	0.5
LB99-7	LBS31	WR	0.5
LB99-8	LBS22	NY	2.0
LB99-9	LBS48	R	2.0
LB100-2	LB95-87	YK	2.0
LE100-3	LB74	B	2.0
LB101-2	LBS60	YK	2.0
LB101-3	LB73	B	2.0
LB102-1	LB74	B	2.0
LB102-2	LBS48	R	2.0
LB105-1	LB85-13	YP	0.5
LB105-2	LB85-11	YO	0.5
LB105-3	LB91-5	BK	0.5
LB106-1	LB86-8	YLG	0.5
LB106-2	LB86-10	YR	0.5
LB106-3	LBS4	BK	0.5
LB108-30	LBS29	NW	0.5
LB108-85	LBS28	RLG	0.5
LB108-86	LBS29	NW	0.5
LE108-87	LBSI	UY	0.5
LB108-87	LBS39	UY	0.5
LB111-1	GB11-1	BS	0.5
LB111-2	LB80	B	0.5
LB114-1	LB152-1	RO	0.5
LB114-2	LB152-2	GU	0.5
LB114-7	LBS40	NG	0.5
LE114-8	LBS3	B	0.5
LB118-30	LB86-4	G	0.5
LB118-85	LBS7	SLG	0.5
LB118-86	LBS25	WB	0.5
LB118-87A	LBS6	G	0.5
LB119-1D	LBS19	NW	0.5
LB119-2D	LBS23	BK	0.5
LB119-3D	LBS28	RLG	0.5
LB110-4D	LBS74	GB	0.5
LB120-1P	LBS19	NW	0.5
LB120-2P	LBS23	BK	0.5
LB120-3P	LBS28	RLG	0.5
LB120-4P	LB120-4P	GB	0.5
LB122	LBS3	E	0.5
LE123	LBS29	NW	0.5
LB124	LBS29	NW	0.5
LE125	LBS3	B	0.5
LB127-1	LBS42	P	2.0
LB127-2	LBS9	NB	2.0
LB127-3	LBS5	NP	1.0
LB127-4	RS114-30	GB	1.0
LB128-1	RS22-25	NK	0.5
LB128-2	LB29-2	NU	2.0
LB128-3	LB25-2	NU	2.0
LB128-4	LB7-2	NP	2.0
LB128-5	LB156-30	NB	2.0
LB128-6	LB19-30	NO	3.0
LB128-7	LB87-9	NS	2.0
LB128-8	LB12-2	NG	2.0
LB128-9	LBS12	WY	0.5
LB129-1	LB135-35	KB	0.5
LB129-2	LBS38	NR	0.5
LB129-3	RS114-34	NLG	0.5
LB129-4	LBS29	NW	2.0
LB129-5	LB16-30	NY	1.0
LB130-1	LBS22	NY	3.0
LB130-2	LBS21	NY	3.0

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size Imml / Querschnitt / Section / Maat / Dametro / Tamano
LB130-3	LB146-1	NK	3.5
LB130-4	LB62-2	NP	2.0
LB130-5	LBS32	NB	1.0
LB130-6	LB134-5	NR	3.5
LB130-7	LB87-1	NS	2.0
LB130-8	LB133-1	NW	@.)
LB130-9	LBS12	WY	3.5
LB131-1	LB135-36	KB	0.5
LB131-2	LBS40	NG	2.0
LB131-3	GB11-3	NS	2.0
LB131-4	LBS62	NB	3.5
LB131-5	LB28-3	NK	3.0
LB132-1	LB21-2	SR	3.5
LB132-2	LB21-3	SU	3.5
LB132-3	LBS20	PK	0.5
LB132-4	LBS9	NB	0.5
LB132-5	LBS4	BK	0.5
LB132-6	LB135-42	R	0.5
LE132-7	LB135-29	Y	0.5
LB132-8	LB135-30	O	0.5
LB132-9	LB135-26	U	0.5
LB132-10	LB135-27	P	0.5
LB132-11	LB135-31	K	0.5
LB132-12	LB135-25	UY	0.5
LB132-13	LB135-28	US	0.5
LB132-14	LB135-32	PG	0.5
LB132-15	LB135-33	PG	0.5
LB132.16	LE13-17	GO	0.5
LB132-17	LB14-24	GS	0.5
LB133-1	LB130-8	NW	2.0
LB133-2	LBS3	B	2.0
LB133-3	LB14-11	YB	0.5
LB134-1	LB27-2	KR	0.5
LB134-2	LB148-1	WO	0.5
LB134-3	LBS4	BK	0.5
LB134-4	LBS4	BK	0.5
LB134-5	LB130-6	NR	0.5
LB134-10	LB55-4	RO	0.5
LB134-13	LB145-5	O	0.5
LE134-14	LB86-6	K	0.5
LB134-15	RS22-4	RIN	0.5
LE134-16	RS22-12	UIN	0.5
LB134-17	RS22-2	BRD	STD
LE134-18	LS1-8	WLG	0.5
LB134-19	RS22-8	OK	0.5
LB134-20	RS22-9	BW	0.5
LB134-21	RS22-7	OS	0.5
LB134-24	RS114-6	RY	0.5
LB135-2	LBS30	U	0.5
LB135-7	RS114-1	O	0.5
LB135-9	RS114-26	BR	0.5
LB135-10	RS114-2	BY	0.5
LB135-11	LBS10	PU	0.5
LB135-12	LB148-6	KB	0.5
LB135-13	RS22-19	OR	0.5
LB135-14	LB35-7	GB	0.5
LB135-15	LB14-3	SB	0.5
LB135-16	LB152-4	RY	0.5
LB135-17	LB31-1	OY	0.5
LB135-18	LB14-2	Y	0.5
LB135-19	LBS5	NP	0.5
LB135-20	LS1-21	SK	0.5
LB135-21	RS22-18	LG	0.5
LE135-22	LB27-3	UG	0.5
LB135-23	RS24-21	UR	0.5
LE135-24	LB49-7	UP	0.5
LB135-25	LE132-12	UY	0.5
LE135-26	LB132.9	U	0.5
LB135-27	LE132-10	P	0.5
LB135-28	LB132-13	US	0.5
LB135-29	LB132-7	Y	0.5
LB135-30	LB132-8	O	0.5
LB135-31	LB132-11	K	0.5
LB135-32	LB132-14	PG	0.5
LB135-33	LB132-15	BR	0.5
LE135-34	LS1-16	OS	0.5
LB135-35	LB129-1	KB	0.5
LB135-36	LB131-1	KB	0.5
LB135-37	LS1-17	OP	0.5
LB135-38	LBS51	RG	0.5
LB135-39	RS114-18	KU	0.5
LB135.40	LB14-10	UW	0.5
LB135-41	LB14-9	UN	0.5
LE135-42	LB132-6	R	0.5
LE132-43	LBS66	KS	0.5
LB135-44	LB35-4	S	0.5
LB135-45	RS114-32	NO	0.5
LB135-46	LBS6	G	0.5
LB135-47	LB8-20	GW	0.5
LB135-48	RS114.27	LB	0.5

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size Imml / Querschnitt / Section / Maat / Dametro / Tamano
LB145-1	LB134-14	K	0.5
LB145-4	LBS62	NB	1.5
LB145-5	LB134-13	O	0.5
LB145 6	LBS4	BK	1.5
LB146-1	LB130-3	NK	1.5
LB146-2	LB152-3	YO	0.5
LB147-30	LB13-19	UR	0.5
LB147-85	LBS50	UO	1.5
LB147-86	LBS6	WN	1.5
LB147 87	LB16-87A	NW	1.5
LB148 1	LB134-2	WO	1.5
LB148-2	LBS11	WB	1.0
LB148-3	RS114-7	WU	0.5
LB148 4	LBS12	WY	0.5
LB148-5	RS22-30	WS	0.5
LB148 6	LB135-12	KB	0.5
L8148-7	LBS80	NB	1.0
LB148-8	LBS81	WG	0.5
LB148-9	LBS99	WP	0.5
LB149-3	RS22-6	WR	0.5
LB149-4	LBS25	WB	1.0
LB149-5	LBS31	WR	1.0
LB151-1	LB15-6	RO	0.5
LB151 2	LBS61	GU	0.5
LB151-3	RS22-3	YO	0.5
LB151-4	RS22-26	RY	0.5
LB152 1	LB114-1	RO	0.5
LB152-2	LB114.2	GU	0.5
LB152-3	LB146-2	YO	0.5
LB152-4	LB135-16	RY	0.5
L8156-30	LB128-5	NB	2.0
LB156-85	LB80	B	0.5
LB156-86	LBS11	WB	0.5
LB156-87	LBS18	OB	2.0
LB164-30	LB135-1	K	2.0
LB164-85	LB165-3	BN	1.0
LB164-86	LBS60	YK	0.5
LB164-87	LBS60	YK	2.0
LB164-87A	LB165-2	K5	2.0
LB165-1	LB164-30	K	2.0
LB165-2	LB164-87A	KS	2.0
LB165-3	LB164-85	BN	2.0
LB180-1	LB73	B	2.0
LB180-2	LBS18	OB	2.0
LB181	LBS33	LB	0.5
LB184-1	LBS33	LB	0.5
LB184-2	LBS18	OB	2.0
LB184-3	LB74	B	2.0

BULKHEAD HARNESS LB (LHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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J86 1034

tern	Description	nterface	.ocation
3B11	PM5 3 way socket(green)	3earbox harness	
-S1	PMHD 36 way socket(black)	.H side harness	.H A' post
.S2	PMHD 15 way socket (yellow)	.H side harness	.H 'A' post
.S3	PM4 9 way socket (black)	.H side harness	.H 'A' post
S 6 4	PM4 6 way socket(yellow)	.H side harness	.H 'A' post
RS22	PMHD 36 way socket(black)	RH side harness	RH 'A' post
RS24	PMHD,24 way socket (yellow)	RH side harness	RH 'A' post
3587	PM4 6 way socket(black)	RH side harness	RH 'A' post
.B6	PM4 4 way socket(black)	nterior map light	Roof centre front
.B7	PM4 4 way socketlblack)	Pass.door harness	.H 'A' post
.B8	PMHD 24 way plug(black)	Pass.door harness	.H 'A' post
.B12	PM4 3 way socketlblack)	CPU	Front passenger footwell
LB13	PMHD 36 way socket(black) - inhibit plug fitted at pin 30 position	CPU	Front passenger footwell
LB14	PMHD 36 way plug(yellow)	CPU	Front passenger footwell
LB15	Kiekert 9 way socket	Door lock ECU	Front passenger footwell
LB16	Relay base(green)	Radio relay	Front passenger footwell
LB17	Relay base (blue)	gnition 'on' relay	Front passenger footwell
LB18	Relay base(black)	Aux side latnp relay	Front passenger footwell
LB19	Relay base(yellow)	Starter relay	Front passenger footwell
LB20	Single lucar connector	Sruise control ECU	Front passenger footwell
LB21	MIC 8 way socket	Sruise control ECU	Front passenger footwell
LB25	PM5 3 way socket(black)	.H Air con blower motor	Front passenger footwell
LB26	PMHD 2 way socket(black)	Glove box harness	Front passenger footwell
LE27	PMHD 6 way socket (yellow) PI harness	Front passenger	footwell
LB28	PM4 6 way plug (yellow)	PI harness	Front passenger footwell
LB29	PM5 3 way socket (black)	RH Air con blower motor	Front passenger footwell
LB30	PMHD 15 way socket (green)	Centre console switch panel	Centre console
LB31	PM5 3 way switch (yellow)	Handbrake switch	Driver seat
LB33	PMHD 15 way socket (white)	Radio and speakers	Centre console
LB35	PMHD 15 way socket (green) socket (black)	Gearbox harness	Centre console
LB41	PMHD 2 way socket (black)	Seat belt switch	Front passenger seat
LB46	PMHD 4 way socket (black)	Seat belt switch	Driver seat
LB49	PMHD 24 way socket (green)- inhibit plug fitted at pin 12 position	Fascia switch panel	Driver footwell
LB55	PMHD 24 way plug (black)	Column switchgea	Driver footwell
LB56	PM4 2 way socket (black)	Brake switch	Driver footwell
LE57	PM4 3 way plug (black)	Brake switch	Driver footwell
LB58	PMHD 15 way socket (black)	Speed warning module	Front pasenger footwell
LB59	PM4 6 way socket (black)	Wiper logic module	Front passenger footwell
LB60	PMHD 4 way socket (black)	Wiper logic module	Front passenger footwell
LB61	PMHD 36 way plug (black)	Drivers door harness	LH 'A' post
LE62	PM4 6 way socket (black)	Drivers door harness	LH 'A' post
LB64	3 way socket	Inertia switch	LH 'A' post
LB66	PMHD 15 way socket (black)- inhibit plug fitted at pin 8 position	Air con control panel	Centre console
LB71	Eyelet	Battery terminal post	Bulkhead LH side
LB72	Eyelet	Earth terminal	LH 'A' post
LB73	Eyelet	Earth terminal	Centre console
LB74	Eyelet	Earth terminals	Centre console
LB75	Eyelets	Earth terminals	Bulkhead LH side
LE78	Eyelets	Logic earth terminals	Bulkhead centre
LB80	Eyelets	Earth terminals	RH 'A' post
LB81	PM4 3 way socket (black)	Centre fusebox	Centre console
LB85	PM4 6 way socket (black)	Passive restraint motor	Driver footwell
LB86	PMHD 24 way socket (black)	Passive restraint ECU	Driver footwell
LB87	PM4 9 way socket (black)	Passive restraint ECU	Driver footwell
LB90	Eyelet	CPU earth terminal	Front passenger footwell
LB92	Relay base(natural)	Sidelights on power relay	Front passenger footwell
LB93	Relay base(violet)	Auto speed control relay	Front passenger footwell
LB94	PM4 3 way plug (black)	Manual speed control shorting plug	Front passenger footwell

BULKHEAD HARNESS LB (LHD-PASSIVE RESTRAINT) 91MY.4.0L
HARNESS SCHEDULE 90.50.09/HS

Item	Description	Interface	Location
LB95	Relay base,(natural)	LH seat relay	Centre console
LB96	Relay base(black)	RH seat relay	Centre console
LB97	PMHD 10 way socket (yellow)	Driver seat heater switch	
LB98	PM5 3 way socket (violet)	Drivers seat heater	Driver seat
LE99	PMHD 3 way socket(white)	Passenger seat heater switch	Centre console
LB100	PM4 3 way socket (black)	Passenger seat switches	Centre console
LB101	PM4 3 way socket (red)	Driver seat switches	Centre console
LB102	PM5 3 way socket(violet)	Pass.seat harness	Front passenger seat
LE106	PMHD 4 way socket (black)	Passive restraint motor	E post
LB108	Relay base (brown)	Puddle latnp relay	Front passenger footwell
LB111	PM5 3 way socket (violet)	Accelerator switch	Driver footwell
LB114	PMHD 8 way socket	IR receiver module	Roof centre front
LB118	Relay base (green)	Reverse light inhibit relay	Driver footwell
LB119	PM4 5 way socket (black)	Driver's interior light and seat switch	Roof centre front
LB120	PM4 5 way socket (black)	Pass interior light and seat switch	Roof centre front
LB122	Lucar socket	Right hand illum. vanity mirror	Passenger side roof
LB123	Lucar socket	Right hand illum. vanity mirror	Passenger side roof
LB124	Lucar socket	Left hand illum vanity mirror	Driver side roof
LB125	Lucar socket	Left hand illum. vanity mirror	Driver side roof
LB127	PM4 5 way socket (black)	Clutch switch	Driver footwell
LB128	TTS 9 wav socket Inatural)	RH fusebox	RH 'A' post
LB129	TTS 5 way socket (natural)	RH fusebox	RH 'A' post
		RH fusebox	RH 'A' post
LB130	TTS 9 way socket 'A' (natural)	LH fusebox	LH 'A' post
LB131	TTS 5 way socket 'C' (natural)	LH fusebox	LH 'A' post
LB132	PMHD 24 way socket(brown)	Fascia	Driver footwell
LB133	PM4 3 way socket	Sunshine roof	Roof centre front
LB134	PMHD 24 way socket (black)	Instrument pack	Driver footwell
LB135	PMHD 48 way socket (black)	Instrument pack	Driver footwell
LE145	PM4 6 way socket(brown)	Diagnostic socket	Driver footwell
LB146	PMHD 4 way socket (yellow)	Remote boot release	Glove box
LB147	Relay base,(black)	Lights on warning module	Driver footwell
LB148	TTS 9 way socket 'A' (natural)	Centre fuse box	Centre console
LB149	TTS 5 way socket 'B' (natural)	Centre fuse box	Centre console
LB151	PM4 5 way socket (black)	Security connector	LH 'A' post
LB152	PM4 5 way plug (black)	Security connector	LH 'A' post
LB156	Relay base lred)	Cigar lighters relay	Front passenger footwell
LB164	Relay base lgreenl	Seat entry switch relay	Driver footwell
LB165	PM4 3 way socket	Seat entry switch	Driver seat
LB180	Econoseal series 'J'2 way plug	Front cigar lighter)	Centre console front ash tray
LE181	Lucar single socket	Front cigar lighter)	
LB184	Econoseal series 'J' 3 way plug	Rear cigar lighter Rear cigar lighter	Centre console rear ash tray

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BULKHEAD HARNESS LB (LHD-PASSIVE RESTRAINT) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
GB11	Passenger footwell	RH dash liner
LS1	LH 'A' post	LH dash liner
LS2	LH 'A' post	LH dash liner
LS3	LH 'A' post	LH dash liner
LS64	LH 'A' post	LH dash liner
RS22	RH 'A' post	RH dash liner
RS24	RH 'A' post	RH dash liner
RS87	RH 'A' post	RH dash liner
LB6	Roof centre front	Mapiinterior light panel
LB7	LH'A' post	LH dash lither
LB8	LH 'A' post	LH dash liner
LB12	Front passenger footwell	LH dash liner
LB13	Front passenger footwell	LH dash liner
LB14	Front passenger footwell	LH dash liner
LB15	Front passenger footwell	LH dash liner
LB16	Front passenger footwell	LH dash liner
LB17	Front passenger footwell	LH dash liner
LB18	Front passenger footwell	LH dash liner
LB19	Front passenger footwell	LH dash liner
LB20	Front passenger footwell	LH dash liner
LB21	Front passenger footwell	LH dash liner
LB25	Front passenger footwell	LH dash liner
LB26	Front passenger footwell	LH dash liner
LB27	Front passenger footwell	LH dash liner
LE28	Front passenger footwell	LH dash liner
LB29	Driver footwell	RH desh liner
LB30	Centre console	Console switch panel
LB31	Below handhrake lever	Beneath floor carpet
LB33	Centre console	Centre console switch panel
LB35	Centre console	Console switch panel
LB41	Passenger seat	Passenger seat cushiorr
LE46	Driver seat	Driver seat
LB49	Driver footwell	RH dash liner
LB55	Driver footwell	RH dash liner and steering column cowls
LB56	Driver footwell	
LB57	Driver footwell	
LB58	Front passenger footwell	LH dash liner
LB59	Front passenger footwell	LH dash liner
LE60	Front passenger footwell	LH dash liner
LB61	RH 'A' post	RH dash liner
LB62	RH 'A' post	RH dash liner
LB64	Driver footwell	
LB66	Centre console	Console switch panel
LB73	Centre console	Centre console ash tray
LB74	Centre console	Centre console ash tray
LB75	Bulkhead (driver side)	RH air blower duct
LB78	Bulkhead (passenger side)	LH air blower duct
LB80	RH 'A' post	RH dash liner
LB81	Centre console	Console trim finisher
LE82	Bulkhead	
LB85	Driver footwall	LH dash liner
LB86	Driver footwell	LH dash liner
LB87	Driver footwell	LH dash liner
LB88	Bulkhead (passenger side)	
LB90	Passenger footwell	LH dash liner
LB92	Passenger footwell	LH dash liner
LB93	Passenger footwell	LH dash liner
LB94	Passenger footwell	LH dash lither
LB95	Centre console	Console switch panel
LB96	Centre console	Console switch panel
LB97	Centre console	Console tritn finisher
LB98	Beneath driver seat	Driver seat cushion
LB99	Centre console	Console trim finisher
LB100	Centre console	Console trim finisher
LB101	Centre console	Console trim finisher
LB102	Below front passenger seat	Front passenger seat cushiorr
LB106	Inside B post	B post trim
LB108	Passenger footwell	LH dash liner
LB111	Accelerator switch	
LB114	IR receiver	Mapiinterior light panel
LB119	Centre console	Centre console trim finisher
LB120	Centre console	Centre console trim finisher
LB122	Driver side roof	Vanity nrirrmr urrit arrd head liner
LB123	Driver side roof	Vanity mirror unit arrd head liner
LB124	Passenger side roof	Vanity mirror unit and tread liner
LB125	Passenger side roof	Vanity niirror unit and head liner
LB127	Driver footwell	

BULKHEAD HARNESS LB (LHD-PASSIVE RESTRAINT) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	location	Access
LB128	AH 'A' post	RH dash liner
LB129	RH 'A' post	RH dash liner
LB130	LH 'A' post	LH fash liner
LB131	LH 'A' post	LH dash liner
LB132	Driver footwell	RH dash liner
LB133	Roof centre front	Mepiinterior light panel
LB134	Driver footwell	RH dash liner
LB135	Driver footwell	RH dash liner
LB145	Driver footwell	RH dash liner
LB146	Glovehox	
LB147	Driver footwell	RH dash liner
LB148	Centre console	Centre console ash tray
LB149	Centre console	Centre console ash tray
LB151	RH 'A' post	RH dash liner
LB152	RH 'A' post	AH dash liner
LB156	Driver footwell	RH desh liner
LB164	Driver footwell	RH dash liner
LB165	Driver seat	Driver seat cushion
LB180	Centre console	Centre console front ash tray
LB181	Centre console	Centre console front ash tray
LB184	Centre console	Centre console rear ash tray

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BULKHEAD HARNESS LB (LHD) PASSIVE RESTRAINT 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
GB11-1	LB111-1	BS	0.5
GB11-2	LBS62	NB	0.5
GB11-3	LB131-3	NS	2.0
LS1-1	LI3570	US	0.5
LS1-2	LB13-15	KR	0.5
LS1-3	LB49-11	UK	0.5
LS1-4	LI314-8	YS	0.5
LS1-5	LBS83	RU	0.5
LS1-6	RS22-36	PS	0.5
LS1-7	LI3525	WB	0.5
LS1-8	LB134-18	WLG	0.5
LS1-9	LBS36	P	0.5
LS1-10	RS114-16	OG	0.5
LS1-11	LBS84	RD	0.5
LS1-12	LBS66	KS	0.5
LS1-13	LBS27	R	0.5
LS1-14	LB33-5	RLG	0.5
LS1-15	LB33-6	RP	0.5
LS1-16	LB135-34	CIS	0.5
LS1-17	LB135.37	P	0.5
LS1-18	L8513	WN	0.5
LS1-22	LB135-20	SK	0.5
LS1-24	LBS10	PU	0.5
LS1-25	LB21-1	LIG	0.5
LS1-26	LB21-6	UR	0.5
LS1-28	LBS82	SLG	0.5
L51-29	LBS1	UY	0.5
LS1-30	LB61-11	BO	0.5
LS1-31	LB61-12	GLG	0.5
LS2-1	LBS98	RG	0.5
LS2-2	LBS12	WY	0.5
LS2-3	LB33-2	FIN	0.5
LS2-5	LB27-1	KN	0.5
LS2-8	LB55-10	GU	C1.5
LS2-10	LBS17	PO	0.5
LS2-11	LBS16	PK	C1.5
L52.12	LBS15	YW	C1.5
LS2-15	LB13-28	KY	0.5
LS3-1	LB59-1	NB	C1.5
LS3-2	L872	B	0.5
Ls3-3	LB59-4	R	C1.5
LS3-4	LBS81	WG	0.5
Ls3-5	LB28-2	UR	0.5
LS3-6	LBS99	WP	0.5
LS3-7	LB59-4	U	0.5
LS3-8	LBS37	BK	0.5
Ls3-9	LB28-6	RG	0.5
LS64-1	LB59-5	RY	0.5
LS64-2	LB59-6	RS	0.5
LS64-3	LBS46	LGO	0.5
LS64-4	LB59 3	BS	0.5
L$64.5	LB57-2	PG	C1.5
LS64-6	LB21-4	UY	2.0
RS22-1	LBS85	US	C1.5
RS22-2	LB134-17	BRD	C1.5
RS22-3	LB151-3	YO	C1.5
RS22-4	LB134-15	PIN	C1.5
RS22-5	LBS13	WN	0.5
RS22-6	LB149-3	WR	0.5
RS22-7	LB134-21	OS	0.5
RS22-8	LB134-19	OK	0.5
RS22-9	LB134-20	BW	0.5
RS22-12	LB134-16	UIN	0.5
RS22-13	LB61-9	BG	0.5
RS22-14	LB61-10	BLG	0.5
RS22-15	LB49-5	UK	0.5
RS22-16	LB14-7	YK	0.5
RS22-17	LBS43	LGO	0.5
RS22-18	LB135-21	LG	0.5
RS22-19	LB135-13	OR	0.5
RS22-20	LBS15	YW	0.5
RS22-21	LB14-20	WG	0.5
RS22-22	LB14-21	WB	0.5
RS22-25	LB128-1	NK	0.5
RS22-26	LB151-4	RY	0.5
RS22-27	LB33-14	KO	0.5
RS22-28	LB33-13	KR	0.5
RS22-29	LBS39	UY	0.5
RS22-30	LB148-5	WS	0.5
RS22-32	LBS10	PU	0.5
RS22-33	LB13.14	KG	0.5
RS22-34	LBS17	PO	0.5
RS22-35	LBS16	PK	0.5
RS22-36	LS1-6	RS	0.5
RS24-1	LB135-7	O	0.5
RS24-2	LB135-10	BY	0.5
RS24-3	LB14-1	LGN	0.5
RS24-4	LBS92	LGY	0.5
RS24-5	LBS36	P	0.5
RS24-6	LB134-24	RY	0.5
RS24-7	LB148-3	WU	0.5

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RS24-8	LBS27	R	C1.5
RS24-9	LBS83	RU	0.5
RS24-10	LI3884	RO	0.5
RS24-12	LB33-8	KY	0.5
RS24-13	LI3829	NW	0.5
RS24-14	LBS66	KS	0.5
RS24-15	LI313-27	KU	0.5
RS24-16	LS1-10	OG	0.5
RS24-17	LI3527	UG	0.5
RS24-18	LI3135 39	KU	0.5
RS24-19	LI3897	KLG	0.5
RS24-21	LI3129-3	UR	0.5
RS24-22	LB66-2	UB	0.5
RS24-23	LB129-3	NLG	0.5
RS24-24	LBS11	WB	0.5
RS87-1	LB62-5	NY	0.5
RS87-1	LB7-5	NY	0.5
RS87-2	LBS81	WG	0.5
RS87-3	LB80	B	0.5
RS87-4	LBS4	BK	0.5
RS87-6	LBS99	WP	0.5
LB6-1	LBS29	NW	0.5
LB6-2	LB30-5	SU	0.5
LB6-4	LBS28	FLG	0.5
LB7-1	LB80	B	2.0
L87 2	LB128-4	NP	2.0
LB7-5	RS87-1	NY	2.0
LB7-6	LBS37	BK	2.0
LB8-1	LBS91	O	C.5
LB8-2	LBS15	YW	0.5
LB8-3	LB61-7	BR	0.5
LB8-4	LB61-8	BP	0.5
LB8-5	L8535	K	C1.5
LB8-6	LB33-7	KW	0.5
LB8-7	LBS36	P	0.5
LB8-8	LBS97	KLG	C1.5
LB8-9	LBS34	PN	0.5
LB8-10	LBS17	PO	0.5
LB8-11	LBS16	PK	C1.5
LB8-12	LBS8	YO	0.5
LB8-13	LBS47	UO	0.5
L88-14	LB61-22	OR	0.5
LB8-15	LB61-23	OG	C1.5
LB8-16	LB61-24	OY	0.5
LB8-17	LB61-25	OP	0.5
LB8-20	LBS45	PW	0.5
LB8-21	LBS39	UY	0.5
LB12-2	LB128-8	NG	0.5
LB13-1	LBS25	WB	0.5
LB13-2	LBS91	R	C1.5
LB13-3	LBS92	LGY	0.5
LB13-4	LB55-2	LGG	C1.5
LB13-5	LBS90	LGR	C1.5
LB13-6	LB49-15	YR	0.5
LB13-7	LB49-14	ULG	0.5
LB13-8	LB49-10	UY	C1.5
LB13-9	LB55-7	YU	0.5
LB13-10	LB55-6	YN	C1.5
L-813-14	RS22-33	KG	C.5
LB13-15	LS1-2	KR	0.5
LB13-16	LB30-11	RO	0.5
LB13-17	LB132-16	GO	C.5
LB13-18	LBS36	P	C.5
LB13-19	LB147-30	UR	0.5
LB13-20	LB51-2	YO	0.5
LB13-21	LBS95	RW	C.5
LB13-22	LBS74	GB	0.5
LB13-23	LBS73	SLG	C.5
LB13-24	LB33-4	LGB	0.5
LB13-25	LB99-1	OW	0.5
LB13-26	LB97-1	KW	D.5
LB13-27	RS114-15	KU	0.5
LB13-28	LS2-15	KY	0.5
LB13-29	LB35-13	US	0.5
LB13-30			
LB13-31	LB30-2	SO	0.5
LB13-32	LB30-3	SY	0.5
LB13-33	LB30-4	SG	0.5
LB13-35	LB30-6	SK	0.5
LB13-36	LBS37	BK	0.5
LB14-1	RS114-3	LGN	0.5
LB14-2	LB135-18	Y	0.5
LB14-3	LB135-15	SB	0.5
LB14-4	LBS61	GU	0.5
LB14-5	LB61-13	BW	0.5
LE14-6	LB49-16	YP	0.5
LB14-7	RS22-16	YK	0.5
LB14-8	LS1-4	YS	0.5

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LB14-9	LB135-41	UN	C1.5
LB14-10	LB135-40	UW	0.5
LB14-11	LB133-3	YB	C1.5
LB14-12	LBS43	LGO	0.5
LB14-13	LBS28	RLG	C1.5
LB14-14	LB58-1	UG	C1.5
LB14-15	LB58-2	PR	C1.5
LB14-16	LB58-3	PS	0.5
LB14-18	LB58-13	LGS	0.5
LB14-19	LBS35	K	0.5
LB14-20	RS22-21	WG	0.5
LB14-21	RS22-22	WB	0.5
LB14-22	LB99-2	O	0.5
LB14-23	LB97-2	KO	0.5
LB14-24	L3132 17	G5	0.5
LB14-26	LB66-5	S	0.5
LB14-27	LB61-28	BN	0.5
LB14-28	LB61-29	BU	0.5
LB14-34	LB60-2	LGP	0.5
LB14-35	LB30-10	SN	0.5
LI314-36	LB30-12	CIN	0.5
LI315.1	LBS40	NG	2.0
L315-2	LB80	B	2.0
LB15-3	LBS17	PO	2.0
LB15-4	Lb516	PK	2.0
LB15-5	LBS8	BO	0.5
LB15-6	LB151-1	RO	0.5
LB15 7	LBS34	PN	0.5
LB15-8	LBS61	GU	0.5
LE16-30	LB16-85	NY	0.5
LB16-30	LB129-5	NY	1.0
LB16-85	LBD7 ODU	U	0.5
LB16-86	LB16-30	NY	0.5
LB16-87	LBS46	LGO	1.0
LB16-87A	LB147-87	NW	C.5
LB17-30	L871	N	3.0
LB17-85	LBD5/DOU	WU	0.5
LB17-86	L8532	NB	C1.5
LE17-87	LBS26	NK	3.0
LB18-30	LBS27	UG	2.0
LB18-30	LBD11-OOW	UG	0.5
LB18-85	LBS50	UO	0.5
LB18-86	LBS38	NR	C1.5
LB18-87	LB78	BK	2.0
LB19-30	LB128-6	NO	C1.0
LB19-85	LBD2-OOU	WR	0.5
LB19-86	LBS11	WB	0.5
LB19-87	LB28-5	W	3.0
LE20	LBS30	U	0.5
LB21-1	LS1-25	UG	1.0
LB21-2	LB132-1	SR	0.5
LB21-3	LB132-2	SU	C1.5
LB21-4	LS64-6	UY	2.0
LB21-5	LBS80	NB	1.0
LB21-6	LS1-26	UR	1.0
LB21-7	LBS10	PU	C1.5
LB17-8	LBS37	BK	C1.0
LB25-1	LB75	B	2.0
LB25-2	LB128-3	NU	2.0
LB26-1	LBS27	UG	0.5
LB26-2	LBD8-OOW	W	0.5
LB27-1	LS2-6	KN	0.5
LB27-2	LB134-1	KR	0.5
LB27-3	LB135-22	UG	0.5
LB27-4	LB35-5	RG	0.5
LB27-5	LBS32	NB	0.5
LB27-6	LBS30	U	0.5
LB28-1	LBS26	WK	2.0
LB28-2	LS3-5	UR	0.5
LB28-3	LB131-5	NK	3.0
LB28-4	LBS62	NB	0.5
LB28-5	LB19-87	W	3.0
LB28-6	153-9	YG	1.0
LB29-1	LB75	B	2.0
LB29-2	LB118-2	NU	2.0

BULKHEAD HARNESS LB (LHD) PASSIVE RESTRAINT 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
LB30-1	LBD9-ODU	SR	0.5
LB30-2	LB13-31	SO	0.5
LB30-3	LB13-32	SY	0.5
LB30-4	LB13-33	SG	0.5
LB30-5	LB6-2	SU	0.5
LB30-6	LB13-35	SK	0.5
LB30-7	LBS24	AG	0.5
LB30-8	LBS13	WN	0.5
LB30-9	LBS20	RK	0.5
LB30-10	LB14-35	SN	0.5
LB30-11	LB13-16	NG	0.5
LB30-12	LB14-36	ON	0.5
LB31-1	LB135 17	OY	0.5
LB31-2	LBS23	BK	3.0
LB33-1	LB61-4	RW	0.5
LB33-2	LS2-3	RN	0.5
LB33-3	LBS98	RG	0.5
LB33-4	LB13-24	LFB	0.5
LB33-5	LS1-14	RLG	0.5
LB33-6	LS1 15	RP	0.5
LB33-7	LBB-6	KW	0.5
LB33-8	RS114-12	KY	0.5
LB33-9	LBS97	KLG	0.5
LB33-10	LBS16	LGO	1.0
LB33-11	LBS19	NW	1.0
LB33-12	LBS24	RG	0.5
LB33.13	RS22-28	KR	0.5
LB33-14	RS22-27	KO	0.5
LB35-1	LBS23	BK	0.5
LB35-2	LB74	B	0.5
LB35-3	LBS41	PW	1.0
LB35-4	LB135-4	S	0.5
LB35-5	LB27-4	RG	0.5
LB35-6	LB93-85	SB	0.5
LB35-7	LB135-14	GB	0.5
LB35-8	LBS42	P	1.0
LB35-9	LBS82	SLG	0.5
LB35-10	LBS95	RW	0.5
LB35-11	LBD2-OOW	WP	0.5
LB35-12	LBS31	WR	0.5
LB35-13	LB13-29	US	0.5
LB35-14	LB49-2	RS	015
LB41-1P	LB120-4P	GB	0.5
LE41-2P	LBS73	SLG	0.5
LB46-1D	LBS73	SLG	0.5
LB46-2D	LBS74	GB	0.5
LB49-1	LBS20	RK	0.5
LB49-2	LB35-14	RS	0.5
LB49-3	LBS83	RU	0.5
LB49-4	LBS-84	RO	0.5
LB49-5	RS22-15	UK	0.5
LB49-6	LBS85	US	0.5
LB49-7	LB135-24	UP	0.5
LB49-8	LB55-14	PG	0.5
LB49-9	LBS70	US	0.5
LB49-10	LB13-8	UY	0.5
LB49-11	LS1-3	UK	0.5
LB49-12			
LB49-13	LBS51	RG	0.5
LB49-14	LB13-7	ULG	0.5
LB49-15	LB13-6	YR	0.5
LB49-16	LB14-6	YP	0.5
LB49-18	LBS50	UO	0.5
LB49-19	LB55-20	RLG	0.5
LB49-20	LBS4	BK	0.5
LB49-21	LB55-23	RY	0.5
LB49-22	LBS25	WB	0.5
LB49-24	LBS32	NB	0.5
LB55-1	LBS92	LGY	0.5
LB55-2	LB13-4	LGG	0.5
LB55-4	LB134-10	RO	0.5
LB55-5	LBS13	WN	0.5
LB55-6	LB13-10	YN	0.5
LB55-7	LB13-9	VU	0.5
LB55-8	LBS90	LGR	0.5
LB55-9	LBS50	JO	0.5
LB55-10	LS2-8	GU	0.5
LB55-11	LB60-1	LGK	0.5
LB55-12	LBS38	NR	0.5
LB55-13	LBS20	RK	0.5
LB55-14	LB49-8	PG	0.5
LB55-15	LBS95	RW	0.5
LB55-16	LB75	B	0.5
LB55-17	LBS12	NY	0.5
LB55-18	LB58-5	GB	0.5
LB55-20	LB49-19	RLG	0.5
LB55-21	LBS13	WN	0.5
LB55-22	LB58-6	GR	2.0
LB55-23	LB49-21	RY	0.5

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LB55-24	LBS4	BK	0.5
LB56-1	LBS10	PU	0.5
LB56-2	LBS12	WY	0.5
LB57-2	LS64-5	PG	2.0
LB57-3	LBS41	PW	2.0
LB58-1	LB14-14	UG	0.5
LB58-2	LB14-15	PR	0.5
LB58-3	LB14-16	PS	0.5
LB58-4	LB75	B	0.5
LB58-5	LB55-18	GB	0.5
LB58-6	LB55-22	GR	0.5
LB58-7	LBS32	NB	0.5
LB58-13	LB14-18	U	0.5
LB58-14	LBS30	U	0.5
LB58-15	LBS37	BK	0.5
LB59-1	LS3-1	NB	3.0
LB59-2	LS-3	R	2.0
LB59-3	LS64-4	U	2.0
LB59-4	LS3-7	U	2.0
LB59-5	LS64-1	RY	2.0
LB59-6	LS64-2	RS	2.0
LB60-1	LB55-11	LGK	0.5
LB60-2	LB14-34	LGP	0.5
LB60-3	LBS90	LGR	0.5
LB60-4	LBS25	WB	0.5
LB61-1	LBS34	PN	0.5
LB61-2	LB13-20	PW	0.5
LB61-3	LBS35	K	0.5
LB61-4	LB33-1	RW	0.5
LB61-5	LBS98	RG	0.5
LB61-6	LBS15	YW	0.5
LB61-7	LB8-3	BR	0.5
LB61-8	LB8-4	BP	0.5
LB61-9	RS22-13	BG	0.5
LB61-10	RS22-14	BLG	0.5
LB61-11	LS1-30	BO	0.5
LB61-12	LS1-31	GLG	0.5
LB61-13	LB14-5	BW	0.5
LB61-15	LBS91	R	0.5
LB61-16	LBS1	UY	0.5
LB61-17	LBS13	WN	0.5
LB61-18	LBS17	PO	0.5
LB61-19	LBS16	PK	0.5
LB61-21	LBS47	UO	0.5
LB61-22	LB8-14	OR	0.5
LB61-23	LB8-15	OG	0.5
LB61-24	LB8-16	OY	0.5
LB61-25	LB8-17	OP	0.5
LB61-26	LBS8	YO	0.5
LB61-28	LB14-27	BN	0.5
LB61-29	LB14-28	BU	0.5
LB61-32	LBS6	G	0.5
LB62-1	LB80	B	2.0
LB62-2	LB130-4	UP	2.0
LB62-5	RS87-1	UY	0.5
LB62-6	LBS4	Bk	2.0
LB64-1	LBS12	WY	0.5
LB64-2	LBS70	WG	0.5
LB64-3	LBD3-OOW	GP	0.5
LB66-1	LBS23	BK	0.5
LB66-2	RS114-22	UB	0.5
LB66-3	LBS46	LGO	0.5
LB66-4	LB73	B	0.5
LB66-5	LB14-26	S	0.5
LB66-6	LBS20	RK	0.5
LB66-7	LBS24	RG	0.5
LB66-8			
LB66-12	LBS25	WB	0.5
LB71	LB17-30	N	3.0
LB72	LS3-2	B	2.0
LB72	LB62-1	B	2.0
LB72	LBS3	B	2.0
LB73	LB98-1	B	2.0
LB73	LB100-3	B	2.0
LE73	LB180-1	B	2.0
LB73	LB66-4	B	2.0
LB74	LB102-1	B	2.0
LB74	LB101-3	B	2.0
LB74	LB184-3	B	2.0
LB74	LB35-2	B	2.0
LB75	LB29-1	B	2.0
LB75	LB25-1	B	2.0

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LB75	LBS14	B	3.0
LB75	LB58-4	B	0.5
LB75	LB55-16	B	0.5
LB75	LB111-2	B	0.5
LB78	LBS37	BK	3.0
LB78	LBS23	BK	3.0
LB78	LBS4	BK	3.0
LB80	LB16-2	B	2.0
LB80	LB156-85	B	0.5
LB80	RS87-3	B	2.0
LB80	LB111-2	B	0.5
LB81-1	LBS26	WK	3.0
LB81-2	LBS26	WK	3.0
LB82	LB17-30	N	3.0
LB85-1	LB86-7	YB	0.5
LB85-2	LB87-2	VG	2.0
LB85-5	LBS4	BK	0.5
LB85-6	LB87-3	VN	2.0
LB86-1	LBS8	YO	0.5
LB86-2	LBS12	WO	0.5
LB86-3	LB13-23	SLG	0.5
LB86-4	LB118-30	G	0.5
LB86-6	LBS2	WY	0.5
LB86-7	LB85-1	YB	0.5
LB86-8	LB106-1	YLG	0.5
LB86-10	LB106-2	YR	0.5
LB86-11	LB105-2	YO	0.5
LB86-13	LB105-1	YP	0.5
LB86-14	LB91-1	YS	0.5
LB86-15	LBS45	GW	0.5
LB86-15	LBS4	BK	0.5
LB87-1	LB130-7	US	2.0
LB87-2	LB95-2	VG	2.0
LB87-3	LB85-6	YN	2.0
LB87-5	LB91-2	VU	2.0
LB87-6	LB91-6	VW	2.0
LB87-7	LBS14	B	2.0
LB87-8	LBS14	B	2.0
LB87-9	LB128-7	US	2.0
LB88	LB90	B	2.0
LB90	LB80	B	2.0
LB91-1	LB86-14	YS	0.5
LB91-2	LB87-5	VU	2.0
LB91-5	LB105-3	BK	0.5
LB91-5	LBS4	BK	0.5
LB91-6	LB87-6	YW	2.0
LBB92-30	LBS38	NR	0.5
LB92-85	LBD11-ODU	U	0.5
LB92-86	LBS38	UA	0.5
LB92-87	LBS33	LB	0.5
LB93-30	LBS42	P	2.0
LB93-85	LB35-6	SB	0.5
LB93-86	LBS11	WB	0.5
LB93-87	LBS41	PW	2.0
LB94-2	LBS41	PW	2.0
LB94-3	LBS42	P	2.0
LB95-30	LBS22	NY	2.0
LB95-85	LBS47	UO	0.5
LB95-86	LBS22	NY	0.5
LB95-87	LB100-2	YK	2.0
LB96-30	LBS21	NY	2.0
LB96-85	LBS47	UO	0.5
LB96-86	LBS21	NY	0.5
LB96-87	LBS60	YK	2.0
LB97-1	LB13-26	KW	0.5
LB97-2	LB14-23	KO	0.5
LB97-3	LBS49	R	0.5
LB97-4	LBS23	BK	0.5
LB97-5	LB97.6	O	0.5
LB97-6	LB97-5	G	0.5
LB97-7	LBS31	WR	3.5
LB97-8	LBS21	NY	2.0
LB97-9	LBS49	R	2.0

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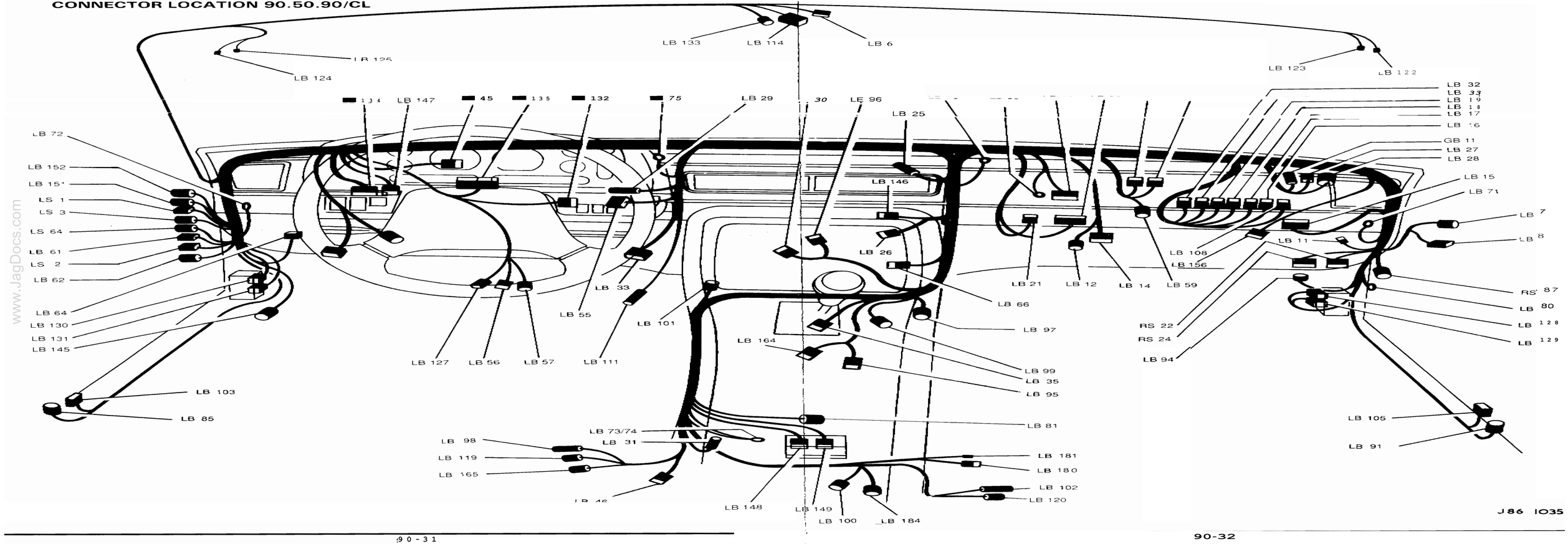
BULKHEAD HARNESS LB (LHD) PASSIVE RESTRAINT 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
LB98-1	LB73	B	2.0
LB98-2	LBS49	R	2 0
LB99-1	LB13-25	OW	0.5
LB99-2	LB14-22	O	0 5
LB99-3	LBS48	R	0.5
LB99-4	LBS23	BK	0 5
LB99-5	LB99-6	O	0.5
LB99-6	LB99-5	O	0 5
LB99-7	LBS31	WR	0.5
LB99-8	LBS22	NY	2.0
LB99-9	LBS48	R	2.0
LB100-2	LB95-87	YK	2.0
LB100-3	LB74	B	2.0
LB101-2	LBS60	YK	2.0
LB101-3	LE73	B	2.0
LB102-1	LB74	B	2.0
LB102-2	LBS48	R	2.0
LB105-1	LB85-13	YP	0.5
LB105-2	LB86-11	YO	0.5
LB105-3	LB91-5	BK	0.5
LB106-1	LB86-8	YLG	0.5
LB106-2	LB86-10	YR	0 5
LB106-3	LBS4	BK	0.5
LB108-30	LBS29	NW	0.5
LB108-85	LBS28	RLG	0.5
LB108-86	LBS29	NW	0.5
LB108-87	LBS1	UY	0 5
LB108-87	LBS39	UY	0.5
LB111-1	GB11-1	BS	0 5
LB111-2	LB80	B	***0.5***
LB114-1	LB152-1	RO	0.5
LB114-2	LB152-2	GU	0.5
LB114-7	LBS40	NG	0.5
LB114-8	LBS3	B	0.5
LB118.30	LB86-4	G	0.5
LB118-85	LBS7	SLG	0.5
LB118-86	LBS25	WE	0.5
LB118-87A	LBS6	G	0.5
LB119-1D	LBS19	NW	0.5
LB119-2D	LBS23	BK	0.5
LB119-3D	LBS28	RLG	0.5
LB119-4D	LBS74	GB	0.5
LB120-1P	LBS19	NW	0.5
LB120-2P	LBS23	BK	0.5
LB120-3P	LBS28	RLG	0.5
LB120-4P	LB120-4P	GB	0.5
LB122	LBS3	B	0.5
LB123	LBS29	NW	0.5
LE124	LBS29	NW	0.5
LB125	LBS3	B	0.5
LB127-1	LBS42	P	2.0
LB127-2	LBS9	NB	2.0
LB127-3	LBS5	NP	1.0
LB127-4	RS114-30	GB	1.0
LB128-1	RS22-25	NK	0.5
LB128-2	LB29-2	NU	2.0
LB128-3	LB25-2	NU	2.0
LB128-4	LB7-2	NP	2.0
LB128-5	LB156-30	NB	2.0
LB128-6	LB19-30	NO	3.0
LB128-8	LB12-2	NG	2.0
LB128-9	LBS12	WY	0.5
LB129-1	LB135-35	KB	0.5
LB129-2	LBS38	NR	0.5
LB129-3	RS114-34	NLG	0.5
LB129-4	LBS29	NW	2.0
LB129-5	LB16-30	NY	1.0
LB130-1	LBS22	NY	3.0
LB130-2	LBS21	NY	3.0
LB130-3	LB146-1	NK	0.5
LB130-4	LB62-2	NP	2.0
LB130-5	LBS32	NB	1.0
LB130-6	LB134-5	NR	0.5
LB130-8	LB133-1	NW	@.)
LB130-9	LBS12	WY	0.5

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
LB131-1	LE135-36	KB	0.5
LB131-2	LBS40	NG	2.0
LB131-3	GB11-3	NS	2.0
LB131-4	LBS62	NB	0.5
LB131-5	LB28-3	NK	3.0
LB132-1	LB21-2	SR	0.5
LB132-2	LB21-3	SU	0.5
LB132-3	LBS20	PK	0.5
LB132-4	LBS9	NE	0 5
LB132-5	LBS4	BK	0.5
LB132-6	LB135-42	R	0 5
LB132-7	LE135-29	Y	0.5
LB132-8	LEI35-30	O	0.5
LE132-9	LB135-26	U	0.5
LB132-10	LB135-27	P	0.5
LB132-11	LB135-31	K	0.5
LB132-12	LB135-25	UY	0.5
LB132 13	LB135-28	US	0.5
LB132-14	LB135-32	PG	0.5
LB132-15	LB135-33	PG	0.5
LB132-16	LB13-17	GO	0.5
LB132-17	LB14 24	GS	0.5
LB133-1	LB130-8	NW	2.0
LB133-2	LBS3	B	2.0
LB133 3	LB14-11	YB	0.5
LB134 1	LB27 2	KR	0.5
LB134-2	LB148-1	WO	0.5
LB134-3	LBS4	BK	0.5
LB134-4	LBS4	BK	0.5
LB134-5	LB130-6	NA	0 5
LB134-10	LB55-4	RO	0 5
LB134-13	LB145-5	O	0 5
LB134-14	LB145-1	K	0.5
LB134.1 5	RS22-4	RIN	0 5
LB134-16	RS22-12	UIN	0.5
LB134 17	RS22-2	BRD	STD
LB134-18	LS1-8	WLG	0.5
LB134-19	RS22-8	OK	0 5
LB134-20	RS22-9	BW	0.5
LB134-21	RS22-7	OS	0.5
LB134-24	RS114-6	RY	0.5
LB135-2	LBS30	U	0.5
LB135-7	RS114-1	O	0.5
LB135-9	RS114.26	BR	0.5
LB135-10	RS114-2	SY	0.5
LB135-11	LBS10	PU	0.5
LB135-12	LEI48-6	KB	0.5
LB135-13	RS22-19	OR	0.5
LB135-14	LB35-7	GB	0.5
LB135-15	LB14-3	SB	0.5
LB135-16	LB152-4	RY	0.5
LB135-17	LB31-1	OY	0.5
LB135-18	LB14-2	Y	0.5
LB135-19	LBS5	NP	0.5
LB135-20	LS1-21	SK	0.5
LB135-21	RS22-18	LG	0.5
LB135-22	LB27-3	UG	0.5
LB135-23	RS24-21	UR	0.5
LB135-24	LB49-7	UP	0.5
LB135-25	LB132-12	UY	0.5
LB135-26	LB132-9	U	0.5
LB135-27	LB132-10	P	0.5
LB135-28	LB132-13	US	0.5
LB135-29	LB132-7	Y	0.5
LB135-30	LB132-8	O	0.5
LB135-31	LB132-11	K	0.5
LB135-32	LB132-14	PG	0.5
LB135-33	LB132-15	BR	0.5
LB135-34	LS1-16	OS	0.5
LB135-35	LB129-1	KB	0.5
LB135-36	LB131-1	KB	0.5
LB135-37	LS1-17	OP	0.5
LB135-38	LBS51	RG	0.5
LB135-39	RS114-18	KU	0.5
LB135-40	LB14-10	UW	0.5
LB135-41	LB14-9	UN	0.5
LB135-42	LB132-6	R	0.5
LB132-43	LBS66	KS	0.5
LB135-44	LB35-4	S	0.5
LB135-45	RS114-32	NO	0.5
LB135-46	LBS6	G	0.5
LB135-47	LE8-20	GW	0.5
LE135-48	RS114-27	LB	0.5
LB145-1	LB134-14	K	***0.5***
LB145-4	LBS62	NB	0.5
LB145-5	LB134-13	O	0.5
LB145-6	LBS4	BK	0.5
LB146-1	LB130-3	NK	0.5
LB146-2	LB152-3	YO	0.5

From / Von / De / Van / Da / Desde	To / Nach / A / Naat / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
LB147-30	LB13-19	UR	0.5
LB147-85	LBS50	UO	0.5
LB147-86	LBS6	WN	0.5
LB147-87	LB16-87A	NW	0.5
LB148-1	LB134-2	WO	0.5
LB148-2	LBS11	WB	1.0
LB148-3	RS114-7	WU	0.5
LB148-4	LBS12	WY	0.5
LB148-5	RS22-30	WS	0.5
LB148-6	LB135-12	KB	0.5
LB148-7	LBS80	NB	1.0
LB148-8	LBS81	WG	0.5
LB148-9	LBS99	WP	0 5
LB149-3	RS22-6	WR	0.5
LB149-4	LBS25	WB	1.0
LB149-5	LBS31	WR	1 0
LB151-1	LE15-6	RO	0 5
LB151-2	LBS61	GU	0.5
LB151-3	RS22-3	YO	0.5
LB151-4	RS22-26	RY	0.5
LB152-1	LE114-1	FIO	0.5
LB152-2	LB114-2	GU	0.5
LB152-3	LB146-2	YO	0.5
LB152-4	LB135-16	RY	0.5
LB156-30	LB128-5	NB	2.0
LB156-85	LB80	B	0.5
LB156-86	LBS11	WB	0.5
LB156-87	LBS18	OB	2.0
LB164-30	LB135-1	K	2.0
LB164-85	LB165-3	BN	2.0
LB164-86	LBS60	YK	0 5
LB164-87	LBS60	YK	2.0
LB164-87A	LB165-2	KS	2.0
LB165-1	LB164-30	K	2.0
LB165-2	LB164-87A	KS	2.0
LEI 65-3	LB164-85	BN	2.0
LB180-1	1b73	B	2.0
LB180-2	LBS18	OB	2.0
LB181	LBS33	LB	0.5
LB184-1	LBS33	LB	0.5
LB184-2	LBS1a	OB	2.0
LB184-3	1b74	B	2.0

BULKHEAD HARNESS LB (LHD) PASSIVE RESTRACNT 9 1MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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RIGHT HAND SIDE HARNESS RS (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

tem	escription	iterface	ocation
S58	MHD 2 way socket(black)	lumber plate light _H side harness)	
IS1	M4 3 way socket (red)	;onnet lamps	IH radiator bracket
iS2	elay base (green)	ir conditioning lutch relay	3H radiator bracket
iS3	elay base lblackl	an relay	3H radiator bracket
IS4	elay base lred)	'ower wash relay	IH radiator bracket
iS5	elay base (yellow)	icreen wash relay	3H radiator bracket
IS7	M4 9 way socket lyellow)	'l harness	Adjacent to ignition coil
IS8	M4 3 way socket (black)	'ower wash pump	lehind front bumper RH side
3S9	M5 3 way plug lyellow)	icreen wash pump	lehind front bumper RH side
3S10	M5 3 way socket (blue)	'hermostat	ladiator support bracket
3S11	M5 3 way socket (black)	Vash fluid level	Behind front bumper RH side
IS12	M5 3 way socket (green)	iide and direction idicator lamps	lehind front bumper RH side
3S13	M5 3 way socket (green)	iide marker	Behind front bumper 3H aide
3S14	M5 3 way socket (yellow)	'og lamp	Behind front bumper RH side
3S15	M5 3 way socket (brown)	leated jet sensor	Behind front bumper RH side
3S16	M4 8 way socket (black)	.amp relay and bulb ailure assembly	7H headlamp cavity
3S17	M4 9 way socket (yellow)	.amp relay and bulb ailure assembly	RH headlight cavity
3S19	M4 6 way socket (yellowl	Ride levelling valves	Engine compartment
RS22	MHD 36 pin plug (black)	Bulkhead harness	RH 'A' post
3S24	MHD 24 pin plug (yellow)	Bulkhead harness	RH 'A' post
RS26	M5 3 way socket (black)	Side repeater	RH inner wing valance
3S29	lelay base (blue)	Ride level	Driver footwell
RS30	M5 3 way socket (black)	Rear passenger door harness	RH 'B' and 'C' post
3S31	MHD 6 way socket (black)	Rear passenger door harness	RH 'B' and 'C' post
RS32	MHD 6 pin plug (yellow)	Rear passenger door harness	RH 'B' and 'C' post
RS33	MHD 2 way socket black)	Bass speaker	RH rear passenger footwell
RS34	.ucar socket	Fuel sender	Luggage compartment
RS35	M4 8 way socket (black)	Rear axle	Luggage compartment
RS36	Relay base (red)	Heated rear screen	Luggage compartment RH side
RS37	Relay base (green)	Aerial up	Luggage compartment RH side
RS38	Relay base (black)	Aerial down	Luggage compartment RH side
RS41	MHD 2 way socket (yellowl	Boot lamp	Boot lid
RS42	.ucar socket	Number plate lamp	Boot lid
RS43	.ucar socket	Number plate lamp	Boot lid
RS45	.ucar socket	Number plate lamp	Boot lid
RS46	.ucar socket	Number plate lamp	Boot lid
RS47	187 spade	Boot switch	Boot lid
RS48	5M5 3 way socket (black)	Electric aerial	Luggage compartment RH side
RS49	.ucar socket	Heated rear window	RH 'E' post
RS50	MHD 15 way socket (black)	Lamp relay and protection module	Luggage compartment RH side
RS51	M4 6 way socket (black)	Lamp relay module	Luggage compartment RH side
RS52	MHD 5 way socket	Rear light	Luggage compartment RH side
RS53	Eyelet	Earth	RH headlight cavity
RS54	M4 3 wav socket lblack)	Bonnet switch	RH headlight cavity
RS55	Eyelet	Earth	Luggage Compartment
RS58	MHD 4 way socket (black)	Speed sensor	Luggage compartment RH 'E' post
RS64	M4 3 way socket lblackl	Interior lamp	Luggage Compartment
RS65	M4 3 way socket lyellow)	Caravan/trailer module	Behind front valance
RS69	M5 3 way socket (black)	Screenwash th'couple	RH side
RS71	M5 3 way socket (violet)	High beam stop light	Rear window shelf
RS72	Lucar connector	Fuel sender unit	Luggage Compartment
RS74	Lucar 2 way socket (black)	Cooling fan	Behind front bumper RH side
RS76	Lucar connector	)Air conditioning)cut-out)	Above ignition coil
RS77	Lucar connector	Air conditioning clutch	Air conditioning compressor
RS78	PM5 3 way socket (green)	High beam stop lamp relay	Rear window shelf
RS79	Relay base (yellow)	Bulkhead harness	RH 'A' post
RS87	PM4 6 way socket lblack)		

RIGHT HAND SIDE HARNESS RS (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
RS88	PMHD 6 way socket (yellow)	Catalyst harness	RH 'A' post
RS99	PM4 2 way socket (black)	Power wash jet	RH headlight
RS102	PM4 2 pin plug (black)	Screenwash jet	Front scuttle
RS105	Kiekert 9 way socket (black)	RH fusebox	RH 'A' post
RS106	Kiekert 5 way socket (black)	RH fusebox	RH 'A' post
RS109	PM4 5 way socket (black)	Boot open warning	Luggage compartment
RS111	Lucar connector	Passive battery cut-out	Luggage compartment
RS132	PMHD 4 way socket (black)	Boot lock/unlock actuator	Boot lid
RS133	Lucar 2 way	Boot release actuator	Boot lid
RS143	BNC socket	Aerial lead	Luggage compartment
RS144	BNC socket	Aerial lead	Luggage compartment

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RH SIDE HARNESS RS (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
LS58		Number plate light (LH side harness)
RS1	RH radiator bracket	Engine compartment
RS2	RH radiator bracket	Engine compartment
RS3	RH radiator bracket	Engine compartment
RS4	RH radiator bracket	Engine compartment
RS5	RH radiator bracket	Engine compartment
RS7	Above ignition coil	Engine compartment
RS8	Front valance RH side	Front valance
RS9	Front valance RH side	Front valance
RS10	RH radiator support bracket	Engine compartment
RS11	Front valance RH side	Front valance RH side
RS12	Front valance RH side	Front valance RH side
RS13	Front valance RH side	Front valance
RS14	Front RH valance	Front valance
RS15	Front RH valance	Front valance
RS16	RH headlight cavity	Engine compartment
RS17	RH headlight cavity	Engine compartment
RS19	Engine compartment	Engine compartment from above
RS22	RH 'A' post	RH dash liner
RS24	RH 'A' post	RH dash liner
RS26	RH inner wing valance	Engine compartment
RS29	Driver footwell	RH dash liner
RS30	RH 'B' and 'C' post	RH 'B' and 'C' post liner
RS31	RH 'B' and 'C' post	RH 'B' and 'C' post liner
RS32	RH 'B' and 'C' post	RH 'B' and 'C' post liner
RS33	RH rear passenger footwell	RH bass speakers
RS34	Fuel tank	Luggage compartment
RS35	Luggage compartment bulkhead	Luggage compartment
RS36	Luggage compartment	RH Luggage compartment
RS37	Luggage compartment	RH Luggage compartment
RS38	Luggage compartment	RH Luggage compartment
RS41	Boot lid	Luggage compartment
RS42	Boot lid	Luggage compartment
RS43	Boot lid	Luggage compartment
RS45	Boot lid	Luggage compartment
RS46	Boot lid	Luggage compartment
RS47	Boot lid	Luggage compartment
RS48	Luggage compartment RH	Luggage compartment
RS49	RH 'E' post	RH 'E' post liner
RS50	Luggage compartment RH	Luggage compartment
RS51	Luggage compartment RH	Luggage compartment
RS52	Luggage compartment RH	Luggage compartment
RS53	RH headlight cavity	Engine compartment
RS54	RH headlight cavity	Engine compartment
RS55	Luggage compartment RH	Engine compartment
RS58	Luggage compartment bulkhead	Luggage compartment
RS64	RH 'E' post	RH 'E' post trim
RS65	Luggage compartment RH	Luggage compartment
RS69	RH front valance	Engine compartment
RS71	Rear window shelf	High beam stop light cover
RS72	Fuel tank	Luggage compartment
RS74	Front valance RH side	Front valance
RS76	Above ignition coil	Engine compartment
RS77	Above ignition coil	Engine compartment
RS78	Air conditioning	Engine compartment
RS79	Rear window shelf	Rear seat/window shelf
RS87	RH 'A' post	RH 'A' post trim
RS88	RH 'A' post	RH 'A' post trim
RS99	RH headlight cavity	Front valance
RS102	Front scuttle	Bonnet
RS105	RH 'A' post	RH 'A' post trim
RS106	RH 'A' post trim	RH 'A' post trim
RS109	Luggage compartment	Luggage compartment
RS111	Luggage compartment RH	Luggage compartment
RS132	Boot lid	Luggage compartment
RS133	Boot lid	Luggage compartment
RS143	Luggage compartment RH	Luggage compartment
RS144	Luggage compartment RH	Luggage compartment

RIGHT HAND SIDE HARNESS RS (RHD) 91MY.4.0L WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	4	Couleur	Section
Van	Naar	Kleur	Maat
Da	4	Colore	Diametro
Desde	Hacia	Color	Tamano
-S53-1	RSS45	RE	0.5
RSI-2	RX16/OOW	NR	0.5
RS1-3	RS54-2	UY	0.5
RS2-30	RSS1	NP	0.5
RS2-85	RSS7	OOW	0.5
RS2-86	RS24-22	UB	0.5
RS2-87	RSS3	GN	0.5
RS2-87	RSD3/OOW	GN	0.5
RS3-30	RSS1	NP	2.0
RS3-85	RSS4	BU	0.5
RS3-86	RS10-2	W	0.5
RS3-87	RS74-8	P	2.0
RS3-87	RSD2/OOW	P	0.5
RS4-30	RSS30	NK	3.0
RS4-85	RS24-3	LGN	0.5
RS4-86	RSS30	NR	0.5
RS24-87	RSD3-2	YR	3.0
RS5-30	RS105-5	NG	0.5
RS5-85	RS24-4	LGY	0.5
RS5-86	RS27	WB	0.5
RS5-87	RS9-2	YG	0.5
RS7-1	RS22-7	OR	0.5
RS7-2	RS22-8	OK	0.5
RS7-3	RSS39	BW	0.5
RS7-4	RS22-9	GY	0.5
RS7-5	RS24-6	RY	0.5
RS8-1	RS54	GR	3.0
RS8-2	RS4-87	YR	3.0
RS9-1	RS24	BU	0.5
RS9-2	RS5-37	YG	0.5
RS10-1	RSS7	WU	0.5
RS10-2	RS3-86	W	0.5
RS11-1	RSS18	BR	0.5
RS11-2	RS22-19	OR	0.5
RS12-1	RS17-3	G	0.5
RS12-2	RSS4	BU	0.5
RS12-3	RS17-2	R	0.5
RS13-1	RS17-5	RB	0.5
RS13-2	RSS4	B	0.5
RS14-1	RSS4	B	2.0
RS14-2	RS17-1	RO	2.0
RS15-1	RSS28	WU	0.5
RS15-2	RSS3	RS	0.5
RS16-1	RS24-10	RO	0.5
RS16-2	RS22-15	UK	0.5
RS16-3	RS22-1	UB	0.5
RS16-4	RSS17	R	0.5
RS16-5	RSS18	BK	0.5
RS16-6	RS87-6	WB	0.5
RS16-7	RX109-1	NO	2.0
RS16-8	RS105-2	NK	3.0
RS16-9	RS10-4	NG	3.0
RS17-1	RS17-4	RO	2.0
RS17-2	RS17-3	OR	0.5
RS17-3	RS54	Y	0.5
RS17-4	RS54	GYK	0.5
RS17-5	RX13-1	RB	0.5
RS17-6	RS26-1	WSB	0.5
RS17-7	RS87-2	KO	0.5
RS17-8	RS87-5	GO	0.5
RS7-9	RS51-6	KU	0.5
RS19-1	RSS31	WS	0.5
RX19-2	RSS5	YLG	0.5
RS19-3	RSS6	WS	0.5
RS19-4	RSS7	YLG	0.5
RS19-5	RSS8	NK	0.5
RS19-6	RSS9	YU	0.5
RS22-1	RS16-3	US	0.5
RS22-2	RS56-1	GRD	STD
RS22-3	RS13-3	YO	0.5
RS22-4	RS56-4	RNM	0.5
RS22-5	RS64-3	VN	0.5
RS22-7	RS7-1	OK	0.5
RS22-8	RS7-2	OW	0.5
RS22-9	RS39-3	UN	0.5
RS22-13	RS31-1R	BG	0.5
RS22-14	RS31-2R	BLG	0.5

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	4	Couleur	Section
Van	Naar	Kleur	Maat
Da	4	Colore	Diametro
Desde	Hacia	Color	Tamano
RS22-15	RS15-2	UK	0.5
RS22-16	RS14-1	YK	0.5
RS22-17	RS38-85	LGO	0.5
RS22-18	RS32-1	LG	0.5
RS22-19	RS11-2	OR	0.5
RS22-20	RS31-3R	YW	0.5
RS22-21	RS37-85	WG	0.5
RS22-22	RS38-85	U	0.5
RS22-25	RS5109-2	NK	0.5
RS22-26	RSS1	Y	0.5
RS22-27	RSS33-1	KO	0.5
RS22-28	RSS32-2	KR	0.5
RX22-29	RSS32-4R	UY	0.5
RS22-30	RSS11	WS	0.5
RX22-32	RSS26	PU	0.5
RX22-33	RSS12	KG	0.5
RS22-34	RSS22-3	PO	0.5
RX22-35	RSS22-4	PK	0.5
RX22-36	RSS10	RS	0.5
RS24-1	RS35-9	O	0.5
RS24-2	RSS11	LGY	0.5
RS24-3	RS24-85	LGN	0.5
RS24-4	RS87-85	LGY	0.5
RS24-5	RS31-4R	R	0.5
RS24-6	RS7-6	RY	0.5
RS24-7	RSS28	R	0.5
RS24-8	RSS17	R	0.5
RS24-9	RS50-1	RU	0.5
RS24-10	RS106-1	RO	0.5
RS24-11	RS50-2	SLG	0.5
RS24-12	RSS31-5	RKY	0.5
RS24-13	RSS19	UW	0.5
RS24-14	RSS31-6	KS	0.5
RS24-15	RS50-14	KU	0.5
RS24-16	RSS6-8	LGO	0.5
RS24-17	RS43-3	LU	0.5
RS24-18	RS65-2	KU	0.5
RS24-19	RS31-5	KLG	0.5
RS24-21	RSS8-6	LR	0.5
RS24-22	RS22-6	LB	0.5
RS24-23	RSS31-7	NLG	0.5
RS24-24	RSS27	WB	0.5
RS26-2	RS5-3	B	0.5
RS26-3	RS17-6	YS	0.5
RS29-30	RSS31	YLG	0.5
RX29-35	RS35-5	YW	0.5
RS29-86	RSS11	WS	0.5
RX29-87	RS513	B	0.5
RS30-1R	RS513	B	2.0
RS30-2R	RS105-9	NS	0.5
RS30-3R	RSS18	BK	0.5
RS31-1R	RS22-13	BG	0.5
RS31-2R	RS22-14	BLG	0.5
RS31-3R	RS22-20	YW	0.5
RS31-4R	RS24-5	RY	0.5
RS31-5	RS24-12	KY	0.5
RS31-6	RS24-19	KLG	0.5
RS32-1	RS22-17	LG	0.5
RS32-2R	RS22-18	LGO	0.5
RS32-3R	RS5200	PK	0.5
RS32-4R	RS22-29	UY	0.5
RS33-1	RS22-27	KO	0.5
RS33-2	RS22-28	KR	0.5
RS34	RS18	BK	0.5
RS35-1	RS515	NK	0.5
RS35-2	RS511	WS	0.5
RS35-3	RS504	B	0.5
RS35-5	RS39-85	YU	0.5
RS35-6	RSS5	U	0.5
RS35-8	RS24-16	OG	0.5
RS35-9	RS24-1	O	0.5
RS36-30	RS522	NY	2.0
RS36-85	RS24-17	LGO	0.5
RS36-86	RS522	NY	2.0
RS36-87	RS49	UY	2.0
RS37-30	RS548-2	GR	1.0
RS37-85	RS22-21	WG	0.5
RS37-86	RSS521	NB	0.5
RS37-87	RSS21	NB	1.0
RS37-87A	RS524	B	1.0
RS33-30	RS548-1	GU	1.0
RS38-85	RS522	WB	0.5
RS38-86	RS5221	NB	0.5
RS38-87	RS521	NB	1.0

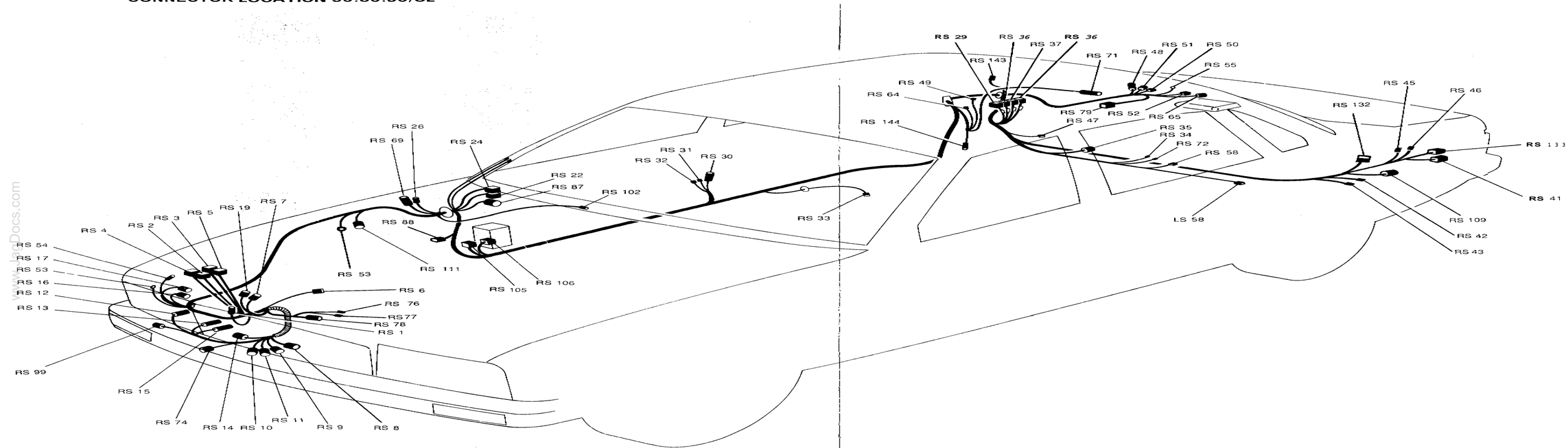
From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	4	Couleur	Section
Van	Naar	Kleur	Maat
Da	4	Colore	Diametro
Desde	Hacia	Color	Tamano
RS38-87A	RS524	B	1.0
RS41-1	RSS19	NW	0.5
RS41-2	RSS47	PR	0.5
RS42-1	RS50-13	RB	0.5
RS43	RS24-5	R	0.5
RS45	RS58-1	RB	0.5
RS46	RSS15	B	0.5
RS47-1	RS41-2	PR	0.5
RS48	RS38-30	GU	1.0
RS48-2	RS37-30	GR	1.0
RS49	RS36-87	UY	2.0
RS50-1	RS24-9	RU	0.5
RS50-2	RS24-11	SLG	0.5
RS50-3	RS518	PU	0.5
RS50-4	RS24	R	0.5
RS50-5	RSS514	YK	0.5
RS50-6	RS516	KS	0.5
RS50-7	RS521	NKG	0.5
RS50-8	RS518	BNU	0.5
RS50-9	RS522-3	BU	0.5
RS50-10	RS522-5	GO	0.5
RS50-11	RS522-4	YG	0.5
RS50-12	RS522-1	R	0.5
RS50-13	RS522	NE	0.5
RS50-14	RS24-15	KU	0.5
RS51-1	RS24-23	NLG	0.5
RS51-2	RS37-2	WLG	0.5
RS51-3	RS532	NR	2.0
RS51-6	RS17-9	KU	0.5
RS52-1	RS50-12	Y	0.5
RS52-2	RS555	BR	3.0
RS52-3	RS50-9	GN	0.5
RS52-4	RS52-4	RG	0.5
RS52-5	RS50-10	GP	0.5
RS53	RS54	B	3.0
RS53	RS53/OOU	B	0.5
RS54-2	RS1-3	UY	0.5
RS54-3	RS24-17	UG	0.5
RS55	RS52-2	B	2.0
RS56	RS524	B	2.0
RS58-7	RS22-2	BRD	STD
RS58-3	RS22-12	UUN	0.5
RS58-4	RS22-4	RN	0.5
RS64-2	RSS9	NW	0.5
RS64-3	RS22-5	WN	0.5
RS65-1	RS524	R	3.0
RS65-2	RS24-18	GKU	3.0
RS65-3	RS106-3	NU	3.0
RS69-1	RS88-3	U	0.22
RS69-2		UN	0.22
RS71-1	RS524	B	0.5
RS71-2	RS79-87	PB	0.5
RS72	RSS29	BW	0.5
RS74/OOA	RSS4	B	2.0
RS74/OOB	RS548	BP	3.0
RS79	RSS7	BK	0.5
RS78-1	RS22-7	UK	0.5
RS79-30	RS532	GN	0.5
RS79-85	RS526	NU	0.5
RS79-87	RS71-2	PB	0.5

RIGHT HAND SIDE HARNESS RS (RHD) 91MY.4.0L WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Jon	Nach	Farbe	Querschnitt
De	4	Couleur	Section
Van	Naar	Kleur	Maat
Da	4	Colore	Diametro
Desde	Hacia	Color	Tamano
RS87-1	RS106-1	NY	0.5
RS87-2	RS512	WG	0.5
RS87-5	RS13	B	3.0
RS87-6	RS518	BK	0.5
	RS1E-5	WP	0.5
RS88-1	RS69-2	N	0.22
RS88-2	RS69-1	WB	0.22
RS88-3	RS513	U	0.22
RS88-4	RSS18	BK	0.5
RS88-5	RS513	B	3.5
RS88-6	RS24-21	UR	3.5
RS99-2	RSS4	B	3.5
	RSS3	RS	3.5
RS102-1	RSS10	RS	3.5
RS102-2	RSY3	B	3.5
RS105-1	RS16-7	NO	2.0
RS105-2	RSS521	NNB	1.0
RS105-3	RSS32	NR	2.0
RS105-4	RSS532	NG	3.0
RS105-5	RS513/O	NS	3.5
RS105-6	RS501	NP	0.5
RS105-8	RS522	NS	0.5
RS105-9	RS30-2	NRD	0.5
RS106-1	RS67-1	NY	0.5
RS106-2	RS106-3	NW	0.5
RS106-3	RS65-3	NU	0.5
RS706-4	RS16-9	NG	3.0
RS 109-1	RS518	BK	0.5
RS109-2	RX22-26	RY	0.5
RS111	RS24-2	WY	0.5
RS132-1	RSS20	PK	0.5
RS132-2	RSS533	PO	0.5
RS132-3	RS523	YO	0.5
RS132-4	RS133-2	YK	0.5
RS133-1	RSS525	B	0.5
RS133-2	RS132-4	YK	0.5
RS144	RS143	B	STD

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RIGHT HAND SIDE HARNESS RS (RHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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LEFT HAND SIDE HARNESS LS (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

tem	)escription	terface	.ocation
I18	'M4 6 pin plug (yellow)	arness LI	Ingine compartment
$1	'MHD 36 pin plug (blackl	rlkhead harness RB	LH 'A' post
S2	'MHD 15 pin plug (yellow)	rlkhead harnessRB	LH 'A' post
s3	'M4 8 pin plug (black)	ulkhead harness RB	LH 'A' post 'C'post
S6	'MHD 6 way socket (black)	3ar passenger door	
		arness	
$7	'M5 3 way socket (black)	ear passenger door	LH 'E' and 'C' post
		mess	
S8	'MHD 6 pin plug (yellow)	ear passenger door	LH 'B' and 'C' post
		arness	
S9	'MHD 2 way socket (black)	ass speaker	LH rear footwell
.S15	'MHD 5 way socket	ear lamp cluster	Luggage compartment
.S16	'M4 6 way socket (black)	amp relay and	Luggage compartment
		otection module	
.S17	'MHD 15 pin plug (black)	amp relay and	Luggage compartment
		otection module	
.S18	'M4 5 way socket (black)	lindscreen wiper	Engine compartment
		otor	
.S19	'M5 3 way socket (black)	ide repeater	Engine compartment
.S24	'M5 3 way socket (black)	ow coolant sensor	Engine compartment
S25	'M5 3 way socket (black)	rake pads sensor	Engine compartment
S26	'M4 3 way socket (natural)	ump and control	Engine compartment
		alve	
.S27	'M5 3 way socket (black)	ump valve	Engine compartment
.S28	PM4 9 pin plug (yellow)	amp relay and	LH headlight cavity
		rotection module	
.S29	PM4 9 way socket (blackl	amp relay and	LH headlight cavity
		rotection module	
LS30	PM5 3 way socket (blue)	lternator module	Engine compartment
LS31	PM5 3 way socket (green)	ide marker	Front valance LH side
LS32	PM4 3 way socket (yellow)	og lamp	Front valance LH side
LS33	Relay base (green)	ir pump relay	Engine Compartment
LS34	Relay base (black)	lorn relay	Engine compartment
LS35	Lucar connector	ligh tone horn	Front valance LH side
LS36	Lucar connector	ligh tone horn	Front valance LH side
LS37	Eyelet	arth	Engine compartment
LS38	PM5 3 way socket(black)	ide and direction	Engine compartment
		ndicator lamps	
LS39	Eyelet	iarth	Luggage compartment
LS41	Lucar connector	ow tone horn	Front valance LH side
LS42	PM4 3 way socket (black)	nterior lamp	LH 'E' post
LS43	PM4 2 way socket (black)	'ower wash jet	Front valance LH side
LS48	Eyelet	iarth	Engine compartment
LS58	PM4 2 pin plug	Number plate lamp	Luggage Compartment
LS59	Relay base (blue)	3reather pipe heater	Engine compartment
		'elay	
LS60	Lucar connector	ow tone horn	Front valance LH side
LS64	PM4 6 pin plug (yellow)	3ulkhead harness	LH 'A' post
LS65	PM4 3 way socket (yellow)	Accessory fusebox	Luggage compartment
LS66	Relay base (narural)	Accessory ignition	Luggage compartment
		on relay	
LS72	Kiekert 9 way socket (blackl	LH fusebox	LH 'A' post
LS73	Kiekert 5 way socket (black)	LH fusebox	LH 'A' post
LS111	Lucar connector	Passive battery	Luggage Compartment
		cut-out	
LS125	PMHD 2 way socket (black)	Purge valve	Engine compartment
LS140	Relay base (yellow)	Fuel pump relay	Luggage compartment
LS141	PM4 2 pin plug (black)	Screen wash jet	Front scuttle
LS142	PM5 3 way socket (black)	Fuel filler flap	Luggage compartment
		solenoid	
LS143	PMHD 2 way socket (black)	Fuel pump	Luggage compartment (fuel tank)

LEFT HAND SIDE HARNESS LS (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
LI18	Engine compartment	Air cleaner housing
LS1	LH 'A' post	LH dash liner
LS2	LH 'A' post	LH dash liner
LS3	LH 'A' post	LH dash liner
LS6	LH 'B' and 'C' posts	LH 'B' and 'C' post liner
LS7	LH 'B' and 'C' posts	LH 'B' and 'C' post liner
LS8	LH 'B' and 'C' posts	LH 'E' and 'C' post liner
LS9	LH tear footwell	LH bass speaker
LS15	Rear lamp cluster	Luggage compartment
LS16	Luggage compartment LH	Luggage compartment
LS17	Luggage compartment LH	Luggage compartment
LS18	Engine compartment bulkhead	Bonnet
LS19	LH bonnet release	Engine compartment
LS24	LH bonnet release	Engine compartment
LS25	Inner wing valance	Engine compartment
LS26	Speed control pump/valve	Engine compartment
LS27	Air cleaner intake	Engine compartment
LS28	LH headlight cavity	Engine compartment
LS29	LH headlight cavity	Engine compartment
LS30	Below air cleaner housing	Engine compartment
LS31	Front valance LH side	Front valance (below)
LS32	Front valance LH side	Front valance (below)
LS33	Radiator support bracket	Engine compartment
LS34	Radiator support bracket	Engine compartment
LS35	Front valance LH side	Front valance (below)
LS36	Front valance LH side	Front valance (below)
LS37	Headlight cavity LH	Engine compartment
LS38	Front valance LH	Front valance (below)
LS39	Luggage compartment LH	Luggage compartment
LS41	Front valance LH side	Front valance (below)
LS42	LH 'E' post	High beam stop lights trim
LS43	Front valance LH side	Front valance (below)
LS48	Engine compartment	Bonnet
LS58	Luggage compartment bulkhead	Luggage compartment
LS59	Radiator support bracket	Engine compartment
LS60	Front valance LH side	Front valance
LS64	LH 'A' post	LH dash trim
LS65	Luggage compartment LH	LH trim
LS66	Luggage compartment LH	LH trim
LS72	LH 'A' post	LH dash trim
LS73	LH 'A' post	LH dash trim
LS111	Luggage compartment LH	LH trim
LS125	Engine compartment	LH radiator support bracket
LS140	Luggage compartment	RH trim
LS141	Front scuttle	Bonnet
LS142	Luggage compartment	LH trim
LS143	Luggage compartment	Fuel tank

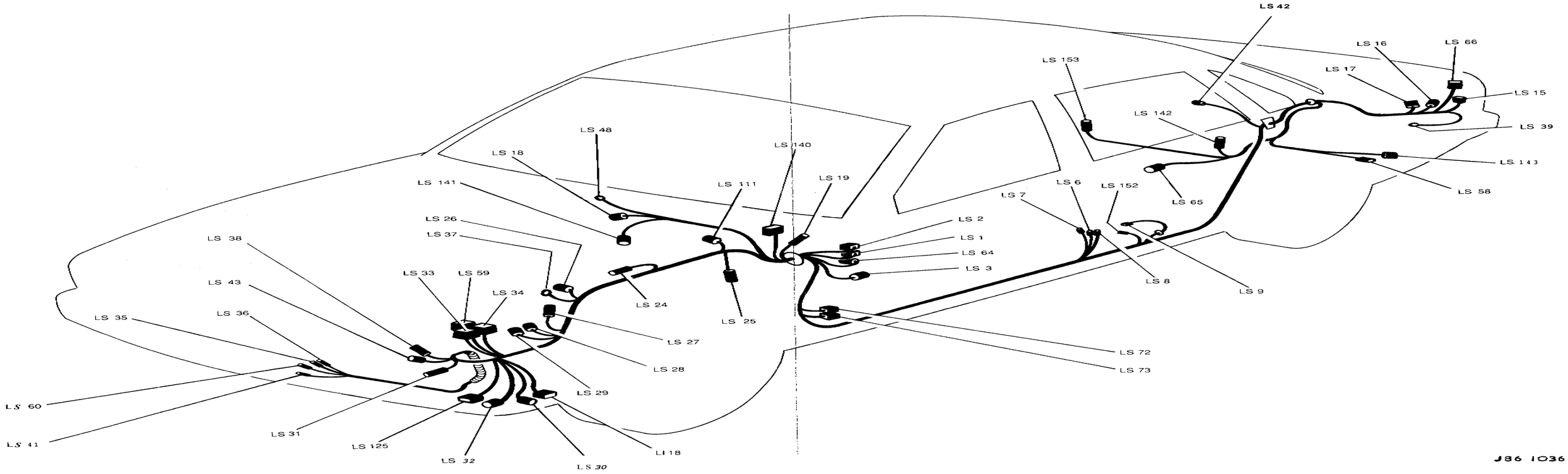
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LEFT HAND SIDE HARNESS LS (RHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
LI18-1	LS33-87	PY	0.5
LI18-2	LSS24	WU	0.5
LI18-4	LS125-1	PG	0.5
LI18-5	LS33-85	GB	0.5
LS1-1	LS29-3	US	0.5
LS1-2	LSS11	KR	0.5
LS1-3	LS29-2	UK	0.5
LS1-4	LSS12	YS	0.5
LS1-5	LS17-1	RU	0.5
LS1-6	LSSI	RS	0.5
LS1-7	LS66-85	WB	0.5
LS1-8	LS30-1	WLG	0.5
LS1.9	LS6-4L	P	0.5
LS1-10	LS25-2	OG	0.5
LS1-11	LS29-1	RO	0.5
LS1-12	LSS14	KS	0.5
LS1-13	LSS13	R	0.5
LS1-14	LS9-2	RLG	0.5
LS1-15	LS9-1	RP	0.5
LS1-16	LS25-1	OS	0.5
LS1-17	LS24-1	OP	0.5
LS1-18	LS42-3	WN	0.5
LS1-22	LS8-1	SK	0.5
LS1-24	LS17-3	PU	0.5
LS1-25	LS27-1	UG	1.0
LS1-26	LS26-2	UR	1.0
LS1-28	LS17-2	SLG	0.5
LS1-29	LS8-4L	UY	0.5
LS1-30	LS6-1L	BO	0.5
LS1-31	LS6-2L	GLG	0.5
LS2-1	LS6-6	RG	0.5
LS2-2	LS111	WY	0.5
LS2-3	LS6-5	RN	0.5
LS2-5	LS42-2	NW	0.5
LS2-6	LS140-85	KN	0.5
LS2-8	LS34-85	GU	0.5
LS2-10	LSS19	PO	0.5
LS2-11	LSS26	PK	0.5
LS2-12	LS6-3L	YW	0.5
LS2-15	LS16-6	KY	0.5
LS3-1	LS72-3	NB	3.0
LS3-2	LSS15	B	2.0
LS3-3	LS18-6	R	2.0
LS3-4	LSS2	WG	0.5
LS3-5	LSS23	UR	0.5
LS3-6	LS16-2	WP	0.5
LS3-7	LS18-5	R	2.0
LS3-8	LSS4	BK	2.0
LS3-9	LS59-87	YG	1.0
LS6-1L	LS1-30	BO	0.5
LS6-2L	LS1-31	GLG	0.5
LS6-3L	LS2-12	YW	0.5
LS6-4L	LS1-9	P	0.5
LS6-5	LS2-3	RN	0.5
LS6-6	LS2-1	RGO	0.5
LS7-1L	LSS15	B	0.5
LS7-2L	LS72-9	NS	2.0
LS7-3L	LSS4	BK	0.5
LS8-1	LS1-22	SK	0.5
LS8-2L	LSS19	PO	0.5
LS8-3L	LSS19	PO	0.5
LS8-4L	LS1-29	UY	0.5
LS9-1	LS1-15	RP	0.5
LS9-2	LS1-14	RLG	0.5
LS15-1	LS17-9	GN	0.5
LS15-2	LS39	B	2.0
LS15-3	LS17-12	Y	0.5
LS15-4	LS17-10	GP	0.5
LS15-5	LS17-11	RG	0.5
LS16-1	LS73-4	NLG	2.0
LS16-2	LS3-6	WP	0.5
LS16-5	LS72-4	NR	2.0
LS16-6	LS2-15	KY	0.5
LS17-1	LS1-5	RU	0.5
LS17-2	LS1-28	SLG	0.5
LS17-3	LS1-24	PU	0.5
LS17-4	LSS13	R	0.5
LS17-5	LSS12	YS	0.5
LS17-6	LSS14	KS	0.5
LS17-7	LSS11	KR	0.5
LS17-8	LSS4	BK	0.5
LS17-9	LS15-1	GN	0.5
LS17-10	LS15-4	GP	0.5
LS17-11	LS15-5	RG	0.5
LS17-12	LS15-3	Y	0.5
LS17-13	LS58-1	RB	0.5
LS17-14	LS28-9	KY	0.5
LS18-1	LS64-1	RY	2.0
LS18-2	LS64-2	RS	2.0
LS18-5	LS3-7	U	2.0
LS18-6	LS3-3	R	2.0
LS19-1	LS28-6	YS	0.5
LS19-2	LSS15	B	0.5
LS24-1	LS1-17	OP	0.5
LS24-2	LSS4	BK	0.5
LS25-1	LS1-16	OS	0.5
LS25-2	LS1-10	OG	0.5
LS26-1	LS64-6	UY	2.0
LS26-2	LS1-26	UR	1.0
LS26-3	LSS3	PG	2.0
LS27-1	LS1-25	UG	1.0
LS27-2	LS3	PG	1.0
LS28-1	LS32-2	RO	2.0
LS28-2	LS38-3	R	0.5
LS28-3	LS38-1	G	0.5
LS28-4	LSS12	YS	0.5
LS28-5	LS31-1	RB	0.5
LS28-6	LS19-1	YS	0.5
LS28-7	LSS11	KR	0.5
LS28-8	LSS14	KS	0.5
LS28-9	LS17-14	KY	0.5
LS29-1	LS1-11	RO	0.5
LS29-2	LS1-3	UK	0.5
LS29-3	LS1-1	US	0.5
LS29-4	LSS13	R	0.5
LS29-5	LSS4	BK	0.5
LS29-6	LSS2	WG	0.5
LS29-7	LS72-1	NO	2.0
LS29-8	LS73-2	NK	2.0
LS29-9	LS73-3	NG	2.0
LS30-1	LS1-8	WLG	0.5
LS30-2	LSD3/OOW	WY	0.5
LS30-3	LS37	B	2.0
LS31-1	LS28-5	RB	0.5
LS31-2	LS37	B	0.5
LS32-1	LS37	B	2.0
LS32-2	LS28-1	RO	2.0
LS33-30	LSS27	NG	1.0
LS33-85	LI18-5	GB	0.5
LS33-86	LSS24	WU	0.5
LS33-87	LI18-1	PY	0.5
LS33-87	LSD1/OOW	PY	0.5
LS34-30	LS72-8	NP	2.0
LS34-30	LS34-86	NP	0.5
LS34-85	LS2-8	GU	0.5
LS34-86	LS34-86	NP	0.5
LS34-87	LS41	Y	2.0
LS35	LSD4/OOW	Y	0.5
LS35	LS41	Y	1.0
LS36	LS37	B	2.0
LS36	LSD4/OOU	B	0.5
LS37	LS43-1	B	0.5
LS37	LSD2/OOU	B	0.5
LS37	LS60	B	2.0
LS37	LSD1/OOU	B	0.5
LS37	LS38	B	2.0
LS37	LS59-85	B	0.5
LS37	LS32-1	B	2.0
LS37	LS31-2	B	0.5
LS37	LS38-2	B	0.5
LS37	LS30-3	B	2.0
LS38-1	LS28-3	G	0.5
LS38-2	LS37	B	0.5
LS38-3	LS28-2	R	0.5
LS39	LS142-3	B	0.5
LS39	LS66-85	B	0.5
LS39	LS143-1	B	3.0
LS39	LS15-2	B	2.0
LS41	LS35	Y	1.0
LS41	LS34-87	Y	2.0
LS42-2	LS2-5	NW	0.5
LS42-3	LS1-18	WN	0.5
LS43-1	LS37	B	0.5
LB43-2	LSSI	RS	0.5
IS 4 8	LS64-4	BS	2.0
LS58-1	LS17-13	RB	0.5
LS59-30	LSS27	NG	1.0
LS59-85	LS37	B	0.5
LS59-86	LSSI	RS	0.5
LS59-87	LS3-9	YG	1.0
LS60	LS37	B	2.0
LS64-1	LS18-1	RY	2.0
LS64-2	LS18-2	RS	2.0
LS64-3	LS65-3	LGO	1.0
LS64-4	LS48	BS	2.0
LS64-5	LSS3	PG	2.0
LS64-6	LS26-1	UY	2.0
LS65-1	LSS18	NY	3.0
LS65-2	LS66-87	WK	3.0
LS65-3	LS64-3	LGO	1.0
LS66-30	LSS18	NY	3.0
LS66-85	LS39	B	0.5
LS66-86	LS1-7	WB	0.5
LS66-87	LS65-2	WK	3.0
LS72-1	LS29-7	NO	2.0
LS72-2	LS125.2	NU	0.5
LS72-3	LS3-1	NB	3.0
LS72-4	LS16-5	NR	2.0
LS72-5	LSS27	NG	1.0
LS72-6	LSS18	NY	3.0
LS72-8	LS34-30	NP	2.0
LS72-9	LS7-2L	NS	2.0
LS73-1	LS140-30	NB	3.0
LS73-2	LS29-8	NK	2.0
LS73-3	LS29-9	NG	2.0
LS73-4	LS16.1	NLG	2.0
LS111	LS2-2	WY	0.5
LS125-1	LI18-4	PG	0.5
LS125-2	LS72-2	NU	0.5
LS140-30	LS73-1	NB	3.0
LS140-85	LS2-6	KN	0.5
LS140-86	LSS24	WU	0.5
LS140-87	LSS23	UR	3.0
LS141-1	LSS1	RS	0.5
LS141-2	LSS15	B	0.5
LS142-1	LSS19	PO	0.5
LS142-2	LSS26	PK	0.5
LS142-3	LS39	B	0.5
LS143-1	LS39	B	3.0
LS143-2	LSS23	UR	3.0
LS152	LS153	STD	STD
LS153	LS152	STD	STD

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LEFT HAND SIDE HARNESS LS (RHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1036

RIGHT HAND SIDE HARNESS (ABS) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	location
LS58	PMHD 2 way socket(black) (LH side harness)	Number plate light	Luggage Compartment
RS1	PM4 3 way socket (red)	Bonnet lamps	RH radiator bracket
RS2	Relay base (green)	Air conditioning clutch relay	RH radiator bracket
RS3	Relay base (black)	Fan relay	RH radiator bracket
RS4	Relay base lred)	Power wash relay	RH radiator bracket
RS5	Relay base (yellow)	Screen wash relay	RH radiator bracket
RS7	PM4 9 way socket (yellow)	Pl harness	Adjacent to ignition coil
RS8	PM4 3 way socket (black)	Power wash pump	Behind front bumper RH side
RS9	PM5 3 way plug (yellow)	Screen wash pump	Behind front bumper RH side
RS10	PM5 3 way socket (blue)	Thermostat	Radiator support bracket
RS11	PM5 3 way socket (black)	Wash fluid level	Behind front bumper RH side
RS12	PM5 3 way socket (green)	Side and direction indicator lamps	Behind front bumper RH side
RS13	PM5 3 way socket (green)	Side marker	Behind front bumper RH side
RS14	PM4 3 way socket (yellow)	Fog lamp	Behind front bumper RH side
RS15	PM5 3 way socket (brown)	Heated jet sensor	Behind front bumper RH side
RS16	PM4 8 way socket (black)	Lamp relay and bulb failure assembly	RH headlamp cavity
RS17	PM4 9 way socket (yellow)	Lamp relay and bulb failure assembly	RH headlight cavity
RS19	PM4 6 way socket (yellow)	Ride levelling valves	Engine compartment
RS22	PMHD 36 pin plug (black)	Bulkhead harness	RH 'A' post
RS26	PM5 3 way socket (black)	Side repeater	RH inner wing valance
RS29	Relay base (blue)	Ride level	Driver footwell
RS30	PM5 3 way socket (black)	Rear passenger door harness	RH 'B' and 'C' post
RS31	PMHD 6 way socket (black)	Rear passenger door harness	RH 'E' and 'C' post
RS32	PMHD 6 pin plug (yellow)	Rear passenger door harness	RH 'B' and 'C' post
RS33	PMHD 2 way socket black)	Bass speaker	RH rear passenger footwell
RS34	Lucar socket	Fuel sender	Luggage compartment
RS35	PM4 8 way socket (black)	Rear axle	Luggage compartment
RS36	Relay base (red)	Heated rear screen	Luggage compartment RH side
RS37	Relay base lgreenl	Aerial up	Luggage compartment RH side
AS38	Relay base (black)	Aerial down	Luggage compartment RH side
RS41	PMHD 2 way socket (yellow)	Boot lamp	Boot lid
RS42	Lucar socket	Number plate lamp	Boot lid
RS43	Lucar socket	Number plate lamp	Boot lid
RS45	Lucar socket	Number plate lamp	Boot lid
RS46	Lucar socket	Number plate lamp	Boot lid
RS47	187 spade	Boot switch	Boot lid
RS48	PM5 3 way socket (black)	Electric aerial	Luggage compartment RH side
RS49	Lucar socket	Heated rear window	RH 'E' post
RS50	PMHD 15 way socket (black)	Lamp relay and protection module	Luggage compartment RH side
RS51	PM4 6 way socket (black)	Lamp relay module	Luggage compartment RH side
RS52	PMHD 5 way socket	Rear light	Luggage compartment RH side
RS53	Eyelet	Earth	RH headlight cavity
RS54	PM4 3 way socket (black)	Bonnet switch	RH headlight cavity
RS55	Eyelet	Earth	Luggage compartment
RS58	PMHD 4 way socket (black)	Speed sensor	Luggage compartment
RS64	'M4 3 way socket (black)	nterior lamp	RH 'E' post
RS65	'M4 3 way socket (yellow)	Caravan/trailer module	Luggage compartment
RS69	'M5 3 way socket (black)	Screenwash th'couple	Behind front valance RH side
RS71	'M4 3 way socket (violet)	High beam stop light	Rear window shelf
RS72	Lucar connector	Fuel sender unit	Luggage compartment
RS74	Lucar 2 way socket black)	Cooling fan	Behind front bumper RH side
RS76	Lucar connector	Air conditioning cut-out	Above ignition coil
RS77	Lucar connector		
RS78	'M5 3 way socket (green)	Air conditioning clutch	Air conditioning compressor
9579	Relay base (yellow)	High beam stop lamp relay	Rear window shelf

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RIGHT HAND SIDE HARNESS (ABS) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	location
RS87	PM4 6 way socket (black)	Bulkhead harness	RH 'A' post
RS88	PMHD 6 way socket (yellow)	Catalyst harness	RH 'A' post
RS89	Lucar 7 way socket(grey)	ABS valve block	Engine compartment RH
RS90	Lucar 5 way socket Iblack)	ABS fluid reservoir	Engine compartment
RS91	Lucar 2 way socket Iblack)	ABS main valve	Engine compartment
RS92	Lucar 2 way socket (black)	ABS pump	Forward of Bulkhead RH side
RS93	PM4 3 pin plug (black)	Front RH ABS sensor	Below brake fluid reservoir
RS94	Lucar 5 way socket (blue)	ABS accumulator	Above pump assembly
RS95	PM4 3 pin plug (black)	Front LH ABS sensor	Below expansion tank
RS96	Relay base (yellow)	ABS pump relay	Driver footwell
RS97	Relay base (natural)	ABS main relay	RH blower motor
RS98	Teves 55 way connector	ABS ECU	Luggage compartment above air extractor outlet box
RS99	PM4 2 way socket (black)	Power wash jet	RH headlight
RS102	PM4 2 pin plug (black)	Screenwash jet	Front scuttle
RS103	Relay base (blue)	ABS ECU relay	Driver footwell
RS104	PM5 3 way socket	ABS test socket	Luggage compartment
RS105	Kiekert 9 way socket (black)	RH fusebox	RH 'A' post
RS106	Kiekert 5 way socket (black)	RH fusebox	RH 'A' post
RS108	PM4 5 way socket	Luggage compartment	Luggage compartment
RS109	PM4 5 way socket (black)	Boot open warning	Luggage Compartment
RS111	Lucar connector	Passive battery cut-out	Luggage compartment
RS114	PMHD 36 pin plug (yellow)	Bulkhead harness RB	Between RH blower and 'A' post
RS115	PM4 3 way plug Iblack)	ABS ECU	Under fuel tank
RS132	PMHD 4 way socket (black)	Boot lock/unlock actuator	Boot lid
RS133	Lucar 2 way	Boot release actuator	Boot lid
RS143	BNC socket	Aerial lead	Luggage compartment
RS144	BNC socket	Aerial lead	Luggage Compartment

RIGHT HAND SIDE HARNESS (ABS) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
LS58	Luggage compartment (LH side harness)	Luggage compartment tritn
RS1	RH radiator bracket	Engine compartment
RS2	RH radiator bracket	Engine compartment
RS3	RH radiator bracket	Engine compartment
RS4	RH radiator bracket	Engine compartment
RS5	RH radiator bracket	Engine compartment
RS7	Above ignition coil	Engine compartment
RS8	Front valance RH side	Front valance
RS9	Front valance RH side	Front valance
RS10	PHS accumulator	Engine cotnpartment
RS11	Front valance RH side	Front valance
RS12	Front valance RH side	Front valance
RS13	Front valance RH side	Front valance
RS14	'Front valance RH side	Front valance
RS15	Front valance RH side	Front valance
RS16	RH headlight cavity	Engine compartment
RS17	RH headlight cavity	Engine compartment
RS19	Above valve block	Engine cotnpartment
RS22	RH 'A' post	RH dash trim
RS26	RH inner wing valance	Driver footwell
RS29	Driver footwell	RH dash trim
RS30	RH 'B' and 'C' post	RH 'B' and 'C' liner
RS31	RH 'B' and 'C' liner	RH 'B' and 'C' liner
RS32	RH 'B' and 'C' liner	RH 'B' and 'C' liner
RS33	RH rear passenger footwell	Bass speaker
RS34	Fuel tank	Luggage compartment
RS35	Luggage compartment bulkhead	Luggage compartnietrt
RS36	Luggage compartment RH	Luggage compartment
RS37	Luggage compartment RH	Luggage compartment
RS38	Luggage compartment RH	Luggage compartment
RS41	Boot lid	Luggage compartment
RS42	Boot lid	Luggage Compartment
RS43	Boot lid	Luggage compartment
RS45	Boot lid	Luggage compartment
RS46	Boot lid	Luggage compartment
RS47	Boot lid	Luggage compartment
RS48	Luggage compartment RH side	Luggage compartment trim
RS49	RH 'E' post	Heated rear window
RS50	Luggage compartment RH side	Luggage compartment
RS51	Luggage compartment RH side	Luggage cotnparttnent
RS52	Rear light cluster	Luggage compartment
RS53	RH headlight cavity	Engine compartment
RS54	RH headlight cavity	Engine compartment
RS55	Luggage compartmer RH rear	Luggage compartment
RS58	Luggage compartment bulkhead	Luggage compartment
RS64	RH 'E' post	Sixth light trim finishe
RS65	Luggage compartment RH side	Luggage compartment
RS69	RH inner wing valanc)	Engine compartment
RS71	Below rear ri d shelf	High beam stop light cover
RS72	Fuel tank	Luggage compartment
RS74	Front alanc l side	Front valance
RS76	M e ignitior oil	Engine compartment
RS77	M e ignitior oil	Engine compartment
RS78	Air conditioning compressor	Engine compartment
RS79	Rear wind shelf	Below rear window shelf
RS87	R 'A'	RH dash liner
RS88	R 'A'	RH dash liner
RS89	Engine compartment RH	Engine compartment
RS90	Engine compartment RH	Engine compartment
RS91	Engir e compartm en RH	Engine compartment
RS92	Engine compartment bulkhead RH side	Engine compartment
RS93	Below brake fluid reserv oi	Engine compartment
RS94	A ove pump assembly	Engine compartment
RS95	Below expansion tank	Engine compartment
RS96	Driver footwel	RH dash liner
RS97	RH blc e m otc	RH dash liner
RS98	l jage compartme e air extractor et ho:	Luggage compartment
RS99	RH headlight ri fr t	Headlight cavity
RS102	Front scuttle	Engine compartment
RS103	Driver footwel	RH dash liner
RS104	l jage compartment RH	Luggage compartment trim
RS105	l A' post	RH dash liner

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RIGHT HAND SIDE HARNESS (ABS) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
RS106	RH 'A'post	RH dfash liner
RS108	Luggage Compartment RH	Luggage compartment trim
AS109	Boot lock tnechanism	Luggage compartment
RS111	Luggage Compartment LH	Luggage compartment trim
RS114	Between RH blower motor 'A'post	AH dash liner
RS115	Under fuel tank	Luggage compartment
RS132	Luggage compartment	Luggage compartment trim
RS133	Luggage compartment	Luggage compartment trim
RS143	Luggage compartment RH	Luggage compartment trim
RS144	Luggage compartment RH	Luggage compartment trim

RIGHT HAND SIDE HARNESS (ABS) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De		Couleur	Section
Van	naar	Kleur	Maat
Da		Colore	Diametro
Desde	Hacia	Color	Tamano
RS58-1	RS45	B	0.5
RS1-2	RS6/OOW	P	0.5
RS1-3	RS4-2	Y	0.5
RS2-30	RS1	P	0.5
RS2-85	RS7	OW	0.5
RS2-86	RS114-22	B	0.5
RS2-87	RS2	N	0.5
RS2-87	RD3/OOW	N	0.5
RS3-30	RS1	P	0.5
RS3-85	RS4		0.5
RS3-86	RS10-2	V	0.5
RS3-87	RS74-8		0.5
RS3-87	RD2/OOU		0.5
RS4-30	RS30	UK	0.5
RS4-85	RS114-3	GN	0.5
RS4-86	RS30	UK	0.5
RS4-87	RS8-2	ER	0.5
RS5-30	RS105-5	UG	0.5
RS5-85	RS114-4	GY	0.5
RS5-86	RS27	VB	0.5
RS5-87	RS9-2	EG	0.5
RS7-1	RS22-7	OS	0.5
RS7-2	RS22-8	OK	0.5
RS7-3	RS29	BW	1.5
RS7-4	RS2	BN	0.5
RS7-5	RS114-6	RY	0.5
RS8-1	RS4	B	3.0
RS8-2	RS4-87	ER	1.0
RS9-1	RS4	B	0.5
RS9-2	RS5-87	EG	1.5
RS10-1	RS7	NU	1.5
RS10-2	RS3-86	N	0.5
RS11-1	RS18	BK	0.5
RS11-2	RS22-19	OR	1.5
RS12-1	RS17-3	U	0.5
RS12-2	RS4	B	1.5
RS12-3	RS17-2	T	0.5
RS13-1	RS17-5	RB	0.5
RS13-2	RS4	B	1.5
RS14-1	RS4	B	1.0
RS14-2	RS17-1	RO	2.0
RS15-1	RS28	*NU*	1.5
RS15-2	RS3	RS	1.5
RS16-1	RS114-1	ORO	1.5
RS16-2	RS22-15	UK	0.5
RS16-3	RS22-1	US	0.5
RS16-4	RS17	R	1.5
RS16-5	RS18	BK	3.5
RS16-6	RS87-6	WP	1.5
RS16-7	RS105-1	NO	2.0
RS16-8	RS106-2	NK	2.0
RS16-9	RS106-4	NG	3.0
RS17-1	RS17-1	RO	2.0
RS17-2	RS12-3	R	3.5
RS17-3	RS12-1	G	3.5
RS17-4	RS14	VK	3.5
RS17-5	RS13-1	RE	3.5
RS17-6	RS26-1	YS	3.5
RS17-7	RS12	KG	3.5
RS17-8	RS16	KS	3.5
RS17-9	RS51-6	KU	0.5
RS19-1	RS11	WS	3.5
RS19-2	RS5	YLG	3.5
RS19-3	RS6	WS	0.5
RS19-4	RS5	YLG	0.5
RS19-5	RS8	NK	0.5
RS19-6	RS9	YU	0.5
RS22-1	RS16-3	US	0.5
RS22-2	RS58-1	BRD	STD
RS22-3	RS132-3	YO	0.5
RS22-4	RS58-4	RIN	0.5
RS22-5	RS61	WN	0.5
RS22-6	RS51	WR	0.5
RS22-7	RS7-1	OS	0.5
RS22-8	RS7-2	OK	0.5
RS22-9	RS29	BW	0.5
RS22-12	RS58-3	UIN	0.5
RS22-13	RS31-1	RBG	0.5
RS22-14	RS31-2R	LG	0.5
RS22-15	RS16-2	K	0.5
RS22-16	RS14	K	0.5
RS22-17	RS36-85	GO	0.5
RS22-18	RS32-1	G	0.5
RS22-19	RS11-2	R	0.5
RS22-20	RS31-3R	W	0.5
RS22-21	RS37-85	VG	0.5
RS22-22	RS38-85	VS	0.5
RS22-25	RS15	K	0.5
RS22-26	RS109-2	Y	0.5
RS22-27	RS33-1	O	0.5
RS22-28	RS33-2	R	0.5
RS22-29	RS32-4R	RY	0.5
RS22-30	RS11	VS	0.5
RS22-32	RS26	U	0.5
RS22-33	RS12	G	0.5
RS22-34	RS23	O	0.5
RS22-35	RS20	K	0.5
RS22-36	RS10	RS	0.5
RS26-2	RS13		0.5
RS26-3	RS17-6	*S*	0.5
RS29-30	RS31	LG	0.5
RS29-85	RS35-5	GN	0.5
RS29-86	RS11	VS	0.5
RS29-87	RS24	I	0.5
RS30-1R	RS13	I	1.0
RS30-2R	RS105-9	RS	1.0
RS30-3R	RS18	RK	1.5
RS31-1R	RS22-13	RG	0.5
RS31-2R	RS22-14	RG	1.5
RS31-3R	RS22-20	GW	1.5
RS31-4R	RS114-5		1.5
RS31-5	RS114-12	GY	0.5
RS31-6	RS114-19	GLG	0.5
RS32-1	RS22-18	RG	0.5
RS32-2R	RS23	GO	1.5
RS32-3R	RS20	GK	0.5
RS32-4R	RS22-29	GY	1.5
RS33-1	RS22-27	GO	0.5
RS33-2	RS22-28	GR	1.5
RS34	RS18	BK	1.5
RS35-1	RS15	NK	0.5
RS35-2	RS11	VS	1.5
RS35-3	RS24	B	1.5
RS35-5	RS29-85	GN	1.5
RS35-6	RS9	YU	1.5
RS35-8	RS114-16	OG	1.5
RS35-9	RS114-1	B	0.5
RS36-30	RS22	NY	1.0
RS36-85	RS22-17	GO	0.5
RS36-86	RS22	NY	1.5
RS36-87	RS49	UY	2.0
RS37-30	RS48-2	GR	1.0
RS37-85	RS22-21	VG	1.5
RS37-86	RS21	NB	1.5
RS37-87	RS21	NB	1.0
RS37-87A	RS24	B	1.0
RS38-30	RS48-1	GU	1.0
RS38-85	RS22-22	WB	0.5
RS38-86	RS21	NB	0.5
RS38-87	RS21	NB	1.0
RS38-87A	RS24	B	1.0
RS41-1	RS19	NW	3.5
RS41-2	RS47	PR	0.5
RS42-1	RS50-13	RB	3.5
RS43	RS25	B	3.5
RS45	LS58-1	RB	3.5
RS46	RS25	B	0.5
RS47	RS41-2	PR	0.5
RS48-1	RS38-30	GU	1.0
RS48-2	RS37-30	GR	1.0
RS49	RS36-87	UY	2.0
RS50-1	RS114-9	RU	0.5
RS50-2	RS114.1 1	SLG	0.5
RS50-3	RS26	PU	0.5
RS50-4	RS17	R	0.5
RS50-5	RS14	YK	0.5
RS50-6	RS16	KS	0.5
RS50-7	RS12	KG	0.5
RS50-8	RS18	BK	0.5
RS50-9	RS52-3	PU	0.5
RS50-10	RS52-5		1.5
RS50-11	RS52-4		0.5
RS50-12	RS52-1		0.5
RS50-13	RS42	B	1.5
RS50-14	RS24-15	J	1.5
RS51-1	RS24-23	LG	0.5
RS51-2	RS87-2	G	1.5
RS51-5	RS32	R	1.0
RS51-6	RS17-9	J	0.5
RS52-1	RS50-12		0.5
RS52-2	RS55		1.0
RS52-3	RS50-9	N	1.5
RS52-4	RS50-11		0.5
RS52-5	RS50-10	P	0.5
RS53	RS54		3.0
RS53	RD3/OOU		1.5
RS54-2	RS1-3	Y	0.5
RS54-3	RS114-17	G	1.5
RS55	RS52-2		2.0
RS55	RS24		1.0
RS58-1	RS22-2	RD	STD
RS58-3	RS22-12	IN	0.5
RS58-4	RS22-4	IN	0.5
RS64-2	RS19	W	0.5
RS64-3	RS61	IN	3.5
RS65-1	RS24		3.0
RS65-2	RS114-18	U	0.5
RS65-3	RS106-3	U	3.0
RS69-1	RS88-3		3.22
RS69-2	RS88-1		0.22
RS71-1	RS24		0.5
RS71-2	RS79-87	B	0.5
RS72	RS29	W	0.5
RS74/OOA	RS54		3.0
RS74/OOB	RS3-87		3.0
RS76	RS18	K	0.5
RS77	RS2-85	RY	0.5
RS78-1	RS2	BN	3.0
RS79-30	RS32	IR	0.5
RS79-85	RS26	U	0.5
RS79-87	RS71-2	B	0.5
RS87-1	RS106-1	RY	0.5
RS87-2	RS51-2	VG	0.5
RS87-3	RS13		3.0
RS87-4	RS18	IK	3.0
RS87-6	RS16-6	VP	0.5
RS88-1	RS69-2	J	0.22
RS88-2	RS27	VB	0.5
RS88-3	RS69-1	J	0.22
RS88-4	RS18	IK	0.5
RS88-5	RS13	B	0.5
RS88-6	RS114-33	UR	0.5
RS89-1	RS98-20	GW	0.5
RS89-2	RS98-2	GY	0.5
RS89-3	RS98-54	JG	1.5
RS89-4	RS98-36	GR	0.5
RS89-5	RS98-21	WR	0.5
RS89-6	RS98-38	WN	0.5
RS89-7	RS56	RY	1.0
RS90-1	RS98-8	WG	0.5
RS90-2	RS94-3	EG	1.5
RS90-3	RS140	B	0.5
RS90-4	RS114-2	BY	0.5

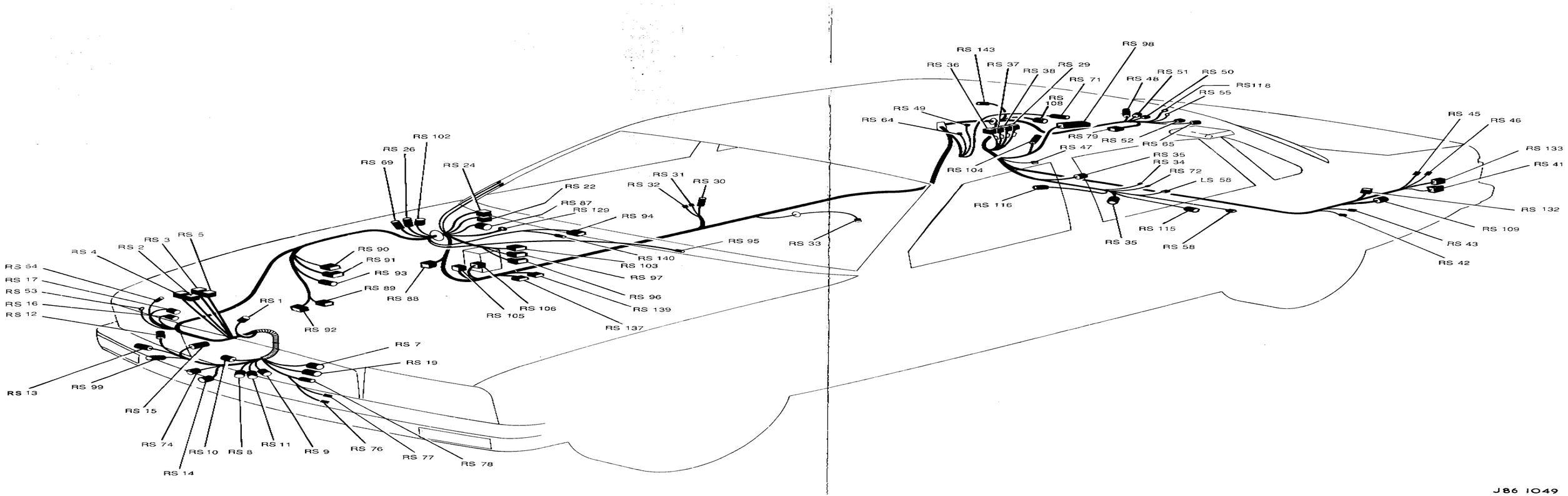
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RIGHT HAND SIDE HARNESS (ABS) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
RS91-1	RSS58	RY	1.0
RS91-2	RS98-39	BS	1.0
RS92-1	RSS60	NU	3.0
RS92-2	RS140	B	3.0
RS93-2	RS98-47	GIN	1.0
RS93-3	RS98-29	BRD	STD
RS94-1	RSS61	WN	0.5
RS94-2	RS114-26	BP	0.5
RS94-3	RS90-2	PG	0.5
RS94-4	RSS21	WP	0.5
RS94-5	RS98-51	WU	0.5
RS95-2	RS98-48	RIN	1.0
RS95-3	RS98-30	BRD	STD
RS96-30	RSS53	NO	3.0
RS96-85	RSS58	PY	0.5
RS96-86	RSS53	NO	1.0
RS96-86	RSD7/OOW	NO	0.5
RS96-87	RSS60	NU	3.0
RS97-30	RSS55	RY	3.0
RS97-85	RS98-34	YG	0 5
RS97-86	RSS51	WR	0.5
RS97-87	RSS57	NP	3.0
RS98-1	RS118	B	2.0
RS98-2	RS89-2	GY	0.5
RS98-3	RSS58	RY	1.0
RS98-8	RS90-1	WG	0.5
RS98-19	RS118	B	2.0
RS98-21	RS89-1	GW	0.5
RS98-23	RS108-2	NK	0.5
RS98-27	RS116-3	BRD	STD
RS98-28	RS115-3	BRD	STD
RS98-29	RS93-3	BRD	STD
RS98-30	RS95-3	BRD	STD
RS98-32	RS114-30	GB	1.0
RS98-33	RSS54	SY	1.0
RS98-34	RS97-85	YG	0.5
RS98-36	RS89-4	GR	0.5
RS98-38	RS89-6	WN	0.5
RS98-45	RS116-2	YIN	1.0
RS98-46	RS115-2	UIN	1.0
RS98-47	RS93-2	GIN	1.0
RS98-48	RS95-2	IRIN	1.0
RS98-51	RS94-5	WU	0.5
RS98-52	RSS52	RB	0.5
RS98-53	RSS51	WR	0.5
RS98-54	RS89-3	UG	0.5
RS99-1	RSS4	B	0.5
RS99-2	RSS3	RS	0.5
RS102-1	RSS10	RS	0.5
RS102-2	RSS13	B	0.5
RS103-30	RSS54	SY	1.0
RS103-85	RS140	B	0.5
RS103-86	RSS55	RY	1 0
RS103-87	RSS57	IUP	1.0
RS103-87A	RS140	B	0.5
RS104-1	RSS60	NU	0.5
RS104-2	RSS21	WP	0.5
RS105-1	RS16-7	NO	2.0
RS105-2	RSS21	NB	1.0
RS105-3	RSS32	NR	2.0
RS105-4	RSS22	NY	3.0
RS105-5	RS5-30	NG	0.5
RS105-6	RSS30	NK	3.0
RS105-8	RSS1	NP	2.0
RS105-9	RS30-2R	NS	2.0
RS106-1	RS87-1	NY	0.5
RS106-2	RS16-8	NK	2.0
RS106-3	RS65-3	NU	3.0
35106.4	RS16-9	NG	3.0
RS108-1	RSS57	NP	1.0
RS108-2	RS98-23	NK	0.5
RS108-5	RSS52	PB	0.5
RS108-6	RS118	B	1 0
RS109-1	RSS18	BK	0.5
RS109-2	RS22-26	RY	0 5
RS111	RS24-2	WY	1.5
RS114-1	RS35-9	O	1.5
RS114.2	RS90-4	WY	0.5
is 114-3	RS4-85	LGN	0.5

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
RS114-4	RS5-85	LGY	0 5
RS114-5	RS31-4R	P	0.5
RS114-6	RS7-5	RY	0.5
RS114-7	RSS28	R	0 5
RS114-8	RSS17	R	0.5
RS114-9	RS50-1	RU	0 5
RS114.10	RS16-1	RO	0.5
RS114-11	RS50-2	SLG	0.5
RS114-12	RS31-5	KY	0.5
RS114-13	RSS19	NW	0.5
RS114-14	RSS16	KS	0 5
RS114-15	RS50-14	KU	0.5
RS114-16	RS35-8	OG	0.5
RS114-17	RS54-3	UG	0.5
RS114-18	RS65-2	KU	0.5
RS114-19	RS31-6	KLG	0.5
RS114-22	RS2-86	UB	0.5
RS114-24	RSS27	WB	0.5
RS114-25	RSS57	NP	1.0
RS114-26	RS94-2	BR	0.5
RS114.27	RSS52	PB	0.5
RS114-30	RS98-32	GB	1.0
RS114-32	RSS53	NO	1.0
RS114-33	RS88-6	UR	0.5
RS114-34	RS51-1	NLG	0.5
RS115-2	RS98-46	UIN	1.0
RS115.3	RS98-28	BRD	STD
RS116-2	RS98-45	YIN	1.0
RS116-3	RS98-27	BRD	STD
RS118	RS98-1	B	2.0
RS118	RS98-19	B	2.0
RS118	RS108-6	B	1.0
RS132-1	RSS20	PK	0.5
RS132-2	RSS23	PO	0.5
RS132-3	RS22-3	YO	0.5
RS132-4	RS133-2	YK	0.5
RS133-1	RSS25	B	0.5
RS133-2	RS132-4	YK	0.5
RS137-1	RSS53	NO	3.0
RS137-2	RS129	N	3.0
RS139-1	RSS57	NP	3.0
RS139-2	RS129	N	3 0
RS140	RSD12/ODU	B	1.0
RS140	RS103-85	B	0.5
RS140	RS92-2	B	3.0
RS140	RS90-3	B	0.5
RS140	RS103-87!	B	0.5
RS143	RS144	B	STD
RS144	RS143	B	STD

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RS 143
RS 36
RS 37
RS 38
RS 29
RS 98
RS 71
RS 48
RS 51
RS 50
RS 118
RS 55
RS 108
RS 49
RS 64
RS 79
RS 52
RS 65
RS 47
RS 104
RS 35
RS 34
RS 72
LS 58
RS 116
RS 115
RS 35
RS 58
RS 45
RS 46
RS 133
RS 41
RS 132
RS 109
RS 43
RS 42
RS 102
RS 26
RS 69
RS 24
RS 22
RS 87
RS 129
RS 94
RS 31
RS 32
RS 30
RS 95
RS 33
RS 140
RS 103
RS 97
RS 96
RS 139
RS 137
RS 90
RS 91
RS 93
RS 89
RS 88
RS 106
RS 105
RS 92
RS 1
RS 5
RS 3
RS 2
RS 4
RS 54
RS 17
RS 53
RS 16
RS 12
RS 13
RS 99
RS 15
RS 74
RS 10
RS 8
RS 11
RS 9
RS 76
RS 77
RS 78
RS 14
RS 7
RS 19

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DRIVER'S DOOR HARNESS DD (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

tem	)escription	Interface	.ocation
DD1	'M4 6 way socket yellow)	Driver door panel	Driver door
302	'MHD 24 way socket yellow)	Driver door panel	Driver door
305	'M5 2 way socket black)	Window lift motor	Jriver door
306	'M4 6 way socket yellow)	Door actuator	Driver door
DD9	'M4 6 way socket black)	Door switch	Driver door
DD12	'MHD 2 way socket (blue)	Driver's door panel	Driver door
DD13	Grote Hartrnann 2 pin plug blue)	Door mirrors	Driver door
3014	Grote Hartmann 4 pin lug (yellow)	Door mirrors	Jriver door
DD15	Grote Hartmann 5 way ocket (black)	Door key switch	Driver door
RB61	'MHD 36 way socket black)	Bulkhead harness LB	LH 'A' post
RB62	'M4 6 way socket (black)	Bulkhead harness LB	LH 'A' post

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DRIVER'S DOOR HARNESS DD (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

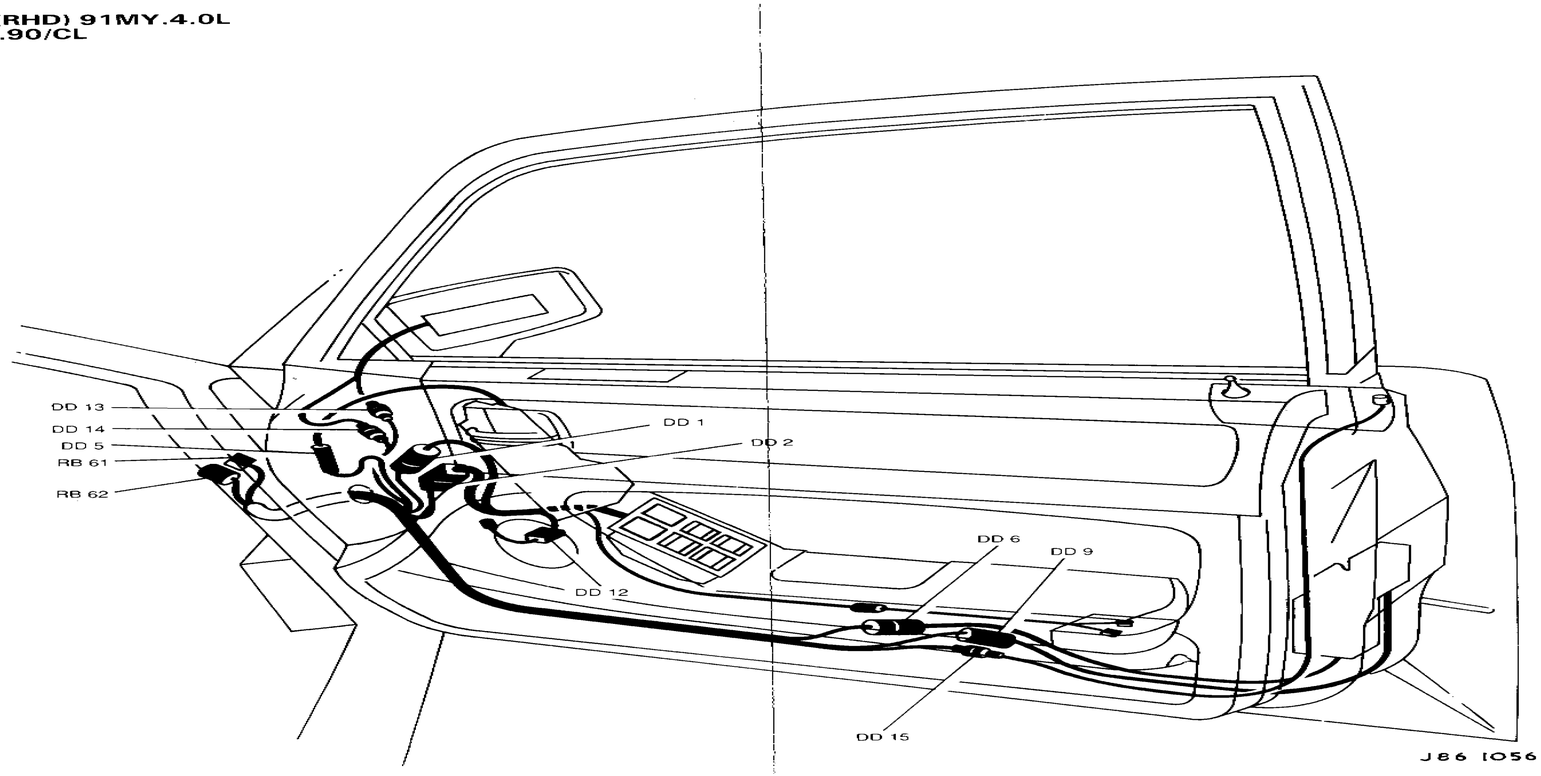
Connector	Location	Access
DD1	Driver door	Door trim pad (lower)
DD2	Driver door	Door trim pad (lower)
DD5	Driver door	Door trim pad (lower)
DD6	Driver door	Door trim pad (lower)
DD9	Driver door	Door trim pad (lower)
OD12	Driver door	Door trim pad (lower)
DD13	Driver door	Door trim pad (upper)
DD14	Driver door	Door trim pad (upper)
DD15	Driver door	Door trim pad (lower)
RE61	LH 'A' post	LH dash trim
RB62	LH 'A' post	LH dash trim

DRIVER'S DOOR HARNESS (RHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Tamano
DD1-1	RB62-2	NP	2.0
DD1-2	DD5-2	OU	2.0
DD1-4	DD5-1	OB	2.0
DD1.5	RB62-1	B	2.0
DD1-6	RB61-17	WN	0.5
DD2-1	RB61-22	OR	0.5
DD2-2	RB61-23	OG	0.5
DD2-3	RB61-24	OY	0.5
DD2-4	RB61-25	OP	0.5
DD2-5	DD14-2	OW	0.5
DD2-6	DD14-1	OK	0.5
DD2-7	DD14-3	OS	0.5
DD2-8	DD14-4	ON	0.5
DD2-11	RB61-13	BW	0.5
DD2-12	RB61-7	BR	0.5
DD2-13	RB61-8	BP	0.5
DD2-14	RB61-9	BG	0.5
DD2-15	RB61-10	BLG	0.5
DD2-16	RB61-11	BO	0.5
DD2-17	RB61-12	GLG	0.5
DD2-18	RB61-4	RW	0.5
DD2-19	RB61-5	RG	0.5
DD2-20	RB61-5	YW	0.5
DD2-21	DDSI	G	0.5
DD2-23	RB61-28	BN	0.5
DD2-24	RB61-29	BU	0.5
DD5-1	DD1-4	OB	2.0
DD5-2	DD1-2	OU	2.0
DD6-1	RB61-1	PN	0.5
DD6-2	RB61-18	PO	0.5
DD6-4	RB61-19	PK	0.5
DD6-5	RB61-26	YO	0.5
DD6-6	RB78	BK	0.5
DD9-1	RB61-2	PW	0.5
DD9-2	RB61-21	UO	0.5
DD9-5	DDSI	G	0.5
DD9-6	RB78	BK	0.5
DD12-1	RB61-16	UY	0.5
DD13-1	RB62-5	NY	0.5
DD13-2	RB61-3	K	0.5
DD14-1	DD2-6	OK	0.5
DD14-2	DD2-5	OW	0.5
DD14-3	DD2-7	OS	0.5
DD14-4	DD2-8	ON	0.5
DD15-1	RB78	BK	0.5
DD15-2	RB61-15	R	0.5
RB61-1	DD6-1	PN	0.5
RB61-2	DD9-1	PW	0.5
RB61-3	DD13-2	K	0.5
RB61-4	DD2-18	RW	0.5
RB61-5	DD2-19	RG	0.5
RB61-6	DD2-20	YW	0.5
RB61-7	DD2-12	BR	0.5
RB61-8	DD2-13	BP	0.5
RB61-9	DD2-14	BG	0.5
RB61-10	DD2-15	BLG	0.5
RB61-11	DD2-16	BO	0.5
RB61-12	DD2-17	GLG	0.5
RB61-13	DD2-11	BW	0.5
RB61-15	DD15-2	R	0.5
RB61-16	DD12-1	UY	0.5
RB61-17	DO1-6	WN	0.5
RB61-18	DD6-2	PO	0.5
RB61-19	DD6-4	PK	0.5
RB61-21	DD9-2	UO	0.5
RB61-22	DD2-1	OR	0.5
RB61-23	DD2-2	OG	0.5
RB61-24	DD2-3	OY	0.5
RB61-25	DD2-4	OP	0.5
RB61-26	DD6-5	YO	0.5
RB61-28	DD2-23	BN	0.5
RB61-29	DD2-24	BU	0.5
RB61-32	DDSI	G	0.5
RB62-1	DD1-5	E	2.0
RB62-2	DD1-1	NP	2.0
RB62-5	DD13-1	NV	0.5
RB62-6	RB78	BK	0.5
DDSI	DD9-5	G	0.5
DDSI	RB61-32	G	0.5
DDSI	DD2-21	G	0.5
RB78	RB62-6	BK	2.0
RB78	DD6-6	BK	0.5
RB78	009.6	BK	0.5
RB78	DD15-1	BK	0.5

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DRIVER'S DOOR HARNESS DD (RHD) 91MY.4.0L
COMNECTOR LOCATION 90.50.90/CL



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DRIVER'S DOOR HARNESS DD (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
DD1	PM4 6 way socket (yellow)	Driver door panel	Driver door
DD2	PMHD 24 way socket (yellow)	Driver door panel	Driver door
DD5	PM5 2 way socket (black)	Window lift motor	Driver door
DD6	PM4 6 way socket (yellow)	Door actuator	Driver door
DD9	PM4 6 way socket (black)	Door switch	Driver door
DD12	PMHD 2 way socket (blue)	Driver's door panel	Driver door
DD13	Grote Hartmann 2 pin plug (blue)	Door mirrors	Driver door
DD14	Grote Hartmann 4 pin plug (yellow)	Door mirrors	Driver door
DD15	Grote Hartmann 5 way socket (black)	Door key switch	Driver door
LB61	PMHD 36 way socket (black)	Bulkhead harness LB	LH 'A' post
LB62	PM4 6 way socket (black)	Bulkhead harness LB	LH 'A' post

DRIVER'S DOOR HARNESS DD (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
OD1	Driver door	Door trim **pad** (lower)
DD2	Driver door	Door trim pad llowerl
DD5	Driver door	Door trim **pad** (lower)
DD6	Driver door	Door trim pad (lower)
DD9	Driver door	Door trim pad (lower)
DD12	Driver door	Door trim pad (lower)
DD13	Driver door	Door trim pad (upper)
DD14	Driver door	Door trim **pad** (upper)
DD15	Driver door	Door trim pad (lower)
LB61	LH 'A' post	LH dash trim
LB62	LH 'A' post	LH dash trim

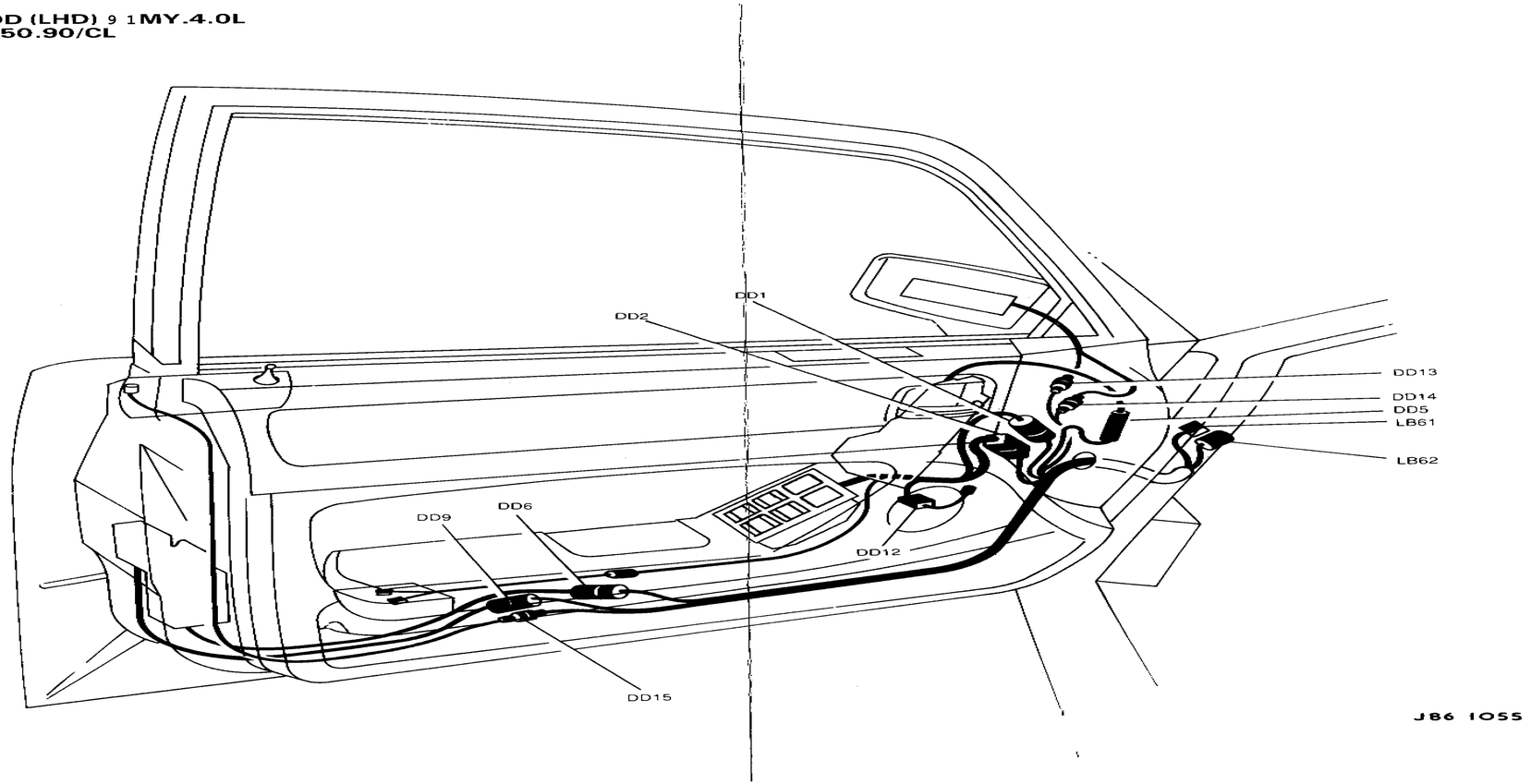
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DRIVER'S DOOR HARNESS (LHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
DD1-1	LB62-2	NP	2.0
DD1-2	DD5-2	OU	2.0
DD1-4	DD5-1	OB	2.0
DD1-5	LB62-1	B	2.0
DD1-6	LB61-17	WN	0.5
DD2-1	LB61-22	OR	0.5
DD2-2	LB61-23	OG	0.5
DD2-3	LB61-24	OY	0.5
DD2-4	LB61-25	OP	0.5
DD2-5	DD14-2	OW	0.5
DD2-6	DD14-1	OK	0.5
DD2-7	DD14-3	OS	0.5
DD2-8	DD14-4	ON	0.5
DD2-11	LB61-13	BW	0.5
DD2-12	LB61-7	BR	0.5
DD2-13	LB61-8	BP	0.5
DD2-14	LB61-9	BG	0.5
DD2-15	LB61-10	BLG	0.5
DD2-16	LB61-11	BO	0.5
DD2-17	LB61-12	GLG	0.5
DD2-18	LB61-4	RW	0.5
DD2-19	LB61-5	RG	0.5
DD2-20	LB61-5	YW	0.5
DD2-21	DDS1	G	0.5
DD2-23	LB61-28	BN	0.5
DD2-24	LB61-29	BU	0.5
DD5-1	DD1-4	OB	2.0
DD5-2	DD1-2	OU	2.0
DD6-1	LB61-1	PN	0.5
DD6-2	LB61-18	PO	0.5
DD6-4	LB61-19	PK	0.5
DD6-5	LB61-26	YO	0.5
DD6-6	LB78	BK	0.5
DD9-1	LB61-2	PW	0.5
DD9-2	LB61-21	UO	0.5
DD9-5	DDS1	G	0.5
DD9-6	LB78	BK	0.5
DD12-1	LB61-16	UY	0.5
DD13-1	LB62-5	NY	0.5
DD13-2	LB61-3	K	0.5
DD14-1	DD2-6	OK	0.5
DD14-2	DD2-5	OW	0.5
DD14-3	DD2-7	OS	0.5
DD14-4	DD2-8	ON	0.5
DD15-1	LB78	BK	0.5
DD15-2	LB61-15	R	0.5
LB61-1	DD6-1	PN	0.5
LB61-2	DD9-1	PW	0.5
LB61-3	DD13-2	K	0.5
LB61-4	DD2-18	RW	0.5
LB61-5	DD2-19	RG	0.5
LB61-6	DD2-20	YW	0.5
LB61-7	DD2-12	BR	0.5
LB61-8	DD2-13	BP	0.5
LB61-9	DD2-14	BG	0.5
LB61-10	DD2-15	BLG	0.5
LB61-11	DD2-16	BO	0.5
LB61-12	DD2-17	GLG	0.5
LB61-13	DD2-11	BW	0.5
LB61-15	DD15-2	R	0.5
LB61-16	DD12-1	UY	0.5
LB61-17	DD1-6	WN	0.5
LB61-18	DD6-2	PO	0.5
LB61-19	DD6-4	PK	0.5
LB61-21	DD9-2	UO	0.5
LB61-22	DD7-1	OR	0.5
LB61-23	DD2-2	DG	0.5
LB61-24	DD2-3	DY	0.5
LB61-25	DD2-4	DP	0.5
LB61-26	DD6-5	YO	0.5
LB61-28	DD2-23	BN	0.5
LB61-29	DD2-24	BU	0.5
LB61-32	DDS1	G	0.5
LB62-1	DD1-5	B	2.0
LB62-2	DD1-1	NP	2.0
LB62-5	DD13-1	NY	0.5
LB62-6	LB78	BK	0.5
DDSI	DD9-5	G	0.5
DDSI	LB61-32	G	0.5
DDSI	DD2-21		0.5
LB78	LB62-6	BK	2.0
LB78	DD6-6	BK	0.5
LB78	DD9-6	BK	0.5
LB78	DD15-1	BK	0.5

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DRCVER'S DOOR HARNESS DD (LHD) 9 1MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



FRONT PASSENGER DOOR HARNESS (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
PD2	'M4 6 way socket black)	Door switch	Front passenger door
PD5	²M4 6 wav socket yellow)	Door actuator	Front passenger door
PD6	²M5 2 wav socket black)	Window lift motor	Front passenger door
PD7	²M4 6 way socket yellowl	Passenger door panel	Front passenger door
PD8	²MHD 6 way socket yellowl	Passenger door panel	Front passenger door
PD15	²MHD 2 way socket blue)	Passenger door panel	Front passenger door
PD16	3rote Harmann 2 way ;ocket (blue)	Passenger door mirror	Front passenger door
PD17	3rote Harmann 4 way ;lug (yellowl	Passenger door mirror	Front passenger door
PD18	;rote Harmann 5 way ;ocket (black)	Door key switch	Front passenger door
RB7	²M4 6 way plug (black)	Bulkhead connection	LH 'A' post
RB8	²MHD 24 way socket black)	Bulkhead connection	LH 'A' post

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FRONT PASSENGER DOOR HARNESS (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

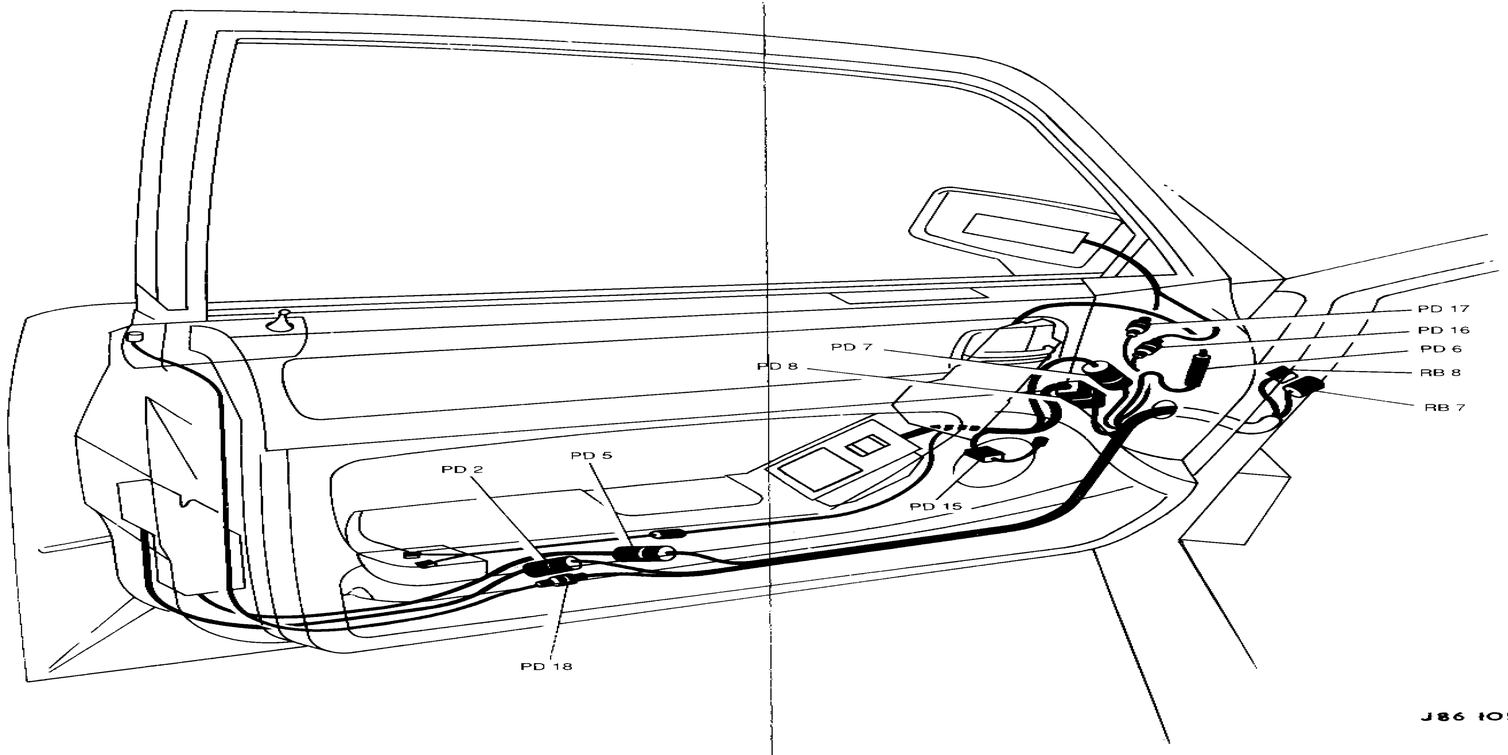
Connector	Location	Access
PD2	Front passenger door	Door trim pad (lower)
PD5	Front passenger door	Door trim pad (lower)
PD6	Front passenger door	Door trim pad (lower)
PD7	Front passenger door	Door trim pad (lower)
PD8	Front passenger door	Door trim pad (lower)
PD15	Front passenger door	Door trim pad (lower)
PD16	Front passenger door	Door trim pad (upper)
PD17	Front passenger door	Door trim pad (upper)
PD18	Front passenger door	Door trim pad (lower)
RB7	LH 'A' post	Front passenger dash liner
RB8	LH 'A' post	Front passenger dash liner

FRONT PASSENGER DOOR HARNESS (RHD)
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	olour / arbe / ouleur / leur / olore / olor	Querschnitt / Section / Maat / Dametro / Tamano
PD2-1	RB8-7		0.5
PD2-2	RB8-13	;W	0.5
PD2-5	PDSI		0.5
PD2-6	RB78	;K	0.5
PD5-1	RB8-9	'N	0.5
PD5-2	RB8-10	'O	0.5
PD5-4	RB8-11	'K	0.5
PD5-5	RB8-12	;O	0.5
PD5-6	RB78	;K	0.5
PD6-1	PD7-5	)B	2.0
PD6-2	PD7-2	)U	2.0
PD7-1	RB7-2	JP	2.0
PD7-2	PD6-2	)U	2.0
PD7-5	PD6-1	)B	2.0
PD7-6	RB7-1	I	2.0
PD8-1	RB8-2	'W	0.5
PD8-2	RB8-3	;R	0.5
PD8-3	RB8-4	;P	0.5
PD8-4	PDSI	;	0.5
PD8-5	RB8-6	:W	0.5
PD8-6	RB8-8	:LG	0.5
PD15-1	RB8-21	JY	0.5
PD16-1	RB7-5	JY	0.5
PD16-2	RB8-5		0.5
PD17-1	RB8-17	)P	0.5
PD17-2	RB8-16	)Y	0.5
PD17-3	RB8-14	)R	0.5
PD17-4	RB8-15	)G	0.5
PD18-1	RB78	;K	0.5
PD18-2	RB8-1	I	0.5
RB7-1	PD7-6	I	2.0
RB7-2	PD7-1	JP	2.0
RB7-5	PD16-1	JY	0.5
RB7-6	RB78	;K	2.0
RB8-1	PD18-2	I	0.5
RB8-2	PD8-1	'W	0.5
RB8-3	PD8-2	;R	0.5
RB8-4	PD8-3	;P	0.5
RB8-5	PD16-2		0.5
RB8-6	PW8-5	:W	0.5
RB8-7	PD2-1		0.5
RB8-8	PD8-6	:LG	0.5
RB8-9	PD5-1	'N	0.5
RB8-10	PD5-2	'O	0.5
RB8-11	PD5-4	'K	0.5
RB8-12	PD5-5	;O	0.5
RB8-13	PD2-2	;W	0.5
RB8-14	PD17-3	)R	0.5
RB8-15	PD17-4	)G	0.5
RB8-16	PD17-2	)Y	0.5
RB8-17	PD17-1	)P	0.5
RB8-20	PDSI	;	0.5
RB8-21	PD15-1	JV	0.5
PDSI	PD2-5	;	0.5
PDS1	PD8-4	;	0.5
PDSI	RB8-20	;	0.5
RB78	RB7-6	IK	2.0
RB78	PD18-1	;K	0.5
RB78	PD5-6	;K	0.5
RB78	PD2-6	;K	0.5

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FRONT PASSENGER DOOR HARNESS (RHD) 9 1MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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FRONT PASSENGER DOOR HARNESS (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
PD2	PM4 6 way socket [black)	Door switch	Front passenger door
PD5	PM4 6 way socket (yellow)	Door actuator	Front passenger door
PD6	PM5 2 way socket (black)	Window lift motor	Front passenger door
PD7	PM4 6 way socket (yellow)	Passenger door panel	Front passenger door
PD8	PMHD 6 way socket (yellow)	Passenger door panel	Front passenger door
PD15	PMHD 2 way socket (blue)	Passenger door panel	Front passenger door
PD16	Grote Harmann 2 way socket (blue)	Passenger door mirror	Front passenger door
PD17	Grote Harmann 4 way plug (yellow)	Passenger door mirror	Front passenger door
PD18	Grote Harmann 5 way socket (black)	Door key switch	Front passenger door
LB7	PM4 6 way plug (black)	Bulkhead connection	LH 'A' post
LB8	PMHD 24 way socket (black)	Bulkhead connection	LH 'A' post

FRONT PASSENGER DOOR HARNESS (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
PD2	Front passenger door	Door trim pad (lower)
PD5	Front passenger door	Door trim pad (lower)
PD6	Front passenger door	Door trim pad (lower)
PD7	Front passenger door	Door trim pad (lower)
PD8	Front passenger door	Door trim pad (lower)
PD15	Front passenger door	Door trim pad (lower)
PD16	Front passenger door	Door trim pad (upper)
PD17	Front passenger door	Door trim pad (upper)
PD18	Front passenger door	Door trim pad (lower)
LB7	LH 'A' post	LH dash liner
LB8	LH 'A' post	LH dash liner

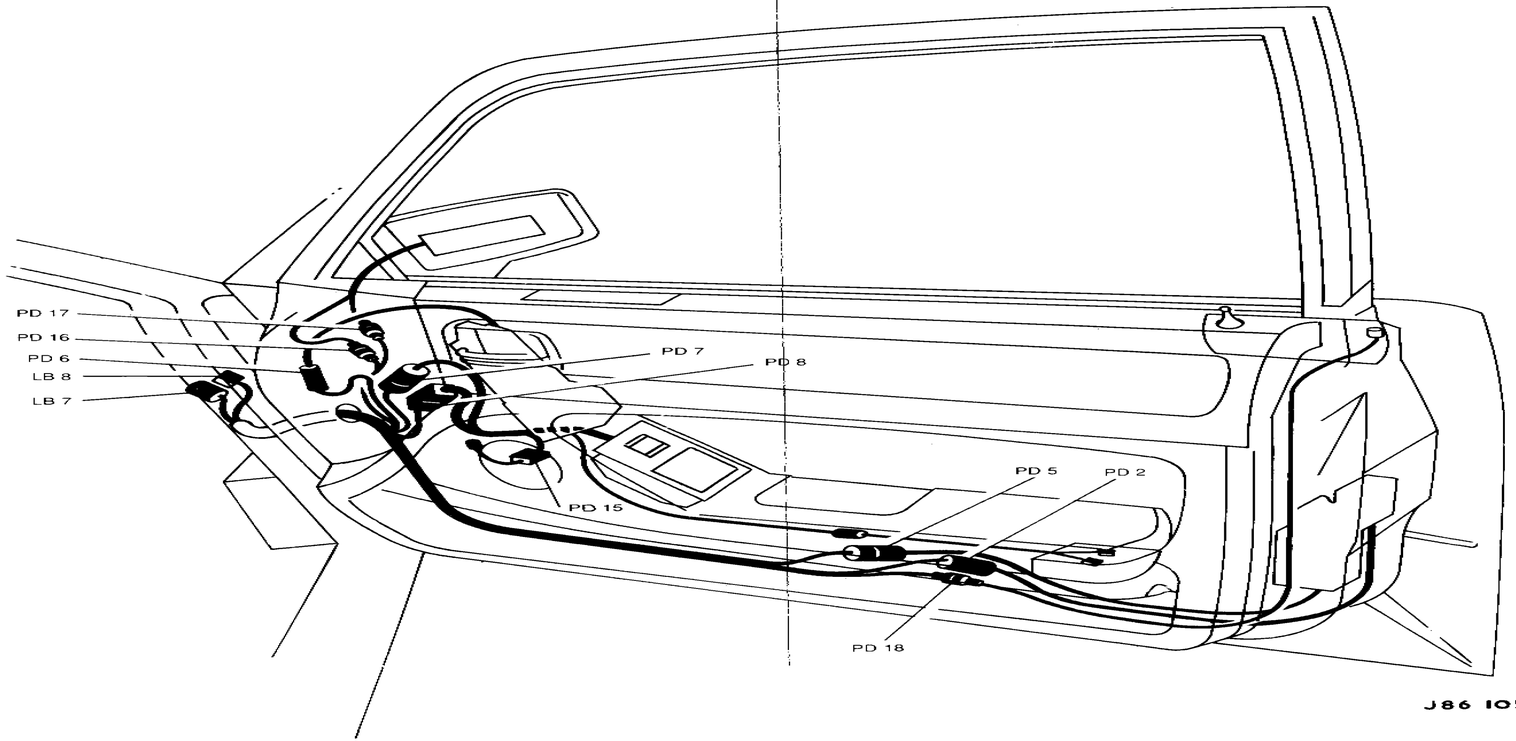
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FRONT PASSENGER DOOR HARNESS (LHD)
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Wacia	Colour / Farbe / Couleur / Kleur / More / Color	Size (mm) / Querschniti / Section / Maat / Dametro / Tarnano
PD2-1	LBB-7	P	0.5
PD2-2	LB8-13	GW	0.5
PD2-5	PDS1	G	0.5
PD2-6	LB78	BK	0.5
PD5-1	LB8-9	PN	0.5
PD5-2	LB8-10	PO	0.5
PD5-4	LB8-11	PK	0.5
PD5-5	LB8-12	RO	0.5
PD5-6	LB78	BK	0.5
PD6-1	PD7-5	OB	2.0
PO6-2	PD7-2	OU	2.0
PD7-1	LB7-2	NP	2.0
PD7-2	PD6-2	OU	2.0
PD7-5	PD6-1	OB	2.0
PD7-6	LB7-1	3	2.0
PW8-1	LB8-2	YW	0.5
PD8-2	LB8-3	3R	0.5
PD8-3	LB8-4	3P	0.5
PD8-4	PDS1	^	0.5
PD8-5	LB8-6	<W	0.5
PD8-6	LB8-8	<LG	0.5
PD15-1	LB8-21	JY	0.5
PD16-1	LB7-5	VY	0.5
PD16-2	LB8-5	<	0.5
PD17-1	LB8-17	3P	0.5
PD17-2	LB8-16	OY	0.5
PD17-3	LB8-14	OR	0.5
PD17-4	LB8-15	OG	0.5
PD18-1	LB78	3K	0.5
PD18-2	LB8-1	R	0.5
LB7-1	PD7-6	3	2.0
LB7-2	PD7-1	UP	2.0
LB7-5	PD16-1	VY	0.5
LB7-6	LE78	3K	2.0
LB8-1	PD18-2	R	0.5
LB8-2	PD8-1	YW	0.5
LB8-3	PDB-2	3R	0.5
LB8-4	PD8-3	3P	0.5
LB8-5	PD16-2	<	0.5
LB8-6	PDB-5	<W	0.5
LB8-7	PD2-1	P	0.5
LB8-8	PD8-6	<LG	0.5
LB8-9	PD5-1	PN	0.5
LB8-10	PD5-2	PO	0.5
LB8-11	PD5-4	PK	0.5
LB8-12	PD5-5	RO	0.5
LB8-13	PD2-2	GW	0.5
LB8-14	PD17-3	OR	0.5
LB8-15	PD17-4	OG	0.5
LB8-16	PD17-2	OY	0.5
LB8-17	PD17-1	OP	0.5
LB8-20	PDS1	^	0.5
LB8-21	PD15-1	JY	0.5
PDS1	PW2-5	Y	0.5
PDS1	PD8-4	^	0.5
PDS1	LB8-20	a	3.5
LB78	LB7-6	BK	2.0
LB78	PD18-1	BK	3.5
LB78	PD5-6	BK	3.5
LB78	PD2-6	BK	3.5

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FRONT PASSENGER DOOR HARNESS (LHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



REAR PASSENGER DOOR HARNESS (RH) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
RD2	PM4 6 way socket (blue)	Door switch	Rear passenger door
RD3	PM5 2 way socket (green)	Door actuator	Rear passenger door
RD4	PM5 2 way socket (black)	Window lift motor	Rear passenger door
RD5	PMHD 6 way socket (yellow)	Passenger door panel	Rear passenger door
RD6	PM4 6 way socket (yellow)	Passenger door panel	Rear passenger door
RD7	PMHD 2 way socket (blue)	Passenger door panel	Rear passenger door
RS30	PM5 3 way plug (black)	Side harness RS	RH 'B'/'C' post
RS31	PMHD 6 way plug (black)	Side harness RS	RH 'B'/'C' post
RS32	PMHD 6 way socket (yellow)	Side harness RS	RH 'B'/'C' post

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REAR PASSENGER DOOR HARNESS (RH) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

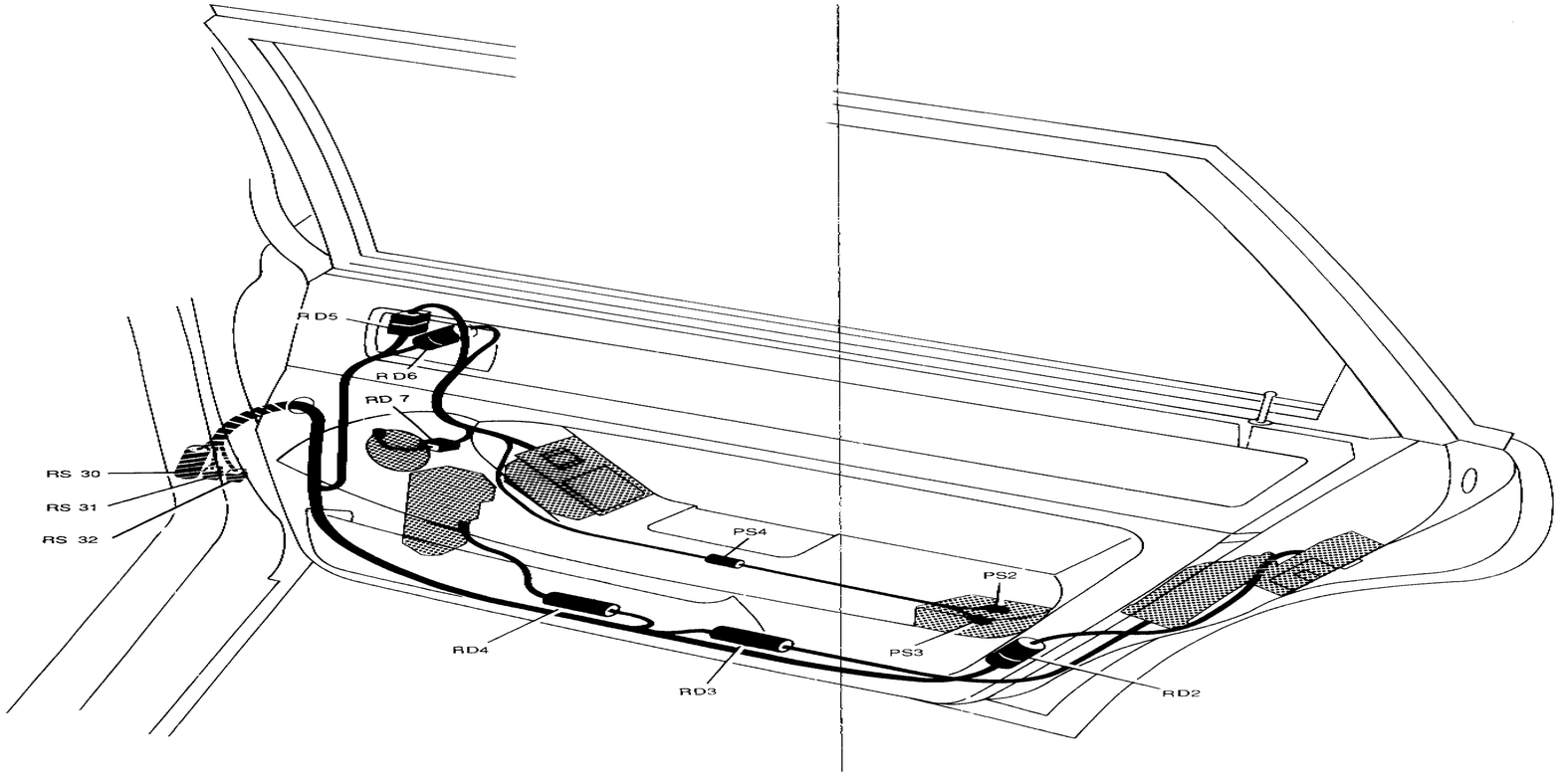
Connector	Location	Access
RD2	Rear passenger door	Door trim pad (lower)
RD3	Rear passenger door	Door trim pad (lower)
RD4	Rear passenger door	Door trim pad (lower)
RD5	Rear passenger door	Door trim pad (lower)
RD6	Rear passenger door	Door trim pad (lower)
RD7	Rear passenger door	Door trim pad (lower)
RS30	RH 'B'/'C' post	RH 'B'/'C' post liner
RS31	RH 'B'/'C' post	RH 'B'/'C' post liner
RS32	RH 'B'/'C' post	RH 'B'/'C' post liner

REAR PASSENGER DOOR HARNESS (RH SIDE)
WIRING SCHEDULE 90.50.90/WS

rom	'o	Colour	ize (mm)
'on	lach	'arbe	luerschnitt
le		Couleur	ection
'an	laai	Kleur	Maat
la		Colore	lametro
lesde	lacia	Color	amano
ID2-1	RS31-4	?	1.5
ID2-2	RS32-1	GK	).5
RD2-5	RDS1R	?	).5
RD2-6	RS30-3	3K	1.5
RD3-1	RS32-3	PK	).5
ID3-2	RS32-2	PO	1.5
RD4-1	RD6-5	DB	!.0
RD4-2	RD6-2	DU	?.0
RD5-1	RS31-3	YW	).5
ID5-2	RS31-1	3D	).5
RD5-3	RS31-2	GLG	).5
RD5-4	RDS1R	?	).5
RD5-5	RS31-5	7N	1.5
RD5-6	RS31-6	RG	).5
RD6-1	RS30-2	US	!.0
RD6-2	RD4-2	DU	!.0
RD6-5	RD4-1	DB	!.0
RD6-6	RS30-1	3	?.0
RD7-1	RS32-4	JV	).5
RS30-1	RD6-6	3	!.0
RS30-2	RD6-1	NS	?.0
RS30-3	RD2-6	3K	1.5
RS31-1	705-2	3O	1.5
RS31-2	RD5-3	GLG	).5
RS31-3	RD5-1	YW	1.5
RS31-4	RD2-1	?	).5
RS31-5	RD5-5	RN	).5
RS31-6	RD5-6	RG	1.5
RS32-1	RD2-2	GK	1.5
RS32-2	RD3-2	PO	).5
RS32-3	RD3-1	PK	).5
RS32-4	RD7-1	JY	1.5
RS32-5	RDS1R	G	).5
RDS1R	RD2-5	G	).5
RDS1R	RS32-5	G	).5
RDS1R	RD5-4	?	1.5

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REAR PASSENGER DOOR HARNESS (RH) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1052

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REAR DOOR HARNESS (LH SIDE) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
RD2	PM4 6 way socket (blue)	Door switch	Rear passenger door
RD3	PM4 2 way socket (green)	Door actuator	Rear passenger door
RD4	PM4 2 way socket (black)	Window lift motor	Rear passenger door
R05	PMHD 6 way socket (yellow)	Passenger door panel	Rear passenger door
RD6	PM4 6 way socket (yellow)	Passenger door panel	Rear passenger door
RD7	PMHD 2 way socket (blue)	Passenger door panel	Rear passenger door
LS7	PM5 3 way plug (black)	Side harness LS	RH 'B'I'C' post
LS6	PMHD 6 way plug (black)	Side harness LS	RH 'B'/'C' post
LS8	PMHD 6 way socket (yellow)	Side harness LS	RH 'R'I'C' post

REAR PASSENGER DOOR HARNESS (LH SIDE) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
RD2	Rear passenger door	Door trim pad (lower)
RD3	Rear passenger door	Door trim pad llowerl
RD4	Rear passenger door	Door trim pad (lower)
RD5	Rear passenger door	Door trim pad llowerl
RD6	Rear passenger door	Door trim pad (lower)
RD7	Rear passenger door	Door trim pad (lower)
LS6	RH 'B'/'C' post	RH 'B'/'C' post liner
LS7	RH 'B'/'c' post	RH 'B'/'C' past liner
LS7	RH 'B'/'C' past	RH 'B'/'C' post liner

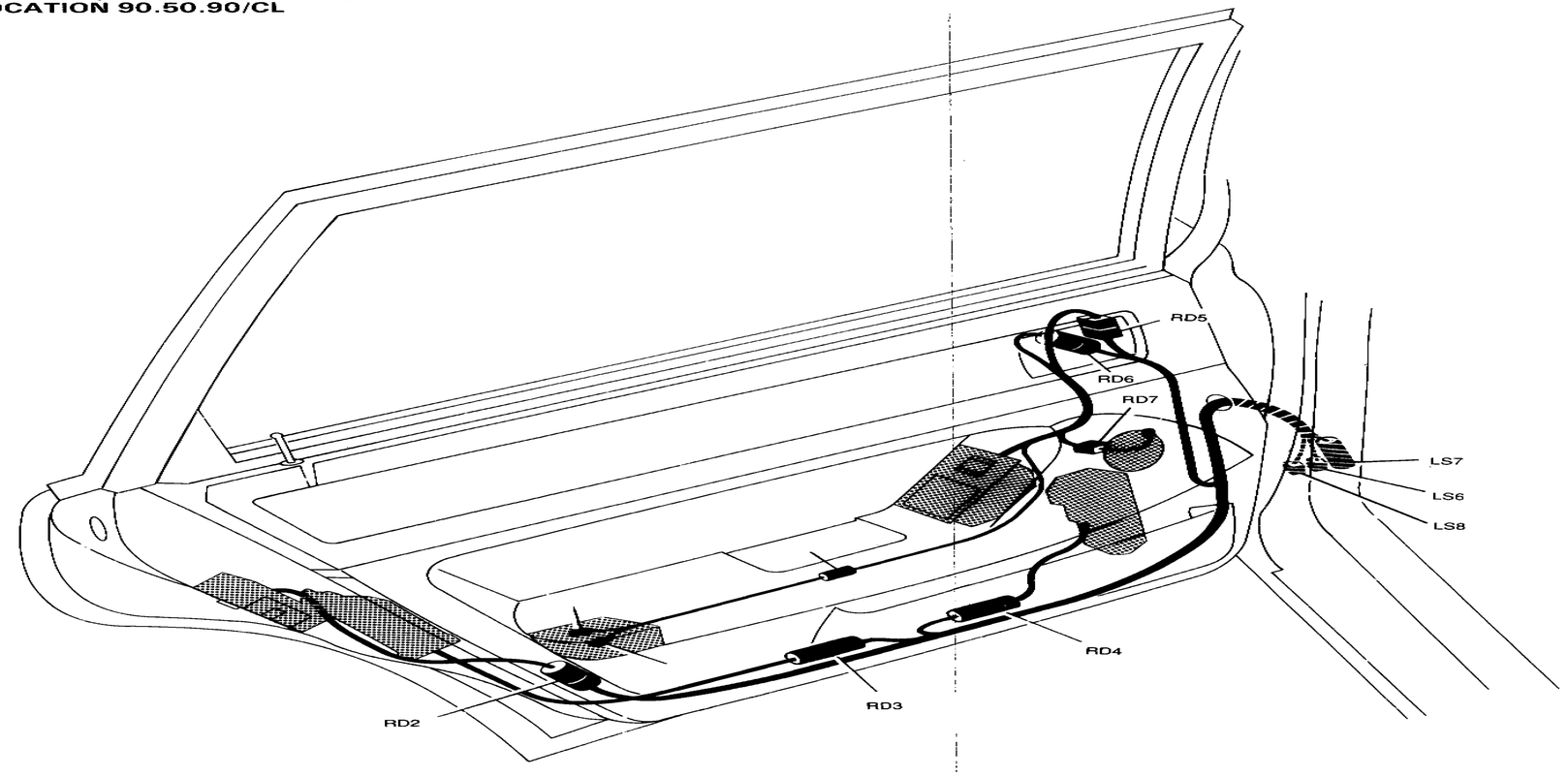
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REAR DOOR HARNESS (LH)
WIRING SCHEDULE 90.50.90/WS

rom	lo	olour	
/on	Nach	irbe	Querschnitt
)e	A	ouleur	Section
/an	Naar	eur	Maat
la	A	olore	Dametro
)esde	Hacia	olor	Tamano
RD2-1	LS6-4		3 5
RD2-2	LS8-1	K	1.5
RD2-5	RDS1R		3.5
RD2-6	LS7-3	K	3.5
RD3-1	LS7-3	K	3.5
RD3-2	LS7-2	O	3.5
RD4-1	RD6-5	B	0
RD4-2	RD6-2	U	.0
RD5-1	LS6-3	W	.5
RD5-2	LS6-1	O	5
RD5-3	LS6-2	LG	.5
RD5-4	RDSIR		.5
RD5-5	LS6-5	N	.5
RD5-6	LS6-6	G	.5
RD6-1	LS7-2	S	.0
RD6-2	RD4-2	U	.0
RD6-5	RD4-1	B	.0
RD6-6	LS7-1		.0
RD7-1	LS8-4	Y	.5
LS7-1	RD6-6		.0
LS7-2	RD6-1	S	0
LS7-3	RD2-6	K	.5
LS6-1	RD5-2	O	.5
LS6-2	RD5-3	LG	.5
LS6-3	RD5-1	W	.5
LS6-4	RD2-1		.5
LS6-5	RD5-5	N	.5
LS6-6	RD5-6	G	.5
LS8-1	RD2-2	K	.5
LS8-2	RD3-2	O	.5
LS8-3	RD3-1	K	.5
LS8-4	RD7-1	Y	.5
LS8-5	RDSIR		.5
RDS1R	RD2-5		.5
RDS1R	LS8-5		.5
RDS1R	RD5-4		.5

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REAR DOOR HARNESS (LH SIDE) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1118

DRIVER POWERED SEAT HARNESS (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

em	lescription	iterface	Location
S1	\MP Econoseal 3 way(red)	eat heaters	H and RH seats
.7	irote Hartmanrr 5 way ocket(black)	nterior light and ?at switch	H and RH seats
82	irote Hartmann 5 way lug (natural)	eat belt switch	H and RH seat belts
M2	\MP Econoseal 3 way ocket(black)	ecline motor	H and RH seats
M3	'50 blade connector(red)	ront raise motor	H and RH seats
M4	'50 blade connector(blue)	ront lower motor	H and RH seats
M5	\MP Econoseal 3 way ocket (black)	ore/aft motor	H and RH seats
M7	150 blade connector natural)	ear raise motor	H and RH seats
M8	!50 blade connector yellow)	ear lower motor	H and RH seats
S3	'M4 9 way plug(violet)	ulkhead harness seat motors)	ink lead SS1 switch ssembly to LH seat
S4	'M4 9 way plug (violet)	ulkhead harness	ink lead SS2 switch ssembly to RH seat
B41	'MHD 2 way plug (black)	ulkhead harness seat belt switch)	H seat
B46	'MHD 2 way plug (black)	ulkhead harness seat belt switch)	tH seat
B98	'M5 2 way plug (violet)	ulkhead harness driver's seat eaters)	H seat
B10	'M5 2 way plug (violet)	ulkhead harness assenger seat heaters)	H seat
18119	Grote Hartmann 5 way plug (black)	ulkhead harness	tH seat pad
B120	;rote Hartmann 5 way plug (black)	ulkhead harness	.H seat pad

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DRIVER POWERED SEAT HARNESS (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

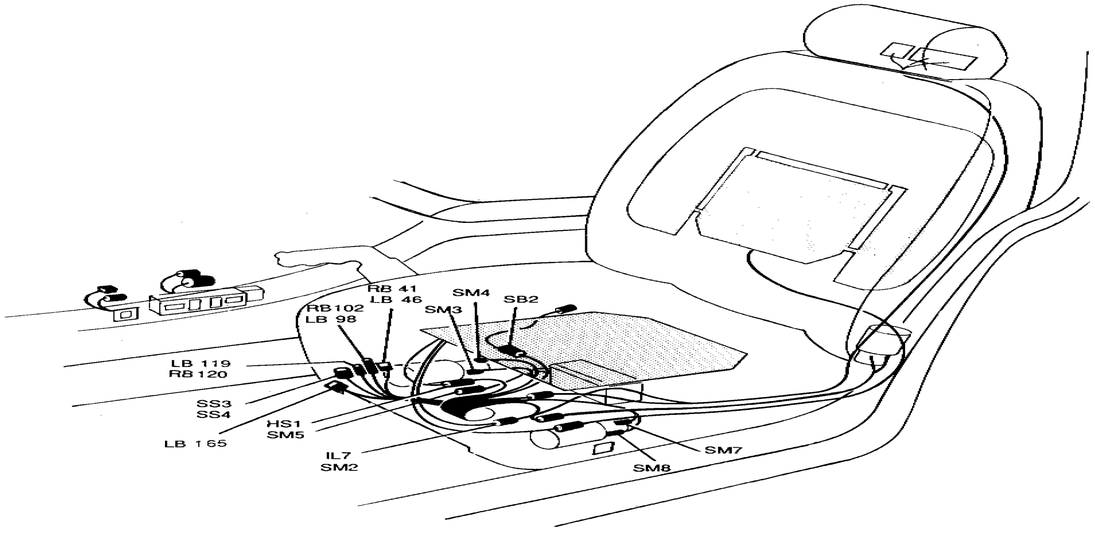
Connector	Location	Access
HS1	RH or LH front seat	Seat cushion
IL7	RH or LH front seat	Driver door
SB2	RH or LH front seat belt	Seat belt
SM2	RH or LH front seat	Seat cushion
SM3	RH or LH front seat	Seat cushion
SM4	RH or LH front seat	Seat cushion
SM5	RH or LH front seat	Seat cushion
SM7	RH or LH front seat	Seat cushion
SM8	RH or LH front seat	Seat cushion
ss3	LH front seat	Seat cushion and rear carpet
ss4	RH front seat	Seat cushion and rear carpet
RB41	Seat	Seat cushion (front of rear carpet)
RB46	Driver seat	Seat cushion (front of rear carpet)
RB98	Driver seat	Seat cushion (front of rear carpet)
RB102	Seat	Seat cushion (front of rear carpet)
RB119	Driver seat	Seat pad
RBI20	Seat	Seat belt

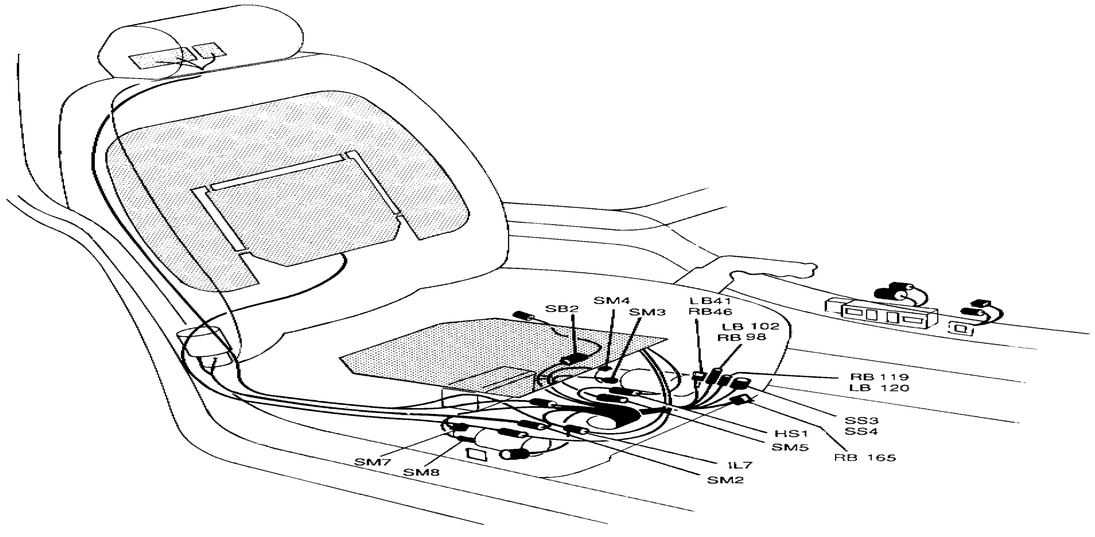
DRIVER'S POWE RED SEAT HARNESS (RHD) 91MY.4.0L
WIRING SCHEDU LE 90.50.90/WS

From / Von / De / Van / Da / Desde	o / Nach / À / Naar / À / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / iection / Maat / Dametro / amano
HS1-2	RB98-2	R	2.0
HS1-3	RB98-1	B	2.0
IL7-1	RB119-1	NW	3.5
IL7-2	RB119-2	BK	3.5
IL7-3	RB119-3	RLG	3.5
IL7-4	RB119-4	GB	3.5
SB2-1	RB41-2	SLG	3.5
SB2-2	RB41-1	GB	3.5
SB2-1	RB46-2	SLG	3.5
SB2-2	RB46-1	GB	3.5
SM2-2	SS3-8	S	2.0
SM2-3	SS3-9	N	2.0
SM2-2	SS4-8	S	2.0
SM2-3	SS3-9	N	2.0
SM3	SS3-3	R	2.0
SM3	SS4-3	R	2.0
SM4	SS3-5	U	2.0
SM4	SS4-5	U	2.0
SM5-2	RB165-1	K	2.0
SM5-3	SMS1	O	2.0
SM5-2	SS4-2	K	2.0
SM5-3	SS4-1	O	2.0
SM7	SS3-6	W	2.0
SM7	SS4-6	W	2.0
SM8	SS3-7	U	2.0
SM8	SS4-7	U	2.0
SM11-2	RB165-3	BN	2.0
SM11-3	SMS1	O	2.0
SS3-1	SMS1	O	2.0
SS3-2	RB165-2	K	2.0
SS3-3	3M3	A	2.0
SS3-5	5M4	U	2.0
SS3-6	3M7	W	2.0
SS3-7	SM8	V	2.0
SS3-8	SM2-2	S	2.0
ss3-9	SM2-3	N	2.0
ss4-1	SM5-3	O	2.0
SS4-2	SM5-2	K	2.0
ss4-3	SM3	R	2.0
SS4-5	3M4	U	2.0
SS4-6	SM7	W	2.0
ss4-7	SM8	Y	2.0
SS4-8	SM2-2	S	2.0
ss4-9	SM2-3	N	2.0
RB41-1	SB2-2	GB	3.5
RB41-2	SB2-1	SLG	3.5
RB46-1	SB2-2	GB	3.5
RB46-2	SB2-1	SLG	3.5
RB98-1	HS1-3	B	2.0
RB98-2	HS1-2	R	2.0
RB102-1	HS1-3	B	2.0
RB102-2	HS1-2	R	2.0
RB119-1	IL7-1	NW	3.5
RB119-2	IL7-2	BK	3.5
RB119-3	IL7-3	RLG	3.5
RB119-4	IL7-4	GB	3.5
AB120-1	IL7-1	NW	3.5
RB120-2	IL7-2	BK	3.5
RB120-3	IL7-3	RLG	3.5
RB120-4	IL7-4	GB	3.5
RB165-1	SM5-2	K	2.0
RB165-2	SS3-2	KS	2.0
RB165-3	SM11-2	BN	D.5
RB165-1	SM5-2	K	2.0
RB165-2	SS4-2	KS	2.0
RB165-3	SM11-2	BN	D.5

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DRIVER POWERED SEAT HARNESS (RHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL





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DRIVER POWERED SEAT HARNESS (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
HS1	AMP Econoseal 3 way(red)	Seat heaters	LH and RH seats
IL7	Grote Hartrnann 5 way socket(black)	Interior light and seat switch	LH and RH seats
SB2	Grote Hartmann 5 way plug (natural)	Seat belt switch	LH and RH seat belts
SM2	AMP Econoseal 3 way socket(black)	Recline motor	LH and RH seats
SM3	250 blade connector(red)	Front raise motor	LH and RH seats
SM4	250 blade connector(blue)	Front lower motor	LH and RH seats
SM5	AMP Econoseal 3 way socket (black)	Fore/aft motor	LH and RH seats
SM7	250 blade connector (natural)	Rear raise motor	LH and RH seats
SM8	250 blade connector (yellow)	Rear lower motor	LH and RH seats
ss3	PM4 9 way plug(violet)	Bulkhead harness (seat motors)	Link lead SS1 switch assembly to LH seat
ss4	PM4 9 way plug (violet)	Bulkhead harness	Link lead 552 switch assembly to RH seat
LB41	PMHD 2 way plug (black)	Bulkhead harness (seat belt switch)	LH seat
LB46	PMHD 2 way plug (black)	Bulkhead harness (seat belt switch)	RH seat
LB98	PM5 2 way plug (violet)	Bulkhead harness (driver's seat heaters)	LH seat
LB102	PM5 2 way plug (violet)	Bulkhead harness (passenger seat heaters)	LH seat
LB119	Grote Hartrnann 5 way plug (black)	Bulkhead harness	RH seat pad
LB120	Grote Hartmann 5 way plug (black)	Bulkhead harness	LH seat pad

DRIVER POWERED SEAT HARNESS (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
HS1	RH or LH front seat	Seat cushion
IL7	RH or LH front seat	Drivsr door
SB2	RH or LH front seat belt	Seat belt
SM2	RH or LH front seat	Seat cushion
SM3	RH or LH front seat	Seat cushion
SM4	RH or LH front seat	Seat cushion
SM5	RH or LH front seat	Seat cushion
SM7	RH or LH front seat	Seat cushion
SM8	RH or LH front seat	Seat cushion
SS3	LH front seat	Seat cushion and rear carpet
SS4	RH front seat	Seat cushion and rear carpet
LB41	Seat	Seat cushion Ifront of rear carpet)
LB46	Driver seat	Seat cushion (front of rear carpet)
LB98	Driver seat	Seat cushion (front of rear carpet)
LB102	Seat	Seat cushion (front of rear carpet)
LB119	Driver seat	Seat pad
LB120	Seat	Seat belt

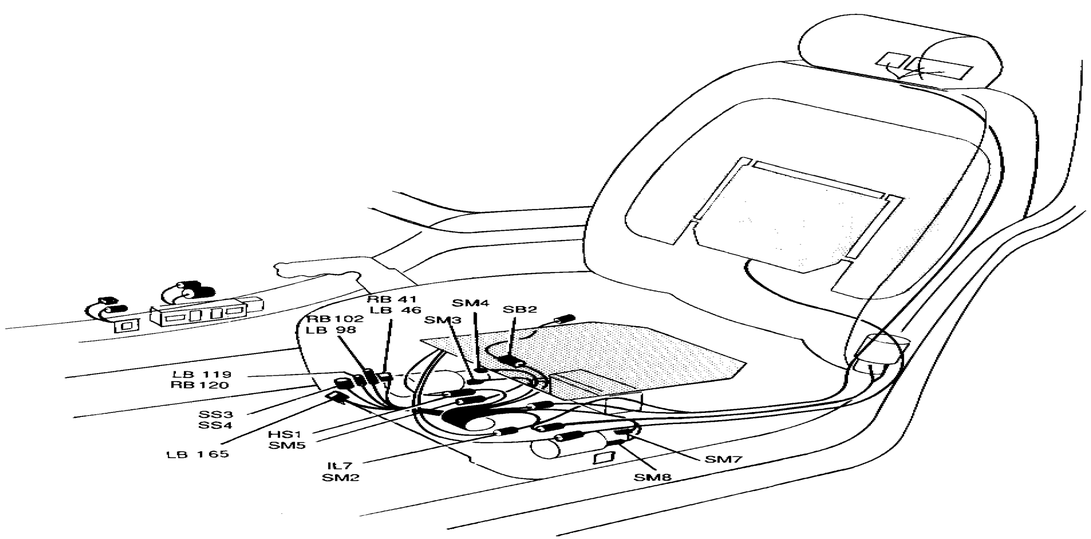
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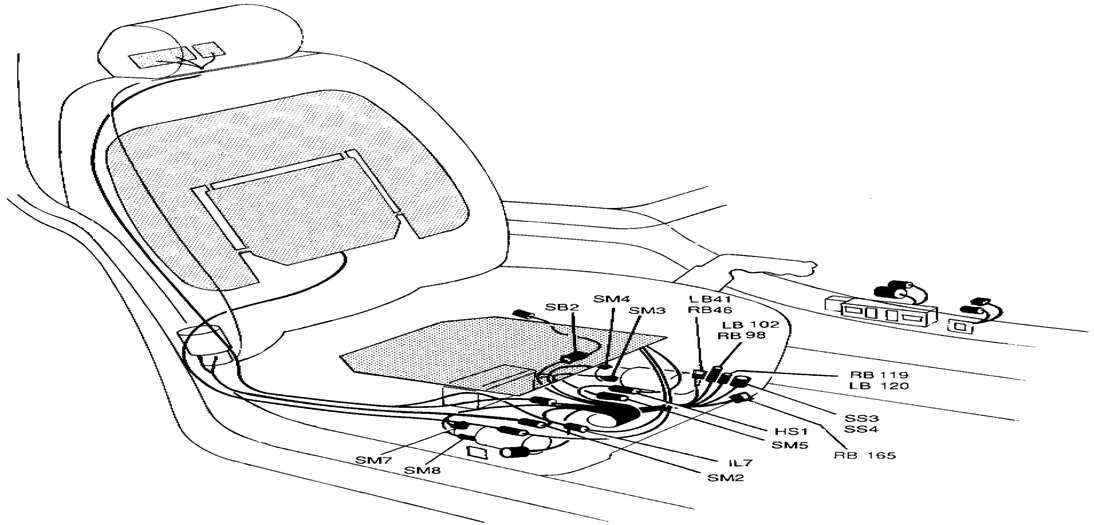
DRIVER'S POWERED SEAT HARNESS (LHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
Dei	A	Couleur	Section
Vàn	Nâar	Kleur	Maat
Da	A	Colore	Dametro
Desde	Hacia	Color	Tamano
HS1-2	LB98-2	R	2.0
HS1-3	LB98-1	B	2.0
IL7-1	LB119-1	NW	0.5
IL7-2	LB119-2	BK	0.5
IL7-3	LB119-3	RLG	0
IL7-4	LB119-4	GB	0.5
SB2-1	LB41-2	SLG	0.5
SB2-2	LB41-1	GB	0.5
SB2-1	LB46-2	SLG	0.5
SB2-2	LB46-1	GB	0.5
SM2-2	SS3-8	S	2.0
SM2-3	SS3-9	N	2.0
SM2-2	SS4-8	S	2.0
SM2-3	SS3-9	N	2
SM3	SS3-3	R	2.0
SM3	SS4-3	R	2.0
SM4	Ss3-5	U	2.0
SM4	SS4-5	U	2.0
SM5-2	RB167-2	K	2.0
SM5-3	SMS1	O	2.0
SM5-2	SS4-2	K	2.0
SM5-3	Ss4-1	O	2.0
SM7	SS3-6	W	2.0
SM7	S54-6	W	2.0
SM8	SS3-7	U	2.0

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DRIVER POWERED SEAT HARNESS (LHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90CL





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PASSENGER POWERED SEAT HARNESS (NARROW-RHD)91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
HS1	AMP Econoseal 3 way(red)	Seat heaters	LH and RH seats
IL7	Grote Hartmann 5 way socket(black)	Interior light and seat switch	LH and RH seats
SB2	Grote Hartmann 5 way plug (natural)	Seat belt switch	LH and RH seat belts
SM2	AMP Econoseal 3 way socket(black)	Recline motor	LH and RH seats
SM3	250 blade connector(red)	Front raise motor	LH and RH seats
SM4	250 blade connector(blue)	Front lower motor	LH and RH seats
SM5	AMP Econoseal 3 way socket (black)	Fore/aft motor	LH and RH seats
SM7	250 blade connector (natural)	Rear raise motor	LH and RH seats
SM8	250 blade connector (yellow)	Rear lower motor	LH and RH seats
SS3	PM4 9 way plug(violet)	Bulkhead harness (seat motors)	Link lead SS1 switch assembly to LH seat
SS4	PM4 9 way plug (violet)	Bulkhead harness	Link lead SS2 switch assembly to RH seat
RB41	PMHD 2 way plug (black)	Bulkhead harness (seat belt switch)	LH seat
RB46	PMHD 2 way plug (black)	Bulkhead harness (seat belt switch)	RH seat
RB98	PM5 2 way plug (violet)	Bulkhead harness (driver's seat heaters)	LH seat
RB102	PM5 2 way plug (violet)	Bulkhead harness (passenger seat heaters)	LH seat
RB119	Grote Hartmann 5 way plug (black)	Bulkhead harness	RH seat pad
RB120	Grote Hartmann 5 way plug (black)	Bulkhead harness	LH seat pad

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PASSENGER POWERED SEAT HARNESS (NARROW RHD) 91MY.4.0L LOCATION AND ACCESS 90.50.90/HS

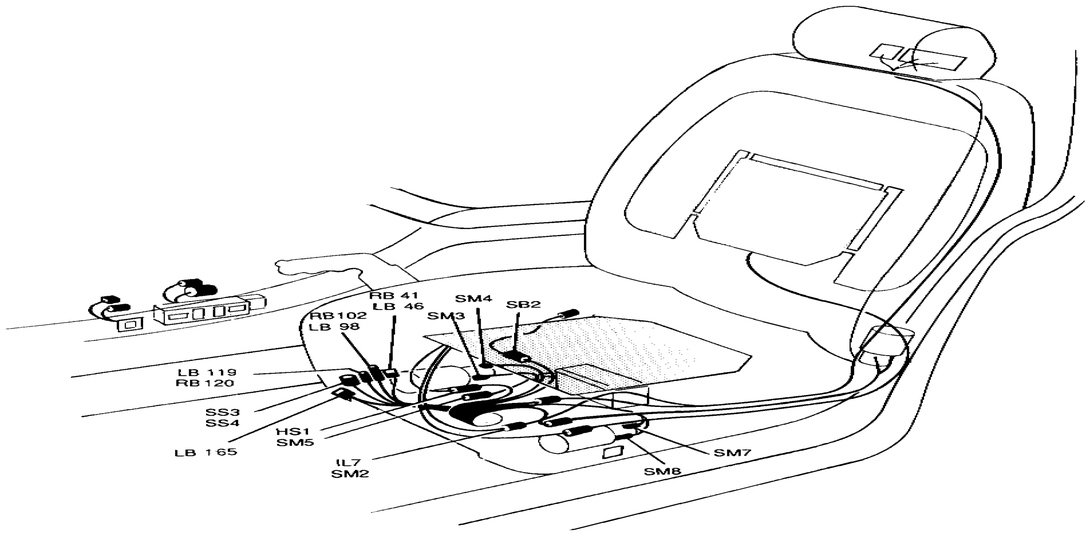
Connector	Location	Access
HS1	RH or LH front seat	Seat cushion
IL7	RH or LH front seat	Driver door
SB2	RH or LH front seat belt	Seat belt
SM2	RH or LH front seat	Seat cushion
SM3	RH or LH front seat	Seat cushion
SM4	RH or LH front seat	Seat cushion
SM5	RH or LH front seat	Seat cushion
SM7	RH or LH front seat	Seat cushion
SM8	RH or LH front seat	Seat cushion
ss3	LH front seat	Seat cushion and rear carpet
ss4	RH front seat	Seat cushion and rear carpet
RB41	Seat	Seat cushion (front of rear carpet)
RB46	Driver seat	Seat cushion (front of rear carpet)
RB98	Driver seat	Seat cushion (front of rear carpet)
RB102	Seat	Seat cushion (front of rear carpet)
RB119	Driver seat	Seat pad
AB120	Seat	Seat belt

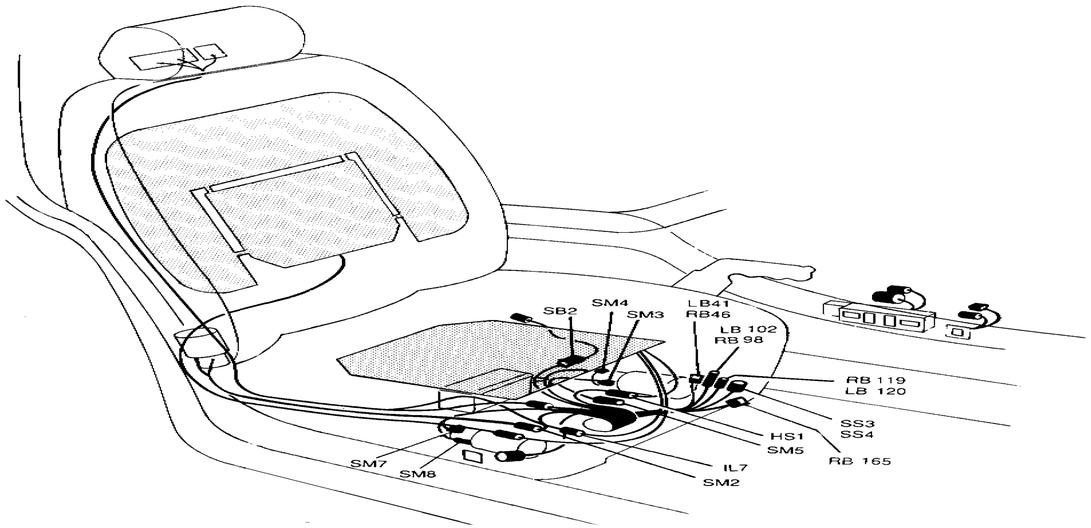
PASSENGER POWERED SEAT HARNESS (NARROW-RHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From / Von / De / Van / Da / Desde	To / Nach / A / Naar / A / Hacia	Colour / Farbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Dametro / Taniano
HS1-2	RB98-2	R	2.0
HS1-3	RB98-1	B	2.0
IL7-1	RB119-1	NW	0.5
IL7-2	RBI 19-2	BK	0.5
IL7-3	RB119-3	RLG	0.5
IL7-4	RB119-4	GB	0.5
SB2-1	RB41-2	GLG	0.5
SB2-2	RB41-1	GB	0.5
SB2-1	RB46-2	GLG	0.5
SB2-2	RB46-1	GB	0.5
SM2-2	ss3-8	G	2.0
SM2-3	SS3-9	W	2.0
SM2-2	SS4-8	G	2.0
SM2-3	SS4-9	U	2.0
SM3	ss3-3	R	2.0
SM3	SS4-3	R	2.0
SM4	ss3-5	J	2.0
SM4	ss4-5	J	2.0
SM5-2	SS3-2	K	2.0
SM5-3	SS3-1	D	2.0
SM5-2	SS4-2	K	2.0
SM5-3	SS4-1	B	2.0
5M7	SS3-6	N	2.0
SM7	SS4-6	N	2.0
SM8	ss3-7	J	2.0
SM8	ss4-7	J	2.0
SS3-1	SMSI	B	2.0
SS3-2	RB165-2	K	2.0
SS3-3	SM3	R	2.0
SS3-5	SM4	J	2.0
SS3-6	SM7	N	2.0
SS3-7	SM8	Y	2.0
SS3-8	SM2-2	G	2.0
SS3-9	SM2-3	W	2.0
SS4-1	SMSI	D	2.0
SS4-2	RBI65-2	K	2.0
SS4-3	SM3	R	2.0
SS4-5	SM4	J	2.0
SS4-6	SM7	N	2.0
SS4-7	SM8	Y	2.0
SS4-8	SM2-2	G	2.0
SS4-9	SM2-3	W	2.0
RB41-1	SB2-2	GB	0.5
RB41-2	SB2-1	GLG	0.5
RB46-1	SB2-2	GB	3.5
RB46-2	SB2-1	GLG	0.5
RB98-1	HS1-3	B	2.0
RB98-2	HS1-2	R	2.0
RB102-1	HS1-3	B	2.0
RB102-2	HS1-2	T	2.0
RB119-1	IL7-1	NW	3.5
RB119-2	IL7-2	BK	0.5
RB119-3	IL7-3	RLG	3.5
RB119-4	IL7-4	GB	3.5
RB120-1	IL7-1	NW	3.5
RB120-2	IL7-2	BK	3.5
RB120-3	IL7-3	RLG	3.5
RB120-4	IL7-4	GB	3.5

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PASSENGER POWEREO SEAT HARNESS (RHD) 9 1MY.4.0L
CONNECTOR LOCATION 90.50.90/CL





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PASSENGER POWERED SEAT HARNESS (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

ern	lescription	.nterface	.ocation
IS1	\MP Econoseal 3 way(red)	Seat heaters	H and RH seals
-7	irote Hartmann 5 way ocket(black)	nterior light and eat switch	H and RH seats
B2	irote Hartniann 5 way lug (natural)	Seat belt switch	H and RH seat belts
M2	MP Econoseal 3 way ocket(black)	Recline motor	H and RH seats
M3	!50 blade connector(red)	Front raise motor	H and RH seats
M4	!50 blade connector(blue)	Front lower motor	H and RH seats
M5	\MP Econoseal 3 way ocket (black)	Fore/aft motor	H and RH seats
M7	!50 blade connector natural)	Rear raise motor	H and RH seats
M8	!50 blade connector yellow)	Rear lower motor	H and RH seats
S3	'M4 9 way plug(violet)	Bulkhead harness seat motors)	ink lead SS1 switch ssembly to LH seat
S4	'M4 9 way plug (violet)	Bulkhead harness	ink lead SS2 switch ssembly to RH seat
B41	'MHD 2 way plug (black)	Bulkhead harness seat belt switch)	H seat
646	'MHD 2 way plug (black)	Bulkhead harness seat belt switch)	IH seat
B98	'M5 2 way plug (violet)	Bulkhead harness driver's seat eaters)	H seat
8102	'M5 2 way plug (violet)	Bulkhead harness passenger seat heaters)	H seat
6119	Grote Hartmann 5 way lug (black)	Bulkhead harness	IH seat pad
8120	Grote Hartmann 5 way lug (black)	Bulkhead harness	H seat pad

PASSENGER POWERED SEAT HARNESS (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
HS1	RH or LH front seat	Seat cushion
IL7	RH or LH front seat	Driver door
SB2	RH or LH front seat belt	Seat belt
SM2	RH or LH front seat	Seat cushion
SM3	RH or LH front seat	Seat cushion
SM4	RH or LH front seat	Seat cushion
SM5	RH or LH front seat	Seat cushion
SM7	RH or LH front seat	Seat cushion
SM8	RH or LH front seat	Seat cushion
SS3	LH front seat	Seat cushion and rear carpet
SS4	RH front seat	Seat cushion and rear carpet
RB41	Seat	Seat cushion (front of rear carpet)
LB46	Driver seat	Seat cushion (front of rear carpet)
LB98	Driver seat	Seat cushion (front of rear carpet)
LB102	Seat	Seat cushion (front of rear carpet)
LB119	Driver seat	Seat pad
LB120	Seat	Seat belt

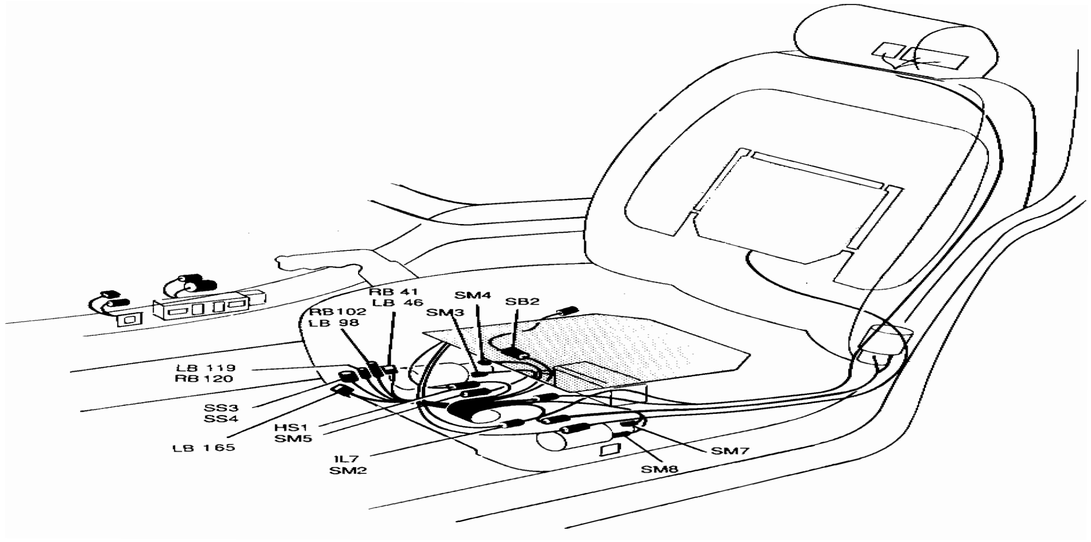
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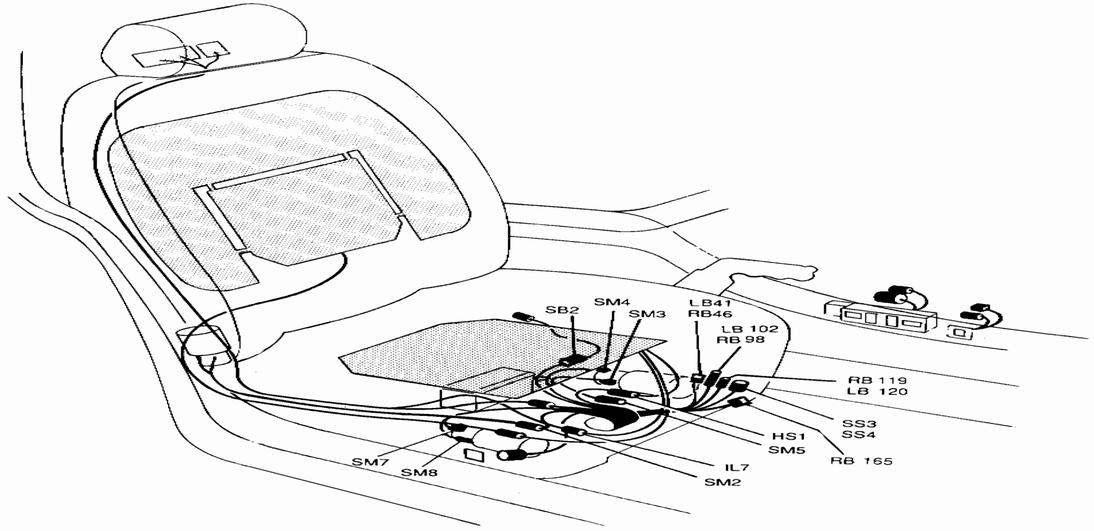
PASSENGER POWERED SEAT HARNESS (LHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Aaat
Da	A	Colore	Diametro
Desde	Hacia	Color	amano
HS1-2	LB98-2	R	2.0
HS1-3	LB98-1	B	2.0
IL7-1	LB119-1	NW	1.5
IL7-2	LB119-2	BK	1.5
IL7-3	LB119-3	RLG	1.5
IL7-4	LB119-4	GB	1.5
SB2-1	LB41-2	SLG	1.5
SB2-2	LB41-1	GB	0.5
SB2-1	LB46-2	SLG	0.5
SB2-2	LB46-1	GB	1.5
SM2-2	SS3-8	S	1.0
SM2-3	SS3-9	N	2.0
SM2-2	SS4-8	S	1.0
SM2-3	SS4-9	U	1.0
SM3	SS3-3	R	1.0
SM3	SS4-3	R	1.0
SM4	SS3-5	U	2.0
SM4	SS4-5	U	1.0
SM5-2	SS3-2	K	1.0
SM5-3	SS3-1	G	2.0
SM5-2	SS4-2	K	1.0
SM5-3	SS4-1	G	2.0
SM7	SS3-6	W	2.0
SM7	SS4-6	W	1.0
SM8	SS3-7	U	2.0
SM8	SS4-5	U	1.0
SS3-1	SM5-3	G	1.0
SS3-2	SM5-2	K	2.0
SS3-3	SM3	R	2.0
SS3-5	SM4	U	2.0
SS3-6	SM7	W	1.0
SS3-7	SM8	Y	2.0
SS3-8	SM2-2	S	1.0
SS3-9	SM2-3	N	1.0
SS4-1	SM5-3	G	1.0
SS4-2	SM5-2	K	2.0
SS4-3	SM3	R	1.0
SS4-5	SM4	U	1.0
SS4-6	SM7	W	1.0
SS4-7	SM8	Y	2.0
SS4-8	SM2-2	S	1.0
SS4-9	SM2-3	N	2.0
LB41-1	SB2-2	GB	1.5
LB41-2	SB2-1	SLG	0.5
LB46-1	SB2-2	GB	0.5
LB46-2	SB2-1	SLG	0.5
LB98-1	HS1-3	B	1.0
LB98-2	HS1-2	R	2.0
LB102-1	HS1-3	B	2.0
LB102-2	HS1-2	R	1.0
LB119-1	IL7-1	NW	1.5
LB119-2	IL7-2	BK	1.5
LB119-3	IL7-3	RLG	1.5
LB119-4	IL7-4	GB	1.5
LB120-1	IL7-1	NW	1.5
LB120-2	IL7-2	BK	1.5
LB120-3	IL7-3	RLG	1.5
LB120-4	IL7-4	GB	1.5

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PASSENGER POWERED SEAT HARNESS (LHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL





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MANUALLY ADJUSTED SEAT HARNESS (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
HS1	AMP Econoseal 3 way socket (red)	Seat heaters	LH and RH seats
IL7	Grote Hartmann 5 way socket (black)	Interior light and seat switch	LH and RH seats
RB41	PMHD 2 way plug (black)	Bulkhead harness (seat belt switch)	Under carpet blow RH seat
RB46	PMHD 2 way plug (black)	Bulkhead harness seat belt switch)	Under carpet below RH seat
RB98	PM5 2 way plug (violet)	Bulkhead harness	Under carpet below RH seat
RB102	PM5 2 way plug (violet)	Bulkhead harness (seat heaters)	Under centre console near LH seat
RB119	Grote Hartrnann 4 way plug black)	Bulkhead harness (interior light and seat switch)	Under carpet below seat

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MANUALLY ADJUSTED SEAT HARNESS 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

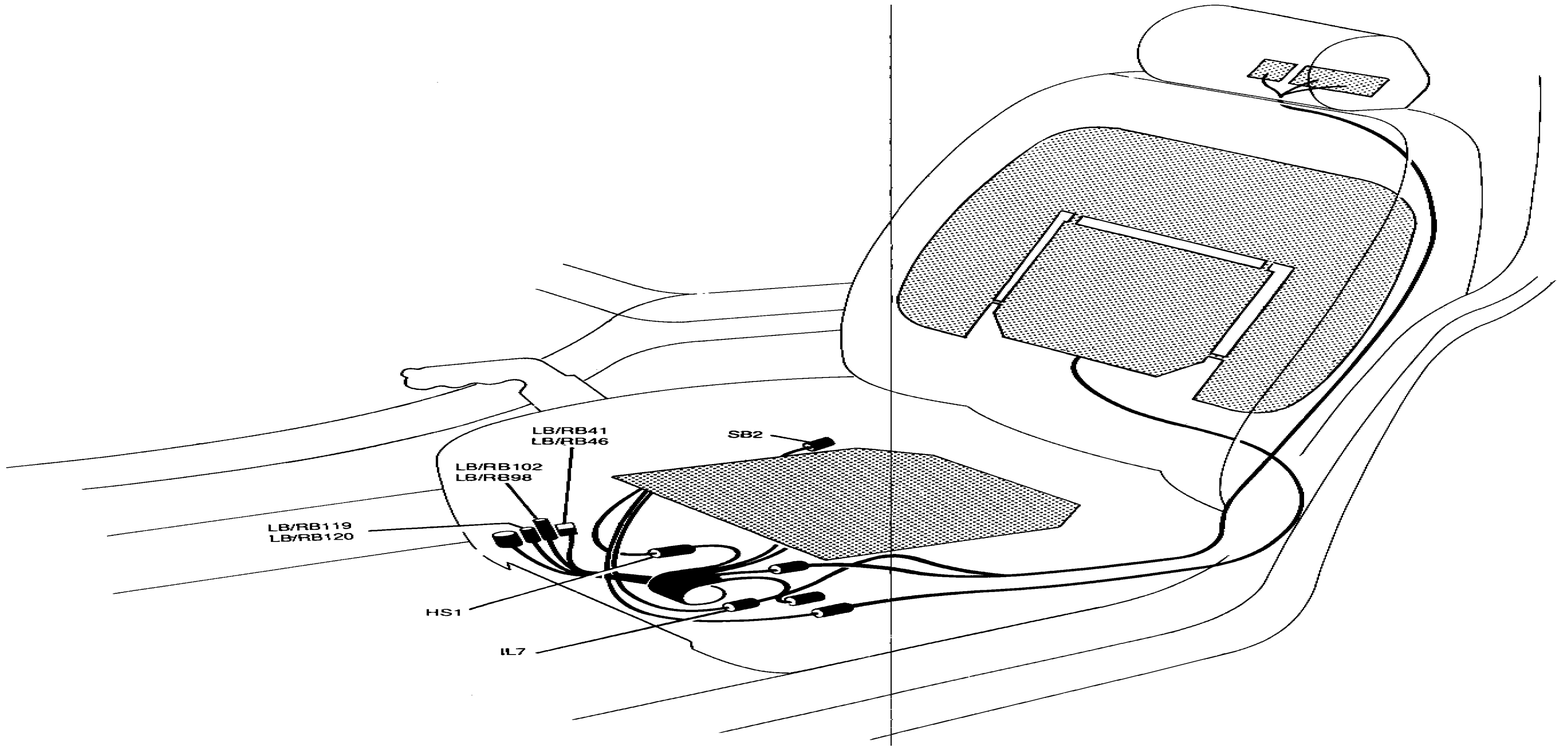
Connector	Location	Access
HS1	LH and RH seats	Below seat
IL7	LH and RH seats	Interior light and seat switch
AB41	Under RH seat	Under carpet
RB46	Under RH seat	Under carpet
RB98	Under RH seat	Under carpet
RB102	Adjacent to LH seat	Under centre console
RB119	Under seat	Under carpet

MANUALLY ADJUSTED SEAT HARNESS (RHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnit
De	A	Couleur	Section
Van	Naar	Kleur	Maat
Da	A	Colore	Dametro
Desde	Hacia	Color	Tamano
HS1-2	RB98-2	R	2.0
HS2-3	RB98-1	B	2.0
IL7-1	RE119-1	WW	0.5
IL7-2	RBI19-2	BK	0.5
L7-3	RB119-3	RLG	0.5
IL7-4	RBI19-4	GB	0.5
IL7-1	RB120-1	WW	0.5
L7-2	RB120-2	BK	0.5
L7-3	RBI20-3	RLG	0.5
IL7-4	RB120-4	GB	***0.5***
SB2-1	RB41-2	SLG	0.5
SB2-2	RB41-1	GB	0.5
SB2-1	RB46-2	SLG	0.5
SB2-2	RB46-1	GB	0.5
RB41-	SB2-2	GB	0.5
RB41-	SB2-1	SLG	0.5
RB46-1	SB2-2	GB	0.5
RB46-2	SB2-1	SLG	D.5
RB98-1	HS1-3	B	2.0
RB98-2	HS1-2	R	2.0
RB102-1	HS1-3	B	2.0
RB102-2	HS1-2	R	2.0
RB119-1	IL7-1	WW	0.5
38119-2	IL7-2	BK	3.5
RB119-3	IL7-3	RLG	3.5
RB119-4	IL7-4	GB	3.5
RB120-1	IL7-1	WW	3.5
RB120-2	IL7-2	BK	0.5
RB120-3	IL7-3	RLG	3.5
RB120-4	IL7-4	GB	3.5

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MANUALLY ADJUSTED SEAT HARNESS (RHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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MANUALLY ADJUSTED SEAT HARNESS (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
51	AMP Econoseal 3 way socket (red)	Seat heaters	LH and RH seats
7	Grote Hartmann 5 way socket (black)	Interior light and seat switch	LH and RH seats
141	PMHD 2 way plug (black)	Bulkhead harnsss (seat belt switch)	Under carpet below RH seat
146	PMHD 2 way plug (black)	Bulkhead harness seat belt switch)	Under carpet below RH seat
198	PM5 2 way plug (violet)	Bulkhead harness	Under carpet below RH seat
1102	PM5 2 way plug (violet)	Bulkhead harness (seat heaters)	Under centre console near LH seat
1119	Grote Hartmann 4 way plug (black)	Bulkhead harness linterior light and seat switch)	Under carpet below seat

MANUALLY ADJUSTED SEAT HARNESS (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
HS1	LH and RH seats	Below seat
IL7	LH and RH seats	Interior light and seat switch
LB41	Under RH seat	Under carpet
LE46	Under RH seat	Under carpet
LB98	Under RH seat	Under carpet
LE102	Adjacent to LH seat	Under centre console
LB119	Under seat	Under carpet

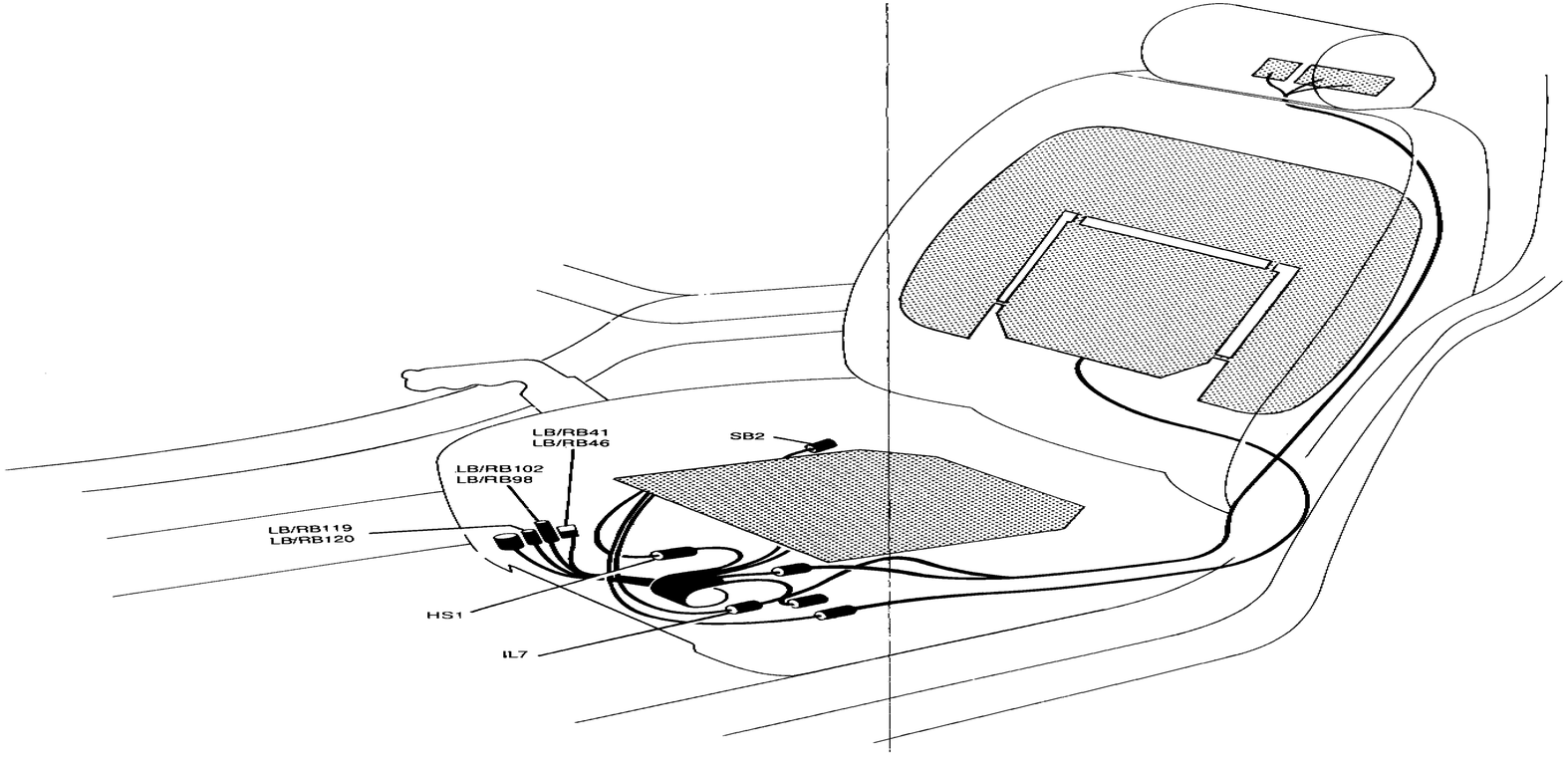
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MANUALLY A DJUSTED SEAT HARNESS (LHD) 91MY.4.0L
WIRING SCHE DULE 90.50.90/WS

From / Von / De / Van / Da / Desde	3 / ach / / aar / / acia	Colour / 'arbe / Couleur / Kleur / Colore / Color	Size (mm) / Querschnitt / Section / Maat / Diametro / Tamano
HS1-2	B98-2	R	1.0
HS2-3	B98-1	B	2.0
IL7-1	8119-1	UW	0.5
IL7-2	B119-2	BK	1.5
IL7-3	B119-3	RLG	0.5
IL7-4	B119-4	GB	1.5
IL7-1	B120-1	NW	1.5
IL7-2	B120-2	BK	0.5
IL7-3	B120-3	BLG	1.5
IL7-4	B120-4	GB	1.5
SB2-1	841-2	BLG	1.5
SB2-2	B41-1	GB	1.5
SB2-1	B46-2	BLG	1.5
SB2-2	B46-1	GB	0.5
LB41-1	B2-2	GB	0.5
LB41-2	B2-1	BLG	1.5
LB46-1	B2-2	GB	1.5
LB46-2	B2-1	BLG	0.5
LB98-1	S1-3	B	1.0
LB98-2	S1-2	R	1.0
LB102-1	S1-3	B	1.0
LB102-2	51.2	R	1.0
LB119-1	.7-1	VW	0.5
LB119-2	.7-2	BK	0.5
LB119-3	.7-3	RLG	1.5
LB119-4	.7-4	GB	1.5
LB120-1	.7-1	NW	1.5
LB120-2	.7-2	BK	1.5
LB120-3	.7-3	RLG	1.5
LB120-4	.7-4	GB	0.5

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MANUALLY ADJUSTED SEAT HARNESS (LHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1070

ENGINE/PI HARNESS 91MY.4.0L (CAT)
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
L14	Relay base (red)	EMS ECU	Passenger footwell
LI8	Lucar 2 way socket	No 6 injector	Engine top
LI9	Lucar 2 way socket	No5 injector	Engine top
LI10	Lucar 2 way socket	No4 injector	Engine top
LI11	Lucar 2 way socket	No3 injector	Engine top
LI12	Lucar 2 way socket	No2 injector	Engine top
LI13	Lucar 2 way socket	No1 injector	Engine top
LI14	250 blade	Lambda sensor	Engine RH side
LI18	PM4 5 waysocket (yellow)	LH side harness	Engine LH side
LI19	Lucar 5 way socket (black)	Air meter	Engine LH side
LI20	Lucar 2 way socket (brown)	Water thermistor	Engine top
LI21	PM4 3 way socket (black)	Crankshaft sensor	Engine front
LI25	Lucar 7 way socket (black)	Ignition amplifier	Engine RH side
LI26	Eyelet (white)	Ignition coil positive	Engine RH side
LI27	Eyelet (white)	Ignition coil negative	Engine RH side
LI28	Eyelet (white)	Ignition amplifier earth	Engine RH side
LI30	Eyelet (white)	)Earths	Bulkhead
LI31	Eyelet (white)	)	
LI32	Eyelet (white)	Manifold earth	Engine top
LI34	PM4 3 way socket (black)	Starter solenoid link lead	
LI37	Lucar 2 way socket (black)	Lambda heater	Engine LH side
LI38	Eyelet (white)	Ignition coil earth	Engine RH side
LI40	Lucar 2 way socket	Breather heater	Engine LH side
L142	Lucar 2 way socket (black)	Air thermistor	Engine LH side
LI52	Type 187 blade	Water temperature transmitter	Engine top
LI53	Type 187 blade	Oil pressure transducer	Engine LH side
LI55	PM4 6 way socket (blue)	Throttle pot.	Engine LH side
LI56	Packard 4 way (black)	Idle speed control	Engine LH side
LI57	PM4 6 way socket (brown)	Diagnostic connector	Engine compartment LH
LI58	25 way connector (blue)	EMS ECU (high power board)	Passenger footwell
LI59	25 way connector	EMS ECU (low power board)	Passenger footwell
LI60	PM4 3 way socket (red)	Fuel fail reset	Passenger footwell
LB27	PMHD 6 pin plug (yellow)	Bulkhead harness (LH drive)	Passenger footwell
LB28	PM4 6 way socket (yellow)	Bulkhead harness (LH drive)	Passenger footwell
RB27	PMHD 6 pin plug (yellow)	Bulkhead harness (RH drivel	Passenger footwell
RB28	PM4 6 way socket (yellow)	Bulkhead harness (RH drive)	Passenger footwell
RS7	PM4 8 pin plug (yellow)	RH side harness	Passenger footwell

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ENGINE/PI HARNESS 91MY.4.0L (CAT)
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
L14	PI main relay	Front passenger footwell
LI8	Engine compartment LH	Engine top
LI9	Engine compartment LH	Engine top
LI10	Engine compartment LH	Engine top
LI11	Engine compartment LH	Engine top
LI12	Engine compartment LH	Engine top
LI13	Engine compartment LH	Engine top
LI14	RH inner wing valance (rear)	Engine compartment
LI19	Engine flow meter	Engine compartment
LI20	Thermostat housing	Engine compartment
LI21	Forward of distributor	Engine compartment
LI25	RH inner wing valance (front)	Engine compartment
LI26	RH inner wing valance	Engine compartment
LI27	RH inner wing valence	Engine compartment
LI28	Ignition amplifier base plate	Engine compartment
LI30	Bulkhead LH side	Engine compartment
LI31	Bulkhead LH side	Engine compartment
LI32	Inlet manifold port 2	Engine compartment
LI34	Below wiper motor	Engine compartment
LI37	RH inner wing valance	Engine compartment
LI38	Ignition coil	Engine compartment
LI40	Breather heater pipe	Engine compartment
LI42	Adjacent to flowmeter	Engine compartment
LI52	Thermostat housing	Engine compartment
LI53	Oil pressure transducer	Engine compartment
LI55	Adjacent to air filter	Engine compartment
LI56	Between injectors 2 and 3	Engine compartment
LI57	Adjacent to battery tray (brown)	Engine compartment
LI58	Passenger footwell	LH dash trim
LI59	Passenger footwell	LH dash trim
LI60	Passenger footwell	LH dash trim
LB27	Driver footwell	LH dash trim
LB28	Driver footwell	LH dash trim
RB27	Driver footwell	RH dash trim
RB28	Driver footwell	RH dash trim
RS7	Adjacent to ignition coil	Engine compartment

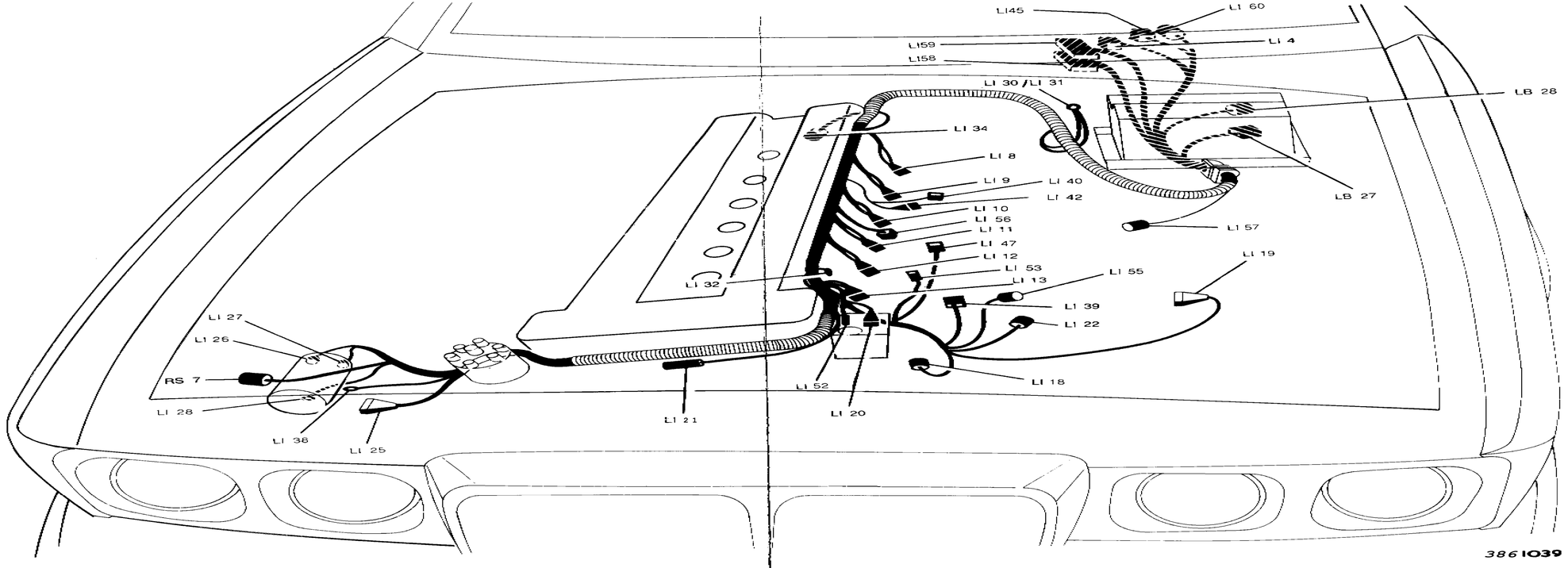
ENGINE /PI HARNESS 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
Da	A	Colore	Dametro
Desde	Hacia	Color	Tamano
LI4-30	RB28-3	OY	0.5
LI4-85	LI31	B	0.5
LI4-86	LIS13	WK	0.5
LI4-87	LIS11	WN	3.0
LI8-1	LIS6	KB	2.0
LI8-2	LIS8	KU	2.0
LI9-1	LIS6	KB	2.0
LI9-2	LIS8	KU	*2.0*
LI10-1	LIS6	KB	2.0
LI10-2	LIS8	KU	2.0
LI11-1	LIS6	KB	2.0
LI11-2	LIS8	KU	*2.0*
LI12-1	LIS6	KB	*2.0*
LI12-2	LIS8	KU	2.0
LI13-1	LIS6	KB	2.0
LI13-2	LIS8	KU	2.0
LI18-2	LIS11	WN	*2.0*
LI19-1	LIS9	BY	2.0
LI19-2	LIS9	BY	2.0
LI19-3	LI59-16	GK	0.5
LI10-5	LIS11	WN	2.0
LI19-6	LI59-10	GR	0.5
LI20-1	LIS9	BY	0.5
LI20-2	LI59-2	UY	0.5
LI21-1	LI59-13	RIN	0.5
LI21-2	LIS12	BRD	STD
LI21-3	LI59-24	UIN	0.5
LI25-1	LI27	WB	2.0
LI25-2	LIS4	WK	0.5
LI25-7	LI58-1	WR	0.5
LI26	LIS4	WK	2.0
LI27	LI25-1	WB	2.0
LI27	LIR1/ODU	WB	0.5
LI28	LI30	B	2.0
LI30	LI57-6	B	0.5
LI30	LI28	B	*2.0*
LI30	LIS12	B	0.5
LI30	LI45-3	B	3.5
LI30	LI58-24	B	2.0
LI31	LI58-11	E	2.0
LI31	LI58-23	B	2.0
LI31	LI4-85	B	3.5
LI32	LI59-18	B	3.5
LI32	LI38	B	1.0
LI34-2	RB28-5	W	3.0
LI38	LI32	B	1.0
LI42-1	LI59-20	UB	3.5
LI42-2	LIS9	BY	3.5
LI45-1	LI58-9	PW	3.5
LI45-2	LI59-7	UN	3.5
LI45-3	LI30	B	3.5
LI45-4	LI59-5	SU	3.5
LI45-5	LI55-4	WU	3.5
LI45-6	LI55-5	GU	3.5
LI45-7	LI55-6	BU	3.5
LI45-8	LIS2	RG	3.5
LI45-9	LI59-11	PY	3.5
LI45-12	LIS17	O	1.0
LI45-13	LIS14	Y	1.0
LI52	RS7-2	OK	3.5
LI55-1	LI59-22	KP	3.5
LI55-2	LIS9	BY	3.5
LI55-3	LI59-14	GY	3.5
LI55-4	LI45-5	WU	3.5
LI55-5	LI45-6	GU	3.5
LI55-6	LI45-7	BU	3.5
LI56-1	LI58-15	OY	3.5
LI56-2	LI58-19	OG	3.5
LI56-3	LI58-18	OR	3.5
LI56-4	LI58-16	OB	3.5
LI57-1	LIS14	Y	3.5

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
Da	A	Colore	Dametro
Desde	Hacia	Color	Tamano
LI57-4	RB28-4	WB	*0.5*
LI57-5	LIS17	B	0.5
LI57-6	LI30	B	*0.5*
LI58-1	LI25-7	WR	0.5
LI58-3	LIS9	BY	*2.0*
LI58-7	RB27-1	OK	0.5
LI58-9	LI45-1	PW	0.5
LI58-10	LIS11	WN	2.0
LI58-11	LI31	B	2.0
LI58-12	LIS8	KU	2.0
LI58-13	LIS6	KB	2.0
LI58-14	RB27-5	WB	0.5
LI58-15	LI56-1	BY	0.5
LI58-16	LI56-4	OB	0.5
LI56-17	LIS8	KU	2.0
LI58-18	LI57-3	OR	0.5
LI58-19	LI56-2	OG	*0.5*
LI58-22	LIS11	WN	2.0
LI58-23	LI31	B	*2.0*
LI58-24	LI30	B	2.0
LI58-25	LIS6	KB	2.0
LI59-1	LIS11	WN	0.5
LI59-2	LI20-2	UY	0.5
LI59-3	LIS2	RG	0.5
LI59-4	LIS14		0.5
LI59-5	LI45-4	GU	0.5
LI59-6	RS7-3	GW	0.5
LI59-7	LI45-2	UN	0.5
LI59-8	RB27-6	U	0.5
LI59-10	LI19-6	GR	0.5
LI59-11	LI45-9	PY	0.5
LI59-12	RB27-3	UG	0.5
LI59-13	LI21-1	RIN	0.5
LI59-14	LI55-3	GY	0.5
LI59-15	LIS15	OR	0.5
LI59-16	LI19-3	GK	0.5
LI59-18	LI32	G	0.5
LI59-19	LIS17	O	0.5
LI59-20	LI42-1	UB	*0.5*
LI59-21	RS7-4	GN	0.5
LI59-22	LI55-1	KP	0.5
LI59-24	LI21-3	UIN	0.5
LI60-3	LIS15	OR	0.5
LB27-1	LI58-7	OK	0.5
LB27-2	LIS15	OR	1.0
LB27-3	LI59-12	UG	0.5
LB27-4	LIS2	RG	0.5
LB27-5	LI58-14	WB	0.5
LB27-6	RB59-8	RG	0.5
LB28-1	LIS13	NK	2.0
LB28-3	LI4-30	WK	3.0
LB28-4	LI57-4	WB	0.5
LB28-5	LI34-2	W	3.0
RB27-1	LI58-7	OK	0.5
RB27-2	LIS15	OR	1.0
RB27-3	LI59-12	UG	0.5
RB27-4	LIS2	RG	0.5
RB27-5	LI58-14	WB	0.5
RB27-6	RB59-8	RG	0.5
RB28-1	LIS13	NK	2.0
RB28-3	LI4-30	WK	3.0
RB28-4	LI57-4	WB	3.5
RB28-5	LI34-2	W	3.0
RS7-1	LI53	IS	3.5
RS7-2	L152	OK	3.5
RS7-3	LI59-6	GW	3.5
RS7-4	LI59-21	GN	3.5
RS7-5	LIR1/ODU	RY	3.5

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ENGINE/PI HARNESS 9 1MY.4.0L (CAT)
COMMECTOR LOCATION 90.50.90/CL



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ENGINE/PI HARNESS 91MY.3.2L (CAT)
HARNESS SCHEDULE 90.50.90/HS

tem	lescription	nterface	ocation
I4	Relay base (red)	EMS ECU	'assenger footwell
I8	.ucar 2 way socket	No 6 injector	ngine top
I9	.ucar 2 way socket	No5 injector	ngine top
I10	.ucar 2 way socket	U04 injector	ngine top
I11	.ucar 2 way socket	No3 injector	ngine top
I12	.ucar 2 way socket	No2 injector	ngine top
I13	.ucar 2 way socket	No1 injector	ngine top
I14	!50 blade	.ambda sensor	ngine AH side
I18	'M4 5 way socket yellow)	.H side harness	ngine LH side
I19	.ucar 5 way socket black)	Air meter	ngine LH side
.I20	.ucar 2 way socket brown)	Water thermistor	ngine top
.I21	PM4 3 way socket black)	Crankshaft sensor	ngine front
.I25	.ucar 7 way socket black)	Ignition amplifier	tngine RH side
.I26	iyelet (white)	Ignition coil positive	ngine RH side
I27	iyelet (white)	Ignition coil negative	ngine RH side
I28	iyelet (white)	Ignition amplifier earth	ngine RH side
I30	Eyelet (white)	Earths	Bulkhead
.I31	iyelet (white)		
.I32	iyelet (white)	Manifold earth	ngine top
.I34	PM4 3 way socket black)	Starter solenoid link lead	
.I37	.ucar 2 way socket black)	Lambda heater	ngine LH side
.I38	iyelet (white)	Ignition coil earth	ngine RH side
.I40	.ucar 2 way socket	Breather heater	ngine LH side
.I42	.ucar 2 way socket black)	Air thermistor	ngine LH side
.I52	Type 187 blade	Water temperature transmitter	ngine top
.I53	Type 187 blade	Oil pressure transducer	ngine LH side
.I55	PM4 6 way socket 'blue)	Throttle pot.	ngine LH side
.I56	Packard 4 way black)	Idle speed control	ngine LH side
.I57	PM4 6 wav socket brown)	Diagnostic connector	ngine compartment LH
.I58	25 way connector blue)	EMS ECU (high power board)	'assenger footwell
.I59	25 way connector	EMS ECU (low power board)	Passenger footwell
.I60	PM4 3 way socket red)	Fuel fail reset	'assenger footwell
.B27	PMHD 6 pin plug yellow)	Bulkhead harness (LH drivel	'assenger footwell
.B28	PM4 6 way socket (yellow)	Bulkhead harness (LH drive)	'assenger footwell
RB27	PMHD 6 pin plug (yellow)	Bulkhead harness (RH drive)	Passenger footwell
RB28	PM4 6 wav socket (yellow)	Bulkhead harness (RH drivel	Passenger footwell
RS7	PM4 8 pin plug (yellow)	RH side harness	Passenger footwell

ENGINE/PI HARNESS 91MY.3.2L (CAT)
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
L14	PI main relay	Front passenger footwell
LI8	Engine compartment LH	Engine top
LI9	Engine compartment LH	Engine top
LI10	Engine compartment LH	Engine top
LI11	Engine compartment LH	Engine top
LI12	Engine compartment LH	Engine top
LI13	Engine compartment LH	Engine top
LI14	RH inner wing valance (rear)	Engine compartment
LI19	Engine flow meter	Engine compartment
LI20	Thermostat housing	Engine comparttnent
LI21	Forward of distributor	Engine compartment
LI25	RH inner wing valance (front)	Engine compartment
LI26	RH inner wing valance	Engine compartment
LI27	RH inner wing valence	Engine compartment
LI28	Ignition amplifier base plate	Engine compartment
LI30	Bulkhead LH side	Engine compartment
LI31	Bulkhead LH side	Engine compartment
LI32	Inlet manifold port 2	Engine compartment
LI34	Below wiper motor	Engine compartment
LI37	RH inner wing valance	Engine compartment
LI38	Ignition coil	Engine compartment
LI40	Breather heater pipe	Engine compartment
LI42	Adjacent to flowmeter	Engine compartment
LI52	Thermostat housing	Engine compartment
LI53	Oil pressure transducer	Engine compartment
LI55	Adjacent to air filter	Engine compartment
LI56	Between injectors 2 and 3	Engine compartment
LI57	Adjacent to battery tray (brown)	Engine compartment
LI58	Passenger footwell	LH dash trim
LI59	Passenger footwell	LH dash trim
LI60	Passenger footwell	LH dash trim
LB27	Driver footwell	LH dash trim
LB28	Driver footwell	LH dash trim
RB27	Driver footwell	RH dash trim
RB28	Driver footwell	RH dash trim
RS7	Adjacent to ignition coil	Engine compartment

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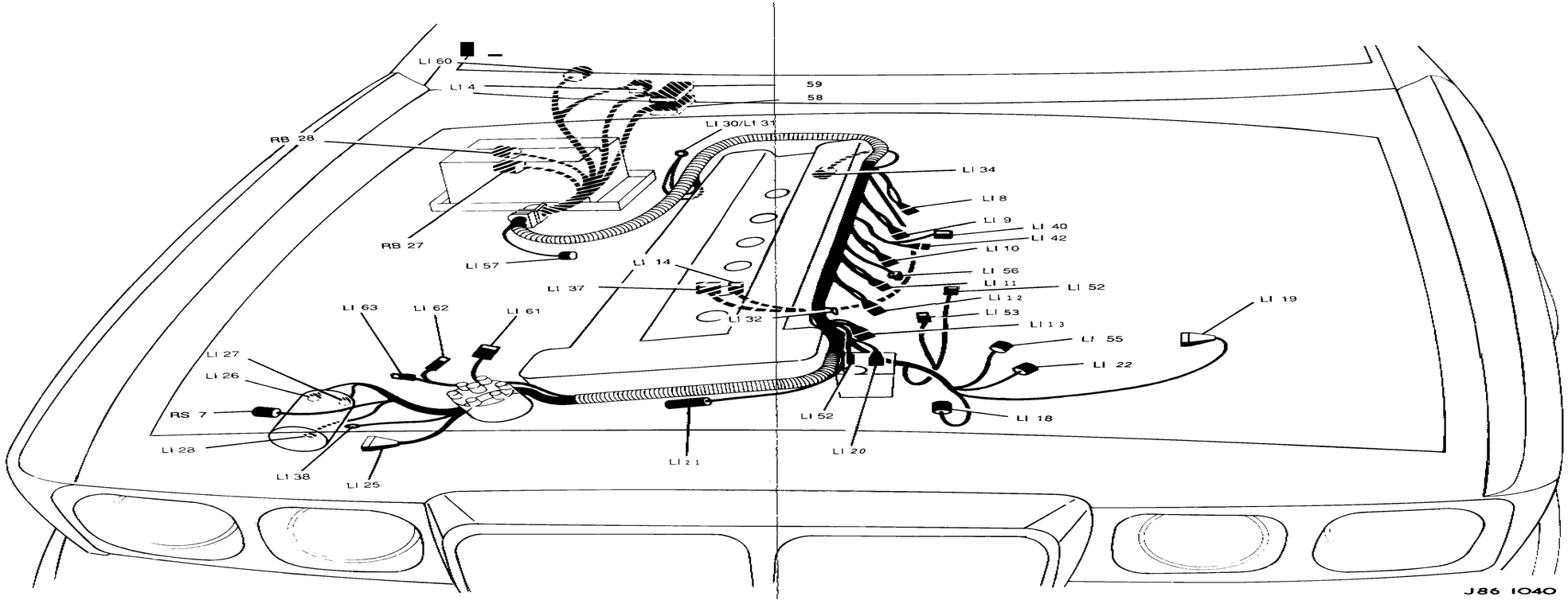
ENGINE/PI HARNESS 91MY.3.2L
WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De	A	Couleur	Section
Van	Naar	Kleur	Maat
Da	A	Colore	Diametro
Desde	Hacia	Color	Tamano
LI4-30	RB28-3	GY	0.5
LI4-85	LI31	B	0.5
LI4-86	LIS13	WK	0.5
LI4-87	LIS11	WN	3.0
LI8-1	LIS6	RB	2.0
LIE-2	LIS8	RU	2.0
LI9-1	LIS6	RB	2.0
LI9-2	LIS8	RU	2.0
LI10-1	LIS6	RB	2.0
LI10-2	LIS8	RU	2.0
LI11-1	LIS6	RB	2.0
LI11-2	LIS8	RU	2.0
LI12-1	LIS6	RB	2.0
LI12-2	LIS8	RU	2.0
LI13-1	LIS6	RB	2.0
LI13-2	LIS8	RU	2.0
LI14	LI59-19	WN	0.5
LI18-2	LIS11	WN	2.0
LI18-4	LIS11	WU	0.5
LI18-5	LI58-2	GB	0.5
LI19-1	LIS9	GY	2.0
LI19-2	LIS9	GY	2.0
LI19-3	LI59-16	GK	0.5
LI19-5	LIS11	WN	2.0
LI19-6	LI59-10	GR	0.5
LI20-1	LIS9	BY	0.5
LI20-2	LI59-2	UY	0.5
LI21-1	LI59-13	RIN	0.5
LI21-2	LIS12	BRD	STD
LI21-3	LI59-24	UIN	0.5
LI25-1	LI27	WB	2.0
LI25-2	LIS4	WK	0.5
LI25-7	LI58-1	WR	0.5
LI26	LIS4	WK	2.0
LI27	LI25-1	WB	2.0
LI27	LIR1/ODU	WB	0.5
LI28	LI30	B	2.0
LI30	LIS12	B	0.5
LI30	LI28	B	2.0
LI30	LIS12	B	0.5
LI30	LI58-24	B	2.0
LI31	LI58-11	B	2.0
LI31	LI58-23	B	2.0
LI31	LI4-85	B	0.5
LI32	LI59-18	B	0.5
LI32	LI38	B	1.0
LI32	LI38	B	1.0
LI32	LI40-2	B	1.0
LI34-2	LB28-5	W	3.0
LI37-1	LI32	B	1.0
LI37-2	LB28-2	UR	0.5
LI38	LI32	B	1.0
LI40-1	LB28-6	VG	1.0
LI40-2	LI32	B	1.0
LI42-1	LI59-20	UB	0.5
LI42-2	LIS9	BY	0.5
LI52	RS7-2	OK	0.5
LI55-1	LI59-22	KP	0.5
LI55-2	LIS9	BY	0.5
LI55-3	LI59-14	GY	0.5
LI56-1	LI58-15	OY	0.5
LI56-2	LI58-19	OG	0.5
LI56-3	LI58-18	OR	0.5
LI56-4	LI58-16	OB	0.5
LI57-1	LI59-4	Y	0.5
LI57-4	RB28-4	NB	0.5
LI57-5	LI59-190		0.5
LI57-6	LI30	B	0.5

From	To	olour	ze (mm)
Von	Nach	arbe	uerschnitt
De	A	ouleur	ection
Van	Naar	leur	aat
Da	A	olore	ametro
Desde	Hacia	olor	amano
LI58-1	LI25-7	WR	.5
LI58-2	LI18-5	IB	.5
LI58-3	LIS9	Y	.0
LI58-5	LI18-4	G	.5
LI58-7	RB27-1	N	.5
LI58-10	LIS11	WN	.0
LI58-11	LI31		.0
LI58-12	LIS8	U	.0
LI58-13	LIS6	B	.0
LI58-14	RB27-5	IB	.5
LI58-15	LI56-1	IY	.5
LI58-16	LI56-4	IB	.5
LI56-17	LIS8	U	.0
LI58-18	LI56-3	IR	.5
LI58-19	LI56-2	IG	.5
LI58-22	LIS11	WN	.0
LI58-23	LI31		.0
LI58-24	LI30		.0
LI58-25	LIS6	B	.0
LI59-1	LIS11	WN	.5
LI59-2	LI20-2	IY	.5
LI59-3	LB27-4	G	.5
LI59-4	LI57-1		.5
LI59-6	RS7-3	IW	.5
LI59-8	RB27-6	I	.5
LI59-10	LI19-6	IR	.5
LI59-12	RB27-3	IG	.5
LI59-13	LI21-1	IIN	.5
LI59-14	LI55-3	IY	.5
LI59-15	LIS15	IR	.5
LI59-16	LI19-3	IK	.5
LI59-17	LI14	WN	.5
LI59-18	LI32		.5
LI59-19	LI57-5	)	.5
LI59-20	LI42-1	IB	5
LI59-21	RS7-4	IN	.5
LI59-22	LI55-1	IP	.5
LI59-24	LI21-3	IIN	.5
LI60-3	LIS15	IR	.5
LB27-1	LI58-7	IN	.5
LB27-2	LIS15	IR	.0
LB27-3	LI59-12	IG	.5
LB27-4	LI59-3	IG	.5
LB27-5	LI58-14	IB	.5
LB27-6	RB59-8	IG	1.5
LB28-1	LIS13	WK	.0
LB28-2	LI37-2	IR	.5
LB28-3	LI4-30	IK	.0
LB28-4	LI57-4	IB	1.5
LB28-5	LI34-2	W	.0
LB28-6	LI40-1	VO	.0
RB27-1	LI58-7	RN	.5
RB27-2	LIS15	RR	.0
RB27-3	LI59-12	RG	.5
RB27-4	LI59-3	RG	1.5
RB27-5	LI58-14	RB	1.5
RB27-6	RB59-8	RG	1.5
RB28-1	LIS13	WK	.0
RB28-3	LI4-30	WK	1.0
RB28-4	LI57-4	WB	.5
RB28-5	LI34-2	W	1.0
RS7-1	LI53	RS	1.5
RS7-2	LI52	RK	1.5
RS7-3	LI59-6	RW	1.5
RS7-4	LI59-21	RN	.5
RS7-5	LIR1/ODU	RY	1.5

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ENGINE/PI HARNESS 91MY.3.2L (CAT)
CONNECTOR LOCATION 90.50.90/CL



GLOVE BOX LAMP HARNESS CB (RHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
CB1	AMP 250 blade connector	Glove box lamp	Glove box
CB2	AMP 250 blade connector	Glove box lamp	Glove box
CB3	AMP 250 blade connector	Glove box switch	Glove box
CB4	AMP 250 blade connector	Glove box switch	Glove box
AB26	PMHD 2 pin plug (black)	Glove box switch and box lamp	Glove box otwell

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GLOVE BOX HARNESS CB (RHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

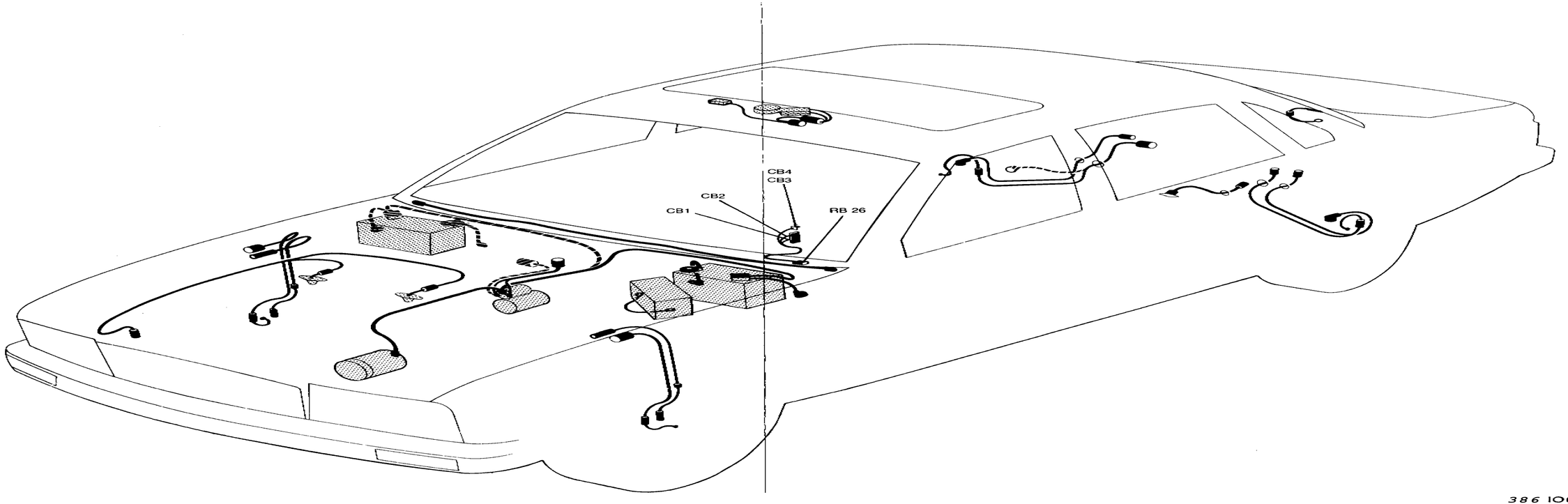
Connector	Location	Access
CB1	Glove box lamp	Glove box
CB2	Glove box lamp	Glove box
CB3	Glove box switch	Glove box
CB4	Glove box switch	Glove box
RB26	Glove box lamp and switch	Glove box

GLOVE BOX LAMP HARNESS (RHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From	o	:olour	ize (mm)
Von	lach	arbe	luerschnitt
De		;ouleur	ection
Van	laar	.leur	laat
Da		:olore	ametro
Desde	lacia	:olor	amano
CB1	:B4		1.5
CB2	IB26-2	JW	).5
CB3	IB26-1	JG	).5
CE4	:E1	⊐	1.5
RB26-1	:B3	JG	1.5
RB26-2	:B2	JW	1.5

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GLOVE BOX LAMP HARNESS CB (RHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



386 1066

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GLOVE BOX LAMP HARNESS (LHD) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
CB1	AMP 250 blade connector	Glove box lamp	Glove box
CB2	AMP 250 blade connector	Glove box lamp	Glove box
CB3	AMP 250 bisde connector	Glove box switch	Glove box
CB4	AMP 250 b connecto	Glove box switch	Glove box
LB26	PMHD 2 ii 1 (black)	Glove box switch and box lamp	Glove box

GLOVE BOX HARNESS CB (LHD) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
CB1	Glove box lamp	Glove box
CB2	Glove box lamp	Glove box
CB3	Glove box switch	Glove box
CB4	Glove box switch	Glove box
LB26	Glove box lamp and switch	Glove bar

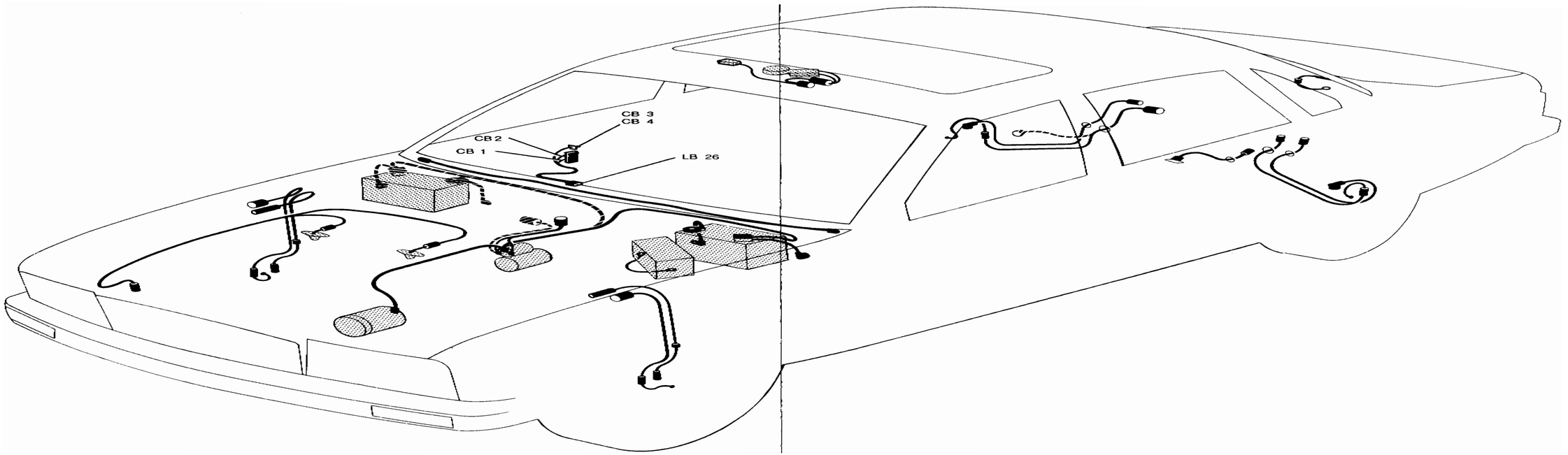
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GLOVE BOX LAMP HARNESS (LHD) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From Von De Van Da Desde	To Nach A Naar A Hacia	Colour Farbe Couleur Kleur Colore Color	Size (mm) Querschnitt Section Maat Dametro Tamano
CB1 CB2	CB4 LB26-2	G WW	0.5 0.5
CB3	LB26-1	JG	0.5
CB4	CB1		0.5
LB26-1 LB26-2	CB3 CB2	JG WW	0.5 0.5

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GLOVE 60X LAMP HARNESS (LHD) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1067

BONNET LAMPS-LINK HARNESS 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

			location
BH1	AMP Econoseal 3 way (black)	Bonnet lamp	Bonnet
BH2	AMP Econoseal 3 wsy (black)	Bonnet lamp	Bonnet
RS1	AMP Econoseal 3 way (red)	Bonnet lamp	Radiator RH bracket

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BONNET LAMPS LINK HARNESS BH 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

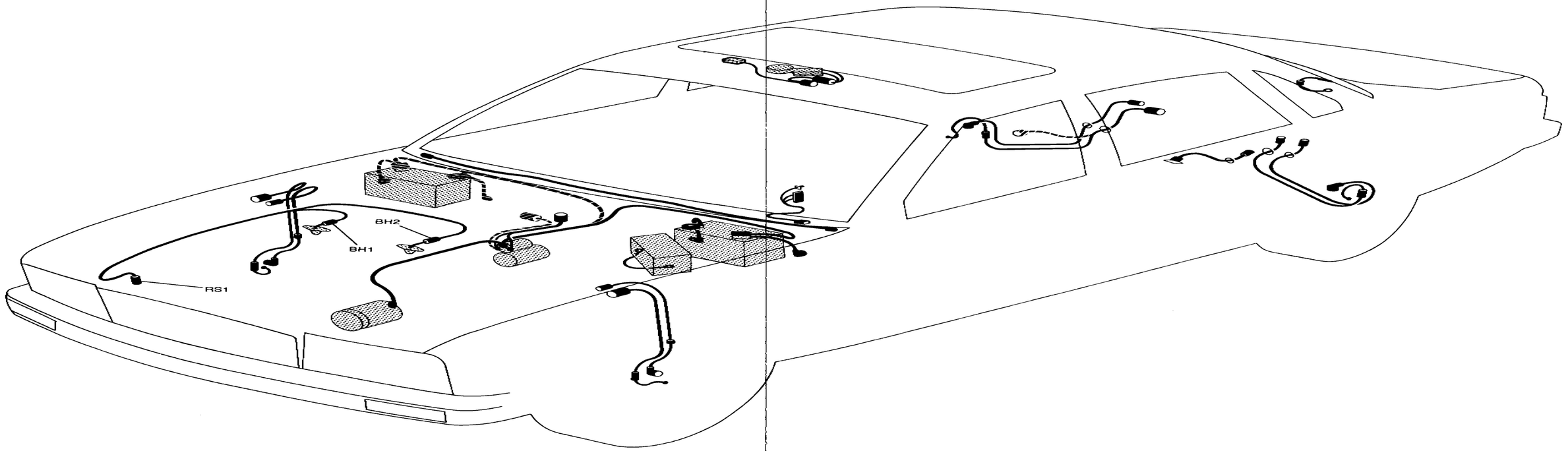
Connector	Location	Access
RS1	Radiator support bracket RH	Engine compartment
BH1	Underside of bonnet	Bonnet
BH2	Underside of bonnet	Bonnet

BONNET LAMPS-LINK HARNESS 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

rom		olour	ize (mm)
'on	ach	arbe	luerschnitt
le		ouleur	ection
'an	aar	leur	/laat
)a		olore	)ametro
)esde	acia	olor	amano
3H1-2	HS1	IY	1.5
3H1-3	HS2	IP	1.5
3H2-2	HS1	IY	1.5
3H2-3	HS2	IP	).5
3S1-2	HS2	IP	1.5
3S1-3	HS1	IY	).5
3HS1	S1-3	IY	1.5
3HS1	H1-2	IY	1.5
3HS1	H2-2	IY	1.5
3HS2	S1-2	IP	1.5
3HS2	H1-3	IP	).5
3HS2	H2-3	IP	).5

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BONNET LAMPS LINK HARNESS 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 507G

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HEADREST HARNESS 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Descriution	Interface	location
IL2	187 blade connector	Interior reading lamp	Headrest
IL3	250 blade connector	Interior reading lamp	Headrest
IL4	187 blade connector	Interior reading lamp	Headrest
IL8	Grote Hartmann 5 way socket (black)	Headrest link harness	Driver seat harness

HEADREST HARNESS 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
IL2	Front seat headrest	Interior/reading light assembly
IL3	Front seat headrest	Interior hading light assembly
IL4	Front seat headrest	Interior heading light assembly
IL8	Driver headrest	Interior heading assembly

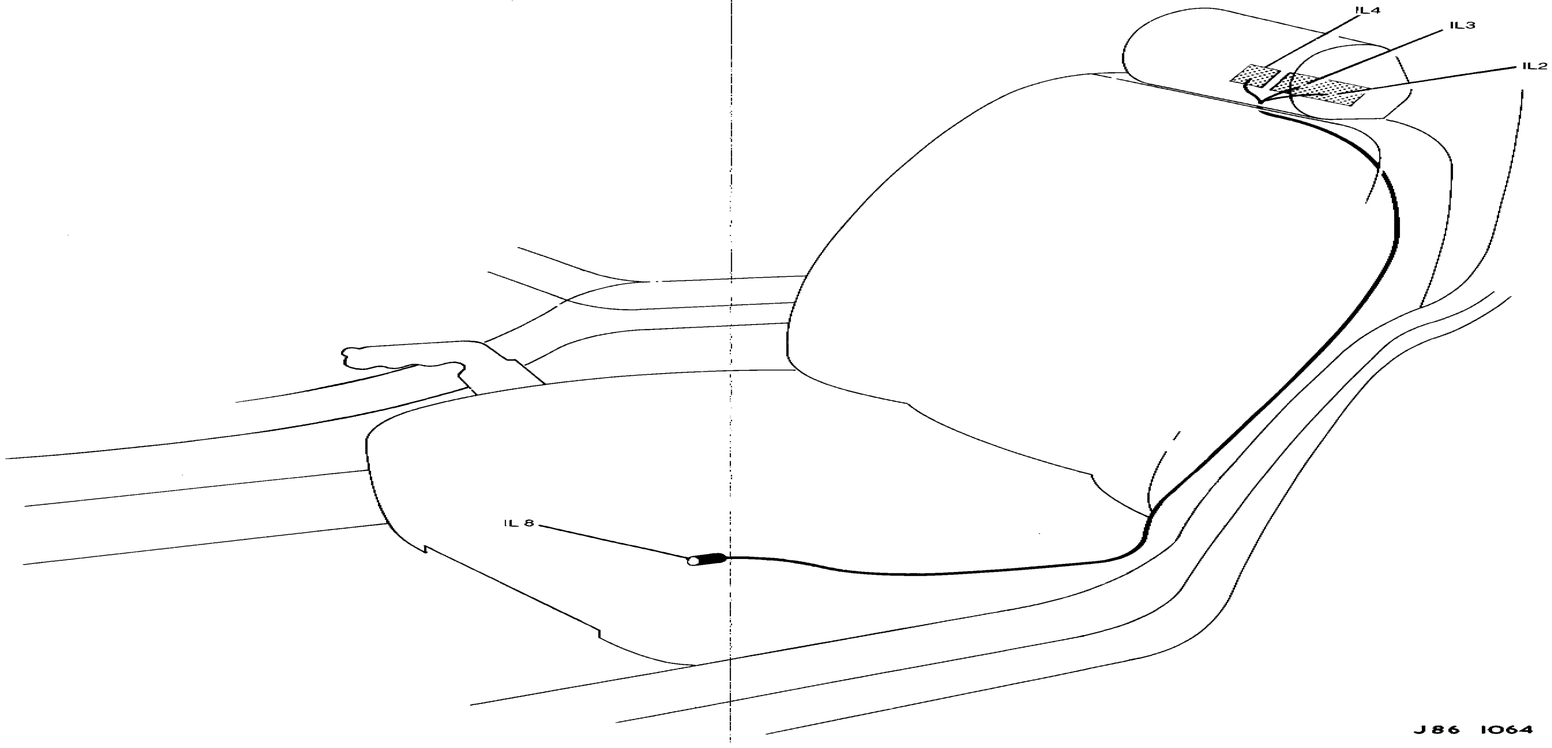
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HEADREST HARNESS 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

om		olour	ize (mm)
on	ach	arbe	uerschnitt
e		ouleur	ection
an	aar	leur	laat
a		olore	ametro
esde	acia	olor	amano
.2	.8-4	ILG	.5
.3	.8-2	JW	.5
.4	.8-1	K	.5
.8-1	.4	IK	1.5
.8-2	.3	JW	1.5
.8-4	.2	LG	1.5

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HEADREST HARNESS 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



HEADREST LINK HARNESS 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	interface	Location
IL6	Grote Hartmann 5 way plug(green)	Seat entry switch	LH and RH seats
IL7	Grote Hartmann 5 way plug (black)	Seat harness	LH and RH seats
IL8	Grote Hartmann 5 way plug (black)	Headrest harness (interior reading lamp)	Driver seat harness

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HEADREST LINK HARNESS 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

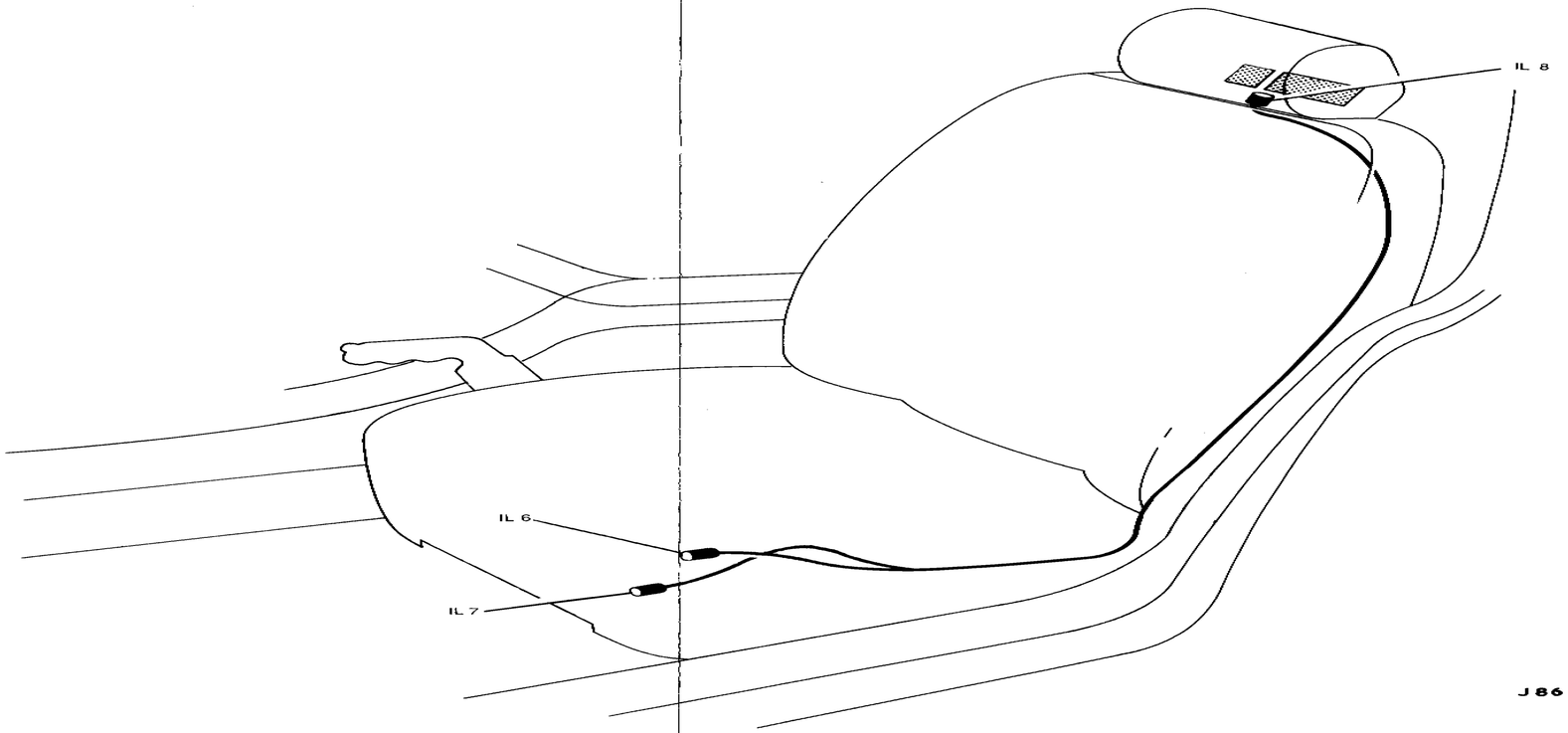
Connector	Location	Access
IL6	LH and RH seats	Seat cushion
IL7	LH and RH seats	Seat cushion
IL8	Driver seat harness	Interior reading light

HEADREST LINK HARNESS 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

ram	'o	Colour	lize (mm)
'on	lach	Farbe	luerschnitr
le	\	Couleur	lection
'an	laar	Kleur	Aaat
la	\	Colore	lametro
lesde	facia	Color	amano
L6-1	L7-4	GB	).5
L6-2	LS1	3K	).5
L7-1	L8-2	NW	1.5
L7-2	LS1	3K	).5
L7-3	L8-4	RLG	).5
L7-4	L6-1	GB	1.5
LS1	L7-2	3K	1.5
LS1	L8-1	3K	1.5
LS1	L6-2	3u	).5

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HEADREST LINK HARNESS 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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FRONT AXLE HARNESS (RH SIDE) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	location
FA1	Grote Hartmann 2 way socket (black)	Brake pads	
RS20	PM5 2 way plug (black)	Side harness RS	Engine compartment

FRONT AXLE HARNESS (RH SIDE) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
FA1	Front brake caliper	Engine compartment
RS20	RH inner wing valance	Engine compartment

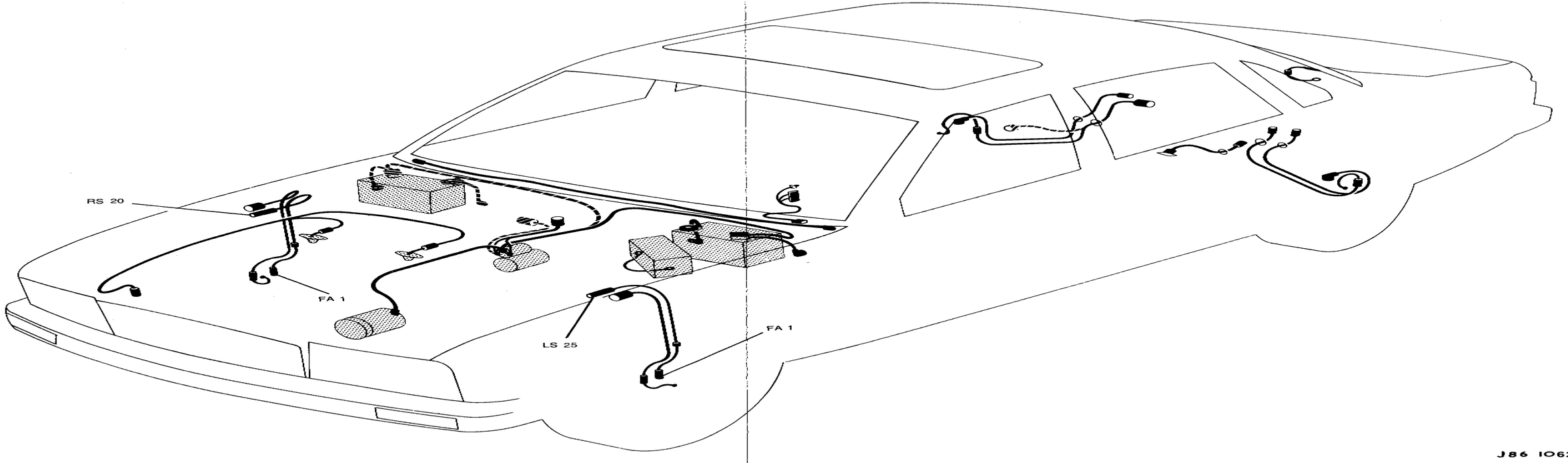
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FRONT AXLE HARNESS (RH SIDE)
WIRING SCHEDULE 90.50.90/WS

From ion De Van Da Desde	To Nach A Naar A Hacia	Colour arbe Couleur Kleur Colore Color	Size (mm) luerschnitt Section Maat Diametro Tamano
FA1-1 FA1-2	RS20-2 RS20-1	B B	3.75 3.75
RS20-1 RS20-2	FA1-2 FA1-1	1 B	0.75 3.75

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FRONT AXLE HARNESS (RH SIDE) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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FRONT AXLE HARNESS (LH SIDE) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	location
FA1	Grote Hartmann 2 way socket (black)	LH front brake pad	Engine compartment
LS25	PM5 2 way plug (black)	Side harness LS	Engine compartment

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FRONT AXLE HARNESS (LH SIDE) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

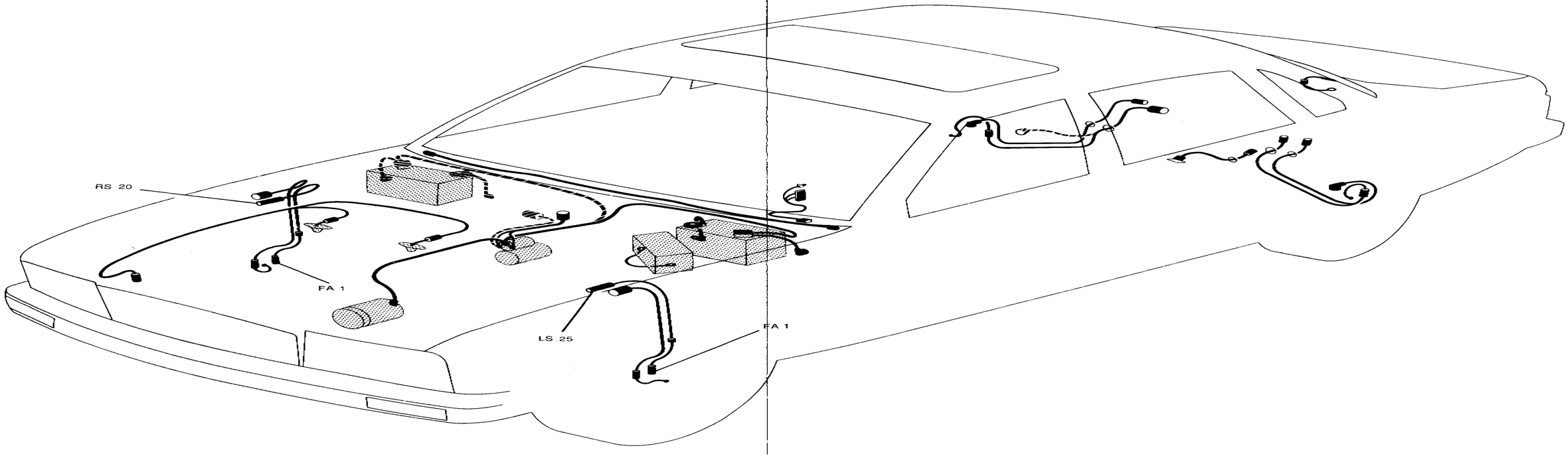
Connector	Location	Access
FA1	Front brake caliper	Engine compartment
LS25	LH inner wing valance	Engine compartment

FRONT AXLE HARNESS (LH SIDE)
WIRING SCHEDULE 90.50.90/WS

		olour	ze (mm)
	ich	rbe	ierschnitt
		ouleur	ction
	ıar	eur	eat
		olore	ametro
Desde	icia	olor	mano
FA1-1	325-2		75
FA1-2	325-1		75
LS25-1	A1-2		75
LS25-2	A1-1		75

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FRONT AXLE HARMESS (LH SIDE) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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RIGHT HAND REAR AXLE HARNESS (RIDE LEVEL) 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

			location
RA2	Grote Hartman 2 way socket	RH rear hub carrier	Brake caliper
RA3	Packard 6 way receptacle (brown)	Ride height sensor	Adjacent to rear axle
RS35	PM49 pin plug (black)	RH side harness	Luggage compartment

RIGHT HAND AXLE HARNESS (RIDE LEVEL) 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
RA2 RA3 R$35	RH rear hub carrier Adjacent to rear axle Luggage compartment bulkhead	Under body 'Under body Luggage compartment

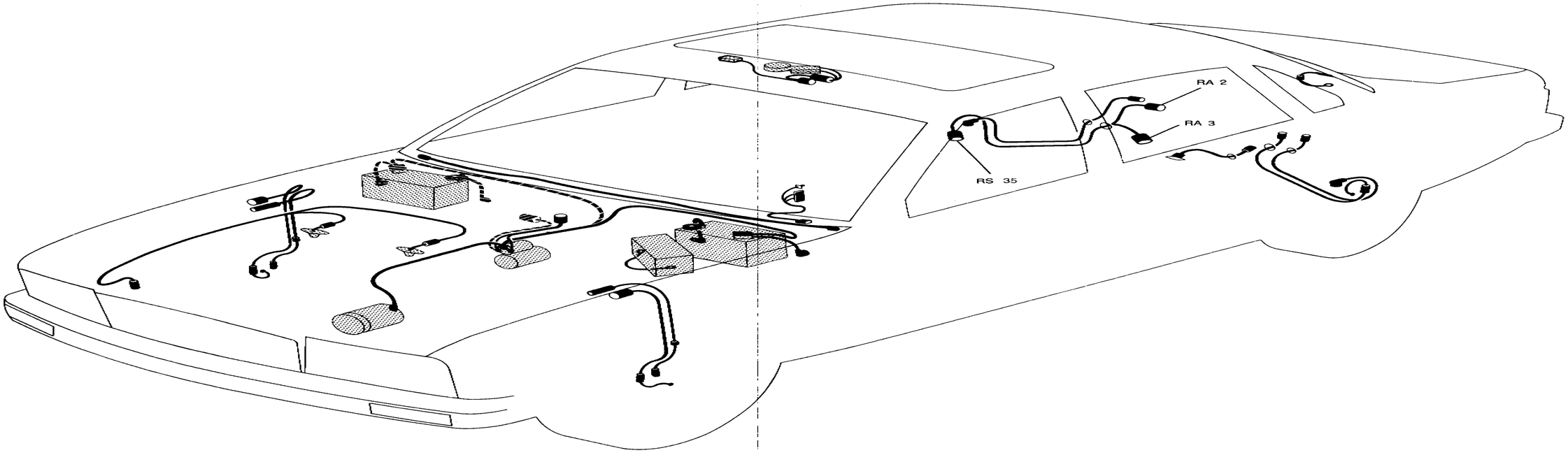
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RIGHT HAND REAR AXLE HARNESS (RIDE LEVEL) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

·rom	o	:olour	ize (mm)
/on	ach	arbe	uorschnitt
)e		:ouleur	ection
/an	aar	leur	laat
)a		:olore	ametro
)esde	acia	:olor	ámano
RA2-1	IS35-8	}	1.75
RA2-2	IS35-9	I	..75
RA3-1	IS35-7	.G	.0
RA3-2	IS35-6	'U	.0
RA3-3	IS35-5	**	.0
RA3-4	1535-3	I	.0
RA3-5	IS35-2	NS	.0
RA3-6	IS35-1	JU	.0
RS35-1	IA3-6	JU	.0
RS35-1	IAO1/OOW	JU	.0
RS35-2	IA3-5	/N	.0
RS35-3	IAD1/OOU	}	.0
RS35-3	IA3-4	}	.0
RS35-5	IA3-3	/N	.0
RS35-6	IA3-2	U	.0
RS35-7	IA3-1	.G	.0
RS35-8	IA2-1	}	1.75
RS35-9	IA2-2	}	1.75

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RIGHT HAND REAR AXLE HARNESS (RIDE LEVEL) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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LEFT HAND SIDE POWERED SEAT-LINK LEAD 91MY.4.0L HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
ss3 SS5	PM4 9 way socket (violet) PMHD 8 pin plug (yellow)	Driver's seat panel Driver's seat panel	Front seat Front seat

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LEFT HAND SIDE POWERED SEAT-LINK LEAD 91MY.4.0L LOCATION AND ACCESS 90.50.90/HS

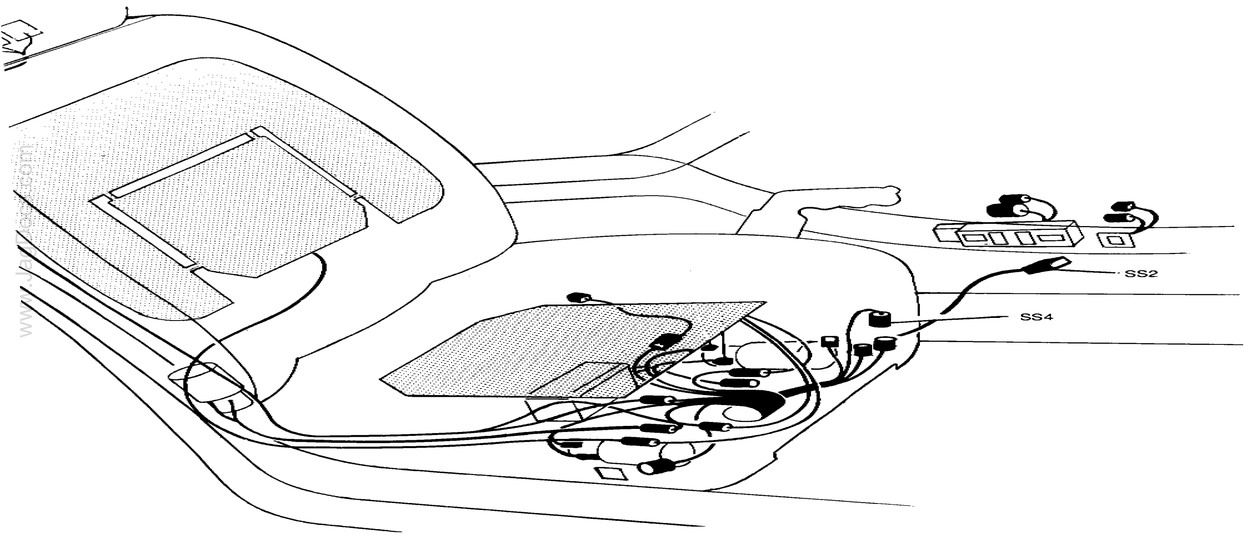
Connector	Location	Access
SS3	Front seat	Seat cushion
SS5	Front seat	Seat cushion

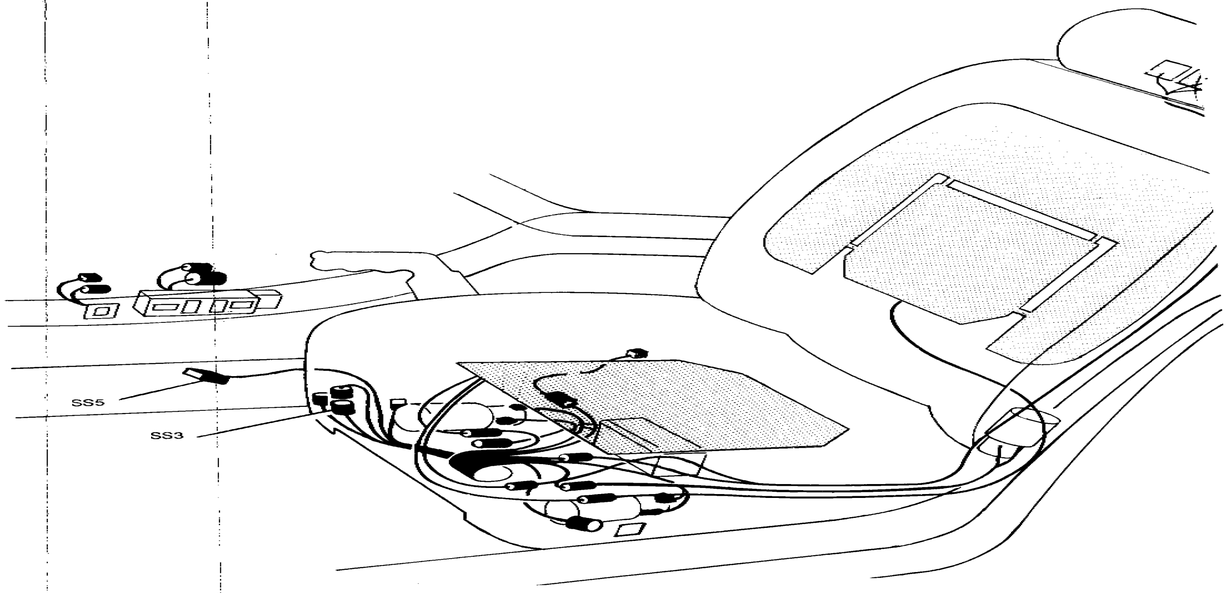
LEFT HAND SIDE POWERED SEAT-LINK LEAD WIRING SCHEDULE 90.50.90/WS

From Von De Van Da Desde	To Nach A Naar A Hacia	Colour Farbe Couleur Kleur Colore Color	Size (mm) Querschnitt Section Maat Diametro Tamano
SS3-1	SS5-1	O	2.0
SS3-2	SS5-2	K	2.0
SS3-3	SS5-3	R	2.0
SS3-5	SS5-4	U	2.0
SS3-6	SS5-5	W	2.0
SS3-7	SS5-6	Y	2.0
SS3-8	SS5-7	S	2.0
SS3-9	SS5-8	N	2.0
SS5-1	SS3-1	O	2.0
SS5-2	SS3-2	K	2.0
SS5-3	SS3-3	R	2.0
SS5-4	SS3-5	U	2.0
SS5-5	SS3-6	W	2.0
SS5-6	SS3-7	Y	2.0
SS5-7	SS3-8	S	2.0
SS5-8	SS3-9	N	2.0

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LEFT HAND SIDE POWERED SEAT LINK LEAD 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL





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RIGHT HAND SIDE POWERED SEAT-LINK LEAD 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

tem	Description	Interface	Location
3S2	PMHD 8 pin plug (white)	Driver's seat panel	Centre console
3S4	PM4 9 way socket (violet)	Driver's seat panel	Centre console

RIGHT HAND SIDE POWERED SEAT-LINK LEAD 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	location	Access
SS2	Centre console	Seat cushion
SS4	Centre console	Seat cushion

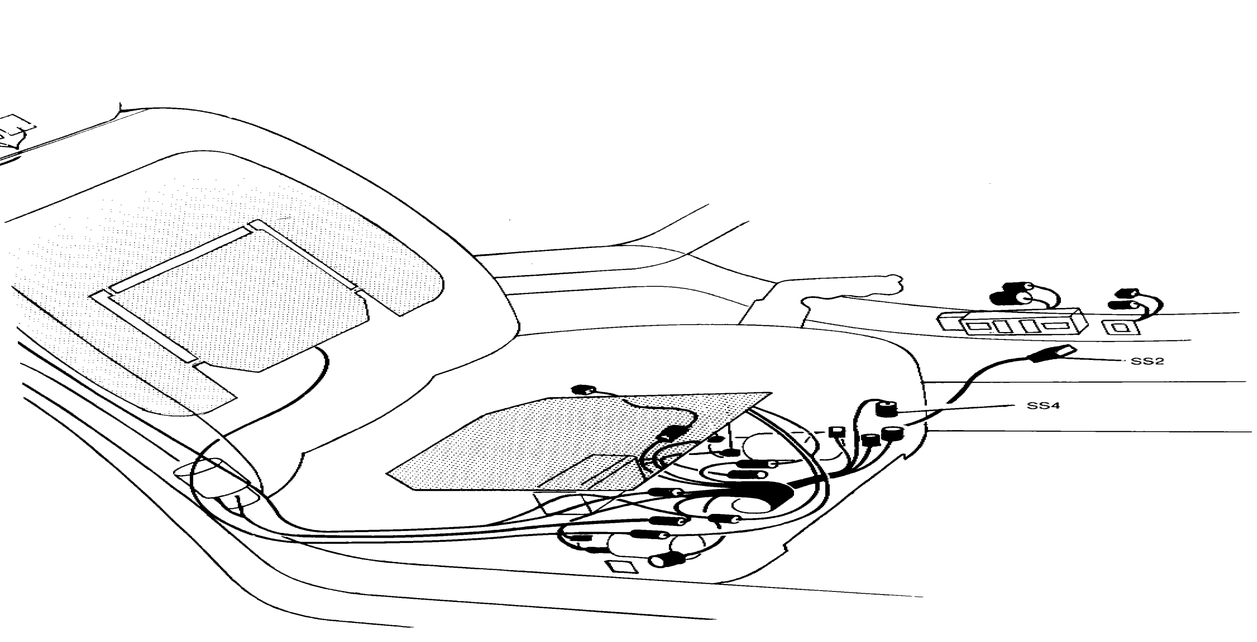
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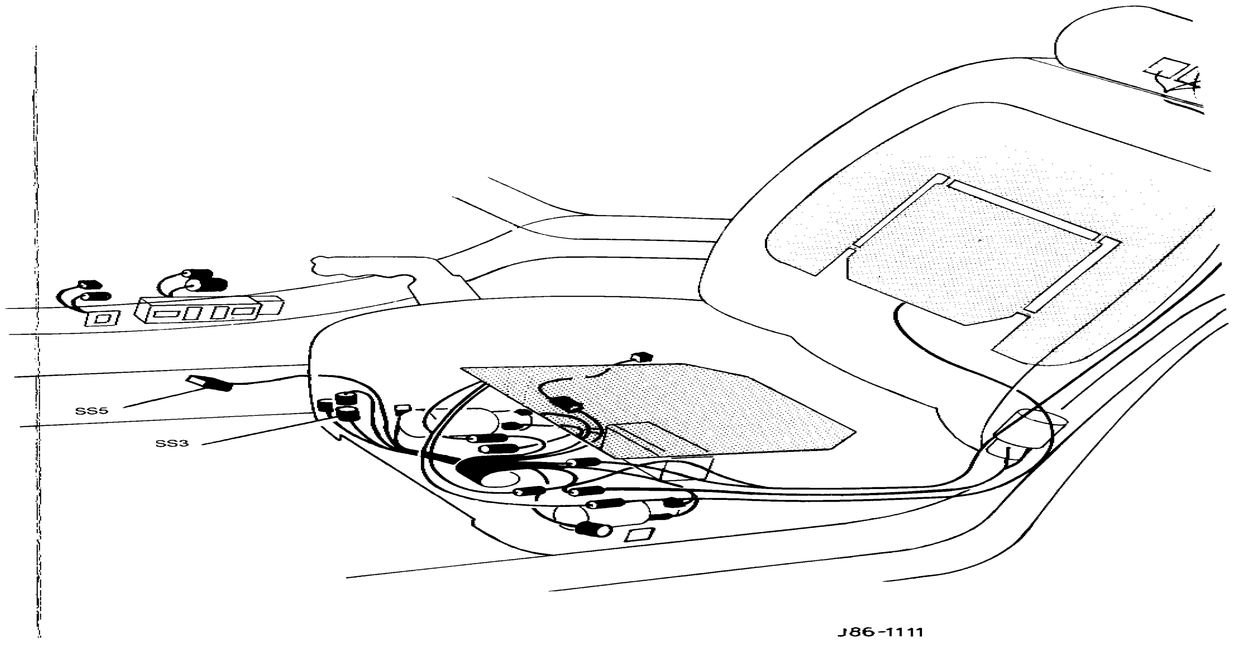
RIGHT HAND SIDE POWERED SEA' -LINK LEAD 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From Von De Van Da Desde	To Nach A Naar A Hacia	Colour Farbe Couleur Kleur Colore Color	Size (mm) Querschnitt Section Maat Dametro Tamano
SS2-1	SS4-1	O	2.0
SS2-2	SS4-2	K	2.0
SS2-3	SS4-3	R	2.0
SS2-4	SS4-5	U	2.0
SS2-5	SS4-6	W	2.0
SS3-6	SS4-7	Y	2.0
SS3-7	SS4-8	S	2.0
SS2-8	SS4-9	N	2.0
SS4-1	SS2-1	O	2.0
SS4-2	SS2-2	K	2.0
SS4-3	SS2-3	R	2.0
SS4-5	SS2-4	U	2.0
SS4-6	SS2-5	W	2.0
SS4-7	SS2-6	Y	2.0
SS4-8	SS2-7	S	2.0
SS4-9	SS2-8	N	2.0

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RIGHT HAND SIDE POWERED SEAT-LINK LEAD 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL





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DOOR LAMP TO DOOR SWITCH PACK-LINK HARNESS 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
DS2	Type 187 blade (white)	Door courtesy lamp	Passenger door
DS3	Type 187 blade (whitel	Door courtesy lamp	Passenger door
DS4	AMP Econoseal 2 way plug (black)	Door switch pack	Passenger door

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DOOR LAMP TO DOOR SWITCH PACK-LINK HARNESS 91MY.4.0L LOCATION AND ACCESS 90.50.90/HS

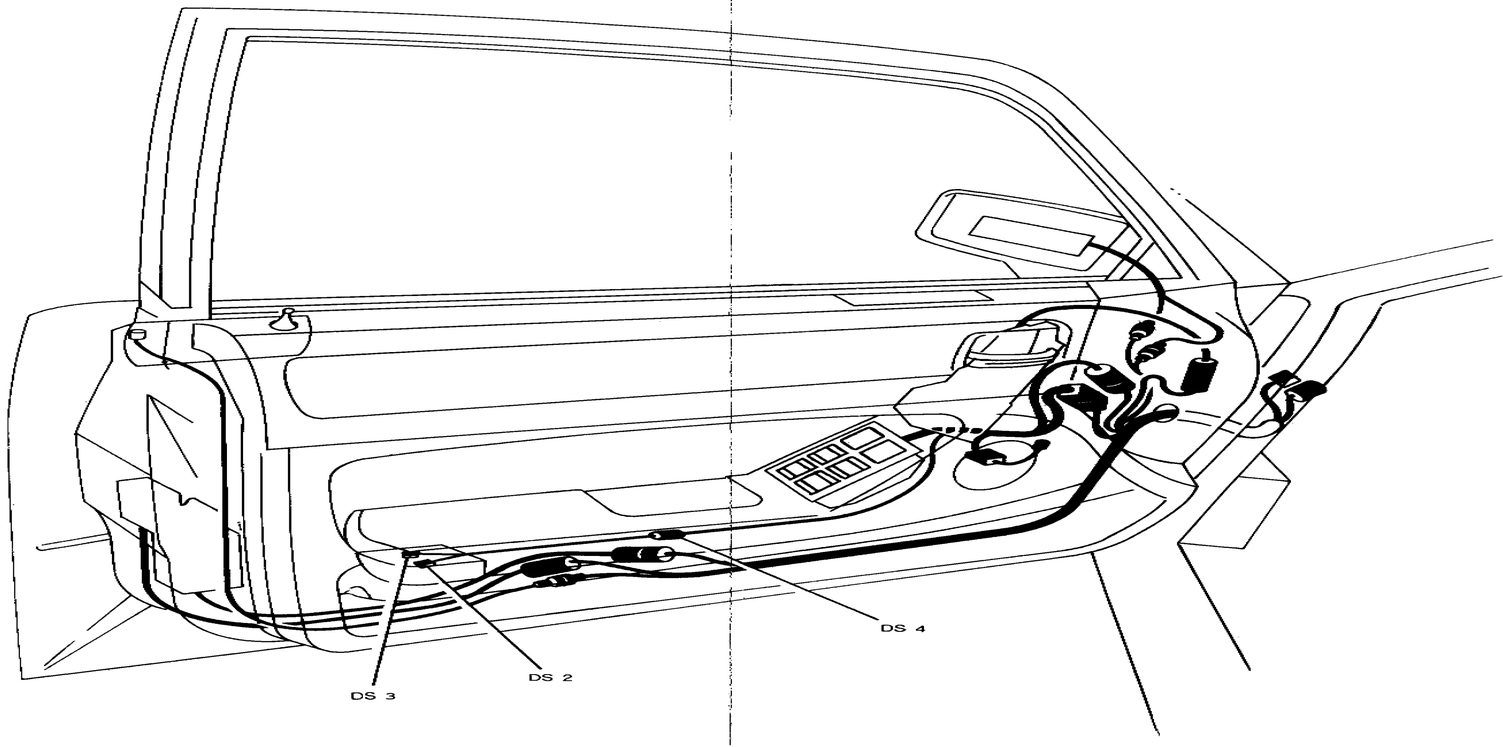
Connector	Location	Access
DS2 DS3 DS4	Passenger door Passenger door Passenger door switch pack	Armrest Armrest RH passenger window lift panel

DOOR LAMP TO DOOR SWITCH PACK-LINK HARNESS 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

'om	o	olour	ıze immi
on	ach	arbe	uerschnitt
e		ouleur	ection
an		leur	laat
a		olore	ametro
esde	acia	olor	amano
)S2	)S4-2	JY	1.5
IS3	)S4-3	;	1.5
)S4-2	)S2	JY	).5
)S4-3	)S3	;	1.5

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DOOR LAMP TO DOOR SWITCH PACK-LINK HARNESS 9 1MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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HIGH BEAM STOP LAMP-LINK HARNESS 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
HM1	AMP edye connector, 3 way (slate)	High beam stop lamp	Rear window shelf
RS71	PM5, 3 way socket (violet)	RH side harness	Luggage compartment

HIGH BEAM STOP LAMP-LINK HARNESS 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
HM1 RS71	Rear window shelf Luggage compartment	Luggage compartment Luggage compartment liner

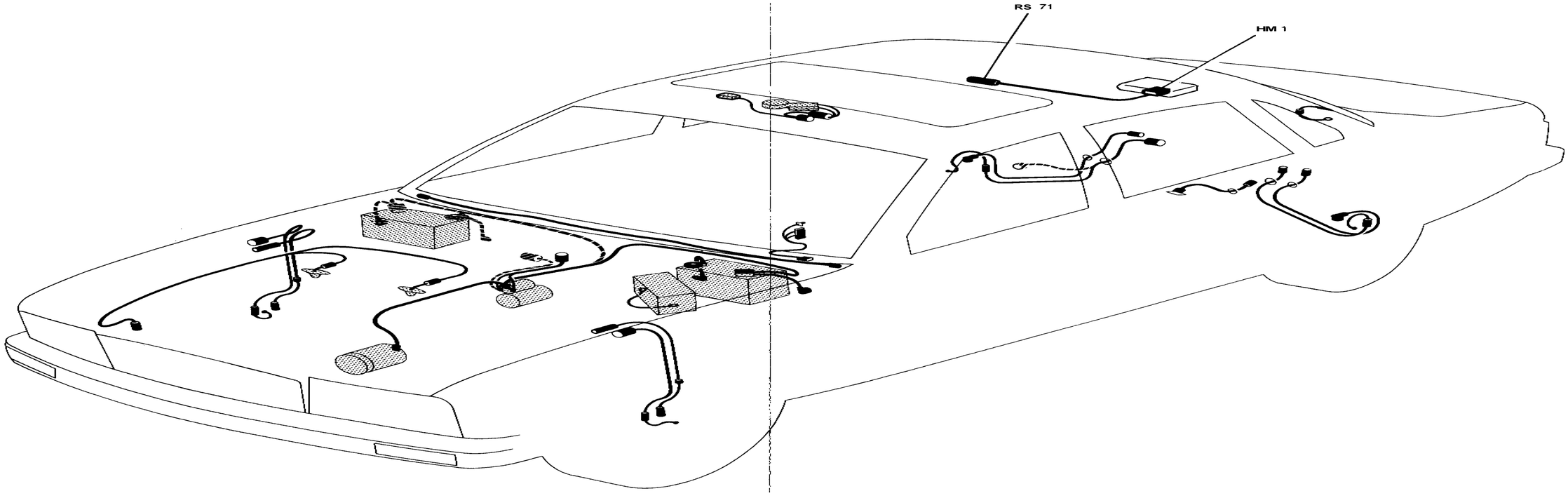
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HIGH BEAM STOP LAMP-LINK HARNESS WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De		Couleur	Section
Van	Naar	Kleur	Kaat
Da		Colore	Sezione
Desde	Hacia	Color	Seccion
HM1-2	RS71-1	R	0.5
HM1-3	RS71-2	RB	0.5
RS71-1	HM1-2	B	0.5
RS71-2	HM1-3	RB	0.5

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HIGH BEAM STOP LAMP - LINK HARNESS 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1065

STARTER SOLENOID LINK LEAD (LUCAS 4 VALVE PI HARNESS) 91MY.4.0L HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
LI34 LL2	**PM4** 3 way plug (blue) Eyelet	PI harness	Starter solenoid

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STARTER SOLENOID-LINK HARNESS (LUCAS 4 VALVE PI HARNESS) 91MY.4.0L LOCATION AND ACCESS 90.50.90/HS

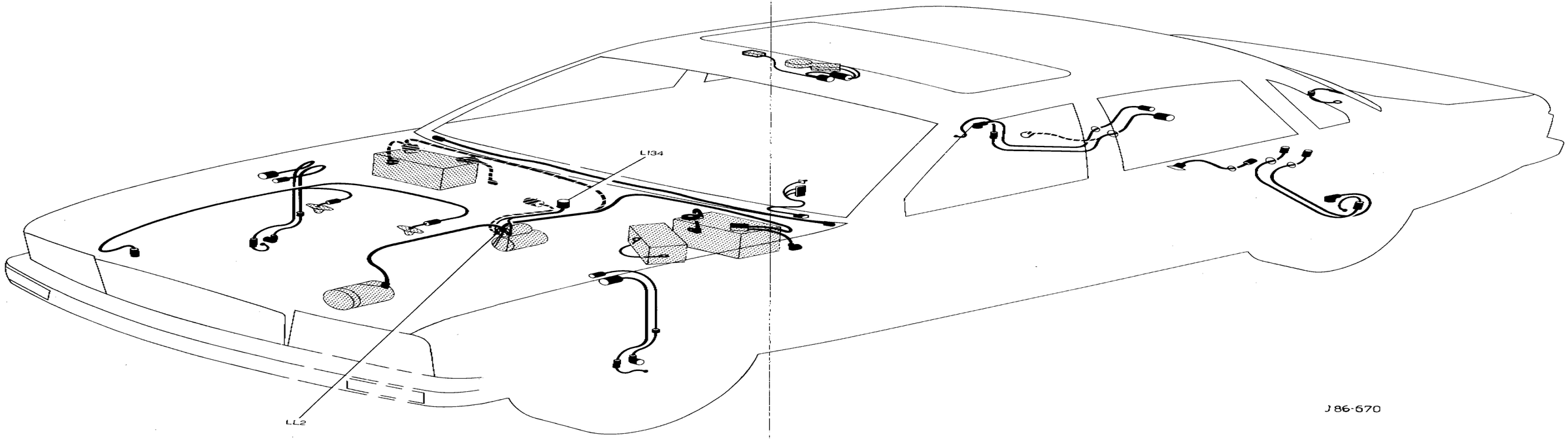
Connector	Location	Access
LI34 LL2	Engine compartment Engine compartment	Bonnet Bonnet

STARTER SOLENOID LINK LEAD (LUCAS 4 VALVE PI HARNESS) 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

From	To	Colour	Size (mm)
Von	Nach	Farbe	Querschnitt
De		Couleur	Section
Van	Naar	Kleur	Maat
Da		Colore	Diametro
Desde	Hacia	Color	Tamano
J134-2	L2	W	3.0

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STARTER SOLENOID LINK LEAD (LUCAS 4 VALVE PI HARNESS) 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



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STARTER TO ALTERNATOR LEAD 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
AS1	Eyelet	Alternator terminal	Engine compartment
AS2	Eyelet	Starter motor	*Engine* compartment

STARTER TO ALTERNATOR LEAD 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
AS1 AS2	Engine compartment Engine Compartment	Beneath engine Beneath engine

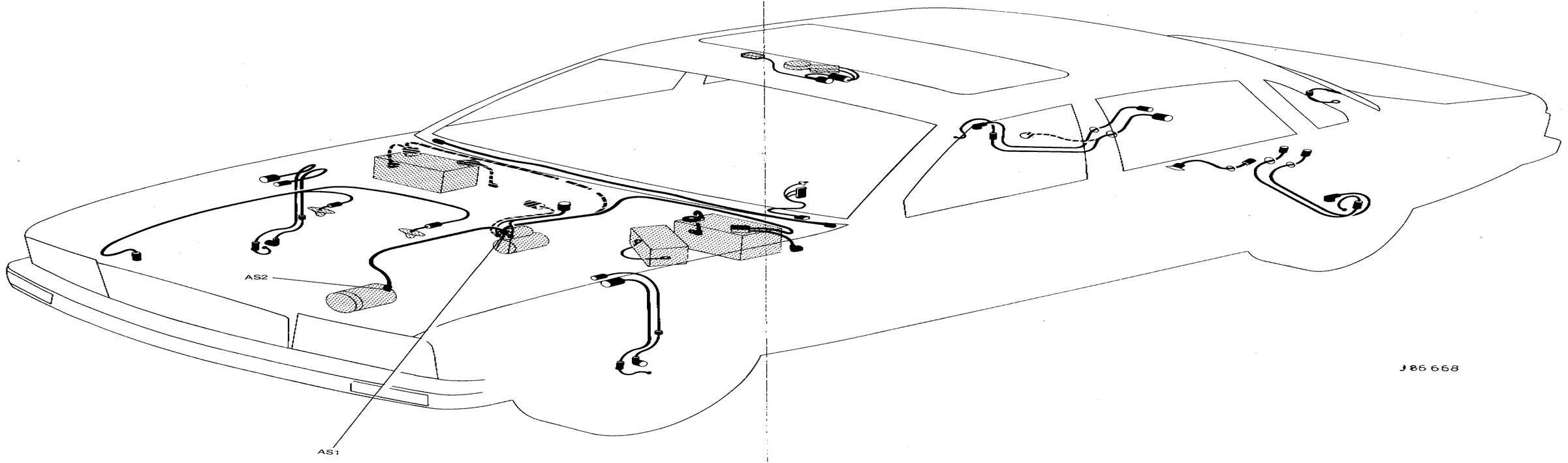
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STARTER TO ALTERNATOR LEAD 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

		lour	ze (mm)
on	ich	rbe	uerschnitt
R		uleur	ection
an	ar	eur	laat
a		lore	ametro
esde	cia	lor	amano
.S1	52	/	ninyvin 6

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STARTER TO ALTERNATOR LEAD 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



HEATED REAR WINDOW EARTH LEAD 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
HB1	250 spade connector	Heated rear window	D/E post
HB2	Eyelet	Chassis	D/E post LH side

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HEATED REAR WINDOW EARTH LEAD 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

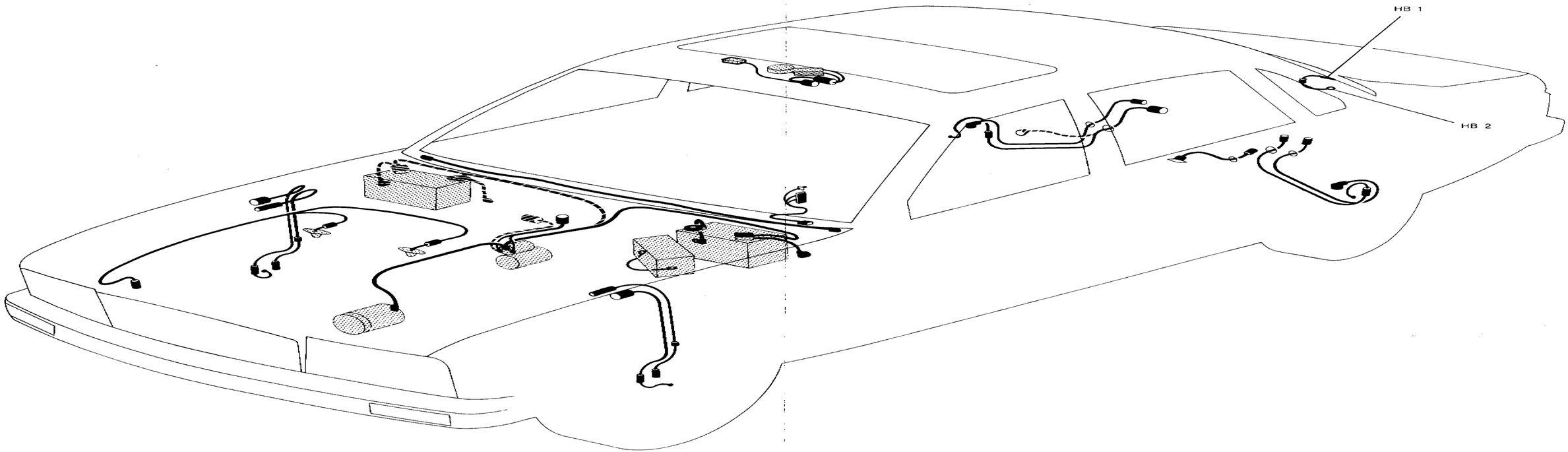
Connector	Location	Access
HB1 HB2	Heated rear window	Six light trim finisher

HEATED REAR WINDOW EARTH LEAD 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

'om	o	olour	ize (mm)
on	ach	arbe	uerschnitt
e		ouleur	ection
an	aar	leur	laat
a		olore	ametro
esde	acia	olor	amano
IB1	IB2	L	0

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HEATED REAR WINDOW EARTH LEAD 9 1MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1063

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REAR CIGAR LIGHTER LINK LEAD 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
CL1	Lucar 2 way socket	Cigar lighter	Centre console
CL2	187 blade connector	Cigar lighter	Centre console
LB184	Econoseal 'J' series plug	Bulkhead harness	

REAR CIGAR LIGHTER LINK LEAD 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

Connector	Location	Access
CL1	Centre console	Rear ash tray
CL2	Centre console	Rear ash tray
LB184	Bulkhead harness LB	Passenger dash liner

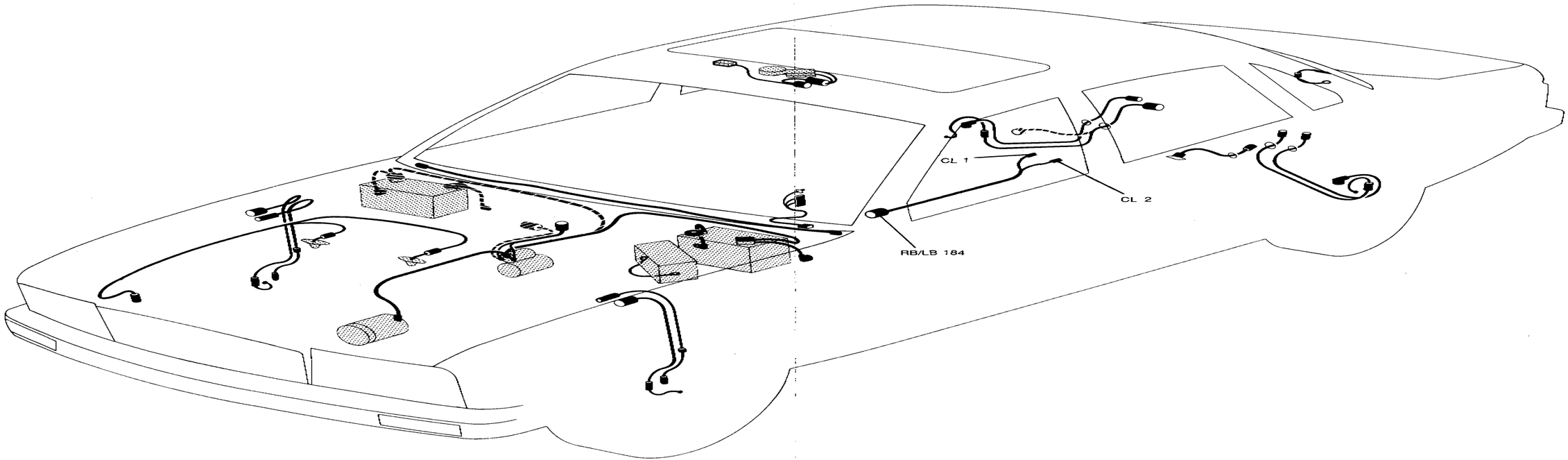
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REAR CIGAR LIGHTER LINK LEAD 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

rom	n	colour	ize (mm)
on	lach	arbe	uerschnitt
e		couleur	ection
an	laar	kleur	laat
a		colore	ametro
esde	lacia	color	amano
CL1-1	B184-3	B	1.0
CL1-2	B184-2	DB	1.0
CL2	B184-1	RB	1.5
B184-1	CL2	RB	1.5
B184-2	CL1-2	DB	1.0
B184-3	CL1-1	B	1.0

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REAR CIGAR LIGHTER LINK LEAD 91MY.4.0L
CONNECTOR LOCATION 90.50.90/CL



J86 1074

FUEL PUMP TO FLANGE LINK LEAD 91MY.4.0L
HARNESS SCHEDULE 90.50.90/HS

Item	Description	Interface	Location
LS143	Econoseal 3 receptacle 250 blade connector 167 blade connector	Harness LS Fuel pump (positive terminal) Fuel pump (negative terminal)	Luggage compartment Fuel tank Fuel tank

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FUEL PUMP TO FLANGE LINK LEAD 91MY.4.0L
LOCATION AND ACCESS 90.50.90/HS

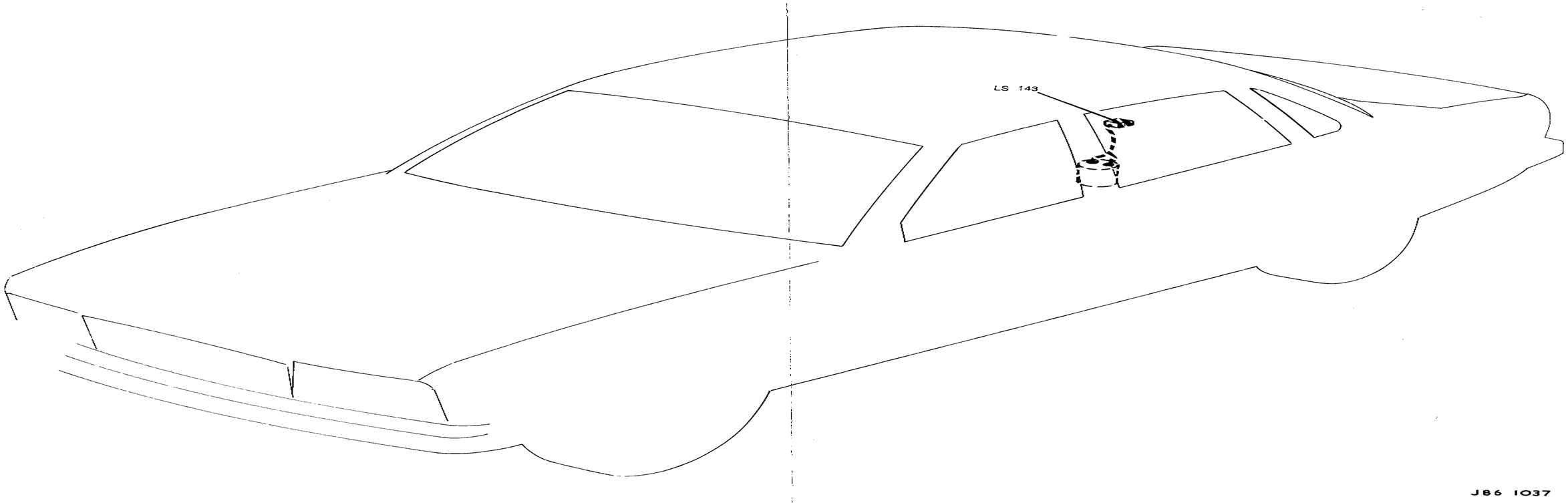
Connector	Location	Access
LS143	Evaporation loss flange	Luggage compartment liner (fuel tank)
+	Fuel tank	Luggage compartment
–	Fuel tank	Luggage compartment

FUEL PUMP TO FLANGE LINK LEAD 91MY.4.0L
WIRING SCHEDULE 90.50.90/WS

rom	o	:olour	ize (mm)
on	ach	arbe	uerschnitt
P		:ouleur	ection
an		leur	laat
a		:olore	ametro
esde	lacia	:olor	amano
S143-1	'ump	3	:.0
S143-2	'ump	JR	:.0

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FUEL PUMP TO FLANGE - LINK LEAD 91MY.4.0L
CONNECTOR LOCATIOM 90.50.90/CL



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