



MG RV8

r e p a i r

m a n u a l



MG RV8

REPAIR

MANUAL

General Information,
General Data,
Torque Wrench Settings,
Engine tuning Data,
Capacities, Fluids and Lubricants



Maintenance



Engine



Ignition System
Fuel System



Cooling



Manifold & Exhaust



Clutch
Manual Gearbox
Propellor Shaft and
Rear Axle



Steering



Front Suspension
Rear Suspension



Brakes



Body

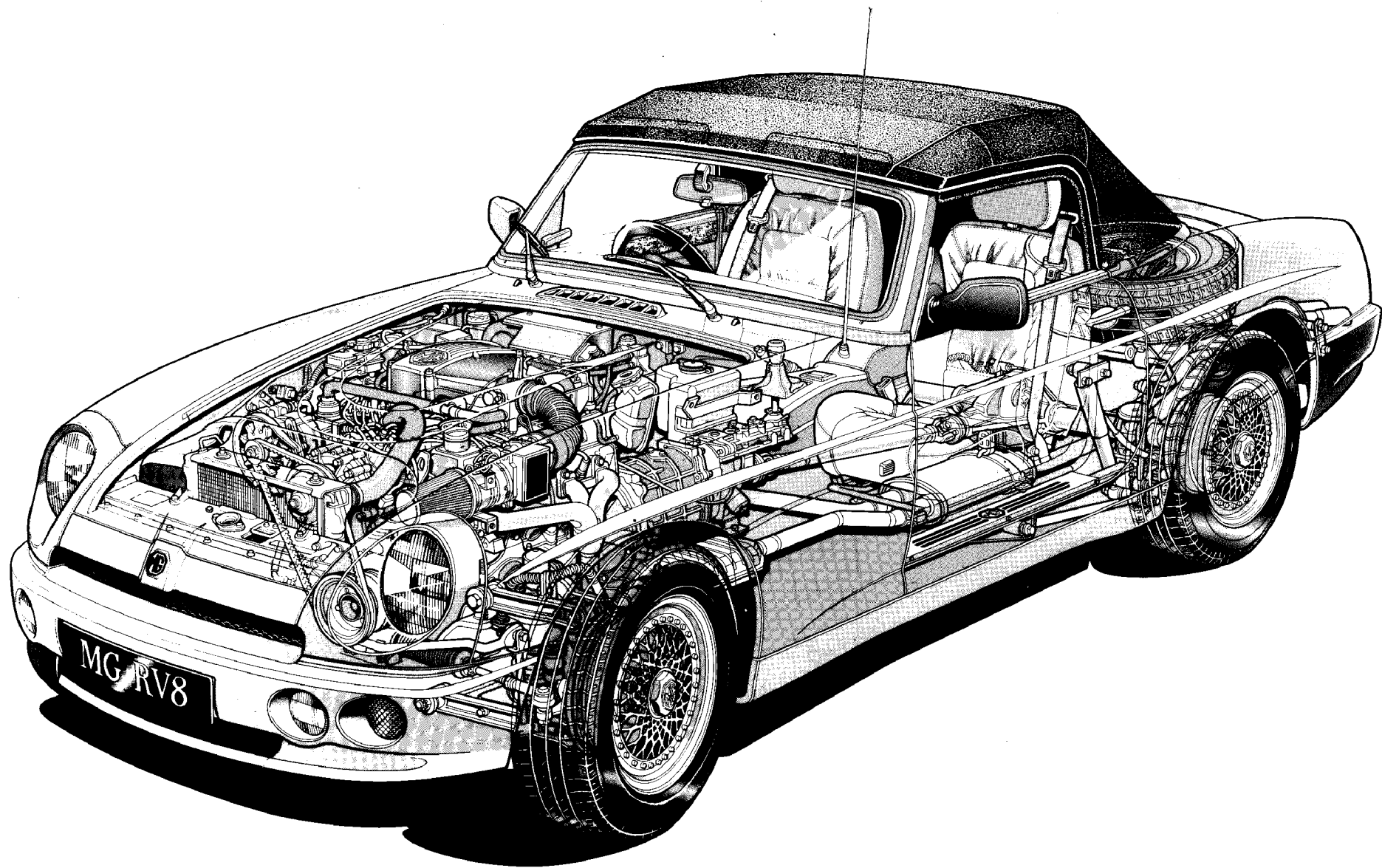


Heating & Ventilation



Wipers and Washers
Electrical
Instruments
Wiring Diagrams





INTRODUCTION

How to use this manual

To assist in the use of this manual the section title is given at the top and the relevant sub – section is given at the bottom of each page.

Each major section starts with a contents page, listing the information contained in the four sub – sections of: Description and Operation, Adjustments and Repairs. To assist filing of revised information each of the four sub – sections is numbered from page 1.

The Adjustments and Repairs sub – sections are illustrated. The individual items within an operation should be followed in the sequence in which they appear. Items numbers in the illustration are referred to in the text.

Adjustment and Repair operations include reference to Service Tool numbers and the associated illustration depicts the tool. Where usage is not obvious the tool is shown in use. Adjustment and Repair operations also include reference to wear limits, relevant data figures, and specialist information and useful assembly details. All fixings must be tightened to the correct torque as given in Torque Wrench Settings. In the majority of cases, each Adjustment or Repair operation is given its Repair Operation Time number for reference.

WARNINGS, CAUTIONS and Notes have the following meanings:

WARNING: *Procedures which must be followed precisely to avoid the possibility of injury.*

CAUTION: *Calls attention to procedures which must be followed to avoid damage to components.*

Note: *Gives helpful information.*

References

References to the LH or RH side given in this manual are made when viewing the vehicle from the rear. With the engine and gearbox assembly removed, the crankshaft pulley end of the engine is referred to as the front.

Operations covered in this manual do not include reference to testing the vehicle after repair. It is essential that work is inspected and tested after completion and if necessary a road test of the vehicle is carried out particularly where safety related items are concerned.

Dimensions

The dimensions quoted are to design engineering specification with Service limits where applicable.

During the period of running – in from new, certain adjustments may vary from the specification figures given in this manual. These will be reset by the Dealer at the appropriate service, and thereafter should be maintained at the figures specified in this manual.

REPAIRS AND REPLACEMENTS

When replacement parts are required it is essential that only Rover recommended parts are used.

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

Safety features and corrosion prevention treatments embodied in the car may be impaired if other than Rover recommended parts are fitted. In certain territories, legislation prohibits the fitting of parts not to the manufacturer's specification. Torque wrench setting figures given in this Manual must be used. Locking devices, where specified, must be fitted. If the efficiency of a locking device is impaired during removal it must be renewed.

Owners purchasing accessories while travelling abroad should ensure that the accessory and its fitted location on the car conform to legal requirements.

The Terms of the vehicle Warranty may be invalidated by the fitting of other than Rover recommended parts.

All Rover recommended parts have the full backing of the vehicle Warranty.

Rover Dealers are obliged to supply only Rover recommended parts.

SPECIFICATION

Rover are constantly seeking to improve the specification, design and production of their vehicles and alterations take place accordingly. While every effort has been made to ensure the accuracy of this Manual, it should not be regarded as an infallible guide to current specifications of any particular vehicle.

This Manual does not constitute an offer for sale of any particular vehicle. Rover Dealers are not agents of Rover and have no authority to bind the manufacturer by any expressed or implied undertaking or representation.

INTRODUCTION

ABBREVIATIONS AND SYMBOLS

After Bottom Dead Centre	ABDC	Maximum	max
After Top Dead Centre	ATDC	Mercury	Hg
Air conditioning	A/C	Metre	m
Air fuel ratio	AFR	Miles per hour	mph
Alternating current	ac	Millimetre	mm
Amperes	A	Minimum	min
Before Bottom Dead Centre	BBDC	Minus (of tolerance)	-
Before Top Dead Centre	BTDC	Minute (angle)	'
Bottom Dead Centre	BDC	Model Year	MY
British Standards	BS	Modular engine management system	MEMS
Carbon monoxide	CO	Multi - function unit	MFI
Celsius (Centigrade)	C	Multi - point injection	MPi
Centimetre	cm	Negative (electrical)	(-)
Chlorofluorocarbons	CFC's	Newton metre	Nm
Cubic centimetres	cm ³	Nitrogen oxides	NOx
Cubic inches	in ³	Number	No.
Cycles per minute	c/min	Outside diameter	o.dia.
Degree (angle)	deg. or °	Percentage	%
Degree (temperature)	deg. or °	Plus or minus	±
Dial test indicator	DTI	Plus (tolerance)	+
Diameter	dia.	Positive (electrical)	+
Direct current	dc	Positive crankcase ventilation	PCV
Double overhead camshaft	DOHC	Positive temperature coefficient	PTC
Electronic Control Unit	ECU	Pounds force per inch squared	lbf/in ²
Electronic fuel injection	EFI	Pound inches	lbf in
Exhaust gas recirculation	EGR	Pounds mass	lb
Electronic air control valve	EACV	Power assisted steering	PAS
Fifth	5th	Radius	r
First	1st	Ratio	:
Fourth	4th	Reference	ref.
Frequency Modulation	FM	Revolutions per minute	rev/min
Gallons (Imperial)	gal	Right - hand	RH
Gramme (mass)	g	Right - hand drive	RHD
High compression	hc	Rover Engineering Standards	RES
High tension (electrical)	HT or ht	Second (angle)	"
Hour	h	Second (numerical order)	2nd
Hydrocarbons	HC	Single carburettor	SC
Internal diameter	i.dia.	Single overhead camshaft	SOHC
International Organisation for Standardisation	ISO	Specific gravity	sp.gr
Kilometre	km	Square centimetres	cm ²
Kilogramme	kg	Square inches	in ²
Kilohertz	kHz	Standard	std.
King pin inclination	kpi	Synchronizer/synchromesh	synchro
Left - hand	LH	Third	3rd
Left - hand drive	LHD	Thousand	k
Light emitting diode	LED	Top dead centre	TDC
Litre	l	United Kingdom	UK
Low Compression	lc	Vehicle identification number	VIN
Low tension	lt	Volt	V
		Watt	W

GENERAL INFORMATION



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GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER

Location

The Vehicle Identification Number (V.I.N.) is stamped on a plate attached to the bonnet lock platform.

Vehicle identification number

S A R R A W B M B M G 900000

Geographic area _____

Country _____

Manufacturer _____

Marque/Model _____

Class _____

Body _____

Engine _____

Transmission and Steering _____

Model change _____

Assembly plant _____

Serial number _____

ROVER GROUP LIMITED			
D E V E L O P M E N T			
			kg
			kg
1 -			kg
2 -			kg
PAINT		TRIM	
PART No		PART No	

RM0527 C

Paint and Trim colour codes

3 - letter codes identifying the original Paint and Trim colours are stamped on the V.I.N. plate

Paint

C O F

Basic colour _____

Marque identifier _____

Colour/Shade name _____

Trim

S M J

Basic colour _____

Marque identifier _____

Colour/Shade name _____

IDENTIFICATION NUMBER LOCATIONS

Engine number:

Stamped on the cylinder block between numbers 3 and 5 cylinders.

Gearbox number:

Stamped on the bottom R.H. side of the gearbox housing.

Rear axle number:

Stamped on rear face of differential housing

Body number:

The body number is stamped on a plate fixed to the bonnet lock platform.

GENERAL PRECAUTIONS AND FITTING INSTRUCTIONS

Ignition system safety precautions

WARNING: Before commencing work on an ignition system, all high tension terminals, adapters and diagnostic equipment for testing should be inspected to ensure that they are adequately insulated and shielded to prevent accidental personal contacts and minimise the risk of shock. Wearers of surgically implanted pacemaker devices should not be in close proximity to ignition circuits or diagnostic equipment.

Dangerous substances

WARNING: Many liquids and other substances used in motor vehicles are poisonous and should under no circumstances be consumed and should, as far as possible, be kept from contact with the skin. These substances among others include acid, anti - freeze, asbestos, brake fluid, fuel, windscreen washer additives, lubricants, refrigerant and various adhesives.

Always read carefully the instructions printed on labels or stamped on components and obey them implicitly. Such instructions are included for reasons of your health and personal safety. Never disregard them.

Used engine oils: Prolonged exposure to used engine oils can cause serious skin disorders, avoid excessive skin contact and always adhere to the following recommendations:

Engine oils

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

Health Protection Precautions

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Do not put oily rags in pockets.
- Avoid contaminating clothes, particularly underpants, with oil.
- Overalls must be cleaned regularly. Discard heavily soiled clothing and oil impregnated footwear.
- First aid treatment should be obtained immediately for open cuts and wounds.

- Use barrier creams, applying before each work period, to help the removal of oil from the skin.
- Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
- Do not use petrol, kerosene, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practicable, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.

Environmental Protection Precautions

It is illegal to pour used oil on to the ground, down sewers or drains, or into water courses.

Burning of used engine oil in small space heaters or boilers can be recommended only for units of approved design. The heating system must meet the regulatory standards of HMIP for small burners of less than 0.4 MW. If in doubt check with the appropriate local authority and/or manufacturer of approved appliance.

Dispose of used oil and used filters through authorised waste disposal contractors to licensed waste disposal sites, or to the waste oil reclamation trade. If in doubt, contact the Local Authority for advice on disposal facilities.

SAFETY INSTRUCTIONS

Jacking

The recommended jacking points are given in **LIFTING AND TOWING**, always ensure that any lifting apparatus has adequate load and safety capacity for the weight to be lifted. Ensure the vehicle is standing on level ground prior to lifting or jacking. Apply the handbrake and chock the wheels.

Never rely on a jack as the sole means of support when working beneath the vehicle. Use additional safety supports beneath the vehicle.

Do not leave tools, lifting equipment, spilt oil, etc. around or on the work bench area.

Precautions against damage

Always fit wing and seat covers before commencing work. Avoid spilling brake fluid or battery acid on paintwork. Wash off with water immediately if this occurs.

GENERAL INFORMATION

Disconnect the battery earth lead before starting work, see **ELECTRICAL PRECAUTIONS**.

Always use the recommended service tool or a satisfactory equivalent where specified.

Protect exposed bearing and sealing surfaces and screw threads from damage.

Brake shoes and pads

WARNING: Always fit the correct grade and specification of brake linings and renew brake pads and brake shoes in axle sets only.

Brake hydraulics

WARNING: It is imperative that the correct brake fittings are used and that threads of components are compatible.

Always use two spanners when slackening or tightening brake pipe or hose connections. Ensure that hoses run in a natural curve and are not kinked or twisted. Fit brake pipes securely in their retaining clips and ensure that the pipe run cannot contact a potential chafing point.

Containers used for hydraulic fluid must be kept absolutely clean. Do not store hydraulic fluid in an unsealed container, it will absorb water and in this condition would be dangerous to use. 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 from the system. Always use clean brake fluid or a recommended alternative to clean hydraulic components. Fit a blanking cap to an hydraulic union and a plug to its socket after removal to prevent the ingress of dirt. Absolute cleanliness must be observed with hydraulic components.

Engine coolant caps and plugs

Extreme care is necessary when removing engine coolant caps and plugs when the engine is hot and especially if it is overheated. To avoid the possibility of scalding allow the engine to cool before attempting coolant cap or plug removal.

Cleaning components

Always use the recommended cleaning agent or equivalent.

Do not use degreasing equipment for components containing items which could be damaged by the use of this process. Whenever possible clean components and the area surrounding them before removal. Always observe scrupulous cleanliness when cleaning dismantled components.

Joints and joint faces

Fit joints dry unless otherwise specified in this Manual.

If gaskets and/or jointing compound is recommended for use; remove all traces of old jointing material prior to reassembly. Do not use a tool which will damage the joint faces and smooth out any scratches or burrs on the joint faces using an oil stone. Do not allow dirt or jointing material to enter any tapped holes.

Prior to reassembly, blow through any pipes, channels or crevices with compressed air.

Screw threads

B.A.	B.S.W.	B.S.F.	U.N.C.	U.N.F.	M
2	$\frac{3}{16}$	$\frac{3}{16}$	10	10	M5
1			12	12	M6
0	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	
	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	M8
	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	M10
	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	
	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	M12

RM1294

Five thread forms replaced by – ISO Metric UNF, UNC and Metric threads to ISO standards are used.

Damaged nuts, bolts and screws must always be discarded.

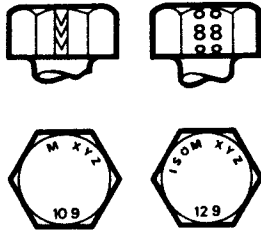
Cleaning up damaged threads with a die or tap impairs the strength and closeness of fit of the threads and is not recommended.

Castellated nuts must not be slackened back to accept a split – pin, except in those recommended cases when this forms part of an adjustment.

Do not allow oil or grease 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 retighten to the correct torque figure.

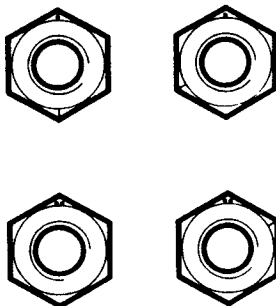


4NC 362

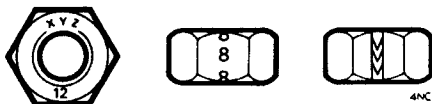
Bolt identification

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 the head.

In addition to marks to identify the manufacturer, the head is also marked with symbols to indicate the strength grade, e.g. 8.8; 10.9; 12.9; 14.9. As an alternative, some bolts and screws have the M and strength grade symbol on the flats of the hexagon.



4NC 360



4NC 361

Nut identification

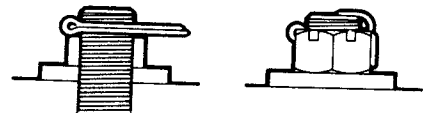
A nut with an ISO metric thread is marked on one face or on one of the flats of the hexagon with the strength grade symbol 8, 12, or 14. Some nuts with a strength grade 4, 5 or 6 are also marked and some have the metric symbol M on the flat opposite the strength grade marking.

A clock face system is used as an alternative method of indicating the strength grade. The external chambers 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.

Locking devices

Always release locking tabs and fit new locking washers, do not re-use locking tabs. Always use a backing spanner when slackening or tightening brake and fuel pipe unions.



4NC 608

Fitting a split pin

Always fit new split-pins of the correct size for the hole in the bolt or stud. Do not slacken back nut to enter split-pin.

Always fit new roll pins of an interference fit in the hole.

Always fit new circlips of the correct size for the groove.

Self-locking nuts can be re-used, providing resistance can be felt when the locking portion passes over the thread of the bolt or stud.

DO NOT re-use self-locking nuts in critical locations, e.g. engine bearings. Always use the correct replacement self-locking nut.



RM2652

Encapsulated bolt

An encapsulated bolt can be identified by a coloured section of thread which is treated with a locking agent. This can either be nylon, which covers approximately 180° of thread or an adhesive which is applied around the full 360°.

Unless a specified repair procedure states otherwise, encapsulated bolts can be reused provided the threads are undamaged.

Remove loose adhesive from the bolt and housing threads, ensure threads are clean and free of oil and grease. Apply an approved adhesive.

GENERAL INFORMATION

Fit a new encapsulated bolt, or if not available a bolt of equivalent specification treated with an approved adhesive.

Oil seals

Always renew oil seals which have been removed from their working location either as an individual component or as part of an assembly.

Ensure the surface on which the new seal is to run is free of burrs or scratches. Renew the component if the original sealing surface cannot be completely restored.

Protect the seal from any surface which could cause damage over which it has to pass when being fitted. Use a protective sleeve or tape to cover the relevant surface.

Lubricate the sealing lips with a recommended lubricant before use to prevent damage in initial use. On dual lipped seals, smear the area between the lips with grease.

Use the recommended service tool to fit an oil seal.

If the correct service tool is not available, use a suitable tube approximately 0.4 mm smaller than the outside diameter of the seal.

Press or drift the seal in to the depth of its housing, with the sealing lip facing the lubricant to be retained if the housing is shouldered, or flush with the face of the housing where no shoulder is provided.

Service tools and garage equipment

Special service tools have been developed to facilitate removal, dismantling and assembly of mechanical components in a cost effective and practical manner without causing damage. Some operations in this Repair Manual cannot be carried out without the aid of the relevant service tools.

A range of 'MICROCHECK' programme cards have been developed to provide a means of fast effective diagnosis of faults on electronic systems currently fitted to ROVER vehicles.

It is essential that operators familiarise themselves with the components of the system to be checked and the instructions for the relevant 'MICROCHECK' programme card before commencing diagnosis.

Where specific garage equipment is required for diagnosis and repair, reference will be made in this manual to the Service Tools and Equipment Programme where details of the equipment recommended by Rover Service may be found.

Body repairs

Any damage found, that would affect the corrosion resistance of the vehicle during the Warranty period must be rectified by an authorised Rover Dealer to the standards, and by the methods, detailed in the Body Repair Manual.

Replacement body panels

Body panels are supplied coated in cathodic electrocoat primer.

Synthetic rubber

Many 'O' ring seals, hoses and flexible pipes and other similar items which appear to be natural rubber, are in fact, made of synthetic materials called Fluoroelastomers. Under normal operating conditions this material is safe and does not present a health hazard. However, if the material is damaged by fire or excessive heating, it can break down and produce highly corrosive Hydrofluoric acid which can cause serious burns on contact with skin. If skin contact does occur:

- Remove any contaminated clothing immediately.
- Irrigate effected area with a copious amount of cold water or limewater for 15 to 60 minutes.
- Obtain medical assistance immediately

Should the material be in a burnt or over - heated condition handle only with seamless industrial gloves. Decontaminate and dispose of gloves immediately after use.

Alloy wheels

Apply a coating of lithium based grease to spigot bore of wheel prior to refitting.

GENERAL INFORMATION

FUEL HANDLING PRECAUTIONS

General

The following information provides basic precautions which must be observed if petrol (gasoline) is to be handled safely. It also outlines other areas of risk which must not be ignored. This information is issued for basic guidance only, and if in doubt appropriate enquiries should be made of your local Fire Officer.

Petrol – Gasoline

Petrol/gasoline vapour is highly flammable and in confined spaces is also explosive and toxic.

When petrol/gasoline evaporates it produces 150 times its own volume in vapour which when diluted with air becomes a readily ignitable mixture. The vapour is heavier than air and will always fall to the lowest level. It can readily be distributed throughout a workshop by air currents; consequently, even a small spillage of petrol/gasoline is potentially very dangerous.

Always have a fire extinguisher containing FOAM, CO₂, GAS or POWDER close at hand when handling or draining fuel or when dismantling fuel systems and in other areas where fuel containers are stored.

Always disconnect the vehicle battery before carrying out dismantling or draining work on a fuel system.

Whenever petrol/gasoline is being handled, drained or stored or when fuel systems are being dismantled, all forms of ignition must be extinguished or removed; any leadlamps must be flameproof and kept clear of spillage.

WARNING: No one should be permitted to repair components associated with petrol/gasoline without first having specialist training.

Fuel tank draining

WARNING: Petrol/gasoline must not be extracted or drained from any vehicle whilst it is standing over a pit.

Draining or extraction of petrol/gasoline from a vehicle fuel tank must be carried out in a well ventilated area.

The receptacle used to contain the petrol/gasoline must be more than adequate for the full amount of fuel to be extracted or drained. The receptacle should be clearly marked with its contents, and placed in a safe storage area which meets the requirements of local authority regulations.

CAUTION: When petrol/gasoline has been extracted or drained from a fuel tank the precautions governing naked lights and ignition sources should be maintained.

Fuel tank removal

When the fuel line is secured to the fuel tank outlet by a spring steel clip, the clip must be released before the fuel line is disconnected or the fuel tank is removed. This procedure will avoid the possibility of residual petrol fumes in the fuel tank being ignited when the clip is released.

As an added precaution fuel tanks should have a 'PETROL (GASOLINE) VAPOUR' warning label attached to them as soon as they are removed from the vehicle.

Fuel tank repairs

Under no circumstances should a repair to any fuel tank involving heat treatment be carried out without first rendering the tank SAFE, by using one of the following methods:

a. STEAMING: With the filler cap and tank unit removed, empty the tank. Steam the tank for at least two hours with low pressure steam. Position the tank so that condensation can drain away freely, ensuring that any sediment and sludge not volatilized by the steam is washed out during the steaming process.

b. BOILING: With the filler cap and tank unit removed, empty the tank. Immerse the tank completely in boiling water containing an effective alkaline degreasing agent or a detergent, with the water filling and also surrounding the tank for at least two hours.

After steaming or boiling, a signed and dated label to this effect should be attached to the tank.

Body and chassis repairs

When a body or chassis repairs involve the use of heat, all fuel pipes which run in the vicinity of the repair area must be removed, and the tank outlet plugged, BEFORE HEAT IS APPLIED. If the repair is in the vicinity of the fuel tank, the tank must be removed.

Plastic fuel pipes are particularly susceptible to heat, even at relatively low temperature, and can be melted by heat conducted from some distance away.

Fuel lines or tanks must not be removed whilst the vehicle is over an inspection pit.

ELECTRICAL PRECAUTIONS

The following guidelines are intended to ensure the safety of the operator whilst preventing damage to the electrical and electronic components fitted to the vehicle. Where necessary specific precautions are detailed in the relevant sections of this manual which should be referred to prior to commencing repair operations.

Equipment – Prior to commencing any test procedure on the vehicle ensure that the relevant test equipment is working correctly and any harness or connectors are in good condition, this particularly applies to mains lead and plugs.

WARNING: *Before commencing work on an ignition system all high tension terminals, adapters and diagnostic equipment for testing should be inspected to ensure that they are adequately insulated and shielded to prevent accidental personal contacts and minimise the risk of shock. Wearers of surgically implanted pacemaker devices should not be in close proximity to ignition circuits or diagnostic equipment.*

Polarity – Never reverse connect the vehicle battery and always observe the correct polarity when connecting test equipment.

High Voltage Circuits – Whenever disconnecting live h.t. circuits always use insulated pliers and never allow the open end of the h.t. lead to come into contact with other components particularly ECU's. Exercise caution when measuring the voltage on the coil terminals while the engine is running, high voltage spikes can occur on these terminals.

Connectors and Harness – The engine compartment of a vehicle is a particularly hostile environment for electrical components and connectors. Always ensure these items are dry and oil free before disconnecting and connecting test equipment. Never force connectors apart either by using tools or by pulling on the wiring harness. Always ensure locking tabs are disengaged before removal and not orientation to enable correct reconnection. Ensure that any protective covers and substances are replaced if disturbed.

Having confirmed a component to be faulty switch off the ignition and disconnect the battery. Remove the component and support the disconnected harness. When replacing the component keep oily hands away from electrical connection areas and push connectors home until any locking tabs fully engage.

Battery disconnecting

Before disconnecting the battery, switch off all electrical equipment. If the radio is to be serviced, ensure the security code has been deactivated.

CAUTION: *To prevent damage to electrical components ALWAYS disconnect the battery when working on the vehicle electrical system. The earth lead must be disconnected first and reconnected last.*

Always ensure that battery leads are routed correctly and are not close to any potential chafing points.

Battery charging

Recharge the battery out of the vehicle and keep the top well ventilated. While being charged or discharged, and for approximately fifteen minutes afterwards, batteries emit hydrogen gas. This gas is inflammable.

Always ensure any battery charging area is well ventilated and that every precautions is taken to avoid naked flames and sparks.

Disciplines

Switch off ignition prior to making any connection or disconnection in the system as electrical surge caused by disconnecting 'live' connections can damage electronic components.

Ensure hands and work surfaces are clean and free of grease, swarf, etc. as grease collects dirt which can cause tracking or high – resistance contacts.

When handling printed circuit boards, treat them as you would a hi – fi record – hold by the edges only; note that some electronic components are susceptible to body static.

Connectors should never be subjected to forced removal or refit, especially inter – board connectors, damaged contacts will cause short – circuit and open – circuit conditions.

Prior to commencing test, and periodically during test, touch a good earth, i.e. cigar lighter socket, to discharge body static as some electronic components are vulnerable to static electricity.

Grease for electrical connectors

All under bonnet and under body connectors are protected against corrosion by the application of a special grease on production. Should connectors be disturbed in service or repaired or replaced, a grease of this type, available in 150 gm tubes under Part No. BAU 5811, should again be applied.

Note: *The use of other greases must be avoided as they can migrate into relays, switches etc. contaminating the contacts and leading to intermittent operation or failure.*

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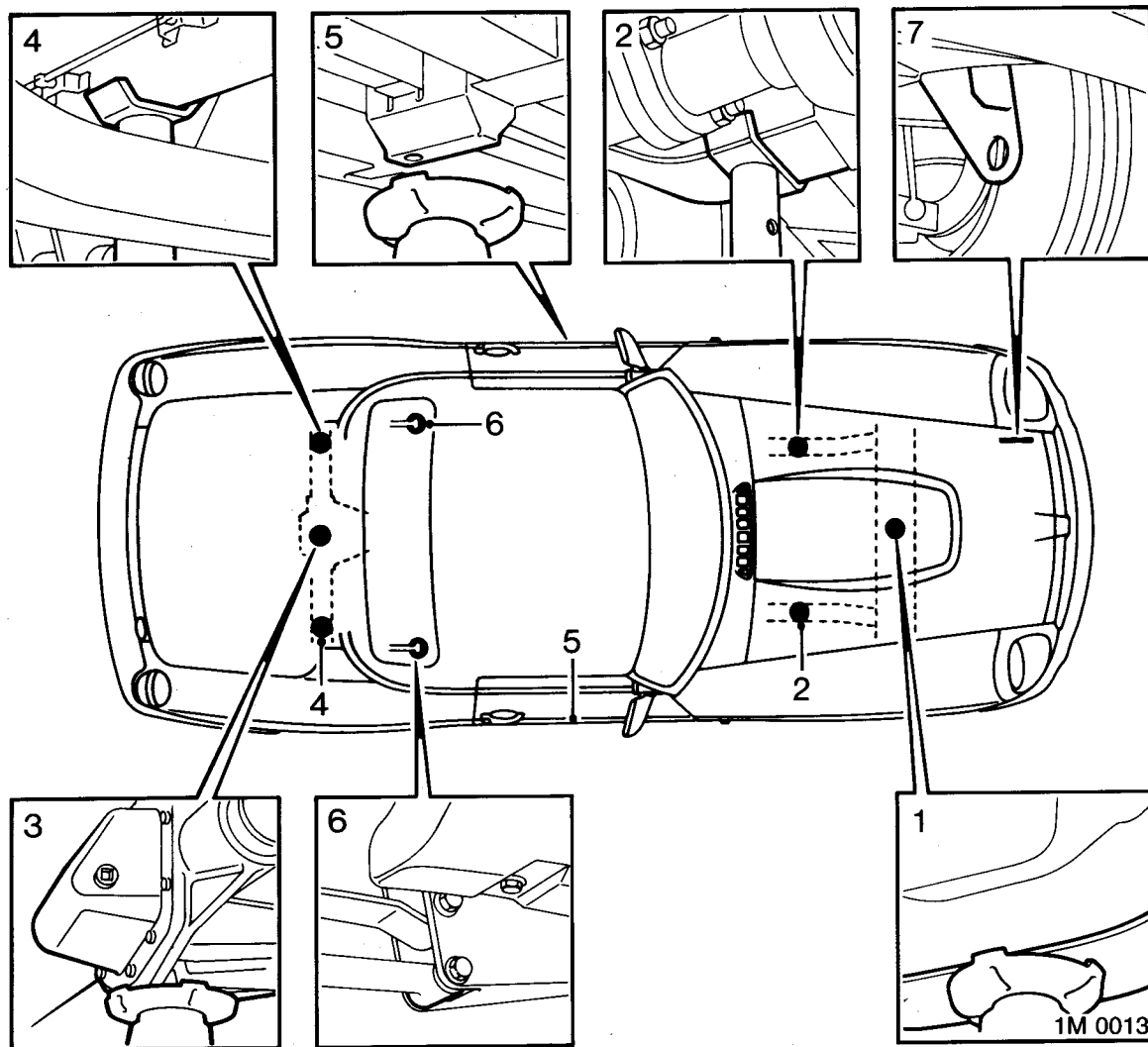
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JACKING, SUPPORTING AND TOWING

WARNING: In accordance with normal workshop practice, and to avoid the possibility of damage or personal injury, work must not be carried out on or under a vehicle when it is supported solely on a jack.

WORKSHOP JACK

Front: Locate the jack head under the front cross – member (1).

Position safety supports under both longitudinals (2)

Rear: Locate the jack head under differential housing (3).

Position safety supports under rear axle tubes (4).

Side: Locate the jack head pad under the reinforced area (5) of the sill and position safety supports under longitudinal (2), and axle tube (4).



WHEEL - FREE LIFT

If crossbeams are available, locate the pads under the longitudinals (2) and torque control arm front attachment points (6).

CAUTION: Do not allow pads to contact torque control arms.

If only longitudinal beams are available, locate the beams under the longitudinals and rear axle tubes with the lifting pads at position (2), and (4). Raise the lift a few inches and ensure the vehicle is firmly supported. Raise the lift to full height and inspect the lifting points for security.

RECOVERY

It is recommended that a recovery trailer be used.

CAUTION: On no account must the vehicle be towed with the rear wheels on the ground and the propeller shaft connected, or if the rear axle is faulty.

If in an emergency the vehicle must be towed on its own wheels, disconnect the propeller shaft from the rear axle and use the front lashing eye (7). Before towing commences release the

handbrake, place the gear lever in neutral and the ignition switch at 'I'. Do not tow at a greater speed than 30 m.p.h., 50 km/h.

WARNING: To ensure that the steering does not lock when the vehicle is being towed, it is essential that the ignition key is turned to position 'I', and remains there while the vehicle is moving.

Ensure the following precautions are observed:

Do not tow with the propeller shaft connected, or if the rear axle is faulty.

Do not tow if a wheel is touching the body or suspension.

Ensure the handbrake is released.

Remember that greater effort than normal will be necessary to apply the brakes if the vehicle is being towed without the engine running.

TOWING

This vehicle should not be used to tow another vehicle or trailer.

ENGINE

Type	V8
Cylinder arrangement	Eight – two banks of four
Bore – liner	94.00 mm
Stroke	71.12 mm
Capacity	3948 cm ³
Firing order	1 – 8 – 4 – 3 – 6 – 5 – 7 – 2
Rotation	Clockwise

Valve Timing

Inlet: Opens at	32° B.T.D.C.
Closes at	73° A.B.D.C.
Exhaust: Opens at	70° B.B.D.C.
Closes at	35° A.T.D.C.
Valve open period	285°

Lubrication

System Type	Wet sump, camshaft driven gear pump
Pressure at 2400 rev/min	2.05 – 2.70 bar (above 82°C)
Oil pressure warning light switch opens	0.25 bar
Oil filter	Full flow with renewable element cartridge

FUEL SYSTEM

Electronic fuel injection	See Engine Tuning Data
---------------------------------	------------------------

Fuel Pump

Type	Electric
Pump delivery pressure	4.1 bar max
Regulated injection pressure	2.5 bar

COOLING SYSTEM

Pressure cap opens	1.03 bar
Thermostat open	92°C
Starts to open	82°C
Cooling fan switch on temperature	107°C
Cooling fan switch off temperature	100°C

CLUTCH

Type	Diaphragm spring, hydraulic operated self adjusting
Clutch plate diameter	240 mm
Master cylinder	
Cylinder bore diameter	19 mm

INFORMATION

GEARBOX

Gearbox code	LT 77S
Gear ratios:	
Fifth	.792 : 1
Fourth	1.00 : 1
Third	1.39 : 1
Second	2.08 : 1
First	3.32 : 1
Reverse	3.43 : 1

PROPELLER SHAFT

Type	Flange type, 50 mm tube
Universal joints	Needle roller, sealed for life

REAR AXLE

Code	12HA
Type	Salisbury hypoid gear drive, torque biasing, semi - floating
Ratio	3.31:1
Road speed at 1000 rev/min in top gear	28.10 m.p.h.

STEERING

Front wheel alignment	0° 5' ± 20' Toe - in
Front wheel camber	0° 24' ± 30' positive
Front wheel castor	3° 48' ± 54'
King pin inclination	7° 12' ± 24'
Steering angle of outer wheel with inner wheel at 20°	18° 25' ± 1°
Turns lock to lock	3.1
Rear wheel camber	0° ± 20'
Rear wheel alignment	0° ± 20' total

Note: Steering and Suspension geometry settings are for a vehicle at unladen weight with full fuel tank, excluding options

SUSPENSION

Front

Type	Independent, double wishbone with coil spring, telescopic damper and anti - roll bar
Nominal height to wheel arch from hub centre at unladen weight with full fuel tank, excluding options	355 ± 10 mm

Rear

Type	Live axle with taper leaf springs, torque control arms, telescopic dampers and anti - roll bar
Nominal height to wheel arch from hub centre unladen weight with full fuel tank, excluding options	372 ± 10 mm

BRAKES

Front brakes

Type	Ventilated disc with 4 pot calipers
Disc diameter	270 mm
Minimum disc thickness	24.25 mm
Pad minimum thickness (including backplate)	6.5 mm

Rear brakes

Type	Drum
Drum inside diameter	229 mm
Lining minimum thickness	1.5 mm

Brake servo

Servo boost ratio	2.56 : 1
-------------------------	----------

Master cylinder

Cylinder bore diameter	20.64 mm
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WHEELS

Rim size/type	6J x 15 - Alloy
---------------------	-----------------

TYRES

Size	205/65 - ZR15
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Pressures (cold):

Size	Loading Condition		bar	kg/cm ²	lbf/in ²
205/65 - ZR15	All conditions	Front	1.5	1.5	22
		Rear	1.6	1.6	24

ELECTRICAL

System	12 volt, negative earth
--------------	-------------------------

Battery

Type - Maintenance free	063S
Cold crank capacity	405 amps
Reserve capacity	70 minutes

Alternator

Make/Type	Magneti Marelli A127 - 65
Maximum output	65 amps at 6000 rev/min
Regulator	21 TR

Starter motor

Make/Type	Bosch AMR 2165 Pre - engaged
Power	1.4 kW

INFORMATION

DIMENSIONS

Overall length	4.01 m
Overall width (includes mirrors)	1.69 m
Overall height:*	1.32 m
Ground clearance:*	130 mm
Wheelbase	2.32 m
Turning circle, kerb to kerb	10.95 m
Track:	
Front	1182 ± 8 mm
Rear	1320 ± 4 mm

* At unladen weight (fuel tank full, excluding options)

WEIGHTS

Unladen (fuel tank full, excluding options)	1130 kg
Maximum gross vehicle weight	1310 kg

Model: MG RV8

Year: 1993 on

Engine

Type/Capacity	V8/3948 cm ³
Firing order	1-8-4-3-6-5-7-2
Cylinder numbers:	
Left bank	1-3-5-7
Right bank	2-4-6-8
Number 1 cylinder location	Pulley end of left bank
Compression ratio	9.35 : 1
Idle speed:	
Controlled by fuel ECU	700 ± 25 rev/min
Setting with air valve closed	500 ± 50
Exhaust gas CO content at idle	0.5 to 1.0% max
Ignition timing:	
At 800 rev/min maximum*+	5° ± 1° B.T.D.C.
Timing marks	Crankshaft damper

Distributor:

Make/type	Lucas 35DLM8 electronic
Serial No/Rotation	42565A/Clockwise

Ignition coil

Type	Bosch 0-221-122-392
Primary resistance at 20° C	8 ohm

Spark Plugs

Type	Champion RN11YCC
Gap	0.84 - 0.96 mm

Electronic Fuel Injection

Type	Indirect multi-point injection with ECU control and hot-wire type air-flow sensor
Fuel ECU	Lucas 14CUX
Air flow sensor	Lucas 5AM
Fuel pressure regulator	Lucas 8RV
Fuel pressure	2.5 bar
Throttle potentiometer	Lucas 215SA
Injectors	Lucas 8NJ
Bypass air valve stepper motor	Lucas 2ACM
Coolant temperature sensor	Lucas 3TT
Fuel temperature sensor	Lucas 6TT
Oxygen sensor	Lucas 3LS
Fuel grade	95 RON minimum - UNLEADED

CAUTION: Serious damage to the engine may occur if a lower octane number fuel than recommended is used.

* Vacuum disconnected

+ Crankshaft degrees and rev/min





GENERAL

– for bolts and nuts not otherwise specified

M5	4 Nm
M6	6 Nm
M8	18 Nm
M10	35 Nm
M12	65 Nm
M14	80 Nm
M16	130 Nm
1/4 UNC/UNF	8 Nm/10 Nm
5/16 UNC and UNF	25 Nm
3/8 UNC and UNF	40 Nm
7/16 UNC and UNF	75 Nm
1/2 UNC and UNF	90 Nm
5/8 UNC and UNF	135 Nm

MAINTENANCE

Refer to appropriate Sections

ENGINE

Crankshaft pulley bolt	270 Nm
Timing cover to cylinder block bolts	25 Nm
Camshaft gear bolt	55 Nm
Rocker cover bolts	7 Nm
Rocker shaft to cylinder head bolts	38 Nm
Cylinder head bolts:*	
Outer row	60 Nm
Centre row	90 Nm
Inner row	90 Nm
Lifting eye to cylinder head bolts	25 Nm
Flywheel bolts	110 Nm
Flywheel locking bolts +	7 Nm +
Oil sump drain plug	45 Nm
Oil sump bolts	10 Nm
Oil feed and return hose unions	15 Nm
Oil pressure relief plug	45 Nm
Oil pump cover to timing cover	12 Nm
Engine mounting to bracket nuts	25 Nm
Engine mounting to body nuts	40 Nm
Engine mounting bracket to engine:	
7/16 UNC bolts	75 Nm
5/16 UNC bolts	25 Nm

* Coat first three threads with Loctite 572 prior to assembly.

+ **DO NOT** exceed torque specified

IGNITION SYSTEM

Distributor clamp bolt	20 Nm
Spark plug	15 Nm

INFORMATION

FUEL SYSTEM

Coolant temperature sensor	15 Nm
Fuel rail feed hose bolts	10 Nm
Fuel rail to inlet manifold bolts	8 Nm
Fuel pressure regulator to fuel rail bolts	10 Nm
Fuel tank nuts	22 Nm
Fuel temperature sensor	15 Nm
Oxygen sensor	45 Nm
Plenum chamber to ram housing bolts	20 Nm
Water jacket to plenum chamber bolts	12 Nm

COOLING

Coolant temperature sensor	15 Nm
Cooling pump pulley bolts*	25 Nm*
Cooling pump timing cover to cylinder block	25 Nm
Thermostat housing to inlet manifold bolts	25 Nm

* Coat first three threads with Loctite 572 prior to assembly.

MANIFOLD AND EXHAUSTS

Exhaust manifold to cylinder head bolts	40 Nm
Exhaust front pipe to manifold bolts	28 Nm
Exhaust pipe nuts	35 Nm
Inlet manifolds gasket clamp bolt	15 Nm
Inlet manifolds to cylinder head bolts	35 Nm
Ram housing to inlet manifold bolts	20 Nm

CLUTCH

Master cylinder nuts	12 Nm
Slave cylinder bolts	22 Nm
Clutch hose to pipe	20 Nm
Clutch pipe to master cylinder	20 Nm
Clutch cover to flywheel bolts	25 Nm

MANUAL GEARBOX

Gearbox drain plug	40 Nm
Gearbox filler/level plug	45 Nm
Gearbox crossmember to body bolts	40 Nm
Gearbox mounting to crossmember bolts	25 Nm
Reverse light switch	25 Nm



PROPELLER SHAFT

Propeller shaft nuts 60 Nm

REAR AXLE

Filler/level plug 15 Nm
 Drain plug 30 Nm
 Differential cover bolts 28 Nm
 Cross - member to body nuts 75 Nm

STEERING

Steering wheel nut 50 Nm
 Steering column upper mounting to fascia rail bolts 25 Nm
 Steering column lower mounting to cross tube bolts 40 Nm
 Steering universal joint bolts 22 Nm
 Track rod ball joint to steering arm nut 35 Nm
 Track rod ball joint to track rod locknut 55 Nm
 Steering arm to swivel hub bolts 85 Nm
 Steering rack to crossmember bolts 25 Nm

FRONT SUSPENSION

Anti - roll bar clamp bolts 20 Nm
 Anti - roll bar link to lower arm nut 75 Nm
 Anti - roll bar link to bar bolts 40 Nm
 Anti - roll bar anti - shuffle clamp bolts 6 Nm
 Lower arm ball joint to swivel hub nut 90 Nm
 Lower arm ball joint housing to lower arm:
 Long bolt 45 Nm
 Short bolt 65 Nm
 Spring pan to wishbone bolts 30 Nm
 Lower arm pivot shaft nut 65 Nm*
 Pivot shaft to crossmember 45 Nm
 Road wheel nuts 70 Nm
 Front hub nut 235 Nm
 RH nut RH thread
 LH nut LH thread
 Damper to top fixing assembly locknut 40 Nm**
 Damper to swivel bracket 55 Nm
 Upper arm ball joint to swivel hub nut 55 Nm
 Upper arm ball joint housing to wishbone 45 Nm
 Upper arm mounting to crossmember 45 Nm
 Upper arm to pivot shaft bolts 65 Nm
 Crossmember to body nuts 75 Nm

*Align to next split pin hole

**Locknut should be flush with top of piston rod thread

INFORMATION

REAR SUSPENSION

Anti-roll bar clamp bolts	45 Nm
Anti-roll bar link to axle bracket bolts	
$\frac{3}{8}$ UNF	40 Nm
M10	45 Nm
Anti-roll bar link to bar	45 Nm
Damper mounting bracket to body bolts	75 Nm
Damper to upper and lower mounting brackets	75 Nm
Spring to hanger bracket bolt	75 Nm
Spring to hanger body bolt	75 Nm
Spring shackle to body bolt	40 Nm
Spring shackle to spring bolt	40 Nm
Torque control arm to spring hanger bolt	75 Nm
Torque control arm to axle bracket nut	75 Nm
Road wheel nuts	70 Nm
Spring to axle 'U' bolt nuts	40 Nm

BRAKES

Caliper bleed screw	10 Nm
Brake pipe to caliper nut	15 Nm
Brake hose to 'T' piece	15 Nm
Brake hose bracket to wishbone bracket	22 Nm
Brake disc to swivel hub bolts	95 Nm
Brake disc shield screws	9 Nm
Brake caliper to swivel hub bolts	95 Nm
Master cylinder securing nuts	25 Nm
Brake pipes to master cylinder	15 Nm
Servo to pedal box	12 Nm
Pedal box cover screws	4 Nm
Pedal box to body:	
M6 screws	10 Nm
M8 screws	20 Nm
Handbrake lever to floor bolts	20 Nm
Handbrake cable abutment bracket bolts	15 Nm
Handbrake cable 'P' clip screw	8 Nm
Brake pipe to pressure valve	20 Nm
Brake 'T' piece to bracket	10 Nm
Brake pipe and hose to 'T' piece	15 Nm
Pressure reducing valve bracket bolts	10 Nm
Brake pipe to wheel cylinder nut	15 Nm
Rear wheel cylinder bleed screw	6 Nm
Brake drum retaining screw	4 Nm
Brake backplate bolts	45 Nm

BODY

Bonnet hinge nuts	10 Nm
Bonnet lock pin bolts	10 Nm
Bonnet safety catch screws	6 Nm
Boot lid hinge nuts	10 Nm
Bumper bracket bolts	22 Nm
Door hinge to body bolts	30 Nm
Door hinge to door bolts	22 Nm
Seat belt anchorage bolts	32 Nm



AIR CONDITIONING

Compressor pipe unions	27 Nm
Compressor bolts	40 Nm
Compressor mounting bracket:	
5/16 UNC bolts*+	27 Nm
3/8 UNC bolts*+	40 Nm
Compressor drive belt tensioner pulley nut	25 Nm
Condenser pipe union - receiver drier to condenser	14 Nm
Condenser pipe union - condenser to compressor	23 Nm
Evaporator pipe union - evaporator to compressor	33 Nm
Evaporator pipe union - evaporator to receiver drier	14 Nm
Receiver drier pipe unions	14 Nm

* Coat first 3 threads with Loctite 572 prior to assembly.

+ Correct tightening sequence must be used.

WIPERS AND WASHERS

Wiper motor clamp to body bolts	7 Nm
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ELECTRICAL

Alternator pivot, link bolts	25 Nm
Alternator shaft pulley nut	75 Nm
Drive belt tensioner bolt	45 Nm
Output cable terminal nut	8 Nm
Sensing cable terminal nut	6 Nm
Starter motor to cylinder block bolts	85 Nm
Starter solenoid terminal nuts	4 Nm
Starter solenoid securing screws	6 Nm



CAPACITIES

Fuel tank	51 litres
Engine oil refill and filter change	5.5 litres
Manual gearbox refill	2.67 litres
Rear axle	0.9 litres
Cooling system refill	5.0 litres
Washer reservoir	3.8 litres

FLUIDS

Brake Fluid

Use only AP New Premium Super DOT 4 brake fluid or Castrol Universal DOT 4 brake/clutch fluid. DO NOT use any other type of fluid.

Anti - freeze solutions

The overall anti - freeze concentration should not fall, by volume, below 50% to ensure that the anti - corrosion properties of the coolant are maintained. Anti - freeze concentrations greater than 60% are not recommended as cooling efficiency will be impaired.

Use **UNIPART Superplus Anti - freeze and Summer Coolant** to protect the cooling system.

The cooling system should be drained, flushed and refilled with the correct amount of anti - freeze solution at the intervals given on the Service Maintenance Check Sheet.

CAUTION: No other 'universal' anti - freeze should be used with **UNIPART Superplus Anti - freeze and Summer Coolant**.

If **UNIPART Superplus Anti - freeze and Summer Coolant** is not available, use an ethylene glycol based anti - freeze containing no methanol with non - phosphate corrosion inhibitors which meet specifications BS6580 and BS5117 suitable for use in mixed metal engines. To ensure the protection of the cooling system against corrosion, these anti - freezes must be renewed every 12 months.

After filling with anti - freeze solution, attach a warning label to a prominent position on the vehicle stating the type of anti - freeze contained in the cooling system to ensure that the correct type is used for topping - up.

The recommended quantities of anti - freeze for different degrees of frost protection are:

Solution	Amount of anti - freeze	Commences freezing		Frozen solid	
		°C	°F	°C	°F
50%	Litres				
50%	2.5	- 36	- 33	- 48	- 53

INFORMATION

LUBRICATION

The engine and other lubricating systems are filled with high – performance lubricants giving prolonged life.

CAUTION: You should always use a high quality oil of the correct viscosity range in the engine and gearbox during maintenance and when topping – up. The use of oil not to the correct specification can lead to high oil and fuel consumption and ultimately to damaged components.

Oil to the correct specification contains additives which disperse the corrosive acids formed by combustion and prevent the formation of sludge which can block the oil ways. Additional oil additives should not be used.

Always adhere to the recommended servicing intervals.

Engine oil

Use oil meeting specification RES.22.OL.G4 or the requirements of CCMC G4, and having a viscosity band recommended for the temperature range of your locality. Where oils to these Rover and European specifications are not available, well known brands of oils meeting API SG or SG/CD quality should be used.

Gearbox oil

Use oil meeting specification ATF type G for refill and topping up.

Rear axle

Use the following oil for refill or topping – up:

SHELL Spirax HD80W/90

If not available, a well known brand of SAE 90 grade oil meeting the specification of MIL – L – 2105C or A.P.I. GL5 quality should be used.

General Greasing

Use Multipurpose Lithium Base Grease N.L.G.I. consistency No. 2.

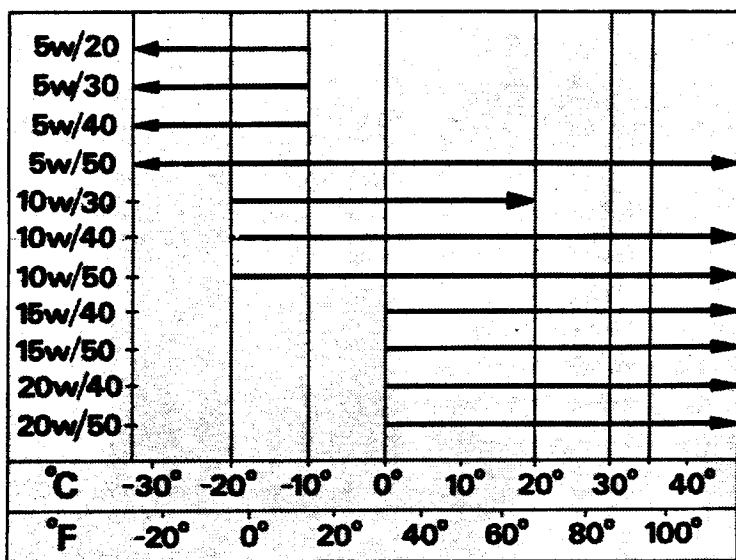
Bonnet latch

Lubricate cable and latch with oil.

Locks, Latches and Hinges

Use Door Lock and Latch Lubricant, Part No. VWN 10075.

SERVICE LUBRICANTS – ALL SEASONS



XH0088

ENGINE OIL VISCOSITY/TEMPERATURE RANGES

RECOMMENDED SERVICE LUBRICANTS

Oil Company	Engine Oil	Gearbox Oil	Rear Axle Oil	General Greasing
Rover Specification	Rover RES. 22.OL, G4			
Other Specifications	CCMC G4			
BP	Visco 2000 Plus 10w/40	Autran MBX	Hypogear 80w/90 EP	Energrease L2
ESSO	Superlube Plus 10w/40 or Superlube EX2	Esso Automatic Transmission Fluid	Gear Oil GX 85w/90	Multipurpose Grease
GULF		Automatic Transmission Fluid II	Multipurpose Gear Lubricant 80w/90	Gulf Crown No. 2
MOBIL	Super 10w/40 Mobil 1 Super XHP 10w/40	Mobil ATF 220	Mobilube HD 80w-90	Mobilgrease HP 2
FINA	First 5w/40 Ekofina Turbo S 10w/40	Dexron II D	Pontonic MP 80w/90	Marson EP L2
SHELL	Helix Plus 10w/40	Dexron II D Donax TG	Spirax HD 80w/90	Retinax LX Retinax A
TEXACO	Havoline Multigrade	Texamatic Universal	GearTex EP-B 85w/90	Multifak Purpose EP-2
TOTAL	Quartz	Fluid ATX	EPB 80w/90	Multis 2
UNIPART	Supreme 10w/40 Red 10w/40	Dexron II	Sureflow EP-B 80w/90	Multipurpose Grease
CASTROL	GTX 3 Lightec	TQ Dexron II E	EPX 80w/90	Castrol LM Grease
DUCKHAMS	Duckhams QXR or 10w/40 Motor Oil	Uni-Matic D-Matic	Hypoid 90S Gear Oil	Duckhams LB10 Grease

NOTE: The above products are not listed in any order of preference and the list is not necessarily exhaustive.

HEALTH WARNING: Used engine oils are contaminated. Avoid prolonged or repeated contact with all types and makes of engine oil.

Protect The Environment – Dispose of used oil properly. Do not empty into drains, pollute water systems, or pour onto the soil.

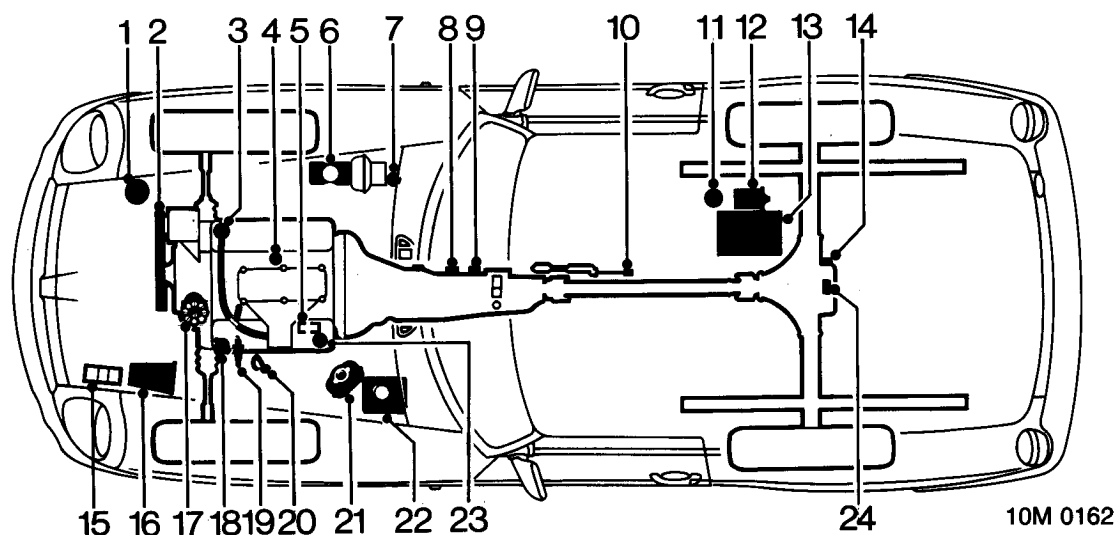
MAINTENANCE

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MAINTENANCE



MAINTENANCE LOCATIONS

- | | |
|-------------------------------------|------------------------------------|
| 1. Oil filter element | 14. Axle oil filler/level plug |
| 2. Alternator/water pump drive belt | 15. Coil |
| 3. PCV filter | 16. Air cleaner |
| 4. Coolant filler plug | 17. Distributor |
| 5. Engine oil drain plug | 18. Engine oil filler cap |
| 6. Brake fluid reservoir | 19. No 1 Spark plug |
| 7. Clutch fluid reservoir | 20. Engine oil dipstick |
| 8. Gearbox oil filler/level plug | 21. Coolant expansion tank and cap |
| 9. Gearbox oil drain plug | 22. Windscreen washer reservoir |
| 10. Handbrake cable adjuster | 23. PCV air intake filter |
| 11. Auxiliary fuel filter | 24. Axle oil drain plug |
| 12. Main fuel filter | |
| 13. Battery | |



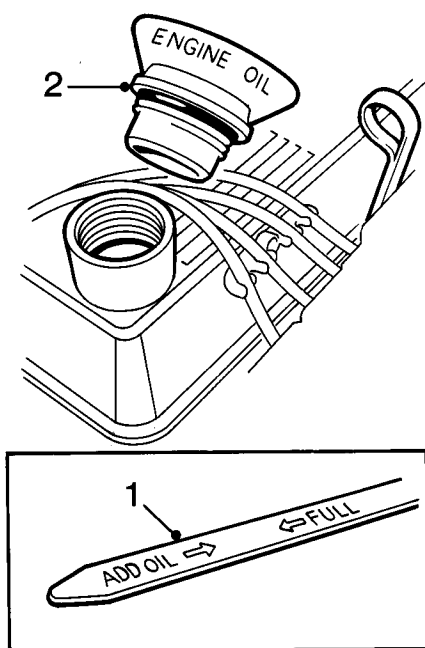
CHECK ENGINE AND TRANSMISSION

1. Visually inspect for oil leaks from engine, gearbox and rear axle, pay particular attention to areas of gaskets and seals.

ENGINE OIL AND FILTER

Oil level check

Always check oil level and drain oil with vehicle level.



10M 0160

1. Withdraw dipstick and wipe blade. Re – insert dipstick fully, withdraw it and check oil level which must be maintained between 'MIN' and 'MAX' marks on dipstick.
2. If required, remove filler cap and top – up with new engine oil to specification 10w/40, see **INFORMATION – CAPACITIES, FLUIDS AND LUBRICANTS**.

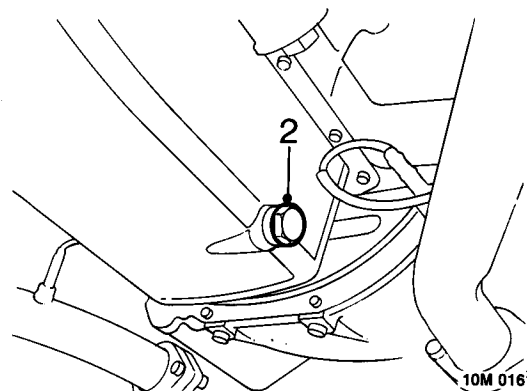
Oil drain and refill

The oil should be drained when engine is warm. The oil filter can be renewed while oil is being drained.

WARNING: Observe due care when draining oil as the oil can be very hot.

Prolonged and repeated contact with used engine oil may cause serious skin disorders, wash thoroughly after contact. Keep out of reach of children.

1. Place a container under sump.



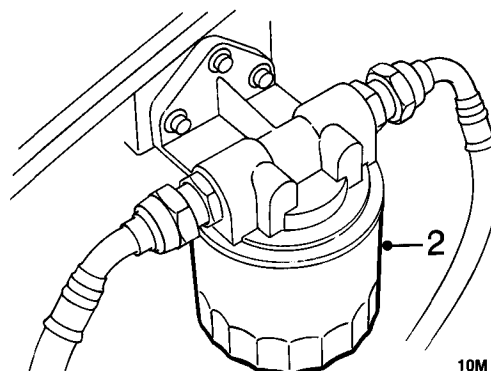
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2. Remove drain plug and sealing washer, allow oil to drain, discard sealing washer.
3. Clean drain plug, fit new sealing washer, refit drain plug and tighten to correct torque.
4. Remove oil filler cap, refill engine with oil to specification 10w/40 until oil level is correct.
5. Fit oil filler cap.

Oil filter renewal

Service Repair No. 12.60.01

1. Clean area around filter head and place a container beneath filter.



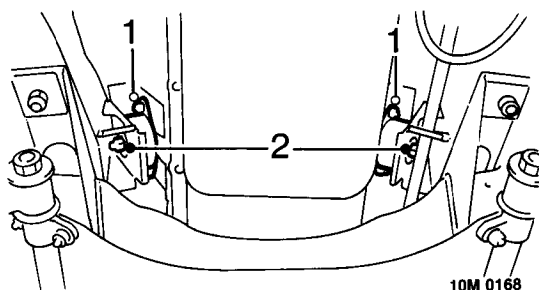
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2. Unscrew filter using a strap wrench, discard filter.
3. Clean mating face of filter head.
4. Lubricate sealing ring of new filter with engine oil.
5. Screw filter on to filter head by hand until it seats then tighten a further half – turn.
6. Top – up engine with oil to specification 10w/40 until level is correct.
7. Start and run engine and check for oil leaks.
8. Stop engine, wait a few minutes, then check oil level and top – up if necessary.

MAINTENANCE

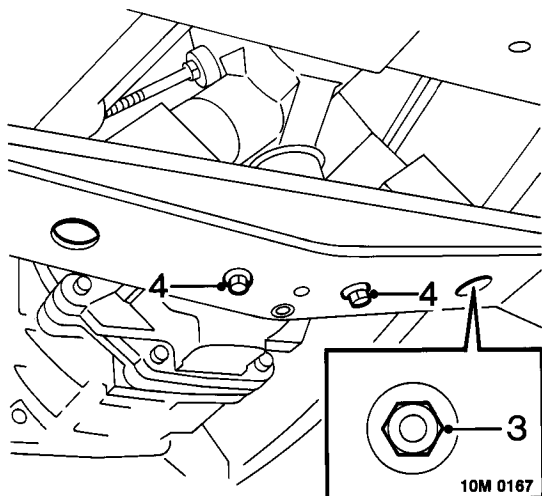
ENGINE & GEARBOX MOUNTINGS

Examine mountings for signs of contamination or splitting.



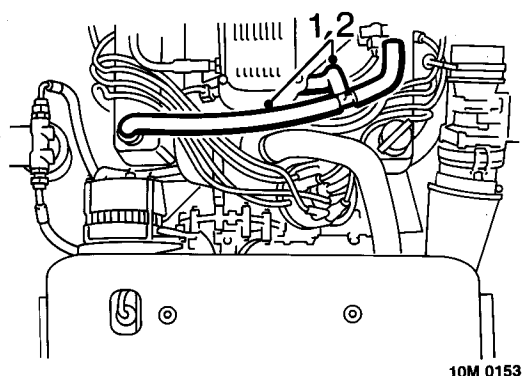
Check following for correct torque:

1. Engine mounting to bracket nuts.
2. Engine mounting to body nuts.



3. Gearbox mounting to cross - member nuts.
4. Gearbox mounting to cross - member bolts.

PCV HOSES

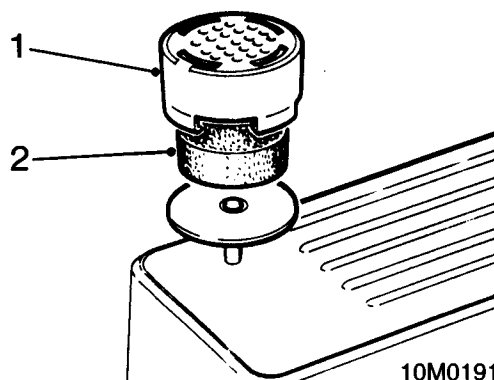


1. Check PCV hoses for signs of splitting and general condition.
2. Check hoses are routed correctly, secure and serviceable.

PCV AIR INTAKE FILTER

Service Repair No. 17.10.15

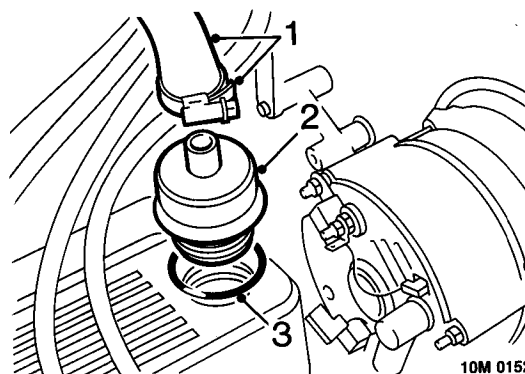
Renew



1. Release filter holder from rocker cover.
2. Remove and discard sponge filter.
3. Clean filter holder and filter location on rocker cover.
4. Fit new filter to holder.
5. Secure holder to rocker cover.

PCV FILTER

Clean

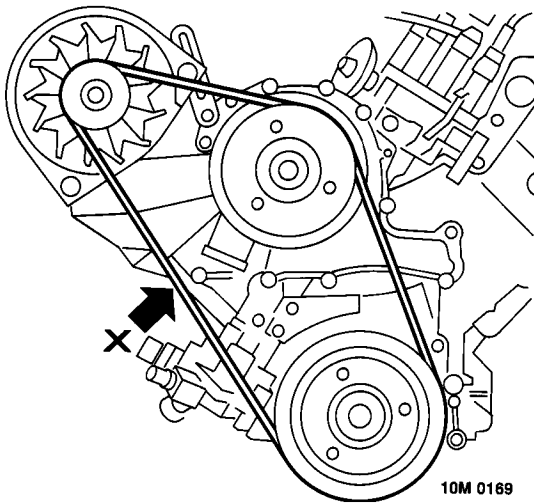


1. Slacken hose clip securing breather hose, disconnect hose.
2. Unscrew and remove filter from rocker cover.
3. Remove and discard 'O' ring.
4. Clean filter gauze.
5. Fit new 'O' ring to filter.
6. Screw filter into rocker cover, hand tight only.
7. Connect hose, tighten hose clip



DRIVE BELT - ALTERNATOR & WATER PUMP

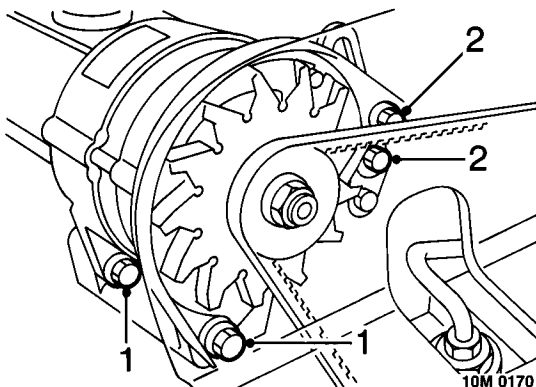
1. Check condition of drive belt; renew a belt that shows signs of wear or splitting.



Check tension of belt.

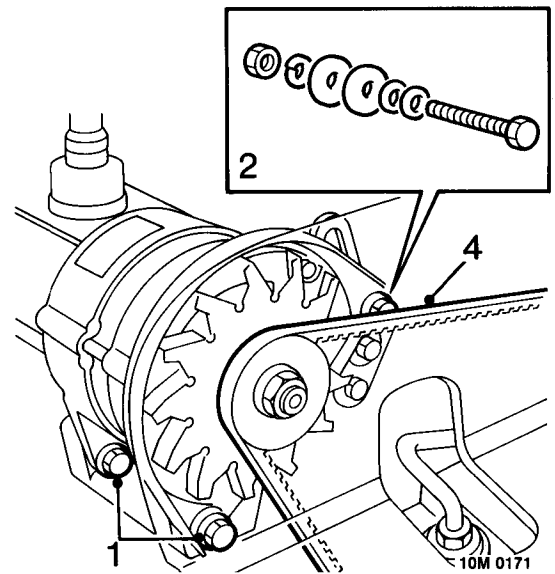
1. Apply a force of 10 kg to drive belt at position 'X' and measure the deflection between crankshaft pulley and alternator pulley.
Deflection must be 8 – 10 mm.

Adjust drive belt tension Service Repair No. 86.10.05.



1. Slacken 2 alternator pivot bolts.
2. Slacken 2 alternator adjusting link bolts.
3. Move alternator as necessary to obtain correct belt tension.
4. Tighten alternator adjusting link and pivot bolts to correct torque.
5. Re - check belt tension.

Renew drive belt Service Repair No. 86.10.03

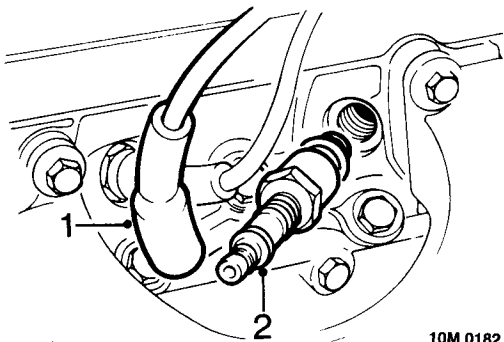


1. Slacken 2 alternator pivot bolts.
2. Remove alternator adjusting link bolt; collect 2 washers.
3. Release belt tension.
4. Remove and discard drive belt.
5. Clean pulley "V"s.
6. Fit new belt to crankshaft and alternator pulleys.
7. Fit washers to adjusting link bolt.
8. Fit adjusting link bolt.
9. Adjust belt tension.
10. Run engine at fast idle for 3 – 5 minutes.
11. Re - check tension.

MAINTENANCE

SPARK PLUGS

Service Repair No. 18.20.02

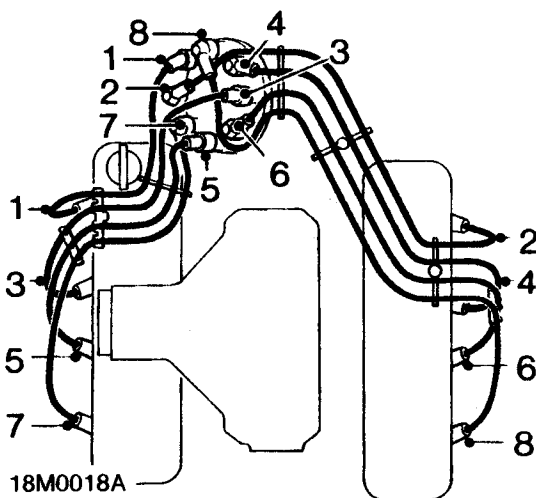


1. Disconnect 8 h.t. leads from spark plugs.
2. Remove 8 spark plugs using spark plug socket.



8RM 0505

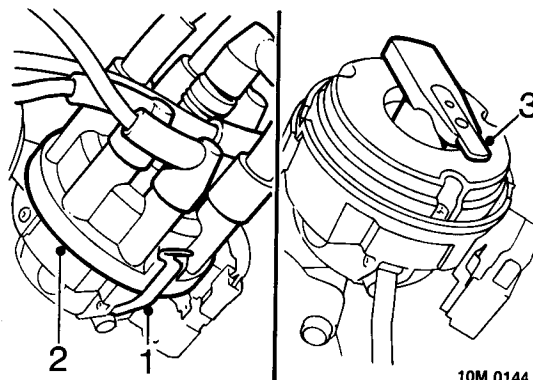
3. Set gap of each new spark plug to 0.85 mm.
4. Fit spark plugs and tighten to correct torque.



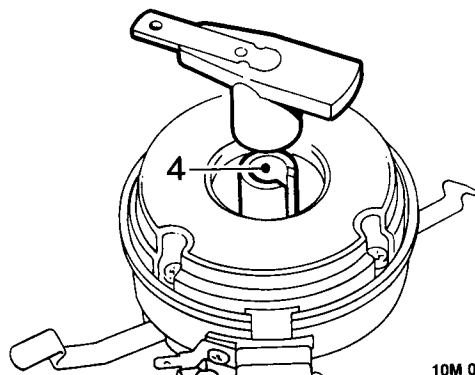
5. Connect h.t. leads

DISTRIBUTOR, DISTRIBUTOR CAP, H.T. LEADS AND COIL TOWER

Check and lubricate

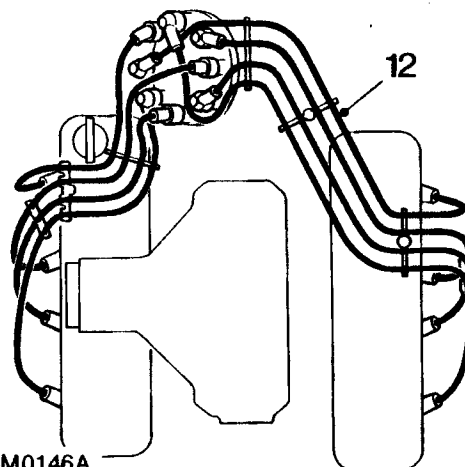


1. Release 2 clips.
2. Lift off distributor cap.
3. Remove rotor arm.



10M 0145

4. Apply 3 drops of clean engine oil to felt pad.
5. Check cap for cracks, warping and burns.
6. Check rotor arm for damage.
7. Clean interior and exterior of distributor cap.
8. Fit rotor arm.
9. Refit distributor cap.
10. Secure 2 clips.
11. Clean ignition coil tower.



10M0146A

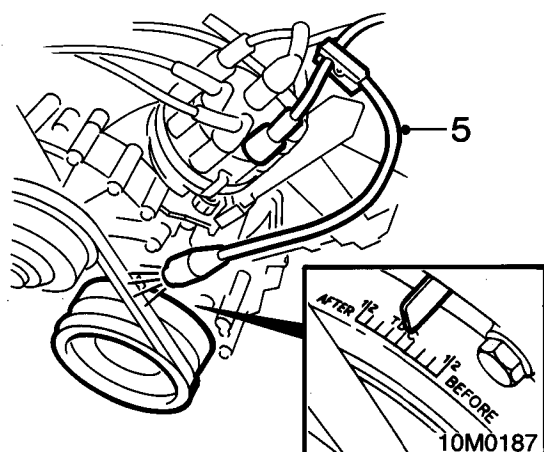
12. Check all h.t. leads are free from damage, routed correctly and connections are tight.



IGNITION TIMING

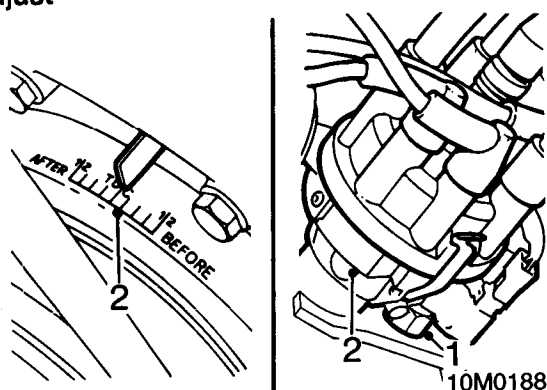
Check and Adjust

1. Connect stroboscopic light and tachometer, ensuring that stroboscopic lead is connected to No. 1 plug h.t. lead.
2. Clean timing marks on crankshaft pulley. Marks each side of TDC are $\pm 3^\circ$ tolerance.
3. Start and run engine until normal temperature is achieved; cooling fan starts to operate.
4. Disconnect vacuum pipe from distributor.

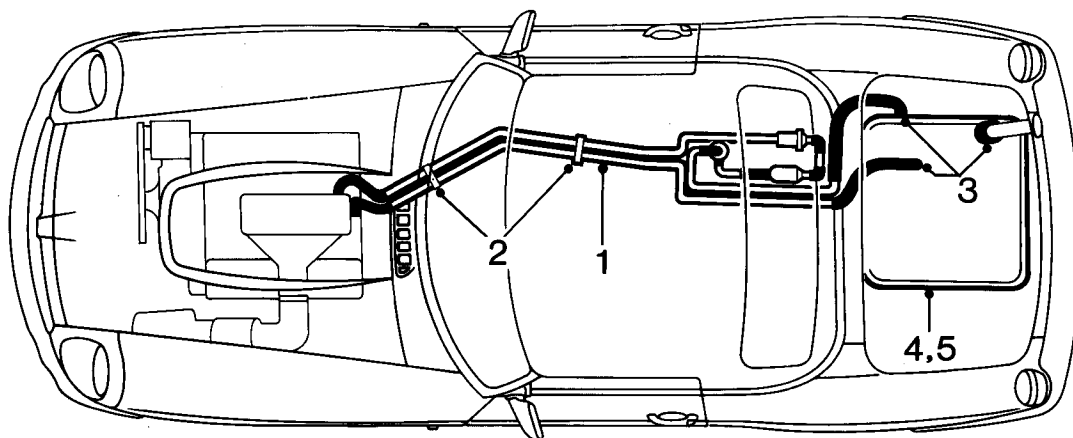


5. Check timing using stroboscopic light:
At 800 rev/min max. with vacuum disconnected = $5^\circ \pm 1^\circ$ B.T.D.C.

Adjust



1. Slacken distributor clamp nut.
2. Carefully rotate distributor body to achieve correct timing. Rotate clockwise to advance or anti-clockwise to retard.
3. Tighten distributor clamp nut to correct torque and recheck timing.
4. Connect vacuum pipe.
5. Switch off engine, disconnect tachometer and stroboscopic light.



10M0199

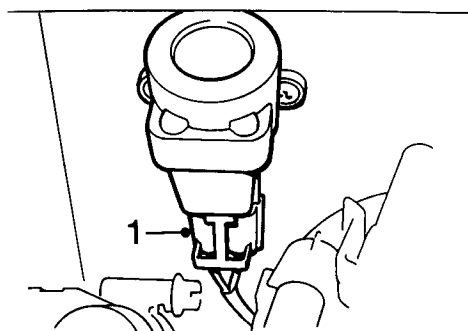
FUEL SYSTEM HOSES, FILTERS, PIPES AND UNIONS

1. Check fuel pipes and connections for chafing and leakage.
2. Check pipes are securely clipped.
3. Check fuel tank connections for security.
4. Check fuel tank is free from leaks and corrosion.
5. Check fuel tank for security of fixings.

Renew main fuel filter

Service Repair No. 19.25.02

WARNING: The spillage of fuel is unavoidable during this operation, see **GENERAL INFORMATION - Fuel Handling Precautions.**

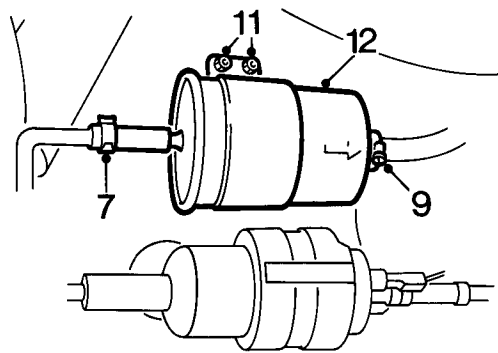


10M0192

1. Disconnect inertia switch multiplug.
2. Operate starter motor and crank engine several times to release pressure from fuel system.

Note: Engine may start and run for a short period.

3. Switch off ignition.
4. Reconnect inertia switch multiplug.
5. Disconnect battery earth lead.



10M0193

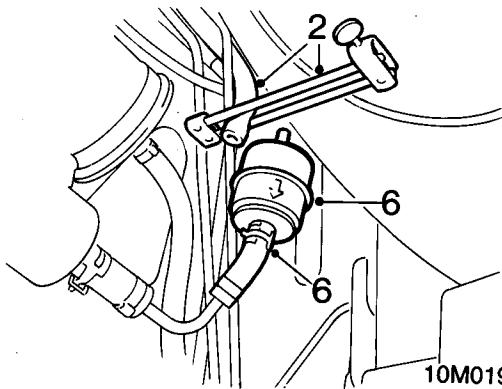
6. Position absorbant cloth around fuel inlet hose.
7. Release clip and disconnect inlet hose.
8. Plug filter and hose.
9. Release clip and disconnect fuel outlet hose.
10. Plug filter and hose.
11. Remove nuts securing filter clamp.
12. Remove filter and clamp assembly.
13. Remove clamp from filter.
14. Discard filter.
15. Position new filter to clamp with arrow pointing towards front of vehicle.
16. Position filter and clamp assembly, fit and tighten nuts.
17. Remove plugs, connect inlet and outlet hoses and secure clips.
18. Connect battery earth lead.

Renew auxiliary fuel filter

Service Repair No. 19.25.01

WARNING: The spillage of fuel is unavoidable during this operation, see **GENERAL INFORMATION - Fuel Handling Precautions.**

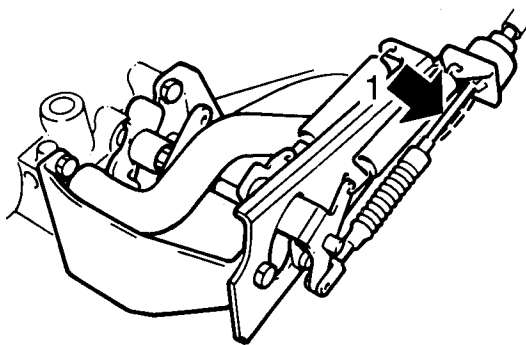
1. Disconnect battery earth lead.



10M0195

2. Using a brake hose clamp, clamp fuel tank outlet hose.
3. Position absorbant cloth around fuel inlet hose.
4. Release clip and disconnect inlet hose.
5. Plug inlet hose.
6. Release clip and remove fuel filter from outlet hose, discard filter.
7. Fit new filter to outlet hose with arrow pointing towards outlet hose and secure clip.
8. Remove plug from inlet hose, connect hose and secure clip.
9. Remove clamp from fuel tank outlet hose.
10. Connect battery earth lead.

THROTTLE CABLE



10M0194

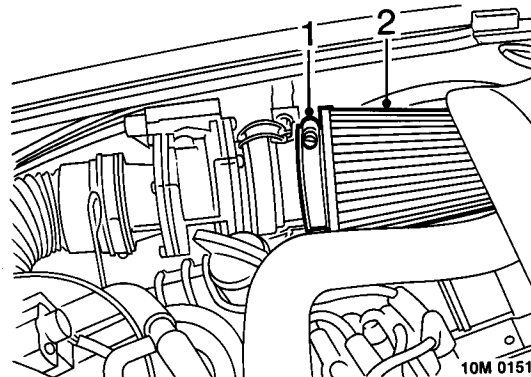
1. Ensure throttle cable has correct amount of free - play and throttle pedal opens throttle fully.

Throttle cable free play = 1.50 mm.

AIR CLEANER

Service Repair No. 19.10.10.

Renew



10M 0151

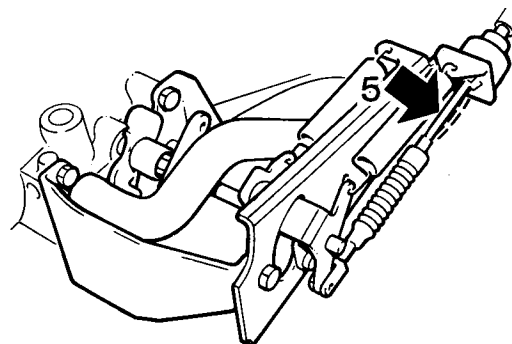
1. Slacken clip securing air cleaner.
2. Remove air cleaner.
3. Remove clip and discard air cleaner.
4. Fit clip to new air cleaner.
5. Fit air cleaner and tighten clip.

ENGINE TUNING

The fuel ECU monitors air/fuel ratio through oxygen sensors positioned in the exhaust pipe. Consequently no manual adjustment of idle mixture is possible.

The following procedure contains a check which determines whether the closed - loop system is operating correctly. This check is vitally important to both prolonged life of catalysts and clean exhaust emissions.

1. Ensure spark plug gaps are correct.
2. Check ignition timing is correct.
3. Ensure air cleaner element is clean.
4. Check engine and breather hoses for leaks or restrictions, and check no air leaks exist in the intake system.



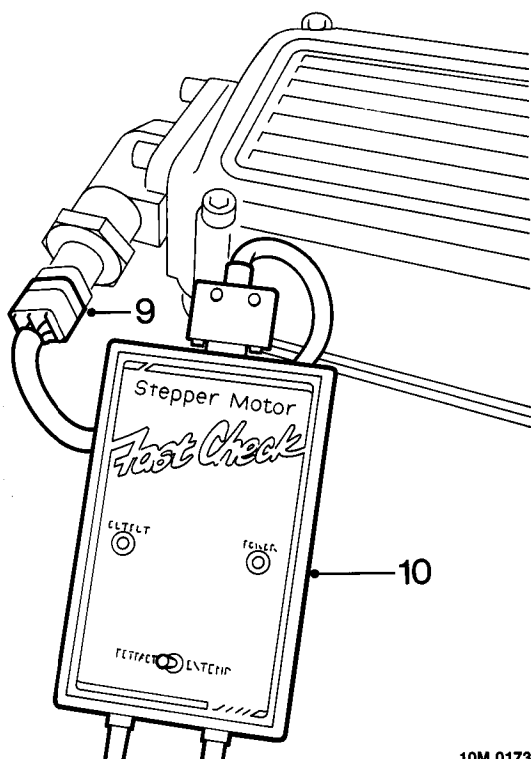
10M 0172

5. Ensure throttle cable has correct amount of free - play and throttle pedal opens throttle fully.
6. Attain normal operating temperature with equivalent of a 4 mile road test.

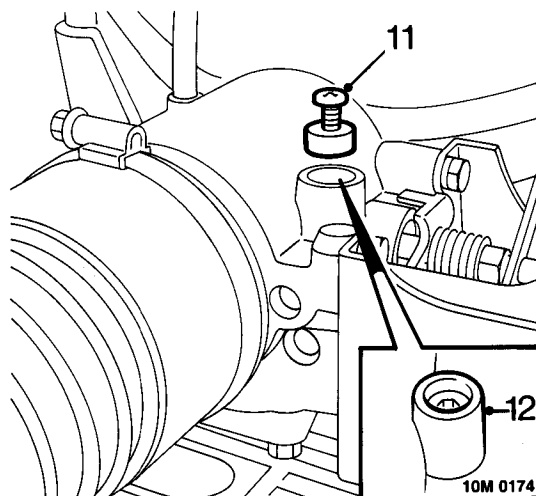
MAINTENANCE

Note: Tuning should be completed within 2 minutes of return without stopping the engine. If tuning cannot be completed within 2 minutes or cooling fan operates, wait for cooling fan to stop and increase engine speed to 2000 rev/min for 30 seconds and continue tuning.

7. Ensure all electrical loads are switched off.
8. Switch off ignition and connect tachometer to ignition system.



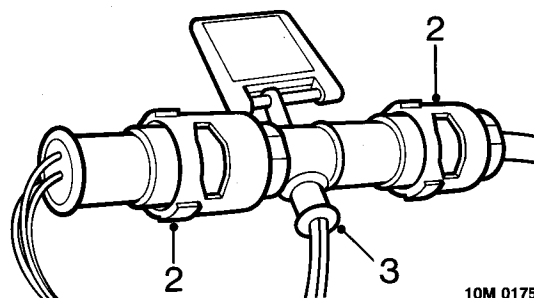
9. Disconnect stepper motor multiplug and connect **Stepper Motor Fast Check SMD 4057/2**.
10. Start engine, move Fast Check switch to EXTEND position.



11. Remove tamperproof seal. Drill plug and insert self tapping screw to enable plug to be removed.
12. Using a suitable Allen key adjust base idle screw to obtain specified base idle speed. Turn screw clockwise to decrease or anti-clockwise to increase idle speed. Base idle speed = 500 ± 50 rev/min
13. Increase engine speed to 2000 rev/min for 10 seconds.
14. Check base idle speed and adjust if necessary.
15. Switch off ignition.
16. Remove Fast Check and connect stepper motor multiplug.
17. Start engine and check engine runs at controlled idle speed. Controlled idle speed = 700 ± 25 rev/min
18. Stop engine and fit a new tamperproof seal.

Oxygen sensor check

1. Disconnect oxygen sensor multiplug.



2. Connect **18G1564** to oxygen sensor harness.
3. Connect multimeter to **18G1564**.
4. Start engine and increase speed to 3000 rev/min for 30 seconds.
5. Check multimeter for a constant voltage swing of below 0.4V to above 0.6V at idle speed.
6. Switch off ignition, remove multimeter and **18G1564** from oxygen sensor harness.
7. Connect oxygen sensor multiplug.



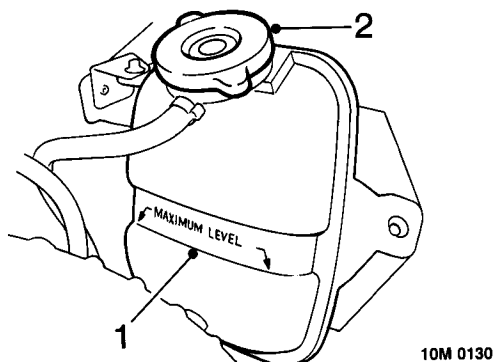
8. Repeat foregoing procedure for second oxygen sensor.
9. Remove tachometer.

COOLING SYSTEM

WARNING: Since injury such as scalding could be caused by escaping steam or coolant, do not remove pressure relief cap from expansion tank while system is hot. Wait until system has cooled, use a cloth or glove to protect hands from escaping steam.

Check level and top – up

CAUTION: The coolant level should only be checked when the system is cold.



1. Visually check that coolant is not below the level marked on expansion tank. If level is appreciably low, suspect leakage or overheating.

CAUTION: If coolant is not visible in expansion tank system must be refilled in accordance with Drain and Refill procedure.

2. If required, remove coolant expansion tank cap:
Top – up with anti – freeze mixture, see **INFORMATION – CAPACITIES, FLUIDS AND LUBRICANTS.**

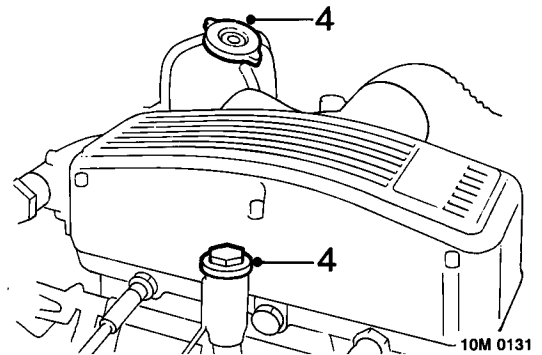
CAUTION: The coolant must not exceed the maximum level indication.

3. Check specific gravity of coolant. The overall anti – freeze concentration must not be below 50% by volume and must not exceed 60% by volume.
4. Refit expansion tank cap.

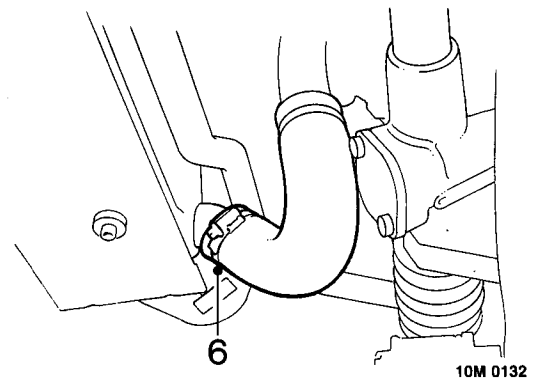
Drain and refill

Service Repair No. 26.10.01

1. Visually check engine and cooling system for coolant leaks.
2. Examine hoses for signs of cracking, distortion and security of connections.
3. Position heater control to HOT.



4. Remove filler plug and expansion tank cap.
5. Position a container to collect drained coolant.



6. Slacken clip, disconnect bottom hose from radiator, allow coolant to drain.
7. Flush system with water under low pressure.

CAUTION: High water pressure could damage the radiator.

8. Connect bottom hose to radiator, tighten clip.
9. Prepare coolant to required concentration.
10. Fill system slowly through coolant pipe until coolant level is to 'MAX' mark on expansion tank.
11. Refit expansion tank cap.
12. Continue filling until coolant reaches top of coolant pipe.
13. Refit filler plug.
14. Start and run engine until radiator cooling fan operates.
15. Switch off engine and allow to cool.
16. Check for leaks and top – up coolant if necessary.

EXHAUST SYSTEM

1. Check for damage and signs of leakage.
2. Check security of system.
3. Check mountings and correct alignment.
4. Check security of heat shields.

MAINTENANCE

CLUTCH

1. Check operation of clutch and free movement of pedal.

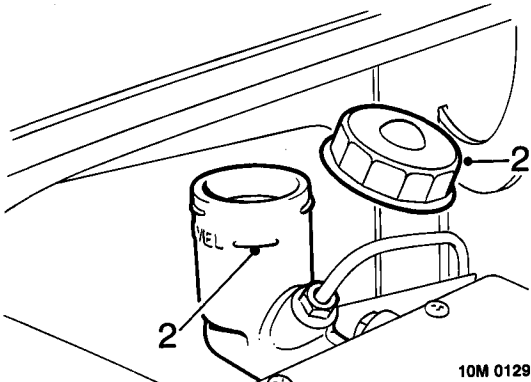
CLUTCH FLUID

WARNING: Do not allow dirt or foreign liquids to enter reservoir when topping - up.

Use only new AP New Premium Super DOT 4 or Castrol Universal DOT 4 brake fluid from airtight containers.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.

Level check

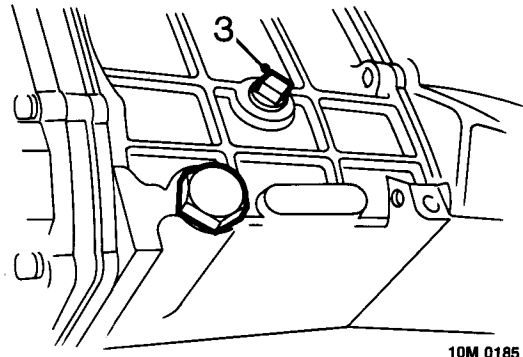


1. Wipe reservoir body and filler cap clean.
2. Remove filler cap and check fluid in reservoir, fluid level must be maintained to 'MAX' mark.

GEARBOX

Oil level check and top - up

1. Ensure vehicle is standing on level surface.
2. Wipe clean area around filler/level plug.



3. Remove plug.
4. Check that oil is level with bottom of level plug hole.

CAUTION: Oil lodged behind level plug will trickle out when plug is removed and can give impression that level is correct.

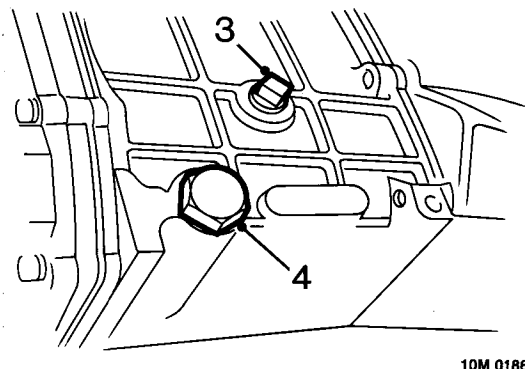
5. Top - up, if required, until oil just runs from hole. Allow sufficient time for oil to flow and reach a common level within gearbox. Use an ATF Type G transmission oil, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**
6. Refit filler/level plug, tighten to correct torque.
7. Wipe away any surplus oil.

Drain oil and refill

The oil should be drained when gearbox is warm.

WARNING: Observe due care when draining gearbox as the oil can be very hot.

1. Place a container under gearbox.
2. Wipe clean area around filler/level plug.



3. Remove gearbox filler/level plug.
4. Remove drain plug, remove and discard sealing washer.
5. Allow oil to drain completely.
6. Clean drain plug and fit new sealing washer.
7. Fit gearbox drain plug and tighten to correct torque.



8. Fill gearbox through filler/level plug hole with new ATF type G transmission oil, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.

Allow sufficient time for oil to flow and reach a common level within gearbox.

9. Refit filler/level plug and tighten to correct torque.
10. Wipe away any surplus oil.

Use an EP type transmission oil of 80W/90 or 85W/90 grade, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.

6. Refit filler/level plug and tighten to correct torque.
7. Wipe away any surplus oil.

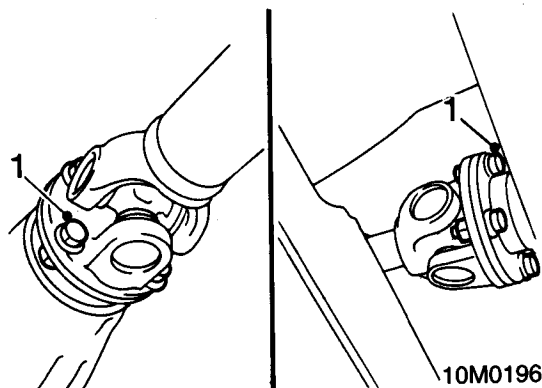
Drain oil and refill

The oil should be drained when axle is warm.

WARNING: Observe due care when draining axle as the oil can be very hot.

1. Place a container under axle.

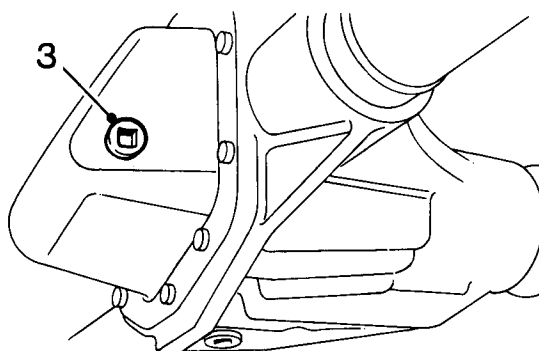
PROPELLER SHAFT



1. Check propeller shaft flange bolts are tightened to correct torque.

REAR AXLE

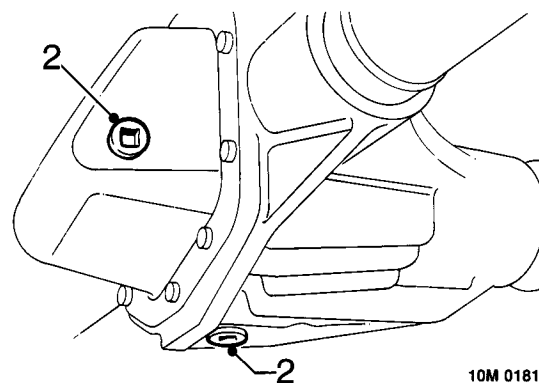
Oil level check and top - up



1. Ensure vehicle is standing on level surface.
2. Wipe clean area around filler/level plug.
3. Remove plug.
4. Check that oil is level with bottom of level plug hole.

CAUTION: Oil lodged behind level plug will trickle out when plug is removed and can give impression that level is correct.

5. Top - up, if required, until oil just runs from hole. Allow sufficient time for oil to flow and reach a common level within axle.



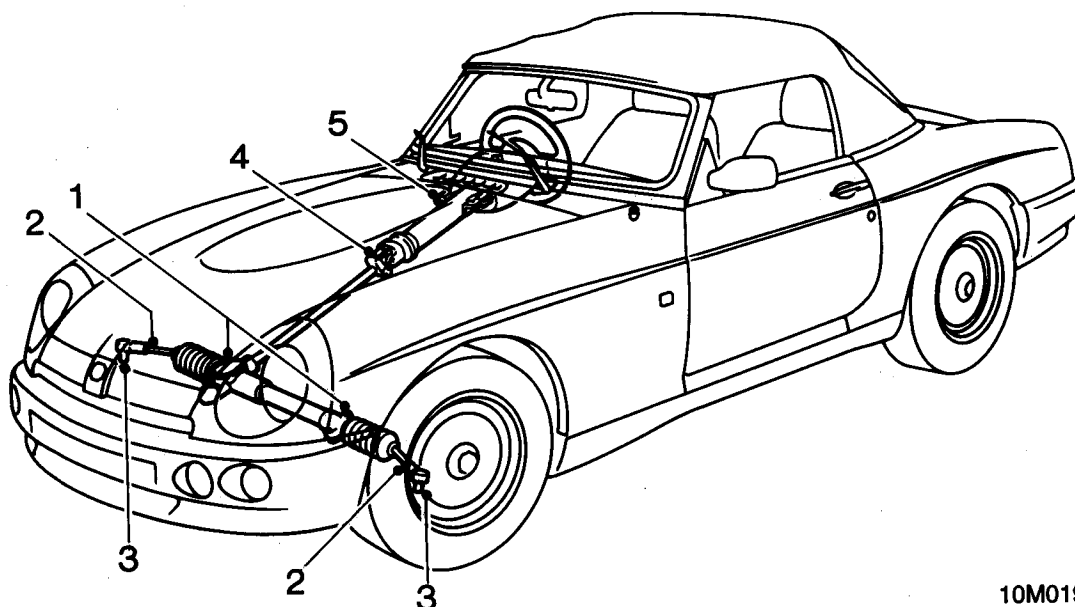
2. Remove axle filler/level plug and drain plug.
3. Allow oil to drain completely.
4. Fit drain plug and tighten to correct torque.
5. Fill axle through filler/level plug hole with an EP type transmission oil of 80W/90 or 85W/90 grade, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.

Allow sufficient time for oil to flow and reach a common level within axle.

6. Refit filler/level plug and tighten to correct torque.
7. Wipe away any surplus oil.

MAINTENANCE

STEERING COLUMN, RACK, JOINTS AND GAITERS



10M0197

Check for signs of lubricant leakage.

Visually check that rack sealing gaiters are not twisted or damaged and clips are secure.

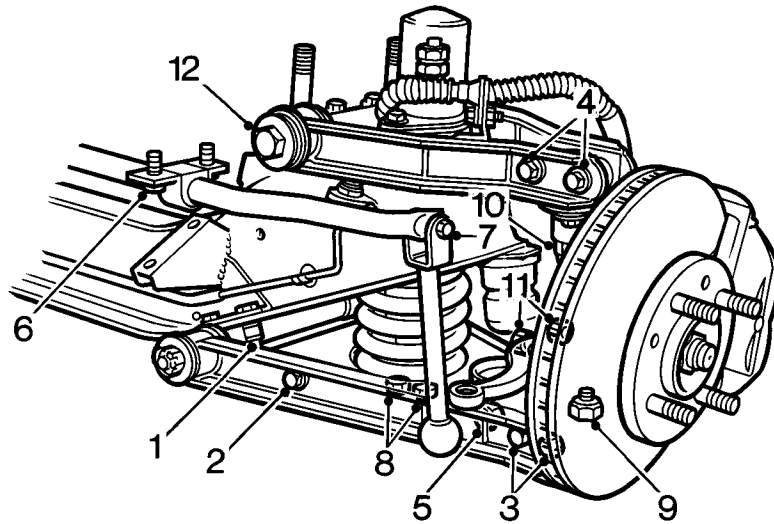
Check following for correct torque:

1. Steering rack to cross – member bolts.
2. Steering rod locknuts – restrain ball joint movement.
3. Track rod ball joint to steering arm nuts.
4. Universal joint bolts.
5. Steering column upper to lower fascia bolts.



SUSPENSION DAMPERS, BALL JOINTS, FIXINGS AND GAITERS

Front suspension



10M 0190

Check suspension dampers for fluid leaks and condition of suspension bushes. Check split pins are fitted to lower wishbone pivot shaft nuts.

Check following for correct torque:

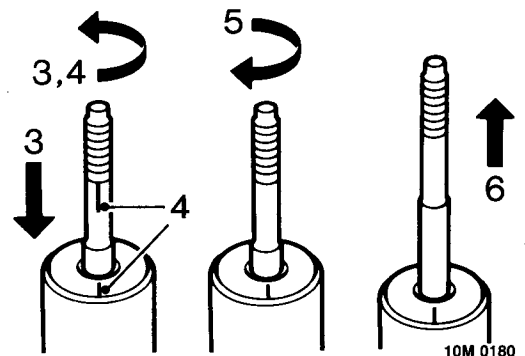
1. Pivot shaft to cross – member bolts.
2. Spring pan to wishbone arm bolts.
3. Lower ball joint housing to wishbone bolts.
4. Upper ball joint housing to wishbone bolts.
5. Anti – roll bar link to wishbone nuts.
6. Anti – roll bar clamp to body bolts.
7. Anti – roll bar link to bar bolts.
8. Damper swivel bracket bolts.
9. Lower ball joint to swivel hub nuts.
10. Upper ball joint to swivel hub nuts.
11. Steering arm to swivel hub bolts.
12. Wishbone to pivot shaft nuts.

Damper adjustment

WARNING: Dampers must be adjusted equally, in axle pairs only, otherwise handling characteristics may be impaired.

1. Remove damper, see **FRONT SUSPENSION**.
2. Hold damper vertically with lower eye in vice.

CAUTION: Use soft jaws to prevent damage.



10M 0180

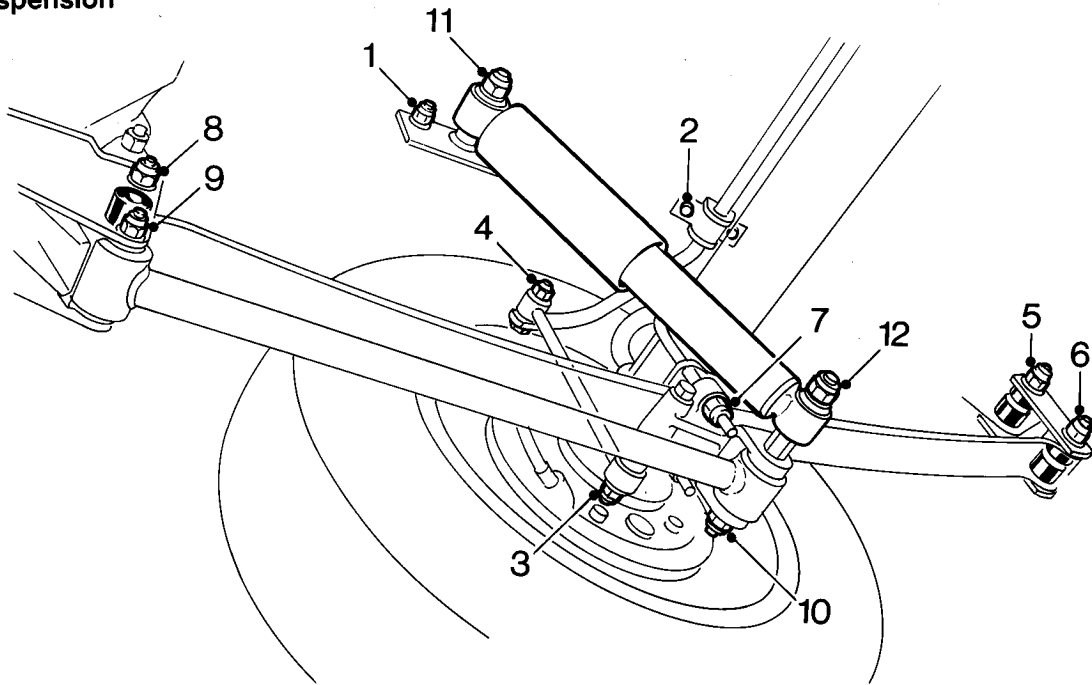
3. Fully close damper whilst at the same time turning piston slowly anti – clockwise to engage adjusting mechanism.
4. Keeping damper closed, ensure piston rod is turned fully anti – clockwise then, using a felt tipped pen, mark relationship between piston rod and cylinder.

MAINTENANCE

5. Whilst keeping damper closed, rotate piston rod $\frac{1}{2}$ turn clockwise for each 48,000 miles completed.
6. Pull piston rod vertically from cylinder without turning for at least 1 cm to disengage adjusting mechanism.
7. Remove damper from vice.
8. Refit damper, see **FRONT SUSPENSION**.



Rear suspension



10M0198

Check suspension dampers for fluid leaks and condition of suspension bushes.

Check following for correct torque:

1. Damper upper mounting bracket to body bolts.
2. Anti-roll bar clamp to body bolts.
3. Anti-roll link to axle bracket bolts.
4. Anti-roll bar to link bolts.
5. Spring shackle to body bolts.
6. Spring shackle to spring bolts.
7. Spring to axle 'U' bolt nuts.
8. Spring to hanger bracket bolts.
9. Torque control arm to spring hanger bolts.
10. Torque control arm to axle bracket nuts.
11. Damper to upper mounting bracket nuts.
12. Damper to lower mounting stud nuts.

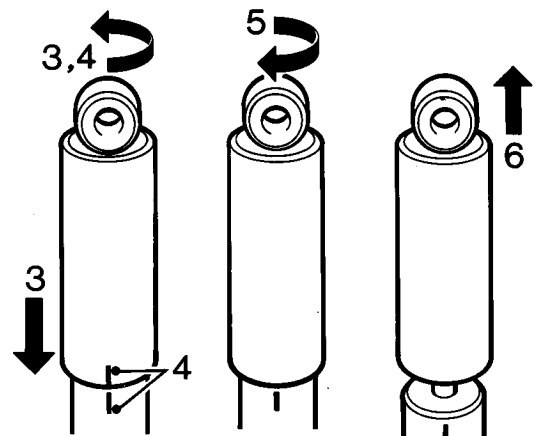
Damper adjustment

WARNING: Dampers must be adjusted equally, in axle pairs only, otherwise handling characteristics may be impaired.

1. Remove damper, see **REAR SUSPENSION**.

2. Hold damper vertically with lower eye in vice

CAUTION: Use soft jaws to prevent damage.

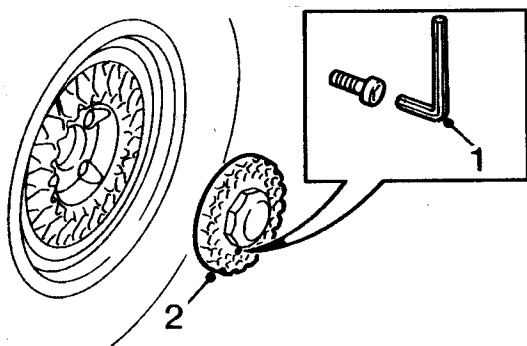


10M0200

3. Fully close damper whilst at the same time turning dust cover slowly anti-clockwise to engage adjusting mechanism.
4. Keeping damper closed, ensure piston rod is turned fully anti-clockwise then, using a felt tipped pen, mark relationship between dust cover and cylinder.
5. Whilst keeping damper closed, rotate dust cover 1/2 turn clockwise for each 48,000 miles completed.
6. Pull piston rod vertically from cylinder without turning for at least 1 cm to disengage adjusting mechanism.
7. Remove damper from vice.
8. Refit damper, see **REAR SUSPENSION**.

MAINTENANCE

ROAD WHEELS AND FASTENINGS

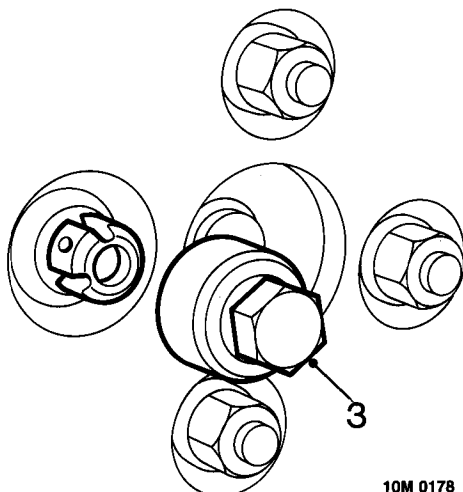


10M0177A

1. Remove screw securing wheel nut cover using tool provided in the tool roll.

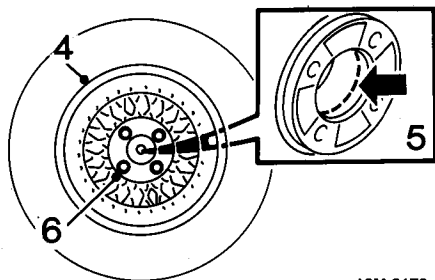
Note: Later models have a 6mm Allen key provided.

2. Remove cover.



10M 0178

3. Fit key socket over locking wheel nut, then fit wheel nut spanner over key socket and unscrew.



10M 0179

4. Check condition of road wheels including spare for signs of buckling and rim damage.
5. Clean wheel spigot and apply a thin smear of lithium based grease around full diameter of spigot bore to a depth of 10mm from rear machined face.

CAUTION: Do not allow grease to contact brake discs or pads.

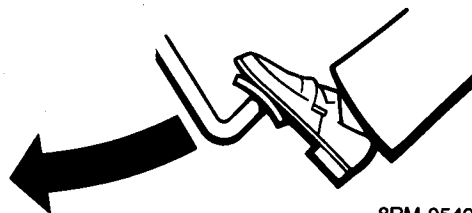
6. Working in a diagonal sequence progressively tighten wheel nuts to correct torque.
7. Refit wheel nut cover.

8. Fit and tighten screw securing cover.

TYRE PRESSURES AND CONDITION

1. Check for signs of tyre wear indicator in tread pattern.
2. Check all tyres including spare for uneven wear, external cuts in fabric, exposure of ply or cord structure, lumps and bulges.
3. Check and adjust tyre pressures.
Tyre pressures (cold)
Front: 1.5 bar 22 lbf/in²
Rear: 1.6 bar 24 lbf/in²

FOOTBRAKE



8RM 0549

1. Press brake pedal and check for firm resistance.

HANDBRAKE

Check

1. Apply handbrake lever one notch at a time and count number of notches required to apply the brakes firmly.

Handbrake lever travel = 3 notches.

2. Adjust handbrake if travel is outside limits.

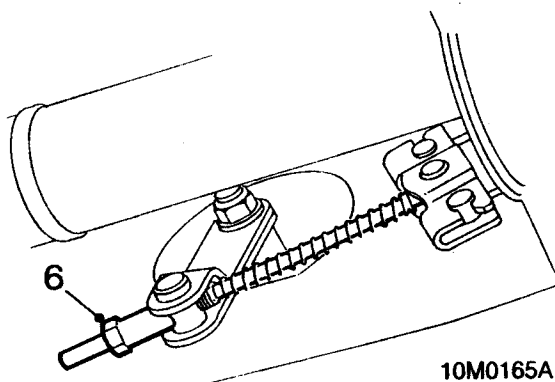
Adjust

Service Repair No. 70.35.10

Note: If carrying out handbrake adjustment after brake drum installation, start engine and depress brake pedal several times to set self-adjusting brakes before adjusting handbrake.

1. Raise rear of vehicle.

WARNING: Support on safety stands.



2. Inspect handbrake equalizer to cable connections for free movement.
3. Rotate wheels by hand, wheels should rotate freely.
4. Apply hand brake lever to 1st notch, wheels should still rotate freely.
5. Apply hand brake lever to 3rd notch, both rear wheels should be locked.
6. Adjust if necessary.
7. Release handbrake lever.
8. Re - check that wheels turn freely with lever set on 1st notch.
9. Re - adjust if necessary.
10. Remove stand(s) and lower vehicle.

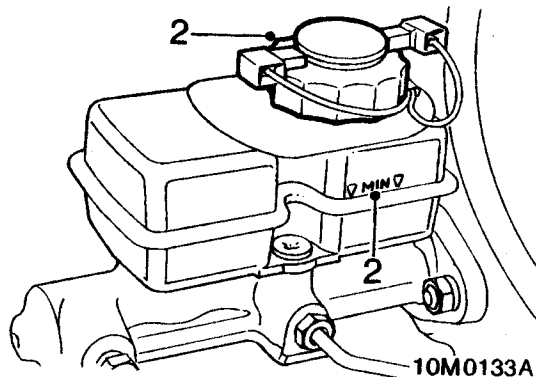
BRAKE FLUID

WARNING: Do not allow dirt or foreign liquids to enter reservoir when topping - up.

Use only new AP New Premium Super DOT 4 or Castrol Universal DOT 4 brake fluid from airtight containers.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.

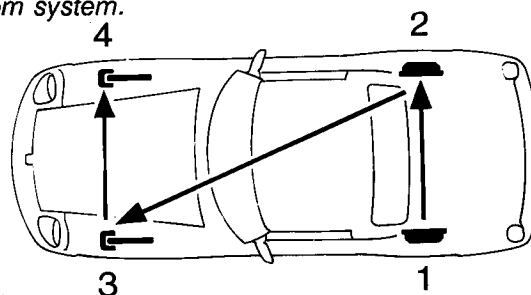
Level check



1. Wipe reservoir body and filler cap clean and check level visually.
2. Remove filler cap and top - up to 'MAX' mark, if required.

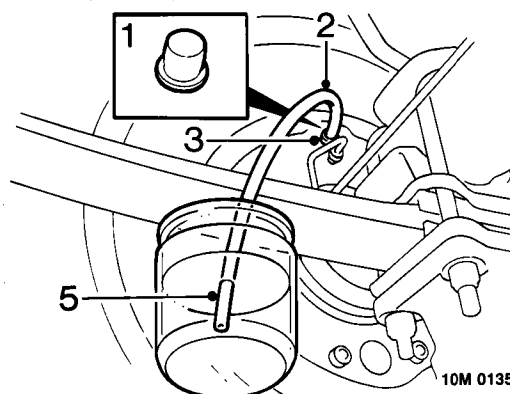
Renew fluid

CAUTION: Never re - use fluid that has been bled from system.



10M 0134

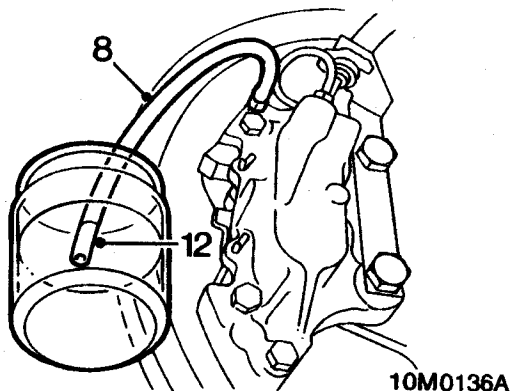
Note: Carry out operation in sequence shown.



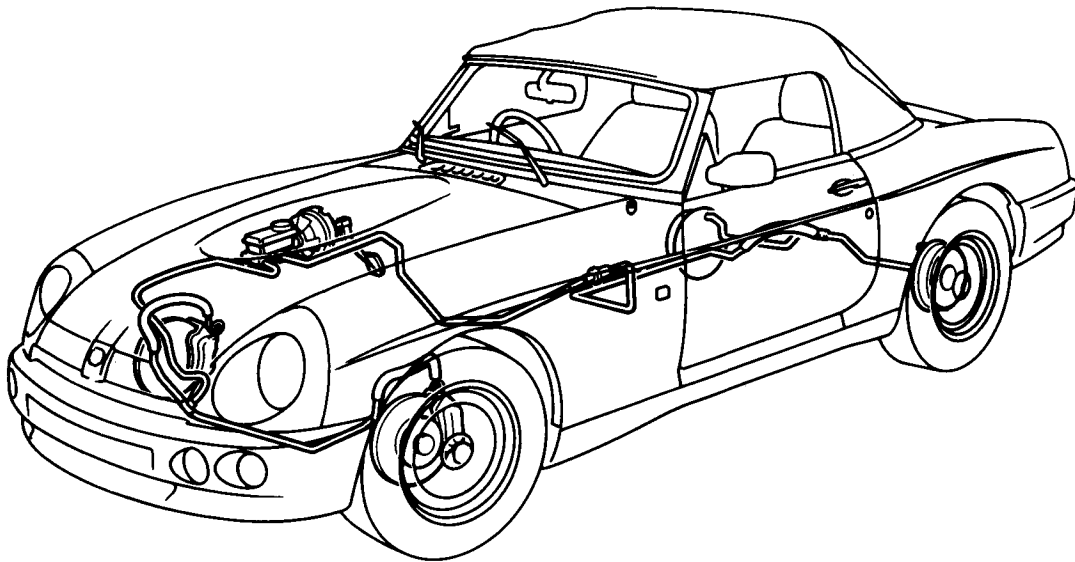
1. Remove cap from bleed screw.
2. Attach a bleed tube to L.H. rear bleed screw. Insert free end of tube into a bottle containing fluid.
3. Open bleed screw and use an assistant to press brake pedal to floor and release.
4. Repeat operation until clean fluid flows from bleed screw.
5. When clear, bubble free fluid flows. Use an assistant to hold pedal to floor and tighten bleed screw to correct torque.
6. Repeat foregoing procedure at R.H. rear bleed screw.
7. Refit caps to bleed screws.

CAUTION: Ensure that fluid level in reservoir is maintained during the complete operational sequence using new brake fluid.

MAINTENANCE



8. Attach bleed tube to L.H. front bleed screw.
9. Carry out bleeding operation as previously described until clean fluid flows from bleed screw.
10. Tighten caliper bleed screw to correct torque.
11. Repeat operation for R.H. front bleed screw.
12. Ensure clean bubble free fluid flows from bleed screw at each sequence stage.
13. Fit caps to bleed screws.
14. Check for a firm footbrake after complete operation.

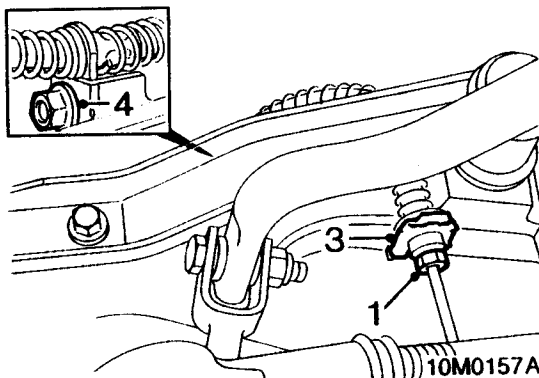


10M 0159

BRAKE HOSES AND PIPES

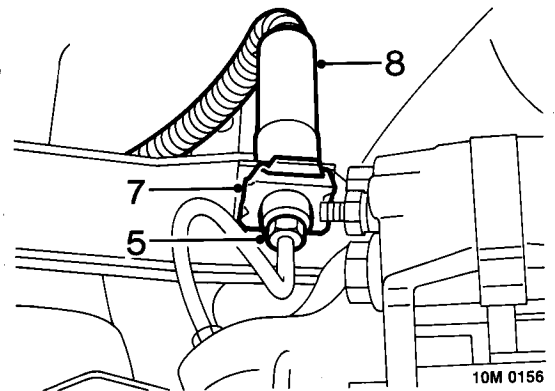
1. Visually check all brake fluid pipes, hoses and connections for correct routing and security.
2. Check for signs of chafing, leakage or corrosion.

Renew front brake hose Service Repair No. 70.15.08



Note: Disconnect hose at end nearest to master cylinder first.

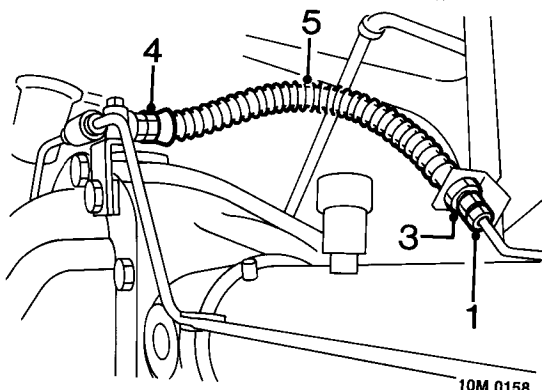
1. Release brake pipe union from hose using correct union spanner.
2. Fit plug to pipe end to prevent undue fluid loss.
3. Remove clip securing brake hose to cross - member bracket.
4. Remove bolt and release hose from bracket.



5. Release brake pipe union at other end using correct union spanner.
6. Plug pipe.
7. Remove clip securing hose to caliper bracket.
8. Remove hose and discard.
9. Position new hose through bracket.
10. Fit clip.
11. Remove plug from pipe, connect brake pipe to hose and tighten to correct torque.
12. Fit brake hose clip to bracket and tap home with hide mallet.
13. Fit and tighten bolt securing hose to bracket.
14. Position hose to cross - member bracket.
15. Fit clip.
16. Remove plug from pipe, connect brake pipe to hose and tighten to correct torque.

MAINTENANCE

Renew rear brake hose Service Repair No. 70.15.17



1. Release pipe union.
2. Fit plug to pipe end to prevent undue fluid loss.
3. Remove nut securing hose to bracket and release hose from bracket.
4. Remove hose from rear axle 'T' piece connection.
5. Discard hose.
6. Fit hose to 'T' piece connection and tighten to correct torque.
7. Connect hose to bracket, fit and tighten nut.
8. Remove plug from pipe, connect brake pipe to hose and tighten to correct torque.
9. Bleed brake system, using method given in **Brake Fluid**.

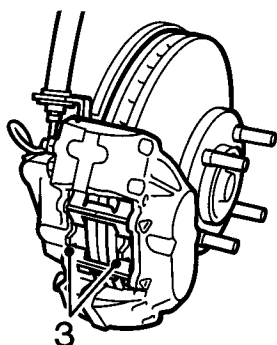
FRONT BRAKES - HYDRAULICS, PADS, DISCS AND CALIPERS

Check

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Remove both front road wheels.



3. Check brake pads visually and assess lining thickness.

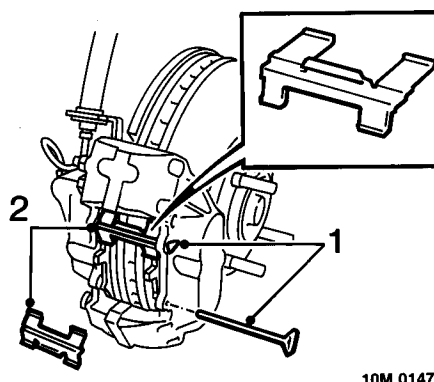


Minimum brake pad thickness:
Dimension A = 6.5 mm.

Note: Measurement includes pad back plate thickness.

Renew brake pads

WARNING: Brake pads must be renewed in axle sets only. Braking efficiency may otherwise be impaired.



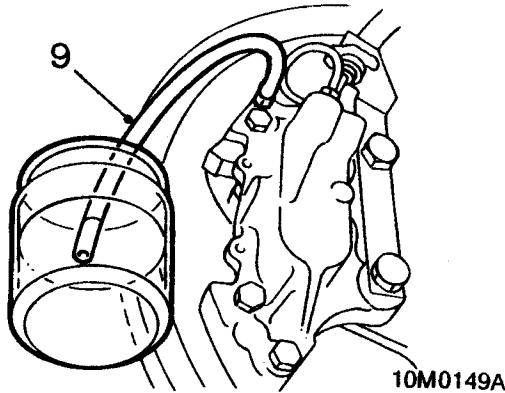
1. Close ends and withdraw 2 split pins from caliper. Discard split pins.
2. Remove 2 anti-rattle spring plates.

Note: Short legs to centre.

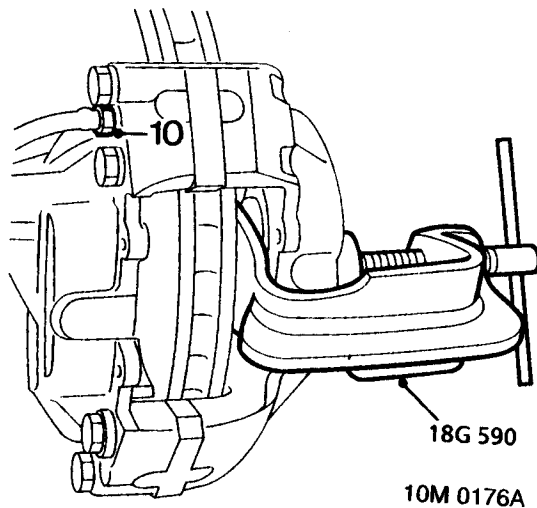
3. Remove 2 brake pads.
4. Examine disc for wear, cracking and scoring.
Minimum disc thickness = 24.25 mm.

CAUTION: Discs must not be refinished.

5. Clean dust from calipers using brake cleaning fluid or industrial alcohol.
6. Examine caliper for signs of hydraulic leakage.
7. Rotate disc by hand, remove all scale and rust from around edge of disc with a scraper.
8. Scrape rust from pad locating surfaces of caliper.



9. Position a bleed bottle and connect bleed hose to bleed screw.



10. Slacken bleed screw.
11. Press pistons back into caliper using **18G590**.
12. Tighten bleed screw.
13. Repeat the foregoing procedure for the second set of pistons.
14. Tighten bleed screw to correct torque, disconnect bleed hose and remove bleed bottle.
15. Fit cap to bleed screw.
16. Fit pads.
17. Fit anti-rattle springs, and secure using new split pins.
18. Repeat procedure for other front brake assembly.
19. Fit road wheel(s) and tighten nuts to correct torque.
20. Remove stand(s) and lower vehicle.
21. Depress footbrake several times in order to give correct pad to disc clearance.
22. Top-up brake fluid level.

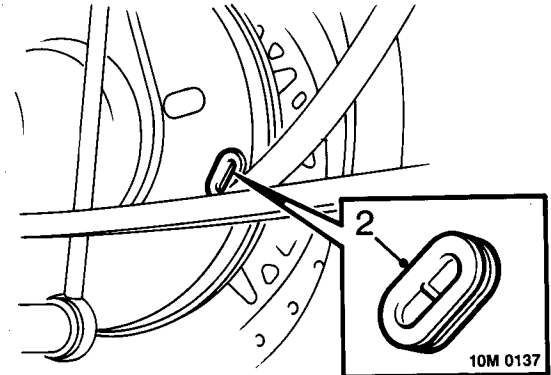
CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.

REAR BRAKES

Check brake linings

1. Raise rear of vehicle.

WARNING: Support on safety stands.



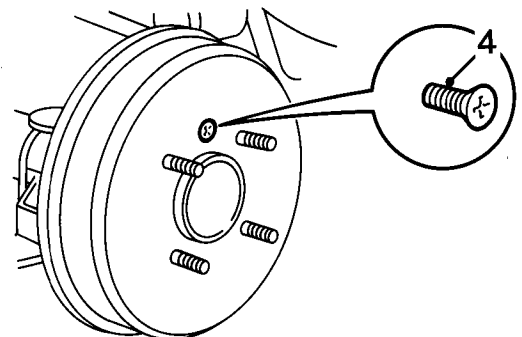
2. Remove rubber inspection grommet from brake backplate.
3. Check brake linings for contamination and assess wear.
Minimum lining thickness = 1.5 mm.

Inspect brake linings and linkage

1. Raise rear of vehicle.

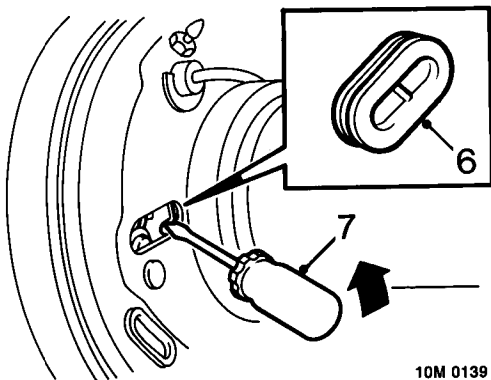
WARNING: Support on safety stands.

2. Remove road wheel(s).
3. Release handbrake.



4. Remove brake drum retaining screw.
5. Remove brake drum. If drum cannot be removed due to a wear/corrosion lip.

MAINTENANCE



6. Remove rubber grommet from rear of brake backplate.
7. Depress adjuster using a small screwdriver and retract brake shoes.
8. Refit rubber grommet.
9. Clean down backplate with brake cleaning fluid.

Note: When checking lining wear, trailing shoe linings are of much thinner section than leading shoe linings. The leading shoe linings are also tapered towards wheel cylinder.

10. Lubricate tips of shoes, shoe platforms on backplate and contact areas of cross lever with Molykote 111 grease.

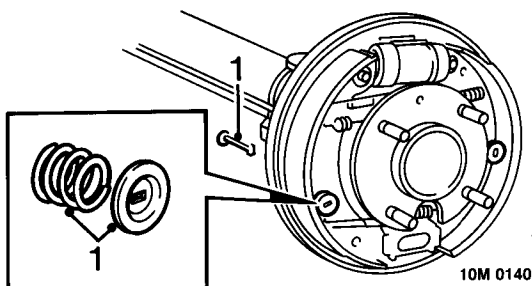
CAUTION: Keep grease away from shoe linings and all hydraulic parts.

11. Inspect drum for cracks, score marks and corrosion. If serviceable remove any loose rust with a wire brush and wipe inside of drum with damp cloth.

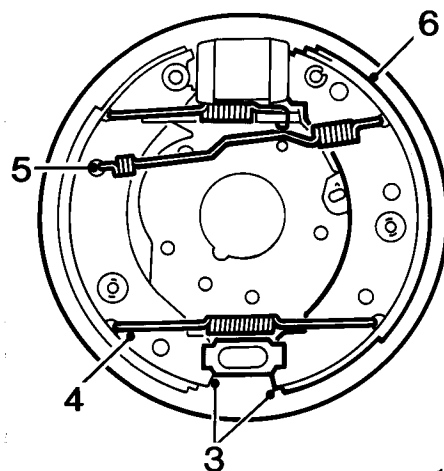
Renew brake linings

WARNING: Brake linings must be renewed in axle sets only. Braking efficiency may otherwise be impaired.

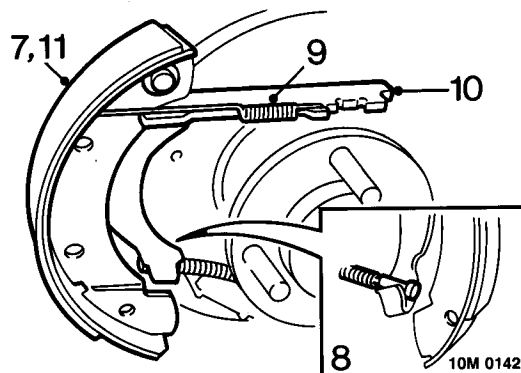
Note: Throughout this text reference to **TRAILING** shoe is shoe with handbrake operating lever attached, and **LEADING** shoe is the one with adjusting mechanism attached.



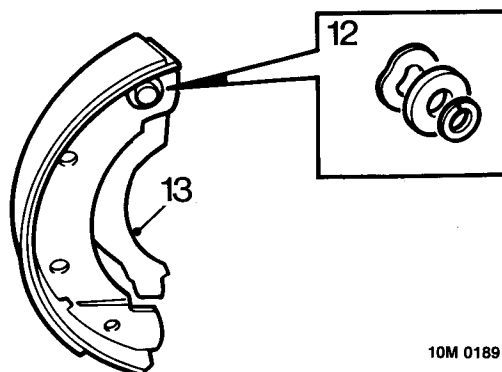
1. Depress and rotate steady spring caps 90° to release.
2. Remove 2 steady spring caps, 2 springs and 2 pins.



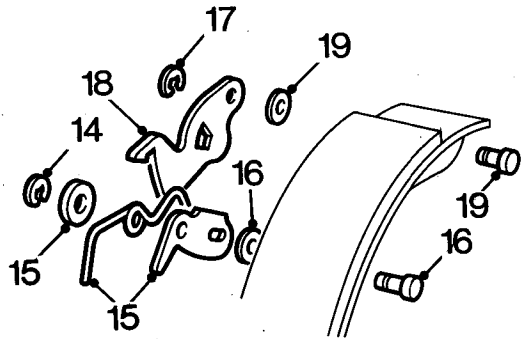
3. Release brake shoes from fixed abutment.
4. Release tension spring from shoe and remove spring.
5. Release pull-off spring from shoe and remove spring.
6. Remove leading shoe assembly.



7. Release trailing shoe assembly.
8. Release handbrake cable from trailing shoe lever.
9. Release cross lever spring from cross lever.
10. Remove cross lever.
11. Remove trailing shoe.



12. Remove handbrake lever pivot pin retaining clip, flat washer and Belville washer.
13. Remove handbrake lever from trailing shoe.



10M 0143

14. Remove small adjuster plate pivot pin retaining clip.
15. Remove flat washer, spring, and small adjuster plate.
16. Remove pivot pin from shoe and collect plain washer.
17. Remove large adjuster plate pivot pin retaining clip.
18. Remove large adjuster plate.
19. Remove pivot pin and collect plain washer.
20. Clean all parts with brake cleaning fluid, inspect all parts for wear, corrosion or damage. Lubricate pivot pins with Molykote 111 grease and transfer parts to new brake shoes.

CAUTION: Do not lubricate ratchet teeth on adjuster plates.

21. Examine outside of wheel cylinder dust seals for signs of brake fluid leakage, a certain amount of dampness is usual. However, if fluid is apparent, lift dust seal lip and check for excessive leakage. Renew wheel cylinder if brake linings have become contaminated.
22. Check pistons of wheel cylinders for freedom of movement.

WARNING: Do not use an air line to blow dust from brake assembly.

Do not use petrol, paraffin or any other petroleum based fluid as damage will occur to rubber components.

23. Clean backplate with brake cleaning fluid and allow to dry.
24. Use a wire brush or emery cloth to remove any corrosion taking care not to damage rubber dust covers of wheel cylinders.
25. Clean brake shoe abutments and platforms.
26. Lightly smear shoe abutments and platforms with Molykote 111 grease.

Refit

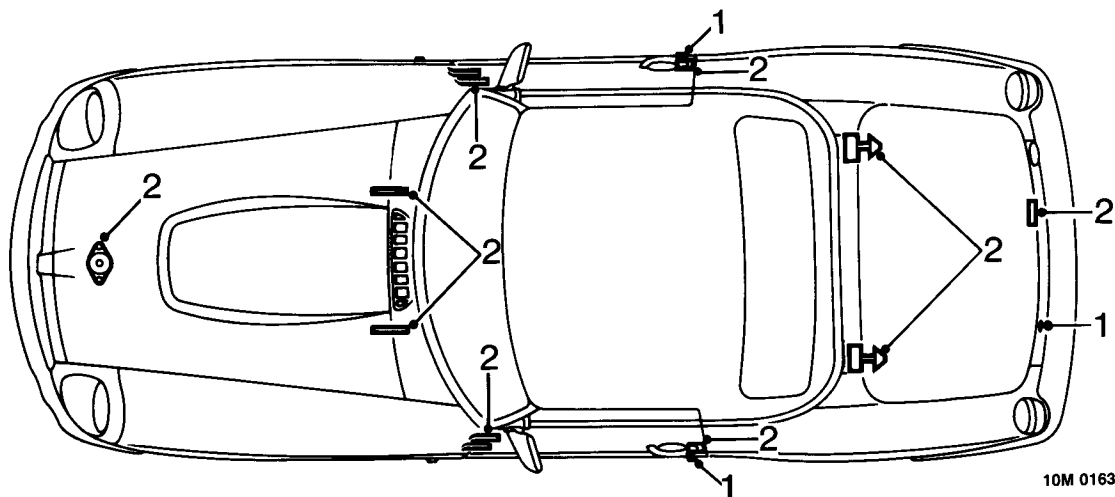
1. Fit cross lever to trailing shoe.
2. Fit and secure cross lever to trailing shoe spring.
3. Secure handbrake cable to trailing shoe lever.
4. Position trailing shoe assembly.

5. Position leading shoe assembly.
6. Fit and secure pull – off spring to shoes.
7. Fit and secure tension spring to shoes.
8. Align brake shoes to wheel cylinder and secure shoes to fixed abutment.
9. Fit steady spring pins, springs and caps.
10. Refit brake drum, fit and tighten screw.
11. Repeat brake shoe renewal procedure for opposite brake assembly.
12. Fit road wheel and tighten nuts to correct torque.
13. Apply footbrake 3 times to set shoe to drum clearance.
14. Adjust handbrake.
15. Remove stand(s) and lower vehicle.

MAINTENANCE

BODY

Locks, hinges and latch mechanism (not steering lock)



1. Functionally check operation of all locks.
2. Ensure that all locks, hinges and latch mechanisms are lubricated using Door Lock and Latch Lubricant, Part No. VWN 10075. Inject lubricant sparingly into lock barrels. Clean off any surplus.
DO NOT lubricate the steering lock.

Exterior paintwork and body panels

Visually check paintwork and body panels for damage and corrosion.

Underbody sealer

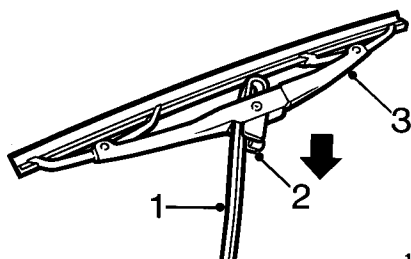
Visually check underbody sealer for damage and continuity.

SCREEN WIPERS AND BLADES

1. Operate screen wiper.
2. Check that blades wipe screen without smearing.
3. Check that wipers park correctly.
4. Operate wiper switch in all modes.
5. Check that wipers operate at speeds selected.

6. Push blade into engagement with arm.
7. Check that it is retained.

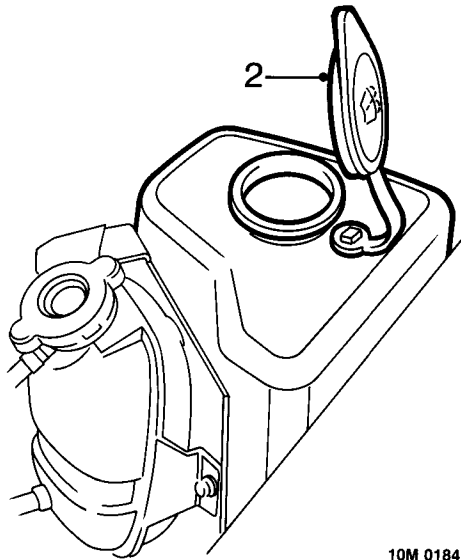
Renew blade



1. Lift wiper arm.
2. Press retaining lever.
3. Slide blade down arm.
4. Withdraw blade assembly from arm.
5. Position new blade to wiper arm.



WINDSCREEN WASHERS

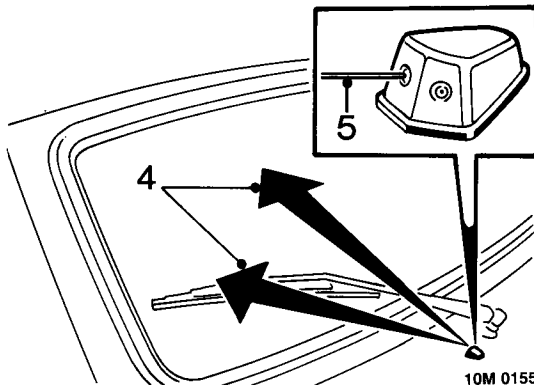


10M 0184

1. Visually check mixture level in reservoir.
2. Top - up by removing filler cap and adding mixture of water and 'Screenwash' of correct concentration.

Reservoir capacity	Temperature °C		
	- 3°	- 7°	- 12°
3.8 litre	380 ml	760 ml	1520 ml

3. Clean windscreen washer jets using thin wire as a probe.



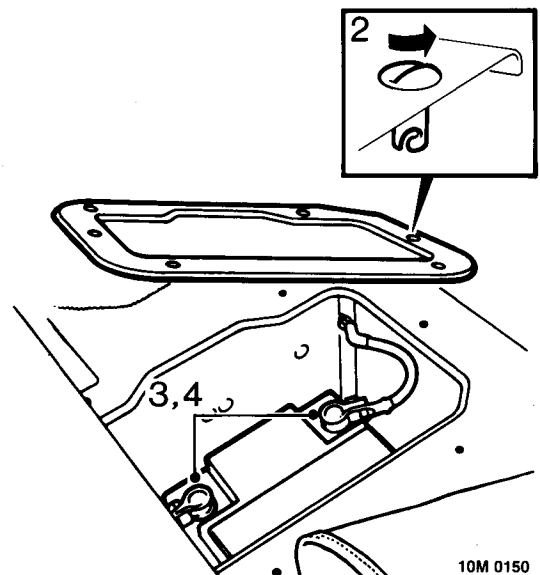
10M 0155

4. Operate windscreen washer and check that jets strike centre of area to be wiped.
5. Adjust jet by inserting a needle into jet hole and repositioning.
6. Check operation of programmed wash/wipe by switching on ignition and operating washer lever.
7. Observe that washer and wiper operate for as long as lever is operated and wiper operates for a further 3 wipes after lever is released.
8. Recheck level in reservoir after adjustments.

LAMPS, HORNS AND WARNING INDICATORS

1. Switch on sidelamps and check that sidelamps, tail lamps, rear number plate lamps, panel illumination lamps and panel sidelamp indicators illuminate.
2. Switch on ignition.
3. Switch on headlamps and check that headlamps illuminate.
4. Operate dip switch and check headlamp dip and main beams and that panel main beam indicator illuminates.
5. Operate flash switch and check that headlamps flash.
6. Switch on front fog lamps and check that lamps illuminate.
7. Open doors and luggage compartment and check that interior lamps illuminate.
8. Press horn and check that horn operates.
9. Operate direction warning indicator switch to right and left and check that warning indicators flash at front and rear.
10. Operate hazard warning switch and check that all warning indicators flash.
11. Engage reverse gear and check that reverse lamps operate, disengage reverse gear.

BATTERY CONNECTIONS



10M 0150

1. Fold drivers seat squab forward and remove rear floor carpet.
2. Turn 5 turnbuckles anti - clockwise one half turn and remove battery compartment cover panel.
3. Ensure battery terminals are tight.
4. Wipe battery top clean and dry, smear terminal posts with petroleum jelly.
5. Position battery compartment cover panel and secure turnbuckles.

MAINTENANCE

6. Fit rear floor carpet and fold seat squab back.

ROAD TEST

Engine start and fast idle speed

1. Start engine from cold and check that fast engine idle speed is maintained until normal engine temperature is reached.

Engine performance and throttle operation

1. Start engine and check that it starts easily.
2. Check that 'oil pressure' and 'no charge' warning lamps extinguish.
3. Check that throttle pedal movement is free and unrestricted.
4. Check that engine is responsive to throttle movement.

Clutch and gear selection Normal driving conditions

1. Check that clutch engages smoothly without judder, slipping or noise.
2. Check for abnormal transmission noise.
3. Check for smooth quiet gear change and that gear selected engages easily.

Steering

1. Check for noise, effort required, free play and self - centralism.

Suspension

1. Check for noise, irregularity in ride (e.g dampers) and wheel imbalance.

Footbrake

1. Check for pedal effort, travel, braking efficiency, pulling and binding.

Instruments

1. Check that all instruments operate.
2. Check speedometer for steady operation, noise and operation of distance recorder.

Body

1. Check for abnormal body noise.

Seat belts

1. Check for operation of inertia reels and condition of belt webbing.

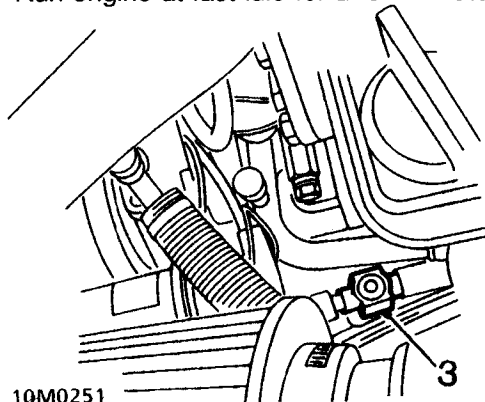
Handbrake

1. Apply handbrake firmly, check travel and ratchet hold and release.

AIR CONDITIONING

Air conditioning refrigerant sight glass - check

1. Start engine and switch on air conditioning.
2. Run engine at fast idle for a few minutes.



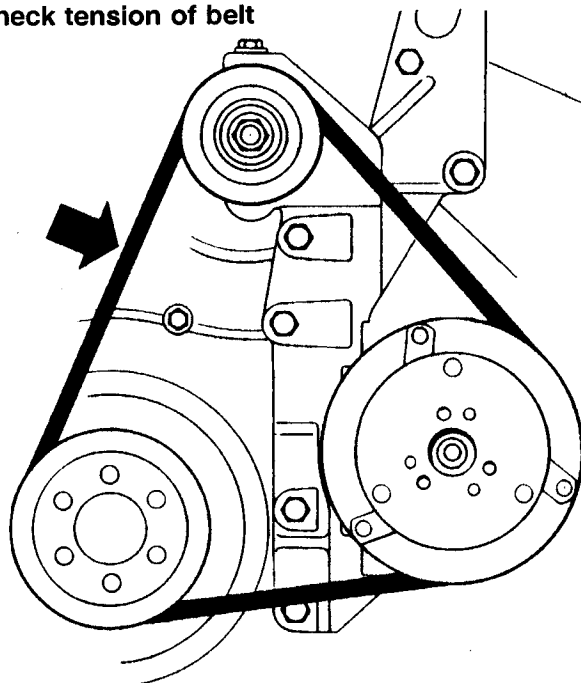
3. Observe sight glass. Occasional bubbles indicates normal condition. A constant stream of bubbles indicates low refrigerant. A clouded or streaky sight glass indicates a compressor fault or drier dessicant circulating.



COMPRESSOR DRIVE BELT

1. Check condition of drive belt; renew a belt that shows signs of wear or splitting.

Check tension of belt

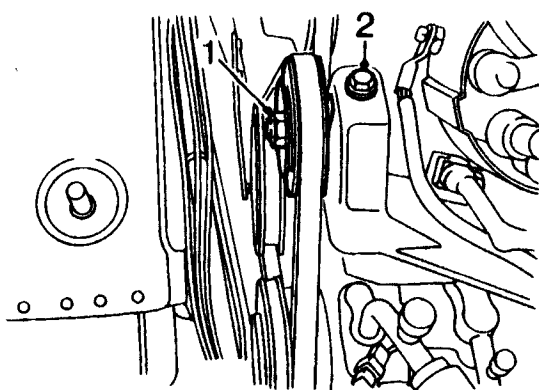


10M0252

1. Apply a force of 10kg to drive belt at position X and measure belt deflection. Deflection must be 10mm.

Adjust drive belt tension

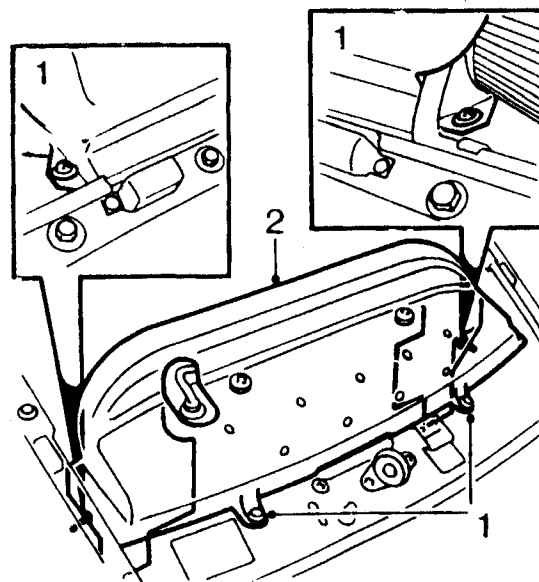
Service Repair No. 82.10.01



10M0253

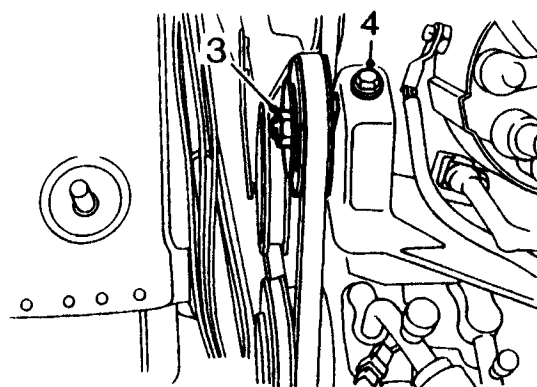
1. Slacken tensioner pulley centre nut.
2. Turn adjusting nut to obtain correct tension.
3. Tighten tensioner pulley centre nut to correct torque.
4. Re - check belt tension.

Renew compressor drive belt Service Repair No. 82.10.02



10M0254

1. Remove 2 bolts and 2 scrivet fasteners securing radiator top cover.
2. Remove top cover.



10M0255

3. Slacken tensioner pulley centre nut.
4. Turn adjusting nut anti - clockwise to fully release belt tension.
5. Remove and discard drive belt.
6. Clean pulley "V"s.
7. Fit new drive belt to crankshaft and compressor pulleys.
8. Adjust drive belt tension.
9. Run engine at fast idle for 3 - 5 minutes with air conditioning switched on.
10. Re - check tension.
11. Fit radiator top cover.
12. Fit 2 scrivet fasteners; fit and tighten 2 bolts.

ENGINE

CONTENTS

REPAIRS

Page

ROCKER COVER GASKET	1
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CRANKSHAFT REAR OIL SEAL	5
SUMP GASKET	6
TIMING COVER GASKET	6
TIMING CHAIN AND GEARS	8
OIL PRESSURE TRANSDUCER	9
ENGINE AND GEARBOX	10





ROCKER COVER GASKET

Service Repair No. 12.29.40 - L.H. Cover Gasket.

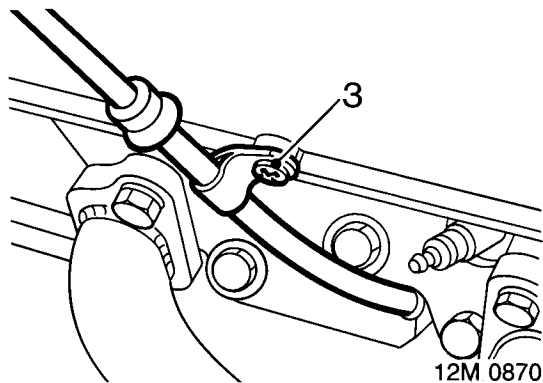
Service Repair No. 12.29.41 - R.H. Cover Gasket.

Remove

1. Disconnect battery earth lead.

L.H. Cover Only

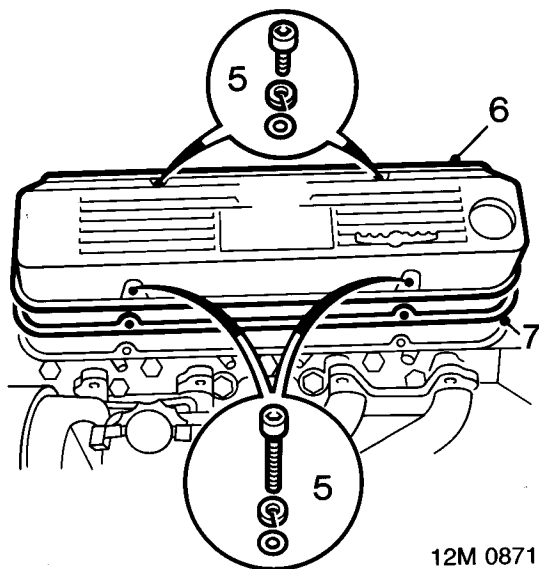
2. Remove plenum chamber, see **FUEL SYSTEM**.



3. Remove screw securing dipstick tube to rocker cover.

L.H. & R.H. Covers

4. Release caps from spark plugs and release H.T. leads from clips on rocker cover.



5. Remove 4 screws securing rocker cover to cylinder head.

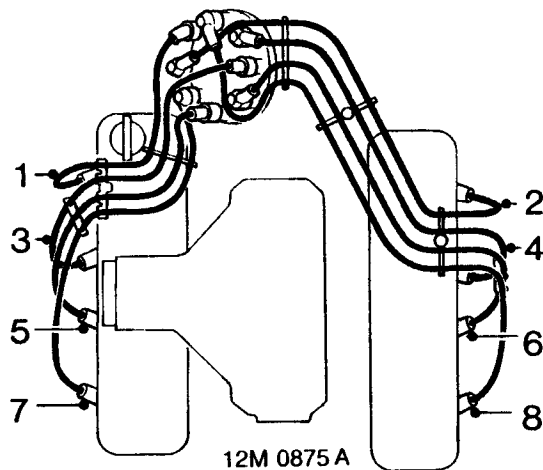
Note: Position of 2 longer screws.

6. Remove rocker cover.
7. Remove gasket from rocker cover.

Refit

1. Remove all traces of old gasket material from rocker cover and cylinder head.

2. Clean gasket surface in rocker cover using Bostik cleaner 6001 or equivalent, and allow to dry.
3. Apply a thin coating of Bostik 1775 or equivalent impact adhesive to mating surfaces of rocker cover and gasket.
4. Allow adhesive to cure, then fit gasket to rocker cover.
5. Fit rocker cover to cylinder head, fit screws and tighten to correct torque.



6. Fit plug caps, route H.T. leads correctly and secure leads to rocker cover clips as shown.

L.H. Cover

7. Align dipstick tube to rocker cover, fit and tighten screw.
8. Fit plenum chamber, see **FUEL SYSTEM**.
9. Connect battery earth lead.

CYLINDER HEAD GASKET

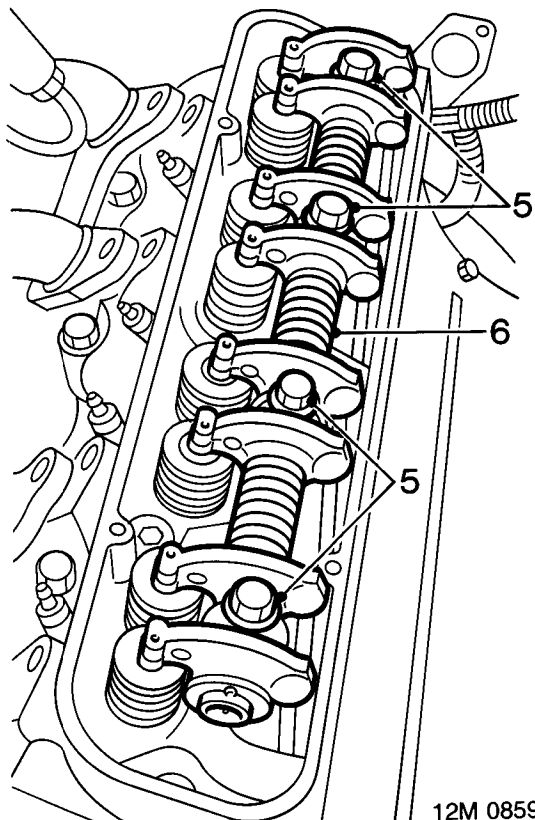
Service Repair No. 12.29.01 - Gaskets - engine set.

Service Repair No. 12.29.02 - Gasket - L.H. cylinder head.

Service Repair No. 12.29.03 - Gasket - R.H. cylinder head.

Remove

1. Disconnect battery earth lead.
2. Remove inlet manifold gasket, see **MANIFOLD & EXHAUST**.
3. Remove relevant exhaust manifold gaskets, see **MANIFOLD & EXHAUST**.
R.H. cylinder head gasket only: Remove alternator, see **ELECTRICAL**.
4. Remove relevant rocker cover.

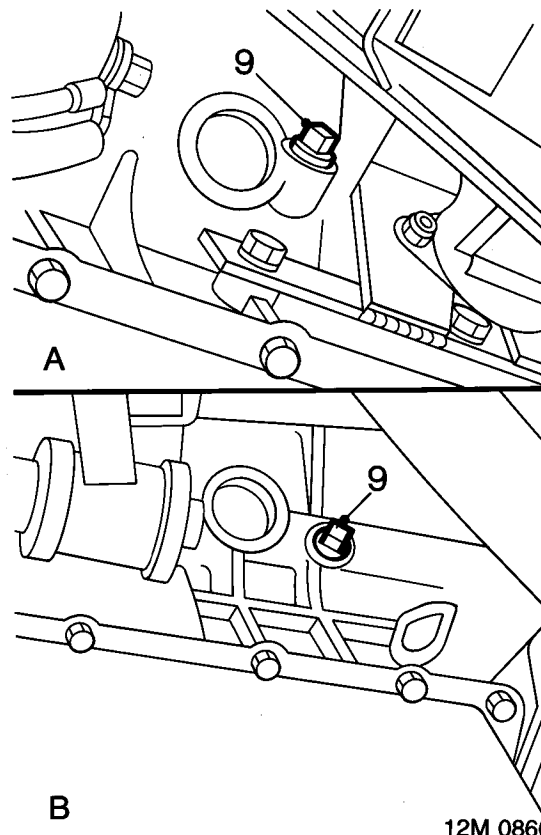


12M 0859

5. Progressively slacken and remove 4 bolts securing rocker shaft assembly to cylinder head.
6. Remove rocker shaft assembly.

CAUTION: If both rocker shaft assemblies are removed, each assembly should be marked in relation to original cylinder head. Incorrect fitment of rocker shafts will lead to an oil feed restriction.

7. Remove pushrods and store in fitted order.



12M 0860

A - R.H. B - L.H.

8. Position container to collect drained coolant.
9. Remove relevant cylinder block drain plug and allow coolant to drain from block.
10. Fit and tighten drain plug and remove container.
11. *LH cylinder head gasket only - air conditioning fitted:* Remove 2 bolts securing compressor mounting bracket to cylinder head.
12. Remove 14 bolts securing cylinder head to cylinder block in reverse order of tightening sequence.

Note: Assistance will be necessary to hold exhaust manifold aside whilst removing cylinder head lower bolts.

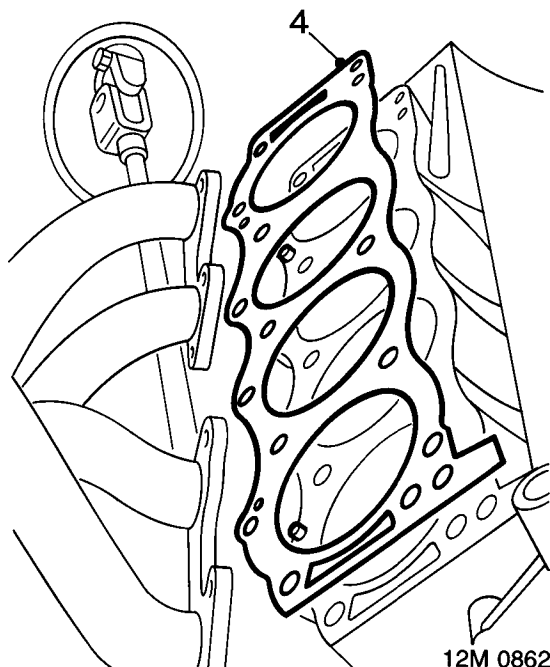
13. Release cylinder head from 2 dowels and remove cylinder head.
14. Remove and discard cylinder head gasket.

Refit

1. Clean mating faces of cylinder head and cylinder block using a suitable release agent and plastic scraper.

CAUTION: Do not use metal scraper, or machined surfaces may be damaged.

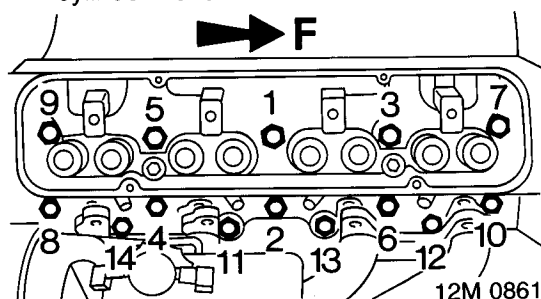
2. Clean pushrods and contact surfaces on rocker shaft assemblies.
3. Remove all traces of sealant from threads of cylinder head bolts.



4. Fit cylinder head gasket with the word 'TOP' uppermost.
5. Carefully fit cylinder head and locate on dowels.

Note: Assistance will be necessary to hold exhaust manifold aside during above operation.

6. Apply Loctite 572 sealant to threads of cylinder head bolts.



7. Fit cylinder head bolts and tighten progressively, in sequence illustrated, to correct torque.
8. *LH cylinder head gasket only - air conditioning fitted:* Clean 2 bolts securing compressor mounting bracket to cylinder head. Apply Loctite 572 to first 3 threads of bolts, fit bolts and tighten to correct torque.
9. Lubricate pushrods and rocker shaft assemblies with clean engine oil.
10. Fit pushrods in removed order.
11. Fit rocker shaft assembly, fit bolts and tighten to correct torque.

CAUTION: Ensure rocker shaft assemblies are fitted to original cylinder heads, or oil feed will be restricted.

12. Fit rocker cover.
R.H. cylinder head gasket only: Fit alternator, see **ELECTRICAL**.

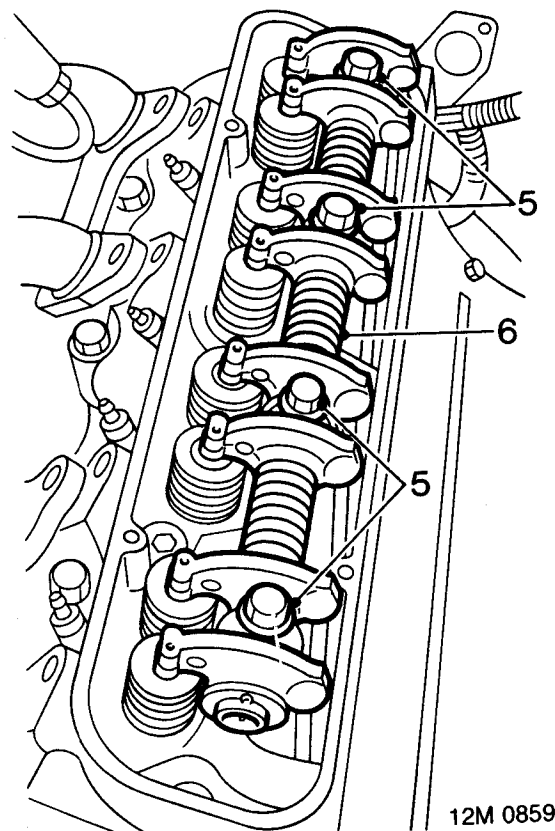
13. Fit relevant exhaust manifold gaskets, see **MANIFOLD & EXHAUST**.
14. Fit inlet manifold gasket, see **MANIFOLD & EXHAUST**.
15. Connect battery earth lead.

TAPPETS - ENGINE SET

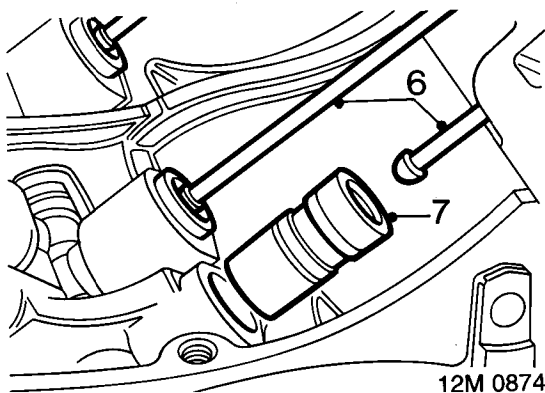
Service Repair No. 12.29.57

Remove

1. Disconnect battery earth lead.
2. Remove inlet manifold gasket, see **MANIFOLD & EXHAUST**.
3. Remove both rocker covers.
4. Identify each rocker shaft assembly to ensure refitment to same bank of cylinders.



5. Progressively slacken and remove 4 bolts securing each rocker shaft.
6. Remove rocker shaft assemblies.



7. Remove pushrods and store in fitted order.
8. Remove tappets.

Note: Store tappets with respective pushrods if they are to be refitted.

Inspect

1. Clean and inspect tappets. Check for an even, circular wear pattern on the camshaft contact area. If contact area is pitted or a square wear pattern has developed, tappet must be renewed and camshaft lobes should be checked for excessive wear.
2. Inspect tappet body for excessive wear or scoring. Replace tappet if scoring or deep wear patterns extend up to oil feed area. Clean and inspect tappet bores in engine block.
3. Ensure that tappets rotate freely in their respective bores.
4. Inspect pushrod contact area of tappet, replace tappet if surface is rough or pitted.
5. Check pushrods for straightness and inspect ball ends for damage, replace as necessary.
6. Inspect pushrod seats in valve rockers.

Refit

1. Immerse tappets in clean engine oil to reduce tappet noise when engine is first started.
2. Lubricate tappet bores with clean engine oil and fit tappets in removed order.
3. Lubricate ball ends of pushrods and fit in removed order.
4. Lubricate rocker shaft assemblies and fit to respective cylinder heads, ensuring correct location of pushrods in rocker seats.
5. Fit rocker shaft bolts and tighten progressively to correct torque.
6. Fit rocker covers.
7. Fit inlet manifold gasket, see **MANIFOLD & EXHAUST**.
8. Connect battery earth lead.

Note: Some tappet noise may be evident on initial start-up. If necessary, run the engine at 2500 rev/min for a few minutes until noise ceases.

CRANKSHAFT PULLEY AND OIL SEAL

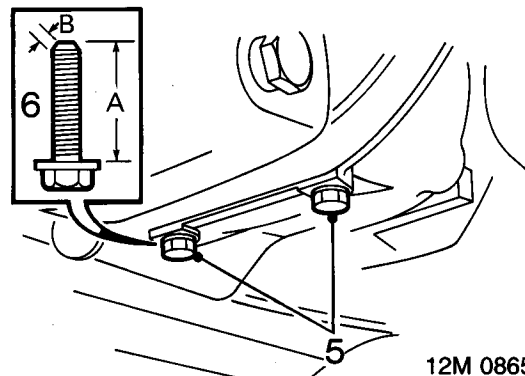
Service Repair No. 12.21.01

Remove

1. Disconnect battery earth lead.
2. Raise front of vehicle.

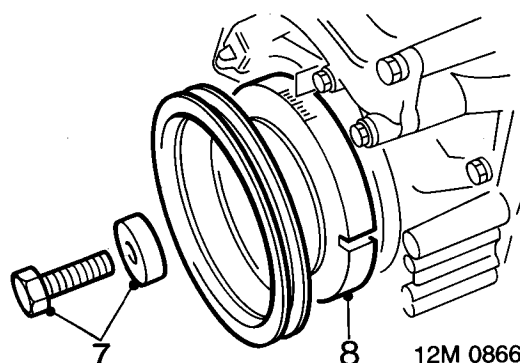
WARNING: Support on safety stands.

3. Remove radiator block, see **COOLING SYSTEM**.
4. Remove alternator/water pump drive belt, see **MAINTENANCE**.



5. Remove 2 bolts from bottom of clutch housing.
6. Fit 2 bolts, to following specification, to lock flywheel. Tighten bolts to correct torque.
Bolt specification:
Thread form = M10
Thread minimum length 'A' = 35mm
Chamfer 'B' = 2mm

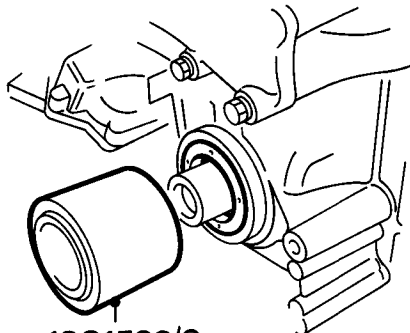
CAUTION: Do not exceed locking bolt torque figure or crankshaft bearings may be damaged.



7. Remove crankshaft pulley bolt and collect spacer washer.
8. Remove crankshaft pulley.
9. Taking care not to damage timing cover, remove oil seal using a suitable lever.
10. Discard oil seal.

**Refit**

1. Use a lint free cloth and thoroughly clean, crankshaft, crankshaft pulley oil seal running surface and oil seal location in timing cover.
2. Lubricate new oil seal sealing surfaces with clean engine oil.



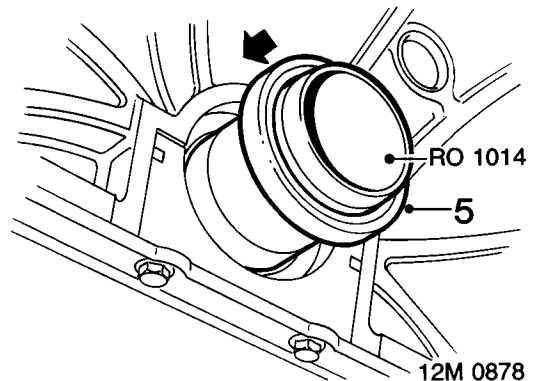
18G1533/2

12M 0867

3. Locate seal in timing cover and drift in squarely until flush with face of timing cover using the plain face of **18G1533/2**.
4. Fit crankshaft pulley.
5. Fit spacer washer to crankshaft pulley bolt, fit bolt and tighten to correct torque.
6. Remove flywheel locking bolts and refit original bolts to clutch housing.
7. Fit alternator/water pump drive belt, see **MAINTENANCE**
8. Fit radiator block, see **COOLING SYSTEM**
9. Remove stand(s) and lower vehicle.
10. Connect battery earth lead.

Refit

1. Clean seal location and running surface on crankshaft.
2. Clean mating surfaces, dowels and dowel locations of flywheel and crankshaft.
3. Clean seal guide **RO1014** and lubricate with clean engine oil.
4. Lubricate oil seal lip with clean engine oil.



12M 0878

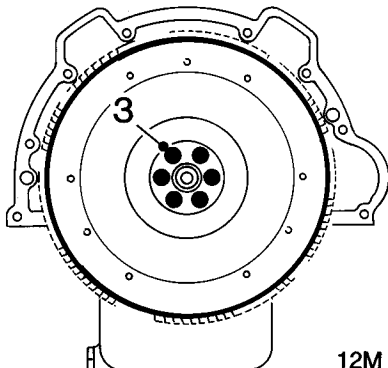
5. Position seal guide **RO1014** to crankshaft and fit oil seal squarely, using hand pressure only, until located fully into recess.
6. Remove seal guide.
7. Fit flywheel and locate on 2 dowels.
8. Fit flywheel bolts.
9. With assistance, restrain crankshaft pulley bolt and tighten flywheel bolts to correct torque.
10. Fit clutch assembly, see **CLUTCH**
11. Connect battery earth lead.

CRANKSHAFT REAR OIL SEAL

Service Repair No. 12.21.20

Remove

1. Disconnect battery earth lead.
2. Remove clutch assembly, see **CLUTCH**



12M 0877

3. With assistance, restrain crankshaft pulley bolt and remove 6 bolts securing flywheel.
4. Remove flywheel.
5. Carefully lever oil seal from location, taking care not to score location or running surface on crankshaft.

SUMP GASKET

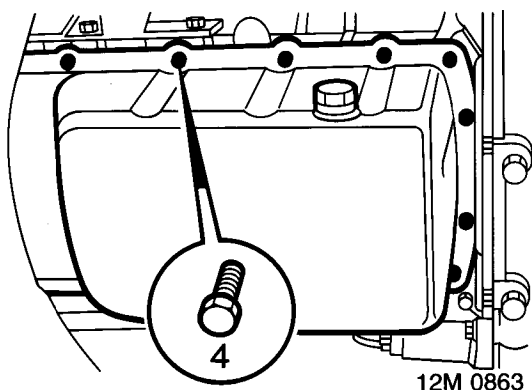
Service Repair No. 12.60.20

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Drain engine oil, see **MAINTENANCE**.
3. Remove dipstick.



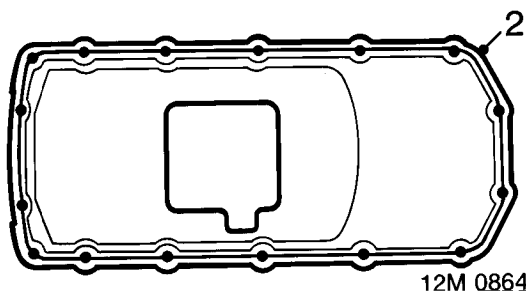
4. Remove 16 bolts securing sump to engine block.
5. Carefully release sump from engine block.

CAUTION: Take care not to damage sealing faces of cylinder block and sump.

6. Remove sump.

Refit

1. Remove all traces of old sealant from mating faces of cylinder block and sump.



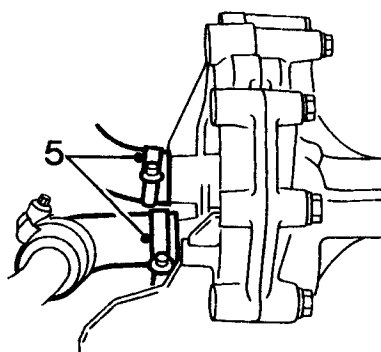
2. Clean mating faces with suitable solvent and apply a 2mm bead of RTV Silicone Sealant to sump joint face as shown.
3. Fit sump, taking care not to damage sealant bead.
4. Fit sump bolts and tighten progressively to correct torque.
5. Remove stand(s) and lower vehicle.
6. Fit dipstick and refill engine oil, see **MAINTENANCE**.

TIMING COVER GASKET

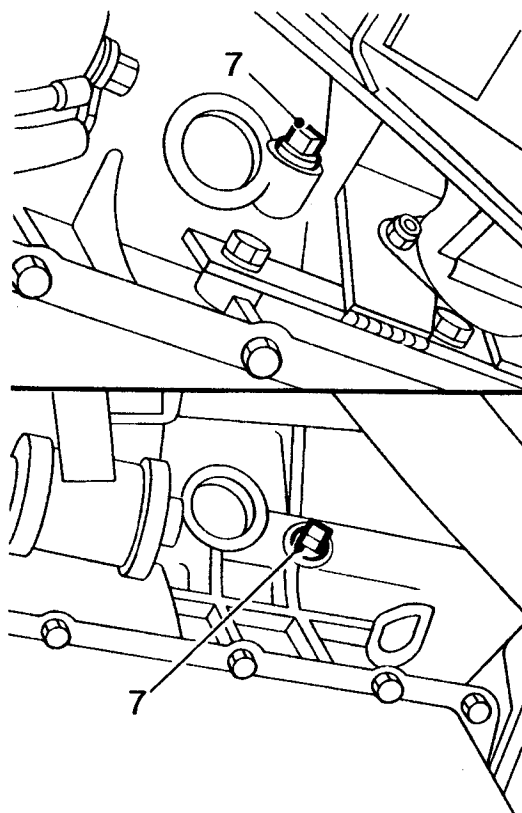
Service Repair No. 12.65.04

Remove

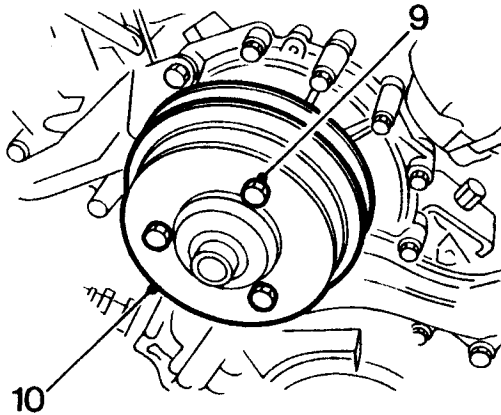
1. Disconnect battery earth lead.
2. Remove crankshaft pulley.
3. Remove distributor, see **IGNITION SYSTEM**.
4. *Air conditioning fitted:* Remove compressor mounting bracket, see **AIR CONDITIONING**.



5. Slacken 2 clips and disconnect 2 coolant hoses from rear of water pump.

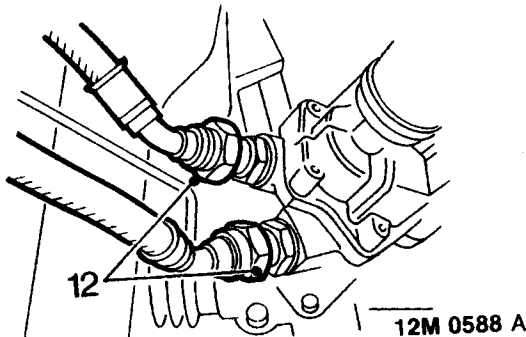


6. Position container to collect drained coolant.
7. Remove both cylinder block drain plugs. Refit and tighten drain plugs when all coolant has drained from block.
8. Remove sump.



12M 0587B

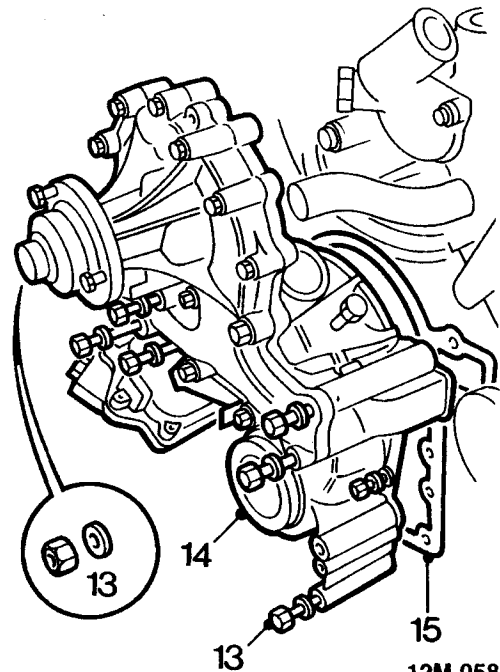
9. Remove 3 bolts securing water pump pulley.
10. Remove pulley.



12M 0588 A

11. Position cloth beneath oil filter feed and return hose unions at oil pump to absorb oil spillage.
12. Unscrew and disconnect oil feed and return hose unions from oil pump.

CAUTION: Plug the connections.

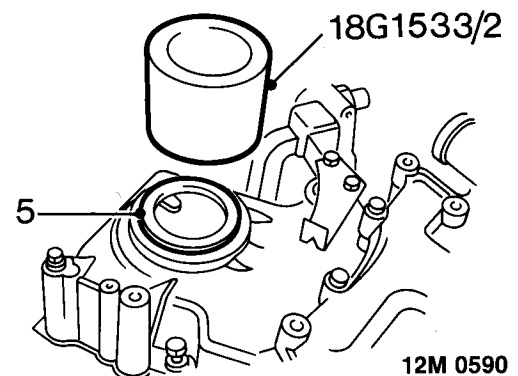


12M 0589 A

13. Remove 8 bolts and nut securing timing cover to engine block.
14. Release timing cover and remove complete with water pump.
15. Remove timing cover gasket.
16. Remove oil seal from timing cover and discard.

Refit

1. Clean sealant from threads of cover bolts.
2. Clean all traces of old gasket material from cover and mating face of block.
3. Use a lint free cloth and thoroughly clean oil seal location in timing cover.
4. Lubricate new oil seal sealing surfaces with clean engine oil.



12M 0590

5. Locate seal to timing cover and drift seal in squarely, using plain face of **18G1533/2** until flush with front face of timing cover.
6. Position new gasket to engine block.
7. Coat threads of timing cover bolts with Loctite 572 sealant.
8. Fit timing cover, fit bolts and nut and tighten to correct torque.
9. Fit sump.
10. Clean oil feed and return pipe unions.

ENGINE

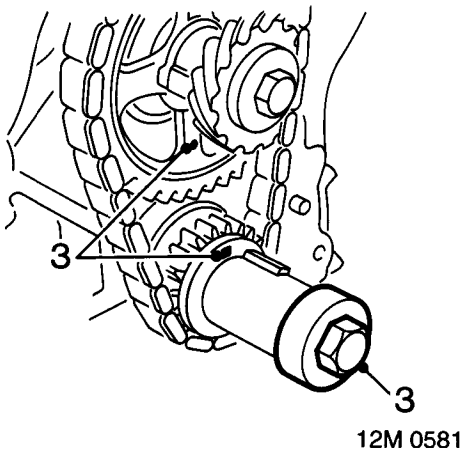
11. Position oil feed and return hose unions to oil pump, tighten unions to correct torque.
12. Fit water pump pulley, fit bolts and tighten to correct torque.
13. Connect coolant hoses to rear of water pump and tighten clips.
14. Fit distributor, see **IGNITION SYSTEM**
15. Fit crankshaft pulley.
16. Connect battery earth lead.

TIMING CHAIN AND GEARS

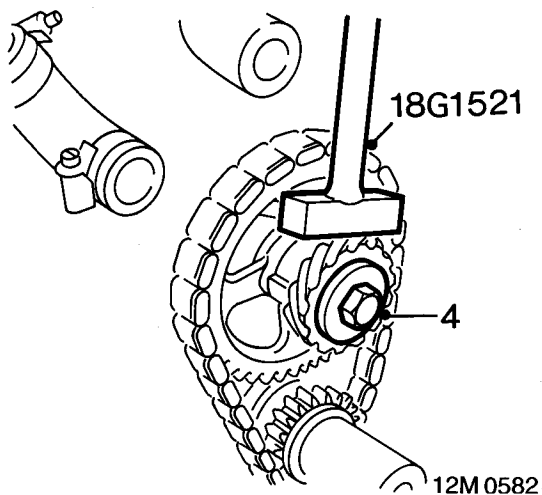
Service Repair No. 12.65.12

Remove

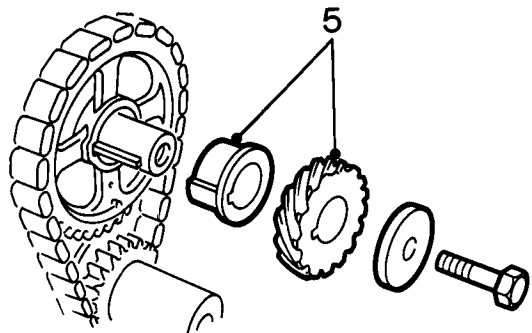
1. Disconnect battery earth lead.
2. Remove timing cover.



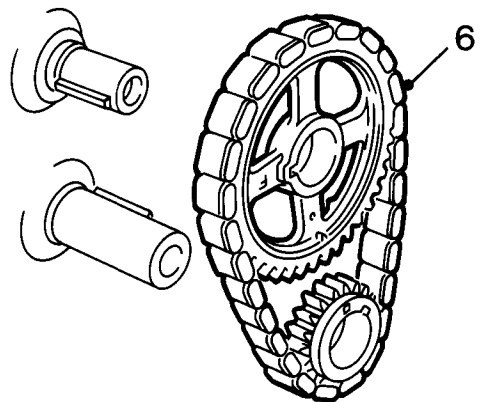
3. Temporarily fit crankshaft pulley bolt and washer, then turn crankshaft until camshaft timing marks align. Remove crankshaft pulley bolt and washer, ensuring crankshaft does not move.



4. Using **18G1521** to restrain gear, remove bolt securing camshaft gear, collect washer.



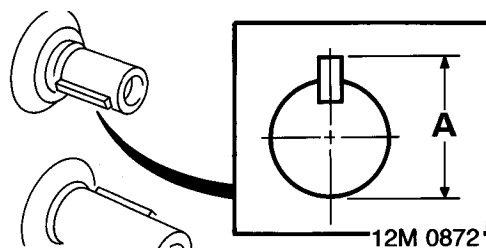
5. Remove distributor drive gear and spacer.



6. Remove timing chain and gears as an assembly.

Refit

1. Clean timing gears.
2. Clean gear locations on camshaft and crankshaft.



3. Check camshaft key is fully engaged in keyway.

CAUTION: Space between key and keyway acts as an oil feed. It is therefore most important that key is properly seated and parallel to axis of camshaft. Overall dimension 'A' must not exceed 30.15mm.



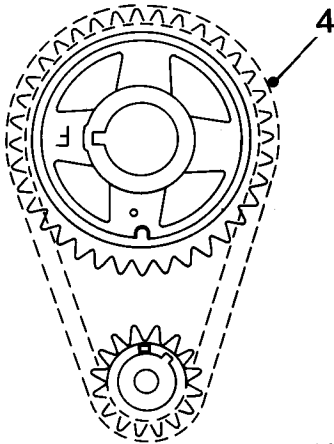
OIL PRESSURE TRANSDUCER

Service Repair No. 12.60.50

Remove

1. Raise front of vehicle.

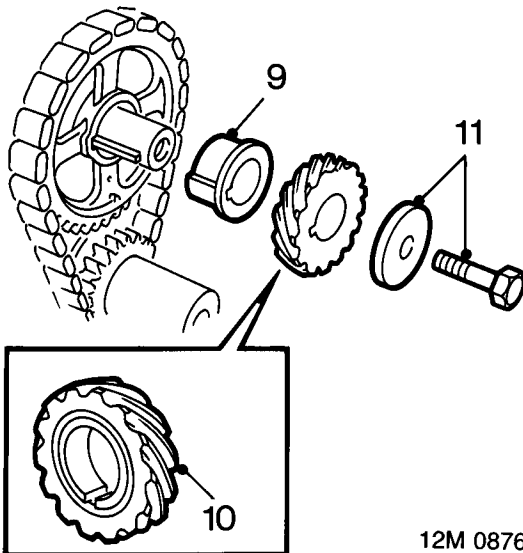
WARNING: Support on safety stands.



12M 0591

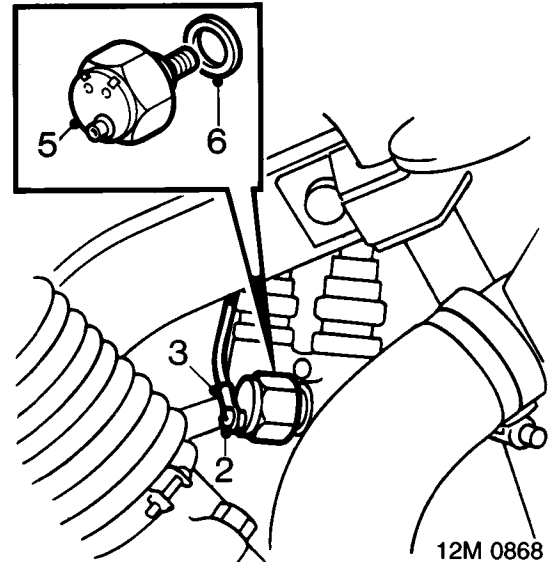
4. Temporarily fit camshaft and crankshaft gears, without chain, to ensure timing marks are still aligned.
5. Remove gears.
6. Position timing gears on work surface with timing marks upwards and aligned.
7. Fit timing chain around gears, keeping timing marks aligned.
8. Fit gear and chain assembly.

Note: Timing marks and 'F' mark on camshaft gear must be facing forwards.



12M 0876

9. Fit spacer to camshaft with flange facing forwards.
10. Fit distributor drive gear to camshaft with grooved face towards camshaft gear.
11. Fit camshaft gear bolt and washer, restrain camshaft gear using **18G1521** and tighten bolt to correct torque.
12. Fit timing cover.
13. Connect battery earth lead.



12M 0868

2. Remove screw securing transducer terminal connector.
3. Release connector.
4. Position cloth beneath transducer to absorb oil spillage.
5. Remove oil pressure transducer.
6. Remove and discard sealing washer.

Refit

1. Clean sealing face and threads of transducer. Clean sealing face of oil pump.
2. Fit new sealing washer to switch.
3. Fit and tighten switch.

CAUTION: Ensure sealing washer locates correctly as switch is tightened.

4. Wipe away any oil spillage.
5. Position connector to transducer terminal, fit and tighten screw.
6. Remove stand(s) and lower vehicle.

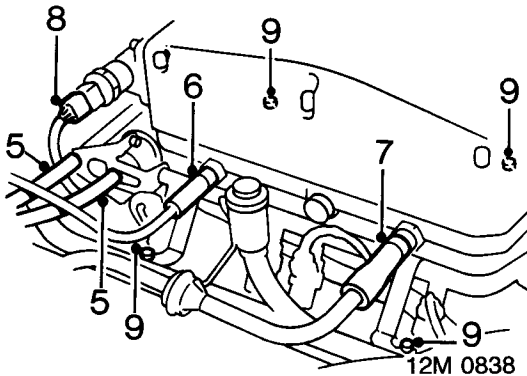
ENGINE

ENGINE AND GEARBOX

Service Repair No. 12.37.01/99

Remove

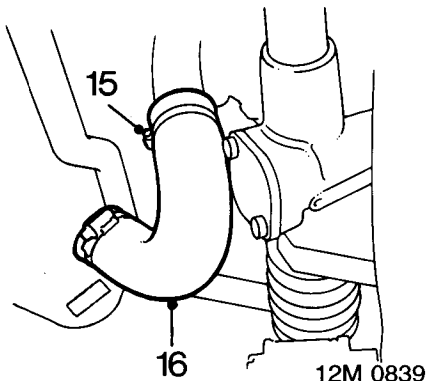
1. Remove bonnet, see **BODY**
2. Depressurise fuel system, see **FUEL SYSTEM**
3. Disconnect battery earth lead.



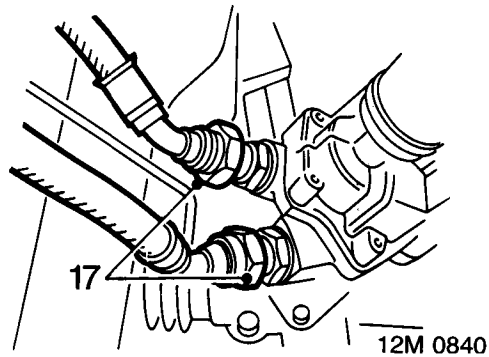
4. Place cloth beneath fuel rail to absorb fuel spillage.
5. Slacken clips and disconnect fuel feed and return hoses from fuel rail.

CAUTION: Plug the connections.

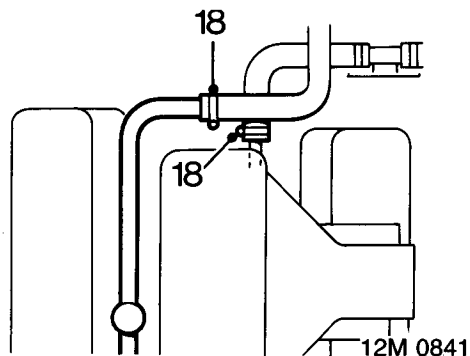
6. Release clip and disconnect purge hose from ram pipe housing.
7. Disconnect brake servo vacuum hose from ram pipe housing.
8. Disconnect stepper motor multiplug.
9. Remove 4 bolts securing fuel rail to inlet manifold.
10. Raise vehicle on a ramp.
11. Remove exhaust system, see **MANIFOLD & EXHAUST**
12. Release both exhaust manifolds from cylinder heads, see **MANIFOLD & EXHAUST**
13. Remove heater blower motor, see **HEATING & VENTILATION**
14. Remove radiator block and cooling fan assembly, see **COOLING SYSTEM**



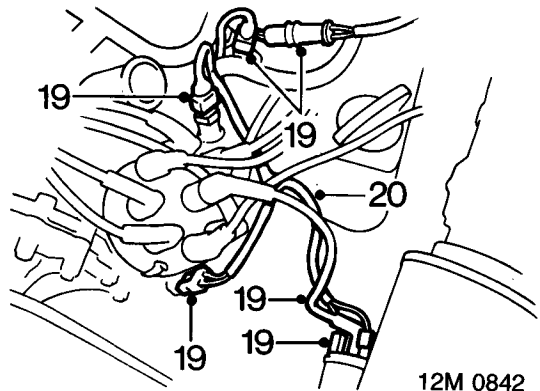
15. Slacken clip securing bottom hose to coolant pump.
16. Remove bottom hose assembly.



17. Position container beneath oil pump, disconnect oil filter feed and return hose unions, plug hoses and place aside.



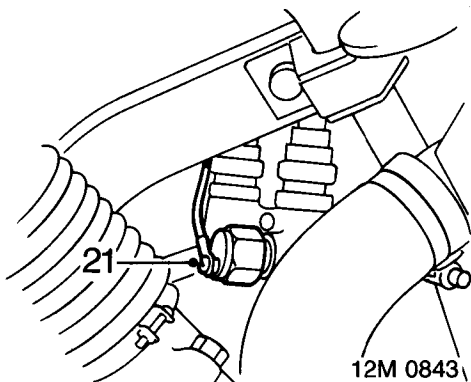
18. Slacken 2 clips and disconnect heater hoses from coolant rail and inlet manifold.



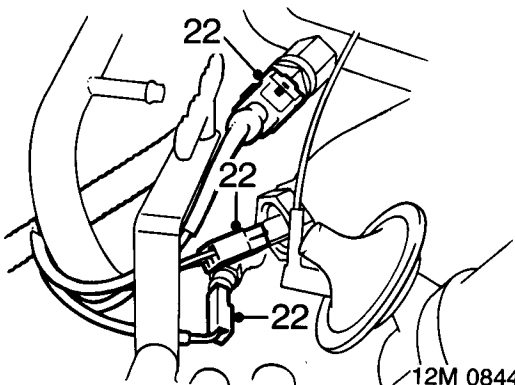
19. Release connectors from ignition coil, amplifier, coolant temperature sensor, throttle potentiometer and L.H. bank of injectors. Disconnect coil H.T. lead.
20. Carefully withdraw wiring harness from behind L.H. bank of injectors.

Note: If necessary, the injectors can be lifted slightly to improve access.

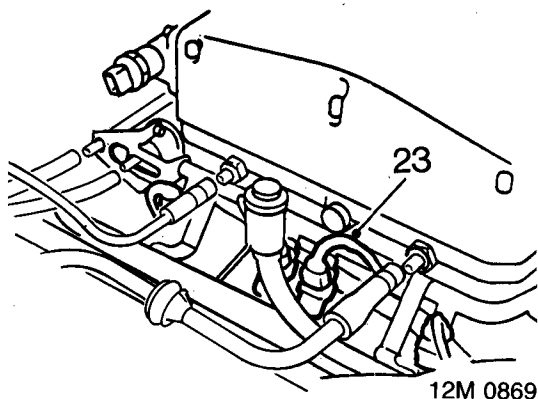
CAUTION: Do not withdraw injectors from locations completely.



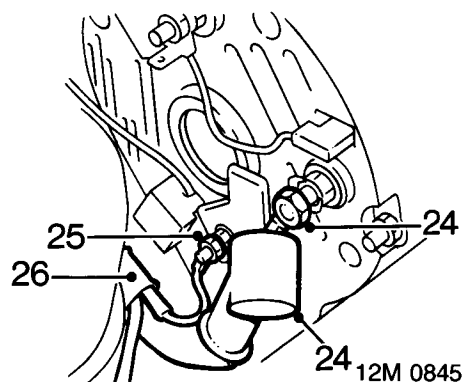
- 21.** Remove screw securing oil pressure switch connector, release lead from terminal.



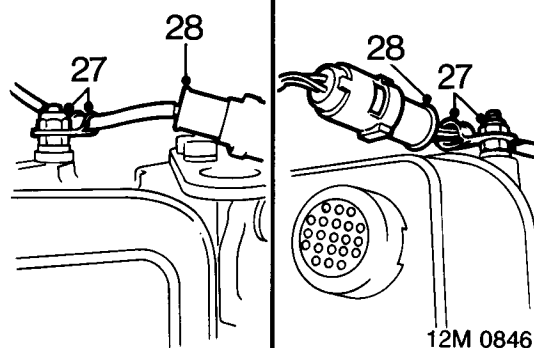
- 22.** Release connectors from cooling fan switch, fuel temperature sensor and temperature gauge sensor.



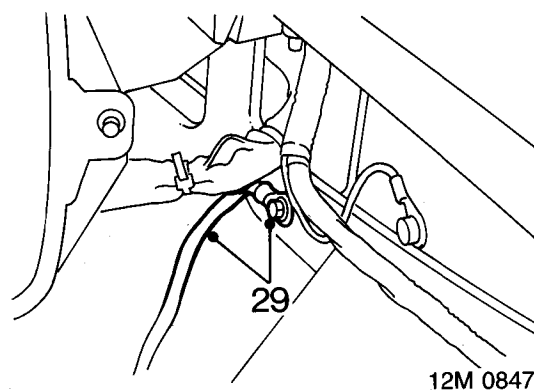
- 23.** Release connectors from R.H. bank of injectors.



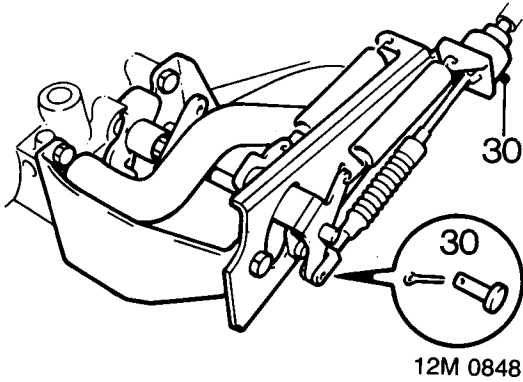
- 24.** Release cover from alternator output terminal, remove nut and lead from terminal.
25. Remove nut from alternator sensing terminal and disconnect lead.
26. Bend up harness tag adjacent to alternator and carefully release harness from behind R.H. bank of injectors.



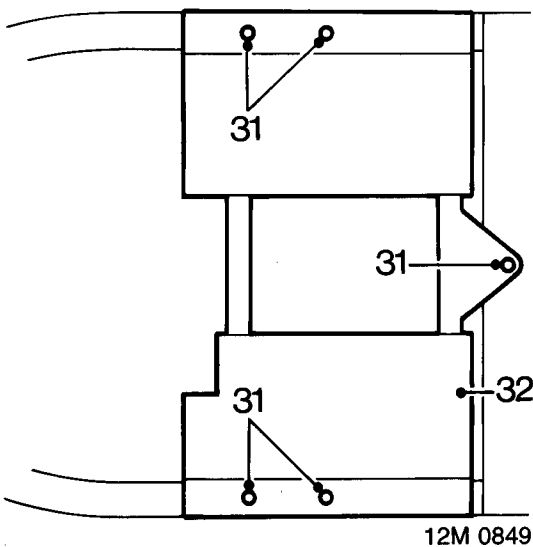
- 27.** Remove nuts and release oxygen sensor harness clips from studs at rear of cylinder heads.
28. Disconnect both oxygen sensor multiplugs and position engine harness aside.



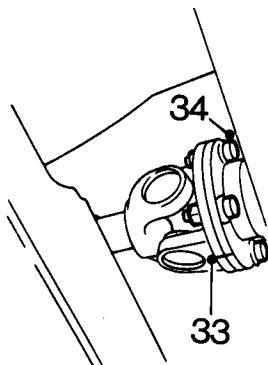
- 29.** Remove bolt securing engine earth strap to body and place earth strap aside.



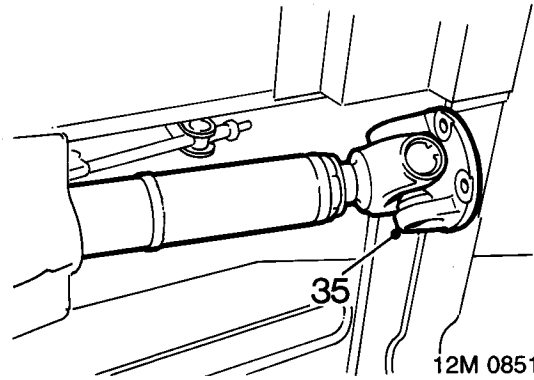
- 30.** Remove split pin and clevis pin from throttle cable trunnion, release cable from abutment bracket and position cable aside.



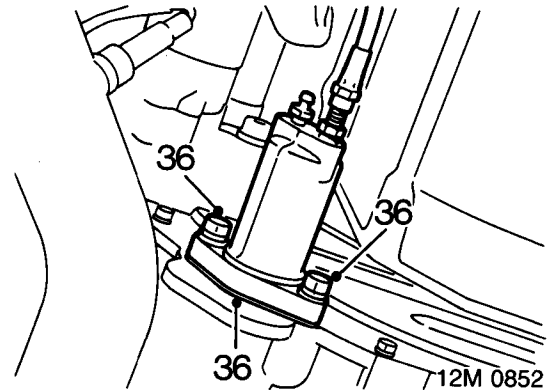
- 31.** Remove 5 bolts securing catalyst heat shield.
32. Remove heat shield.



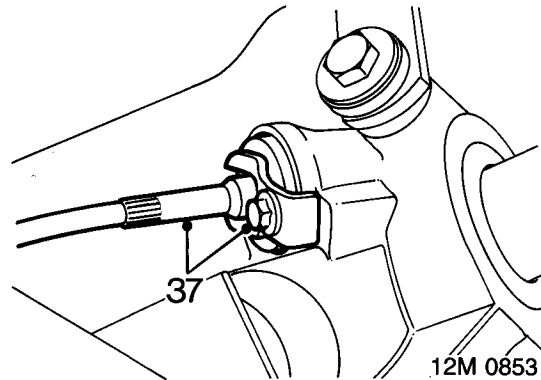
- 33.** Mark propeller shaft flange to gearbox drive flange relationship.
34. Remove 4 bolts securing propeller shaft flange.



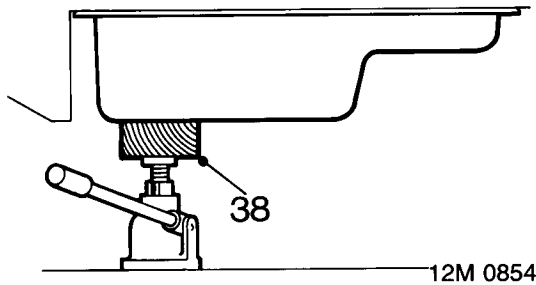
- 35.** Release propeller shaft from gearbox drive flange.



- 36.** Remove 2 bolts securing clutch slave cylinder, release slave cylinder from gearbox and place aside. Collect shim.

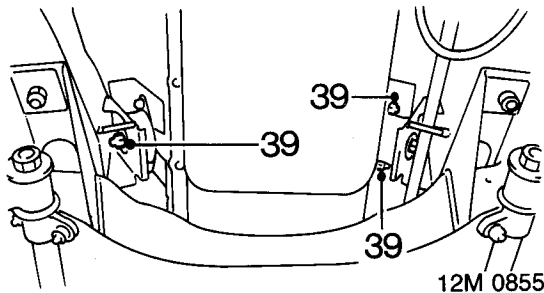


- 37.** Slacken screw securing speedometer pinion clamp, remove clamp and release speedometer cable from pinion. Place speedometer cable aside.

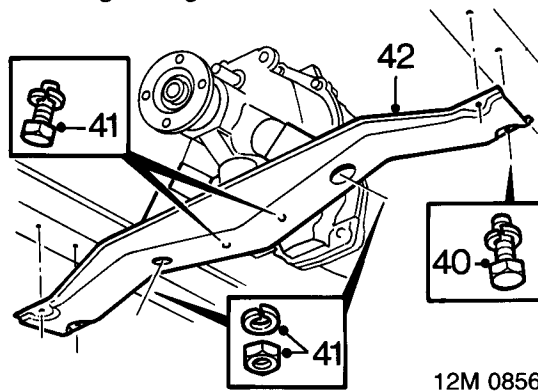


38. Support engine on jacking beam placed towards rear of sump.

CAUTION: Use a block of wood or hard rubber pad to protect sump.

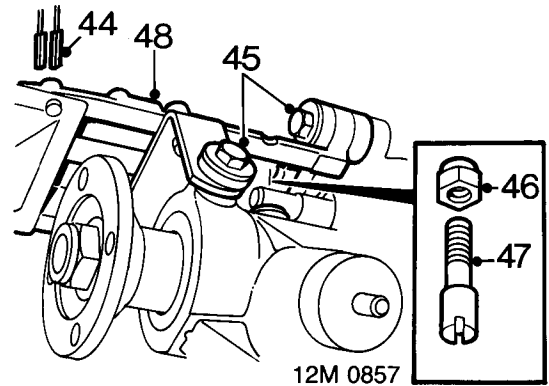


39. Remove nut securing L.H. engine mounting rubber to body and 2 nuts securing R.H. mounting to engine.

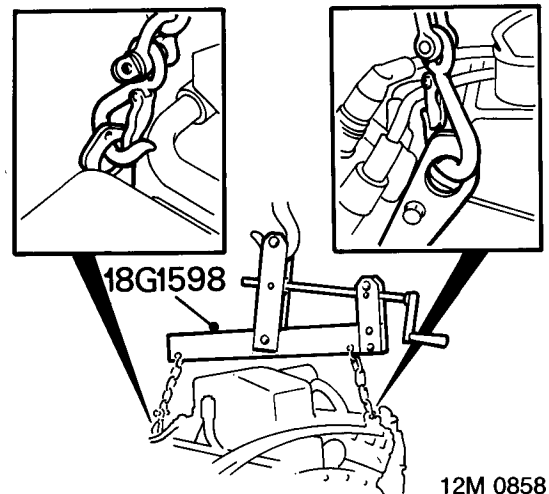


40. Remove 4 bolts securing gearbox cross - member to body.
41. Remove 2 nuts and 2 bolts securing cross - member to gearbox.
42. Remove cross - member.
43. Lower engine on jacking beam to improve access to selector remote housing bolts.

CAUTION: Engine will foul bulkhead if lowered excessively.



44. Disconnect 2 Lucars from reverse light switch.
45. Remove 4 bolts securing selector remote housing to gearbox.
46. Remove nut securing pin to selector shaft.
47. Remove pin.
48. Release selector remote housing from gearbox and place aside.



49. Fit lifting bracket **18G1598** to lifting eyes and support weight of engine on hoist.
50. Lower jacking beam from sump and position aside.
51. Raise and tilt power unit, with gearbox down.
52. Manoeuvre engine and gearbox from vehicle.

Do not carry out further dismantling if component is removed for access only

53. Remove gearbox from engine. see **MANUAL GEARBOX**

Refit

1. Lower power unit into vehicle with gearbox end tilted down.

Note: Assistance will be necessary to position exhaust manifolds.

2. Adjust lifting bracket gradually, as power unit is lowered, until almost horizontal, and engage engine mounting studs in body locations.

ENGINE

3. Fit nuts to engine mountings and tighten to correct torque.
4. Support weight of engine on jacking beam, placed towards rear of sump.

CAUTION: Use a block of wood or hard rubber pad to protect sump.

5. Release lifting bracket from eyes and position hoist aside.
6. Move selector shaft to neutral position.
7. Position selector remote housing, fit pin through remote linkage and selector shaft. Secure pin with self – locking nut.
8. Secure selector remote housing to gearbox with bolts and plain washers.
9. Fit gearbox cross – member, fit nuts and bolts and tighten to correct torque.
10. Connect reverse light switch Lucars.
11. Raise engine on jacking beam, fit bolts securing cross – member to body and tighten to correct torque.
12. Locate speedometer cable in pinion, fit clamp and secure with nut.
13. Position clutch slave cylinder, ensuring steel shim is positioned correctly, and engage clutch pushrod in piston.
14. Fit bolts securing clutch slave cylinder and tighten to correct torque.
15. Position propeller shaft, align flanges with previously made marks, fit nuts and bolts with nuts towards universal joints. Tighten nuts to correct torque.
16. Fit catalyst heat shield, fit and tighten bolts.
17. Engage throttle cable in abutment bracket, fit clevis pin and secure with new split pin.
18. Adjust throttle cable free – play, see **FUEL SYSTEM**
19. Position engine earth strap to body, fit and tighten bolt.
20. Connect H.T. lead to ignition coil.
21. Connect oxygen sensor multiplugs, secure clips to studs, fit and tighten nuts.
22. Route engine harnesses behind injectors.
23. Connect L.H. harness to injectors, throttle potentiometer, coolant temperature sensor, amplifier and ignition coil.
24. Connect R.H. harness to stepper motor, injectors, fuel temperature sensor, temperature gauge sensor, cooling fan switch, alternator terminals and oil pressure switch.
25. Fit cover over alternator output terminal.
26. Position harness behind alternator and bend tag to secure.
27. Engage injectors fully in locations, fit bolts securing fuel rail and tighten to correct torque.
28. Connect heater hoses to coolant rail and inlet manifold, tighten clips.
29. Connect oil filter feed and return hoses to oil pump, tighten unions to correct torque.

30. Fit bottom hose assembly to water pump and tighten clip.
31. Fit radiator block and cooling fan assembly, see **COOLING SYSTEM**
32. Fit heater blower motor, see **HEATING & VENTILATION**
33. Fit exhaust manifolds, see **MANIFOLD & EXHAUST**
34. Fit exhaust system, see **MANIFOLD & EXHAUST**
35. Lower ramp.
36. Connect hoses to fuel rail and secure clips.
37. Connect purge hose and brake servo vacuum hose to ram pipe housing. Secure purge hose with clip.
38. Fit bonnet, see **BODY**
39. Connect battery earth lead.

IGNITION

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REPAIRS

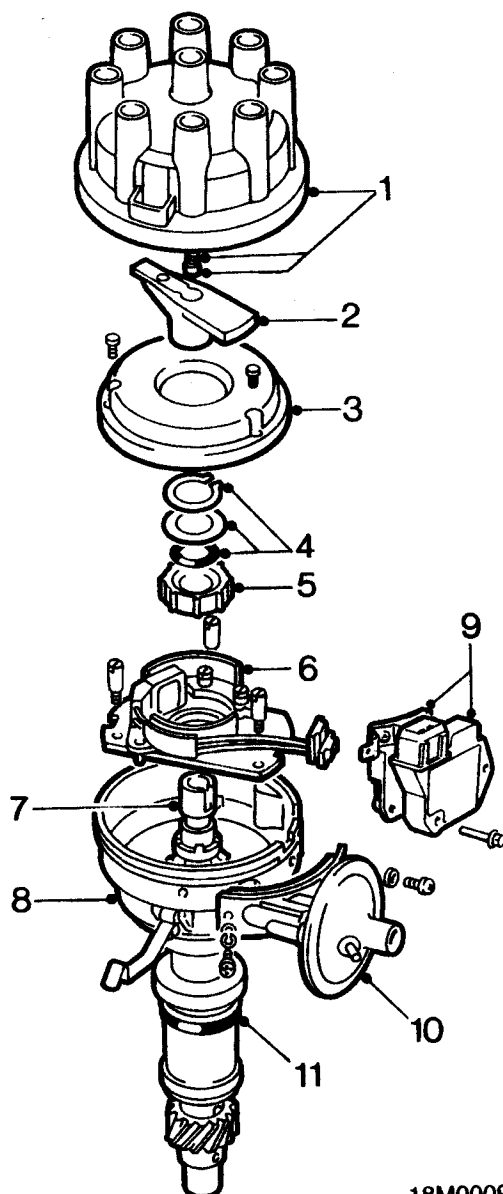
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DISTRIBUTOR	1
AMPLIFIER MODULE	2
DISTRIBUTOR CAP AND ROTOR ARM	3



IGNITION

DISTRIBUTOR - LUCAS 35 DLM8



18M0009 A

- | | |
|---|--|
| 1. Distributor cap, brush and spring | 7. Reluctor carrier shaft |
| 2. Rotor arm | 8. Distributor housing |
| 3. Anti - flash shield | 9. Amplifier module and clamping plate |
| 4. Circlip, washer and 'O' ring | 10. Vacuum unit |
| 5. Reluctor | 11. 'O' ring |
| 6. Pick - up module and base plate assembly | |



IGNITION SYSTEM

Lucas 35 DLM8 distributor

The variable reluctance electronic distributor for constant energy ignition systems incorporates standard centrifugal and vacuum advance components and an externally mounted amplifier module.

Ignition timing

When the distributor shaft rotates, the reluctor poles pass the pick – up winding.

As each pole passes it disturbs the weak magnetic field created by the pick – up and causes a signal current to flow.

As the signal from the pick – up exceeds a threshold level determined by engine speed, a high voltage transistor in the amplifier is switched on and coil current starts to flow. Once the coil current has reached the required level, it is held constant until the transistor is switched off thus triggering the spark. As engine speed increases so the threshold level is reduced to allow the coil time to produce the required voltage at the advanced timing point.

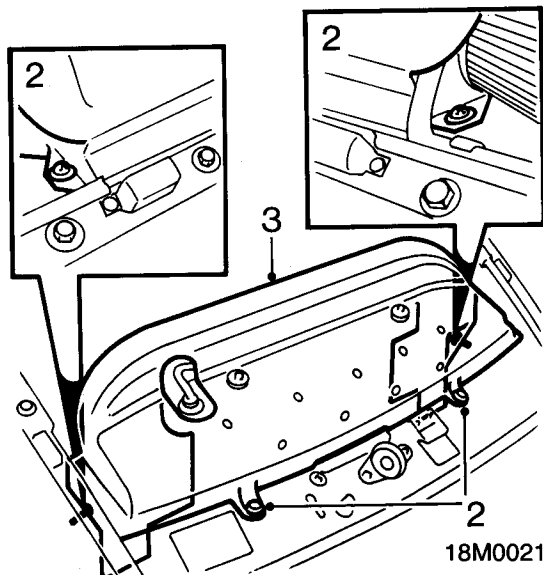


IGNITION COIL

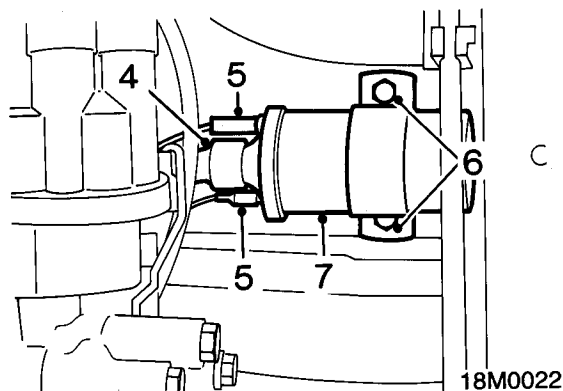
Service Repair No. 18.20.32

Remove

1. Disconnect battery earth lead.



2. Remove 2 bolts and 2 scriveners securing cooling fan cowl.
3. Remove cowl.



4. Disconnect h.t. lead.
5. Disconnect 2 Lucars from coil.
6. Remove 2 bolts securing coil.
7. Remove coil.

Do not carry out further dismantling if component is removed for access only

8. Slacken coil mounting bracket screw.
9. Remove bracket from coil.
10. Fit bracket to new coil and tighten screw.

Refit

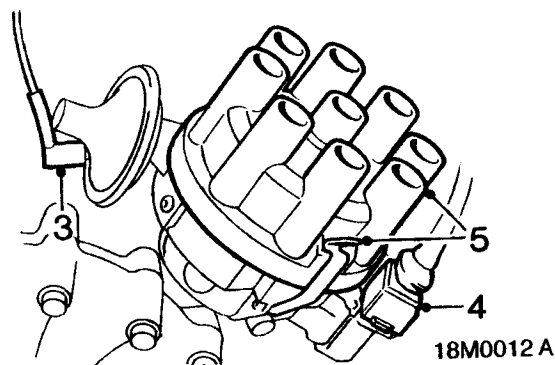
1. Position coil, fit and tighten bolts.
2. Connect Lucars to coil terminals.
3. Connect h.t. lead.
4. Fit fan cowl.
5. Fit and tighten bolts.
6. Fit scriveners.
7. Connect battery earth lead.

DISTRIBUTOR

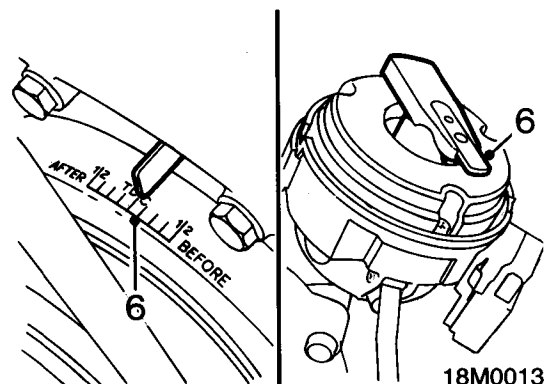
Service Repair No. 18.20.20

Remove

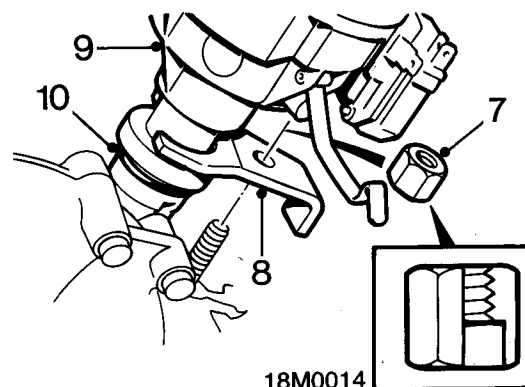
1. Disconnect battery earth lead.
2. Disconnect 9 h.t. leads from distributor cap.



3. Disconnect vacuum hose.
4. Disconnect multiplug from amplifier.
5. Release 2 clips and remove distributor cap.



6. Rotate crankshaft until timing pointer is aligned with 3° B.T.D.C. mark on crankshaft pulley with No 1 cylinder on the compression stroke, and the rotor arm points towards No 1 spark plug segment in distributor cap.

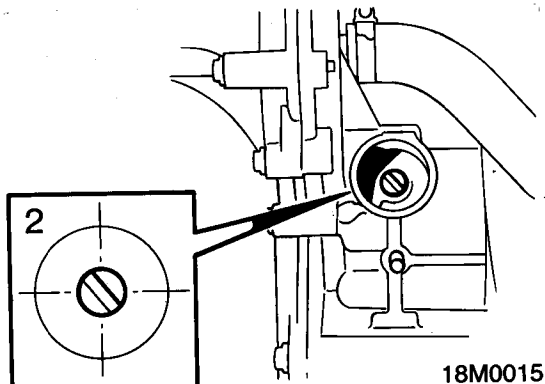


7. Remove nut securing distributor clamp.
8. Remove clamp.
9. Remove distributor.
10. Remove 'O' ring from distributor.

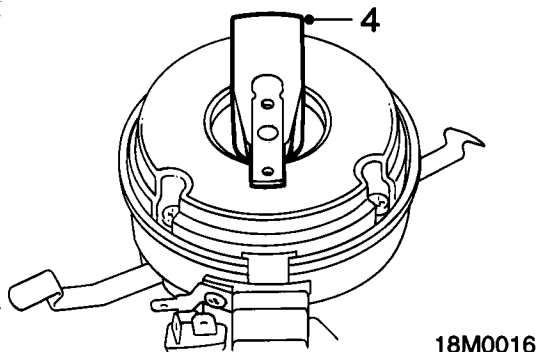
IGNITION

Refit

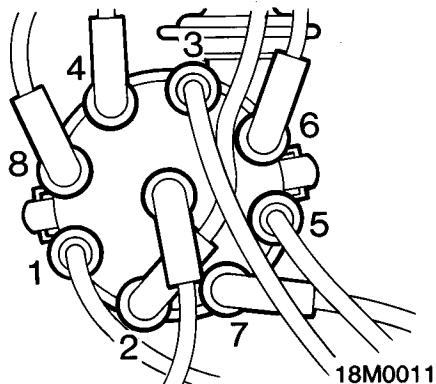
1. Ensure timing pointer is aligned with 3° mark on crankshaft pulley with No 1 cylinder on the compression stroke.



2. Position oil pump drive shaft tongue at the ten to four position.
3. Fit new 'O' ring to distributor, lubricate with engine oil.



4. Turn distributor drive until rotor arm is approximately 30° anti-clockwise from No 1 spark plug segment in distributor cap.
5. Insert distributor into timing cover, engage drive gear and push distributor down until 'O' ring enters bore. Locate slotted adapter to oil pump drive shaft tongue.
6. Check that centre line of rotor arm is aligned with No 1 spark plug segment in distributor cap. Reposition distributor if necessary.
7. Remove rotor arm.
8. Rotate distributor to position pick-up opposite nearest reluctor tooth.
9. Position clamp, fit nut and lightly tighten.
10. Fit rotor arm.
11. Connect amplifier multiplug.
12. Fit distributor cap, secure clips.
13. Connect vacuum hose.



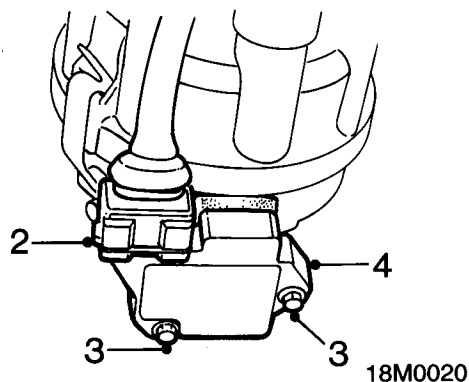
14. Identify and connect h.t. leads in the sequence shown.
15. Connect battery earth lead.
16. Set ignition timing, see **MAINTENANCE**.

AMPLIFIER MODULE

Service Repair No. 18.20.30

Remove

1. Disconnect battery earth lead.



2. Disconnect multiplug from module.
3. Remove 2 screws securing module.
4. Remove module.

WARNING: The amplifier module is a sealed unit containing Beryllia. This substance is extremely dangerous if handled. Do not attempt to open or crush module.

Refit

1. Ensure mating faces on module and distributor are clean, smear with high conductive silicone grease.
2. Fit module to distributor, fit and tighten screws.
3. Connect multiplug to module.
4. Connect battery earth lead.

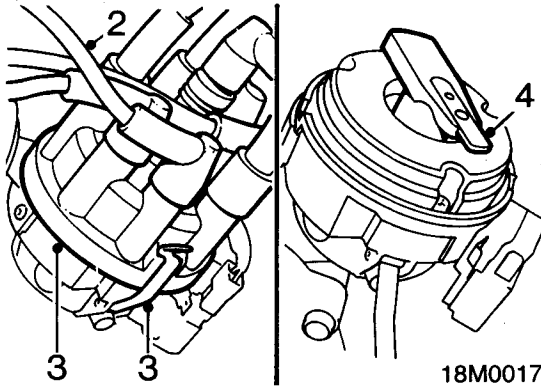


DISTRIBUTOR CAP AND ROTOR ARM

Service Repair No. Distributor cap - 18.20.10
Service Repair No. Rotor arm - 18.20.23

Remove

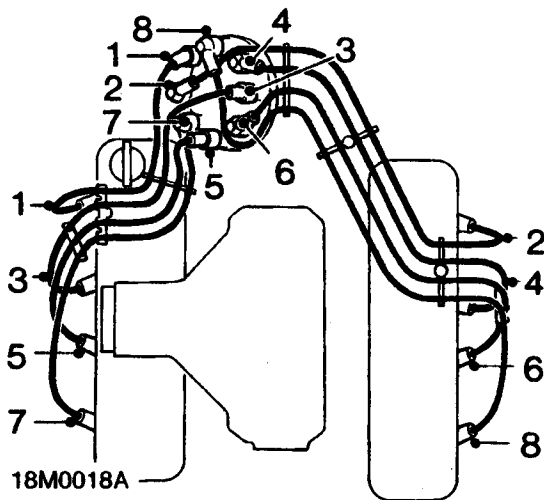
1. Disconnect battery earth lead.



2. Disconnect 9 h.t. leads from distributor cap.
3. Release 2 clips and remove distributor cap.
4. Remove rotor arm.

Refit

1. Fit rotor arm.
2. Fit distributor cap and secure clips.



3. Identify and connect h.t. leads to cap in the sequence shown.
4. Connect battery earth lead.

FUEL SYSTEM

CONTENTS

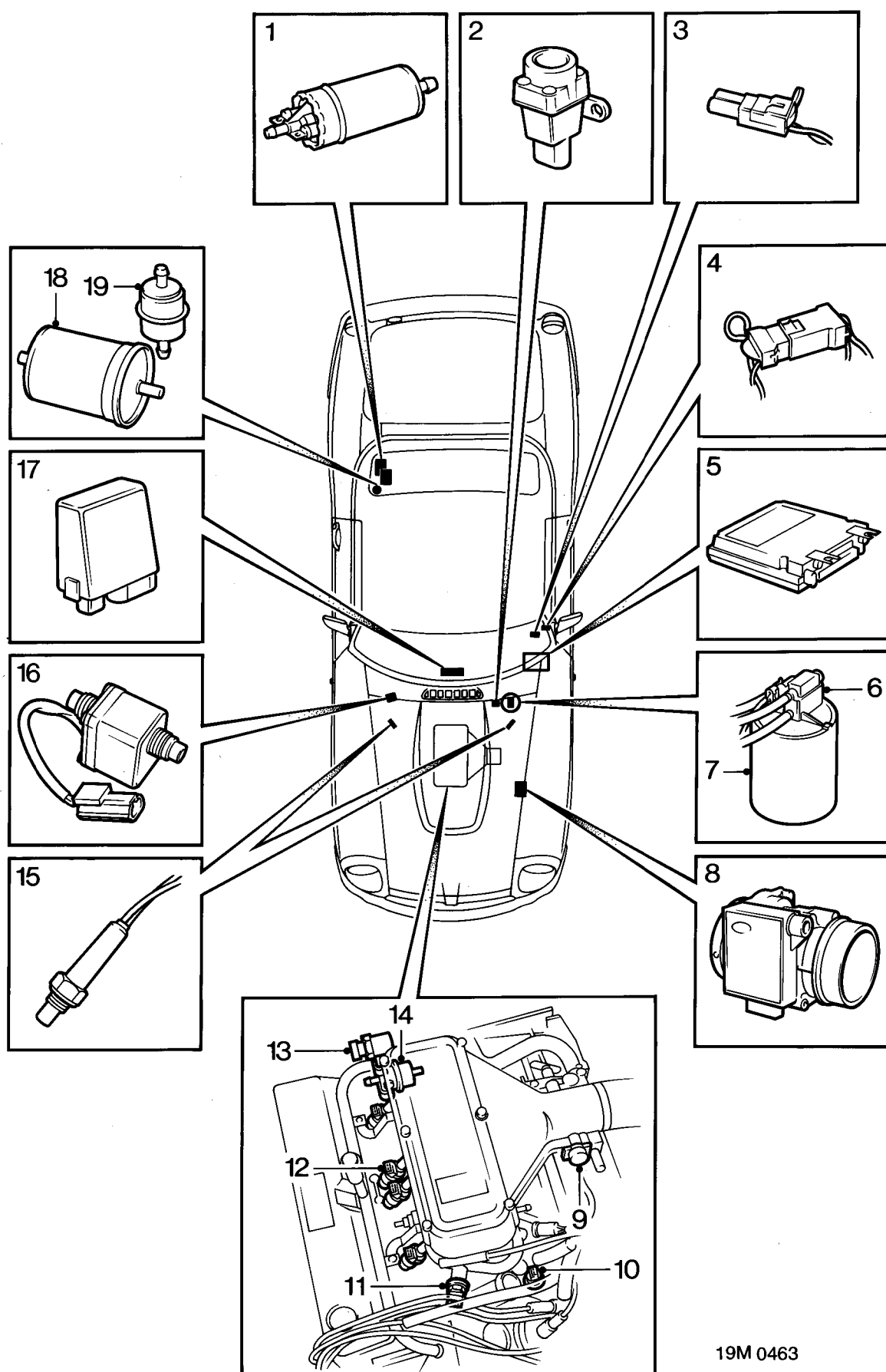
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FUEL SYSTEM



19M 0463



FUEL INJECTION SYSTEM COMPONENTS

1. Fuel pump
2. Inertia switch
3. Diagnostic socket
4. Tune resistor
5. Fuel ECU
6. Purge control valve
7. Charcoal canister
8. Airflow sensor
9. Throttle potentiometer
10. Coolant temperature sensor
11. Fuel temperature sensor
12. Injectors
13. Air bypass valve stepper motor
14. Fuel pressure regulator
15. Oxygen sensors
16. Road speed transducer
17. Relay module
18. Main fuel filter
19. Auxiliary fuel filter

FUEL SYSTEM

FUEL INJECTION SYSTEM

Introduction

The 14 CUX Electronic Fuel Injection (EFi) system provides a reliable and efficient microprocessor controlled fuel management system.

The function of the EFi system is to supply the exact amount of fuel directly into the inlet manifolds according to the prevailing engine operating conditions.

To monitor these conditions various sensors are fitted to the engine to measure engine parameters. Data from the sensors is received by the fuel Electronic Control Unit (ECU) which will then determine the exact amount of fuel required for any condition.

The ECU having received data from the sensors produces pulses, the length of which will determine the simultaneous open time of each bank of injectors, which will govern the amount of fuel injected.

The main items comprising the EFi system are shown in the illustration with their locations indicated. The ignition coil is also directly associated with the EFi system.

Note: The following function descriptions of system components are not in an operational sequence.

Fuel ECU

The EFi system is controlled by the Electronic Control Unit (ECU) which is located under the fascia on the passenger's side. The control unit is a microprocessor with integrated circuits and components mounted on printed circuit boards. The ECU is connected to the main harness by a 40 – pin multiplug.

Injectors

The 8 fuel injectors are fitted between the pressurised fuel rail and inlet manifold. Each injector comprises a solenoid operated needle valve and a specially designed nozzle to ensure good fuel atomisation.

Engine coolant temperature thermistor

The coolant temperature thermistor is located by the front L.H. branch of the intake manifold.

The thermistor is a resistive device in which the resistance varies with temperature. The thermistor is enclosed in a housing immersed in the engine coolant.

Air – flow sensor

The hot – wire air flow sensor consists of a cast alloy body through which air flows. A proportion of this air flows through a bypass in which two wire elements are situated, one is the sensing wire and the other is a compensating wire.

Under the control of an electronic module which is mounted on the flow sensor body, a small current is passed through the sensing wire to produce a heating effect. The compensating wire is also connected to the module and is not heated but reacts to the temperature of air taken in, as intake air passes over the wires a cooling effect takes place, altering the value of resistance and current in the sensing wire.

Throttle potentiometer

The throttle potentiometer is mounted on the side of the plenum chamber and is directly coupled to the throttle disc shaft.

The throttle potentiometer is a resistive device supplied with a voltage from the ECU. Movement of the accelerator pedal causes the throttle shaft to rotate and the potentiometer's wiper arm varies the resistance in proportion to throttle position. The ECU lengthens the injector open time when it detects a change in output voltage.

Air valve stepper motor

The air valve stepper motor is screwed into a housing fitted to rear of the plenum chamber. The stepper motor has two control windings which enable the motor to be energised in each direction, thus opening or closing the air valve as required by the ECU.

Opening the valve allows air to bypass the closed throttle to maintain engine idle speed when the engine is under increased electrical and mechanical loads during idle.

Throttle housing

The throttle housing is an integral part of the plenum chamber and contains the throttle disc, throttle stop and base idle speed adjusting screws.

Road speed transducer

The road speed transducer is located in the engine compartment on the R.H. side of the bulkhead, adjacent to the heater unit.

The transducer provides road speed data to the ECU. The ECU in turn detects vehicle movement from the road speed input and ensures that the idle speed mode is disengaged. Should the speed transducer fail, the ECU idle speed control would become erratic.



Fuel pump

The electric fuel pump, located on the R.H. underside of the body, forward of the rear axle, is a self-priming centrifugal 'wet' pump, the motor and pump are filled with fuel.

The fuel pump draws fuel from the fuel tank, through an auxiliary filter, and supplies fuel under pressure through the main filter to the fuel rail and pressure regulator.

Fuel pressure regulator

The pressure regulator is a mechanical device controlled by plenum chamber depression and is mounted in the fuel rail. The regulator ensures that fuel rail pressure is maintained at a constant pressure difference of 2.5 bar above that in the inlet manifold, as manifold depression increases the regulated fuel pressure is reduced in direct proportion.

When pressure exceeds the regulator setting excess fuel is spill returned to the fuel tank swirl pot.

Relays

The relays are mounted in a Relay Module located under the centre console.

The starter relay supplies current to the starter solenoid and is energised when the ignition key is turned to the cranking position.

The main relay is energised when the ignition is switched on and supplies current to the ECU.

The fuel pump relay is energised by the ECU for a short period when the ignition is switched on and whilst the engine is running.

Fuel temperature switch

The fuel temperature switch is a normally open bi-metallic switch. When the temperature in the fuel rail is above 90°C the switch closes and the engine coolant temperature thermistor signal is bypassed.

This is sensed by the ECU which increases the opening period of the injectors during a hot start to minimise the effects of fuel vaporisation. The ECU reduces the additional fueling when the switch opens again after a short period.

Inertia switch

The inertia switch is a mechanically operated, normally closed switch which is connected into the ignition switch feed to the ECU and fuel pump relay.

Under a sudden vehicle impact the switch opens, switching off the ECU and fuel pump relay. The switch is reset by pressing down the switch button.

The switch is located in the engine compartment, on the bulkhead, to the L.H. side of the heater unit.

Oxygen sensors

The oxygen sensors are fitted in the exhaust manifold downpipes, and senses the content of the exhaust gases and modifies fuel mixture via the ECU thereby maintaining exhaust emissions consistent with efficient fuelling of the engine.

Tune resistor

A tune resistor is incorporated in the EFi harness, the value of this resistor determines the fuelling map used within the ECU.

Operation

Ignition on

When the ignition is switched on, voltage is applied through the closed inertia switch to the main ECU relay, fuel pump and the ECU. The ECU energises the fuel pump relay and voltage is applied to the fuel pump, the stepper motor closes the air bypass to enrich the mixture.

The ECU runs the pump for a short period to pressurise the fuel rail. The fuel pressure regulator will open at its setting and excess fuel will be returned to the spill return pot in the fuel tank.

The ECU earths the ECU relay. Once energised voltage is supplied to the following. The injectors, air flow meter, ECU and purge valve.

Starter operation

Whilst the starter motor solenoid is energised, voltage is applied directly to the fuel pump.

Data inputs to the ECU during cranking are the following; road speed, engine coolant, throttle potentiometer, air flow data, ignition pulses and oxygen sensor

From this data the ECU calculates the amount of fuel required and determines the opening period for the injectors.

The ECU provides an earth signal for the period the injectors are required to be open, the eight injectors are simultaneously energised and fuel is sprayed into the inlet tracts. During cranking the injectors are opened at each ignition pulse (i.e. twice the normal rate). This provides fuel enrichment during starting but the number of consecutive impulses at this rate is limited to prevent flooding.

When the engine fires and the starter solenoid is released, the ECU senses from the coil that the engine speed is in excess of 600 rev/min and energises the fuel pump relay.

FUEL SYSTEM

With the engine speed in excess of 600 rev/min, the ECU now opens the injectors once per crankshaft revolution. Each open period providing half the amount of fuel required to be injected. The engine will now continue to idle, the ECU modifying the injector open periods as the engine temperature rises.

If during engine idle, the load on the engine is increased, by for example additional electrical load on the alternator, the engine speed will drop (more than 45 rev/min) and the ECU energises the stepper motor and opens the air valve thus maintaining the idle speed. Constant engine idle speed is maintained by the ECU progressively opening or closing the air valve.

Driving

During driving the ECU continually monitors road speed air flow position and rate of throttle movement, on engine coolant temperature and speed of the engine.

The coolant temperature sensor resistance decreases as temperature increases. This resistance is used by the ECU in determining the fast idle speed which deteriorates as temperatures rise until idle speed is reached.

The throttle shaft is directly connected to the throttle potentiometer which is supplied with a voltage from the ECU. When the throttle is fully closed the output voltage is 0.3V and fully open the output is above 3.5V. Therefore output voltage is an indication of throttle angle and rate of change of voltage is a measure of speed of throttle movement.

Engine speed is sensed from the negative side of the ignition coil.

As the engine intake air passes over the wires of the airflow sensor, the electronic module provides output signals in proportion to the air mass flow rate which are compatible with the requirements of the ECU.

When the ECU senses a change in one or more of the input parameters, the programme enters a sub-routine to determine the new fuel requirement and sets injector opening time accordingly.

The basic fuelling requirement is stored in the electronic memory in digital form of a three-dimensional map giving the correct injector pulse lengths for 16 different engine speeds and 8 different engine loads. From this basic fuelling requirement the ECU will take into consideration information from the other sensors, e.g. coolant temperature, throttle position etc. and make various corrections to ensure the engine is supplied with the correct amount of fuel by adjusting injector open time as required.

Overrun conditions

During engine overrun the ECU will implement 'fuel cut off' provided the following conditions prevail:

- Coolant temperature above 30°C.
- Throttle in idle position, potentiometer output 0.3V.
- Engine speed above 1500 rev/min.

When the engine speed falls below 1500 rev/min or the accelerator pedal is actuated, fuel is gradually re-instated ensuring a smooth take-up.

Full throttle

During hard acceleration, extra injector impulses are generated to compensate for throttle movement. At full throttle, the ECU provides a full load enrichment independent of engine temperature. This is a fixed amount and is achieved by opening the injectors for a longer period.

Overspeed fuel cut-off

As an overspeed protection, the ECU will cut off the injector pulses should the engine speed exceed 6700 rev/min. The injector pulses are then gradually reinstated when engine speed falls below 6300 rev/min.

Ignition switch off

When the ignition is switched off the events are as follows:

- Fuel pump relay is switched off by the ECU - fuel pump off
- Main relay remains energised by the ECU for 5 seconds enabling the stepper motor to be driven to fast idle position.
- Main relay and the fuel system is now switched off by the ECU.

Hot start conditions

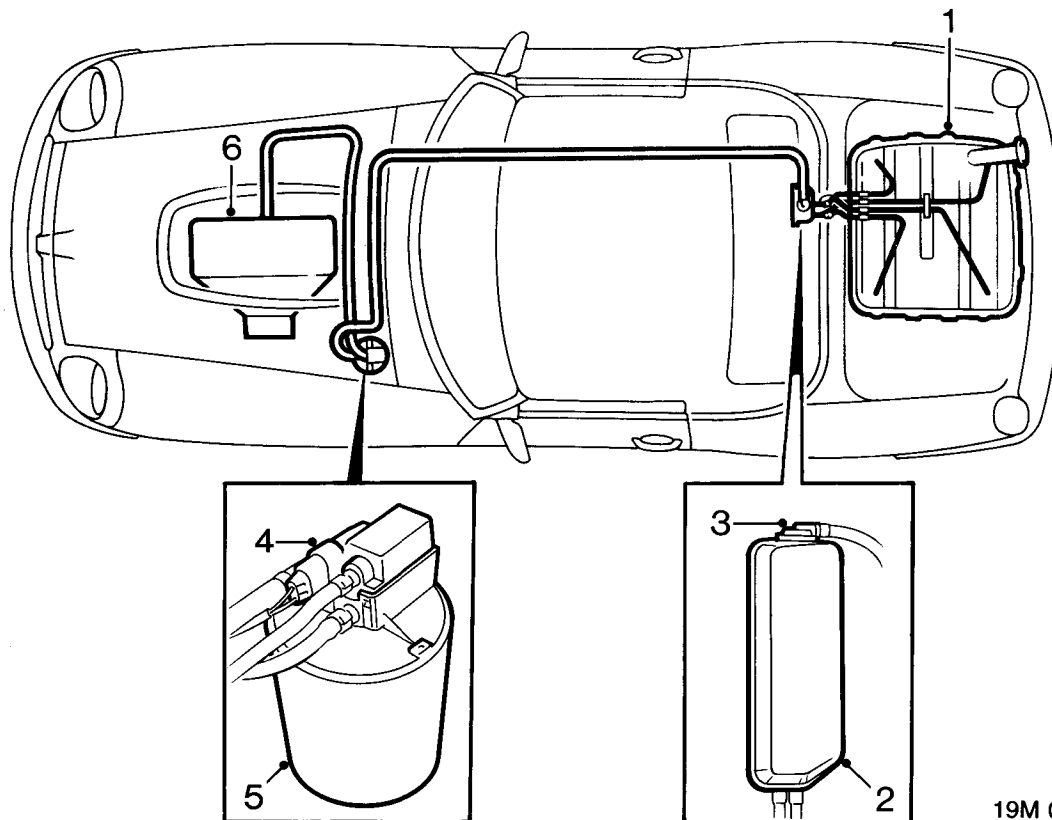
The ECU continuously monitors the signal from the fuel thermistor. When restarting an engine, with the fuel rail temperature above 60°C, the fuel thermistor signal causes the ECU to implement the same procedure it uses for cold starting. This increases the opening period for the injectors and provides extra fuelling to counteract the possible effects of fuel vapourisation and thus reduce the possibility of the engine stalling.

Vehicle deceleration

Under a sudden vehicle impact the inertia switch opens and breaks the voltage supply to the ECU. This switches the fuel pump off thus reducing any fire hazard.



NON - EVAPORATIVE LOSS SYSTEM



19M 0457

- 1. Fuel tank
- 2. Vapour trap
- 3. Fuel cut off valve
- 4. Purge valve

- 5. Charcoal canister
- 6. Plenum chamber

Introduction

The non - evaporative loss control system is designed to prevent fuel vapours from escaping to the atmosphere by providing an internal breathing system and fuel tank venting. Vapour created while the engine is switched off is stored in the charcoal canister and then drawn into the engine via the plenum chamber when the engine is running.

Fuel tank

The fuel tank is fitted with venting tubes to pass vapour and excess fuel to the vapour separator during heat expansion. The fuel filler cap contains a valve which allows fuel tank venting if the pressure in the fuel tank exceeds 0.03 bar.

Charcoal canister

The charcoal canister is connected to the vapour separator. The charcoal granules within the canister absorb the fuel vapour and store it. Filter pads on either side of the charcoal prevent the granules leaving the canister.

Purge valve

The purge valve is fitted to the charcoal and is connected to the plenum chamber. Operating in conjunction with the fuel ECU the valve prevents purging under conditions which may affect engine tune or catalyst performance when the engine is cold or at idling speed.

Vapour trap

The vapour trap is connected to the fuel tank and the charcoal canister via the fuel cut - off valve. Its purpose is to separate fuel from vapour and to pass vapour to the charcoal canister while temporarily storing the liquid fuel.

Fuel cut - off valve

This ball type valve is fitted to the separation tank and is designed to prevent fuel draining into the charcoal canister.

FUEL SYSTEM

Operation

Fuel expansion or vapourisation occurs in the fuel tank as a result of the ambient temperature changing or heating of the fuel by engine temperature. This fuel and vapour is passed to the vapour separator where the vapour is separated from the fuel. The vapour then passes to the charcoal canister to be retained by the charcoal granules.

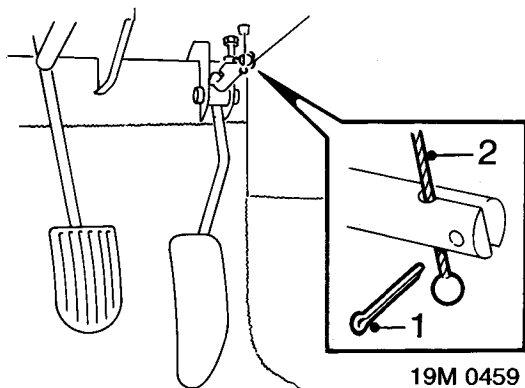
The charcoal canister is purged when the purge control valve is opened by the ECU, allowing fresh air to be drawn through the charcoal canister via the purge air hose and into the plenum chamber.



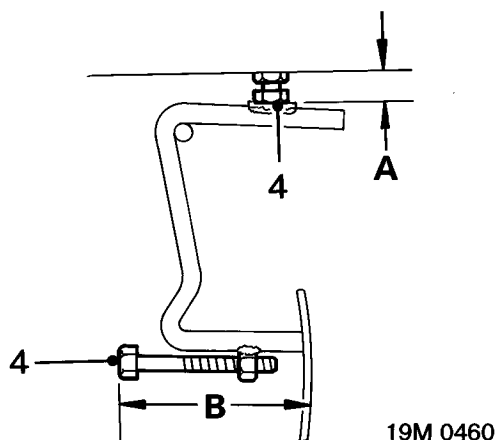
THROTTLE CABLE ADJUST

Service Repair No. 19.20.06

Throttle pedal setting



1. Remove split pin retaining throttle cable to throttle pedal, discard split pin.
2. Release inner cable from pedal.



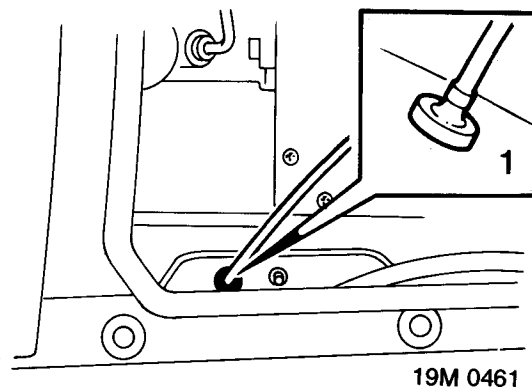
3. Check throttle pedal stop settings:

Dimension 'A' = 16 mm

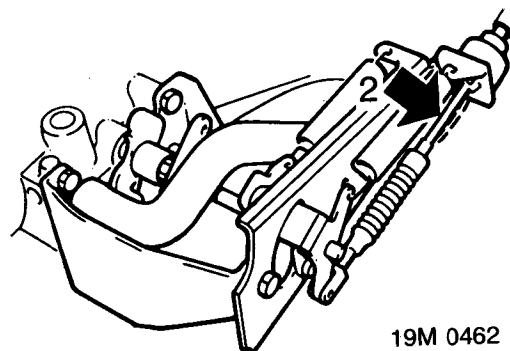
Dimension 'B' = 117 mm

4. Adjust stops if necessary to obtain correct settings.
5. Connect inner cable to pedal, fit new split pin to retain cable.

Throttle cable setting



1. Ensure outer cable is fully seated in bulkhead grommet.



2. Check throttle inner cable free play:

Inner cable free play = 1.50 mm

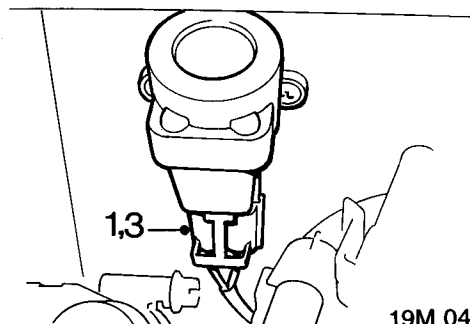
3. Adjust outer cable if necessary to obtain correct free play.
4. Depress throttle pedal and check that throttle opens fully.
5. Re-check inner cable free play and re-adjust if necessary.



FUEL SYSTEM DEPRESSURISE

Service Repair No. 19.50.02

WARNING: The fuel system must be depressurised before any part of fuel line between fuel pump and engine is disconnected.



19M 0449

1. Disconnect multiplug from inertia switch.
2. Operate starter motor and crank engine several times to release pressure from system.

Note: Engine may start and run for a short period.

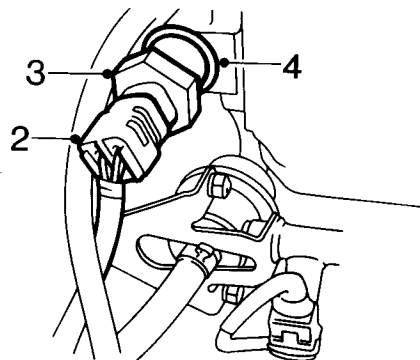
3. On completion of work, reconnect inertia switch multiplug, switch on ignition, wait a few seconds for fuel pump to pressurise system, then operate starter motor until engine fires and runs evenly.

AIR VALVE STEPPER MOTOR

Service Repair No. 18.30.05

Remove

1. Disconnect battery earth lead.



19M 0455

2. Disconnect multiplug.
3. Unscrew stepper motor and remove.
4. Discard sealing washer.

Refit

1. Remove old thread sealant from stepper motor housing.
2. Fit new sealing washer.
3. Apply thread sealant to stepper motor, screw stepper motor into housing and carefully tighten.
4. Connect multiplug.
5. Connect battery earth lead.

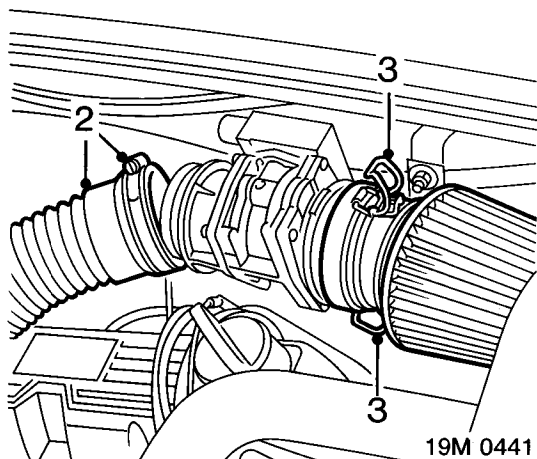
FUEL SYSTEM

AIR FLOW SENSOR

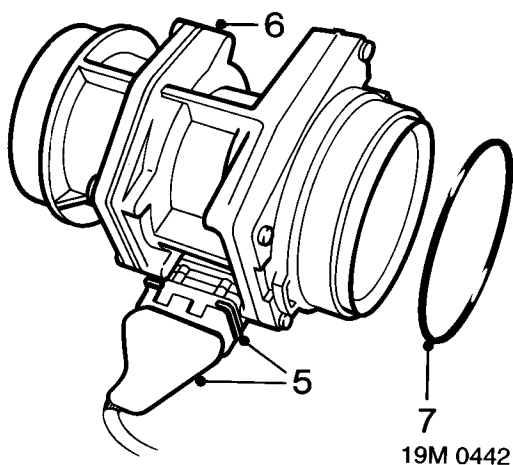
Service Repair No. 19.22.25

Remove

1. Disconnect battery earth lead.



2. Slacken clip securing air intake hose to air flow meter, disconnect hose.
3. Release 2 clips securing air flow meter to air cleaner adapter.
4. Release air flow meter from adapter.



5. Release clip and disconnect multiplug.
6. Remove air flow meter.
7. Remove and discard 'O' ring.

Refit

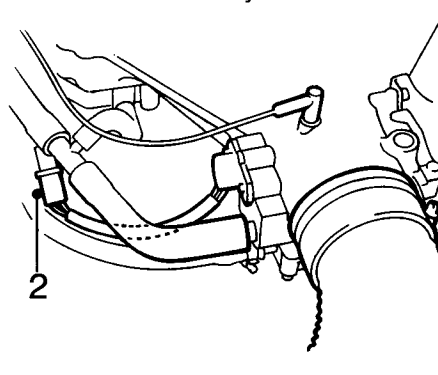
1. Fit new 'O' ring to air flow meter.
2. Connect multiplug, secure clip.
3. Fit air flow meter to air cleaner adapter.
4. Secure clips.
5. Connect intake hose to air flow meter, tighten clip.
6. Connect battery earth lead.

THROTTLE POTENTIOMETER

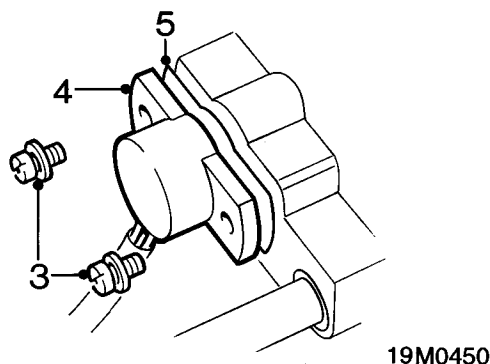
Service Repair No. 18.30.17

Remove

1. Disconnect battery earth lead.



2. Disconnect throttle potentiometer multiplug.



3. Remove 2 screws securing throttle potentiometer.
4. Remove throttle potentiometer.
5. Remove and discard gasket.

Refit

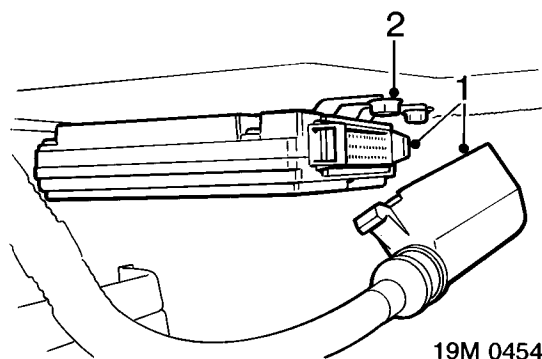
1. Clean mating faces of potentiometer and housing.
2. Fit new gasket.
3. Fit throttle potentiometer, ensure correct engagement with throttle disc spindle.
4. Fit and tighten screws.
5. Connect multiplug.
6. Connect battery earth lead.



FUEL ECU

Service Repair No. 18.30.01

Remove



19M 0454

1. Release clip and disconnect multiplug from ECU.
2. Remove 2 nuts securing ECU to fascia support.
3. Remove ECU.

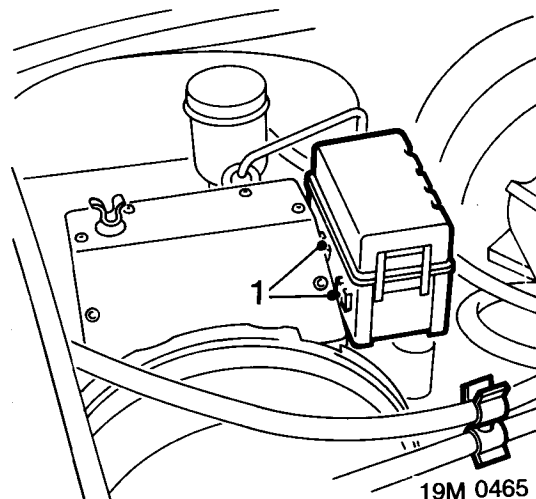
Refit

1. Position ECU to fascia support, fit and tighten nuts.
2. Connect multiplug and secure clip.

ROAD SPEED TRANSDUCER

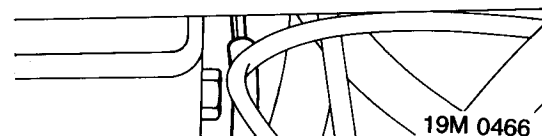
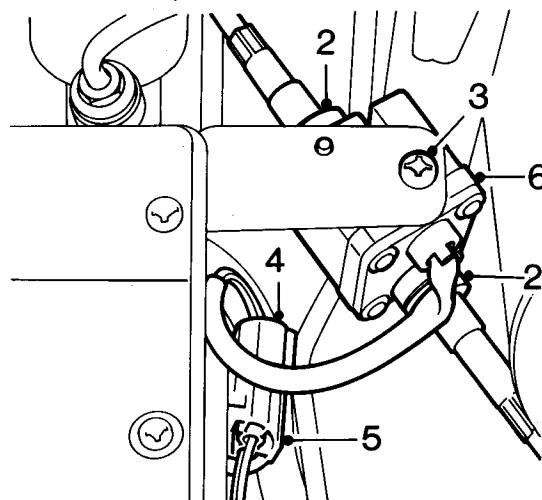
Service Repair No. 88.30.14

Remove



19M 0465

1. Release clips securing fusible link box to bracket and place box aside.



19M 0466

2. Unscrew and disconnect upper and lower speedometer cables from speed transducer.
3. Remove screw and release speed transducer from pedal box.
4. Release clip securing speed transducer connector to pedal box.
5. Disconnect multiplug.
6. Remove speed transducer.

Refit

1. Position speed transducer, connect multiplug and secure multiplug to pedal box.
2. Position transducer to pedal box, fit and tighten screw.

FUEL SYSTEM

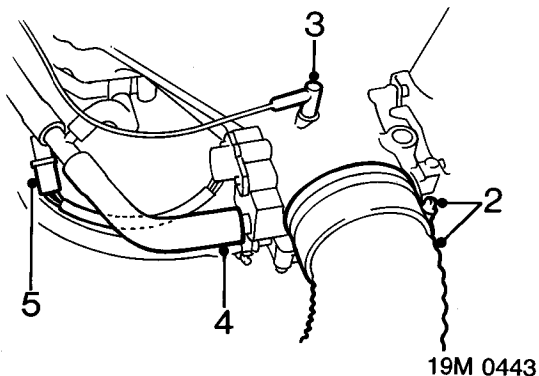
3. Connect and tighten upper and lower speedometer cables.
4. Position fusible link box and secure to bracket.

PLENUM CHAMBER

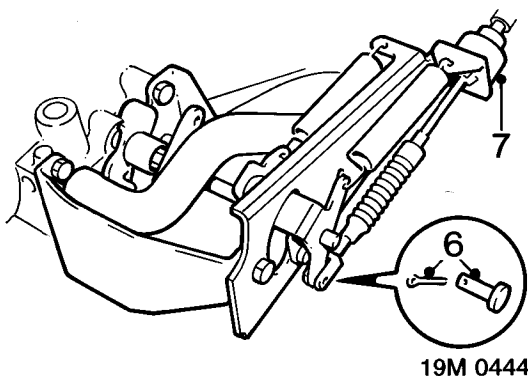
Service Repair No. 19.22.46

Remove

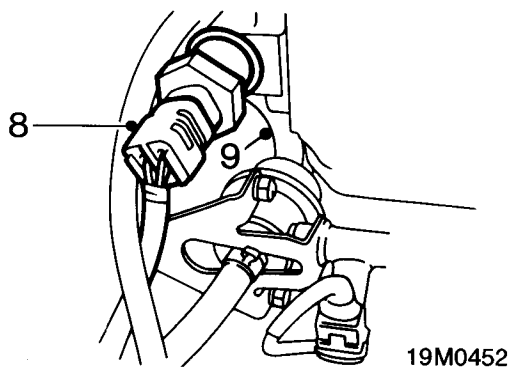
1. Disconnect battery earth lead.



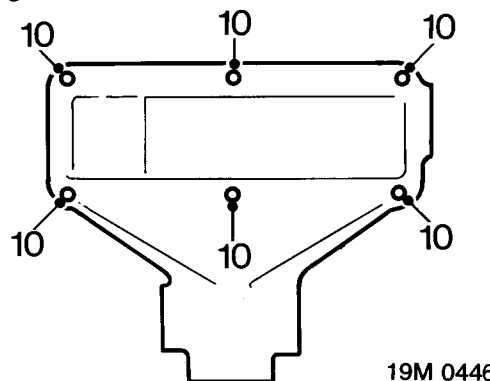
2. Slacken clip securing intake hose to plenum chamber, disconnect hose.
3. Disconnect distributor vacuum hose.
4. Disconnect PCV hose.
5. Disconnect multiplug from throttle potentiometer.



6. Remove split pin and clevis pin from throttle cable trunnion, discard split pin.
7. Release throttle cable from abutment bracket and place cable aside.



8. Disconnect multiplug from stepper motor.
9. Disconnect vacuum hose from fuel pressure regulator.

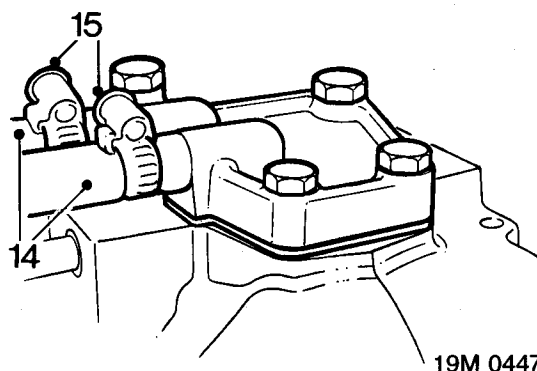


10. Remove 6 bolts securing plenum chamber to ram pipe housing.
11. Place small packing block on inlet manifold and lever between packing block and plenum chamber to break seal.

CAUTION: Assistance will be necessary to restrain plenum chamber as seal breaks.

12. Move plenum chamber assembly aside.
13. Place cloth over ram pipes to prevent ingress of foreign matter.

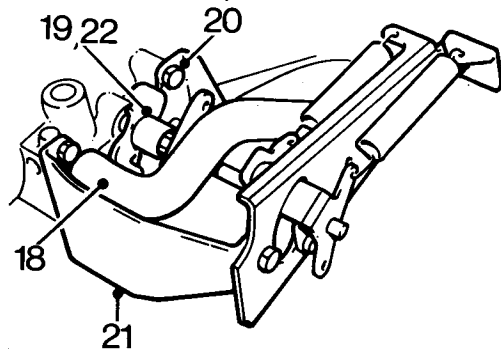
Do not carry out further dismantling if component is removed for access only



14. Clamp coolant hoses with an approved brake hose clamp and position cloth to absorb coolant spillage.
15. Slacken hose clips, and noting their fitted positions, disconnect coolant hoses from plenum chamber coolant jacket.
16. Remove plenum chamber assembly.

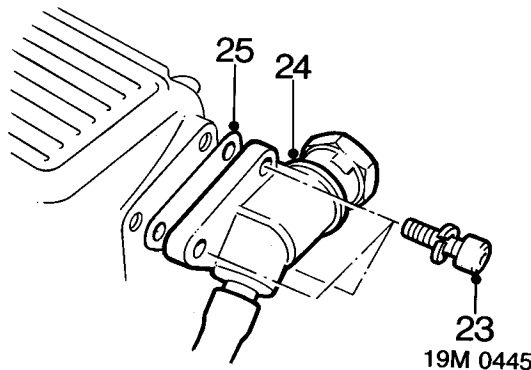


17. Remove throttle potentiometer.



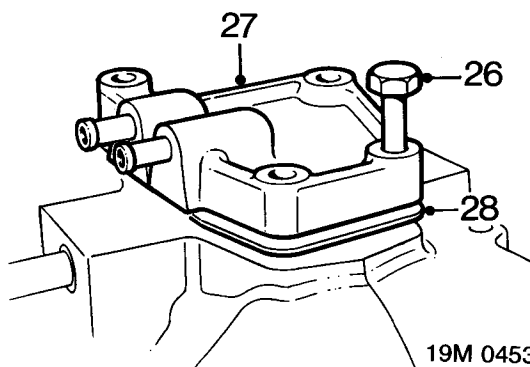
19M0451

18. Disconnect air hose from plenum chamber.
19. Release throttle disc return spring.
20. Remove 4 bolts securing throttle cable bracket.
21. Remove bracket.
22. Remove throttle disc return spring.



19M 0445

23. Remove 3 screws securing air valve stepper motor housing.
24. Remove air valve stepper motor housing.
25. Remove and discard gasket.



19M 0453

26. Remove 4 bolts securing coolant jacket cover.
27. Remove cover.
28. Remove and discard gasket.

Refit

1. Clean coolant jacket cover and mating face.
2. Using new gasket, position cover, fit bolts and tighten to the correct torque.
3. Clean air valve stepper motor housing and mating face.

4. Using new gasket, position housing, fit screws and tighten to the correct torque.
5. Fit throttle disc return spring.
6. Fit throttle cable bracket, fit bolts and tighten to the correct torque.
7. Secure throttle disc return spring.
8. Connect air hose to plenum chamber.
9. Fit throttle potentiometer.
10. Clean all traces of old sealant from ram pipe housing and plenum chamber.
11. Apply a thin, uniform coating of Hylomar sealant to mating faces of plenum chamber and ram pipe housing.
12. Fit plenum chamber.
13. Fit plenum chamber bolts and tighten to the correct torque.
14. Connect coolant hoses, tighten hose clips.
15. Remove hose clamps.
16. Connect vacuum hose to fuel pressure regulator.
17. Secure throttle cable to abutment.
18. Align throttle cable trunnion to lever, fit clevis pin and secure with new split pin.
19. Adjust throttle cable, see **Adjustments**.
20. Connect multiplugs to throttle potentiometer and stepper motor.
21. Connect breather hose to plenum chamber.
22. Connect distributor vacuum hose to plenum chamber.
23. Connect intake hose to plenum chamber and tighten clip.
24. Top up cooling system, see **MAINTENANCE**.
25. Connect battery earth lead.
26. Check base idle speed and adjust if necessary, see **MAINTENANCE**.

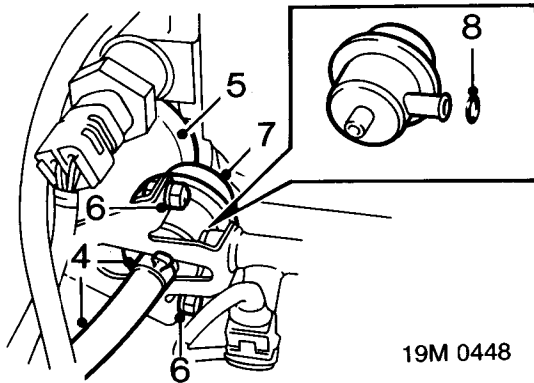
FUEL SYSTEM

FUEL PRESSURE REGULATOR

Service Repair No. 19.45.06

Remove

1. Depressurise fuel system.
2. Disconnect battery earth lead.
3. Place cloth beneath fuel pressure regulator to absorb fuel spillage.



4. Release clip and disconnect fuel return hose from regulator.

CAUTION: Plug the connections.

5. Disconnect vacuum hose from regulator.
6. Remove 2 nuts and bolts securing regulator to fuel rail.
7. Carefully remove fuel pressure regulator from fuel rail.
8. Remove 'O' ring from regulator.

Refit

1. Clean locations on fuel rail and pressure regulator.
2. Fit new 'O' ring to regulator, lubricate with silicone grease.
3. Carefully fit regulator to fuel rail, fit and tighten nuts and bolts.
4. Connect vacuum hose to regulator.
5. Connect fuel return hose to regulator and secure with clip.
6. Connect battery earth lead.
7. Start engine and check for fuel leaks.

FUEL RAIL AND INJECTORS

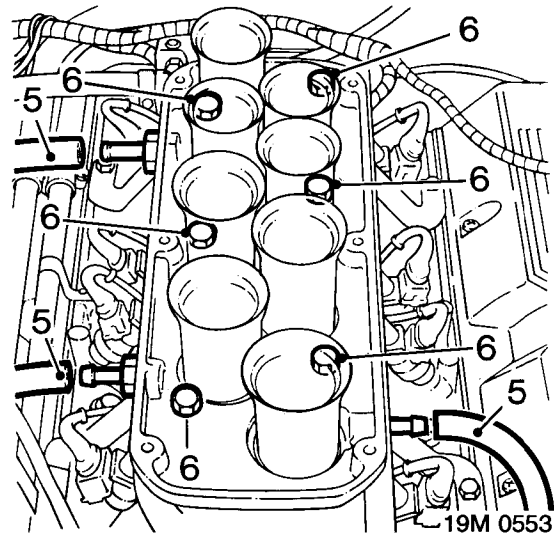
Service Repair No. Fuel Rail - 19.60.04

Service Repair No. Injector - each - 19.60.10

Service Repair No. Injector - extra - each - 19.60.10/10

Remove

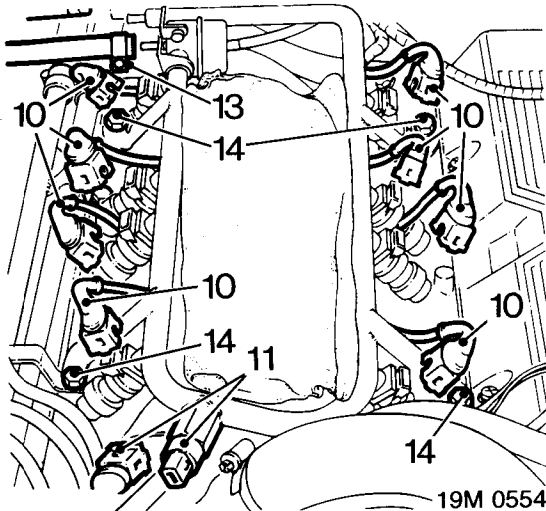
1. Depressurise fuel system.
2. Disconnect battery earth lead.
3. Remove plenum chamber and place aside.



4. Release clip securing purge hose to ram pipe housing.
5. Disconnect purge hose, servo vacuum hose and crankcase breather hose from ram pipe housing.
6. Remove 6 bolts securing ram pipe housing to inlet manifold.
7. Place small packing block on inlet manifold and lever between packing block and ram pipe housing to break seal.

CAUTION: Assistance will be necessary to restrain ram pipe housing as seal breaks.

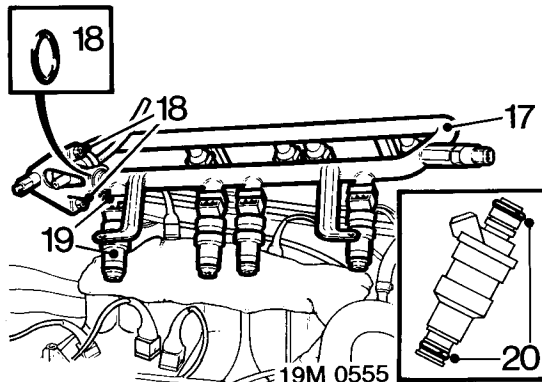
8. Remove ram pipe housing.
9. Place cloth over inlet manifold to prevent ingress of foreign matter.



10. Disconnect 8 injector multiplugs.
11. Disconnect fuel temperature sensor multiplug.
12. Place cloth beneath fuel hoses to absorb spillage.
13. Slacken clips and disconnect fuel feed and return hoses from fuel rail.

CAUTION: Plug the connections.

14. Remove 4 bolts securing coolant pipe and fuel rail to inlet manifold.
15. Place coolant pipe aside.



16. Release each injector from manifold location, one bank at a time.
17. Remove fuel rail and injector assembly.

Do not carry out further dismantling if component is removed for access only

18. Remove 2 nuts and bolts securing fuel pressure regulator to fuel rail. Carefully ease regulator from fuel rail, remove and discard 'O' ring.
19. Remove clips securing injectors to fuel rail, remove injectors.
20. Remove and discard 'O' rings.

Refit

1. Clean all traces of old sealant from mating faces of ram pipe housing and inlet manifold.
2. Clean all locations in fuel rail and inlet manifold.

3. Fit new 'O' rings to injectors and fuel pressure regulator.
4. Lubricate injector 'O' rings with silicone grease, fit injectors to fuel rail and secure with clips.
5. Lubricate pressure regulator 'O' ring with silicone grease, fit regulator to fuel rail, fit and tighten nuts and bolts.
6. Position fuel rail assembly to inlet manifold, engage injectors in locations, one bank at a time.
7. Position coolant pipe and fuel rail, fit bolts and tighten to correct torque.
8. Connect fuel feed and return hoses to fuel rail, tighten clips.
9. Connect multiplugs to injectors and fuel temperature sensor.
10. Apply a thin, uniform coating of Hylomar sealant to mating faces of inlet manifold and ram pipe housing.
11. Fit ram pipe housing to inlet manifold, fit bolts and tighten to correct torque.
12. Connect crankcase breather, servo vacuum and purge hoses to ram pipe housing.
13. Secure purge hose with clip.
14. Fit plenum chamber.
15. Connect battery earth lead.
16. Start engine and check for fuel leaks around fuel rail and injectors.

FUEL SYSTEM

OXYGEN SENSOR

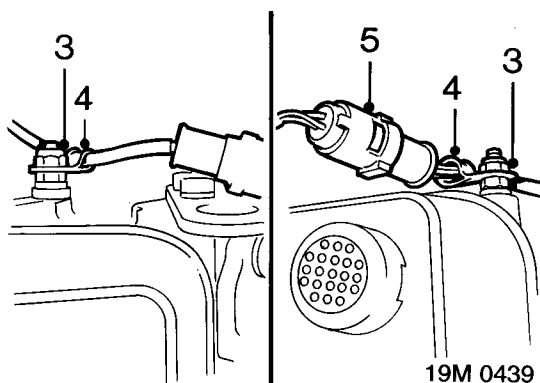
Service Repair No. 19.26.16

Note: Removal of sensors must only be carried out when engine is cold.

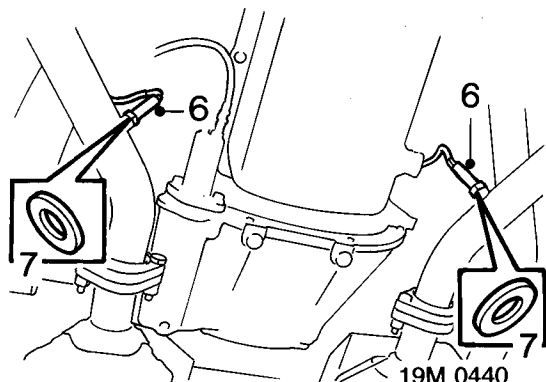
Remove

1. Disconnect battery earth lead.
2. Raise front of vehicle.

WARNING: Support on safety stands.



3. Remove nut securing harness clip.
4. Remove clip.
5. Disconnect multiplug.



6. Remove sensor.
7. Discard sealing washer.

Refit

1. Fit new sealing washer to sensor.
2. Apply anti-sieze compound to sensor threads.

CAUTION: Do not allow compound to contact sensor nose.

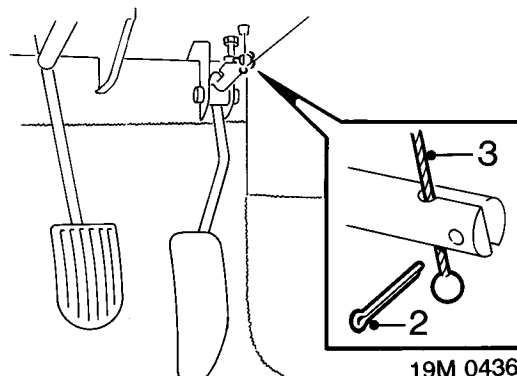
3. Fit sensor and tighten to correct torque.
4. Connect multiplug.
5. Fit harness clip, secure clip to stud, fit and tighten nut.
6. Remove stand(s) and lower vehicle.
7. Connect battery earth lead.

THROTTLE CABLE

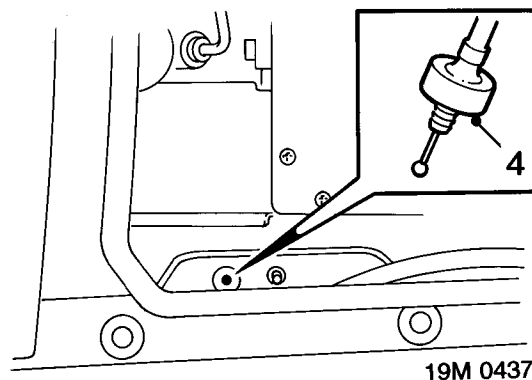
Service Repair No. 19.20.06

Remove

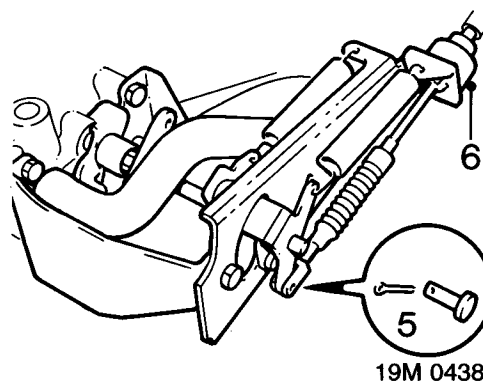
1. Disconnect battery earth lead.



2. Remove split pin retaining throttle cable to throttle pedal, discard split pin.
3. Release cable from pedal.



4. Release outer cable from bulkhead grommet and withdraw cable into engine compartment.



5. Remove split pin and clevis pin from throttle cable trunnion, discard split pin.
6. Release outer cable from abutment bracket.
7. Remove throttle cable.

Refit

1. Check throttle pedal setting, see **Adjustments**.
2. Position throttle cable and secure outer cable to abutment bracket.



3. Align throttle cable trunnion to lever, fit clevis pin and secure with new split pin.
4. Pass inner cable through bulkhead and secure outer cable to bulkhead grommet.

CAUTION: Ensure cable is fully seated in bulkhead grommet.

5. Connect inner cable to pedal, fit new split pin to retain cable.
6. Adjust throttle cable, see **Adjustments**.
7. Connect battery earth lead.

FUEL PUMP

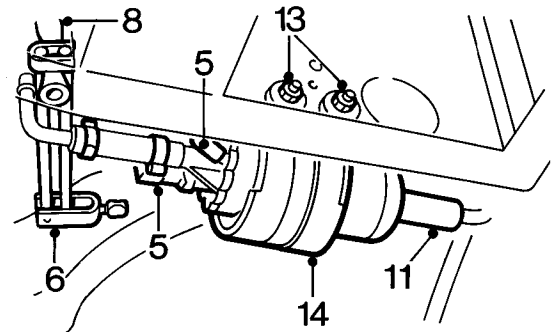
Service Repair No. 19.45.08

WARNING: The spillage of fuel is unavoidable during this operation, see **GENERAL INFORMATION - Fuel Handling Precautions**.

1. Depressurise fuel system.
2. Remove battery, see **ELECTRICAL**
3. Raise R.H. rear of vehicle.

WARNING: Support on safety stand.

4. Remove R.H. road wheel.



19M 0556

5. Disconnect 2 Lucars from fuel pump.
 6. Using a brake hose clamp, clamp fuel pump inlet hose.
 7. Position absorbent cloth around fuel inlet hose.
 8. Release clip and disconnect inlet hose.
 9. Plug pump.
 10. Position absorbent cloth around fuel outlet hose.
 11. Release clip and disconnect fuel outlet hose.
 12. Plug pump and hose.
 13. Remove 2 nuts securing pump bracket to battery box.
 14. Remove pump and bracket assembly.
- Do not carry out further dismantling if component is removed for access only**
15. Remove bracket from pump.

Refit

1. Fit bracket to pump.
2. Position pump and bracket assembly, fit and tighten nuts.
3. Remove plugs, connect inlet and outlet hoses and secure clips.
4. Remove clamp from inlet hose.
5. Connect Lucars.
6. Fit R.H. road wheel and tighten nuts to correct torque.
7. Remove stand and lower vehicle.
8. Fit battery, see **ELECTRICAL**

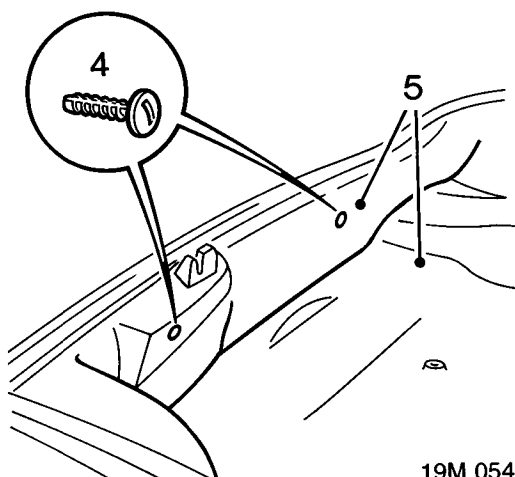
FUEL SYSTEM

FUEL TANK

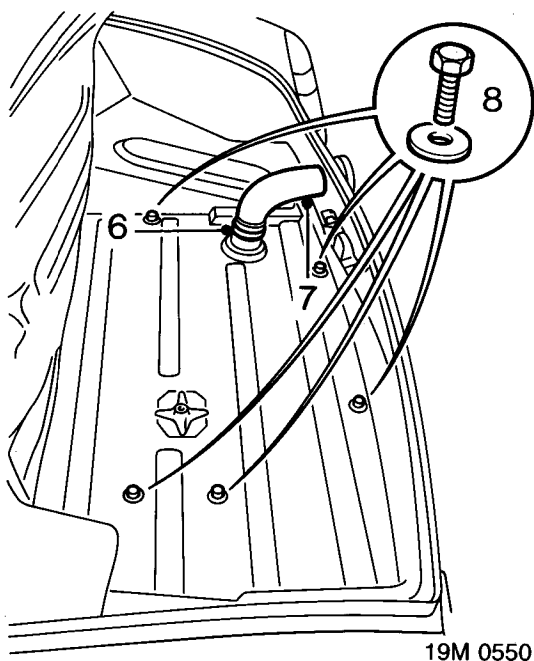
Service Repair No. 19.55.01

Remove

1. Disconnect battery earth lead.
2. Drain fuel system, see **GENERAL INFORMATION. Fuel Handling Precautions.**
3. Remove spare wheel.

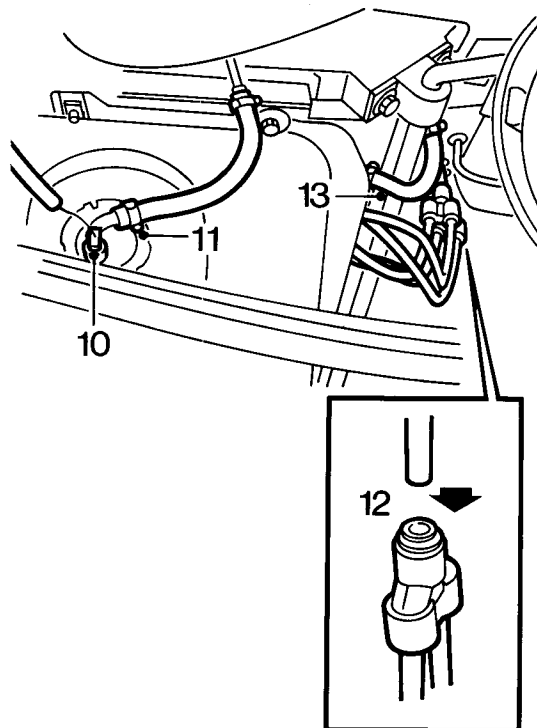


4. Remove 2 quarter turn fastenings securing luggage compartment rear trim casing.
5. Remove trim casing and fold luggage compartment floor carpet forwards.



6. Release and remove clip securing fuel tank hose to filler neck.
7. Release filler neck from fuel tank.
8. Remove 5 bolts securing fuel tank from inside luggage compartment.
9. Raise rear of vehicle.

WARNING: Support on safety stands.



10. Disconnect Lucar from fuel gauge tank unit.
11. Remove clip and disconnect hose from fuel gauge tank unit.

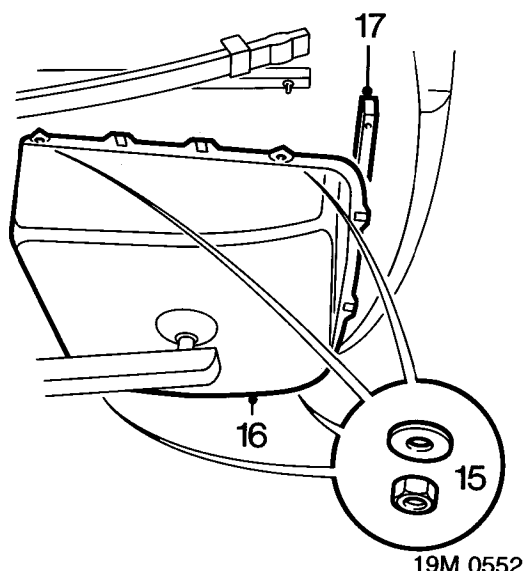
CAUTION: Plug the connections.

12. Disconnect fuel non - evaporative loss control system pipes from fuel tank breather adapter.

CAUTION: Plug the connections.

13. Release clip and disconnect fuel return hose from pipe.

CAUTION: Plug the connections.



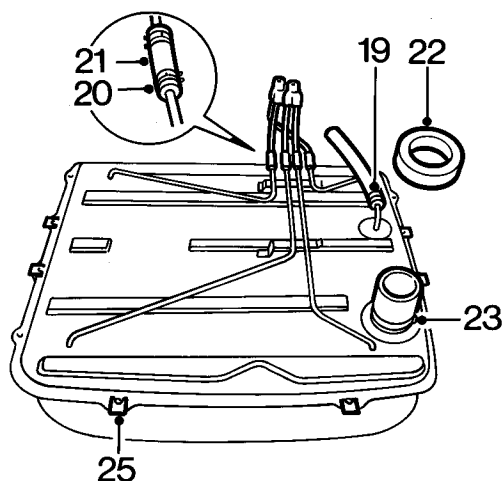
19M 0552

14. Position trolley jack to support fuel tank.
15. Remove 4 nuts securing fuel tank.
16. Release and lower fuel tank from vehicle.
17. Collect rear spacer.

Do not carry out further dismantling if component is removed for access only

18. Remove fuel gauge tank unit, see

INSTRUMENTS



19M 0456

19. Release clip securing fuel return hose and remove hose.
20. Release clips securing fuel tank breather hoses to fuel tank pipes.
21. Release hoses from pipes and remove pipes.

CAUTION: Plug the connections.

22. Remove tank to body sealing ring.
23. Release clip securing filler neck hose and remove hose.
24. Plug fuel tank.
25. Remove nuts from tank flange.
26. Transfer components to new fuel tank.

Refit

1. Position rear spacer.
2. Raise fuel tank into position, fit and tighten nuts securing tank.
3. Remove trolley jack.
4. Remove plugs from pipes and hoses, connect pipes and hoses and secure clips.
5. Connect Lucar to fuel gauge tank unit.
6. Remove stand(s) and lower vehicle.
7. Fit bolts securing fuel tank inside luggage compartment.
8. Fit fuel filler neck and secure clip.
9. Fold down luggage compartment floor carpet. Fit luggage compartment rear trim casing and secure with quarter turn fastenings.
10. Fit spare wheel.
11. Re - fill fuel tank.
12. Connect battery earth lead.

COOLING SYSTEM

CONTENTS

DESCRIPTION AND OPERATION

Page

COOLING SYSTEM COMPONENTS3

REPAIRS

Page

RADIATOR BLOCK AND COOLING FAN 1

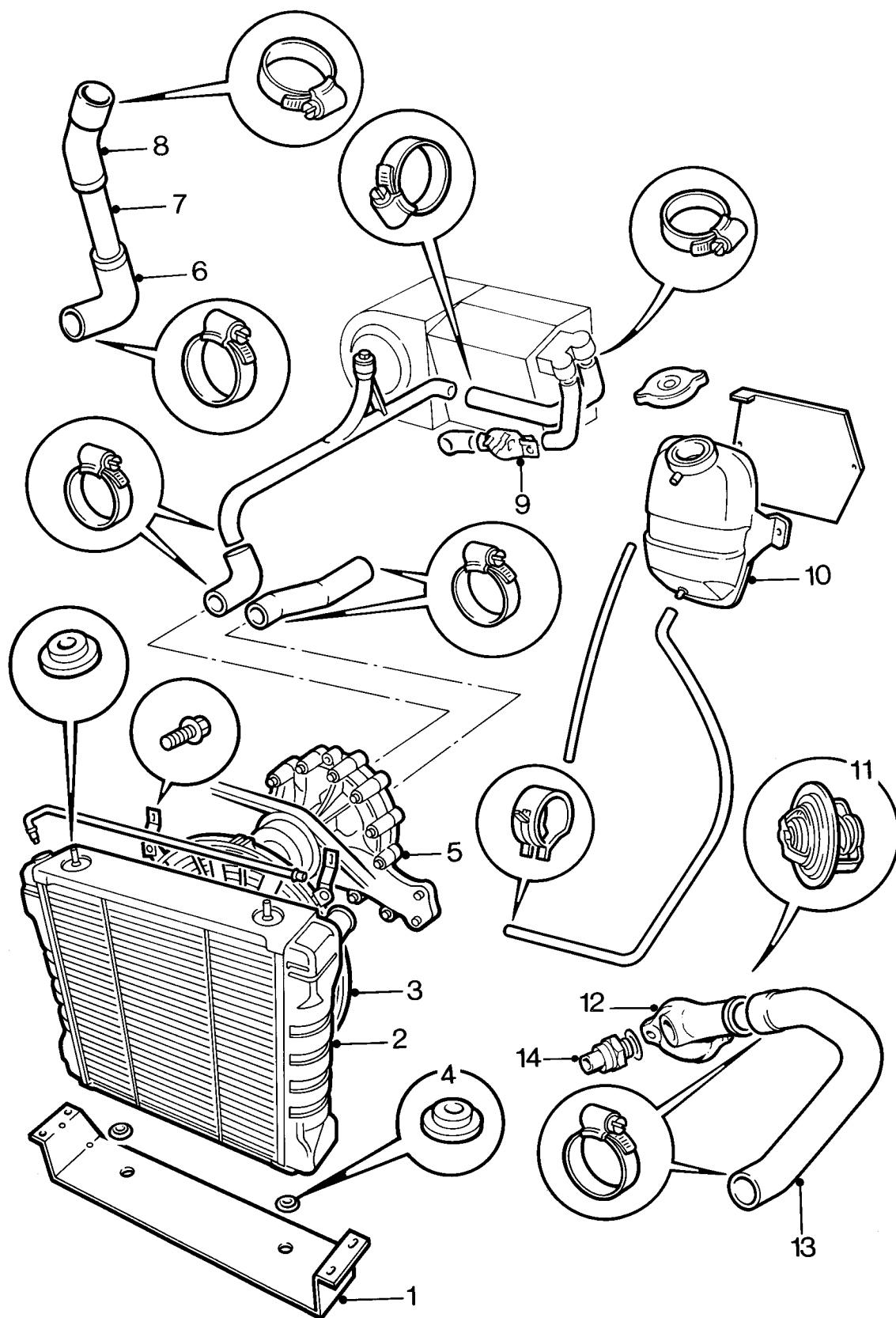
COOLANT PUMP2

THERMOSTAT3

THERMOSTATIC SWITCH3



COOLING SYSTEM



26M 0154 A



COOLING SYSTEM COMPONENTS

1. Radiator lower mounting plate
2. Radiator
3. Cooling fan and cowl
4. Radiator mounting bushes
5. Coolant pump
6. Radiator bottom hose
7. Connecting pipe
8. Hose – connecting pipe to coolant pump
9. Heater temperature control valve
10. Expansion tank
11. Thermostat
12. Thermostat housing
13. Top hose
14. Thermostatic switch



RADIATOR BLOCK AND COOLING FAN

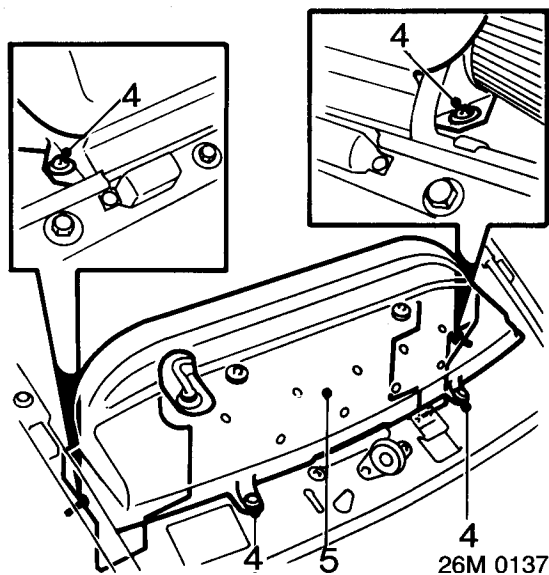
Service Repair No. 26.40.04 – Radiator block
Service Repair No. 26.25.23 – Cooling fan and motor

Remove

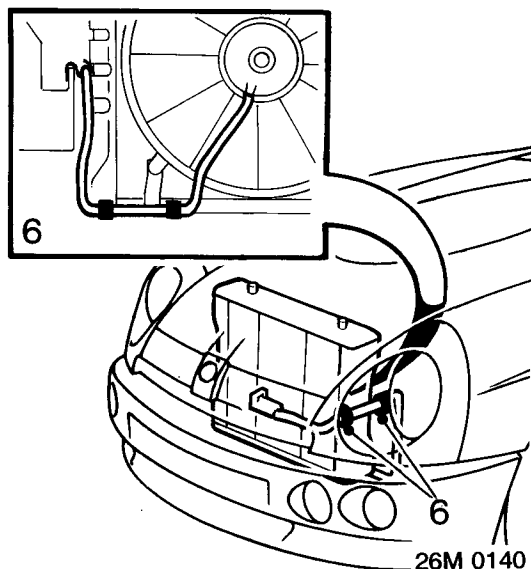
1. Raise front of vehicle.

WARNING: Support on safety stands.

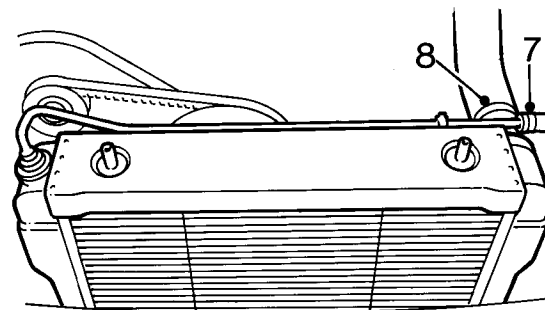
2. Drain cooling system, see **MAINTENANCE**.
3. Remove underbelly cowling, see **BODY**.



4. Remove 2 bolts and 2 scrivet fasteners securing radiator top cover.
5. Remove radiator top cover.

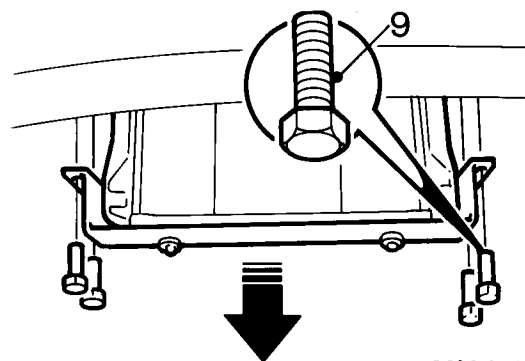


6. Disconnect cooling fan multiplug and release fan fly – lead from 4 clips.



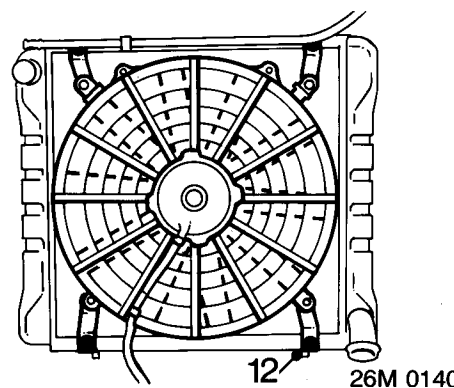
26M 0138

7. Slacken clip and disconnect expansion tank hose from radiator connecting pipe.
8. Slacken hose clip and disconnect top hose from radiator.



26M 0139

9. Using assistance to support radiator, remove 4 bolts securing radiator lower mounting plate to body.
 10. Carefully manoeuvre radiator and cooling fan assembly from beneath vehicle.
- Do not carry out further dismantling if component is removed for access only**
11. Remove lower mounting plate from radiator.



26M 0140

12. Remove 4 bolts securing cooling fan and motor to radiator, remove cooling fan assembly.

Refit

1. Position cooling fan and motor to radiator, fit and tighten 4 bolts to correct torque.
2. Fit lower mounting plate to radiator.

COOLING SYSTEM

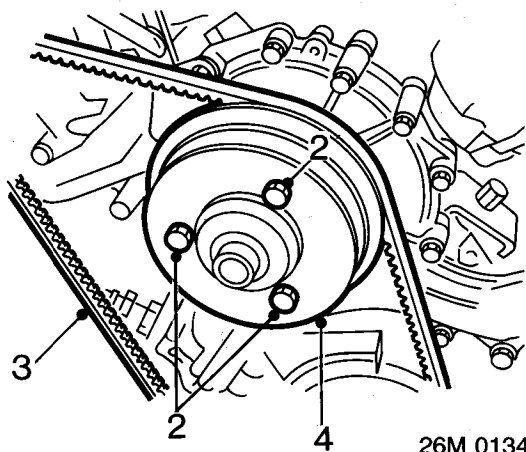
3. Using assistance, manoeuvre radiator block into position and fit lower mounting plate to body bolts. Tighten bolts to correct torque.
4. Fit clip to expansion tank hose, connect hose to radiator connecting pipe and tighten clip.
5. Connect top hose to radiator and tighten clip.
6. Secure fan fly - lead with clips and connect multiplug.
7. Fit radiator top cover, secure with scrivet fasteners and bolts.
8. Fit underbelly cowling, see **BODY**.
9. Remove stand(s) and lower vehicle.
10. Refill cooling system, see **MAINTENANCE**.

COOLANT PUMP

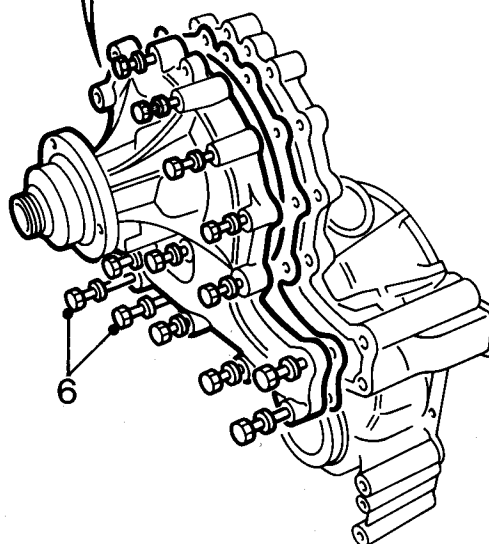
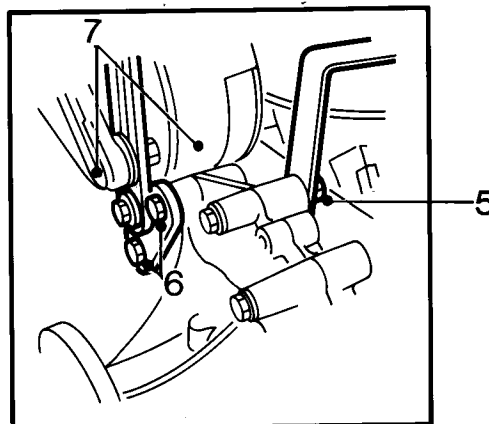
Service Repair No. 26.50.01

Remove

1. Remove radiator block and cooling fan.



2. Slacken but do not remove 3 bolts securing pulley to coolant pump.
3. Remove alternator drive belt, see **MAINTENANCE**.
4. Remove bolts and remove pulley from coolant pump.



26M 0135

5. Remove nut securing H.T. lead bracket and position bracket aside.
6. Noting their fitted position, remove 15 bolts securing coolant pump to timing cover.
7. Position alternator aside.
8. Carefully break gasket seal and remove coolant pump from timing cover.
9. Remove and discard gasket.

Refit

1. Remove all traces of gasket material from mating faces of coolant pump and timing cover.
2. Clean sealant from threads of 4 longest bolts and coat threads with Loctite 572 sealant.
3. Apply a thin coating of grease to new gasket and fit to timing cover.
4. Position coolant pump.
5. Align alternator bracket holes and fit coolant pump bolts. Tighten bolts to correct torque.
6. Position H.T. lead bracket and secure with nut.
7. Fit pulley to coolant pump and fit but do not tighten bolts.



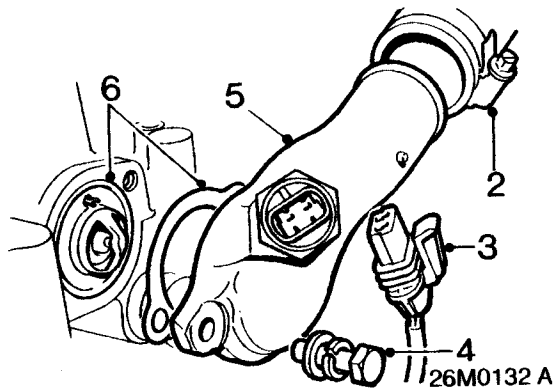
8. Fit alternator drive belt, see **MAINTENANCE..**
9. Tighten coolant pump pulley bolts to correct torque.
10. Fit radiator block and cooling fan.

THERMOSTAT

Service Repair No. 26.45.09

Remove

1. Drain cooling system, see **MAINTENANCE..**



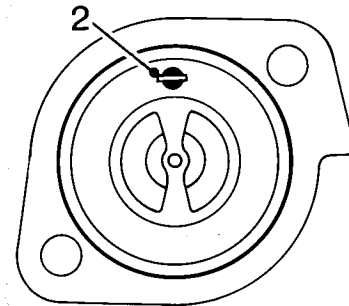
2. Slacken clip and disconnect top hose from thermostat housing.
3. Disconnect multiplug from thermostatic switch.
4. Remove 2 bolts, plain and spring washers securing thermostat housing.
5. Remove thermostat housing cover.
6. Remove thermostat from housing; discard gasket.

Test

1. Test thermostat using approved test equipment. Renew thermostat if necessary.
Starts to open = 82°
Fully open = 92°
Open travel = 9 mm

Refit

1. Clean mating faces of cover and thermostat housing.



26M 0133

2. Fit thermostat to housing with vent pin in 12 o'clock position.

CAUTION: Failure to position thermostat correctly can lead to air locks and overheating.

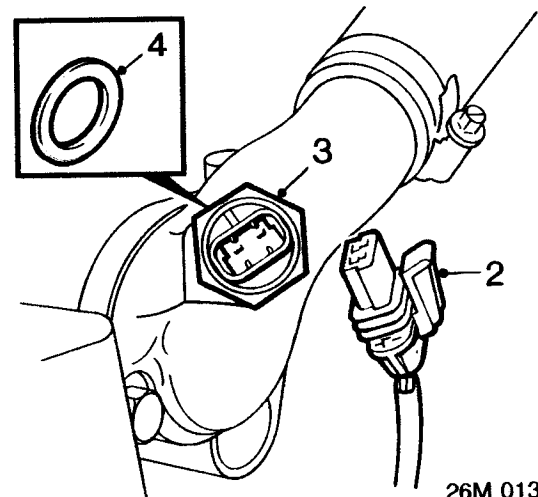
3. Position new gasket and fit cover.
4. Fit thermostat housing cover bolts and tighten to correct torque.
5. Connect multiplug to thermostatic switch.
6. Connect top hose and tighten clip.
7. Refill cooling system, see **MAINTENANCE..**

THERMOSTATIC SWITCH

Service Repair No. 26.25.35

Remove

1. Position container to collect spilled coolant.



26M 0136 A

2. Disconnect multiplug from thermostatic switch.
3. Remove thermostatic switch.
4. Remove and discard sealing washer.

Refit

1. Fit new sealing washer.
2. Fit switch and tighten to correct torque.
3. Connect multiplug to switch.
4. Top - up cooling system, see **MAINTENANCE..**

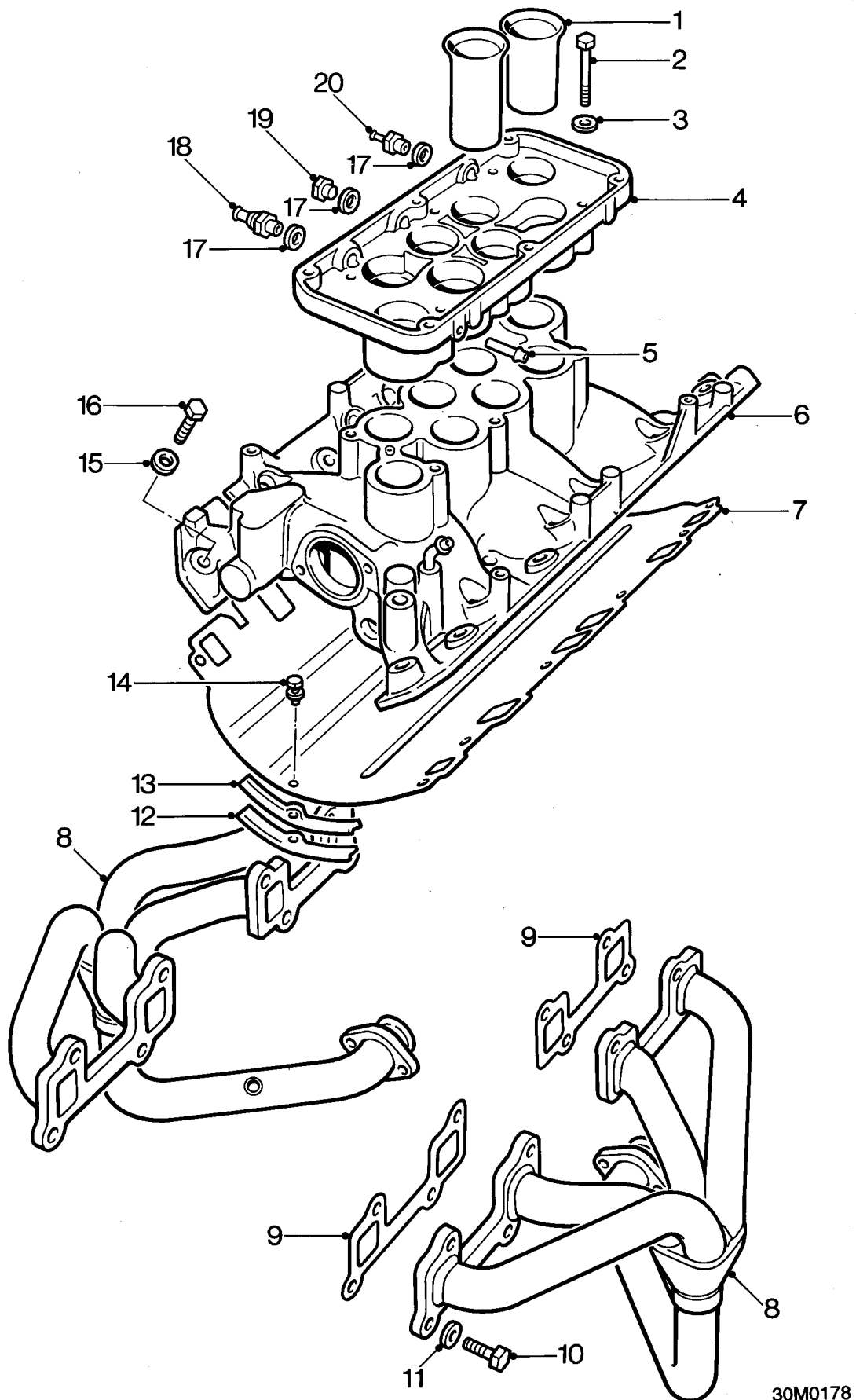
MANIFOLD & EXHAUST

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MANIFOLD & EXHAUST



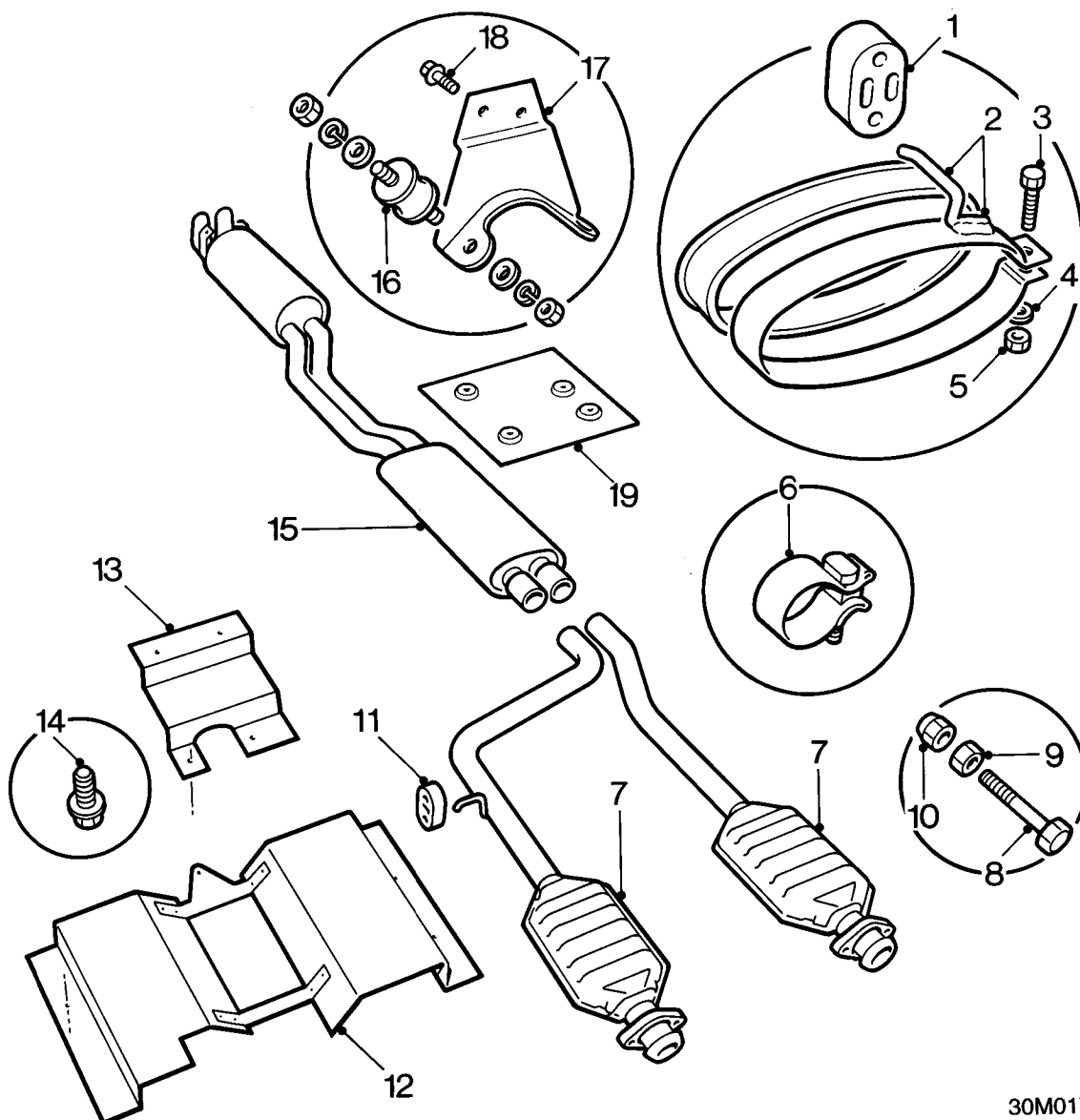
30M0178



INLET AND EXHAUST MANIFOLD COMPONENTS

- | | |
|-----------------------------|-------------------------------|
| 1. Ram pipe | 12. Gasket seal |
| 2. Ram pipe housing bolt | 13. Clamp plate |
| 3. Washer | 14. Clamp plate bolt |
| 4. Ram pipe housing | 15. Washer |
| 5. Stub pipe | 16. Inlet manifold bolt |
| 6. Inlet manifold | 17. Sealing washers |
| 7. Inlet manifold gasket | 18. Servo vacuum pipe tapping |
| 8. Exhaust manifolds | 19. Blanking plug |
| 9. Exhaust manifold gaskets | 20. Purge hose tapping |
| 10. Exhaust manifold bolt | |
| 11. Washer | |

MANIFOLD & EXHAUST



30M0173 A

EXHAUST SYSTEM COMPONENTS

- | | |
|--|--|
| 1. Rubber mounting | 11. Rubber mounting |
| 2. Clamp - silencer to mounting | 12. Catalytic converter heat shield |
| 3. Bolt | 13. Fuel pump and brake pipe heat shield |
| 4. Washer | 14. Bolt |
| 5. Nut | 15. Tail pipe and silencers |
| 6. Clamp | 16. Tail pipe rear mounting |
| 7. Intermediate pipes and catalytic converters | 17. Tail pipe rear mounting bracket |
| 8. Intermediate pipe to exhaust manifold bolt | 18. Bolt |
| 9. Spacer washer | 19. Silencer heat shield |
| 10. Nut | |



INLET MANIFOLD

The inlet manifold is a one – piece alloy casting incorporating passages for coolant to keep manifold temperatures stable, and is located between the cylinder heads. Manifold to cylinder head sealing is by means of a one piece gasket which is secured to the cylinder block using clamp strips and seals.

The ram pipe chamber is bolted directly to the face of the inlet manifold.

EXHAUST MANIFOLD

A fabricated steel, four branch manifold is fitted to each bank of cylinders. Each manifold has a single downpipe. An oxygen sensor is inserted in each downpipe.

The manifolds are sealed to the cylinder heads using gaskets.

EXHAUST SYSTEM

The exhaust system consists of twin intermediate pipes, each incorporating a catalytic converter and twin tailpipes incorporating two silencers.

Both silencers contain a series of expansion chambers, resonators and baffles designed to give an improved exhaust system, eliminating condensation and giving a longer life.

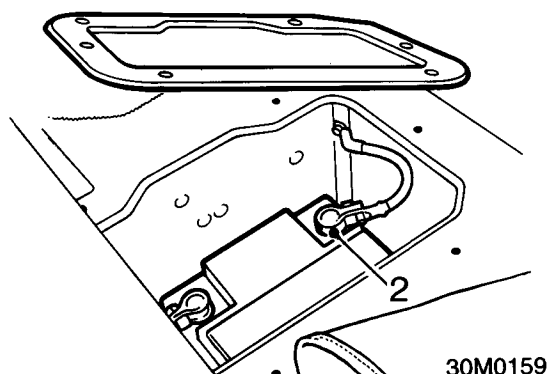


INLET MANIFOLD GASKET

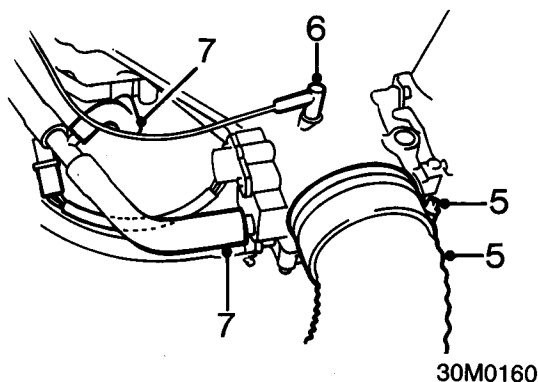
Service Repair No. 30.15.08

Remove

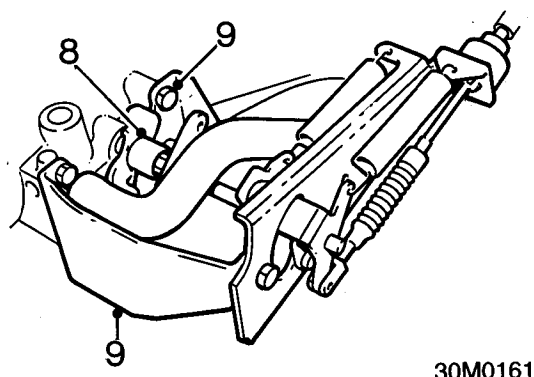
1. Depressurise fuel system, see **FUEL SYSTEM. - Repairs.**



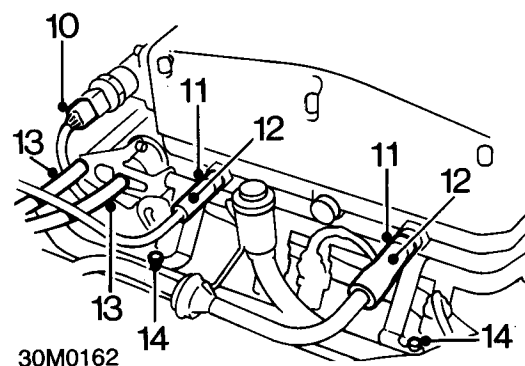
2. Disconnect battery earth lead.
3. Disconnect multiplug to fuel cut - off inertia switch.
4. Drain cooling system, see **MAINTENANCE.**



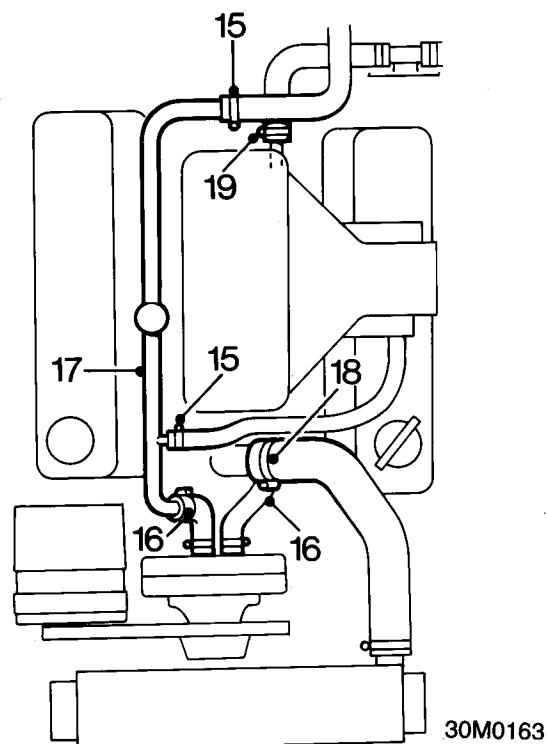
5. Slacken clip securing intake hose to plenum chamber, disconnect hose.
6. Disconnect distributor vacuum pipe from plenum chamber.
7. Disconnect breather hoses from plenum chamber and ram pipe housing.



8. Release throttle disc return spring.
9. Remove 4 bolts securing throttle linkage bracket and place aside.

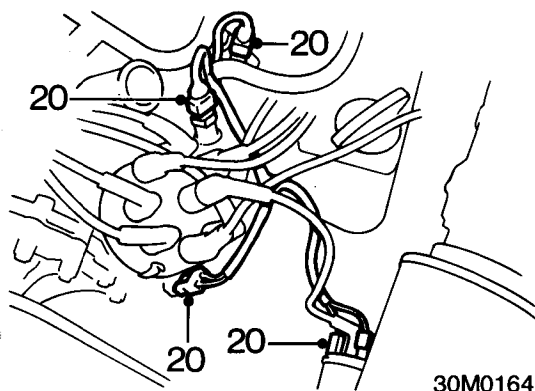


10. Disconnect multiplug from stepper motor.
11. Release clips securing purge hose and servo vacuum hose to ram pipe housing.
12. Disconnect purge hose and servo vacuum hose from ram pipe housing.
13. Position cloth beneath fuel hoses to catch spillage, slacken clips and release feed and return hoses from fuel rail.
14. Remove 4 bolts securing fuel rail to inlet manifold.



15. Slacken clips and disconnect throttle body cooling hoses from coolant rail.
16. Slacken clips and disconnect coolant pump hoses from coolant rail.
17. Place coolant rail aside.
18. Slacken clip and disconnect top hose from thermostat housing.
19. Slacken clip and disconnect hose between inlet manifold and heater valve.

MANIFOLD & EXHAUST

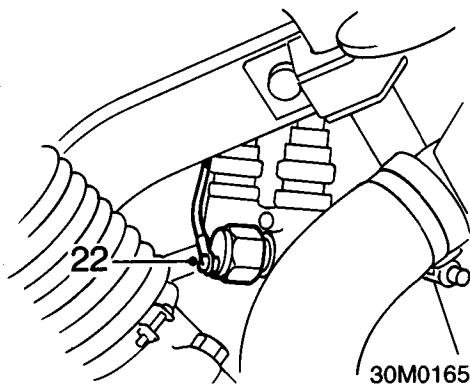


20. Disconnect harness from ignition coil, amplifier, coolant temperature sensor, throttle potentiometer and L.H. bank of injectors.

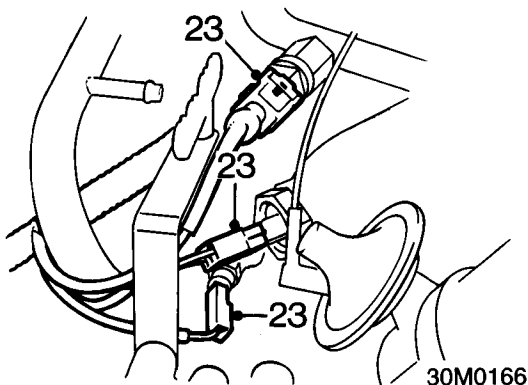
21. Carefully withdraw harness from behind L.H. bank of injectors.

Note: If necessary, the injectors can be lifted slightly to improve access.

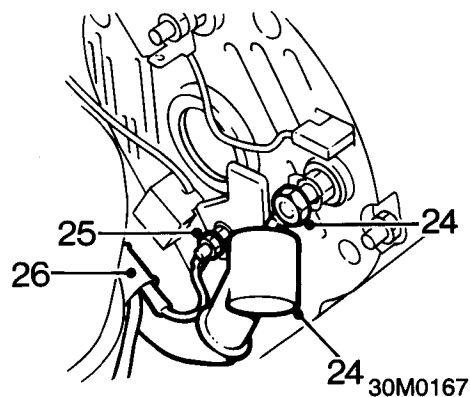
CAUTION: Do not completely withdraw injectors from fitted locations.



22. Remove screw securing wire to oil pressure switch and release wire from terminal.



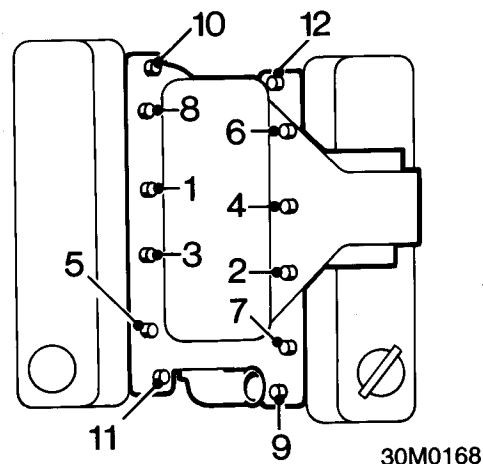
23. Disconnect harness from cooling fan switch, fuel temperature sensor, coolant temperature gauge sensor and R.H. bank of injectors.



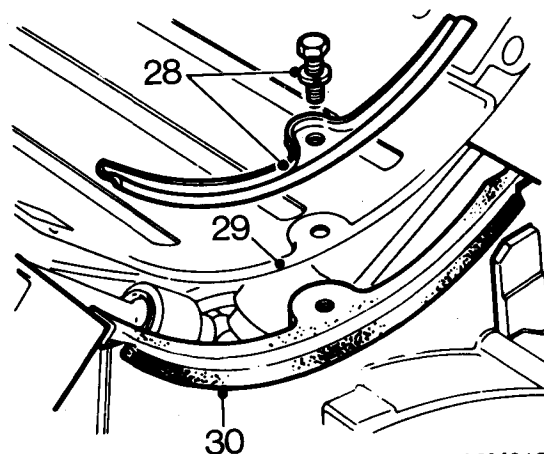
24. Release cover from alternator output terminal, slacken nut and release harness from terminal.

25. Remove nut from alternator sensing terminal and release harness.

26. Bend up harness tag adjacent to alternator and carefully release harness from behind R.H. bank of injectors. Place harness aside.



27. Using sequence shown, remove 12 bolts securing inlet manifold to cylinder head, remove manifold assembly.



28. Noting their fitted position, remove bolts and clamps securing inlet manifold gasket to cylinder block.

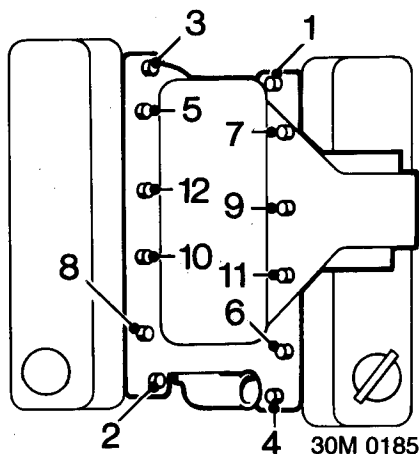
29. Remove and discard gasket.



30. Remove and discard gasket seals.

Refit

1. Clean all traces of sealant from around coolant passages in cylinder head and inlet manifold. Remove sealant from gasket seal locations.
2. Apply a thin bead of RTV silicone sealant to each corner of the joints between cylinder heads and cylinder block.
3. Fit new gasket seals.
4. Apply a thin coating of Hylomar sealant around coolant passages in cylinder heads and gasket.
5. Fit a new gasket and secure with clamps. Do not fully tighten clamp bolts at this stage.



6. Fit inlet manifold assembly. Fit bolts and working in sequence shown, tighten progressively to the correct torque.
7. Tighten gasket clamp bolts to the correct torque.
8. Route wiring harnesses behind injectors.
9. Connect L.H. harness to injectors, throttle potentiometer, coolant temperature sensor, amplifier and ignition coil.
10. Connect R.H. harness to injectors, fuel temperature sensor, coolant temperature gauge sensor, cooling fan switch, alternator terminals and oil pressure switch.
11. Fit cover over alternator output terminal.
12. Position harness behind alternator and bend tag to secure.
13. Connect coolant rail hose and tighten clip.
14. Connect thermostat housing, coolant pump and coolant rail hoses to inlet manifold.
15. Position and tighten all hose clips.
16. Ensure all injectors are fully engaged in seatings before fitting fuel rail securing bolts.
17. Connect fuel feed and return hoses to fuel rail and secure with clips.
18. Connect brake servo and purge hoses to ram pipe housing. Secure hose with clips.

19. Position throttle linkage, secure linkage with bolts and connect throttle disc return spring.
20. Connect breather hose to plenum and ram pipe housing.
21. Connect distributor vacuum hose to plenum chamber.
22. Connect multiplug to stepper motor.
23. Connect intake hose to plenum chamber and tighten clip.
24. Connect battery earth lead.
25. Fill cooling system, see **MAINTENANCE**.
26. Check base idle and adjust if necessary, see **MAINTENANCE**.

EXHAUST MANIFOLD GASKET

Service Repair No. Gasket - 30.15.12

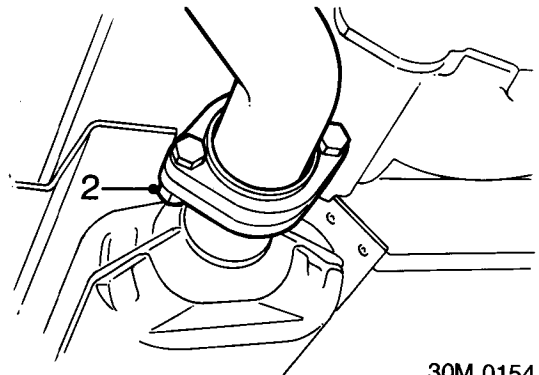
Service Repair No. Manifold - 30.15.10

If the exhaust manifold is to be renewed, the engine must first be removed for access.

Remove

1. Raise front end of vehicle.

WARNING: Support on safety stands.

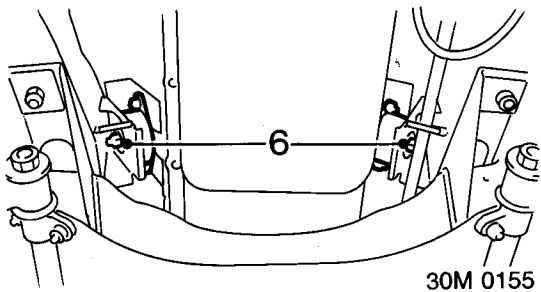


2. Remove 2 nuts and bolts securing manifold flange to intermediate pipe, collect spacer washers.
3. Release spark plug caps on relevant bank of cylinders and place leads aside.

R.H. Manifold Gaskets

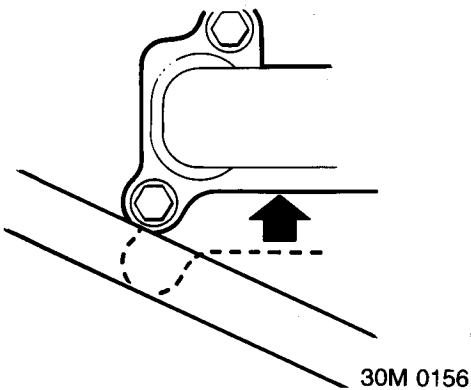
4. Remove starter motor, see **ELECTRICAL - Repairs**.
5. Remove blower assembly, see **HEATING & VENTILATION - Repairs**.

MANIFOLD & EXHAUST



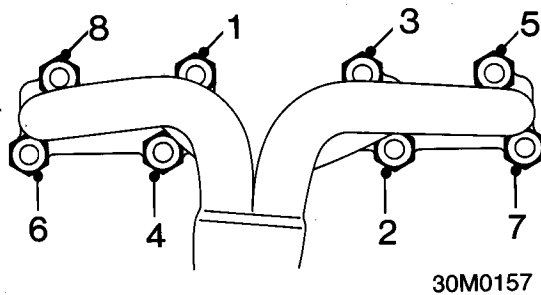
6. Slacken but do not remove both engine mounting nuts.

CAUTION: If R.H. nut is removed, it will prove difficult to fit due to proximity of steering rack pinion.

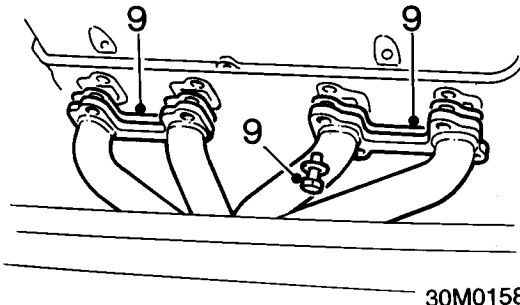


7. Raise engine slightly on jack to improve access to rear mounting bolt on R.H. manifold.

R.H. and L.H. manifold gaskets



8. Working in sequence shown, remove 8 bolts securing exhaust manifold to cylinder head.

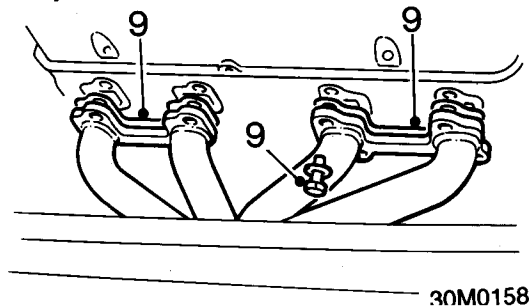


9. Release manifold from cylinder head, remove and discard gaskets.

Refit

1. Clean mating faces of exhaust manifold and cylinder head.

2. Fit new gaskets and align exhaust manifold to cylinder head.



3. Fit manifold bolts and working in sequence shown, tighten to correct torque.

R.H. Manifold Gaskets

4. Fit starter motor, see **ELECTRICAL - Repairs.**
5. Fit blower assembly, see **HEATING & VENTILATION - Repairs.**
6. Lower engine and remove jack.
7. Tighten both engine mounting nuts to correct torque.

R.H. and L.H. manifold gaskets

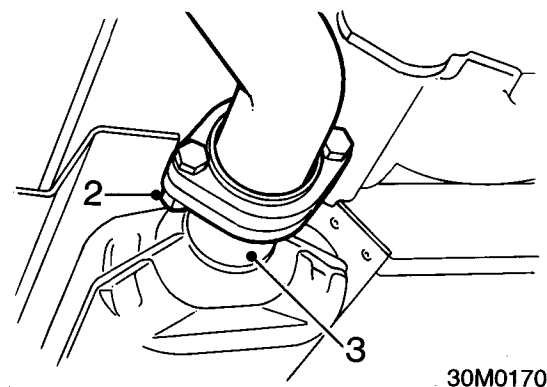
8. Position spark plug leads and fit plug caps.
9. Position intermediate pipe to manifold, fit nuts, bolts and spacer washers; tighten nuts to correct torque.
10. Remove stand(s) and lower vehicle.

INTERMEDIATE PIPE AND CATALYTIC CONVERTER

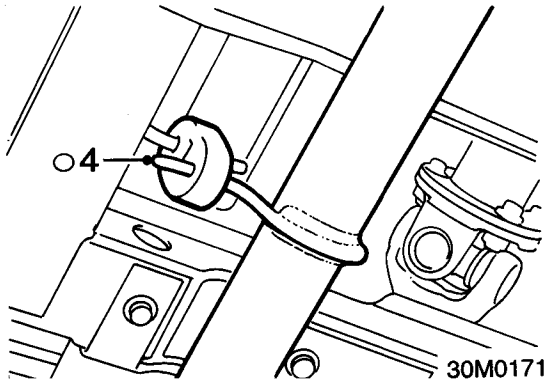
Service Repair No. 30.10.11

Remove

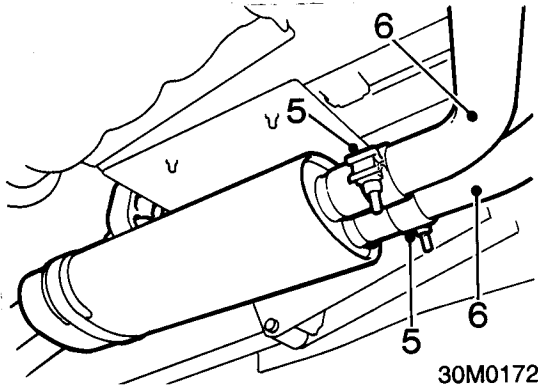
1. Raise vehicle on a ramp.



2. Remove 2 nuts and bolts securing intermediate pipe to exhaust manifold and collect spacer washers.
3. Separate intermediate pipe from manifold.



4. *R.H. intermediate pipe only:* Release rubber mounting from body.



5. Slacken clamp securing intermediate pipe to tail pipe.
6. Use twisting action to loosen sleeved joint and remove intermediate pipe and catalytic converter assembly.

CAUTION: Catalytic converters are manufactured from ceramic material which is very fragile, avoid heavy impacts on converter casing.

Refit

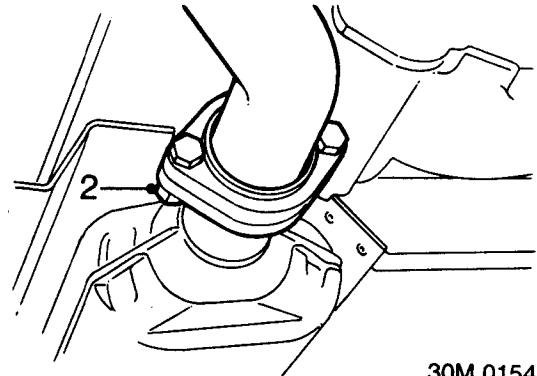
1. Clean mating surfaces of intermediate pipe, tail pipe and manifold.
2. *R.H. intermediate pipe only:* Fit rubber mounting to intermediate pipe.
3. Fit intermediate pipe to tail pipe.
4. *R.H. intermediate pipe only:* Connect rubber mounting to body.
5. Position intermediate pipe to manifold, fit bolts, spacer washers and nuts. Tighten nuts to correct torque.
6. Ensure correct engagement of intermediate pipe to tail pipe sleeved joint and adjust if necessary.
7. Position clamp and tighten nut to correct torque.
8. Lower ramp.

TAIL PIPE

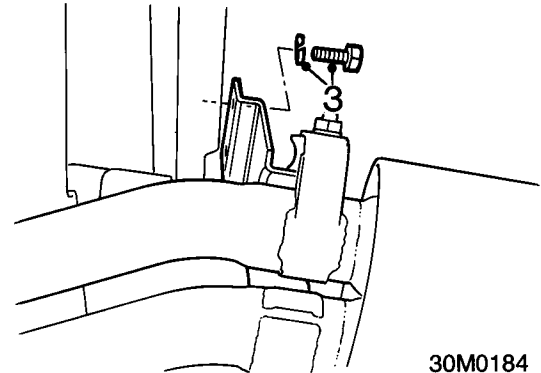
Service Repair No. 30.10.22

Remove

1. Raise vehicle on a ramp.

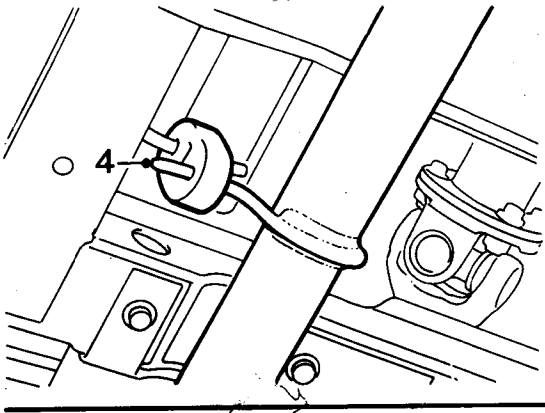


2. Remove 2 nuts and bolts securing each intermediate pipe to exhaust manifolds and collect spacer washers.



3. Remove 2 bolts and spring washers securing rear bracket to body.

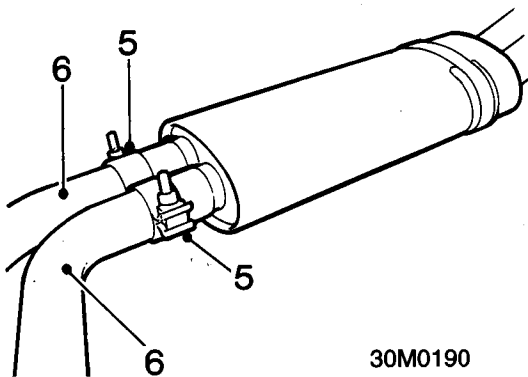
MANIFOLD & EXHAUST



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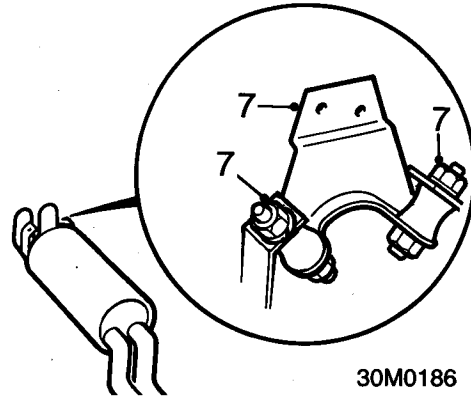
4. Using assistance, release 2 mounting rubbers from body, remove intermediate and tail pipe assembly.

Do not carry out further dismantling if component is removed for access only



30M0190

5. Slacken 2 clamps securing intermediate pipes to tail pipe.
6. Use twisting action to loosen sleeved joints and remove intermediate pipes.



30M0186

7. Remove 2 nuts, plain and spring washers securing rear mounting bracket rubbers to tail pipe, remove bracket.

Refit

1. Clean mating surfaces of intermediate pipes, tail pipe and exhaust manifolds.
2. Fit clamps to tail pipe.
3. Position rear mounting bracket to tail pipe, fit washers; tighten nuts to correct torque.
4. Fit intermediate pipes to tail pipe, do not tighten nuts at this stage.
5. Fit rubber mountings to R.H. intermediate pipe and front silencer of tail pipe.
6. Using assistance, position exhaust system and connect mounting rubbers to body.
7. Position rear mounting bracket to body, fit washers; tighten bolts to correct torque.
8. Position intermediate pipes to exhaust manifolds and fit bolts, spacer washers and nuts. Tighten nuts to correct torque.
9. Ensure correct engagement of intermediate pipes to tail pipe sleeved joints and adjust if necessary.
10. Position clamps and tighten nuts to correct torque.
11. Lower ramp.

CLUTCH

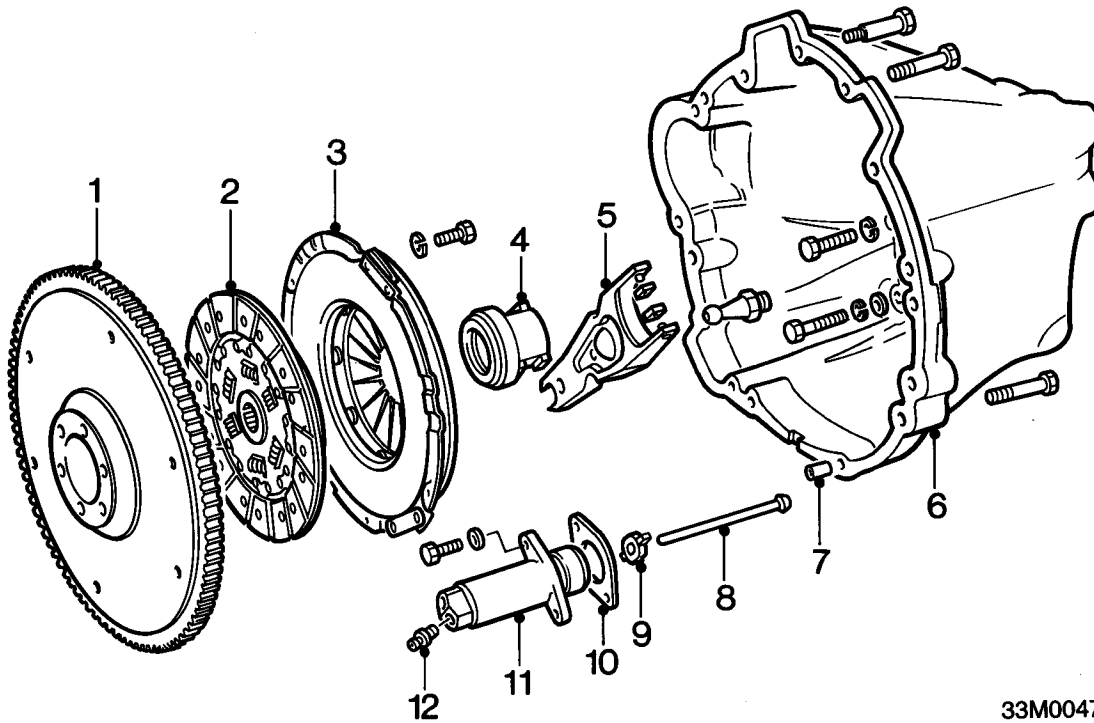
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CLUTCH

CLUTCH COMPONENTS



33M0047

- | | |
|--------------------------|----------------------|
| 1. Flywheel | 8. Push rod |
| 2. Driven plate | 9. Push rod retainer |
| 3. Clutch cover assembly | 10. Shim |
| 4. Release bearing | 11. Slave cylinder |
| 5. Release fork | 12. Bleed screw |
| 6. Flywheel housing | |
| 7. Dowel | |



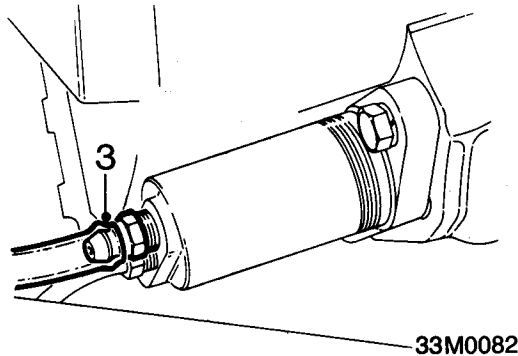
CLUTCH HYDRAULIC SYSTEM BLEED

Service Repair No. 33.10.01

1. Top - up clutch master cylinder. see
**INFORMATION - CAPACITIES, FLUIDS
AND LUBRICANTS**

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.

2. Clean area around bleed screw.



3. Connect bleed tube to bleed screw and immerse free end of tube in container containing brake fluid.
4. Hold clutch pedal down and slacken bleed screw.
5. Release clutch pedal, allow it to return unassisted then depress pedal again.
6. Repeat procedure until fluid issuing from bleed tube is free from air bubbles.

CAUTION: Top - up fluid in master cylinder at frequent intervals to avoid drawing air into the system. Do not use fluid bled from the system as it will contain air.

7. When fluid is free from air bubbles, tighten bleed screw, remove bleed tube.
8. Top - up master cylinder, fit cap.

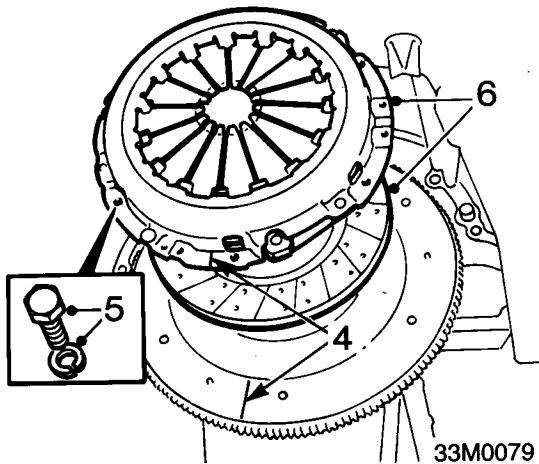


CLUTCH ASSEMBLY AND RELEASE BEARING

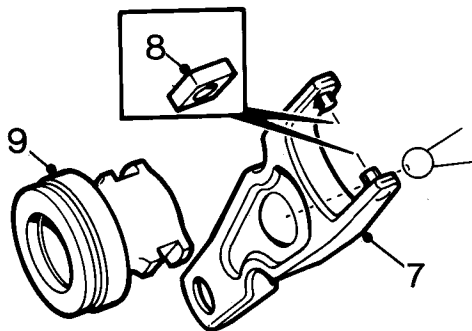
Service Repair No. 33.10.07

Remove

1. Raise vehicle on a ramp.
2. Disconnect battery earth lead.
3. Remove gearbox assembly, see **MANUAL GEARBOX**.



4. If original pressure plate is to be refitted, make suitable alignment marks between pressure plate and flywheel.
5. Restrain flywheel and working in diagonal sequence, progressively slacken and remove 6 bolts and spring washers securing pressure plate to flywheel.
6. Remove pressure plate, collect clutch plate.



7. Disengage clutch release lever from pivot and remove release lever.
8. Collect slipper pads from release lever.
9. Remove release bearing.

Inspect

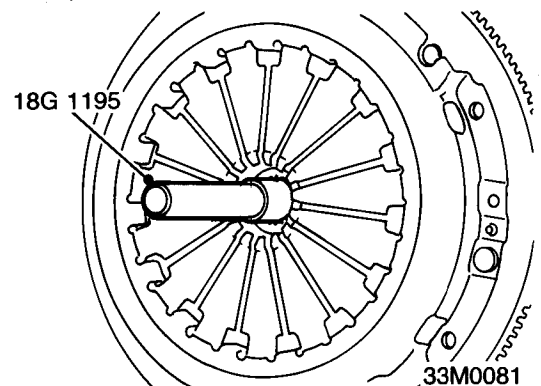
1. Check linings of clutch plate for excessive or uneven wear, burning or contamination.
2. Check splines of clutch plate for excessive wear.
3. Check friction surface of pressure plate for burning, distortion or scoring.

4. Check fingers of pressure plate for cracks and distortion.
5. Renew components as necessary.
6. Check release bearing for smooth operation.

CAUTION: Bearing is packed with grease, do not wash in solvent.

Refit

1. Clean pressure plate and flywheel, dowels and dowel holes.
2. Clean release lever pivot and release bearing location on gearbox.
3. Clean release lever and slipper pads.
4. Smear bore of release bearing with molybdenum disulphide grease and fit to gearbox location.
5. Smear pivot post, mating surface of release lever, slipper pad locations and slipper pads with molybdenum disulphide grease.
6. Fit slipper pads to release lever. Fit release lever by engaging slippers to release bearing and lever to pivot post simultaneously.
7. Smear clutch plate splines with molybdenum disulphide grease.



8. Position clutch plate with 'FLYWHEEL SIDE' marking facing flywheel and fit aligning tool 18G 1195.
9. Fit pressure plate, locate on dowels and fit bolts and spring washers. Tighten bolts progressively, working in a diagonal sequence, to correct torque.

Note: If original pressure plate is refitted, align previously made markings on plate and flywheel.

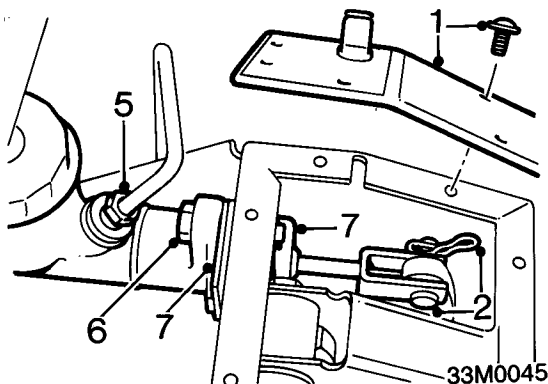
10. Remove 18G 1195.
11. Fit gearbox assembly, see **MANUAL GEARBOX**.
12. Lower ramp.
13. Connect battery earth lead.

CLUTCH

CLUTCH MASTER CYLINDER

Service Repair No. 33.20.01

Remove



1. Remove 8 screws securing pedal box cover and remove cover.
2. Remove retaining clip and remove clevis pin from master cylinder trunnion.
3. Remove stop light switch for access to master cylinder bolts, see **BRAKES**.
4. Position cloth beneath master cylinder to absorb fluid spillage.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with warm water.

5. Unscrew union from master cylinder. Plug end of pipe and master cylinder orifice.
6. Remove bolts securing master cylinder to pedal box.
7. Release rubber boot from end of master cylinder, manoeuvre cylinder from pedal box and collect steel spacer shims.

Refit

1. Clean mating surfaces of pedal box and master cylinder.
2. Clean pipe union and extension union.
3. Fit upper mounting bolt to master cylinder.
4. Fit extension union to master cylinder, use a new copper washer.
5. Release rubber boot from end of replacement master cylinder.
6. Manoeuvre master cylinder to pedal box.
7. Position steel spacer shims, fit master cylinder to pedal box, fit and tighten bolts.
8. Position rubber boot and align trunnion with clutch pedal.
9. Fit clevis pin to trunnion and secure with clip.
10. Fit and tighten pipe union to master cylinder.
11. Fit and adjust stop lamp switch, see **BRAKES**.
12. Fit pedal box cover plate and secure with screws.
13. Bleed clutch system, see **Adjustments**.

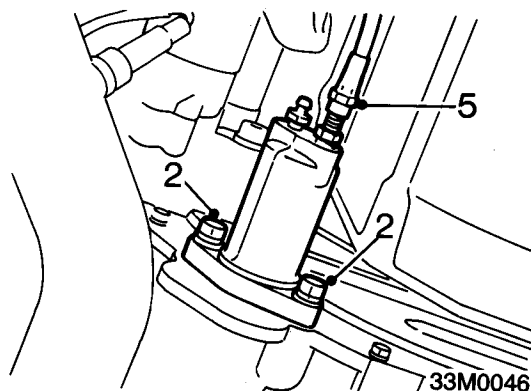
CLUTCH SLAVE CYLINDER

Service Repair No. 33.35.01

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.



2. Remove bolts securing slave cylinder and release cylinder from clutch housing.
3. Collect steel spacer shim from slave cylinder.
4. Position container to fluid catch spillage.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with warm water.

5. Unscrew slave cylinder from flexible hose, plug end of hose.

Refit

1. Remove plug and clean flexible hose union.
2. Clean mating surfaces of slave cylinder, shim and clutch housing.
3. Fit slave cylinder to flexible hose and tighten union.
4. Fit steel spacer shim to slave cylinder and position cylinder to clutch housing.
5. Fit and tighten slave cylinder bolts to correct torque.
6. Bleed clutch system, see **Adjustments**.
7. Remove stands and lower front of vehicle.

GEARBOX

CONTENTS

ADJUSTMENTS

Page

REVERSE LAMP SWITCH ADJUSTMENT1

REPAIRS

Page

INPUT SHAFT OIL SEAL1

GEARBOX OUTPUT SHAFT OIL SEAL1

GEARBOX2

REVERSE LAMP SWITCH5



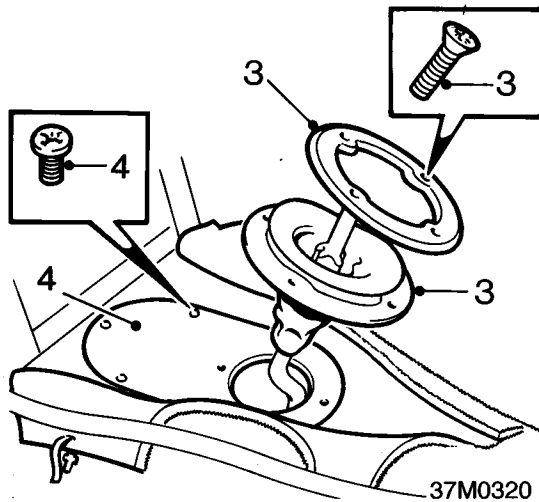


REVERSE LAMP SWITCH ADJUSTMENT

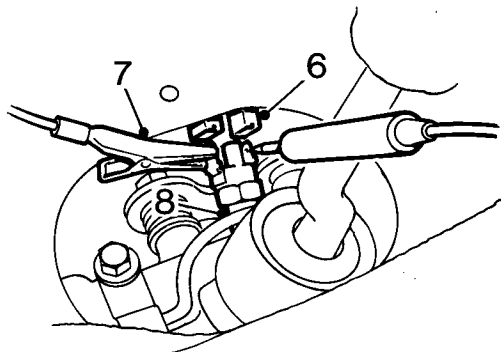
16. Fit front console, see **BODY** .

Service Repair No. 37.27.02

1. Remove front console, see **BODY** .
2. Cut 2 clips securing front halves of carpet and place carpet aside.



3. Remove 4 screws securing gear lever gaiter ring, remove gaiter and ring.
4. Remove 3 screws securing aperture cover plate, remove plate.
5. Select reverse gear.



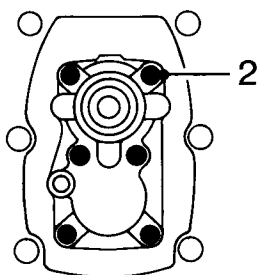
6. Disconnect 2 Lucars from reverse lamp switch.
7. Connect Ohmmeter across switch terminals.
8. Slacken switch locknut.
9. Unscrew switch until open circuit exists, then screw switch in to exact point where meter reads continuity.
10. Screw switch in a further half turn and tighten locknut.
11. Disconnect Ohmmeter and connect Lucars to switch.
12. Turn ignition on and check reverse lamp operation. Turn ignition off.
13. Fit aperture cover plate, fit and tighten screws.
14. Position gaiter, fit gaiter ring, fit and tighten screws.
15. Position carpet and secure with new clips. Trim off loose ends of clips.



INPUT SHAFT OIL SEAL

Service Repair No. 37.23.06

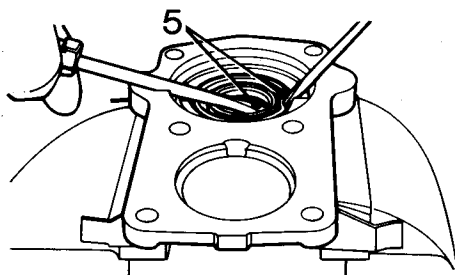
1. Remove clutch release bearing, see **CLUTCH**.



37M0341

2. Remove 6 bolts and spring washers, remove front cover from gearbox.
3. Remove and discard gasket.
4. Noting their fitted position, remove selective washers from front cover.

Note: Washers are of different diameters.



37M0326

5. Remove and discard input shaft oil seal.

Refit

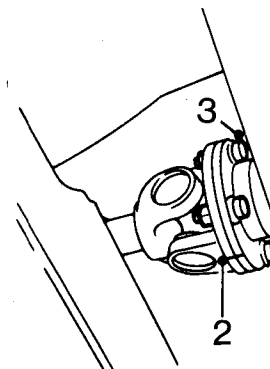
1. Clean all traces of gasket material from front cover and mating surface of gear casing.
2. Clean seal location.
3. Lubricate lip of new seal with gearbox oil and carefully press in until fully seated in location.
4. Position gasket to front cover.
5. Apply masking tape to input shaft splines to protect seal lip.
6. Fit selective washers to front cover locations.
7. Fit front cover and secure with bolts and spring washers. Tighten bolts to correct torque.
8. Remove masking tape from input shaft splines.
9. Fit clutch release bearing, see **CLUTCH**.
10. Check/top - up gearbox oil level, see **MAINTENANCE**.

OUTPUT SHAFT OIL SEAL

Service Repair No. 37.23.01

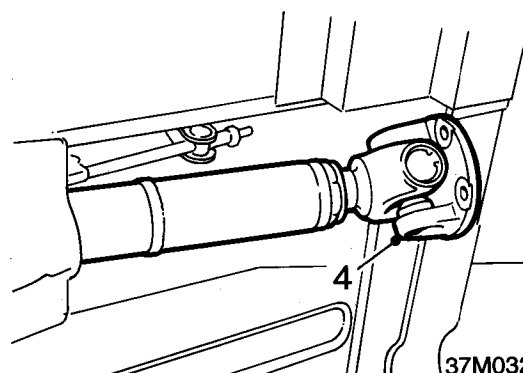
Remove

1. Raise vehicle on a ramp.



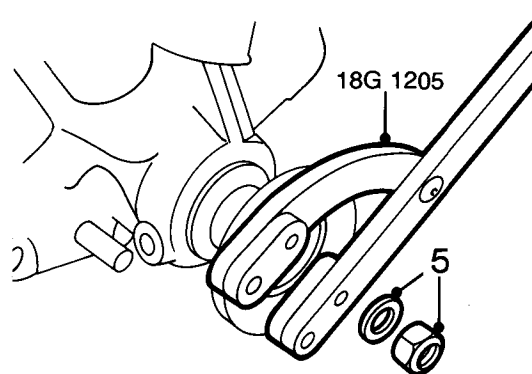
37M0343

2. Mark relationship of propeller shaft flanges to drive flanges.
3. Remove 4 nuts and bolts securing each propeller shaft flange.



37M0322

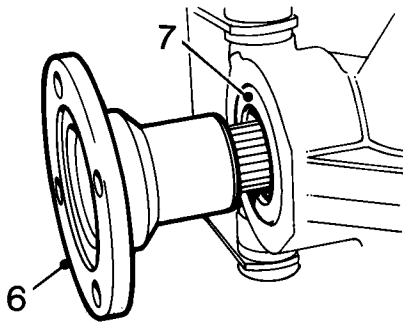
4. Release propeller shaft and guide rearwards for clearance.



37M0323

5. Using **18G1205** to restrain flange, remove self - locking nut securing drive flange to output shaft; discard nut.

GEARBOX

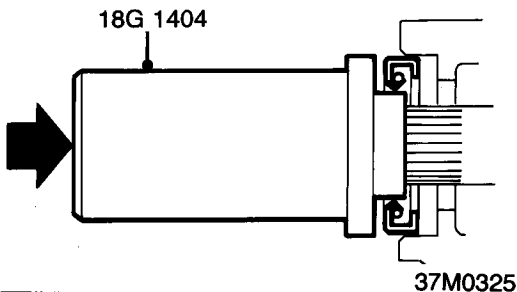


37M0324

6. Remove drive flange, using tool **18G 2** if necessary. Discard flat washer with integral, fibre sealing washer.
7. Carefully lever seal from gearbox extension housing, taking care not to score location. Discard seal.

Refit

1. Clean all traces of fibre washer from threads of output shaft.
2. Clean seal location in extension housing and running surface of drive flange.



37M0325

3. Lubricate seal lip with engine oil and using tool **18G 1404**, drift seal in squarely until flush with face of extension housing.
4. Lubricate leading edge of drive flange and fit flange fully over output shaft.
5. Fit new washer with fibre insert.

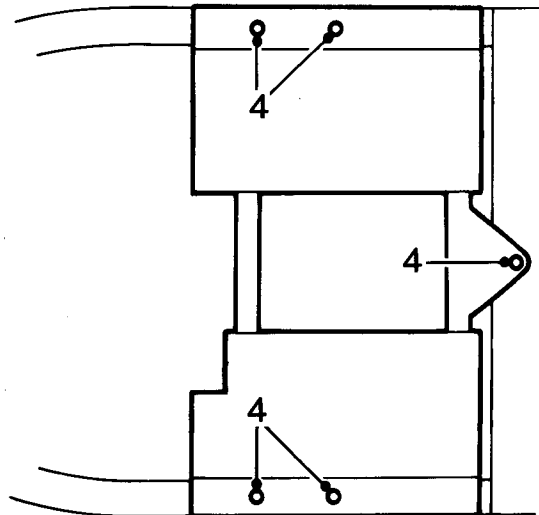
Note: Fibre insert must be towards gearbox.

6. Fit new self-locking nut, and using **18G 1205** to restrain flange, tighten nut to correct torque.
7. Position propeller shaft flanges, ensuring reference marks are aligned. Fit nuts and bolts with nuts towards universal joints. Tighten nuts to correct torque.
8. Check/top-up gearbox oil level, see **MAINTENANCE**
9. Lower ramp.

GEARBOX

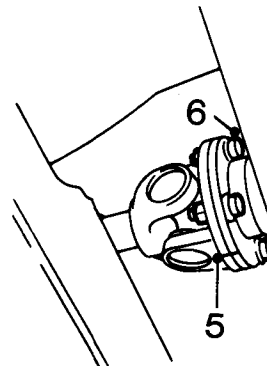
Remove

1. Disconnect battery earth lead.
2. Raise vehicle on a 4 post ramp.
3. Remove exhaust intermediate pipes and tail pipe assembly, see **MANIFOLD & EXHAUST**.



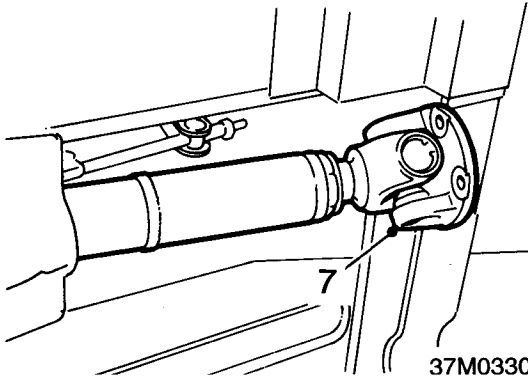
37M0327

4. Remove 5 bolts securing catalyst heat shield, remove shield.



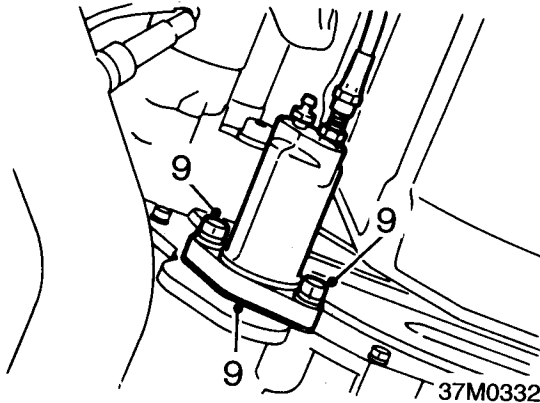
37M0329

5. Mark relationship of propeller shaft flanges to drive flanges.
6. Remove 4 nuts and bolts securing each propeller shaft flange.

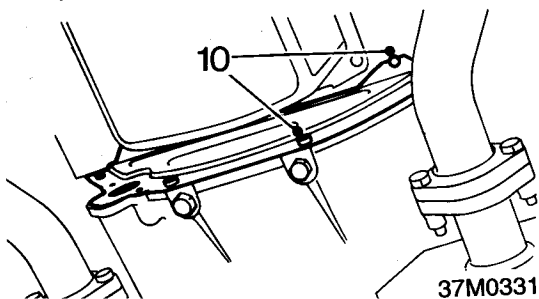


7. Release propeller shaft and guide rearwards for clearance.

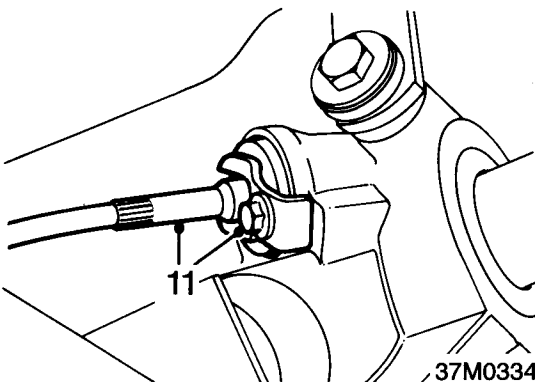
8. Remove starter motor, see **ELECTRICAL**.



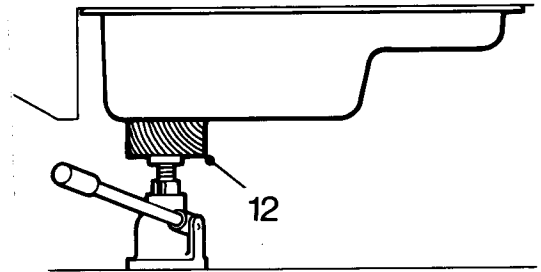
9. Remove 2 bolts, plain and spring washers, release clutch slave cylinder from gearbox and place aside; recover steel spacer shim.



10. Remove 6 bolts and spring washers; remove flywheel cover plate.



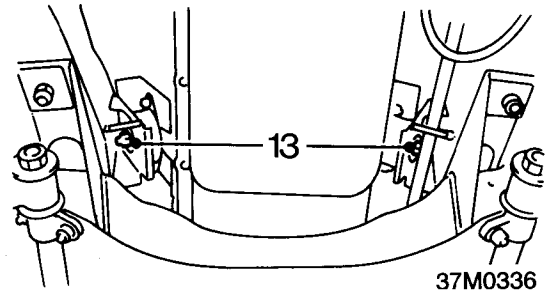
11. Slacken screw securing speedometer pinion clamp, remove clamp and release speedometer cable from pinion. Place speedometer cable aside.



37M0333

12. Support engine on jacking beam placed towards rear of sump.

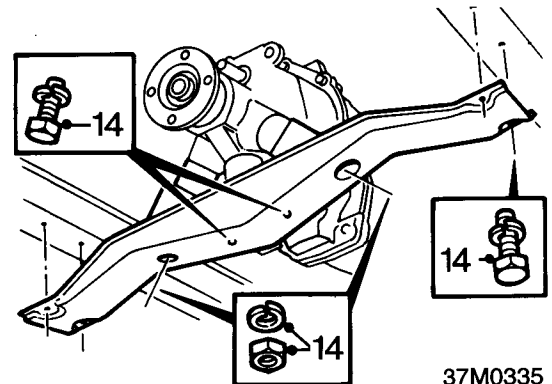
CAUTION: Use a block of wood or hard rubber pad to protect sump.



37M0336

13. Slacken 2 nuts securing engine mounting rubbers to body.

CAUTION: Do not remove nuts.



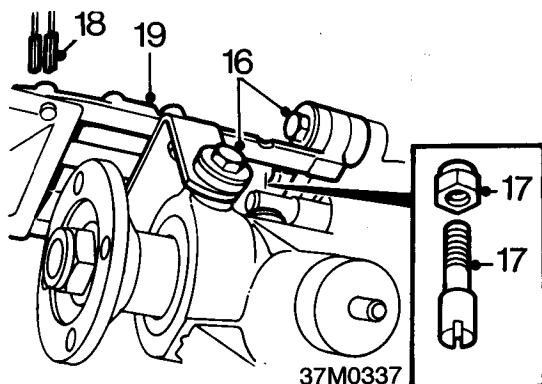
37M0335

14. Remove 4 bolts, 2 nuts and spring washers securing gearbox cross member.

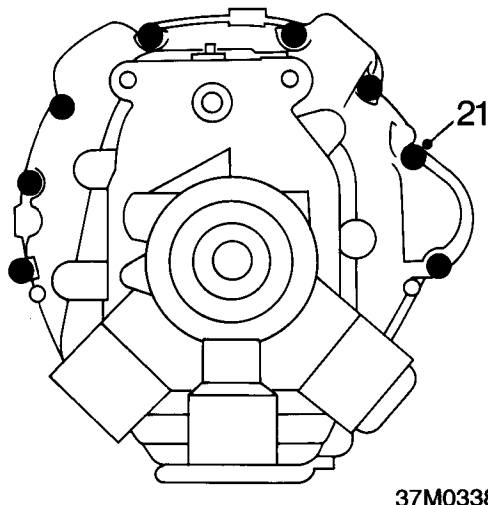
15. Lower engine on jacking beam to improve access to selector remote housing bolts.

CAUTION: Engine will foul bulkhead if lowered too far.

GEARBOX



16. Remove 4 bolts and plain washers securing selector remote housing to gearbox.
17. Remove nut securing pin to selector shaft and remove pin.
18. Disconnect 2 Lucars from reverse lamp switch.
19. Release selector remote housing from gearbox and place aside.
20. Support gearbox on hydraulic lift.

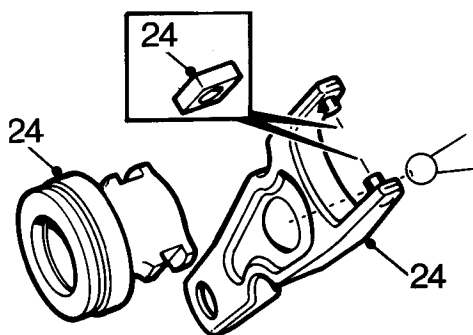


21. Remove 8 bolts securing clutch housing to cylinder block, noting fitted positions of bolts.

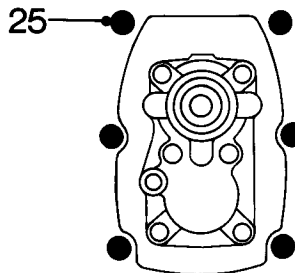
Note: Lower bolt on R.H. side will remain captive until gearbox is removed.

22. Using assistance, release gearbox from engine and rotate clockwise to allow starter motor location on clutch housing to clear bulkhead.
23. When input shaft is clear of clutch plate, lower gearbox and remove from hydraulic lift.

Do not carry out further dismantling if component is removed for access only



24. Remove clutch arm and bearing, collect slipper pads from release arm.



25. Transfer components to new gearbox as necessary.

Refit

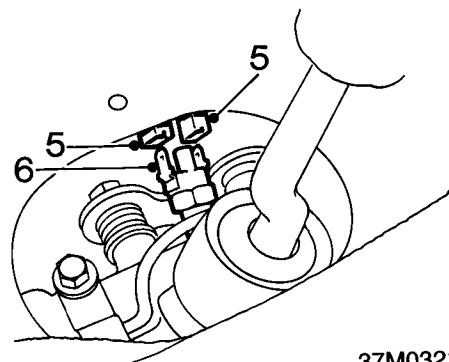
1. Clean mating faces of clutch housing and cylinder block.
2. Ensure locating dowels are fitted and dowel holes are clear.
3. Select gear to aid alignment of input shaft splines during refit.
4. Position gearbox to hydraulic lift.
5. Fit mounting bolt and spring washer to R.H. lower position in clutch housing.
6. Using assistance, raise gearbox into position and engage input shaft into clutch plate and spigot bush.

Note: Gearbox must be rotated during above procedure to allow clutch housing to clear bulkhead.

7. Locate clutch housing onto location dowels, fit bolts and tighten to correct torque.
8. Move selector shaft to neutral position.
9. Position selector remote housing and fit pin through remote linkage and selector shaft. Secure pin with self-locking nut and tighten to correct torque.
10. Fit selector remote housing to gearbox, fit bolts and plain washers; tighten bolts to correct torque.
11. Raise engine on jacking beam and position gearbox cross-member to body. Fit bolts and spring washers. Tighten bolts to correct torque.
12. Lower jacking beam and tighten engine mounting nuts to correct torque.



13. Locate speedometer cable in pinion, fit clamp and tighten nut.
14. Connect Lucars to reverse lamp switch.
15. Fit flywheel cover plate and, fit bolts and spring washers and tighten to correct torque.
16. Position clutch slave cylinder, ensuring steel spacer shim is positioned correctly and engage clutch pushrod in piston.
17. Fit bolts, plain and spring washers to clutch slave cylinder and tighten to correct torque.
18. Fit starter motor, see **ELECTRICAL**.
19. Position propeller shaft flanges, ensuring reference marks are aligned. Fit nuts and bolts with nuts towards universal joints. Tighten nuts to correct torque.
20. Check/top - up gearbox oil level, see **MAINTENANCE**.
21. Fit catalyst heat shield, fit and tighten bolts.
22. Fit exhaust intermediate and tailpipe assembly, see **MANIFOLD & EXHAUST**.
23. Lower ramp.
24. Connect battery earth lead.



37M0321

5. Disconnect 2 Lucars from reverse lamp switch.
6. Slacken locknut and remove reverse lamp switch from gearbox selector remote housing.
7. Remove locknut.

Refit

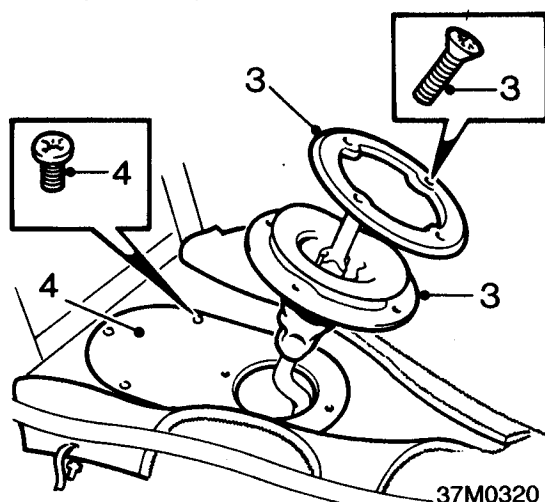
1. Fit locknut to reverse lamp switch.
2. Fit switch to gearbox selector remote housing.
3. Adjust switch, see **Adjustments**.
4. Connect Lucars to switch.
5. Fit aperture cover plate, fit and tighten screws.
6. Position gaiter, fit gaiter ring, fit and tighten screws.
7. Position carpet and secure with new clips. Trim off loose ends of clips.
8. Fit front console, see **BODY**.

REVERSE LAMP SWITCH

Service Repair No. 37.27.01

Remove

1. Remove front console, see **BODY**.
2. Cut 2 clips securing front halves of carpet and place carpet aside.



37M0320

3. Remove 4 screws securing gear lever gaiter ring, remove gaiter and ring.
4. Remove 3 screws securing aperture cover plate, remove plate.

PROPELLER SHAFT & REAR AXLE

CONTENTS

DESCRIPTION AND OPERATION

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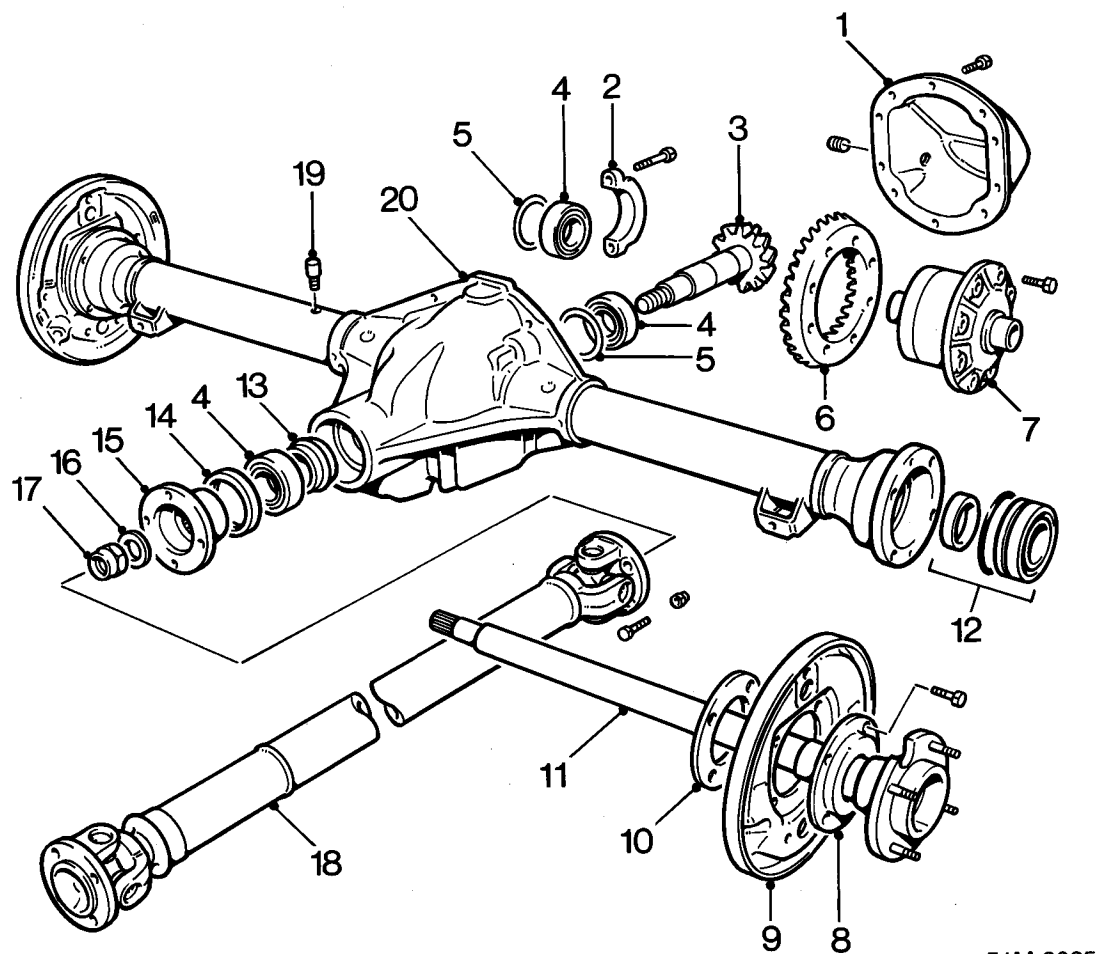
REPAIRS

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DIFFERENTIAL PINION OIL SEAL	4
DIFFERENTIAL COVER	6
REAR AXLE ASSEMBLY	6



PROPELLER SHAFT & REAR AXLE



51M 0025

PROPELLER SHAFT AND REAR AXLE COMPONENTS

- | | |
|--------------------------|--|
| 1. Rear cover | 12. Bearing, 'O' ring and bearing collar |
| 2. Carrier bearing cap | 13. Collapsible spacer |
| 3. Pinion | 14. Oil seal |
| 4. Bearing | 15. Pinion drive flange |
| 5. Shims | 16. Washer |
| 6. Crown wheel | 17. Pinion nut |
| 7. Differential assembly | 18. Propeller shaft |
| 8. Oil shield | 19. Breather |
| 9. Brake back plate | 20. Rear axle casing |
| 10. Bearing retainer | |
| 11. Half shaft | |



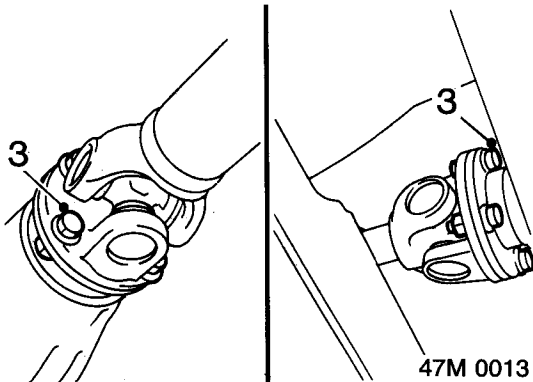
PROPELLER SHAFT

Service Repair No. 47.15.01

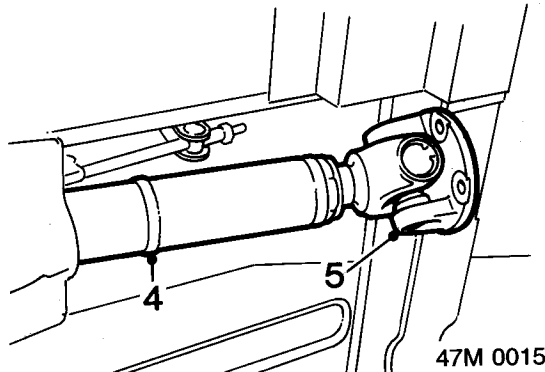
Remove

1. Raise vehicle on a ramp.
2. Remove exhaust system, see **MANIFOLD & EXHAUST**

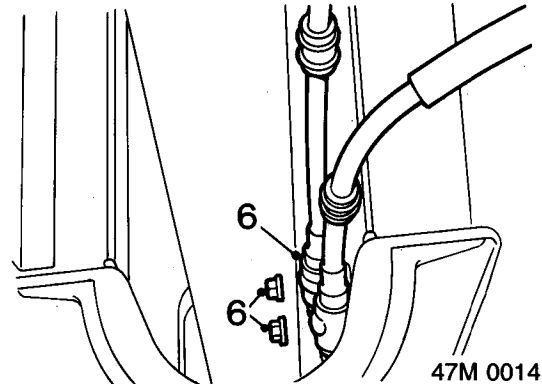
Note: If original propeller shaft is to be refitted, mark relationship between propeller shaft flanges and both gearbox and rear axle drive flanges.



3. Remove 8 nuts and bolts securing propeller shaft flanges.



4. Release propeller shaft and guide rearwards to clear body cross - member.
5. Guide front end of propeller shaft below body cross - member.



6. Remove 2 nuts securing handbrake cable abutment bracket to body and release bracket from studs to provide clearance for flange.
7. Guide propeller shaft forwards and out from tunnel closing panel.

Refit

1. Clean drive flanges and propeller shaft flanges.
2. Fit propeller shaft with sliding joint to front and manoeuvre into position.
3. Position handbrake cable abutment bracket to studs, fit and tighten nuts to correct torque.
4. Position propshaft flanges, fit nuts and bolts, with nuts towards universal joints, tighten nuts to correct torque.

Note: Flanges must be aligned with previously made marks if original propeller shaft is fitted.

5. Fit exhaust system, see **MANIFOLD & EXHAUST**
6. Lower ramp.

PROPELLER SHAFT & REAR AXLE

HALF SHAFT BEARING

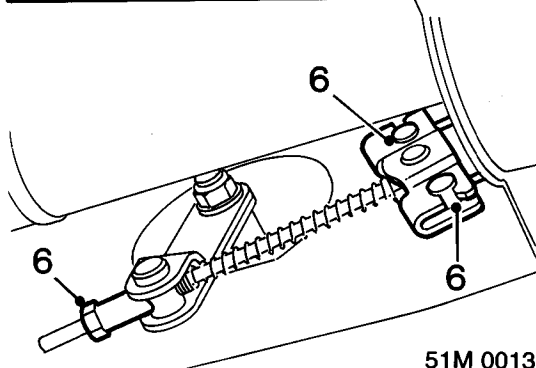
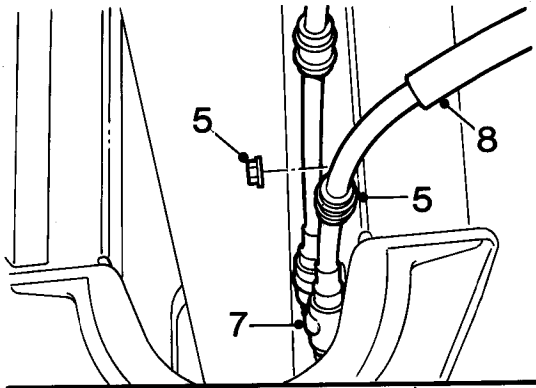
Service Repair No. 51.10.28

Remove

1. Raise rear of vehicle.

WARNING: Support on safety stands.

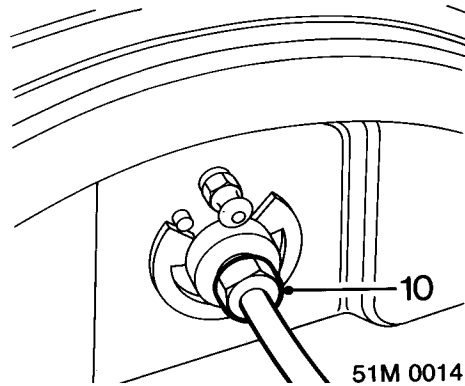
2. Remove road wheel(s).
3. Release handbrake.
4. Remove brake drum, see
MAINTENANCE – Rear Brakes.



51M 0013

5. Remove nut and release handbrake cable clip from transmission tunnel stud.
6. Slacken handbrake cable adjuster nut and release cable from compensator.
7. Release cable from abutment bracket.
8. Pull L.H handbrake cable through retaining loop.
9. Position cloth beneath brake pipe union to absorb spilled fluid.

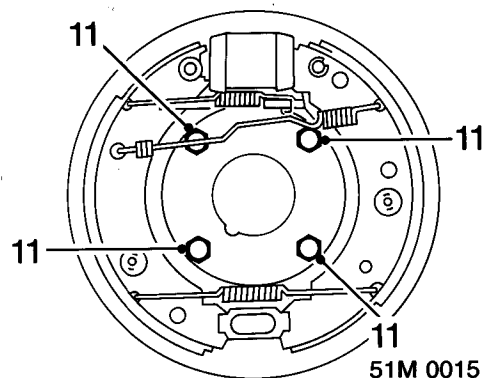
CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.



51M 0014

10. Unscrew and release brake pipe union from wheel cylinder.

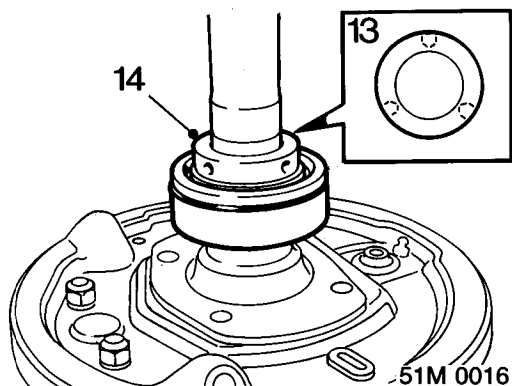
CAUTION: Plug the connections.



51M 0015

11. Remove 4 bolts securing brake back plate to axle.

Note: Rotate hub during above for access to bolts.

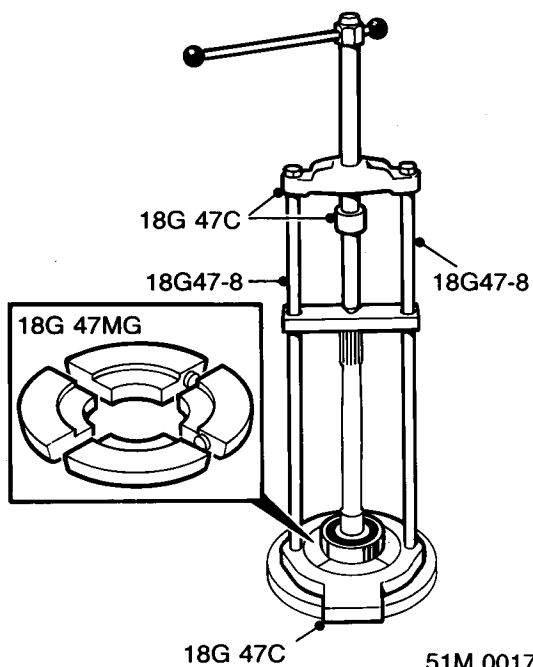


12. Remove hub and shaft assembly.
13. Drill 3 holes, 6mm diameter, into bearing collar as shown.

CAUTION: Do not drill into half shaft.

14. Support shaft and remove collar by splitting with a cold chisel.

WARNING: Wear safety goggles.



15. Withdraw bearing from half shaft using **18G47C**, **18G47-8** with adapter **18G47-MG**.

Refit.

1. Clean shaft, bearing and bearing collar.
2. Clean threadlock from brake back plate retaining bolts.

CAUTION: Bearing is pre-packed with grease, do not immerse in solvent.

3. Lubricate new 'O' ring with clean oil and fit to bearing.
4. Ensure oil shield, brake back plate and bearing retainer are fitted to half shaft.
5. Fit bearing to half shaft with larger inner race shoulder towards drive flange.
6. Press bearing onto shaft, using a hand press and piece of tube locating on inner

race of bearing, until it butts against drive flange shoulder.

7. Press bearing collar onto shaft, using same method as previously described for bearing, until it butts against bearing.
8. Fit half shaft assembly, align bearing retainer plate, back plate and oil shield with axle casing.
9. Apply Loctite 242 to first three threads of bolts.
10. Fit brake back plate bolts and tighten to correct torque.
11. *L.H. bearing:* Feed handbrake cable through retaining bracket.
12. Position cable to abutment bracket and connect cable to compensator
13. Fit cable clip to stud, fit and tighten nut.
14. Remove plugs from brake pipe and wheel cylinder.
15. Clean brake pipe union.
16. Connect brake pipe union to wheel cylinder and tighten to correct torque.
17. Fit brake drum, see **MAINTENANCE - Rear Brakes**.
18. Bleed brake system, see **BRAKES - Adjustments**.
19. Fit road wheel and tighten nuts to correct torque.
20. Adjust handbrake, see **MAINTENANCE**.
21. Remove stand(s) and lower vehicle.
22. Check axle oil and top-up if necessary, see **MAINTENANCE**.

PROPELLER SHAFT & REAR AXLE

DIFFERENTIAL PINION OIL SEAL

Service Repair No. 51.20.01

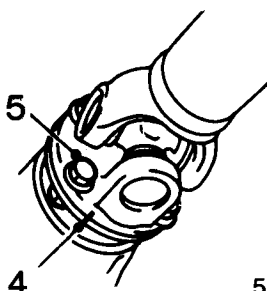
Remove

1. Raise rear of vehicle.

WARNING: Support on safety stands.

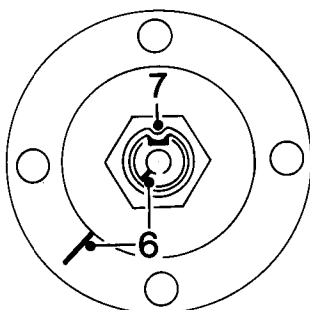
2. Drain axle oil, see **MAINTENANCE**.
3. Remove both brake drums, see **MAINTENANCE – Rear Brakes**.

Note: Removal of the brake drums is necessary to ensure that torque tests carried out on the differential are not influenced by the brake system.



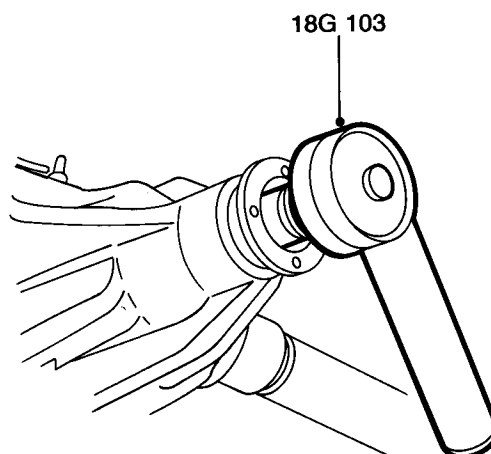
51M 0018

4. Mark relationship of propeller shaft and differential flange.
5. Remove 4 bolts, release propeller shaft from differential and place shaft aside.



51M 0019

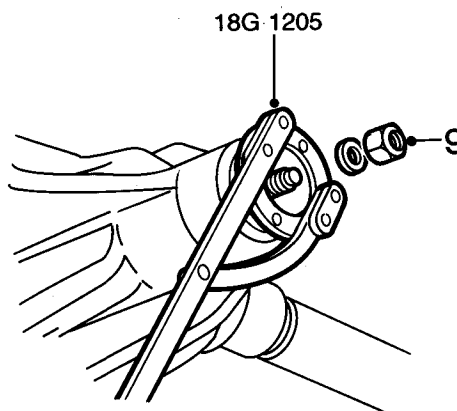
6. Scribe line across differential drive flange and end of pinion shaft to identify its original position.
7. Release staking on pinion nut.



51M 0020

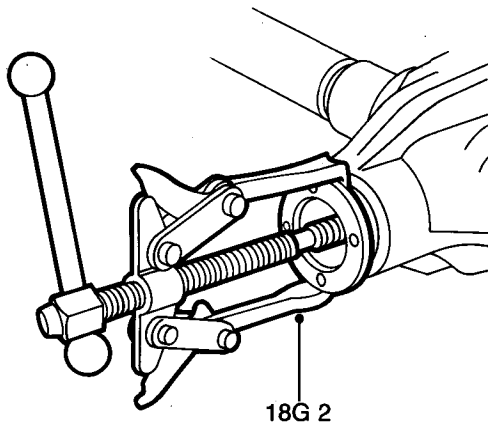
8. Using **18G103**, check and record torque required to turn differential pinion.

Note: Record torque required to keep pinion turning, not torque required to start it turning.



51M 0021

9. Using **18G1205** to restrain pinion, remove and discard drive flange nut. Remove flat washer.

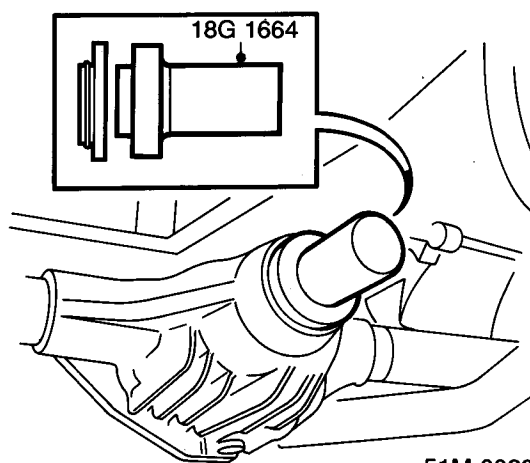


51M 0022

10. Remove drive flange from pinion using **18G2**.
11. Lever seal from differential casing, taking care not to damage recess.
12. Discard oil seal.

Refit

1. Clean seal location in carrier.
2. Lubricate oil seal using clean axle oil, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.



51M 0023

3. Drift seal in squarely, sealing lip inwards, into axle casing, using **18G 1664**.
4. Clean drive flange and check condition of seal running surface, ensure completely free from damage. If damaged, replace drive flange. If existing flange is used, fit so that scribe marks previously made are aligned.
5. Fit drive flange, plain washer and new nut.
6. Restrain flange using **18G1205** and tighten nut gradually until resistance is felt.
7. Rotate pinion to settle bearings and using **18G103**, check torque required to turn flange.

Torque required to turn pinion = Original torque reading + 3 lbf/in.

8. If necessary continue to tighten pinion nut, in **very** small increments, rotating flange at regular intervals to settle bearings and using **18G103** to check pinion torque each time, until torque reading is achieved.

CAUTION: Preload build up is very rapid. If torque reading required to turn flange exceeds original reading plus 3 lbf/in. a new collapsible spacer must be fitted. There is no torque tightness figure for pinion nut.

9. Stake nut into pinion shaft recess using suitable punch.
10. Position propeller shaft to drive flange, align marks, fit bolts with nuts towards universal joint, and tighten to correct torque.
11. Fit brake drums, see **MAINTENANCE**
12. Fit road wheels and tighten nuts to correct torque.
13. Remove stand(s) and lower vehicle.
14. Refill axle oil, see **MAINTENANCE**.

PROPELLER SHAFT & REAR AXLE

DIFFERENTIAL COVER

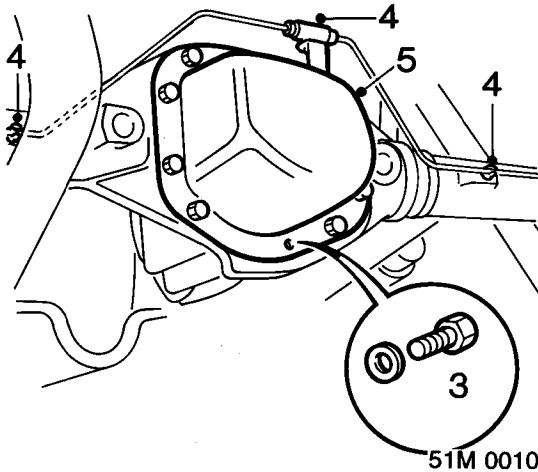
Service Repair No. 51.20.09

Remove

1. Raise rear of vehicle.

WARNING: Support on safety stands.

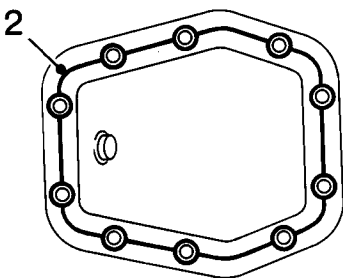
2. Drain axle oil, see **MAINTENANCE**.



3. Remove 10 bolts securing differential cover.
4. Release brake pipes from 2 clips and move brake pipe bracket aside.
5. Remove cover.

Refit

1. Clean all traces of oil and old sealant from cover and mating face on differential casing.



2. Apply a 3mm bead of RTV silicone sealant to cover as shown.
3. Position cover, align brake pipe bracket, fit bolts and tighten progressively in a diagonal sequence to correct torque.
4. Secure brake pipes to clips.
5. Remove stands and lower vehicle.
6. Refill axle oil, see **MAINTENANCE**.

REAR AXLE ASSEMBLY

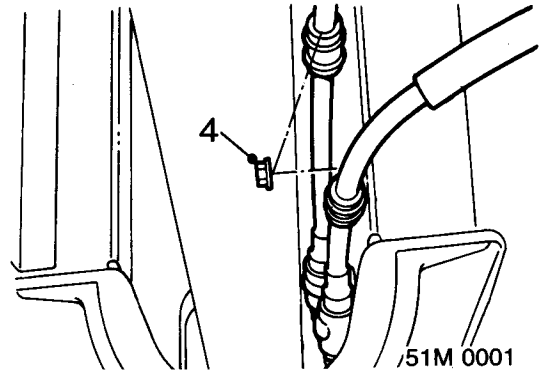
Service Repair No. 51.25.01

Remove

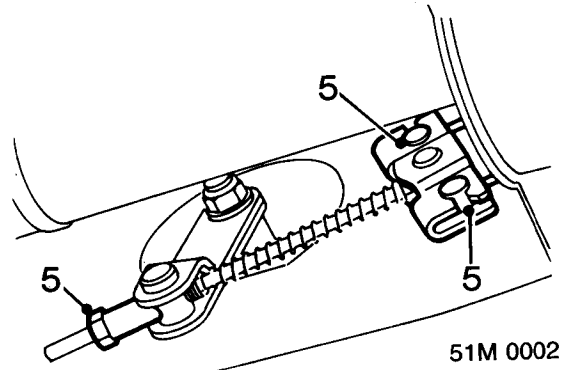
1. Raise rear of vehicle.

WARNING: Support on safety stands.

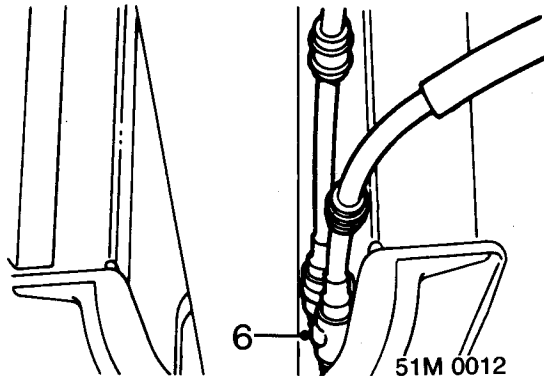
2. Remove road wheel(s).
3. Release handbrake.



4. Remove 2 nuts and release handbrake cable clips from transmission tunnel studs.

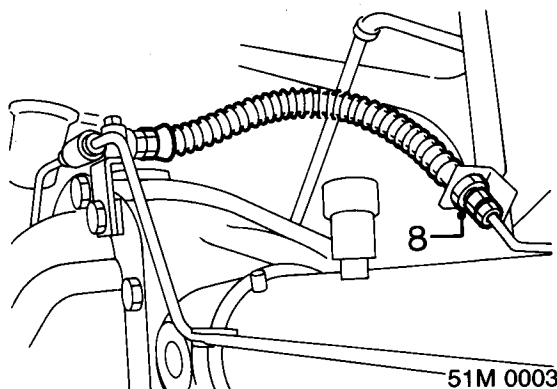


5. Slacken handbrake cable adjusting nut and release cables from compensator.



6. Release cables from abutment bracket and pull L.H. cable through retaining loop.
7. Position cloth beneath brake pipe union to absorb spilled fluid.

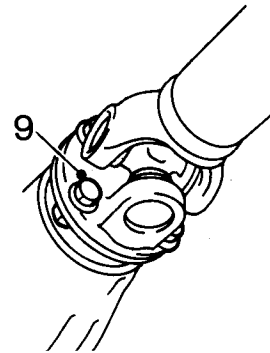
CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.



8. Disconnect brake pipe union from flexible hose, remove nut and locking washer securing hose and release hose from battery box.

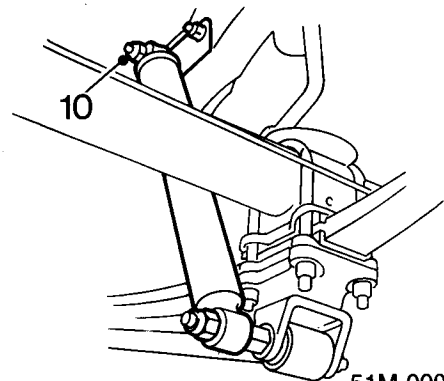
CAUTION: Plug the connections.

Note: If original axle assembly is to be refitted, mark differential and propeller shaft flange relationship.



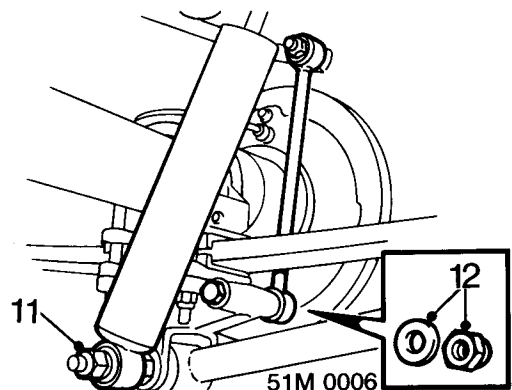
51M 0004

9. Remove 4 bolts securing propeller shaft to differential flange and disconnect shaft.



51M 0005

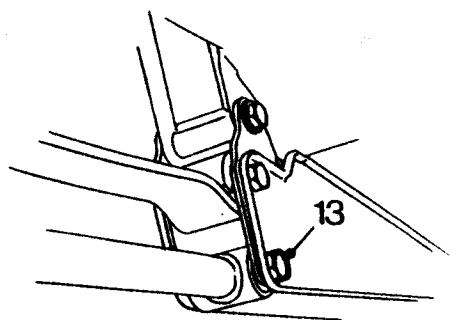
10. Slacken 2 damper upper mounting nuts.



51M 0006

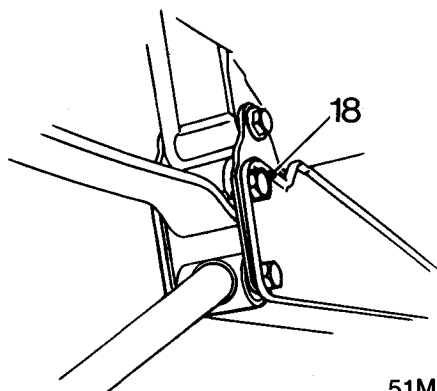
11. Remove 2 damper lower mounting nuts, release from lower mountings and collect 4 flat washers.
12. Remove 2 bolts securing anti-roll bar links to spring plates and raise anti-roll bar clear of axle.

PROPELLER SHAFT & REAR AXLE



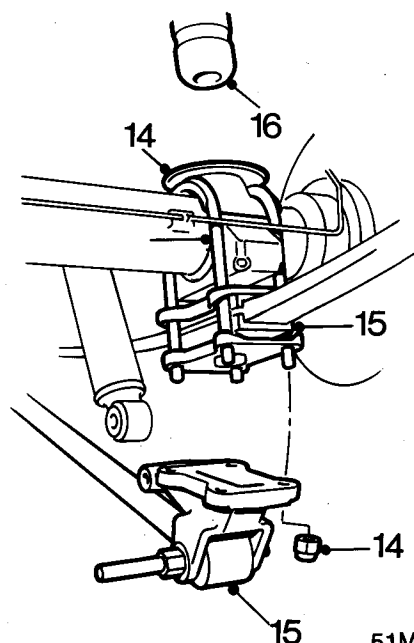
51M 0007A

13. Slacken bolts securing torque control arms to body.



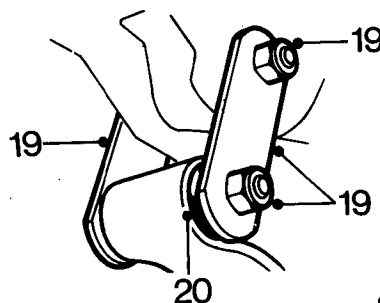
51M 0011

18. Slacken bolt securing R.H. leaf spring to spring hanger bracket.



51M 0008

14. Remove 8 nuts securing axle 'U' bolts, remove 'U' bolts together with bump stop plates.
15. Lower both torque control arms and remove lower saddle plates and rubbers.
16. Unscrew and remove 2 bump stops from body to give clearance for axle.
17. Support axle on jack.



51M 0009

19. Remove 2 nuts from R.H. leaf spring shackle, remove shackle plates
20. Lower rear end of leaf spring and collect 4 shackle rubbers.
21. With assistance, manoeuvre axle over L.H. spring and remove from R.H. side of vehicle.

Refit

1. Transfer components to new axle as necessary.
2. With assistance, manoeuvre axle into position and support on jack.
3. Fit upper saddle plates and rubbers to leaf springs.
4. Fit spring shackle rubbers, raise R.H. spring into position and fit shackle plates.
5. Lightly tighten shackle nuts.
6. Remove jack supporting axle.
7. Fit bump stop rubbers.
8. Fit lower saddle plates and rubbers, then fit 'U' bolts and bump stop plates.
9. Raise torque control arms and align spring plates to 'U' bolts. Fit nuts to 'U' bolts and lightly tighten nuts progressively in a diagonal sequence.

CAUTION: Lower spring plate must be level.

10. Align anti-roll bar links to spring plates, fit nuts and bolts and lightly tighten.



11. Fit washers and connect dampers to lower mounting points. Fit plain washers and nuts and lightly tighten nuts.
12. Align propeller shaft to drive flange, fit nuts and bolts, with nuts toward universal joint, and tighten to correct torque.
13. Remove plugs from brake hose and pipe.
14. Clean hose and pipe unions.
15. Position brake hose to battery box bracket, fit and tighten nut.
16. Connect brake pipe union to hose and tighten to correct torque.
17. Feed L.H. handbrake cable through retaining bracket and position both cables to abutment bracket.
18. Connect cables to compensator, fit cable clips to studs, fit and tighten nuts.
19. Bleed brake system, see **BRAKES**.
20. Fit road wheels and tighten nuts to correct torque.
21. Remove stand(s) and lower vehicle.
22. Tighten R.H. leaf spring front hanger bracket bolt and shackle plate nuts to correct torque. Tighten 'U' bolt nuts to correct torque.

CAUTION: *Lower spring plate must be level*

23. Tighten torque control arm bolts to correct torque.
24. Tighten anti-roll bar link nuts to correct torque.
25. Adjust handbrake, see **MAINTENANCE**.
26. Fill or check and top-up axle oil as required, see **MAINTENANCE**.

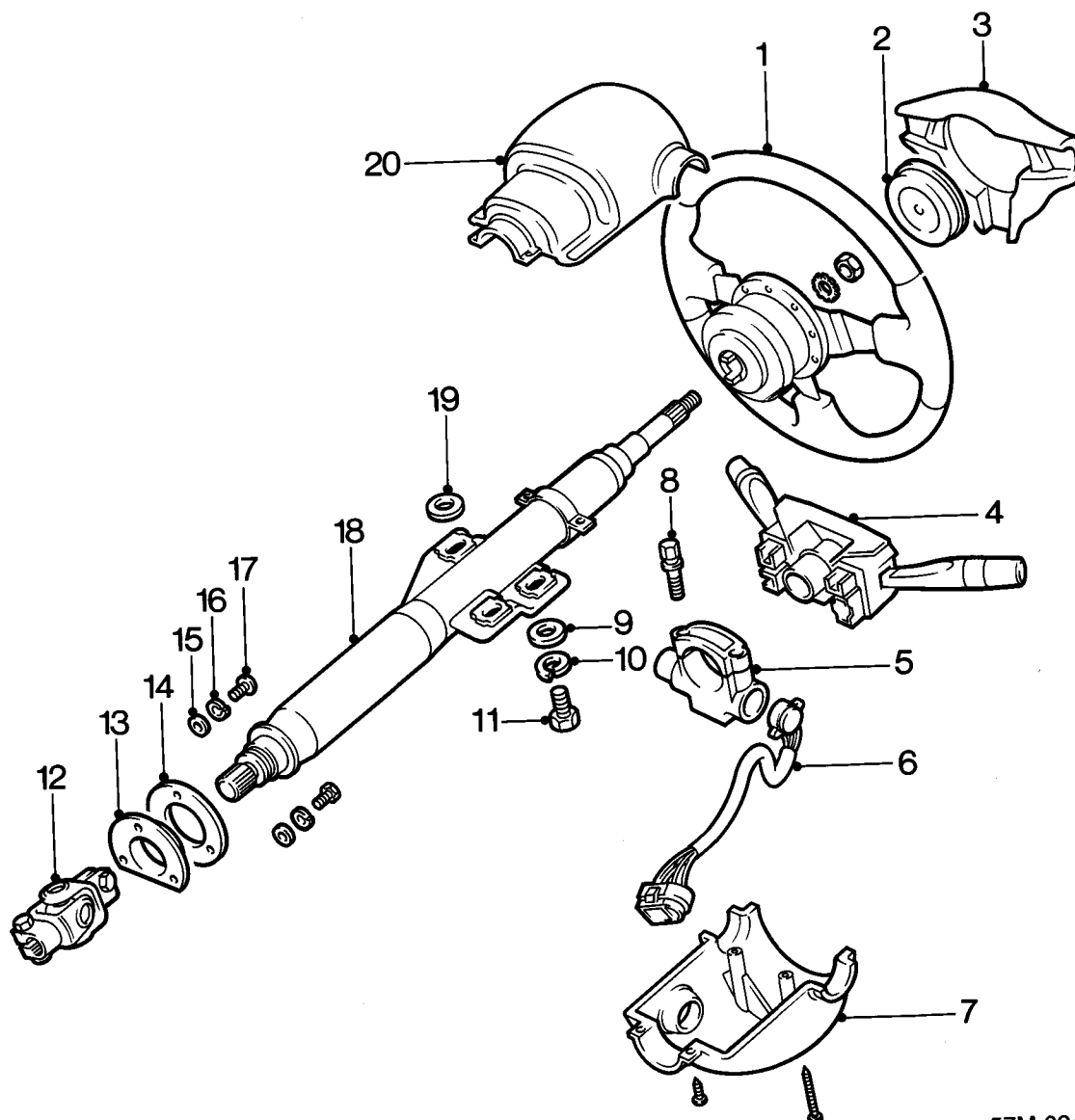
STEERING

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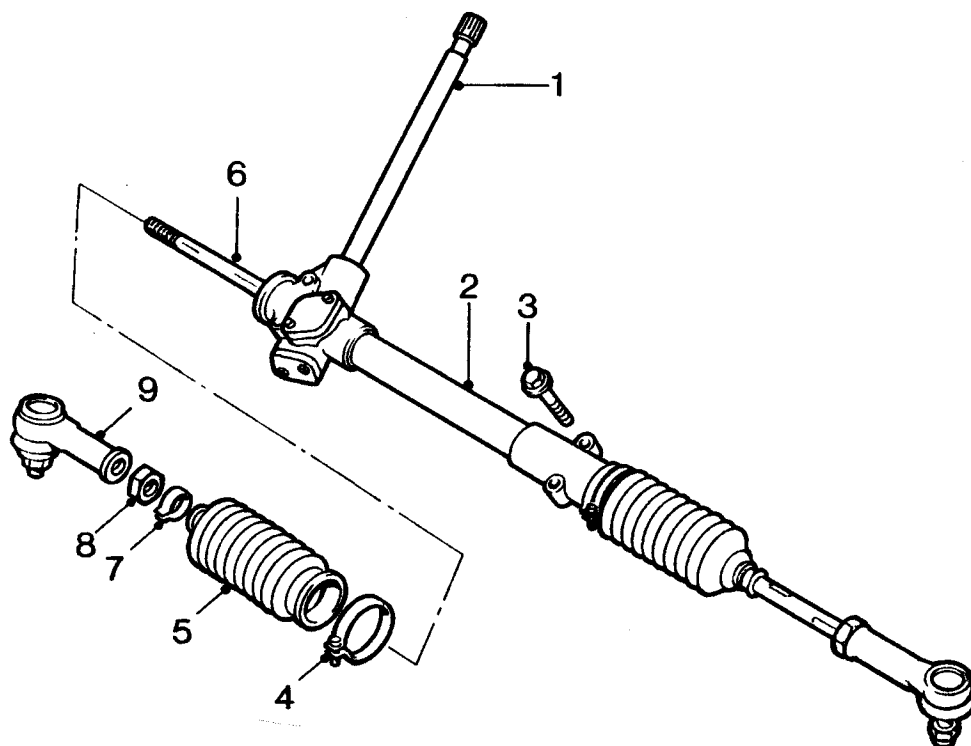
STEERING



57M 0245A

STEERING COLUMN COMPONENTS

- | | |
|---|---|
| 1. Steering wheel | 12. Universal joint |
| 2. Horn button | 13. Seal |
| 3. Centre pad | 14. Clamp - steering column to bulkhead |
| 4. Column switch | 15. Plain washer |
| 5. Steering column lock | 16. Spring washer |
| 6. Column lock to ignition switch harness | 17. Bolt - steering column to bulkhead |
| 7. Nacelle - lower | 18. Steering column |
| 8. Shear bolt | 19. Packing washer |
| 9. Plain washer | 20. Nacelle - upper |
| 10. Spring washer | |
| 11. Bolt - steering column to fascia rail | |



57M 0246 A

STEERING RACK COMPONENTS

- | | |
|-------------------------------------|-------------------------------|
| 1. Pinion | 6. Track rod |
| 2. Steering rack | 7. Clip - gaiter to track rod |
| 3. Bolt - steering rack to mounting | 8. Locknut - track rod end |
| 4. Clip - gaiter to steering rack | 9. Track rod end |
| 5. Gaiter | |



FRONT WHEEL ALIGNMENT

Service Repair No. 57.65.01

Check

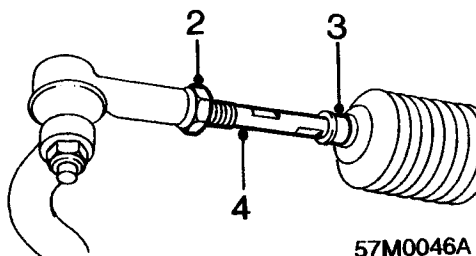
1. Ensure tyre pressures are correct, vehicle is at kerbside weight and on a level surface.
2. Release handbrake.
3. Roll vehicle backwards and forwards to relieve stresses in steering and front suspension.
4. Ensure that equipment is properly calibrated and take average of three readings.

Note: Use only equipment recommended in the S.T.E.P. (Service Tools and Equipment Programme) Manual.

5. Check that front wheel alignment is within tolerance:
Front wheel alignment = toe - in $0^{\circ} 05' \pm 0^{\circ} 20'$

Adjust

1. Mark position of track rod for reference.



2. Restrain track rod end and slacken track rod lock nut.
3. Release clip securing gaiter to track rod.
4. Rotate track rod to obtain correct alignment.

CAUTION: Both track rods must be rotated an equal amount.

5. Roll vehicle backwards and forwards to relieve stresses in steering and front suspension.
6. Recheck front wheel alignment taking average of three readings.
7. Restrain track rod end and tighten track rod lock nut to correct torque.
8. Roll vehicle backwards and forwards to relieve stresses in steering and front suspension.
9. Repeat check procedure.
10. Repeat adjustment procedure if necessary.
11. Ensure gaiters are not strained or twisted, then tighten clip securing gaiter to track rod.

STEERING

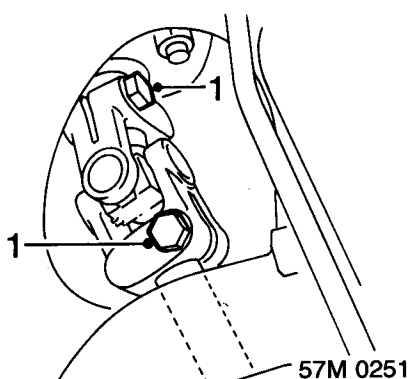
STEERING COLUMN AND PINION ALIGNMENT

Service Repair No. 57.35.04

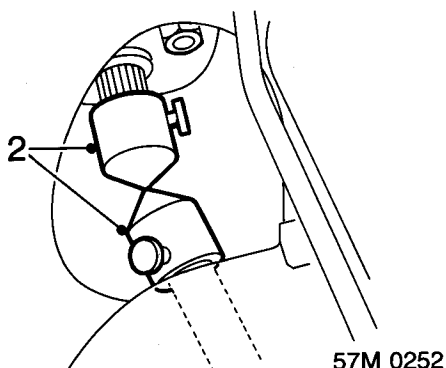
Check

CAUTION: If a new steering column or rack is being fitted, it will be necessary to remove universal joint prior to positioning column or rack in vehicle.

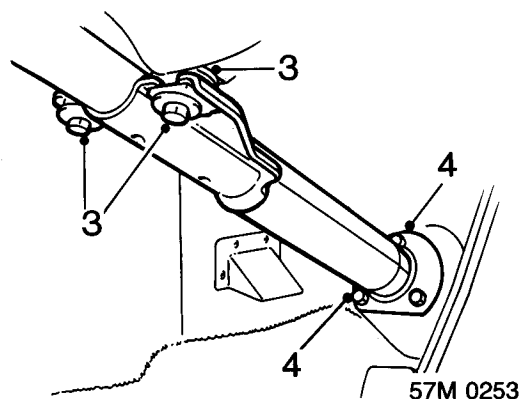
Note: If a new steering column has been fitted carry out following.



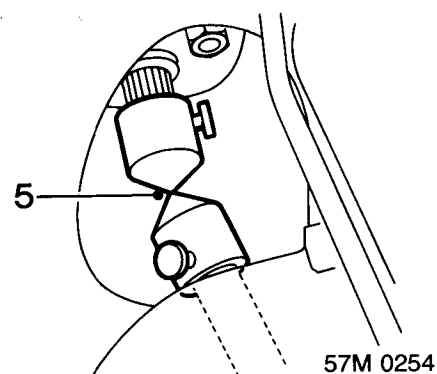
1. Remove bolt securing universal joint, remove joint from steering rack or column.



2. Fit **18G1668** to splines of steering column and rack.



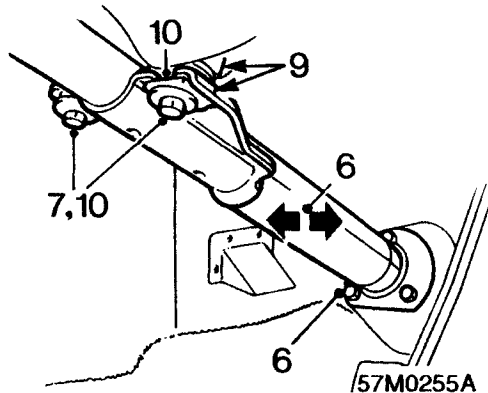
3. Fit original packing washer to each of the 2 top bolts securing column to fascia rail, tighten bolts sufficiently to just pinch washers.
4. Centralise steering column in bulkhead aperture, tighten bolts sufficiently to retain column in this position.



5. Check alignment of **18G1668**. Correct alignment is when points of tool meet. If misalignment exceeds 1.5 mm proceed as follows:

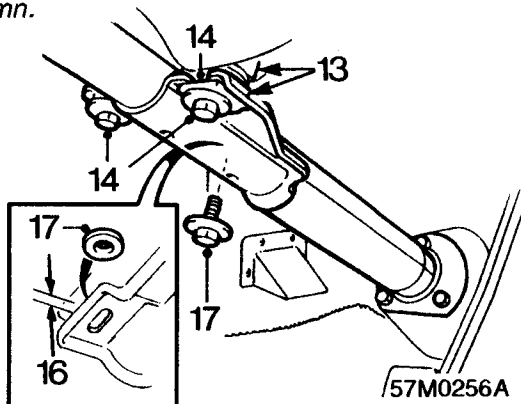


Horizontal alignment



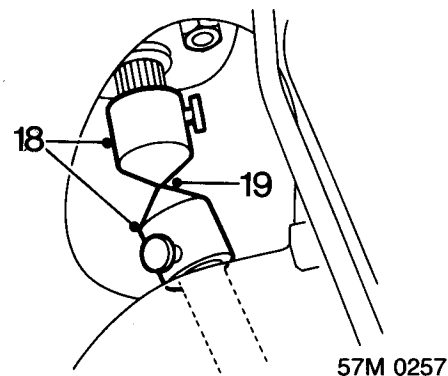
6. Move end of steering column until horizontal alignment is correct, tighten steering column to bulkhead bolts to correct torque.
7. Tighten the 2 top bolts to correct torque.
8. Recheck alignment.
9. Make suitable alignment marks between steering column brackets and fascia rail.
10. Remove bolts securing column to fascia rail and bulkhead.
11. Withdraw column sufficiently to enable **18G1688** to be removed.
12. Remove **18G1688** and fit universal joint.

CAUTION: Ensure bolt holes in universal joint are aligned with grooves in pinion and steering column.

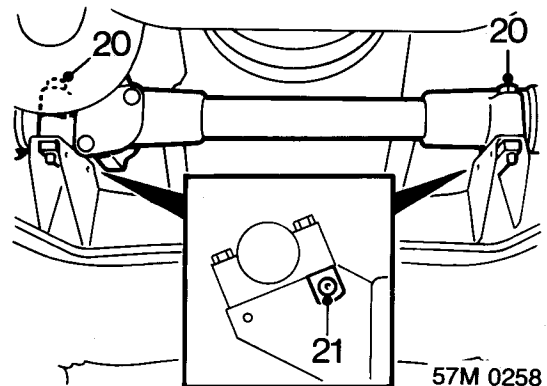


13. Position steering column, ensuring alignment marks previously made are aligned.
14. Fit top bolts and bulkhead bolts, tighten bolts to correct torque.
15. Tighten universal joint bolts to correct torque.
16. Measure distance between steering column bracket and fascia rail at the lower bolt position.
17. Select a packing washer that equals this dimension, fit washer selected, fit bolt and tighten to correct torque.

Vertical alignment



18. Fit **18G1688** to splines of steering column and rack.
19. Check alignment of **18G1688**. Correct alignment is when points of tool meet. If misalignment exceeds 1.5 mm proceed as follows:



20. Slacken, but do not remove 4 bolts securing steering rack to sub - frame.
21. Drill out pop rivets and remove existing shims.
22. Add or subtract shims as necessary until alignment is correct.

CAUTION: A maximum of five 0.5 mm shims may be fitted to each bracket.

23. Tighten steering rack bolts to correct torque and recheck alignment.
24. If misalignment still exists repeat shimming operation.
25. When correct alignment has been achieved, rivet shims to steering rack mounting brackets.

CAUTION: If correct alignment cannot be achieved with maximum number of shims fitted, fit an additional packing washer to each of the three steering column to fascia rail bolts and re - check steering column horizontal alignment.

26. Remove **18G1688** and fit universal joint.

CAUTION: Ensure bolt holes in universal joint are aligned with grooves in pinion and steering column.

27. Tighten steering rack and universal joint bolts to correct torque.

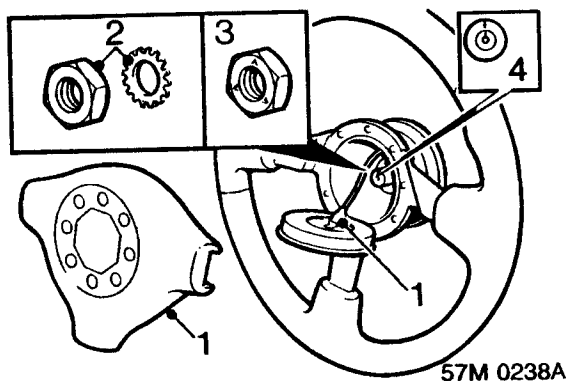


STEERING WHEEL

Service Repair No. 57.60.01

Remove

CAUTION: The steering column is the safety type and incorporates shear pins. Do not impart shock loads to the column during removing, refitting or at any other time.



1. Carefully prise centre pad and horn button from steering wheel, disconnect lead.

Early cars

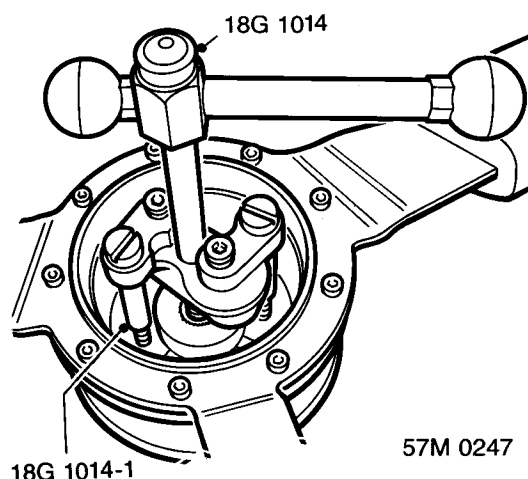
2. Restrain steering wheel, remove nut and lockwasher securing wheel.

Later cars

3. Restrain steering wheel, remove and discard self - locking nut securing wheel.

CAUTION: Do not use steering column lock to prevent steering column from rotating as nut is slackened.

4. Make suitable alignment marks between steering wheel and inner column.



5. Remove steering wheel using tools 18G1014 and 18G1014 - 1 .

Note: On some early cars the steering wheel will not have tapped holes to except 18G1014 - 1 . In this case use a 2 legged puller.

CAUTION: The steering column is the safety type and incorporates shear pins. Do not impart shock

loads to the column during removing, refitting or at any other time.

Refit

1. Position steering wheel to inner column ensuring reference marks are aligned.

Note: If steering wheel or steering column have been replaced, ensure front road wheels are in 'straight ahead' position.

2. Fit nut, restrain steering wheel and tighten nut to correct torque.

CAUTION: Do not use steering column lock to prevent steering column from rotating as nut is tightened.

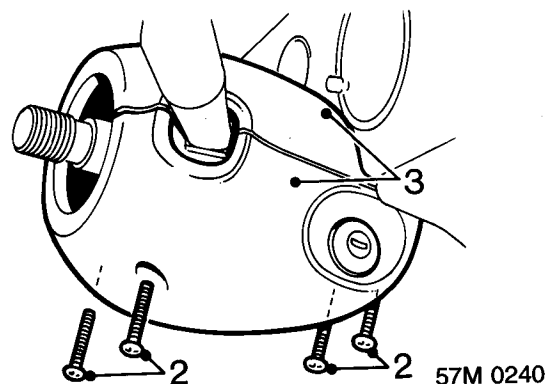
3. Connect lead to horn button, fit horn button and centre pad.

STEERING COLUMN NACELLE

Service Repair No. 57.40.29

Remove

1. Remove steering wheel.



2. Remove 4 screws securing both halves of nacelle.
3. Carefully separate both halves of nacelle; manoeuvre them clear of steering column.

Refit

1. Position nacelle halves to steering column, fit and tighten screws.
2. Fit steering wheel.

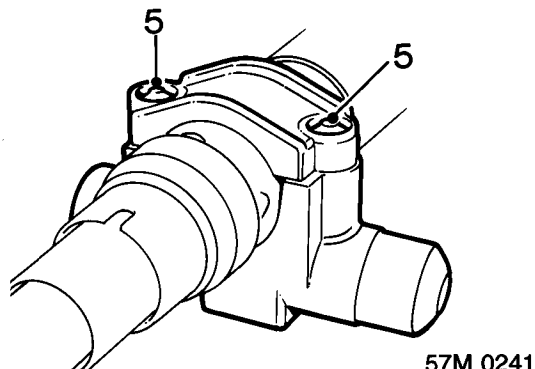
STEERING

STEERING COLUMN LOCK

Service Repair No. 57.40.31

Remove

1. Disconnect battery earth lead.
2. Remove steering column.
3. Secure steering column in a vice.
4. Release straps securing wiring harness.



5. Drill out shear bolts securing steering column lock, remove lock.

Refit

1. Position steering column lock to column.
2. Fit shear bolts but do not tighten sufficiently to shear the bolt heads at this stage.
3. Insert ignition key in lock and turn key to release column lock.
4. Remove key and rotate steering inner column until lock engages in column.
5. Insert ignition key in lock and turn to release column lock; check inner column rotates freely.
6. Tighten shear bolts until heads shear off.
7. Secure wiring harness to steering column.
8. Fit steering column.
9. Connect battery earth lead.

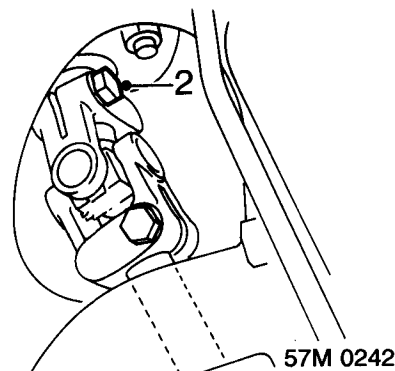
STEERING COLUMN

Service Repair No. 57.40.01

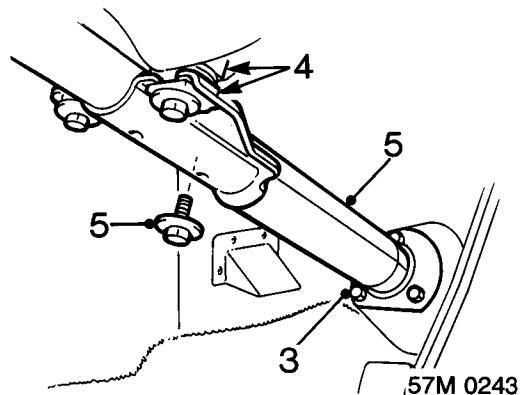
Remove

CAUTION: The steering column is of the safety type and incorporates shear pins. Do not impart shock loads to the column during removing, refitting or at any other time.

1. Remove steering column nacelle.

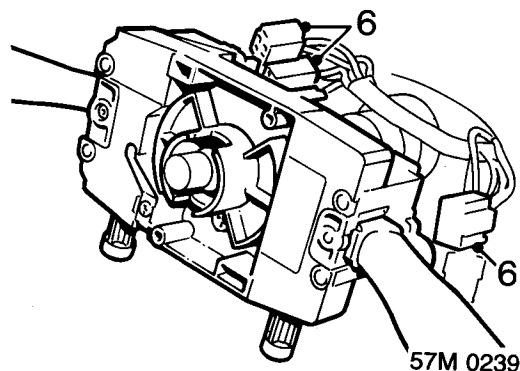


2. Remove bolt securing steering column universal joint to column.

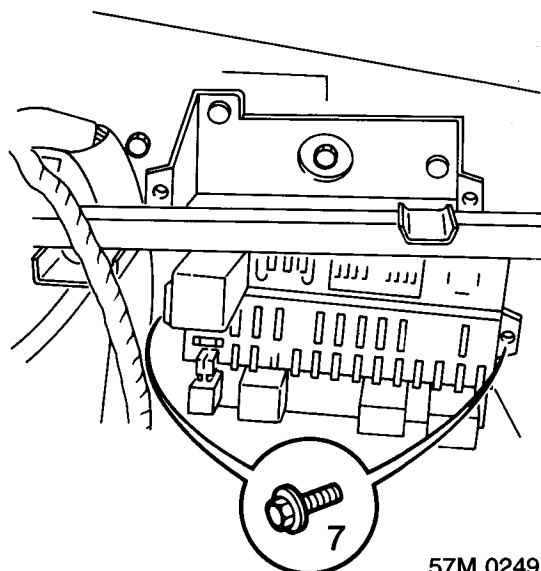


3. Remove 3 bolts securing column to bulkhead.
4. Make suitable alignment marks between steering column brackets and fascia rail.
5. Remove 3 bolts securing steering column to fascia rail, recover packing washer(s).

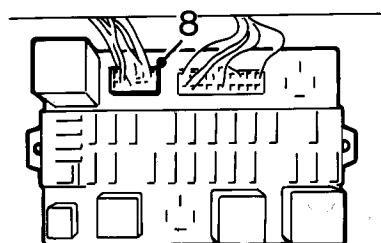
Note: Retain packing washer(s).



6. Disconnect multiplugs from steering column switch.

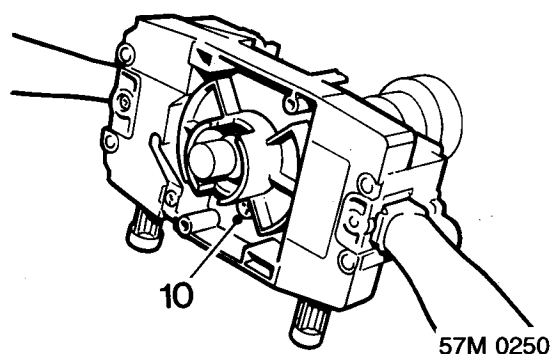


7. Remove 2 bolts securing fuse box to fascia rail. Lower the fusebox.



8. Disconnect multiplug from ignition module.
9. Remove steering column.

Do not carry out further dismantling if component is removed for access only



10. Remove screw securing switch to steering column, remove switch.

Refit

1. Position switch to steering column, fit and tighten screw.
2. Set road wheels to straight ahead position.
3. Position steering column ensuring inner column is located in universal joint and reference marks on bracket and fascia rail are aligned.

4. Fit 3 bolts and packing washers – if originally fitted.

CAUTION: Do not tighten bolts at this stage.

5. If a new steering column has been fitted, carry out alignment check, see – **Adjustments.**
6. Position steering column centrally in bulkhead aperture, fit but do not tighten bolts.
7. Ensure groove in inner column aligns with bolt hole in universal joint.
8. Fit universal joint bolt and tighten to correct torque.
9. Tighten steering column to fascia rail bolts to correct torque.
10. Connect multiplug to ignition module.
11. Connect multiplugs to steering column switch.
12. Raise fuse box to fascia rail, fit and tighten bolts.
13. Fit steering column nacelle.

STEERING

STEERING RACK GAITER

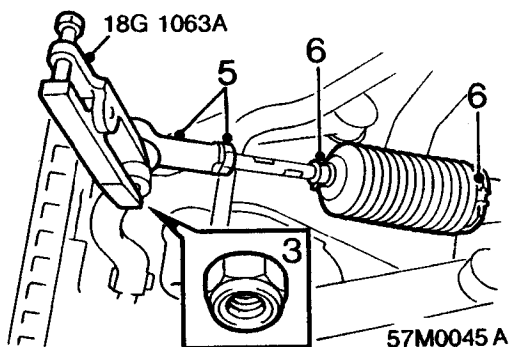
Service Repair No. 57.25.03

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Remove road wheel(s).



3. Remove nut from track rod end ball joint.
4. Break taper joint using tool **18G 1063A**.
5. Restrain joint and slacken track rod end locknut, remove track rod end and locknut.
6. Slacken screws securing steering rack gaiter clips; remove gaiter.

Refit

1. Fit clips to steering rack gaiter, position gaiter to steering rack and track rod.
2. Tighten clip retaining screws.
3. Fit track rod end locknut, fit track rod end.

Note: Do not tighten locknut at this stage.

4. Connect track rod end ball joint to steering arm, fit and tighten nut to correct torque.
5. Tighten track rod end locknut.
6. Fit road wheel(s) and tighten nuts to correct torque.
7. Remove stand(s) and lower vehicle.
8. Check/adjust front wheel alignment, see - **Adjustments**.

STEERING RACK

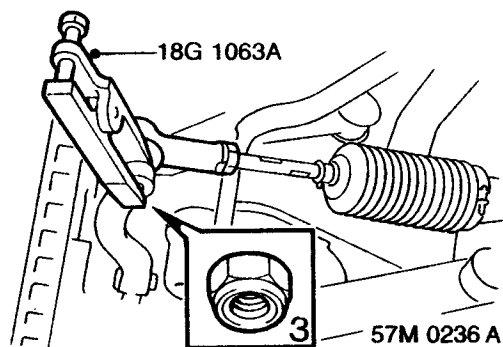
Service Repair No. 57.25.01

Remove

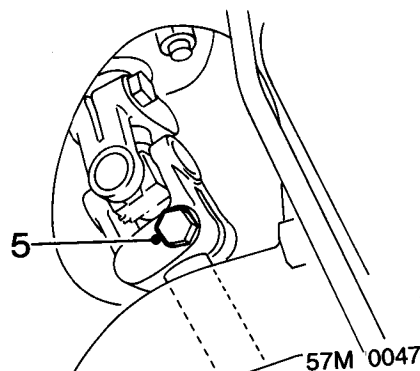
1. Raise front of vehicle.

WARNING: Support on safety stands.

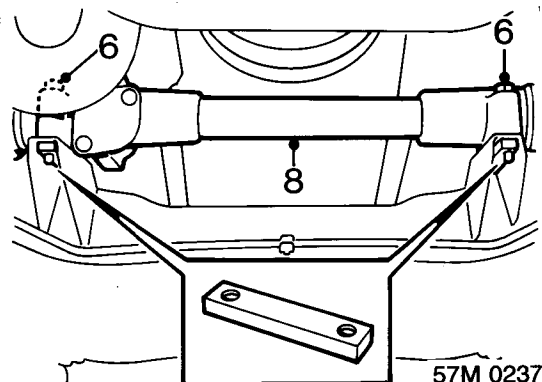
2. Remove road wheel(s).



3. Remove nuts from both track rod end ball joints.
4. Break taper joints using **18G 1063A**.



5. Remove bolt securing universal joint to steering rack.



6. Remove 4 bolts securing steering rack to cross - member.
7. Disconnect steering rack pinion from universal joint.
8. Using assistance, hold radiator bottom hose aside and manoeuvre steering rack from vehicle.

**Refit**

1. Using assistance, hold radiator bottom hose aside and manoeuvre steering rack to position.
2. Connect steering rack pinion to universal joint ensuring that groove in pinion aligns with bolt hole in universal joint.
3. Fit bolts securing steering rack to cross – member, tighten bolts to correct torque.
4. If a new steering rack has been fitted, carry out alignment check, see – **Adjustments**.
5. Fit universal joint bolt and tighten to correct torque.
6. Connect track rod end ball joints, fit nuts and tighten to correct torque.
7. Fit road wheels, tighten nuts to correct torque.
8. Remove stand(s) and lower vehicle.
9. Check/adjust front wheel alignment, see – **Adjustments**.

FRONT SUSPENSION

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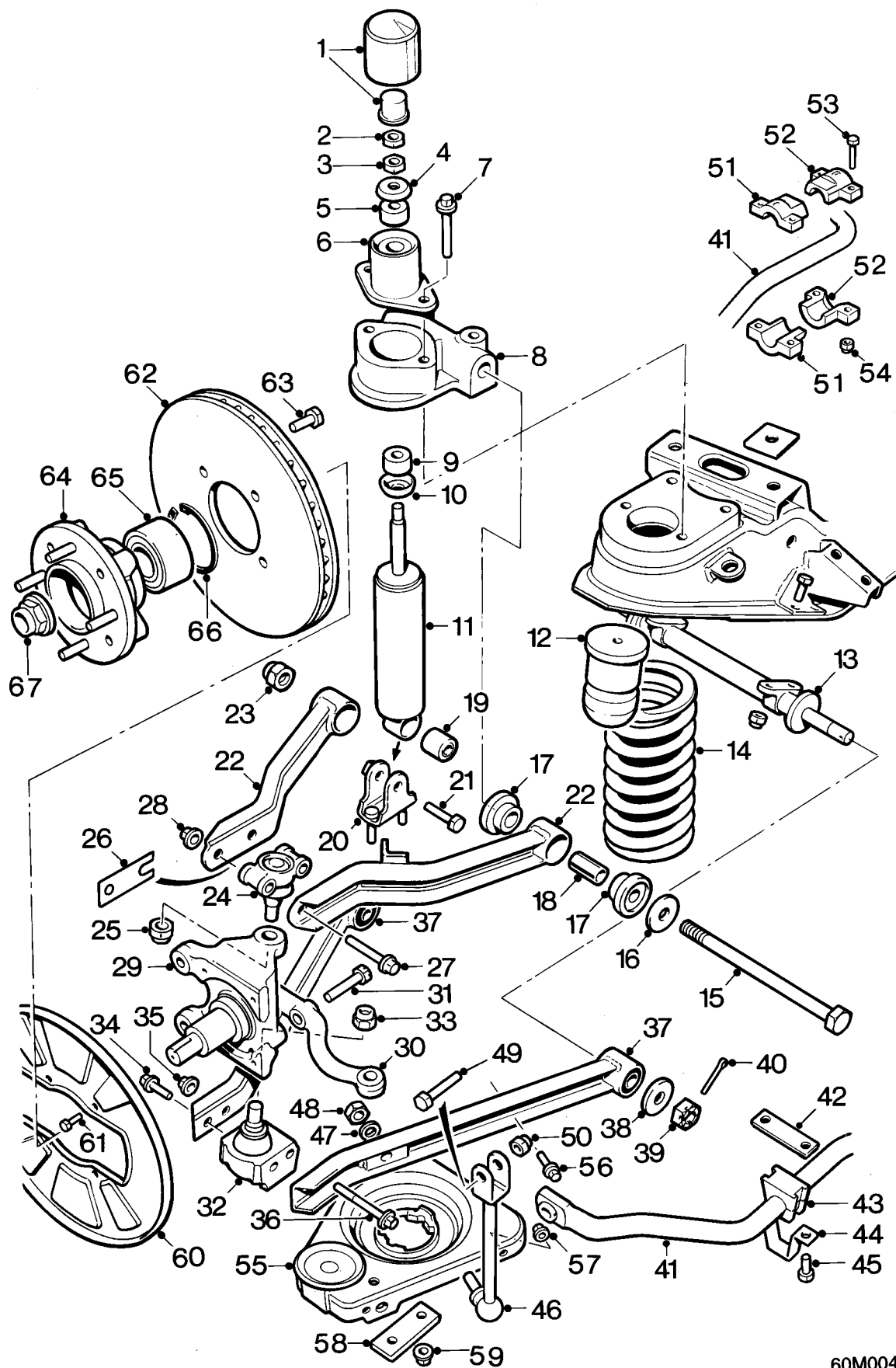
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FRONT SUSPENSION



60M0044 A



FRONT SUSPENSION COMPONENTS

1. Dust caps
2. Locknut
3. Nut - damper
4. Cup
5. Mounting rubber
6. Top mounting
7. Bolt - top mounting
8. Suspension turret
9. Mounting rubber
10. Cup
11. Damper
12. Bump stop
13. Lower arm pivot
14. Road spring
15. Pivot bolt - upper arm
16. Thrust washer
17. Upper arm bush
18. Steel bush
19. Bush - damper
20. Bracket - damper lower mounting
21. Bolt - bracket
22. Upper arms
23. Nut - pivot bolt
24. Upper ball joint
25. Nut - upper ball joint
26. Castor shim(s)
27. Bolt - upper ball joint
28. Nut - upper ball joint bolt
29. Stub axle
30. Steering arm
31. Bolt - steering arm
32. Lower ball joint
33. Nut - lower ball joint
34. Bolt - lower ball joint
35. Nut - lower ball joint bolt
36. Bolt - lower ball joint
37. Lower arms
38. Washer
39. Castellated nut
40. Split pin
41. Anti-roll bar
42. Shim
43. Bush - anti-roll bar
44. Bracket - anti-roll bar
45. Bolt - anti-roll bar bracket
46. Anti-roll bar link
47. Washer
48. Nut - anti-roll bar link
49. Bolt - anti-roll bar link
50. Nut - anti-roll bar link bolt
51. Anti-shuffle clamp - inner
52. Anti-shuffle clamp - outer
53. Anti-shuffle clamp bolt
54. Nut - anti-shuffle clamp bolt
55. Spring plate
56. Spring plate bolt
57. Nut - spring plate bolt
58. Damper mounting plate
59. Nut
60. Disc shield
61. Bolt - disc shield
62. Brake disc
63. Bolt - disc to hub
64. Hub
65. Hub bearing
66. Circlip
67. Hub nut



FRONT ANTI - ROLL BAR

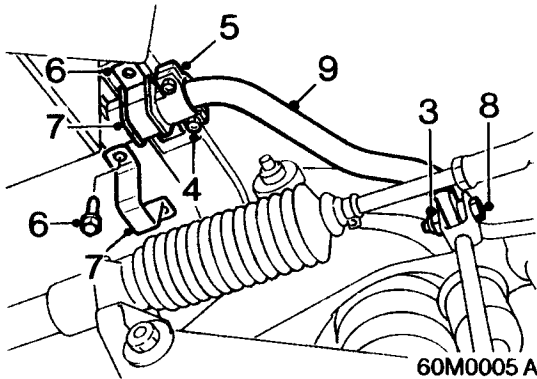
Service Repair No. 60.10.01

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Disconnect bottom hose and allow coolant to drain, see **MAINTENANCE**. To facilitate removal of the anti - roll bar.



3. Remove nuts from anti - roll bar to link securing bolts.

CAUTION: Do not remove bolts at this stage.

4. Remove 4 nuts and bolts securing anti - shuffle clamps.
5. Noting their fitted positions, remove clamps.

Note: The clamps are marked I and O denoting inner and outer, and are fitted to the LH side only.

6. Remove 4 bolts securing anti - roll bar brackets to body, collect clamp plates.
7. Remove brackets and rubber bushes from anti - roll bar.
8. Remove bolts securing anti - roll bar to links.
9. Remove anti - roll bar.

Refit

1. Inspect rubber bushes for splits and deterioration, replace as necessary.
2. Position anti - roll bar to vehicle.
3. Fit bolts securing anti - roll bar to links.

CAUTION: Do not fit nuts at this stage.

4. Apply rubber grease to anti - roll bar bushes.
5. Position rubber bushes and brackets to anti - roll bar.

Note: Split in bushes must face towards front of vehicle.

6. Position clamp plates.
7. Fit but do not tighten 4 bolts securing anti - roll bar brackets to body.
8. Fit nuts securing anti - roll bar to links.
9. Ensure anti - roll bar is centralised.
10. Fit anti - shuffle clamps, ensuring inner clamp faces abut bushes.
11. Fit nuts and bolts and tighten to correct torque.

12. Refill cooling system, see **MAINTENANCE**.
13. Remove stand(s) and lower vehicle.
14. Tighten anti - roll bar bracket bolts and link bolts to the correct torque.

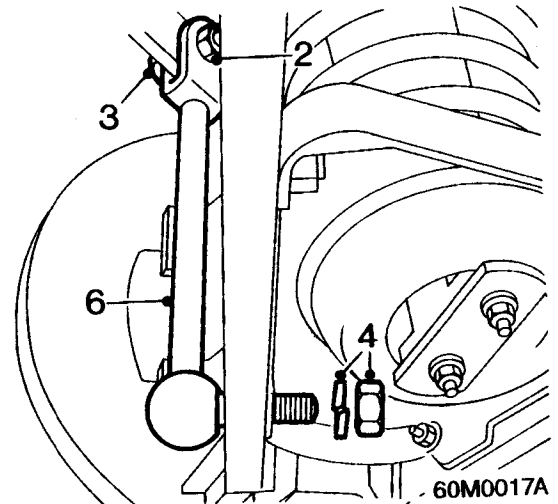
FRONT ANTI - ROLL BAR LINK

Service Repair No. 60.10.02

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.



2. Remove nut from bolt securing anti - roll bar link to anti - roll bar.
3. Remove bolt from anti - roll bar.
4. Remove nut securing anti - roll bar link to lower arm.
5. Release anti - roll bar link from anti - roll bar and from lower arm.
6. Remove anti - roll bar link.

Refit

1. Position anti - roll bar link to anti - roll bar and to lower arm.
2. Fit anti - roll bar link to lower arm nut and tighten to correct torque.
3. Fit anti - roll bar link to anti - roll bar nut and bolt, tighten nut to correct torque.
4. Remove stand(s) and lower vehicle.

FRONT SUSPENSION

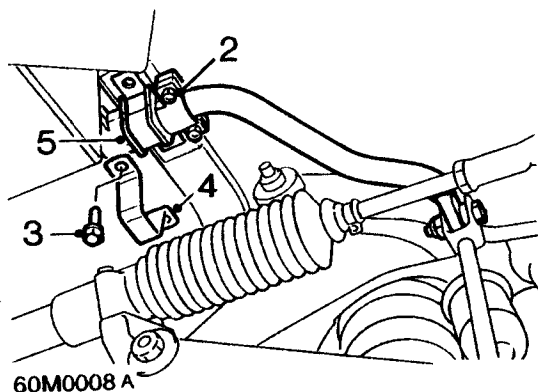
FRONT ANTI - ROLL BAR BUSHES

Service Repair No. 60.10.05

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.



2. *LH side only:* Slacken bolts securing anti - shuffle clamps.
3. Remove 2 bolts securing each anti - roll bar bracket to body.
4. Remove brackets and collect clamp plates.
5. Remove rubber bushes.

Refit

1. Apply rubber grease to anti - roll bar bushes.

Note: *Splits in bushes must face towards front of vehicle.*

2. Position rubber bushes and brackets to anti - roll bar.
3. Position clamp plates.
4. Fit but do not tighten bolts securing brackets to body.
5. Ensure anti - roll bar is centralised and anti - shuffle clamps abut bushes.
6. Tighten anti - shuffle clamp bolts to correct torque.
7. Remove stand(s) and lower vehicle.
8. Tighten bracket securing bolts to correct torque.

BALL JOINT - LOWER

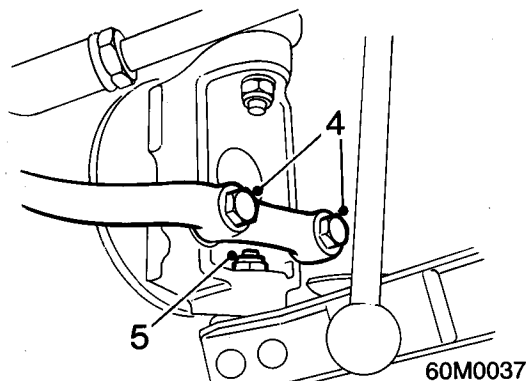
Service Repair No. 60.15.03

Remove

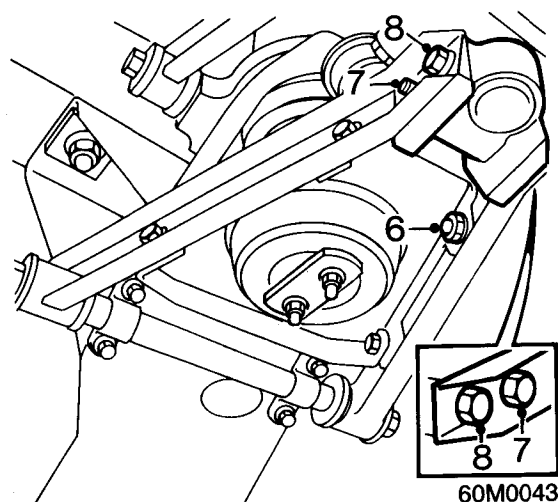
1. Turn steering in direction of side to be worked on.
2. Raise front of vehicle.

WARNING: Support on safety stands.

3. Remove road wheel(s).



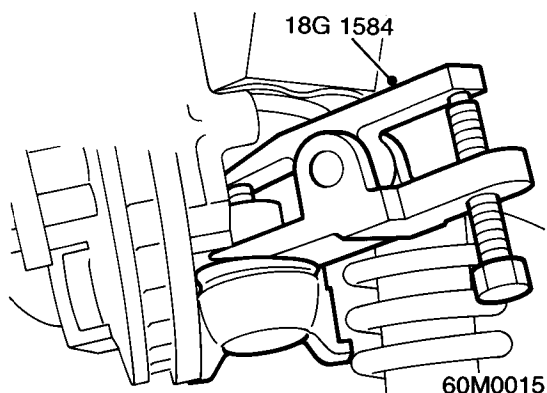
4. Remove 2 bolts securing steering arm to stub axle.
5. Remove nut from lower ball joint.



6. Slacken but do not remove nut securing anti - roll bar link to suspension arm.
7. Remove nut and bolt securing lower ball joint to suspension arm.
8. Remove 2 bolts securing lower ball joint to suspension arm; release ball joint from arm.

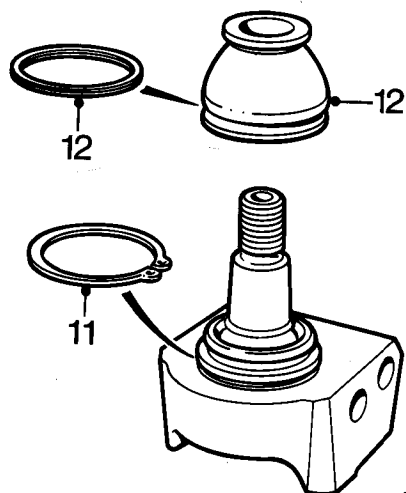
CAUTION: *These bolts are a special length and should not be interchanged with any other bolts.*

9. Insert a suitable block of wood between sub - frame and upper suspension arm.

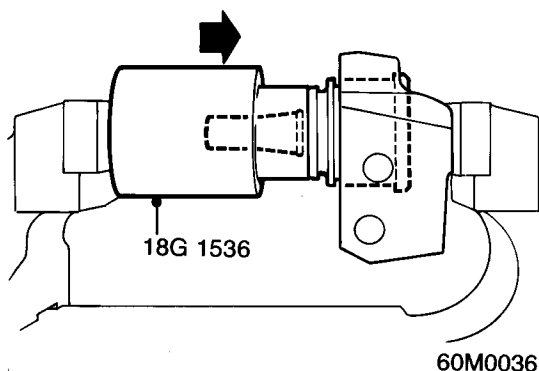


10. Break lower ball joint taper using tool **18G1584** , remove ball joint.

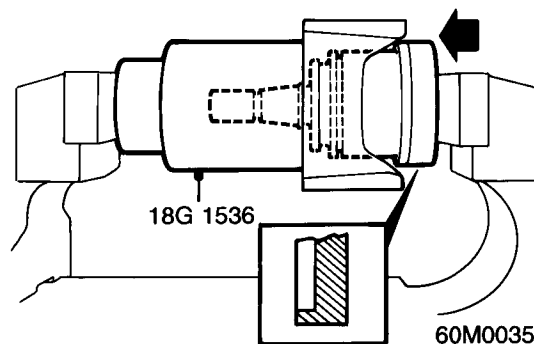
Do not carry out further dismantling if component is removed for access only



11. Remove and discard circlip.
12. Remove spring ring retaining rubber boot, remove boot.



13. Secure lower ball joint and tool **18G1536** in a soft jawed vice.
14. Tighten vice and press the lower ball joint out of housing.



15. Discard joint.
16. Clean housing.
17. Secure lower ball joint and tool **18G1536** in a soft jawed vice.
18. Tighten vice and press lower ball joint into housing.
19. Fit rubber boot and secure with spring ring.
20. Fit new circlip.

CAUTION: Ensure circlip is seated in groove.

Refit

1. Position lower ball joint to suspension arm, fit bolts and nut and tighten to correct torque.
2. Remove wooden block from between sub - frame and upper suspension arm.
3. Fit ball joint to stub axle, fit nut and tighten to correct torque.
4. Tighten anti - roll bar link nut to correct torque.
5. Position steering arm to stub axle, fit bolts and tighten to correct torque.
6. Fit road wheel and tighten nuts to correct torque.
7. Remove stand(s) and lower vehicle.

FRONT SUSPENSION

BALL JOINT - UPPER

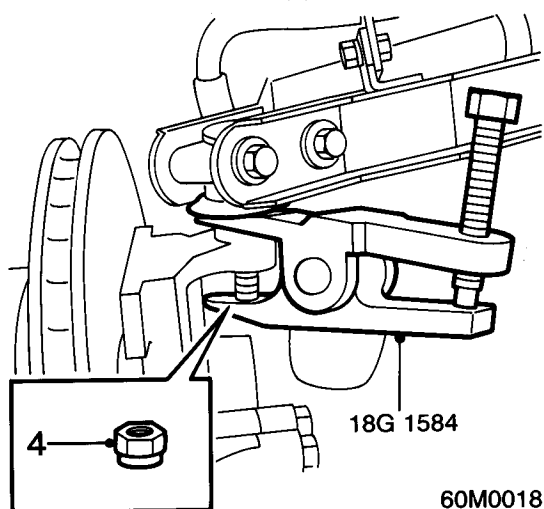
Service Repair No. 60.15.02

Remove

1. Turn wheels on to full lock in direction of side to be worked on.
2. Raise front of vehicle.

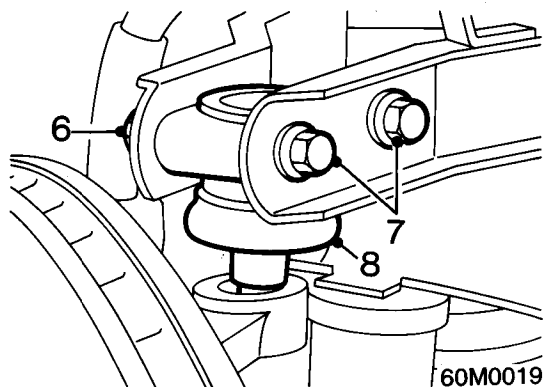
WARNING: Support on safety stands.

3. Remove road wheel(s).



4. Remove upper ball joint retaining nut.
5. Break taper joint using tool **18G 1584**.

CAUTION: Support hub assembly.



6. Remove 2 nuts retaining upper ball joint to upper arm bolts.
7. Remove 2 bolts from upper ball joint and upper arm.
8. Release upper ball joint from upper arm.
9. Collect castor shim(s)

Refit

1. Clean upper ball joint and stub axle mating faces.
2. Position castor shim(s) and fit ball joint to upper arm.

CAUTION: Fit castor shim(s) to original position.

3. Fit bolts through upper arm and upper ball joint retaining bolts.
4. Fit nuts and tighten to correct torque.
5. Position stub axle to upper arm ball joint.

6. Fit nut securing upper ball joint to stub axle; tighten nut to correct torque.
7. Fit front road wheel(s) and tighten nuts to correct torque.
8. Remove stand(s) and lower vehicle.

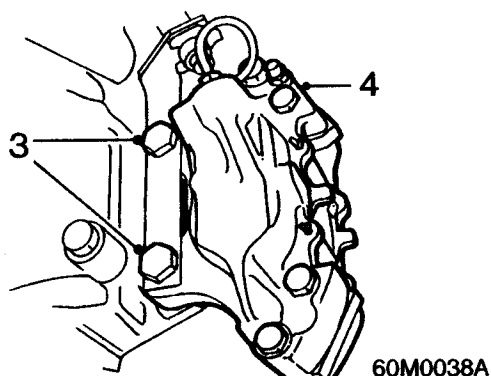
FRONT HUB BEARING

Service Repair No. 60.25.14

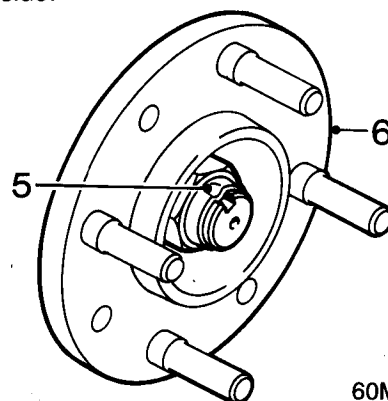
1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Remove road wheel(s).



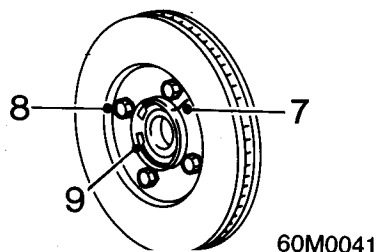
3. Remove 2 bolts securing brake caliper to hub.
4. Release caliper from brake disc and tie it aside.



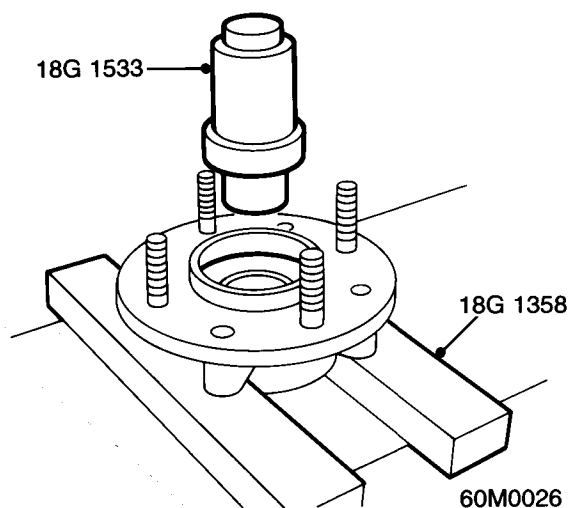
5. Release staking, remove and discard hub nut.

Note: L.H.Side - L.H. thread; R.H.Side - R.H. thread.

6. Slide hub off stub axle.



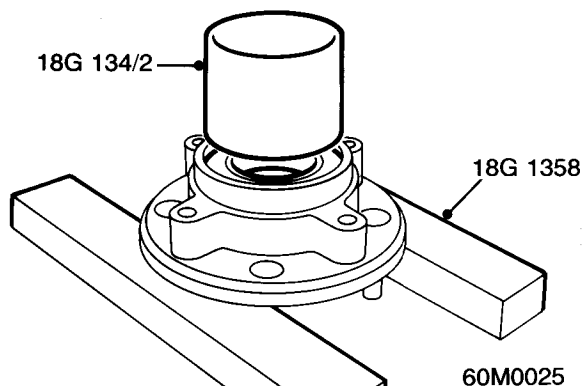
7. Make suitable alignment marks between hub and brake disc.
8. Remove 4 bolts securing brake disc to hub, separate hub from disc.
9. Remove and discard circlip retaining hub bearing.



10. Support hub on bed of press using tool **18G1358**, with circlip groove in hub towards bed of press.
11. Position tool **18G1533** to hub bearing and press out bearing.
12. Discard bearing.

Refit

1. Clean bearing mating surfaces in hub.



2. Support hub on bed of press using tool **18G1358** with circlip groove in hub facing away from tool.
3. Press new bearing into hub using tool **18G134/2**.

CAUTION: Bearing must be pressed in from circlip groove side of hub.

4. Fit new circlip to retain bearing.
5. Apply recommended grease to bearing and stub axle shaft, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.
6. Position brake disc to hub ensuring reference marks are aligned.
7. Fit 4 brake disc retaining bolts and tighten to correct torque.
8. Position hub to stub axle shaft, fit new nut.

Note: L.H. Side - L.H. thread; R.H. Side - R.H. thread.

9. Tighten hub nut to correct torque, secure nut by staking.

CAUTION: Rotate hub as nut is tightened to settle bearings.

10. Check disc run - out.
11. Position brake caliper to disc, fit bolts and tighten to correct torque.
12. Bends over tabs of locking plate to retain bolts.
13. Fit road wheel(s) and tighten nuts to correct torque.

FRONT LOWER ARM

Service Repair No. Arm - 60.35.02

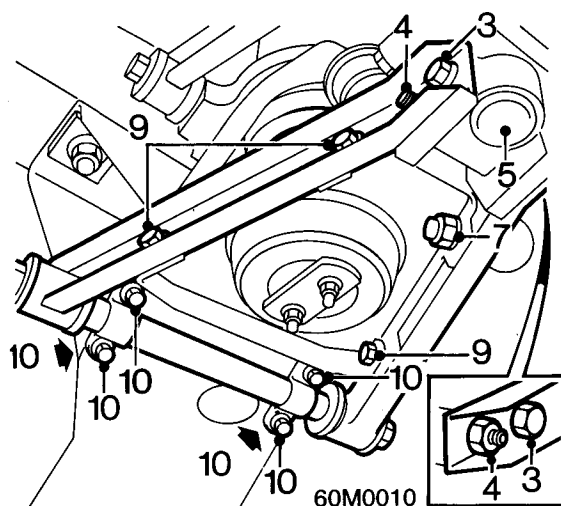
Front lower arm

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Remove road wheel(s).



3. Remove 2 bolts securing ball joint to lower arm.

CAUTION: These bolts are a special length and should not be interchanged with any other bolts.

4. Remove nut and bolt securing ball joint to lower arm.

FRONT SUSPENSION

5. Release stub axle and ball joint from lower arm.
6. Place suitable wooden block between sub - frame and upper suspension arm.
7. Remove nut and bolt securing anti - roll bar link to lower arm.
8. Position jack beneath lower arm spring plate, raise jack to support arm.
9. Remove 3 nuts and bolts securing spring plate to lower arm.
10. Remove 4 nuts securing lower arm to cross member, remove lower arm; recover 2 bolts.

Refit

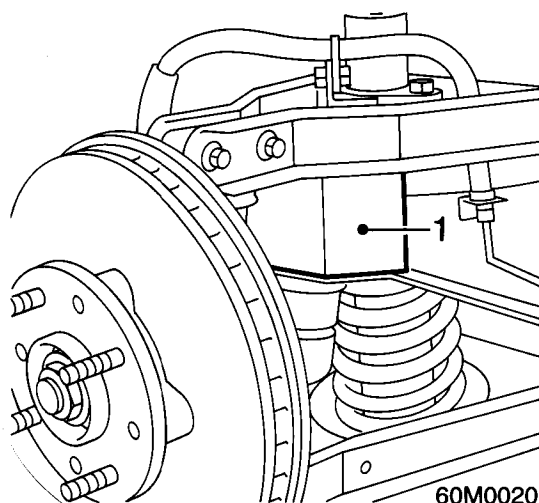
1. Align both lower arms to each other.
2. Fit washers and castellated nuts and tighten to correct torque. Secure nuts with new split pins.
3. Position lower arms, fit 2 rearmost bolts; fit 4 nuts and tighten to correct torque.
4. Position spring plate to lower arms, fit but do not tighten 3 nuts and bolts.
5. Position anti - roll bar link, fit nut and tighten to correct torque.
6. Tighten spring plate to lower arm nuts to correct torque.
7. Remove wooden block.
8. Position stub axle and ball joint assembly to lower arms, fit nut and 3 bolts, tighten nut and bolts to correct torque.
9. Fit road wheels and tighten nuts to correct torque.
10. Remove stand(s) and lower vehicle.

FRONT DAMPER

Service Repair No. 60.30.02

CAUTION: Dampers must be replaced in pairs only, otherwise handling characteristics may be impaired.

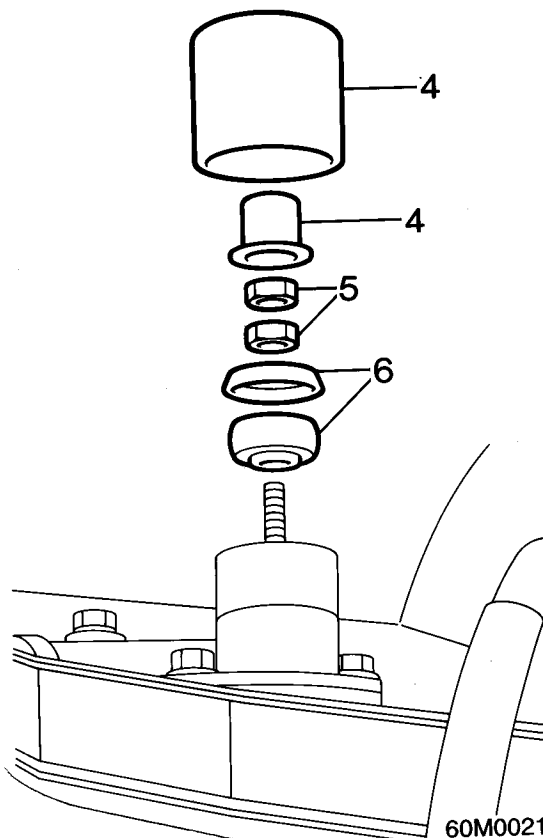
Remove



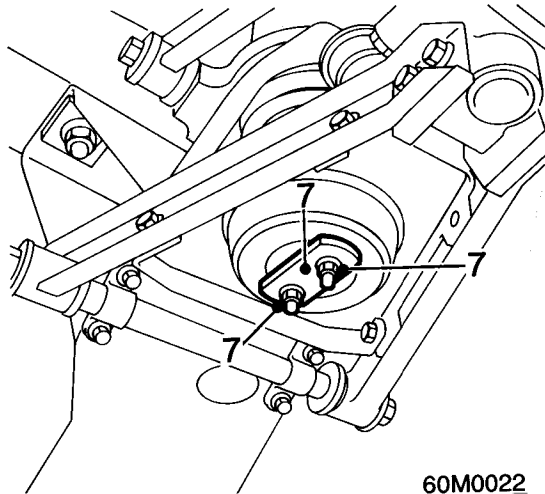
1. Position a wooden block between sub - frame and upper suspension arm.
2. Raise front of vehicle.

WARNING: Support on safety stands.

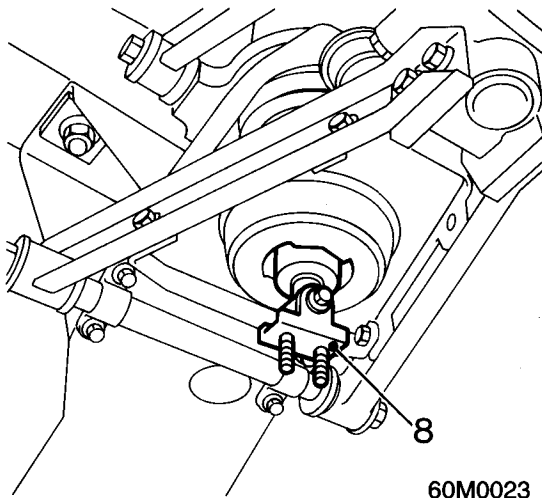
3. Remove road wheel(s).



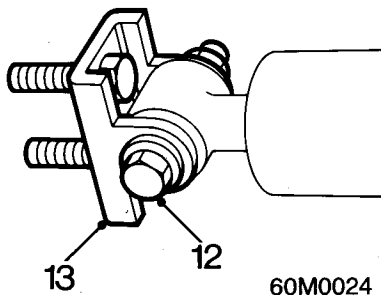
4. Remove dust shields from damper turret.
5. Remove lock nut and retaining nut from damper.
6. Remove washer and mounting rubber.



7. Remove 2 damper base plate retaining nuts and remove base plate.



8. Push damper base fixing bracket into spring to clear studs from lower spring plate.
9. Rotate damper 90° to release base fixing bracket from lower spring plate.
10. Rotate damper back 90° to release base fixing bracket retaining bolt from lower spring plate.
11. Remove damper.

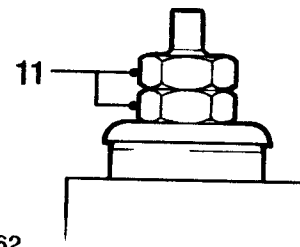


12. Remove bolt securing damper base fixing bracket.
13. Remove bracket from damper.

Refit

CAUTION: Before fitting new dampers carry out the following check to ensure damper has not been adjusted:

1. Hold damper vertically with lower eye in vice.
- CAUTION:** Use soft jaws to prevent damage.
2. Fully close damper whilst at the same time turning piston rod slowly anti-clockwise until cams of adjusting nut engage in recesses of foot valve assembly. Then check that piston rod is turned fully anti-clockwise, **DO NOT** use force.
3. Pull piston rod vertically from cylinder without turning for at least 1 cm to disengage adjusting mechanism.
4. Remove damper from vice.
5. Fit base fixing bracket to new damper.
6. Fit bolt securing damper base fixing bracket.
7. Fit damper.
8. Position damper base fixing bracket retaining bolt through lower spring plate and rotate 90°.
9. Rotate damper back 90° and fit base fixing bracket into position.
10. Fit mounting rubber and washer to damper.



11. Fit nut securing damper piston rod; fit and tighten lock nut.
- Note:** When tightened, lock nut should be flush with top of thread on damper rod as illustrated.
12. Fit base plate to damper and tighten nuts to correct torque.
 13. Fit dust shields to damper top fixing and turret.
 14. Fit road wheel and tighten nuts to correct torque.
 15. Remove stand(s) and lower vehicle.
 16. Remove wooden block from between sub-frame and upper suspension arm.

FRONT SUSPENSION

FRONT UPPER ARM AND BUSHES

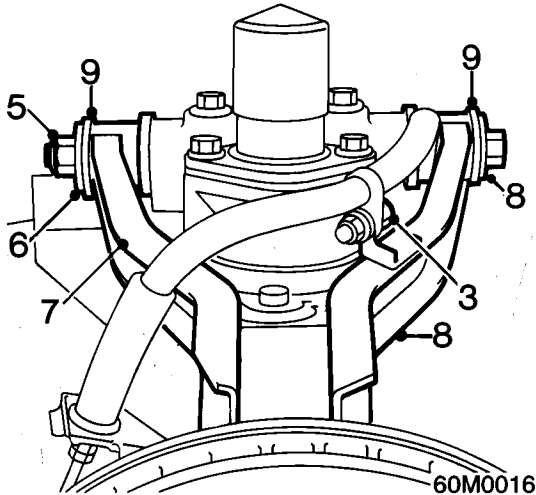
Service Repair No. 60.35.01

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Remove road wheel(s).



3. Remove nut and bolt securing brake hose to upper arm bracket.
4. Remove upper ball joint.
5. Remove self – locking nut from pivot bolt; discard nut.
6. Remove thrust washer.
7. Remove rearmost half of upper arm, collect second thrust washer.
8. Withdraw pivot bolt and thrust washer, collect front half of upper arm and thrust washer.
9. Remove and discard bushes.

Refit

1. Lubricate replacement bushes with rubber grease and fit new bushes to upper arms.
2. Fit thrust washer, pivot bolt and second thrust washer to front facing half of upper arm and fit to suspension turret.
3. Fit thrust washer, rearmost half of upper arm and second thrust washer to pivot bolt.
4. Fit but do not tighten new self – locking nut.
5. Fit upper ball joint.
6. Position brake hose to upper arm bracket, fit and tighten nut and bolt.
7. Fit road wheels, tighten nuts to correct torque.
8. Remove stand(s) and lower vehicle.
9. Tighten pivot bolt self – locking nut to correct torque.

REAR SUSPENSION

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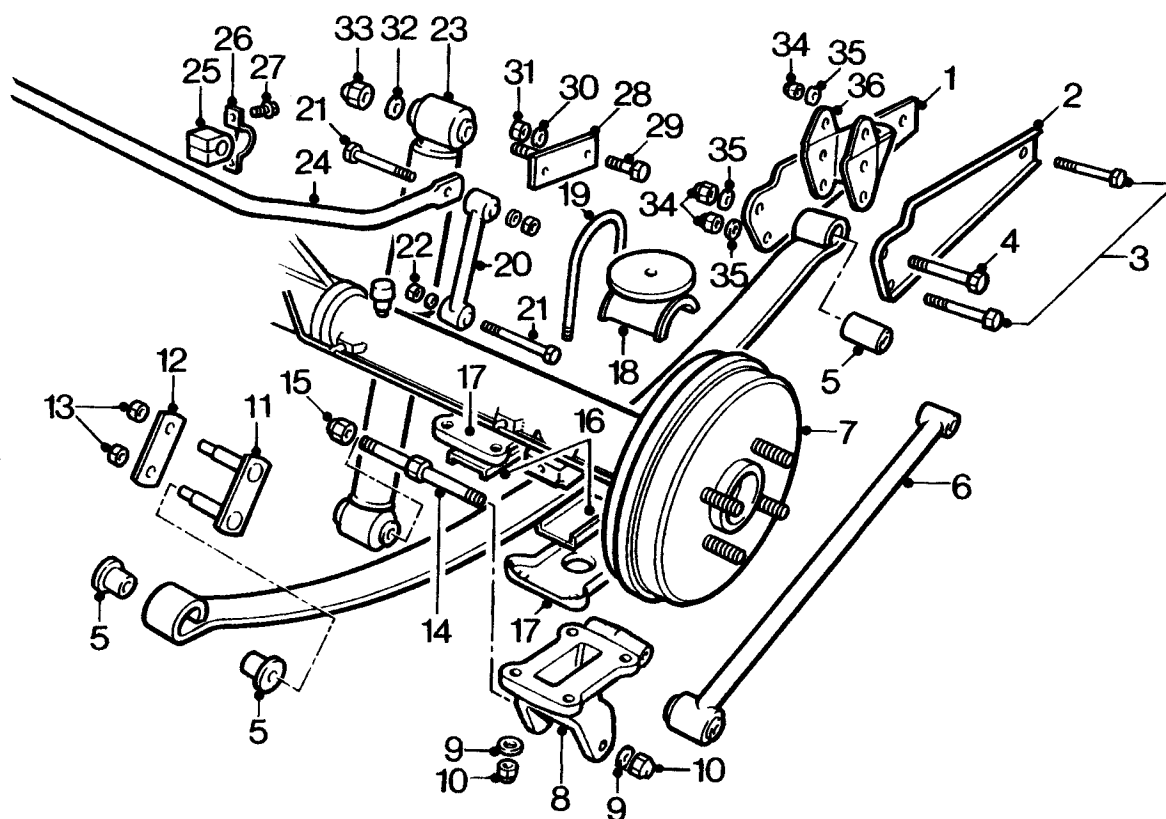
REPAIRS

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REAR SUSPENSION



60M0042 A

REAR SUSPENSION COMPONENTS

- | | |
|--------------------------|--|
| 1. Inner clamp plate | 20. Anti-roll bar link |
| 2. Outer clamp plate | 21. Bolts - anti-roll bar and link |
| 3. Clamp plate bolts | 22. Nuts |
| 4. Pivot bolt | 23. Damper |
| 5. Bush | 24. Anti-roll bar |
| 6. Torque control arm | 25. Bush - anti-roll bar |
| 7. Rear hub | 26. Bracket - anti-roll bar bush |
| 8. Spring plate | 27. Bolt - bracket |
| 9. Washer | 28. Damper mounting bracket |
| 10. Nut | 29. Bolt - mounting bracket |
| 11. Outer shackle plate | 30. Washer - mounting bracket |
| 12. Inner shackle plate | 31. Nut - mounting bracket |
| 13. Nut - shackle plates | 32. Washer |
| 14. Stud - damper | 33. Nut - damper |
| 15. Nut - stud | 34. Nuts - pivot and shackle plate bolts |
| 16. Rubber | 35. Washers |
| 17. Saddle plate | 36. Spring pivot bracket |
| 18. Bump stop | |
| 19. 'U' bolt | |



REAR ANTI - ROLL BAR

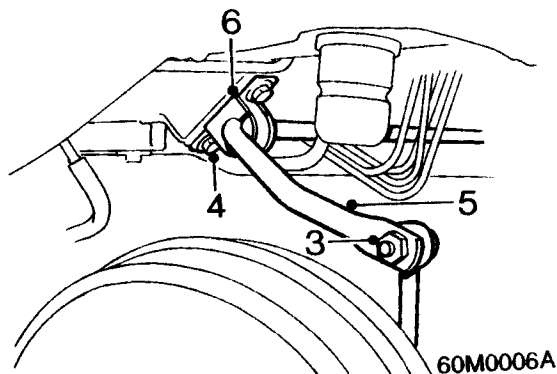
Service Repair No. 64.35.08

Remove

1. Raise rear of vehicle.

WARNING: Support on safety stands.

2. Remove R.H. rear road wheel.



3. Remove nut and bolt securing anti - roll bar to each roll bar link.
4. Remove 2 bolts securing each anti - roll bar bracket to body, remove brackets.
5. Manoeuvre anti - roll bar clear of fuel pipes, remove bar.
6. Remove 2 rubber bushes from anti - roll bar.

Refit

1. Inspect rubber bushes for splits and deterioration, replace as necessary.
2. Apply rubber grease to anti - roll bar rubber bushes.
3. Fit rubber bushes to anti - roll bar.
4. Manoeuvre anti - roll bar to position.
5. Position rubber bushes, fit anti - roll bar brackets; fit but do not tighten bolts.
6. Align links to anti - roll bar, fit nuts and bolts, tighten nuts to correct torque.
7. Fit R.H. road wheel and tighten nuts to correct torque.
8. Remove stand(s) and lower vehicle.
9. Tighten anti - roll bar bracket bolts to correct torque.

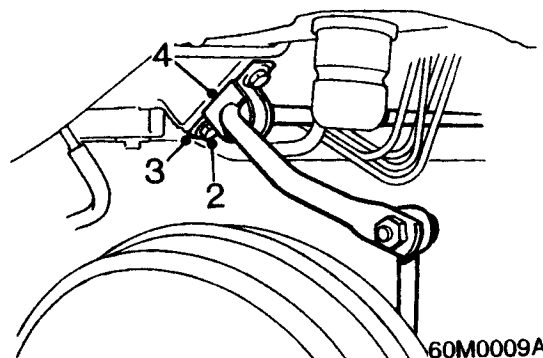
REAR ANTI - ROLL BAR BUSHES

Service Repair No. 64.10.05

Remove

1. Raise rear of vehicle.

WARNING: Support on safety stands.



2. Remove 2 bolts securing each anti - roll bar bracket to body.
3. Remove brackets.
4. Remove bushes.

Refit

1. Apply rubber grease to bushes.
2. Position bushes and brackets to anti - roll bar.
3. Fit but do not tighten bolts securing anti - roll bar brackets to body.
4. Remove stand(s) and lower vehicle.
5. Tighten bracket securing bolts to correct torque.

REAR SUSPENSION

REAR DAMPER

Service Repair No. 64.30.02

WARNING: Dampers must be replaced in pairs only, otherwise handling characteristics may be impaired.

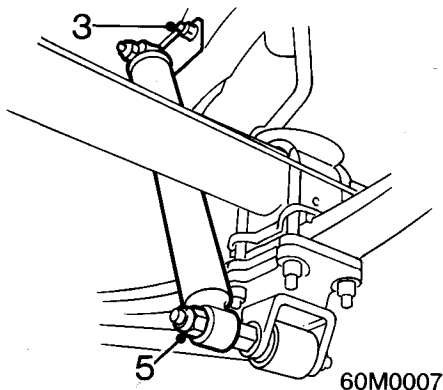
Remove

1. Raise rear of vehicle.

WARNING: Support on safety stands.

R.H. Side

2. Remove R.H. rear road wheel.



3. Remove 2 bolts securing damper top mounting bracket to body.
4. L.H. side: Remove nut securing damper to top mounting bracket.
5. Remove nut securing damper to bottom mounting stud, remove damper.
6. R.H. side: remove nut securing damper to top mounting bracket, remove bracket.

Refit

CAUTION: Before fitting new dampers carry out the following check to ensure damper has not been adjusted.

1. Hold damper vertically with lower eye in vice.

CAUTION: Use soft jaws to prevent damage.

2. Fully close damper whilst at the same time turning piston rod anti - clockwise until cams of adjusting nut engage in recesses of foot valve assembly. Then check that piston rod is turned fully anti - clockwise, **DO NOT** use force.
3. Pull piston rod vertically from cylinder without turning for at least 1 cm to disengage adjusting mechanism.
4. Remove damper from vice.

R.H. Side

5. Position damper to top mounting bracket, fit but do not tighten nut.
6. Position damper top mounting bracket to body, fit bolts and tighten to correct torque.
7. L.H. side: Position damper to top mounting bracket, fit but do not tighten nut.

8. Position damper to bottom mounting stud, fit but do not tighten nut.
9. R.H. side: Fit road wheel and tighten nuts to correct torque.
10. Remove stand(s) and lower vehicle.
11. Tighten 2 damper securing nuts to correct torque.

REAR ROAD SPRING

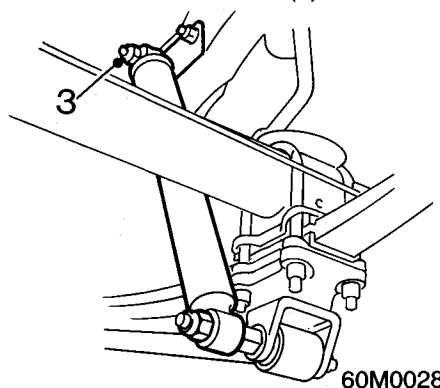
Service Repair No. 64.20.01

Remove

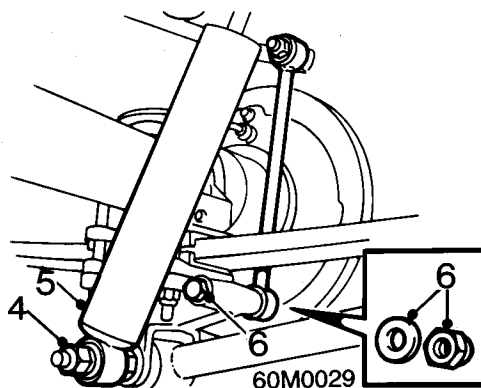
1. Raise rear of vehicle.

WARNING: Support on safety stands.

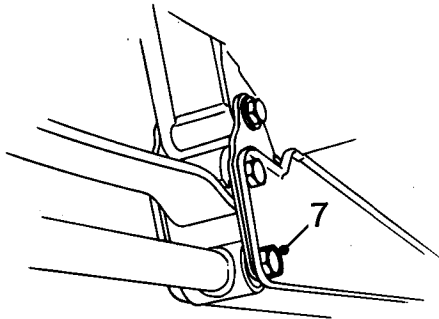
2. Remove road wheel(s).



3. Slacken but do not remove nut securing damper to top mounting bracket.

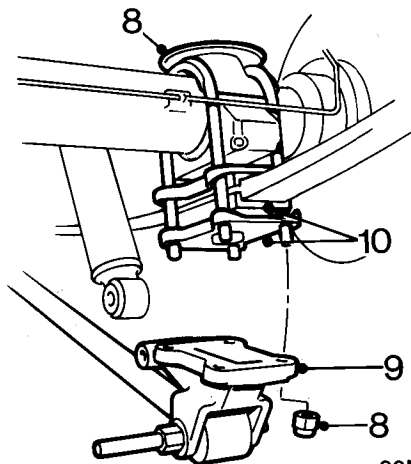


4. Remove nut securing damper to bottom mounting stud.
5. Release damper from bottom mounting stud.
6. Remove nut, bolt and washer securing anti - roll bar link to spring plate.



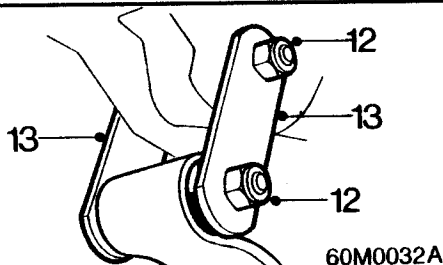
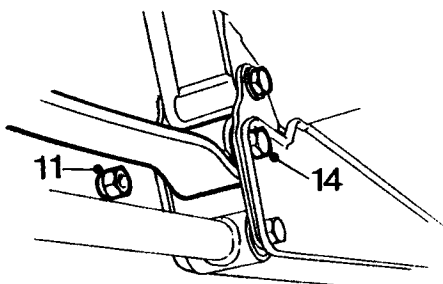
60M0030

7. Slacken but do not remove bolt securing torque control arm to body bracket.



60M0031

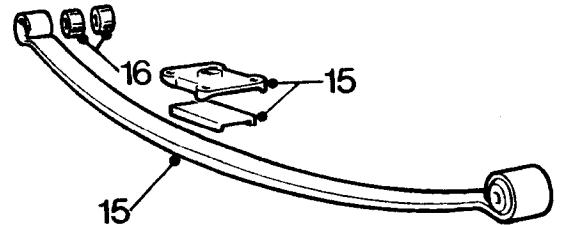
8. Remove 4 nuts securing 'U' bolts, remove 2 'U' bolts and rebound rubber plate from rear axle.
9. Move spring plate and torque control arm away from road spring.
10. Recover lower saddle plate and rubber.



60M0032A

11. Remove nut from road spring front pivot bolt.
12. Remove 2 nuts securing road spring rear shackle plates.
13. Remove inner and outer shackle plates.

14. Support road spring and remove front pivot bolt.



60M0033A

15. Remove road spring, recover upper saddle plate and rubber.
16. Remove 2 bushes from road spring.

Refit

1. Check all rubbers and bushes for damage and deterioration, replace as necessary.
2. Apply rubber grease to 2 bushes and fit to road spring.
3. Position road spring to front clamp plate, fit pivot bolt; fit but do not tighten nut.
4. Position upper saddle plate and rubber to road spring.
5. Raise road spring to position, fit inner and outer rear shackle plates; fit but do not tighten nuts.
6. Tighten pivot bolt nut to correct torque.
7. Position lower saddle plate and rubber to road spring.
8. Raise clamp plate and torque control arm to fitted position.
9. Position rebound rubber plate to rear axle.
10. Fit 'U' bolts, fit nuts and tighten progressively, in a diagonal sequence to correct torque.

CAUTION: Lower spring plate must be level.

11. Tighten torque control arm to body bolt to correct torque.
12. Position anti-roll bar link to spring plate, fit nut, bolt and washer and tighten to correct torque.
13. Position damper to bottom mounting stud, fit but do not tighten nut.
14. Fit road wheel and tighten nuts to correct torque.
15. Remove stand(s) and lower vehicle.
16. Tighten rear shackle plate nuts to correct torque.
17. Tighten damper top and bottom nuts to correct torque.

BRAKES

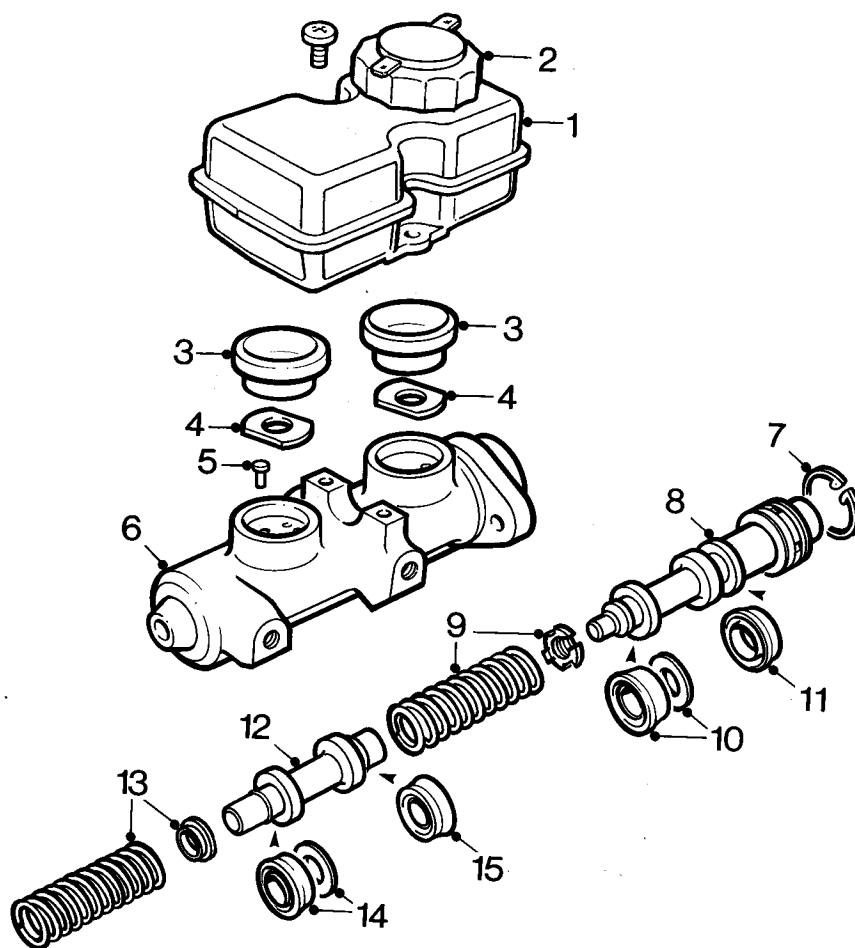
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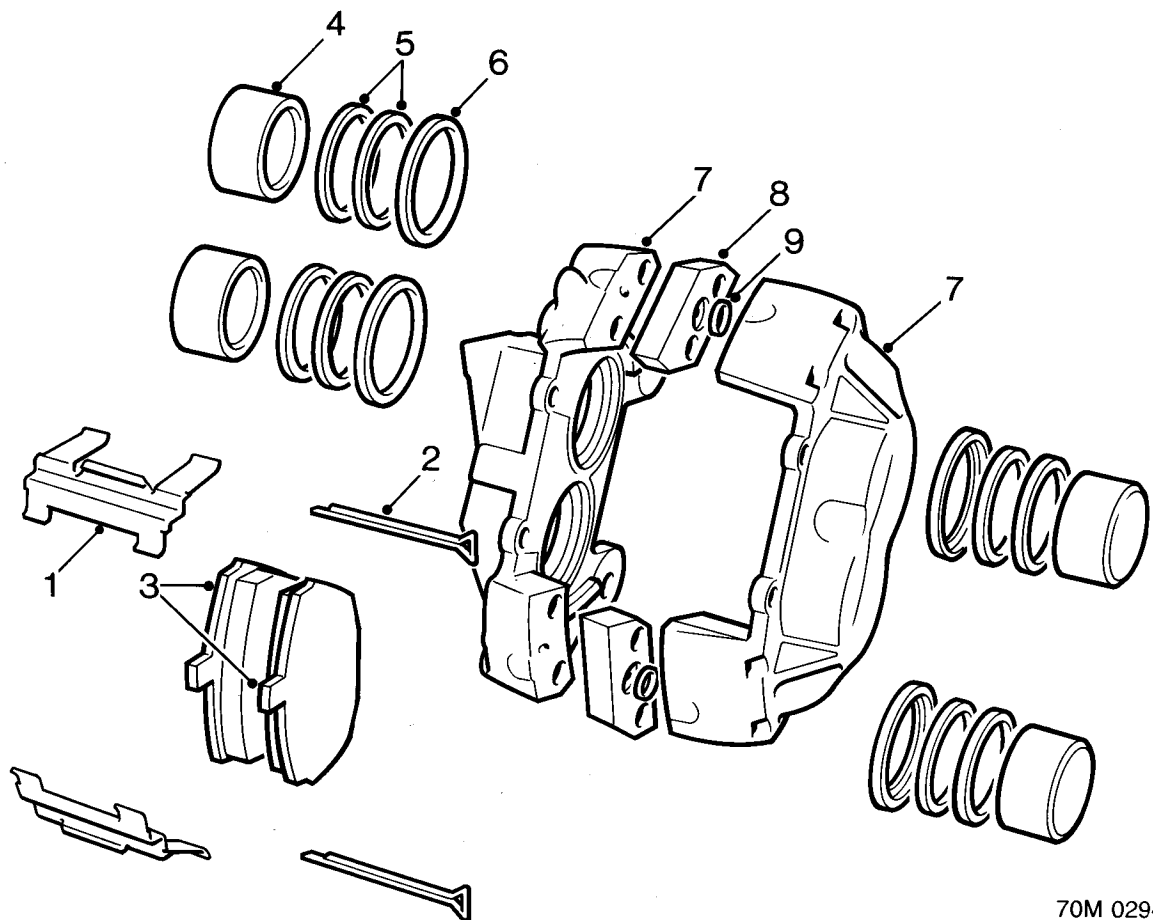




70M 0293

MASTER CYLINDER COMPONENTS

- | | |
|--------------------------------|--------------------------------------|
| 1. Fluid reservoir | 9. Primary piston spring and cup |
| 2. Filler cap and level switch | 10. Primary piston seal and washer |
| 3. Reservoir seals | 11. Primary piston seal |
| 4. Baffle plates | 12. Secondary piston |
| 5. Secondary piston stop pin | 13. Secondary piston spring and cup |
| 6. Master cylinder body | 14. Secondary piston seal and washer |
| 7. Circlip | 15. Secondary piston seal |
| 8. Primary piston | |

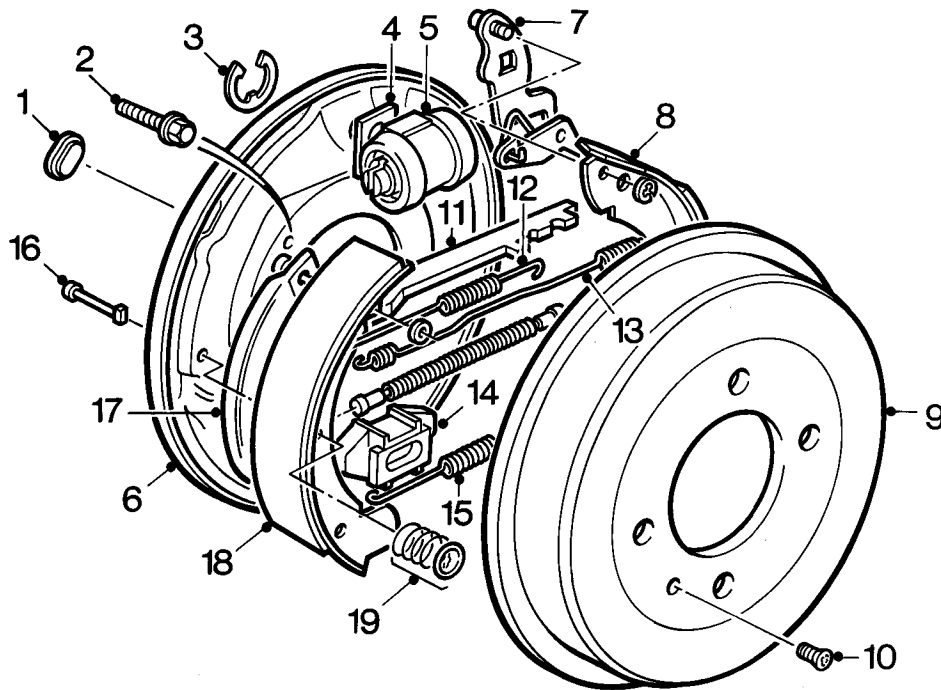


70M 0294

FRONT BRAKE CALIPER COMPONENTS

- | | |
|-------------------------------|---------------|
| 1. Spring plate | 6. Wiper seal |
| 2. Spring plate retaining pin | 7. Caliper |
| 3. Brake pads | 8. Spacer |
| 4. Piston | 9. Seal |
| 5. Fluid seal | |

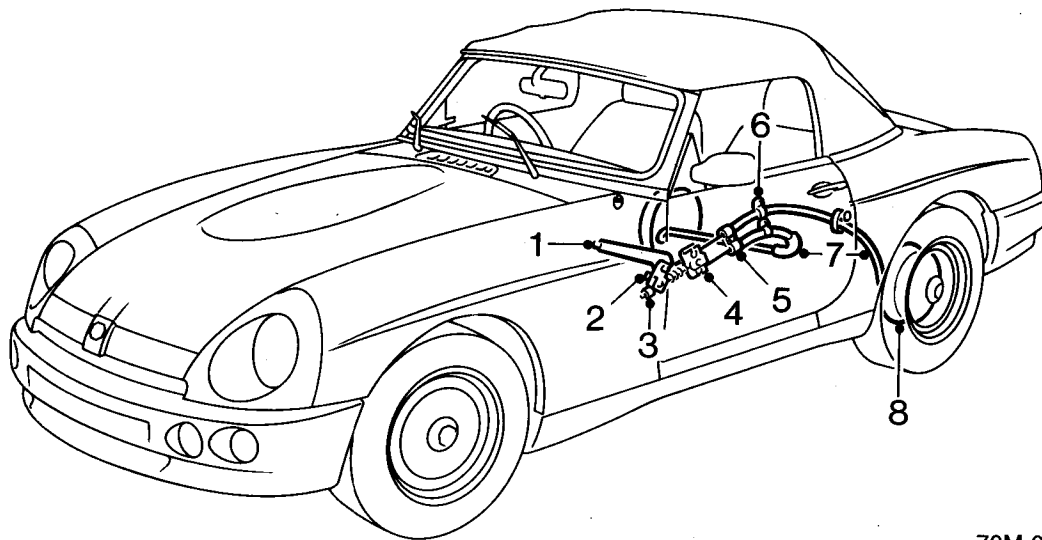
BRAKES



70M 0351

REAR DRUM BRAKE COMPONENTS

- | | |
|----------------------------------|-------------------------------------|
| 1. Access grommet | 11. Cross lever |
| 2. Backplate mounting bolt | 12. Cross lever spring |
| 3. Wheel cylinder circlip | 13. Pull off spring |
| 4. Wheel cylinder gasket | 14. Fixed abutment |
| 5. Wheel cylinder | 15. Tension spring |
| 6. Backplate | 16. Shoe retainer pin |
| 7. Automatic adjusting mechanism | 17. Handbrake lever |
| 8. Secondary (trailing) shoe | 18. Primary (leading) shoe |
| 9. Brake drum | 19. Shoe retainer spring and washer |
| 10. Screw, drum to hub | |

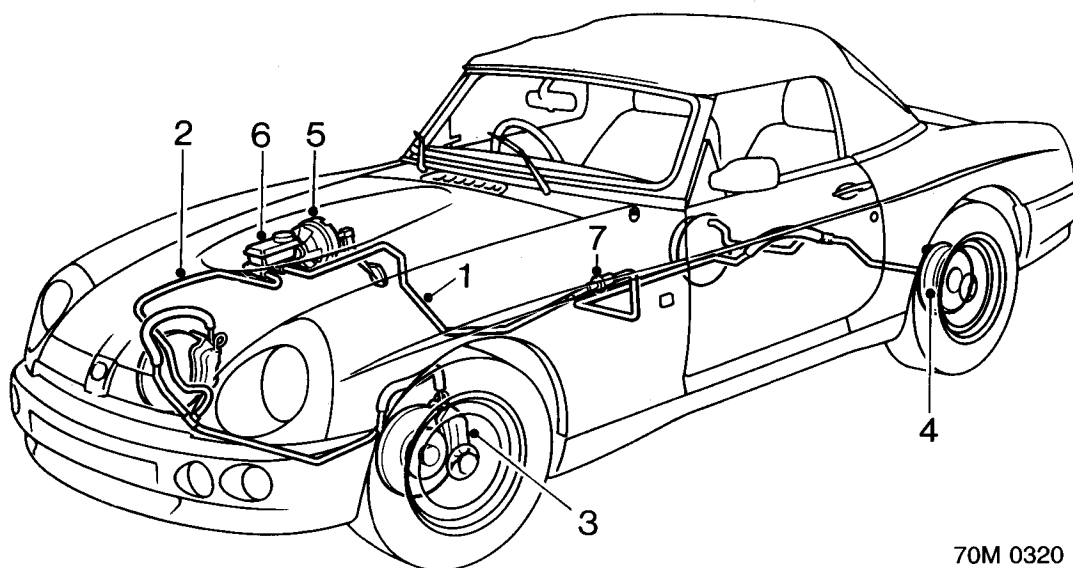


70M 0319

HANDBRAKE COMPONENTS

- | | |
|--|--------------------------|
| 1. Handbrake lever assembly | 5. Cable abutment |
| 2. Warning switch | 6. Handbrake cable clips |
| 3. Adjusting nut, trunnion, spring and rod | 7. Handbrake cables |
| 4. Compensator | 8. Brake drum |

BRAKES



Braking system

- | | |
|----------------------|----------------------------|
| 1. Primary circuit | 5. Servo |
| 2. Secondary circuit | 6. Master cylinder |
| 3. Front caliper | 7. Pressure reducing valve |
| 4. Rear drum | |

BRAKING SYSTEM

INTRODUCTION

The hydraulic braking system comprises of a direct acting vacuum operated servo, a tandem master cylinder, front disc brakes and self-adjusting rear drum brakes.

A pressure reducing valve in the rear brake fluid line controls pressure application to the rear brakes and reduces the possibility of rear wheels locking.

Rear brake adjustment occurs on foot brake application when required to compensate for brake lining wear.

The system is split front to rear with the primary system operating the rear drums and the secondary system operating the front calipers.

Each front brake caliper is of the four piston type, actuated from a single fluid input adjacent to a single bleed screw. Brake pad anti-rattle springs are secured by the pad retaining pins and all pads are fitted with adhesive backing shims.

Each rear drum brake incorporates a single double-acting cylinder, acting on one leading and one trailing brake shoe.

The direct acting brake servo unit applies pressure to the master cylinder via a push rod.

A brake pressure reducing valve is fitted to limit the fluid pressure to the rear brake cylinders so that, under conditions of heavy braking, the rear wheels do not lock in advance of the front wheels.

The handbrake operates on the rear wheels only and incorporates a switch which illuminates a warning light on the instrument panel when the handbrake is applied. A warning light is provided to draw attention to brake fluid low level.



FOOTBRAKE OPERATION

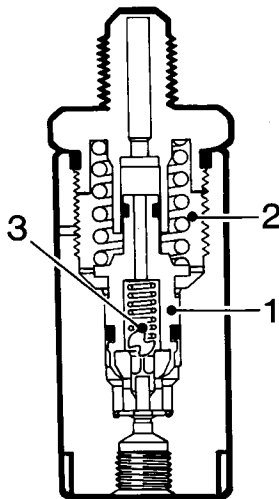
Servo

Inlet manifold vacuum is transmitted through a hose and non - return valve to the servo. Inside the servo, this vacuum is felt on both sides of the diaphragm. When the brake pedal is pressed, the servo push - rod opens a valve and allows atmospheric pressure to be drawn through the servo filter into the foot pedal side of the diaphragm. The pressure differential acting on the diaphragm increases the pressure being applied at the brake pedal and transmits it to the master cylinder through a push - rod.

Master Cylinder

Pressure from the servo forces the primary piston up its bore against the primary spring. The strong primary spring overcomes the weaker secondary spring and causes the secondary piston to move simultaneously. Initial movement of both pistons takes the recuperation seals beyond the supply ports from the reservoir. Further piston movement directs fluid pressure into the two separate hydraulic circuits.

Pressure Reducing Valve



70M 0302

1. Plunger
2. Spring
3. Ball

The purpose of the valve is to provide a reduced pressure to the rear brakes relative to that supplied to the front brakes.

Pressure from the master cylinder is fed into the valve and out to the rear brakes at the other end. When pressure acting on the plunger overcomes the pre - loaded spring, the plunger moves and the ball seats, isolating the front from the rear pressure. Further increase in fluid pressure from

the master cylinder, moves the plunger in the other direction thereby unseating the ball. The increase in pressure to the rear again causes the ball to seat. By this means, the rear pressure is reduced relative to the front.

HANDBRAKE OPERATION

The handbrake operates on both rear drums via two rear cables, a compensator and rod which connects to the handbrake lever.

As the handbrake lever is applied, movement is transmitted through the handbrake rod to the compensator which, in turn, transmits movement to the two rear cables. Each rear cable pulls on a lever which is pivoted on the secondary (trailing) brake shoe. This lever reacts with the cross - lever to force the brake shoes apart, bringing the brake linings into contact with the drum. Brake shoe lining wear is compensated for by a ratchet mechanism fitted to the primary (leading) shoe reacting with the cross - lever.

Manual adjustment of the handbrake cables is effected via a nut on the threaded rod connected to the compensator.



BRAKE SYSTEM - BLEED

Service Repair No.

Complete system - 70.25.02

Primary system - 70.25.04

Secondary system - 70.25.05

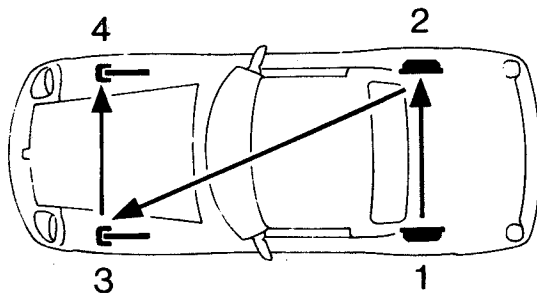
The following procedure covers bleeding the complete hydraulic system but where only the primary or secondary circuit has been disturbed in isolation, it should only be necessary to bleed that system. Partial bleeding of the hydraulic system is only permissible if a brake pipe or hose has been disconnected with only a minor loss of fluid.

CAUTION: Never re-use fluid which has been bled from the brake system. Do not allow the fluid level in the master cylinder to fall so low that air can enter the system during bleeding. Check reservoir fluid level during bleeding and top-up as required. Do not fill above the MAX mark.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.

Bleed

1. Raise vehicle on a ramp.
2. Check that all pipe and hose connections are tight and that there are no leaks in the system.
3. Top-up brake fluid reservoir, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.



4. Bleed sequence: 10M 0134
Secondary circuit: L.H. front to R.H. front.
Primary circuit: L.H. rear to R.H. rear.
5. Attach bleed tube to L.H. rear brake wheel cylinder bleed screw.
6. Submerge free end of bleed tube in brake fluid held in a transparent container.
7. Open bleed screw $\frac{1}{4}$ - $\frac{1}{2}$ turn anti-clockwise.
8. Depress brake pedal steadily and allow pedal to return unassisted. Repeat procedure until flow of clean air-free fluid is purged to container then, whilst maintaining pedal at end of downward stroke, tighten bleed screw to correct torque.
9. Check fluid level in reservoir and top up if necessary.

10. Repeat procedure at each wheel in sequence shown.
11. Check system for leaks.
12. Lower ramp.
13. Road test vehicle and check that brake pedal feels firm and has short travel.

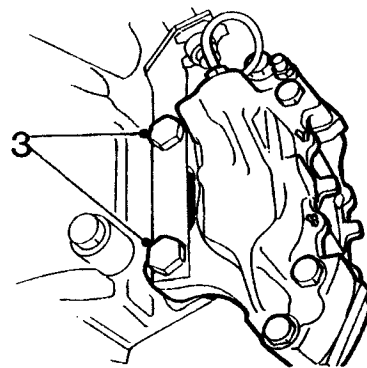
BRAKE DISC CHECKING

Service Repair No. 70.10.14

1. Raise front of vehicle.

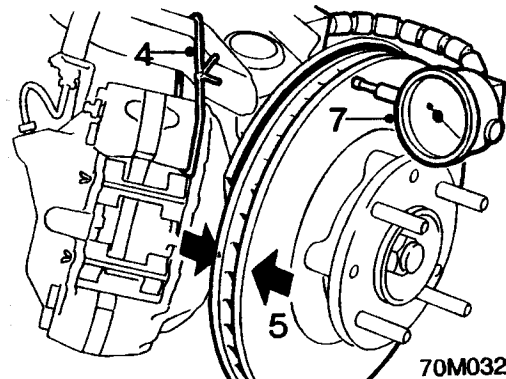
WARNING: Support on safety stands.

2. Remove road wheel(s).



70M0321 A

3. Remove 2 bolts securing caliper to hub.



70M0322 A

4. Release caliper from disc and tie aside.

CAUTION: Do not allow caliper to hang on brake hose as weight of caliper may damage hose.

5. Using a micrometer positioned 10 mm from outer edge of disc, measure the thickness of the disc at four points.

Disc thickness, new = 25.25 mm

Service limit = 24.25 mm

Disc thickness variation = 0.015 mm

6. Renew brake disc if below service limits or disc thickness variation is outside tolerances.

CAUTION: Brake discs must be renewed in pairs.

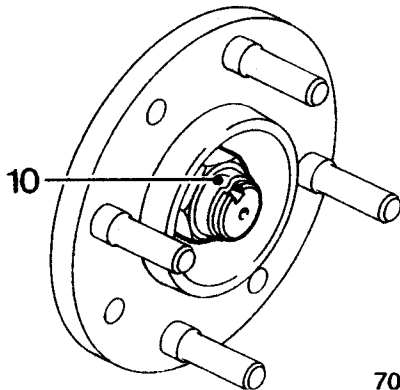
7. Position dial test indicator 6 mm from disc outer edge.

8. Rotate disc and measure disc run-out.

Disc run-out limit = 0.040 mm

BRAKES

9. If run - out exceeds limit, mark disc and hub to show position of disc on hub.

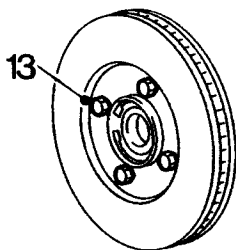


70M0323A

10. Release hub nut lock tab.
11. Remove and discard hub nut.

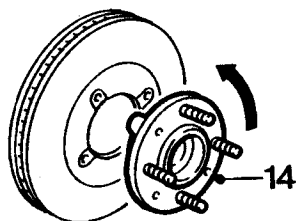
Note: Hub nuts are L.H. thread on L.H. side, and R.H. thread on R.H. side of vehicle.

12. Remove hub and disc assembly from stub shaft.



70M0324A

13. Remove 4 bolts securing disc to hub,



70M0325A

14. Remove disc from hub, rotate disc 180° then refit disc to hub.
15. Fit bolts and tighten to correct torque.
16. Refit hub and disc assembly to stub shaft, fit new hub nut and lightly tighten.
17. Recheck run - out.
18. Renew disc if run - out exceeds limit even after repeated repositioning of disc on hub.
19. Tighten hub nut to correct torque.
20. Secure lock tab.
21. Support caliper weight, untie caliper and position to hub.
22. Fit bolts and tighten to correct torque.

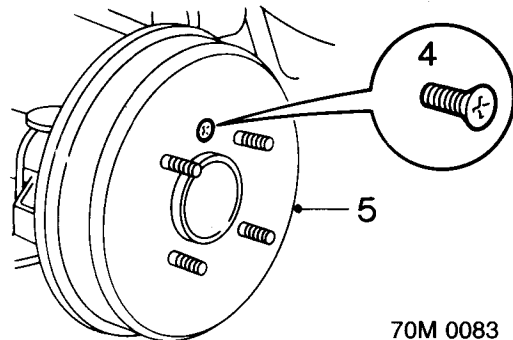
23. Fit road wheel(s) and tighten nuts to correct torque.
24. Remove stand(s) and lower vehicle.

BRAKE DRUM CHECK

1. Raise rear of vehicle.

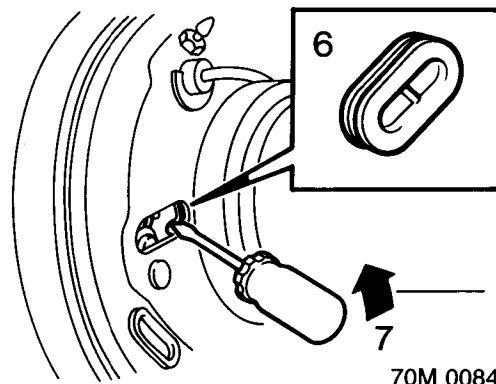
WARNING: Support on safety stands.

2. Remove road wheel(s).
3. Release handbrake.



70M 0083

4. Remove screw securing drum to hub.
5. Remove drum.



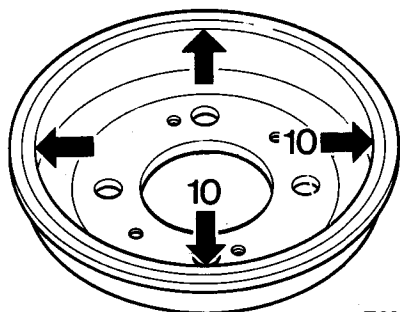
70M 0084

6. If drum cannot be removed due to wear/corrosion lip, remove rubber grommet from rear of brake backplate.
7. Depress adjuster using a small screwdriver and retract brake shoes.
8. Refit rubber grommet.
9. Renew drum if scored, grooved or cracked.



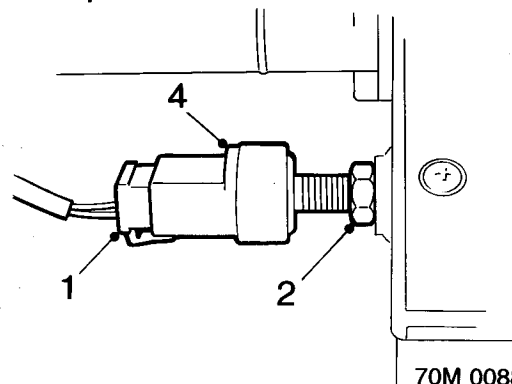
STOPLIGHT SWITCH - ADJUST

Service Repair No. 70.35.41



70M0328

10. Using internal micrometer, measure inside diameter of drum at 4 points.
Drum standard internal dia. = 229mm
Drum service limit = 230mm
Maximum drum ovality = 0.12mm
11. Renew drum if service limits are exceeded.
12. Wipe drum clean.
13. Apply Molykote 111 grease to brake shoe contact points.
14. Fit drum, fit and tighten screw to correct torque.
15. Fit road wheel(s) and tighten nuts to correct torque.
16. Remove stand(s) and lower vehicle.
17. Apply footbrake 3 times to set shoe to drum clearance.



70M 0088

1. Disconnect multiplug from stoplight switch.
2. Slacken switch locknut.
3. Connect Ohmmeter across switch terminals.
4. With brake pedal released, screw switch in until open circuit exists, then screw switch in one further complete turn.
5. Hold switch against rotation and tighten locknut.

CAUTION: Ensure that switch does not prevent pedal from returning fully.

6. Disconnect Ohmmeter and connect multiplug to switch.
7. Switch on ignition and check operation of stoplights.



FRONT BRAKE DISC

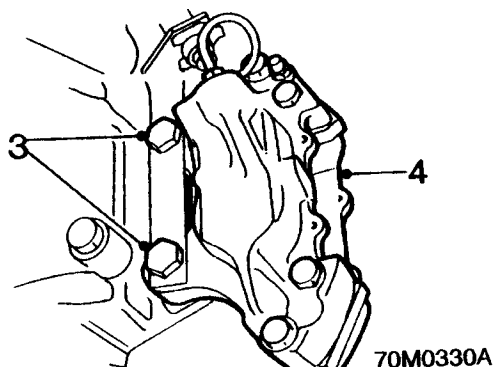
Service Repair No. 70.10.10

Remove

1. Raise front of vehicle, one side.

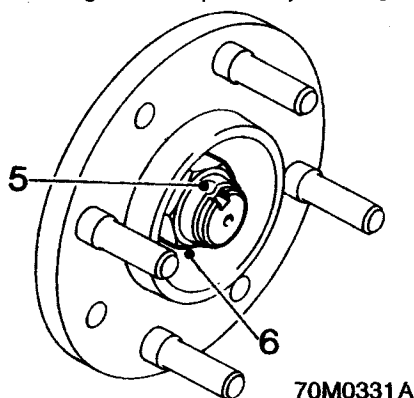
WARNING: Support on safety stands.

2. Remove road wheel(s).



3. Remove 2 bolts securing caliper to hub.
4. Release caliper from disc and tie aside.

CAUTION: Do not allow caliper to hang on brake hose as weight of caliper may damage hose.



5. Release hub nut staking from slot in hub shaft.
6. Remove and discard hub nut.

CAUTION: Hub nuts are handed:

L.H. thread on L.H. side.

R.H. thread on R.H. side.

7. Remove hub and disc assembly from stub shaft.
8. Remove 4 bolts securing disc to hub.
9. Remove disc from hub.

Refit

CAUTION: Brake discs must only be replaced in pairs.

1. Fit disc to hub. Tighten bolts to correct torque.
2. Fit hub and disc assembly to stub shaft, fit new hub nut and lightly tighten.
3. Check disc run - out, see **Adjustments**.
4. Tighten hub nut to correct torque and stake nut to slot in shaft.

5. Support caliper weight, untie caliper and position to hub.
6. Fit bolts and tighten to correct torque.
7. Apply footbrake several times to enable brake pads to position correctly.
8. Fit road wheels and tighten nut to correct torque.
9. Remove stand(s) and lower vehicle.

FRONT BRAKE CALIPER

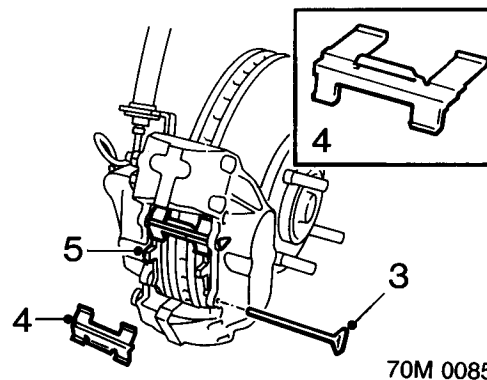
Service Repair No. 70.55.02

Remove

1. Raise front of vehicle, one side.

WARNING: Support on safety stands.

2. Remove road wheel(s).

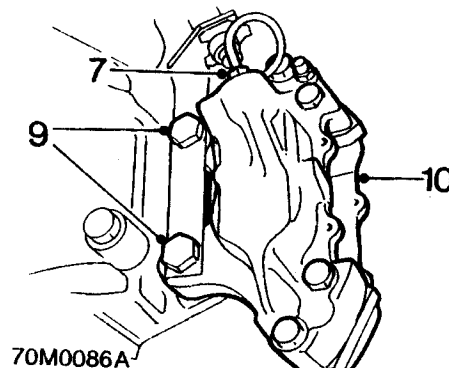


3. Close ends and withdraw 2 split pins from caliper. Discard split pins.
4. Remove 2 anti - rattle springs.

Note: Short legs to centre.

5. Remove 2 brake pads.
6. Position cloth to absorb spilled brake fluid.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.



7. Release caliper brake pipe union.
8. Plug pipe and caliper.
9. Remove 2 bolts securing caliper to hub.
10. Remove caliper.

BRAKES

Refit

1. Position caliper to hub.
2. Position brake hose bracket to caliper.
3. Fit bolts and tighten to correct torque.
4. Fit new pads if old pads are unserviceable.
Minimum pad thickness including backplate
= 6.5mm.

WARNING: Brake pads must be renewed in axle sets only. Braking efficiency may otherwise be impaired.

5. Fit anti-rattle springs and secure using new split pins.
6. Remove plugs from brake pipe and caliper.
7. Position pipe to caliper and tighten pipe union to correct torque.
8. Bleed brakes, see **Adjustments**.
9. Apply footbrake several times to enable pads to position correctly.
10. Fit road wheel(s) and tighten nuts to correct torque.
11. Remove stand(s) and lower vehicle.

BRAKE MASTER CYLINDER AND FLUID LEVEL SWITCH

Service Repair No. Master cylinder - 70.30.08

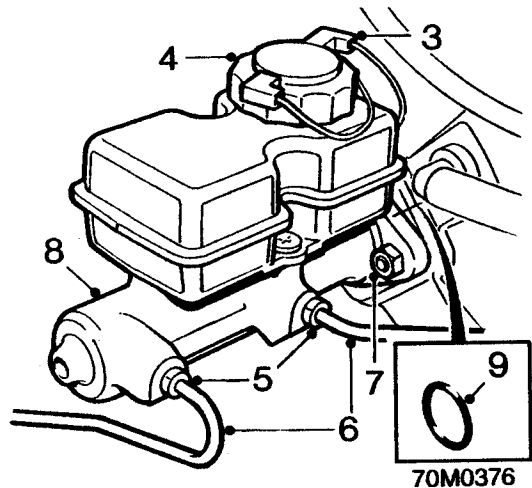
Service Repair No. Fluid level switch - 70.25.08

Remove

1. Disconnect battery earth lead.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.

2. Clean area around master cylinder filler cap.



3. Disconnect 2 Lucars from fluid level switch.
4. Remove filler cap.

Note: Invert cap during removal to prevent fluid spillage from fluid level switch float chamber.

5. Release 2 master cylinder pipe unions.
6. Release 2 pipes from master cylinder. Plug pipe and master cylinder.
7. Remove 2 nuts and washers securing master cylinder to servo.
8. Remove master cylinder.
9. Remove and discard 'O' ring.

CAUTION: Do not allow hydraulic fluid or foreign matter to enter servo.

Refit

1. Remove plastic plugs from new master cylinder.
2. Fit and correctly locate new 'O' ring to master cylinder.
3. Position master cylinder, engage servo push rod and fit master cylinder to servo.
4. Fit washers, fit nuts and tighten to correct torque.
5. Remove plugs from pipes.
6. Align pipes to master cylinder and tighten pipe unions to correct torque.
7. Using recommended fluid, fill master cylinder reservoir to correct level.



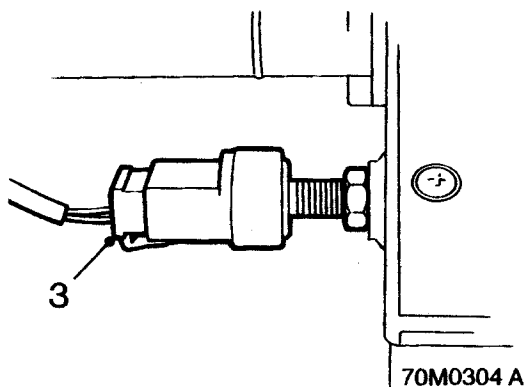
8. Bleed brake system, see **Adjustments**.
9. Fit filler cap and connect Lucars to fluid level switch.
10. Connect battery earth lead.

SERVO ASSEMBLY

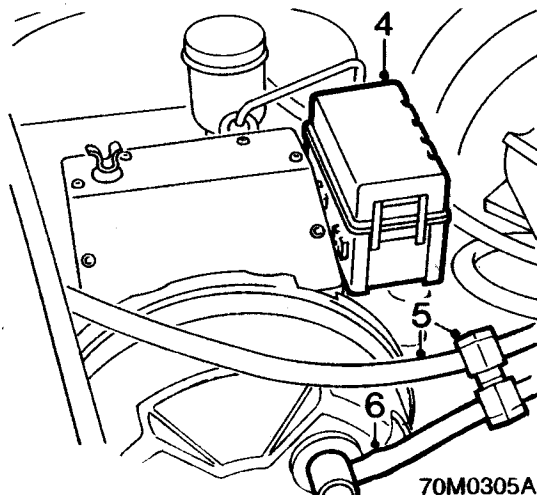
Service Repair No. Servo Assembly - 70.50.01

Remove

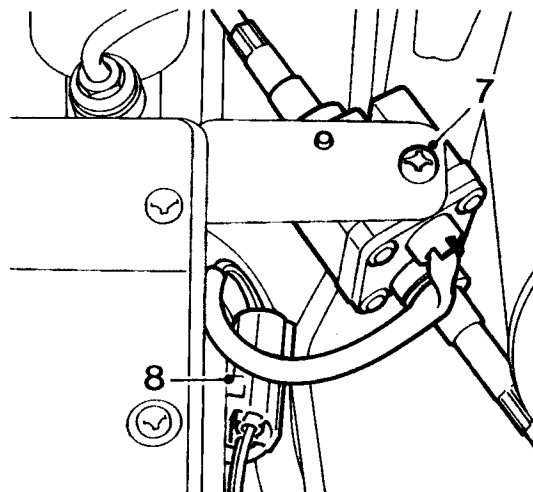
1. Disconnect battery earth lead.
2. Remove brake master cylinder.



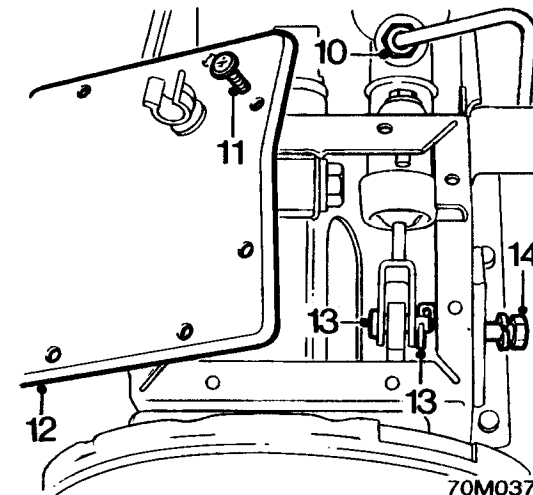
3. Release connector from stop light switch.



4. Release fuse box from pedal box and position aside.
5. Release throttle cable from clip and position aside.
6. Release vacuum hose from brake servo.

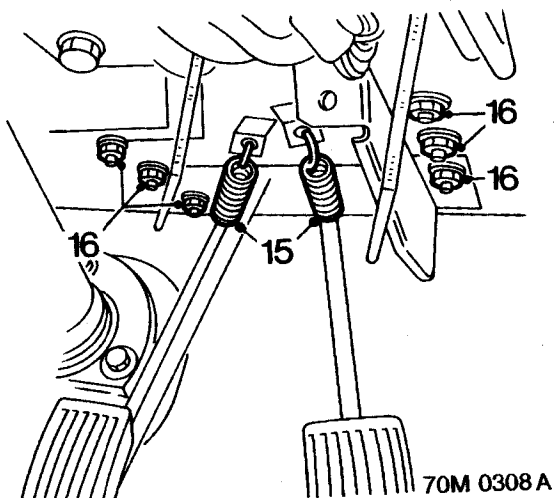


7. Remove screw securing speed sensor to bracket and position sensor aside.
8. Release clip securing speed sensor connector to pedal box and position harness aside.

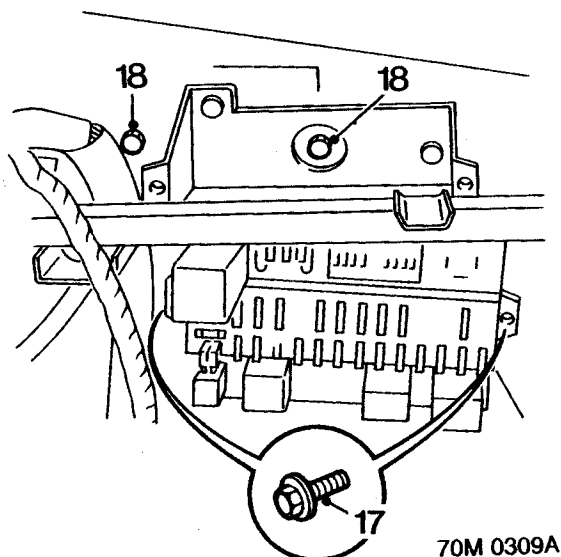


9. Place cloth beneath clutch master cylinder to absorb fluid spillage.
10. Release pipe union from clutch master cylinder; plug pipe and master cylinder, position pipe aside.
11. Remove 8 screws securing pedal box cover plate.
12. Remove cover plate.
13. Remove retaining clip and clevis pin from from clutch pedal.
14. Remove pivot bolt from clutch lever; collect spring washer.

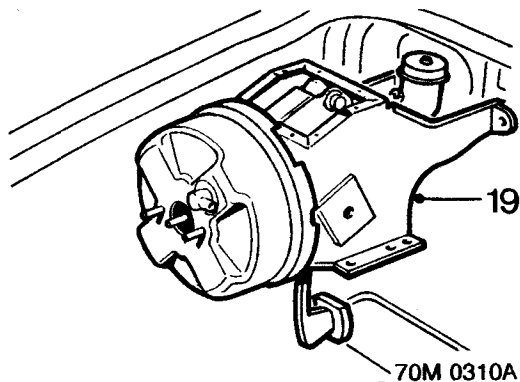
BRAKES



15. Release pedal return springs from body tags.
16. Remove 6 nuts securing pedal box to body.

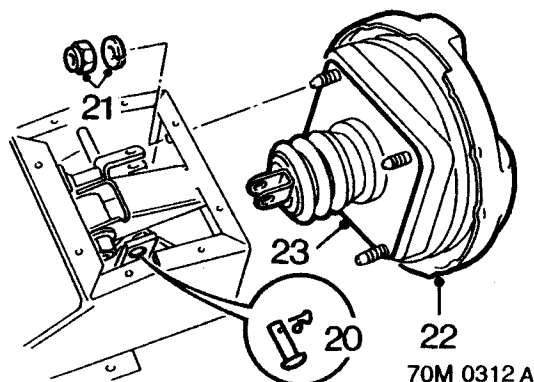


17. Remove 2 bolts securing main fuse box to bracket and position fuse box aside for access.
18. Remove 2 bolts securing pedal box to bulkhead.



19. Release clutch pedal from pedal box and remove pedal box complete with brake pedal and servo.

Do not carry out further dismantling if component is removed for access only



20. Remove retaining clip and clevis pin from brake pedal.
21. Remove 4 nuts and spring washers securing brake servo to pedal box.
22. Remove servo.
23. Remove and discard gasket.

Refit

1. Clean mating surfaces of pedal box and brake servo.
2. Clean clevis pin.
3. Fit new servo gasket.
4. Fit servo to pedal box; fit spring washers and nuts; tighten nuts to correct torque.
5. Lubricate servo trunnion clevis pin using Molykote 44 grease.
6. Align holes in pedal and brake servo trunnion; fit clevis pin and secure with retaining clip.
7. Fit pedal box assembly and locate clutch pedal.
8. With assistance, align clutch lever and fit pivot bolt with spring washer. Tighten pivot bolt.
9. Align pedal box to body; fit nuts and bolts and tighten to correct torque.
10. Connect pedal return springs to body tags.
11. Position main fuse box to bracket; fit and tighten bolts.
12. With assistance, align holes in clutch pedal and master cylinder trunnion.
13. Clean clevis pin and lubricate using Molykote 44 grease.
14. Fit clevis pin and secure with retaining clip.
15. Fit cover plate to pedal box; fit screws and tighten to correct torque.
16. Connect multiplug to brake light switch.
17. Secure speed sensor connector to pedal box.
18. Position speed sensor to bracket; fit and tighten screw.
19. Position fuse box and secure clips to bracket.
20. Remove plugs from clutch master cylinder and pipe.
21. Connect pipe to clutch master cylinder; tighten union to correct torque.



22. Connect vacuum hose to servo, ensuring grommet is not distorted.

CAUTION: Avoid pushing grommet into servo.

23. Position throttle cable and secure to clip.
24. Refit brake master cylinder.
25. Bleed brakes, see **Adjustments**.
26. Bleed clutch system, see **CLUTCH**.
27. Connect battery earth lead.

WHEEL CYLINDER

Service Repair No. 70.60.19

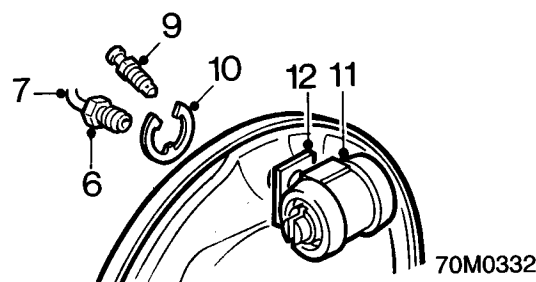
Remove

1. Raise rear of vehicle.

WARNING: Support on safety stands.

2. Remove road wheel(s).
3. Release handbrake.
4. Remove brake shoes, see **MAINTENANCE**.
5. Position cloth to absorb spilled brake fluid.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.



6. Release wheel cylinder brake pipe union.
7. Move pipe aside.
8. Plug pipe and wheel cylinder orifices.
9. Remove bleed screw.
10. Remove circlip, wheel cylinder to backplate, noting correct fitting of circlip.
11. Remove wheel cylinder.
12. Remove gasket.

Refit

1. Remove bleed screw from new wheel cylinder.
2. Fit gasket to wheel cylinder and fit cylinder to backplate using circlip.

CAUTION: Ensure that circlip is fitted correctly.

3. Fit but do not tighten bleed screw.
4. Remove brake pipe plug.
5. Position pipe to wheel cylinder and tighten pipe union to correct torque.
6. Bleed brakes, see **Adjustments**.
7. Fit road wheel(s) and tighten nuts to correct torque.
8. Remove stand(s) and lower vehicle.

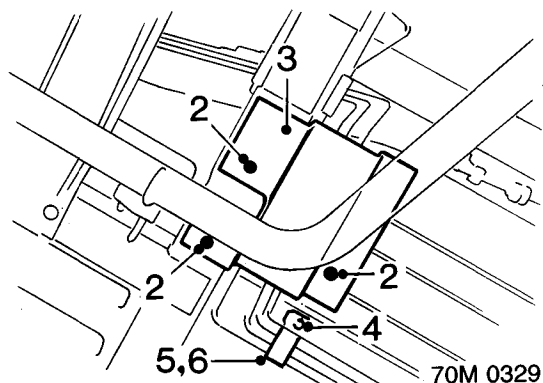
BRAKES

PRESSURE REDUCING VALVE

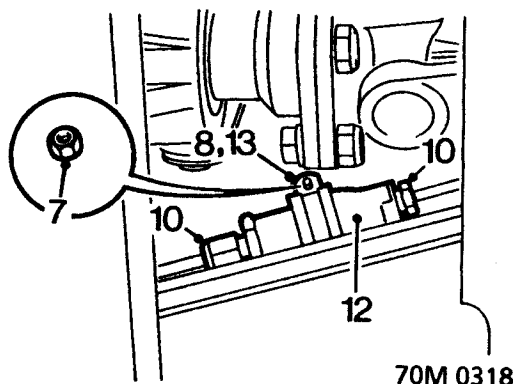
Service Repair No. 70.25.21

Remove

1. Raise vehicle on a ramp.



2. Remove 2 bolts and nut securing centre exhaust heatshield.
3. Remove heatshield.
4. Remove nut securing brake and fuel pipe clamp.
5. Release and remove clamp.
6. Remove clamp rubber.



7. Remove nut securing valve mounting bracket.
8. Release mounting bracket from stud.
9. Position cloth to absorb brake fluid spillage.

CAUTION: Do not allow brake fluid to contact paint finished surfaces as paint may be damaged. If spilled, remove fluid and clean area with clean warm water.

10. Release pipe unions from valve.
11. Plug pipes and valve orifices.
12. Remove valve.
13. Remove mounting bracket from valve.

Refit

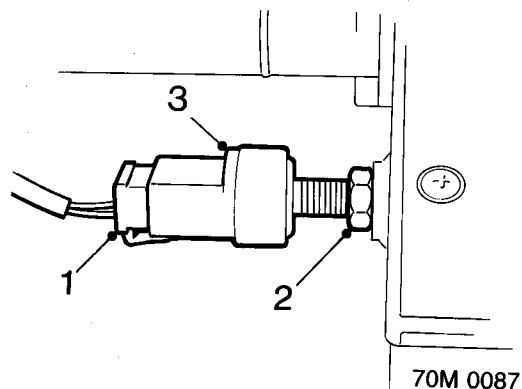
1. Fit mounting bracket to valve.
2. Remove plugs from pipes and valve.
3. Clean pipe unions.
4. Connect pipes to valve.
5. Position valve mounting bracket to stud.
6. Fit and tighten nut.
7. Fit clamp rubber to fuel and brake pipes.
8. Fit clamp.

9. Secure clamp to stud and fit and tighten nut.
10. Fit centre exhaust shield.
11. Fit and tighten nut and bolts.
12. Bleed brakes, see **Adjustments**.
13. Lower ramp.

STOPLIGHT SWITCH

Service Repair No. 70.35.42

Remove



1. Disconnect switch multiplug.
2. Slacken switch locknut.
3. Remove switch.
4. Remove switch locknut.

Refit

1. Fit locknut to new switch.
2. Fit switch to pedal bracket.
3. Adjust switch, see **Adjustments**.



HANDBRAKE CABLES

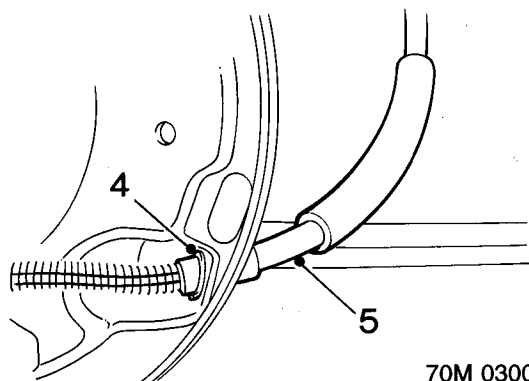
Service Repair No. 70.35.16

Remove

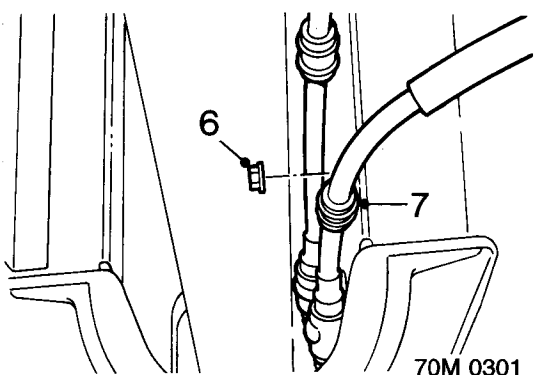
1. Raise rear of vehicle.

WARNING: Support on safety stands.

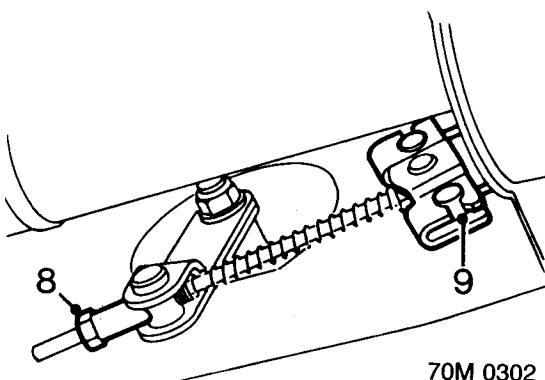
2. Remove road wheel(s).
3. Remove brake shoes, see **MAINTENANCE**.



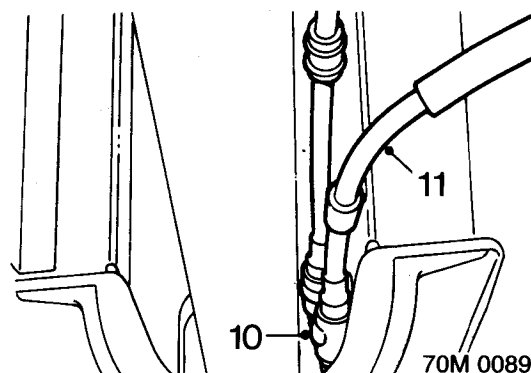
4. Remove clip securing handbrake cable to brake backplate.
5. Release cable from backplate.



6. Remove nut securing cable clip to transmission tunnel.
7. Release clip from stud.



8. Slacken handbrake cable adjusting nut.
9. Release inner cable from compensator.



10. Release outer cable from fixed abutment.
11. Remove handbrake cable.
12. Repeat procedure for other cable.

Refit

1. Fit cable to fixed abutment and connect inner cable to compensator.
2. Secure cable clip to stud, fit and tighten nut.
3. Fit cable to backplate and secure with clip.
4. Repeat procedure for other cable.
5. Fit brake shoes, see **MAINTENANCE**.
6. Adjust handbrake, see **MAINTENANCE**.
7. Apply handbrake hard several times to pre-stretch cables.
8. Re-check handbrake adjustment.
9. Fit road wheel(s) and tighten nuts to correct torque.
10. Remove stand(s) and lower vehicle.

BODY

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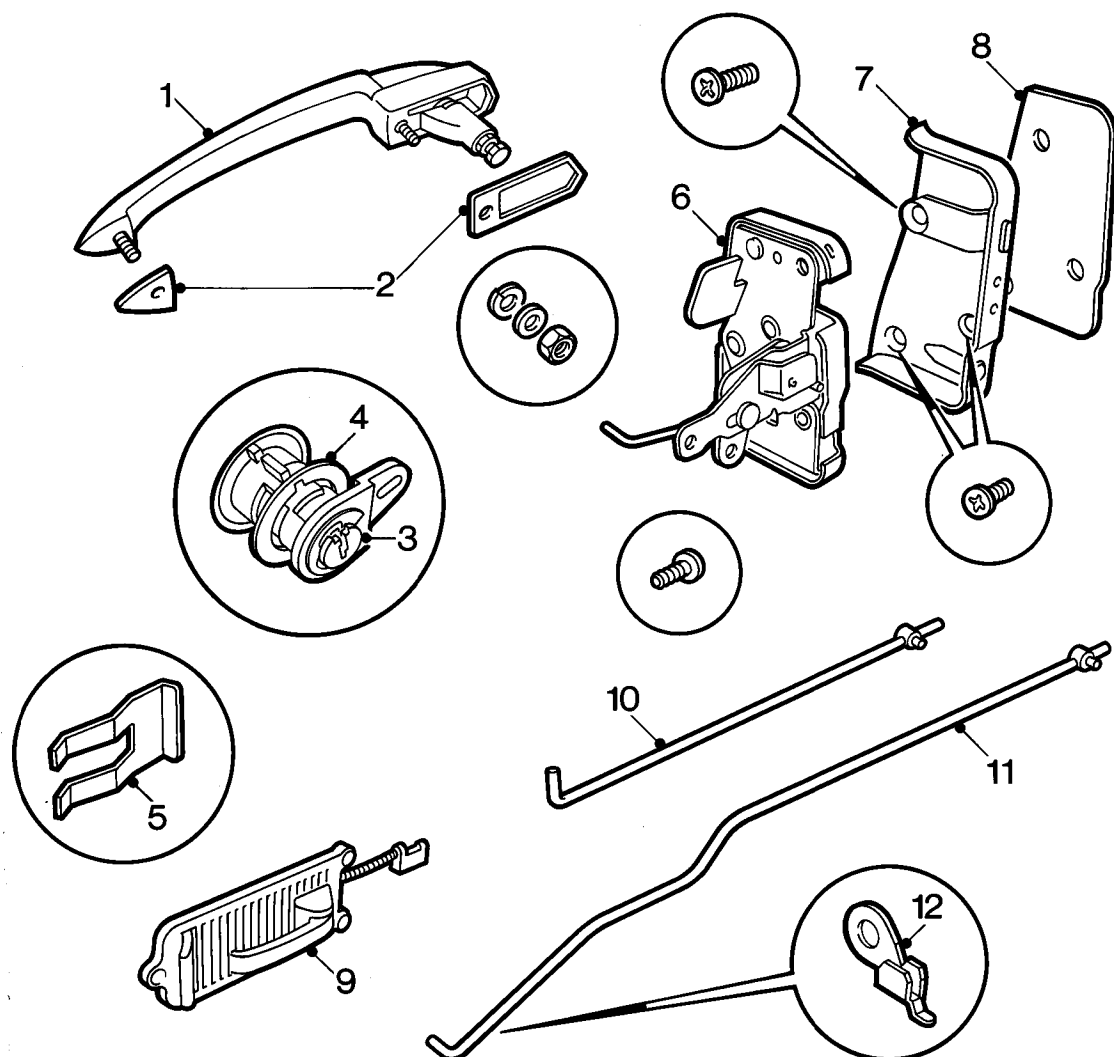
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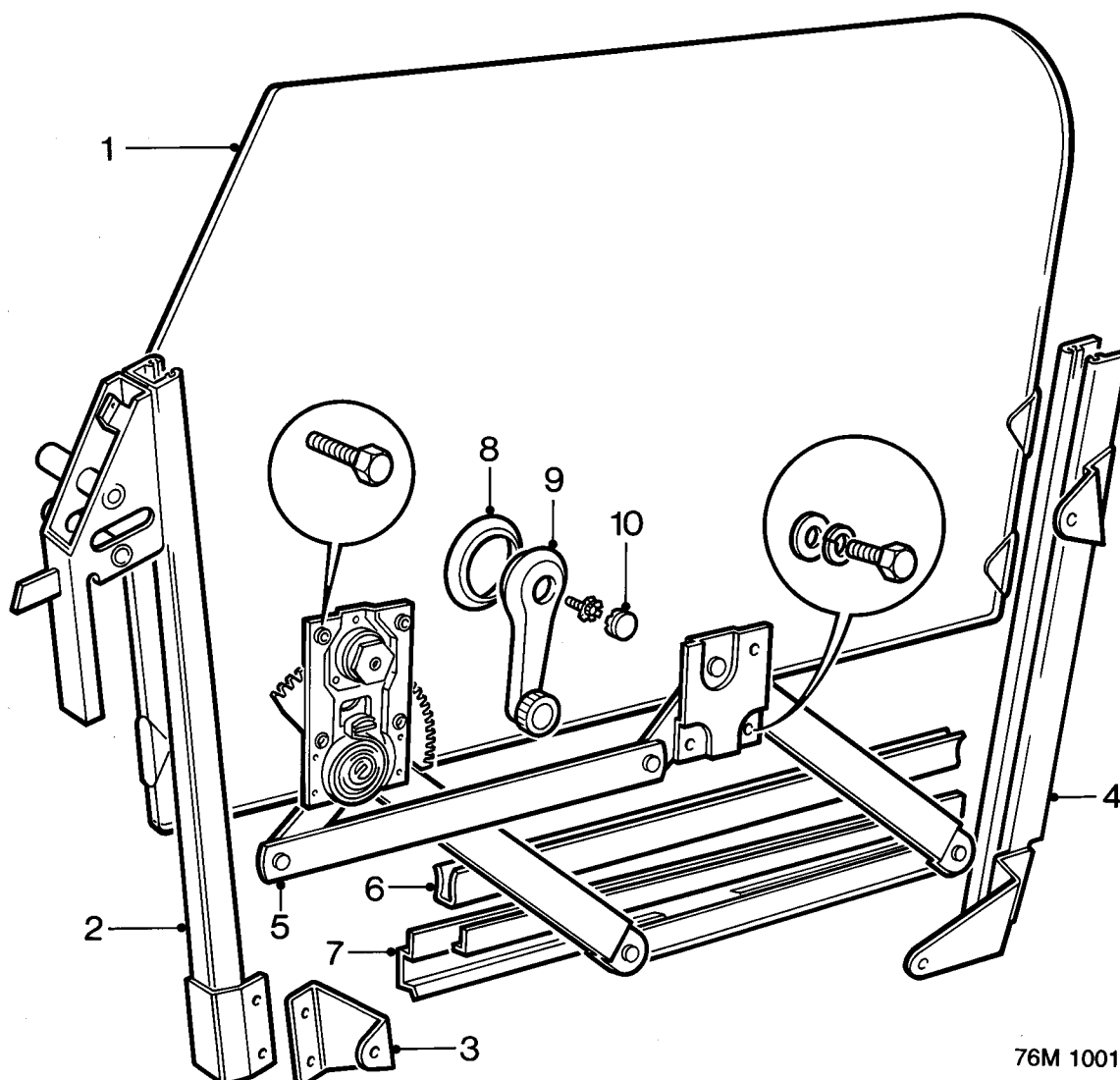
BODY



76M 1002

DOOR LOCK COMPONENTS - RH illustrated

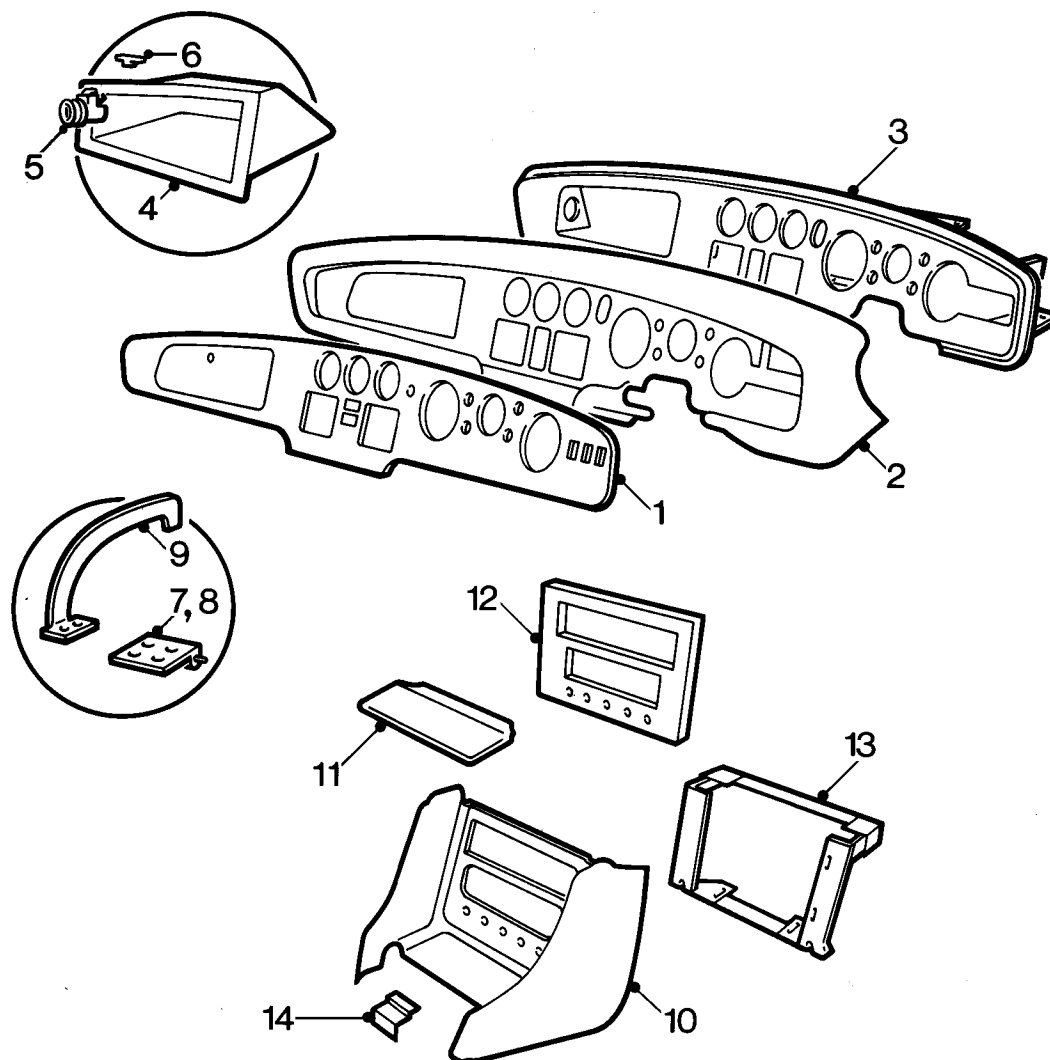
- | | |
|-------------------|-----------------------------|
| 1. Door handle | 7. Striker plate |
| 2. Handle gaskets | 8. Shim (as required) |
| 3. Door lock | 9. Door lock release handle |
| 4. Lock gasket | 10. Link rod - locking |
| 5. Spring clip | 11. Link rod - opening |
| 6. Latch assembly | 12. Link rod clip |



76M 1001

WINDOW LIFT COMPONENTS - RH illustrated

- | | |
|-------------------------|----------------------------|
| 1. Door glass | 6. Glazing rubber |
| 2. Glass front channel | 7. Lower channel |
| 3. Lower inner bracket | 8. Handle escutcheon |
| 4. Glass rear channel | 9. Window regulator handle |
| 5. Door glass regulator | 10. Handle cap |



76M 1000

FASCIA AND CONSOLE COMPONENTS - RH illustrated

- | | |
|-----------------------------|-----------------------------|
| 1. Fascia panel veneer | 8. Hinge - right |
| 2. Fascia crash roll | 9. Check arm |
| 3. Fascia armature | 10. Front console - radio |
| 4. Glovebox | 11. Console pad |
| 5. Lock assembly - glovebox | 12. Radio panel veneer |
| 6. Striker - lock | 13. Trim bracket - console |
| 7. Hinge - left | 14. Lower bracket - console |



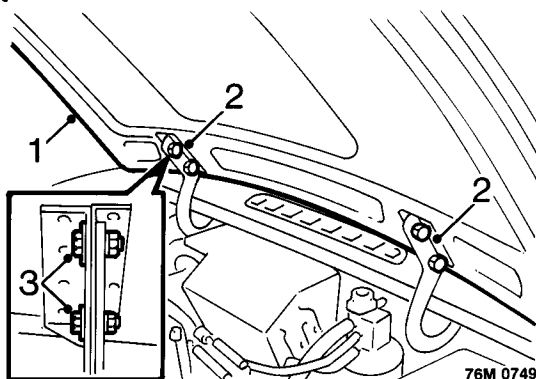
BONNET ALIGNMENT

Service Repair No. 76.16.02

Check

1. Close bonnet, note alignment of bonnet in body aperture.
Clearances should be equal.
2. Press against bonnet in lock area.
Bonnet should move fractionally against latch pin spring.

Adjust



1. Open bonnet and support.
2. Mark round hinges for reference.
3. Slacken 2 nuts and bolts securing bonnet to hinges.
4. Lower bonnet onto its safety catch.
5. Adjust bonnet position to equalise gaps to body and align height to wings.
6. Open bonnet and support.
7. Tighten bonnet hinge nuts and bolts.
8. Close bonnet, check height of bonnet relative to grille panel.
9. Bonnet low – screw striker pin out.
10. Bonnet high – screw striker pin in.
11. Lubricate bonnet catch and safety catch.
12. Recheck bonnet for ease of closing.

DOOR STRIKER

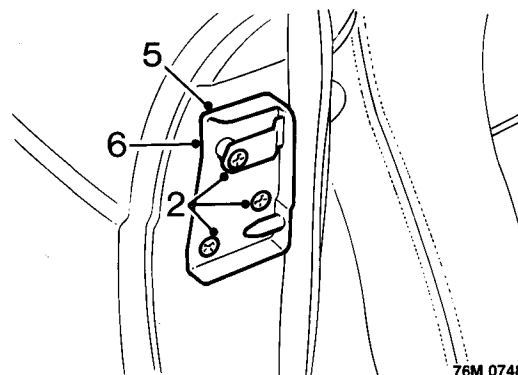
Service Repair No. 76.28.05

Check

1. Close door, note alignment of door in body aperture.
Clearances should be equal.
2. Press against door in lock area.
Door should move fractionally against its seal.

Adjust

1. Open door.



2. Slacken 3 screws securing striker, to permit striker movement but tight enough to allow door to be closed.
3. Close door to fully latched position. **Never slam the door.**
4. Press door inwards or pull it outwards to align with body panel.
5. Open door, draw a pencil line round striker.
6. Set striker at right angles to hinge axis and tighten striker screws.
7. Recheck door for ease of closing and alignment.

DOOR ALIGNMENT

Service Repair No. 76.28.07

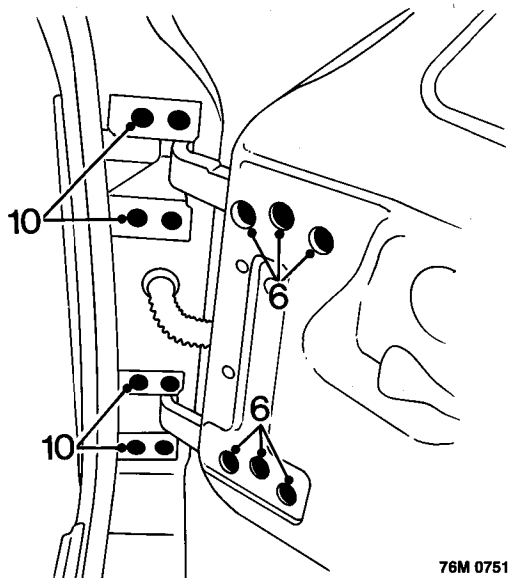
Check

1. Close door, note alignment of door in body aperture press against door in lock area.
Clearances should be equal and fractional movement should be felt against the door seals, if not, adjust striker.
2. Open door, if door drops or lifts as door latch is released, adjust door.

Adjust door

1. Remove door capping.
2. Remove door trim pad.
3. Release front of plastic sheet from door.
4. Remove door latch.
5. Position trolley jack under centre of open door and raise jack until it just supports door.

CAUTION: Place protective pad on lifting head of jack.



76M 0751

6. Slacken 6 hinge to door screws.
7. Adjust door alignment using the jack.
8. Tighten hinge to door screws.
9. Remove jack, close door and check alignment.
10. Slacken 8 hinge to body screws.
11. Adjust door alignment to wing panel.
12. Tighten hinge to body screws.
13. Fit and adjust door latch.
14. Refit plastic sheet to door panel.
15. Refit door trim pad.
16. Refit door capping.

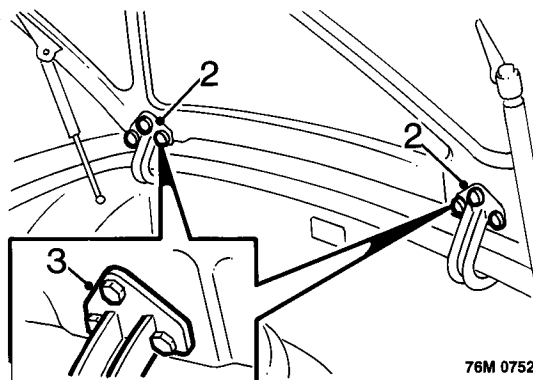
LUGGAGE COMPARTMENT LID ALIGNMENT

Service Repair No. 76.19.03

Check

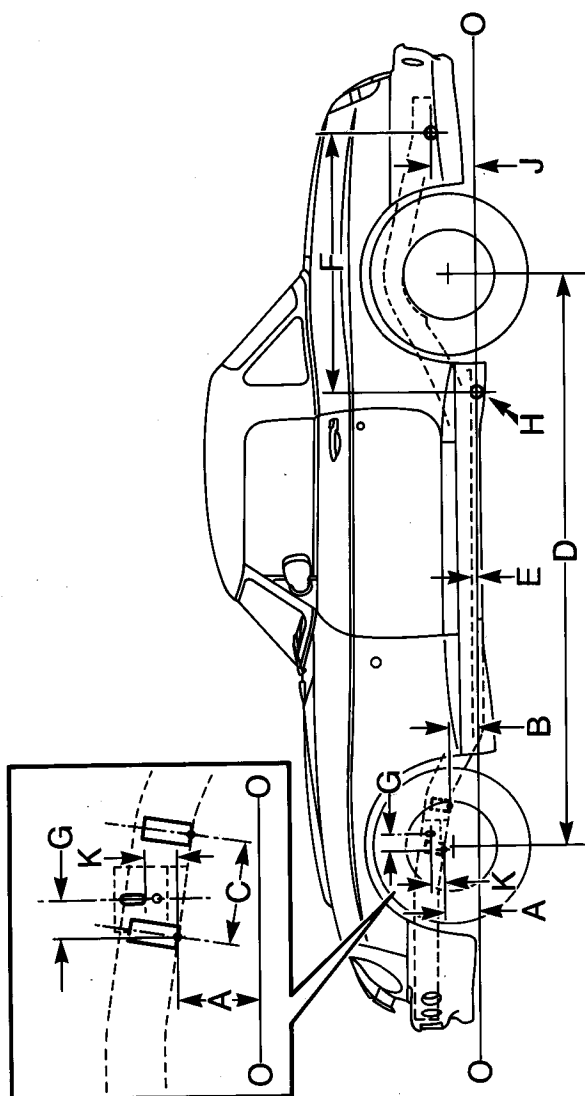
1. Close luggage compartment lid, note alignment of lid in body aperture. Lid should align with body panel and clearances should be equal all round.

Adjust



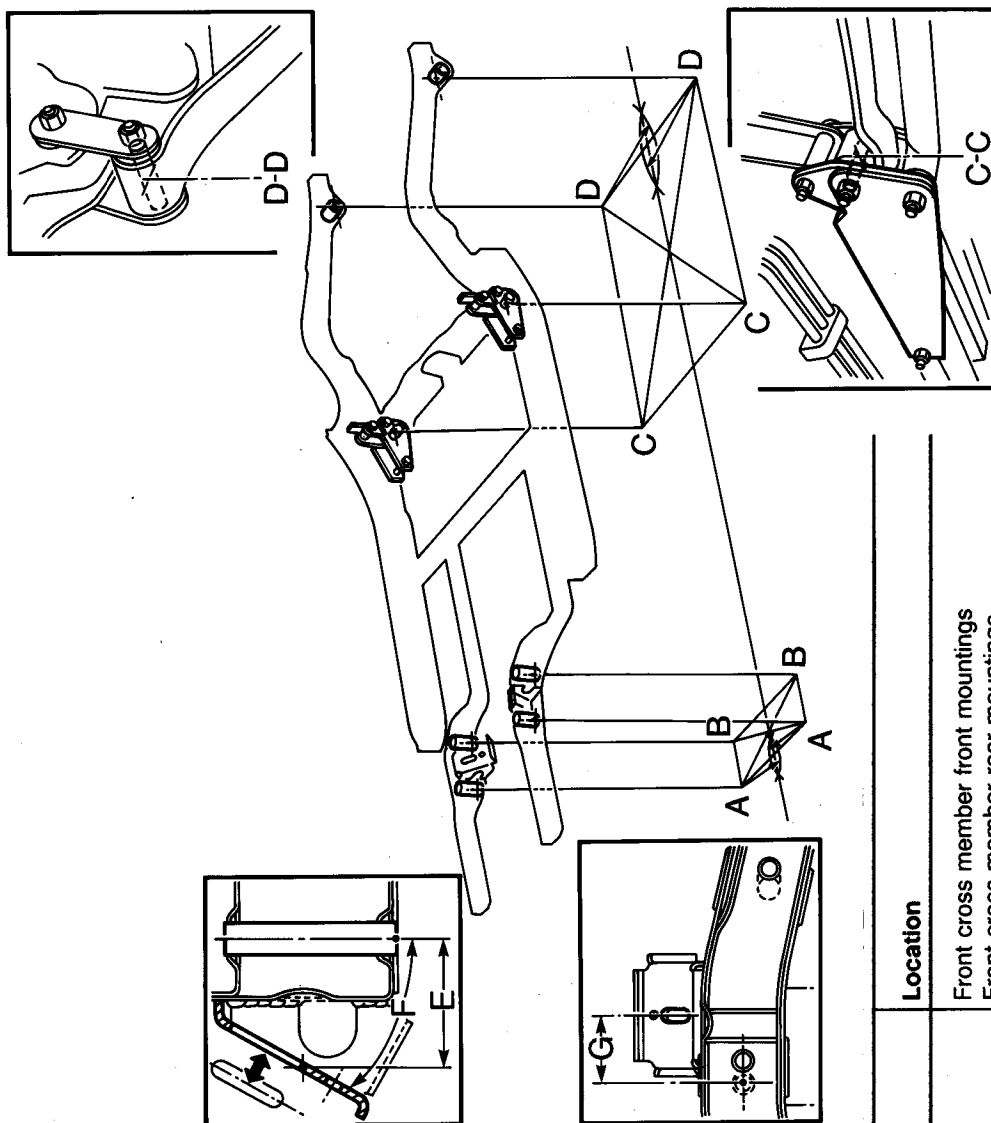
76M 0752

1. Open luggage compartment lid.
2. Mark around hinges for reference.
3. Slacken 6 bolts securing lid to hinges.
4. Adjust lid position to equalise gaps and fit shims to align height to body. Tighten bolts.
5. Close lid. Check height of lid relative to body, adjust striker position as required.
6. Lubricate latch and check lid for ease of closing.



76M 1040

Code	Dimension	Location
O - O	--	Datum line
A	168.1 \pm 1.6 mm	Datum to front cross member front mounting
B	138.4 \pm 1.6 mm	Datum to front cross member rear mounting
C	163.5 \pm 1.0 mm	Front to rear mounting - front cross member
D	2310 mm	Wheelbase
E	10.3 mm	Datum to bottom sill
F	1093.8 \pm 1.6 mm	Rear spring centres - eye to eye
G	54 mm	Engine mounting slot to cross member front mounting - rearward dimension
H	0 \pm 1.6 mm	Datum to rear spring front mounting
J	142.25 mm	Datum to rear spring shackle mounting
K	35.7 \pm 8 mm	Bottom of engine mounting slot to cross member front mounting - vertical height



76M 1039

Code	Dimension	Location
A - A	473.1 ± 1.6 mm	Front cross member front mountings
B - B	515.1 ± 1.6 mm	Front cross member rear mountings
C - C	940 ± 1.0 mm	Rear spring front mounting brackets - centre of brackets
D - D	940 ± 1.0 mm	Rear spring shackle mounting brackets - centre of brackets
E	60.7 mm	Engine mounting slot to front cross member - inside faces
F	30°	Angle to vertical of engine mounting bracket
G	54 mm	Engine mounting slot to cross member front mounting - rearward dimension



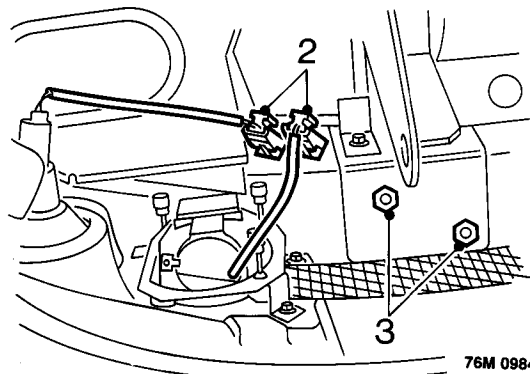
FRONT BUMPER VALANCE

Service Repair No. 76.22.72

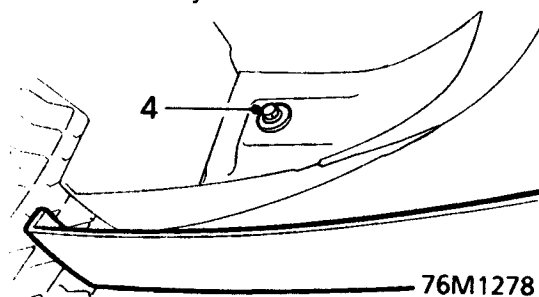
Remove

1. Raise front of vehicle.

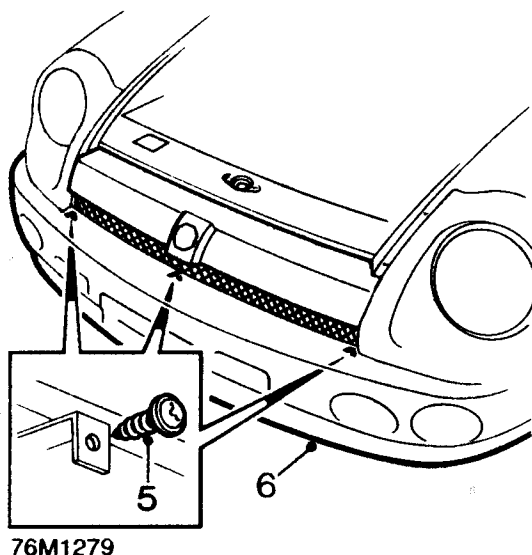
WARNING: Support on safety stands.



2. Release multiplug retainers and disconnect 2 fog and 2 indicator lamp multiplugs.
3. Remove 2 nuts and bolts securing bumper to each body bracket.



4. Remove 2 bolts securing bumper to body; 1 each side.

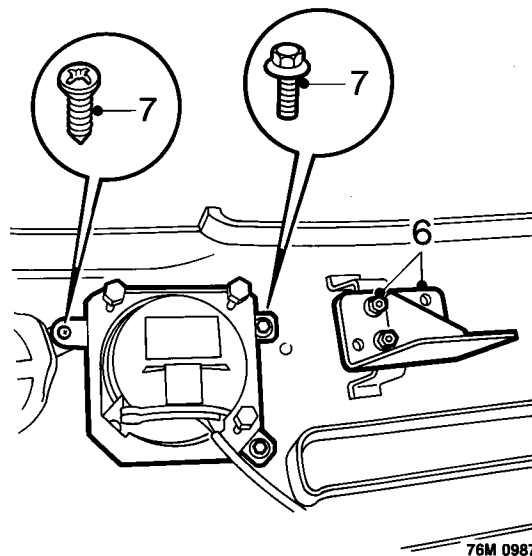


5. Remove 3 screws securing front grille to bumper brackets.

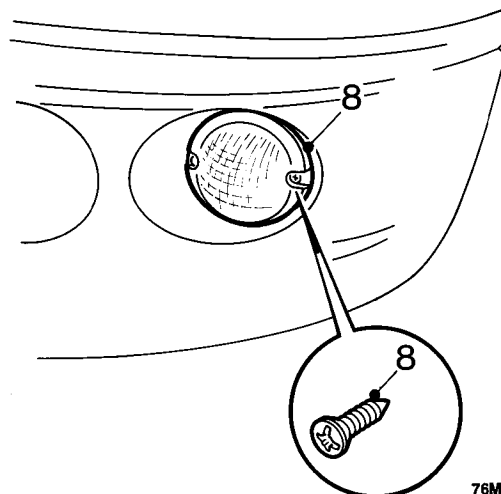
Note: Cars fitted with air conditioning only have one screw fitted in the centre.

6. Using assistance, remove bumper valance assembly.

Do not carry out further dismantling if component is removed for access only



7. Remove 2 nuts and bolts securing each mounting bracket and remove brackets.
8. Remove 3 screws securing each fog lamp and remove lamps.



9. Remove 2 screws securing each indicator lamp and remove lamps.
10. Remove number plate.
11. Remove 10 screws securing front grille to bumper and remove grille.
12. Transfer components removed to new bumper.

Refit

1. Using assistance, position bumper.
2. Fit and tighten bumper to body bracket bolts.
3. Fit and tighten bumper side bracket bolts.
4. Fit and tighten screws securing front grille

BODY

5. Connect fog and indicator lamp multiplugs and secure multiplug retainers.
6. Remove stand(s) and lower vehicle.

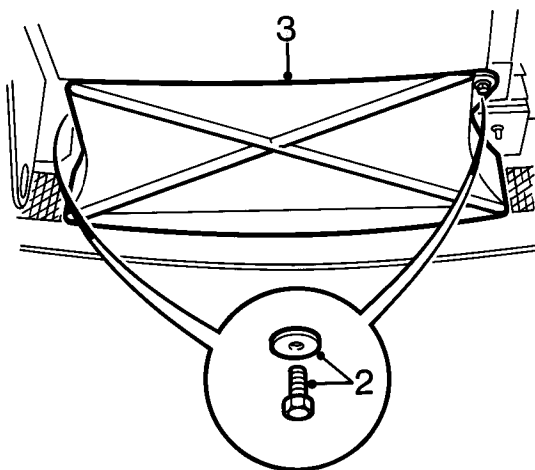
UNDER COWLING

Service Repair No. 76.10.50

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.



76M 0990

2. Remove 2 bolts with plain washers securing under cowl to body.
3. Remove under cowl.

Refit

1. Position under cowl and engage rearward end to radiator.
2. Secure under cowl with bolts and plain washers.
3. Remove stand(s) and lower vehicle.

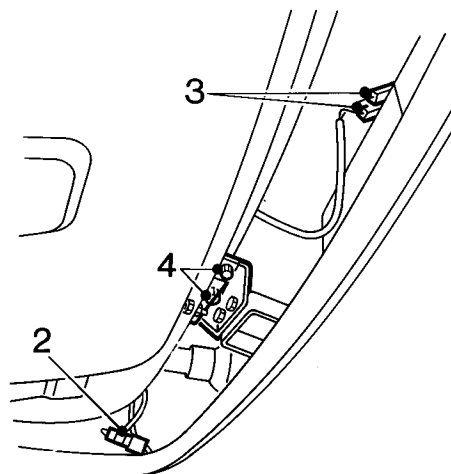
REAR BUMPER VALANCE

Service Repair No. 76.22.74

Remove

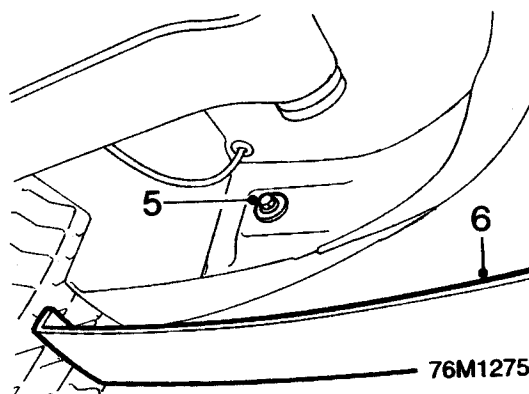
1. Raise rear of vehicle.

WARNING: Support on safety stands.



76M 0988

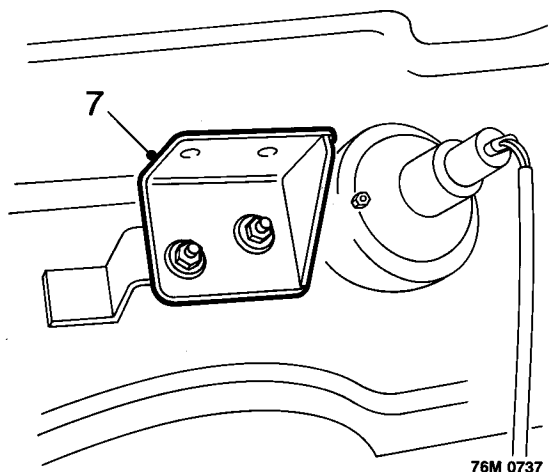
2. Release retainers and disconnect 2 fog guard lamp multiplugs.
3. Disconnect 2 Lucars from each number plate lamp.
4. Remove 2 nuts and bolts securing bumper to each body bracket.



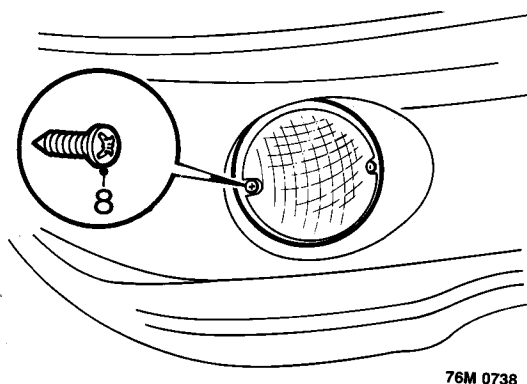
76M1275

5. Remove 2 bolts securing bumper to body; 1 each side.
6. Using assistance, remove bumper valance assembly.

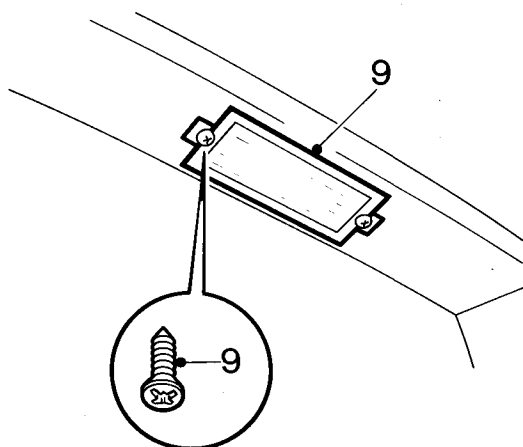
Do not carry out further dismantling if component is removed for access only



7. Remove 2 nuts and bolts securing each mounting bracket and remove brackets.



8. Remove 2 screws securing each fog guard lamp and remove lamps.



9. Remove 2 screws securing each number plate lamp and remove lamps.
10. Remove number plate.
11. Transfer components removed to new bumper.

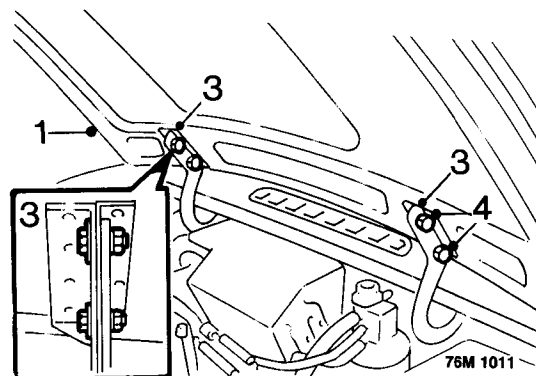
Refit

1. Using assistance, position bumper to body brackets and tighten bolts.
2. Fit and tighten bumper side bracket bolts.
3. Connect Lucars to each number plate lamp.
4. Connect fog guard lamp multiplugs and secure multiplug retainers.
5. Remove stand(s) and lower vehicle.

BONNET

Service Repair No. 76.16.01

Remove



1. Support bonnet in open position.
2. Fit protective covers to wings.
3. Mark hinge outline on bonnet, if bonnet is to be refitted.
4. Remove 2 nuts and bolts with spring and plain washers securing bonnet to each hinge.
5. Remove bonnet assembly.

Refit

1. Position bonnet on hinges.
Existing bonnet: Align hinge outlines. *New bonnet:* Centralise bolts in hinges.
2. Fit bolts and lightly tighten.
3. Adjust bonnet, see **Adjustments**.

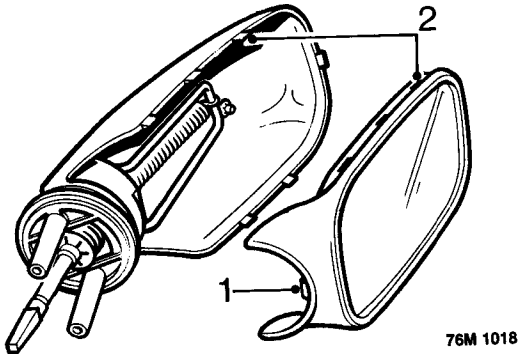
BODY

EXTERIOR MIRROR GLASS

Exterior mirror glass

Service Repair No. 76.11.11

Remove

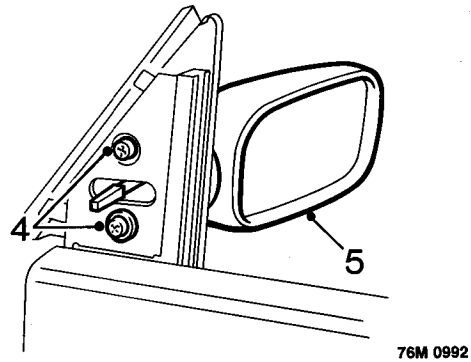


WARNING: Eye protection and gloves must be worn when removing and fitting glass.

1. Use a flat ended screwdriver and ease central retainer out of engagement.
2. Ease top and bottom retainers out of engagement and remove mirror glass bezel from mirror casing.

Refit

1. Align new mirror glass bezel to mirror casing, press together and engage central retainer.



4. Remove 2 screws securing mirror to door panel.
5. Remove mirror.
6. Remove and discard sealing pad.

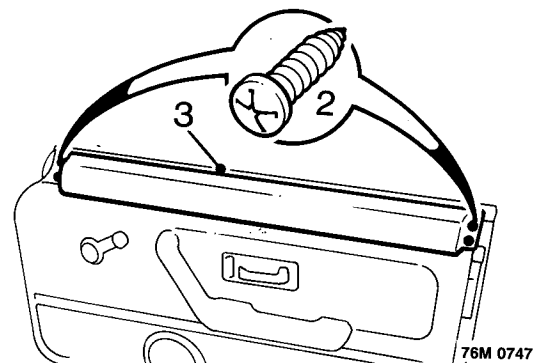
Refit

1. Attach new sealing pad to mirror.
2. Position mirror to door panel and tighten screws.
3. Fit cheater panel and tighten screws.
4. Fit handle to operating lever and set mirror.

FRONT DOOR CAPPING

Service Repair No. 76.34.15

Remove



1. Open door.
 2. Remove 4 screws securing door capping to door.
 3. Remove door capping assembly.
- Do not carry out further dismantling if component is removed for access only**
4. Release securing screws and remove 4 mounting plates from door capping.
 5. Release 8 screws and remove inner waist seal from door capping.
 6. Transfer components removed to new door capping.

Refit

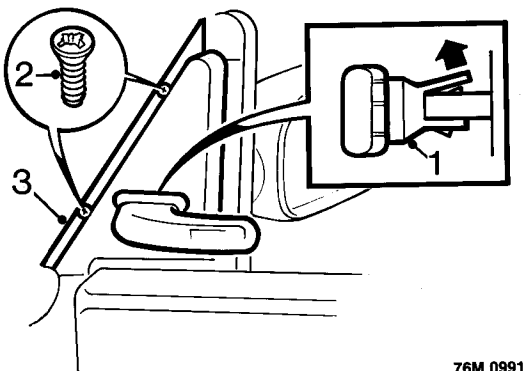
1. Locate door capping to door.
2. Fit retaining screws.

EXTERIOR MIRROR

Mirror glass

Service Repair No. 76.10.52

Remove



1. Remove handle from operating lever.
2. Remove 2 screws securing cheater panel.
3. Remove cheater panel.

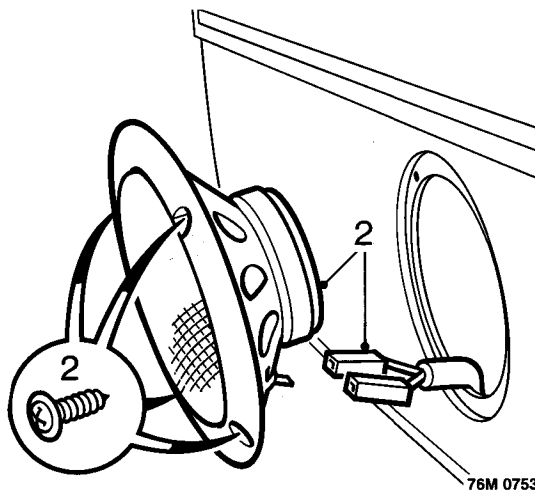


FRONT DOOR TRIM PAD

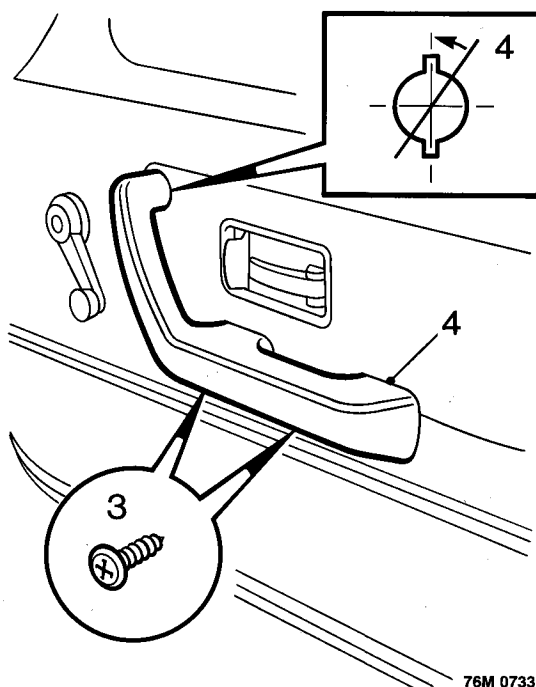
Service Repair No. 76.34.01

Remove

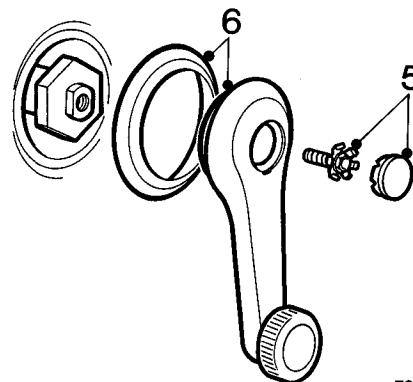
1. Remove door capping.



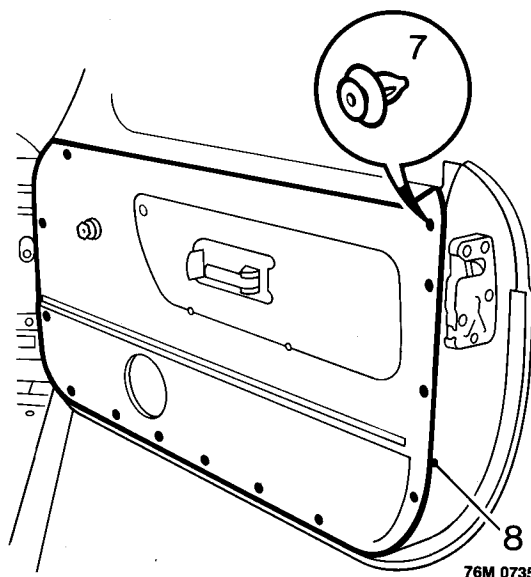
2. Remove 4 screws and release speaker from trim pad, disconnect multiplug and remove speaker.



3. Remove 2 screws securing arm rest to door.
4. Rotate armrest 45° upwards to release spigot from door panel and remove arm rest.



5. Remove screw cover and screw from door glass regulator handle.
6. Remove regulator handle and escutcheon.



7. Use a trim stud removal fork and release 12 trim studs from the door.
 8. Remove trim casing.
- Do not carry out further dismantling if component is removed for access only**
9. Remove studs from trim pad.
 10. Transfer components removed to new trim pad.

Refit

1. Locate trim pad to door.
2. Align trim studs to holes in door and press into place.
3. Fit regulator handle and escutcheon, secure with screw and fit screw cover.
4. Position armrest spigot in door panel 45° upwards from fitted position, engage spigot and fit retaining screws.
5. Connect multiplug and refit door speaker.
6. Refit door capping.

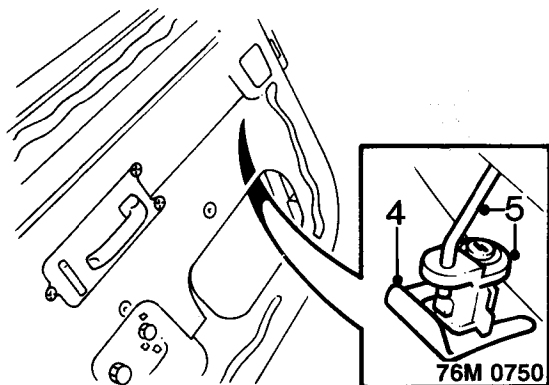
BODY

PRIVATE LOCK

Service Repair No. 76.37.39

Remove

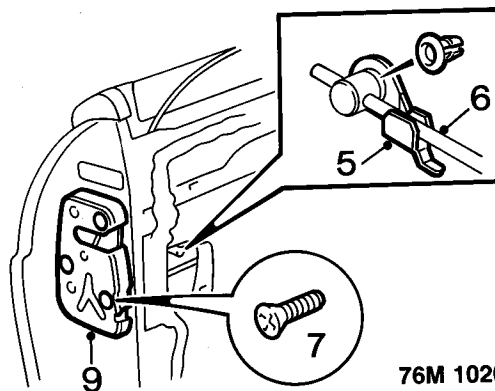
1. Remove door capping.
2. Remove door trim pad.
3. Release top rear corner of plastic sheet from door



4. Remove 'U' clip securing private lock to door.
5. Remove private lock from door and disconnect operating rod.
6. Remove gasket from lock.

Refit

1. Fit new gasket to lock.
2. Engage operating rod and insert private lock in door panel
3. Retain private lock with 'U' clip.
4. Refit plastic sheet to door panel.
5. Refit door trim pad.
6. Refit door capping.



5. Release 2 clips retaining remote control and lock rods.
6. Disconnect rods from latch
7. Remove 3 screws securing latch to door.
8. Release latch from private lock.
9. Remove latch

Do not carry out further dismantling if component is removed for access only

10. Remove 2 clips from latch levers.
11. Transfer components removed to new latch.

Refit

1. Position latch in door and connect to private lock.
2. Fit and tighten latch retaining screws.
3. Connect rods to latch and engage clips.
4. Refit plastic sheet to door panel.
5. Refit door trim pad.
6. Refit door speaker, see **ELECTRICAL**
7. Refit door capping.

DOOR LATCH

Service Repair No. 76.37.12 Door latch

Remove

1. Remove door capping.
2. Remove door speaker, see **ELECTRICAL**
3. Remove door trim pad.
4. Release top rear corner of plastic sheet from door

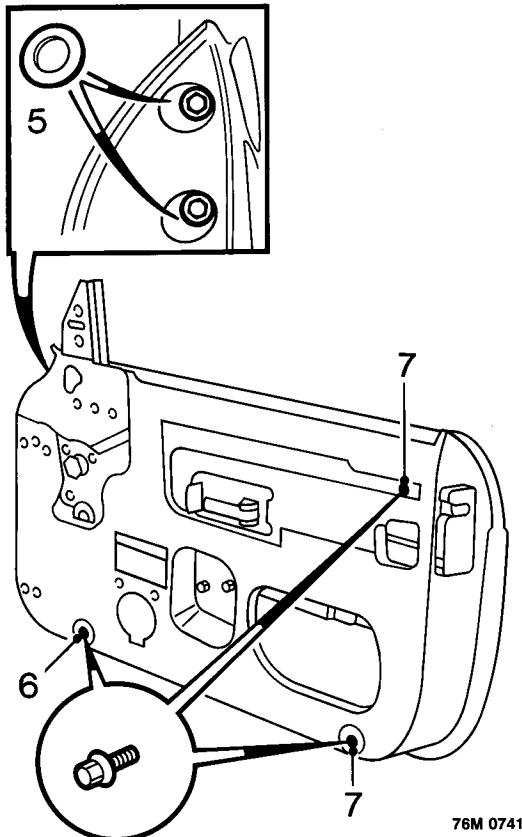


DOOR GLASS AND REGULATOR

Service Repair No. 76.31.45 Glass regulator
Service Repair No. 76.31.01 Door glass

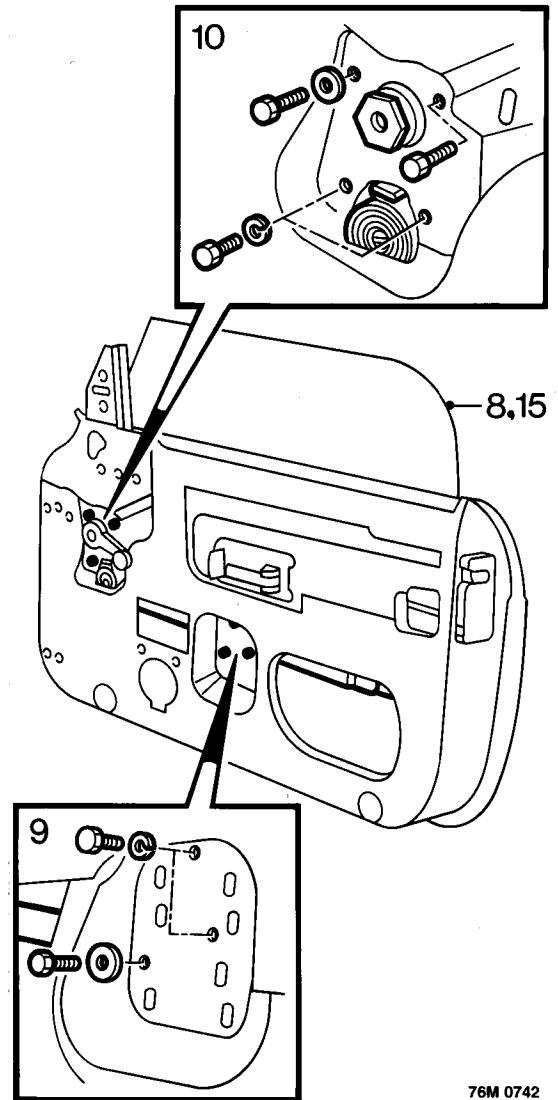
Remove

1. Remove exterior mirror.
2. Remove door capping.
3. Remove door trim pad.
4. Remove plastic sheet from door



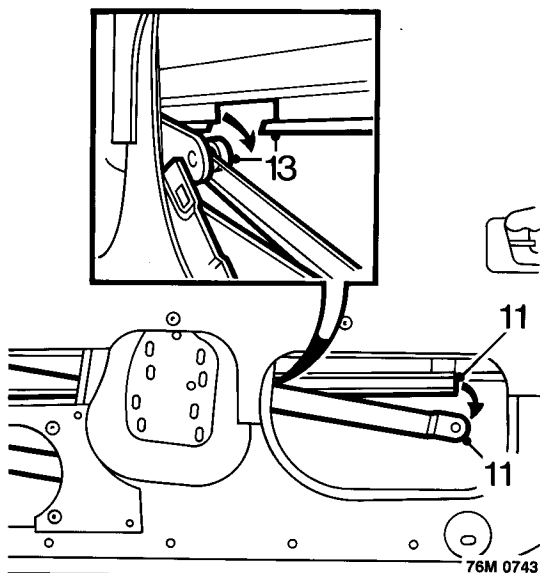
5. Remove screw covers and slacken 2 screws retaining cheater panel.
6. Remove bolt securing lower end of front glass channel.
7. Remove covering tape and 2 bolts securing rear glass channel.

76M 0741

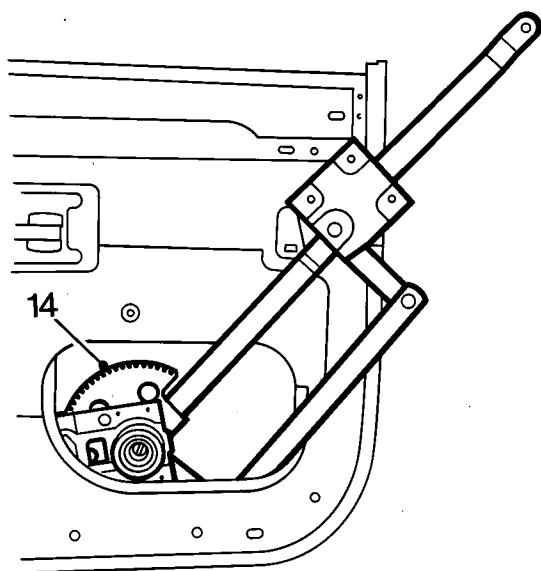


76M 0742

8. Refit window regulator handle and wind window to half open position.
9. Remove 3 bolts securing regulator extension to door.
10. Remove 3 bolts securing regulator to door.



11. With assistant holding door glass, release regulator from rear end of glass channel.
12. Remove regulator handle.
13. Release regulator from front end of glass channel.



14. Remove regulator from door.
15. Lower glass into door.

Door glass

16. Remove door glass through top of door.

Refit

Door glass

1. Lower door glass into door.

Regulator

2. Smear grease on regulator channels.
3. With assistant holding door glass at midway position, fit regulator to door.
4. Refit regulator handle.

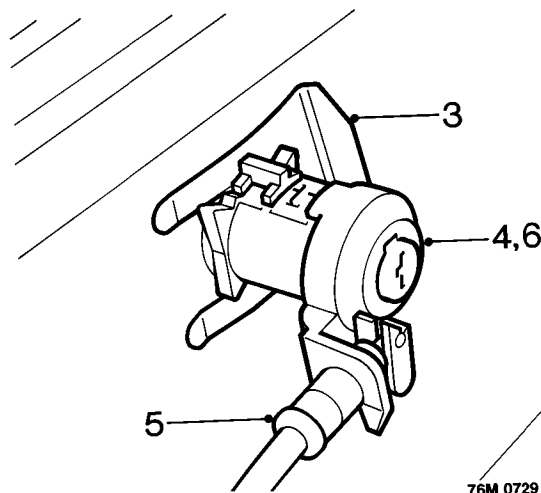
5. Align regulator and connect to rear end of glass channel.
6. Rotate handle to align regulator and extension bolt holes.
7. Assistant: Fit 1 bolt to regulator and extension.
8. Fit remaining bolts but DO NOT tighten.
9. Align rear glass channel, fit bolts but DO NOT tighten.
10. Align cheater and glass front channel, tighten cheater bolts and fit covers.
11. Fit bolt to lower end of front glass channel, DO NOT tighten.
12. Move window down and then fully close to centralise channels.
13. Tighten glass channel bolts and tape over bolts.
14. Remove regulator handle.
15. Fit plastic sheet to door panel.
16. Refit door trim pad.
17. Refit door speaker, see **ELECTRICAL**
18. Refit door capping.
19. Refit exterior mirror.

LUGGAGE COMPARTMENT LOCK

Service Repair No. 76.19.10

Remove

1. Open luggage compartment lid.
2. Remove carpet from rear sill.



3. Remove 'C' clip securing lock to body.
4. Release lock from body.
5. Disconnect release cable, outer cable from abutment bracket and inner cable from lock.
6. Remove lock.



Refit

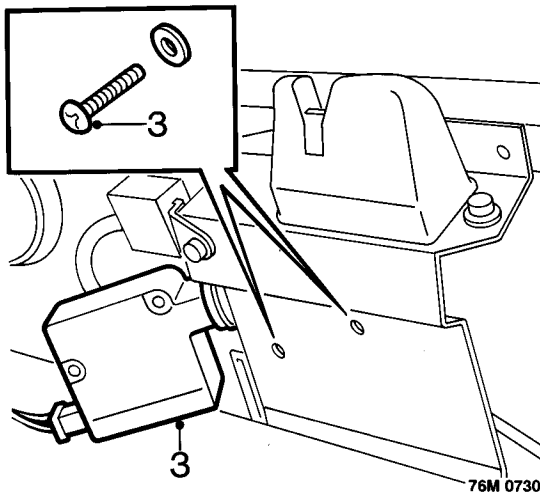
1. Fit new gasket to lock, if required.
2. Position lock in body, engage inner cable in lock and outer cable in abutment bracket.
3. Engage lock in body panel and retain with 'C' clip.
4. Refit sill carpet.

LUGGAGE COMPARTMENT LATCH

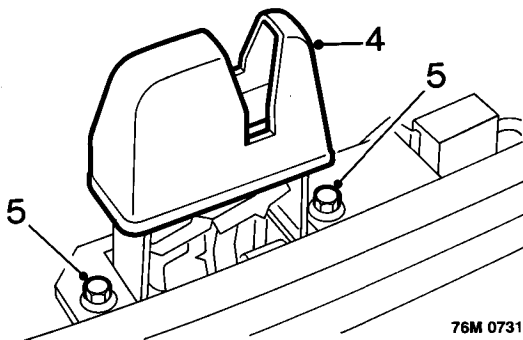
Service Repair No. 76.19.11

Remove

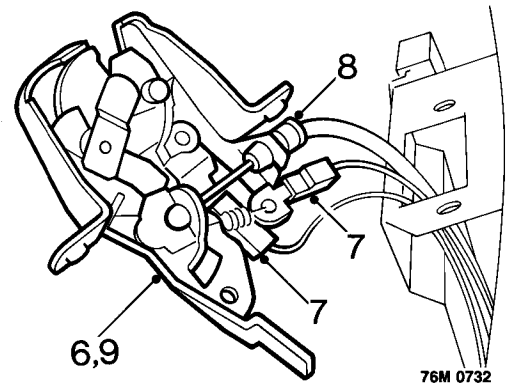
1. Open luggage compartment lid.
2. Release studs and remove carpet from rear sill.



3. Remove 2 screws securing latch release actuator to mounting bracket, position actuator aside.



4. Remove latch cover.
5. Remove 2 screws securing latch to mounting bracket.



6. Release latch from mounting bracket.
7. Disconnect 2 lucar connectors from latch.
8. Disconnect latch release outer cable from abutment bracket and inner cable from lever.
9. Remove latch.

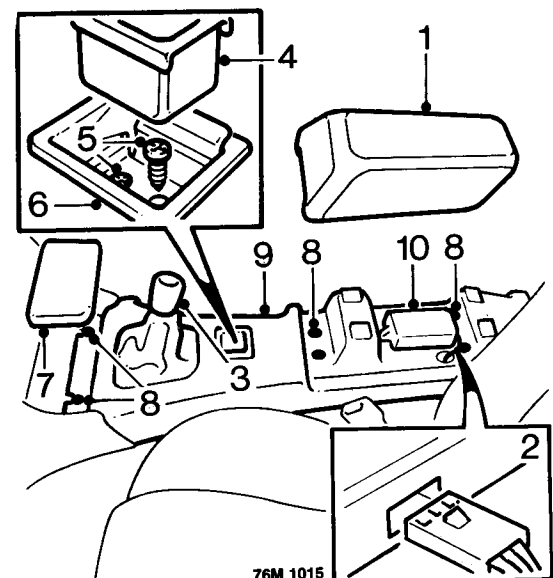
Refit

1. Connect inner cable to latch lever and engage outer cable in abutment bracket.
2. Connect 2 lucar connectors to latch.
3. Position latch in mounting bracket and secure with screws.
4. Fit latch cover.
5. Position latch release actuator and secure with screws.
6. Position carpet on rear sill and secure with studs.

REAR CONSOLE

Service Repair No. 76.25.04

Remove

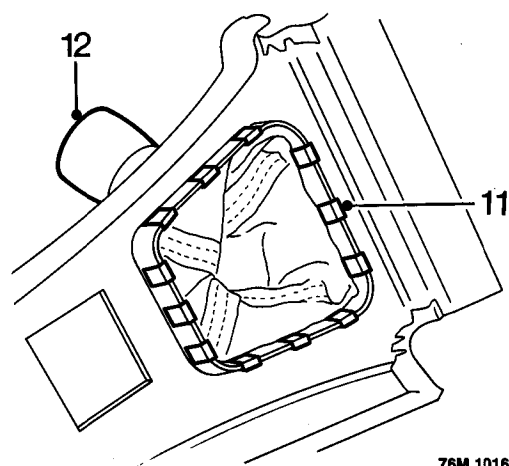


1. Remove centre arm rest.
2. Disconnect multiplug from alarm module.
3. Unscrew gear lever knob, do not detach from gaiter.

4. Remove ashtray.
5. Remove 2 screws securing ashtray retainer to console.
6. Remove ashtray retainer.
7. Remove closing panel from console.
8. Remove 6 screws securing rear console.
9. Remove rear console assembly.

Do not carry out further dismantling if component is removed for access only

10. Remove 2 screws and remove alarm ECU from console.



11. Release 12 clips and remove gear lever gaiter and gear lever knob from console.
12. Transfer components removed to new console.

Refit

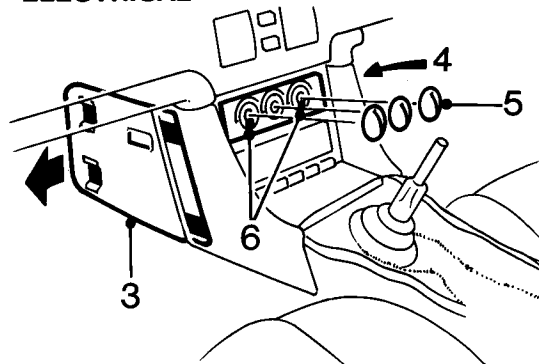
1. Position rear console with alarm lead through console.
2. Fit console retaining screws.
3. Fit ashtray retainer and secure with screws.
4. Fit ashtray.
5. Fit gear lever knob.
6. Connect multiplug to alarm module.
7. Fit centre arm rest.

FRONT CONSOLE

Service Repair No. 76.25.01

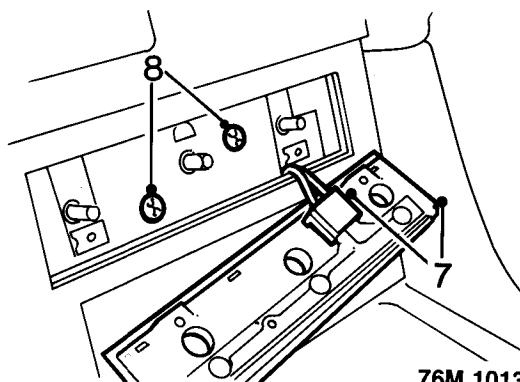
Remove

1. Remove rear console.
2. Remove radio cassette player, see **ELECTRICAL**



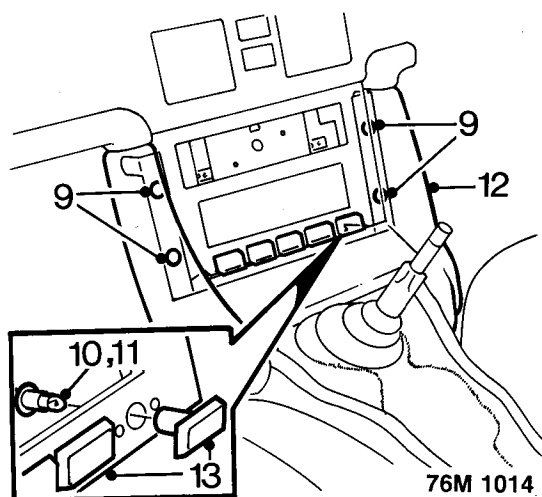
76M 1012

3. Release 4 Velcro pads, disconnect 2 Lucars from interior lamp and remove LH closing panel from console.
4. Remove RH closing panel from console.
5. Remove 3 heater control knobs.
6. Remove 2 screws securing heater face plate and illumination panel.



76M 1013

7. Disconnect multiplug and remove heater face plate and illumination panel.
8. Remove 2 screws securing heater control to front console.



9. Remove 4 nuts securing front console to fascia brackets.
 10. Mark each bulb holder for refitting reference (1 to 5)
 11. Release 5 warning lamp bulb holders from front console.
 12. Remove front console assembly.
- Do not carry out further dismantling if component is removed for access only**
13. Remove warning lamps and veneered panel from console
 14. Remove radio mounting tube.
 15. Transfer components removed to new console.

Refit

1. Position front console and fit warning lamp bulb holders.
2. Align front console with mounting brackets.
3. Fit heater control to front console and align illumination lead.
4. Fit nuts to secure front console.
5. Connect multiplug to heater face plate and illumination panel.
6. Position heater face plate and illumination panel and secure with screws.
7. Fit heater control knobs.
8. Connect Lucars to interior lamps and fit closing panels.
9. Refit radio cassette player, see **ELECTRICAL**
10. Refit rear console.

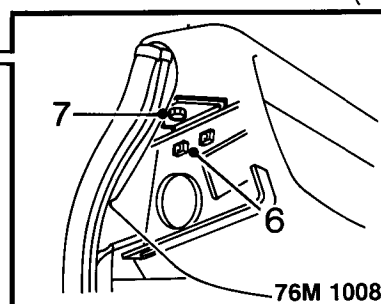
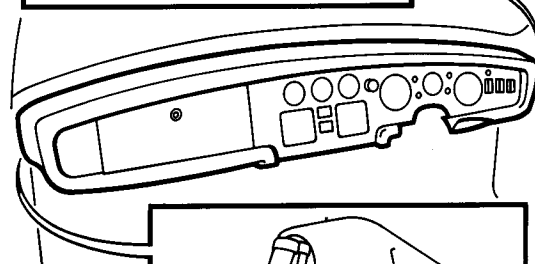
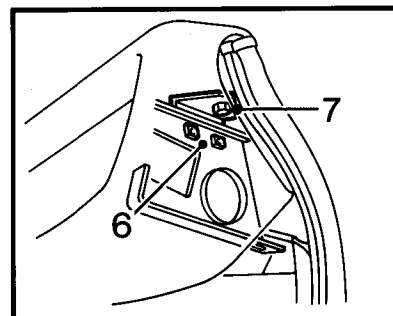
FASCIA ASSEMBLY

Service Repair No. 76.46.23

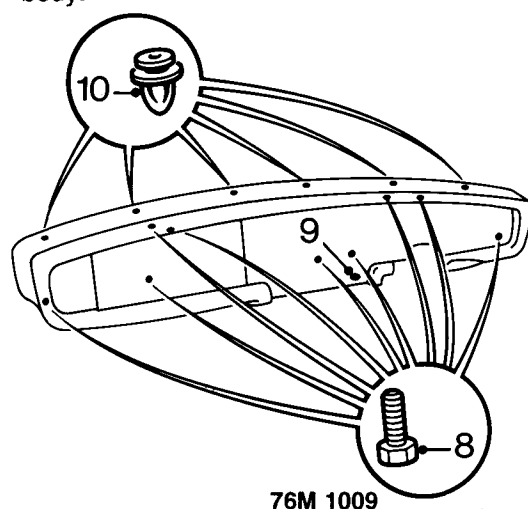
Remove

1. Fold hood to increase access.
2. Disconnect battery earth lead. see **ELECTRICAL**
3. Remove rear console.
4. Remove front console.

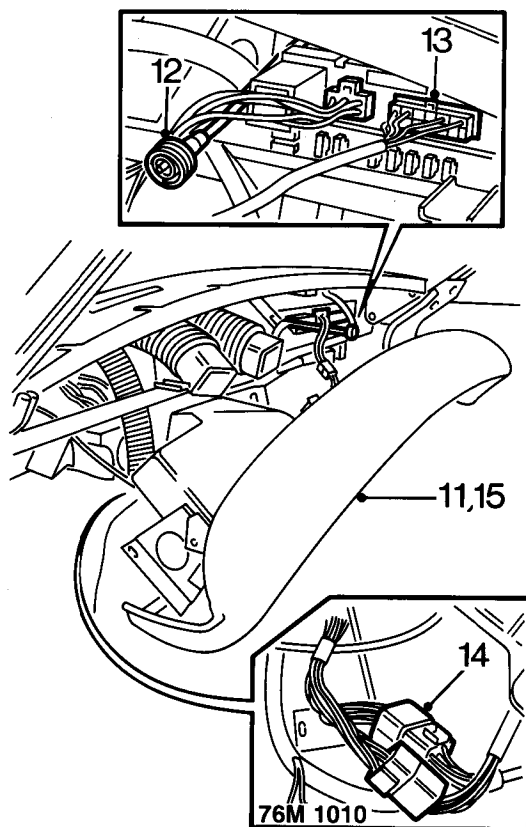
5. Remove steering column, see **STEERING**



6. Slacken 2 screws securing each end bracket to fascia.
7. Remove nut securing each end bracket to body.



8. Remove 9 screws securing fascia to fascia rail.
9. Remove screw securing console RH support bracket to fascia.
10. Using a trim stud release fork, ease 6 trim studs retaining top lip of fascia from body.



11. Pull fascia rearward to gain access to rear of speedometer
12. Unscrew drive cable from speedometer.
13. Disconnect fascia harness multiplug from fusebox.
14. Disconnect 2 fascia harness multiplugs from main harness.
15. With assistance, remove fascia assembly from car.
16. Remove any trim studs remaining in top panel.

Refit

1. Fit trim studs to retainers under top lip of fascia.
2. With assistance, position fascia assembly in car.
3. Connect fascia harness multiplugs to main harness and fusebox.
4. Connect speedometer drive cable.
5. Push fascia into fitted position, align top lip fixing studs and press into engagement
6. Fit screws and secure fascia to fascia rail.
7. Fit screw and secure console RH support bracket to fascia.
8. Fit nut and secure each end bracket to body.
9. Tighten screws securing each end bracket to fascia.
10. Refit steering column, see **STEERING**
11. Refit front console.
12. Refit rear console.
13. Connect battery earth lead. see **ELECTRICAL**

14. Raise hood.

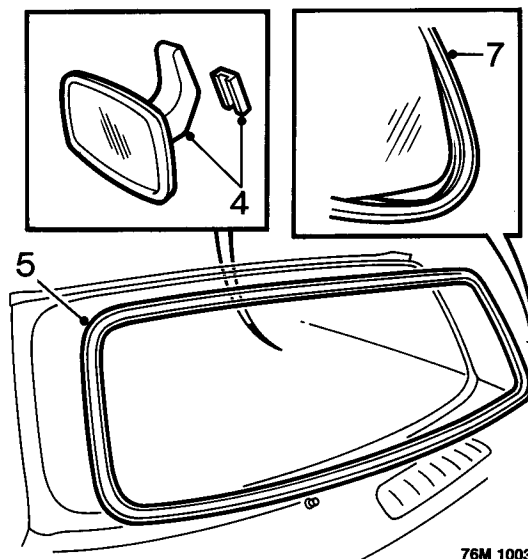
WINDSCREEN

Service Repair No. 76.81.01

WARNING: Eye protection and gloves must be worn when removing and fitting glass.

Remove

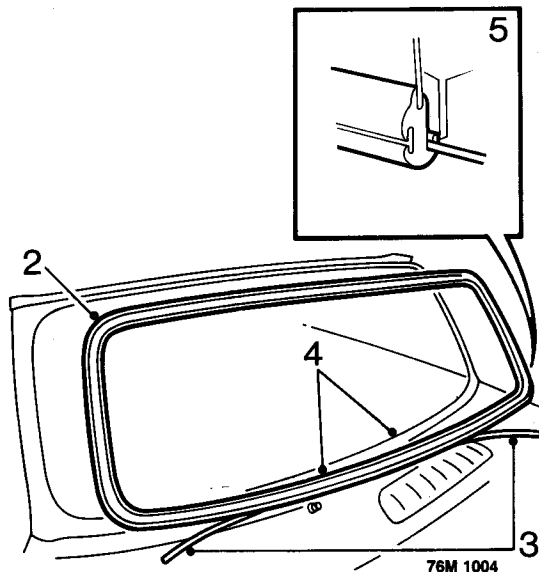
1. Place protective pad over body and bonnet.
2. Lock wiper arms in raised position.
3. Open doors for access.



4. Slide upwards and remove interior mirror from its mounting pad.
5. With assistance to support glass on outside, start at a top corner and carefully prise lip of rubber seal around flange of frame. Work along top and down sides.
6. Remove windscreen assembly from car and place on glazing stand.
7. Remove glazing rubber from glass.
8. Remove mirror mounting pad from glass.

Refit

1. Clean frame flange and check for distortion, rectify as necessary.



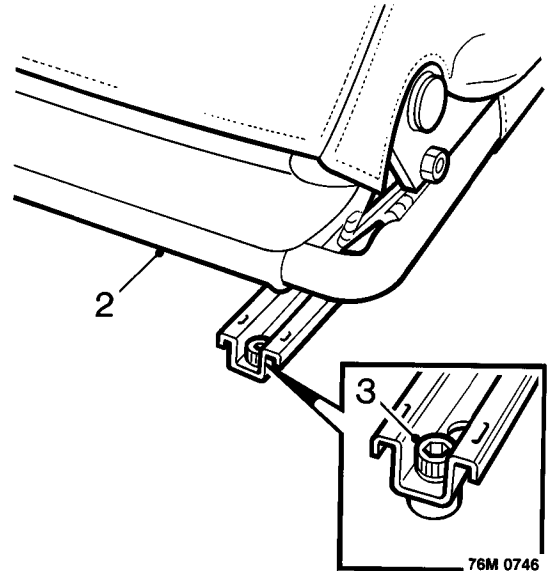
2. Apply rubber lubricant to windscreen edge and fit glazing rubber, ensure corners of glazing rubber are equalised on windscreen.
3. Insert a suitable length of cord in flange groove of glazing rubber, overlap ends along bottom.
4. With assistance, position windscreen assembly and engage the bottom of rubber groove over flange.
5. Push the glass and glazing rubber onto the flange whilst using cord to pull glazing rubber lip over frame flange.
6. Measure position of mirror pad on old screen for fitting reference and stick mirror pad to glass.
7. Fit interior mirror.
8. Lower wiper arms onto windscreen.

SEAT

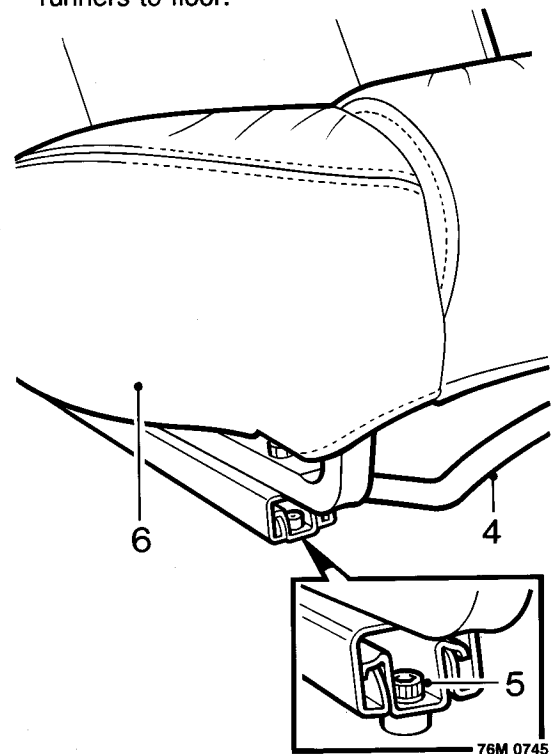
Service Repair No. 76.10.44

Remove

1. Open door and release seat belt from retainer.



2. Slide seat fully forward.
3. Remove 2 Allen screws securing seat runners to floor.



4. Slide seat fully rearward.
5. Remove 2 Allen screws securing seat runners to floor.
6. Remove seat assembly.

BODY

Refit

1. Position seat assembly in car, align seat runners.
2. Fit Allen screws securing front of seat runners to floor, do not tighten.
3. Slide seat fully forward, fit and tighten Allen screws securing seat of runners to floor.
4. Slide seat fully rearward, tighten seat runner screws.
5. Position seat and engage seat belt in retainer.

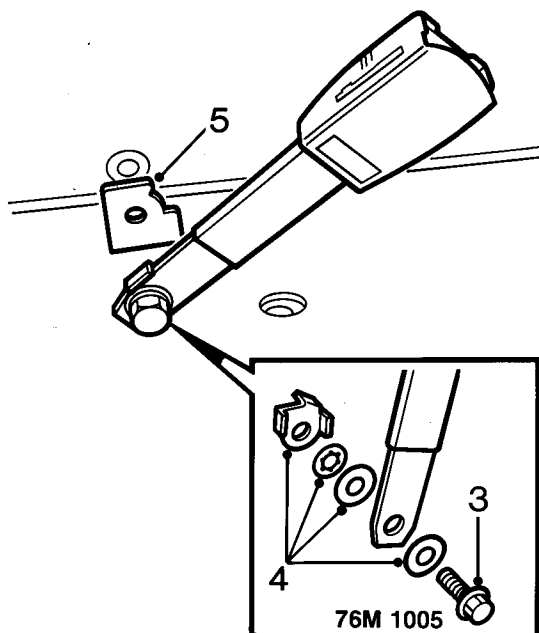
SEAT BELTS

Service Repair No. 76.13.12

Remove

1. Release seat belt from retainer.
2. Slide appropriate seat fully forward and fold seat squab forward.

Short belt

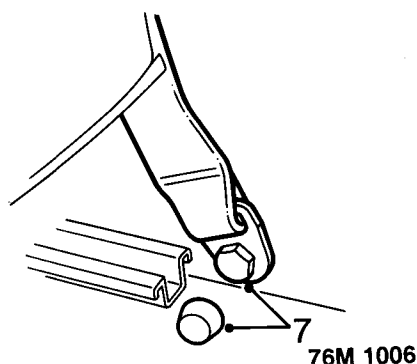


3. Unscrew bolt securing short belt to body.
4. Retaining brackets and washers on bolt, remove short belt assembly.

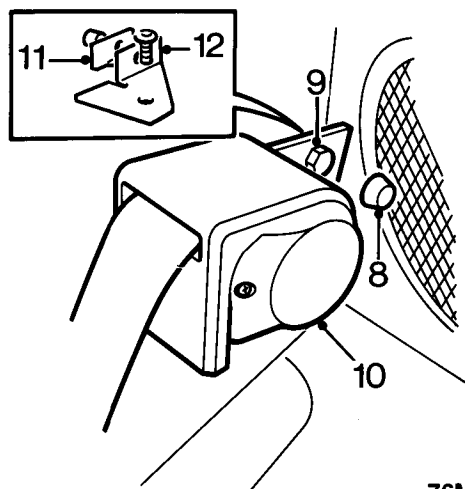
Do not carry out further dismantling if component is removed for access only

5. Remove anti-rotation bracket.
6. Transfer component removed to new belt. Ensure flat washer, tab washer and anti-rattle washer are fitted correctly.

Belt reel



7. Remove cover and unscrew bolt securing lower anchorage to body. Retain spacer and anti-rattle washer on bolt, securing belt anchorage to side panel.



8. Remove cover from bolt head.
9. Unscrew bolt securing reel assembly to side panel.
10. Retaining brackets and washers on bolt, remove seat belt reel assembly.

Do not carry out further dismantling if component is removed for access only

11. Remove anti-rotation bracket and spacer.
12. Remove mounting bracket.
13. Transfer component removed to new belt. Ensure spacer is fitted correctly.

Refit

Belt reel

1. Position and align seat belt reel assembly on side panel.
2. Fit and tighten bolt to correct torque and fit cover to bolt head.
3. Position belt anchorage on side panel, tighten bolt to correct torque and fit cover to bolt head.

Short belt

4. Position short belt assembly align anti-rotation bracket.
5. Fit and tighten bolt to correct torque.

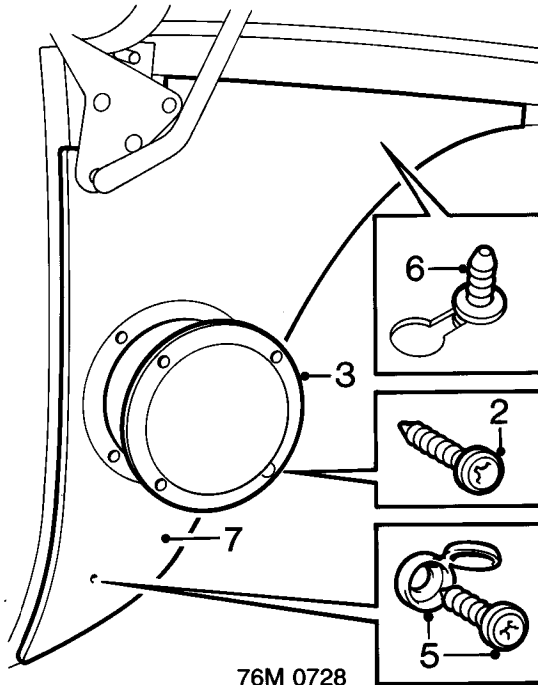


REAR QUARTER TRIM PAD

Service Repair No. 76.13.12

Remove

1. Fold hood to improve access.
2. Open appropriate door.



3. Remove 4 screws retaining speaker grille.
4. Remove speaker grille.
5. Lift cover and remove retaining screw.
6. Use a trim stud removal fork and release trim stud.
7. Remove rear quarter trim pad.

Refit

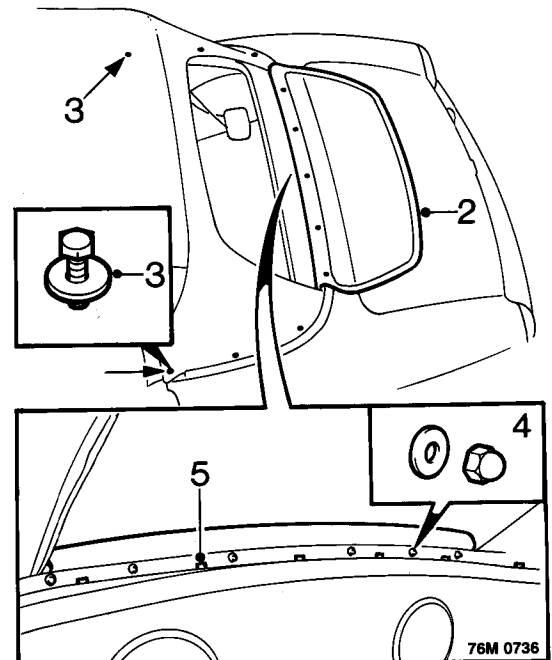
1. Renew trim studs as required.
2. Locate trim pad to body, align trim studs and press into place.
3. Fit speaker grille.
4. Raise hood if required.

REAR SCREEN

Service Repair No. 76.61.15

Remove

1. Release hood from windscreen frame and snap fasteners securing hood to frame and hinge bracket – see **Hood Assembly**



2. Locate end of zip under hood lining on RH side, unzip rear screen and fold out onto rear panel.
3. Progressively slacken all 11 bolts securing hood to rear panel and wings, for clearance of rear screen retainer.
4. Remove 6 cap nuts and flat washers securing rear screen retainer to hood frame.
5. Lift rear of hood clear of hood finishers, detach rear screen retainer from frame and remove rear screen.

Refit

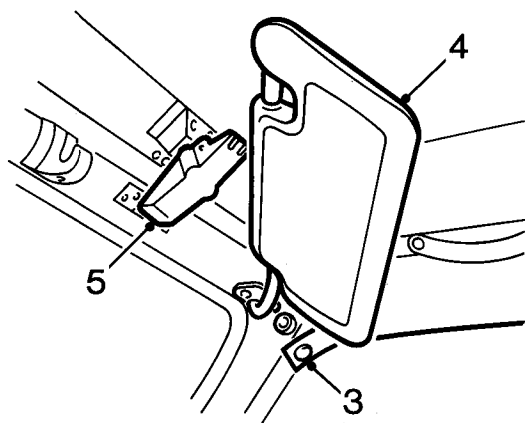
1. Lift rear of hood clear of hood finishers, insert rear screen retainer studs into hood frame.
2. Fit cap nuts and flat washers and secure rear screen retainer to hood frame.
3. Check finisher alignment and progressively tighten bolts securing hood frame to rear panel.
4. Position rear screen inside hood and zip up rear screen.
5. Connect snap fasteners securing hood to frame and hinge bracket and secure hood to windscreen frame – see **Hood Assembly**

HOOD ASSEMBLY

Service Repair No. 76.61.10

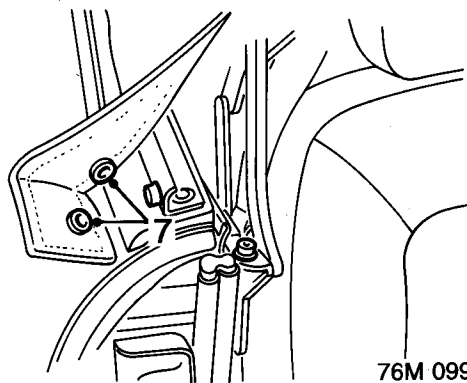
Remove

1. Place protective cover on rear panel.
2. Open doors for access.



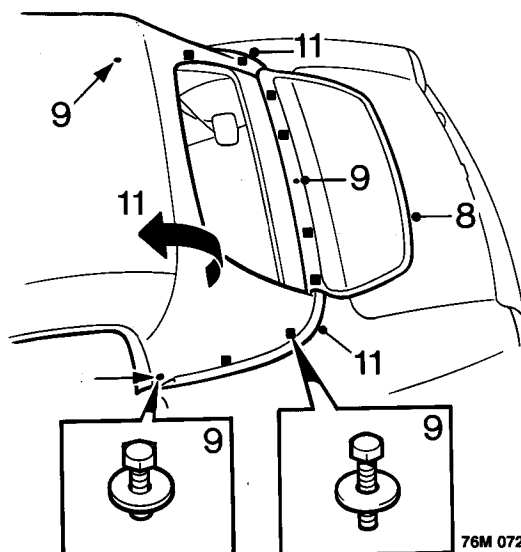
76M 0993

3. Disconnect snap fastener on each side, securing hood strap to windscreen frame.
4. Release sun visors and swing aside.
5. Release 2 toggle catches securing hood to windscreen frame.
6. Release seat belt from guide and fold both seat squabs fully forward.



76M 0994

7. Disconnect 2 snap fasteners on each side, securing hood to frame and strap to hinge bracket.

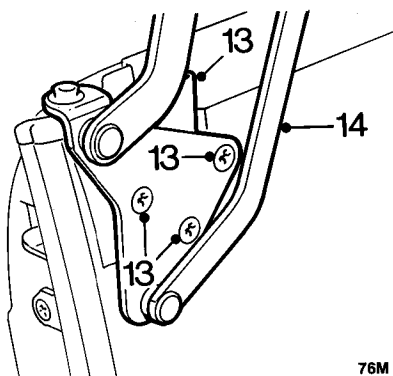


76M 0726

8. Locate end of zip under hood lining on RH side, unzip rear screen and fold out onto rear panel.
9. Progressively slacken and remove 11 bolts and large flat washers securing hood to rear panel and wings.

Note: 3 shorter bolts are used, at each end and middle.

10. Zip up rear screen.
11. Lift rear of hood and remove 3 hood finishers.



76M 0727

12. Lift front of hood to 45° open.
13. With assistance: Remove 3 screws securing each hood hinge to 'B' post and collect tonneau rail socket from behind each hinge.
14. Remove hood assembly from car and place on clean surface.

Refit

1. Partially extend front of hood, unzip rear screen and fold out.
2. With assistance: Carefully position frame, align fixing position of hinges and hood frame on rear panel.
3. Fit tonneau rail socket behind each hinge bracket, align fixing holes with bradawls, fit and tighten screws.
4. Position central finisher and hood on rear panel, locate central fixing hole and start



short bolt. Centralize assembly and start long bolts.

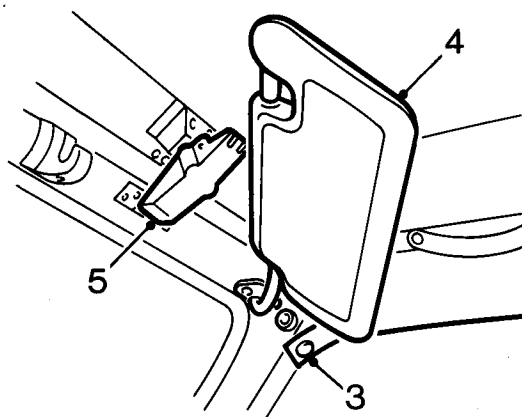
5. Position LH and RH side finishers and start bolts, short bolt at each end.
6. Check finisher alignment and progressively tighten bolts.
7. Zip up rear screen.
8. Connect snap fasteners securing hood to frame and strap to hinge bracket.
9. Return both seat squabs to upright position and engage seat belts in guides.
10. Pull hood onto top rail, engage tongues and secure toggle catches.
11. Engage sun visors and secure hood straps to windscreen frame.

HOOD COVER

Service Repair No. 76.61.11

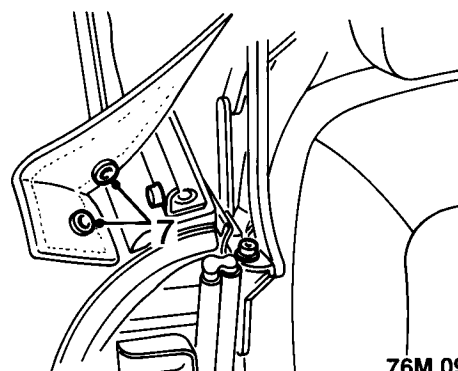
Remove

1. Place protective cover on rear panel.
2. Open doors for access.



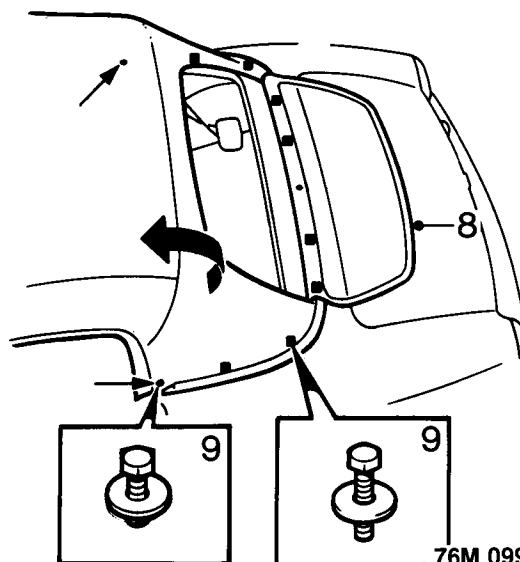
76M 0993

3. Disconnect snap fastener on each side, securing hood strap to windscreen frame.
4. Release sun visors and swing aside.
5. Release 2 toggle catches securing hood to windscreen frame.
6. Release seat belt from guide and fold both seat squabs fully forward.



76M 0994

7. Disconnect 2 snap fasteners on each side, securing hood to frame and strap to hinge bracket.

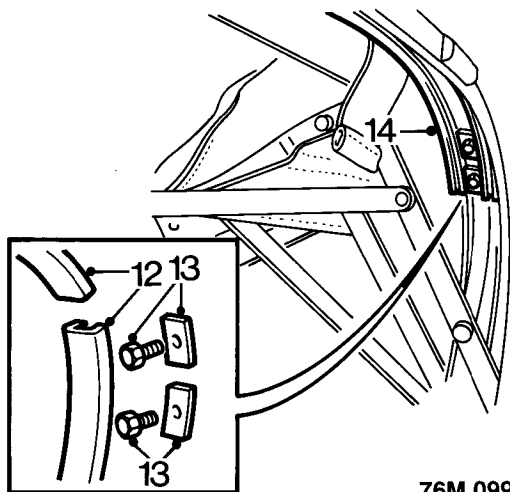


76M 0995

8. Locate end of zip under hood lining on RH side, unzip rear screen and fold out onto rear panel.
9. Progressively slacken and remove 11 bolts and large flat washers securing hood to rear panel and wings.

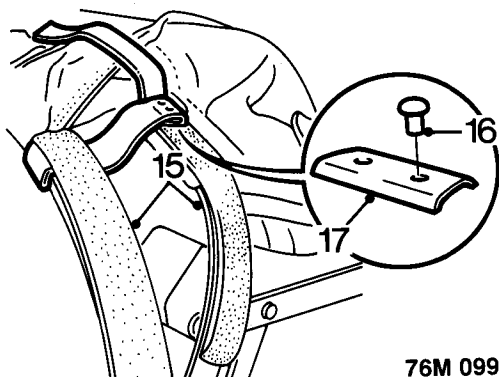
Note: 3 short bolts, at centre and at each end.

10. Zip up rear screen.
11. Lift rear of hood over onto hood cover.



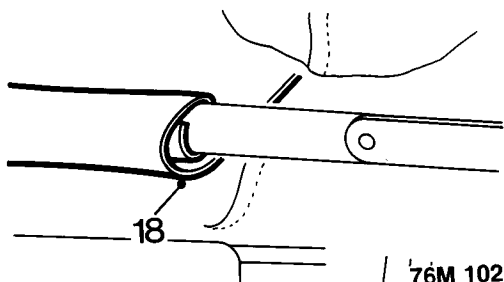
76M 0996

12. Release hood material and remove finisher from No.3 bow.
13. Remove 2 screws and remove clamping plate each side, securing No. 3 bow to frame.
14. Spring No.3 bow from frame arms



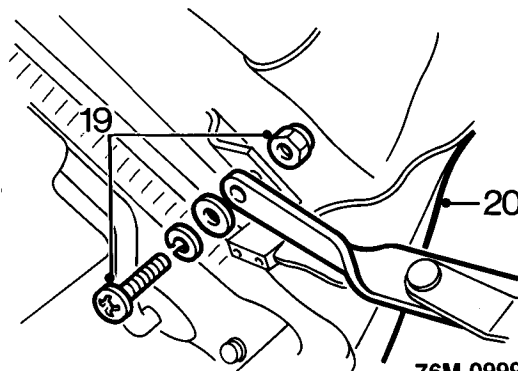
76M 0997

15. Release Velcro strip from each end of No.2 bow, to clear tensioning strips.
16. Drill out 2 pop rivets securing each tensioning strip to No.2 bow.
17. Remove reinforcement plate from each strip.



76M 1021

18. Release hood material flaps glued to No.1 bow, unwrapped from front and then rear.

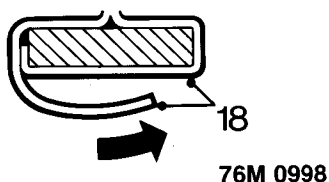


76M 0999

19. Push back material, remove screw and locknut securing hood frame to header rail each side.
20. Remove hood cover.
21. Remove 2 screws securing each toggle catch, remove toggle catches.

Refit

1. Fit toggle catches to header rail, do not tighten screws.
2. Extend front of new hood, lift rear of hood and fold over.
3. Carefully position front of hood over hood frame .
4. Position header rail on frame ends, fit screws from below and secure with locknuts. Position hood material over frame ends.
5. Fit reinforcement plate, concave face down, to each tensioning strip.
6. Align tensioning strips to No.2 bow and retain with pop rivets.
7. Secure Velcro strip over each end of No.2 bow.
8. Spring No.3 bow and insert frame arms, position clamping plates and retain with screws but do not tighten.
9. Extend rear of hood onto rear panel.
10. Unzip rear screen and fold out onto rear panel.
11. Position central finisher and hood on rear panel, locate fixing holes and start retaining bolts.
12. Position LH and RH side finishers and start fixing bolts.
13. Check finisher alignment and progressively tighten bolts.
14. Zip up rear screen.
15. Position header rail on windscreen frame, engage tongues and secure toggle catches. Adjust tension on frame and tighten toggle catch screws.
16. Engage sun visors and secure hood straps to windscreen frame.
17. Raise No.3 bow to tension hood material and tighten clamp screws.
18. Fit finisher to No.3 bow.



19. Position No.1 bow along seam with material flaps each side. Check wrap of material around bow, trim excess material from flaps if necessary.
20. Apply Dunlop S1358 adhesive to bow and flaps, allow to flash off. Wrap flap from front around bow and then flap from rear.
21. Connect snap fasteners securing hood to frame and strap to hinge bracket.
22. Return both seat squabs to upright position and engage seat belts in guides.

HEADLAMP COWL

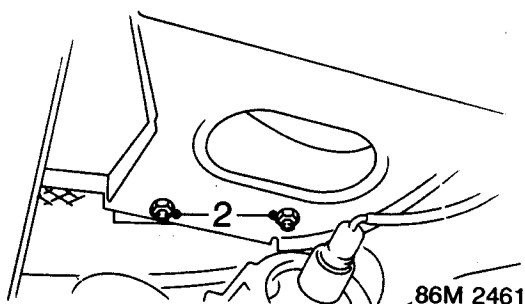
Service Repair No. 76.11.72

Remove

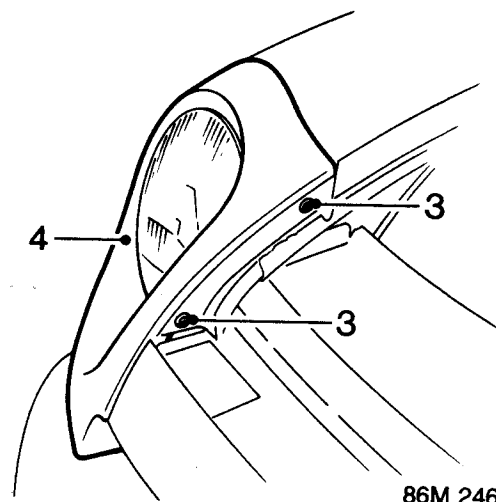
1. Raise front of vehicle, one side.

WARNING: Support on safety stands.

Early cars

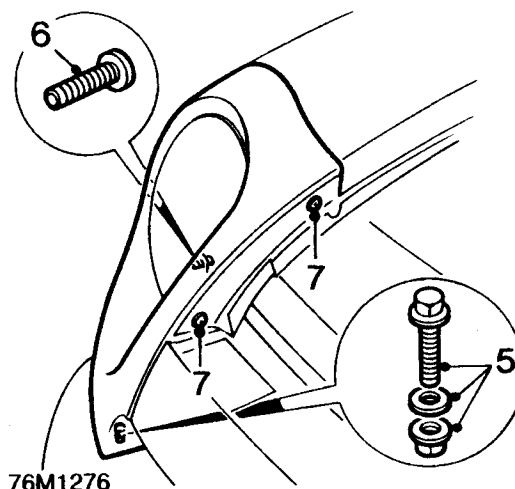


2. From under bumper, remove 2 nuts and bolts securing headlamp cowl to body panel.



3. Remove 2 screws securing headlamp cowl to wing panel
4. Release from behind headlamp and remove headlamp cowl.

Later cars



5. From under bumper, remove nut and screw securing headlamp cowl to body panel.
6. From inside wheel arch, remove access plug, and through hole remove screw securing cowl to wing panel.
7. Remove 2 screws securing headlamp cowl to wing panel
8. Slide cowl outboard to release from front wing panel upper fixing.
9. Remove cowl.

Refit

1. Position and engage headlamp cowl behind headlamp.
2. Fit screws and bolts retaining cowl, align cowl and then tighten fixings.
3. Remove stand(s) and lower vehicle.

BODY

FRONT PANEL AND GRILLE

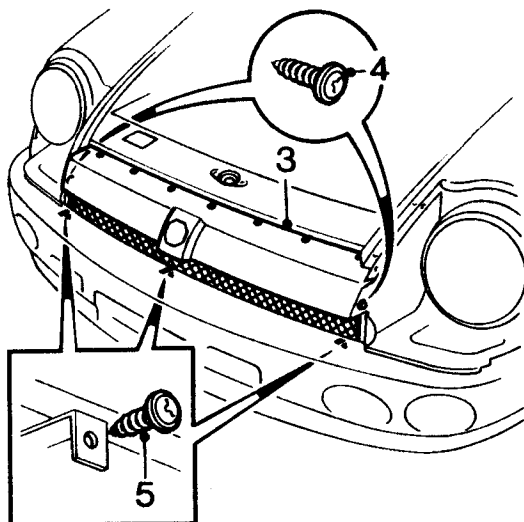
Service Repair No. 76.55.03

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Remove both front headlamp cowls.



76M1277

3. Remove 7 screws securing front panel to bonnet locking platform.
4. Remove 2 screws securing front panel to body.
5. Remove 3 screws securing front grille to front bumper valance.

Note: Cars fitted with air conditioning only have one screw fitted in the centre.

6. Remove front panel and grille assembly.

Do not carry out further dismantling if component is removed for access only

7. Remove 4 screws securing grille to front panel.
8. Remove grille.

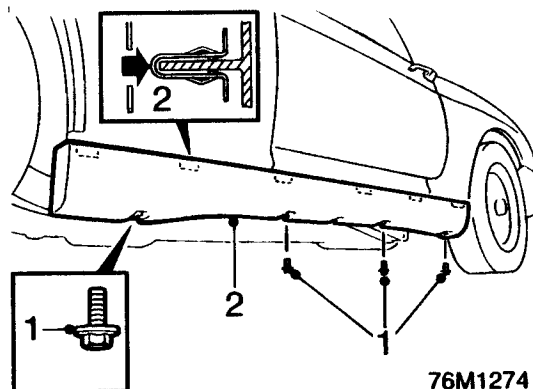
Refit

1. Position grille to front panel; fit and tighten 4 screws.
2. Fit front grille and panel assembly; fit and tighten 3 screws securing grille to bumper valance. Fit and tighten 2 screws securing front panel to body and 7 screws securing front panel to bonnet locking platform.
3. Refit headlamp cowls.
4. Remove stand(s) and lower vehicle.

SILL FINISHER

Service Repair No. 76.43.28

Remove



76M1274

1. Remove 4 screws securing sill finisher to body mounting brackets.
2. Carefully ease top of finisher away from body, and starting at front, disengage 6 clips securing finisher to body; remove finisher.

Refit

1. Position finisher and secure 6 clips.
2. Align finisher and fit 4 screws securing finisher to body.

HEATING AND VENTILATION

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HEATER BLOWER MOTOR1

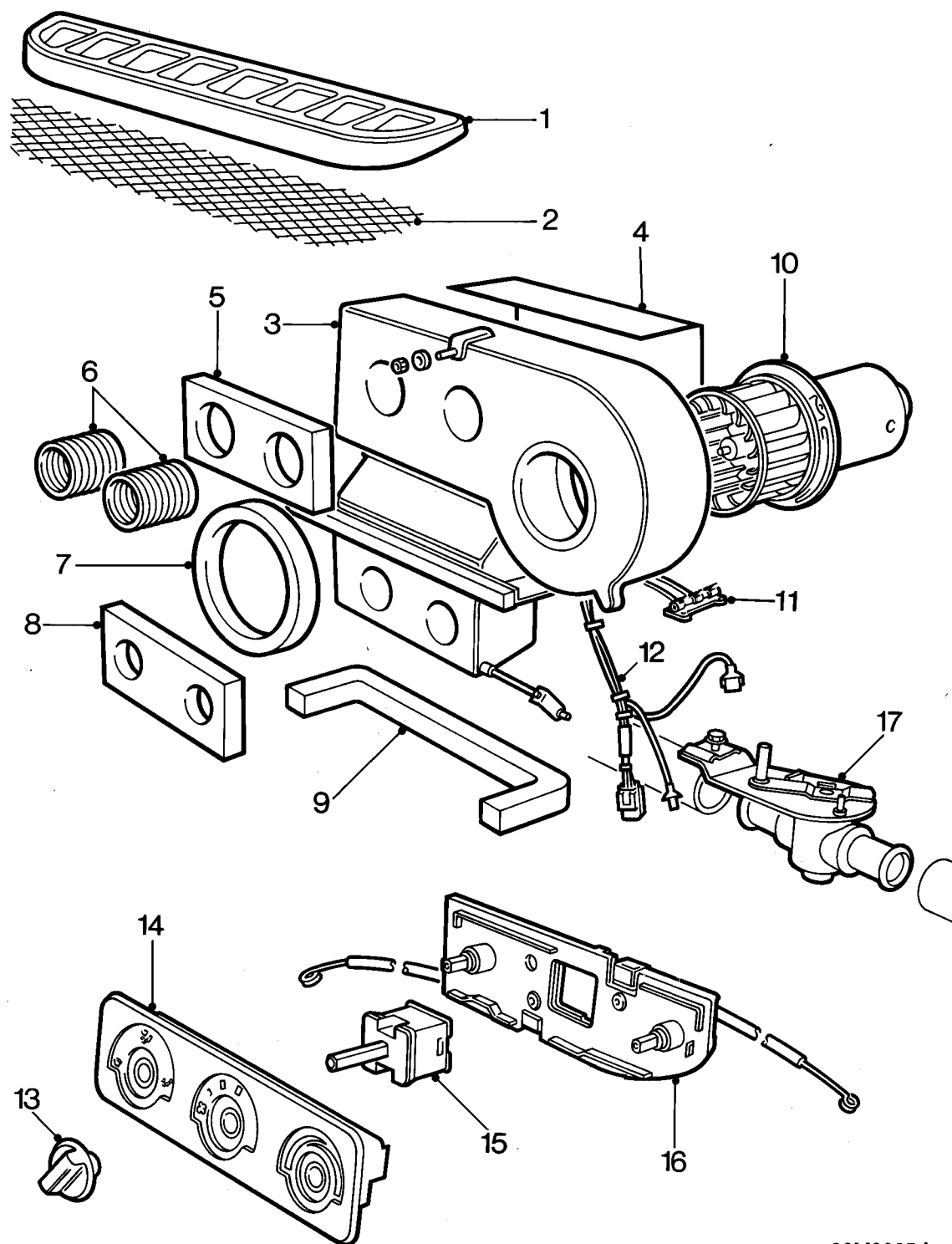
HEATER VALVE1

HEATER MATRIX2

HEATER CONTROLS2

HEATER UNIT AND BLOWER RESISTOR3

HEATING AND VENTILATION



80M0025 A

HEATER COMPONENTS

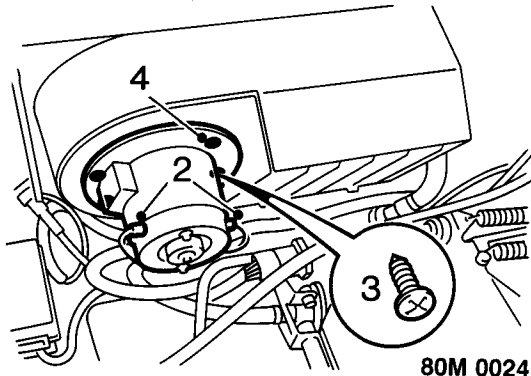
- | | |
|---|----------------------------|
| 1. Intake grille | 10. Blower motor assembly |
| 2. Mesh - intake grille | 11. Blower resistor |
| 3. Heater unit | 12. Heater harness |
| 4. Heat shield | 13. Control knob |
| 5. Seal - duct to casing | 14. Light box |
| 6. Duct - fresh air | 15. Blower switch |
| 7. Seal - blower inlet to bulkhead | 16. Heater control |
| 8. Seal - casing to demister ducts | 17. Heater valve - coolant |
| 9. Foam or mastic seal - casing to bulkhead | |

HEATER BLOWER MOTOR

Service Repair No. 80.20.15

Remove

1. *Air conditioning fitted:* Remove heater cut-off flap vacuum actuator, see **AIR CONDITIONING**.



2. Disconnect 2 Lucar connectors from motor.
3. Remove 4 screws securing motor housing to heater casing.
4. Remove blower motor assembly.

Do not carry out further dismantling if component is removed for access only

5. Remove 2 nuts and flat washers securing motor to housing.
6. Remove blower motor housing.
7. Transfer components to new motor.

Note: Apply Loctite 242 to nuts securing motor.

Refit

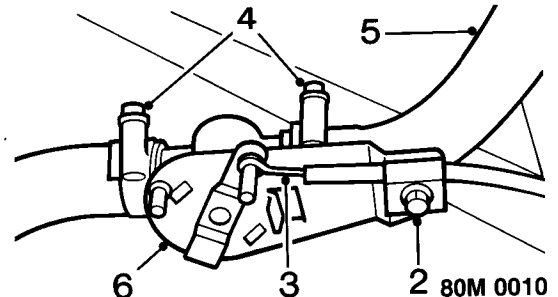
1. Locate motor housing in heater casing and secure with screws.
2. Connect Lucar connectors to motor.
3. *Air conditioning fitted:* Fit heater cut-off flap vacuum actuator, see **AIR CONDITIONING**.

HEATER VALVE

Service Repair No. 80.10.16

Remove

1. Drain cooling system, see **MAINTENANCE**.



2. Slacken clamp and disconnect outer cable from heater valve.
3. Disconnect inner cable from heater valve lever.
4. Slacken 2 heater hose clips.
5. Disconnect outlet hose from valve.
6. Remove heater valve from inlet hose.

Refit

1. Fit heater valve to inlet hose, with lever positioned horizontally.
2. Connect outlet hose to valve and tighten hose clips.
3. Set heater control to COLD (BLUE) position.
4. Set heater valve to fully closed position (right)
5. Connect inner cable to heater valve lever, position outer cable and tighten clamp.
6. Check heater valve lever for full travel.
7. Refill cooling system, see **MAINTENANCE**.

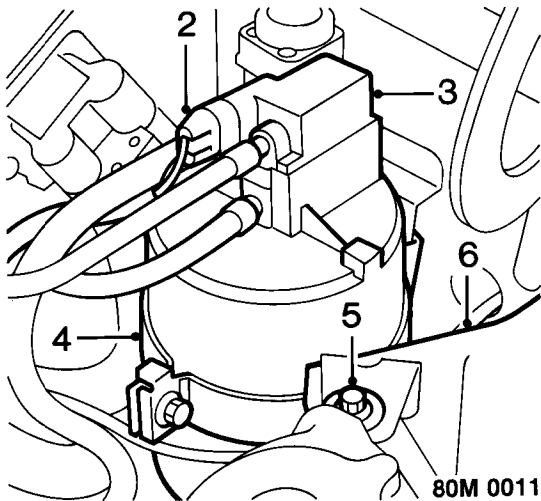
HEATING AND VENTILATION

HEATER MATRIX

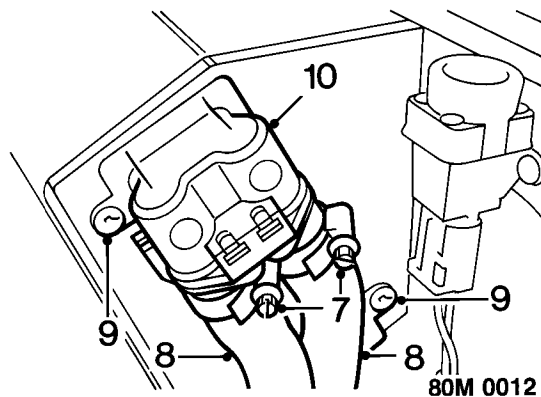
Service Repair No. 80.20.29

Remove

1. Drain cooling system, see **MAINTENANCE**.



2. Disconnect multiplug from purge valve.
3. Withdraw charcoal canister from clamp and position aside.
4. Remove charcoal canister mounting bracket.
5. Remove bolt securing washer bottle to expansion tank bracket.
6. Lift washer bottle and position on expansion tank bracket.



7. Slacken 2 heater hose clips.
8. Disconnect inlet and outlet hoses from matrix pipes.
9. Remove 2 screws securing matrix to casing.
10. Remove matrix from casing.

Refit

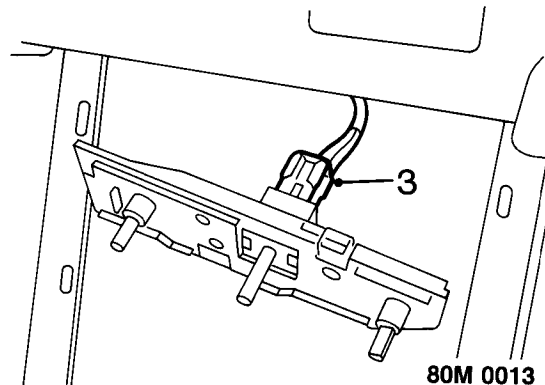
1. Position matrix in casing and retain with screws.
2. Connect inlet and outlet hoses to matrix pipes and tighten clips.
3. Refit washer bottle.
4. Refit charcoal canister mounting bracket, charcoal canister and connect multiplug to purge valve.
5. Refill cooling system, see **MAINTENANCE**.

HEATER CONTROLS

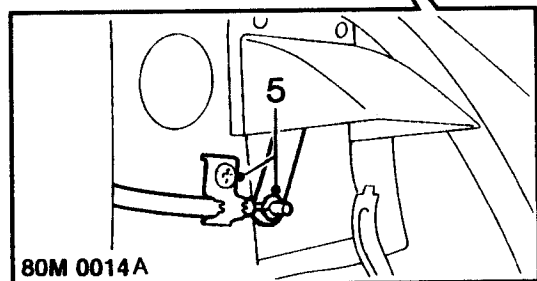
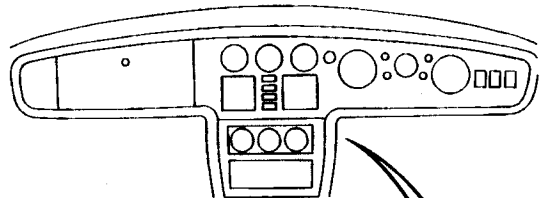
Service Repair No. 80.10.02

Remove

1. Remove rear console, see **BODY**
2. Remove front console, see **BODY**



3. Disconnect multiplug from heater blower switch.



4. Pull carpet aside on RH side of tunnel, for access to heater cable.
5. Remove clamp screw and disconnect control inner cable from heater flap.

HEATER UNIT AND BLOWER RESISTOR

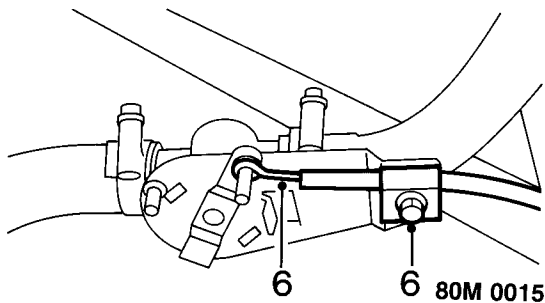
Service Repair No. 80.20.01 Heater Unit

Service Repair No. 80.20.07 Blower Resistor

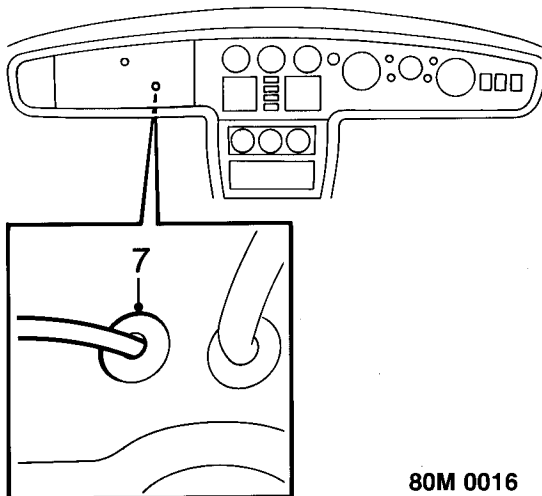
Remove

Heater unit

1. Drain cooling system, see **MAINTENANCE**.



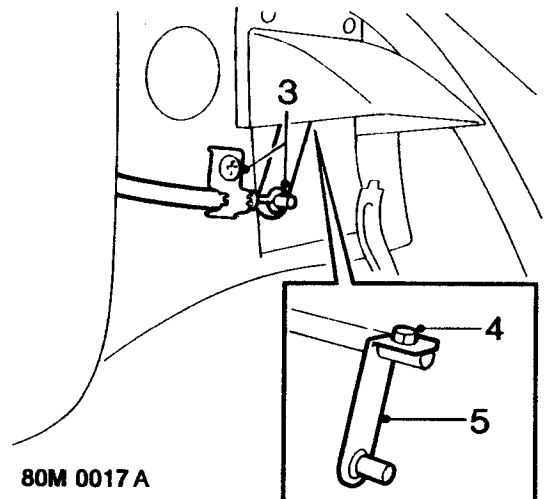
6. *Engine compartment:* Slacken clamp, disconnect outer cable and inner control cable from heater valve.



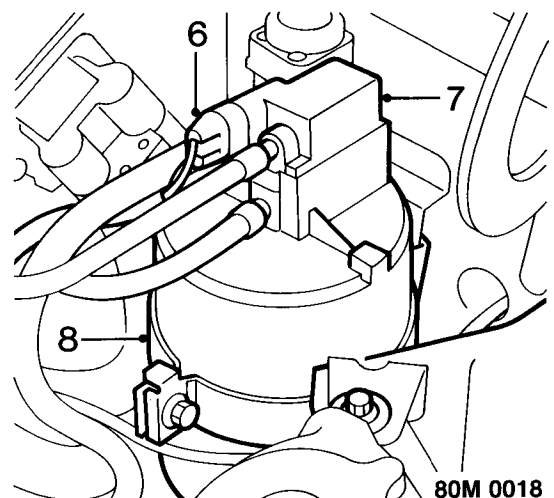
7. Release cable grommet from bulkhead.
8. Remove heater controls
9. Remove grommet from heater valve control cable.

Refit

1. Position grommet on heater valve control cable.
2. Position heater controls behind console bracket.
3. Pass heater valve control cable through bulkhead and fit grommet.
4. Fit control cable to heater flap.
5. Push carpet into position.
6. Set heater control to COLD (BLUE) position.
7. Set heater valve to fully closed position.
8. Connect inner cable to heater valve lever, position outer cable and tighten clamp.
9. Fit front console see **BODY**
10. Fit rear console see **BODY**

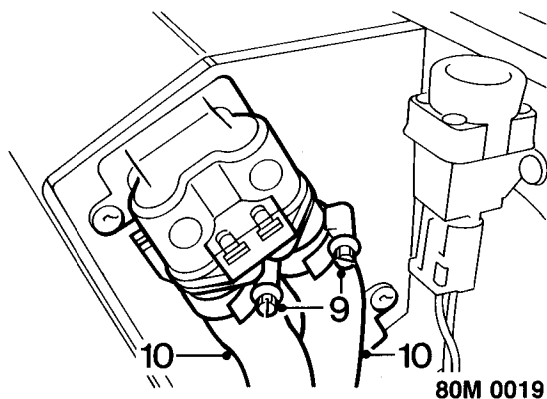


2. Pull carpet aside on RH side of tunnel, for access to heater cable.
3. Remove clamp screw and disconnect control cable from heater flap.
4. Remove screw securing control lever to heater flap spindle.
5. Remove control lever.

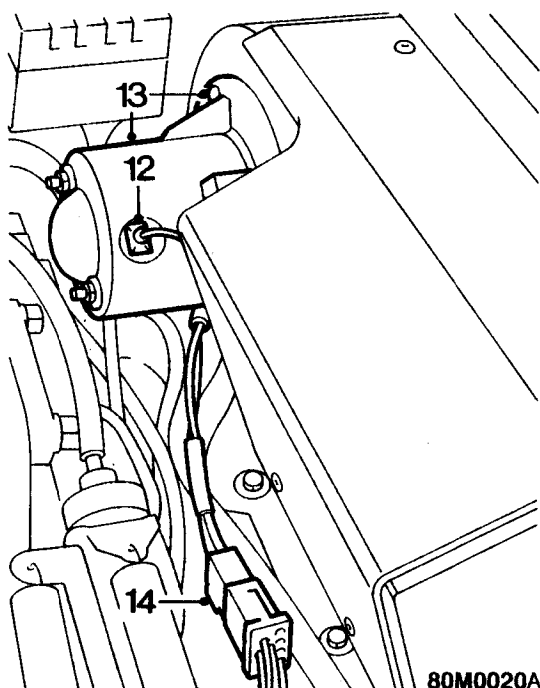


6. Disconnect multiplug from purge valve.
7. Withdraw charcoal canister from clamp and position aside.
8. Remove charcoal canister mounting bracket.

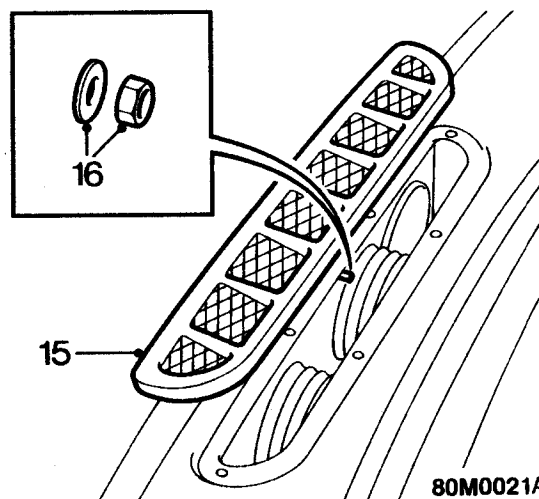
HEATING AND VENTILATION



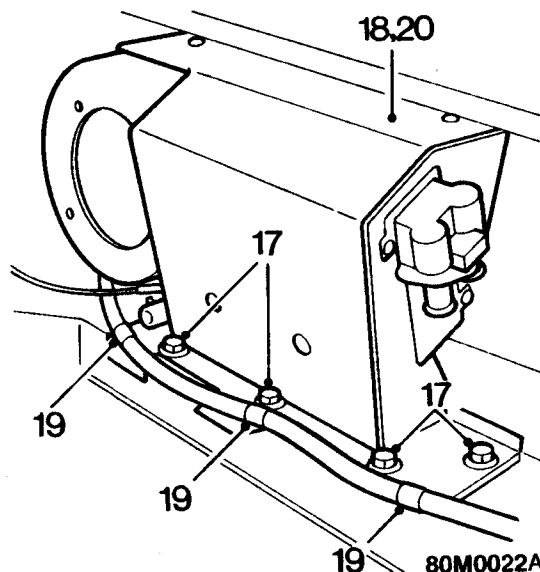
9. Slacken 2 heater hose clips.
10. Disconnect inlet and outlet hoses from heater matrix pipes.



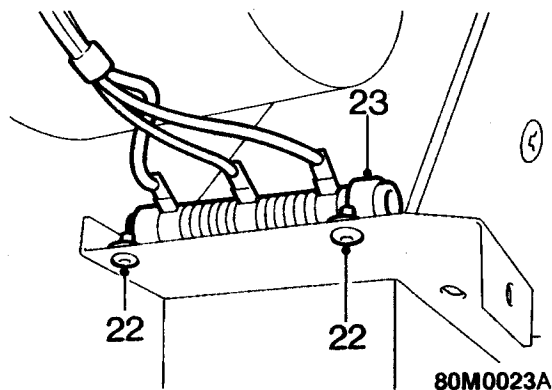
11. *Air conditioning fitted:* Remove heater cut - off flap vacuum actuator, see **AIR CONDITIONING**.
12. Disconnect 2 Lucar connectors from blower motor.
13. Remove 3 screws and withdraw blower motor from heater unit.
14. Disconnect multiplug from blower resistor.



15. Protect paintwork, carefully lever at each end and remove intake grille and mesh.
16. Remove nut and flat washer securing top of heater casing.



17. Remove 4 screws and flat washers securing heater casing to bulkhead.
18. Extract casing from bulkhead.
19. Release 3 harness retainers from front of casing.
20. Remove heater unit.
21. Remove seals from casing and bulkhead.

Blower resistor

22. Drill out 2 pop rivets securing resistor to heater casing.
23. Remove blower resistor.

Refit**Blower resistor**

1. Pop rivet new resistor to heater casing.

Heater unit

2. Fit new seals to bulkhead and casing.
3. Enter heater unit casing into bulkhead and locate top fixing stud.
4. Engage harness retainers on casing.
5. Secure heater casing to bulkhead with screws and nut.
6. Fit blower motor and secure with 3 screws.
7. Connect wiring to blower motor and resistor.
8. *Air conditioning fitted:* Fit heater cut - off flap vacuum actuator, see **AIR CONDITIONING**.
9. Fit intake grille and mesh to top panel.
10. Connect inlet and outlet hoses to heater matrix pipes and tighten clips.
11. Refit charcoal canister mounting bracket, charcoal canister and connect multiplug to purge valve.
12. Refill cooling system, see **MAINTENANCE**.

AIR CONDITIONING

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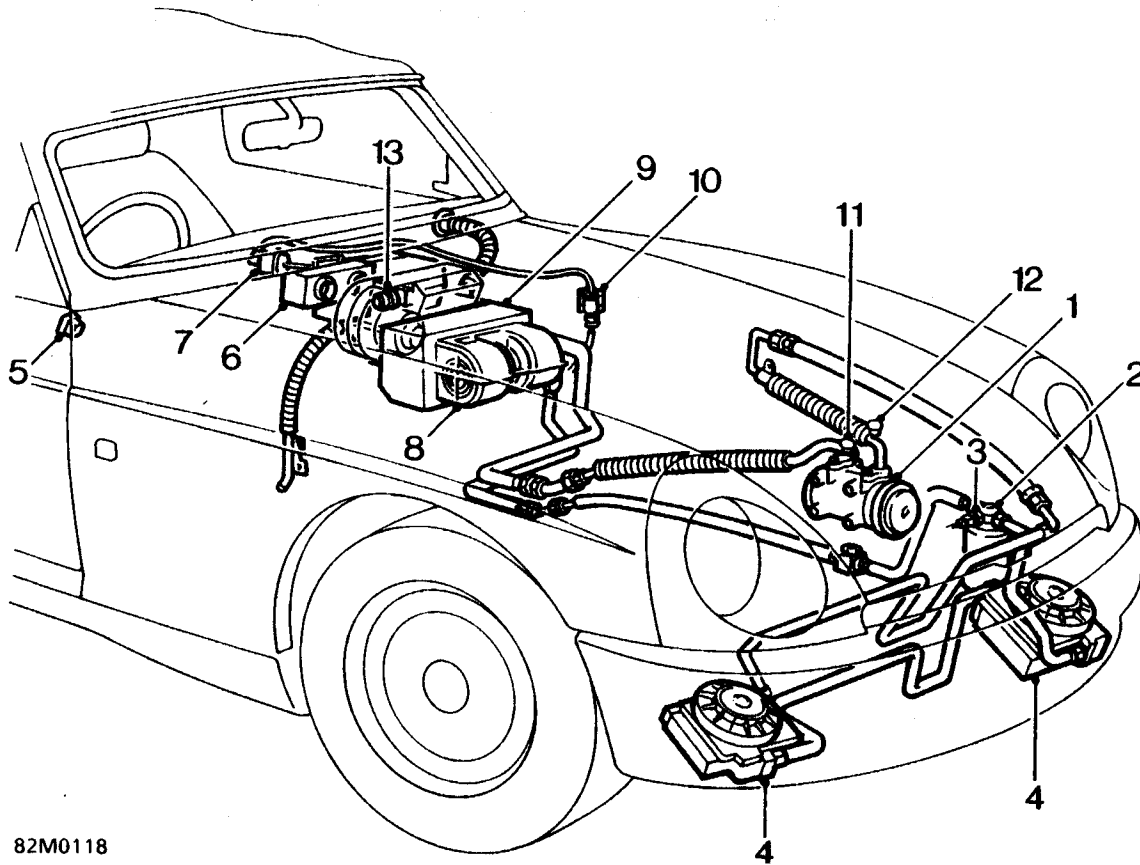
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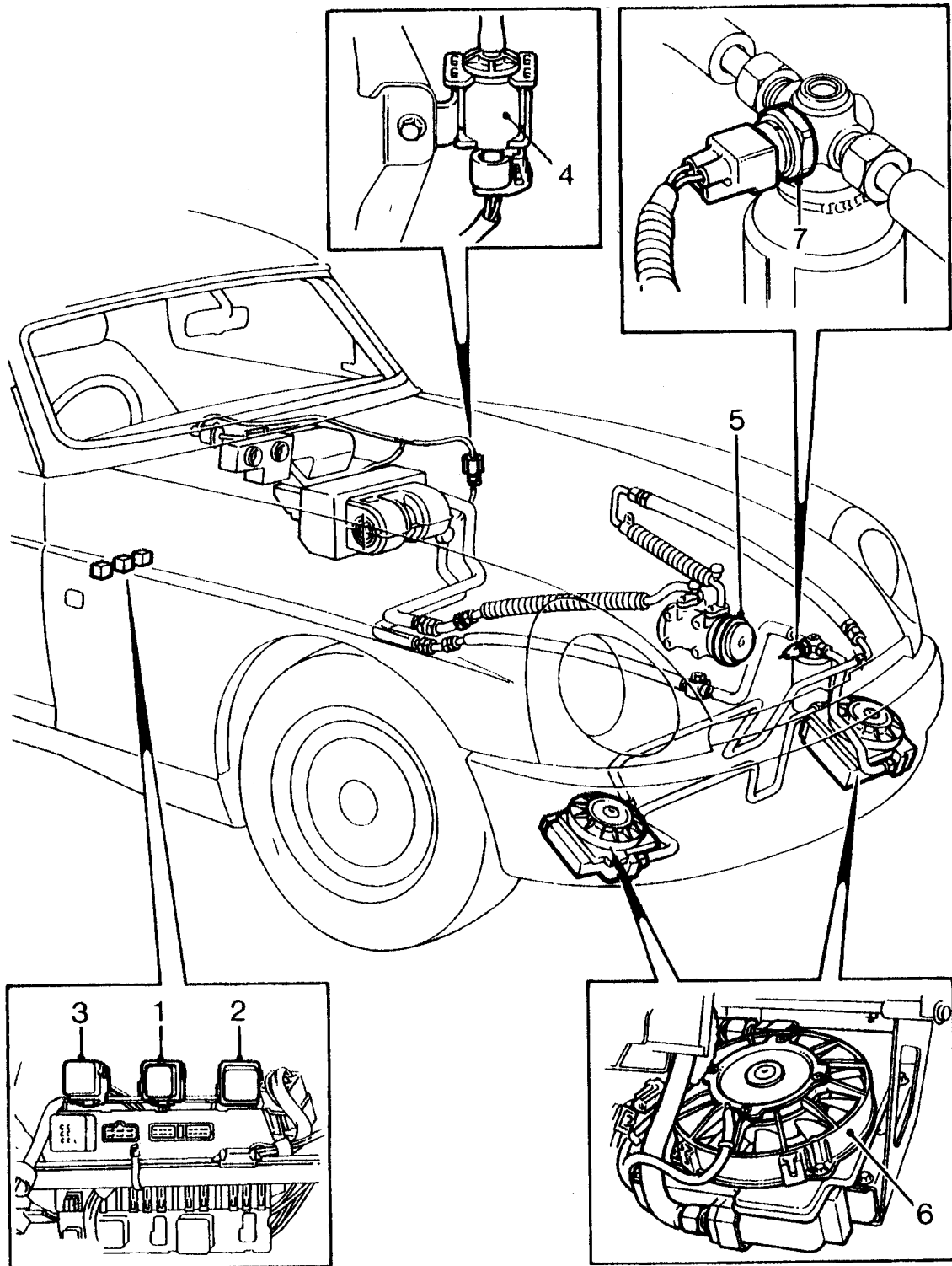
AIR CONDITIONING



82M0118

AIR CONDITIONING SYSTEM COMPONENTS

- | | |
|---|---|
| 1. Compressor | 8. Blower unit |
| 2. Receiver/drier | 9. Evaporator |
| 3. Dual pressure switch | 10. Vacuum solenoid valve |
| 4. Condensers | 11. Low pressure servicing connection |
| 5. Control switch | 12. High pressure servicing connection |
| 6. Distribution box | 13. Heater cut - off flap vacuum actuator |
| 7. Distribution box flap vacuum acuator | |



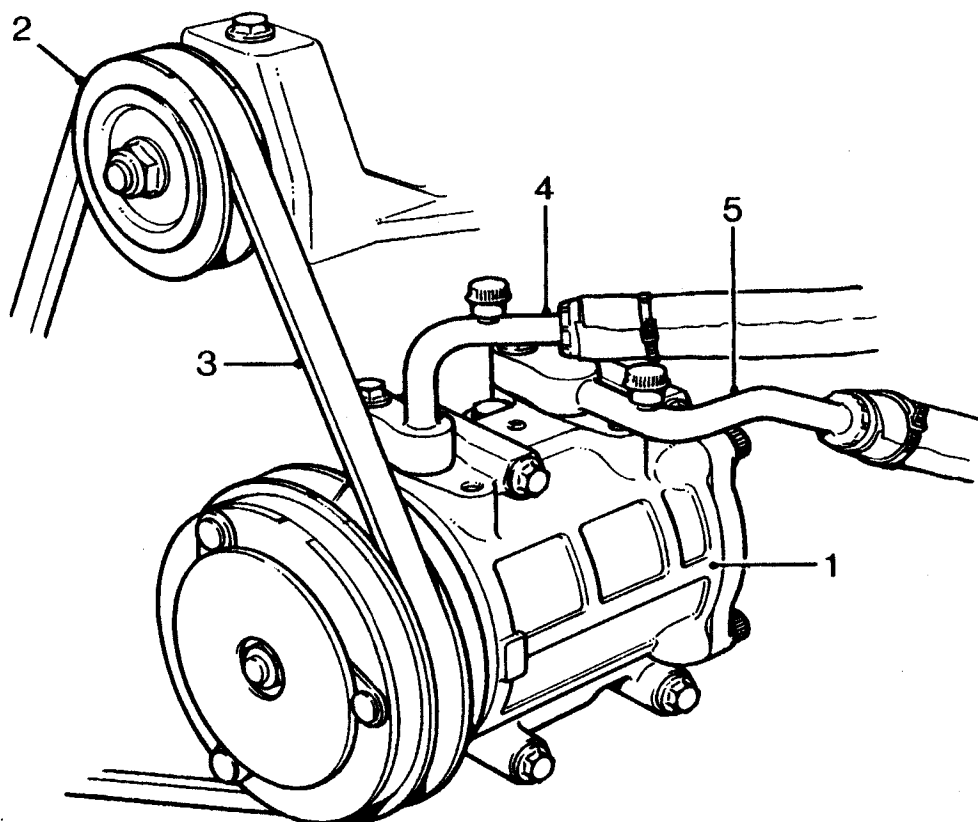
32M0119

AIR CONDITIONING ELECTRICAL COMPONENTS

1. Compressor clutch relay
2. Condenser fans relay
3. Blower motor changeover relay
4. Vacuum solenoid valve

5. Compressor clutch
6. Condenser fans
7. Dual pressure switch

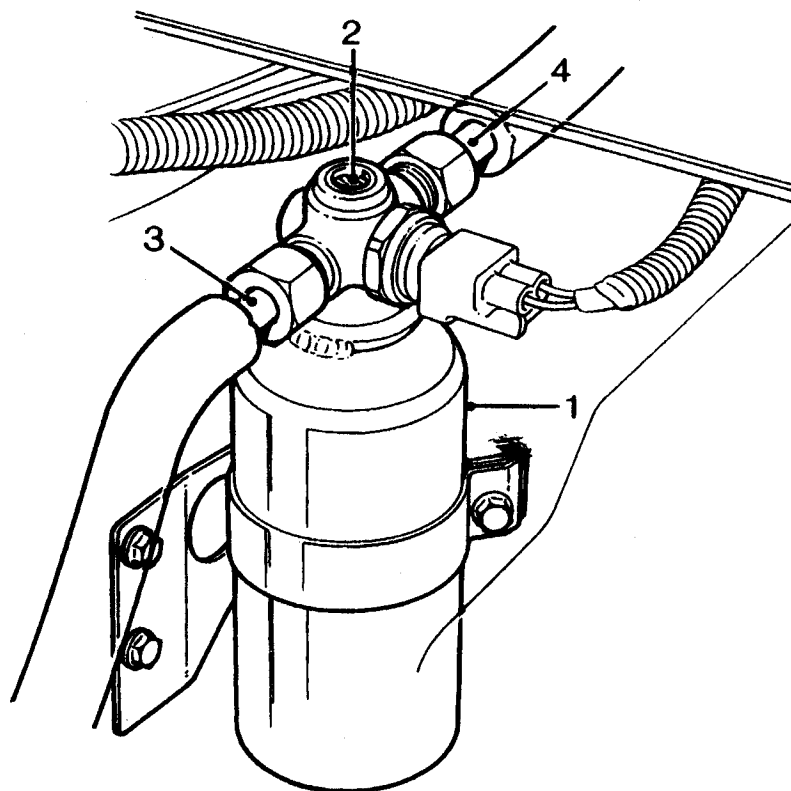
AIR CONDITIONING



82M0120

COMPRESSOR COMPONENTS

- | | |
|---------------------|--|
| 1. Compressor | 4. High pressure line, compressor to condenser |
| 2. Tensioner pulley | 5. Low pressure line, evaporator to compressor |
| 3. Drive belt | |

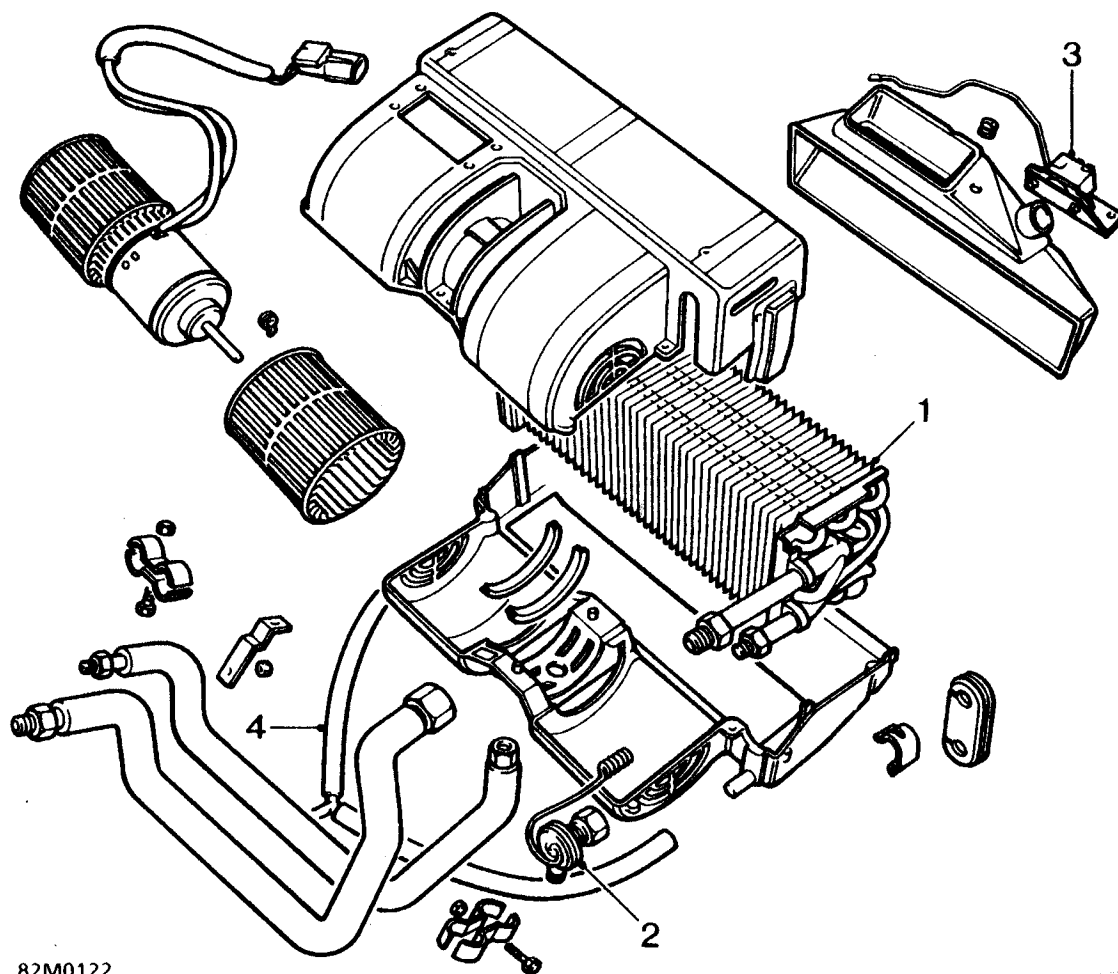


82M0121

RECEIVER/DRIER COMPONENTS

- | | |
|---|--|
| 1. Receiver/drier | 4. High pressure line – receiver to evaporator |
| 2. Sight glass | |
| 3. High pressure line – condenser to receiver | |

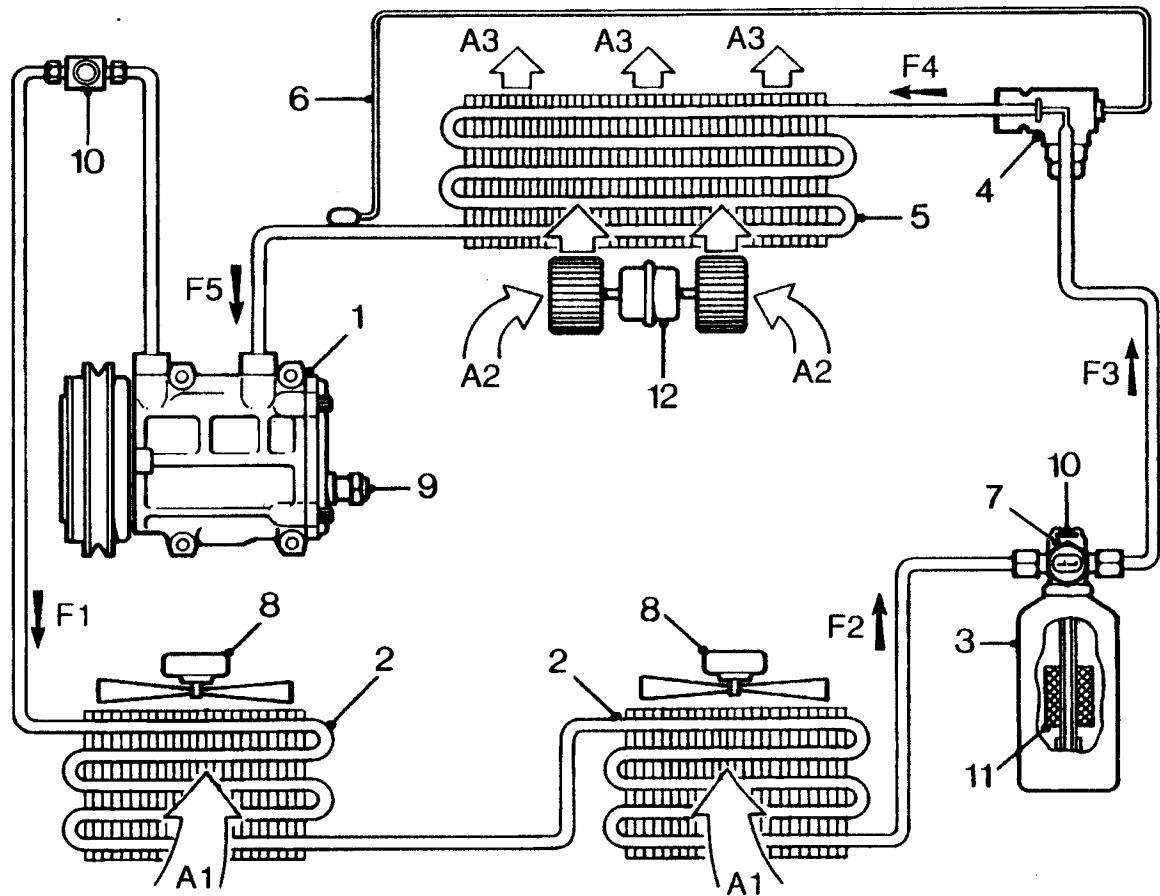
AIR CONDITIONING



82M0122

EVAPORATOR COMPONENTS

- | | |
|---------------------------------|---------------|
| 1. Evaporator | 3. Thermostat |
| 2. Thermostatic expansion valve | 4. Drain tube |



82M0150

SCHEMATIC LAYOUT OF THE AIR CONDITIONING SYSTEM

1. Compressor
2. Condenser
3. Receiver/drier
4. Thermostatic expansion valve
5. Evaporator
6. Capillary tube
7. Dual pressure switch
8. Cooling fans to increase air flow
9. Compressor high pressure relief valve
10. Sight glass
11. Drying agent - receiver/drier
12. Blower motor

- A1. Ambient air flow through condenser
- A2. Ambient air flow through fan and evaporator
- A3. Cooled air flow to vehicle interior
- F1. High pressure high temperature refrigerant vapour
- F2. High pressure slightly subcooled refrigerant liquid
- F3. High pressure slightly subcooled refrigerant liquid with moisture, vapour bubbles and foreign matter removed
- F4. Low pressure low temperature mixed liquid and vapour
- F5. Low pressure slightly superheated refrigerant vapour

AIR CONDITIONING SYSTEM OPERATION

The air conditioning system provides the means of supplying cooled and dehumidified recirculated air to the interior of the vehicle. The cooling effect is obtained by blowing air through the matrix of an evaporator unit to provide the conditions required inside the vehicle. The volume of conditioned air being supplied is controlled by a variable speed blower.

Sealed refrigerant

A sealed system, charged with Refrigerant R134a, together with a blower unit and control system combine to achieve the cooled air condition.

The sealed system comprises the following main components:

1. Compressor
2. Condensers
3. Receiver/drier
4. Thermostatic expansion valve
5. Evaporator
6. Thermostat capillary tube

The compressor, belt driven from the crankshaft pulley, pressurises and circulates the refrigerant through the system. The compressor is of the swashplate type having a fixed displacement. Mounted on the compressor, an electro – mechanical clutch maintains the correct temperature and pressure by engaging or disengaging to support the system's requirements. The clutch action is normally controlled by a thermostat located at the evaporator.

Should the temperature at the evaporator fall low enough for ice to begin to form on the fins, the thermostat signals the fuel ECU to disengage the clutch and also isolates the cooling fans relay. When the temperature at the evaporator rises to the control temperature, the system is reactivated.

Should the system pressure become excessive or drop sufficiently to cause damage to the compressor, the dual pressure switch, located in the high pressure line, signals the fuel ECU to disengage the clutch.

From the compressor, which has an emergency high pressure relief valve fitted, high pressure vaporised refrigerant passes to the two condensers mounted behind the front bumper valance. Ram air passing through the condensers supplemented by two cooling fans mounted in front of the condensers cools the refrigerant vapour sufficiently to form a high pressure slightly subcooled liquid. This liquid then passes to a

receiver/drier which fulfils three functions. It acts as a reservoir, moisture extractor and by means of a sight glass provides a method of determining the state of the refrigerant without breaking into the system.

From the receiver/drier the moisture free refrigerant liquid passes through a thermostatic expansion valve. This valve, converts the liquid refrigerant to a low temperature, low pressure liquid vapour mixture.

To prevent liquid passing through to the compressor, a capillary tube attached to the outlet pipe of the evaporator and connected to the thermostatic expansion valve controls the amount that the valve opens and closes in relation to the temperature of the low pressure, high temperature refrigerant vapour at the outlet. The atomised refrigerant then passes through the evaporator. Fan blown air passes through the matrix of the evaporator and is cooled by absorption due to the low temperature refrigerant passing through the evaporator.

A thermostat capillary tube is positioned in the airflow from the evaporator to sense the temperature of the exterior fins. Should ice begin to form due to excessive cooling it will signal the electro – mechanical clutch on the compressor to disengage.

From the evaporator, low pressure slightly superheated refrigerant passes to the compressor to complete the cycle.

AIR CONDITIONING CONTROL SYSTEM

The air conditioning control system comprises relays, thermostat, pressure switch, and controls. Together these controls, in conjunction with the cooling fans, compressor clutch, and blower enable minimal input to maintain the required environment inside the vehicle.

When air conditioning is not selected, air is supplied by ram effect or blower to the areas selected by the controls. The water valve controls the temperature of the air being supplied. No cooled air is available.

When air conditioning is selected the vacuum solenoid valve opens and allows vacuum to operate the heater blower and distribution box flaps, closing off the outside air ducts and opening the air conditioning ducts. The heater functions ie, hot or cold outside air, air to feet, air to screen are disabled.

Dual pressure switch

This switch, located in the receiver drier, monitors refrigerant pressure and by means of the fuel ECU controls the following system functions:

1. Refrigerant pressure drops below 2.0 bar, 29.5 lbf/in² (due to possible leakage), the compressor's electro - mechanical clutch is dis - engaged.

When pressure rises above 2.0 bar, 29.5 lbf/in² the compressor's clutch is re - engaged.

2. Refrigerant pressure rises above 25 bar, 363 lbf/in² (due to possible blockage), even with maximum cooling fan operation, the compressor electro - mechanical clutch is dis - engaged.

Condenser cooling fans

The condenser cooling fans operate automatically, at one speed, whenever the air conditioning system is switched on, providing the system pressure is correct.

Blower control

The blower can be operated at any one of three speeds by rotating the blower switch to the required position. When the blower is switched off the air conditioning system will not operate.

GENERAL PRECAUTIONS

The refrigerant used in the air conditioning system is HFC (Hydrofluorocarbon) R134a.

WARNING: R134a is a hazardous liquid and when handled incorrectly can cause serious injury. Suitable protective clothing must be worn when carrying out servicing operations on the air conditioning system.

WARNING: R134a is odourless and colourless. Do not handle or discharge in an enclosed area, or in any area where the vapour or liquid can come in contact with naked flame or hot metal. R134a is not flammable but can form a highly toxic gas.

WARNING: Do not smoke or weld in areas where R134a is in use. Inhalation of concentrations of the vapour can cause dizziness, disorientation, inco-ordination, narcosis, nausea or vomiting.

WARNING: Do not allow fluids other than R134a or compressor lubricant to enter the air conditioning system. Spontaneous combustion may occur.

WARNING: R134a splashed on any part of the body will cause immediate freezing of that area. Also refrigerant cylinders and replenishment trolleys when discharging will freeze skin to them if contact is made.

WARNING: The refrigerant used in an air conditioning system must be reclaimed in accordance with the recommendations given with a Refrigerant Recovery Recycling Recharging Station.

Note: Suitable protective clothing comprises: Wrap around safety glasses or helmet, heatproof gloves, rubber apron or waterproof overalls and rubber boots.

REMEDIAL ACTIONS

1. If liquid R134a strikes the eye, do not rub it. Gently run large quantities of eyewash over the eye to raise the temperature. If eyewash is not available cool, clean water may be used. Cover eye with clean pad and seek immediate medical attention.
2. If liquid R134a is splashed on the skin run large quantities of water over the area as soon as possible to raise the temperature. Carry out the same actions if skin comes into contact with discharging cylinders. Wrap affected parts in blankets or similar material and seek immediate medical attention.
3. If suspected of being overcome by inhalation of R134a vapour seek fresh air. If unconscious remove to fresh air. Apply artificial respiration and/or oxygen and seek immediate medical attention.

Note: Due to its low evaporating temperature of -30°C , R134a should be handled with care.

WARNING: Do not allow a refrigerant container to be heated by a direct flame or to be placed near any heating appliance. A refrigerant container must not be heated above 50°C .

WARNING: Do not leave a container of refrigerant without its cap fitted. Do not transport a container of refrigerant that is unrestrained, especially in the boot of a car.

AIR CONDITIONING

SERVICING PRECAUTIONS

Care should be taken when handling components of the refrigeration system. Units must not be lifted by their hoses, pipes or capillary lines. Hoses and lines must not be subjected to any twist or stress. Ensure that hoses are positioned in their correct run before fully tightening the couplings, and ensure that all clips and supports are used. Torque wrenches of the correct type must be used when tightening refrigerant connections to the stated value. An additional spanner must be used to hold the union to prevent twisting of the pipe.

Before connecting any hose or pipe ensure that refrigerant oil is applied to the seat of the new 'O' ring but not to the threads.

Check the oil trap for the amount of oil lost.

All protective plugs must be left in place until immediately prior to connection.

The receiver/drier contains dessicant which absorbs moisture. It must be positively sealed at all times.

CAUTION: *Whenever the refrigerant system is opened, the receiver/drier must be renewed immediately before evacuating and recharging the system.*

Use alcohol and a clean cloth to clean dirty connections.

Ensure that all new parts fitted are marked for use with **R134a**.

Refrigerant oil

Use approved refrigerant lubricating oil:

Unidap 7

CAUTION: *Do not use any other type of refrigerant oil.*

Refrigerant oil easily absorbs water and must not be stored for long periods. Do not pour unused oil back into the container.

When renewing system components, add the following quantities of refrigerant oil:

Condenser	30cm ³
Evaporator	60cm ³
Pipe or hose	10cm ³
Receiver/drier	10cm ³

Total amount of oil in system = 140cm³

A new compressor is sealed and pressurised with Nitrogen gas, slowly release the sealing cap, gas pressure should be heard to release as the seal is broken.

Note: *A new compressor should always have its sealing caps in place and must not be removed until immediately prior to fitting*

Fitting a new compressor

A new compressor is supplied with an oil fill (Xcm³) of: 140cm³

A calculated quantity of oil must be drained from a new compressor before fitting.

To calculate the quantity of oil to be drained:

1. Remove drain plug from the OLD compressor
2. Invert compressor and gravity drain oil into measuring cylinder. Rotating the compressor clutch plate will assist complete draining.
3. Note the quantity of oil drained (Ycm³).
4. Calculate the quantity (Qcm³) of oil to be drained from the NEW compressor using the following formula:

$$Xcm^3 - (Y + 20cm^3) = Qcm^3$$

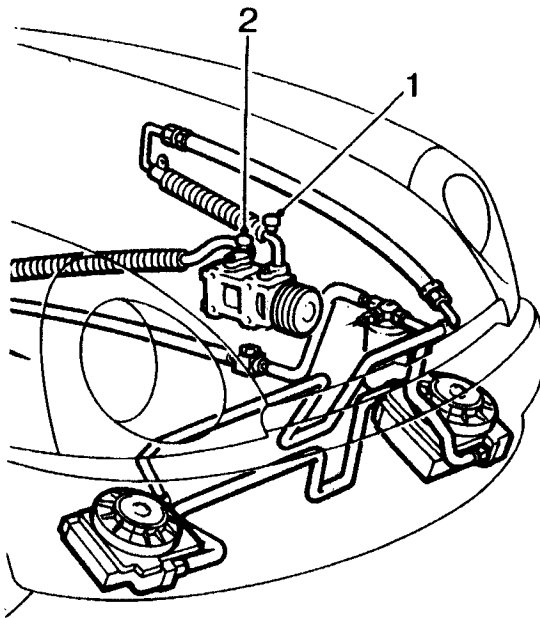
Rapid refrigerant discharge

When the air conditioning system is involved in accident damage and the circuit is punctured, the refrigerant is discharged rapidly. The rapid discharge of refrigerant will also result in the loss of most of the oil from the system. The compressor must be removed and all the remaining oil in the compressor drained and refilled as follows:

5. Remove the drain plug and gravity drain all the oil, assist by rotating the clutch plate (not the pulley).
6. Refill the compressor with the following amount of new refrigerant oil: 120cm³
7. Refit the drain plug and plug the inlet and outlet ports.

REFRIGERANT RECOVERY RECYCLING RECHARGING

An air conditioning portable Refrigerant Recovery Recycling Recharging Station for use with R134a refrigerant incorporates all the features necessary to recover refrigerant R134a from the A/C system, to filter and remove moisture, to evacuate and recharge with the reclaimed refrigerant. The unit can also be used for performance testing and air conditioning system analysis.



82M0146

1. High pressure servicing connection
2. Low pressure servicing connection

Recovery and recycling

1. Connect a Refrigerant Station to the high and low pressure servicing connections.
2. Operate the refrigerant recovery system according to the manufacturers instructions.
3. Measure the amount of oil discharged from the system and add an equal amount of new oil to the system before the charging sequence, as outlined in **Servicing Precautions**.

WARNING: Refrigerant must always be recycled before reuse, to ensure that the purity of the refrigerant is high enough for safe use in the air conditioning system.

Recycling should always be carried out with equipment which is design certified by Underwriter Laboratory Inc. for compliance with SAE - J1991. Other equipment may not recycle refrigerant to the required level of purity.

A R134a Refrigerant Recovery Recycling Recharging Station must not be used with any other type of refrigerant.

Refrigerant R134a from domestic and commercial sources must not be used in motor vehicle air conditioning systems.

Evacuation and recharging

1. Renew the receiver/drier.
2. Add the calculated amount of refrigerant oil to the compressor.
3. Connect a Refrigerant Station to the high and low pressure servicing connections.

CAUTION: Whenever the refrigerant system is opened, the receiver/drier must be renewed immediately before evacuating and recharging the system.

4. Operate the refrigerant evacuation system according to the manufacturers instructions.

Note: If the vacuum reading is below 700mmHg after 15 minutes, suspect a leak in the system. Partially recharge the system and check for leaks using an electronic leak tester.

CAUTION: The system must be Evacuated immediately before recharging commences. Delay between Evacuation and Recharging is not permitted.

5. Operate the refrigerant recharging system according to the manufacturers instructions.

Refrigerant to charge system is 0.70kg

6. If the full charge has not been accepted by the system, start the engine and run it at idle.
Switch on the air conditioning system and switch the blower to maximum speed.
7. Consult Refrigerant Station Manual for correct procedure to complete the charge through the low pressure side of the system.
8. Carry out the air conditioning system performance test.

AIR CONDITIONING SYSTEM - PERFORMANCE TEST

Carry out this test with bonnet, doors and windows closed, air conditioning switched on, and blower at maximum speed.

1. Insert dry bulb thermometer into cold air outlet.
2. Start engine and run it at 1500 rev/min for 10 minutes with air conditioning switched on.
3. Check that the receiver/drier sight glass is free of bubbles.
4. Check that the air outlet temperature remains below 10°C and above 0°C.
5. Switch off air conditioning, stop engine and remove thermometer.

COMPRESSOR

Service Repair No. 82.10.20

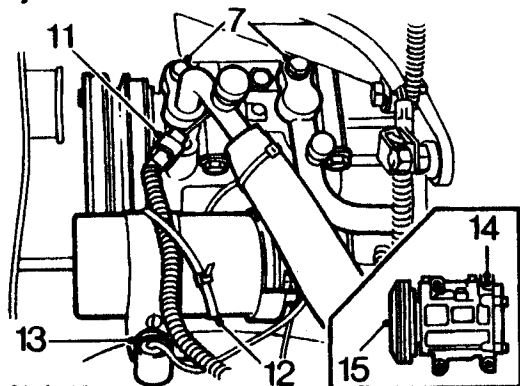
Remove

1. Recover refrigerant from air conditioning system, see **Adjustments**.
2. Disconnect battery earth lead.
3. Raise front of vehicle.

WARNING: Support on safety stands.

4. Remove compressor drive belt, see **MAINTENANCE**.
5. Position container to collect spilled coolant.
6. Slacken clip and disconnect radiator top hose.

WARNING: Since injury such as scalding could be caused by escaping steam or coolant, do not disconnect hose while system is hot. Wait until system has cooled.



10M0123

7. Remove 2 bolts securing high and low pressure pipes to compressor.
8. Release pipes from compressor.
9. Remove 'O' rings from pipes and discard.
10. Cap open fittings immediately to keep moisture and dirt out of system.
11. Disconnect harness connector from compressor clutch.
12. Remove clip securing compressor clutch harness to ignition coil.
13. Remove 2 bolts securing ignition coil bracket to body; move coil and radio suppressor aside.
14. Remove 4 bolts securing compressor to mounting bracket.
15. Remove compressor.

Refit

1. Position compressor to mounting bracket.
2. Fit 4 bolts securing compressor; tighten bolts to correct torque.
3. Position ignition coil and radio suppressor; fit and tighten 2 bolts.
4. Reconnect harness connector to compressor.
5. Secure compressor harness to ignition coil with clip.
6. Remove caps from compressor and pipes.

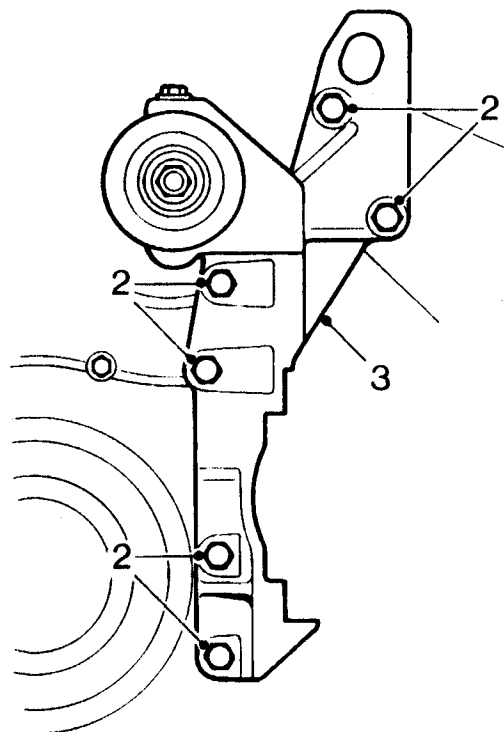
7. Clean pipes and joints on compressor.
8. Lubricate new 'O' rings with refrigerant oil.
9. Fit 'O' rings to pipes.
10. Connect high and low pressure pipes to compressor; fit 2 bolts and tighten to correct torque.
11. Connect coolant top hose to radiator; tighten clip.
12. Fit and adjust compressor drive belt, see **MAINTENANCE**.
13. Top - up cooling system, see **MAINTENANCE**.
14. Remove stand(s) and lower vehicle.
15. Connect battery earth lead.
16. Recharge air conditioning system, see **Adjustments**.

COMPRESSOR MOUNTING BRACKET

Service Repair No. 82.10.34

Remove

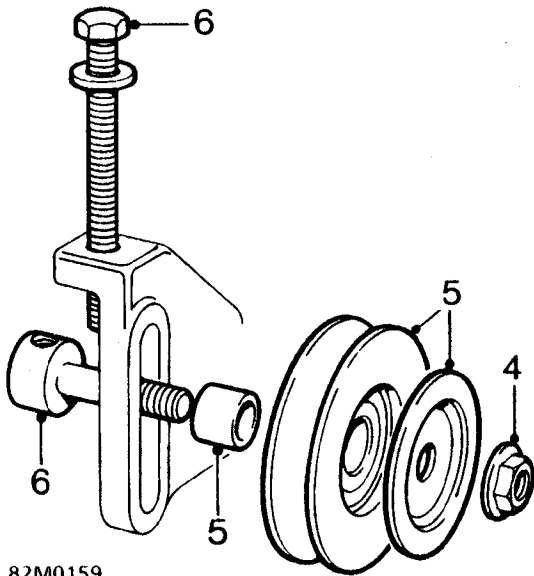
1. Remove compressor.



82M0158

2. Noting their fitted positions, remove 6 bolts securing mounting bracket.
 3. Remove mounting bracket assembly.
- Do not carry out further dismantling if component is removed for access only**

AIR CONDITIONING

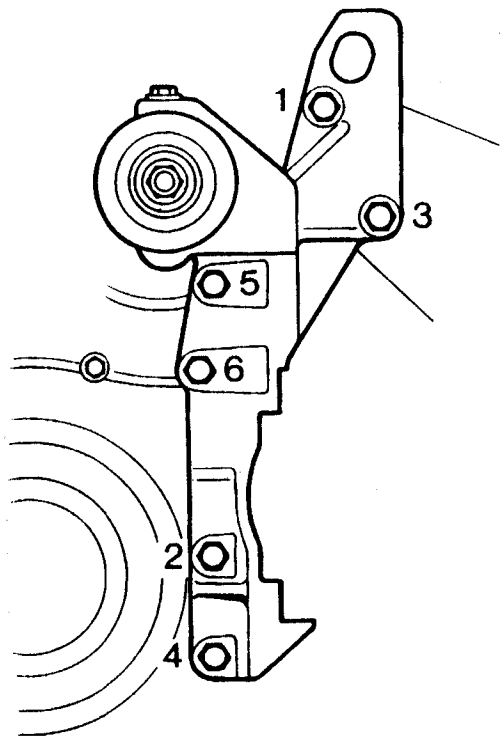


82M0159

4. Remove nut securing drive belt adjuster pulley to mounting bracket.
5. Remove pulley, dished washer and spacer sleeve.
6. Remove pulley adjuster bolt and pulley mounting bolt.
7. Position pulley mounting bolt and fit adjuster bolt.
8. Clean pulley and mating face.
9. Clean dished washer and spacer sleeve.
10. Fit spacer sleeve to pulley.
11. Fit pulley.
12. Fit dished washer.
13. Fit, but do not tighten pulley nut.

Refit

1. Clean compressor mounting bracket mating faces.
2. Position mounting bracket.
3. Coat first 3 threads of mounting bracket bolts with Loctite 572.



82M0160

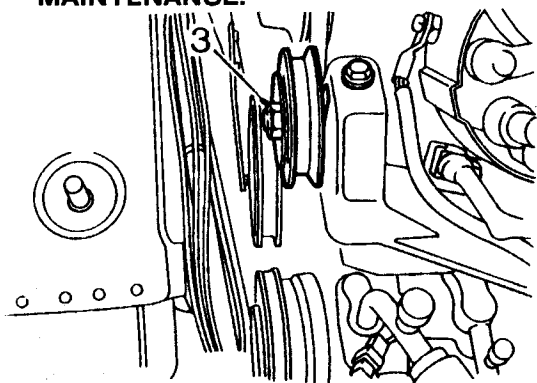
4. Fit and hand tighten bolts, then tighten in sequence shown to correct torque.
5. Refit compressor.

DRIVE BELT TENSIONER PULLEY

Service Repair No. 82.10.03

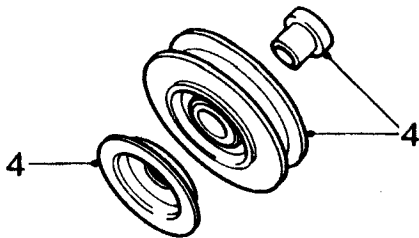
Remove

1. Disconnect battery earth lead.
2. Remove compressor drive belt, see **MAINTENANCE**.



82M0125

3. Remove nut securing tensioner pulley to mounting bracket.



82M0126

4. Remove pulley, dished washer and spacer sleeve.

Refit

1. Clean pulley and mating face.
2. Clean dished washer and spacer sleeve.
3. Fit spacer sleeve to pulley.
4. Fit pulley.
5. Fit dished washer.
6. Fit, but do not tighten pulley nut.
7. Fit and adjust compressor drive belt, see **MAINTENANCE**.
8. Connect battery earth lead.

CONDENSER FAN AND MOTOR

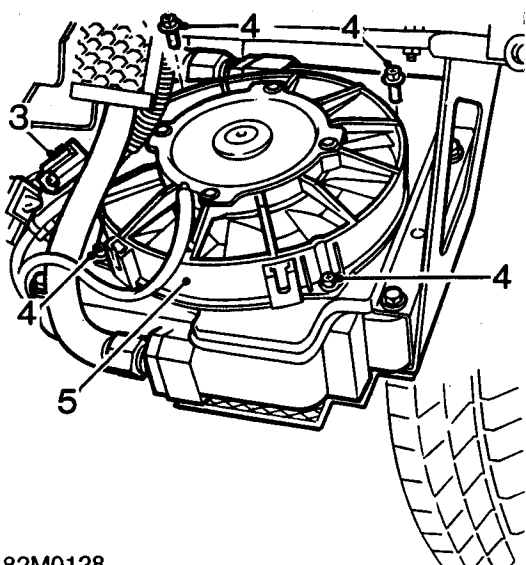
Service Repair No. 82.15.01

Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.

2. Remove front bumper valance, see **BODY**



82M0128

3. Disconnect multiplug from condenser cooling fan.
4. Remove 4 screws securing cooling fan to condenser.
5. Remove cooling fan assembly.

Refit

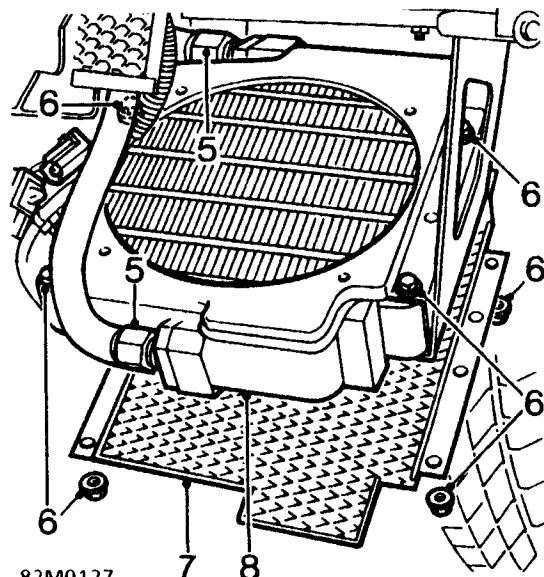
1. Fit and align cooling fan assembly; fit and tighten 4 screws.
2. Reconnect multiplug to condenser cooling fan.
3. Refit front bumper valance, see **BODY**
4. Remove stand(s) and lower vehicle.

CONDENSER

Service Repair No. 82.15.07

Remove

1. Disconnect battery earth lead.
2. Recover refrigerant from air conditioning system, see **Adjustments**.
3. Remove front bumper valance, see **BODY**
4. Remove condenser fan motor.



82M0127

5. Disconnect 2 condenser pipe unions.
6. Remove 4 nuts and bolts securing condenser.
7. Remove condenser shield and fan mounting plate.
8. Remove condenser.
9. Remove 2 'O' rings from condenser pipe unions.
10. Cap open fittings immediately to keep moisture and dirt out of system.

Refit

1. Remove caps from condenser and pipes.
2. Clean condenser and pipe joints.
3. Lubricate new 'O' rings with refrigerant oil.
4. Fit 'O' rings to pipes.
5. Fit condenser.
6. Connect pipes and tighten unions to correct torque.
7. Fit condenser shield and fan mounting plate.
8. Fit and tighten 4 nuts and bolts securing condenser.

AIR CONDITIONING

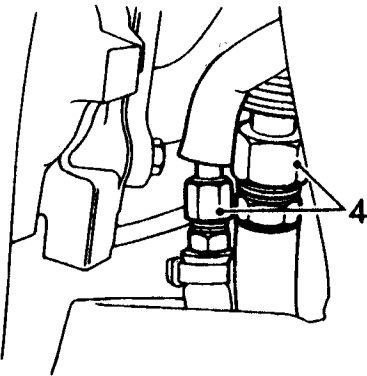
9. Refit condenser fan motor.
10. Refit front bumper valance, see **BODY**
11. Connect battery earth lead.
12. Recharge air conditioning system, see **Adjustments**.

EVAPORATOR

Service Repair No. 82.25.20

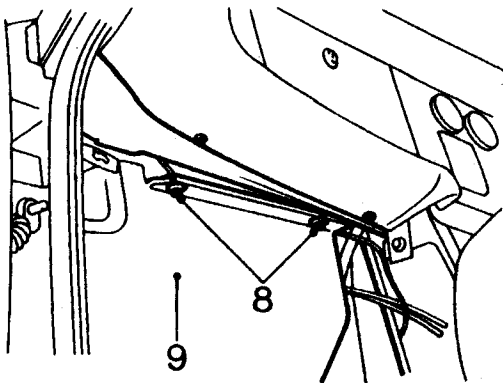
Remove

1. Disconnect battery earth lead.
2. Recover refrigerant from air conditioning system, see **Adjustments**.
3. Raise vehicle on a ramp.



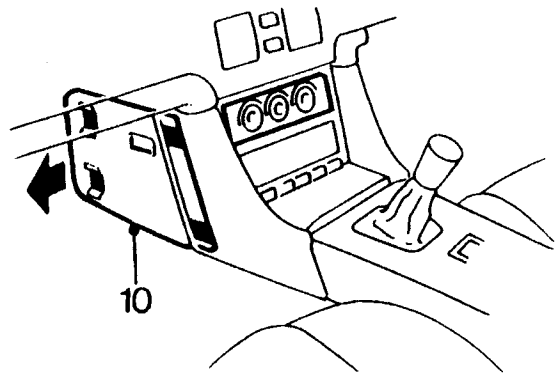
82M0129

4. From under vehicle, disconnect 2 evaporator pipe unions.
5. Remove 'O' rings from pipes and discard.
6. Cap open fittings immediately to keep moisture and dirt out of system.
7. Lower ramp.



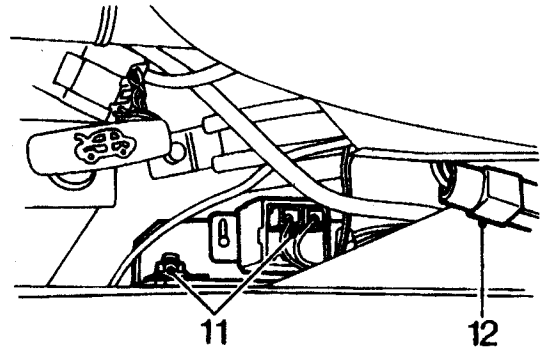
82M0130

8. Remove 2 bolts securing evaporator closing panel to fascia.
9. Remove closing panel.



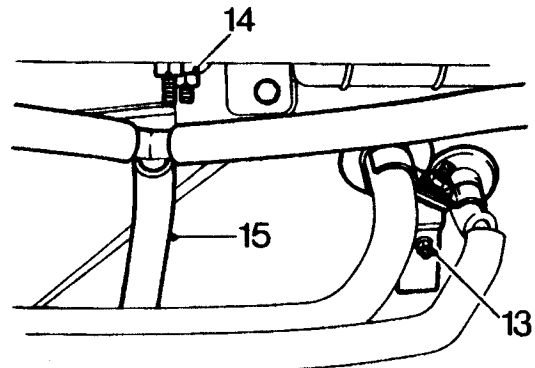
82M0141

10. Release closing panel from centre console; disconnect 2 interior lamp Lucar connectors and remove closing panel.



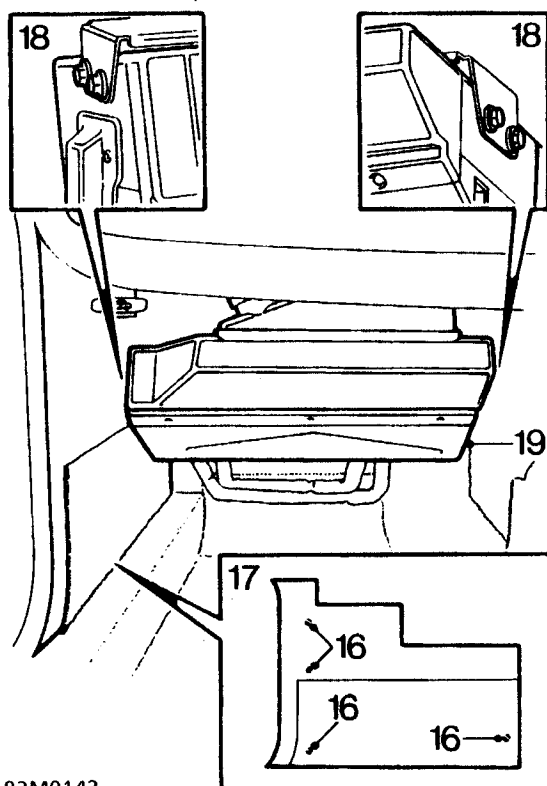
82M0133

11. Remove nut securing thermostat bracket to evaporator bracket; release thermostat from mounting stud and disconnect 2 Lucar connectors.
12. Disconnect blower motor multiplug.



82M0131

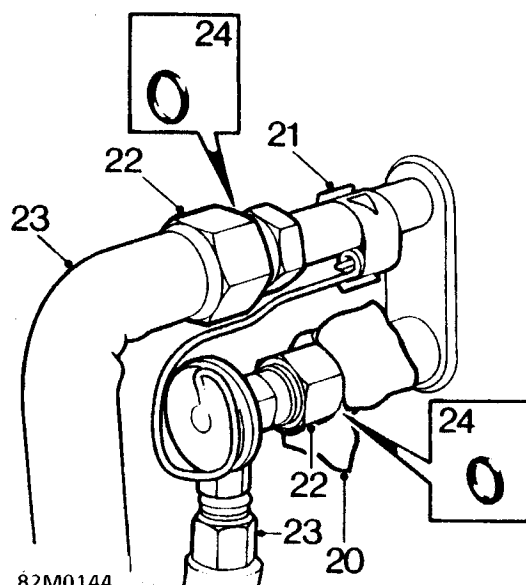
13. Remove bolt securing evaporator pipe bracket to bulkhead.
14. Remove nut securing evaporator rear mounting plate; remove plate.
15. Release evaporator drain hose from 'Y' piece connector.



82M0143

16. Release 4 passenger footwell side trim retaining clips.
17. Remove side trim from footwell.
18. Remove 4 bolts securing evaporator to mounting bracket.
19. Release evaporator pipes from bulkhead and remove evaporator.

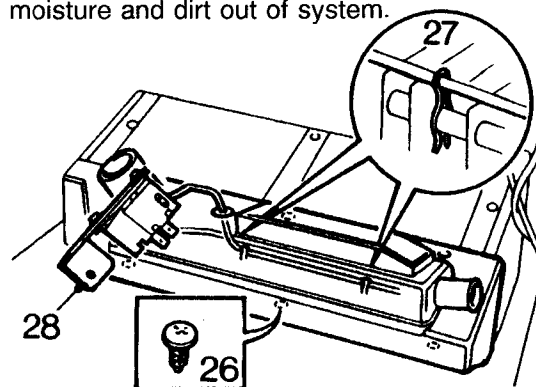
Do not carry out further dismantling if component is removed for access only



82M0144

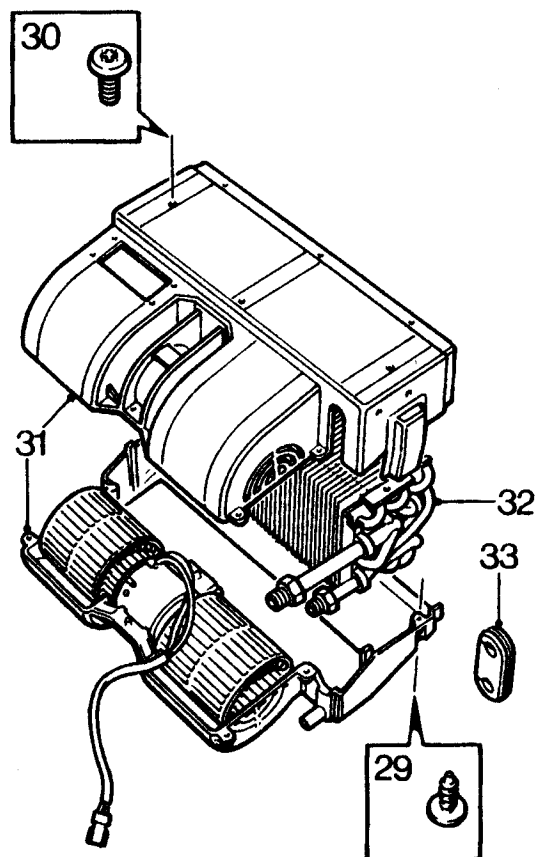
20. Release evaporator pipe insulation.
21. Remove clip securing expansion valve capillary tube to pipe.
22. Disconnect 2 pipe unions.
23. Remove pipes.
24. Remove 'O' rings from pipes and discard.

25. Cap open fittings immediately to keep moisture and dirt out of system.



82M0134

26. Remove 6 screws securing air duct to evaporator casing.
27. Release air duct and remove 2 clips securing thermostat capillary tube to evaporator.
28. Remove air duct and thermostat assembly.



82M0145

29. Remove 10 screws securing halves of evaporator casing together.
30. Remove 2 screws securing evaporator to casing.
31. Split evaporator casing.
32. Remove evaporator from casing.
33. Remove grommet from evaporator pipes.

Refit

1. Fit grommet to evaporator pipes.
2. Fit evaporator to casing.

AIR CONDITIONING

3. Position evaporator casing halves together.
4. Fit 2 screws securing evaporator to casing.
5. Fit 10 screws securing evaporator casing halves.
6. Position air duct, align thermostat capillary tube and secure with 2 clips.
7. Fit air duct to evaporator casing; fit and tighten 6 screws.
8. Remove caps from pipes and evaporator.
9. Clean pipes and evaporator joints.
10. Lubricate new 'O' rings with refrigerant oil.
11. Fit 'O' rings to pipes.
12. Connect pipes to evaporator; tighten unions to correct torque.
13. Position expansion valve capillary tube to evaporator pipe and secure with clip.
14. Fit evaporator pipe insulation.
15. Fit evaporator to vehicle and feed pipes through bulkhead.

Note: Apply a soap solution to evaporator pipe connections to aid fitting pipes through bulkhead grommets.

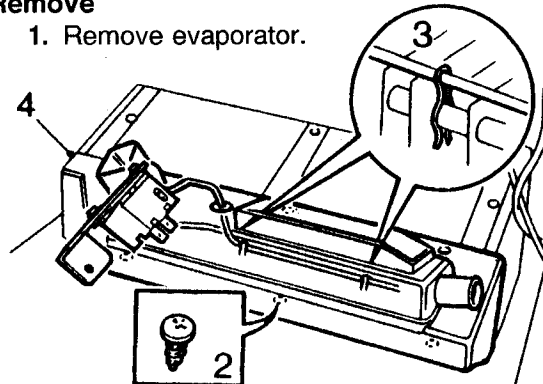
16. Fit, but do not tighten 4 bolts securing evaporator to mounting bracket.
17. Secure evaporator drain hose to 'Y' piece connector.
18. Connect blower motor multiplug.
19. Connect Lucar connectors to thermostat, position thermostat bracket to mounting stud; fit and tighten nut.
20. Fit evaporator rear mounting plate.
21. Fit, but do not tighten mounting plate nut.
22. Raise vehicle on a ramp.
23. Remove caps from pipes.
24. Clean pipes, lubricate new 'O' rings with refrigerant oil and fit 'O' rings to pipes.
25. Connect pipes and tighten unions to correct torque.
26. Lower ramp.
27. Tighten 4 bolts securing evaporator to mounting bracket.
28. Tighten nut securing evaporator rear mounting plate.
29. Position centre console closing panel; connect 2 interior lamp Lucar connectors and secure panel.
30. Fit passenger footwell side trim and secure 3 clips.
31. Fit evaporator closing panel; fit and tighten 2 bolts.
32. Connect battery earth lead.
33. Recharge air conditioning system, see **Adjustments**.

THERMOSTAT

Service Repair No. 82.25.50

Remove

1. Remove evaporator.



82M0157

2. Remove 6 screws securing air duct to evaporator casing.
3. Release thermostat capillary tube from 2 clips.
4. Remove air duct.
5. Release thermostat capillary tube from evaporator casing.
6. Remove 2 screws securing thermostat to mounting bracket.
7. Remove thermostat.

Refit

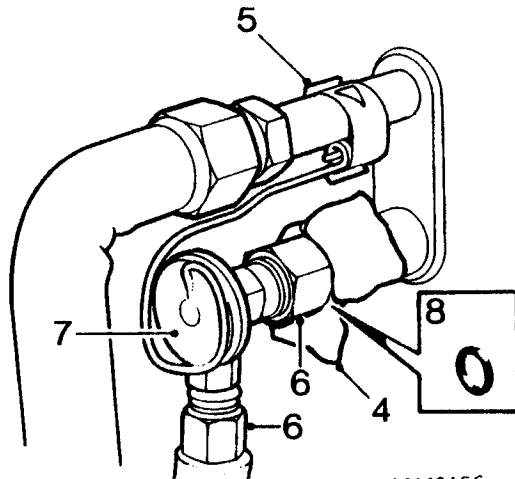
1. Fit thermostat to mounting bracket; fit and tighten 2 screws.
2. Secure thermostat capillary tube to evaporator casing.
3. Position air duct to evaporator casing and secure thermostat capillary tube to 2 clips.
4. Fit and tighten 6 screws securing air duct to evaporator casing.
5. Refit evaporator.

THERMOSTATIC EXPANSION VALVE

Service Repair No. 82.17.06

Remove

1. Disconnect battery earth lead.
2. Recover refrigerant from air conditioning system, see **Adjustments**.
3. Remove evaporator.



82M0156

4. Release evaporator pipe insulation.
5. Remove clip securing expansion valve capillary tube to pipe.
6. Disconnect expansion valve pipe unions.
7. Remove valve.
8. Remove 'O' rings from pipes and discard.
9. Cap open fittings immediately to keep moisture and dirt out of system.

Refit

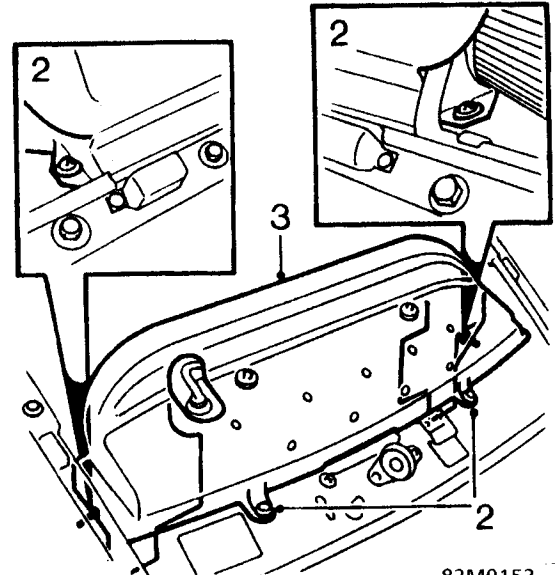
1. Clean pipes and evaporator joints.
2. Lubricate new 'O' rings with refrigerant oil.
3. Fit 'O' rings to pipes.
4. Fit expansion valve and tighten unions to correct torque.
5. Position expansion valve capillary tube to evaporator pipe and secure with clip.
6. Fit evaporator pipe insulation.
7. Refit evaporator.
8. Recharge air conditioning system, see **Adjustments**.
9. Connect battery earth lead.

RECEIVER DRIER

Service Repair No. 82.17.03

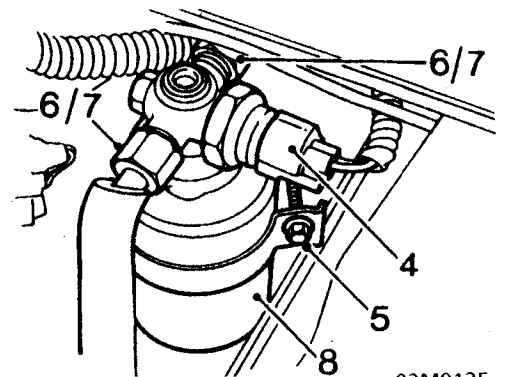
Remove

1. Recover refrigerant from air conditioning system, see **Adjustments**.



82M0153

2. Remove 2 bolts, and 2 scrivet fasteners securing radiator top cover.
3. Remove radiator top cover.



82M0135

4. Disconnect dual pressure switch multiplug.
5. Slacken receiver drier clamp screw.
6. Disconnect receiver drier pipe unions.
7. Release pipes from receiver drier.
8. Remove receiver drier.
9. Remove 'O' rings from pipes and discard.
10. Cap open fittings immediately to keep moisture and dirt out of system.
11. Remove dual pressure switch from receiver drier.
12. Remove 'O' ring from switch and discard.

Refit

1. Fit receiver drier.
2. Remove caps from pipes and receiver drier joints.
3. Clean pipes and receiver drier joints.
4. Lubricate new 'O' rings with refrigerant oil.

AIR CONDITIONING

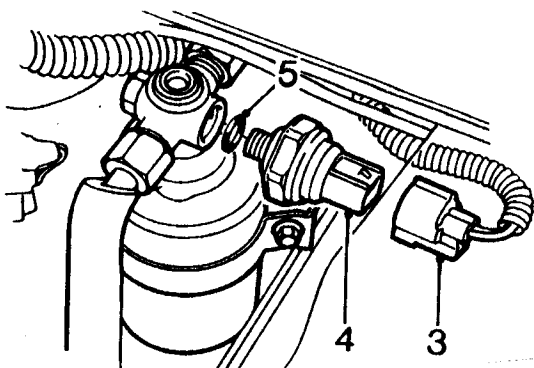
5. Fit 'O' rings to pipes and dual pressure switch.
6. Connect pipes to receiver drier and tighten unions to correct torque.
7. Fit dual pressure switch.
8. Tighten receiver drier clamp screw.
9. Reconnect dual pressure switch multiplug.
10. Fit radiator top cover.
11. Fit 2 scrivet fasteners
12. Fit and tighten 2 bolts.
13. Recharge air conditioning system, see **Adjustments**.

DUAL PRESSURE SWITCH

Service Repair No. 82.20.83

Remove

1. Disconnect battery earth lead.
2. Recover refrigerant from air conditioning system, see **Adjustments**.



82M0148

3. Disconnect switch multiplug.
4. Remove switch from receiver drier.
5. Remove 'O' ring from switch and discard.

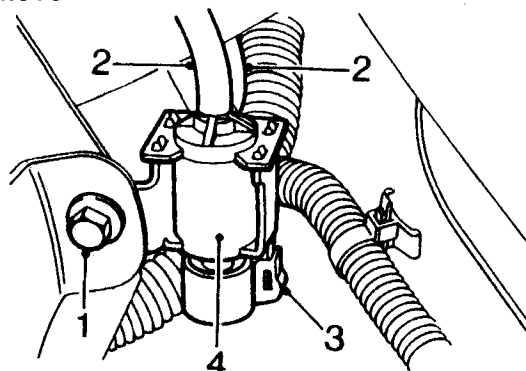
Refit

1. Clean switch and receiver drier mating face.
2. Lubricate new 'O' ring with refrigerant oil.
3. Fit 'O' ring to switch.
4. Fit switch to receiver drier.
5. Connect switch multiplug.
6. Connect battery earth lead.
7. Recharge air conditioning system, see **Adjustments**.

VACUUM SOLENOID VALVE

Service Repair No. 82.20.97

Remove



82M0137

1. Remove bolt securing vacuum solenoid valve to expansion tank bracket.
2. Disconnect 2 vacuum hoses from valve.
3. Disconnect multiplug.
4. Remove valve.

Refit

1. Position valve; connect multiplug and 2 vacuum hoses.
2. Align valve to expansion tank bracket; fit and tighten bolt.

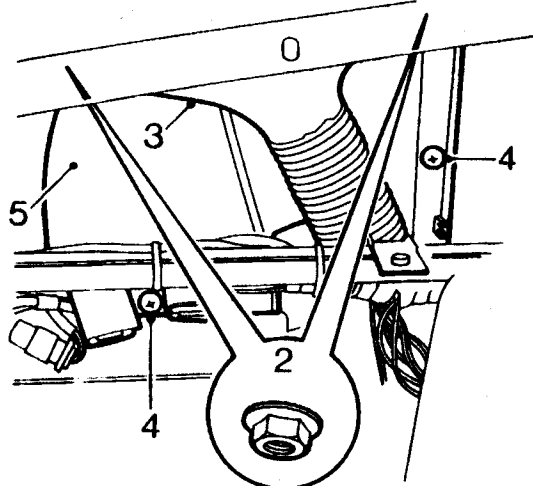
DISTRIBUTION BOX AND VACUUM ACTUATOR

Service Repair No. 82.25.53 - Distribution box

Service Repair No. 82.20.98 - Vacuum actuator

Remove

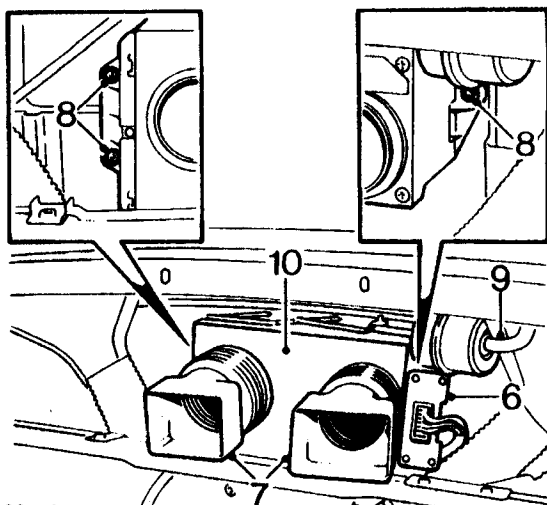
1. Remove fascia assembly, see **BODY**



82M0138

2. Remove 2 nuts securing L.H. heater duct.
3. Remove duct.
4. Remove 2 scrivet fasteners securing air duct; evaporator to distribution box.

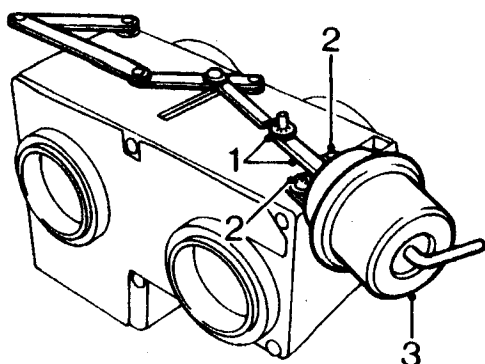
5. Remove air duct.



82M0147

6. Release engine immobiliser control unit from distribution box.
7. Remove 2 hoses; distribution box to fascia
8. Remove 3 nuts securing distribution box to body.
9. Disconnect vacuum hose from vacuum actuator.
10. Remove distribution box and vacuum actuator assembly.

Vacuum actuator



82M0140

1. Remove clip securing vacuum actuator link rod to flap lever; disconnect rod.
2. Remove 2 bolts securing vacuum actuator to distribution box.
3. Remove vacuum actuator.
4. Fit vacuum actuator to distribution box; fit and tighten 2 bolts.
5. Connect vacuum actuator link rod to flap lever; fit clip.

Refit

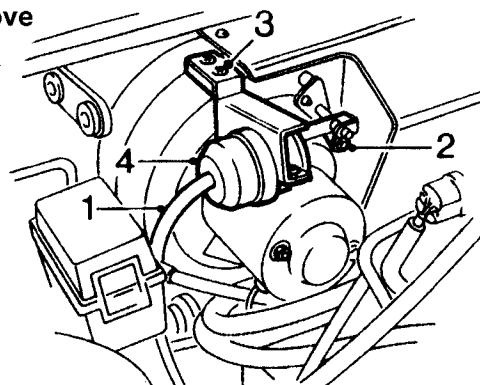
1. Fit distribution box to body; fit and tighten 3 nuts.
2. Connect vacuum hose to vacuum actuator.
3. Fit 2 hoses; fascia to distribution box.
4. Secure engine immobiliser control unit to distribution box.
5. Fit air duct; evaporator to distribution box and secure with 2 scrivers.
6. Fit L.H. heater duct; fit and tighten 2 nuts.

7. Refit fascia assembly, see BODY

HEATER CUT - OFF FLAP VACUUM ACTUATOR

Service Repair No. 82.22.99

Remove



82M0155

1. Disconnect vacuum hose
2. Remove clip securing vacuum actuator to flap lever.
3. Remove 2 screws securing vacuum actuator.
4. Remove vacuum actuator.

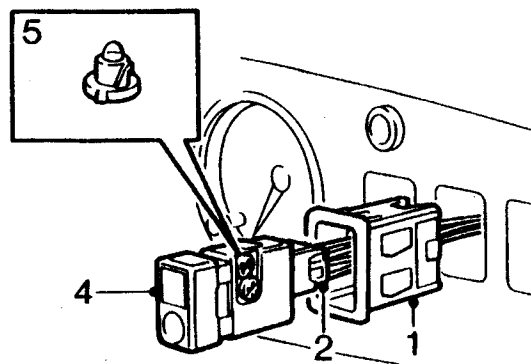
Refit

1. Fit actuator and connect link.
2. Fit and tighten 2 screws securing actuator.
3. Fit clip securing actuator to flap lever and connect vacuum hose.

CONTROL SWITCH AND BULB

Service Repair No. 82.20.07

Remove



82M0142

1. Release switch holder from fascia panel.

Note: Switch can be pressed out by reaching behind panel

2. Disconnect switch multiplug.

AIR CONDITIONING

3. Remove switch and holder assembly.

Do not carry out further dismantling if component is removed for access only

4. Remove switch from holder.
5. Remove bulb from switch.

Refit

1. Fit new bulb to switch.
2. Fit switch to holder.
3. Position assembly and connect multiplug.
4. Align and press switch holder into fascia panel.

WIPERS & WASHERS

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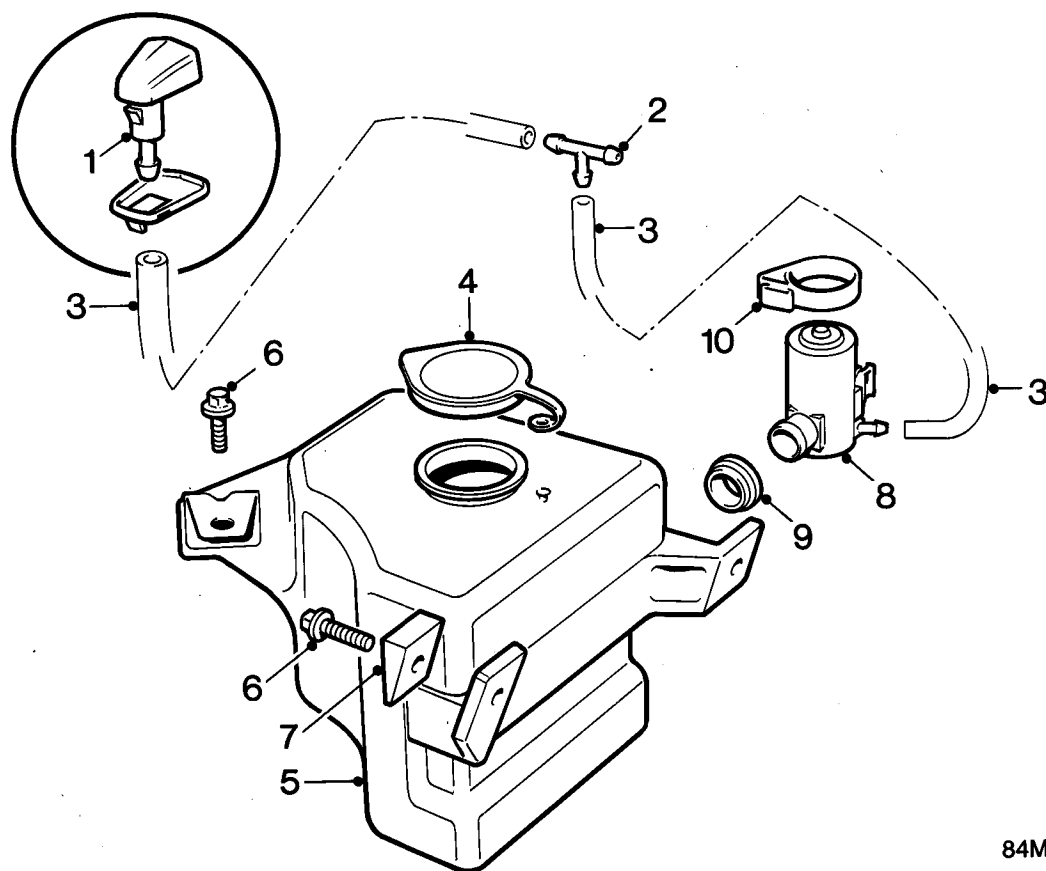
WIPERS & WASHERS



**WINDSCREEN WIPER COMPONENTS**

- | | |
|-------------------------------|---------------------------|
| 1. Arm - windscreen wiper | 15. Gear housing cover |
| 2. Blade - windscreen wiper | 16. Circlip |
| 3. Nut - wiper spindle | 17. Connecting rod |
| 4. Washer - wiper spindle | 18. Washers |
| 5. Rubber spacer - top | 19. Drive gear |
| 6. Rubber spacer - bottom | 20. Dished washer |
| 7. Wheel boxes | 21. Plain washer |
| 8. Cable tubes | 22. Circlip |
| 9. Clamp | 23. Gear housing |
| 10. Clamp rubber | 24. Limit switch assembly |
| 11. Pad - motor support | 25. Brush gear |
| 12. Clamp screws | 26. Armature |
| 13. Cable rack assembly | |
| 14. Gear housing cover screws | |

WIPERS & WASHERS



84M0062

WINDSCREEN WASHER COMPONENTS

- | | |
|--|----------------------------------|
| 1. Washer jets | 7. Washers – reservoir retaining |
| 2. Tee connection – windscreen washer tube | 8. Pump |
| 3. Washer tube | 9. Pump seal |
| 4. Reservoir cap | 10. Pump retaining clip |
| 5. Reservoir | |
| 6. Screws – reservoir retaining | |



WINDSCREEN WASH AND WIPER OPERATION

Operation of the windscreen wipers and washers is controlled by the wash/wipe switch mounted at the R.H side of the steering column. The wiper system is capable of five separate functions, dependent upon switch position. The wiper switch may be rotated from the OFF position to selected positions; Intermittent, Normal or Fast wipe speeds. Single wipe being obtained by a downward movement of the lever from the OFF position. The windscreen washer will operate when the lever is moved rearwards towards the driver.

When the wiper switch is selected to any ON position a two speed wiper motor provides drive to a connecting rod, onto the cable and through to the wheel boxes which converts the lateral motion into the sweeping motion of the wiper arm and blade.

The fast, normal and intermittent speeds, when selected, are controlled by a relay unit situated in the fusebox. The intermittent wipe delay can be varied by means of a control on the switch lever. The windscreen wipers are only operational when the ignition switch is at position 'II' .

The wipers will continue to operate for three extra wipes after the washer switch has been released.

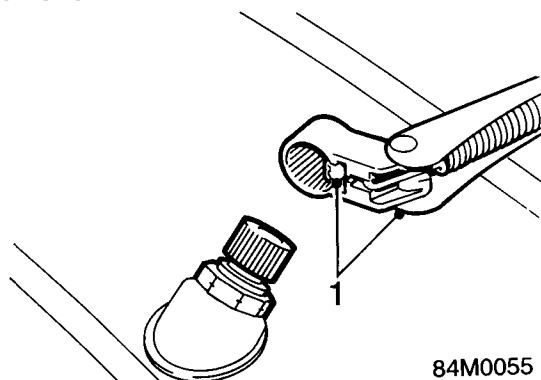
The operation of the windscreen washer is controlled by the switch at the outer end of the wash/wipe lever, when the switch is depressed the wipers operate and, washer fluid is drawn by an electric pump from the reservoir located in the the engine compartment, and is sprayed against the windscreen by the jets.



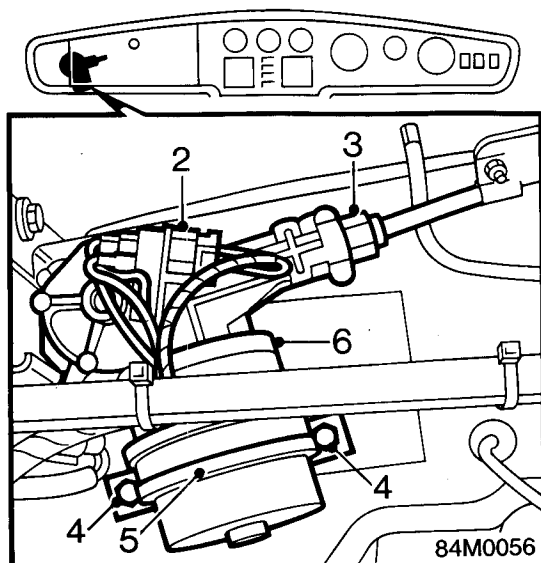
WIPER MOTOR

Service Repair No. 84.15.12

Remove



1. Release clips and remove both wiper arm and blade assemblies.



2. Disconnect multiplug from motor.
3. Unscrew nut securing cable rack tube to motor.
4. Remove 2 screws securing motor clamp.
5. Remove clamp.
6. Withdraw motor assembly complete with cable rack.
7. Collect motor support pad.

Note: Wheel box spindles will rotate when cable rack is withdrawn.

Refit

1. Apply grease to cable rack, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.
2. Position wiper motor assembly and feed cable rack into tube, align motor to tube and fit the nut.
3. Position motor support pad, align motor and fit clamp. Fit and tighten clamp screws.
4. Tighten cable rack tube nut.
5. Connect multiplug.

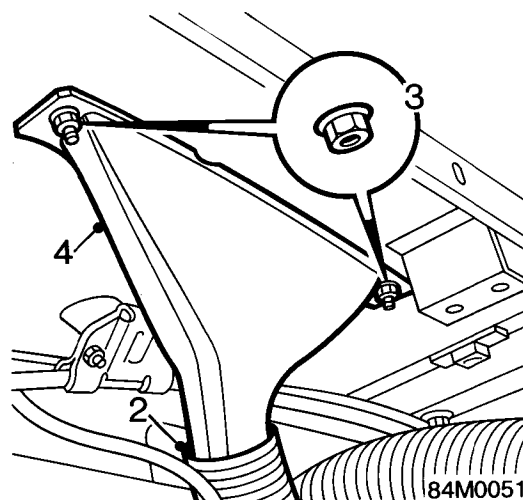
6. Operate motor and switch off, to position wiper arm spindles in 'PARK' position.
7. Fit wiper blade and arm assemblies in the 'PARK' position.

WIPER MOTOR CABLE RACK AND WHEELBOXES

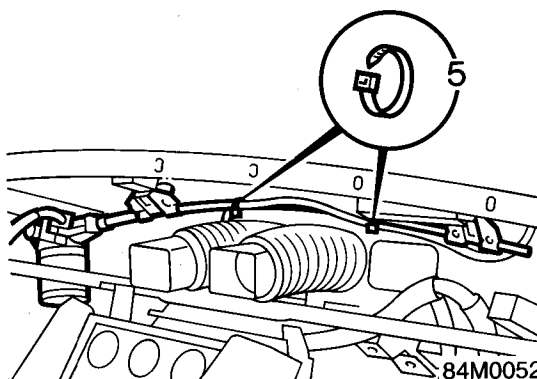
Service Repair No. 84.15.24 Cable rack
Service Repair No. 84.15.25 Wheelboxes

Remove

1. Remove fascia panel, see **BODY**.

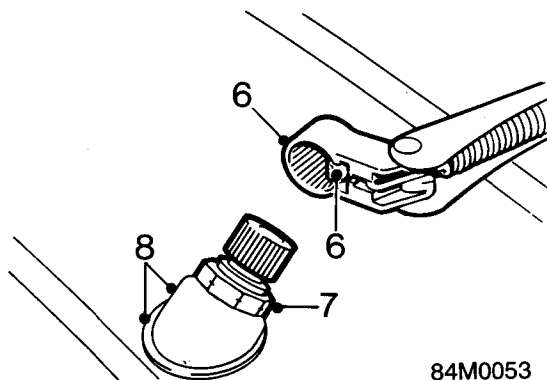


2. Disconnect 2 tubes from demister ducts.
3. Remove 4 nuts securing ducts.
4. Remove 2 demister ducts.

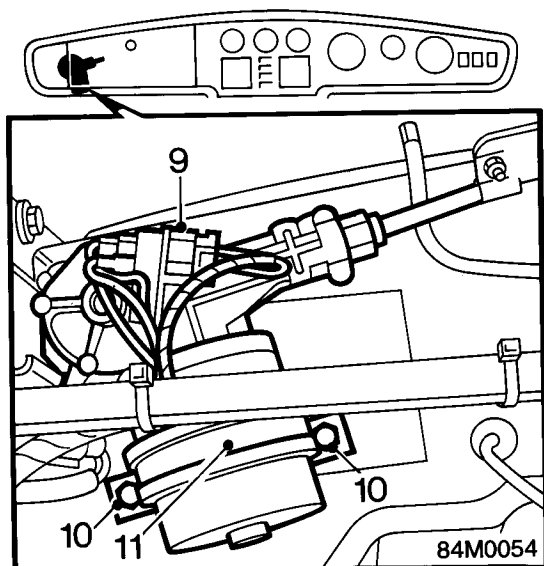


5. Remove 2 clips securing windscreen washer tube to cable rack tubes.

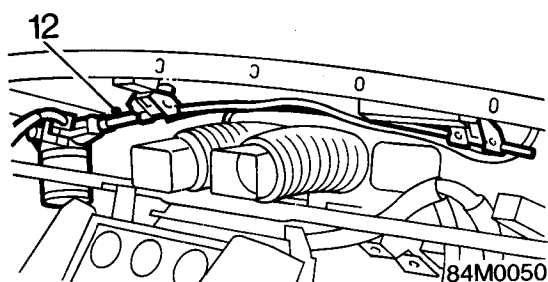
WIPERS & WASHERS



6. Release clips and remove both wiper arm and blade assemblies.
7. Remove 2 wiper spindle nuts.
8. Remove 2 spacers and 2 sealing washers.

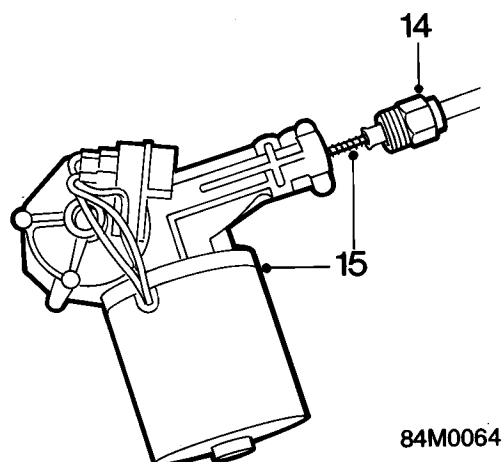


9. Disconnect motor multiplug.
10. Remove 2 screws securing motor clamp.
11. Remove clamp.

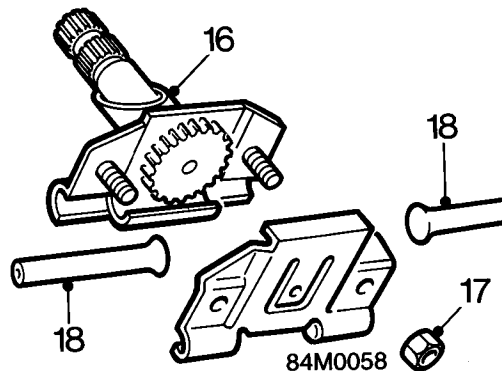


12. Release and remove motor assembly complete with cable rack tubes and wheelboxes.
13. Collect motor support pad.

Wheelboxes



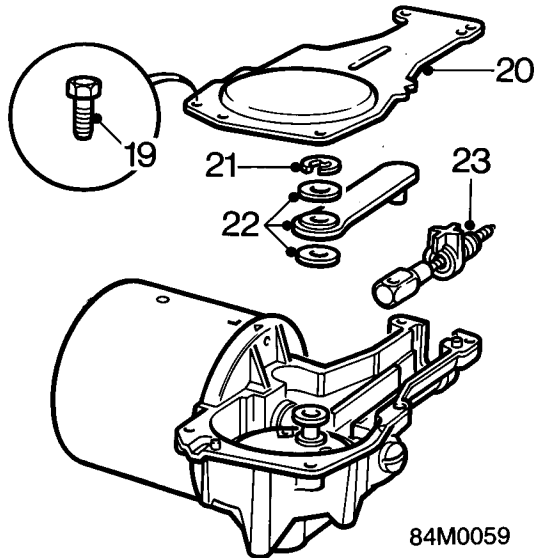
14. Unscrew nut securing cable rack tube to motor.
15. Withdraw motor assembly complete with cable rack.



16. Remove spacers from wheelbox spindles.
17. Remove 4 nuts securing wheelbox covers.
18. Remove cable rack tubes from wheelboxes.



Cable rack



84M0059

19. Remove 4 screws securing gear housing cover.
20. Remove cover.
21. Remove circlip securing connecting rod to drive gear.
22. Remove connecting rod and 2 washers.

Note: The larger washer fits under connecting rod.

23. Remove cable rack from gear housing.

Refit

Cable rack

1. Clean connecting rod, drive gear crank pin and washers.
2. Apply grease to drive gear crank pin, connecting rod pivots and cable rack, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**
3. Fit cable rack to gear housing.
4. Fit washers and connecting rod, secure with circlip.
5. Position gear housing cover, fit and tighten screws.

Wheelboxes

6. Slacken 4 wheelbox cover nuts.
7. Fit cable rack tubes to wheelboxes, align tubes and tighten wheelbox cover nuts.
8. Position wiper motor assembly and feed cable rack into tube, align motor to tube and start nut.
9. Fit spacers to wheelbox spindles.
10. Position motor, cable rack tube and wheelbox assembly and fit wheelbox spindles through bulkhead.
11. Position motor support pad, align motor and fit clamp. Fit and tighten clamp screws.
12. Fit wheelbox spindle sealing washers and spacers.
13. Fit and tighten spindle nuts.
14. Tighten cable rack tube nut.

15. Connect multiplug.
16. Fit demister ducts, fit and tighten nuts.
17. Connect demister tubes.
18. Fit fascia panel, see **BODY**.
19. Operate motor and switch off to position wiper arm spindles in 'PARK' position.
20. Fit wiper blade and arm assemblies in the 'PARK' position.

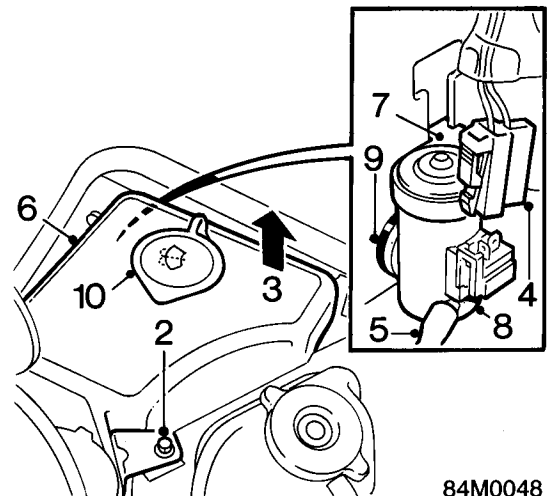
WASHER PUMP AND RESERVOIR

Service Repair No. 84.10.21 - Pump

Service Repair No. 84.10.01 - Reservoir

Remove

1. Drain reservoir if necessary.



84M0048

2. Remove bolt securing reservoir.
3. Release reservoir from bracket on wing valance.
4. Disconnect washer pump multiplug.
5. Disconnect washer tube.
6. Remove reservoir.
7. Remove clip securing pump.
8. Remove pump from reservoir.
9. Remove pump seal.
10. Remove filler cap.

Refit

1. Fit pump seal to reservoir.
2. Lubricate seal and fit pump into reservoir.
3. Fit clip securing pump.
4. Position reservoir.
5. Connect washer tube and multiplug.
6. Secure reservoir to wing valance bracket, align reservoir and fit and tighten bolt.
7. Fill reservoir, see **MAINTENANCE**
8. Fit cap and check for leaks.

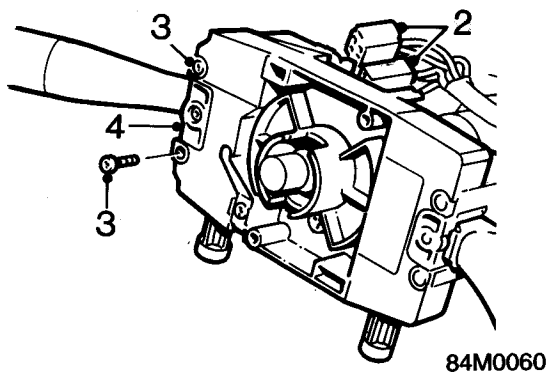
WIPERS & WASHERS

WINDSCREEN WIPER AND WASHER SWITCH

Service Repair No. 84.15.34

Remove

1. Remove steering wheel and column nacelle, see **STEERING**.



2. Disconnect 2 multiplugs from switch.
3. Remove 2 screws securing switch.
4. Remove switch.

Refit

1. Fit switch, fit and tighten screws.
2. Connect multiplugs.
3. Fit column nacelle and steering wheel, see **STEERING**

ELECTRICAL

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ADJUSTMENTS

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HEADLAMPS ADJUST

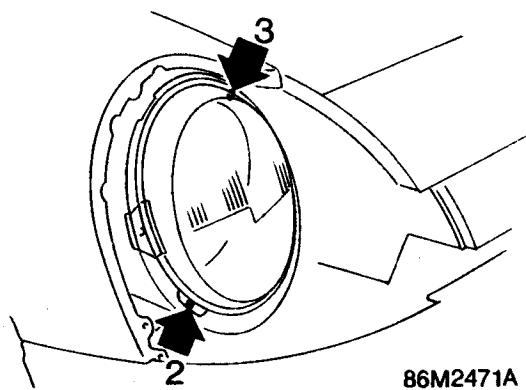
Service Repair No. 86.40.17

Inspect

1. Position vehicle on a level surface.
2. Line up beam setting equipment to one headlamp.
3. Switch headlamps onto dip - beam.
4. Check beam alignment:
Headlamp setting = $0^{\circ}42' \pm 0^{\circ}4'$ or 0.75 to 1.25% below horizontal and parallel.

Adjust

1. Remove headlamp cowl, see **BODY**



2. Turn adjustment screw:
Clockwise or anti - clockwise to move beam in horizontal plane.
3. Turn adjustment screw:
Clockwise or anti - clockwise to move beam in vertical plane.
4. Remove setting equipment.
5. Fit headlamp cowl, see **BODY**
6. Adjust 2nd headlamp.

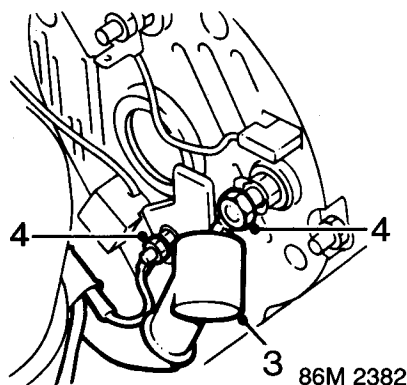


ALTERNATOR

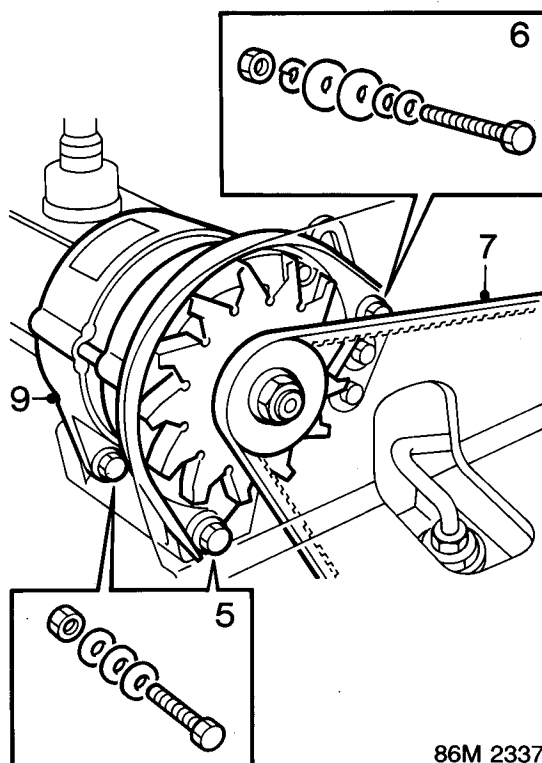
Service Repair No. 86.10.02

Remove

1. Disconnect battery earth lead. see **Battery**
2. Remove 2 bolts and remove radiator top cover.

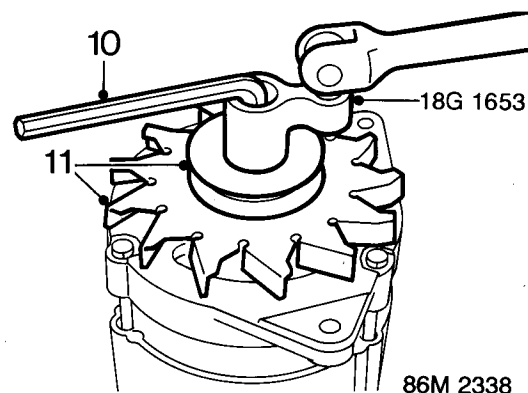


3. Release cover from alternator '+' terminal.
4. Remove 2 nuts and release wiring eyelets from terminals.



5. Slacken 2 alternator pivot bolts.
6. Slacken adjusting bracket bolt and remove alternator adjustment bolt.
7. Pivot alternator and release drive belt from alternator pulley.
8. Support alternator and remove 2 pivot bolts.
9. Remove alternator.

Do not carry out further dismantling if component is removed for access only



10. Hold alternator centre shaft using an Allen key and remove nut using tool **18G1653**.
11. Remove spring washer, alternator pulley and fan.
12. Transfer components removed to new alternator and tighten retaining nut.

Refit

1. Position alternator to mounting and fit pivot bolts. Do not tighten.
2. Fit and tension alternator drive belt, see see **MAINTENANCE**
3. Fit wiring eyelets to alternator terminals and secure with nuts.
4. Position cover over '+' terminal.
5. Connect battery earth lead.
6. Fit radiator top cover and secure with bolts.

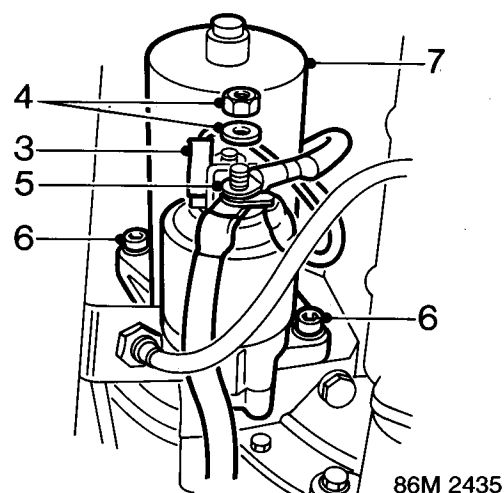
STARTER MOTOR

Service Repair No. 86.60.01

Remove

1. Disconnect battery earth lead.
2. Raise front of vehicle.

WARNING: Support on safety stands.



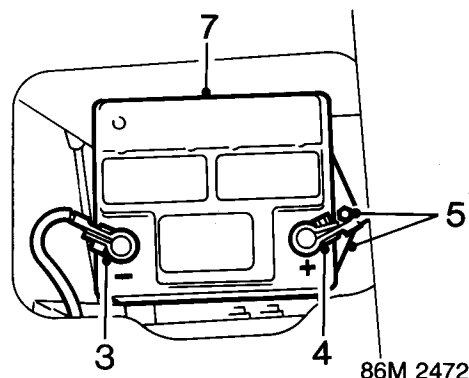
3. Release Lucar from solenoid.
4. Remove nut and Belville washer securing feed wires to starter solenoid.
5. Release 3 feed wires from starter solenoid.

ELECTRICAL

6. Remove 2 bolts securing starter motor to engine.
7. Remove starter motor.

Refit

1. Clean mating faces of starter motor and engine block.
2. Position starter to engine block.
3. Fit bolts and tighten.
4. Position feed wires on starter solenoid terminal and secure with Belville washer and nut.
5. Fit Lucar connector to starter solenoid.
6. Remove stand(s) and lower vehicle.
7. Connect battery earth lead.



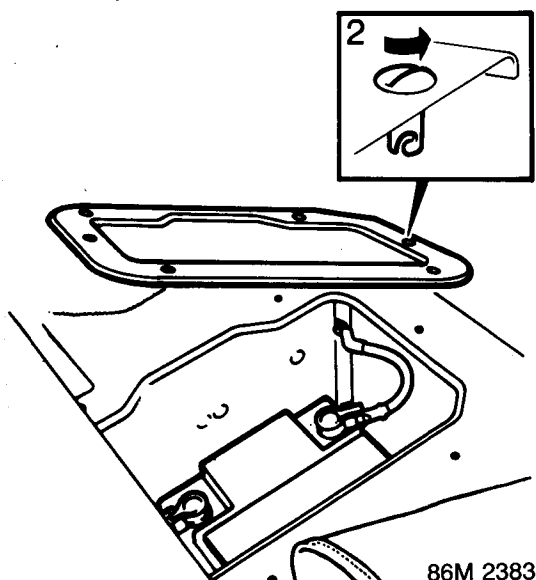
3. Slacken terminal nut and disconnect negative ' - ' lead from battery.
4. Slacken terminal nut and disconnect positive ' + ' lead from battery.
5. Remove screw and battery clamp.
6. Obtain battery carrier from vehicle's tool kit.
7. Engage battery carrier hooks under lip each end and lift battery out of vehicle.

BATTERY

Service Repair No. 86.15.01

Remove

1. Fold seats squabs forward and remove rear floor carpet.



2. Release 5 turnbuckles and remove battery cover from rear floor.

Refit

1. Clean battery casing and terminals, apply anti - corrosion grease to terminals. Clean battery tray.
2. Position battery on battery tray with negative ' - ' terminal to rear.
Place battery carrier in vehicle's tool kit.
3. Fit battery clamp and tighten screw.
4. Connect battery positive ' + ' lead to battery.
5. Connect battery negative ' - ' lead to battery.
6. Check condition of seal, position battery cover on rear floor and secure with turnbuckles.
7. Fit rear floor carpet and position seat squabs in driving position.

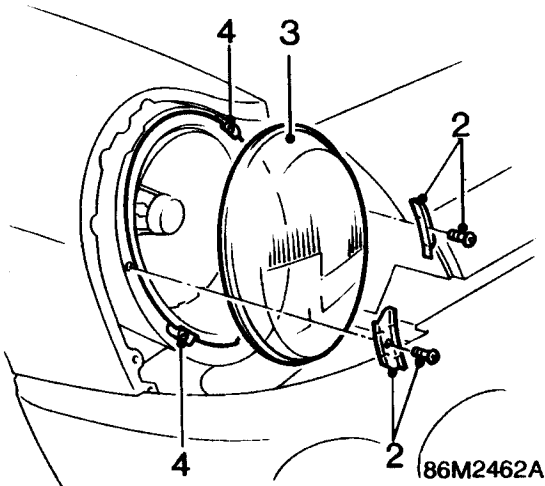


HEADLAMP

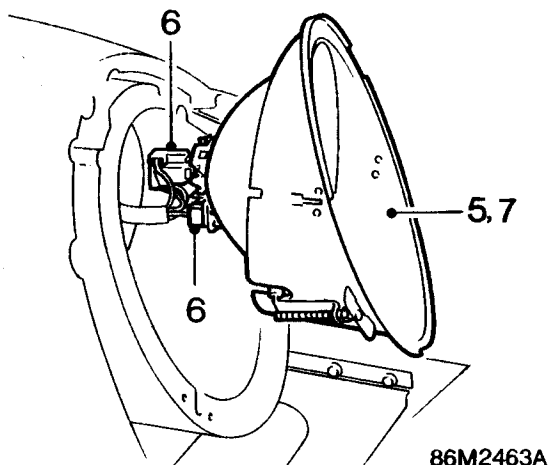
Service Repair No. 86.40.49

Remove

1. Remove headlamp cowl, see **BODY**



2. Remove 2 screws and clamps retaining headlamp lens.
3. Remove headlamp lens.
4. Remove 2 screws securing headlamp to front wing.



5. Withdraw headlamp from front wing.
6. Disconnect 2 multiplugs from bulbs.
7. Remove headlamp assembly.

Refit

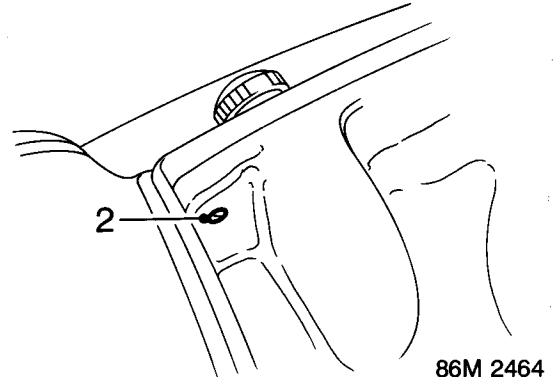
1. Connect multiplugs to headlamp bulbs.
2. Position headlamp in front wing and secure with screws.
3. Position headlamp lens and clamps and secure with screws.
4. Check headlamp adjustment, see **Adjustments**.
5. Fit headlamp cowl, see **BODY**

TAIL LAMP

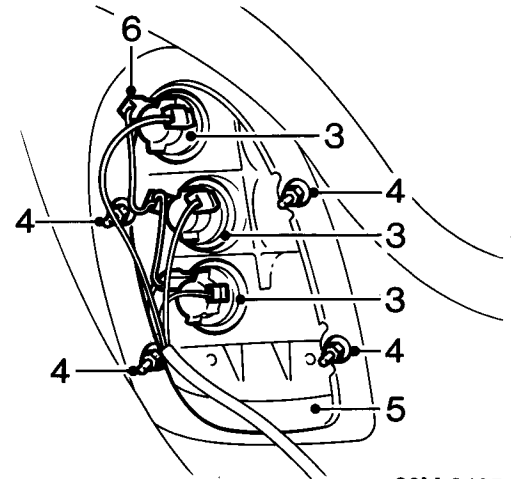
Service Repair No. 86.40.70

Remove

1. Open luggage compartment.



2. Rotate turnbuckle half - turn and pull trim panel clear of tail lamp.



3. Turn anti - clockwise and release 3 bulb holders from tail lamp.
BLUE holder - Direction indicator
BLUE holder - Reverse
YELLOW holder - Stop/tail
4. Remove 4 nuts securing tail lamp to panel.
5. Remove tail lamp.

Do not carry out further dismantling if component is removed for access only

6. Note fitted positions and remove 7 Lucar connectors from bulb holders

Refit

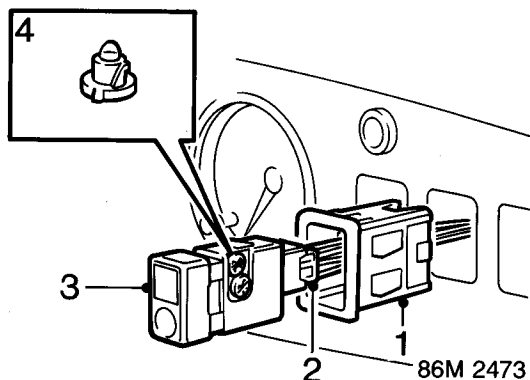
1. Check condition of seal and clean joint surfaces.
2. Position tail lamp on panel and retain with nuts.
3. Fit bulb holders to tail lamp.
4. Fit trim panel.

ELECTRICAL

SWITCH AND BULB

Service Repair No. 86.45.29

Remove



1. Ease switch holder from fascia panel.

Note: RH switches can be pressed out by reaching behind panel.

2. Disconnect multiplug from switch.

Do not carry out further dismantling if component is removed for access only

3. Remove switch from holder – not Hazard switch.
4. Remove bulb(s) from switch.

Refit

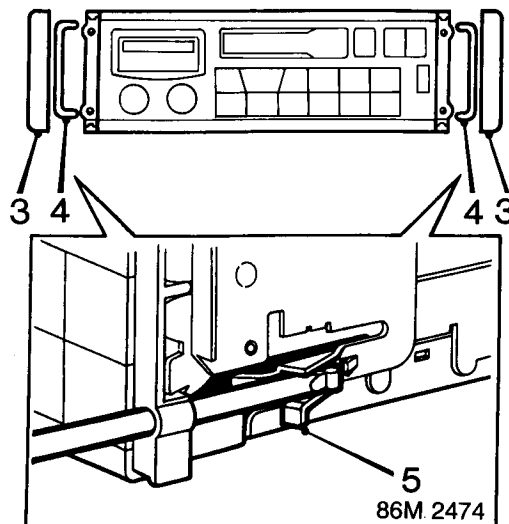
1. Fit new bulb(s) to switch.
2. Fit switch to holder – not Hazard switch.
3. Connect multiplug to switch.
4. Align and press switch holder into fascia panel.

RADIO

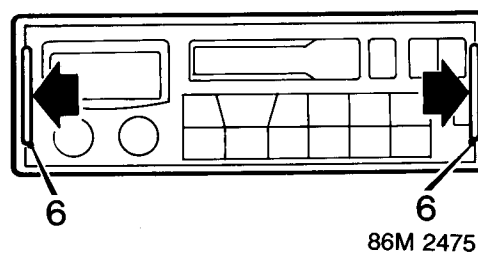
Service Repair No. 86.50.03

Remove

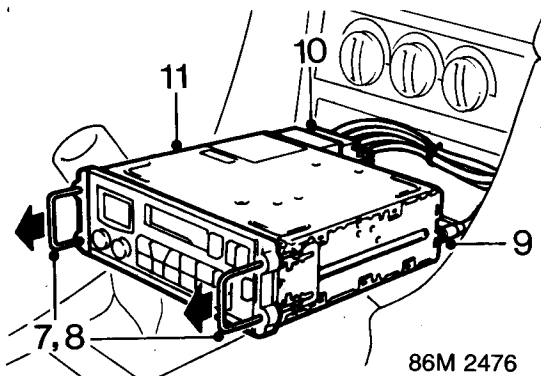
1. Deactivate radio security code.
2. Disconnect battery earth lead. see **Battery**.



3. Carefully prise side finishers from each end of unit.
4. Insert 2 parts of radio removal tool **SMD 4091**, one into each pair of holes at each end of unit.
5. Engage retaining clip lugs (2 each side).



6. Press removal tools outwards to depress clips.



7. Pull removal tools to withdraw radio cassette player from mounting tube.
8. Remove tool **SMD 4091**.
9. Disconnect aerial lead from unit.
10. Disconnect 2 multiplugs from unit.
11. Remove radio cassette player.

Refit

1. Position radio cassette player and connect 2 multiplugs to unit.
2. Connect aerial coaxial lead to unit.
3. Slide radio cassette player into mounting tube until retaining clips are engaged.
4. Fit side finishers to unit.
5. Connect battery earth lead. see **Battery**.
6. Activate radio security code.
7. Check radio and cassette player for correct operation.

AERIAL

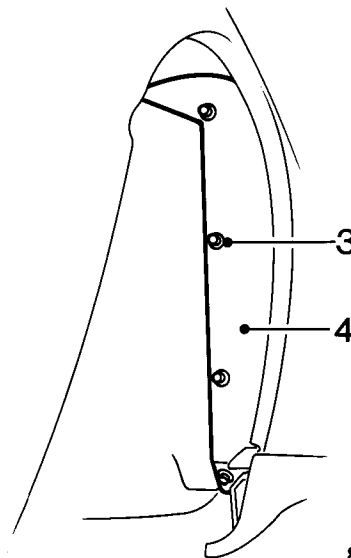
Service Repair No. 86.50.18

Remove

1. Raise front of vehicle, one side. LH.

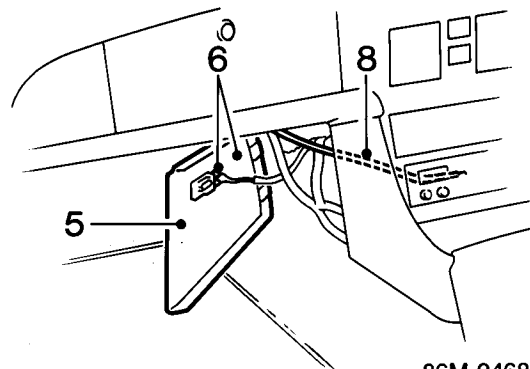
WARNING: Support on safety stands.

2. Turn steering onto full left lock.



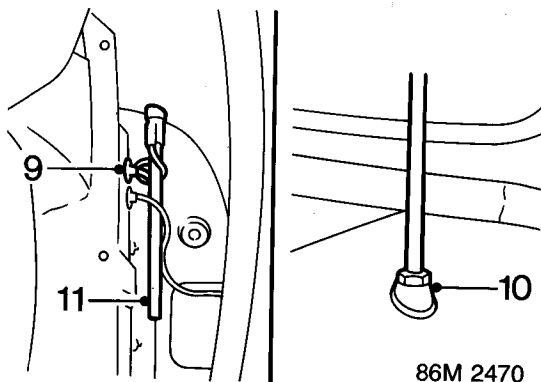
86M 2469

3. Remove 4 screws and flat washers securing closing panel.
4. Remove closing panel from under wing.



86M 2468

5. Release 4 Velcro strips and withdraw closing panel from LH side of centre console.
6. Disconnect 2 Lucars from interior lamp and remove closing panel.
7. Release ties securing coaxial lead to fascia rail.
8. Disconnect aerial coaxial lead from rear of radio.



86M 2470

9. Release grommet from panel and pull coaxial lead to under front wing.
10. Remove nut, ferrule and seal securing aerial to top of front wing.
11. Remove aerial from below front wing.

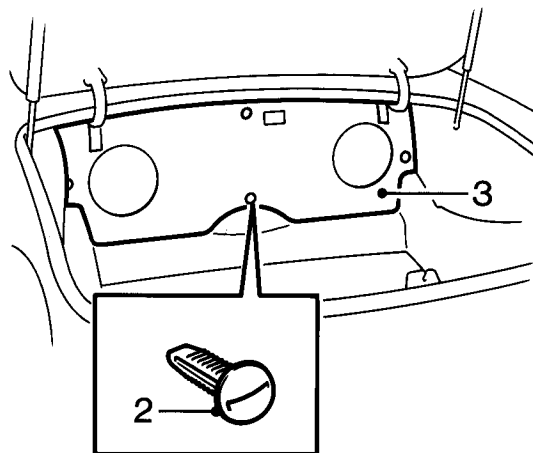
Refit

1. Clean earthing ferrule contact area under front wing.
2. Position aerial through wing, ensure earthing ferrule is positioned correctly.
3. Fit ferrule and seal to aerial and secure with nut.
4. Feed coaxial lead through panel.
5. Position coaxial lead over tunnel and connect to radio.
6. Position coaxial lead to fascia rail and secure with ties.
7. Connect Lucars to interior lamp and fit closing panel.
8. Fit coaxial lead grommet to panel.
9. Position closing panel under wing and retain with screws.
10. Remove stand(s) and lower vehicle.

REAR SPEAKER

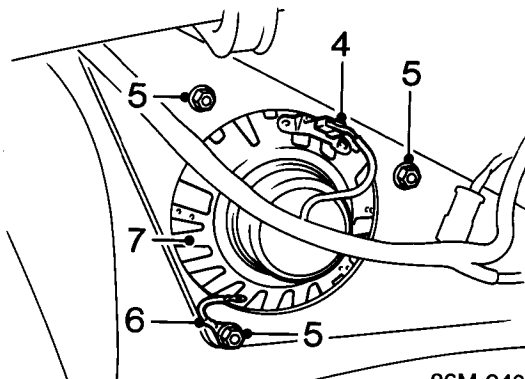
Service Repair No. 86.50.12

Remove



86M 2466

1. Open luggage compartment.
2. Turn 4 studs 90° and release from retainers.
3. Remove carpet from rear bulkhead.



86M 2467

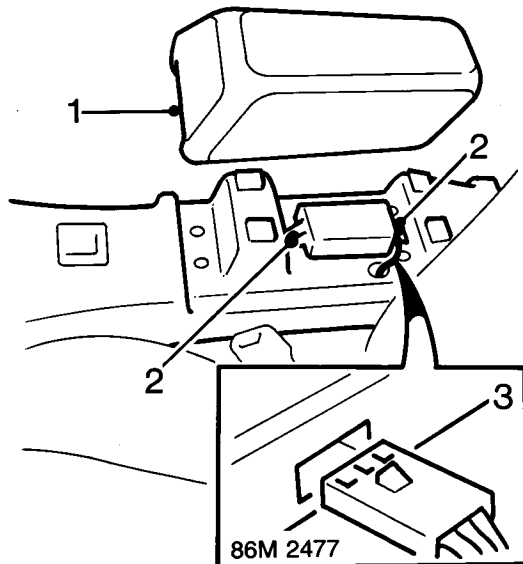
4. Release multiplug from speaker.
5. Remove 3 nuts securing speaker to rear bulkhead.
6. Release earth eyelet from speaker stud.
7. Fold passenger's seat squab forward.
8. Remove speaker from front of rear bulkhead carpet.

Refit

1. Position speaker and press studs through rear bulkhead carpet.
2. Fit earth eyelet to speaker stud.
3. Fit nuts and secure speaker to rear bulkhead.
4. Fit multiplug to speaker.
5. Position carpet on rear bulkhead and engage studs.
6. Close luggage compartment. Reposition seat squab.

**ANTI - THEFT VOLUMETRIC SENSOR**

Service Repair No. 86.55.964

Remove

1. Remove centre console armrest
2. Remove 2 screws securing anti - theft volumetric sensor to console.
3. Disconnect multiplug and remove anti - theft volumetric sensor.

Refit

1. Connect multiplug to anti - theft volumetric sensor.
2. Position volumetric sensor on console and retain with screws.
3. Fit centre console armrest

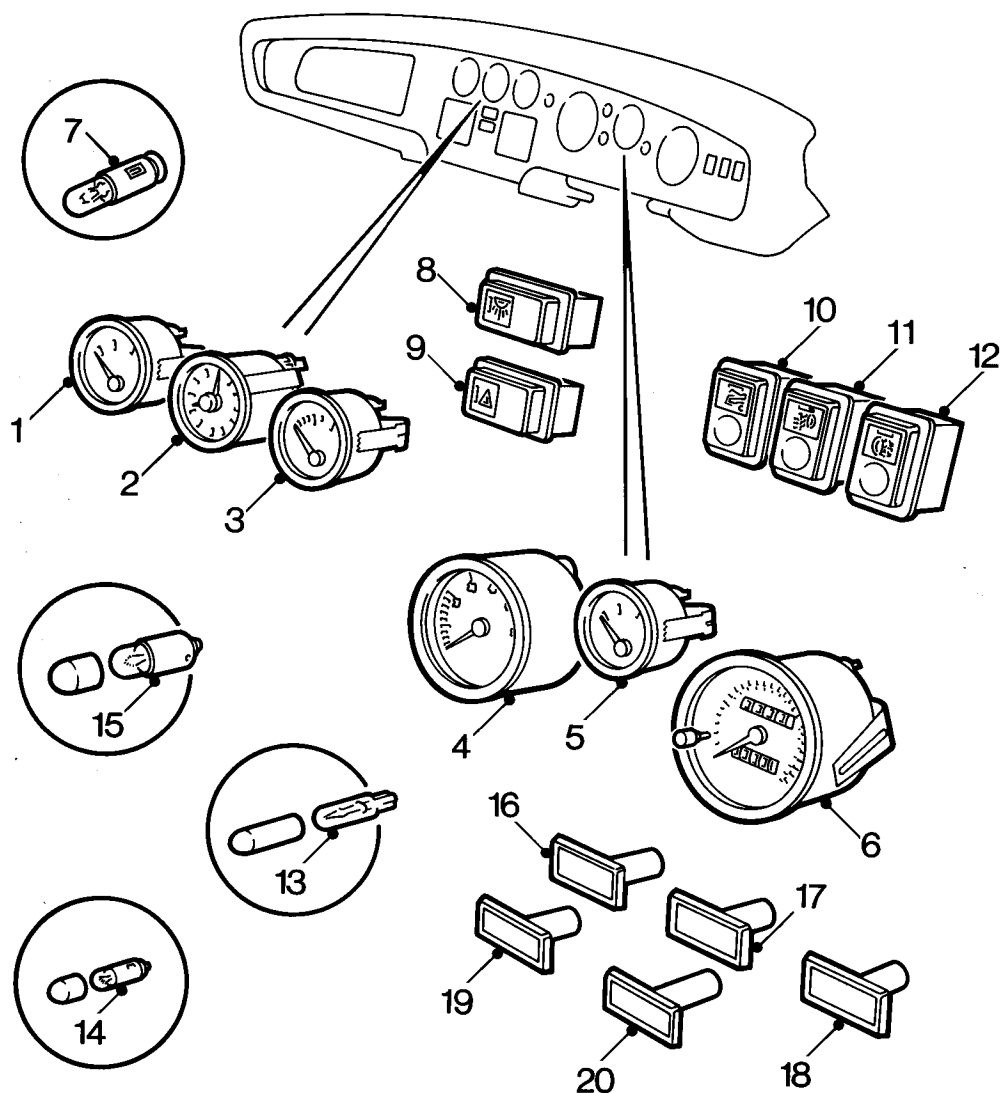
INSTRUMENTS

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INSTRUMENTS



88M0033

INSTRUMENT PACK COMPONENTS

- | | |
|--|---|
| 1. Voltmeter | 13. Main beam indicator light - BLUE |
| 2. Clock | 14. Direction indicator lights - GREEN |
| 3. Coolant temperature gauge | 15. No charge warning light - RED |
| 4. Tachometer | Alarm indicator light - RED |
| 5. Fuel gauge | 16. Handbrake applied warning light - RED |
| 6. Speedometer | 17. Brake fluid low warning light - RED |
| 7. Instrument illumination bulb | 18. Hazard lights operating warning light - RED |
| 8. Interior lamp switch | 19. Oil pressure low warning light - RED |
| 9. Hazard warning switch | 20. Engine ECU malfunction warning light - RED |
| 10. Luggage compartment release switch | |
| 11. Fog lamp switch | |
| 12. Fog guard lamp switch | |



INSTRUMENT PANEL

The instrument panel is an electro – mechanical device receiving electrical and mechanical inputs. Electrical signals are received from sender units and are transposed into analogue gauge readouts. Mechanical input to the speedometer is received via a flexible drive from the gearbox.

Instrument panel illumination

Each instrument has its own illumination bulb, which is connected into the sidelight circuit supply from fuse 2, located in the passenger compartment fusebox.

Speedometer

The speedometer is driven by a worm gear system from a flexidrive input. A seven digit odometer and a four digit trip distance readout up to 999.9 miles is fitted. The drive cable is in two parts, connecting into a speed transducer which supplies a signal to the fuel ECU.

Tachometer

The tachometer signal is taken from the coil. The pointer reading is averaged over all of the engine cylinders to reduce fluctuations.

Fuel gauge

The fuel gauge is driven by an air cored electronic movement which is fluid damped. This type of gauge consists of a pointer mounted on a pivot point with a connection to the movement. An electronic damping unit is also used in the circuit to average out the tank unit signals over a 40 second cycle.

The fuel tank gauge unit comprises a float and is connected to a wirewound resistor which is connected to the electronic damping unit which provides a stabilised signal to the fuel gauge and then to earth. The resistor controls the current flow through to the fuel gauge circuit, which in turn drives the gauge movement against the resistance of the fluid damping. The pivot on which the pointer is mounted is fitted with a return magnet causing the gauge to return to zero when the ignition is switched off.

When the ignition is switched on, the electronic damping and fluid damping prevents pointer fluctuations caused by fuel movement in the tank.

When the gauge unit float is at its lowest point, indicating an empty fuel tank, the resistance to earth is at its least.

Coolant temperature gauge

The temperature gauge is driven by an air cored electronic movement. The centre pivot on which the pointer is mounted is fluid damped and fitted with a return magnet causing the gauge to return to zero when the ignition is switched off.

The signal from the temperature sensor is passed through an ECU which modifies the signal to the gauge. The needle is maintained at mid point until an high temperature signal is given, the needle is then moved to show high temperature in the RED sector.

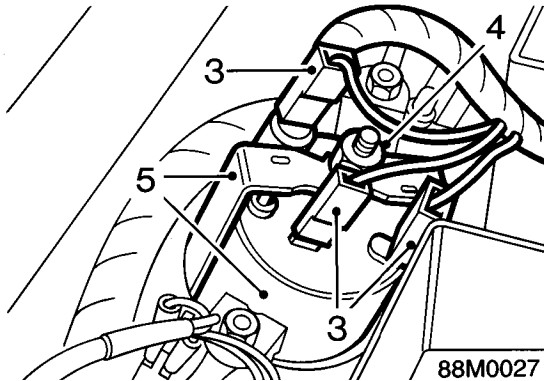


CLOCK

Service Repair No. 88.15.07

Remove

1. Remove fascia assembly, see **BODY**.
2. Place fascia assembly face down on bench.



3. Release 3 Lucars from rear of clock - note their fitted positions.
4. Remove nut securing clock to clamp plate.
5. Remove clock through front of fascia and collect clamp plate.

Refit

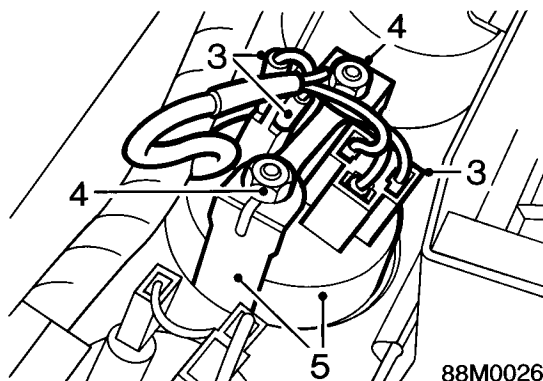
1. Position clock in fascia assembly.
2. Position clamp and secure to clock with nut.
3. Connect Lucars.
4. Refit fascia assembly, see **BODY**.

TEMPERATURE GAUGE

Service Repair No. 88.25.14

Remove

1. Remove fascia assembly, see **BODY**.
2. Place fascia assembly face down on bench.



3. Release multiplug and 2 connectors from rear of gauge - note their fitted positions.
4. Remove 2 nuts securing gauge to clamp.
5. Remove gauge through front of fascia and collect clamp.

Refit

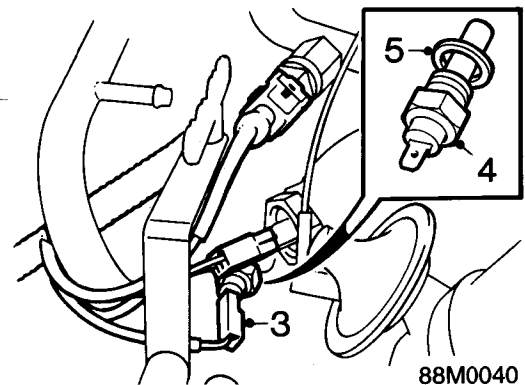
1. Position temperature gauge to fascia assembly.
2. Position clamp and secure to gauge with nuts.
3. Connect multiplug and connectors.
4. Refit fascia assembly see **BODY**

TEMPERATURE TRANSMITTER

Service Repair No. 88.25.20

Remove

1. Support bonnet in open position.
2. Position drain tray below engine.



3. Disconnect Lucar from temperature transmitter.
4. Unscrew and remove temperature transmitter.
5. Remove sealing washer.

Refit

1. Clean threads and sealing face.
2. Fit sealing washer and apply sealant to threads and washer.
3. Fit and tighten temperature transmitter.
4. Connect Lucar to temperature transmitter.
5. Top - up cooling system, see **MAINTENANCE**

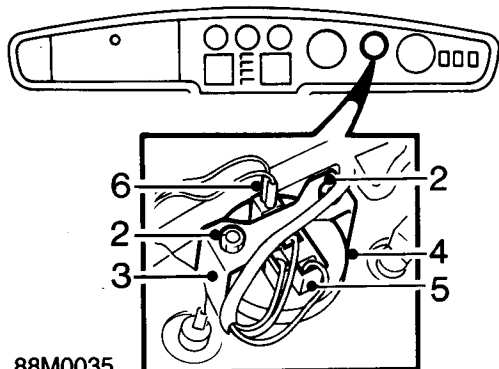
INSTRUMENTS

FUEL GAUGE

Service Repair No. 88.25.26

Remove

1. Move driver's seat to rearmost position.



88M0035

2. Reach behind fascia panel from below, remove 2 nuts securing gauge to clamp plate.
3. Remove clamp from gauge.
4. Withdraw gauge through front of fascia.
5. Disconnect multiplug from rear of gauge and 2 Lucars from bulb holder.
6. Remove fuel gauge.

Refit

1. Ensure sealing washer is in place.
2. Connect multiplug and Lucars.
3. Position and align gauge in fascia panel.
4. Position clamp and secure to gauge with nuts.

FUEL GAUGE TANK UNIT

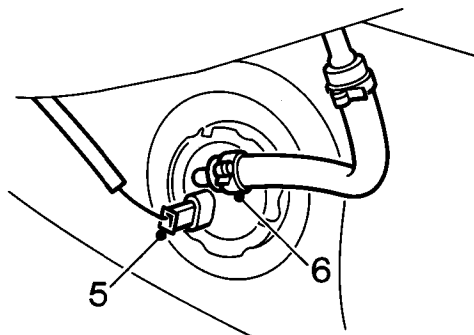
Service Repair No. 88.25.32

Remove

1. Disconnect battery earth lead.
2. Drain fuel from fuel tank see **GENERAL INFORMATION**
3. Raise rear of vehicle.

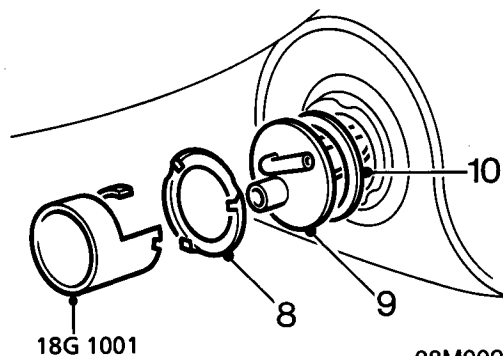
WARNING: Support on safety stands.

4. Remove LH rear wheel.



88M0028

5. Disconnect Lucar from tank unit.
6. Release clip and disconnect fuel hose from tank unit. Plug hose and tank unit.



18G 1001

88M0029

7. Engage tool **18G 1001** in clamping ring.
8. Turn clamping ring anti-clockwise and remove.
9. Remove tank unit.
10. Remove tank unit seal.

Refit

1. Clean sealing surfaces and fit new seal to tank unit.
2. Position tank unit in tank.
3. Fit clamping ring and tighten using tool **18G 1001**.
4. Unplug and connect fuel hose to tank unit.
5. Connect Lucar to tank unit.
6. Fit LH rear wheel.
7. Remove stand(s) and lower vehicle.
8. Replace fuel in tank.
9. Connect battery earth lead.

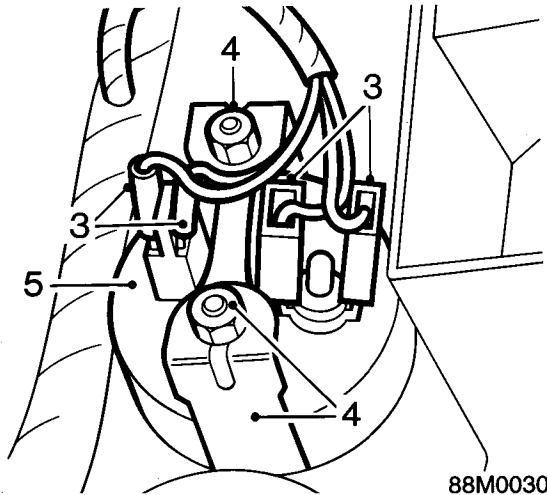


VOLTMETER

Service Repair No. 88.25.40

Remove

1. Remove fascia assembly, see **BODY**.
2. Place fascia assembly face down on bench.



3. Release 4 Lucars from rear of voltmeter - note their fitted positions.
4. Remove 2 nuts and clamp securing voltmeter to panel.
5. Remove voltmeter through front of panel.

Refit

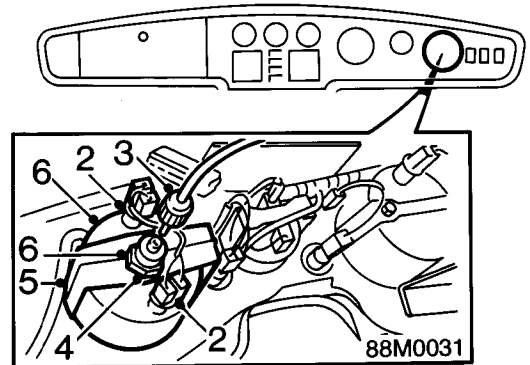
1. Ensure sealing washer is in place.
2. Position and align voltmeter in fascia panel.
3. Position clamp and secure to voltmeter with nuts.
4. Connect Lucars.
5. Refit fascia assembly, see **BODY**.

SPEEDOMETER

Service Repair No. 88.30.08

Remove

1. Move driver's seat to rearmost position.



2. Reach behind fascia panel from below, disconnect 2 bulb holders from rear of speedometer.
3. Unscrew retaining nut and disconnect speedometer cable
4. Remove nut securing speedometer to clamp.
5. Remove clamp from gauge.
6. Withdraw speedometer through front of panel.

Refit

1. Ensure sealing washer is in place.
2. Position and align speedometer in fascia panel.
3. Position clamp and secure to speedometer with nut.
4. Engage speedometer cable in speedometer and secure with nut.
5. Insert bulb holders into rear of speedometer.

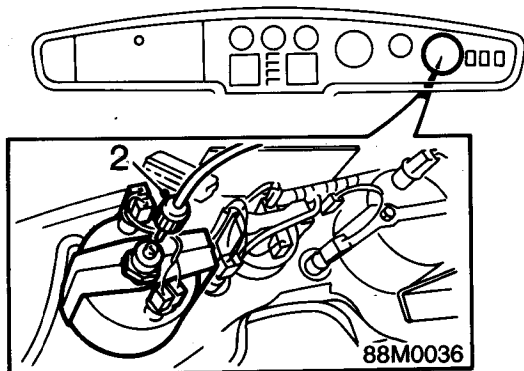
INSTRUMENTS

SPEEDOMETER CABLE - UPPER

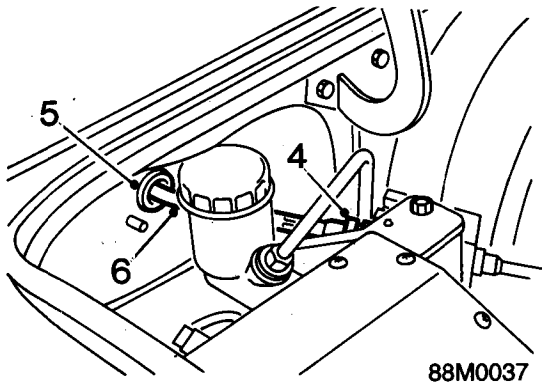
Service Repair No. 88.30.08

Remove

1. Move driver's seat to rearmost position.



2. Reach behind fascia panel from below, unscrew retaining nut and disconnect speedometer cable from speedometer.
3. Support bonnet in open position.



4. Unscrew retaining nut and disconnect speedometer cable from speed transducer.
5. Release speedometer cable grommet from bulkhead.
6. Remove upper speedometer cable.
7. Remove grommet from cable.

Refit

1. Fit grommet to cable.
2. Position upper speedometer cable through bulkhead.
3. Connect upper speedometer cable to speedometer and tighten retaining nut.
4. Connect upper speedometer cable to speed transducer and tighten retaining nut.
5. Fit grommet to bulkhead.

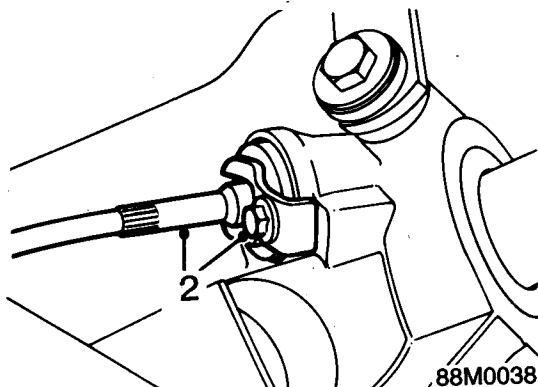
SPEEDOMETER CABLE - LOWER

Service Repair No. 88.30.09

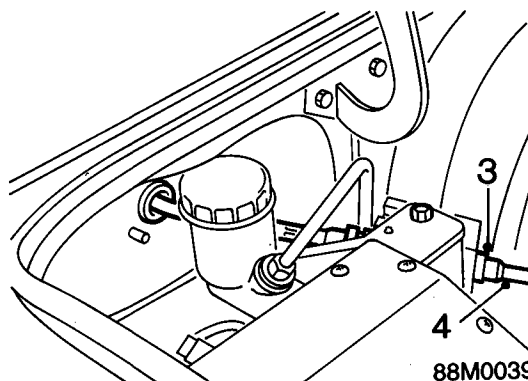
Remove

1. Raise front of vehicle.

WARNING: Support on safety stands.



2. Remove bolt and clamp retaining lower speedometer cable to gearbox.



3. Unscrew retaining nut and disconnect speedometer cable from speed transducer.
4. Remove upper speedometer cable.

Refit

1. Position lower speedometer cable, connect to speed transducer and tighten retaining nut.
2. Connect lower speedometer cable to gearbox, align clamp and tighten bolt.
3. Remove stand(s) and lower vehicle.

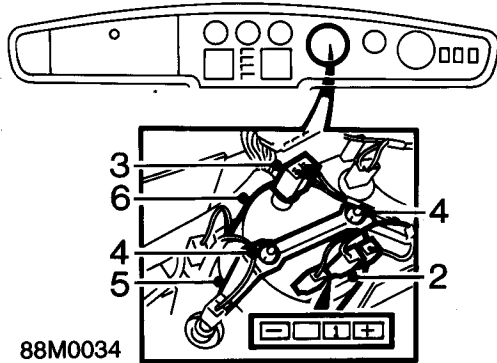


TACHOMETER

Service Repair No. 88.30.21

Remove

1. Move driver's seat to rearmost position.



2. Reach behind fascia panel from below, disconnect 3 Lucars from rear of tachometer.
3. Disconnect bulb holder from rear of tachometer.
4. Remove 2 nuts securing tachometer to clamp plate.
5. Remove clamp from tachometer.
6. Withdraw tachometer through front of panel.
7. Note terminal positions:
 - '+' = RED lucar
 - '1' = WHITE lucar
 - '-' = BLACK lucar

Refit

1. Ensure sealing washer is in place.
2. Connect 3 Lucars, in previously noted positions, to rear of tachometer.
3. Position and align tachometer in fascia panel.
4. Position clamp and secure to tachometer with nuts.
5. Insert bulb holder into rear of tachometer.

WIRING DIAGRAMS

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FUSES	5
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Fascia harness	11
Main harness - underbonnet	12
Main harness - passenger compartment and boot	13
Main harness - fascia and door	14

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Header joint 3 - Main harness	4
Header joint 4 - Fascia harness	5
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Header joint 3 - Main harness - air conditioning fitted	10
Header joint 4 - Fascia harness - air conditioning fitted	11
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WIRING DIAGRAMS

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Horns	2
Cigar lighter	3
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Interior lamps	9
Wipers and washers	10
Anti - theft alarm	11
Radio cassette/CD player	12
Headlamps/tail lamps/number plate lamps	13
Fog lamps	14



WIRING DIAGRAMS

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Indicator/hazard/brake/reverse lamps	15
Ignition/starting/charging	16
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Heater controls - air conditioning fitted	18
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Warning lights - air conditioning fitted	20
Catalyst overheat	21
Instruments - air conditioning fitted	22
Fascia illumination - air conditioning fitted	23
Interior lamps - air conditioning fitted	24
Anti-theft alarm - air conditioning fitted	25
Radio cassette/CD player - air conditioning fitted	26
Headlamps/tail lamps/number plate lamps - air conditioning fitted	27
Fog lamps - air conditioning fitted	28
Indicators/hazard/brake/reverse lamps - air conditioning fitted	29
Fuel system - air conditioning fitted	30



WIRING DIAGRAMS

HOW TO USE THIS SECTION

Circuit diagrams and connectors.

Each circuit diagram shows a separate wiring system. The diagrams are not arranged in any particular order.

Wiring between connectors and components shown in the diagrams represents the actual wiring as it exists on the vehicle. A chart is provided in this part of the manual, giving colour codes for wiring colour identification.

Header Joints

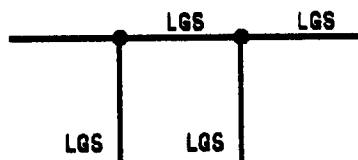
A header joint connects wires of the same circuit together and also can carry more than one circuit.

Earth Distribution

The earth distribution diagrams show the individual earth points and all the circuits effected by them.

SYMBOLS USED IN THE CIRCUIT DIAGRAMS

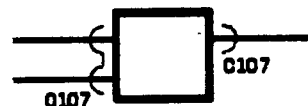
Wire colour



86M 1810

Wire insulation is either all one colour, or is one predominant colour with a stripe in a second colour. Wire colours are identified by a letter code, the main colour is identified first. LG/S = Light Green / Slate stripe.

Connectors



86M 1811

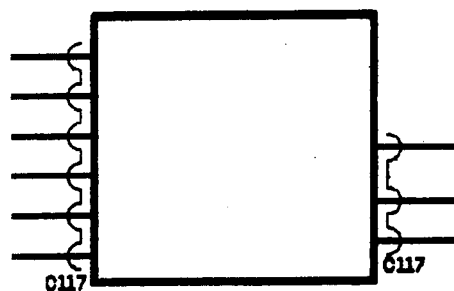
The reference number shown by the connector should be used in conjunction with the harness layout drawings.

Line types



86M 1812

This means the wire connects to another circuit or component.

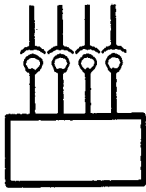


86M 1813

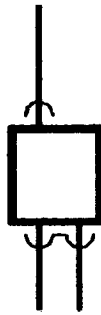
This means that these wires are in connector C117.



A



B



86M 1814

Connector – Direction of the 'symbol' indicates male and female halves of connector.

A. Plug on lead (Flylead) wired directly to the component.

B. Connector plugs directly into component.

Components



**AUTOMATIC
TRANSMISSION
SELECTOR 209**

86M 1815

Name or description – appears next to the component.

Connector options

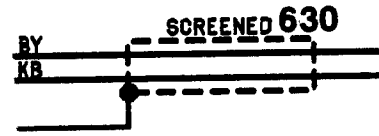
Earth points



86M 1818

An earth symbol indicates the earth terminal. Each earth wire is numbered. For position see **Earth Distribution**.

An earth symbol adjacent to the component – indicates electrical earth is direct through the component mounting.



86M 1819

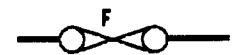
Identifies Radio Frequency Interference (R.F.I.) shielded wire. The shielding is always connected to earth.

Fuses and Diodes

A



B



C



D



86M 1820

Fusible links (a) and current rated fuses (b) are drawn as shown.

Diode (c) current flow is shown by the direction of the arrow.

Zener type diode (d) – prevents voltage passing until a precise value is reached.

WIRING DIAGRAMS

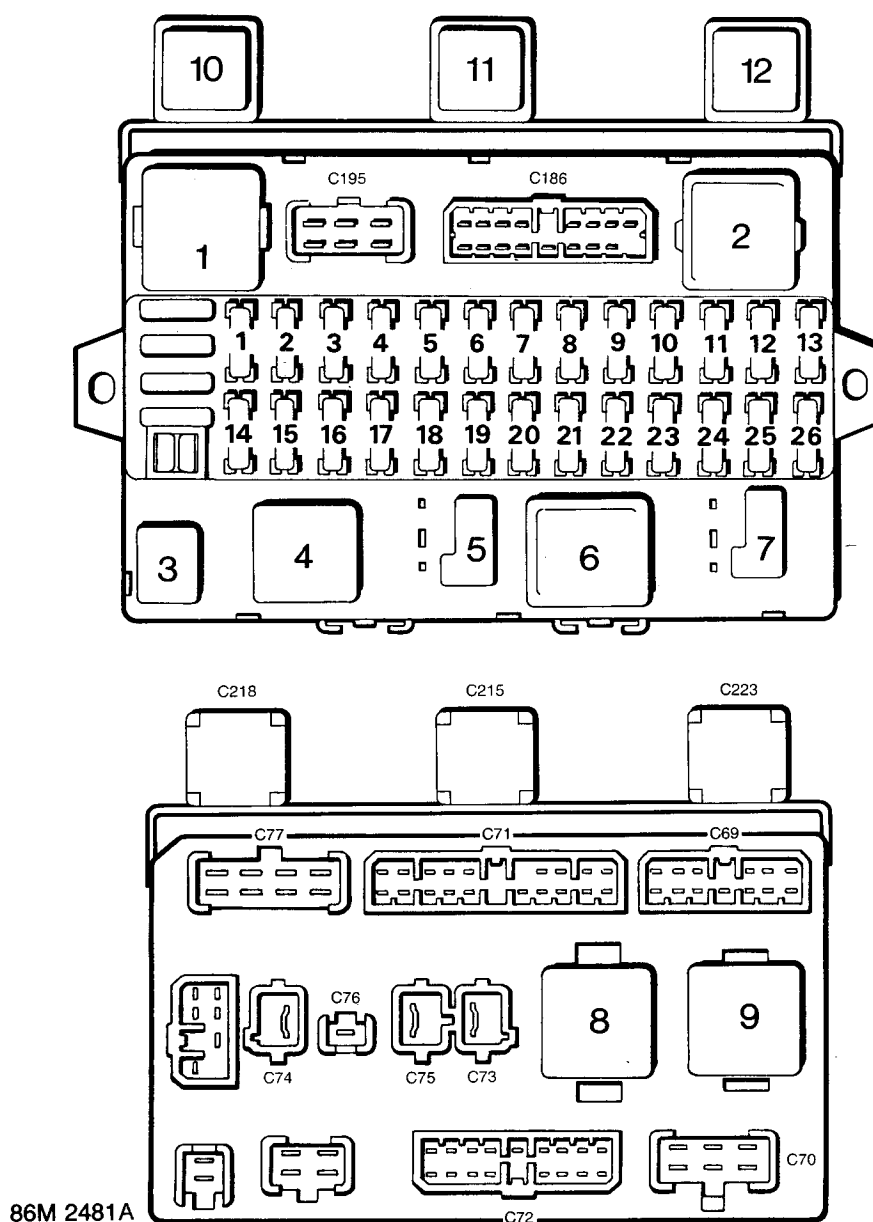
WIRE COLOUR CODES

The following list contains the wire colour codes used on the vehicle harness and is intended to give an indication of the function a particular colour wire is usually used for. These guidelines do not always apply to the wiring between components and the main harness.

Code	Colour	Function
B	Black	Earth wire from a component to an Earth tag. Black with a tracer is also usually an earth wire but the earth is switched by a control unit.
G	Green	Ignition fused supply from Passenger compartment fusebox i.e. Clock, instrument, indicators, electric mirrors
K	Pink	Fused supply
LG	Light Green	Ignition auxiliary fused supply from passenger compartment fusebox i.e. Reverse lamps, brake lamps
N	Brown	Battery supply. To ignition switch from fusible link 1 and 2.
O	Orange	Fused supply
P	Purple	Fused permanent supply. To interior lamps, radio cassette, clock, anti - theft alarm, electric aerial
R	Red	Fused supply i.e. Sidelamps
S	Slate (grey)	Fused supply
U	Blue	Fused supply i.e. Headlamps, Cooling fan
W	White	Ignition switched supply to passenger compartment fusebox.
Y	Yellow	Ignition switched supply to passenger compartment fusebox.



FUSES



Passenger compartment fusebox – fuse functions

FUSE No.	RATING	WIRE COLOUR	FUNCTION
1.	10 amp	W	Engine, ignition coil, anti – theft alarm.
2.	10 amp	R/O	RH side, tail and number plate, interior lights and instrument illumination.
3.	10 amp	G	Temperature and fuel gauges, tachometer, air conditioning
4.	15 amp	U	Air conditioning
5.	10 amp	U/G	RH headlamp main beam
6.	10 amp	G	Brake lights, warning lights, voltmeter

WIRING DIAGRAMS

FUSE No.	RATING	WIRE COLOUR	FUNCTION
7.	10	U/R	Front fog lights
8.	10 amp	R/B	Cigar lighter
9.	10 amp	U/R	Indicators and reverse lights, warning lights (centre console)
10.	10 amp	U/K	Rear fog guard lights
11.	20 amp	U/B	Cooling fan
12.	15 amp	P	Engine management ECU, alarm indicator, boot switch indicator, clock, interior lights, radio memory, horn
13.	20 amp	W/R	Air conditioning
14.	15 amp	LG	Heater blower motor, air conditioning blower motor
15.	15 amp	LG/S	Cooling fan Rear wash/wipe
16.	–	–	Spare
17.	10 amp	W/S	Fuel pump
18.	15 amp	U/S	RH headlamp main beam
19.	20 amp	N/R	Relays: Headlights, sidelights and anti – theft alarm, boot lid release
20.	–	–	Spare
21.	15 amp	P/O	Hazards
22.	15 amp	LG	Radio cassette, rear speaker amplifier
23.	–	–	Spare
24.	10 amp	U/B	RH headlamp dipped beam
25.	10 amp	U/K	LH headlamp dipped beam
26.	10 amp	R/B	LH side, tail and number plate, radio illumination



Relay functions

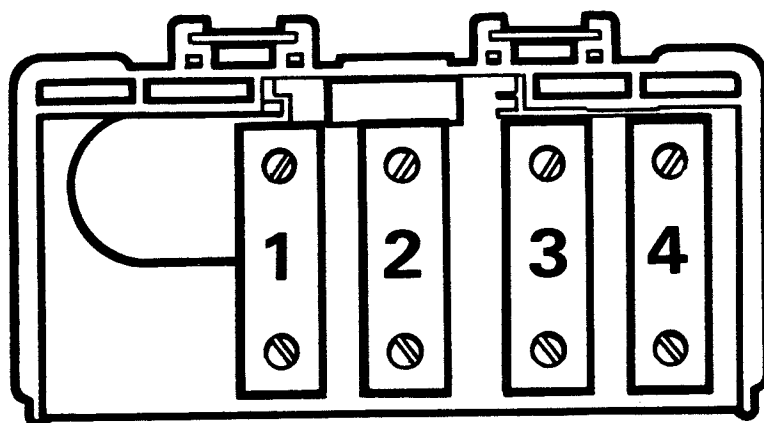
RELAY	FUNCTION
1.	Lights on alarm, interior lamp delay unit
2	Cooling fan relay
3	Headlamp relay
4	Ignition relay
5	Link
6	Direction indicator, hazard warning unit
7	Link
8	Wiper relay
9	Not used
10	Blower motor changeover relay (air conditioning)
11	Compressor clutch relay (air conditioning)
12	Condenser fan relay (air conditioning)

Connector sockets – Fusebox

CONNECTOR	HARNESS
C69	Main harness
C70	Main harness
C71	Main harness
C72	Main harness
C73	Main harness – Fusible link 3
C74	Main harness – Fusible link 2
C75	Main harness – Fusible link 1
C76	Main harness
C77	Main harness
C186	Fascia harness
C195	Ignition switch harness
C215	Compressor clutch relay (air conditioning)
C218	Condenser fan relay (air conditioning)
C223	Blower motor changeover relay (air conditioning)

WIRING DIAGRAMS

Engine compartment fusible links



8RM 2605

FUSE LINK NO.	RATING	WIRE COLOUR	FUNCTION
1	60 amp	N	Ignition switch, ignition relay
2	60 amp	N	Passenger compartment fusebox
3	60 amp	N	Passenger compartment fusebox
4	30 amp	N	Relay module 2

RELAY MODULES

Relay Module 1

Located on the tunnel behind the centre console. Relay module 1 contains 4 relays to operate the following:

1. Rear fog guard lamps
2. Luggage compartment release.
3. Horns
4. Front fog lamps

Relay Module 2

Located in a bracket on the engine bulkhead behind the centre console.

Relay module 2 uses 3 relays to operate the following:

1. Main relay – fuel ECU, injectors, air flow meter
2. – –
3. Fuel pump
4. Starter solenoid



FAULT FINDING

The following general points on fault finding should be observed at all times.

- Check the circuit fuses.
- Check the battery for state of charge and clean and tight connections.
- Check alternator belt tension.
- DO NOT start removing or replacing components until the fault has been positively identified.
- Familiarise yourself with the circuit diagram of the affected system.
- Where other systems share the same circuit, check their function to verify the extent of the problem. If shared systems operate the indications are that the fault is confined to the one circuit.
- Test for the most likely cause first based on the symptoms and how the system operates.
- Use the appropriate test equipment.
- Always carry out a full functional check of the system after repair including any other system that shares the same fuses or earths.

Test equipment

Microcheck

The following Microcheck programmed cards are available for testing components and circuits. Always follow precisely the instructions provided with the tester:

Burglar Alarm and CDL
Transmitter reprogramming system
Lucas EFi - MPi

Test Lamp

CAUTION: Do not use a test lamp on a circuit containing solid - state components as damage to the solid - state components may occur. Always use a multimeter of 10 megaohms or higher impedance to test circuits containing solid - state components.

Test lamps with a 12v bulb, can be used to check circuits without solid - state components to verify that voltage is present.

Voltmeter

In addition to confirming that voltage is present at a particular point in a circuit, the reading obtained, when compared with the battery or alternator output voltage, will indicate the volt - drop of the wiring and components in that part of the circuit.

Ohm - meter

Use an ohm - meter to check circuits for continuity and to measure the resistance in part or all of a circuit.

When taking resistance readings on a circuit containing diodes or solid - state components, take a reading then reverse the test leads and compare the result. False ohm - meter reading can sometimes occur where diodes or solid - state components are connected in a circuit.

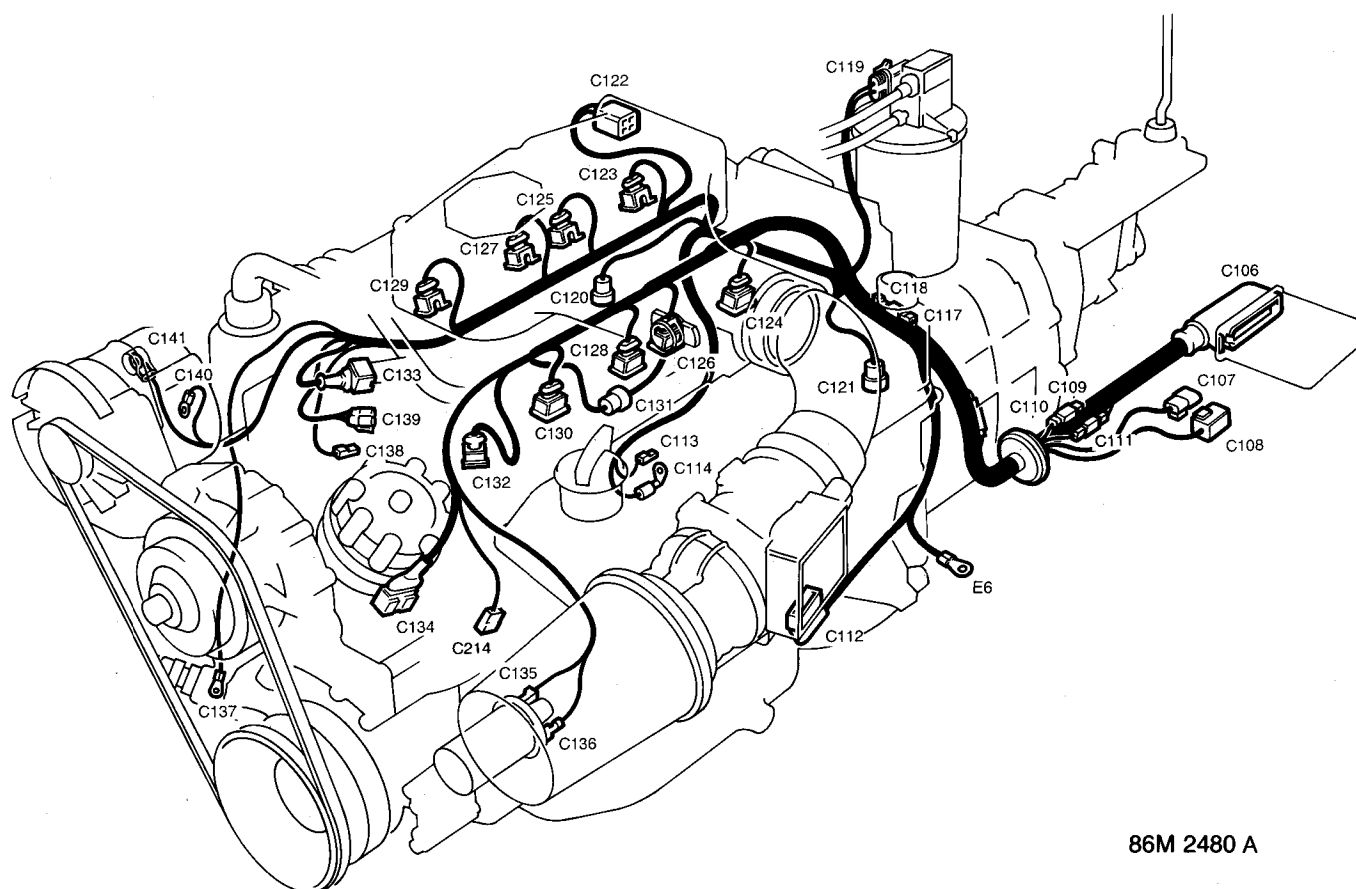
Testing

Always observe the following when carrying out fault finding tests:

- Follow precisely the instructions provided with the test instrument or equipment.
- It is not necessary to disconnect a connector to check for continuity or voltage, use a test probe in the back of the connector.
- Always check from both sides of a connector to ensure that dirt, corrosion or poor contact of the pins is not the cause of an open circuit, poor or intermittent continuity or a high resistance in the circuit.

WIRING DIAGRAMS

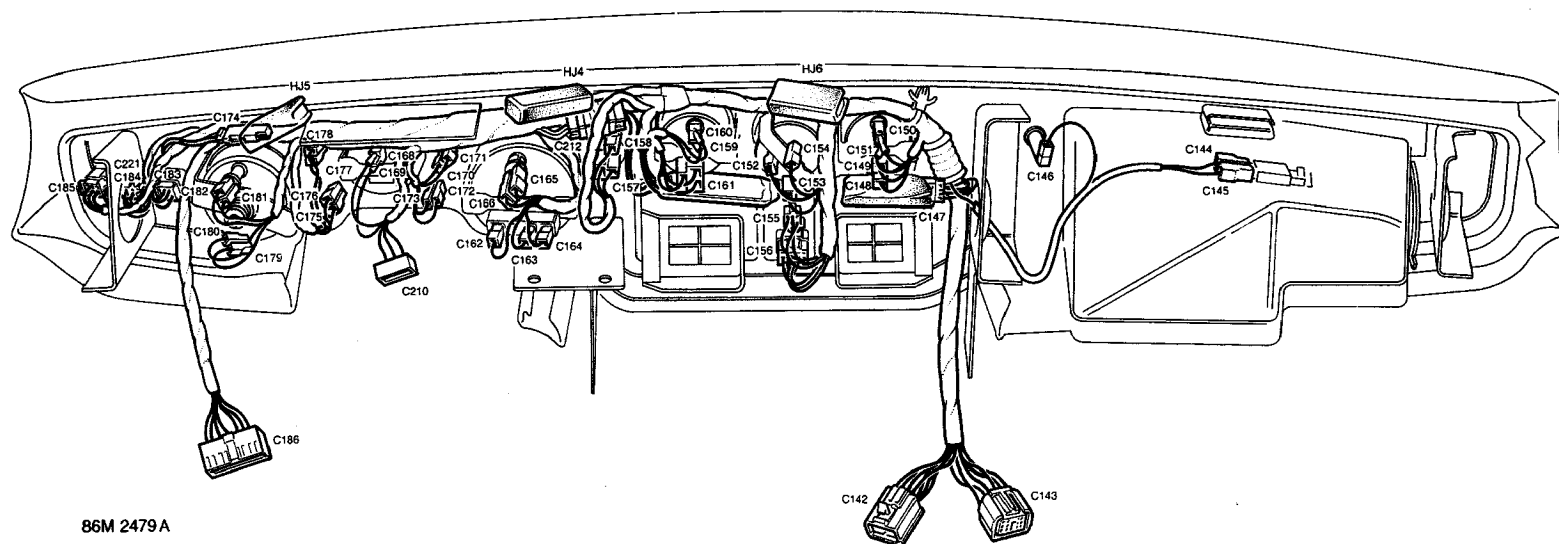
HARNESS RUNS



86M 2480 A

Engine harness

- | | |
|---|---|
| E6 Earth point 6 | C125 Injector 6 |
| C106 Fuel ECU | C126 Injector 5 |
| C107 Engine to main harness | C127 Injector 4 |
| C108 Engine to main harness | C128 Injector 3 |
| C109 Diagnostic connector - link | C129 Injector 2 |
| C110 Diagnostic connector | C130 Injector 1 |
| C111 Tune selection resistor | C131 Throttle potentiometer |
| C112 Air flow meter | C132 Coolant temperature sensor - fuel ECU |
| C113 Starter solenoid | C133 Fuel temperature sensor |
| C114 Starter motor | C134 Ignition amplifier module |
| C117 Ignition resistor | C135 Ignition coil |
| C118 Ignition resistor | C136 Ignition coil |
| C119 Purge control valve | C137 Oil pressure switch |
| C120 Oxygen sensor - RH | C138 Coolant temperature switch - gauge |
| C121 Oxygen sensor - LH | C139 Fan switch - Otterstat |
| C122 Stepper motor | C140 Alternator sensing |
| C123 Injector 8 | C141 Alternator |
| C124 Injector 7 | C214 Compressor clutch (air conditioning) |

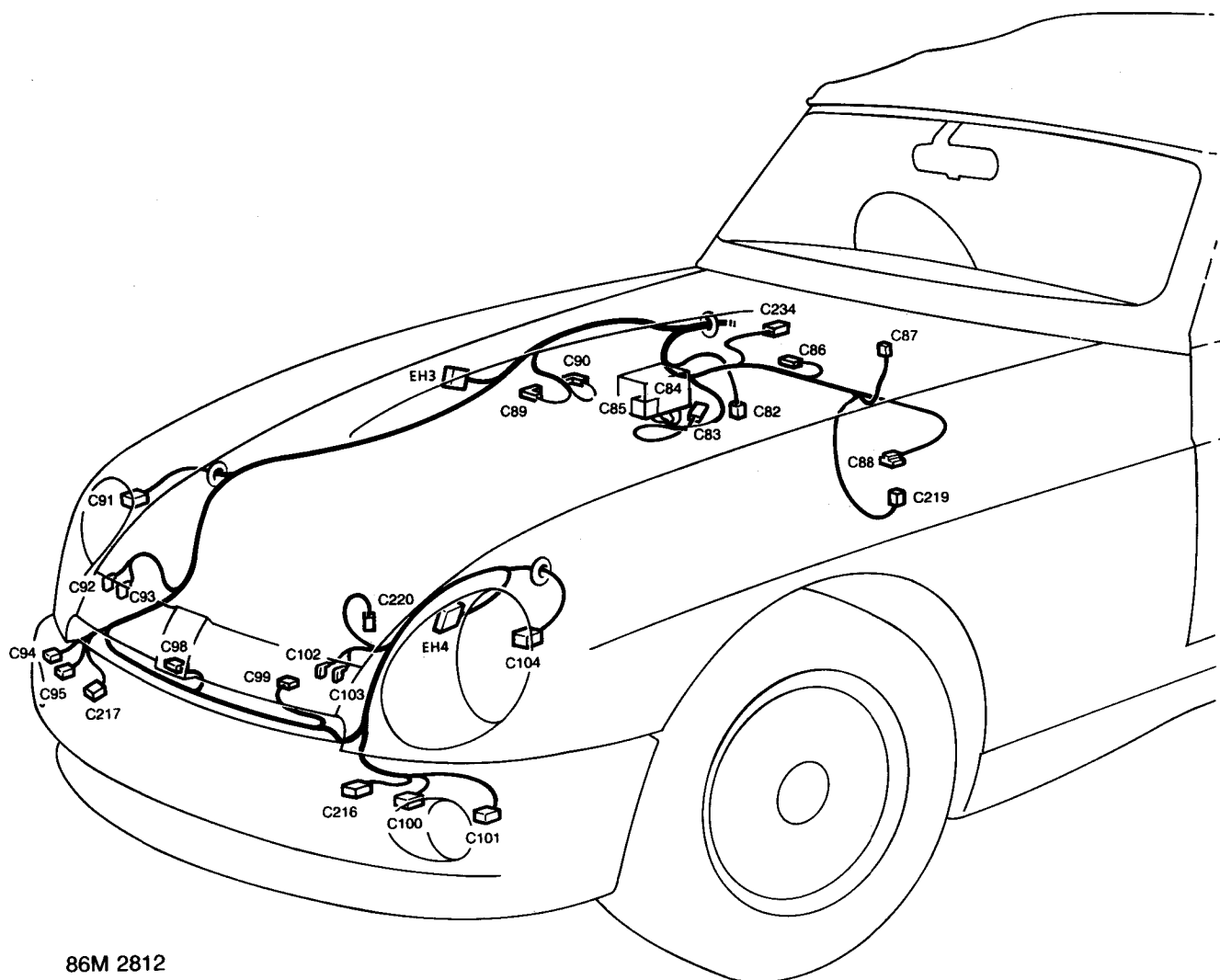


86M 2479 A

Fascia harness – viewed from rear of fascia

- | | | |
|---------------------------------|---|---|
| C142 Fascia to main harness | C159 Coolant temperature gauge illumination | C175 No charge warning light |
| C143 Fascia to main harness | C160 Coolant temperature gauge illumination | C176 No charge warning light |
| C144 Glovebox lamp | C161 Coolant temperature gauge | C177 Direction indicator warning light – RH |
| C145 Glovebox lamp | C162 Tachometer | C178 Direction indicator warning light – RH |
| C146 Glovebox switch | C163 Tachometer | C179 Speedometer illumination |
| C147 Dimmer unit | C164 Tachometer | C180 Speedometer illumination |
| C148 Voltmeter | C165 Tachometer illumination | C181 Speedometer illumination |
| C149 Voltmeter | C166 Tachometer illumination | C182 Speedometer illumination |
| C150 Voltmeter illumination | C167 Fuel level gauge | C183 Boot release switch |
| C151 Voltmeter illumination | C168 Fuel level gauge illumination | C184 Front fog lamps switch |
| C152 Clock | C169 Fuel level gauge illumination | C185 Rear fog guard lamps switch |
| C153 Clock | C170 Direction indicator warning light – LH | C186 Fusebox connector |
| C154 Clock illumination | C171 Direction indicator warning light – LH | C210 Fuel level damping ECU |
| C155 Interior lamp switch | C172 Main beam warning light | C211 Fuel level damping ECU |
| C156 Hazard warning lamp switch | C173 Main beam warning light | C212 Coolant temperature ECU (sub harness) |
| C157 Cigar lighter | C174 Anti – theft alarm LED | C221 Air conditioning switch |
| C158 Cigar lighter illumination | | |

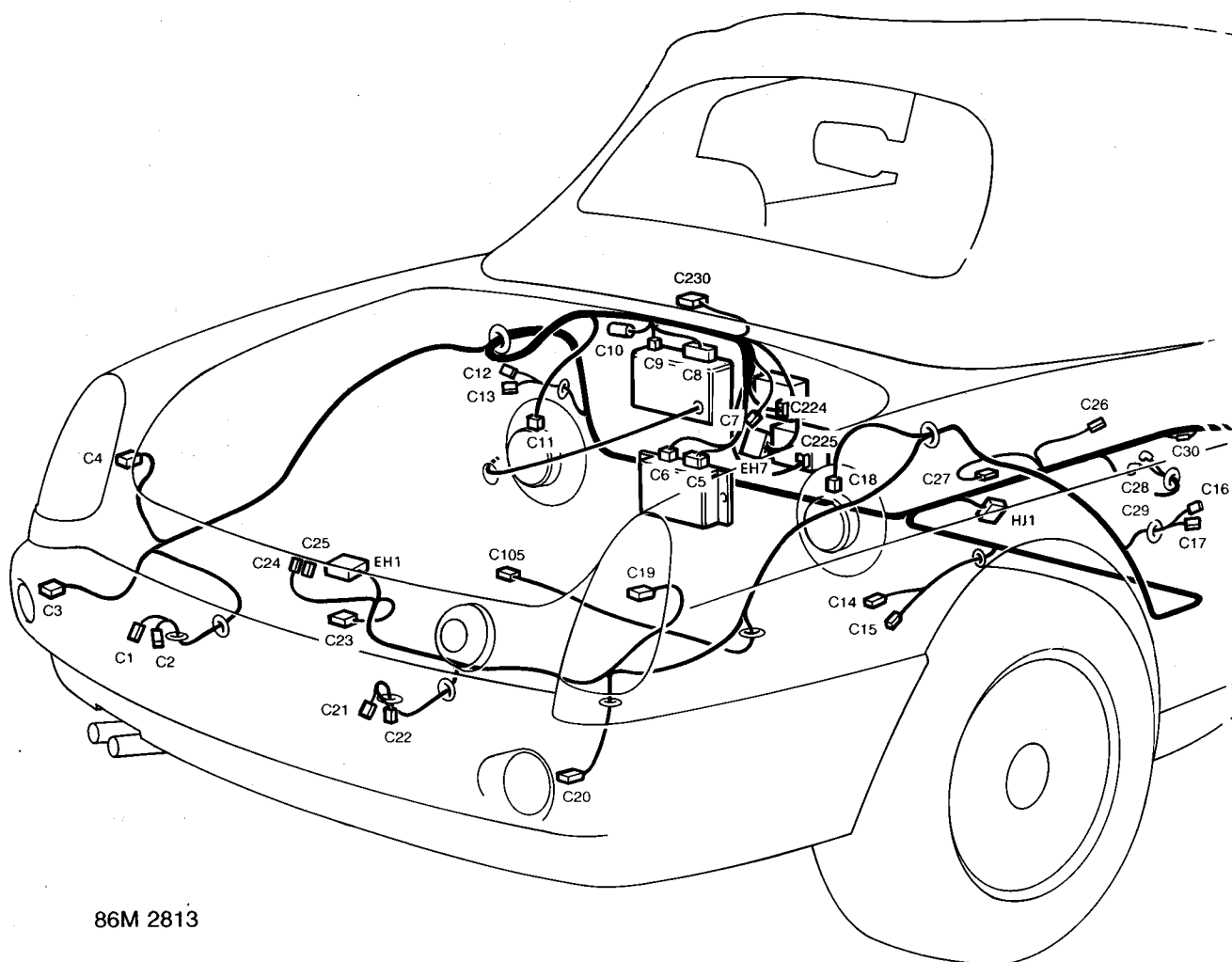
WIRING DIAGRAMS



86M 2812

Main harness - underbonnet

- | | |
|--|--|
| EH3 Earth header 3 | C94 RH front direction indicator lamp |
| EH4 Earth header 4 | C95 RH front fog lamp |
| C82 Brake lamps switch | C98 Bonnet switch - anti-theft |
| C83 Speed transducer | C99 Cooling fans motor |
| C84 Fusible link box (fusible link 2,3 & 4) | C100 LH front fog lamp |
| C85 Fusible link box (fusible link 1) | C101 LH front direction indicator lamp |
| C86 Heater motor | C102 LH horn |
| C87 Inertia switch | C103 LH horn |
| C88 Windscreen washer pump | C104 LH headlamp |
| C89 Brake fluid level switch | C216 LH condenser fan (air conditioning) |
| C90 Brake fluid level switch | C217 RH condenser fan (air conditioning) |
| C91 RH headlamp | C219 Vacuum solenoid valve (air conditioning) |
| C92 RH horn | C220 Dual pressure switch (air conditioning) |
| C93 RH horn | C234 Blower motor (air conditioning) |

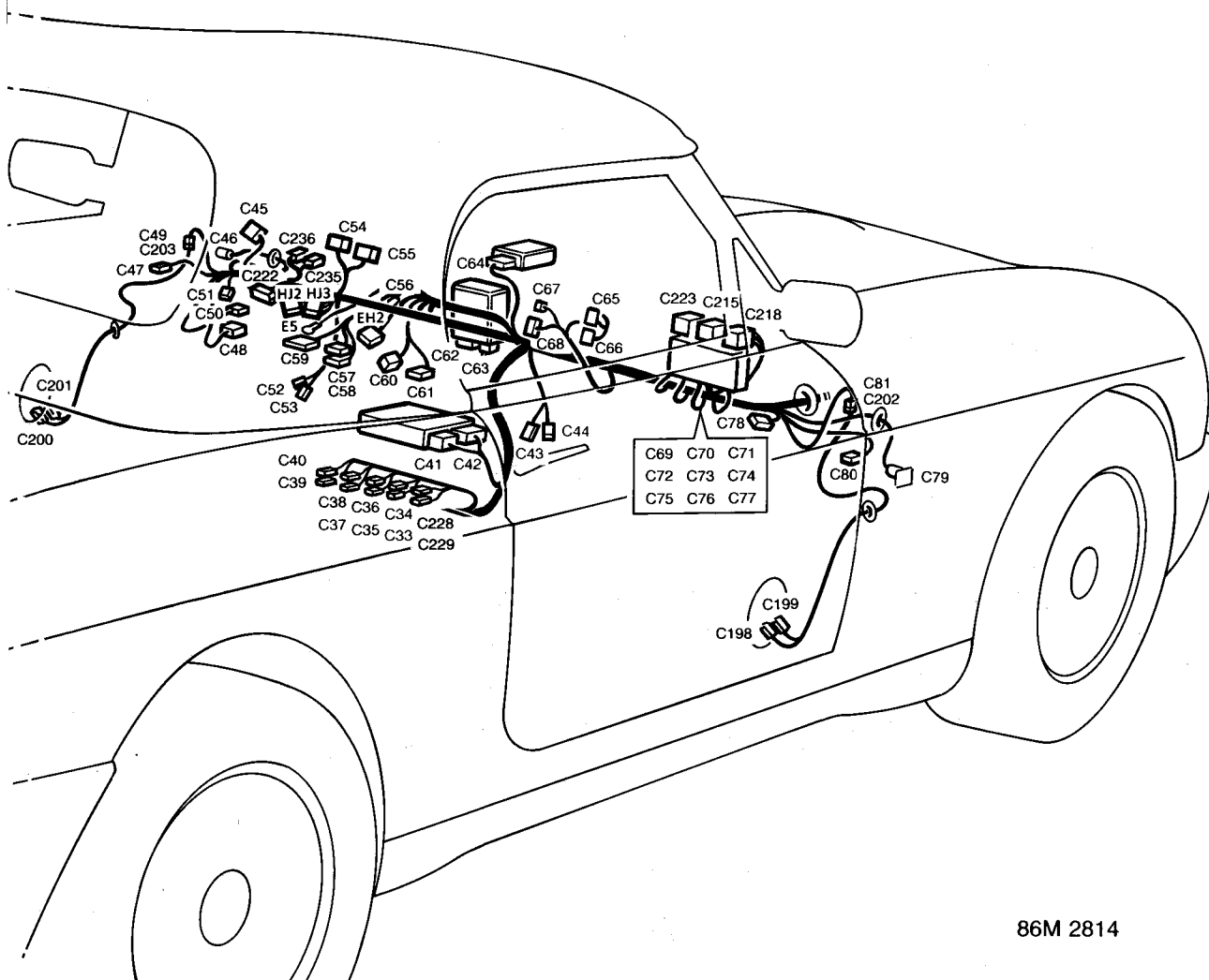


86M 2813

Main harness - passenger compartment and boot

- | | |
|--|-------------------------------------|
| EH1 Earth header 1 | C17 RH quarter panel speaker |
| EH7 Earth header 7 | C18 RH rear speaker |
| HJ1 Header joint 1 | C19 RH rear lamps |
| C1 LH Number plate lamp | C20 RH rear fog lamp |
| C2 LH number plate lamp | C21 RH number plate lamp |
| C3 LH rear fog lamp | C22 RH number plate lamp |
| C4 LH rear lamp | C23 Boot release motor |
| C5 Amplifier (radio cassette/CD player) | C24 Boot lamp switch |
| C6 Amplifier (radio cassette/CD player) | C25 Boot lamp switch |
| C7 Boot lamp | C26 Handbrake switch |
| C8 Anti - theft ECU | C27 Volumetric sensor |
| C9 Anti - theft ECU | C28 Reverse lamps switch |
| C10 Anti - theft diagnostic socket | C29 Reverse lamps switch |
| C11 LH rear speaker | C30 Diode 1 (warning lights) |
| C12 LH quarter panel speaker | C105 Fuel tank sender unit |
| C13 LH quarter panel speaker | C224 Catalyst overheat ECU 1 |
| C14 Fuel pump | C225 Catalyst overheat ECU 2 |
| C15 Fuel pump | C230 High mounted brake lamp |
| C16 RH quarter panel speaker | |

WIRING DIAGRAMS



86M 2814

Main harness – fascia and door

EH2 Earth header 2

E5 Earth point 5

HJ2 Header joint 2

HJ3 Header joint 3

C33 Oil pressure warning light

C34 Oil pressure warning light

C35 Hazard warning light

C36 Hazard warning light

C37 Brake fluid warning light

C38 Brake fluid warning light

C39 Handbrake warning light

C40 Handbrake warning light

C41 Relay module 1

C42 Relay module 1

C43 RH interior lamp

C44 RH interior lamp

C45 Wiper motor switch

C46 LH side repeater lamp

C47 Passenger door switch

C48 Main to engine harness

C49 Main to passenger door harness

C50 Main to engine harness

C51 Main to passenger door harness (not used)

C52 LH interior lamp

C53 LH interior lamp

C54 Main to fascia harness

C55 Main to fascia harness

C56 Rear amplifier resistor (PCB)

C57 Radio cassette/CD player (speakers)

C58 Radio cassette/CD player (feed)

C59 Radio cassette/CD player (PCB)

C60 Heater blower switch

C61 Heater control illumination

C62 Relay module 2

C63 Relay module 2

C64 Anti – theft immobiliser unit

C65 Wiper column switch

C66 Wiper column switch

C67 Direction indicator switch

C68 Lighting column switch

C69 Passenger compartment fusebox

C70 Passenger compartment fusebox

C71 Passenger compartment fusebox

C72 Passenger compartment fusebox

C73 Passenger compartment fusebox

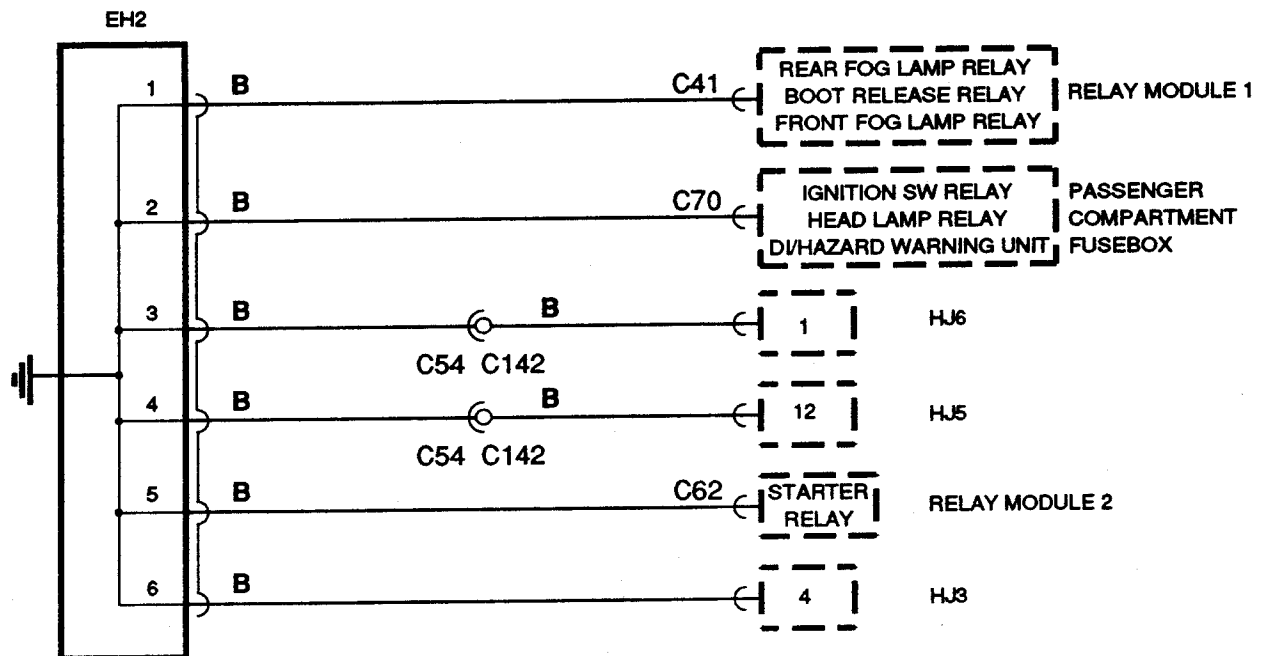
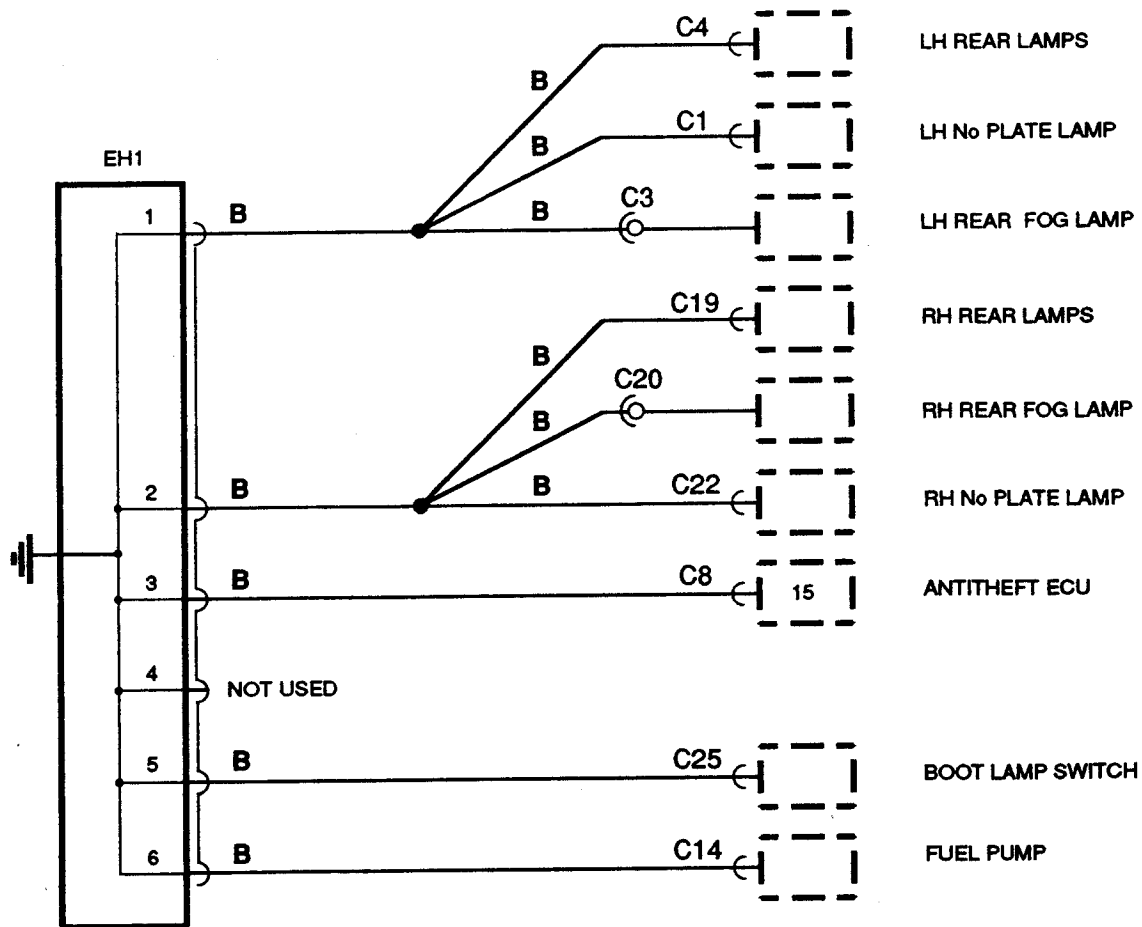
C74 Passenger compartment fusebox



C75 Passenger compartment fusebox
C76 Passenger compartment fusebox
C77 Passenger compartment fusebox
C78 Main to drivers door harness (not used)
C79 RH repeater lamp
C80 Drivers door switch
C81 Main to drivers door harness
C198 Drivers door speaker
C199 Drivers door speaker
C200 Passenger door speaker
C201 Passenger door speaker
C202 Main to drivers door harness
C203 Main to passenger door harness
C215 Compressor clutch relay (air conditioning)
C218 Condenser fan relay (air conditioning)
C222 Blower motor (air conditioning)
C223 Blower changeover relay (air conditioning)
C228 Catalyst overheat warning light
C229 Catalyst overheat warning light
C235 Evaporator thermostat (air conditioning)
C236 Evaporator thermostat (air conditioning)

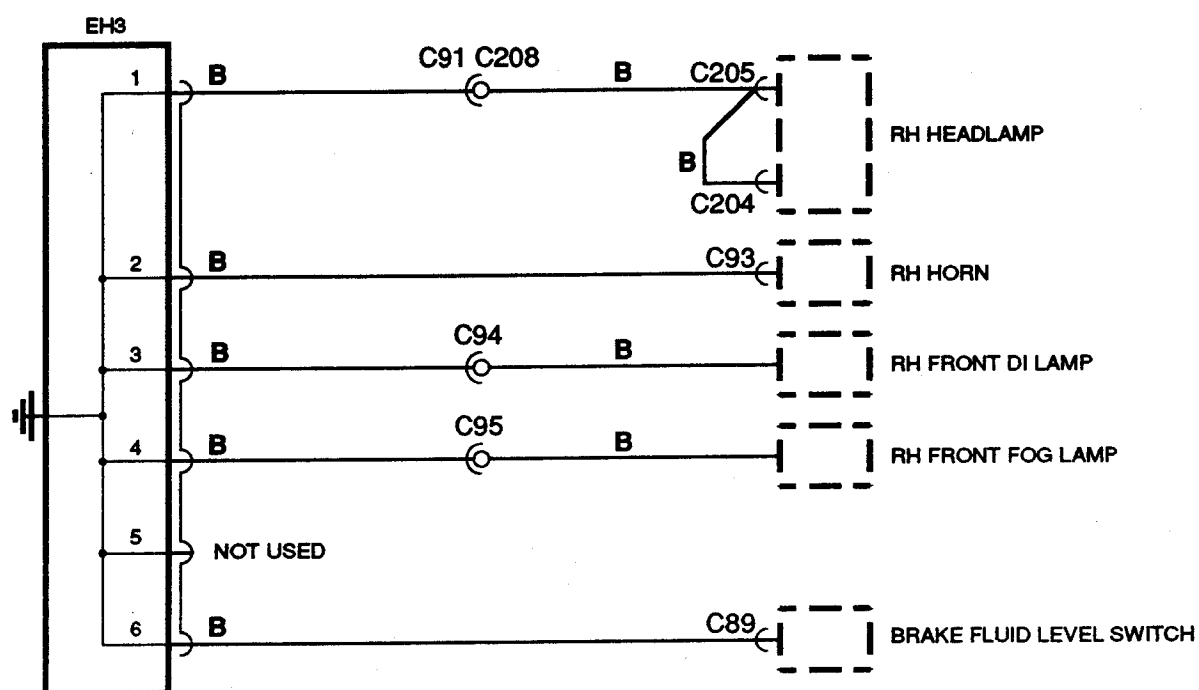
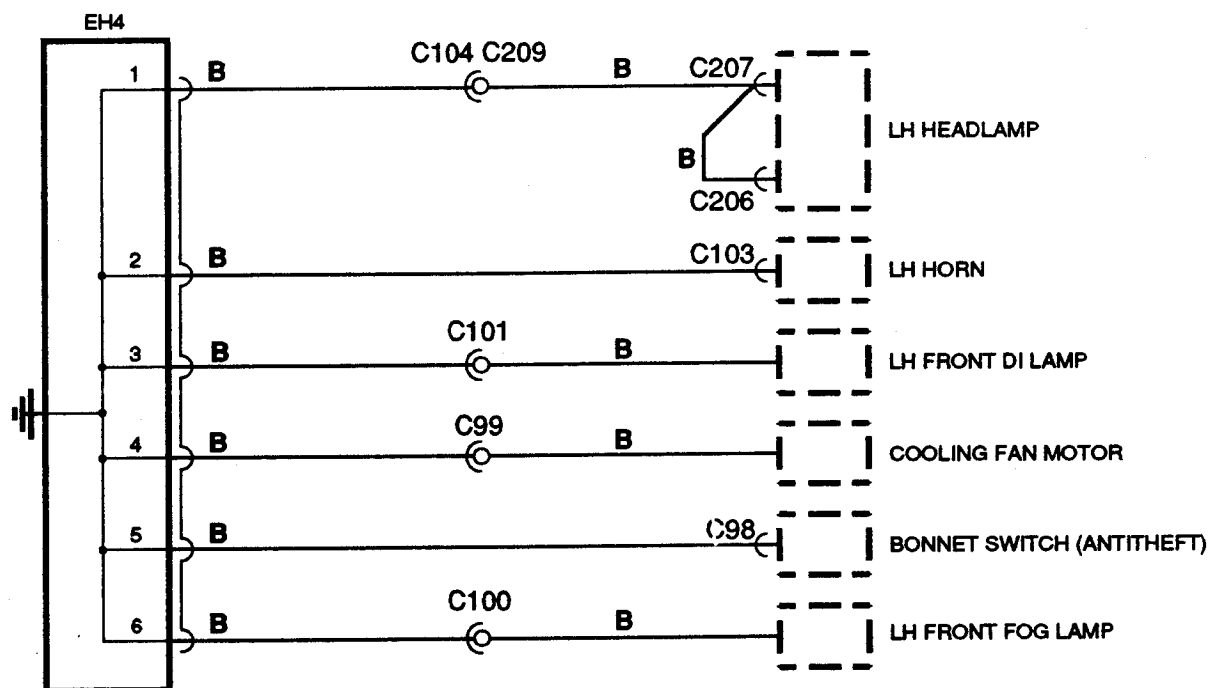


Earth Header 1 and 2



WIRING DIAGRAMS

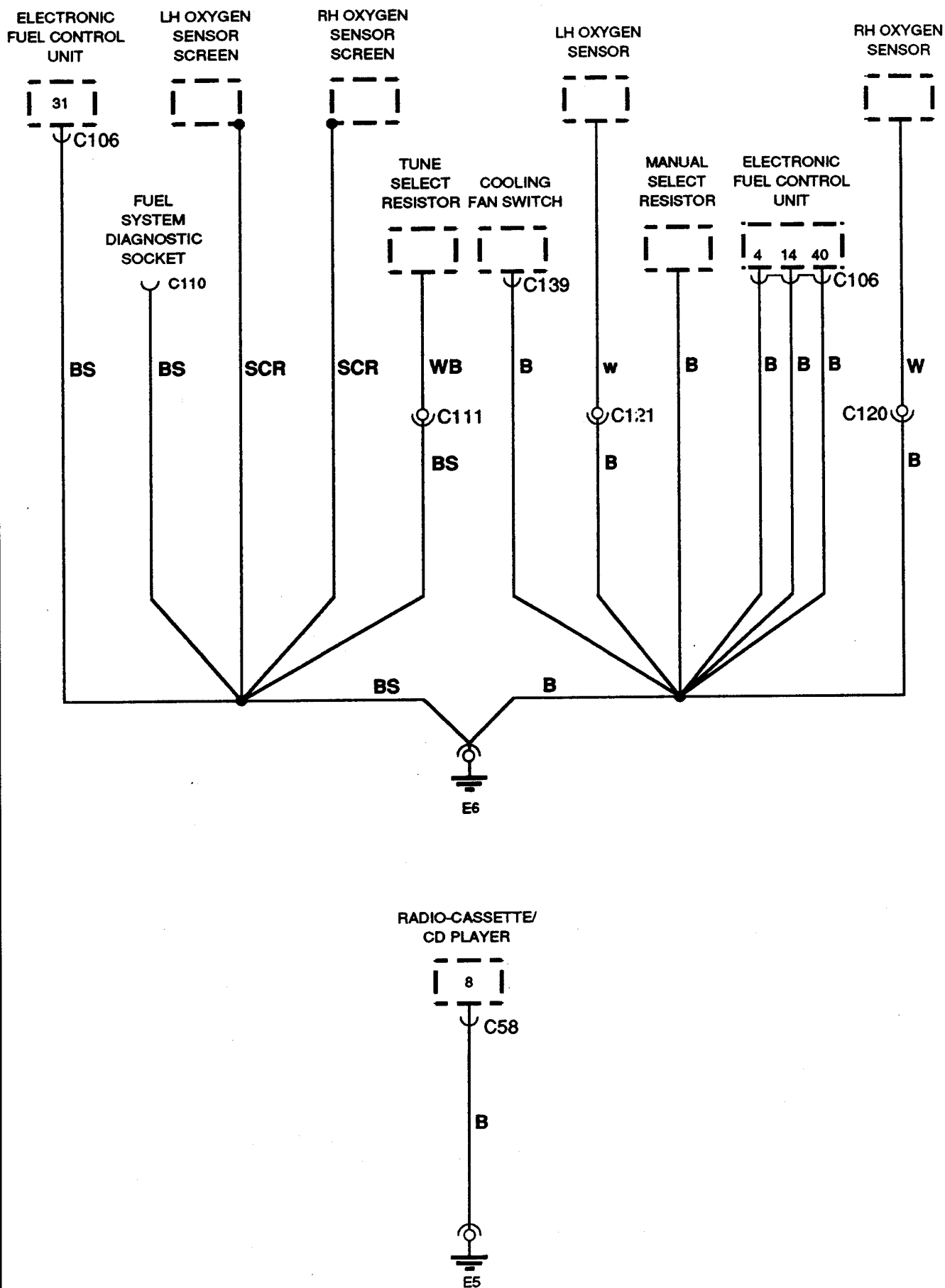
Earth Header 3 and 4



86M2426



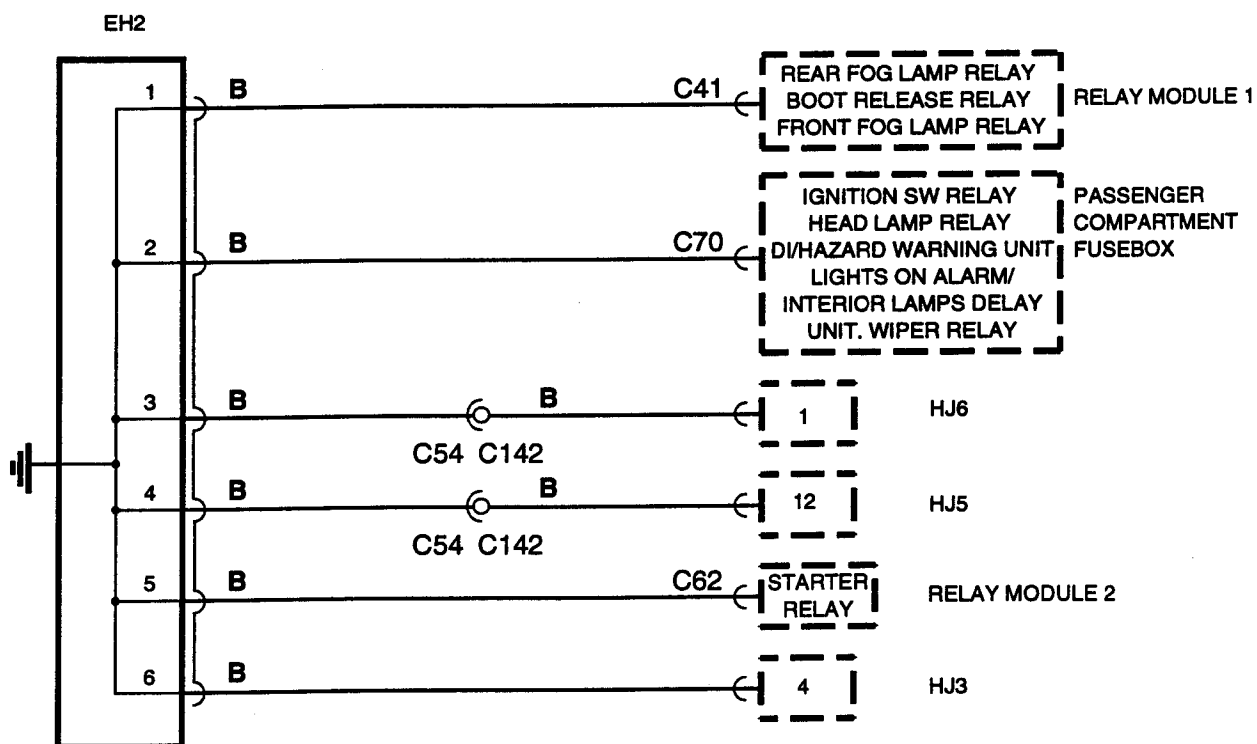
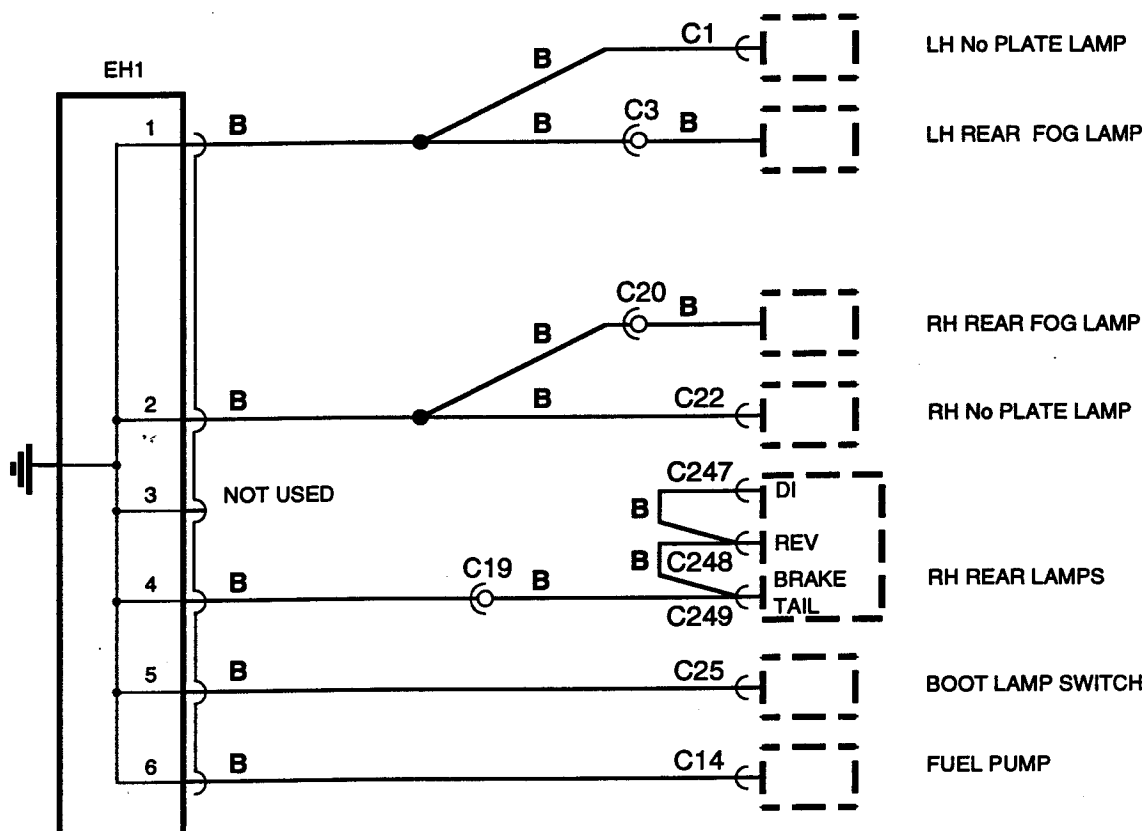
Earth Point 5 and 6



86M2427

WIRING DIAGRAMS

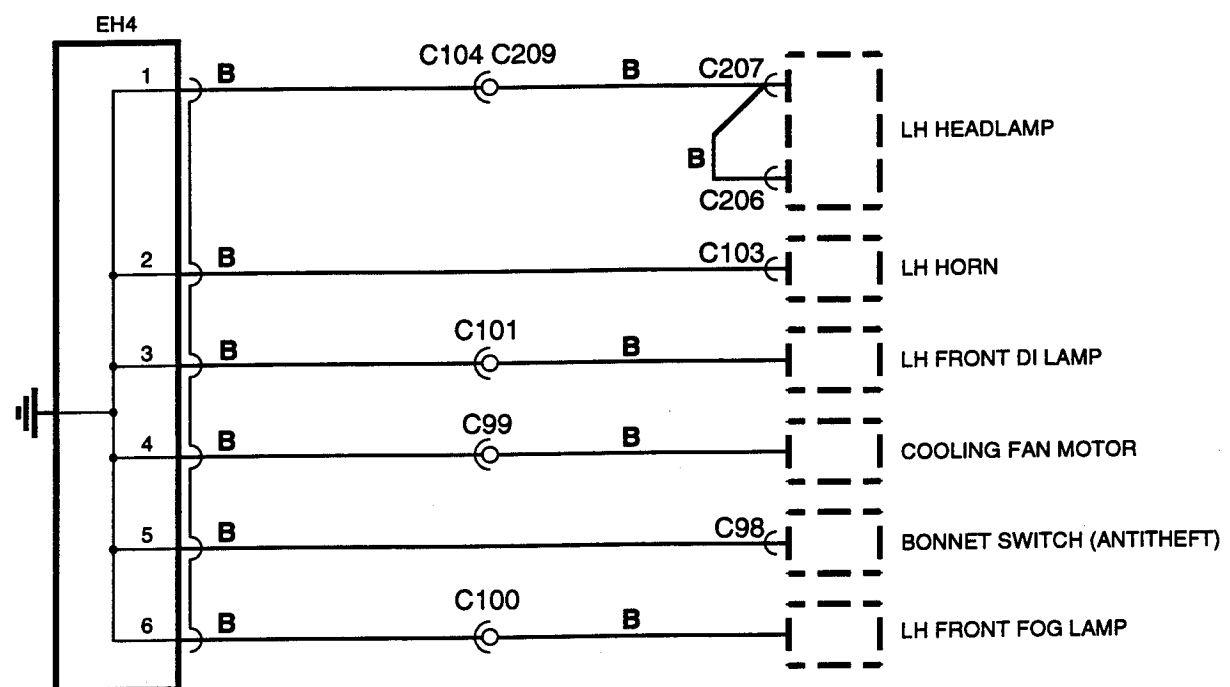
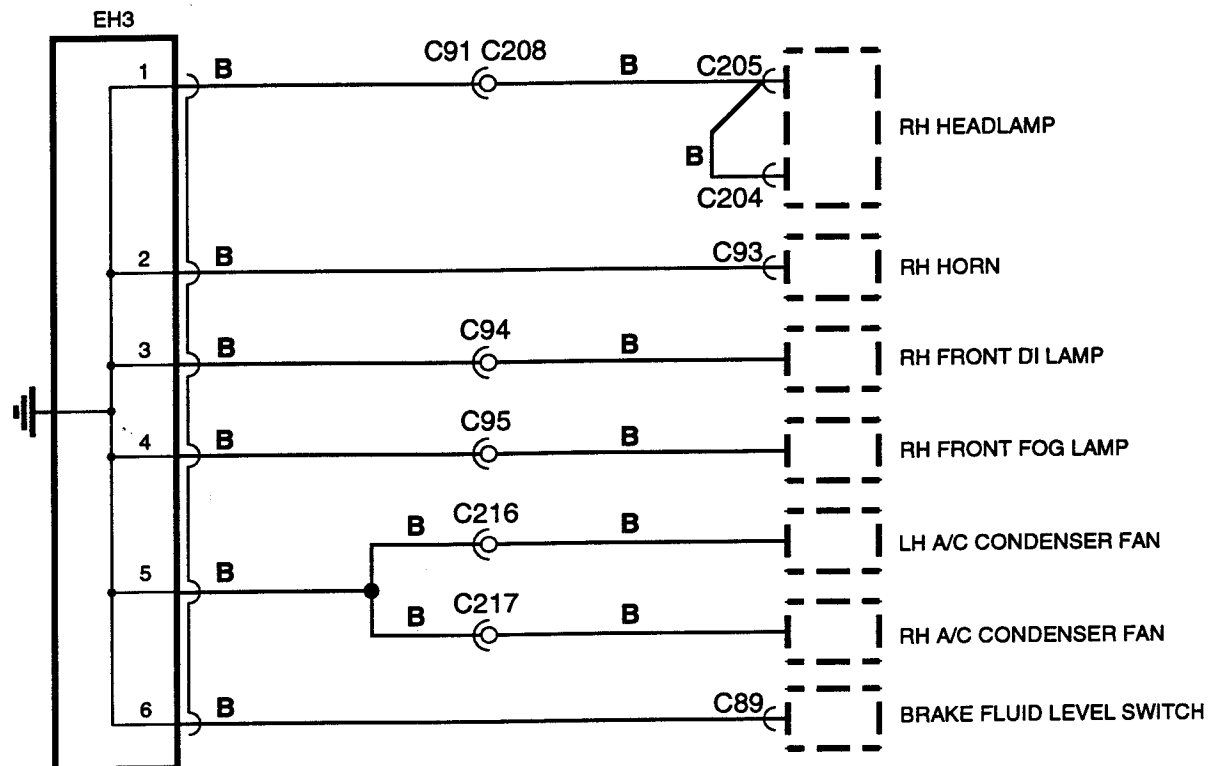
Earth Header 1 and 2 - air conditioning fitted



RAM2425A

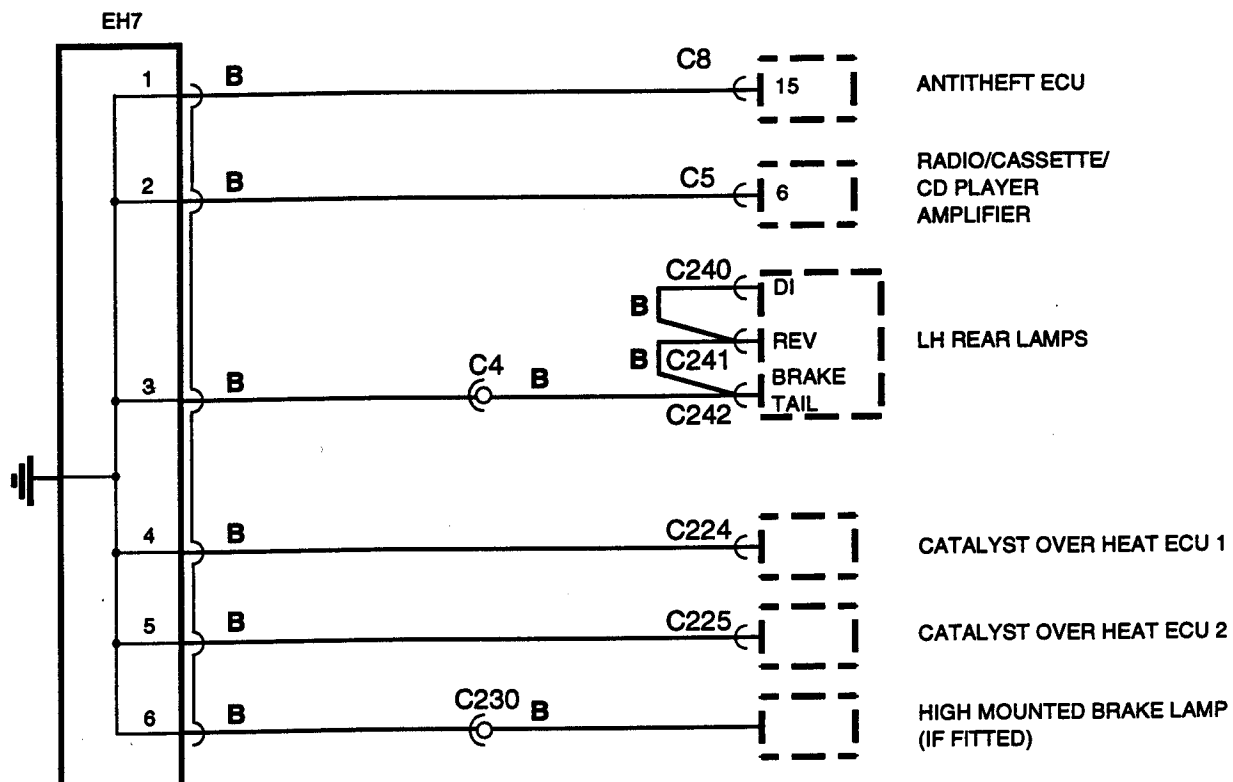


Earth Header 3 and 4 - air conditioning fitted



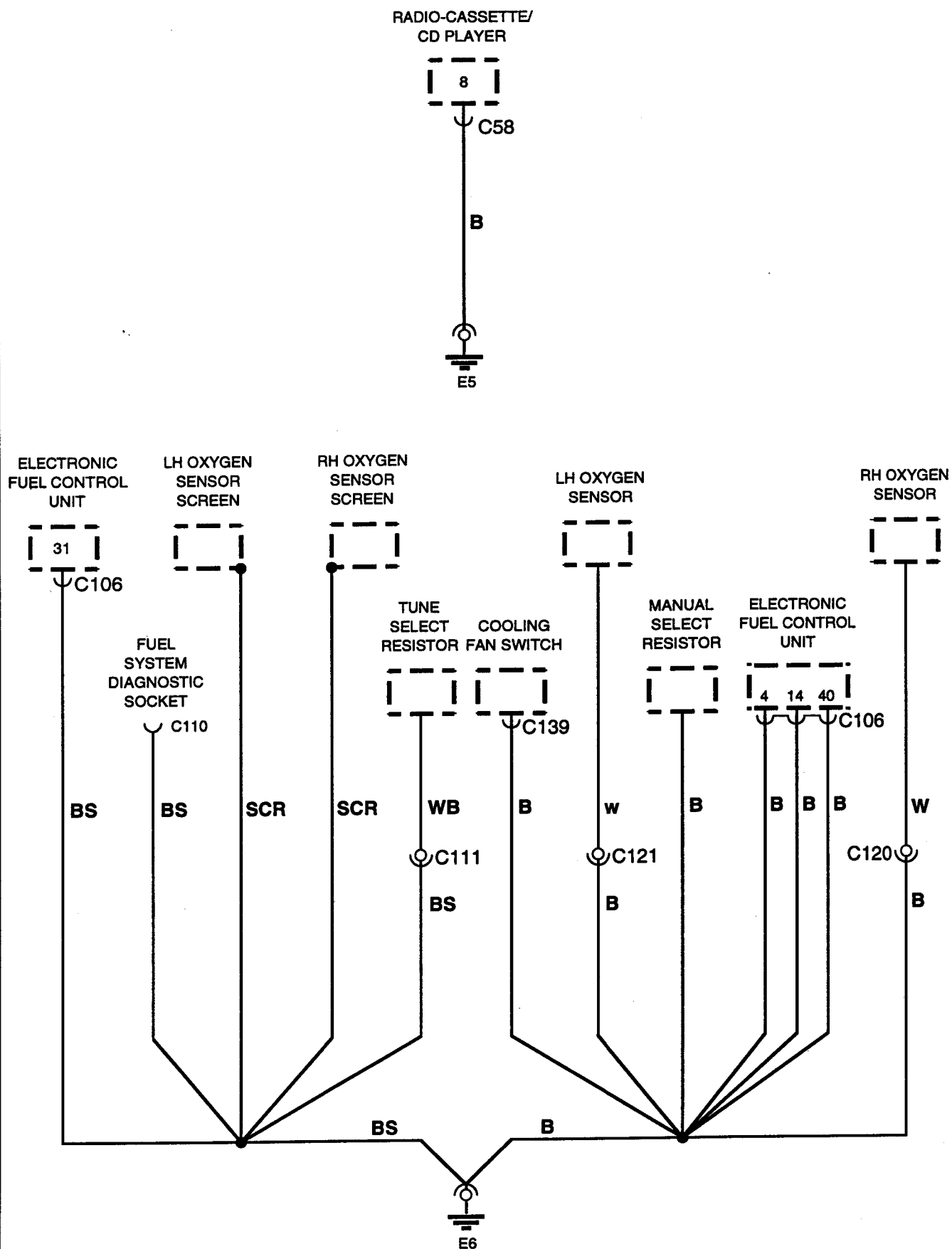
WIRING DIAGRAMS

Earth Header 7 - air conditioning fitted





Earth Point 5 and 6 – air conditioning fitted



86M2427A



HEADER JOINTS

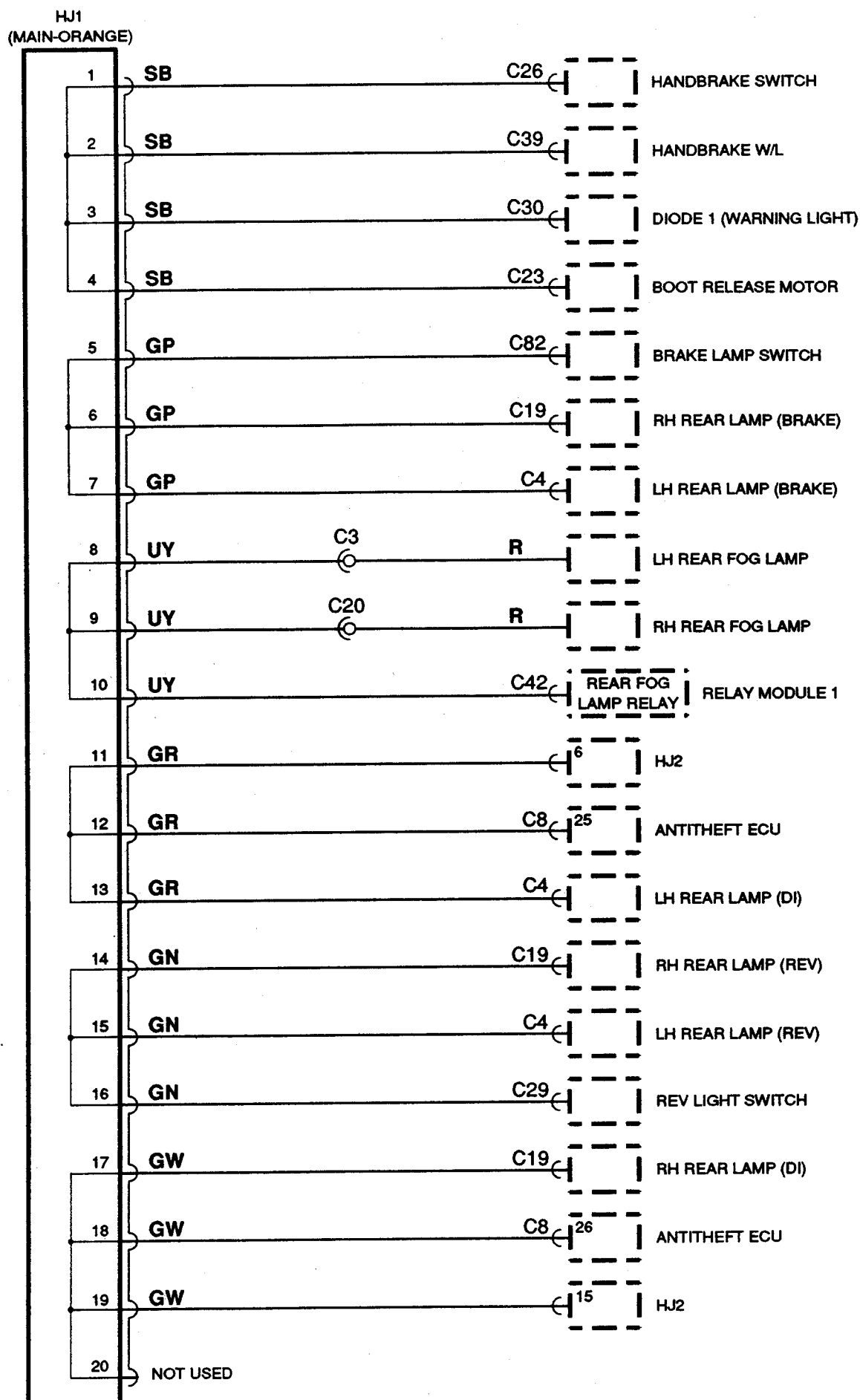
The header joint replaces the previously large number of soldered or crimped joints. Some of the advantages of this system are its ease of manufacture, less chance of faulty joints and the ability to incorporate more than one circuit into an individual header joint.

Header joint location chart.

HEADER	COLOUR	LOCATION
HJ1	ORANGE	Under rear console
HJ2	BLUE	On fascia rail, below LH side of glovebox
HJ3	GREY	On fascia rail, below LH side of glovebox
HJ4	ORANGE	Behind fascia, above instruments
HJ5	GREY	Behind fascia, above instruments
HJ6	GREY	Behind fascia, above instruments

WIRING DIAGRAMS

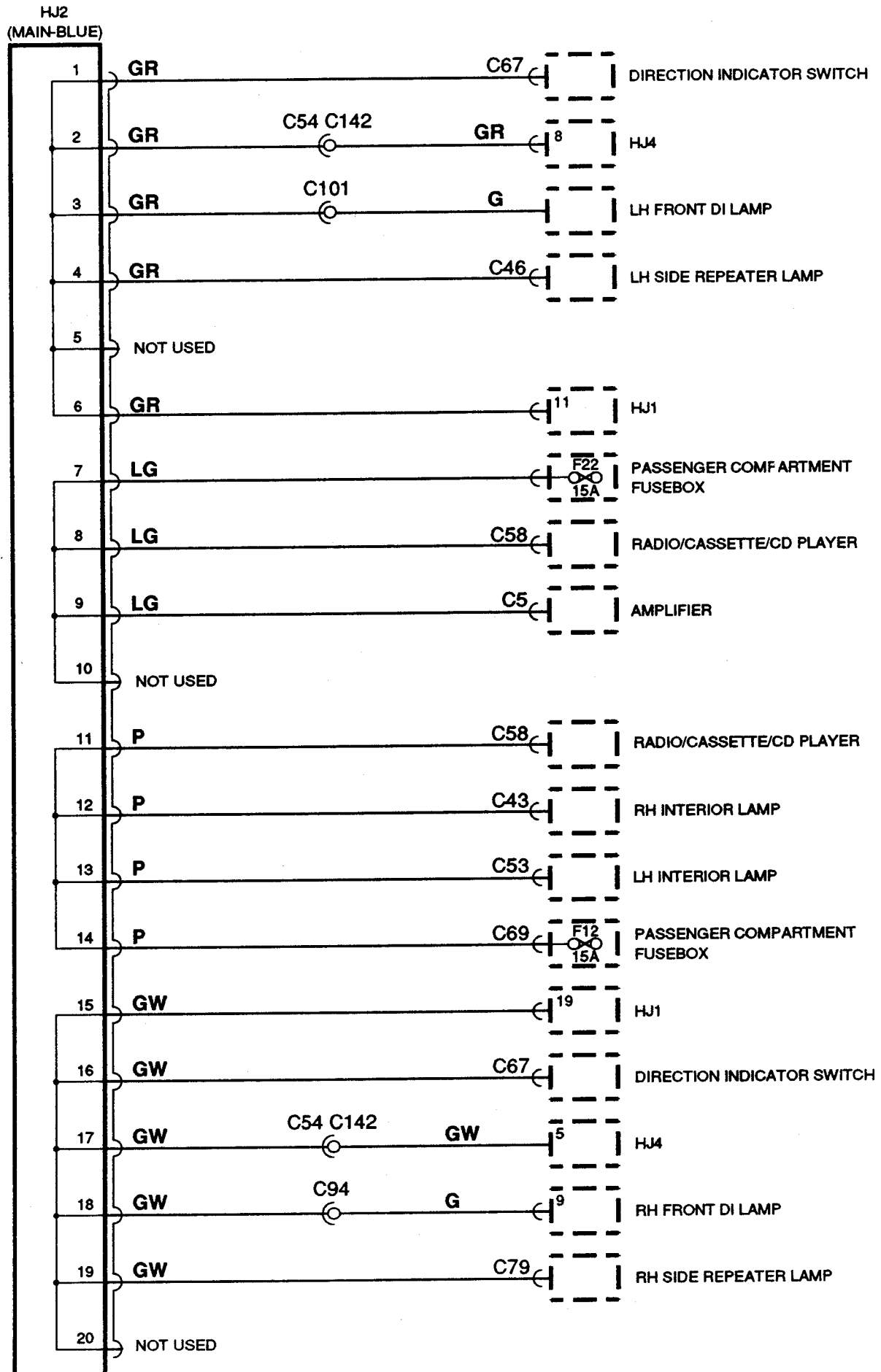
Header Joint 1 - Main harness



86M2428

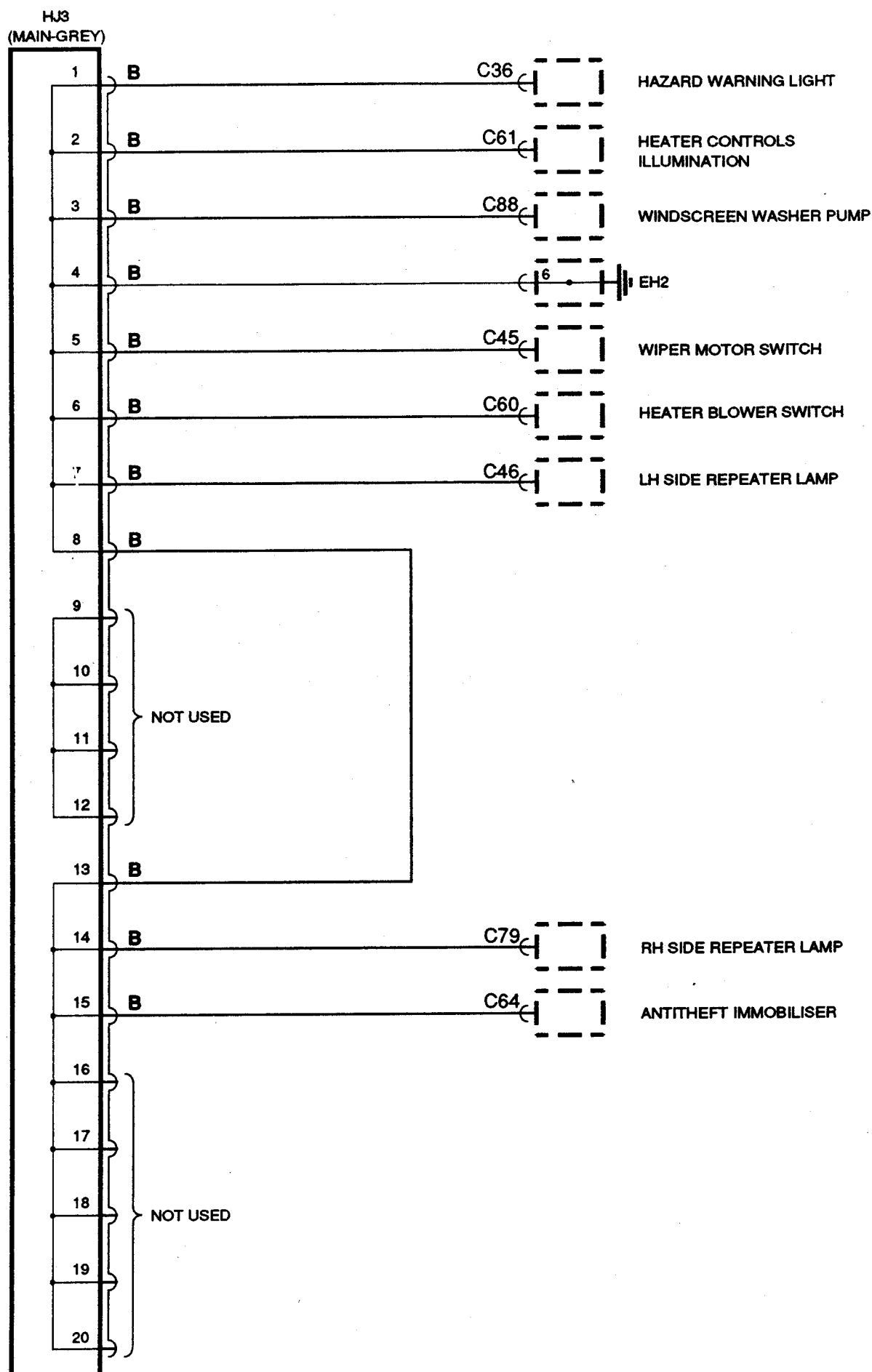


Header Joint 2 - Main harness



WIRING DIAGRAMS

Header Joint 3 - Main harness

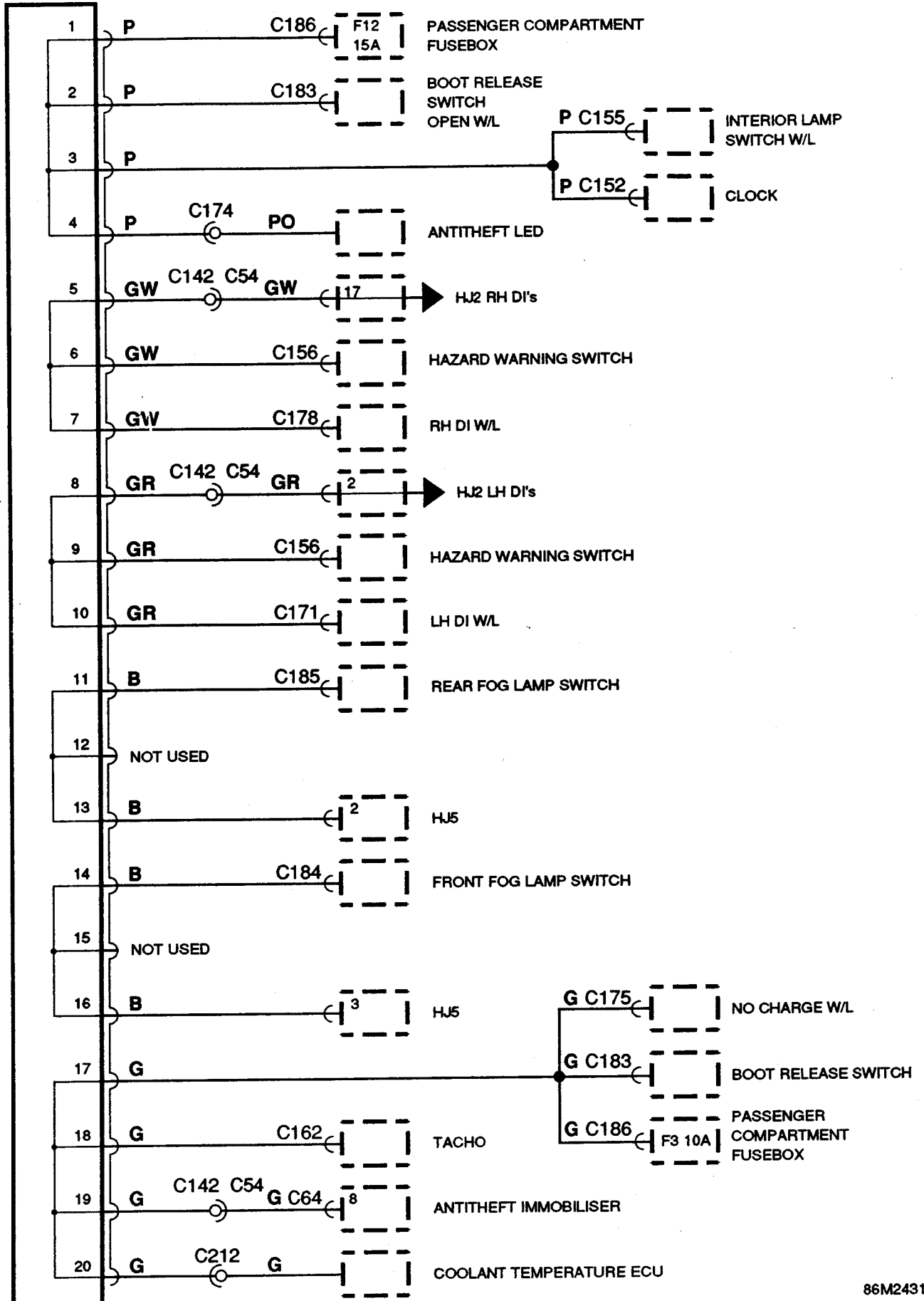


86M2430



Header Joint 4 - Fascia harness

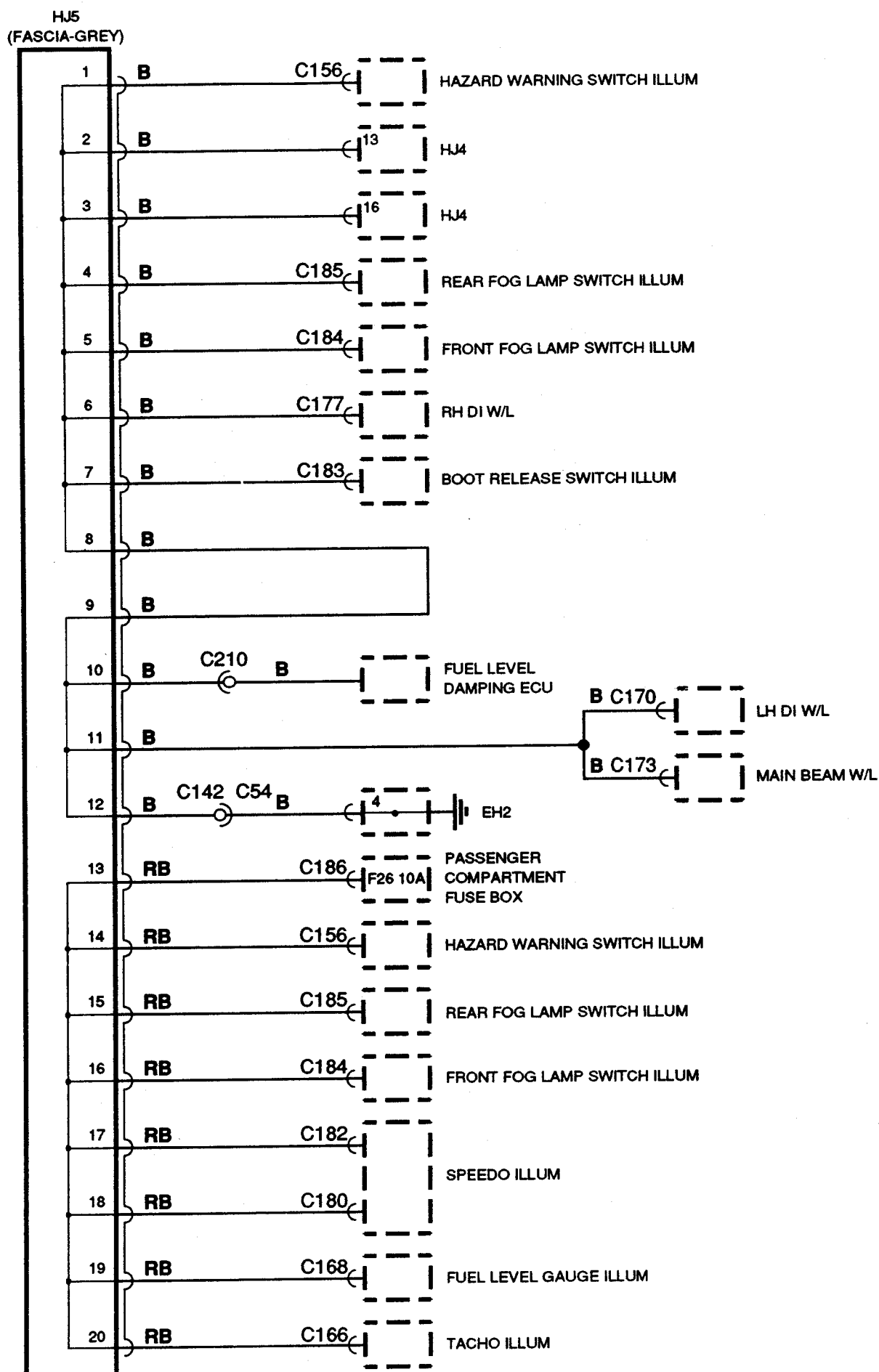
HJ4
(FASCIA-ORANGE)



86M2431

WIRING DIAGRAMS

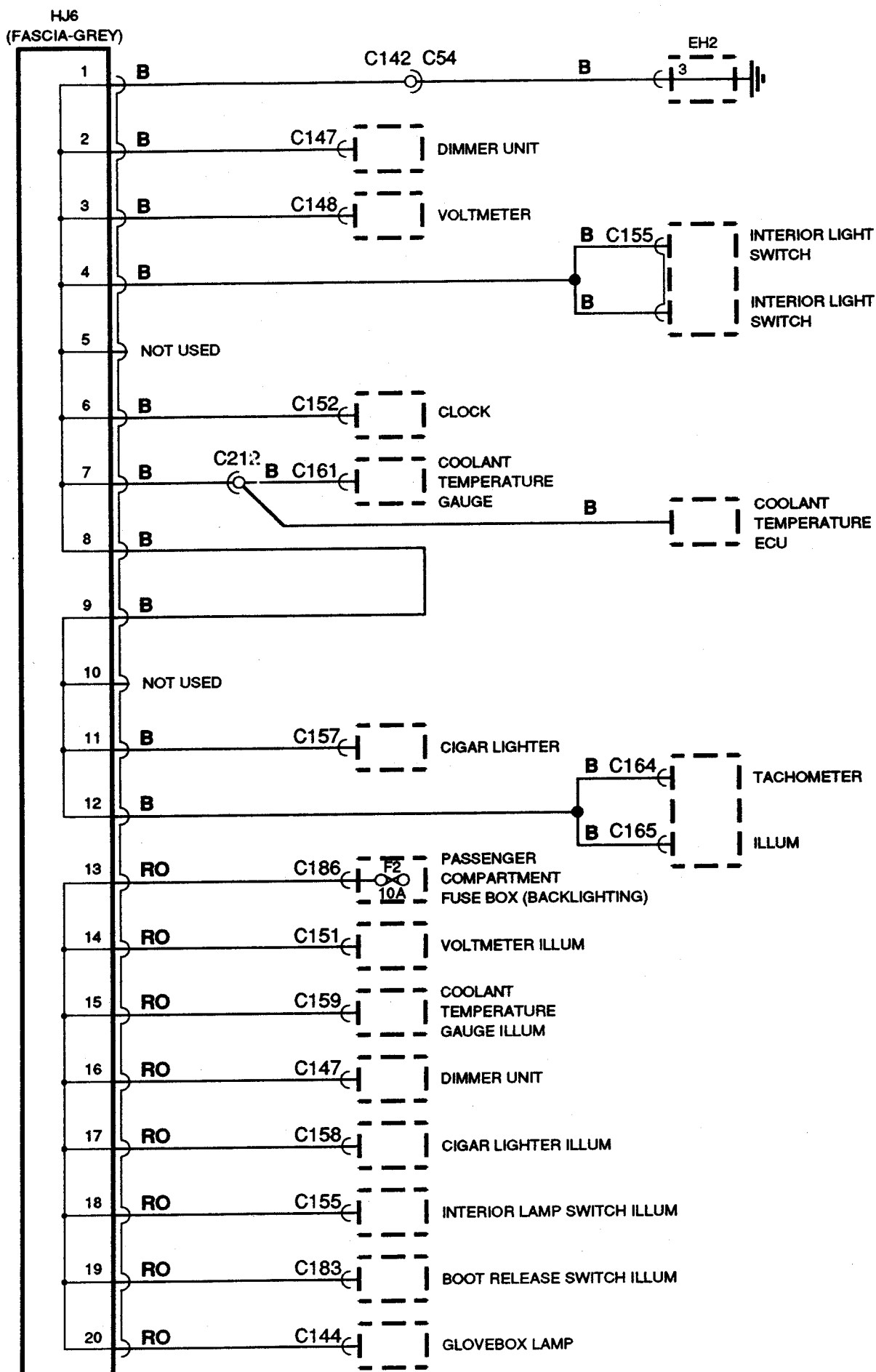
Header Joint 5 - Fascia harness



86M2432



Header Joint 6 - Fascia harness

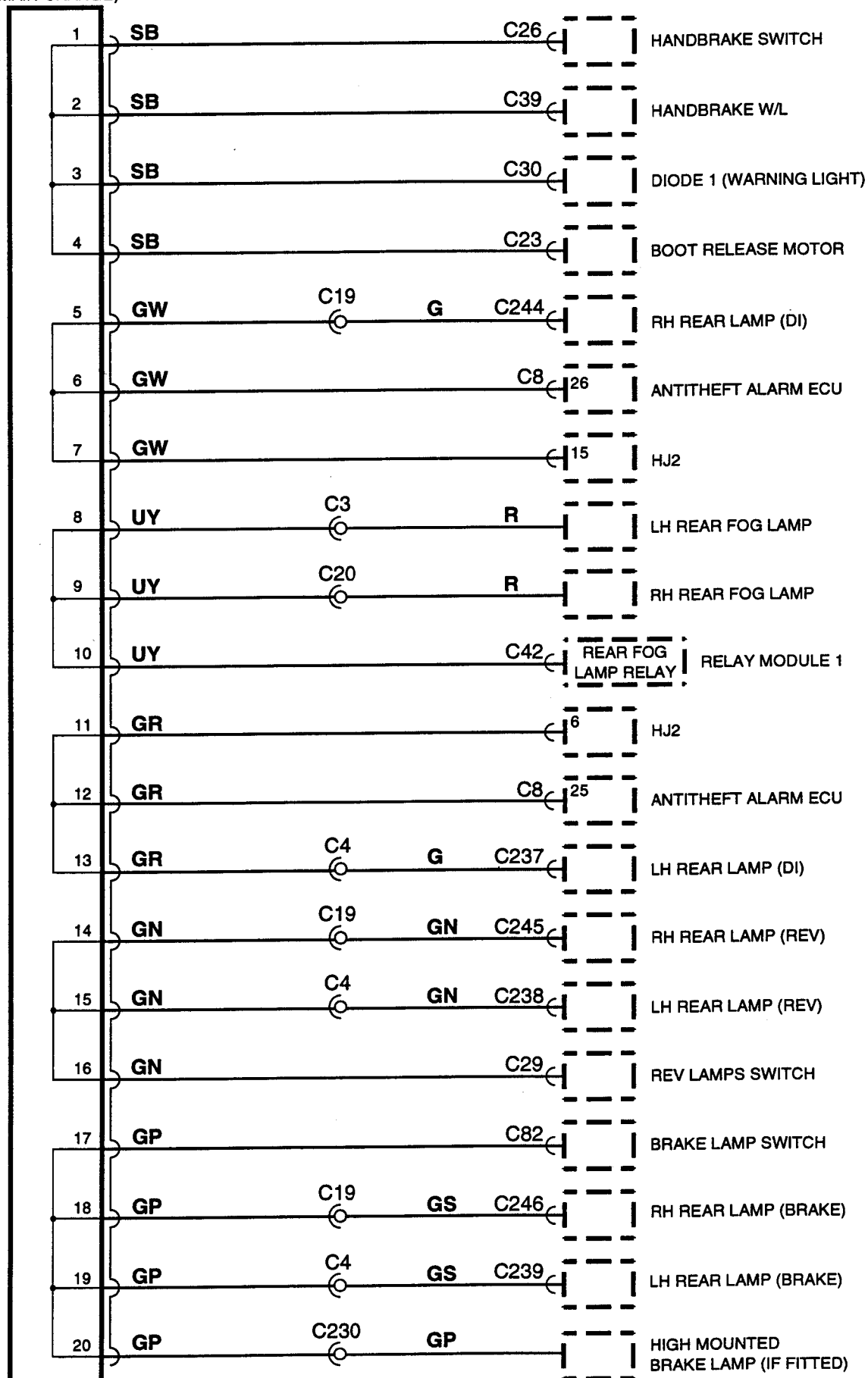


86M2433

WIRING DIAGRAMS

Header Joint 1 - Main harness - air conditioning fitted

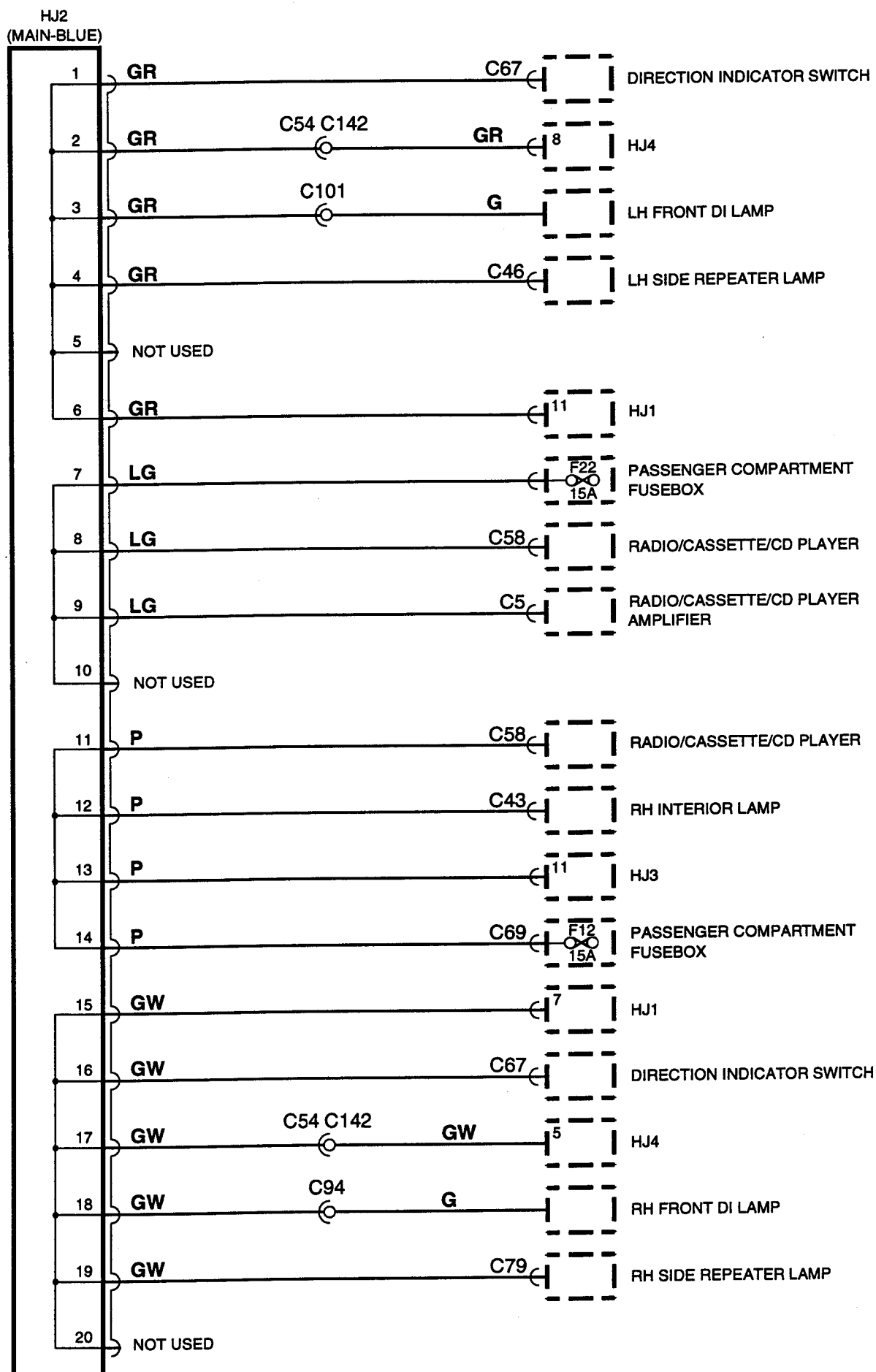
HJ1
(MAIN-ORANGE)



86M2428A



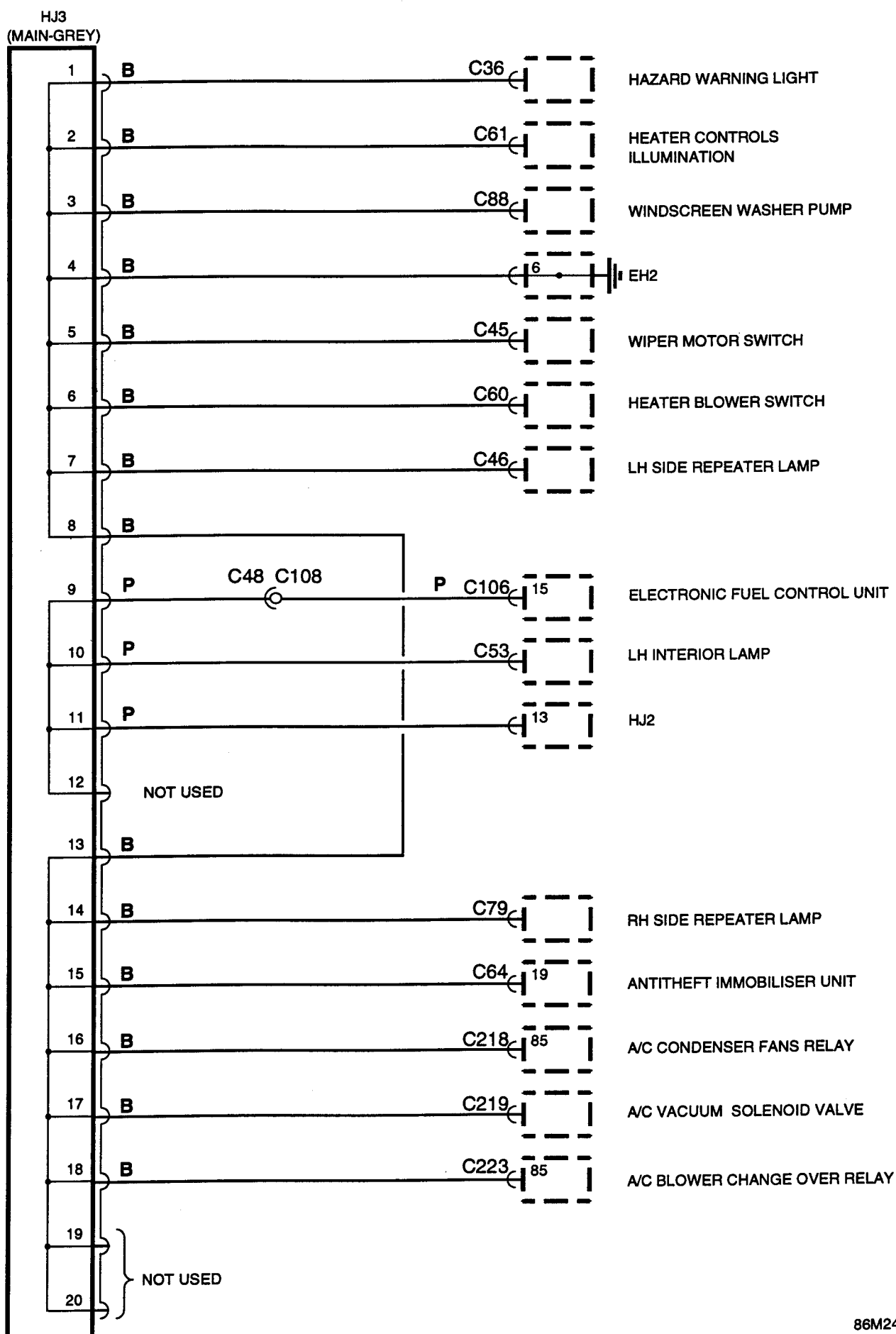
Header Joint 2 - Main harness - air conditioning fitted



86M2429A

WIRING DIAGRAMS

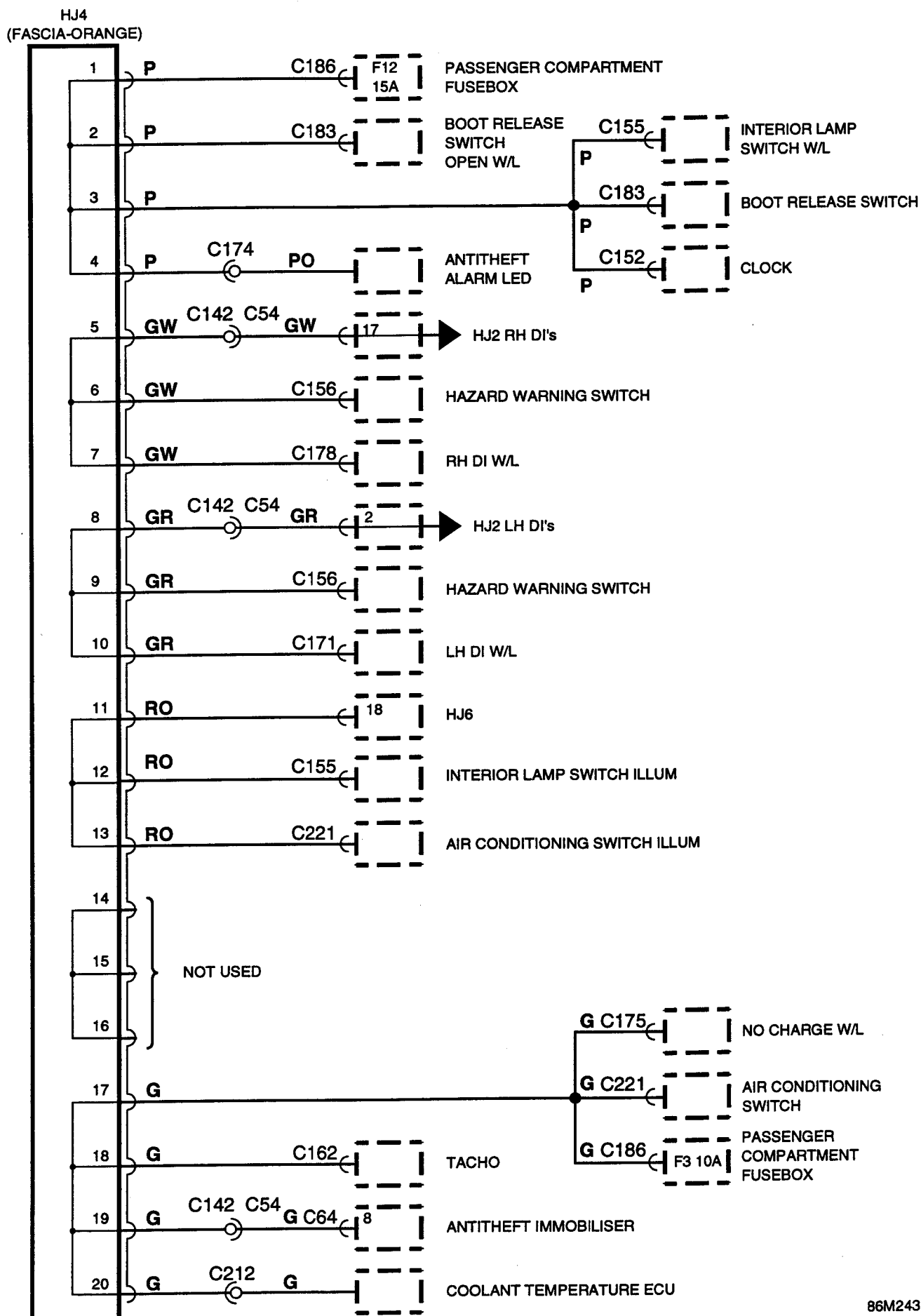
Header Joint 3 - Main harness - air conditioning fitted



86M2430A



Header Joint 4 - Fascia harness - air conditioning fitted

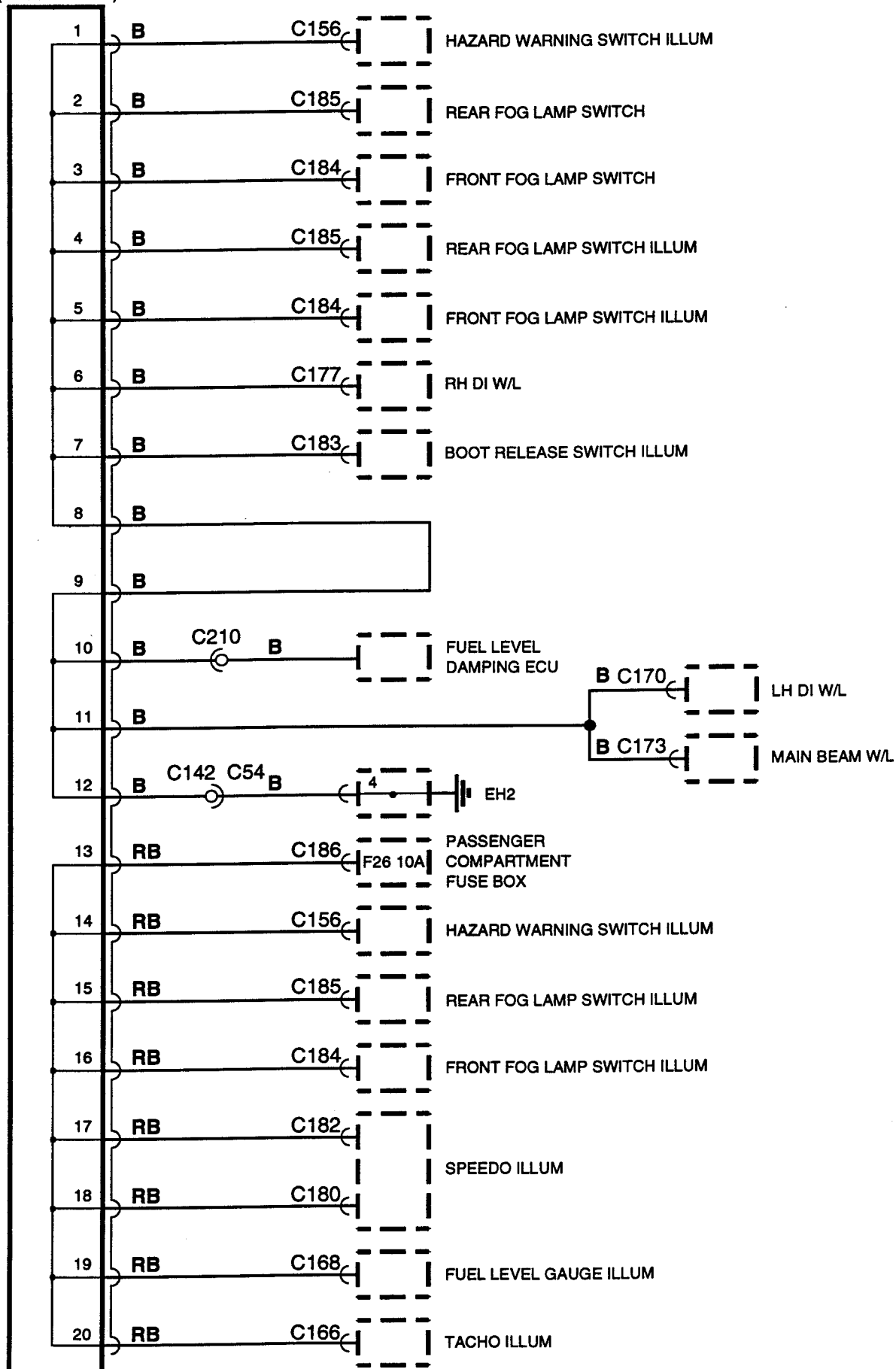


86M2431A

WIRING DIAGRAMS

Header Joint 5 - Fascia harness - air conditioning fitted

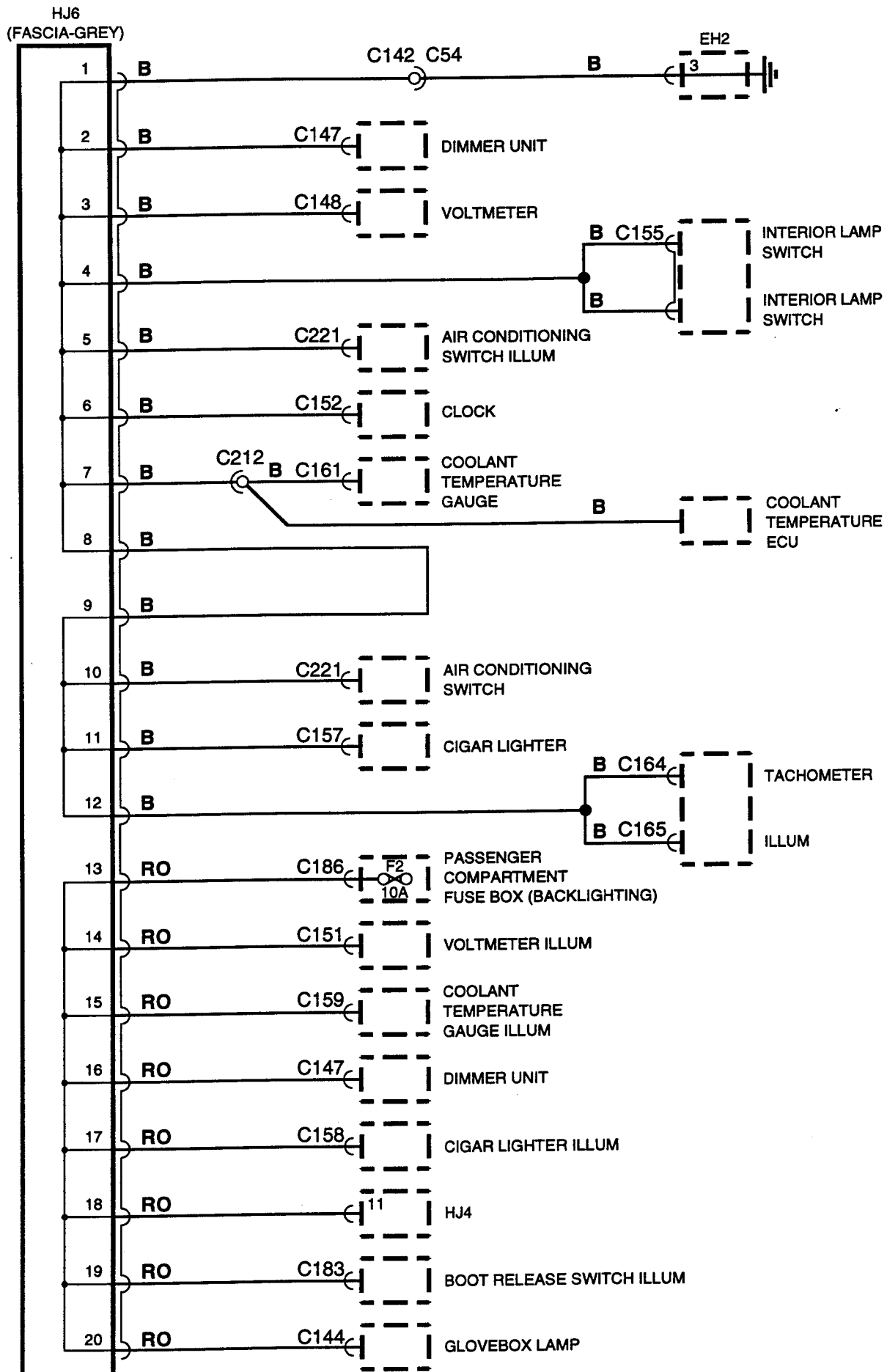
HJ5
(FASCIA-GREY)



86M2432A



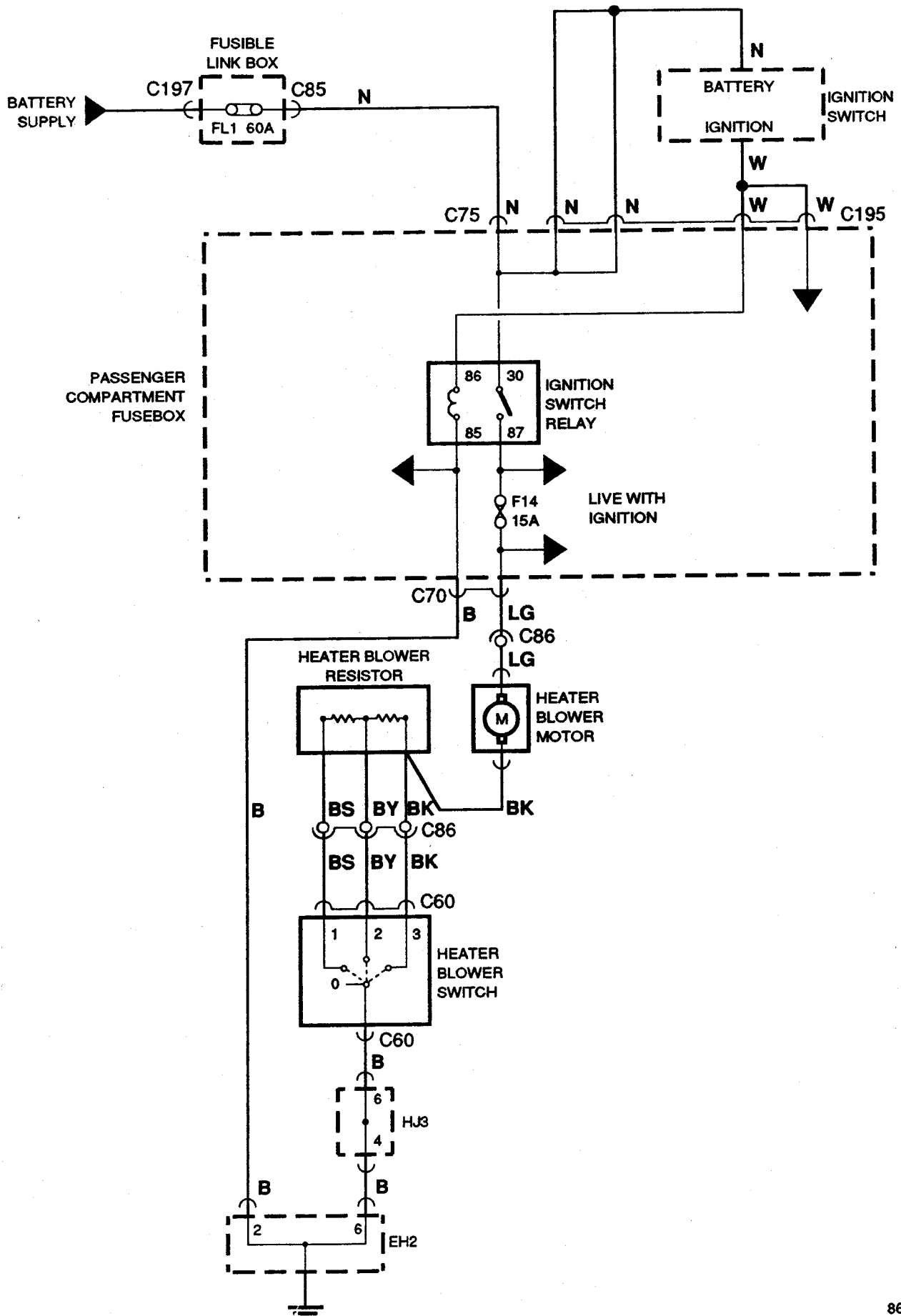
Header Joint 6 - Fascia harness - air conditioning fitted



86M2433A



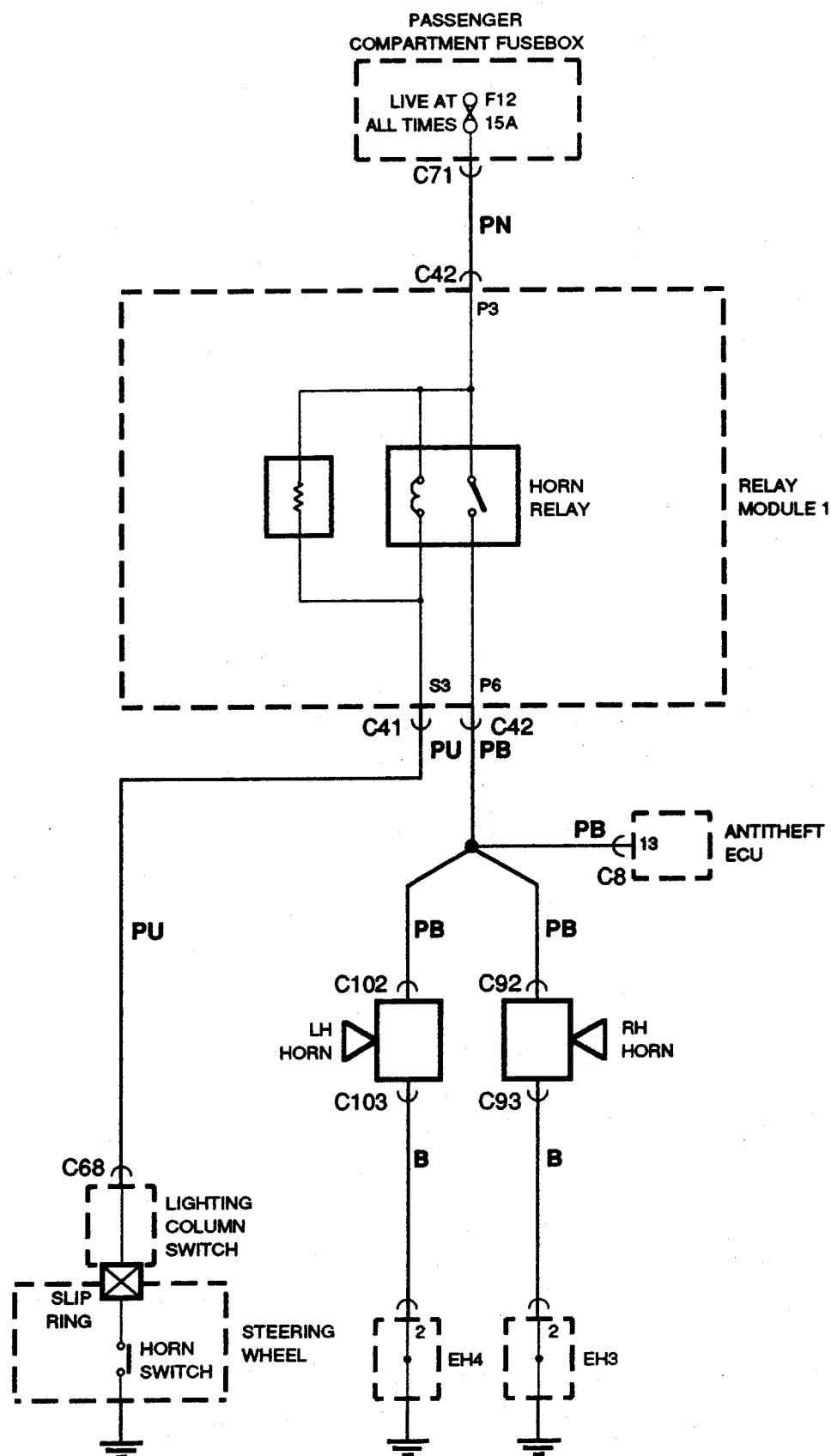
Heater controls



86M2408

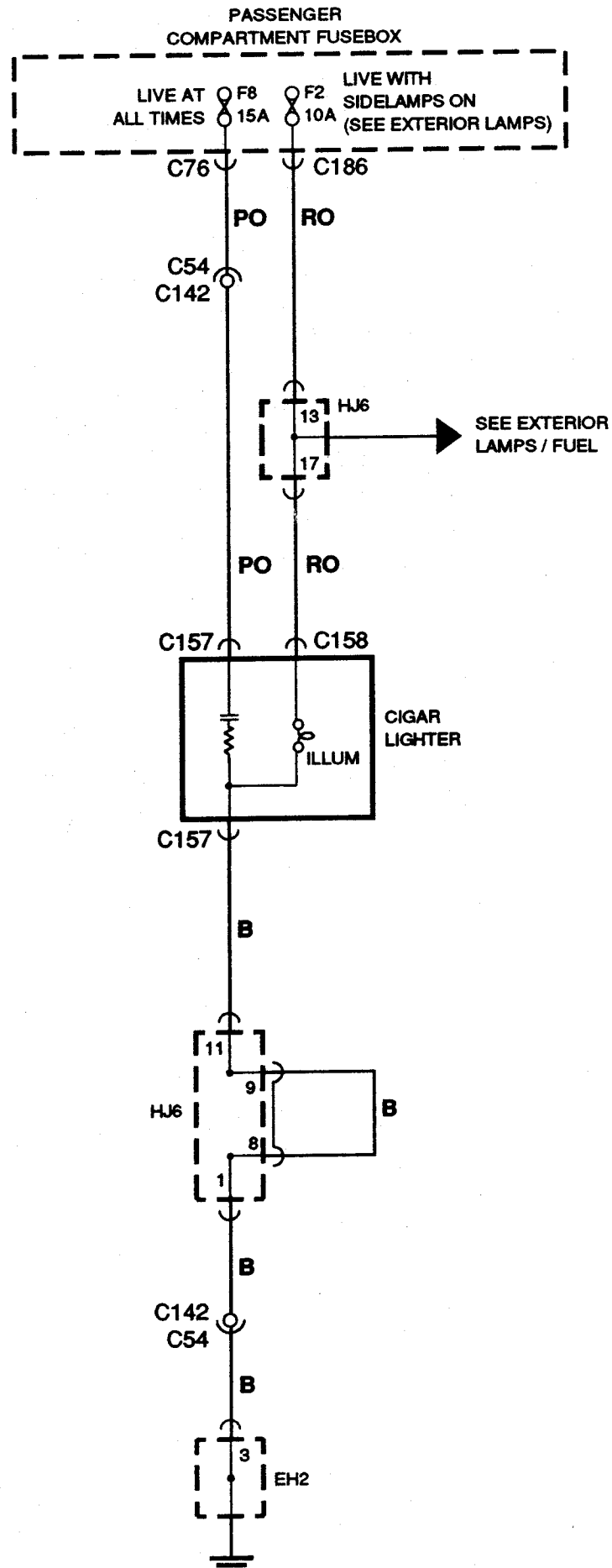
WIRING DIAGRAMS

Horns





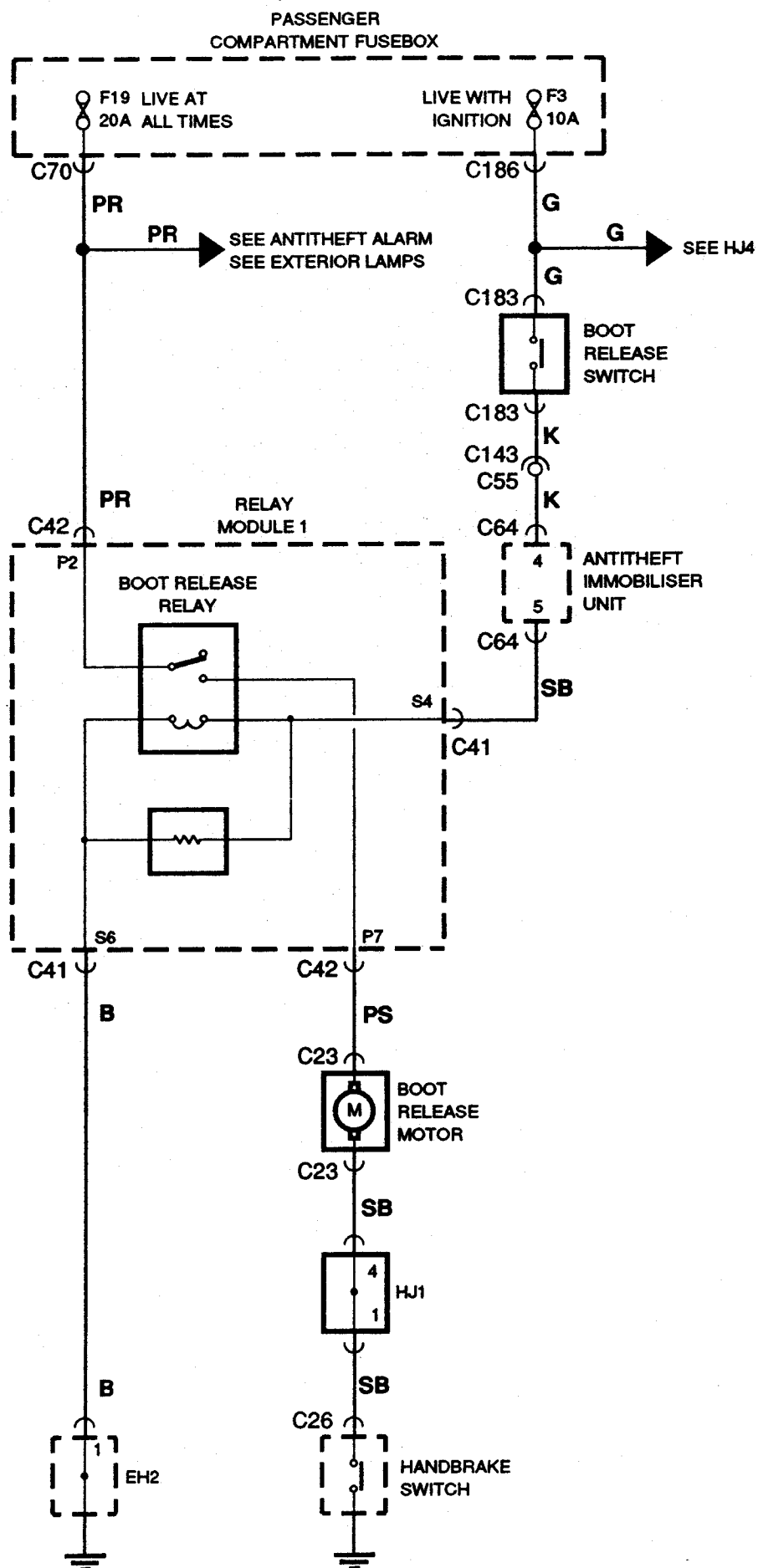
Cigar lighter



86M2410

WIRING DIAGRAMS

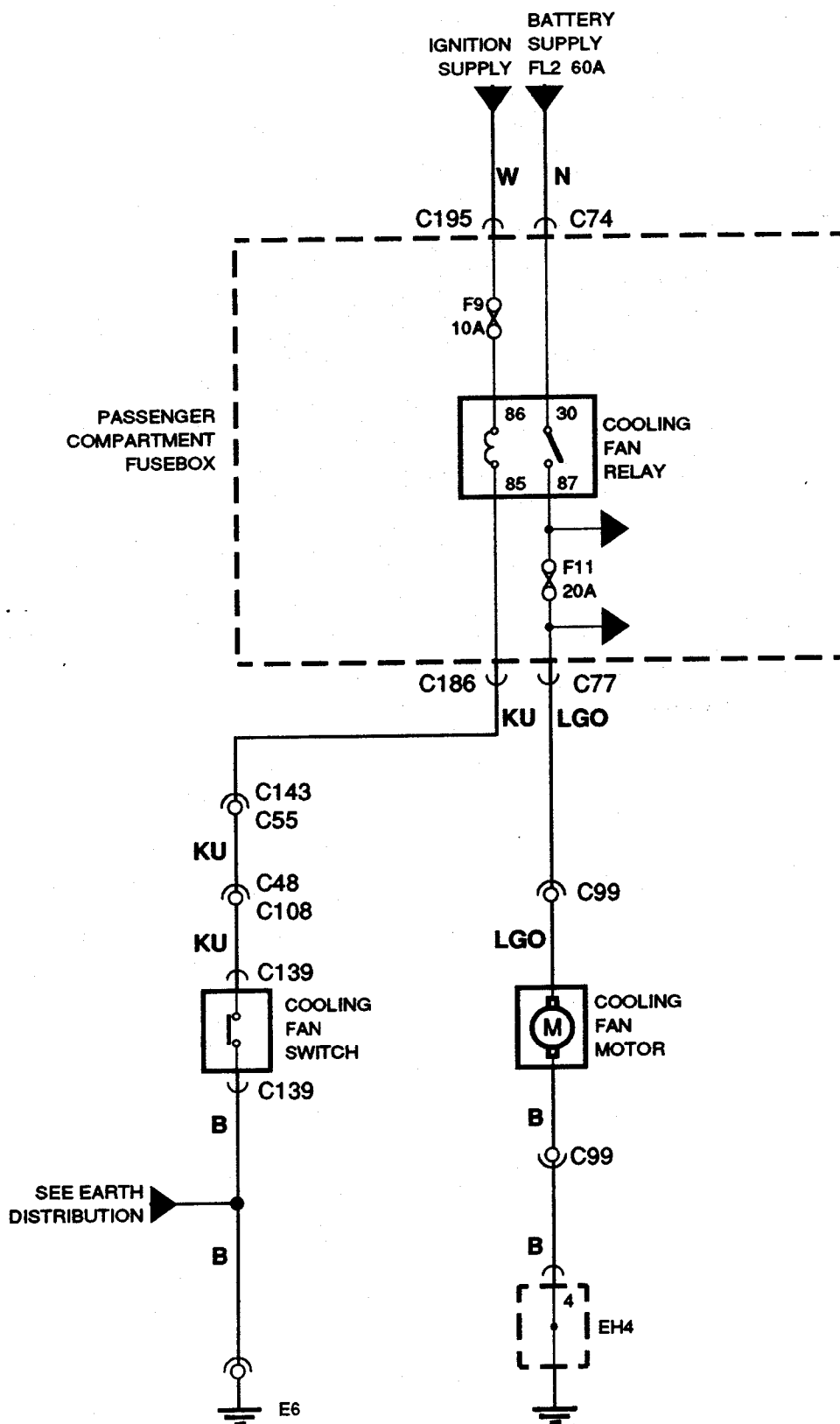
Boot release



86M2411

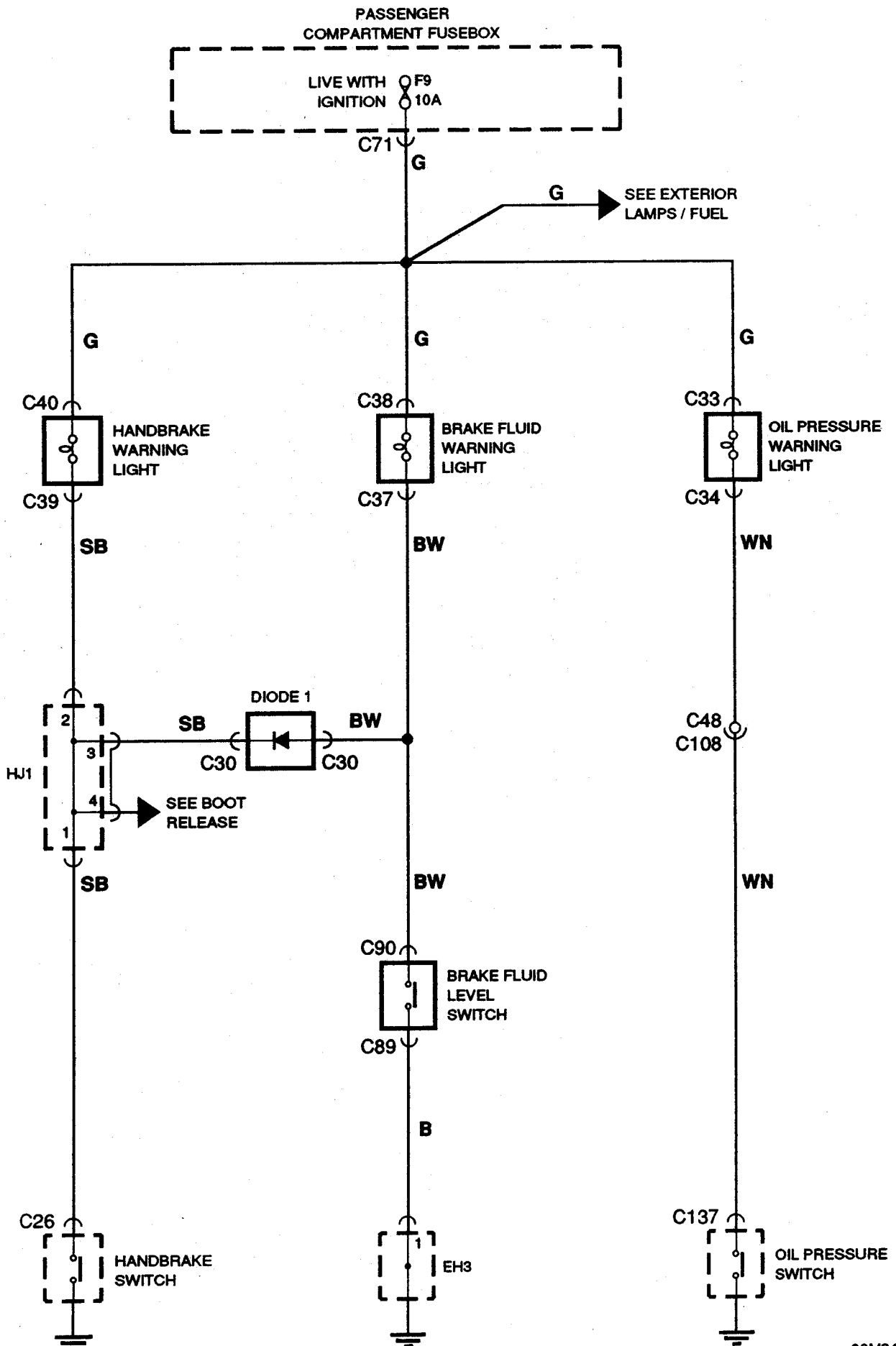


Cooling fan



WIRING DIAGRAMS

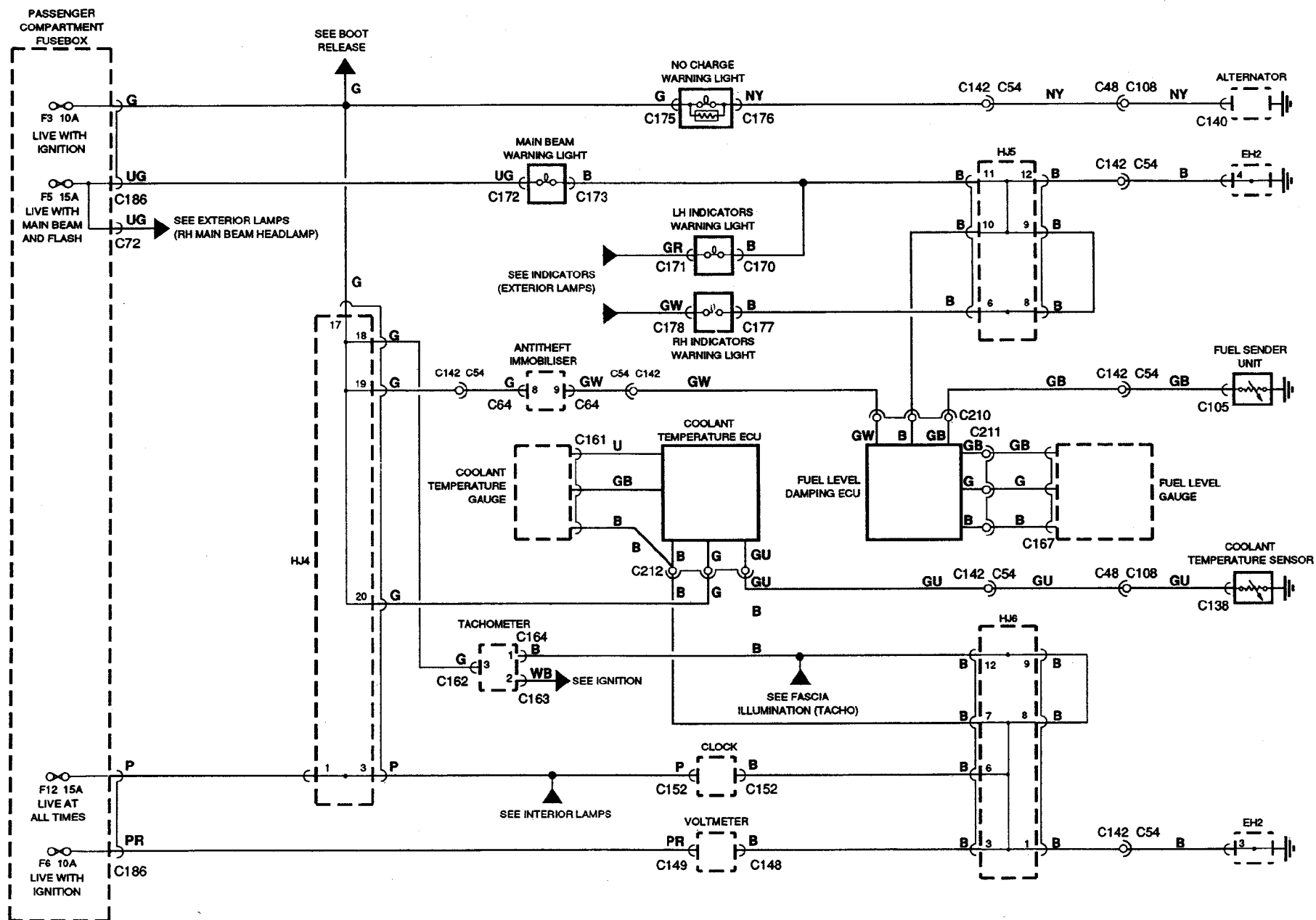
Warning lights



86M2413

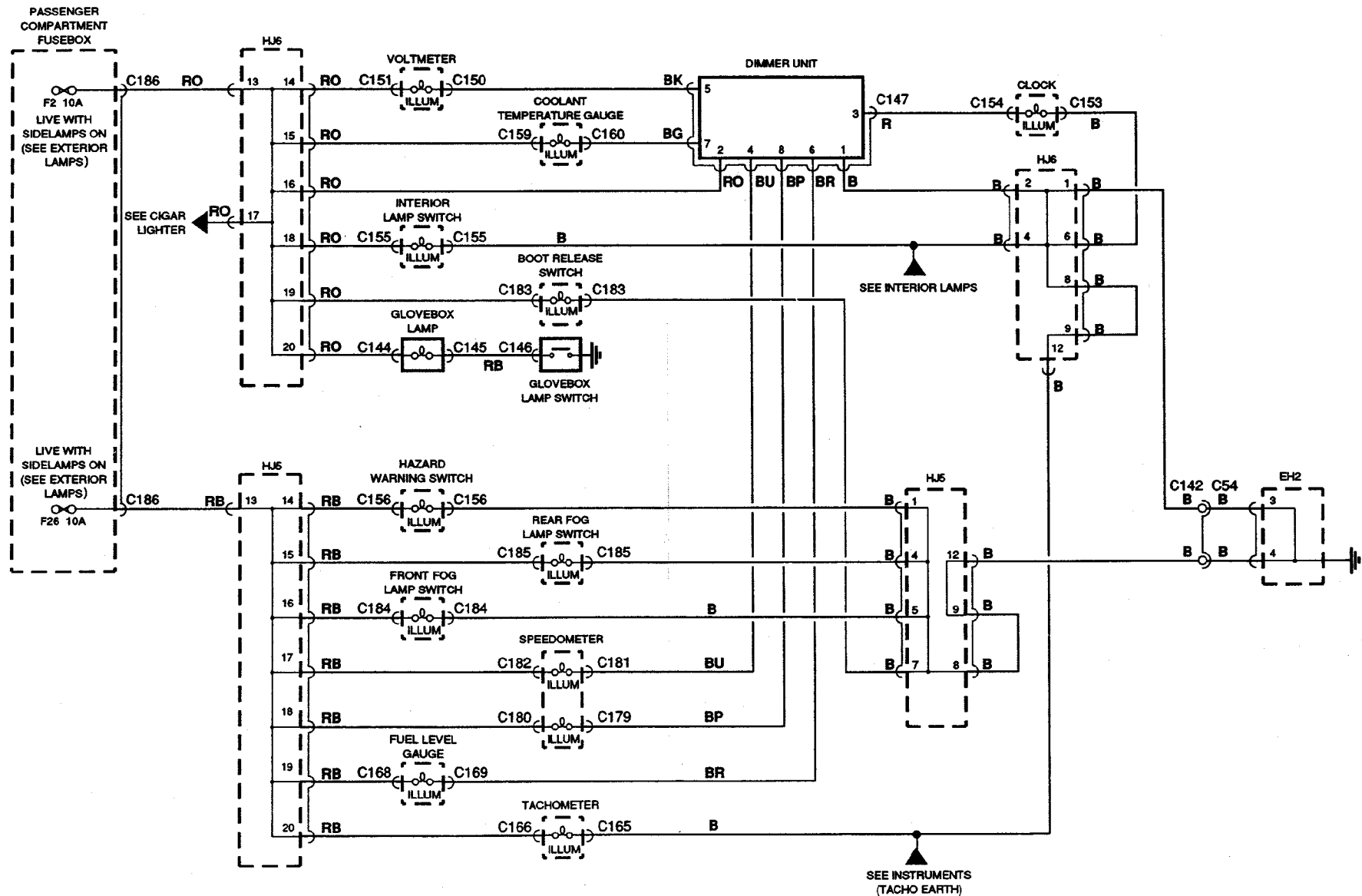


Instruments



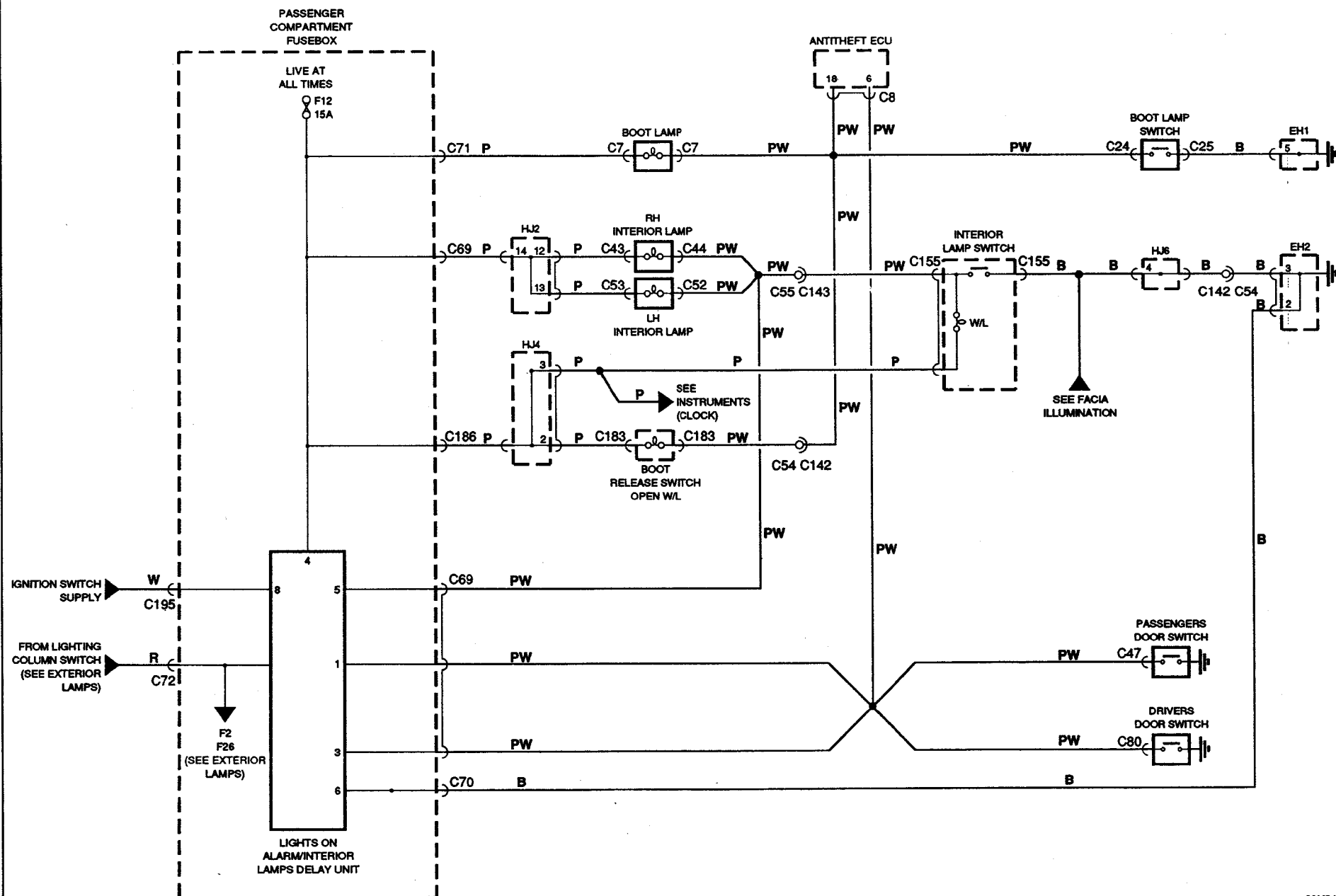
WIRING DIAGRAMS

Fascia Illumination



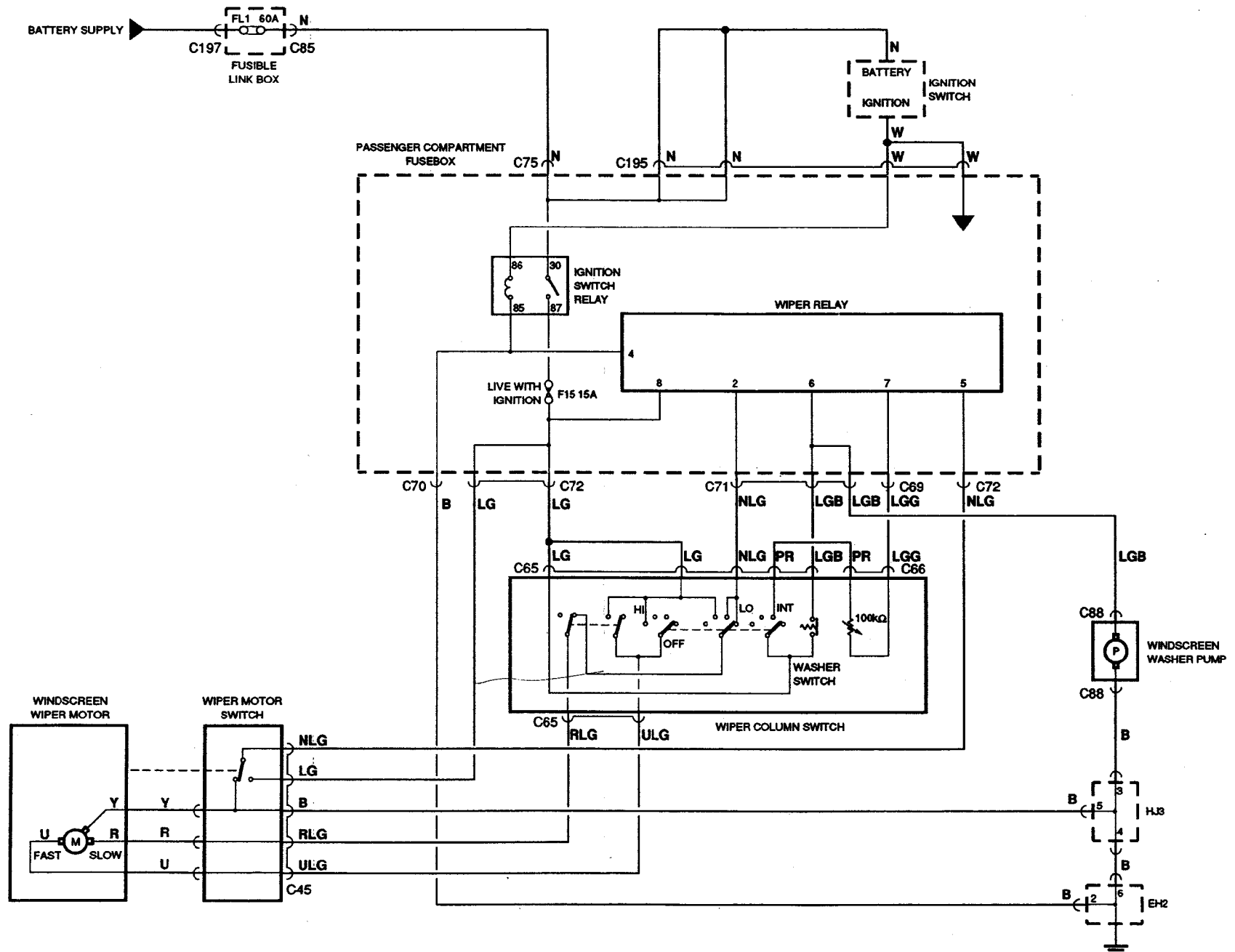


Interior lamps



WIRING DIAGRAMS

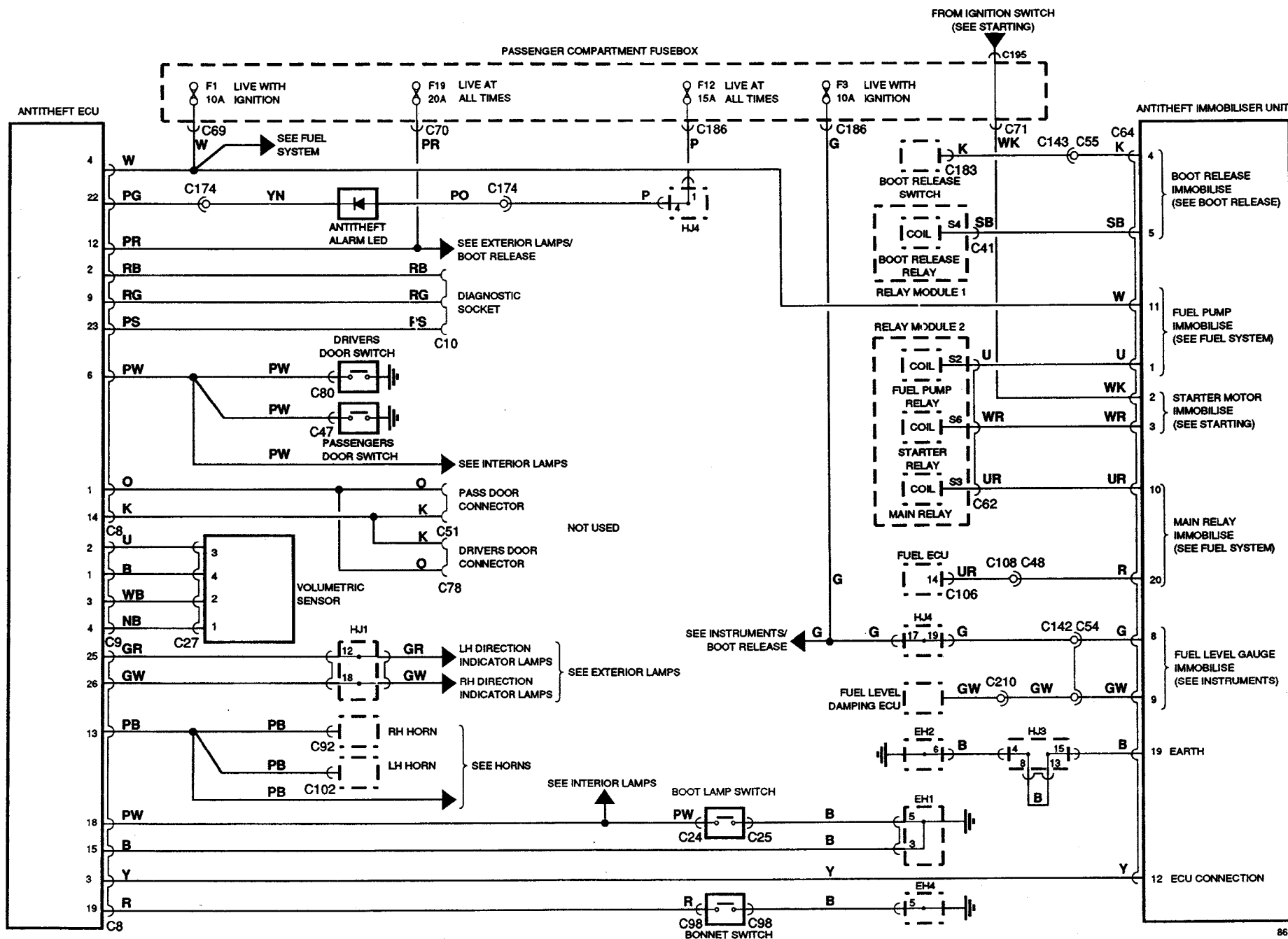
Wipers and washers



86M2416

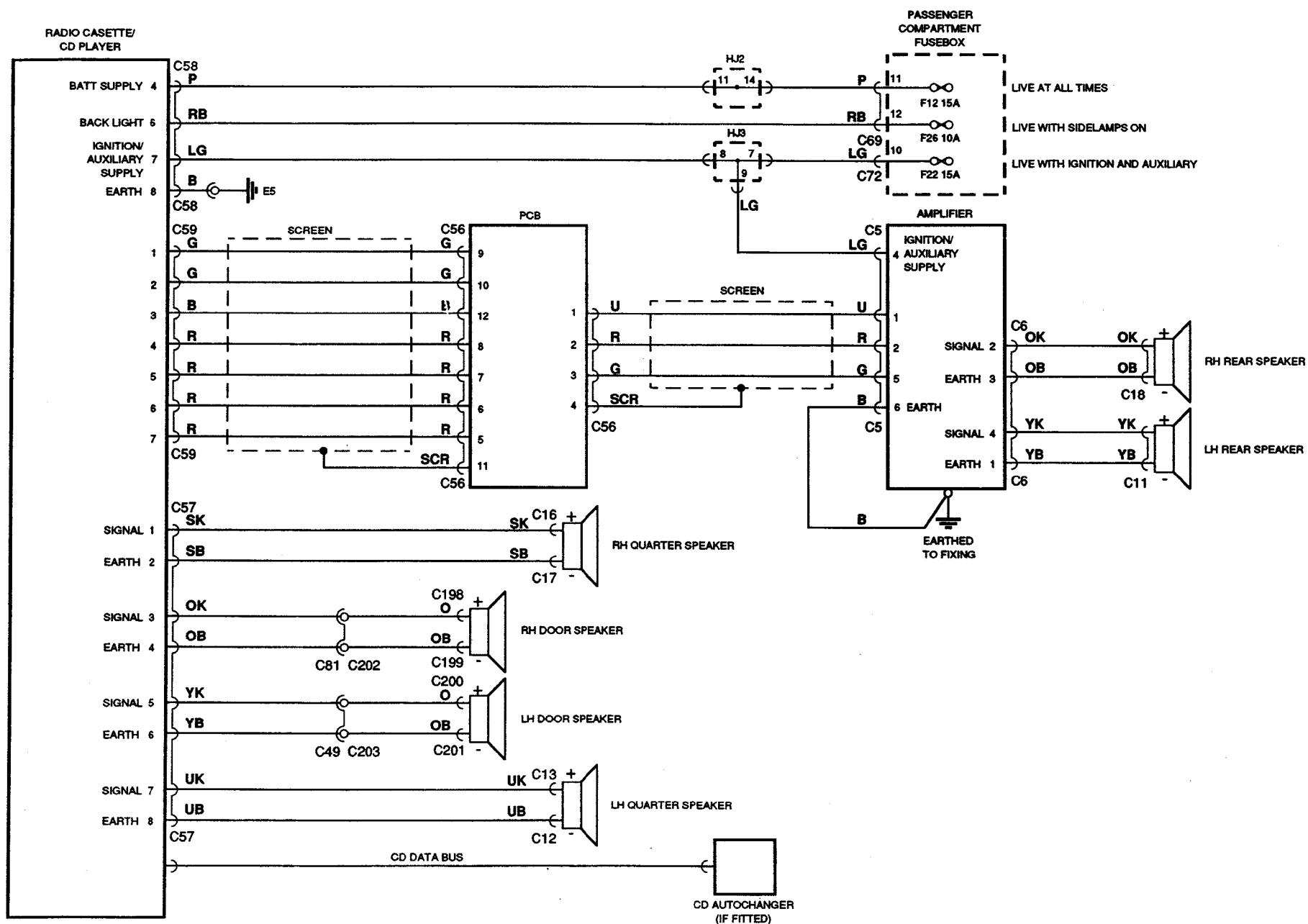


Anti-theft alarm



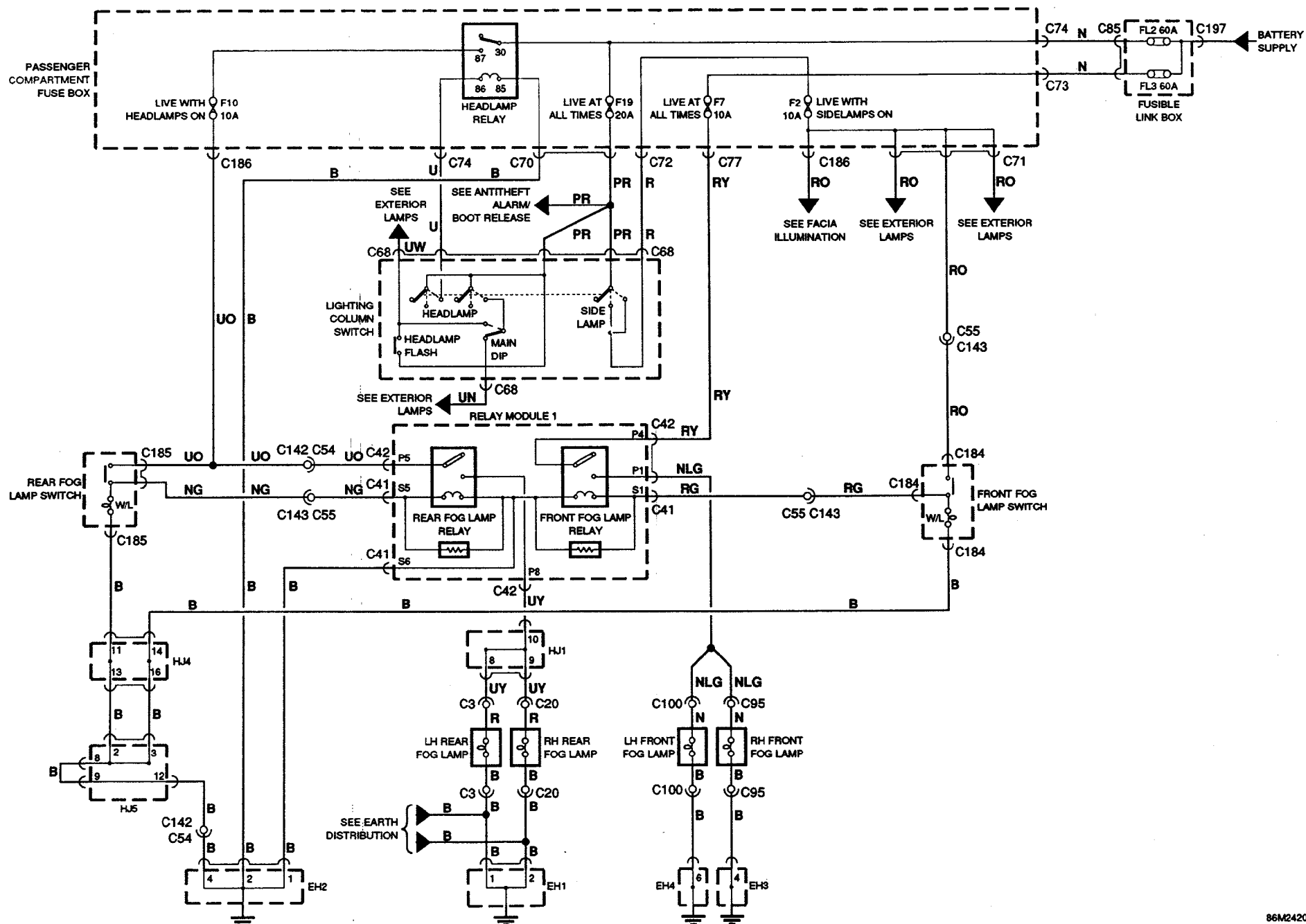
WIRING DIAGRAMS

Radio cassette player



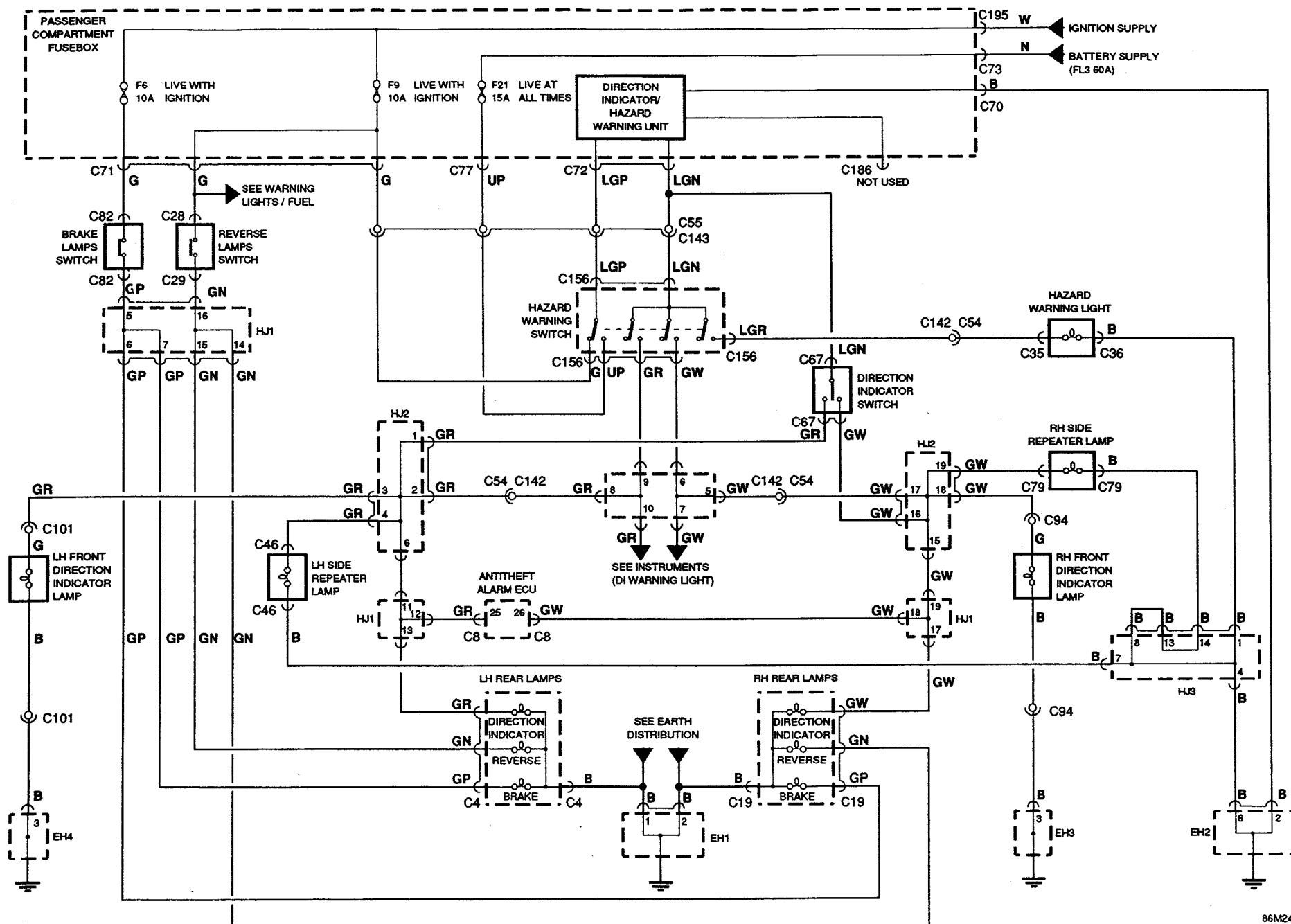
WIRING DIAGRAMS

Fog lamps



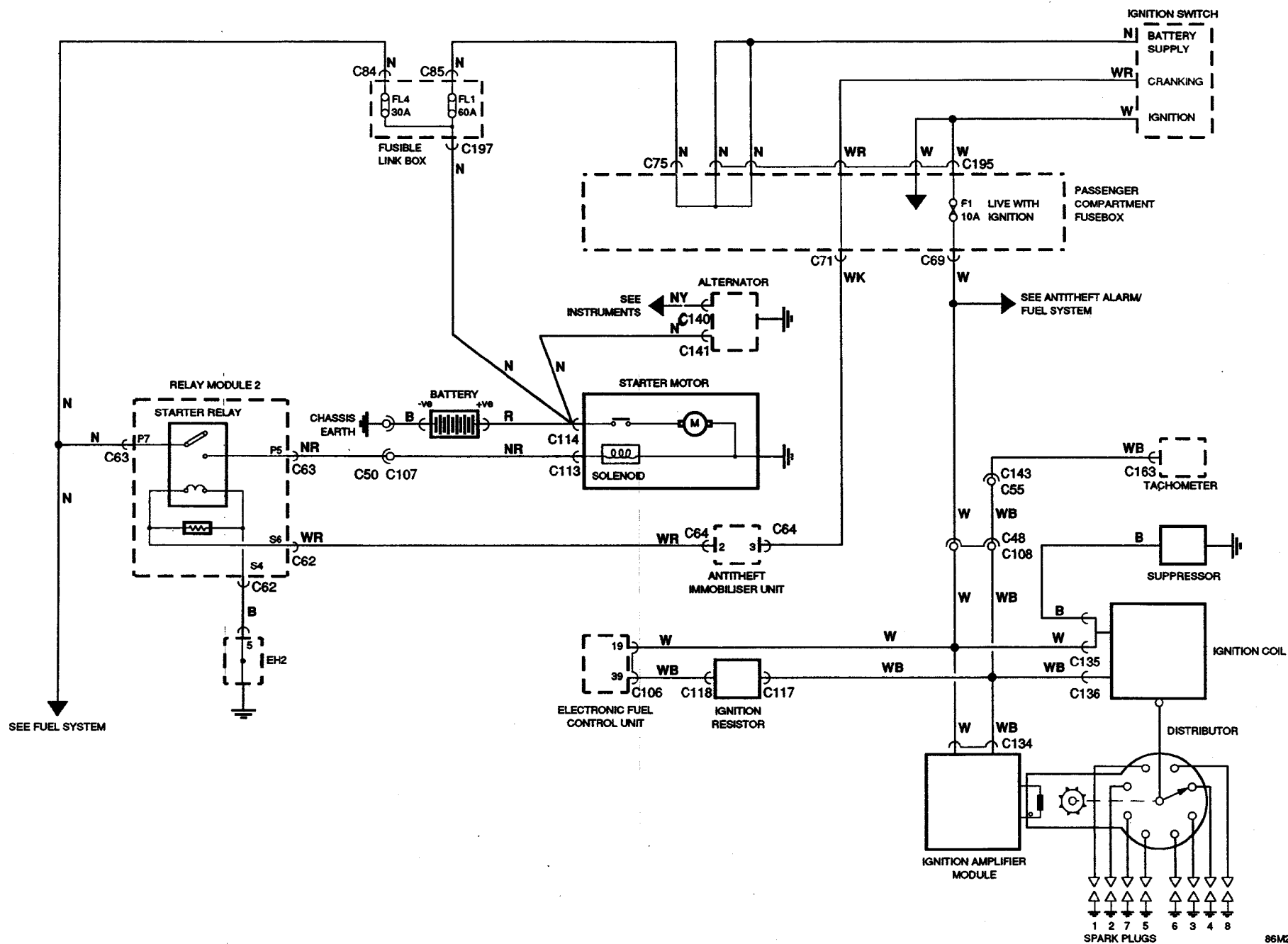


Indicators/hazard/brake/reverse lamps



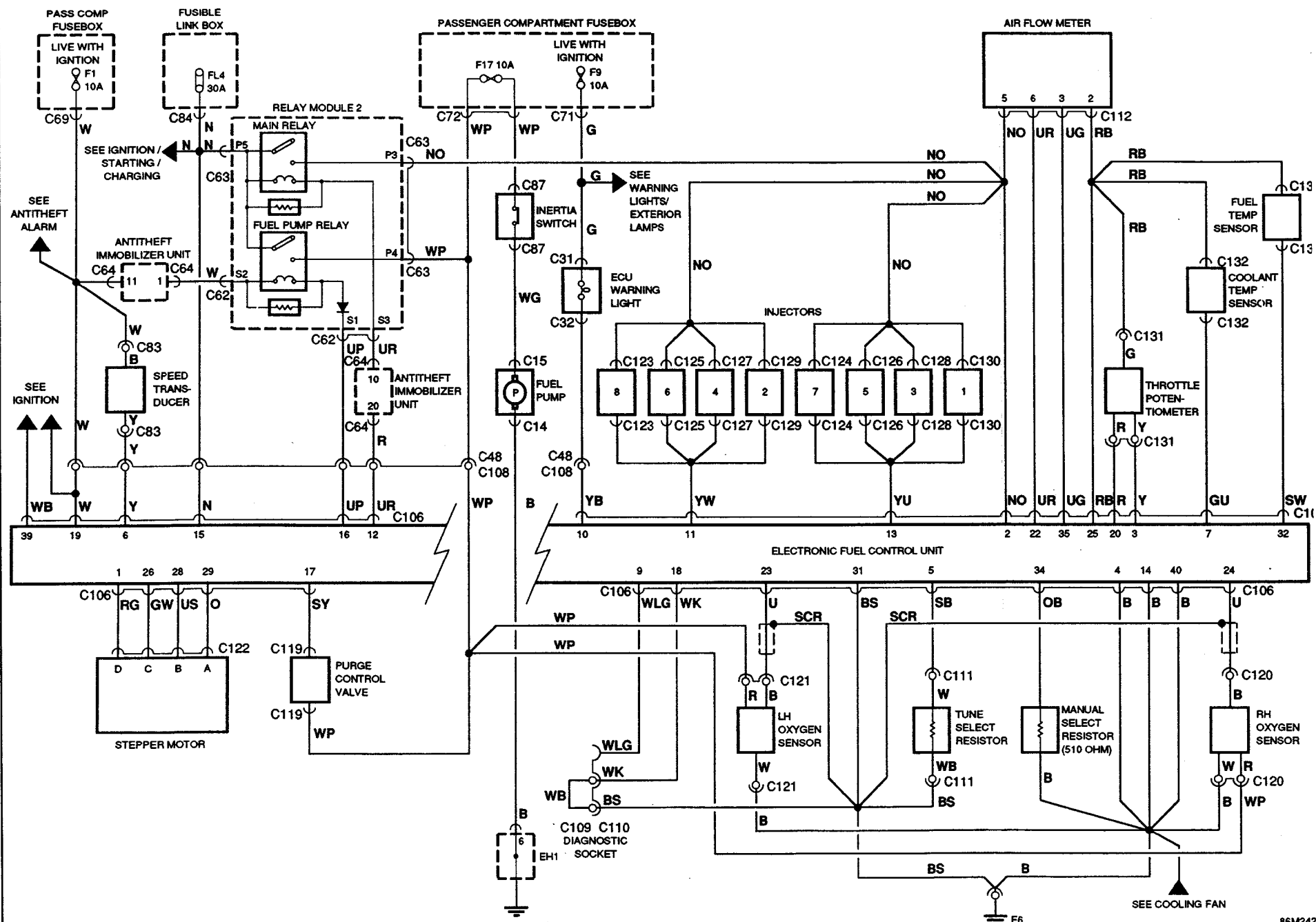
WIRING DIAGRAMS

Ignition/starting/charging



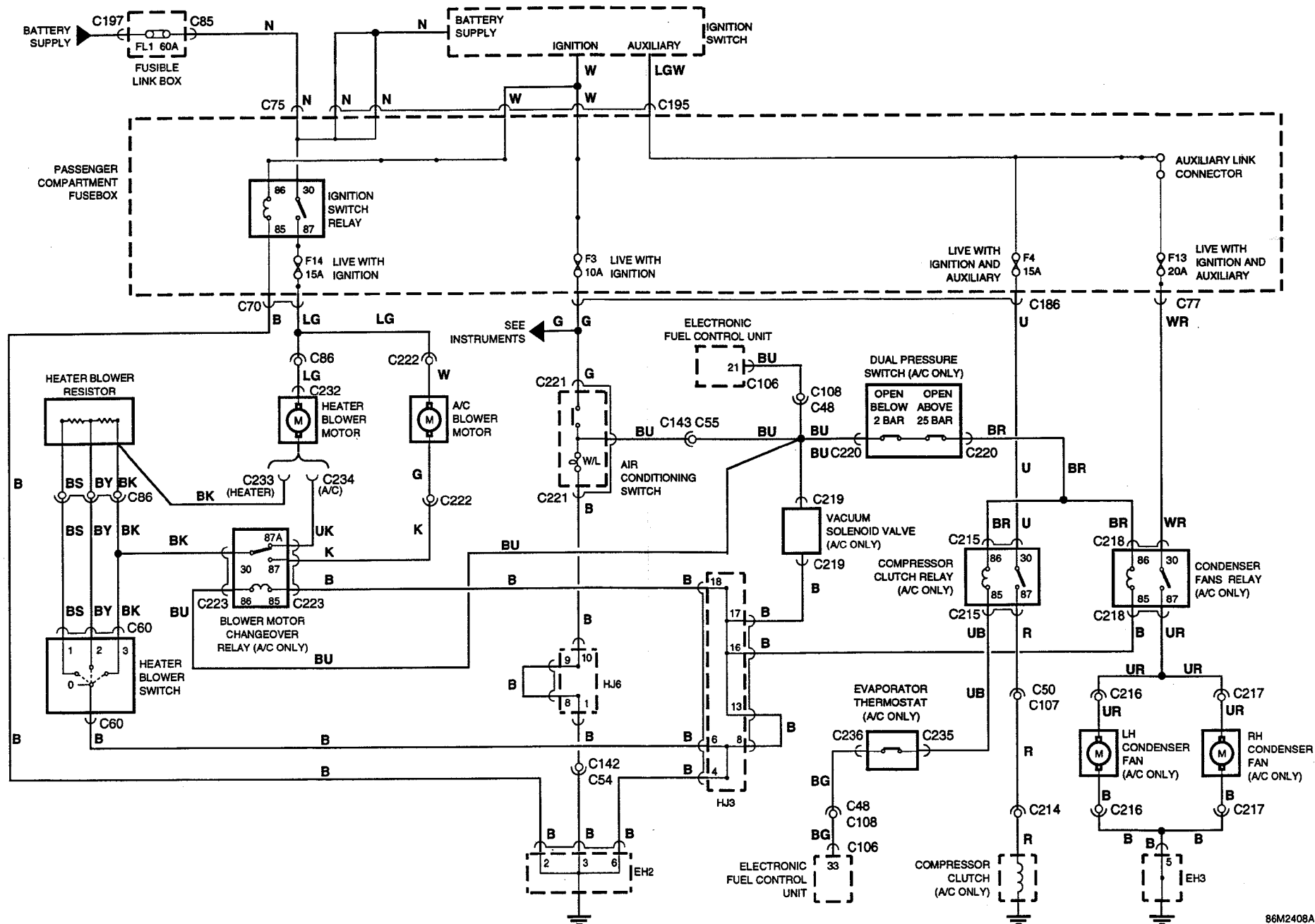


Fuel system



WIRING DIAGRAMS

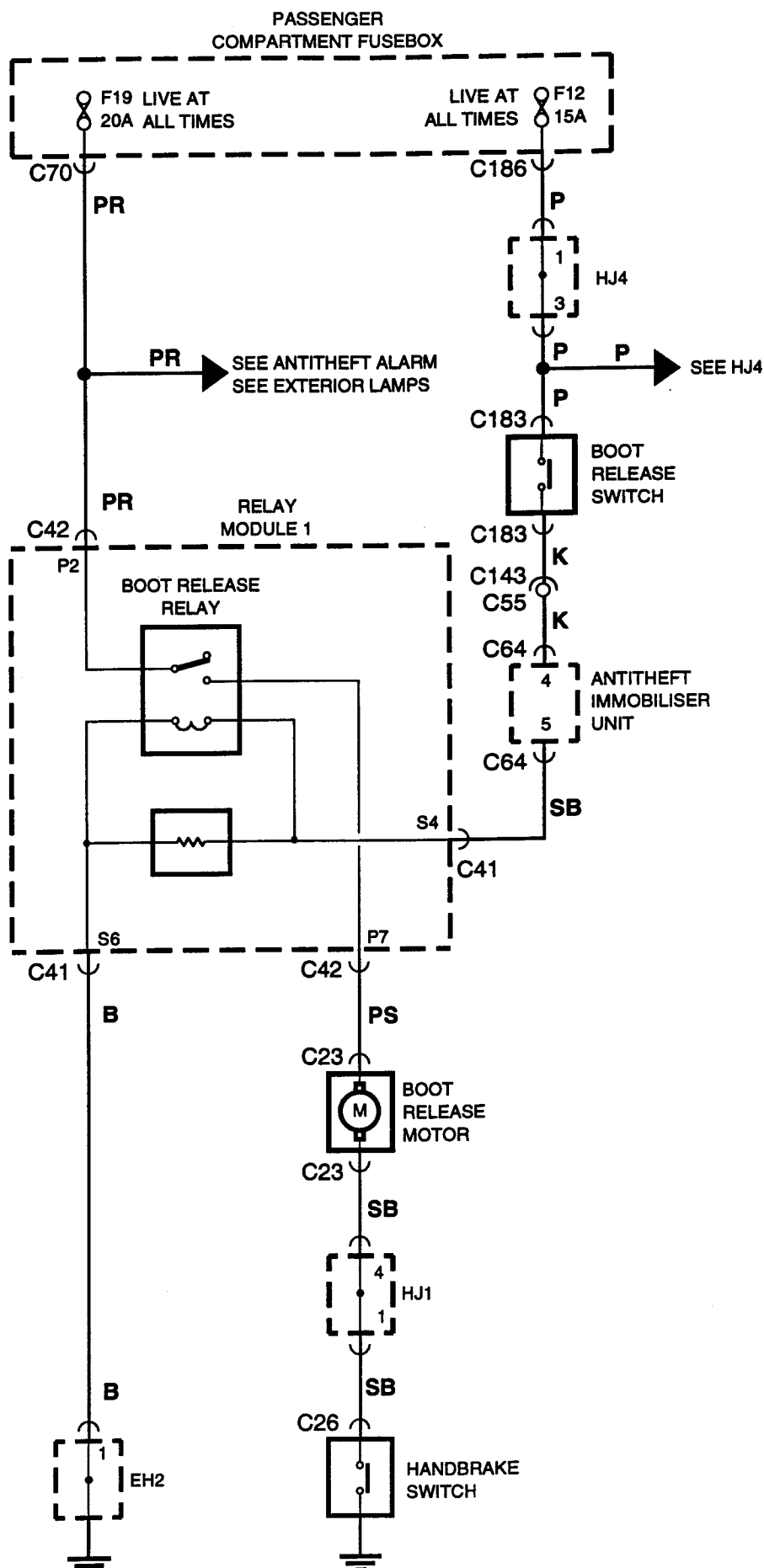
Heater controls - air conditioning fitted



86M2408A



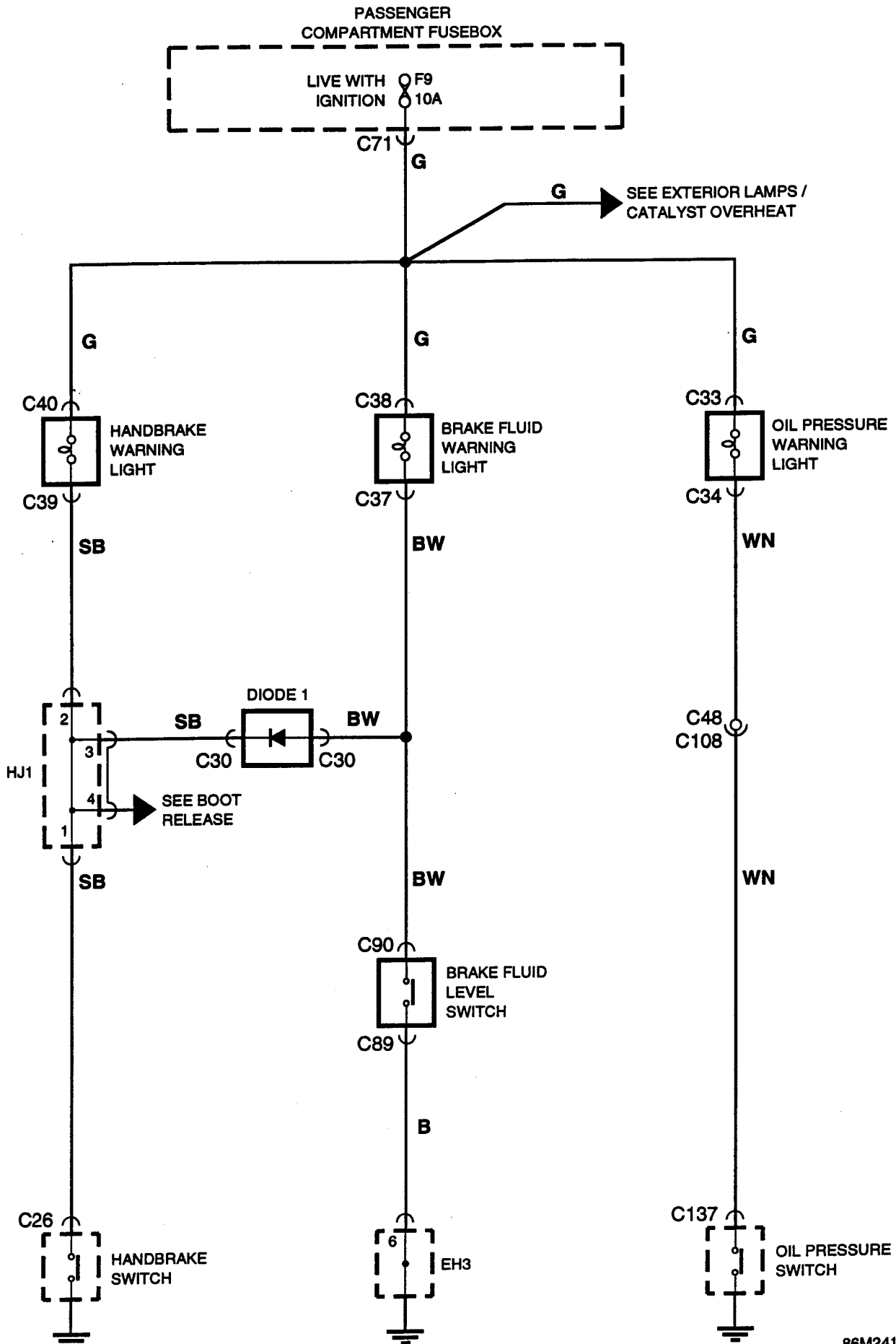
Boot release - air conditioning fitted



86M2411A

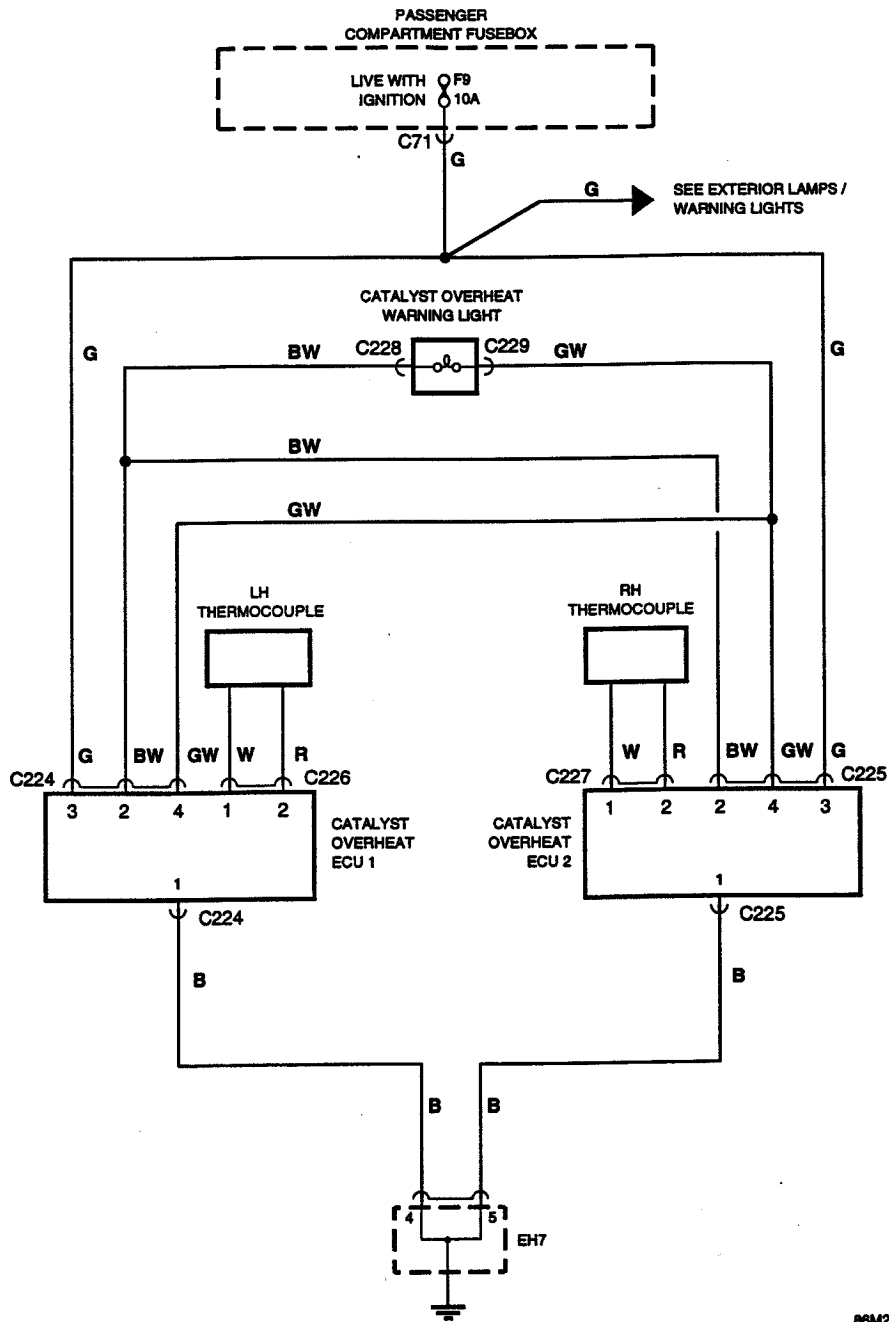
WIRING DIAGRAMS

Warning lights - air conditioning fitted



86M2413A

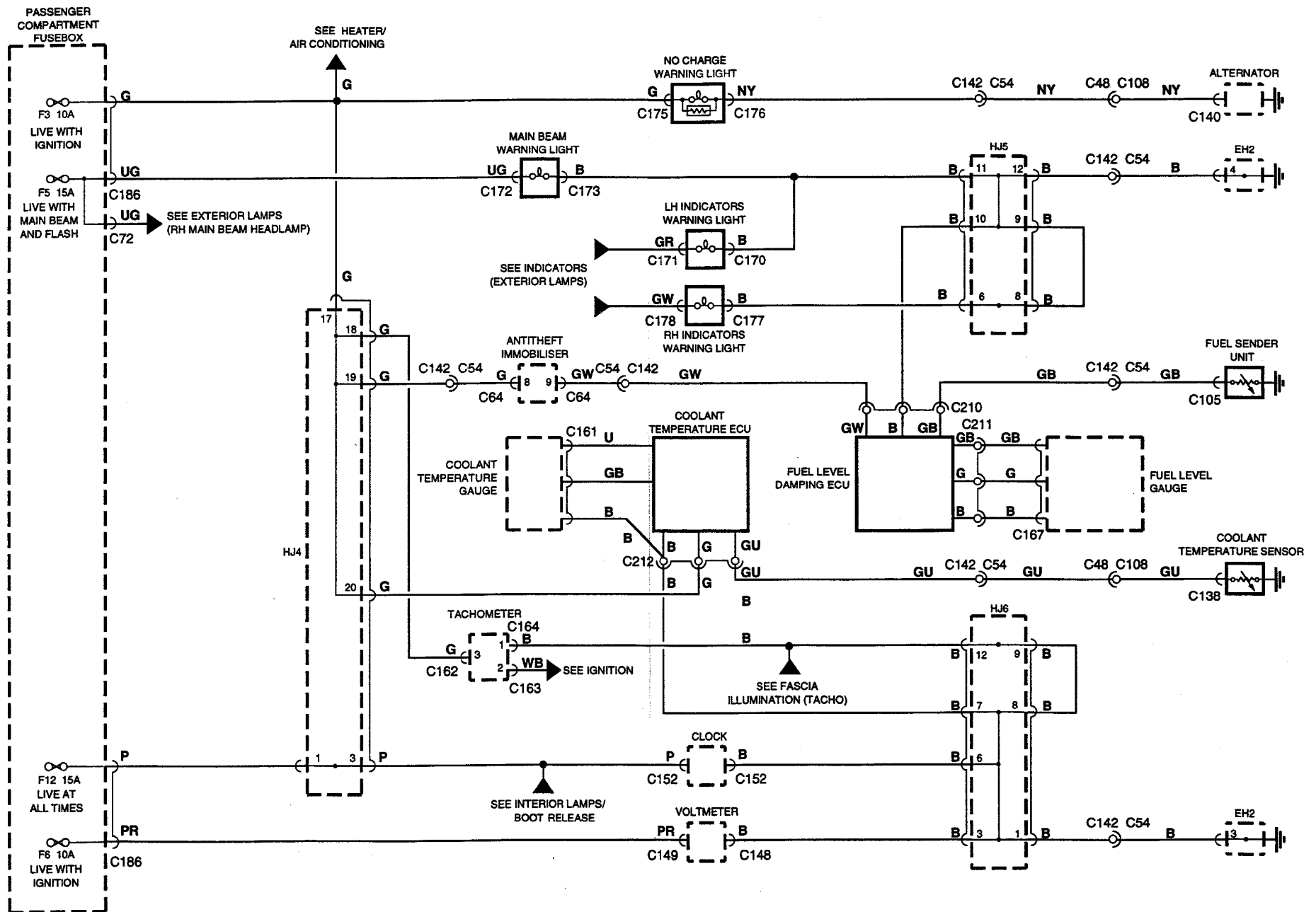
Catalyst overheat



86M2676

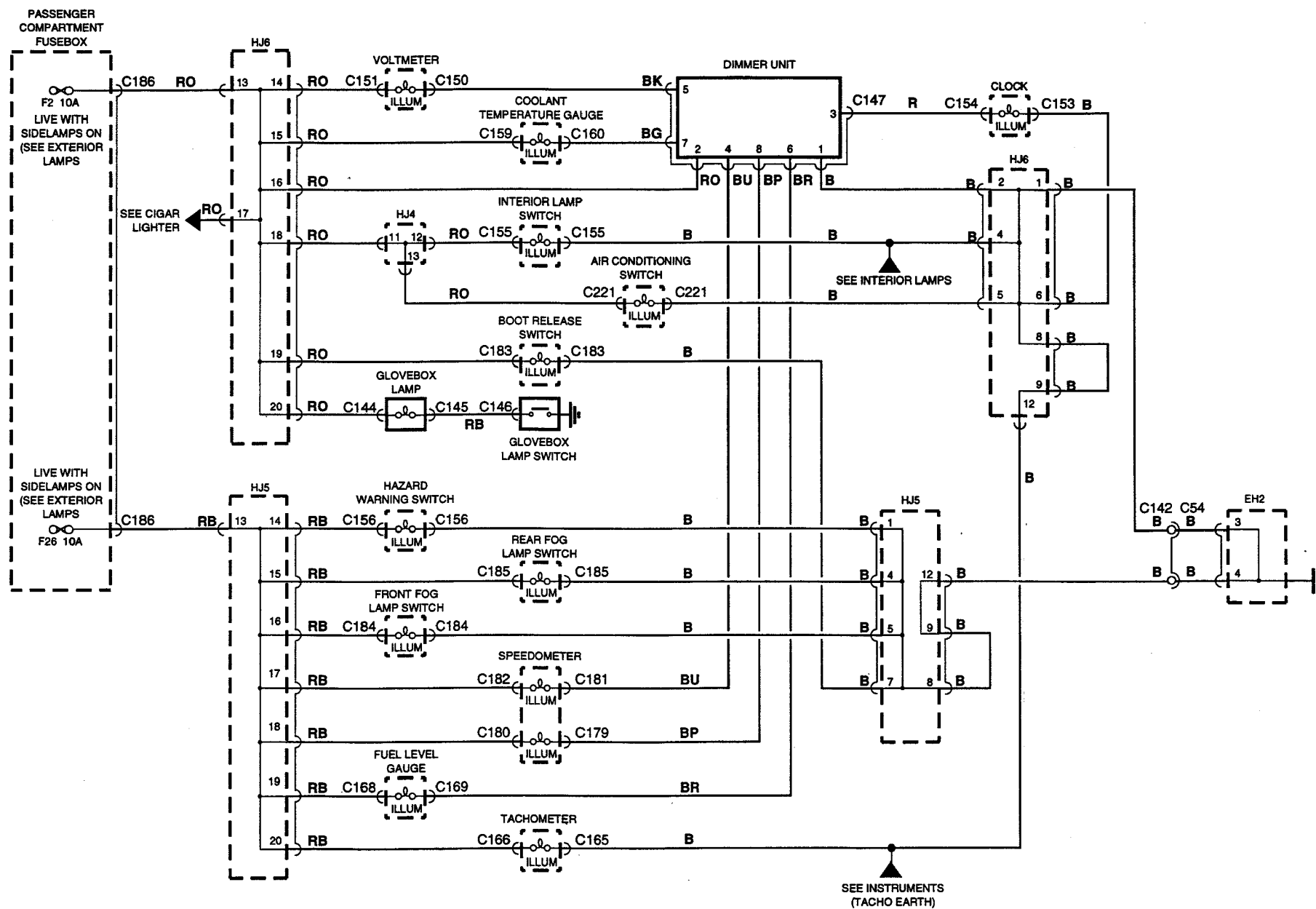
WIRING DIAGRAMS

Instruments - air conditioning fitted



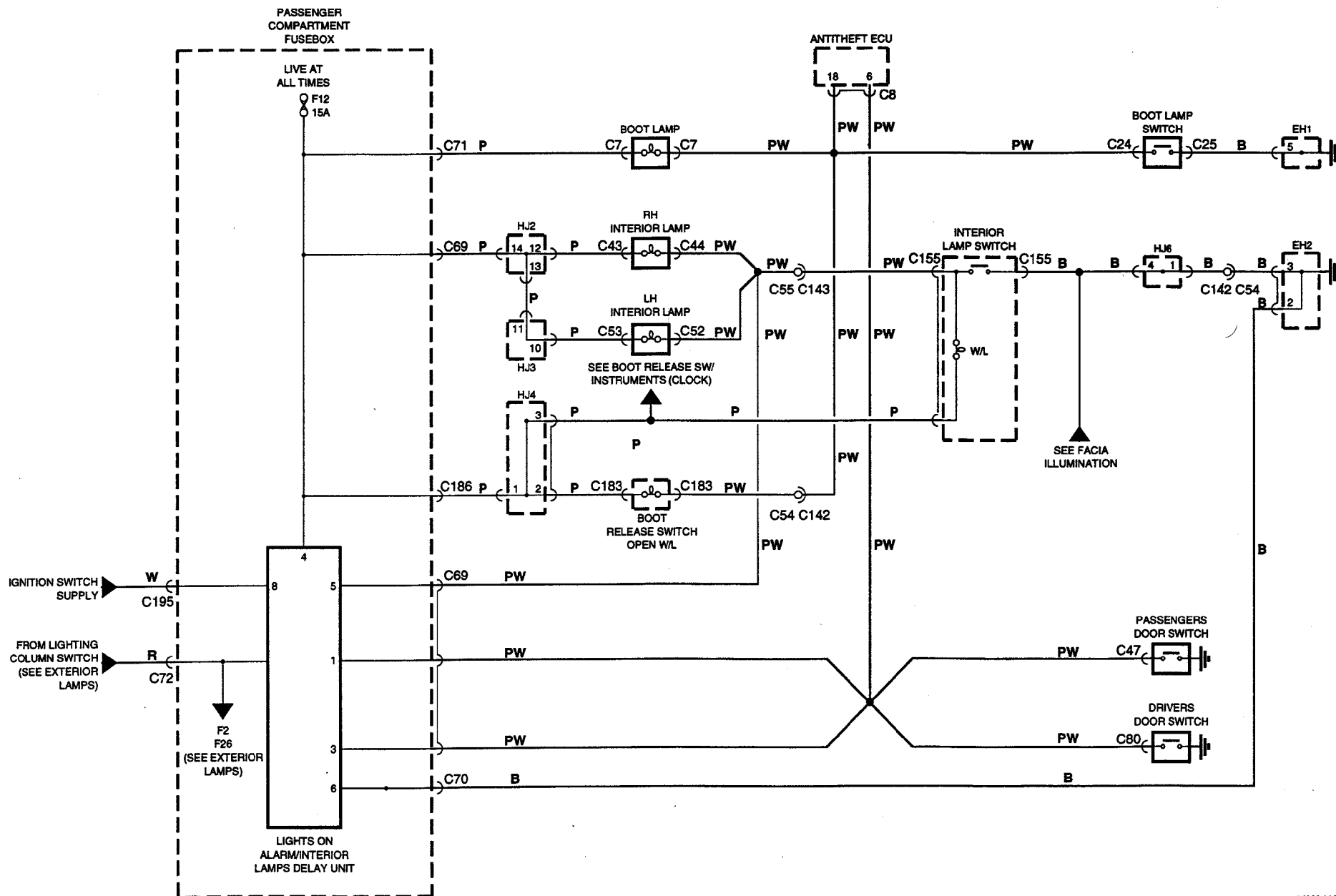


Fascia illumination - air conditioning fitted



WIRING DIAGRAMS

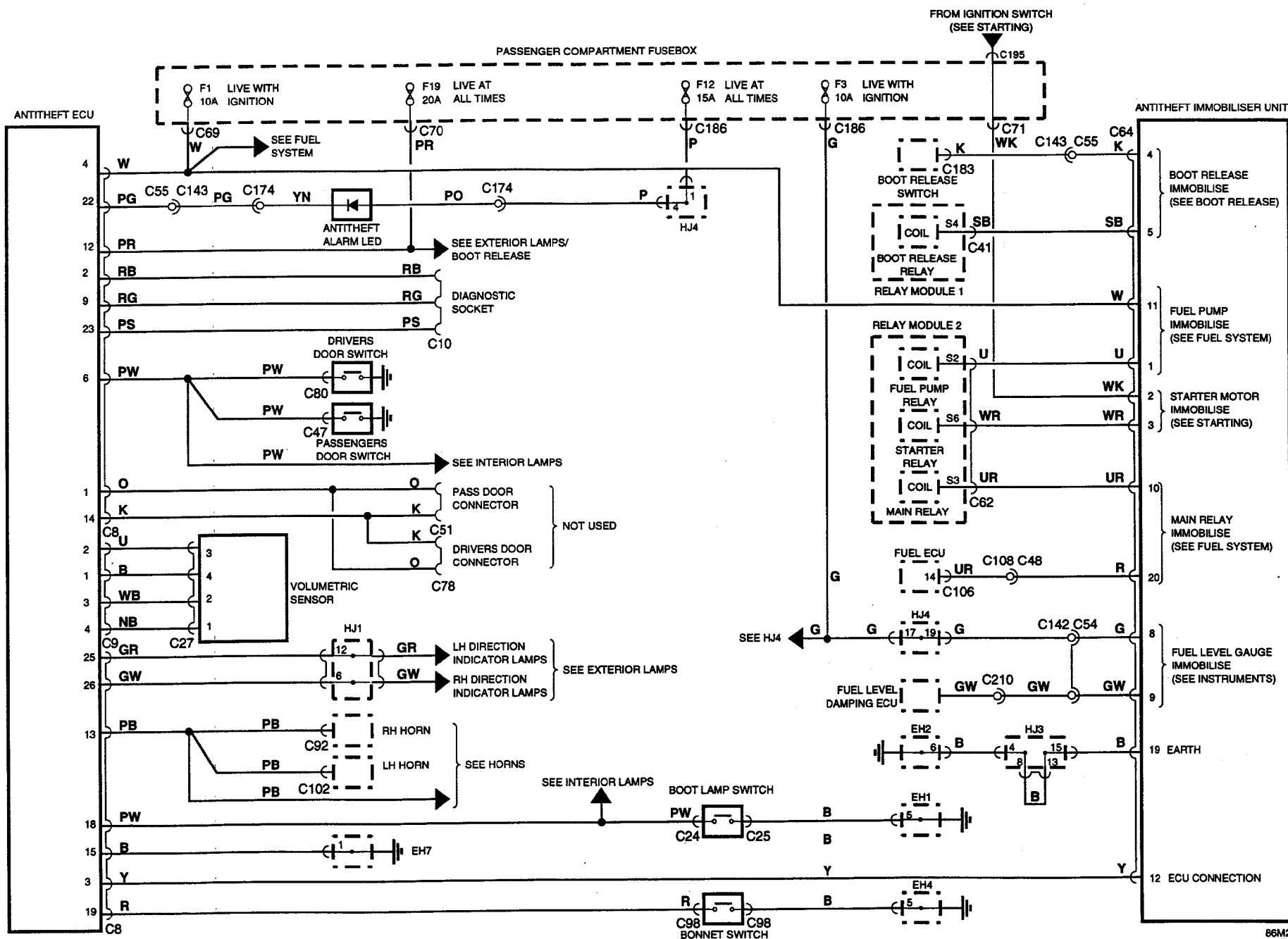
Interior lamps - air conditioning fitted



86M2415A



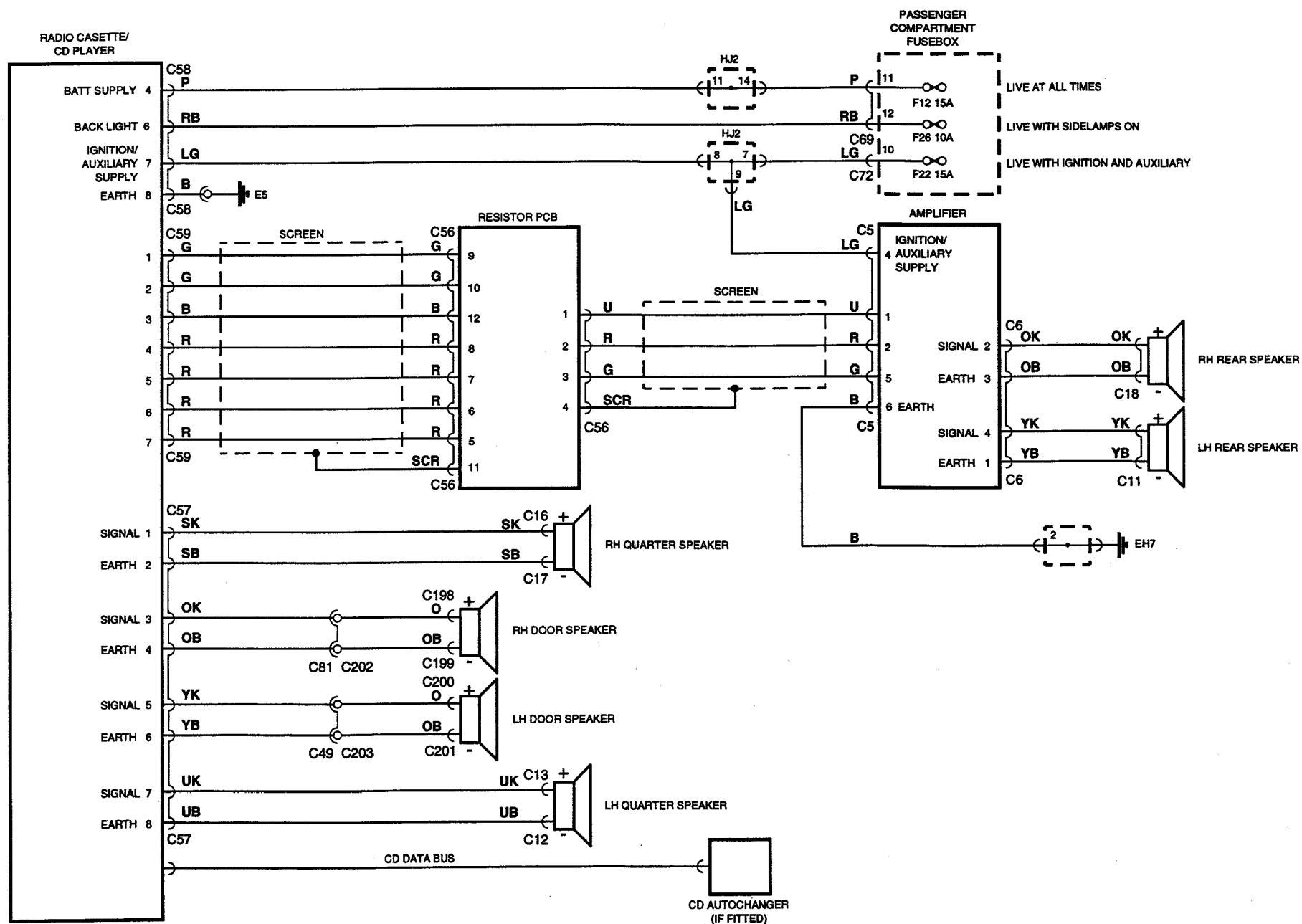
Anti-theft alarm - air conditioning fitted



86M2417A

WIRING DIAGRAMS

Radio cassette player - air conditioning fitted

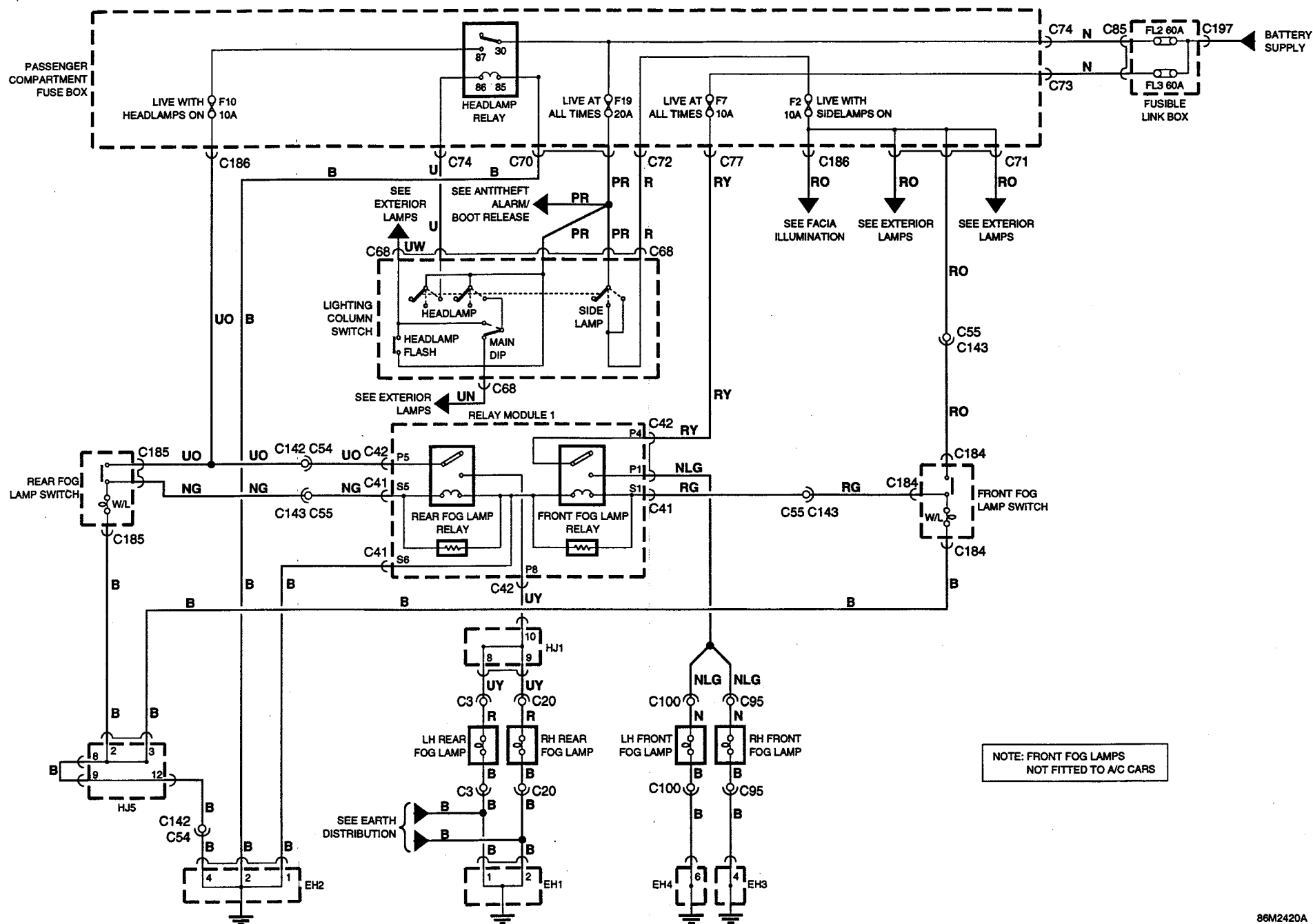


86M2418A

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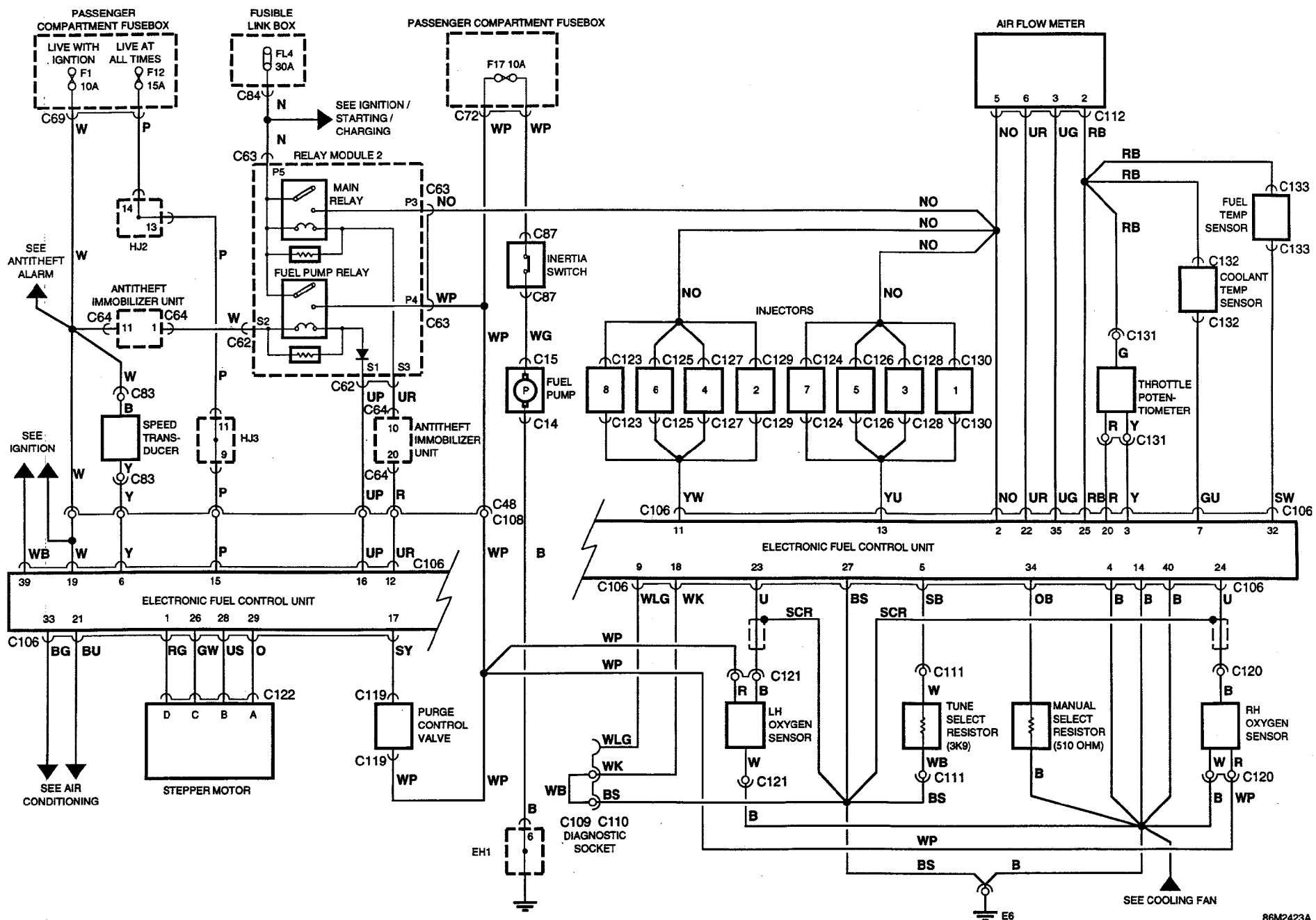
WIRING DIAGRAMS

Fog lamps - air conditioning fitted



WIRING DIAGRAMS

Fuel system - air conditioning fitted



86M2423A