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

SERIES III
SERVICE MANUAL

Published by Technical Publications Jaguar Cars Limited
Publication Part No AKM 9006 Ed 5

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 if 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 0,0025 mm (0.0001 in) 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 de-greaser; maintain absolute cleanliness throughout the operations.

Inspect visually for markings of any form on rolling elements, raceways, outer surface of outer rings or inner suface 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 finger 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 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).

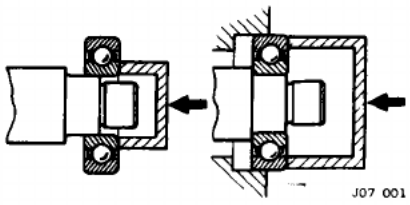


Fig. 1

In the case of grease-lubricated bearings (e.g. hub bearings) fill the space between the bearings and outer seal with a recommended grade of grease before fitting 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.

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 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 or splines. If fitting sleeve is not available, use plastic tube or adhesive tape to prevent damage to sealing lip.

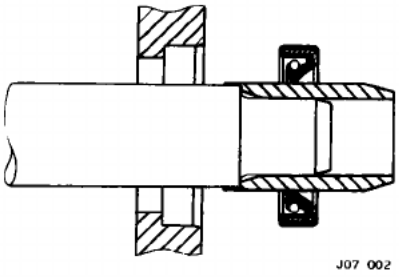


Fig. 2

Grease the 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 some cases it may be preferable to fit the seal to the housing before fitting to the shaft). Never let weight of an unsupported shaft rest in a seal.

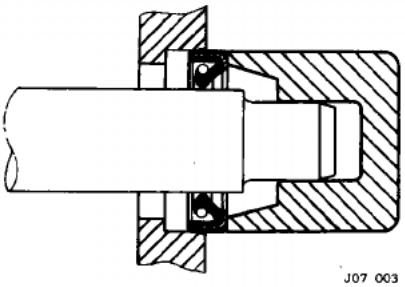


Fig. 3

If correct service tool is not available, use a suitable drift approximately 0,4 mm (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 obtained.

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 no 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, 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 hose, ensure that no unnecessary bends are introduced, and that 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 car while a second operator applies maximum pressure to the brakes (engine running) and operates the steering.

Metric Bolt Identifcation

An ISO metric bolt or screw, made of steel and larger than 6 mm in diameter can be identified by either of the symbols ISO M or M embossed or indented on top of head (Fig. 4).

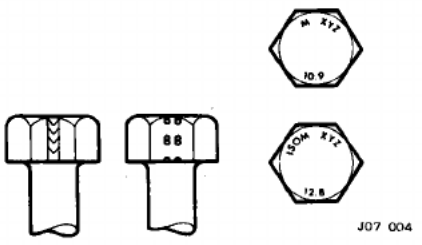


Fig. 4

speed at which the set switch was pressed, if the button is constantly depressed the vehicle will accelerate until the button is released.

Inhibit Switch

The inhibit switch, comprising a cam and micro-switch, is mounted on the gear selector mechanism, and inhibits the cruise control from operating in any selector positioned other than 'D'

Brake Operated Switches

The existing brake light switch is utilised for cancelling the cruise mode when the brakes are applied. As an additional safety feature, a second brake pedal operated switch, which makes and breaks the direct feed signal from the control unit to actuator, is also fitted.

This second switch is mounted in tandem with the brake light switch, but operates fractionally later. When the switch is operated, the current to the actuator is cut.

This switch functions completely independently to the brake light cancellation or control unit commands.

STATIC TEST

These tests are carried out using the ECONOCRUISE Installation Tester (Fig. 117).

1. Disconnect the main harness multi-plug connector from the electronic speed control unit.
2. Connect the Test Unit leads to the control unit and main harness plug.
3. Switch on the ignition, move the gear selector to the 'D' position; position the master switch to 'ON' and the Test Unit to the 'STATIC' position.
   Lamps 1, 2, 5, 7 and 9, should illuminate indicating correct continuity of the wiring.
4. To check the Neutral Gear position override, move the gear lever to 'N', lamp No. 8 should illuminate.
5. The set switch can be checked, by pressing it, lamp No. 3 should illuminate.
6. To check the 'RESUME' position of the main function switch, select 'RESUME' and lamp No. 4 should illuminate.
7. To check the Brakes Canellation and Safety switches, press the brake pedal, lamps 1, 2 and 5, should extinguish and No. 6 illuminate. If both lamps 5 and 6 illuminate together, check for an open circuit in the Brake Light Switch/Brake Light Circuit. If this circuit is not continuous, then the speed control system will not function.

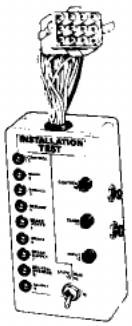


Fig. 117

Running Test

1. Switch the Test Unit to the 'RUN' position.
2. Start the engine, press and hold the dump and control buttons on the Test Unit, the engine revolutions should increase, release buttons. This test indicates that the actuator functions.
   Engage gear and drive off. The lower indicator lamp, on the run side of the Test Unit, should flicker, indicating the presence of an impulse from the Transducer Unit, mounted at the propshaft.
3. At approximately 80 km/h, 50 m/h press 'Set' button and release, the middle lamp marked 'Dump', should illuminate and the top light marked 'Control', should flicker. Press brake and both lamps should go out.

Checking the Set Speed

This check is the main dynamic test which ensures that there is no surge or drop off of the set speed when the engage command is given. Before carrying out this test, ensure that:

(i) The actuator cable is adjusted so that the free play at the actuator does not exceed 1 mm (0.040 in).
(ii) The air gap at the speed transducer is 7 ± 1 mm (0.275 ± 0040 in).
(iii) The inhibit switch only operates in the 'D' position.

To check the set speed, proceed as follows:

1. Switch system on.
2. Drive at approximately 80 km/h 50 mh on a quiet, flat road.
3. Engage the cruise control and remove foot from the accelerator pedal.
4. Record the speed at which the system is cruising.
5. Press and release the set button; allow the system to settle to the cruise speed again.
6. Note the new cruise speed. If the system is correctly set, then there should not be any increase or decrease in the noted cruising speed. If there is a change, then the Speed Control Unit will require adjustment.
7. Remove the rubber grommet from the side of the Control Unit and adjust the set speed potentiometer, with a suitable screwdriver, clockwise to increase or anti-clockwise to decrease the cruise speed.

Repeat the above procedure until the system is set correctly.

Fault Diagnosis

A. SYSTEM DOES NOT ENGAGE – at any speed above Low Speed Lock Out.

Causes:

1. Control unit malfunction.
2. Engage switch failure.
3. Inhibit switch failure.
4. Inhibit switch incorrectly adjusted.
5. Back-up switch failure.
6. Brake light switch, incorrectly adjusted, or failed. This switch must operate before the back-up switch.
7. Master switch malfunction.
8. Main fuse (No. 12) blown.
9. Stop lamp fuse (No. 12) blown.
10. Transducer air gap too large.
11. Transducer unit knocked out of alignment.
12. Loss of magnetic tab at transducer pick-up.
13. No vacuum supply to throttle actuator.

B. SYSTEM DOES NOT FUNCTION AT LOW SPEED

Causes:

1. Vehicle speed below low speed lock out. System not designed to function below 22 to 25 mph.
2. Loss of magentic tab at transducer pick-up.

C. SYSTEM WILL NOT RESUME

Causes:

1. Speed control unit malfunction.
2. Low speed lock out speed too high – loss of magnetic tab at transducer pick-up (Vehicle also will not engage at low speeds).

D. SYSTEM HUNTS AT LOW SPEED

Causes:

1. Air gap transducer too large. Reset to 7 ± 1 mm (0.275 ± 0.040 in).
2. Actuator cable too slack.
3. Control unit malfunction.

CONTENTS

KEY TO WIRING DIAGRAMS 1981-83 6 Cylinder

		Grid ref.	Circuit Number
1	Alternator	A1	
3	Battery	A1	
4	Starter solenoid	A1	
5	Starter motor	A1	
6	Master lighting switch	A1	
7	Headlamp dip switch	A2	
8	Headlamp beam R.H	A2	
9	Headlamp beam L.H	A2	
10	Main beam warning light	A2	
11	R.H. Side lamp	A2	
12	L.H. Side lamp	A2	
13	Panel lamps rheostat	B1	
14	Panel lamps	B1	
15	Number plate illumination lamp(s)	A2	
16	Stop lamp(s)	A3	
17	Tail lamp R.H	A2	
18	Stop lamp switch	A3	
19	Fuse box(es)		
20	Interior light(s)	C1	
21	Door switch	C1	
22	Tail lamp L.H	A2	
23	Horns	B2	
24	Horn push	B2	
25	Flasher unit (part of 154)	A3	
26	Direction indicator switch	A3	
27	Direction indicator warning lights	A3	
28	R.H. front flasher	A3	
29	L.H. front flasher	A3	
30	R.H. rear flasher	A3	
31	L.H. rear flasher	A3	
33	Blower motor	C3	
34	Fuel gauge	B1	

		Grid ref.	Circuit Number
35	Fuel gauge tank unit	B1	
36	Windscreen wiper switch	B2	
37	Windscreen wiper motor	B2	
38	Ignition/starter switch	A1	
38A	Key switch (part of 38)	A1	
39	Ignition coil	A1	
40	Distributor	A1	
41	Fuel pump		2 & 4
42	Oil pressure switch	B2	
43	Oil pressure warning light	B2	
44	Ignition warning light	A1	
46	Coolant temperature gauge	B1	
47	Water temperature transmitter	B1	
48	Oil pressure gauge	B1	
49	Reverse lamp switch	A3	
50	Reverse lamp(s)	A3	
54	Fog lamp R.H	A2	
55	Fog lamp L.H	A2	
56	Clock	C1	
57	Cigar lighter socket	C1	
59	Interior light switch	C1	
60	Radio	C1	
61	Horn relay	B2	
65	Boot light switch	C1	
66	Boot light	C1	
67	Line fuse		
75	Automatic gearbox safety switch	A1	
76	Automatic gearbox selector lamp	B1	
77	Windscreen washer pump	B2	
78	Windscreen washer switch	B2	
93	Charging and inspection lamp socket	C2	

		Grid ref.	Circuit Number
95	Tachometer	B1	
101	Map light switch	C1	
102	Map light	C1	
113	Headlamp inner R.H	A2	
114	Headlamp inner L.H	A2	
115	Rear window demist switch	B2	
116	Rear window demist unit	B2	
140	Fuel changeover switch	B1	
146	Battery condition indicator	B1	
147	Oil pressure transmitter	B1	
150	Rear window demister warning light	B2	
152	Hazard warning light	A3	
153	Hazard warning switch	A3	
154	Hazard warning flasher unit	A3	
159	Brake fluid level warning light	A1	
160	Brake differential pressure switch	B1	
164	Ballast resistor	A1	
165	Handbrake switch	A3	
166	Handbrake warning light	B1	
170	Side markers R.H. front	A2	
171	Side markers L.H. front	A2	
172	Side markers R.H. rear	A3	
173	Side markers L.H. rear	A3	
174	Radiator cooling fan diode(s)	C3	
177	Radiator cooling fan relay	C3	
178	Radiator cooling thermostat (in system)	C3	
179	Radiator cooling fan motor	C3	
182	Brake fluid level switch	B1	
183	Ignition amplifier	A1	
185	Aerial motor	C1	

		Grid ref.	Circuit Number
186	Aerial motor relay	C1	
188	Resistor	C3	
189	Blower speed relay	C3	
190	Compressor clutch		3
191	Thermostat		3
192	Control switch		3
194	Starter solenoid/ballast coil relay	A1	
196	Anti-run on solenoid valve 3.4		
197	Anti-run on oil pressure switch only		
198	Seat belt switch—driver	C1	
199	Seat belt switch—passenger (Non Fed)	C1	
200	Seat switch—passenger (Non Fed)	C1	
202	Seat belt warning light	C1	
204	Ignition protection relay	A1	
205	Fuel solenoid valve	B1	
206	Battery cooling fan	B2	
207	Battery cooling fan thermostat	B2	
208	Cigar lighter illumination	B1	
209	Headlamp dip beam R.H and L.H	A2	
215	Window lift master switch	B3	
216	Window lift switch R.H front	B3	
217	Window lift switch L.H front	B3	
218	Window lift switch R.H rear	B3	
219	Window lift switch L.H rear	B3	
220	Window lift motor(s)	B3	
221	Window lift relay	B3	
231	Headlamp relay	A2	
250	Inertia switch	B1	
255	Fibre optic illumination bulb	B1	
257	Door lock solenoid	B3	
258	Door lock solenoid relay	B3	
259	Thermal circuit breaker	B3	

		Grid ref.	Circuit Number
260	Door lock switch	B3	
261	Amplifier		3
262	Servo		3
263	Vacuum valve		3
264	In-car sensor		3
265	Ambient sensor		3
266	Headlamp wiper motor	A2	
267	Headlamp wash motor	B2	
277	Service interval counter		
278	Oxygen sensor warning light		
287	Fog guard warning light	A2	
288	Fog guard lamp	A2	
289	Direction indicator blocking diode	A3	
290	Seat belt logic unit (Federal)	C1	
293	Fuel injection control unit (ECU)		
294	Fuel safety relay		
295	Fuel injectors		
297	Air temperature sensor		
298	Thermotime switch		
299	Cold start relay		
300	Cold start injector		
301	Stop lamp failure sensor	A3	
303	Low coolant control unit	B1	
304	Park lamp failure sensor	A2	
305	Coolant temperature sensor		
306	Low coolant sensor	B1	
310	Throttle switch		2 & 4
311	Air flow meter		
312	Main relay		2 & 4
313	Power resistor		4
314	Fuel pump relay		2 & 4
315	Blocking diode—inhibit incorrect polarity		2 & 4

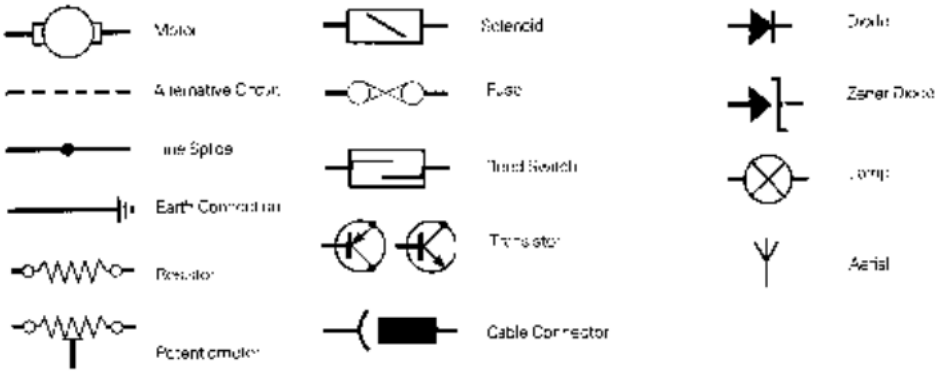
		Grid ref.	Circuit Number
316	Oxygen sensor		4
317	Extra air valve		
320	Low coolant warning light	B1	
323	Lamp failure warning light	A1	
324	Inverter	B1	
325	Full throttle switch		4
327	Temperature selector		3
329	Timer Relay wipers	B2	
330	Seat adjust motor	C2	
331	Seat adjuster switch	C2	
332	Sliding roof switch	B3	
333	Sliding roof motor	B3	
334	Electric door mirror	C2	
335	Interior lamp delay	C1	
338	Aerial adjusting switch	C1	
339	Headlamp wiper relay	B2	
340	Heated back light relay	B2	
341	Boot lock solenoid	B3	
342	Speed control unit	C2	
343	Magnetic pick-up	C2	
344	Inhibit switch	C2	
345	Set switch	C2	
346	Switch control unit	C2	
347	Actuator	C2	
349	Throttle micro-switch		4
350	Overtemperature switch		3
351	Thermal fuse		3
352	Speed control brake switch	C2	

CABLE COLOUR CODE

When a cable has two colour code letters, the first denotes the Main Colour and the second the Tracer Colour

N. Brown — Positive Cable
B. Black — Negative Cable
W. White
K. Pink **Ignition switch controlled**
G. Green
R. Red **Y. Yellow** **O. Orange** **S. Slate** **L. Light** **P. Purple**

SYMBOLS USED



BULB CHART

	WATTS	LUCAS PART NO.	UNIPART NO.	NOTES
Headlamps —				
LH Traffic Markers				
Tungsten — Outer	60/45	54629039	GLU 736	XU5.4 Ste only. Sealed beam light unit
Inner	50	54629740	GLU 734	XU5.4 Ste only. Sealed beam light unit
— Halogen Outer	60/55	472	GLB 472	H4 base
— Tungsten	55	448	GLB 448	H1 base
RH Traffic Markers				
Normal Halogen — Outer	60/55	472	GLB 472	H4 base
Inner	55	448	GLB 448	H1 base
France — Halogen Outer	60/55	476	GLB 476	Yellow bulb H1 base
Inner	40/40	411	GLB 411	Yellow bulb. The 40 watt filament is not used
USA Tungsten — Outer	37.5/50			Sealed beam light unit
Inner	50			Sealed beam light unit
Front Parking Lamp	4	233	GLB 233	Not USA Headlamp pilot
Front Flasher Lamp	21	382	GLB 382	Not USA
Front Parking and Flasher Lamp	5/21	380	GLB 380	USA only
Front Fog Lamp — Clear	55		GLB 212	H3 base
Flasher Repeater	4	233	GLB 233	Not USA
Front Marker Lamp	4	233	GLB 233	USA only
Rear Marker Lamp	4	233	GLB 233	USA only
Rear Door Guard Lamp	5	989	GLB 989	
Stop Lamp	21	382	GLB 382	
Tail Lamp	6	207	GLB 207	
Rear Flasher Lamp	21	382	GLB 382	
Reversing Lamp	21	382	GLB 382	
Plate Illumination Lamp	4	233	GLB 233	
Rear Fog Lamp	21	382	GLB 382	Not USA
Instrument Illumination	2.2	987	GLB 987	
Warning Light — Cluster	1.2	286	GLB 286	
L.H. Turn Signal	3	504	GLB 504	
Heated Backlight	2.8	650	GLB 650	24 volt bulb
— Body Failure	2.2	987	GLB 987	
— R.H. Turn Signal	3	504	GLB 504	
Rectangular Cluster	2	281	GLB 281	Special markets only
Map Lamp	6	254	GLB 254	
Clock Illumination	2.2	987	GLB 987	
Switch Panel Illumination	1.2		GLB 286	
Automatic Selector Illumination	2.2	987	GLB 987	
Cigarette Lighter Illumination	2		GLB 288	
Fibre Optic Lamp	6	254	GLB 274	
Interior Lamp	5	989	GLB 989	
Reading Lamp	4	233	GLB 233	
Luggage Boot Lamp	5	239	GLB 239	

MAIN FUSE BOX L.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	FOG LAMPS	20A	GFS 420
2	HAZARD WARNING, SEAT BELT LOGIC UNIT	15A	GFS 415
3	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	WINDSCREEN WIPERS	35A	GFS 435
7			—
8	PANEL ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	BATTERY COOLING FAN, HORN RELAY WINDINGS, RADIATOR AUXILIARY FAN, RELAY WINDINGS, WINDSCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

MAIN FUSE BOX R.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	ANTI RUN-ON VALVE (4 CARS ONLY	10A	GFS 410
2	HAZARD WARNING	15A	GFS 415
3	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	AIR CONDITIONING RELAY AND CLUTCH	15A	GFS 415
7	WINDSCREEN WIPERS	35A	GFS 435
8	PANEL ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	BATTERY COOLING FAN, HORN RELAY WINDING, RADIATOR AUXILIARY FAN RELAY, SCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

AUXILIARY FUSE BOX R.H. Stg.

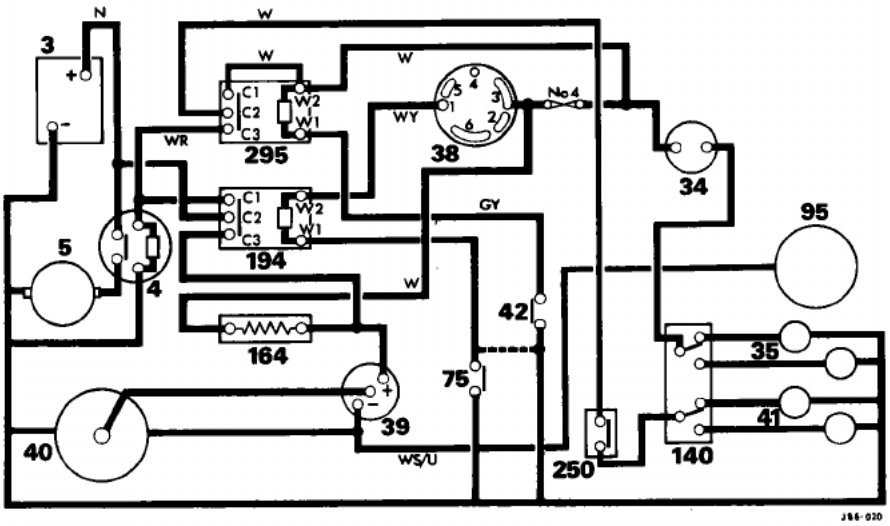
FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
14	DOOR LOCK RELAY ELECTRIC DOOR MIRROR DOOR LAMPS	5A	GFS 45
15	FOG LAMPS	20A	GFS 420
16	—	—	—
17	FRONT PARKING LAMPS	3A	GFS 43

AUXILIARY FUSE BOX L.H. Stg.

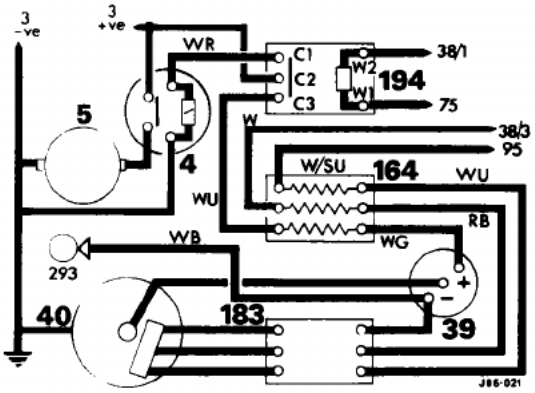
FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	AIR CONDITIONING, RELAY AND CLUTCH	15A	GFS 415
14	FRONT PARKING LAMPS	3A	
15	FRONT PARKING LAMPS	10A	GFS 410
16	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
17	DOOR LOCK RELAY, ELECTRIC DOOR MIRRORS, DOOR LIGHTS	3A	

HEADLAMP FUSE BOX

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	RADIATOR, COOLING FAN — WHERE FITTED	8/15A	GFS 415
2	RH DIP	10/20A	GFS 420
3	RH MAIN	17/35A	GFS 435
4	LH MAIN	10/20A	GFS 420
5	LH MAIN	17/35A	GFS 435

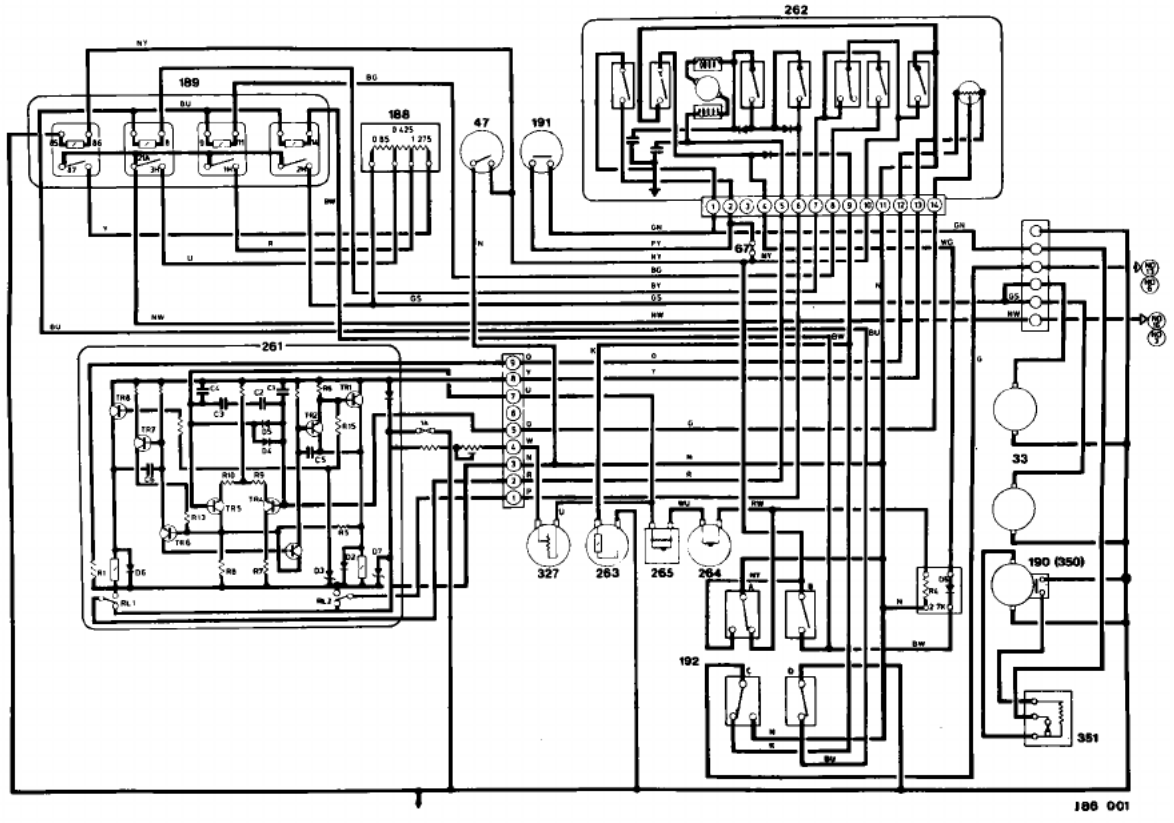


IGN SYSTEM (Early Models)

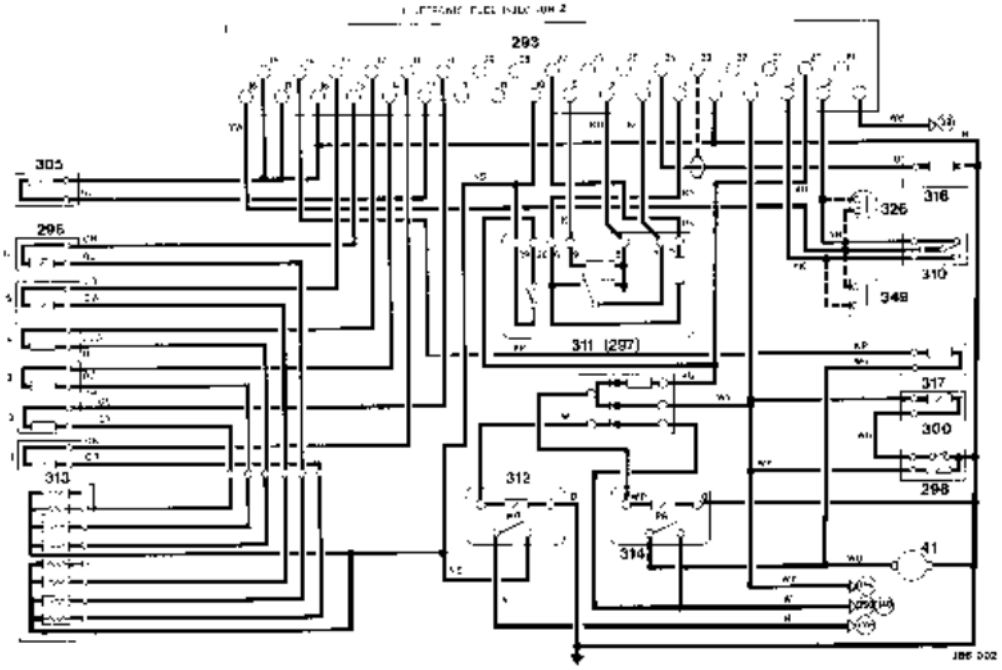


3.4 IGN & FUEL SYSTEM

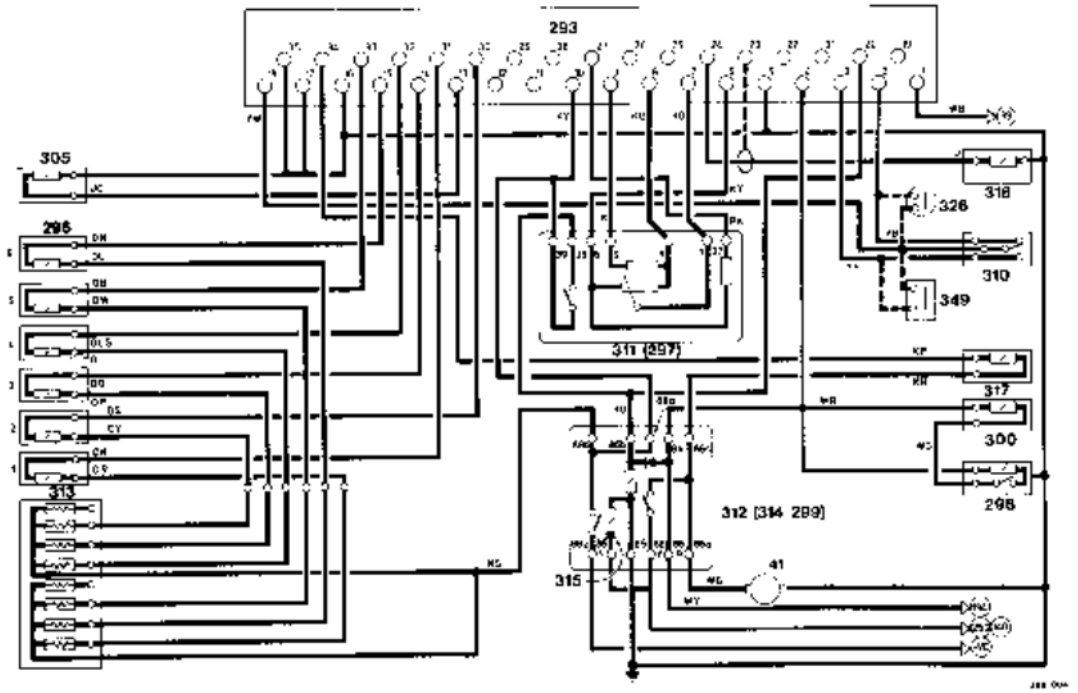
AIR CONDITIONING

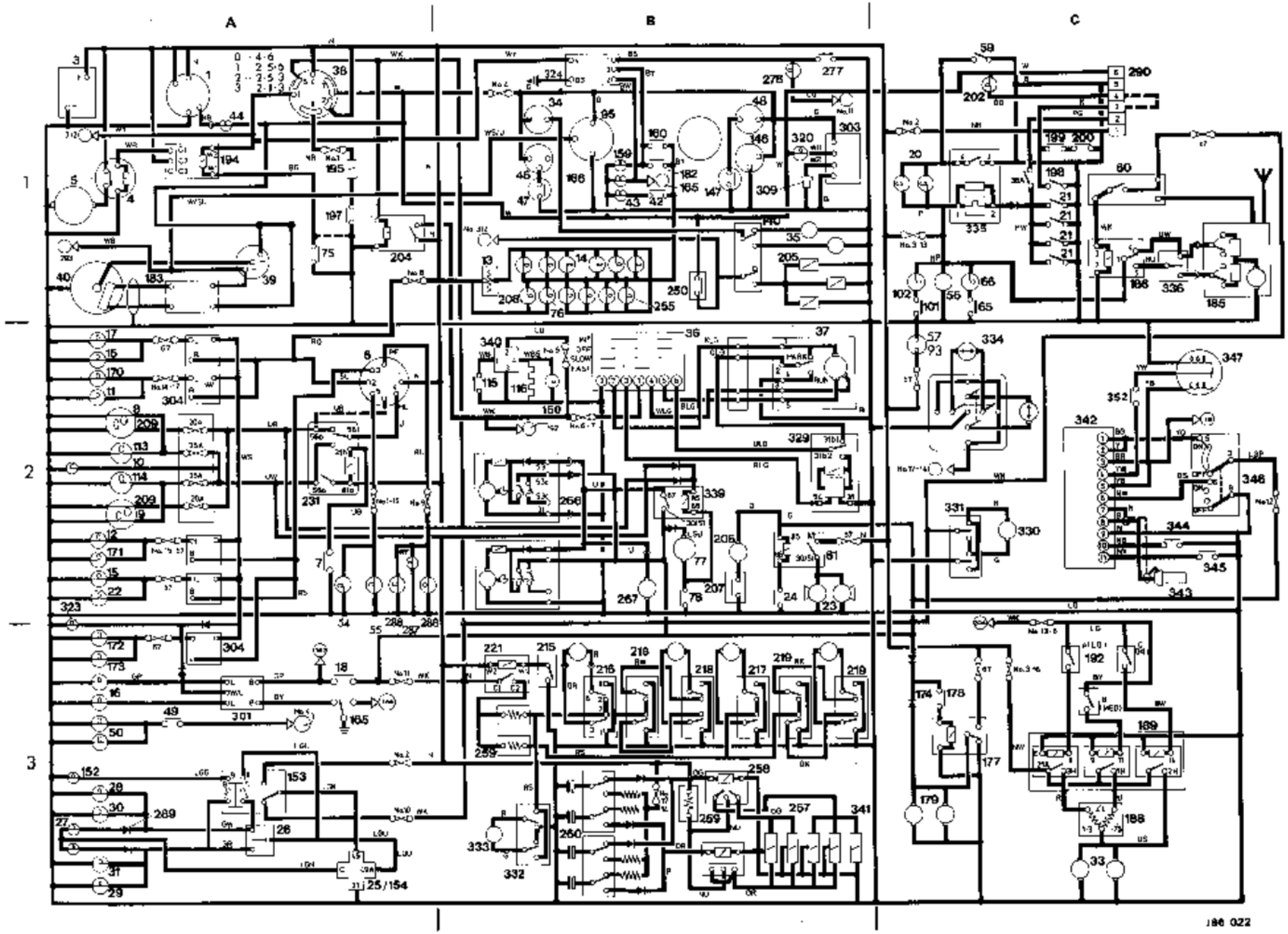


FUEL INJECTION



FUEL INJECTION (EARLY MODELS)





1981 – 83 6 CYLINDER MODELS

KEY TO WIRING DIAGRAMS 1981 – 83 12 Cylinder

	Grid ref.	Circuit Number
1 Alternator	A1	
2 Battery	A1	
4 Starter solenoid	A1	
5 Starter motor	A1	
6 Master lighting switch	A1	
7 Headlamp flash switch	A2	
8 Headlamp beam R.H.	A2	
9 Headlamp beam L.H.	A2	
10 Main beam warning light	A2	
11 R.H. side lamp	A2	
12 L.H. side lamp	A2	
13 Panel lamp (nearside)	B1	
14 Panel lamps	B1	
15 Number plate illumination lamp(s)	A2	
16 Stop lamp(s)	A3	
17 Tail lamp R.H.	A2	
18 Stop lamp switch	A3	
19 Fuse box(es) (not shown)		
20 Interior light(s)	C1	
21 Door switch	C1	
22 Tail lamp L.H.	A2	
23 Horns	B2	
24 Horn push	B2	
25 Flasher unit (part of 154)	A3	
26 Direction indicator switch	A3	
27 Direction indicator warning light(s)	A3	
28 R.H. front flasher	A3	
29 L.H. front flasher	A3	
30 R.H. rear flasher	A3	
31 L.H. rear flasher	A3	
33 Blower motors	C3	
34 Fuel gauge	B1	
35 Fuel gauge tank unit	B1	
36 Windscreen wiper switch	B2	
37 Windscreen wiper motor	B2	
38 Ignition/starter switch	A1	
38A Key switch (part of 38)	A1	
39 Ignition coil	A1	
40 Distributor	A1	
41 Fuel pump	—	2 & 4
42 Oil pressure switch	B2	
43 Oil pressure warning light	B2	
44 Ignition warning light	A1	
46 Coolant temperature gauge	B1	
47 Water temperature transmitter	B1	
48 Oil pressure gauge	B1	
49 Reverse lamp switch	A3	
50 Reverse lamp(s)	A3	
54 Fog lamp R.H.	A2	
55 Fog lamp L.H.	A2	
56 Clock	C1	
57 Cigar lighter socket	C1	
59 Interior light switch	C1	
60 Radio	C1	
61 Horn relay	B2	
65 Boot light switch	C1	
66 Boot light	C1	
67 Line fuse	—	
75 Automatic gearbox safety switch	A1	
76 Automatic gearbox selector lamp	B1	
77 Windscreen washer pump	B2	
79 Windscreen washer switch	B2	
93 Charging and inspection lamp socket	C2	
95 Tachometer	B1	
101 Mirror light switch	C1	
102 Map light	C1	
112 Headlamp inner R.H.	A2	
114 Headlamp inner L.H.	A2	
115 Rear window demist switch	B2	
116 Rear window demist unit	B2	
140 Fuel change over switch	B1	
146 Battery condition indicator	B1	
147 Oil pressure transmitter	B1	
150 Rear window demister warning light	B2	
152 Horn warning light	A3	
153 Hazard warning switch	A3	
154 Hazard warning flasher unit	A3	
159 Brake fluid level warning light	B1	
160 Brake differential pressure switch	B1	
164 Ballast resistor	A1	
165 Handbrake switch	A3	
166 Handbrake warning light	B1	
170 Side marker R.H. front	A2	
171 Side markers L.H. front	A2	
172 Side markers R.H. rear	A3	
173 Side markers L.H. rear	A3	
174 Resistor cooling fan diode(s)	C3	
177 Radiator cooling fan relay	C3	
178 Radiator cooling thermostat (in pump)	C3	
179 Radiator cooling fan motor	C3	
180 Kickdown switch	B2	
181 Kickdown solenoid	B2	
182 Brake fluid level switch	B1	

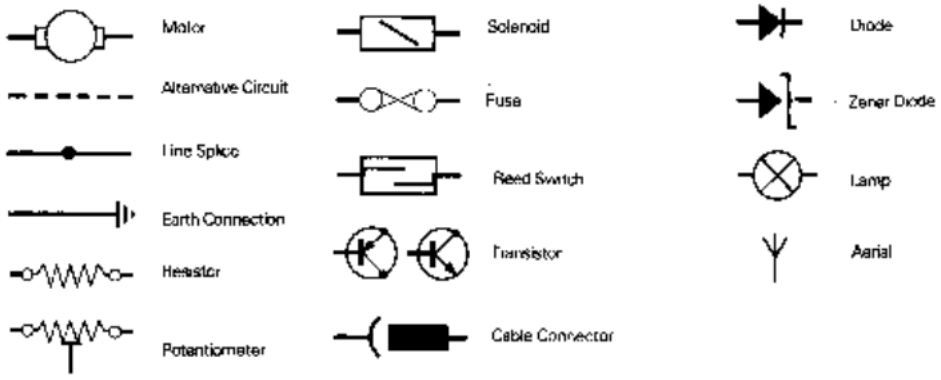
	Grid ref.	Circuit Number
185 Ignition amplifier	A1	
186 Aerial motor	C1	
188 Aerial motor relay	C1	
189 Resistor	C1	
189 Blower speed relay	C1	
190 Compressor clutch		3
191 Thermostat		3
192 Control switch		3
194 Starter solenoid/ballast resistor relay	A1	
198 Seat belt switch—driver	C1	
199 Seat belt switch—passenger (Non Fed)	C1	
200 Seat switch—passenger (Fed)	C1	
202 Seat belt warning light	C1	
204 Ignition protection relay	A1	
205 Fuel solenoid valves	B1	
206 Battery cooling fan	B2	
207 Battery cooling fan thermostat	B2	
208 Cigar lighter illumination	B1	
209 Headlamp dip beam R.H. & L.H.	A2	
215 Window lift master switch	B3	
216 Window lift switch R.H. front	B3	
217 Window lift switch L.H. front	B3	
218 Window lift switch R.H. rear	B3	
219 Window lift switch L.H. rear	B3	
220 Window lift motor(s)	B5	
221 Window lift relay	B3	
232 Headlamp relay	A2	
250 Inertia switch	B1	
256 Fibre optics illumination bulb	B1	
257 Door lock solenoid	B3	
258 Door lock solenoid relay	B3	
268 Thermal circuit breaker	B3	
260 Door lock switch	B3	
261 Amplifier		3
262 Servo		3
263 Vacuum valve		3
264 In car sensor		3
265 Ambient sensor		3
266 Headlamp wiper motor	B2	
267 Headlamp wash motor	B2	
267 Fog guard warning light	A2	
268 Fog guard lamp	A2	
269 Direction indicator blocking diode	A3	
280 Seat belt logic unit (Federal)	C1	
291 EGR control unit		2
292 Fuel injection amplifier		2
293 Fuel injection control unit (ECU)		2 & 4
296 Fuel injectors		2 & 4
297 Air temperature sensor		2 & 4
298 Thermotime switch		2 & 4
299 Cold start relay		2 & 4
300 Cold start injector		2 & 4
301 Stop lamp failure sensor	A3	
303 Low coolant control unit	B1	
304 Park lamp failure sensor	A2	
305 Coolant temperature sensor		2 & 4
306 Trigger unit		2
307 EGH valve		2
308 EGR thermo switch		2
309 Low coolant sensor	B1	
310 Throttle switch		2 & 4
312 Main relay		2 & 4
313 Power resistor		4
314 Fuel pump relay		2 & 4
315 Blocking diode (part of 312)		2 & 4
316 Oxygen sensor		4
318 Manifold pressure sensor		2
320 Low coolant warning light	B1	
323 Lamp failure warning light	A2	
324 Inverter	B1	
326 Full throttle switch		4
327 Temperature selector		3
329 Timer Relay — wipers	B2	
330 Seat adjuster motor	C2	
331 Seat adjuster switch	C2	
332 Sliding roof switch	B3	
333 Sliding roof motor	B3	
334 Electric door mirror	C2	
335 Interior lamps delay	C1	
336 Aerial adjusting switch	C1	
338 Headlamp wiper relay	B2	
340 Heated back light delay	B2	
341 Boot lock solenoid	B3	
342 Speed control unit	C2	
343 Magnet pick up	C2	
344 Inhibit switch (see 256)	C2	
345 Set switch	C2	
346 Switch control unit	C2	
347 Actuator	C2	
349 Throttle micro-switch		4
350 Over-temperature switch		3
351 Thermal fuse		3
352 Speed control brake switch	C2	
353 Feedback monitor socket		4
354 Feedback disable socket		4
355 Feedback relay		4
356 Kickdown/Speed control inhibit switch.	C2	

CABLE COLOUR CODE

When a cable has two colour code letters, the first denotes the Main Colour and the second the Tracer Colour.

N. Brown — Positive Cable
B. Black — Negative Cable
W. White
K. Pink **Ignition switch controlled**
G. Green
R. Red **Y. Yellow** **O. Orange** **S. Slate** **L. Light** **P. Purple**

SYMBOLS USED



BULB CHART

	WATTS	LUCAS PART NO.	UNIPART NO.	NOTES
Headlamps —				
L.H. Traffic Markers —				
— Tungsten Outer	60/45	54529739	GLU 136	XJ 3.4 Std only. Sealed beam light unit
— Inner	50	54529740	GLU 134	XJ 3.4 Std only. Sealed beam light unit
— Halogen — Outer	60/55	472	GLB 472	H4 base
Inner	55	448	GLB 448	H1 base
R.H. Traffic Markers —				
Normal — Halogen — Outer	60/55	472	GLB 472	H4 base
Inner	55	448	GLB 448	H1 base
France — Halogen — Outer	60/55	476	GLB 476	Yellow bulb H4 base
— Inner	45/40	411	GLB 411	Yellow bulb. The 40 watt filament is not used
USA — Tungsten Outer	37.5/60			Sealed beam light unit
— Inner	50			Sealed beam light unit
Front Parking Lamp	4	233	GLB 233	Not USA Headlamp pilot
Front Flasher Lamp	21	382	GLB 382	Not USA
Front Parking and Flasher Lamp	5/21	380	GLB 380	USA only
Front Fog Lamp — Cibie	55		GLB 212	H2 base
Flasher Repeater	4	233	GLB 233	Not USA
Front Marker Lamp	4	233	GLB 233	USA only
Rear Marker Lamp	4	233	GLB 233	USA only
Rear Door Guard Lamp	5	989	GLB 989	
Stop Lamp	21	382	GLB 382	
Tail Lamp	5	207	GLB 207	
Rear Flasher Lamp	21	382	GLB 382	
Reverse Lamp	21	382	GLB 382	
Plate Illumination Lamp	4	233	GLB 233	
Rear Fog Lamp	21	382	GLB 382	Not USA
Instrument Illumination	2.2	987	GLB 987	
Warning Light — Cluster	1.2	286	GLB 286	
— LH Turn Signal	3	504	GLB 504	
Heated Backlight	2.8	650	GLB 650	24 volt bulb
— Bulb Failure	2.2	987	GLB 987	
— RH Turn Signal	3	504	GLB 504	
Rectangular Unit	2	281	GLB 281	Special markets only
Map Lamp	6	254	GLB 254	
Clock Illumination	2.2	987	GLB 987	
Switch Panel Illumination	1.2	—	GLB 284	
Automatic Selector Illumination	2.2	987	GLB 987	
Cigarette Lighter Illumination	2	—	GLB 288	
Fibre Optic Lamp	6	254	GLB 254	
Interior Lamp	5	989	GLB 989	
Reading Lamp	4	233	GLB 233	
Luggage Boot Lamp	5	239	GLB 239	

MAIN FUSE BOX L.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	JNIPART NUMBER
1	ANTI RUN ON VALVE 3.4 CARS ONLY	10A	GFS 410
2	HAZARD WARNING	15A	GFS 415
3	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	AIR CONDITIONING RELAY AND CLUTCH	15A	GFS 415
7	WINDSCREEN WIPERS	35A	GFS 435
8	PANEL ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	BATTERY COOLING FAN, HORN RELAY WINDING RADIATOR AUXILIARY, FAN RELAY, SCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

MAIN FUSE BOX R.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	JNIPART NUMBER
1	FOG LAMPS	20A	GFS 420
2	HAZARD WARNING, SEAT BELT LOGIC UNIT	15A	GFS 415
3	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	WINDSCREEN WIPERS	35A	GFS 435
7	—	—	—
8	PANEL ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	BATTERY COOLING FAN, HORN RELAY WINDINGS, RADIATOR AUXILIARY FAN, RELAY WINDINGS, WINDSCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

AUXILIARY FUSE BOX R.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
14	DOOR LOCK RELAY ELECTRIC DOOR MIRROR DOOR LAMPS	5A	GFS 45
15	FOG LAMPS	20A	GFS 420
16	—	—	—
17	FRONT PARKING LAMPS	3A	GFS 43

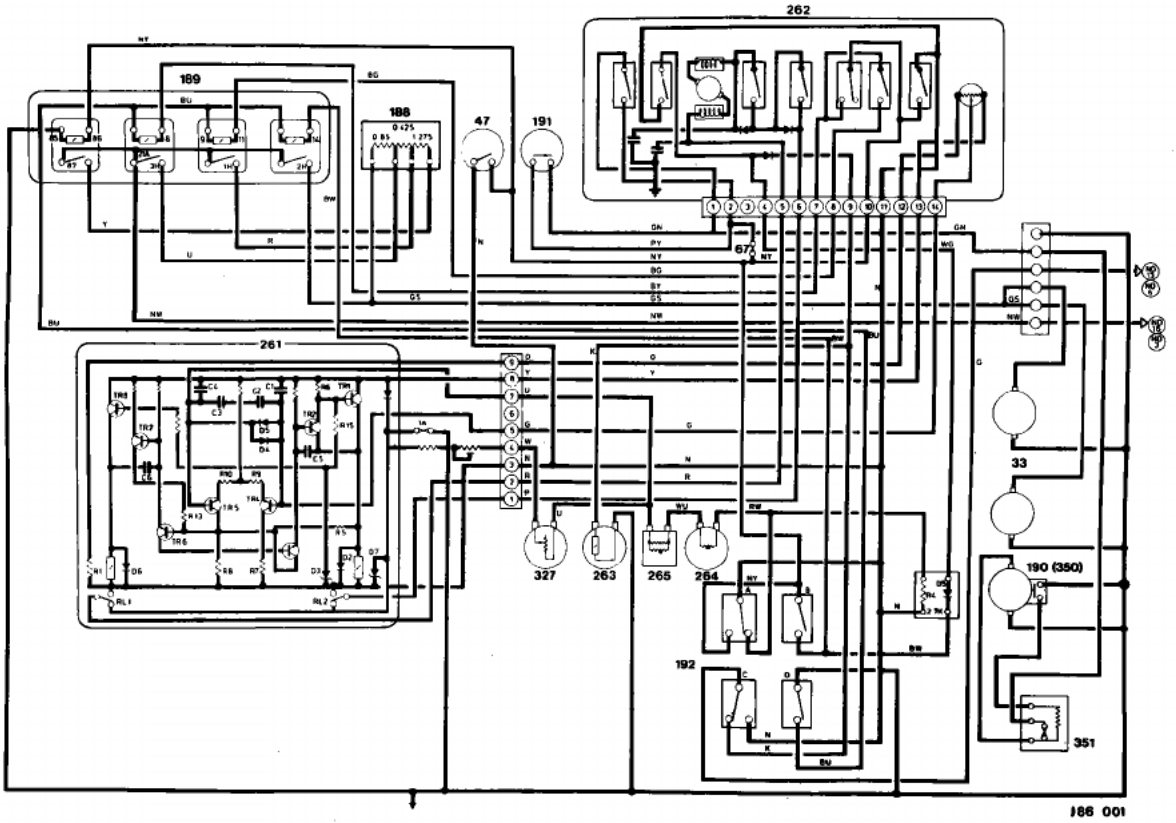
AUXILIARY FUSE BOX L.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	AIR CONDITIONING, RELAY AND CLUTCH	15A	GFS 415
14	FRONT PARKING LAMPS	3A	GFS 43
15	FRONT PARKING LAMPS	10A	GFS 410
16	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
17	DOOR LOCK RELAY, ELECTRIC DOOR MIRRORS, DOOR LIGHTS	3A	GFS 43

HEADLAMP FUSE BOX

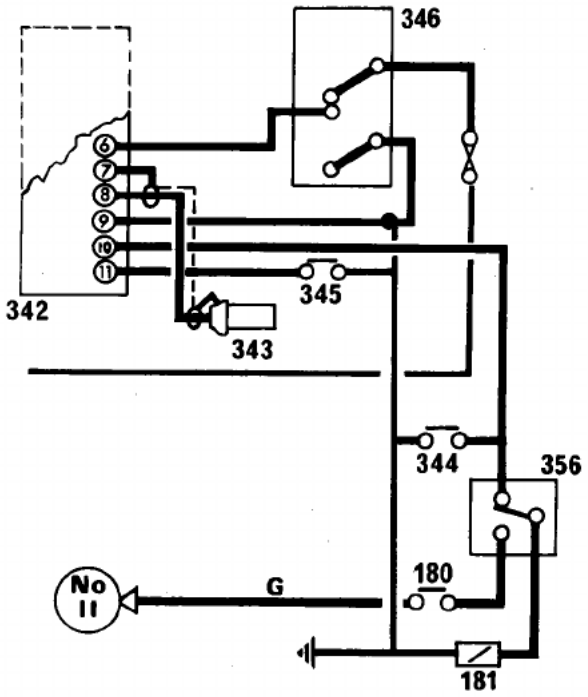
FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	RADIATOR, COOLING FAN — WHERE FITTED	8/15A	GFS 415
2	RH DIP	10/20A	GFS 420
3	RH MAIN	17/35A	GFS 435
4	LH DIP	10/20A	GFS 420
5	LH MAIN	17/35A	GFS 435

AIR CONDITIONING



KICK DOWN INHIBIT/SPEED CONTROL
(Alternative Circuit)

5



In addition to marks to identify the manufacture, the head is also marked with symbols to indicate the strength grade i.e. 8.8, 10.9, 12.9, or 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. 5) or on one of the flats (2, Fig. 5) of the hexagon with the strength grade symbol 8, 12 or 14. Some nuts with a strength 4, 5 or 6 are also marked and some have the metric symbol M on the flat opposite the strength grade marking.

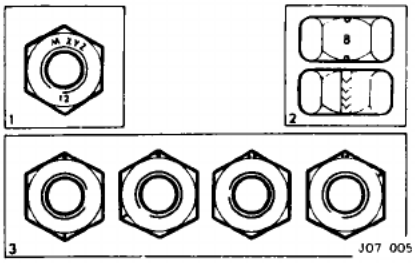


Fig. 5

A clock face system (3, Fig. 5) is used as an alternative method of indicating the strength grade. The external chamfers or 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 – Metrication

WARNING: Metric and Unified threaded hydraulic parts. Although pipe connections to brake system units incorporate threads of metric form, those for power assisted steering are of U.N.F. type. It is vitally important 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 U.N.F. and metric threaded hydraulic parts continue together in service.
Fitting U.N.F. pipe nuts into metric ports and vice-versa should not happen, but experience of the change from B.S.F. to U.N.F. indicated that there is no 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 U.N.F. pipe nuts are slightly different in shape.

NOTE: In Figs 6 to 9, A indicates the metric type and 'B' the U.N.F. 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. 6).

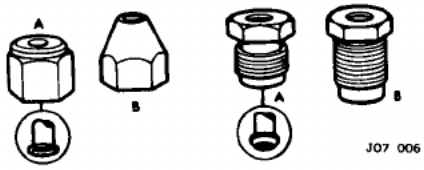


Fig. 6

All metric ports in cylinders and calipers have no counterbores, but unfortunately a few cylinders with U.N.F. threads also have no counterbore. The situation is, all parts with counterbores are U.N.F., but ports not counterbored are most likely to be metric (Fig. 7)

Fig. 7

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:

	U.N.F.
RED	$\frac{3}{8}$" × 24 U.N.F.
GREEN	$\frac{7}{16}$" × 20 U.N.F.
YELLOW	$\frac{1}{2}$" × 20 U.N.F.
PINK	$\frac{5}{8}$" × 18 U.N.F.
	METRIC
BLACK	10 × 1 mm
GREY	12 × 1 mm
BROWN	14 × 1,5 mm

Hose ends differ slightly between metric and U.N.F. (Fig. 8)

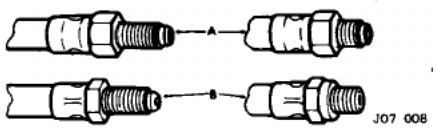


Fig. 8

Gaskets are not used with metric hoses.
The U.N.F. 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. 9).

Fig. 9

Pipe sizes for U.N.F. are $\frac{3}{16}$ in, $\frac{1}{4}$ in, and $\frac{5}{16}$ in outside diameter.
Metric pipe sizes are 4,75 mm, 6 mm and 8 mm.
4.75 mm pipe is exactly the same as $\frac{3}{16}$ in pipe.
6 mm pipe is 0.014 in smaller than $\frac{1}{4}$ in pipe.
8 mm pipe is 0.002 in larger than $\frac{5}{16}$ in 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 10 mm and $\frac{3}{8}$ in U.N.F. pipe nuts used for $\frac{3}{16}$ in (or 4,75 mm) pipe. The $\frac{3}{8}$ in U.N.F. pipe nut or hose can be screwed into a 10 mm port but is very slack and easily stripped. The thread engagement is very weak and cannot provide an adequate seal. The opposite condition, a 10 mm nut in a $\frac{3}{8}$ in port, is difficult and unlikely to cause trouble. The 10 mm nut will screw in $1\frac{1}{2}$ 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.

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 indentation 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. 10 unless otherwise stated.

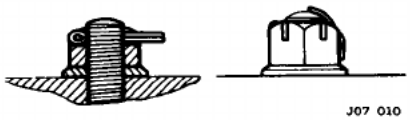


Fig. 10

Tab Washers

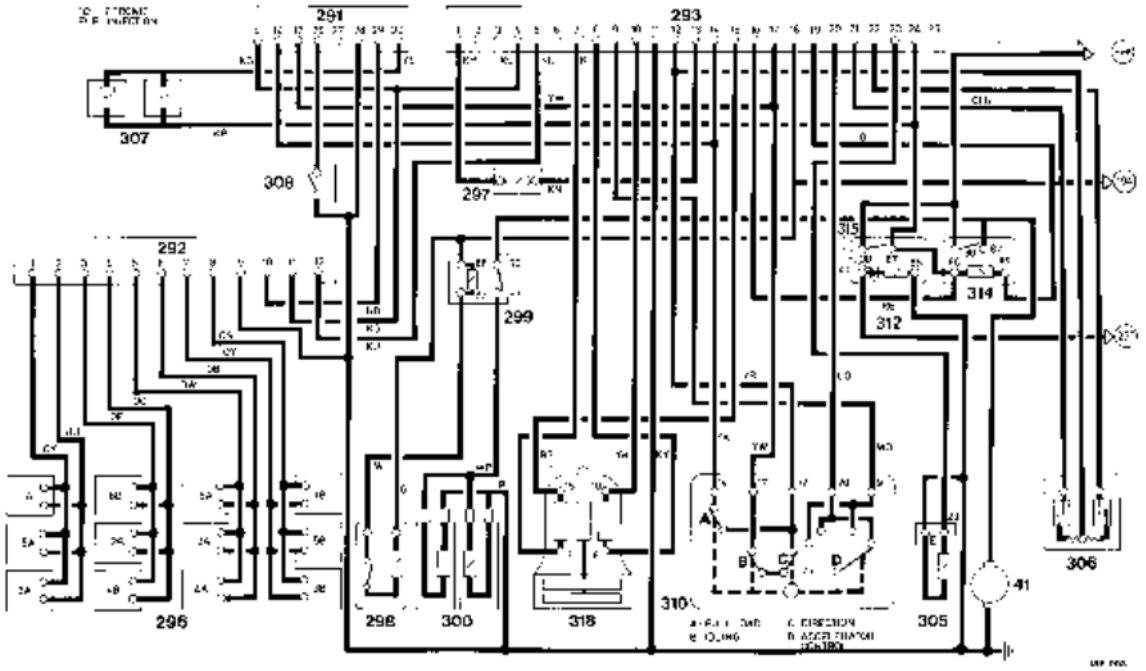
Fit new tab washers in all places where they are used. Never replace with a used tab washer.
Ensure that the new tab washer is of the same design as that replaced.

Nuts

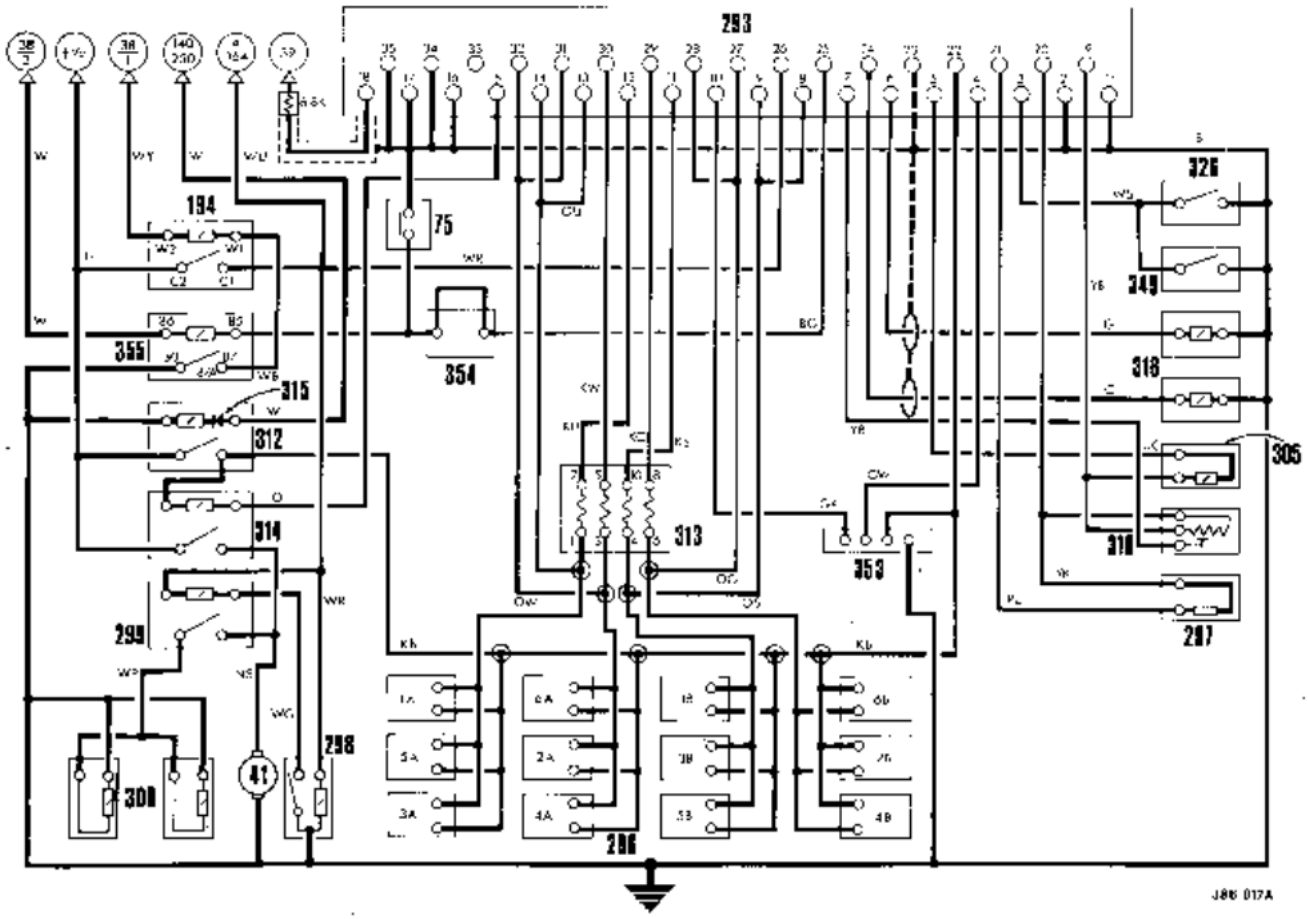
When tightening up a slotted or castellated nut **never slacken it back** to insert split pin or locking wire wire except in those recommended cases where this forms part of an adjustment. If difficulty is experienced, alternative washers or nuts should be selected, or washer thickness reduced.
Where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

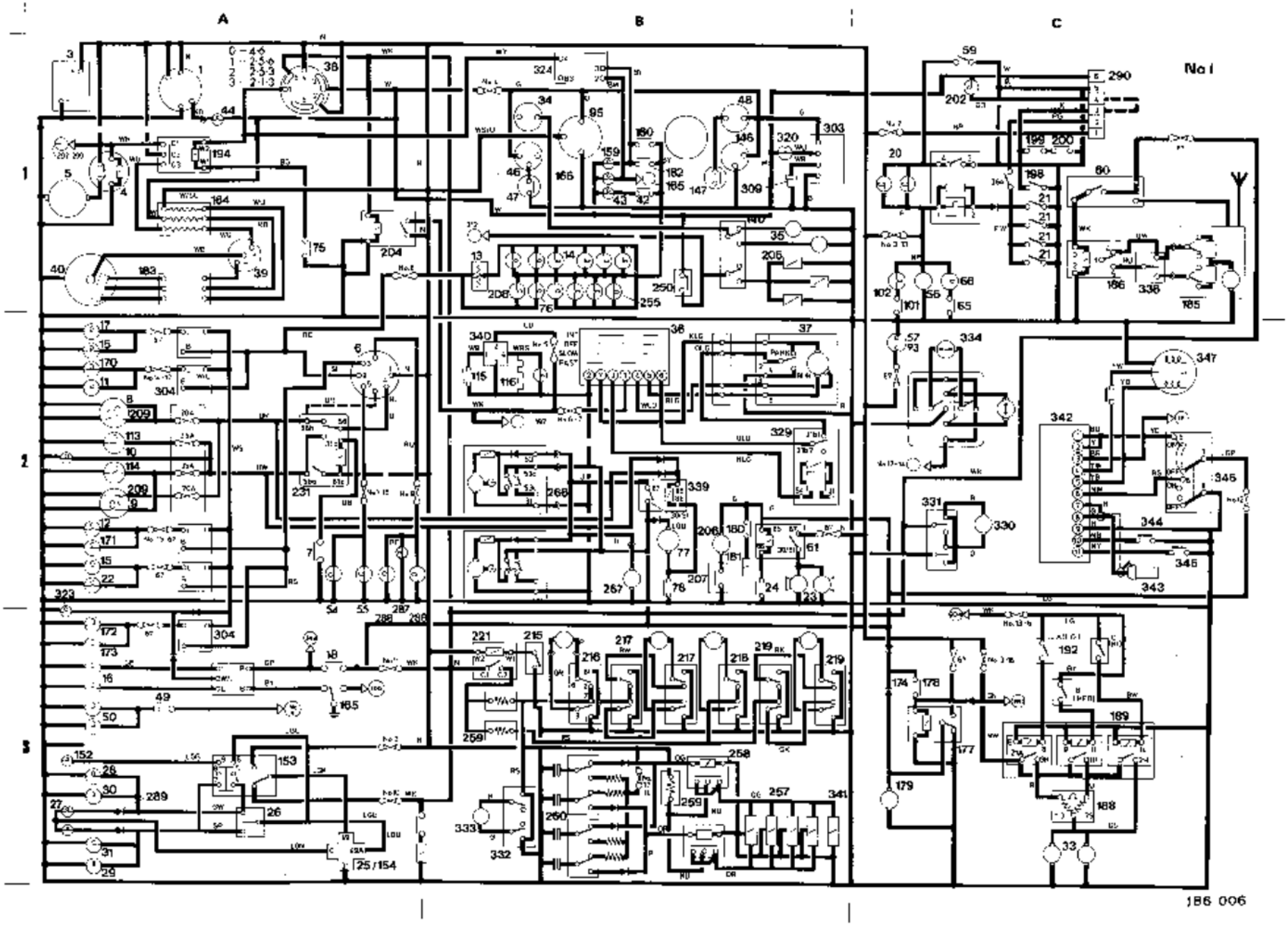
NOTE: Where bearing pre-load is involved nuts should be tightened in accordance with special instructions.

FUEL INJECTION 'D' JETRONIC



FUEL INJECTION 'P' PRESSURE SENSING





1981 – 83 12 CYLINDER MODELS

KEY TO WIRING DIAGRAMS 1983-1985 MY'S

	Grid ref.	Circuit Number
1 Alternator	A1	
3 Battery	A1	
4 Starter solenoid	A1	
5 Starter motor	A1	
6 Master lighting switch	A1	
7 Headlamp flash switch	A2	
8 Headlamp beam RH	A2	
9 Headlamp beam LH	A2	
10 Main beam warning light	A2	
11 RH side lamp	A2	
12 LH side lamp	A2	
13 Panel lamp resistor	B1	
14 Panel lamps	H1	
15 Number plate illuminator lamp(s)	A2	
16 Stop lamp(s)	A3	
17 Tail lamp RH	A2	
18 Stop lamp switch	A3	
19 Fuse box(es) (not shown)		
20 Panel light(s)	C1	
21 Door switch	C1	
22 Tail lamp LH	A2	
23 Horns	B2	
24 Horn push	B2	
25 Flasher unit (pre Oct 1984)	A3	
26 Direction indicator switch	A3	
27 Direction indicator warning lights	A3	
28 RH front flasher	A3	
29 LH front flasher	A3	
30 RH rear flasher	A3	
31 LH rear flasher	A3	
33 Blower motors	C2	
34 Fuel gauge	H1	
35 Fuel gauge tank unit	B1	
36 Windscreen wiper switch	B2	
37 Windscreen wiper motor	B2	
38 Ignition/starter switch	A1	
38A Key switch (part of 38)	A1	
39 Ignition coil	A1	
39A Auxiliary coil 12 volt		
40 Distributor	A1	
41 Fuel pump		
42 Oil pressure switch	D2	
43 Oil pressure warning light	H2	
44 Ignition warning light	A1	
46 Coolant temperature gauge	B1	
47 Water temperature transmitter	B1	
48 Oil pressure gauge	B1	
49 Reverse lamp switch	A3	
50 Reverse lamp(s)	A3	
54 Fog lamp RH	A2	
56 Fog lamp LH	A2	
56 Clock (where fitted)	C1	
57 Cigar lighter socket	C1	
58 Interior light switch	C1	
60 Radio	C1	
61 Horn relay	H2	
65 Boot light switch	C1	
66 Boot light	C1	
67 Line fuse	—	
75 Automatic gearbox safety switch	A1	
76 Automatic gearbox selector lamp	B1	
77 Windscreen washer pump	B2	
78 Windscreen washer switch	B2	
82 Charging and inspection lamp socket	C2	
85 Tachometer	B1	
101 Map light switch	C1	
102 Map light	C1	
111 Heat passenger airpot		
112 Drivers lamp		
113 Headlamp inner RH	A2	
114 Headlamp inner LH	A2	
115 Rear window demist switch	B2	
116 Rear window demist unit	B2	
140 Horn changeover switch	H1	
146 Battery condition indicator	B1	
147 Oil pressure transducer	D1	
151 Rear window demister warning light	H2	
152 Hazard warning light	A3	
153 Hazard warning switch	A3	
154 Hazard warning flasher unit	A3	
159 Brake fluid level warning light	B1	
160 Brake differential pressure switch	B1	
164 Ballast resistor	A1	
165 Handbrake switch	A3	
166 Handbrake warning light	B1	
170 Side marker RH front	A2	
171 Side marker LH front	A2	
172 Side markers RH rear	A3	
173 Side markers LH rear	A3	
174 Radiator cooling fan (coupe)	C3	
177 Resistor cooling fan relay	C3	
178 Radiator cooling fan thermostat (in pump)	C3	
179 Resistor cooling fan motor	C3	
180 Kickdown switch	B2	
181 Kickdown solenoid	D2	
182 Brake fluid level switch	H1	
183 Ignition amplifier	A1	
185 Aerial motor	C1	
186 Aerial motor relay	C1	
188 Resistor	C3	
189 Blower speed relay	C3	
190 Compressor clutch		
191 Thermostat		

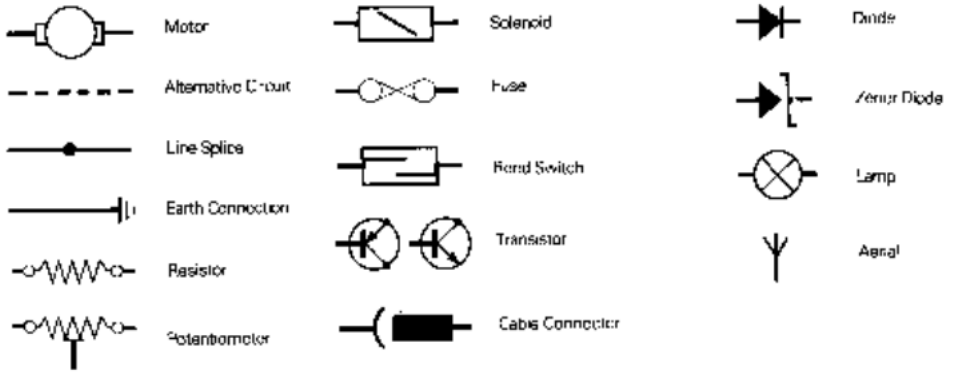
	Grid ref.	Circuit Number
192 Control switch		
194 Starter solenoid/ballast coil relay	A1	
196 Seat belt switch—driver	C1	
199 Seat belt switch—passenger (Non Fed	C1	
200 Seat switch—passenger (Fed	C1	
202 Seat belt warning light	C1	
204 Ignition protection relay	A1	
205 Fuel solenoid valves	B1	
206 Battery cooling fan	B2	
207 Battery cooling fan thermostat	B2	
208 Cigar lighter illumination	B1	
209 Headlamp dip beam RH and LH	A2	
215 Window lift master switch	B3	
216 Window lift switch RH front	B3	
217 Window lift switch LH front	B3	
218 Window lift switch RH rear	B3	
219 Window lift switch LH rear	B3	
220 Window lift motor(s)	B3	
221 Window lift relay	B3	
231 Headlamp relay	A2	
231A Headlamp inhibit relay (XJ6 only)		
250 Inertia switch	B1	
255 Hazard switch illumination bulb	B1	
257 Door lock solenoid	B3	
257A Rear door lock solenoid		
258 Door lock solenoid relay	B3	
259 Thermal circuit breaker	B3	
260 Door lock switch	B3	
261 Amplifier		
262 Servo		
263 Vacuum valve		
264 Inertia sensor		
265 Ambient sensor		
266 Headlamp wiper motor	B2	
267 Headlamp wash motor	B2	
268 Roof lamps		
287 Fog guard warning light	A2	
288 Fog guard lamp	A2	
289 Direction indicator blocking diode	A3	
290 Seat belt logic unit (Federal)	C1	
291 EGR control unit		
292 Fuel injection amplifier		
293 Fuel injection control unit (EFI)		
296 Fuel injectors		
297 Air temperature sensor		
298 Thermotime switch		
299 Cold start relay		
300 Cold start injector		
301 Stop lamp failure sensor	A3	
303 Low coolant control unit	B1	
304 Park lamp failure sensor	A2	
305 Coolant temperature sensor		
306 Trigger unit		
307 EGR valve		
308 EGR memory switch		
309 Low coolant sensor	B1	
310 Throttle switch		
312 Main relay		
313 Power resistor		
314 Fuel pump relay		
315 Blocking diode (part of 312)		
316 Oxygen sensor		
318 Manifold pressure sensor		
320 Low coolant warning light	B1	
322 Lamp failure warning light	A3	
324 Inverter	B1	
325 Full throttle switch		
327 Temperature selector		
329 Timer Relay wipers	B2	
330 Seat adjust motor	C2	
331 Seat adjuster switch	C2	
332 Sliding roof switch	B3	
333 Sliding roof motor	B3	
334 Heating door mirror	C2	
335 Interior lamp delay up to '86	C1	
339 Headlamp wiper relay	B2	
340 Heated back light relay (XJ6 only)	B2	
341 Boot lock solenoid (not applicable to XJ6)		
342 Speed control unit	C2	
344 Inhibit switch (see 3B6)	C2	
345 Set switch	C2	
346 Switch control unit	C2	
347 Actuator	C2	
349 Throttle micro-switch		
350 Overtemperature switch		
351 Thermal fuse		
352 Speed control brake switch	C2	
353 Feedback monitor socket		
354 Hatchback disable socket		
355 Feedback relay		
356 Kickdown/Speed control inhibit switch	C2	
357 Trip computer (where fitted)	C1	
358 Interface unit	C1	
359 Pulse generator	C2	
360 Speedometer (electronic)	H1	
361 Vacuum timer relay		
362 Solenoid valves		
364 Coolant temperature switch		
564 Service interval counter (NAS)		
365 Purge valve		

CABLE COLOUR CODE

When a cable has two colour code letters, the first denotes the Main Colour and the second the Tracer Colour.

N. Brown — Positive Cable
B. Black — Negative Cable
W. White
K. Pink **Ignition switch controlled**
G. Green
R. Red **Y. Yellow** **O. Orange** **S. Slate** **L. Light** **U. Blue** **P. Purple**

SYMBOLS USED



BULB CHART 1983

	WATTS	LUCAS PART NO.	UNIPART NO.	NOTES
Headlamps				
LH Traffic Markers —				
— Tungsten Outer	60/45	54529739	GLU 136	XJ 3.4 Std only. Sealed beam light unit
— Inner	50	54529740	GLU 134	XJ 3.4 Std only. Sealed beam light unit
Halogen — Outer	60/55	472	GLB 472	H4 base
Inner	55	448	GLB 448	H1 base
RH Traffic Markers —				
Normal — Halogen Outer	60/55	472	GLB 472	H4 base
— Inner	55	448	GLB 448	H1 base
France Halogen — Outer	60/55	476	GLB 476	Yellow bulb H4 base
Inner	45/40	411	GLB 411	Yellow bulb. The 40 watt filament is not used
USA — Tungsten — Outer	37.5/60			Sealed beam light unit
— Inner	50			Sealed beam light unit
Front Parking Lamp	4	233	GLB 233	Not USA Headlamp pilot
Front Flasher Lamp	21	382	GLB 382	Not USA
Front Parking and Flasher Lamp	5/21	380	GLB 380	USA only
Front Fog Lamp — Cibie	55	—	GLB 472	H2 base
Flasher Repeater	4	233	GLB 233	Not USA
Front Marker Lamp	4	233	GLB 233	USA only
Rear Marker Lamp	4	233	GLB 233	USA only
Rear Door Guard Lamp	5	989	GLB 989	
Stop Lamp	21	382	GLB 382	
Tail Lamp	6	207	GLB 207	
Rear Flasher Lamp	21	382	GLB 382	
Reverse Lamp	21	382	GLB 382	
Plate Illumination Lamp	4	233	GLB 233	
Rear Fog Lamp	21	382	GLB 382	Not USA
Instrument Illumination	2.2	987	GLB 987	
Warning Light — Cluster	1.7	286	GLB 286	
— LH Turn Signal	3	504	GLB 504	
Heated Backlight	2.8	650	GLB 650	24 volt bulb
— Bulb Failure	2.2	987	GLB 987	
— RH Turn Signal	3	504	GLB 504	
Rectangular Unit	2	281	GLB 281	Special markets only
Map Lamp	6	254	GLB 254	
Clock Illumination	2.2	987	GLB 987	
Switch Panel Illumination	1.2		GLB 284	
Automatic Selector Illumination	2.2	987	GLB 987	
Cigarette Lighter Illumination	2	–	GLB 286	
Fibre Optic Lamp	6	254	GLB 254	
Interior Lamp	5	989	GLB 989	
Reading Lamp	4	233	GLB 233	
Luggage Boot Lamp	6	239	GLB 239	

HEADLAMP FUSE BOX 1983

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	RADIATOR COOLING FAN (WHERE FITTED) 12 CYLINDER 6 CYLINDER	 8/15A 10/20A	 GFS 415 GFS 420
2	RH DIP	10/20A	GFS 420
3	RH MAIN	17/35A	GFS 435
4	LH DIP	10/20A	GFS 420
5	LH MAIN	17/35A	GFS 435

IN LINE FUSES 1983

PROTECTED CIRCUIT	FUSE	UNIPART No.	LOCATION
Horn	15A	GFS 415	Adjacent to servo RH cars To the battery LH cars
Cigar Lighter	20A	GFS 420	Behind RH front console side casing
Electric Seat Adjustment	30A	GFS 430	Under carpet below LH side of console in front of seat
Air conditioning Amplifier	3A	GFS 43	Behind LH front console side casing
RH Tail lamp and No. plate lamp (Red lead with black ring) LH Tail lamp and No. plate lamp (Red lead with yellow ring) Side marker lamps (where fitted) Red lead	3A	GFS 43	In the luggage compartment behind the trim below the parcel shelf
Radio cassette	2A	GFS 42	Behind the radio

MAIN FUSE BOX L.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	FOG LAMPS	20A	GFS 420
2	HAZARD WARNING, SEAT BELT LOGIC UNIT	15A	GFS 415
3	MAP AND INTERIOR LAMPS, CLOCKS, AERIAL, CIGAR LIGHTER	15A	GFS 415
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	WINDSCREEN WIPERS	35A	GFS 435
7	—	—	—
8	PANEL ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	BATTERY COOLING FAN, HORN RELAY WINDINGS RADIATOR AUXILIARY FAN, RELAY WINDINGS, WINDSCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

MAIN FUSE BOX R.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	FOG LAMPS	20A	GFS 420
2	HAZARD WARNING, SEAT BELT LOGIC UNIT	15A	GFS 415
3	MAP AND INTERIOR LAMPS, CLOCKS, AERIAL, CIGAR LIGHTER	15A	GFS 415
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	WINDSCREEN WIPERS	35A	GFS 435
7	TRIP COMPUTER	2A	GFS 42
8	PANEL, CIGAR LIGHTER AND GLOVE BOX ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	AUTOMATIC TRANSMISSION KICK DOWN SOLENOID, HORN RELAY WINDINGS, RADIATOR AUXILIARY FAN, RELAY WINDINGS, WINDSCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY), HEADLAMP WASH/WIPE (WHERE FITTED)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

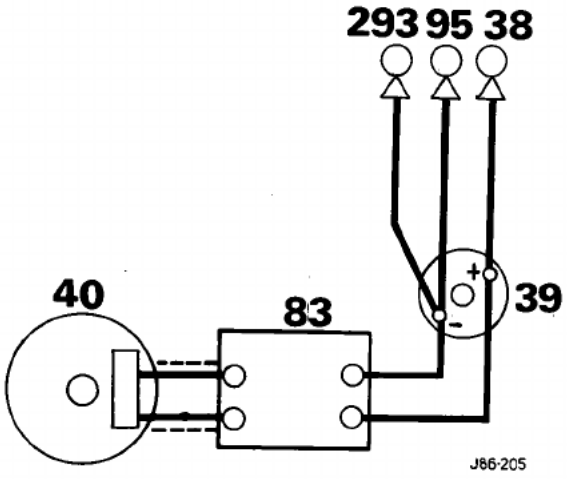
AUXILIARY FUSE BOX R.H. Stg. 1983

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
14	DOOR LOCK RELAY, ELECTRIC DOOR MIRROR, DOOR LAMPS	5A	GFS 45
15	FOG LAMPS	20A	GFS 420
16	—	—	—
17	FRONT PARKING LAMPS	3A	GFS 43

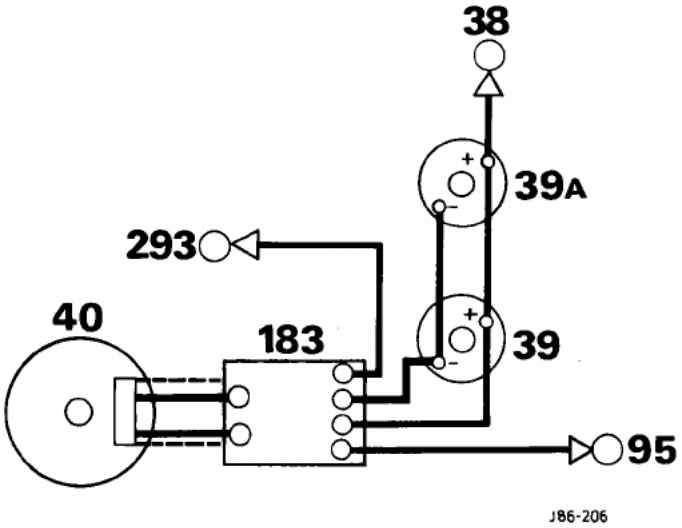
AUXILIARY FUSE BOX L.H. Stg. 1983

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	AIR CONDITIONING, RELAY AND CLUTCH	15A	GFS 415
14	FRONT PARKING LAMPS	3A	GFS 43
15	ANTI RUN-ON VALVE 3.4 CARS ONLY	10A	GFS 410
16	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
17	DOOR LOCK RELAY, ELECTRIC DOOR MIRRORS, DOOR LIGHTS	3A	GFS 43

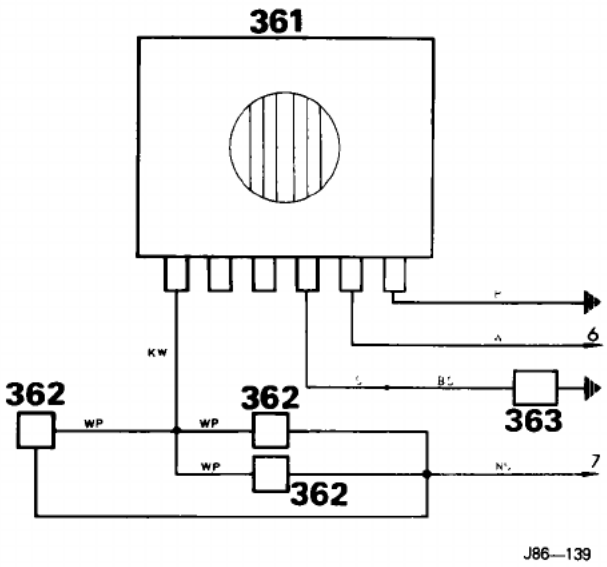
4.2 IGNITION SYSTEM



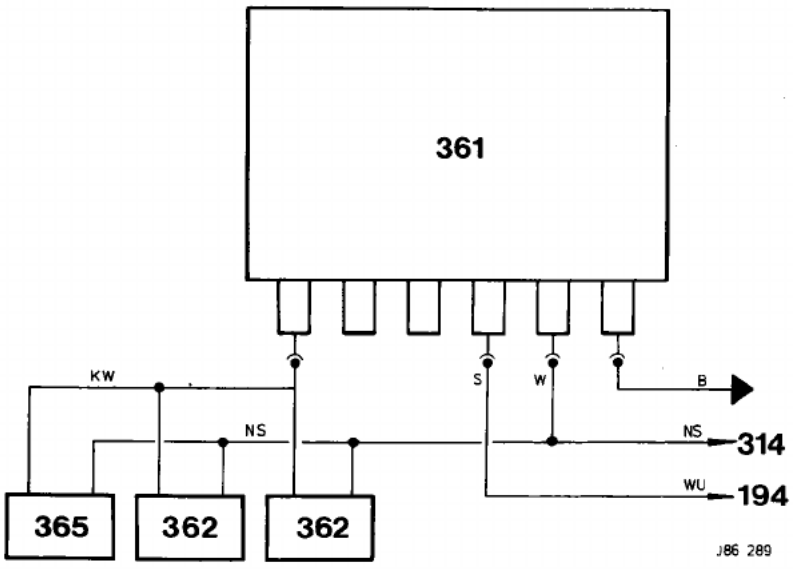
5.3 IGNITION SYSTEM



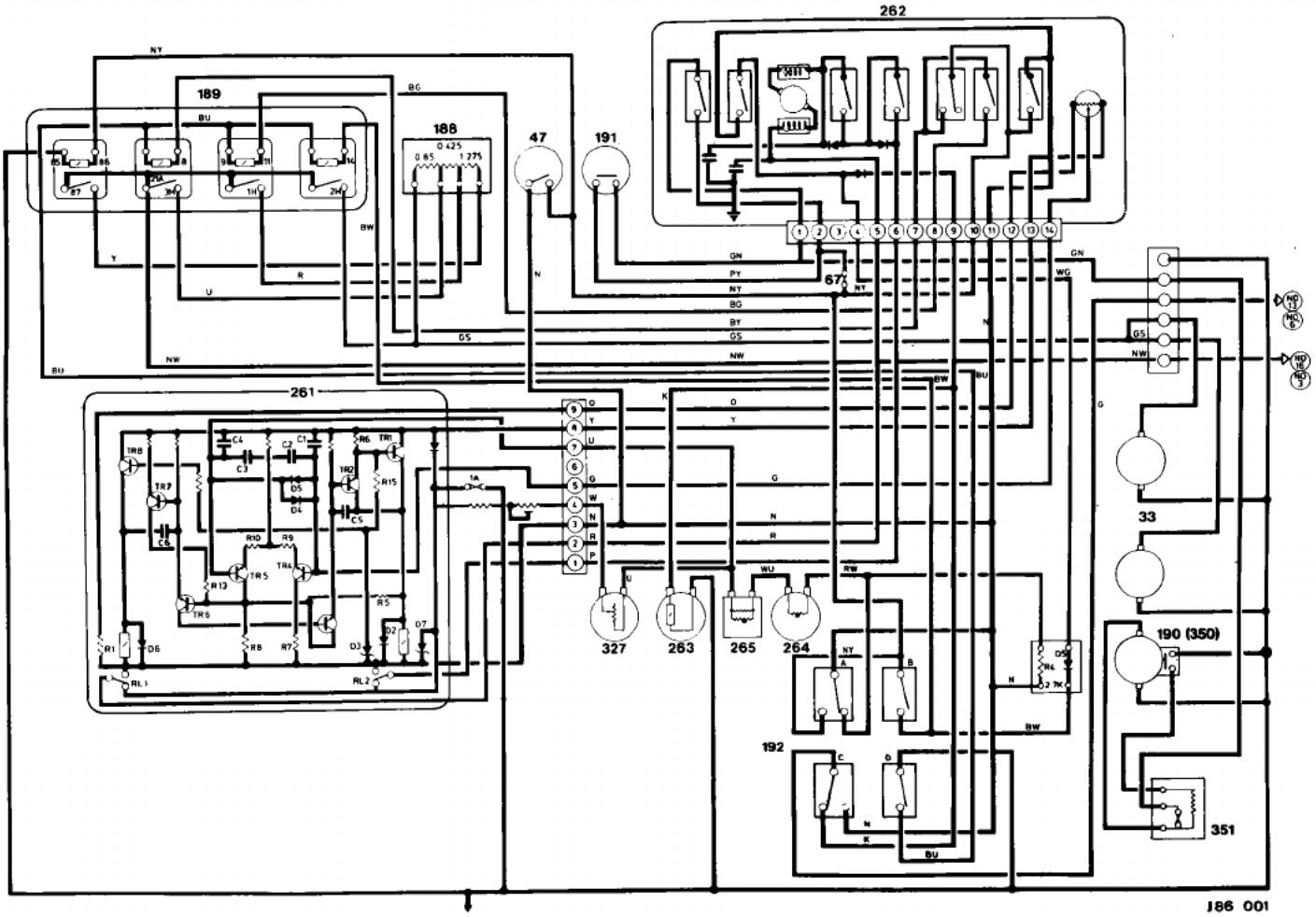
VACUUM DELAY TIMER

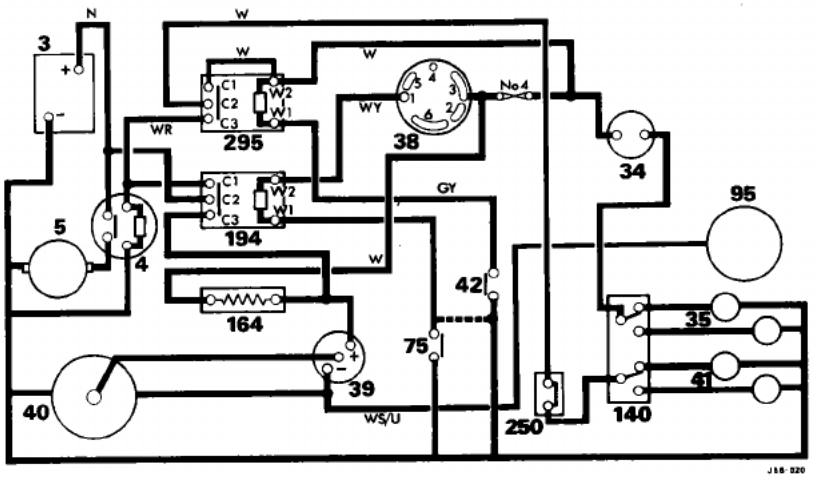


VACUUM DELAY TIMER USA

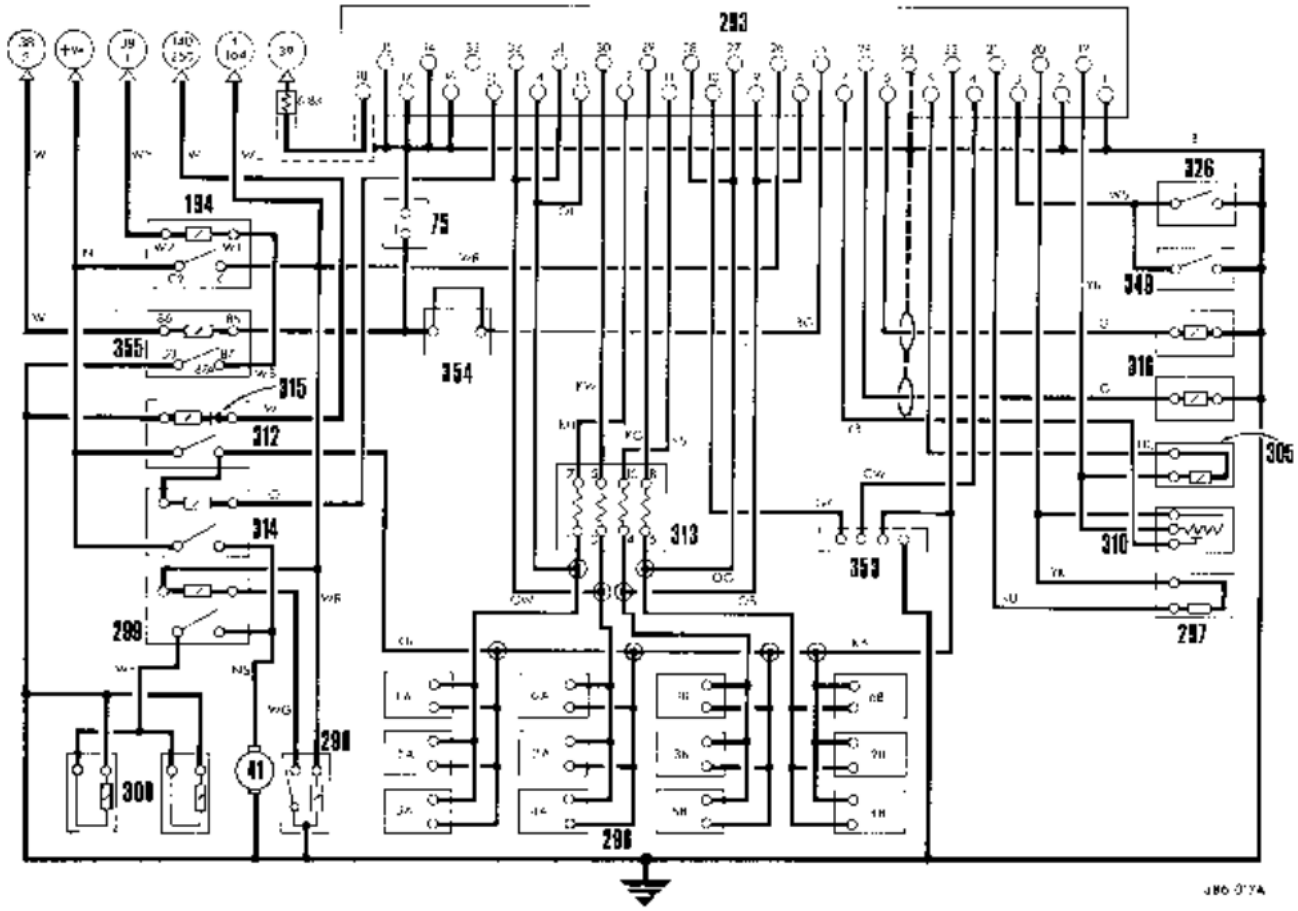


AIR CONDITIONING 1983 – 85 MY's



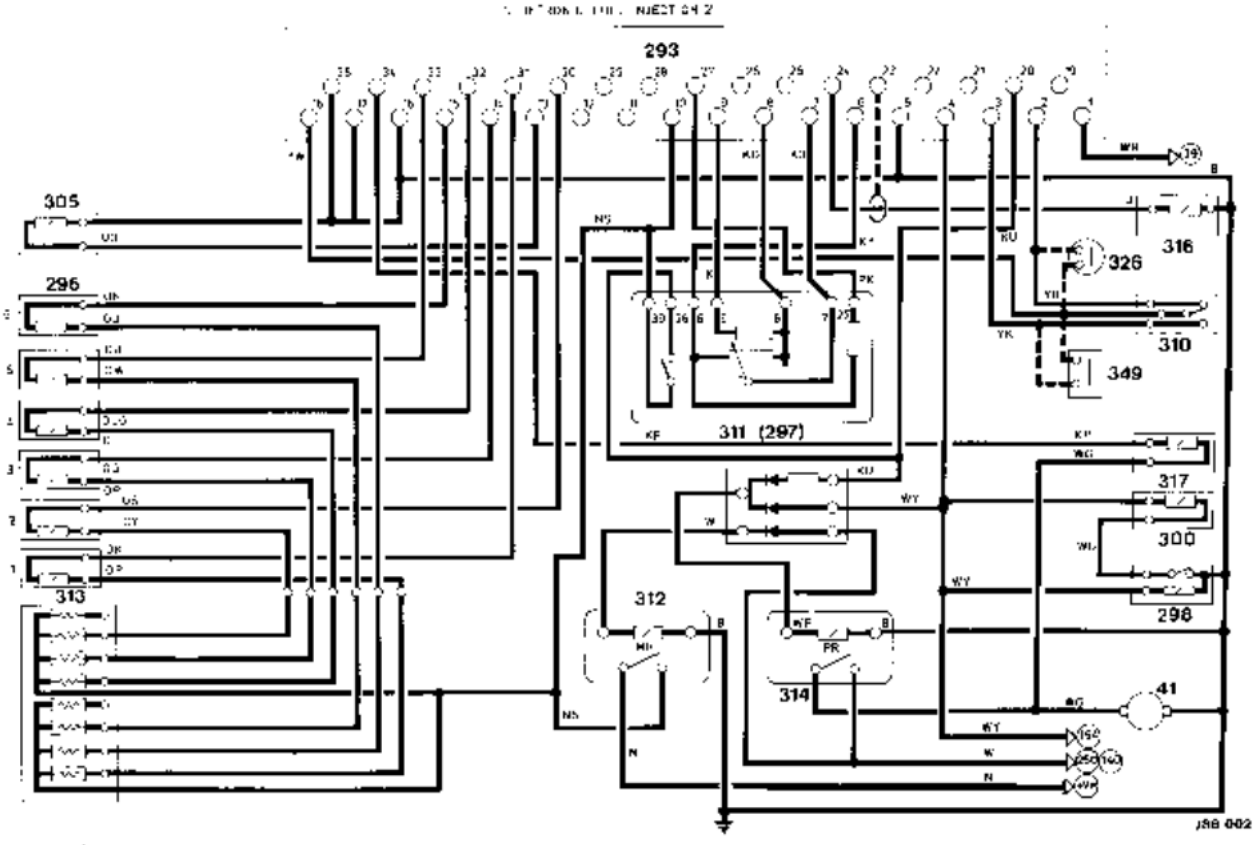


3.4 IGN & FUEL SYSTEM

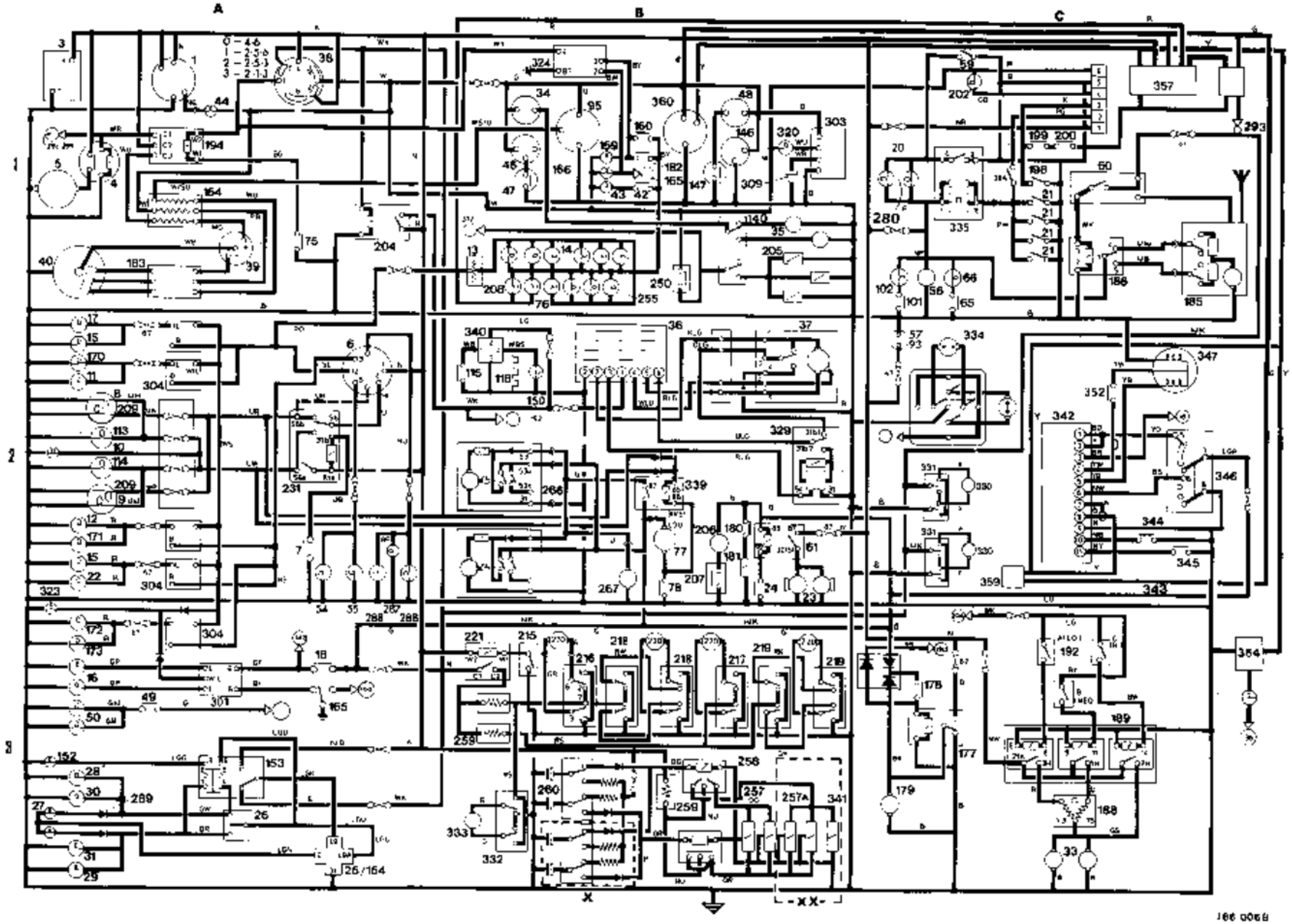


12 cyl

DIGITAL FUEL INJECTION



6 cyl FUEL INJECTION



166 0068

KEY TO WIRING DIAGRAMS 1986

	Grid ref.	Circuit Number
1 Alternator	A1	
3 Battery	A1	
4 Starter solenoid	A1	
5 Starter motor	A1	
8 Master lighting switch	A1	
8 Headlamp beam RH	A2	
9 Headlamp beam LH	A2	
10 Main beam warning light	A2	
11 RH side lamp	A2	
12 LH side lamp	A2	
13 Panel lamp rheostat	B1	
14 Panel lamps	B1	
15 Number plate illumination lamp(s)	A2	
16 Stop lamp(s)	A3	
17 Tail lamp RH	A2	
18 Stop lamp switch	A3	
19 Fuse box(es) (not shown)		
20 Puddle light(s)	C1	
21 Door switch	C1	
22 Tail lamp RH	A2	
23 Horns	B2	
24 Horn push	B2	
25 Flasher unit (part of 154)	A3	
26 Direction indicator switch	A3	
27 Direction indicator warning lights	A3	
28 RH front flasher	A3	
29 LH front flasher	A3	
30 RH rear flasher	A3	
31 LH rear flasher	A3	
33 Blower motors	C3	
34 Fuel gauge	B1	
35 Fuel gauge tank unit	B1	
36 Windscreen wiper switch	B2	
37 Windscreen wiper motor	B2	
38 Ignition/starter switch	A1	
38A Key switch (part of 38)	A1	
39 Ignition coil	A1	
39A Auxiliary coil (2 off)		
40 Distributor	A1	
41 Fuel pump	—	
42 Oil pressure switch	H2	
43 Oil pressure warning light	B2	
44 Ignition warning light	A1	
46 Coolant temperature gauge	B1	
47 Water temperature transmitter	B1	
48 Oil pressure gauge	B1	
49 Reverse lamp switch	A3	
50 Reverse lamp(s)	A3	
54 Fog lamp RH	A2	
55 Fog lamp LH	A2	
56 Clock (where fitted)	C1	
57 Cigar lighter socket	C1	
58 Interior light switch	C1	
60 Radio	C1	
61 Horn relay	B2	
65 Boot light switch	C1	
66 Boot light	C1	
67 Line fuse		
75 Automatic gearbox safety switch	A1	
76 Automatic gearbox selector lamp	B1	
77 Windscreen washer pump	B2	
78 Windscreen washer switch	B2	
93 Charging and inspection lamp socket	C2	
95 Tachometer	B1	
107 Map light switch	C1	
108 Map light	C1	
111 Rear passenger lamps		
112 Drivers lamp		
113 Headlamp inner RH	A2	
114 Headlamp inner LH	A2	
115 Rear window demist switch	B2	
116 Rear window demist unit	B2	
143 Fuel changeover switch	B1	
148 Battery condition indicator	B1	
147 Oil pressure transmitter	B1	
150 Rear window demister warning light	B2	
152 Hazard warning light	A3	
153 Hazard warning switch	A3	
154 Hazard warning flasher unit	A3	
159 Brake fluid level warning light	H1	
160 Brake differential pressure switch	B1	
164 Ballast resistor	A1	
165 Handbrake switch	A3	
166 Handbrake warning light	B1	
170 Side markers RH front	A2	
171 Side markers LH front	A2	
172 Side markers RH rear	A3	
173 Side markers LH rear	A3	
174 Resistor cooling fan (diode(s))	C3	
177 Resistor cooling fan relay	C3	
179 Radiator cooling thermostat (in pump)	C3	
179 Resistor cooling fan motor	C3	
180 Kickdown switch	B2	
181 Kickdown solenoid	B2	
182 Brake fluid level switch	B1	
183 Ignition amplifier	A1	
185 Aerial motor	C1	
186 Aerial motor relay	C1	
189 Resistor	C3	
189 Blower speed relay		
190 Compressor clutch	C3	
191 Thermostat		

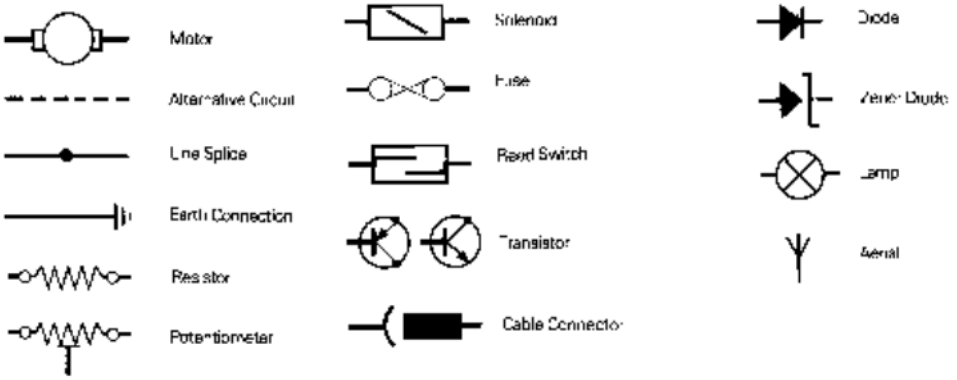
	Grid ref.	Circuit Number
192 Control switch		
194 Starter solenoid relay	A1	
196 Seat belt switch—driver	C1	
198 Seat belt switch—passenger (Non	C1	
200 Seat switch—passenger (Fed	C1	
202 Seat belt warning light	C1	
204 Ignition protector relay	A1	
206 Fuel solenoid valves	B1	
208 Battery cooling fan	B2	
207 Battery cooling fan thermostat	H2	
208 Cigar lighter illumination	B1	
209 Headlamp dip beam RH and LH	A2	
215 Window lift master switch	B3	
216 Window lift switch RH front	B3	
217 Window lift switch LH front	B3	
218 Window lift switch RH rear	B3	
219 Window lift switch LH rear	B3	
220 Window lift motor(s)	B3	
221 Window lift relay	A2	
231 Headlamp relay	A2	
231A Headlamp inhibit relay (XJS only)		
253 Inertia switch	B1	
255 Horn optics illuminator bulb	H1	
257 Passenger door lock motor	B3	
259 Rear door lock motor	B3	
258 Thermal circuit breaker	B3	
260 Door lock control module	B3	
261 Amplifier		
262 Servo		
263 Vacuum valve		
264 In car sensor		
265 Ambient sensor		
266 Headlamp wiper motor	B2	
267 Headlamp wash motor	B2	
268 Roof lamps		
287 Fog guard warning light	A2	
288 Fog guard lamp	A2	
288 Direction indicator bleeding diode	A3	
290 Seat belt logic unit (Federal)	C1	
291 EGR control unit		
292 Fuel injector amplifier		
293 Fuel injector control unit (ECU)		
296 Fuel injectors		
297 Air temperature sensor		
298 Thermotime switch		
299 Cold start relay		
300 Cold start injector		
301 Stop lamp failure sensor	A3	
303 Low coolant control unit	B1	
304 Park lamp failure sensor	A2	
305 Coolant temperature sensor		
306 Trigger unit		
307 HGR valve		
308 EGR warning switch		
309 Low coolant sensor	B1	
310 Throttle switch		
312 Main relay		
313 Power resistor		
314 Fuel pump relay		
315 Blocking diode (part of 312)		
316 Oxygen sensor		
318 Manifold pressure sensor		
320 Low coolant warning light	B1	
323 Lamp failure warning light	A3	
324 Inverter	B1	
326 Full throttle switch		
327 Temperature selector		
329 Timer Relay wipers	B2	
330 Seat adjust motor	C2	
331 Seat adjuster switch	C2	
332 Sliding roof switch	B3	
335 Sliding roof motor	B3	
334 Electric door mirror	C2	
338 Interior lamp delay up to '86	C1	
339 Headlamp wiper relay	B2	
340 Heated back-light relay (XJS only)	B2	
341 Boot lock motor		
342 Speed control unit	C2	
344 Inhibit switch (see 356)	C2	
345 Set switch	C2	
346 Switch control unit	C2	
347 Actuator	C2	
348 Throttle micro-switch		
350 Over temperature switch		
351 Thermo fuse		
352 Speed control brake switch	C2	
353 Feedback monitor socket		
354 Feedback cable socket		
355 Feedback relay		
356 Kickdown/Speed control inhibit switch	C2	
357 Trip computer (where fitted)	C1	
360 Interface unit	C1	
358 Pulse generator	C2	
360 Speedometer (electronic)	B1	
361 Vacuum timer relay		
362 Solenoid valves		
363 Coolant temperature switch		

CABLE COLOUR CODE

When a cable has two colour code letters, the first denotes the Main Colour and the second the Tracer Colour.

N. Brown — Positive Cable
B. Black — Negative Cable
W. White
K. Pink **Ignition switch controlled**
G. Green
R. Red **Y. Yellow** **O. Orange** **S. Slate** **L. Light** **U. Blue** **P. Purple**

SYMBOLS USED



AUXILIARY FUSE BOX R.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
14	DOOR LOCK RELAY, ELECTRIC DOOR MIRROR, DOOR LAMPS	5A	GFS 45
15	FOG LAMPS	20A	GFS 420
16	TRIP COMPUTER (WHERE FITTED)	2A	GFS 42
17	FRONT PARKING LAMPS	3A	GFS 43

AUXILIARY FUSE BOX L.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	AIR CONDITIONING, RELAY AND CLUTCH	15A	GFS 415
14	FRONT PARKING LAMP RH	3A	GFS 43
15	FRONT PARKING LAMP LH	3A	GFS 43
16	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
17	DOOR LOCK RELAY, ELECTRIC DOOR MIRRORS, DOOR LIGHTS	3A	GFS 43

MAIN FUSE BOX L.H. Stg.

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	NOT USED		
2	HAZARD WARNING	15A	GFS 415
3	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	AIR CONDITIONING RELAY AND CLUTCH	15A	GFS 415
7	WINDSCREEN WIPERS	35A	GFS 435
8	PANEL, CIGAR LIGHTER AND GLOVE BOX ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	AUTOMATIC TRANSMISSION KICK DOWN SOLENOID, HORN RELAY WINDINGS, RADIATOR AUXILIARY FAN RELAY, WINDSCREEN WASHERS, STOP LAMPS, HEADLAMP WASH/WIPE (WHERE FITTED)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

MAIN FUSE BOX R.H. Stg.

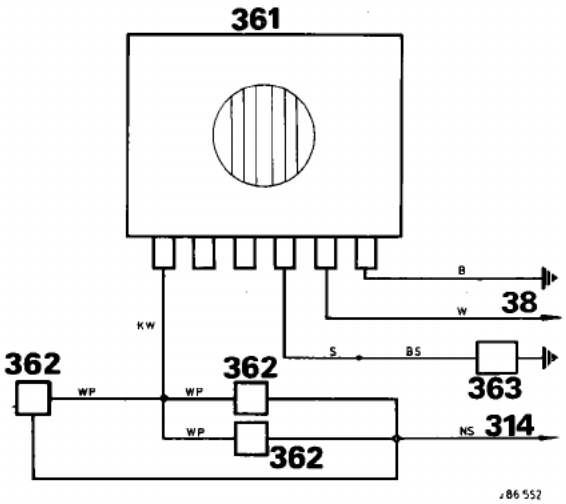
FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	FOG LAMPS	20A	GFS 420
2	HAZARD WARNING, SEAT BELT LOGIC UNIT	15A	GFS 415
3	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	WINDSCREEN WIPERS	35A	GFS 435
7	TRIP COMPUTER	2A	GFS 42
8	PANEL, CIGAR LIGHTER AND GLOVE BOX ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	AUTOMATIC TRANSMISSION KICK DOWN SOLENOID, HORN RELAY WINDINGS, RADIATOR AUXILIARY FAN, RELAY WINDINGS, WINDSCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY), HEADLAMP WASH/WIPE (WHERE FITTED)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

IN LINE FUSES 1986 – 88

PROTECTED CIRCUIT	FUSE	UNIPART No.	LOCATION
HORN	15A	GFS 415	ADJACENT TO SERVO RH CARS TO THE BATTERY LH CARS
CIGAR LIGHTER	20A	GFS 420	BEHIND RH FRONT CONSOLE SIDE CASING
ELECTRIC SEAT ADJUSTMENT	30A	GFS 430	UNDER CARPET BELOW LH SIDE OF CONSOLE IN FRONT OF SEAT
AIR CONDITIONING AMPLIFIER	3A	GFS 43	BEHIND LH FRONT CONSOLE SIDE CASING
RH TAIL LAMP AND NO. PLATE LAMP (RED LEAD WITH BLACK RING) LH TAIL LAMP AND NO. PLATE LAMP (RED LEAD WITH YELLOW RING) SIDE MARKER LAMPS (WHERE FITTED) RED LEAD	3A	GFS 43	IN THE LUGGAGE COMPARTMENT BEHIND THE TRIM BELOW THE PARCEL SHELF
RADIO CASSETTE	2A	GFS 42	BEHIND THE RADIO

HEADLAMP FUSE BOX 1986 – 88

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	RADIATOR COOLING FAN (WHERE FITTED) 12 CYLINDER 6 CYLINDER	 8/15A 10/20A	 GFS 415 GFS 420
2	RH DIP	10/20A	GFS 420
3	RH MAIN	17/35A	GFS 435
4	LH DIP	10/20A	GFS 420
5	LH MAIN	17/35A	GFS 435



VACUUM DELAY TIMER

BULB CHART

	WATTS	LUCAS PART NO.	UNIPART NO.	NOTES
Headlamps —				
LH Traffic Markers —				
— Halogen — Outer	60/55	472	GLB 472	H4 base
— Inner	55	448	GLB 448	H1 base
RH Traffic Markers —				
Normal — Halogen — Outer	60/65	472	GLB 472	H4 base
— Inner	55	448	GLB 448	H1 base
France — Halogen — Outer	60/55	475	GLB 476	Yellow bulb H4 base
— Inner	45/40	411	GLB 411	Yellow bulb. The 40 watt filament is not used
Front Parking Lamp	4	233	GLB 233	Headlamp pilot
Front Flasher Lamp	21	382	GLB 382	
Front Parking and Flasher Lamp	5/21	380	GLB 380	
Front Fog Lamp — Cibie	55	—	GLB 212	H2 base
Flasher Repeater	4	233	GLB 233	
Rear Door Guard Lamp	5	989	GLB 989	
Stop Lamp	21	382	GLB 382	
Tail Lamp	5	207	GLB 207	
Rear Flasher Lamp	21	382	GLB 382	
Reverse Lamp	21	382	GLB 382	
Plate Illumination Lamp	4	233	GLB 233	
Rear Fog Lamp	21	382	GLB 382	
Instrument Illumination	2.2	987	GLB 987	
Warning Light — Cluster	1.2	286	GLB 286	
— LH Turn Signal	3	504	GLB 504	
— Heated Backlight	2.8	650	GLB 650	24 volt bulb
— Bulb Failure	2.2	987	GLB 987	
— RH Turn Signal	3	504	GLB 504	
— Rectangular Unit	2	281	GLB 281	Special markets only
Map Lamp	6	254	GLB 254	
Clock Illumination	2.2	987	GLB 987	
Switch Panel Illumination	1.2	—	GLB 284	
Automatic Selector Illumination	2.2	987	GLB 987	
Cigarette Lighter Illumination	2	—	GLB 288	
Fibre Optic Lamp	6	254	GLB 254	
Interior Lamp	5	989	GLB 989	
Reading Lamp	4	233	GLB 233	
Luggage Boot Lamp	5	239	GLB 239	

Locking Wire

Fit 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 U.N.F. 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.

Unifed Thread Identification

Bolts

A circular recess is stamped in the upper surface of the bolt head (1, Fig. 11).

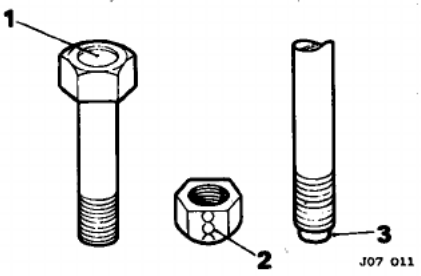


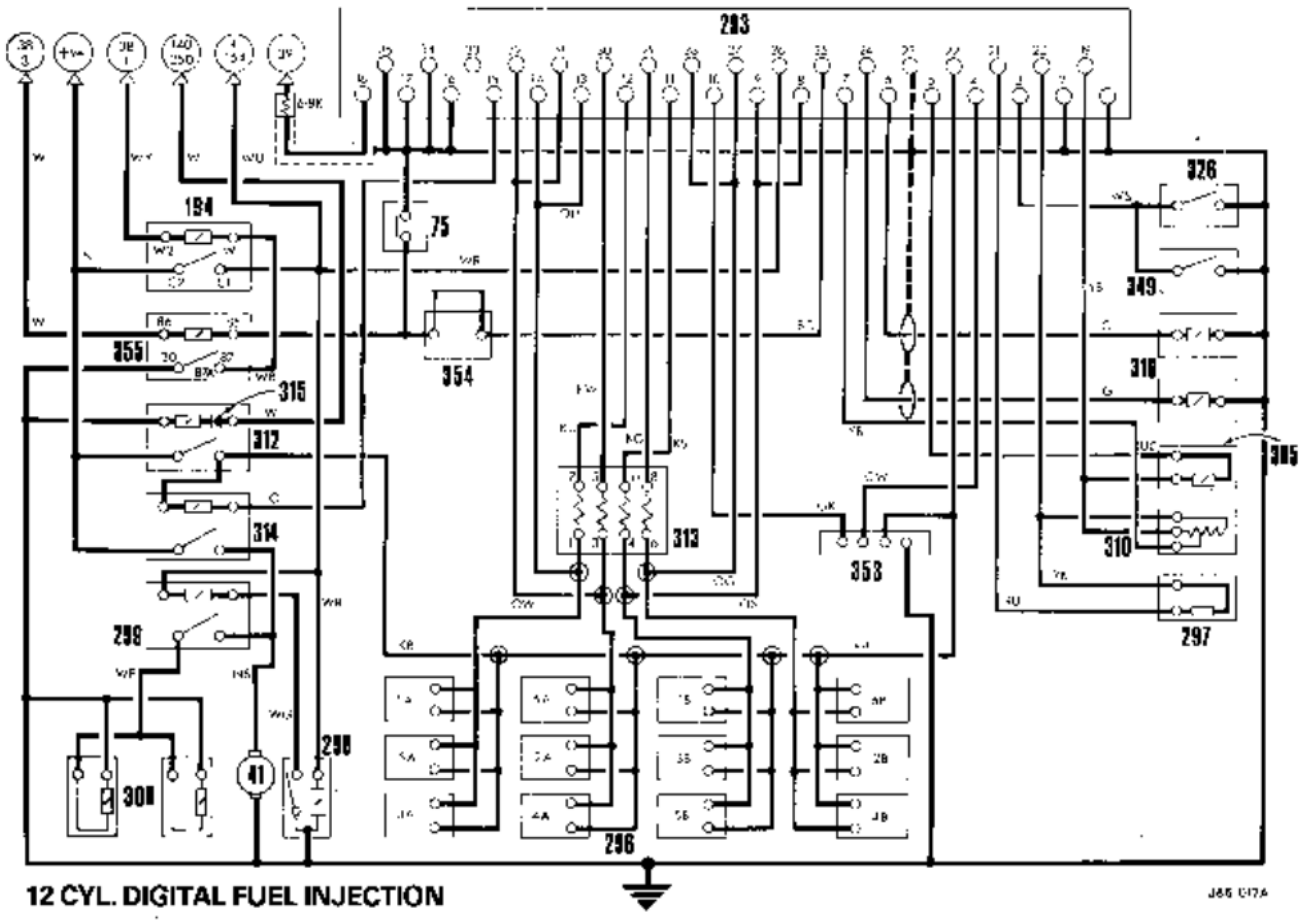
Fig. 11

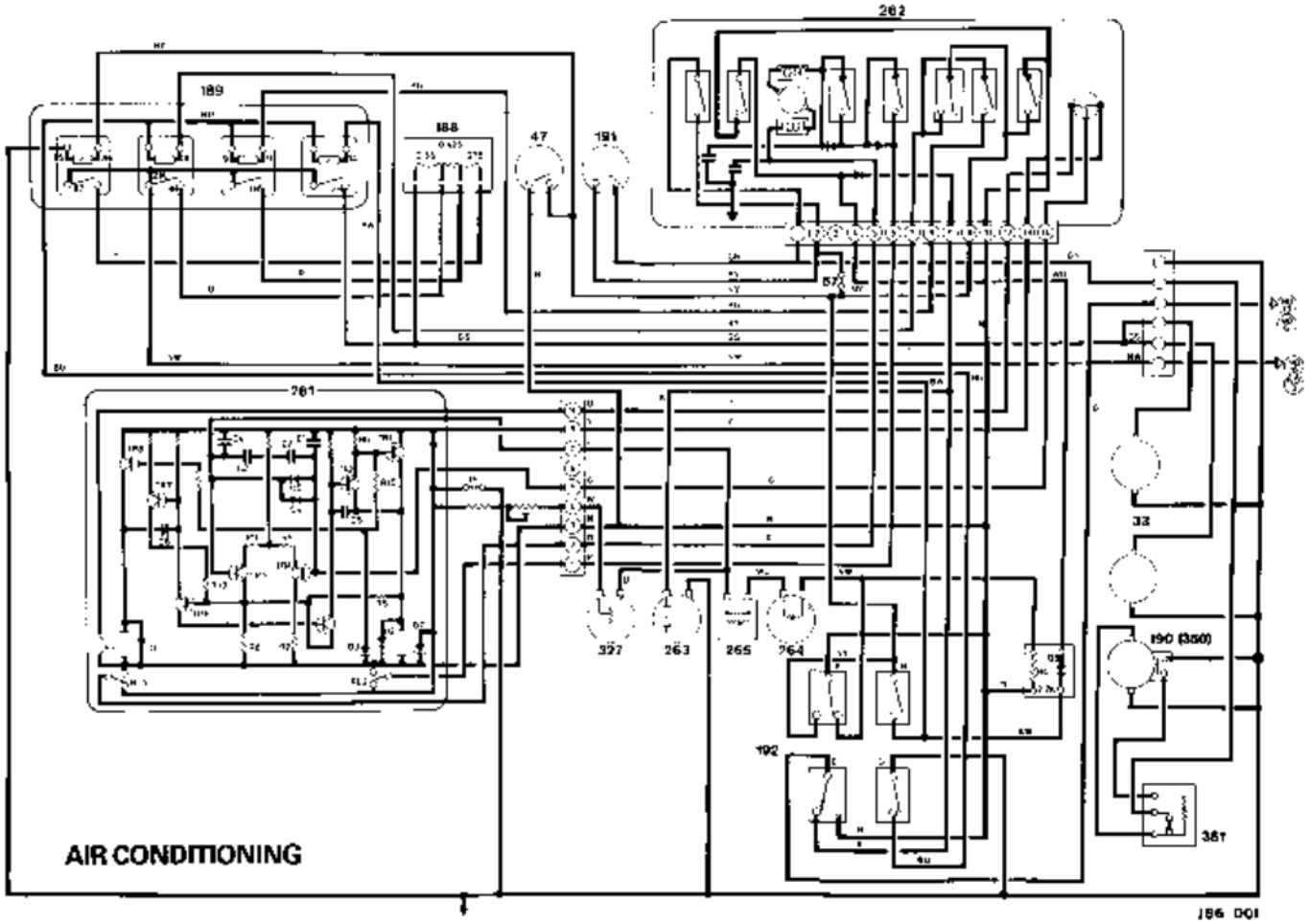
Nuts

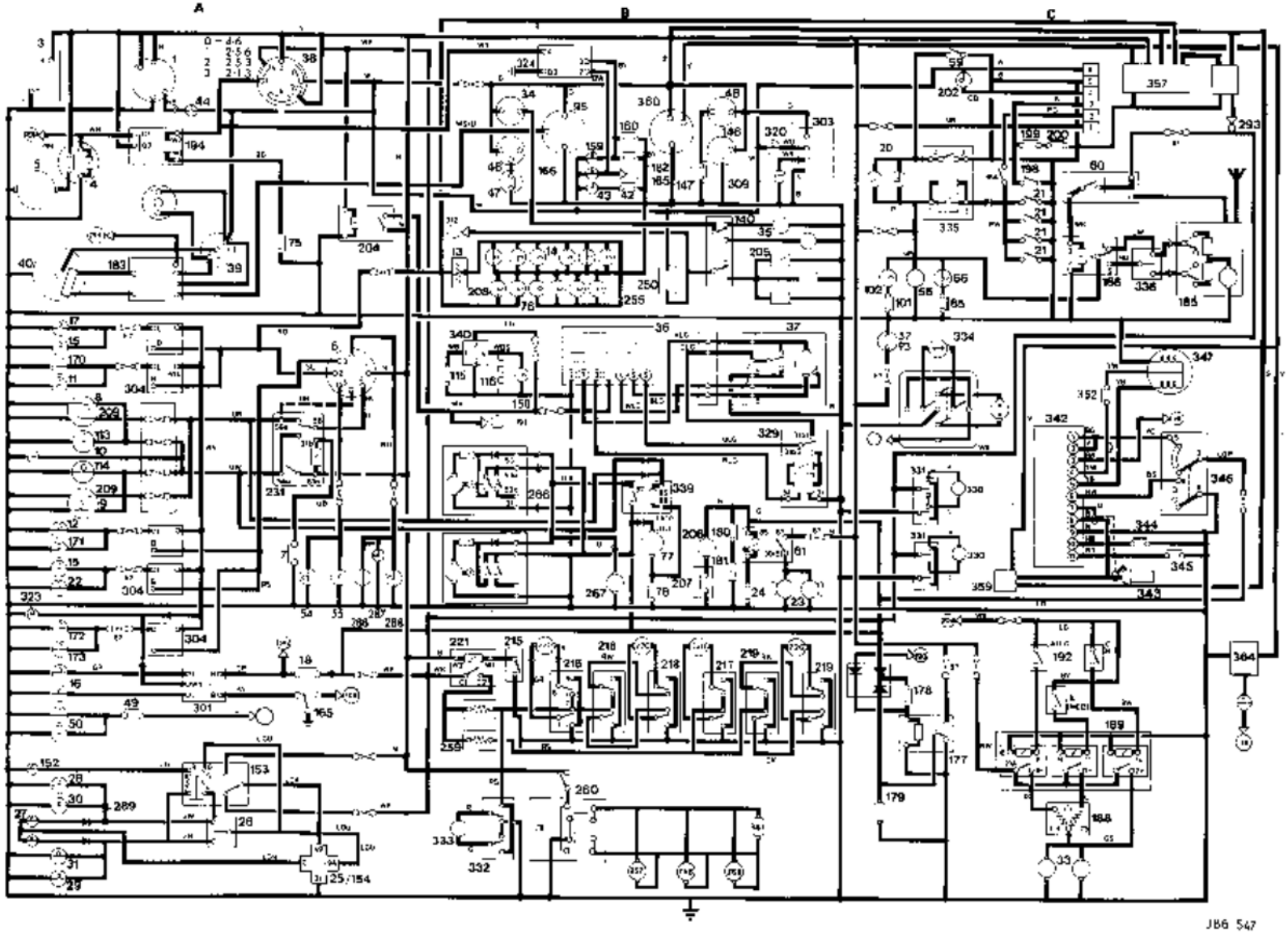
A continuous line of circles is indented on one of the flats of the hexagon, parallel to the axis of the nut (2, Fig. 11).

Studs, Brake Rods, etc.

The component is reduced to the core diameter for a short length at its extremity (3, Fig. 11).


293
326
194
75
349
355
354
316
315
312
385
313
314
353
310
298
297
296
41
300
12 CYL. DIGITAL FUEL INJECTION


282
189
188
47
191
281
327
263
265
264
192
190 (350)
387
AIR CONDITIONING

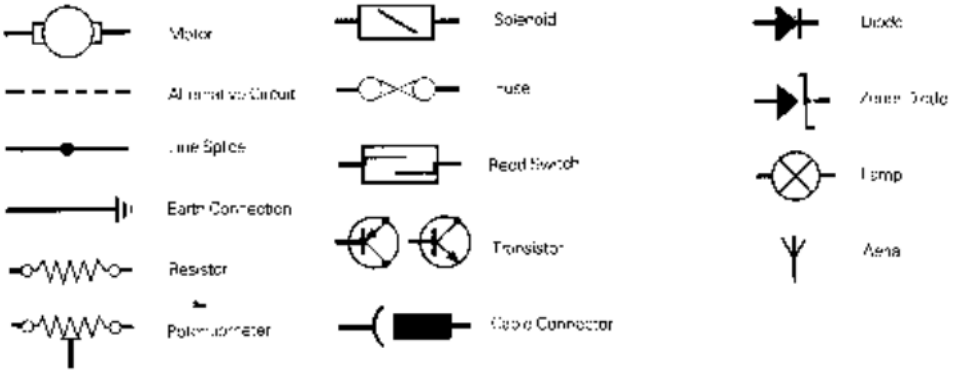

A
B
C
1
2
3
J86 547

CABLE COLOUR CODE

When a cable has two colour code letters, the first denotes the Main Colour and the second the Tracer Colour.

N. Brown — Positive Cable
B. Black — Negative Cable
W. White
K. Pink **Ignition switch controlled**
G. Green
R. Red **Y. Yellow** **O. Orange** **S. Slate** **L. Light** **U. Blue** **P. Purple**

SYMBOLS USED



AUXILIARY FUSE BOX R.H. Stg. 1988

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
14	DOOR LOCK RELAY, ELECTRIC DOOR MIRROR, DOOR LAMPS	5A	GFS 45
15	FOG LAMPS	20A	GFS 420
16	TRIP COMPUTER (WHERE FITTED)	2A	GFS 42
17	FRONT PARKING LAMPS	3A	GFS 43

AUXILIARY FUSE BOX L.H. Stg. 1988

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
13	AIR CONDITIONING, RELAY AND CLUTCH	15A	GFS 415
14	FRONT PARKING LAMP RH	3A	GFS 43
15	FRONT PARKING LAMP LH	3A	GFS 43
16	AIR CONDITIONING OR HEATER MOTORS RH	50A	GFS 450
17	DOOR LOCK, ELECTRIC DOOR MIRRORS, DOOR LIGHTS	3A	GFS 43

MAIN FUSE BOX L.H. Stg. 1988

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	ANTI-RUN ON VALVE		
2	HAZARD WARNING	15A	GFS 415
3	AIR CONDITIONING OR HEATER MOTORS	50A	GFS 450
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	AIR CONDITIONING RELAY AND CLUTCH	15A	GFS 415
7	WINDSCREEN WIPERS	35A	GFS 435
8	PANEL, CIGAR LIGHTER AND GLOVE BOX ILLUMINATION	15A	GFS 415
9	FOG REAR GUARD LAMPS	10A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	AUTOMATIC TRANSMISSION KICK DOWN SOLENOID, HORN RELAY WINDINGS, RADIATOR AUXILIARY FAN RELAY, WINDSCREEN WASHERS, STOP LAMPS, HEADLAMP WASH/WIPE (WHERE FITTED)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

MAIN FUSE BOX R.H. Stg. 1988

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	FOG LAMPS	20A	GFS 420
2	HAZARD WARNING, SEAT BELT LOGIC UNIT	15A	GFS 415
3	MAP AND INTERIOR LAMPS, CLOCK, AERIAL, CIGAR LIGHTER	15A	GFS 415
4	PANEL INSTRUMENTS, REVERSE LAMPS, LOW COOLANT SENSOR and WARNING LIGHT	15A	GFS 415
5	HEATED REAR SCREEN	35A	GFS 435
6	WINDSCREEN WIPERS	35A	GFS 435
7	REAR FOG GUARD	10A	GFS 42
8	PANEL, CIGAR LIGHTER AND GLOVE BOX ILLUMINATION	15A	GFS 415
9	AIR CONDITION OR HEATER MOTOR LH	50A	GFS 410
10	DIRECTION INDICATORS	15A	GFS 415
11	AUTOMATIC TRANSMISSION KICK DOWN SOLENOID, HORN RELAY WINDINGS, RADIATOR AUXILIARY FAN, RELAY WINDINGS, WINDSCREEN WASHERS, STOP LAMPS, SERVICE INTERVAL COUNTER (AMERICA ONLY), HEADLAMP WASH/WIPE (WHERE FITTED)	35A	GFS 435
12	CRUISE CONTROL	2A	GFS 42

KEY TO WIRING DIAGRAMS 1988 MY ON

	Grid ref.	Circuit Number
1 Alternator	A1	
3 Battery	A1	
4 Starter solenoid	A1	
5 Starter motor	A1	
6 Master lighting switch	A1	
8 Headlamp beam RH	A2	
9 Headlamp beam LH	A2	
10 Main beam warning light	A2	
11 RH side lamp	A2	
12 LH side lamp	A2	
13 Panel lamp rheostat	B1	
14 Panel lamps	B1	
15 Number plate illumination lamp(s)	A2	
16 Stop lamp(s)	A3	
17 Tail lamp LH	A2	
18 Stop lamp switch	A2	
19 Fuse box/test input [illegible]		
20 Puddle lights	C1	
21 Door switch	C1	
22 Tail lamp RH	A2	
23 Horns	B2	
24 Horn push	D2	
25 Flasher unit (part of 154)	A3	
26 Direction indicator switch	A3	
27 Direction indicator warning lights	A3	
28 RH front flasher	A3	
29 LH front flasher	A3	
30 RH rear flasher	A3	
31 LH rear flasher	A3	
34 Fuel gauge	B1	
35 Fuel gauge tank unit	D	
36 Windscreen wiper switch	B2	

	Grid ref.	Circuit Number
37 Windscreen wiper motor	B2	
38 Ignition/starter switch	A1	
38A Key switch (part of 38)	A1	
39 Ignition coil	A1	
39A Auxiliary coil 12 cyl.		
40 Distributor	A1	
41 Fuel pump	-	
42 Oil pressure switch	B2	
43 Oil pressure warning light	B2	
44 Ignition warning light	A1	
46 Coolant temperature gauge	B1	
47 Water temperature transmitter	B1	
48 Oil pressure gauge	B1	
49 Reverse lamp switch	A3	
50 Reverse lamp(s)	A3	
54 Fog lamp RH	A2	
55 Fog lamp LH	A2	
56 Clock (where fitted)	C1	
57 Cigar lighter socket	C1	
59 Interior light switch	C1	
60 Radio	C1	
61 Horn relay	B2	
65 Boot light switch	C1	
66 Boot light	C1	
67 Line fuse		
75 Automatic gearbox safety switch	A1	
76 Automatic gearbox selector lamp	B1	
77 Windscreen washer pump	B2	
78 Windscreen washer switch	B2	
83 Charging and inspection lamp sockets	C2	
95 Tachometer	B	
101 Map light switch	C1	
102 Map light	C1	
111 Rear passenger lamps		
112 Drivers lamp		

	Grid ref.	Circuit Number
113 Headlamp inner RH	A2	
114 Headlamp inner LH	A2	
115 Rear window demister switch	B2	
116 Rear window demister unit	B2	
140 Fuel changeover switch	B1	
146 Battery condition indicator	B1	
147 Oil pressure transmitter	B1	
150 Rear window demister warning light	B2	
152 Hazard warning light	A3	
153 Hazard warning switch	A3	
154 Hazard warning flasher unit	A3	
158 Brake fluid level warning light	B1	
159 Brake pipe failure pressure switch	D1	
164 Ballast resistor	A1	
165 Handbrake switch	A3	
166 Handbrake warning light	D1	
170 Side markers RH front	A2	
171 Side markers LH front	A2	
172 Side markers RH rear	A3	
173 Side markers LH rear	A3	
174 Radiator cooling fan diode(s)	C3	
177 Radiator cooling fan relay	C3	
178 Radiator cooling thermostat (in pump)	C3	
179 Radiator cooling fan motor	C3	
180 Kickdown switch	B2	
181 Kickdown solenoid	B2	
182 Brake fluid level switch	D1	
183 Ignition amplifier	A1	
185 Aerial motor	C1	
186 Aerial motor relay	C1	
188 LH Blower motor	C1	
189 RH Blower motor		
190 Compressor clutch relay	C2	
191 Thermostat		

	Grid ref.	Circuit Number
192 Blower motor speed switch		
194 Starter solenoid relay	A1	
196 Seat belt switch—driver	C1	
198 Seat belt switch—passenger } Non	C1	
200 Seat switch—passenger } Fed	C1	
202 Seat belt warning light	C1	
204 Ignition protection relay	A1	
205 Fuel solenoid valves	B1	
206 Battery cooling fan	B2	
207 Battery cooling fan thermostat	B2	
208 Cigar lighter illumination	B1	
209 Headlamp dip beam RH and LH	A2	
215 Window lift master switch	B3	
216 Window lift switch RH front	B3	
217 Window lift switch LH front	B3	
218 Window lift switch RH rear	B3	
219 Window lift switch LH rear	B3	
220 Window lift motor(s)	B3	
22 Window lift relay	B3	
231 Headlamp relay	A2	
231A Headlamp inhibit relay (XJS only)		
250 Inertia switch	B1	
255 Fibre optics illumination bulb	B1	
257 Passenger door lock motor	B3	
258 Rear door lock motor	B3	
259 Thermal circuit breaker	B3	
260 Door lock control module	B3	
261 Electronic control module		
262 Ambient temp sensor		
263 Evaporator temp sensor		
264 In car sensor		
265 Rapid vacuum solenoid		
266 Headlamp wiper motor	B2	
267 Headlamp wash motor	B2	
280 Boot lamps		
287 Fog guard warning light	A2	

	Grid ref.	Circuit Number
288 Fog guard lamp	A2	
289 Direction indicator blocking diode	A3	
290 Seat belt logic unit (Federal)	C1	
291 EGR control unit		
292 Fuel injection amplifier		
293 Fuel injection control unit (ECU)		
296 Fuel injectors		
297 Air temperature sensor		
298 Thermotime switch		
299 Cold start relay		
300 Cold start injector		
301 Stop lamp failure sensor	A3	
303 Low coolant control unit	B1	
304 Park lamp failure sensor	A2	
305 Coolant temperature sensor		
306 Trigger unit		
307 EGR valve		
308 EGR thermo switch		
309 Low coolant sensor	B1	
310 Throttle switch		
312 Main relay		
313 Power resistor		
314 Fuel pump relay		
315 Blocking diode (part of 314)		
316 Oxygen sensor		
318 Manifold pressure sensor		
320 Low coolant warning light	B1	
323 Lamp failure warning light	A3	
324 Inverter	B1	
326 Full throttle switch		
327 Temperature selector		
329 Timer Relay wipers	B2	
330 Seat adjust motor	C2	
331 Seat adjuster switch	C2	
332 Sliding roof switch	B3	
333 Sliding roof motor	B3	
334 Electric door mirror	C2	

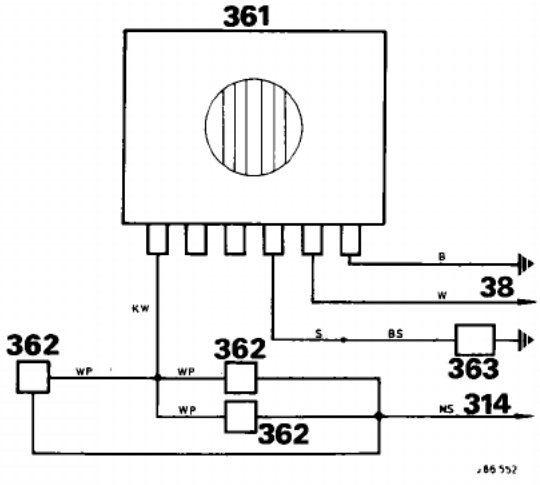
	Grid ref.	Circuit Number
338 Interior lamp delay up to 1983	C1	
339 Headlamp wiper relay	C2	
340 Heated back-light delay (XJS only)	B2	
341 Door lock motor		
342 Speed control unit	C2	
344 Inhibit switch (see 356)	C2	
345 Set switch	C2	
346 Switch control unit	C2	
347 Actuator	C2	
349 Throttle micro switch		
350 [illegible] temperature switch		
351 Thermal fuse		
352 Speed control brake switch	C2	
353 Feedback monitor socket		
354 Feedback disable socket		
355 Feedback relay		
356 Kickdown/Speed control inhibit switch	C2	
357 Trip computer } (where fitted)	C1	
358 Interface unit	C1	
359 Pulse generator	C2	
360 Speedometer (electronic)	B1	
361 Vacuum timer relay		
362 Solenoid valves		
363 Coolant temperature switch		
364 Radio telephone transceiver		
365 Radio telephone handset		
366 Radio telephone microphone		
367 Defrost vacuum solenoid		
368 Water valve vacuum solenoid		
369 Centre vent vacuum solenoid		
370 Differential control		
371 Lower feedback Potentiometer		
372 Upper feedback Potentiometer		
373 Servo motors		
374 Compressor clutch		
375 To fuse		
376 To fuse no. 11		
377 To fuse in line V12, fuse 16 for 3.6		
378 High speed relays		

IN LINE FUSES 1988 ON

PROTECTED CIRCUIT	FUSE	UNIPART NO.	LOCATION
HORN	15A	GFS 415	ADJACENT TO SERVO RH CARS TO THE BATTERY LH CARS
CIGAR LIGHTER	20A	GFS 420	BEHIND RH FRONT CONSOLE SIDE CASING
ELECTRIC SEAT ADJUSTMENT	30A	GFS 430	UNDER CARPET BELOW LH SIDE OF CONSOLE IN FRONT OF SEAT
AIR CONDITIONING AMPLIFIER	3A	GFS 43	BEHIND LH FRONT CONSOLE SIDE CASING
RH TAIL LAMP AND NO. PLATE LAMP (RED LEAD WITH BLACK RING) LH TAIL LAMP AND NO. PLATE LAMP (RED LEAD WITH YELLOW RING) SIDE MARKER LAMPS (WHERE FITTED) RED LEAD	3A	GFS 43	IN THE LUGGAGE COMPARTMENT BEHIND THE TRIM BELOW THE PARCEL SHELF
RADIO CASSETTE	2A	GFS 42	BEHIND THE RADIO

HEADLAMP FUSE BOX 1988 ON

FUSE NUMBER	PROTECTED CIRCUIT	FUSE CAPACITY	UNIPART NUMBER
1	RADIATOR COOLING FAN 12 CYLINDER 6 CYLINDER	 8/15A 10/20A	 GFS 415 GFS 420
2	RH DIP	10/20A	GFS 420
3	RH MAIN	17/35A	GFS 435
4	LH DIP	10/20A	GFS 420
5	LH MAIN	17/35A	GFS 435



VACUUM DELAY TIMER

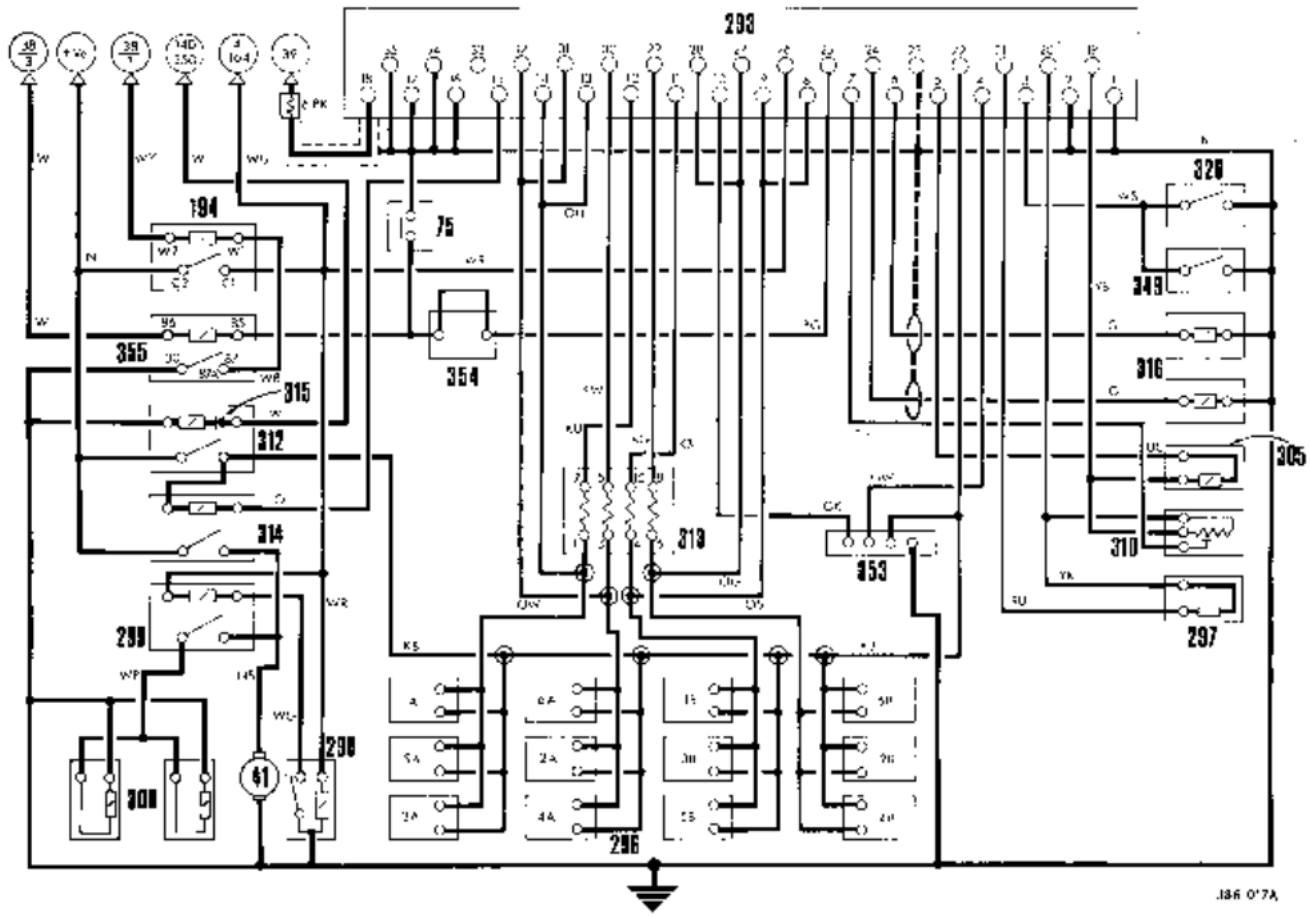
BULB CHART 1988 ON

Description	Capacity	Type	Part No.
Cigar lighter illumination	12V 2W	Capless	JLM 468
Door guard lamp	12V 5W	Capless 501	JLM 9600
Flasher side repeaters	12V 4W	Bayonet 233	JLM 9589
Fibre optic light source	12V 6W	Bayonet 989	JLM 9601
Fog lamps – Front	12V 55W	Halogen 479	JLM 9588
– Rear	12V 21W	Bayonet 382	C 9126
Front flasher lamp	12V 21W	Bayonet 382	C 9126
Glove compartment lamp	12V 5W	Festoon 239	JLM 9590
Headlamps – France only – Inner – France only – Outer – Japan only – Inner – Japan only – Outer – Rest of World – Inner – Rest of World – Outer	 12V 45/40W 12V 60/55W 12V 4W 12V 60/55W 12V 55W 12V 60/55W	 Halogen yellow Halogen yellow 476 Bayonet 233 Halogen H4 Halogen H1 Halogen H4	 JLM 9596 JLM 9599 JLM 9589 JLM 9598 JLM 9597 JLM 9598
Headlamp pilot bulb Front side light	12V 4W	Bayonet 233	JLM 9589
Instrument illumination	12V 2.2W	Bayonet 987	C 15788
Interior Light	12V 10W	Festoon 272	C 31106
Luggage compartment lamp	12V 5W	Festoon 239	JLM 9590
Map light	12V 10W	Festoon 272	C 31106
Number plate lamp	12V 4W	Bayonet 233	JLM 9589
Panel switch illumination	12V 1.2W	Bayonet 284	JLM 9593
Rear flasher lamp (Direction indicator)	12V 21W	Bayonet 382	C 9126
Reversing lamp	12V 21W	Bayonet 382	C 9126
Stop lamp	12V 21W	Bayonet 382	C 9126
Tail lamp	12V 5W	Bayonet 207	JLM 9587
Warning lights	12V 1.2W	Capless 286	C38966

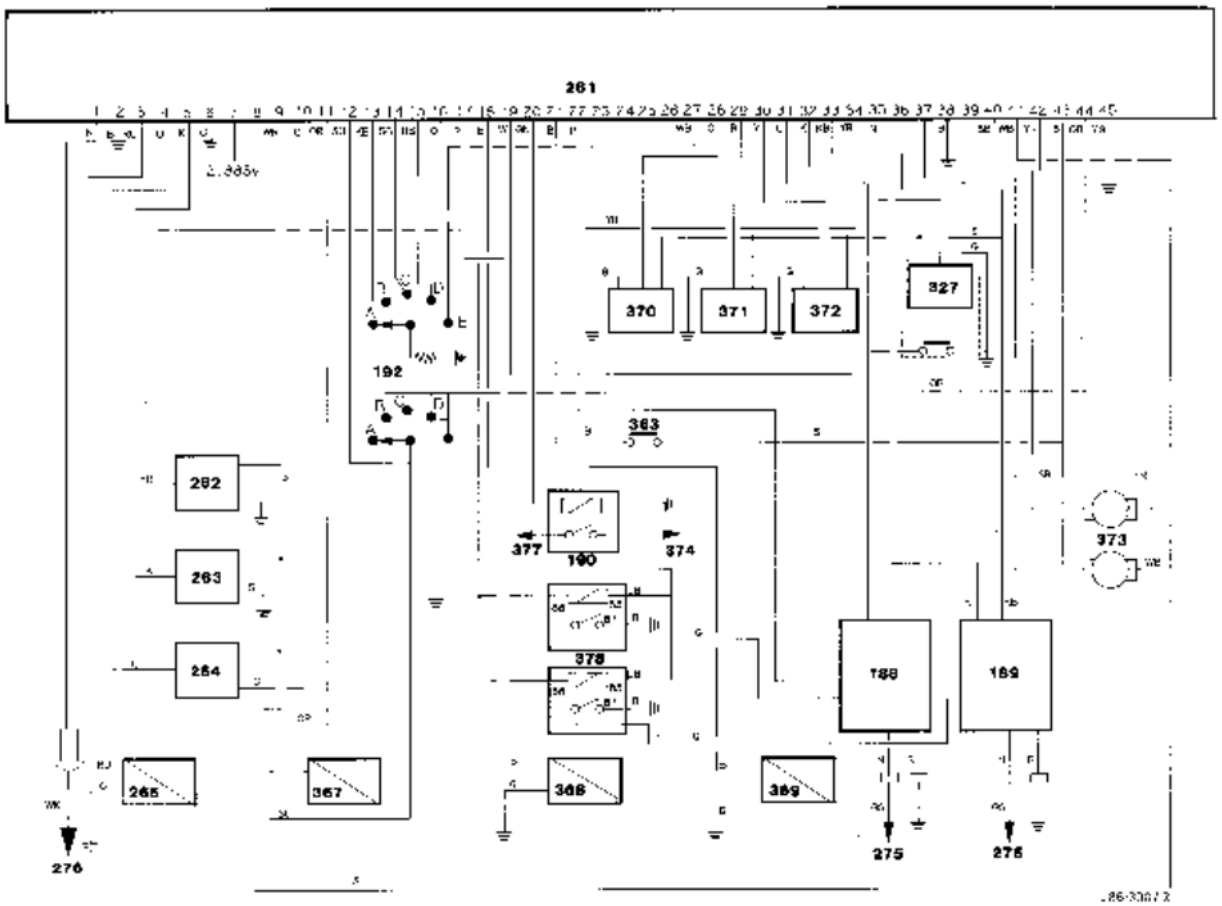
IN LINE FUSES 1990 MY

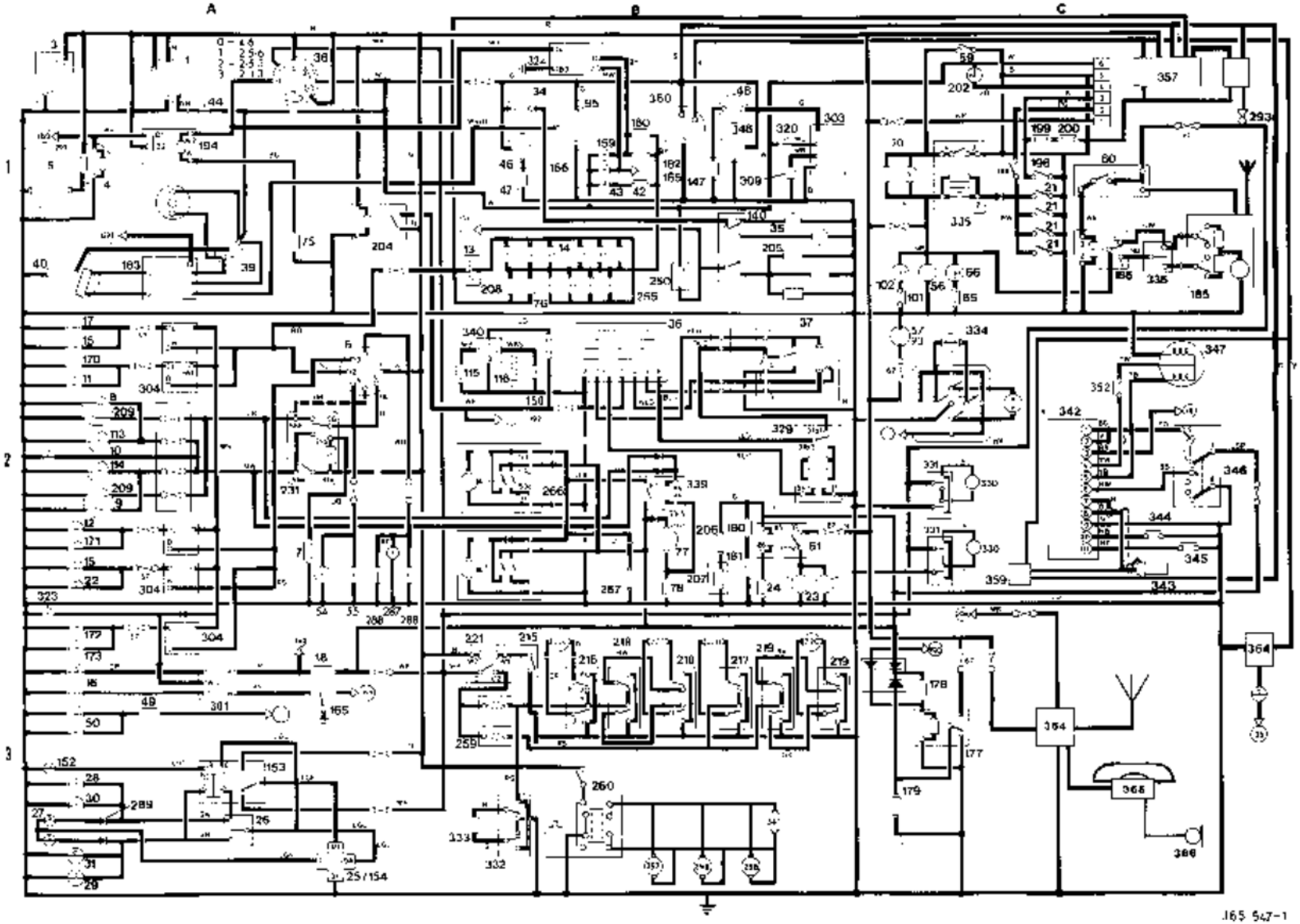
PROTECTED CIRCUIT	FUSE	UNIPART NO.	LOCATION
Headlamp levelling – controlling upward movement	2A	GFS42	Engine compartment. LH wing valance (German market)
Headlamp levelling – controlling downward movement	2A	GFS42	Engine compartment LH wing valance (German market)
Daytime running lamps	35A	GFS435	Adjacent to brake servo (Canadian market)

12 CYL. DIGITAL FUEL INJECTION



AIR CONDITIONING





1988 MY ON

CONTENTS

CLOCK

Remove and refit **88.15.07**

Disconnect the battery.
Lever the clock from the aperture.
Pull the clock illumination bulb holder from the back of the clock.
Note the position of the Lucar connectors and disconnect the cables.

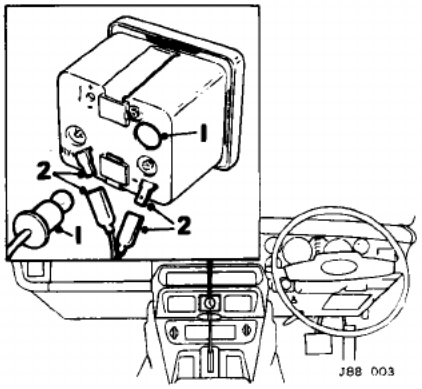


Fig. 1

OIL PRESSURE TRANSMITTER

Remove and refit **88.25.07**

Disconnect the battery.
Disconnect the cable from the connector on top of the transmitter (1).
Remove the transmitter, located on the oil filter head on 6 cylinder models (2, Fig. 2), and on the manifold on 12-cylinder models (2, Fig. 3).

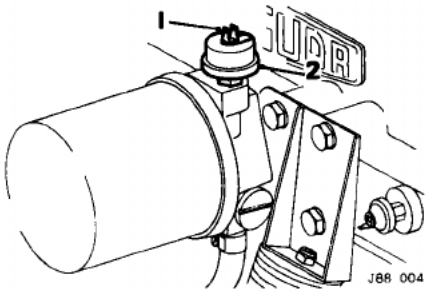


Fig. 2

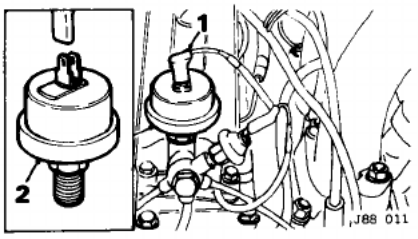


Fig. 3

OIL PRESSURE WARNING SWITCH

Remove and refit **88.25.08**

Disconnect the battery.
Disconnect the cable from the connector on top of the switch (1).
Withdraw the switch from the cylinder block on 6 cylinder models (2, Fig. 4), and the manifold on 12 cylinder models (2, Fig. 5).

CAUTION: When refitting, care must be taken not to overtighten the switch, torque figure 4 to 5,5 Nm (3 to 4 lb ft), or the oil pressure transmitter.

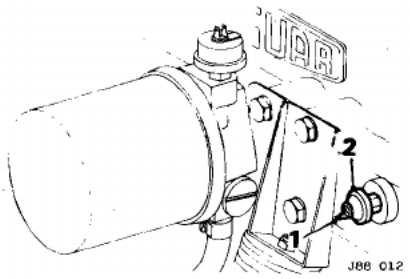


Fig. 4

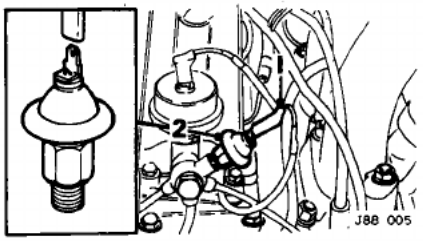


Fig. 5

COOLANT TEMPERATURE TRANSMITTER

Remove and refit **88.25.20**

Disconnect the battery.
Remove the remote header tank cap to depressurize the cooling system.

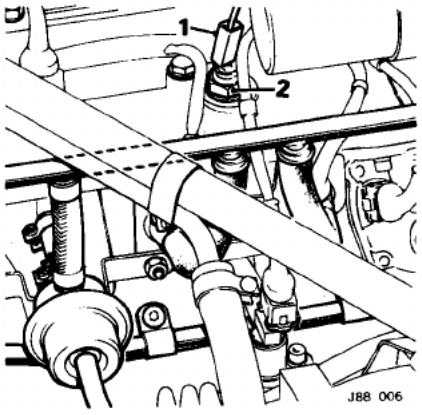


Fig. 6

WARNING: Only remove the cap when the engine is cold.

Disconnect the connector on top of the transmitter (1), and withdraw the transmitter (2, Fig. 6). 6 cylinder cars or (1, Fig. 7) 12 cylinder cars.

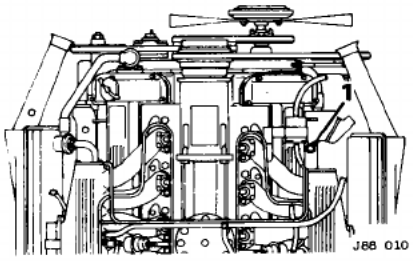


Fig. 7

Refitting

Reverse the above procedure.

FUEL TANK UNIT

Remove and refit **88.25.32**

Disconnect the battery.
Raise the rear of the car and drain the fuel tank.
Remove the wheel.
On later cars remove the rear lamp assembly for access.
Remove the cover-plate and disconnect the Lucar connections (1, Figs. 8 or 9).
Using tool No. 18G 1001, rotate the locking ring anti-clockwise to clear the lugs in the tank.
Remove the locking ring and withdraw the tank unit (2, Figs. 8 or 9).
WARNING: Tank unit seal should be replaced with a new seal every time this operation is carried out.

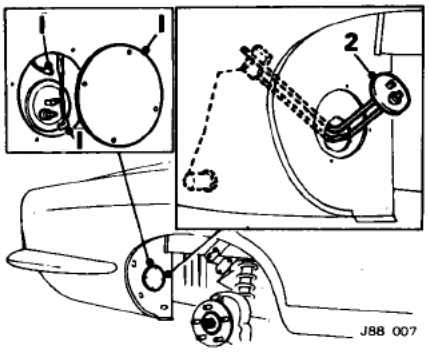


Fig. 8

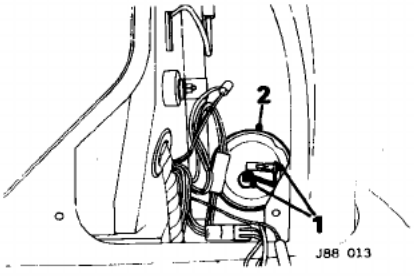


Fig. 9

SPEEDOMETER

Remove and refit **88.30.01**

Includes:

Speedometer illumination bulb—remove and refit **86.45.49**
Flasher indicator bulb—remove and refit **86.45.63**
Ignition low charge indicator bulb—remove and refit **86.45.64**
Fuel gauge—remove and refit **88.25.26**
Fuel gauge illumination bulb—remove and refit **86.45.52**
Temperature gauge—remove and refit **88.25.14**
Temperature gauge illumination bulb—remove and refit **86.45.51**

Removing

Disconnect the battery.
Press the speedometer (1, Fig. 10) in towards the fascia and rotate in a clockwise direction for right-hand drive cars and anti-clockwise for left-hand drive cars, until the instrument releases from the locking tabs. Withdraw speedometer from the fascia (1, Fig. 11).
Note the positions of the cables and disconnect from the Lucar connectors at the back of the instrument (2, Fig. 11).
Unscrew the speedometer drive cable and turn the trip reset connector anti-clockwise until it releases, then pull it off.

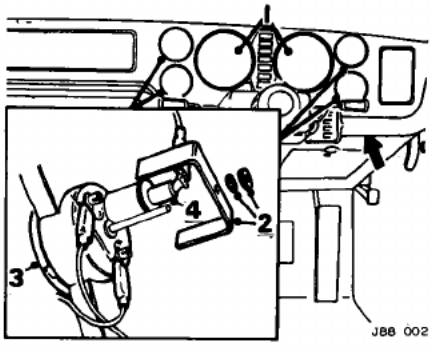


Fig. 10

Withdraw the speedometer illumination bulb, the flasher indicator bulb, and the ignition low charge indicator bulb (3, Fig. 11).

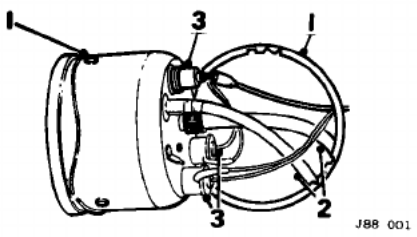


Fig. 11

With the speedometer removed, the fuel gauge retaining bracket nut (2, Fig. 10) can be removed and the indicator (3, Fig. 10) withdrawn from the fascia.
Remove the fuel gauge illumination bulb holder and remove the bulb (4, Fig. 10).
The temperature gauge can also be removed by removing the retaining bracket nut and withdrawing the indicator from the fascia.
Remove the temperature gauge illumination bulb holder and remove the bulb.

Refitting

Reverse the above operations.

SPEEDOMETER TRIP RESET

Remove and refit **88.30.02**

Disconnect the battery.
Remove the retaining ring from the speedometer trip reset knob, located in the driver's side dash casing.
Press the speedometer in towards the fascia, rotate anti-clockwise and release it from the fascia.
NOTE: When refitting the speedometer trip reset, it is advisable to remove the fuse block access panel, to assist in the location of the lower end of the reset cable through the mounting bracket.

SPEEDOMETER CABLE ASSEMBLY

Remove and refit **88.30.06**

Disconnect the battery.
Press the speedometer in towards the fascia; rotate and release it from the fascia.
Disconnect the cable at the angle drive (1, Fig. 12).
Attach a draw-string to the end of the cable.
Raise the car.
Undo the knurled nut securing the speedometer cable to the angle drive on the gearbox.
Displace the grommet from the transmission tunnel and feed the cable into the car.
Withdraw the cable (2, Fig. 12) from the instrument into the footwell, remove the draw-string.

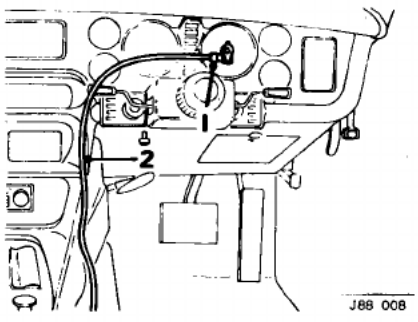


Fig. 12

Refitting

Feed the cable through the hole in the transmission tunnel and replace the grommet.
Reconnect the cable to the angle dive and tighten the knurled nut to secure.
Attach the draw-string to the instrument end of the cable and draw the cable up to the rear of the speedometer.
Reconnect the cable to the angle drive on the speedometer.
Detach the draw-string.
Refit the speedometer.
Reconnect the battery.

SPEEDOMETER CABLE—INNER

Remove and refit **88.30.07**

Removing

Disconnect the battery.
Remove the speedometer.
Remove the inner cable.
If the cable is broken, the gearbox end will have to be disconnected to allow the other half to be relieved.

Refitting

Reverse the above operations. Lubricate the cable before refitting.
NOTE: (a) Lubrication should not be excessive; oil should never be used. Use only T.S.D. 119 or equivalent.
(b) The inner cable should only project by 9,52 mm (⅜in) from the outer casing at the instrument end to ensure correct engagement at the point of drive.

SPEEDOMETER RIGHT ANGLE DRIVE—INSTRUMENT

Remove and refit **88.30.15**

Removing

Disconnect the battery.
Remove the speedometer.
Unscrew the knurled retaining ring and withdraw the drive.

Refitting

Reverse the above procedure.

SPEEDOMETER RIGHT ANGLE DRIVE—GEARBOX

Remove and refit **88.30.16**

Removing

Disconnect the speedometer drive cable.
Remove the right angle drive by unscrewing the knurled retaining ring nut.

Refitting

Reverse the above procedure.

TACHOMETER

Remove and refit **88.30.21**

Includes:

Tachometer illumination bulb—remove and refit	**86.45.53**
Oil gauge—remove and refit	**88.25.01**
Oil gauge illumination bulb—remove and refit	**86.45.50**
Heated back-light warning lamp bulb—remove and refit	**86.45.82**
Warning lamp cluster—remove and refit	**86.45.62**
Battery condition indicator—remove and refit	**88.10.07**
Battery condition indicator bulb—remove and refit	**86.45.56**

Removing

Disconnect the battery.
Press the tachometer (1, Fig. 13) in towards the fascia and rotate in a clockwise direction for right-hand drive cars and anti-clockwise for left-hand drive cars, until the instrument releases from the locking tabs. Withdraw the tachometer from the fascia (1, Fig. 14).

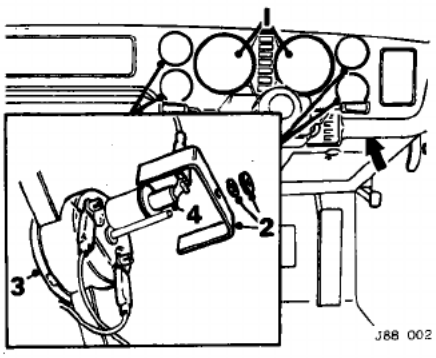


Fig. 13

Lever the warning lamp cluster lens from the assembly and working through the tachometer aperture, disconnect the warning lamp cluster harness block connector.
Bend back the clip securing the cluster harness at rear of the fascia.
Remove the cluster securing screws and withdraw the unit from the fascia.

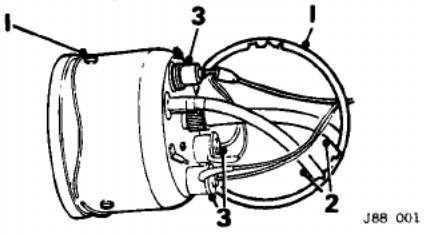


Fig. 14

Note the position of the cables and disconnect the Lucar connectors at the back of the instrument (2, Fig. 14).
Withdraw the bulb holder from the instrument and remove the bulb (3, Fig. 14).
Remove the heated back-light bulb holder and withdraw the bulb.
With the tachometer removed, the oil gauge retaining bracket nut (2, Fig. 13) can be removed and the gauge withdrawn from the fascia (3, Fig. 13).
Remove the oil gauge illumination bulb holder (4, Fig. 13) from the gauge and withdraw the bulb.
The battery condition indicator can also be removed by removing the retaining bracket nut and withdrawing the indicator from the fascia.
Disconnect the cables at the Lucar connectors.
Remove the battery condition indicator illumination bulb holder and remove the bulb.

ELECTRONIC SPEEDOMETER

Description 86.30.00

The pulse signal required to operate both the speedometer and service interval counter is controlled by a speed transducer situated in the automatic transmission unit in place of the angle drive.
The service interval counter, if fitted, is situated in the boot compartment and is located by removing the rear detachable boot trim panel.
It is important to note that should the harness controlling the pulse input to the speedometer become disconnected at the speedometer, the service interval counter will also CEASE TO OPERATE. The control for resetting the speedometer is now situated in the speedometer fascia and is operated by depressing the control button.

Fault Finding

The cause of faults which result in the incorrect operation of the speedometer are best diagnosed by substitution, having first checked all connections and the fuse. Ensure the earth connections are clean and tight, and battery voltage is applied to the speedometer and the transducer.

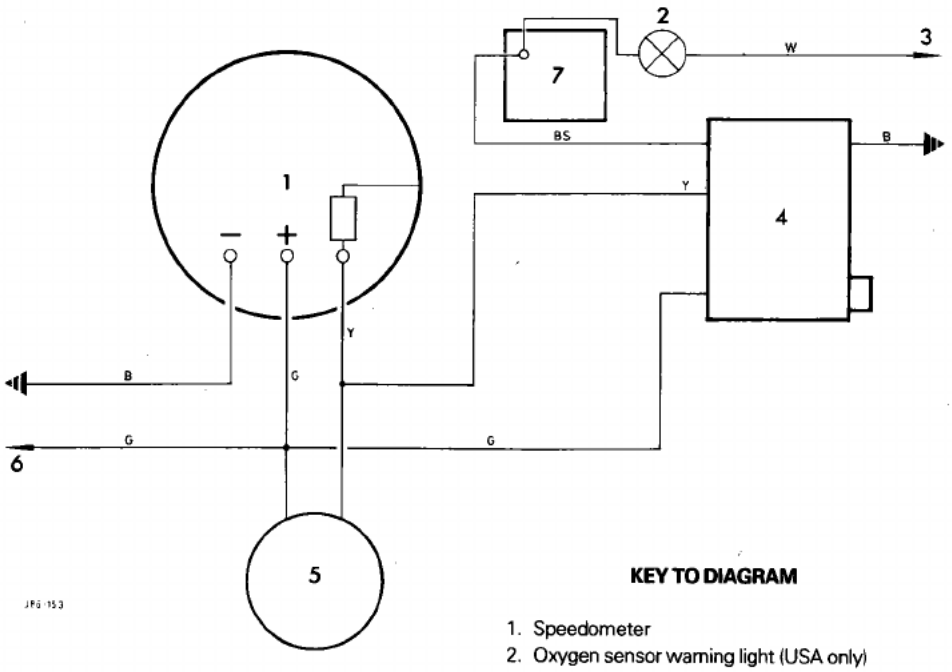


Fig. 15

KEY TO DIAGRAM

1. Speedometer
2. Oxygen sensor warning light (USA only)
3. To ignition switch
4. Service interval counter (USA only)
5. Speed transducer
6. To fuse
7. Bulb failure unit

TRIP COMPUTER

88.00.00

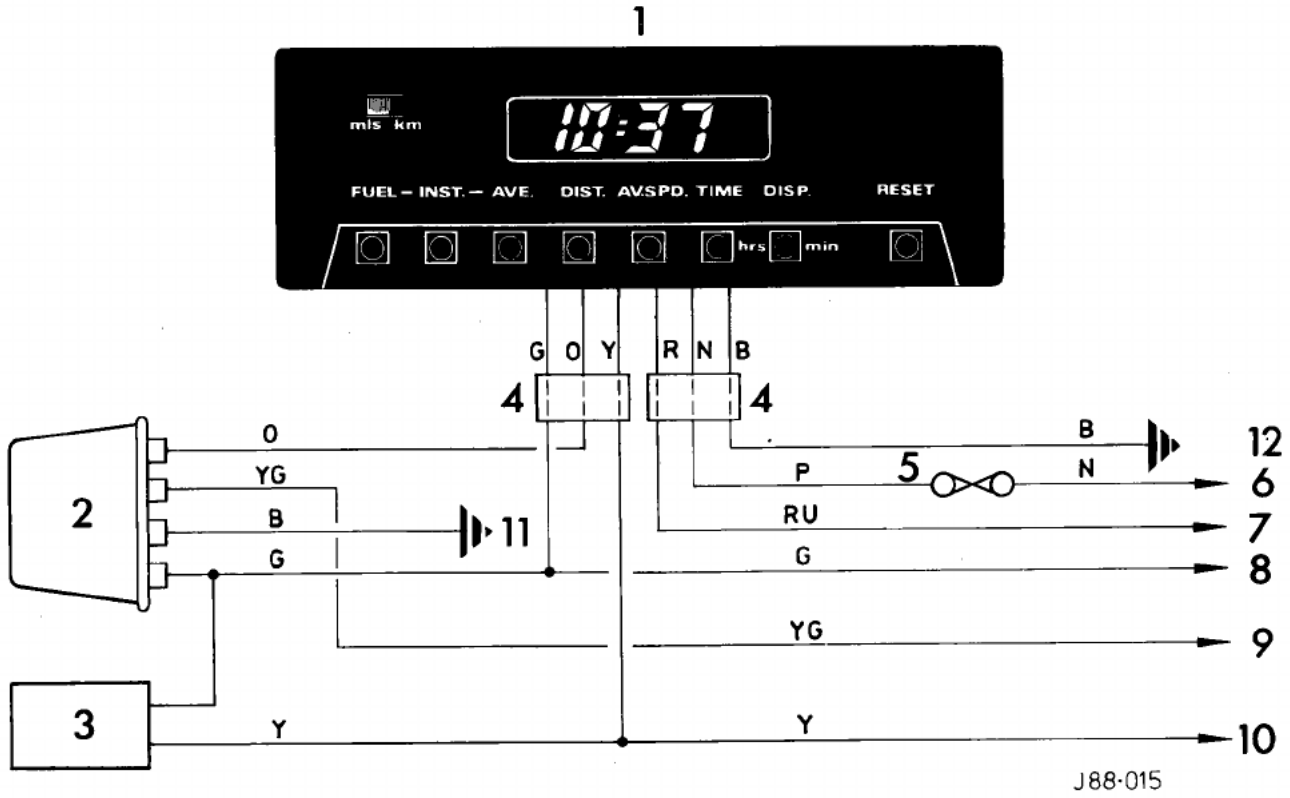
DESCRIPTION

The trip computer records fuel usage, time and distance. By storing the three sets of information and relating one to another it computes fuel consumption, both average consumption for the journey or a current consumption figure updated every three seconds.

The information may be displayed either in miles and gallons or litres and kilometers.

The signals required to operate the trip computer are picked up from the ECU via the interface unit (2 Fig. 16) and the pulse generator (3 Fig. 16). A 12 volt supply is via the fuse (5 Fig. 16). This supply voltage enables the clock to function and for the computer to retain information it has received when the ignition is switched off.

A second 12 volt supply is via fuse (8 Fig.16) this supply enables the computer to display information when the ignition is switched on. The third 12 volt supply is via the red and blue lead (4 Fig. 16). This supply voltage enables the display and the buttons to dim when the sidelamps are switched on. The legend strip is also illuminated.



Key:

1. Trip Computer
2. Interface Unit
3. Speed Transducer
4. Connector Blocks
5. Inline Fuse (2 amps)
6. Terminal Post
7. To Sidelamps
8. To Fuse No. 4 (10 amps)
9. To ECU
10. To Speedometer
11. Earth point between battery and wheel arch in luggage compartment
12. Earth point on steering column bracket behind the instrument panel.

Fig. 16

TRIP COMPUTER CONTROLS

There are nine controls on the computer face:

mls/km – Use this switch to display metric or imperial/US units.

RESET – Press for 5 seconds to switch off all functions displays to zero.

DISP – Press to switch display off (function updating continues).

TIME – Press to display time of day – press again to display elapsed time since reset – after 6 seconds, display will revert to time of day.

AV SPD – Press to display average speed since reset.

DIST – Press to display distance travelled since reset.

AVE – Press to display average fuel consumption since reset.

INST – Press to display the fuel consumption at that time.

FUEL – Press to display fuel consumed since reset.

To show which function is on display the relevant button will be illuminated. When the vehicle lights are switched on the computer illumination is dimmed but the legend plate is illuminated.

FAULT DIAGNOSIS

Check all fues and connections. Ensure that earth connections are clean and tight. With the ignition switched off, 12 volts should be obtained on the purple lead to the trip computer.
The voltmeter should give the following readings with the ignition switched on: 12 Volts at the green lead to the trip computer, the green lead to the pulse generator, the green lead and the yellow/green lead to the interface unit.
With the engine running a voltage should be obtained at the orange lead to the computer. A zero reading indicates a faulty interface unit or lack of continuity in the wiring between the computer and the interface unit. Re-check at the interface unit located in the luggage compartment.
With the rear of the vehicle jacked up and on stands, start the engine and put the vehicle into drive. A voltage should be obtained at the yellow lead to the computer. A zero reading indicates a faulty pulse generator or lack of continuity in the wiring between the pulse generator and the computer.

FAULT	ACTION
Computer inoperative Screen blank (All voltages correct)	Replace computer
Computer does not dim with sidelamps on (Battery voltage at red/blue cable connection)	Replace computer
More than one LED illuminated simultanously (All battery voltages correct)	Replace computer
Time of day displayed Average speed/distance displayed Fuel characteristics zero Speedometer operating (All battery voltages correct – Zero voltage on orange lead with engine running	Replace interface unit
Time of day displayed All other functions zero Speedometer not operating (All battery voltages correct – Zero voltage on orange lead with car on axle stands, engine running, transmission in 'DRIVE')	Replace pulse generator (speed transducer)

JACKING, LIFTING AND TOWING

JACKING POINT

Four jacking points are provided beneath the body side-members (1, Fig. 1), one in front of each rear wheel and one behind each front wheel. They consist of downward-facing spigots (2, Fig. 1) designed to engage the lifting head of the tool kit jack (3, Fig. 1).

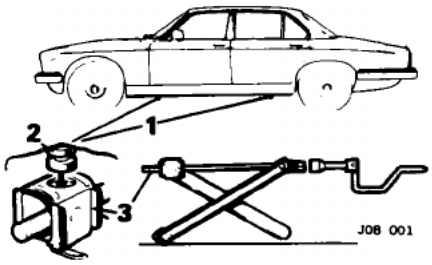


Fig. 1

Ensure that the jack head is fully engaged with spigot before lifting the car, and that wheels on side opposite to that being lifted are chocked, as well as checking handbrake application.

STANDS

When carrying out any work which requires a wheel to be raised (apart from a simple wheel-change) always replace the tool kit jack by a stand engaging the jacking spigot, to provide secure support.

WORKSHOP JACK

Front—one wheel

Place the jack head under the lower spring support pan, interposing a suitable wooden block before raising the wheel. Place a stand in position at the adjacent spigot and remove the jack before working on the car.

Rear—one wheel (Fig. 2)

Place the jack head under the outer fork of the wishbone at the wheel to be raised; interpose a suitable wooden block between the jack head and the wishbone, ensuring that the aluminium alloy hub carrier and its grease nipple will not be contacted by the block as the wheel is raised. Place a stand in position at the adjacent spigot and remove the jack before working on the car.

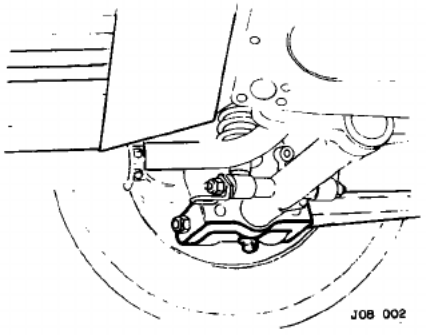


Fig. 2

Front—both wheels (Fig. 3)

Place the jack, with a shallow wooden block on its head, centrally beneath the front cross-member, between the lower wishbones. Raise the car, then lower it on to two stands engaging the front jacking spigots; remove the jack before working on the car.

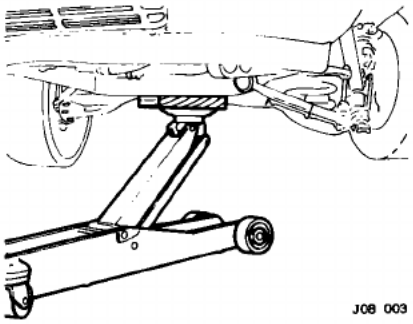


Fig. 3

Rear—both wheels (Fig. 4)

Place the jack head centrally under the plate below the final drive unit and interpose a wooden block between the jack head and plate, the block being shaped to prevent load being applied to the plate flanges. Raise the rear end of the car, then lower on to two stands engaging rear jacking spigots; remove the jack before working on the car.

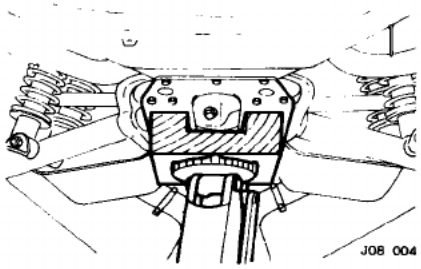


Fig. 4

LIFTING

Locate lifting pads at the four jacking spigots.

TOWING

Two towing eyes are provided on all cars, located adjacent to the front cross-member forward attachments, for use in towing from the front. Tie-down lugs at rear damper lower attachments are NOT suitable for rear towing. When towing an automatic transmission car, it is essential to carry out the following operations:

A. With automatic transmission functioning correctly:

1. Add 1,7 litres (3.0 pints) of correct automatic transmission fluid to the transmission, via the underbonnet filler tube.
2. Place the selector lever at 'N'.
3. Check that the ignition key is in place, and turn it to position '1'.
4. Tow the car at a speed not exceeding 48 km/h (30 m.p.h.) for not more than 48 km (30 miles).
5. After completing the tow, remove sufficient fluid from the transmission to restore correct reading on the dipstick.

CAUTION: It must be remembered that steering is no longer power-assisted when the engine is not running, and that the brake servo will become ineffective after a few applications of the brakes. Be prepared, therefore, for relatively heavy steering and the need for increased pressure on the brake pedal. This applies to manual transmission cars as well as to those with automatic transmission.

B. With automatic transmission defective, either tow the car with the rear wheels clear of the ground, or disconnect the propeller shaft at the final drive input flange and firmly secure the rear end of the shaft to one side of the flange. Restrictions on towing distance do not apply when the output shaft of the gearbox is not being turned, but it is still essential that the ignition key is turned to position '1' and the cautionary note above still applies.

Recovery of cars fitted with manual gearbox: Due to the possibility of internal gearbox damage, resulting from inadequate lubrication, it is essential, if the car is to be towed, that either the rear wheels are clear of the ground, or the propeller shaft is disconnected from the final drive input flange. If the propeller shaft is disconnected it must be firmly secured away from the final drive flange. Ensure that the ignition key is in position '1'.

TRANSPORTING

Automatic transmission cars only

CAUTION: When the vehicle is being transported the selector lever must be in 'N' or 'D', never in 'P'. To obviate the possibility of damage to the pawl mechanism, the handbrake should be applied.

CONTENTS

WASHER RESERVOIR

Remove and refit **84.10.01**
Bracket **84.10.02**

Pull the plastic cap from the neck of the reservoir; (1, Fig. 1) withdraw the cap, feed the tube and filter complete from the reservoir.
Withdraw the reservoir from the bracket. The bracket is secured by two setscrews (2, Fig. 1).

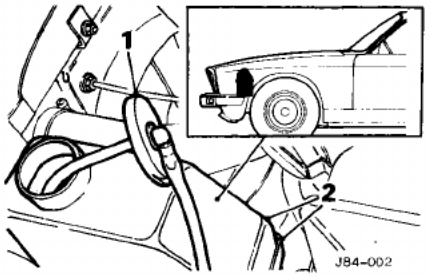


Fig. 1

Refitting is a reversal of the removal procedure.

NOTE: It is recommended that only soft water mixed with a proprietary cleaning fluid to the correct proportions is used when filling the washer system. This will minimize the formation of deposits that affect the performance of the system.

WASHER JETS

Remove and refit **84.10.09**

Prise and raise the grille clear of the scuttle.
Disconnect the washer tube from the jet assembly, then remove the grille from the car.
Remove the washer jet butterfly nut and remove the jet from the grille (Fig. 2).

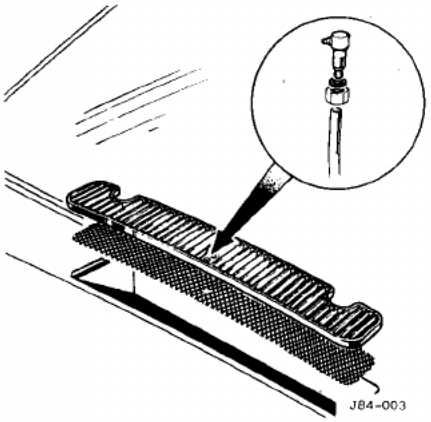


Fig. 2

After refitting operate the washers and adjust the jets.

WINDSCREEN WASHER PUMP

Remove and refit **84.10.21**

Note the position of the leads, then disconnect the leads from the washer pump (1, Fig. 3).
Carefully prise the washer tube from the pump nozzles (2, Fig. 3).
Remove the screws securing the pump and tubing retaining clip to valance (3, Fig. 4) then withdraw the pump.

NOTE: Warming the tubing will facilitate refitting.

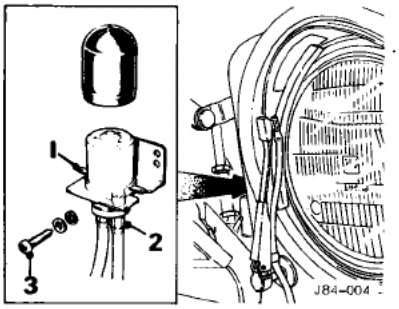


Fig. 3

WINDSCREEN WIPER ARM/ BLADES POSITION

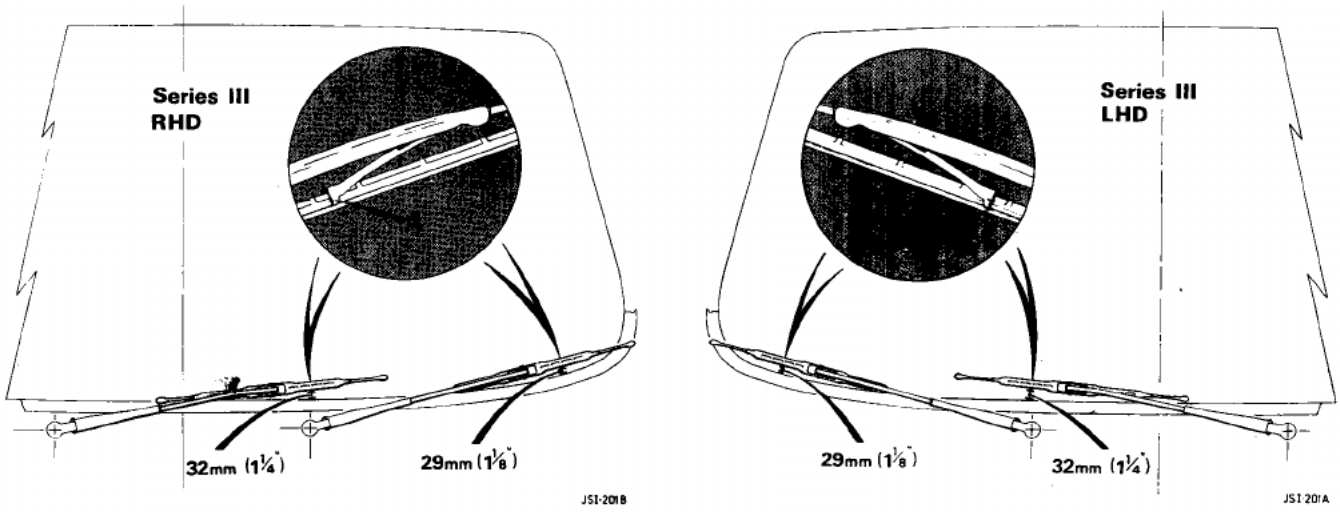


Fig. 4

WIPER ARMS

Remove and refit **L.H. 84.15.02**
R.H. 84.15.03

Raise the plastic cover to expose the spindle nut (1, Fig. 5).
Note the position of the arm, then remove the nut.
Remove the arm and blade assembly.

When refitting, locate the arm and blade assembly to its noted position on the spindle.

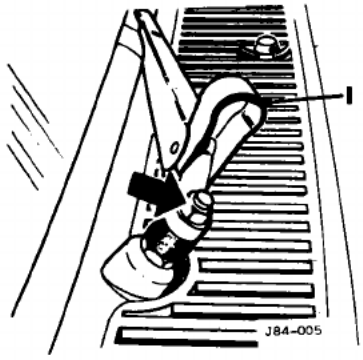


Fig. 5

WIPER BLADES

Remove and refit **84.15.05**

Raise the blade with one hand and with the thumb-nail of the other hand depress the spring clip (1, Fig. 6).
Press the wiper arm towards the windscreen to disengage the dimple from the blades (2, Fig. 6); slide the blade from the arm.

Press the blade straight onto the wiper arm until the dimple engages the spring clip to refit.

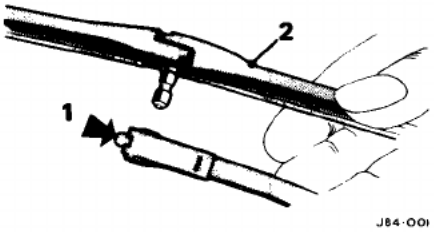


Fig. 6

WIPER MOTOR

Remove and refit **84.15.12**

Disconnect and remove the battery.
Withdraw the wiper arms and blades from the spindles.
Remove the bonnet pull bracket nuts and bolts.
Remove the wiper motor cover.
Disconnect the cable rack conduit from the motor (1, Fig. 7).
Remove the two retaining nuts and washers from the motor clamp (2, Fig. 7).
Tilt the motor towards the engine and withdraw the cable connectors.
Remove the motor and drive as a complete assembly, drawing the rack drive from the conduit.

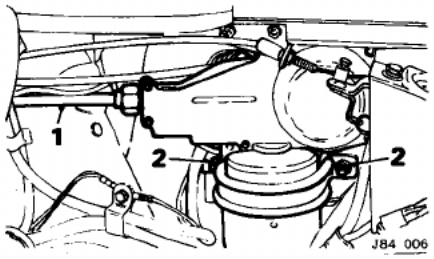


Fig. 7

When refitting, insert the rack into the conduit. It may be necessary to turn the wheelbase spindles to enable the rack to be pushed right home.

WIPER MOTOR GEAR ASSEMBLY

Remove and refit **84.15.14**

Remove the wiper motor and rack drive cable.
Remove the circlip and washer on the gear assembly shaft (1, Fig. 8).
Mark and note the position of the gear assembly in relation to a chosen point on the housing and remove the gear (2, Fig. 8).

When refitting, ensure that the gear is to the position marked.

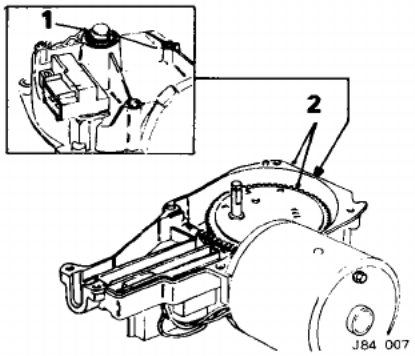


Fig. 8

WINDSCREEN WIPER RACK DRIVE

Remove and refit **84.15.24**

Disconnect the battery.
Remove the wiper arm and blades.
Remove the bonnet-pull bracket nuts and bolts, and the wiper motor cover.
Remove the gear cover-plate by withdrawing the hexagon-head screws (1, Fig. 9).
Remove the link arm by removing the retaining clip and washer (2, Fig. 9).
Manoeuvre and withdraw the rack drive cable (3, Fig. 9).

To refit, grease and insert the rack into the tube, turning the wheelbox spindles to enable the rack to be just right home.
Align the rack with the link arm and fit the link arm. Continue to refit by reversing the above instructions.

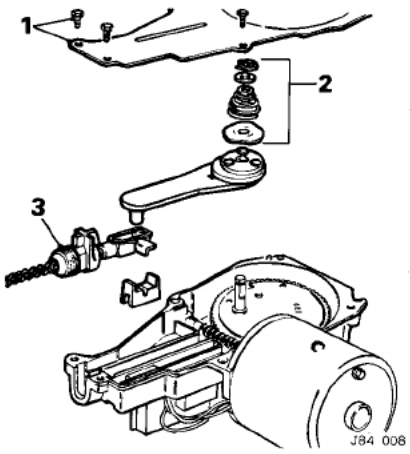


Fig. 9

WHEEL BOXES

Remove and refit

Disconnect and remove the battery.
Remove the wiper arm and blades.
Remove the screen rail fascia.
Remove the wiper motor.
Remove the demister flap/actuator assembly.
Remove the two nuts (1, Fig. 10) retaining the wheelbox backplate and release the drive conduit (2, Fig. 10).
Remove the nuts securing the wheelbox(es) to the scuttle and remove the chrome distance pieces and sealing rings (3, Fig. 10).
Remove the wheelboxes.

Reverse the above procedure to refit.

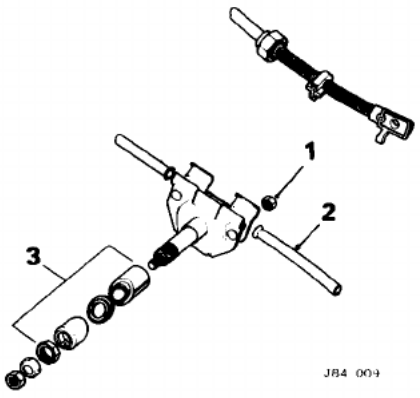


Fig. 10

WIPER MOTOR DELAY UNIT

Remove and refit **84.15.36**

Remove the passenger's side dash casing.
The delay unit is retained in a socket behind the left-hand fusebox (1, Fig. 11).

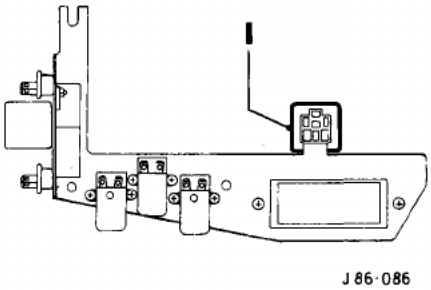


Fig. 11

WINDSCREEN WASHER/WIPER SWITCH

Remove and refit **84.15.34**

Disconnect the battery.
Remove the driver's dash liner.
For access, remove the indicator switch.
Remove the upper shroud (1, Fig. 12).
Disconnect the wiper switch cable harness at the multi-pin connectors.
Remove the Spire nut from the switch spigot (2, Fig. 12).
Remove the two screws securing the wiper switch to assembly (3, Fig. 12) and remove switch.

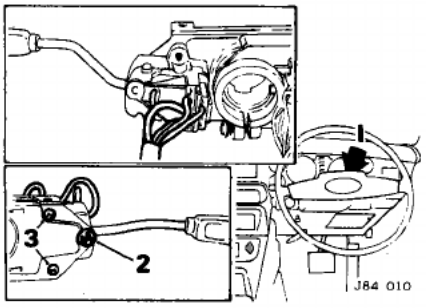


Fig. 12

Reverse the above procedure to refit.

HEADLAMP WASHER RESERVOIR

Remove and refit **84.20.01**

NOTE: This reservoir supplies both windscreen and headlamp washing systems.

Raise the front of the car and place on stands.
Remove the L.H. front wheel.
Remove the three screws and detach the stoneguard; collect the sealing strips.
Slacken the hose clip securing the rubber elbow to filler neck (1, Fig. 13).
Remove the three screws securing the mounting strap assembly (2, Fig. 13), detach the mounting strap and lower the reservoir until the screws attaching the manifold assembly to the reservoir are accessible.
Remove the four screws securing the manifold assembly (3, Fig. 13), withdraw the reservoir from the pipes.

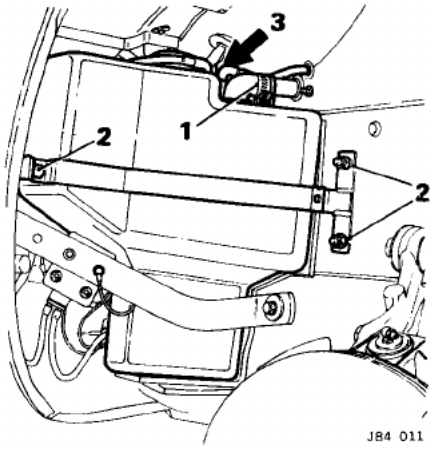


Fig. 13

Reverse the above procedure to refit.

HEADLAMP WIPER MOTOR

Left and Right Hand

Remove and refit **84.25.12**

Disconnect the battery.
Remove the L.H. or R.H. cable harness cover.
Disconnect the tube from the washer reservoir filler cap (L.H. side).
Disconnect the cable block connector and reposition the tube and the cable block connector through the body grommets.
Turn the steering to full L.H. or R.H. lock.
Remove the wiper motor cable harness clip.
Displace the washer pump for access (L.H. side).

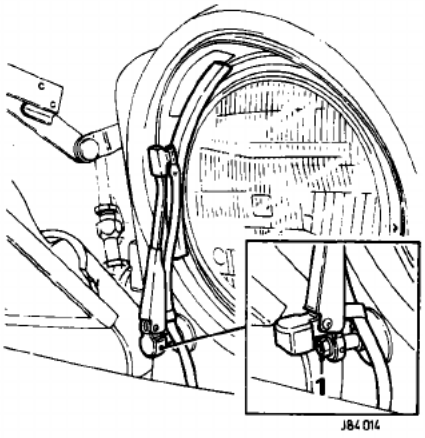


Fig. 14

Lift the wiper arm securing nut cover.
Remove the nut securing the wiper arm and remove the wiper arm (1, Fig. 14).
Slacken the wiper motor securing nut (1, Fig. 15) and remove the wiper motor.

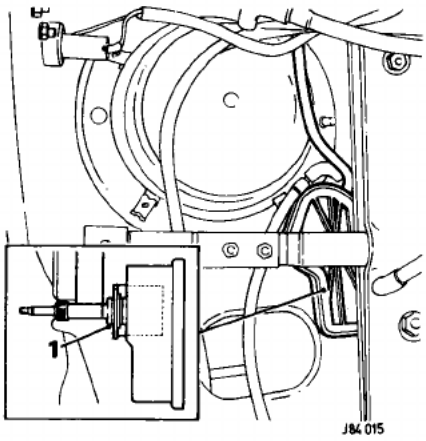
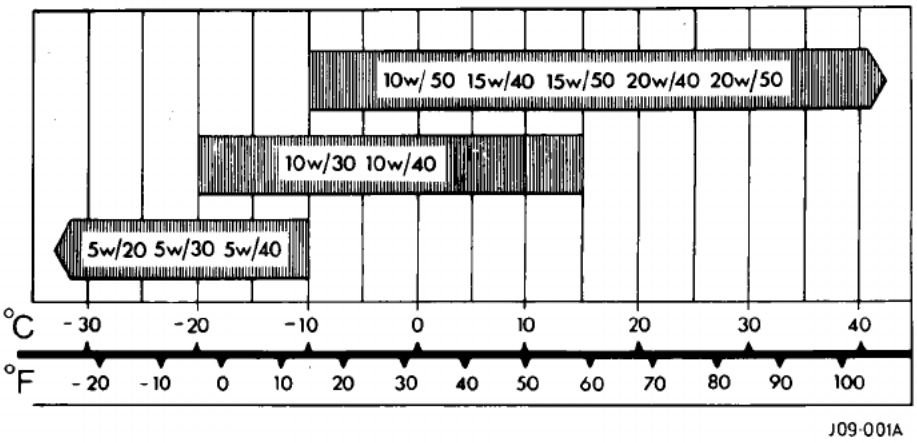


Fig. 15

Refitting is the reversal of the above procedure.

RECOMMENDED LUBRICANTS, FLUIDS, CAPACITIES AND DIMENSIONS

Engine Oil—Recommended S.A.E. Viscosity Range / Ambient Temperature Scale



J09-001A

Component—Model	Temperature Range	Specification	S.A.E. Viscosity Rating	Approved Brands Available in U.K. for Temperatures Above −10°C (14°F)
Engine—All Models **Distributor—All Models** **Oil Can—All models**	Above −10°C (14°F) −20°C to 10°C (−4°F to 50°F) Below −10°C (14°F)	BLSO OL.02 or MIL-L-2104 B or A.P.1. SE	10W/50, 15W/50, 20W/40, 20W/50 10W/30, 10W/40, 10W/50 5W/20, 5W/30	Unipart Super Multigrade, BP Super Viscostatic, Castrol GTX, Duckhams (15W/50) Hypergrade Motor Oil, Esso Uniflow, Fina Super Grade, Mobiloil Super, Shell Super Oil, Texaco Havoline
Manual Gearbox—6 cyl. —Refill —Top up ONLY	 All All	 Shell E3766 Hypoid Oil	 75W EP 80 W	 JRT Part No. RTC 1896
Powr-Lok Differential—All —Initial Fill —Refill	 All All	 Use only approved brands of fluid specially formulated for Powr-Lok	 90 90	 Shell Spirax Super 90, Shell Spirax Super 90, BP Gear Oil 1453, BP Limslip Gear Oil 90/1, Castrol G722, Castrol Hypoy LS, Duckhams Hypoid 90 DL,Texaco 3450 Gear Oil, Veedol Multigear Limited Slip S.A.E. 90
Drain and Top-Up —Top-up only if above oil not available **Normal Differential—6 cyl.** —Refill or top-up	All All	MIL-L-2105 B	EP 90	BP Gear Oil S.A.E. 90 EP, Castrol Hypoy, Duckhams Hypoid 90, Esso Gear Oil GX 90/140, Mobilube HDGO, Shell Spirax HD 90 Texaco Multigear Lubricant EP 90
GM 400 Automatic Transmission—12 cyl.	All	Dexron 2D		BP Autran DX, Castrol TQ Dexron, Esso ATF Dexron, Mobil ATF 220 Dexron, Shell ATF Dexron, Texaco Texamatic Fluid 6673
Borg-Warner Automatic Transmission Model 66 6 cyl.	All	Type G (M2C 33 G)	—	BP Autran G, Castrol TQF, Duckhams Q-Matic, Esso Glide Type G, Fina Purfimatic 33F, Mobil ATF 210, Shell Donax TF, Texaco Texamatic Type G
Power Assisted Steering—All	All	Above Specification or Dexron 2D	—	BP Autran DX, Castrol TQ Dexron, Esso ATF Dexron, Mobil ATF 220 Dexron, Shell ATF Dexron, Texaco Texamatic Fluid 6673
Grease Points—All	All	Multipurpose Lithium Grease, N.L.C.I. Consistency No. 2	—	BP Energrease L8, Castrol LM, Duckhams LB10, Esso Multipurpose H, Fina Marson HTL2, Mobilgrease MP, Shell Retinax A, Texaco Marfak

COOLING SYSTEM

Additive	Jaguar Radiator Leak Sealer 2 135 ml bottles per vehicle – 12 cyl. 1 135 ml bottle per vehicle – 6 cyl. Barrs leaks 2 sachets per vehicle – 12 cyl. 1 sachet per vehicle – 6 cyl.
Coolant	Jaguar Anti–freeze/Coolant/Corrosion Inhibitor Concentration – 50% Canada/USA Jaguar Anti–freeze/Summer Coolant Concentration – 50% Australia JRA Limited Year Round Coolant Concentration – 33% to 50% Should these not be available then phosphate free anti–freeze conforming to specification BS6580 may be used.
Always top up the system with the recommended type and strength of coolant, NEVER with water only.	

CAPACITIES

	Litres	Imperial	U.S.
Engine refill (including filter)			
6 cylinder model			
Up to Vin nos. 8L161546; 8A15190; 7M4883	8,25	14.5 pt	17.5 pt
From Vin nos. 8L161546; 8A15190; 7M4883	8,81	15.5 pt	18.7 pt
12 cylinder model	10,8	19 pt	22.8 pt
Automatic transmission unit			
6 cylinder model (from dry)	8,00	14 pt	16.75 pt
12 cylinder model	9,1	16 pt	19.2 pt
Final drive unit	1,6	2.75 pt	3.25 pt
Cooling system, including reservoir and heater or air conditioning:			
6 cylinder model	18,2	32 pt	38.5 pt
12 cylinder model Not HE	21,2	37.5 pt	45 pt
HE	19,5	35 pt	42 pt
Fuel tanks – left and right – per tank	47,7	10.5 gal	12.6 gal
Luggage compartment	0,27 m^3	9.55 ft^3	9.55 ft^3

DIMENSIONS

Wheelbase	2865 mm	112.8 in
Track Front	1480 mm	58.26 in
Rear	1495 mm	58.86 in
Overall length: European cars	4959 mm	195.25 in
U.S.A. and Canada	5067 mm	199.5 in
Overall width	1770 mm	69.7 in
Overall height	1377 mm	54.2 in
Turning circle: between kerbs	12,2 mm	40 ft
Ground clearance: kerb condition	152,4 mm	6 in

Introduction

The Service Manual covers the Jaguar and Daimler Series III range of vehicles. It is primarily designed to assist skilled technicians in the efficient repair and maintenance of Jaguar vehicles.

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

The Service Manual has been produced in one loose leaf book; this allows pages to be updated periodically when modifications and improvements occur.

The table of contents following this introduction lists the major components and systems together with the section in which they are contained. Each section starts with a list of operations in alphebetical order.

Operation Numbering

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

Each operation described in this manual is allocated a number from the master index and cross-refers with an 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 a 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 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 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.
3. Locking devices, where specified, must be fitted. If the efficiency of the locking device is impaired during removal, it must be replaced.
4. Owners purchasing accessories while travelling abroad, should ensure that the accessory and its fitted location on the vehicle, conform to mandatory requirements exisiting in their country of origin.
5. The vehicle warranty may be invalidated by the fitting of other than genuine Jaguar parts. All Jaguar replacements have the full backing of the factory warranty.
6. Jaguar/Daimler Dealers are obliged to supply only genuine service parts.

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 a Jaguar/Daimler dealer.

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

Whilst every effort is made to ensure the accuracy of the particulars contained in this Manual, neither the Manufacturer or the Dealer, by whom this Manual is supplied, shall in any circumstances be held liable for any inaccuracy or the consequences thereof.

COPYRIGHT

MAINTENANCE SUMMARY North American Markets

15 000 MILES
C INTERVAL

LUBRICATION
Lubricate all grease points
Lubricate handbrake mechanical linkage and cables
Lubricate front/rear wheel hubs
Lubricate steering rack (hand operated equipment only)
Renew engine oil and engine oil filter
Renew manual transmission fluid
Check/top-up rear axle oil
Check/top-up brake fluid reservoir
Check/top-up automatic transmission fluid
Check battery condition/clean and grease connections if necessary
Check/top-up cooling system
Check/top-up power steering reservoir
Check/top-up windscreen washer fluid
Lubricate accelerator control linkages and pedal pivot; check operation
Lubricate all locks and hinges (not steering lock)
Renew brake fluid every 18 000 miles or 18 months
Renew coolant every 2 years
Check/top-up clutch fluid

ENGINE
Check for oil leaks
Check all driving belts; adjust/renew as necessary (applicable above 30 000 miles)
Check cooling and heater system for leaks, for hose condition and security

FUEL AND EXHAUST SYSTEMS
Check fuel system for leaks, pipes and unions for chafing and corrosion
Check exhaust system for leaks and security

TRANSMISSION, BRAKES, STEERING AND SUSPENSION
Check for fluid/oil leaks
Check condition and security of steering unit, joints and gaiters
Check visually brake hydraulic pipes and unions for cracks, chafing, leaks and corrosion
Check suspension component condition and security
Check shock absorbers for leaks and condition
Inspect brake pads for wear and discs for condition (including handbrake pads)
Check/adjust front wheel alignment
Check/adjust front hub bearing end float
Check tightness of propeller shaft coupling bolts
Check brake servo hoses for security and condition

WHEELS AND TYRES
Check that tyres comply with manufacturer's specification
Check tyres for tread depth and visually for external cuts in fabric, exposure of ply or cord structure, lumps or bulges
Check tyres for irregular tread wear; perform necessary alignment/repair
Check and adjust tyre pressure, including spare wheel
Check for damaged/deformed wheel rims
Check tightness of road wheel fastenings

ELECTRICAL
Check/adjust operation of windscreen wipers and washers
Check function of all original equipment: lights, horns, warning indicators, radio, etc.
Check wiper blades and arms; renew if necessary
Check/adjust headlight alignment (refer to state and local requirement)

BODY
Check operation and security of seats and seat belts — front and rear
Check operation of all door, bonnet and boot locks
Check operation of window and sunroof controls
Check/open underbody drains (also during annual rust inspection)

GENERAL
Road Test:
Check vehicle performance, shifting, braking, handling
Check function of all instrumentation
Check function of trip computer
Check function of cruise control
Check function of climate control and ventilation systems

Report Additional Work Required After Road Test:
Check engine for leaks
Check/top-up automatic transmission fluid
Check/top-up brake fluid reservoir
Check/top-up power steering reservoir

MAINTENANCE SUMMARY North American Markets

30 000 MILES
D INTERVAL

LUBRICATION
Lubricate all grease points
Lubricate handbrake mechanical linkage and cables
Lubricate front/rear wheel hubs
Lubricate steering rack (hand operated equipment only)
Renew engine oil and engine oil filter
Renew automatic transmission fluid (and filter GM400) (clean screen BW)
Check/top-up rear axle oil
Check/top-up brake fluid reservoir
Check/top-up manual transmission fluid
Check battery condition/clean and grease connections if necessary
Check/top-up cooling system
Check/top-up power steering reservoir
Check/top-up windscreen washer fluid
Lubricate accelerator control linkage and pedal pivot; check operation
Lubricate distributor
Lubricate all locks and hinges (not steering lock)
Renew brake fluid every 18 000 miles or 18 months
Renew coolant every 2 years
Check/top-up clutch fluid

ENGINE
Check for oil leaks
Renew air cleaner element(s)
Renew spark plugs
Check all driving belts; adjust/renew as necessary (applicable above 30 000 miles)
Check cooling and heater system for leaks, for hose condition and security
Check crankcase breathing and evaporative loss control system

FUEL AND EXHAUST SYSTEMS
Check fuel system for leaks, pipes and unions for chafing and corrosion
Check exhaust system for leaks and security
Renew oxygen sensor(s)

TRANSMISSION, BRAKES, STEERING AND SUSPENSION
Check for fluid/oil leaks
Check condition and security of steering unit, joints and gaiters
Check visually brake hydraulic pipes and unions for cracks, chafing, leaks and corrosion
Check suspension component condition and security
Check shock absorbers for leaks and condition
Inspect brake pads for wear and discs for condition (including handbrake pads)
Check/adjust front wheel alignment
Check/adjust front hub bearing end float
Check tightness of propeller shaft coupling bolts
Check brake servo hoses for security and condition

WHEELS AND TYRES
Check that tyres comply with manufacturer's specification
Check tyres for tread depth and visually for external cuts in fabric, exposure of ply or cord structure, lumps or bulges
Check tyres for irregular tread wear; perform necessary alignment/repair
Check and adjust tyre pressure, including spare wheel
Check for damaged/deformed wheel rims
Check tightness of road wheel fastenings

ELECTRICAL
Check/adjust operation of windscreen wipers and washers
Check function of all original equipment: lights, horns, warning indicators, radio, etc.
Check wiper blades and arms; renew if necessary
Check/adjust headlight alignment (refer to state and local requirement)

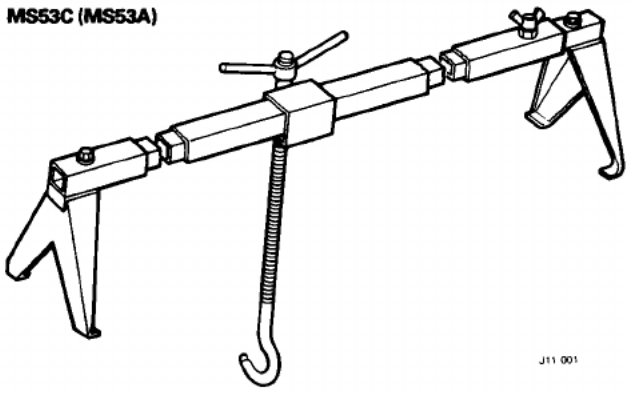
BODY
Check operation and security of seats and seat belts — front and rear
Check operation of all door, bonnet and boot locks
Check operation of window and sunroof controls
Check/open underbody drains (also during annual rust inspection)

GENERAL
Road Test:
Check vehicle performance, shifting, braking, handling
Check function of all instrumentation
Check function of trip computer
Check function of cruise control
Check function of climate control and ventilation systems

Report Additional Work Required After Road Test:
Check engine for leaks
Check/top-up automatic transmission fluid
Check/top-up brake fluid reservoir
Check/top-up power steering reservoir

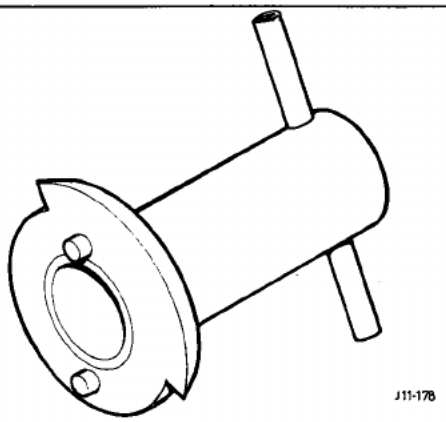
SERVICE TOOLS – SECTION 11 – 6 CYLINDER ENGINE – SECTION 12

MS53C (MS53A)



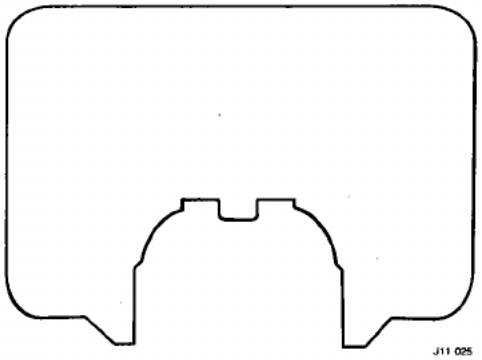
Engine support bracket

JD 2B



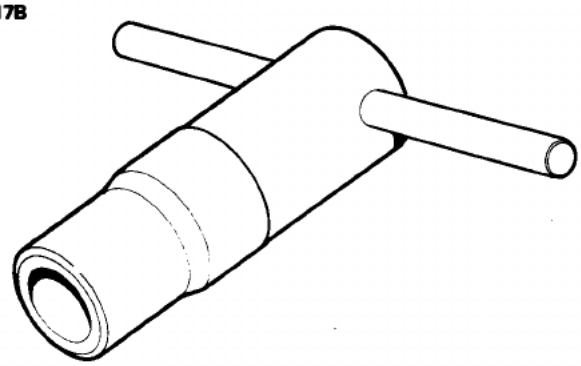
Timing chain adjusting plate

C 3993



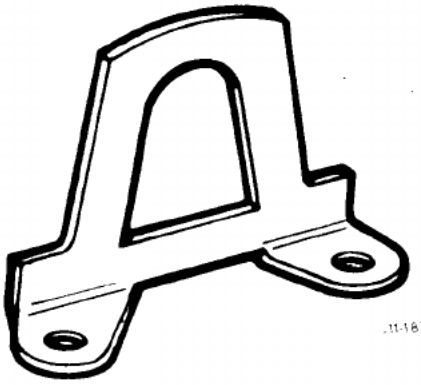
Valve and Timing gauge

JD 17B



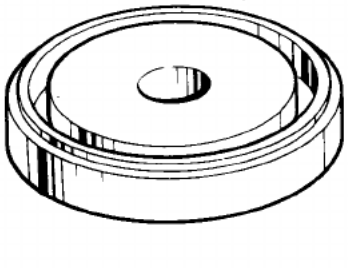
Oil seal packing presizing tool

***C37851**



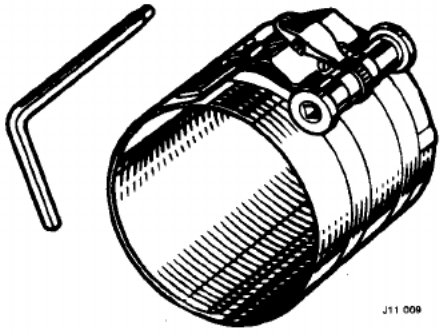
Lifting eye

JD 6118C



Valve spring compressor

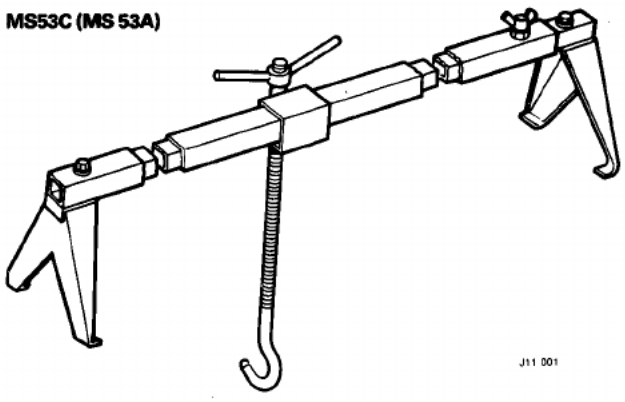
18G 55A (38U3)



Piston ring compressor

12 CYLINDER ENGINE – SECTION 12

MS53C (MS 53A)

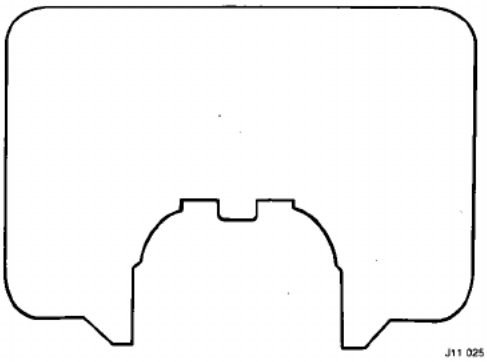


Engine support bracket

JD 17B-1

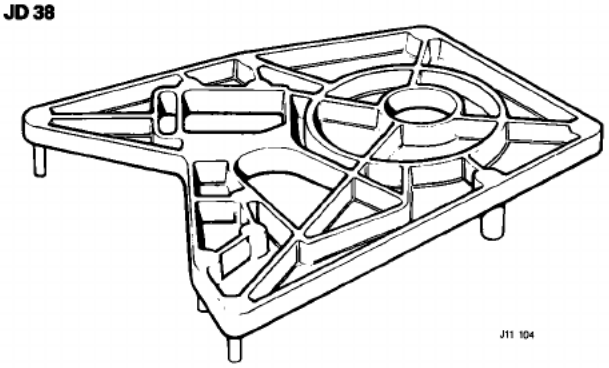
Adaptor crankshaft rear oil seal presizing tool

***C 3993**



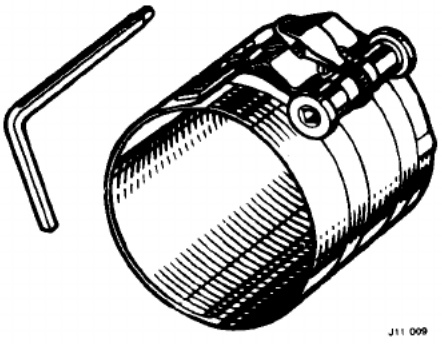
Valve and Timing gauge

JD 38



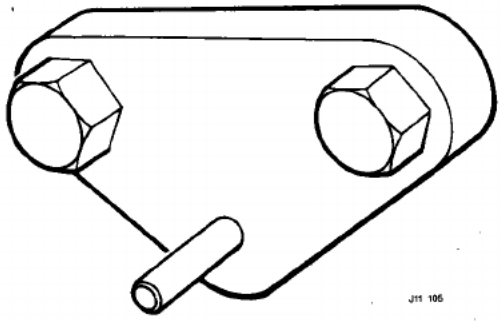
Damper setting jig

18G.55A (38U3)



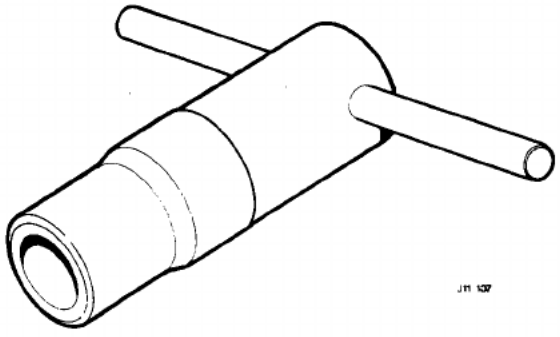
Piston ring compressor

JD 39



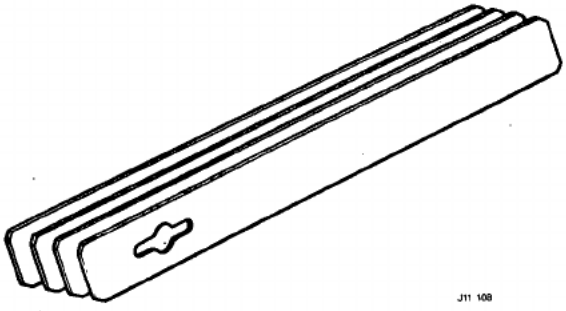
Jackshaft sprocket holder

JD 17B



Oil seal packing presizing tool

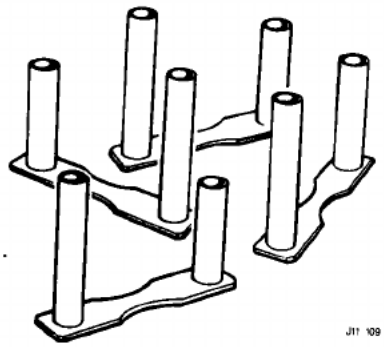
JD 40



Camshaft sprocket retainer

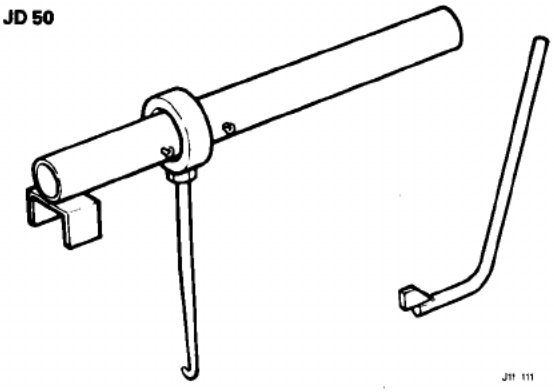
12 CYLINDER ENGINE – SECTION 12 – continued

JD 41



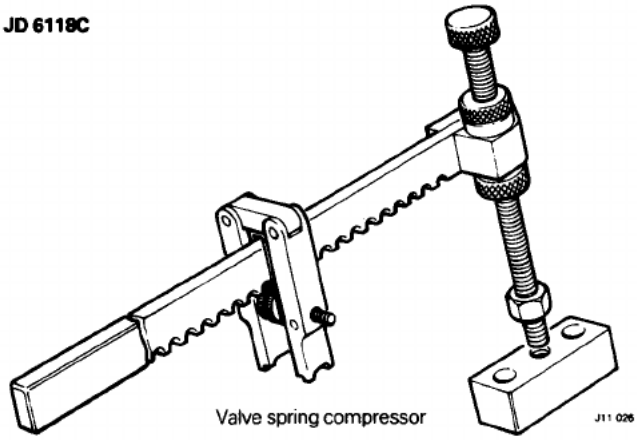
Cylinder liner retainers

JD 50



Timing chain tensioner retainer

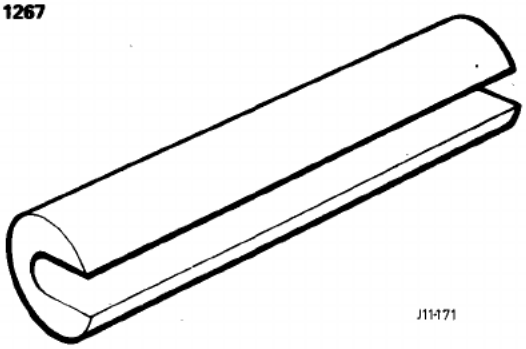
JD 6118C



Valve spring compressor

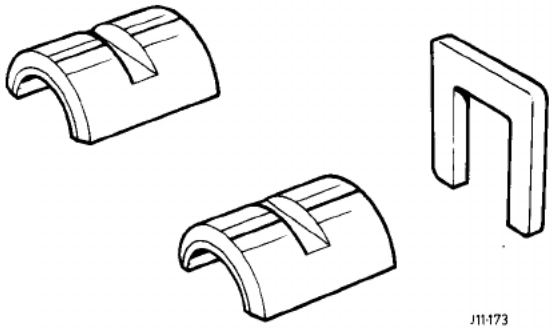
FUEL SYSTEM – SECTION 19

18G 1267



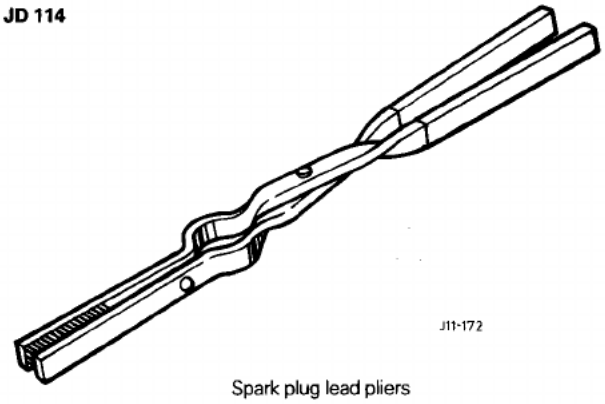
Replacer – Damper assembly retainer

JD 116



Injector hose fitting tool

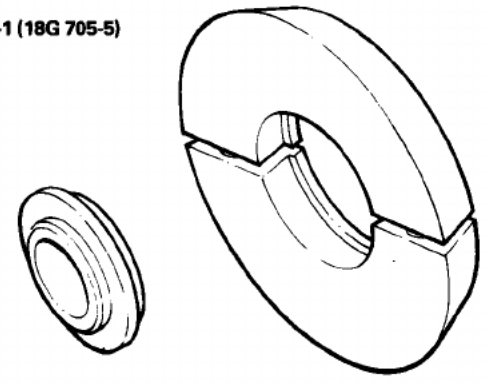
JD 114



Spark plug lead pliers

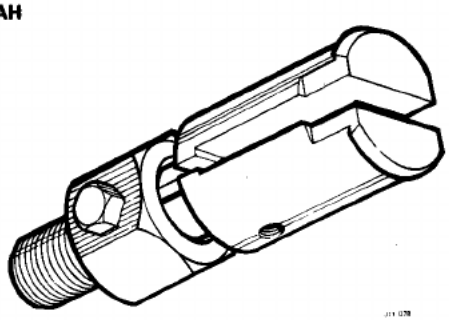
MANUAL GEARBOX – SECTION 37

18G 47-1 (18G 705-5)



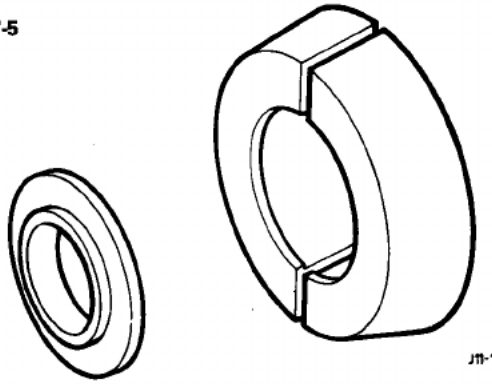
Adaptor – remover, layshaft cluster bearings

18G 284AAH



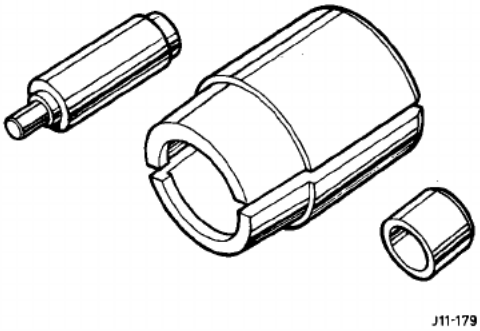
Adaptor/remover – mainshaft pilot outer bearing outer track

18G 47-5



Adaptor remover/replacer constant pinion bearing

18G 705-1A

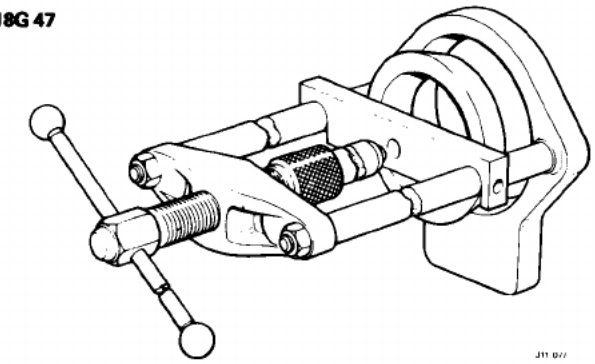


Adaptor/remover 5th speed gear

TABLE OF CONTENTS

REAR SUSPENSION – SECTION 64 Continued

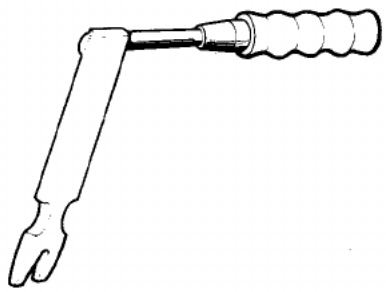
18G 47



Multipurpose handpress

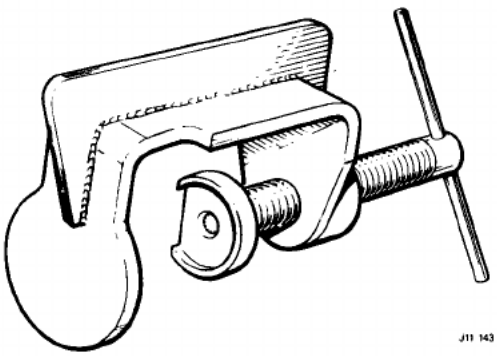
BRAKES – SECTION 70

+64932392



Girling brake piston retraction tool

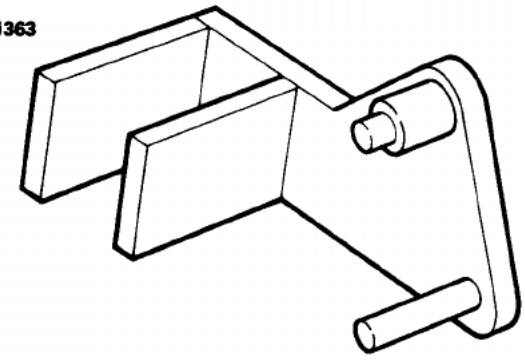
18G 672



Replacer – disc brake piston seal

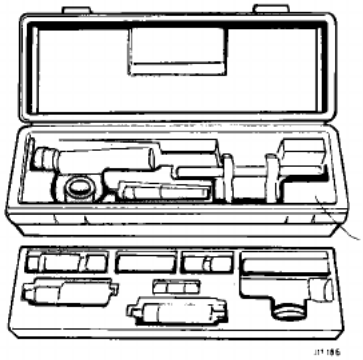
AIR CONDITIONING – SECTION 82

18G 1363



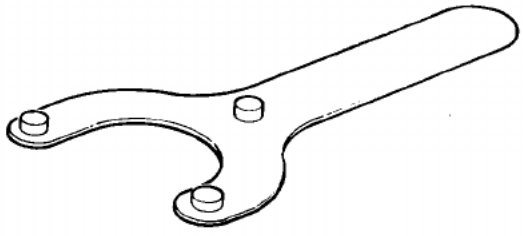
Air conditioning link setting jig

$10500



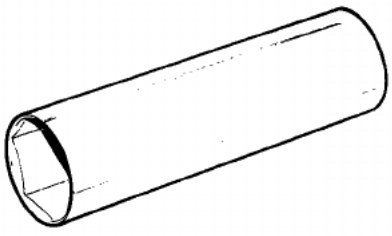
Tool kit

$10418



Hub holding tool

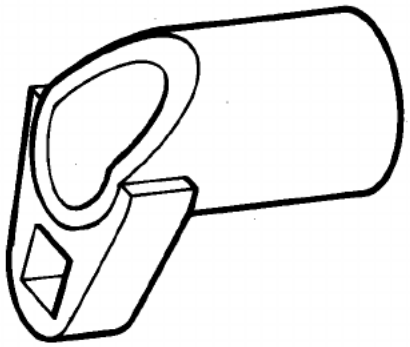
$10416



Thin walled socket

ELECTRICAL – SECTION 86

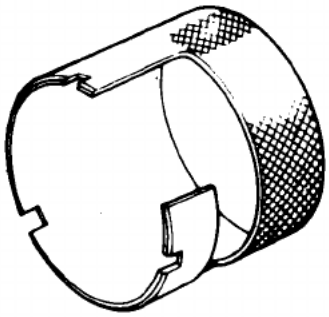
18G 1364



Spark plug wrench

INSTRUMENTS – SECTION 88

18G 1001



Spanner for fuel tank

All service tools listed are available from:

V. L. Churchill & Co. Limited
P.O. Box 3
Daventry
Northamptonshire NN11 4NF

excepting items marked thus:

* Available from Jaguar Parts Division
\# Snap-on tool available from a Snap-on tool retail outlet
\+ Girling tool available from a Girling tool retail outlet
$ Kent Moore tool available from Kent Moore

CONTENTS

TORQUE WRENCH SETTINGS

SECTION 12

NOTE: Set the torque wrench to the mean of the figures quoted unless otherwise specified.

Early cars prior to / Later cars from } Engine 8L137746 — (4.2); 8A14210 — (3.4)

ITEM	DESCRIPTION	TIGHTENING TORQUE		
		Nm	kgf m	lbf ft
ENGINE				
Cam cover (domed nuts) — early cars	$\frac{1}{4}$ in U.N.F. nut	6,7 to 8,1	0,69 to 0,83	5 to 6
— later cars	$\frac{1}{4}$ in U.N.F. nut	9,5 to 11	0,98 to 1,12	7 to 8
Camshaft bearing caps	$\frac{5}{16}$ in U.N.F. nut	12,2 max.	1,24 max.	9.0 max.
Connecting rod big-end	$\frac{3}{8}$ in U.N.F. bolt	48,4 to 50,8	4,93 to 5,18	35.7 to 37.5
Crankshaft front end	$\frac{3}{4}$ in U.N.F. bolt	170 to 203	17,29 to 20,73	125 to 150
Cylinder head nuts: check/reset	$\frac{7}{16}$ in U.N.F. nut	70,5 to 73,2	7,19 to 7,47	52 to 54
initial assembly	$\frac{7}{16}$ in U.N.F. nut	67,8 to 70,5	6,92 to 7,19	50 to 52
Distributor clamp bolt	$\frac{1}{4}$ in trapped nut	5,7 max.	0,58 max.	4.2 max.
Fan drive assembly securing bolt	$\frac{3}{8}$ in U.N.F. bolt	40,7 max.	4,15 max.	30 max.
Flywheel	$\frac{7}{16}$ in U.N.F. bolt	85,9 to 90,4	8,76 to 9,22	63.4 to 66.6
Gemi hose clips (up to No. 16)	4 mm thread	0,34 to 0,68	0,04 to 0,07	0.25 to 0.50
Main bearing caps	$\frac{1}{2}$ in U.N.F. bolt	93 to 97,6	9,46 to 9,96	68.4 to 72
Power assisted steering pump to mounting bracket	$\frac{3}{8}$ in U.N.C. nut	50,2 max.	5,12 max.	37.0 max.
Pulleys to crank damper	$\frac{5}{16}$ in U.N.F. bolt	16,3 to 20,3	1,66 to 2,07	12 to 15
Sealing cap, CO sampling adaptor	$\frac{7}{16}$ in U.N.F.	8,5 to 10,2	0,86 to 1,03	6.3 to 7.5
Torque converter	$\frac{3}{8}$ in U.N.F. bolt	47,5 max.	4,84 max.	35.0 max.
ENGINE MOUNTINGS				
Front mounting bracket to beam	$\frac{5}{16}$ in U.N.F. nut	19,0 to 24,4	1,94 to 2,48	14 to 18
Rear mounting bracket to body fixing	$\frac{7}{16}$ in U.N.F. nut	10,8 to 13,6	1,1 to 1,38	8 to 10
	$\frac{5}{16}$ in U.N.F. bolt	19,0 to 24,4	1,94 to 2,48	14 to 18
	$\frac{3}{8}$ in U.N.F. bolt	36,7 to 43,4	3,74 to 4,42	27 to 32
Rear mounting peg	$\frac{1}{2}$ in U.N.F. nut	33,9 to 40,7	3,46 to 4,14	25 to 30
Rear rubbers	$\frac{3}{8}$ in U.N.F. nut	36,7 to 43,4	3,74 to 4,42	27 to 32
Strengthening plate assembly to body	M8 setscrew	16,3 to 19,0	1,66 to 1,93	12 to 14
Tie-bolts	$\frac{1}{2}$ in U.N.F. nut	33,9 to 40,7	3,46 to 4,14	25 to 30

DESCRIPTION

The 6-cylinder engine fitted to Series III Jaguar and Daimler cars is developed directly from the 3 4 litre unit introduced with the Jaguar XK 120 car in 1948; although superficially very similar, these two engines now have few parts in common and none of the accessories fitted to the current engines are interchangeable with those of the early units. The basic design of the engine has, however, remained unchanged, and the latest units retain chain-driven twin-overhead camshafts, seven main bearings and a stroke of 106 mm (4.173 in) which were incorporated in the first production engines.

Major changes have been made in recent years to the arrangements for fuel supply and the reduction of undesirable emissions, and a redesigned, electronically triggered ignition system is fitted to the 4.2L Series III cars; these items are dealt with fully in the appropriate sections of the manual, but the necessity for the removal of fuel injection and emission control equipment before certain operations can be carried out on the engine will be found to have affected certain of the repair operations in this section, when compared with the instructions for similar operations in earlier publications.

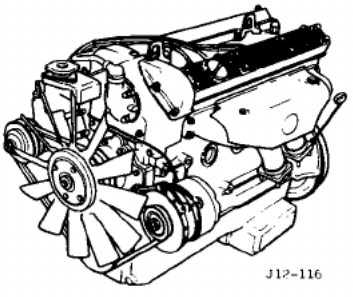


Fig. 1

CYLINDER PRESSURES

Check 12.25.01

Set the transmission selector at 'P'— automatic transmission cars only.

Run the engine until normal operating temperature is reached. Switch off the engine.

Remove the h.t. cable from the ignition coil.

Remove all sparking plugs.

Fit an approved pressure gauge (1, Fig. 2) at one plug hole and with the throttle held fully open, crank the engine with the starter motor. Note the highest steady pressure reading achieved and repeat at each plug hole in turn. The reading taken at each cylinder must not differ from the reading taken at any other cylinder by more than 0,35 kgf/cm² (5 lbf/in²).

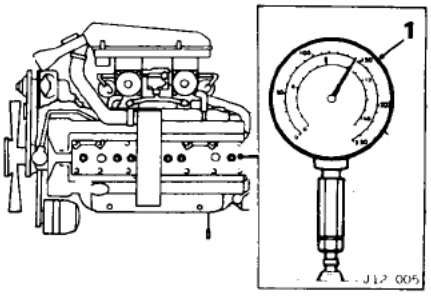


Fig. 2

FAULT FINDING

The location and rectification of faults in the fuel system, emission control and ignition systems is detailed in the sections of the manual dealing with these components; the emission control section includes basic engine checks which are repeated below.

BASIC ENGINE CHECKS

POSSIBLE CAUSE	CHECK AND REMEDIAL ACTION
Low battery condition	Check the battery condition with a hydrometer. Re-charge, clean and secure the terminals, or renew as necessary. (If the battery is serviceable but discharged, trace and rectify the cause of flat battery, e.g. short circuit or insufficient charge from the alternator.)
Start system deficient	If the starter fails to turn the engine briskly, check the engagement circuit and connections. Check and clean the main starter circuit and connections.
Poor compressions	Check compressions with a proprietary tester. If compressions are low or uneven, check/adjust valve clearances and re-test. If compressions are still unsatisfactory, remove the cylinder head for further examination and rectification. NEVER turn the crankshaft when the head is removed, or the valves and pistons will be damaged when the head is replaced.
Exhaust system leaking or blocked	Check and rectify as necessary.
Faults on areas of the vehicle other than the engine	Check for binding brakes, slipping clutch, etc.
Air leaks at the inlet manifold	Check the inlet manifold/cylinder head joint. Re-make with a new gasket if necessary. Check the manifold tappings for leaks; seal as necessary.
Cooling system blocked or leaking	Flush the system and check for blockage. Check the hoses and connections for security and leakage. Renew as necessary. Check the thermostat, and renew if faulty.
Cylinder head gasket leaking	Check the cylinder block/head joint for signs of leakage. Renew the gasket if necessary.

CAMSHAFT

Remove and refit—Left-hand **12.13.02**
Right-hand **12.13.03**

Service tools: Top timing chain adjuster tool JD 2B; valve timing gauge C 3993

Removing

Remove the camshaft covers.
Remove the nuts (1, Fig. 3) securing the breather housing to the front of the cylinder head and withdraw the housing.

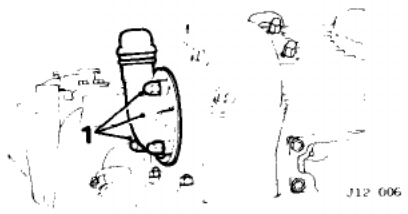


Fig. 3

Slacken the nut on the idler sprocket shaft.
Knock down the tabs and remove the two camshaft sprocket retaining bolts (1, Fig. 4).
Rotate the engine until the valve timing gauge (1, Fig. 5) can be fitted to the slot in the camshaft, remove the remaining camshaft bolts.
Use service tool JD 2B (2, Fig. 4), turned in a clockwise direction, to slacken the camshaft chain.

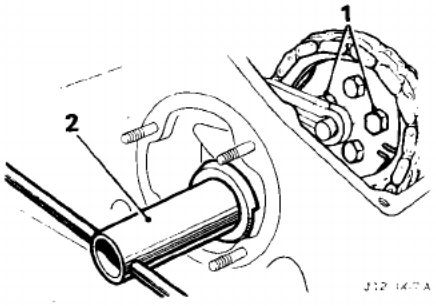


Fig. 4

CAUTION: Do not rotate the engine with the camshafts disconnected.

Slide the sprocket up the support bracket.

NOTE: Mark 'fit' holes in the adjuster plates.

Progressively slacken the camshaft bearing cap nuts, starting with the centre cap and working outwards; lift off the bearing caps. Note the mating marks on each bearing cap (2, Fig. 5).

NOTE: If the same shell bearings are being refitted, note their location to ensure that they are fitted in the original position.

Lift the camshaft from the cylinder head.

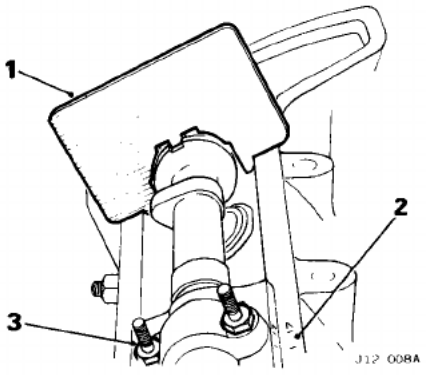


Fig. 5

STANDARDIZED ABBREVIATIONS AND SYMBOLS IN THIS MANUAL

Abbreviation or Symbol	Term
A	Ampere
A.B.D.C.	After bottom dead centre
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	Centigrade (Celsius)
cm	Centimetres
cm^2	Square centimetres
cm^3	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
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)
h.c.	High compression
hp	Horse-power
h.t.	High tension (electrical)
i.dia.	Internal diameter
i.f.s.	Independent front suspension
in	Inches
in^2	Square Inches
in^3	Cubic inches
inHg	Inches of mercury
kg	Kilogrammes (mass)
kgf/cm^2	Kilogrammes per square centimetre
kgf m	Kilogrammes metres
km	Kilometres
km/h	Kilometres per hour
kPa	Kilopascals
k.p.i.	King pin inclination
kV	Kilovolts
kW	Kilowatts
lb	Pounds (mass)
lbf	Pounds (force)
lbf ft	Pounds feet (torque)
lbf/ft^2	Pounds per square foot
lbf in	Pounds inches (torque)
lbf/in^2	Pounds per square inch
l.c.	Low compression
L.H.	Left-hand

Abbreviation or Symbol	Term
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	Millimetres
mmHg	Millimetres of mercury
m.p.g.	Miles per gallon
m.p.h.	Miles per hour
N	Newton
Nm	Newton metres
No.	Numbers
Nox	Oxides of nitrogen
N.P.T.F.	American Standard Taper Pipe (thread)
O_2	Oxygen
O/D	Overdrive
o.dia.	Outside diameter
oz	Ounces (mass)
ozf	Ounces (force)
ozf in	Ounces inch (torque)
para.	Paragraph
Part no.	Part numer
PAS	Power assisted steering
pt	Imperial pints
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 carburetters
sp. gr.	Specific gravity
Std.	Standard
s.w.g.	Standard wire gauge
Synchro	Synchronizer Synchromesh
T.C.	Twin caburetters
T.D.C.	Top dead centre
t.p.i.	Threads per inch
U.N.C.	Unified Coarse (screw thread)
U.N.F.	Unifed Fine (screw thread)
U.K.	United Kingdom
U.S. gal	Gallons (US)
U.S. pt	Pints (US)
V	Volts
W	Watts
1st	First
2nd	Second
3rd	Third
4th	Fourth
5th	Fifth
°	Degree (angle or temperature)
∞	Infinity
'	Minute (angle)
–	Minus (tolerance)
%	Percentage
+	Plus (tolerance)
+ ve	Positive (electrical)
– ve	Negative (electrical)
±	Plus or minus (tolerance)
"	Second (angle)
Ω	Ohms

CAUTION: The following procedure is not recommended owing to the difficulty of removing the old tappet guide and the risk of damage to the cylinder head; it should not be attempted unless comprehensive machine shop facilities are available. A replacement cylinder head should be considered as an alternative.

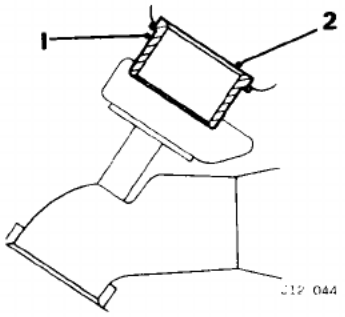


Fig. 51

Remove the old tappet guide (1, Fig. 51) by boring out until the guide collapses. Take great care not to damage the guide bore in the cylinder head.
Carefully measure the diameter of the tappet guide bore at room temperature 20°C (68°F).
Grind down the outside diameter of the replacement tappet guide to a dimension 0.089 mm (0.0035 in) larger than the tappet guide bore diameter measured above.
Grind the same amount from the 'lead-in' at the bottom of the tappet guide. The reduction in diameter from the adjacent diameter should be 0.089 to 0.16 mm (0.0037 to 0.0062 in).
Heat the cylinder head in an oven for half an hour from cold at a temperature of 150°C (300°F).
Fit the tappet guide, ensuring that the lip at the top of the guide beds evenly in the recess in the top of the cylinder head, see 2, Fig. 51.
Allow the cylinder head to cool, then ream the tappet guide bore to the diameter of 34,925 mm + 0,018 mm − 0,000 mm (1.375 in + 0.007 in − 0.000 in).
It is essential that, when reamed, the tappet guide bore is concentric with the valve guide bore.

Adjusting pads

Examine the adjusting pads (1, Fig. 52) for signs of indentation.
Renew, if necessary, with appropriate size when making valve clearances adjustment on reassembly.

Valve springs

Test the valve springs for pressure either by checking against Valve Spring Data or against a new spring.

Reassembling

Examine the valves for pitting, burning or distortion, and reface or renew valves as necessary. Also reface the valve seats in the cylinder head and grind the valves to their respective seats using a suction valve tool. When refacing valves or seat inserts do not remove more metal than is necessary to clean up the facings.
Refit the valves in the order removed and place the cylinder head on the wooden blocks.

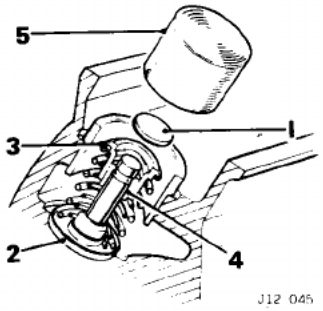


Fig. 52

Refit the valve spring seats (2, Fig. 52) and refit the inlet valve guide oil seals.
Refit the springs and collars (3, Fig. 52).
Compress the springs using service tool JD 6118C and fit the split cotters (4, Fig. 52). Tap the valve stems to ensure that the cotters are seated.
Fit the adjusting pads and tappets (5, Fig. 52) to their respective valves.

CAUTION: Camshafts must not be rotated independently.

Fit the camshaft shell bearings, locate one camshaft and secure the bearing cap nuts working from the centre outwards. Tighten the nuts to the correct torque.
Check the tappet adjustment.
Remove the camshaft fitted previously after checking, and fit the remaining camshaft.
Check the tappet adjustment.
Fit adjustment pads as required and fit camshafts, lining each up using service tool C 3993.

OIL PUMP

Overhaul **12.60.32**

Dismantling

Remove the oil pump.
Unscrew the four bolts and detach the bottom cover.
Withdraw the inner and outer rotors from the oil pump body.

NOTE: Do not attempt to separate the inner rotor from the shaft.

Inspection

Thoroughly clean all components.
Check that the clearance between the lobes of the inner and outer rotors (1, Fig. 53) does not exceed 0,15 mm (0.006 in).
Check that the clearance between outer rotor and pump body (1, Fig. 54) does not exceed 0,25 mm (0.010 in).
Check that the end-float of the rotors (1, Fig. 55) does not exceed 0,06 mm (0.0025 in).

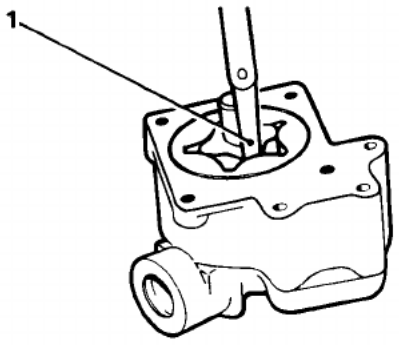


Fig. 53

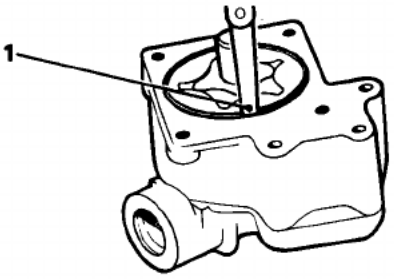


Fig. 54

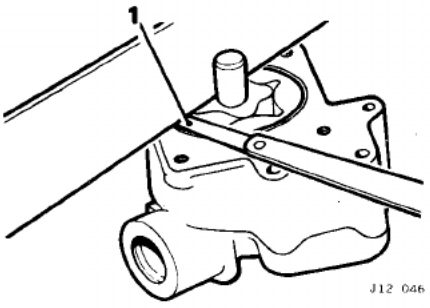


Fig. 55

NOTE: If necessary the outer rotor and/or body may be lapped on a surface plate to rectify.

Examine all components for signs of scoring or wear.
Ensure that the inner rotor is tight on the drive shaft.

NOTE: Inner rotor drive shaft and outer rotor are only available as an assembly.

Renew the 'O' ring seals in the pump body.

Reassembling

Assemble the inner rotor to the body.
Assemble the outer rotor to the body ensuring that the chamfered end is inserted first.
Secure the bottom cover using four bolts and lock washers.
Fit the oil pump.

ENGINE

Dismantle and reassemble 12.41.05

Deglazing cylinder bores see page 12—21

Service tools: Oil seal pre-sizing tool JD 17B; timing chain adjuster tool JD 2B; piston ring compressor 38 U3; valve timing gauge C 3993.

Drain the engine oil. For plug see item 1, Fig. 56.

Remove the torque converter—cars fitted with automatic transmission only.

Remove the clutch assembly—cars fitted with manual transmission only.

Secure the engine to an approved engine stand.

Dismantling

Remove the distributor cap (2, Fig. 56); pull the vacuum pipe from the capsule.

Remove the ignition coil bracket from the engine.

Note the connection and remove the engine cable harness.

Slacken the clips (3, Fig. 56) on the coolant pipes at the front of the engine.

Remove the two screws (4, Fig. 56) securing the hot air duct on 3.4 litre cars only.

Remove the four plain nuts (5, Fig. 56) and spring washers securing the fan and Torquatrol unit to the water pump pulley.

Remove the air-conditioning compressor (6, Fig. 56) and bracket (7, Fig. 56)—cars fitted with air-conditioning only.

Remove the alternator and bracket (8, Fig. 56).

Remove the power assisted steering pump and bracket (9, Fig. 56).

Remove the nut securing the automatic transmission unit filler tube bracket (10, Fig. 56)—cars fitted with automatic transmission only.

Cars fitted with exhaust gas recirculation only

Release the union nut at the E.G.R. system 'Y' piece (11, Fig. 56).

Remove the setscrew at the rear of the cylinder block securing the E.G.R. system supply pipe (12, Fig. 56).

Remove the camshaft oil feed pipe banjo bolts (13, Fig. 56).

Remove the ten dome headed nuts (14, Fig. 56) and two cross-head screws securing each camshaft cover.

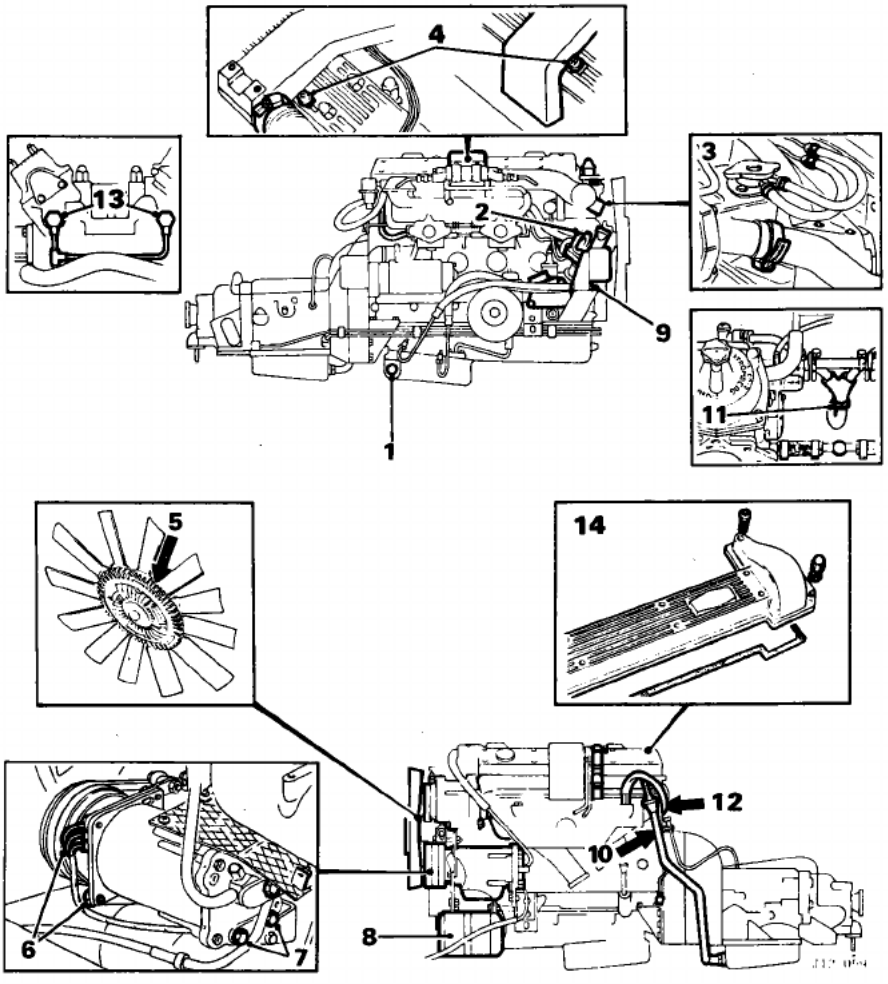


Fig. 56

Remove the dome headed nuts (1, Fig. 57) securing the crankcase breather.

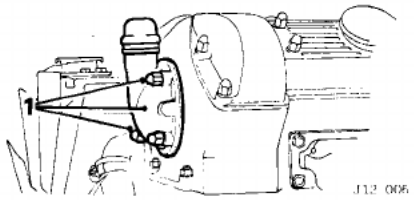


Fig. 57

Slacken the locknut and use tool JD 2B (1, Fig. 58) to slacken the top timing chain. Rotate the tool in a clockwise direction.

Knock down the tabs at the camshaft sprockets and remove the two bolts (2, Fig. 58) from each.

Rotate the engine to gain access to the remaining bolts and remove.

CAUTION: Engine MUST NOT be rotated with the camshaft sprockets disconnected and the cylinder head in place.

Draw the sprockets from the camshafts and slide the sprockets up the support brackets.

NOTE: Mark 'fit' holes in the adjuster plates.

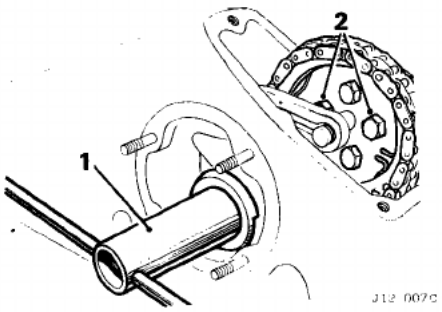


Fig. 58

Remove the fourteen cylinder head domed nuts and six nuts securing the front of the cylinder head working out from the centre.

Recover the two lifting brackets. Lift the h.t. leads clear.

Carefully lift the cylinder head assembly from the cylinder block.

NOTE: As the valves in the fully open position protrude below the cylinder head joint face, the cylinder head MUST NOT be placed joint face downwards directly on a flat surface; support the cylinder head on wooden blocks, one at each end.

Remove and discard the gasket, clean the face of the block.

On the flywheel on manual transmission cars, or the drive plate on automatic transmission cars, tap down the lock plate tabs and remove the bolts. Remove the drive plate/flywheel from the crankshaft using draw-bolts through the dowels.

Inspection

CAUTION: Ensure that all components are scrupulously clean, blow out all oil galleries in the crankcase, crankshaft and camshaft with clean, dry compressed air.

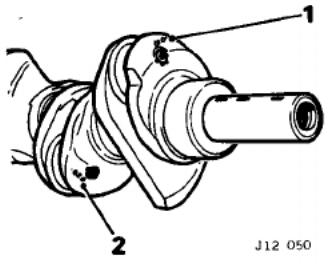


Fig. 65

Early engines prior to engine nos:-

8A15562	All 3.4
8L168437	R o W except
8L147650	UK and Europe

a. Crankshaft. Regrinding of the crankshaft is generally recommended when wear or ovality in excess of 0,08 mm (0.003 in) is found. Grinding may be undertaken to a limit of 0,51 mm (0.020 in). Grinding beyond the limit of 0,51 mm (0.020 in) is not recommended and in such circumstances a new crankshaft must be obtained. Oversizes of journals are stamped in the adjacent web at the forward end of the crankshaft. 1.—Main journal. 2.—Crankpin. See Fig. 65

Later engines from engine nos:

8A15562	All 3.4
8L168437	R o W except
8L147650	UK and Europe

The crankshaft of the above engines are specially hardened and cannot be reground.

b. Cylinder Block. Check the top face of the cylinder block for truth. Check that the main bearing caps have not been filed and that the bearing bores are in alignment. Should the caps show damage or the bearing housing misaligned, the caps must be re-machined and the bearing housings line bored.

Remove the cylinder head studs (1, Fig. 66). Check the area around the studs holes for flatness (2, Fig. 66). Skim any raised areas flush with the joint face to ensure a perfectly flat surface. Reboring is normally recommended when the ovality exceeds 0,15 mm (0.006 in). Reboring beyond the limit of 0,51 mm (0.020 in) is not recommended. Oversize pistons are available of this size, see group 05. If the bores will not clean out at 0,51 mm (0.020 in) new liners and standard size pistons should be fitted.

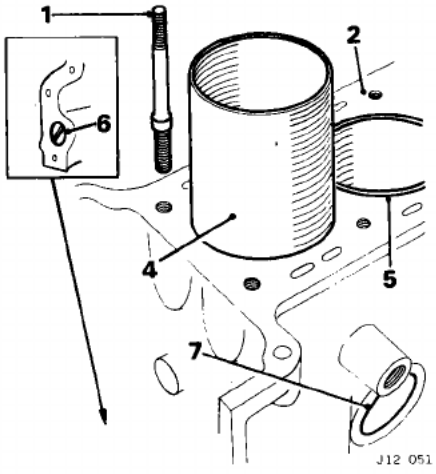


Fig. 66

Press out the worn liners (Fig. 67) from below. Before fitting a new liner, lightly smear the cylinder walls with jointing compound to a point halfway down the bore and also smear the top outer surface of the liner (4, Fig. 66). Press in the new liners flush with the top face of the cylinder block (5, Fig. 66). Dry liners are fitted in engine manufacture to early 4.2 litre blocks, but not normally to 3.4 litre blocks.

Bore out and hone the liners to suit the grade of pistons to be fitted. (See piston grades below). See Bore Deglazing page 12—21.

Following reboring, the blanking plugs in the main oil gallery (6, Fig. 66) should be removed and the cylinder block oilways and crankcase interior thoroughly cleaned.

When dry, coat the interior of the crankcase with an oil- and heat-resisting paint.

Check all core plugs (7, Fig. 66) fitted to the cylinder block and renew any which show signs of leaking.

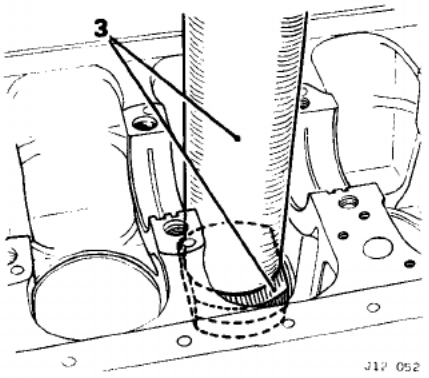


Fig. 67

c. Piston and connecting rod

Piston grades

The following selective grades are available in standard size pistons only. When ordering standard size pistons the identification letter of the selective grade should be clearly stated. Pistons are stamped on the crown with the letter identification and the cylinder block is also stamped on the top face adjacent to the bores.

Grade Identification

Letter	For cylinder bore size	
	3.4 Litre	4.2 Litre
F	82,989 to 82,997 mm (3.2673 to 3.2676 in)	92,075 to 92,0826 mm (3.6250 to 3.6253 in)
G	83,000 to 83,007 mm (3.2677 to 3.2680 in)	92,0852 to 92,0928 mm (3.6254 to 3.6257 in)
H	83,010 to 83,017 mm (3.2681 to 3.2684 in)	92,0953 to 92,1029 mm (3.6258 to 3.6261 in)

'S' pistons are 82,995 to 83,020 mm (3.2675 to 3.2685 in) dia. across bottom of skirt for 3.4 litre engines and 92,080 to 92,105 mm (3.6252 to 3.6262 in) dia. across bottom of skirt for 4.2 litre engines.

Measure exact dimension, at right angles to the gudgeon pin, and hone the bores to 0,018 to 0,033 mm (0.0007 to 0.0013 in) more than this measured dimension when fitting 'S' pistons.

Always use new circlips on assembly.

Gudgeon pins are graded by colour coding (red or green). For identification purposes the colour coding is also indicated on the gudgeon pin hole boss on the pistons.

Oversize pistons

Oversize pistons are available in + 0,51 mm (0.020 in) only.

There are no selective grades in oversize pistons as grading is necessary purely for factory production methods. For reboring the cylinder see the instructions given above.

If connecting rods have been in use for very high mileage, or if bearing failure has been experienced, it is desirable to renew the rod(s) owing to the possibility of fatigue.

The connecting rods fitted to an engine should not vary one with another by more that 3.5 grammes (2 drams). The alignment should be checked on an approved connecting rod alignment jig.

If alignment is incorrect, an exchange rod should be fitted.

The big-end bearings are of the precision shell type and under no circumstances should they be hand-scraped or the bearing cap filed.

The small-ends are fitted with steel-backed phosphor-bronze bushes which are a press fit in the connecting rod. After fitting, the bush should be bored, reamed and honed to a diameter of 22,225 to 22,23 mm (0.875 to 0.8752 in). Always use new connecting bolts and nuts at overhauls.

Before fitting new big-end bearings, the crankpins must be examined for damage or the transfer of bearing metal.

When a new connecting rod is fitted, although the small-end bush is reamed to the correct dimensions, it may be necessary to hone the bush to achieve the correct gudgeon pin fit.

d. General. Remove the oil suction strainer in the sump and clean thoroughly. Inspect all components for damage.

Reassembling

NOTE: Before refitting the crankshaft the rear oil seal must be offered up and sized correctly. Before fitting the seal halves into the housing grooves, brush a thin coat of red Hermetite into both grooves for 25 mm (1 inch) from the joint face on opposite halves (from leading edge of seal on both).

Carefully tap the new rear oil seal halves (1, Fig. 68) on side face to narrow section and press into the grooves in the seal housings (2, Fig. 68). Use a hammer handle (3, Fig. 68) to roll the seal into the housing until the ends do not protrude. DO NOT cut the ends of the seal. Use a knife or similar tool to ensure that no loose strands are proud.

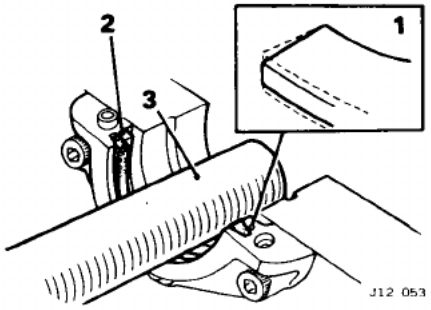


Fig. 68

Assemble the two halves of the seal and secure using two socket head screws (1, Fig. 69).
Fit the rear main bearing cap without bearings and tighten the bolts to torque quoted in data sheet.
Assemble the rear oil seal housing to the cylinder block using three socket head screws.

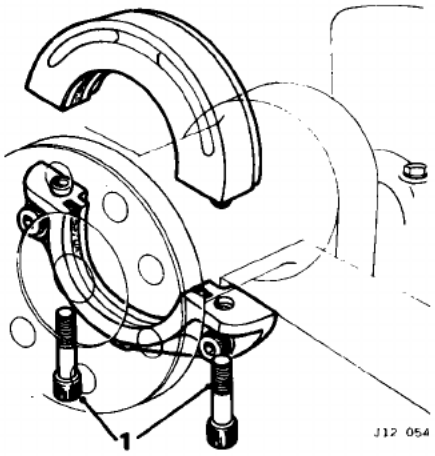


Fig. 69

Smear a small quantity of colloidal graphite around the inside surface of the oil seal and insert the sizing tool JD 17B (1, Fig. 70).
Press the tool inwards and rotate it until fully home. Withdraw the tool by pulling and twisting at the same time.
Remove and separate the rear main bearing oil seal housing and remove the rear main bearing cap (2, Fig. 70).
Check the distributor drive shaft bush for wear, and, if necessary, renew it.
Tap the bush in from the bottom of the crankcase ensuring that the locating holes line up.
Fit the locating peg.
Fit the main bearing shells in the cylinder block, lay the crankshaft in position and fit the rear oil seal housing.

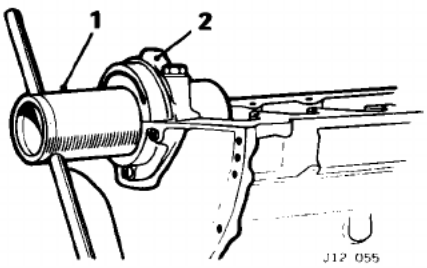


Fig. 70

Fit new thrust washers (1, Fig. 71) to centre main bearing cap, white metal side outwards.
Fit the cap to the cylinder block.
Check the crankshaft end-float which should be 0,10 to 0,15 mm (0.004 to 0.006 in).

NOTE: Thrust washers are supplied in two sizes, standard and 0,10 mm (0.004 in) oversize and should be selected to bring the end-float within required limits. Oversize washers are stamped .004 on the steel face.

Fit the main bearing shells and caps with the numbers on the caps corresponding with the numbers on the cylinder block (2, Fig. 71).
Fit the main bearing bolts, locating the oil pipe brackets as noted, and lock washer and tighten to the correct torque.
Test the crankshaft for free rotation.
Fit the Woodruff key to the inner slot and tap oil pump/distributor drive gear into position.
Fit the pistons and connecting rods to cylinder bores and secure to crankshaft using special nuts. Check the crankshaft for free rotation.

CAUTION: Ensure that the pistons are fitted with 'FRONT' on each crown towards the front of the cylinder block.

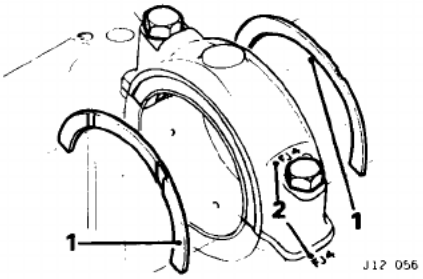


Fig. 71

Turn the crankshaft to accurately set pistons 1 and 6 to T.D.C.
Place the distributor drive shaft in position with the offset slot as shown (1, Fig. 72).
Slightly withdraw the shaft and fit Woodruff key (2, Fig. 72), thrust washer (3, Fig. 72) and drive gear (4, Fig. 72) on shaft.
Maintaining correct slot position, press the shaft into gear, ensuring that the keyway engages correctly.
Fit the pegged tab washer (5, Fig. 72) and secure it with plain nut (6, Fig. 72).
Check the end-float of the shaft. The clearance should be 0,10 to 0,15 mm (0.004 to 0.006 in). If no clearance exists, renew drive gear. In emergency, the thrust washer can be reduced.
Locate the lower timing chain dampers (7, Fig. 72) and loosely fasten.
Fit the Woodruff key to the second slot.
Offer the top and bottom timing chain assembly and chain sprockets (8, Fig. 72) into position and secure using four setscrews and locking washers (9, Fig. 72).
Position the damper in light contact with the chain and secure it.
Screw the slipper of the chain tensioner into the body casting. Fit the slip gauge or distance card (10, Fig. 72) supplied with the new tensioner to maintain a clearance of 3,17 mm (0.125 in) between slipper and body.
Locate the conical filter (11, Fig. 72) in the cylinder block.
Secure the chain tensioner to the cylinder block using two setscrews (12, Fig. 72) and lockwashers. Fit the shims as required to ensure that the slipper runs central on the chain.
Set the adjustable damper (13, Fig. 72) into light contact with the chain and secure it.

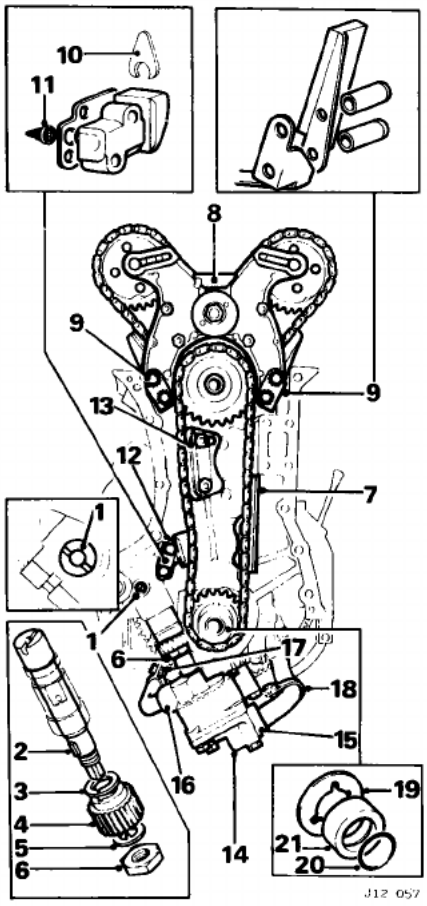


Fig. 72

Remove the slip gauge or distance card, lightly tap to release ratchet.
Locate the coupling on the oil pump (14, Fig. 72) and secure it to the front main bearing cap.
Fit the lockplates and pipe bracket.
Ensure that the 'O' ring seal is fitted in the oil pump suction (15, Fig. 72) and delivery ports (16, Fig. 72).
Use a new gasket and fit the delivery pipe between the oil pump and cylinder block.
Secure the pipe clip (17, Fig. 72).
Fit the oil suction pipe and secure the pipe clips (18, Fig. 72).

continued

NOTE: Locate the pipe on the main bearing cap brackets so that the intake end is on the centre line of the engine.

Fit the oil thrower (19, Fig. 72) at the timing chain sprocket, if originally fitted.
Use new gaskets smeared with grease and fit the timing cover. Fit the ignition timing pointer.
Liberally coat a new front oil seal with engine oil and locate it in the timing cover recess, open side inwards.
Check the 'O' ring seal (20, Fig. 72) in the distance piece (21, Fig. 72) and fit on to the crankshaft.
Use new gaskets smeared with grease and fit the oil sump. Locate the transmission oil cooler pipe brackets on cars fitted with automatic transmission only.

CAUTION: Ensure that the short setscrew is fitted at the front right-hand corner.

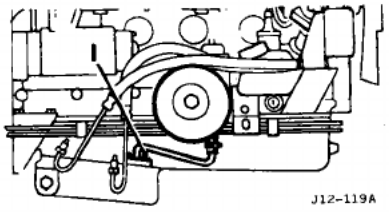


Fig. 73

Fit a new 'O' ring seal on the oil return pipe and secure it to the sump using two plain nuts and spring washers (1, Fig. 73).
Using a new gasket lightly smeared with grease, fit the oil filter housing. Locate the oil return pipe hose, oil feed pipe to camshafts and oil cooler hoses, if fitted.
Secure the housing to the block using four setscrews and shakeproof washers.
Tighten the hose clips and replace the oil pressure transmitter and pedestal.
Smear the seal of the new canister with engine oil and screw it into place by hand only. DO NOT OVERTIGHTEN.
Fit the water pump, omitting the lower right-hand bolt if the car is to Federal emission control specification.

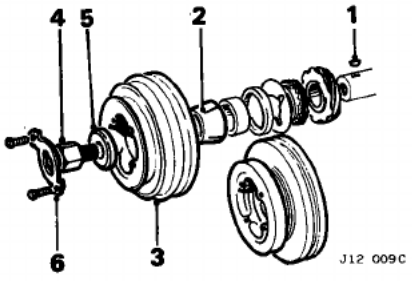


Fig. 74

Fit the Woodruff key (1, Fig. 74) to the forward slot in the crankshaft and fit the damper cone (2, Fig. 74).
Fit the Woodruff key in the damper cone and fit the torsional damper (3, Fig. 74). Secure with the large bolt (4, Fig. 74) and plain washer (5, Fig. 74).
Fit the crankshaft pulley(s) and secure using four setscrews and lockplate (6, Fig. 74).

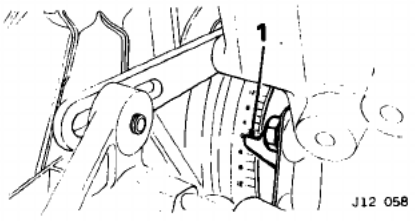


Fig. 75

Accurately set No. 1 and No. 6 pistons at T.D.C. and adjust the position of the ignition timing pointer (1, Fig. 75).
Locate flywheel/drive plate on the crankshaft and tap the dowels through. Secure using ten bolts on the new lockplate.

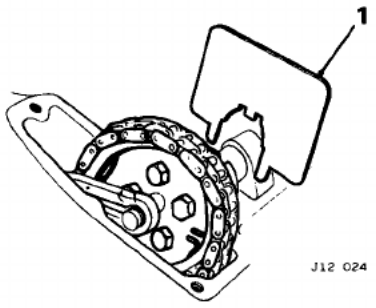


Fig. 76

Fit a new cylinder head gasket, dry, ensuring that the side marked 'TOP' is uppermost.
Check that No. 6 (front) cylinder is at T.D.C.
Carefully rotate the camshafts and set with gauge C 3993 (1, Fig. 76).

CAUTION: Ensure that the valves do not foul each other.

Fit the cylinder head, complete with manifolds, to the cylinder block.

CAUTION: The engine MUST NOT be rotated until the camshaft sprockets are connected.

Fit the spark plug lead carrier brackets and lifting eyes to the appropriate studs and fit plain washers to the rest.
Fit and tighten the fourteen large dome headed nuts to the correct torque.
Fit the six nuts and spring washers across the front of the cylinder head.

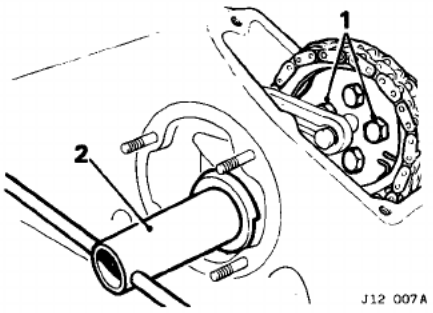


Fig. 77

Locate the camshaft sprockets on the camshafts, remove the circlips and pull the adjuster plates forward to disengage the serrations.
Rotate the adjuster plates until the 'fit' holes line up exactly with the tapped holes in the camshafts.
Fit one bolt at each camshaft.
Rotate the engine to afford access to the remaining holes and fit the bolts (1, Fig. 77). Lock the bolts at both camshafts.
Tension the top timing chain using special tool JD 2B (2, Fig. 77) until there is slight flexibility on the outer sides of the chain. Tighten the locknut.
Complete the reassembly by reversing the early dismantling operations as appropriate.

DEGLAZING CYLINDER BORES

Should it be necessary to deglaze cylinder bores due to excessive oil consumption, the following procedure must be observed. This is the only deglazing method approved by Jaguar Service:

Equipment

a. GBD 89 mm (3.5 in) diameter 80 grit silicon carbide flex hone tool. The Flex Hone Tool is colour coded orange at the hone end of the tool.
b. Variable speed electric drill, which must be capable of running at 750 rev/min unladen.

Method

1. Remove engine and dismantle as per Repair Operation 12.41.05.

   NOTE: It is NOT necessary to dismantle the cylinder head.
2. Position the dismantled cylinder block so that The Flex Hone Tool can be inserted vertically. Tape over water and oil galleries on cylinder block top face.
3. Lubricate each cylinder using clean engine oil.
4. Secure the Flex Hone Tool in drill.
5. The Flex Hone Tool must be revolving when inserted OR removed from each cylinder, and must not be stopped and restarted during the deglazing cycle.
   Using a vertical stroking motion (with flex hone already revolving), hone for 45 seconds at the rate of 2 strokes per second.
   THE DURATION OF HONING TIME AND THE NUMBER OF STROKES PER SECOND MUST BE STRICTLY OBSERVED TO GIVE THE CORRECT BORE FINISH AND CROSS-HATCH SPECIFICATION.

ENGINE DATA — 3.4 LITRE

General Data	Number of cylinders	6 (in line)		
	Bore	83,0 mm		3.2677 in
	Stroke	106,0 mm		4.1732 in
	Cubic capacity	3441,2 cm^3		210 in^3
Cylinder Block	Material	Chromium cast iron		
	Type of cylinder liner	Dry (used for salvage only)		
	Material (liners)	Cast iron		
	Liner interference fit	0,064 to 0,0114 mm		0.0025 to 0.0045 in
	Bore diameters after honing: Piston Grade	Maximum	Minimum	Maximum Minimum
	F	82,997 mm	82,989 mm	3.2676 in 3.2673 in
	G	83,007 mm	83,000 mm	3.2680 in 3.2677 in
	H	83,017 mm	83,010 mm	3.2684 in 3.2681 in

NOTE: 'S' grade pistons are 82,995 to 83,020 mm (3.2675 to 3.2685 in) diameter across bottom of skirt at right angles to gudgeon pins. Honed diameter of bore for these pistons must be 0,018 to 0,133 mm (0.0007 to 0.0013 in) greater than measured diameter of piston at this position.

	Outside diameter of liners	86,220 to 86,246 mm	3.3945 to 3.3955 in
	Line bore for main bearings	74,08 to 74,09 mm	2.9165 to 2.9170 in
Cylinder Head	Material	Aluminium alloy	
	Valve seat angle: Inlet	45°	
	Exhaust	45°	
Crankshaft	Material	BS 970–709M 40/T (EN 19 T) or BS 970–605M 36/T (EN 16 T)	
	Number of main bearings	7	
	Main bearing type	Vandervell VP2C	
	Journal diameter	69,855 to 69,842 mm	2.7502 to 2.7497 in
	Journal length, over 2,4 mm (0.095 in) radii:		
	Front	39,675 ± 0,254 mm	1.562 ± 0.010 in
	Centre	34,938 to 34,950 mm	1.3755 to 1.3760 in
	Intermediate	30,912 to 31,013 mm	1.217 to 1.221 in
	Rear	42,4 mm	1.67 in
	Thrust taken	Centre bearing thrust washers	
	Thrust washer thickness	2,311 to 2,362 mm or	0.091 to 0.093 in or
		2,413 to 2.464 mm	0.095 to 0.097 in
	Permissible end-float	0,10 to 0,15 mm	0.004 to 0.006 in
	Width of main bearing: Front	34,544 to 34,925 mm	1.360 to 1.375 in
	Centre	28,321 to 28,702 mm	1.115 to 1.130 in
	Rear	34,544 to 34,925 mm	1.360 to 1.375 in
	Intermediate	25,019 to 24,400 mm	0.985 to 1.00 in
	Diametrical clearance	0,020 to 0,064 mm	0.0008 to 0.025 in
	Crankpins: Diameter	52,987 to 52,974 mm	2.0861 to 2.0865 in
	Length	30,142 to 30,193 mm	1.1867 to 1.1887 in
	Regrind undersizes	0,51 mm	0.020 in
	Minimum diameter for regrind	−0,51 mm	−0.020 in
Connecting Rods	Length between centres	196,85 mm	7.75 in
	Big-end bearing type	Vandervell VP2C	
	Bore for big-end bearing	56,718 to 56,731 mm	2.2330 to 2.2335 in
	Width of big-end bearing	24,38 to 24,77 mm	0.960 to 0.975 in
	Big-end diametrical clearance	0,025 to 0,069 mm	0.0010 to 0.0027 in
	Big-end side clearance	0,132 to 0,234 mm	0.052 to 0.0092 in
	Small-end bush material	Vandervell VP10	
	Bore for small-end bush	25,387 to 25,413 mm	0.9995 to 1.0005 in
	Width of small-end bush	26,92 to 27,43 mm	1.06 to 1.08 in
	Bore diameter of small-end bush	22,231 to 22,235 mm	0.87525 to 0.87540 in

AIR SWITCHING VALVE VACUUM FEED HOSE

Renew **17.25.46**

Open the bonnet.
Cut and remove the plastic straps securing the vacuum feed hose.
Disconnect the vacuum feed hose from the air switching valve.
Disconnect the hose from the manifold.
Remove the vacuum hose.
Fit the new vacuum hose to the engine.
Connect the hose to the manifold.
Connect the hose to the air switching valve.
Reposition the hose to its mounting position and secure with plastic straps.
Close the bonnet.

HOSE — FEED PIPE TO AIR CLEANER

Renew **17.25.45**

Open the bonnet.
Slacken the air cleaner feed pipe to the air cleaner hose securing clips.
Disconnect the hose from the air cleaner.
Remove the hose assembly from the feed pipe.
Remove the hose clips.

HOSE — AIR SWITCHING VALVE TO AIR CLEANER FEED PIPE

Renew **17.25.44**

Open the bonnet.
Slacken the air switching valve to the air cleaner feed pipe hose clips.
Disconnect the hose from the switching valve.
Remove the hose assembly from the air pipe.
Remove the hose clips.
Place the hose aside.
Place the new hose to the front.
Fit the hose clips.
Fit the hose assembly to the air feed pipe.
Connect the hose to the air switching valve.
Tighten the hose clips.
Close the bonnet.

HOSE — CHECK VALVE TO AIR RAIL

Renew **17.25.43**

Open the bonnet.
Slacken the check valve to air rail hose securing clips.
Disconnect the hose from the air rail.
Remove the hose assembly.
Remove the clips.
Place the hose aside.
Place the new hose to the front.
Fit the hose clips.
Fit the hose assembly to the check valve.
Connect the hose to the air rail.
Tighten the hose clips.
Close the bonnet.

HOSE — AIR RAIL FEED PIPE TO CHECK VALVE

Renew **17.25.42**

Open the bonnet.
Slacken the air rail feed pipe to check valve hose clips.
Disconnect the hose from the check valve.
Remove the hose assembly from the feed pipe.
Remove the hose clips.
Place the hose aside.
Place the new hose to the front.
Fit the hose clips.
Fit the hose assembly to the feed pipe.
Connect the hose to the check valve.
Tighten the hose clips.
Close the bonnet.

HOSE — AIR SWITCHING VALVE TO AIR RAIL FEED PIPE

Renew **17.25.41**

Open the bonnet.
Slacken the air switching valve to air rail feed hose securing clips.
Disconnect the hose from the feed pipe.
Remove the hose from air pump.
Remove the hose clips.
Place the hose aside.
Place the new hose to the front.
Fit the hose clips.
Fit the hose to the air pump.
Connect the hose to the feed pipe.
Tighten the hose clip.
Close the bonnet.

THERMAL SWITCH

Renew **17.25.40**

Open the bonnet.
Remove and refit the pressure cap to the relieve coolant pressure.
Disconnect the switch feed wires.
Undo and remove the switch.
Fit and tighten the new switch.
Connect the switch feed wires.
Close the bonnet.

AIR SWITCHING VALVE

Renew **17.25.38**

Open the bonnet.
Disconnect the switching valve block connector.
Disconnect the switching valve vacuum hose.
Slacken the air cleaner feed pipe hose securing clip.
Disconnect the hose from valve.
Slacken the air rail feed pipe hose securing clip.
Disconnect the hose from valve.
Undo and remove the switching valve to **lower** air pump securing nuts.
Remove the air switching valve.
Remove and discard the switching valve gasket.
Clean the gasket faces.
Fit the new valve gasket.
Fit the new switching valve.
Fit and tighten the switching valve securing nuts.
Connect the air rail feed pipe hose to the valve.
Tighten the hose clip.
Connect the air cleaner feed pipe hose to the valve.
Tighten the hose clip.
Connect the valve vacuum feed hose.
Connect the valve block connector.
Close the bonnet.

CHECK VALVE/NON RETURN VALVE

Renew **17.25.21**

Open the bonnet.
Slacken the valve hose securing clips.
Disconnect the air rail feed hose from the valve.
Remove the check valve assembly.
Undo and remove the check valve from the union.
Fit and tighten the check valve to the union.
Fit the check valve assembly to the feed hose.
Connect the air rail feed hose.
Tighten the hose clips.
Close the bonnet.

AIR RAIL — SINGLE

Renew **17.25.17**

Open the bonnet.
Slacken the air rail feed hose clip.
Disconnect the hose from air rail.
Undo and remove the heat shield to air rail securing nuts.
Remove clamp halves.
Displace the rear plug lead bracket for access.
Remove the heat shield.
Undo the air rail to cylinder head union nuts.
Remove the air rail assembly.
Remove and discard the air rail olives.
Finally remove the union nuts.
Place the air rail aside.
Clean the air rail, seatings and olives.
Place the new air rail to the front.
Fit the air rail union nuts.
Fit the new sealing olives.
Fit and seat the air rail assembly to the head.
Seat the air rail sealing olives.
Tighten the union nuts.
Fit the heat shield to the air rail.

Fit the heat shield clamps.
Fit and tighten the heat shield securing nuts.
Reposition and secure the plug lead bracket.
Connect the air rail feed hose.
Tighten the hose clip.
Close the bonnet.

AIR PUMP DRIVE BELT

Renew **17.25.15**

Open the bonnet.
Undo the link arm adjusting nut.
Slacken the link arm trunnion nut.
Slacken the link arm pivot bolt.
Slacken the pump pivot nut/bolt.
Pivot the pump to the engine.
Release the drive belt from the pulley.
Slacken the power steering pump adjuster link trunnion.
Slacken the adjuster link eye bolt at the power assisted steering pump.
Slacken the power steering pump pivot bolt/nut.
Slacken the adjuster link lock nut.
Pivot the power steering pump towards the engine.
Release the power steering pump from the air pump drive belt pulley.
Reposition the air pump belt from the pulley and into the fan cowl.
Release the drive belt from the fan blades.
Remove the air pump drive belt.
Clean the pulley registers.
Fit the new belt to engine.
Engage the belt over fan blades.
Reposition the air pump belt behind the P.A.S. belt.
Reposition the P.A.S. belt over the pullies.
Tighten the adjusting nut.
Check the tension and tighten the locknut.
Tighten the adjuster link trunnion bolt.
Tighten the adjuster link eye bolt.
Tighten the pump pivot nut/bolt.
Engage the drive belt over the air pump pulley.
Pivot the pump from the engine.
Tighten the link arm adjusting nut to obtain the correct belt tension.
Tighten the lock nut.
Tighten the link arm trunnion nut.
Tighten the link arm pivot bolt.
Tighten the air pump pivot bolt.
Close the bonnet.

AIR PUMP BELT

Tensioning **17.25.13**

Open bonnet.
Slacken the air pump pivot nut/bolt.
Slacken the link arm pivot bolt.
Slacken the link arm trunnion nut.
Slacken the link arm locknut.
Tighten the link arm adjusting nut to give the correct belt tensioning.
Tighten the link arm locknut.
Tighten the link arm trunnion nut.
Tighten the link arm pivot bolt.
Tighten the air pump pivot nut/bolt.
Close the bonnet.

AIR PUMP

Renew **17.25.07**

Open bonnet.
Disconnect the switching valve block connector and the switching valve vacuum hose.
Slacken the air cleaner feed pipe hose securing clip.
Disconnect the hose from the valve.
Slacken the air rail feed pipe hose securing clip.
Disconnect the hose from the valve.
Manually tension the air pump drive belt and break 'Sticktion' of pump pulley securing bolts.
Undo the link arm adjusting nut.
Slacken the link arm trunnion nut.
Undo and remove the air pump pivot nut only.
Undo the link arm pivot bolt.
Pivot the pump to the engine.
Disconnect the drive belt from the pulley.
Finally remove the pump pulley securing bolts.
Remove the pump pulley.
Finally remove the link arm pivot bolt.
Pivot the link arm aside.
Remove the link arm spacer.
Finally remove the pump pivot bolt.
Remove the air pump assembly.
Undo and remove the air switching valve securing nuts.
Remove the switching valve.
Remove and discard the gasket.
Undo and remove the air switching valve studs.
Place the pump aside.
Clean the gasket faces.
Place the new air pump to front.
Fit and tighten the switching valve studs.
Fit switching valve gasket.
Fit switching valve to pump.
Fit and tighten the switching valve securing nuts.
Fit the pump assembly to engine.
Fit but do not tighten the pump pivot nut/bolt.
Align the pump and link arm and fit the spacer.
Fit but do not tighten the link arm pivot bolt.
Fit the pump pulley to pump.
Fit but do not tighten the pump securing bolts.
Engage the drive belt over the pump pulley.
Pivot the pump from the engine.
Tighten the link arm adjusting nut to obtain the correct belt tension.
Tighten the lock nut.
Tighten the link arm trunnion nut.
Finally tighten the link arm pivot bolt.
Finally tighten the pump pivot bolt/nut.
Manually tension the belt.
Finally tighten the pump pulley securing bolts.
Connect the air rail feed hose to the valve.
Tighten the hose clip.
Connect the air cleaner feed pipe hose to valve.
Tighten the hose clip.
Connect the vacuum feed hose to the valve.
Connect the valve block connector.
Close the bonnet.

CONTENTS

DATA 19.15.00

Needle type	BDW
Spring	RED
A.E.D. unit type	TZX 1002

Torque figures

All fuel feed hoses 0,20 to 0,23 kgf m (17 to 21 lbf in).

Description 19.15.00

The HIF (Horizontal Integral Floatchamber) carburetter is functionally similar to preceding SU designs and operates on the variable choke/constant depression principle. This instrument has been designed as part of a carburation system which can achieve the precise induction of mixture required to control exhaust emissions to within statutory limits.

The HIF employs the familiar suction chamber/piston assembly together with a single jet-needle fuel metering system.

Main design changes are to be found in the position and layout of the float chamber, the incorporation of a fuel temperature compensating device and the arrangement for mixture setting.

Float chamber design

The float chamber is integral with the main body casting. Access to the chamber is obtained by removing the bottom cover-plate. The moulded float is shaped so that it surrounds the jet tube and is pivoted along a line parallel to the inlet flange. The float is retained by a spindle which screws into the body casting.

Entry of fuel into the float chamber is through a brass tube in the side of the carburetter body via a needle valve assembly.

The jet is pressed into the top of an aluminium tube which is in turn pressed into a plastic moulding. This hollow moulding known as the jet head is open at the lower end allowing fuel to enter the jet tube.

Mixture adjustment

The jet tube is moved in the vertical plane to provide mixture adjustment only.

Fuel temperature compensation

This device alters the jet position in relation to the metering needle to compensate for changes in fuel viscosity which takes place with changes in fuel temperature.

The jet head is attached to a bi-metal blade. This bi-metal blade is immersed in fuel in the float chamber and will move in the vertical plane in response to changes in fuel temperature. The jet will be raised to a weaker position on the jet needle when the fuel temperature rises and will be lowered to a richer position when the temperature falls.

From this it will be seen that once the jet position has been selected by adjusting the mixture screw, alterations of fuel temperature will bring about slight alterations in jet position to compensate for the change in fuel viscosity.

The effect of this device is that driveability is improved over wide ranges of temperature, and exhaust emissions kept within closer limits during cold starting and warm-up period. Temperature compensation also allows carburetters to have the mixture setting pre-set and sealed before a vehicle is delivered.

AIR CLEANER

Remove and refit 19.10.01

Removing

Disconnect the flexible inlet pipe and the air duct flexible pipe (1, Fig. 1).

Pull the vacuum pipe from the flap valve servo motor (3, Fig. 1).

Release the hose clip securing the vent hose to stub pipe on the inner face of the backplate (2, Fig. 1).

Release the toggle clips and withdraw the air

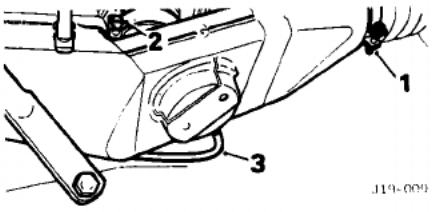


Fig. 1

cleaner cover (1 & 2, Fig. 2).

Lift out the filter element (3, Fig. 2).

Remove the outer pair of nuts and bolts securing the backplate to the carburetter flanges and spacers (4, Fig. 2).

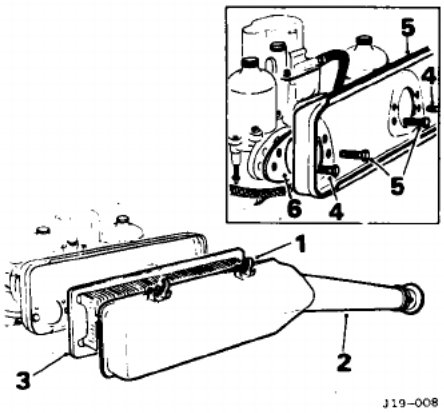


Fig. 2

Support the A.E.D. unit and remove the inner pair of nuts and bolts. Collect spacers (5, Fig. 2).

Move the backplate away from the carburetters and disconnect the vacuum pipe from the temperature sensor unit and the vent hose from the stub.

Lift out the backplate; remove and discard the gaskets (6, Fig. 2).

When refitting, use new gaskets.

RAM TUBE

Remove and refit 19.10.21

Remove the nuts, bolts and washers securing the expansion tank pipe and radiator bleed pipe clips. Retain the cable harness clips (1, Fig. 3).

Remove the setscrews, washers and locknuts securing the fan cowl brackets (2, Fig. 3).

Remove the two self-tapping screws securing the headlamp relay (3, Fig. 3).

Pull the connectors from the headlamp relay and fuse boxes (4 Fig. 3), noting the connections.

Carefully pull the cable harness from the top rail grommet.

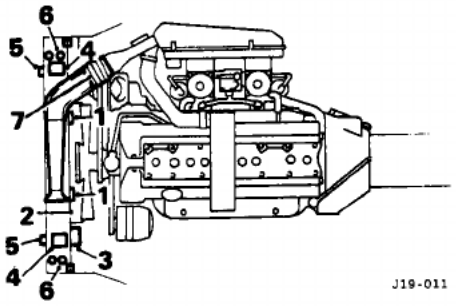


Fig. 3

Cars fitted with air conditioning only

Remove the Phillips head screws, washers and rubber bushes securing the condenser unit (5, Fig. 3). Support the condenser, using suitable padding.

All cars

Remove the six setscrews and two nuts, bolts and washers securing the radiator top rail (6, Fig. 3).

Release the clip securing the flexible inlet pipe.

Lift the ram tube and radiator top rail assembly from car.

Release the clips (7, Fig. 3) and remove the fuse boxes from the top rail.

CARBURETTERS—CAR SET

Tune and adjust 19.15.02

NOTE: Carburetter mixture adjustment is preset and sealed and should not normally be altered. The only adjustments that should be made are to idle speed setting and throttle controls.

Before making any adjustment to carburetters or throttle controls, check and if necessary rectify, spark plug conditions and gaps, contact breaker gap, ignition timing, distributor centrifugal advance mechanism and compression pressures. Check tappet clearances if compression pressures are uneven.

If satisfactory results are not achieved by carrying out the procedure detailed below it will be necessary to refer to 'Mixture Controls, Adjust and Reset'.

NOTE: The operations may not be undertaken unless suitable CO metering equipment is available for emission testing, and it is a legal

requirement for cars in the United Kingdom that the tamperproofing seals fitted to the carburetters of these cars may not be removed unless such equipment is provided. Tamperproof seals MUST be renewed after current emission regulations have been met in test.

Remove the air cleaner element.
Unscrew the damper cap of one carburetter (2, Fig. 4).

CAUTION: (Early models only) It is essential that in lifting the cap, the damper retainer clip fitted below it is not displaced from its position in the position rod. If the retainer is inadvertently displaced it must be refitted by pressing fully into the piston rod.

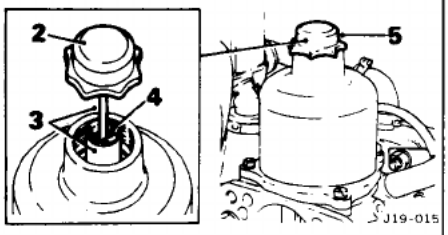


Fig. 4

Carefully withdraw the damper, by raising the cap, until the piston and damper TOGETHER reach the limit of upward travel, and inspect the oil level in the damper retainer (3, Fig. 4).
If the oil is not visible in the retainer, add engine oil (preferably S.A.E. 20) to the recess in the retainer until it is just visible at the bottom of the retainer recess (4, Fig. 4). Move the damper GENTLY up and down to 'pump' any trapped air out of the reservoir.
Replace the cap and tighten firmly by hand.
Repeat on the other carburetter (5, Fig. 4).
Check that the throttle linkage and cable to pedal operate smoothly.
Remove the lids of the tamperproof caps over the slow-running adjusting setscrews (1, Fig. 5). Detach the setscrews, remove the tamperproof seals and replace with new seals. Refit the adjusting screws and screw in until they almost contact the throttle levers. DO NOT close the lid on this operation.

NOTE: If the tamperproof cap is not fitted, unscrew the slow-running adjusting screws until they no longer contact the throttle levers.

Slacken the nuts of the clamp bolts on the throttle operating spindles on both sides of rear carburetter (2, Fig. 5).
Raise the piston in each carburetter with a finger and, using the mirror, inspect to check that both butterfly valves are fully closed and that the over-run valves are correctly seated.
Screw down both of the adjusting screws until they just contact the throttle levers, then screw down another one turn (1, Fig. 5).
Start the engine and run until it reaches normal operating temperature; stop the engine.
Check that the mixture pipe from the A.E.D. unit is warm (3, Fig. 5).
Start the engine again and using a rubber tube as a 'listening tube', compare the intensity of hiss of air entering each choke. Alter the setting of the adjusting screws until hiss is the same on both carburetters.

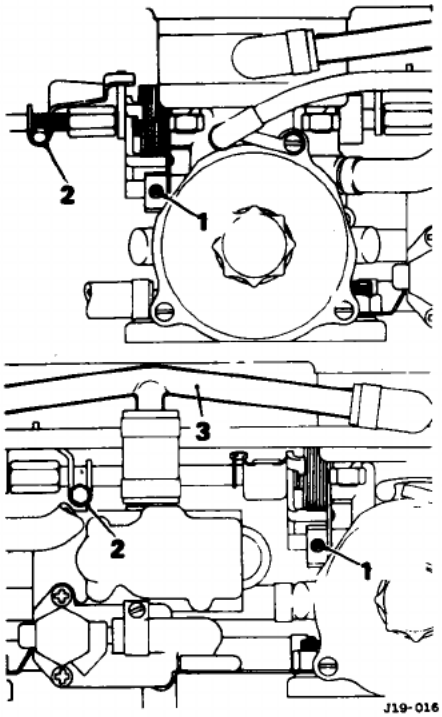


Fig. 5

NOTE: This operation may, if preferred, be carried out using a balance meter to makers' instructions.

Alter the settings of both adjusting screws by the same amount to achieve correct idling speed, i.e. 750 rev/min (1, Fig. 5).
When the correct idling speed is achieved, recheck the balance of the carburetters, alter the settings of the adjusting screws if necessary to secure the correct balance and idling speed.
Stop the engine.
Re-tighten the clamp bolts on the throttle operating rods (2, Fig. 5) to secure the correct opening characteristics on throttle. On automatic transmission cars there should be no backlash between the tongue and upper arm of yoke behind the rear carburetter, or between the tongue and the lower arm of the yoke between carburetters: both butterflies should start to open as soon as throttle cable is moved. On manual transmission cars there should be a gap of up to 0,9 mm (0.036 in) between the tongue and the lower arm of yoke between carburetters, so that the rear butterfly opens by up to 3° before front butterfly starts to open.
There should be no backlash between the tongue and the upper arm of yoke behind the rear carburetter.
Slacken the locknuts on the outer throttle cable and adjust the position of the cable in abutment so that the throttle operating lever rests against the back stop, yet the inner cable is not slack; tighten the locknuts (1, Fig. 6).
Check the operation of the throttle cable; the cable should pick up linkage immediately the pedal is moved (2, Fig. 6).
Slacken the locknut and wind back the operating lever to stop screw (3, Fig. 6).
Press the operating lever (4, Fig. 6) to open the butterfly valves and turn the stop screw (5, Fig. 6) to contact the lever. Tighten the locknut (3, Fig. 6).
Depress the pedal and ensure that the operating lever moves to touch the stop screw with the pedal at the end of its travel.
Adjust the pedal stop so that cable is not under due strain when the pedal is fully depressed.
Check the operation of the kick-down cable on cars fitted with automatic transmission (6, Fig. 6).
Refit the air cleaner element. Check CO emissions, using approved equipment, and correct if necessary to bring within current requirements.
Secure the lids of the tamperproof caps over the slow-running adjustment setscrews.

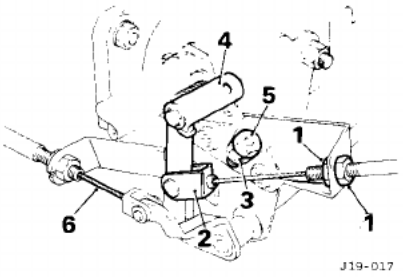


Fig. 6

MIXTURE CONTROL

Adjust and reset 19.15.06

NOTE: Do not adjust the mixture control on carburetters until all other possible factors which could cause faulty carburation have been eliminated; control setting has been correctly set and sealed before delivery, and should not require alteration.
Resetting mixture controls necessitates a check of emissions, using an exhaust gas analyser; regulation regarding emissions must be strictly adhered to. Ensure that equipment required for emission check is available before commencing mixture adjustment, and proceed as follows:
If possible, choose a location with an ambient temperature of between 15° and 26°C (60° to 80°F) to carry out the job. Place selector at 'P' on automatic transmission cars.
Remove the air cleaner.
Remove the plugs and sealant from both carburetter jet adjustment screws (1, Fig. 7).
Turn the jet adjusting screws clockwise, if necessary, (to lower jets) until jets are below level of the transverse bridges in the carburetter bores (2, Fig. 7).
Lift one carburetter piston by hand and insert straight-edge approximately 13 mm (0.5 in) wide alongside the needle in a vertical plane (3, Fig. 7).

continued

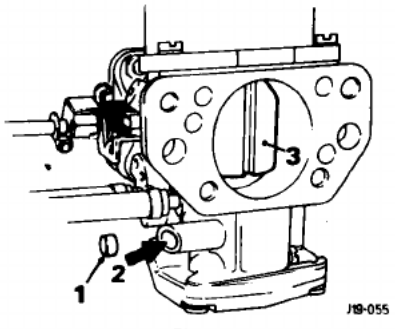


Fig. 7

Turn the adjusting screw anti-clockwise until the jet just contacts the steel rule. The jet is then accurately positioned level with the carburetter bridge.
Screw in the adjusting screw 3⅜ turns, bringing jet 2,97 mm (0.117 in) below carburetter bridge. This is the datum position at 20°C (68°F) from which final adjustments are to be made.
Repeat on the second carburetter.
Check the oil level in the carburetter piston bores.
Start the engine and run until fully warm, for at least five minutes after thermostat opens.
Run the engine at approximately 2500 rev/min for one minute; stop the engine.

NOTE: Adjustment may now be carried out for three minutes, then engine must be run again for one minute at 2500 rev/min before any further adjustment is made.

This cycle of operations—run for one minute, adjust for three—may be repeated as often as necessary.
Check that the idling speed is 750 rev/min and, if not, adjust to this figure.
Turn each jet adjusting screw clockwise to enrich the mixture or anti-clockwise to weaken, turning each screw by the same small amount until fastest idling speed is indicated.
Turn each screw anti-clockwise, each by the same amount, until engine speed just begins to fall.
Turn each screw clockwise by the same very small amount until maximum speed is regained.
Re-adjust the tickover, if necessary, to 750 rev/min.
Connect a suitable exhaust gas analyser to the vehicle exhaust and allow it to stabilise for at least one minute before checking CO emission.
If necessary, adjust the mixture screws further to bring emissions just within current regulation limit.
Seal the mixture setting screws and close the aperture with a red plug.
Refit the air cleaner.

CARBURETTERS—CAR SET

Remove and refit **19.15.11**

Removing.

Remove the air cleaner and the A.E.D. unit (1, Fig. 8).
Disconnect the crankcase breather pipes from the carburetters (2, Fig. 8).
Disconnect the fuel pipes from the carburetters, and plug the fuel supply pipe (3, Fig. 8).
Disconnect the vacuum pipe from the rear carburetter (4, Fig. 8).
Release the external circlips from the throttle rod and lower pin in linkage (1, Fig. 9). Withdraw the pin.
Disengage the links from the lever on the rod and draw the rod back until its forward end disengages from the nut on the rear carburetter spindle (2, Fig. 9).
Remove the eight nuts and spring washers securing the carburetters to the manifold, and slide the carburetters off the studs (5, Fig. 8).

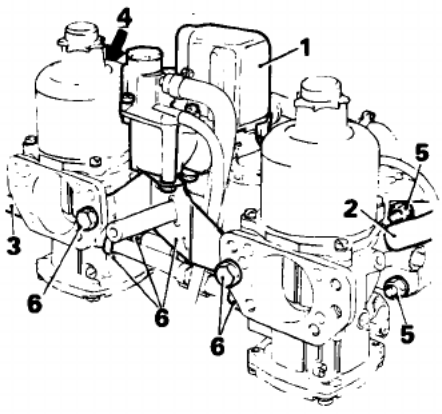


Fig. 8

Discard the flange gaskets but replace two nuts on studs to retain the adaptors and insulating spacers in their original positions.
Release the clips off fuel and vent pipes, remove the A.E.D. bracket and draw the front carburetter with throttle linking rod away from the rear carburetter (6, Fig. 8).

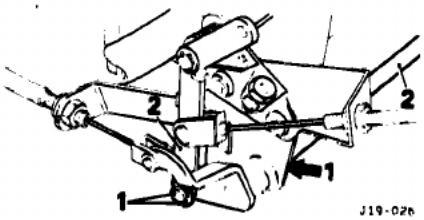


Fig. 9

Refitting

Slide new 'O' clips over the fuel and vent hoses and fit the hoses over the stubs on the carburetters. Do not tighten the clips at this stage.
Engage the rear end of the throttle linking rod with hollow nut on front of the rear carburetter spindle and engage the tongue of clamping bracket with the yoke.
Remove the nuts from manifold studs, place new gaskets in position and offer up carburetter to the studs.
Fit the spring washers and retaining nuts and tighten the nuts by diagonal selection. Ensure that the fuel and vent hoses between the carburetters are not twisted or distorted and secure the 'O' clips retaining them to the stubs.
Move throttle rod forward, engaging its ball-end with the hollow nut on the rear throttle spindle, and the tongue of the clamping bracket with the yoke.
Replace the link pin and circlips.

NOTE: Ensure that the circlips are replaced on the rod and pin. They are not interchangeable.

Check that both of the throttle butterflies are fully closed.
Refit the A.E.D. unit and connect the fuel, breather and vacuum hoses. Tune and adjust the carburetters. Refit the air cleaner.

CARBURETTER

Overhaul **19.15.17**

Dismantling

NOTE: Overhaul procedure is given for rear carburetter. Front carburetter differs in fuel supply and vent pipe connections, throttle spindle details and in absence of vacuum take-off stub.

Service tools: Replacer damper assembly retainer (early models only).

Unscrew the cap of the suction chamber, lift until resistance is felt, support the piston (with a finger through the intake) at the top of its travel and pull the cap firmly upwards to release the damper retainer from the piston rod. Remove the damper (1, Fig. 10).
Unscrew the suction chamber retaining screws and remove the identity tag (2, Fig. 10).
Slightly rotate the suction chamber to free it, and lift vertically from the body without tilting (3, Fig. 10).
Remove the spring, lift out the piston and needle assembly and empty the oil from the piston rod (4, Fig. 10).
Mark the lower face of the piston (to locate the

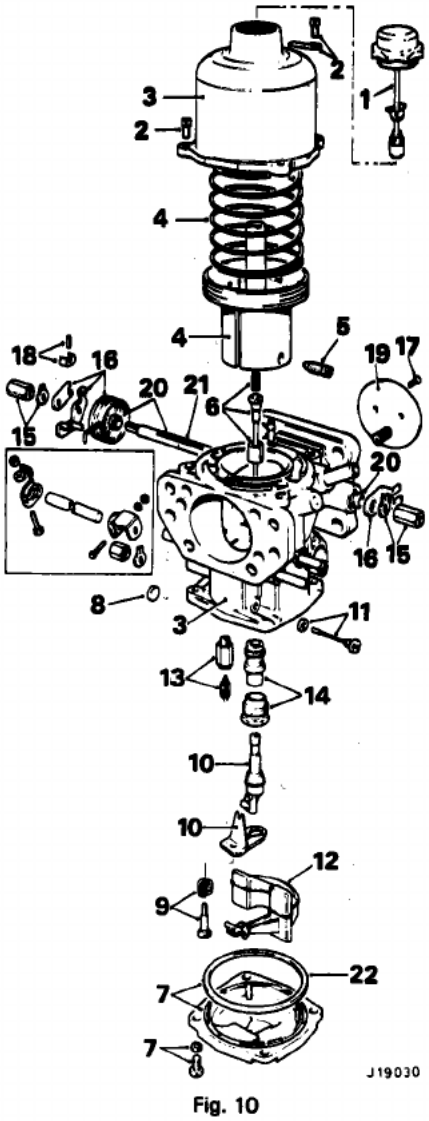


Fig. 10

GENERAL SPECIFICATION

Pistons	Type	Solid skirt	
	Skirt clearance (measured midway down bore across bottom of piston skirt)	0,018 to 0,033 mm	0.0007 to 0.0013 in
Piston Rings	Number of compression rings	2	
	Number of oil control rings	1	
	Top compression ring width	1,562 to 1,588 mm	0.0615 to 0.0625 in
	Second compression ring width	1,961 to 1,986 mm	0.0772 to 0.0782 in
	Oil control ring width	Self expanding ring	
	Top compression ring thickness	3,150 to 3,302 mm	0.124 to 0.130 in
	Second compression ring thickness	3,150 to 3,302 mm	0.124 to 0.130 in
	Side clearance of top compression ring in groove	0,038 to 0,089 mm	0.0015 to 0.0035 in
	Side clearance of second compression ring in groove	0,038 to 0,089 mm	0.0015 to 0.0035 in
	Side clearance of oil control ring in groove	Self expanding ring; groove width	
		4,008 to 4,034 mm	0.1578 to 0.1588 in
	Top compression ring gap in bore	0,33 to 0,46 mm	0.013 to 0.018 in
	Second compression ring gap in bore	0,23 to 0,36 mm	0.009 to 0.014 in
Gudgeon Pins	Type	Fully floating	
	Length	71,882 to 72,263 mm	2.830 to 2.845 in
	Outside diameter: Marked Red	22,228 to 22,230 mm	0.8751 to 0.8752 in
	Marked Green	22,225 to 22,228 mm	0.8750 to 0.8751 in
Camshafts	Number of journals	4 per shaft	
	Number of bearings	4 per shaft (8 half bearings)	
	Type of bearings	White metal steel-backed, Vandervell	
	Journal diameter	25,375 to 25,387 mm	0.999 to 0.9995 in
	Diametrical clearance	0,013 to 0,056 mm	0.0005 to 0.0022 in
	Thrust taken	Front end shafts	
Valves and Valve Springs	Inlet valve material	Silico chrome steel	
	Exhaust valve material	Austenitic steel	
	Inlet valve head diameter	44,32 to 44,58 mm	1.745 to 1.755 in
	Exhaust valve head diameter	41,15 to 41,40 mm	1.620 to 1.630 in
	Valve stem diameter: Inlet and exhaust	7,87 to 7,94 mm	0.310 to 0.3125 in
	Valve lift	9,53 mm	0.375 in
	Inlet valve clearance	0,305 to 0,356 mm	0.012 to 0.014 in
	Exhaust valve clearance	0,305 to 0,356 mm	0.012 to 0.014 in
	Outer valve spring free length	53,42 mm	2.103 in
	Inner valve spring free length	44,04 mm	1.734 in
Valve Guides and Seats	Valve guide material	Cast iron (Brico Alloy 2 or BS. 1452/12)	
	Inlet valve guide length	47,24 mm	1.86 in
	Exhaust valve guide length	49,53 mm	1.95 in
	Outside diameter (both guides):		
	Standard	12,725 to 12,751 mm	0.501 to 0.502 in
	First oversize	12,776 to 12,802 mm	0.503 to 0.504 in
	Second oversize	12,852 to 12,878 mm	0.506 to 0.507 in
	Third oversize	12,979 to 13,005 mm	0.511 to 0.512 in
	Interference fit in cylinder head	0,013 to 0,056 mm	0.0005 to 0.0022 in
	Valve seat material	Sintered iron (Brico AO25/M)	
	Inlet valve seat outside diameter: Standard	47,041 to 47,054 mm	1.852 to 1.8525 in
	Interference fit in cylinder head	0,0762 mm	0.003 in
	Exhaust valve seat outside diameter: Standard	43,066 to 43,078 mm	1.6955 to 1.6960 in
	Interference fit in cylinder head	0,0762 mm	0.003 in
Tappets	Tappet material	Chilled cast iron	
	Outside diameter of tappet	34,895 to 34,905 mm	1.3738 to 1.3742 in
	Tappet guide interference fit	0,185 to 0,221 mm	0.0073 to 0.0087 in
	Diametrical clearance of tappet in guide	0,020 to 0,048 mm	0.0008 to 0.0019 in

MAINTENANCE

There is no routine maintenance procedure laid down for the electronic fuel injection system other than that, at all service intervals, the electrical connectors must be checked for security. The fuel filter must be discarded and a replacement component fitted at intervals specified in the Maintenance Summary.

CAUTION

The following instructions must be strictly observed:

Always disconnect the battery before removing any components.

Always depressurize the fuel system before disconnecting any fuel pipes.

When removing fuel system components always clamp fuel pipes approximately 38 mm (1.5 in) from the unit being removed. Do not overtighten clamp.

Ensure that material is available to absorb possible fuel spillage.

When reconnecting electrical components, always ensure that good contact is made by the connector before fitting the rubber cover. Always ensure that ground connections are made to clean bare metal, and are tightly fastened using correct screws and washers.

AIR CLEANER ELEMENT

The air cleaner element is of the paper type and is situated between the air intake trumpet and the air-flow meter.

Remove and refit **19.10.08**

To renew the element:

Slacken the clips (1, Fig. 4) securing the inlet and outlet hoses; slide the air cleaner assembly forward until the bracket is clear of the mounting spigots.

Release the spring clips securing front cover (2, Fig. 4) and the Nyloc nut (3, Fig. 4) securing the end-plate, withdraw the end-plate filter element and gasket (4, Fig. 4).

Remove dirt, grease, etc., from the air cleaner casing.

Do not overtighten the Nyloc nut when refitting.

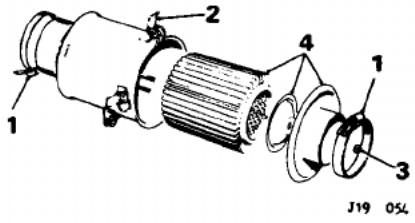


Fig. 4

THROTTLE PEDAL

Remove and refit **19.20.01**

Removing

Fold the carpet away from the base of the throttle pedal.

Remove the nuts and washers securing the base of the pedal to the mounting plate (1, Fig. 5).

Pull the base of the pedal away from the mounting plate and disengage the spring from the pedal (2, Fig. 5).

Examine the spring for wear, and renew if necessary (3, Fig. 5).

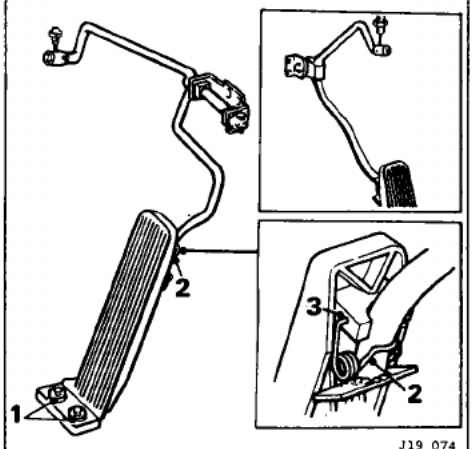


Fig. 5

Refitting

Engage the rod with the pedal. Position the spring on the pedal and push the base of the pedal to locate on the mounting studs, fit nuts and tighten.

THROTTLE SWITCH

U.K. and European Automatic Transmission

Check and adjust **19.22.37**

Check that the throttle butterflies are adjusted correctly with 0,05 mm (0.002 in) between valve and housing when closed. See 19.20.11 for full details.

To adjust throttle micro-switch, connect Continuity Tester across switch terminals (1, Fig. 6).

When throttle lever (2, Fig. 6) is held in direction of arrow by spring (3, Fig. 6) contacts are closed, bulb is on.

Pull lever against spring until spigot (4, Fig. 6) contacts the opposite side of slot (5, Fig. 6). Bulb is off.

Slacken screws (6, Fig. 6) to adjust micro-switch as required. Re-tighten screws.

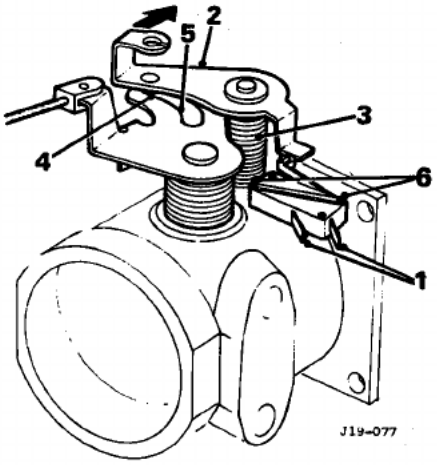


Fig. 6

THROTTLE LINKAGE

Check and adjust **19.20.05**

Checking

Ensure that the throttle return springs are correctly secured and that the throttle moves freely and rests against the closed stop when released.

Ensure that the throttle butterfly closed stop screw has not been moved. If it has, check and if necessary, adjust.

Adjusting

Slacken the locknuts at the outer throttle cable abutment (1, Fig. 7).

Adjust the position of the outer cable in abutment to place inner cable under light tension but NOT to move the throttle operating lever.

Tighten locknuts.

Re-check adjustment.

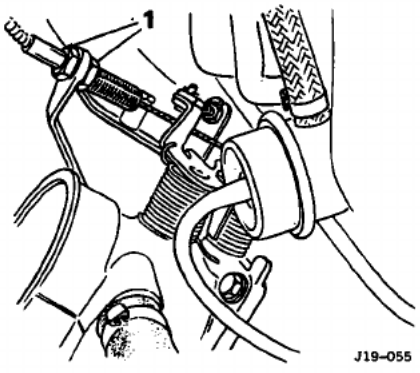


Fig. 7

THROTTLE CABLE

Remove and refit **19.20.06**

Removing

Disengage the throttle return spring from the throttle operating lever.
Slacken the locknuts at the outer throttle cable abutment and draw the cable clear.
Remove the 'C' clip securing the cable yoke clevis pin and detach inner cable from the operating lever: temporarily replace clevis pin.
Slacken the locknut on the top surface of footwell.
Remove the under-scuttle casing.
Remove the split pin at the top end of the operating rod (1, Fig. 8).
Disengage the sleeve and nipple from the rod (2, Fig. 8).
Remove the nut (3, Fig. 8) from the cable sheath and draw the cable assembly into the engine compartment. Recover the operating rod abutment plate.

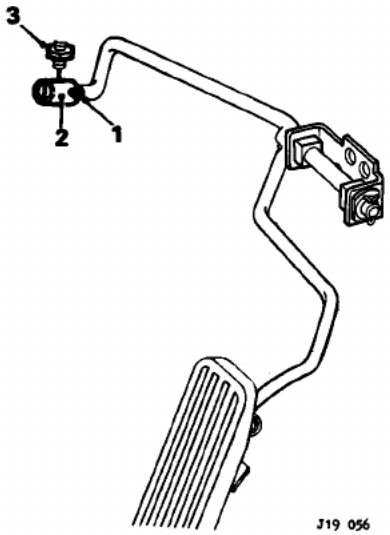


Fig. 8

Refitting

Examine the grommets for wear, and renew as necessary.
Reverse above procedure. Apply sealing compound around thread on top surface of footwell.

THROTTLE BUTTERFLY VALVE

Adjust **19.20.11**

Remove the elbow and convolute hose to expose the throttle body.
Slacken the throttle butterfly locknut and stop screw to ensure that the throttle butterfly valve closes fully.
Insert 0,05 mm (0.002 in) feeler gauge between top of valve and housing to hold valve open (Fig. 9).
Set the stop screw to just touch the stop arm and tighten locknut with the feeler in position.
Press the stop arm against the screw and withdraw the feeler.
Seal the threads of the adjusting screws and locknuts using a spot of paint.
Refit the elbow and convolute hose.
Check the throttle linkage adjustment, operation of the throttle switch and the kickdown switch adjustment.

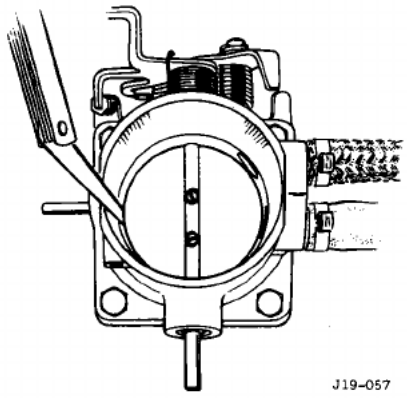


Fig. 9

AUXILIARY AIR VALVE

Description

The auxiliary air valve (Fig. 10) is mounted on the water outlet rail and is controlled by coolant temperature. The valve opens to pass additional air into the inlet manifold under cold start and cold idle conditions.

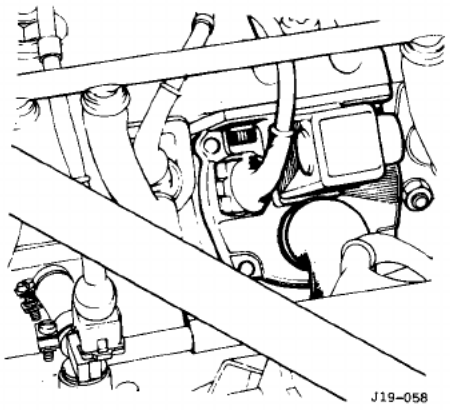


Fig. 10

Remove and refit **19.20.16**

Removing

NOTE: This procedure MUST ONLY be carried out on a cold or cool engine.

Disconnect the battery.
Carefully remove the pressure cap from the remote expansion tank to release any cooling system residual pressure. Replace the cap tightly.
Slacken the clips securing the air hoses to the auxiliary air valve. Pull the hoses clear.
Remove the two screws and washers securing the auxiliary air valve to coolant pipe and lift clear.
Clean all traces of gasket from the coolant pipe, taking care not to damage seating area.

Refitting

Refit the air valve by reversing the above procedure.
Coat the new gasket with suitable non-hardening sealing compound.
Check the coolant level at the remote header tank, and if necessary, top-up.

AUXILIARY AIR VALVE

Test **19.20.17**

Remove the electrical connector from the auxiliary air valve.
Connect a voltmeter across the terminals of the connector.
Crank the engine: battery voltage should be obtained. If there is no voltage there is a fault in the electrical system: check cables for loose connections or open circuit. When power is reaching the extra air valve, the heating coils resistance should be checked.
Connect an ohmmeter between the terminals of the air valve. A resistance of 33 ohms should be obtained. If there is no resistance the air valve should be replaced.
Remove the extra air valve mounting plate from the water rail.
Place the air valve in cold water, do not let water into the electrical terminals or into the by-pass channel. The blocking plate should fully expose the by-pass orifice.
Immerse the air valve mounting plate in hot water. The blocking plate should gradually close the by-pass orifice.

IDLE SPEED

Adjust **19.20.18**

Ensure that the engine is at normal operating temperature.
Check the throttle linkage for correct operation, and that return springs are secure and effective.
Start the engine and run for two to three minutes.
Set the idle speed adjustment screw on air distribution block to achieve 800 rev/min.

NOTE: If it proves impossible to reduce idle speed to specified level carry out the following:

Check ALL pipes and hoses to inlet manifold for security and condition.
Check security of injectors and cold start injectors.
Ensure that all joints and inlet manifold to cylinder head fastenings are tight.
Ensure that throttle butterfly is correctly adjusted.
Check operation of over-run valve.
If the above do not reduce the idle speed, check operation of auxiliary air valve.

OVER-RUN VALVE—Cars fitted with Emission Control

Description

An over-run valve is fitted beneath the air distributor block. The valve is calibrated to open and limit manifold depression under conditions

continued

of closed throttle over-run. This ensures that air is available to maintain a combustible air/fuel ratio under all conditions. Air bleeds into the inlet manifold at 564 mm/Hg 22.2 in/Hg depression.

Test 19.20.21

Slacken the hose clip securing the over-run valve air feed hose to the throttle body and block the hose.
Start the engine; idle speed should remain correct.
If the idle speed is not correct, renew the over-run valve.

Remove and refit 19.20.22

Disconnect the battery.
Remove the air-flow meter.
Slacken the securing clip and disconnect the auxiliary air hose from the air distribution block (1, Fig. 11).
Slacken the clip securing the hose from the throttle butterfly housing.
Remove the three screws securing the air distribution block to the inlet manifold.
Lift the air distribution block from the inlet manifold and disconnect the air hose.
Withdraw the over-run valve (2, Fig. 11).
Reverse the above procedure to refit.

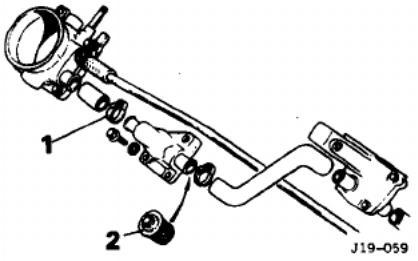


Fig. 11

FUEL CUT-OFF INERTIA SWITCH

Remove and refit 19.22.09

Removing

Disconnect the battery.
Unclip the switch cover at passenger side of fascia.
Disconnect cables from switch and switch from spring clips.

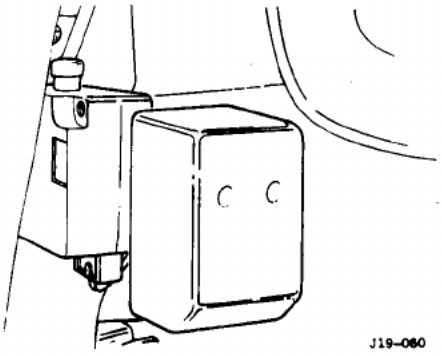


Fig. 12

Refitting

Press switch into spring clips with the ribs towards rear of car and terminals at bottom. Ensuring that the switch is raised in clips to abut on top lip of bracket.
Connect cables and press in plunger at top of switch.
Fit cover and re-connect battery.

OXYGEN SENSOR

Description

The oxygen sensor is located in the exhaust down-pipe. The sensor monitors the oxygen content in the exhaust and sends a proportional signal to the E.C.U., thus maintaining close air/fuel ratio control under all operating conditions.

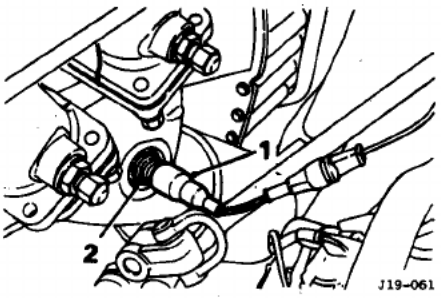


Fig. 13

Remove and refit 19.22.16

Disconnect the battery.
Disconnect the electrical connector on the oxygen sensor and remove (1, Fig. 13).
Clean the sensor sealing face (2, Fig. 13) and fit new oxygen sensor.
Reset the Service Interval Counter.

COOLANT TEMPERATURE SENSOR

Description

The coolant temperature sensor (Fig. 14) is located at the rear of the water rail.
The sensor comprises a temperature-sensitive resistor with a negative temperature coefficient, that is, the electrical resistance decreases with increasing temperature. The sensor provides the E.C.U. with a coolant temperature parameter that controls the injector signal pulse with respect to engine temperature. Practically, the sensor establishes a rich level of fuelling at low temperature, and a weaker level at high temperature. In conjunction with the auxiliary air valve the coolant temperature sensor forms an equivalent to a carburetter automatic choke.

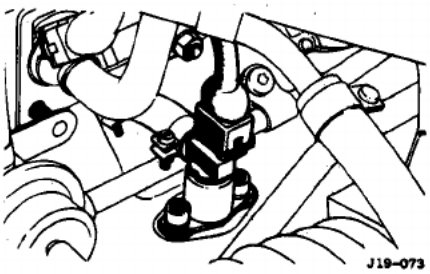


Fig. 14

Remove and refit 19.22.18

NOTE: This procedure MUST ONLY be carried out on a cold or cool engine.

Disconnect the battery and the connector from the coolant temperature sensor.
Carefully remove the pressure cap from the remote header tank to release any cooling system residual pressure. Replace the cap tightly.
Ensure that the sealing washer is located on a replacement temperature sensor and coat the threads with suitable sealing compound, then remove the temperature sensor from the water rail and screw the replacement temperature sensor into position.
Refit the electrical connector, re-connect the battery and check the coolant level at the remote header tank. If necessary, top-up.

Test 19.22.19

Disconnect the battery.
Disconnect the cable from the temperature sensor.
Connect a suitable ohmmeter between the terminals; note the resistance reading. The reading is subject to change according to temperature and should closely approximate to the relevant resistance value given in the table.
Disconnect the ohmmeter.
Check the resistance between each terminal in turn and the body of the sensor. A very high resistance reading (open circuit) must be obtained.
Re-connect cable to sensor and re-connect the battery.

Coolant Temperature (°C)	Resistance (kilohms)
−10	9.2
0	5.9
+20	2.5
+40	1.18
+60	0.60
+80	0.325

THERMOTIME SWITCH

Description

The Thermotime switch (Fig. 15) is located at the front of the water rail. The switch comprises a bi-metallic contact opened and closed by coolant temperature and, in addition, auto-excited by a heating element. The switch controls the cold start injector through the cold

start relay and is energized by operation of the starter motor. While the start system is in operation a voltage is applied to the bi-metallic switch contact heating element which then tends to open the contact and isolate the relay and injector. The time that this takes depends upon the initial temperature of the bi-metallic element and can be up to eight seconds under conditions of extreme cold. When the engine is warm, or at normal operating temperature, there will be no fuel supplied by the cold start injector.

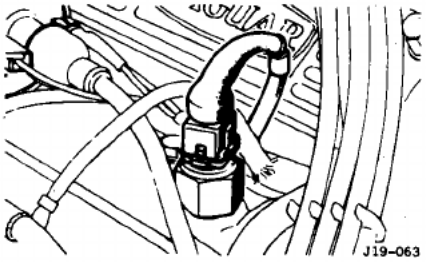


Fig. 15

Remove and refit 19.22.20

NOTE: This procedure MUST ONLY be carried out on a cool or cold engine.

Disconnect the battery and the connector from the Thermotime switch.
Carefully remove the pressure cap from the remote header tank to release any cooling system residual pressure. Replace the cap tightly.
Ensure that a new sealing washer is located on replacement Thermotime switch and coat the threads with a suitable sealing compound.
Remove the Thermotime switch from the front of the water rail.
Screw replacement Thermotime switch in position.
Refit electrical connector and re-connect battery.
Check coolant level at remote header tank, and top-up if necessary.

Test 19.22.21

Equipment required: Stop watch, ohmmeter, single-pole switch, jump lead for connecting switch to battery and Thermotime switch, and a thermometer.

NOTE: Check coolant temperature with thermometer and note reading before carrying out procedures detailed below. Check rated value of Thermotime switch (stamped on body flat). The test must be carried out with coolant temperature below the operating temperature to ensure correct operation of the switch.

Disconnect the battery earth lead and the electrical connector from the Thermotime switch.
Connect ohmmeter between terminal 'W' and earth. A very low resistance reading (closed circuit) should be obtained.
Connect 12V supply via isolating switch to terminal 'G' of Thermotime switch.
Using stop watch, check time delay between making isolating switch and indication on ohmmeter changing from low to high resistance. Delay must closely approximate to time stated below.
Renew Thermotime switch if necessary and re-connect the battery.

Coolant Temperature	Delay
−20°C	8 seconds
0°C	4½ seconds
+10°C	3½ seconds
+35°C	0 seconds

AIR TEMPERATURE SENSOR

Description

The air temperature sensor is an integral part of the air-flow meter. The sensor provides information to the E.C.U. relating to the ambient air density and temperature thus maintaining an optimum fuel/air ratio.

Test 19.22.23

Disconnect the battery and remove the multi-pin electrical connector from the air-flow meter.
Connect a suitable ohmmeter between terminals 6 and 27 of the air-flow meter.

Ambient Air Temperature (°C)	Resistance (kilohms)
−10	9.2
0	5.0
+20	2.5
+40	1.18
+60	0.60

Note the resistance reading. The reading is subject to change according to the temperature and should closely approximate to the relevant resistance value given in the table above.
Disconnect the ohmmeter.
Re-connect the multi-pin connector and battery.

AIR-FLOW METER

Description

The air-flow meter is located between the air cleaner and the inlet manifold mounted throttle butterfly. The flap in the air-flow meter is opened when the air is drawn into the engine. The E.C.U. uses the flap angle to compute fuel requirements.

Remove and refit 19.22.25

Disconnect the battery.
Slacken the two clips which secure the air-intake hoses on each side of the air-flow meter (1, Fig. 16).
Disconnect the electrical connector from the air-flow meter.
Remove the three screws which secure the air-flow meter to its mounting bracket (2, Fig. 16), remove the air-flow meter and withdraw the air-intake hoses.
After refitting reset idle mixture screw using correct equipment.

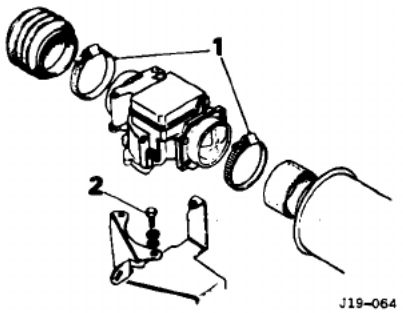


Fig. 16

COLD START SYSTEM

Test 12.22.32

WARNING: This test results in fuel vapour being present in the engine compartment. It is therefore imperative that all due precautions are taken against fire and explosion.

NOTE: The ambient temperature and the engine temperature must be below 35°C in order for the system to work and be testable.

Remove the electrical connector from the cold start injector.
Connect a voltmeter across the terminals of the connector.
Crank the engine: battery voltage should be obtained.
Remove the setscrew and washer securing the cold start injector to the inlet manifold. Remove the cold start injector.
Arrange a container to collect sprayed fuel, and refit the connector.
Check for fuel leaking past the nozzle.
Crank the engine. The cold start injector should spray fuel out for a few seconds until the Thermotime switch switches off the injector. When the engine is warm the injector should not spray fuel during engine cranking.

ELECTRONIC CONTROL UNIT (E.C.U.)

Description

The E.C.U. is mounted in the luggage compartment against the front bulkhead (Fig. 17). The E.C.U. receives all electrical input signals from the various sensors. This information is used to determine the correct period of time for which the injectors are held open in each engine cycle.

continued

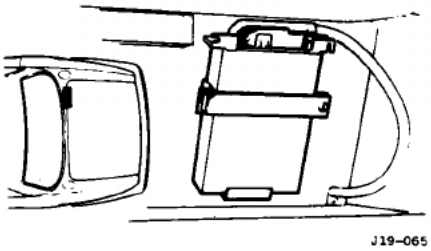


Fig. 17

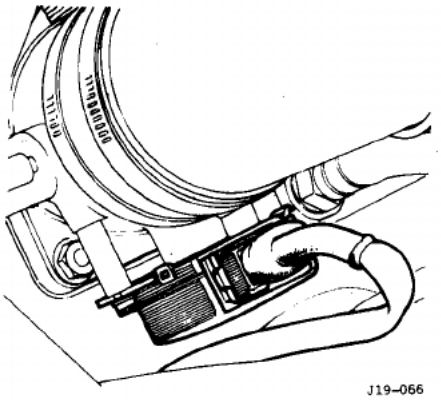
Remove and refit **19.22.34**

Disconnect the battery.
At the forward end of the luggage compartment, remove the E.C.U. cover.
Remove the retainer band and cable clamp clip.
Unclip the end cover.
Locate handle on the harness plug and withdraw the plug, lift out the unit.

THROTTLE SWITCH (FEDERAL CARS)

Description

The throttle switch (Fig. 18) is located on the end of the throttle spindle. The switch closes when the throttle nears the wide-open position and provides information to the E.C.U. of fuel quantity required by the injector for maximum power output at full throttle.



J19-066

Fig. 18

Remove and refit **19.22.36**

Disconnect the battery.
Pull the electrical connector from the throttle switch.
Remove the two screws, plain and shakeproof washers securing the throttle switch and lift the switch from the spindle. Collect spacers.
Refit by reversing the above procedure.

Test **19.22.37**

NOTE: Before commencing the following tests ensure that the throttle butterfly valve and throttle linkage are correctly adjusted.

Disconnect the battery.
Remove the electrical connector from the throttle switch.
Connect a powered test lamp between terminals 3 and 18 of the throttle switch.
Open the throttle; the bulb should light up when the throttle nears the wide open position.
If the bulb does not light, replace the throttle switch.
Refit the electrical connector to the switch.
Re-connect the battery.

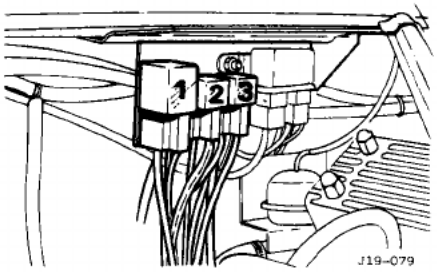
THROTTLE SWITCH (U.K. and EUROPE)—Manual Gearbox only

A micro-switch actuated by the throttle is fitted to U.K. and European cars. This switch replaces the Federal switch. A full load vacuum switch is also fitted all European cars.

MAIN RELAY/PUMP RELAY/ DIODE UNIT

Description

Three relays, main relay cold start (2, Fig. 19), pump relay (3, Fig. 19), diode unit (1, Fig. 19) are mounted on the engine rear bulkhead next to the vehicle battery. When the ignition key is turned, the main relay is activated, connecting the battery circuit to the ballast resistors and the injectors. The relay also allows current to flow to the E.C.U. and the pump switch on the air-flow meter.
When the engine is cranked for starting, the diode unit is activated and thus energizes the auxiliary air valve, the cold start system and the fuel pump.



J19-079

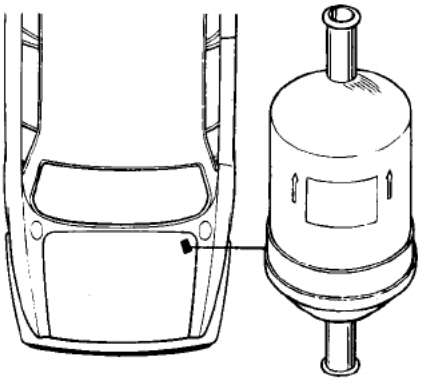
Fig. 19

FUEL LINE FILTER

Remove and refit **19.25.01**

WARNING: The spilling of fuel is unavoidable during this operation. It is therefore imperative that all due precautions are taken against fire and explosion.

The fuel filter (Fig. 20) is located in the luggage compartment mounted on the right-hand side under the floor.



J19-067

Fig. 20

NOTE: Early Series III cars were built with the fuel filter mounted in the engine compartment on the R.H. valance under the air cleaner.

Disconnect the battery and remove the luggage compartment floor.
Remove the bolt securing the filter and draw the filter clear of the clamp.
Clamp the inlet and outlet pipes.
Slacken the pipe clips on either side of the filter and remove the filter unit.
Fit a new filter, observing the direction of flow denoted by arrows on the filter.
After fitting a new filter check for leakproof joints by running the engine before fitting the luggage compartment floor.

FUEL TANK CHANGE-OVER VALVE

Description

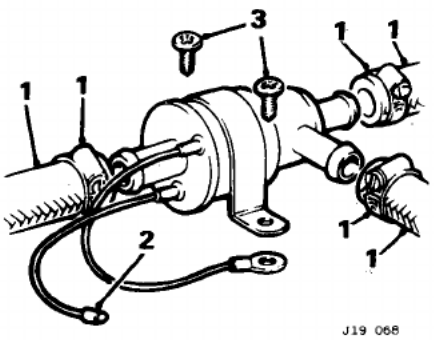
The change-over valve is located in the luggage compartment adjacent to the fuel pump. When energized by the change-over switch, the valve opens the outlet pipe from the right-hand fuel tank. When de-energized, the valve opens the outlet pipe from the left-hand fuel tank.

Remove and refit **19.40.31**

Disconnect the battery.
Remove the spare wheel.
Clamp the inlet and outlet pipes, release the pipe clips and pull the pipes from the change-over valve.
Disconnect the cable to the valve.
Remove the valve by unscrewing the clamp securing screws.

Refitting

When refitting ensure that the ground lead is secured by one foot of securing clamp.



J19 068

Fig. 21

FUEL TANK CHANGE-OVER VALVE

Test 19.40.32

Depressurize the fuel system and disconnect the battery.
Remove the spare wheel.
Clamp the inlet and outlet pipes, release the pipe clips and pull the pipes from the change-over valve.
Disconnect the cable to the valve.
Push a suitable length of rubber pipe on the centre inlet port of the valve.
Blow through the rubber pipe. Air should flow from the outlet union through the body of the solenoid.
Apply 12V d.c. to the valve cable.
Blow through the rubber pipe. Air should flow from the outlet union towards the opposite side.
If the results are satisfactory, reverse the above procedure.
If the results are not satisfactory, fit new valve.

FUEL COOLER

Remove and refit 19.40.40

Removing

WARNING: Refrigerant gas can cause blindness. It is therefore essential to depressurize the air conditioning system prior to disconnecting refrigerant hose to fuel cooler. See Air Conditioning System.

Depressurize the fuel and air conditioning systems.
Disconnect refrigerant inlet and outlet hoses (1, Fig. 22). Plug hoses.
Clamp the fuel hoses and disconnect (2, Fig. 22).
Remove setscrews, washers and Spire nuts securing the fuel cooler to the compressor (3, Fig. 22).

Refitting

Test systems after refitting.

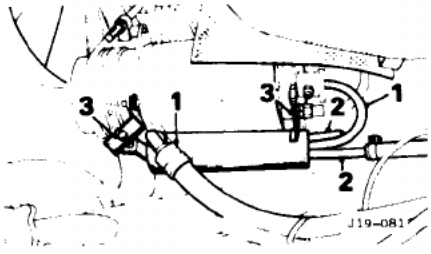


Fig. 22

FUEL RETURN VALVES

Remove and refit 19.40.44

Removing

Depressurize the fuel system.
Place the vehicle on stands and remove the rear wheel(s).
Remove the valve cover (1, Fig. 23).
Remove screws securing valve to body (2, Fig. 23).
Fit hose clamps both sides of the valve and slacken the hose to valve clips (3, Fig. 23).
Disconnect the solenoid cables from the valve and remove valve (4, Fig. 23).

Refitting

Reverse the above procedure, ensuring tight connections. Check for fuel leaks.

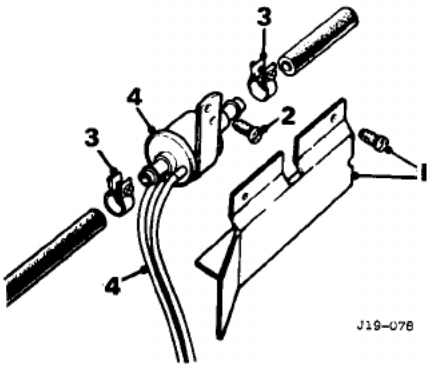


Fig. 23

FUEL PUMP

Description

The fuel pump is located beneath the luggage compartment floor. It is flexibly mounted and secured using noise- and shock-absorbing material. The pump is a roller-type machine delivering a continuous flow of fuel under pressure.

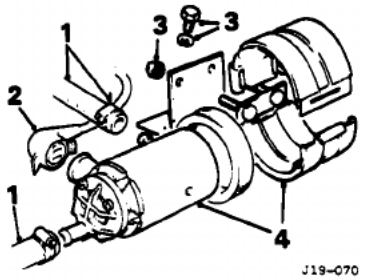


Fig. 24

Remove and refit 19.45.08

Disconnect the battery
Remove the spare wheel.
Clamp the inlet and outlet pipes, release the clips and pull the pipes from the pump unions (1, Fig. 24).
Remove the electrical connector (2, Fig. 24).
Remove the screws securing the pump mounting bracket (3, Fig 24).
Remove securing nuts from clamp and withdraw the pump (4, Fig. 24).
Reverse above procedure to refit, locating the earth wire on bright metal beneath one securing screw.

FUEL PRESSURE REGULATOR

Description

The fuel pressure regulator is mounted on the inlet manifold and is connected to the fuel rail on one side and inlet manifold depression on the other (Fig. 25). The regulator maintains the correct fuel pressure in the fuel rail.

Remove and refit 19.45.11

Depressurize the fuel system and disconnect the battery.
Remove two setscrews and washers (1, Fig. 25) securing the pressure regulator mounting bracket and carefully pull regulator and brackets upwards. Note orientation of regulator in bracket.

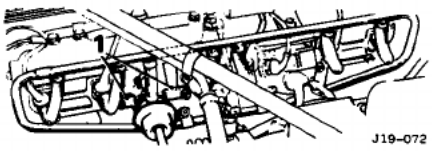


Fig. 25

Clamp inlet and outlet pipes of regulator, release the clips and pull the pipes from the regulator unions.
Remove the nut and washer and release the regulator from the bracket.
When refitting, locate the regulator in the bracket orientated as noted; ensuring that pipes are not kinked or twisted.

Check 19.45.12

Depressurize the fuel system:
Slacken the pipe clip securing the cold start injector supply pipe to the fuel rail and pull the pipe from the rail.
Connect the pressure gauge pipe to the fuel rail and tighten the pipe clip.

CAUTION: The pressure gauge must be checked against an approved standard at regular intervals.

Pull the '—ve' L.T. lead from the ignition coil and switch ignition on.
Check reading on pressure gauge: reading must be 2,55 ± 0,05 kgf/cm² (36.25 ± 0.725 lbf/in²).

NOTE: The pressure reading may drop slowly through either the regulator valve seating or the pump non-return valve. A slow, steady drop is permissible; a rapid fall MUST be investigated.

Operate fuel change-over switch on centre instrument panel.
Re-check the pressure gauge reading.

NOTE: If satisfactory results have been obtained, depressurize the fuel system. Disconnect the pressure gauge. If satisfactory results have not been obtained replace the regulator with a new unit.

Lubricating System

Oil pump	Hobourn-Eaton rotor-type	
Oil filter	Full-flow, renewable element or disposable canister	

Timing Chains and Sprockets

Type	Duplex	
Pitch	9,5 mm	⅜ in
Number of pitches: Lower chain	82	
Upper chain	100	
Crankshaft sprocket: Teeth	21	
Intermediate sprocket (outer): Teeth	28	
Intermediate sprocket (inner): Teeth	20	
Camshaft sprockets: Teeth	30	

4.2 LITRE ENGINE

General Data

Number of cylinders	6 (in line)	
Bore	92,07 mm	3.625 in
Stroke	106 mm	4,173 in
Cubic capacity	4235 cm³	258.43 in³

Cylinder Block

Material (cylinder block)	Chromium cast iron			
Type of cylinder liner (early cars only)	Interference fit, dry liner			
Material (liners)	Brivadium			
Liner interference fit	0,076 to 0,127 mm		0.003 to 0.005 in	
Bore diameters after honing: Piston Grade	Maximum	Minimum	Maximum	Minimum
F	92,083 mm	92,075 mm	3.6253 in	3.6250 in
G	92,093 mm	92,085 mm	3.6257 in	3.6254 in
H	92,103 mm	92,095 mm	3.6261 in	3.6258 in

NOTE: 'S' grade pistons are 92,080 to 92,105 mm (3.6252 to 3.6262 in) diameter across bottom of skirt at right angles to gudgeon pins. Honed diameter of bore for these pistons must be 0,018 to 0,033 mm (0.0007 to 0.0013 in) greater than measured diameter of piston at this position.

Outside diameter of liners	95,66mm max. 95,63mm min.	3.766 in max. 3.765 in min.
Line bore for main bearings	74,08 to 74,09 mm	2.9165 to 2.9170 in

Cylinder Head

Material	Aluminium alloy	
Valve seat angle: Inlet	45°	
Exhaust	45°	

Crankshaft (C41200)

Material	En 16, 18 or 111	
Number of main bearings	7	
Main bearing type	Vandervell VP2C	
Journal diameter	69,85 to 69,86 mm	2.7500 to 2.7505 in
Journal length (over 3/32 in radii): Front	39,69 ± 0,254 mm	1.562 ± 0.10 in
Centre	34,925 $^{+0.025}_{-0.013}$ mm	1.375 $^{+0.001}_{-0.0005}$ in
Intermediate	30,96 ± 0,051 mm	1.2188 ± 0.002 in
Rear	42,86 mm	1.6875 in
Thrust taken	Centre main bearing cap, half washers	
Thrust washer thickness	2,31 to 2,36 mm	0.091 to 0.093 in
Permissible end-float	0,10 to 0.15 mm	0.004 to 0.006 in
Width of main bearing: Front	34,54 to 34,93 mm	1.360 to 1.375 in
Centre	28,32 to 28,70 mm	1.115 to 1.130 in
Intermediate	24,81 to 25,40 mm	0.985 to 1.00 in
Rear	34,54 to 34,93 mm	1.360 to 1.375 in
Diametrical clearance	0,0203 to 0,0635 mm	0.0008 to 0.0025 in
Crankpins: Diameter	52,984 to 53,00 mm	2.0860 to 2.0866 in
Length	30,158 to 30,181 mm	1.1873 to 1.1882 in
Regrind undersize	0,51 mm	0.020 in
Minimum diameter for regrind	− 0,51 mm	− 0.02 in

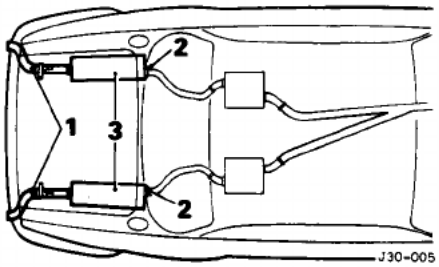


Fig. 6

Refitting

When refitting coat the joint with Firegum.

NOTE: Cars to U.S.A. Federal Specification must have a distance of 38 mm (1.5 in) between top surface of exhaust trim and lower surface of energy absorbing beam.

EXHAUST TRIM

Remove and refit **30.10.23**

Remove the grub screw using an Allen key and separate trim from tail pipe and silencer (1, Fig. 7).
Use Firegum to seal the joint when refitting.

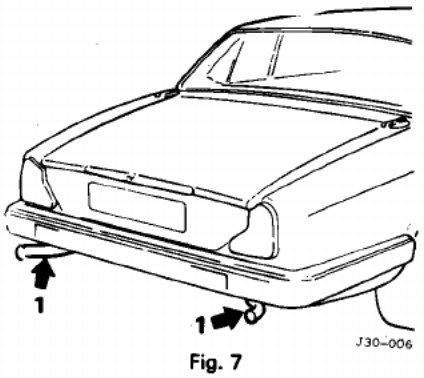


Fig. 7

NOTE: Cars to U.S.A. Federal Specification must have a distance of 38 mm (1.5 in) between the top surface of exhaust trim and lower surface of energy absorbing beam.

REAR INTERMEDIATE PIPE

Remove and refit

Left-hand **30.10.24**
Right-hand **30.10.25**

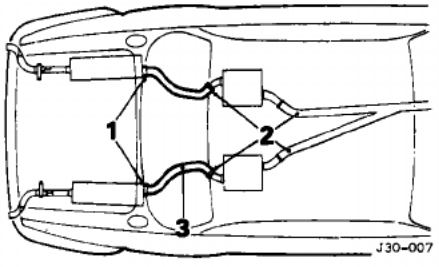


Fig. 8

Release the clamp to the tail pipe and silencer and separate (1, Fig. 8).
Support the intermediate pipe, release the clamp to silencer and separate (2, Fig. 8).
Draw the rear intermediate pipe from the suspension unit (3, Fig. 8).
Check the condition of mounting rubbers, and renew as necessary.

Reverse above procedure to refit. Always use Firegum to seal the joints.

INDUCTION MANIFOLD

Remove and refit **30.15.02**

Remove the radiator header tank cap and open the radiator drain tap to drain coolant.

NOTE: Conserve coolant if anti-freeze is in use.

Depressurize the fuel system.
Remove the air cleaner and the air-flow meter from the throttle housing.
Remove the servo hose from NR valves, hoses from throttle housing. Disconnect the cables from the air-flow meter throttle switch.
Remove the throttle cable, kick-down cable and service interval counter (if fitted).
Remove the breather pipe and fuel feed pipe from the fuel rail. Remove the thermostat housing.
Remove the ignition amplifier coil and harness.
Remove the distributor cap and H.T. cables.
Remove the connector from the auxiliary air valve cold start injector, coolant temperature sensor, and Thermotime switch.
Remove the F.I. harness, disconnect the fuel hoses from the cold start injector regulator and fuel rail.
Remove the nuts and withdraw the induction manifold.
Clean gasket surfaces.

To refit reverse above procedure. Use new gaskets.

EXHAUST MANIFOLD

Remove and refit **30.15.10**

Removing

Cars fitted with emission control only
Remove the two cross-head screws and washers securing the hot air duct to the camshaft covers (1, Fig. 9).
Pull the hot air duct from the exhaust manifold heat shield (2, Fig. 9).

Cars to U.S.A. Federal Specification only
Remove the nut, washers, spacer and bolt securing the air delivery pipe clip to the exhaust manifold heat shield (3, Fig. 9).
Pull the air delivery pipe from the air pump outlet elbow (4, Fig. 9).
Slacken the locknuts on the air pump belt

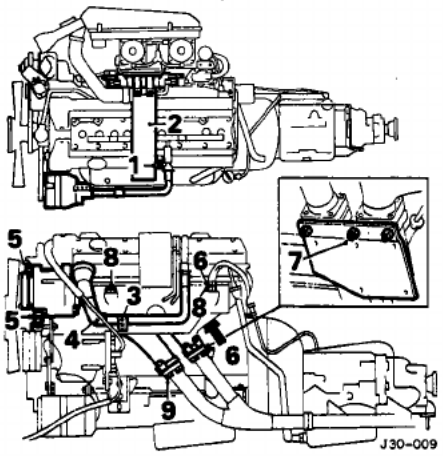


Fig. 9

adjustment, remove the air pump belt from the pulley and draw pump as far as possible away from the cylinder head (5, Fig. 9).
Restrain the adaptor and release the nut securing the E.G.R. pipe.

Rear manifold only on cars with SU carburetters
Slacken the pipe clip and pull hot air pipe from the A.E.D. hot air pick-up unit (6, Fig. 9).

Left-hand-drive cars only
Remove the three 2 B.A. nuts, bolts and washers securing the steering pinion heat shield (7, Fig. 9).

Remove the setscrews/adaptor and washers securing the exhaust manifold heat shield to the exhaust manifolds (8, Fig. 9).

NOTE: Do not mislay the restrictor from the E.G.R. adaptor (fixed orifice system only).

Cars fitted with air conditioning only
Remove the compressor heat shield.

Remove the eight nuts and the washers securing the exhaust manifolds to the exhaust front pipes (9, Fig. 9).
Remove the eight nuts and washers securing each exhaust manifold to the cylinder head.
Remove the three screws securing the hot air pick-up unit to the rear exhaust manifold.
Clean all traces of gaskets from the joint faces.

Refitting

Reverse the above procedures as appropriate, using new gaskets and seals throughout.

NOTE: After loosely securing the exhaust manifolds to the cylinder head, locate the exhaust front pipe on studs before finally tightening manifold nuts.

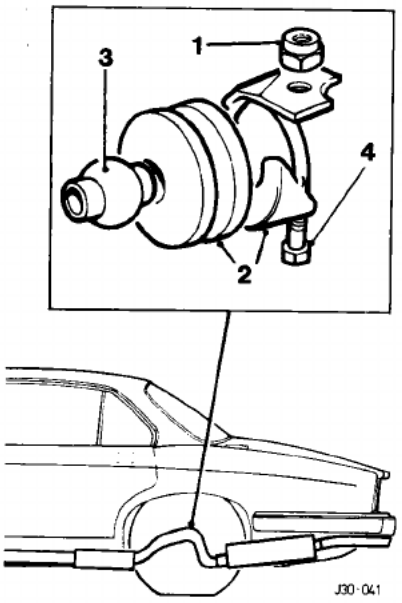
MOUNTING RUBBER — FRONT

Remove and refit **30.20.02**

Removing

Reach over the rear suspension unit and release the self-locking nut and bolt securing the rear mounting bracket (1, Fig. 10).
Slide the bracket from the spigot on the rear intermediate pipe and remove.

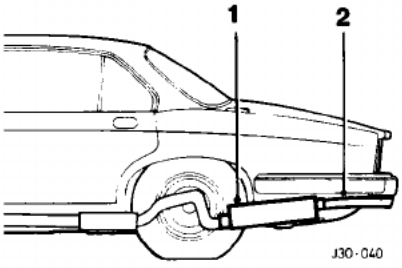
When refitting locate the replacement mounting rubber in the bracket ring, noting that the brackets are handed (2, Fig. 10).
Smear the bush with soft soap and press into the mounting rubber (3, Fig. 10).
Locate the bush on the spigot and secure using the bolt from below and self-locking nut (4, Fig. 10).



MOUNTING RUBBER — REAR

Remove and refit **30.20.04**

Remove the tail pipe and silencer (1, Fig. 11).
In the luggage boot, remove the two self-locking nuts securing the rear mounting (2, Fig. 11).



CONTENTS

TORQUE WRENCH SETTINGS

ITEM	DESCRIPTION	TIGHTENING TORQUE		
		Nm	kgf m	lbf ft
Clutch lever pivot bolt	—	40,7	4,15	30
Bottom cover to bell housing	6 mm setscrew	9,5	0,96	7
Tie plate to bell housing	10 mm setscrew	50,2	5,12	37
Bell housing to gear case	12 mm bolt and setscrew	80	8,16	59
Bell housing to cylinder block	8 mm bolt and dowel bolt	28,5	2,90	21
Cover plate to bell housing	8 mm bolt	20,3	2,07	15
Slave cylinder to bell housing	3/8 in nut	14,9 to 17,6	1,53 to 1,79	11 to 13
Master cylinder to pedal box	5/16 U.N.F. nut	14,9 to 17,6	1,53 to 1,79	11 to 13
Pedal box to body	5/16 U.N.F. nut	14,9 to 17,6	1,53 to 1,79	11 to 13
Hydraulic connections	—	8,2 to 9,5	0,87 to 0,96	6.3 to 7

HYDRAULIC SYSTEM

Bleed 33.15.01

WARNING: Only Castrol/Girling Universal Brake Fluid may be used in the clutch hydraulic system. This fluid exceeds S.A.E. J1703/D

Bleeding

Attach one end of a tube (1, Fig. 1) to the slave cylinder bleed nipple.
Partially fill a clean container with hydraulic fluid and immerse the other end of the bleed tube in the fluid.

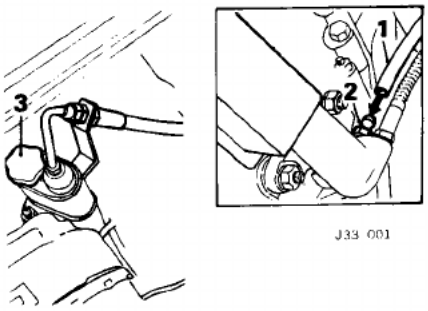


Fig. 1

Slacken the bleed nipple (2, Fig. 1) and pump the clutch pedal firmly up and down, pausing between each stroke.

CAUTION: The fluid should be topped up after every three pedal strokes.

Pump the clutch pedal until the fluid issuing from the bleed tube is free from air bubbles; tighten the bleed nipple.
Top up the reservoir (3, Fig. 1) and apply working pressure to the clutch pedal for two or three minutes then examine the system for leaks.

WARNING: Do not use fluid bled from system for topping up purposes as this will contain air. If fluid has been in use for some time it should be discarded. Fresh fluid bled from system may be used after allowing it to stand for a few hours to allow air bubbles to disperse.

FLUID HOSE

Remove and refit—R.H.D. only 33.15.13

Removing

Remove the nut securing the hose clip to the bell housing bolt.
Release the union nut (1, Fig. 2) securing the hose to the master cylinder pipe.

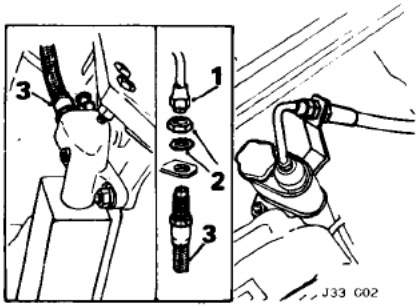


Fig. 2

Restrain the hose union at the bracket and remove the locknut and shakeproof washer (2, Fig. 2).
Unscrew the hose (3, Fig. 2) from the slave cylinder; plug or tape broken connections to prevent the ingress of dirt.

Refitting

CAUTION: Take great care to ensure that unions are not overtightened when refitting a flexible hose.

Connect the hose to the slave cylinder and ensuring that hose is not kinked or twisted, locate the other end in the bracket (1, Fig. 3).
Fit the shakeproof washer and locknut (2, Fig. 3); connect the master cylinder pipe (3, Fig. 3).
Remove the filler cap from the fluid reservoir and top up fluid to the correct level.

WARNING: Only Castrol/Girling Universal Brake Fluid may be used in the clutch hydraulic system. This fluid exceeds S.A.E. J1703/D.

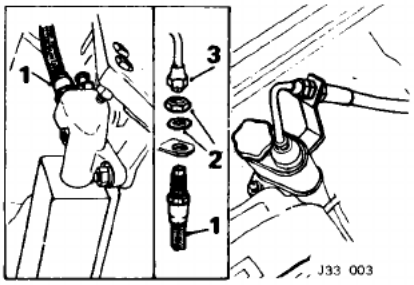


Fig. 3

Attach one end of a bleed tube (1, Fig. 4) to the slave cylinder bleed nipple.
Partially fill a clean container with hydraulic fluid and immerse the other end of the bleed tube in the fluid.

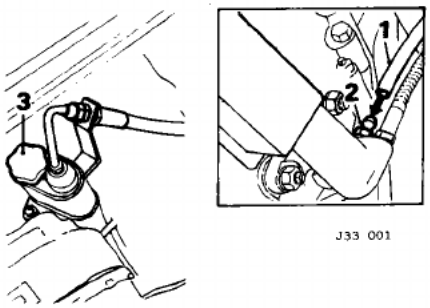


Fig. 4

Slacken the bleed nipple (2, Fig. 4) and pump the clutch pedal firmly up and down, pausing between each stroke.

CAUTION: The fluid should be topped up after every three pedal strokes.

Pump the clutch pedal until the fluid issuing from the bleed tube is free from air bubbles; tighten bleed nipple.
Top up the reservoir (3, Fig. 4) and apply working pressure to the clutch pedal for two to three minutes then examine the system for leaks.

WARNING: Do not use fluid bled from system for topping up purposes as this will contain air. If fluid has been in use for some time it should be discarded. Fresh fluid bled from system may be used after allowing it to stand for a few hours to allow air bubbles to disperse.

FLUID HOSE

Remove and refit—L.H.D. only **33.15.13**

Removing

Remove the banjo bolt and washer (1, Fig. 5) securing the flexible hose (2, Fig. 5) to the master cylinder.

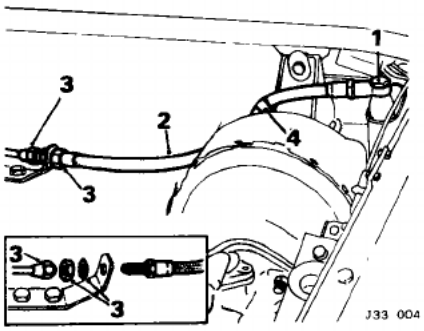


Fig. 5

Disconnect the bundy pipe and hose (3, Fig. 5) at the bracket.
Restrain the hose union and remove the locknut and shakeproof washer also the clip (4, Fig. 5) securing hose to brake servo stud.
Withdraw the hose and plug or tape all broken connections to prevent the ingress of dirt.

Refitting

CAUTION: Take great care to ensure that unions are not overtightened when refitting a flexible hose.

Locate threaded end of hose connector in the bracket and fit the shakeproof washer and locknut (1, Fig. 6).
Connect the bundy pipe (2, Fig. 6) and ensuring that the hose is not kinked or twisted, refit the banjo bolt and washer (3, Fig. 6); fit the clip (4, Fig. 6) to the brake servo mounting stud.

Remove the filler cap from the fluid reservoir and top up fluid to the correct level.

WARNING: Only Castrol/Girling Universal Brake Fluid may be used in the clutch hydraulic system. This fluid exceeds S.A.E. J1703/D.

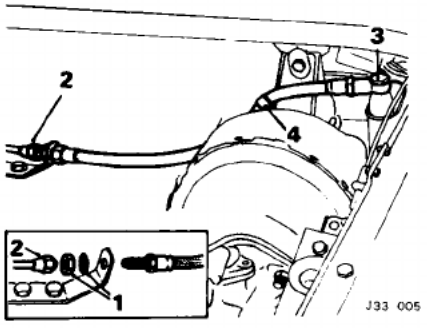


Fig. 6

Attach one end of a bleed tube (1, Fig. 7) to the slave cylinder bleed nipple.

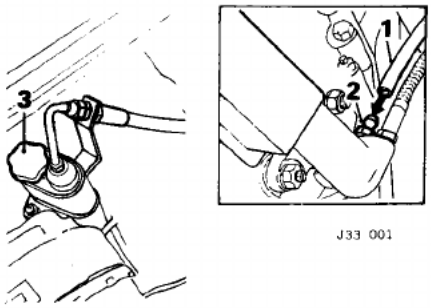


Fig. 7

Partially fill a clean container with hydraulic fluid and immerse the other end of the bleed tube in the fluid.
Slacken the bleed nipple (2, Fig. 7) and pump the clutch pedal slowly up and down, pausing between each stroke.

CAUTION: The fluid should be topped up after every three pedal strokes.

Pump the clutch pedal until the fluid issuing from the bleed tube is free from air bubbles; tighten the bleed nipple.
Top up the reservoir (3, Fig. 7) and apply working pressure to the clutch pedal for two to three minutes then examine the system for leaks.

WARNING: Do not use fluid bled from system for topping up purposes as this will contain air. If fluid has been in use for some time it should be discarded. Fresh fluid bled from system may be used after allowing it to stand for a few hours to allow air bubbles to disperse.

MASTER CYLINDER

Remove and refit **33.20.01**

Removing

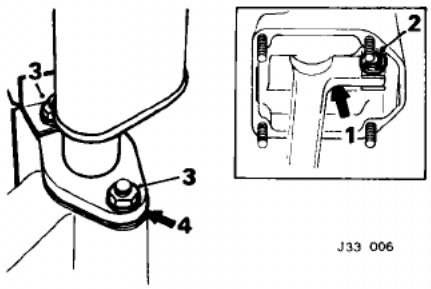


Fig. 8

Remove clevis pin clip (2, Fig. 8); withdraw clevis pin.
Remove the nuts and spring washers (3, Fig. 8) securing the master cylinder to the pedal box.
Lift off the master cylinder and retrieve any shims (4, Fig. 8) that may be fitted.

Refitting

Locate the master cylinder (1, Fig. 9), together with any shims (2, Fig. 9) that were removed, on the mounting studs.

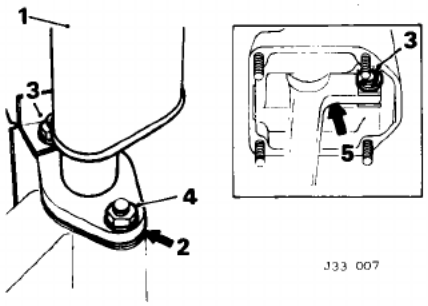


Fig. 9

Connect the master cylinder push-rod to the clutch pedal by means of the clevis pin (3, Fig. 9); refit the clevis clip.

NOTE: Should hole in the clevis not align with hole in pedal, add or subtract shims as necessary until the correct relationship is obtained.
(4, Fig. 9). Secure master cylinder with spring washers and nuts.

SLAVE CYLINDER

Remove and refit—R.H.D. only **33.35.01**

Removing

Remove the setscrews securing slave cylinder cover (1, Fig. 10) to the bell housing.
Slacken the union (3, Fig. 10) but DO NOT attempt to remove the flexible hose. Slide the rubber boot (4, Fig. 10) off the slave cylinder and along the push rod.
Remove the nuts and spring washers (5, Fig. 10) securing the slave cylinder to the bell housing; withdraw the slave cylinder until it can be drawn off the push rod.
Restrain the hose (6, Fig. 10) and screw the cylinder off the union; plug or tape all broken connections to prevent the ingress of dirt.
Release the push-rod from the withdrawal lever.

continued

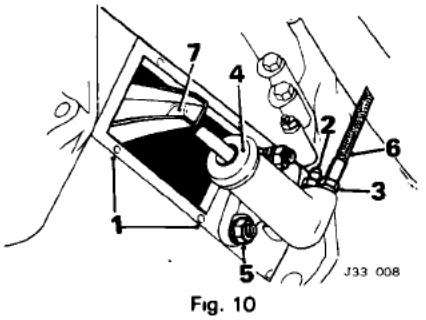


Fig. 10

Refitting

Restrain the hose (1, Fig. 11) and screw slave cylinder on to union.
Fit push-rod on to the withdrawal lever (2, Fig. 11) and slide the rubber boot (3, Fig. 11) along the rod.

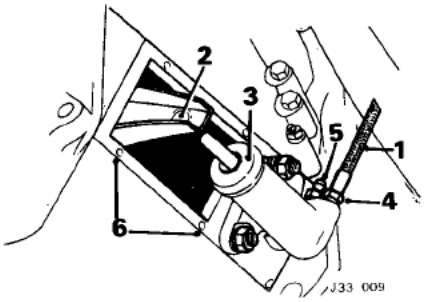


Fig. 11

Position push-rod inside the slave cylinder.
Refit the cylinder and tighten the hose union (4, Fig. 11).
Position the rubber boot on the cylinder.
Ensure that the cover is located correctly and secure it with the four setscrews (6, Fig. 11).

WARNING: Only Castrol/Girling Universal Brake Fluid may be used in the clutch hydraulic system. This fluid exceeds S.A.E. J1703/D.

Attach one end of a bleed tube (1, Fig. 12) to the slave cylinder bleed nipple.
Partially fill a clean container with hydraulic fluid and immerse the other end of the bleed tube in the fluid.

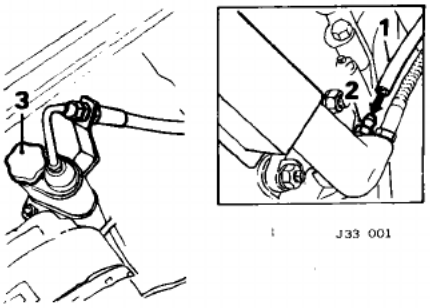


Fig. 12

Slacken the bleed nipple (2, Fig. 12) and pump the clutch pedal firmly up and down, pausing between each stroke.

CAUTION: The fluid should be topped up after every three pedal strokes.

Pump the clutch pedal until the fluid issuing from the bleed tube is free from air bubbles; tighten the bleed nipple.
Top up the reservoir (3, Fig. 12) and apply working pressure to the clutch pedal for two to three minutes then examine the system for leaks.

WARNING: Do not use fluid bled from system for topping up purposes as this will contain air. If fluid has been in use for some time it should be discarded. Fresh fluid bled from the system may be used after allowing it to stand for a few hours to allow air bubbles to disperse.

SLAVE CYLINDER

Remove and refit—L.H.D. only **33.35.01**

Removing

Remove the setscrews securing slave cylinder cover to the bell housing (1, Fig. 13).
Slide the rubber boot (2, Fig. 13) off the slave cylinder and along the push-rod.

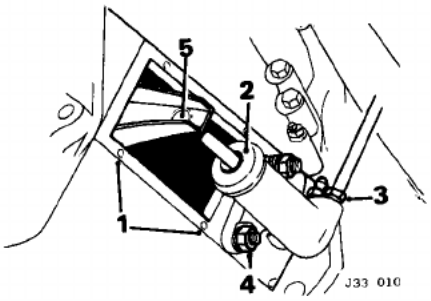


Fig. 13

Disconnect the hydraulic pipe (3, Fig. 13) and plug or tape all broken connections to prevent the ingress of dirt.
Remove the nuts and washers (4, Fig. 13) securing slave cylinder to the bell housing; withdraw cylinder slightly until it can be drawn off the push-rod.
Release the push-rod from the withdrawal lever (5, Fig. 13).

Refitting

Fit the push-rod on to the withdrawal lever (1, Fig. 14), slide rubber boot onto rod.
Position the push-rod inside the cylinder, refit cylinder.

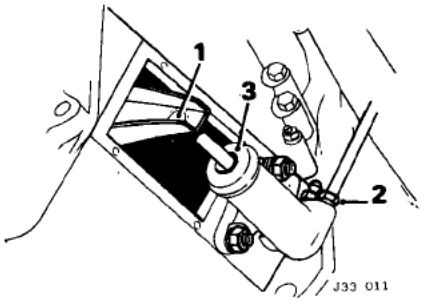


Fig. 14

Reconnect the hydraulic pipe (2, Fig. 14) and position the rubber boot (3, Fig. 14) on the cylinder.
Ensure that the cover is located correctly and secure it with the four setscrews.

WARNING: Only Castrol/Girling Universal Brake Fluid may be used in the clutch hydraulic system. This fluid exceeds S.A.E. J1703/D.

Attach one end of a bleed tube (1, Fig. 15) to the slave cylinder bleed nipple (2, Fig. 15).
Partially fill a clean container with hydraulic fluid and immerse the other end of the bleed tube in the fluid.

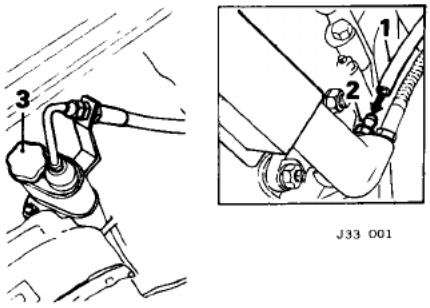


Fig. 15

Slacken the bleed nipple and pump the clutch pedal slowly up and down, pausing between each stroke.

CAUTION: The fluid should be topped up after every three pedal strokes.

Pump the clutch pedal until the fluid issuing from the bleed tube is free from air bubbles; tighten the bleed nipple.
Top up the reservoir (3, Fig. 15) and apply working pressure to the clutch pedal for two to three minutes then examine the system for leaks.

WARNING: Do not use fluid bled from system for topping up purposes as this will contain air. If fluid has been in use for some time it should be discarded. Fresh fluid bled from system may be used after allowing it to stand for a few hours to allow air bubbles to disperse.

CLUTCH ASSEMBLY

Remove and refit **33.10.01**

Service tools: Engine support tool MS 53A; Tangye Epco V.1000 transmission hoist; ST 1136 Offset spanner.

Removing

Drive the vehicle onto a ramp and disconnect the battery.
Unscrew the gear knob and withdraw the cigar lighter.

Remove the screws (1, Fig. 16) securing the centre console and raise console (2, Fig. 16) slightly to gain access to the electric window switches.

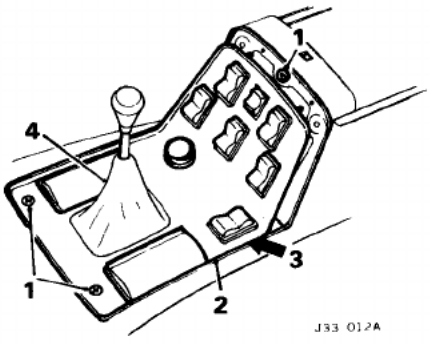


Fig. 16

Disconnect the harnesses at the multi-plug connectors and withdraw the console followed by the gear lever gaiter (4, Fig. 16) and rubber finisher.
Place gear lever in third gear position.

GENERAL SPECIFICATION

Crankshaft (EAC 5742)	As (C41200) except:		
	Journal diameter	69,84 mm to 69,85 mm	2.7497 to 2.7502 in
	Crankpins: Diameter	52,964 mm to 52,976 mm	2.0852 to 2.0857 in
Connecting Rods	Length between centres	196,85 mm	7.75 in
	Big-end bearing type	Vandervell VP2C	
	Bore for big-end bearing	56,72 to 56,73 mm	2.2330 to 2.2335 in
	Width of big-end bearing	24,38 to 24,77 mm	0.960 to 0.975 in
	Big-end diametrical clearance	0,025 to 0,069 mm	0.0010 to 0.0027 in
	Big-end side clearance	0,147 to 0,221 mm	0.0058 to 0.0087 in
	Small-end bush material	Vandervell VP10	
	Bore for small-end bush	25,4 ± 0,013 mm	1.0 ± 0.0005 in
	Width of small-end bush	26,92 to 27,43 mm	1.060 to 1.080 in
	Bore diameter of small-end bush	22,23 $^{+0.0038}_{-0.000}$ mm	0,87525 $^{+0.00015}_{-0.000}$ in
Pistons	Type	Solid skirt	
	Skirt clearance (measured midway down bore across bottom of piston skirt)	0,018 to 0,033 mm	0.0007 to 0.0013 in
Piston Rings	Number of compression rings	2	
	Number of oil control rings	1	
	Top compression ring width	2 mm nominal	0.0781 in nominal
	Second compression ring width	2 mm nominal	0.0781 in nominal
	Oil control ring width	Self expanding	
	Top compression ring thickness	4,35 to 4,60 mm	0.171 to 0.188 in
	Second compression ring thickness	4,35 to 4,60 mm	0.171 to 0.188 in
	Side clearance of top compression ring in groove	0,038 to 0,089 mm	0.0015 to 0.0035 in
	Side clearance of second compression ring in groove	0,038 to 0,089 mm	0.0015 to 0.0035 in
	Side clearance of oil control ring in groove	Self expanding	
Prior to Vin No. 8L 103481	Top compression ring gap in bore	0,38 to 0,51 mm	0.015 to 0.020 in
	Second compression ring gap in bore	0,23 to 0,35 mm	0.009 to 0.014 in
	Oil control ring gap in bore	0,38 to 1,14 mm	0.015 to 0.045 in
From Vin No. 8L 103481	Top ring	0,38 to 0,51 mm	0.015 to 0.020 in
	2nd ring	0,41 to 0,66 mm	0.016 to 0.026 in
	Oil control ring	0,31 to 0,61 mm	0.012 to 0.024 in
Gudgeon Pins	Type	Fully-floating	
	Length	75,95 to 76,2 mm	2.990 to 3.000 in
	Outside diameter: Marked Red	22,228 to 22,230 mm	0.8751 to 0.8752 in
	Marked Green	22,225 to 22,228 mm	0.8750 to 0.8751 in
Camshafts	Number of journals	4 per shaft	
	Number of bearings	4 per shaft (8 half bearings)	
	Type of bearings	White metal steel-backed, Vandervell	
	Journal diameter	25,387 to 25,375 mm	0.9995 to 0.9990 in
	Diametrical clearance	0,013 to 0,051 mm	0.0005 to 0.002 in
	Thrust taken	Front end of shafts	
Valves and Valve Springs	Inlet valve material	Silico chrome steel	
	Exhaust valve material	Austenitic steel	
	Inlet valve head diameter	47,50 to 47,75 mm	1.870 to 1.880 in
	Exhaust valve head diameter	41,15 to 41,40 mm	1.620 to 1.630 in
	Valve stem diameter: Inlet and exhaust	7,87 to 7,94 mm	0.310 to 0.3125 in
	Valve lift	9,53 mm	0.375 in
	Inlet valve clearance	0,305 to 0,356 mm	0.012 to 0.014 in
	Exhaust valve clearance	0,305 to 0,356 mm	0.012 to 0.014 in
	Outer valve spring free length	49,21 to 50,80	1.938 to 2.00 in
	Inner valve spring free length	42,07 to 43,66 mm	1.656 to 1.719 in