



13.7.4 **Spot Cleaning – Localized Stains**

Localized stains caused by accidental spillage may be one of three types:

- Water based stains caused by foodstuffs, starches, sugars, soft drinks, fruit stains, washable ink etc. These stains adhere readily to the pile and do not respond to vacuum cleaning. They are best removed immediately using the procedure detailed below.
- Oil/grease based stains caused by spillage or other contamination by butter, grease, hand cream, ball point pen ink, crayon, lipstick etc.
- A combination of both these types.

To remove water based stains:

- Blot up liquids and /or scrape off semi-solids using a spatula.
- Sponge the affected area with clean luke-warm water. Use a clean, damp, undyed, cotton cloth to absorb as much of the moisture as possible, working from the edge to the centre of the stain.
- If the stain persists, apply a suitable carpet shampoo solution made up to the manufacturers instructions, again working from the edge to the centre of the stain.
- Rinse with clean, warm water, taking care not to over-wet the carpet.
- Absorb excess moisture by laying dry, undyed cloths or white paper towels over the moist carpet under light pressure; replace when necessary.
- When the carpet is thoroughly dry, vacuum clean the area to lift the carpet pile.

CAUTION: When liquids are applied to the pile, use only a clean cloth or sponge. Do not apply liquids directly to the carpet – when attempting to remove stains, blot the pile as heavy rubbing can destroy the yarn structure of the carpet.

To remove oil/grease based stains:

- Using a suitable aerosol containing solvent loaded with absorbent powder, spray the affected areas of the carpet. The solvent loosens the grease from the fibre and the powder then absorbs the grease-carrying solvent.
- Allow the solvent to evaporate and remove the powder containing the grease by using a vacuum cleaner or brush.

Note: Neat solvent, eg dry cleaning fluid, may be used, but should be used sparingly from a clean white cloth.

CAUTION: Solvents must only be used in well-ventilated areas where naked lights and smoking are prohibited.

To remove stains which are a combination of oil and water based contamination (usually resulting from food or drink):

- Treat combination stains as for water based stains.
- Allow to dry out.
- Treat as for grease based stains.



13.7.5 Carpet Cleaning and Stain Removal Materials

The carpet cleaning and stain removal materials listed in the table below must be used according to manufacturer's instructions.

| | | |
|-----|------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| | | |
| 1 a | 'Fibrefresh' | Servicemaster 308 Melton Road, Leicester LE4 7SL (Tel. 0533 6107610) |
| 1 b | '1001 Foam Shampoo' | P C Products Swinton, Manchester (Tel. 061 792 6111) |
| 1 c | 'Novatreat' | British Nova Works 57 / 61 Lea Road, Southall, Middx (Tel. 081 574 6531) |
| 2 a | Trichloroethane - 'Genklene' | ICI |
| 2 b | 'Spot Remover' | RPM. Marketing (Sussex) 11 Chaucer Industrial Estate Dittons Road, Polegate, East Sussex BN26 6JF (Tel. 0424 211427) |
| 3 a | UK | SEBO (UK) Ltd. Baker Street, High Wycombe, HP11 2RX (Tel. 0494 534801) |
| 3 b | Continental Europe | Stain & Co. GmbH Wulfrather Strasse 49 - 49, D-5620 Velbert Germany |
| 3 c | UK | HOST (UK) Unit 1, Ranch House, Normanton Lane, Bottesford, Nottingham NG13 OEL (Tel. 0949 43372) |
| 3 d | Continental Europe | Mr Alex de Roeper Sanfresh BV Dotterbloemstraat 1, 3053 JV Rotterdam, Holland (Tel. 31 10 422 5455) |

13.7.6 Repair of Damaged Carpet

The most common cause of accidental damage to carpets is cigarette burns (especially to polypropylene carpet). These can be repaired easily on new carpets by cutting out the face material in the affected area and replacing with new face material with a latex locking coat of approximately 100g/m² dry then incorporating a P.S.A.B. (pressure sensitive adhesive backing) which would be applied to roll carpet in the form of a laminate film at Firth Furnishings subsidiary Textile Bonding, Higham Ferrers, Northampton, UK.

The film has a peelable release paper, which means that the new material would simply be cut to size, the release paper removed and then the new carpet pressed into position.

The problem in replacing areas in old or soiled carpets is that the replacement of damaged areas with new carpet would create a visual difference, ie un-worn pile, clean appearance, which would then cause the repaired area to stand out from the rest of the carpet. The only answer would be to abrade the rest of the new carpet to the same degree as the old carpet.



13.8 SEATING AND SEAT BELTS

13.8.1 Seating, Description

The front seats are available in a range of materials consisting of sculptured fabric / leather, leather, sports cloth / leather, embossed leather / leather and autolux. Both seats are available as 'manual', ie manually adjustable with electric rise and fall, manual height adjustment headrests, 'power', ie 12-way electric adjustment, 'power with memory', ie memory controlled, 12-way electric adjustment of seat, steering column and exterior rear view mirrors and 'heated', ie with integral heating.

Front seats are based on a non-handed, one-piece frame which includes cushion and squab frames and seat adjuster mechanisms. The seat switchpacks (powerseats) are fitted to the outboard side of driver and passenger seats; on 'manual' seats, the seat height adjustment switch is similarly located. Seat control modules SCMs are contained within the seat assemblies. The seats are secured through four mounting points to the vehicle floor.

Rear seats are of the bench type with full width removable cushion and individual seat squabs.

Electrical components installed on the heel board below the rear passenger seat are protected by two covers secured by two locating brackets on the floor and by two latches on the cover. The latches are released by pushing down on the two recesses in the top edge of the cover.

13.8.2 Front Manual Seat, Renew

- Disconnect vehicle battery ground lead.
- Disconnect electrical connections as required.
- Remove the seat forward fixings.
- Move the seat fully forward.
- Remove the rear fixing / slide covers.
- Remove the seat rear fixings.
- Reposition seat for access and remove seat from vehicle.
- To refit seat, carry out reversal of above procedure.

13.8.3 Front Seat (Power Operated) Squab Back Cover, Renew

- Disconnect vehicle battery ground lead.
- Move the seat fully forward to gain access to squab back cover outer fixings.
- Remove squab side fixings, disconnect lamp harness and remove squab back cover.
- To refit, carry out reversal of the above procedure.

13.8.4 Front Seat (Power Operated), Renew

- Position seat as required for access.
- Disconnect vehicle battery ground lead.
- Release sound insulation retainers and displace insulation.
- Remove SCM cover, move SCM aside and remove seat switch multi-plug from its mounting bracket.
- Remove the seat forward fixings and move the seat fully forward.
- Remove the seat rearward fixing covers and remove the seat rearward fixings.
- Disconnect multi-plugs, seat switch and motor harness to SCM.
- Release harness tie strap and remove seat assembly from vehicle.
- To refit, carry out reversal of the above procedure, ensuring that fixings are tightened to the correct torque.



13.8.5 Front Seat Head Restraint (Power Operated), Renew

- Recline the seat to give access to the head restraint from the rear.
- Disengage the head restraint from its retainers with a sharp upward pull.
- To refit, carry out reversal of the above procedure, ensuring that the restraint is fully locked in position.

13.8.6 Rear Seat Cushion, Renew

- Release the seat cushion quick release fittings.
- Remove the seat cushion from the vehicle.
- To refit, carry out reversal of the above procedure.

13.8.7 Rear Seat Squab, Renew

- Release the rear seat cushion quick release fittings and remove the cushion.
- Release the rear squab fixings and remove the squab.
- Move the rear seat belts aside and remove the squab assembly from the vehicle.
- Remove the armrest from the squab assembly.
- Remove the seat belt stowage pocket.
- To refit, carry out reversal of the above procedure.



13.8.8 Seat Belts, Description

Three types of seat belt are used: tear loop inertia seat belts used on front seats in association with driver and passenger airbags, standard inertia types fitted to the outer, rear seats and static belts fitted to the center, rear seat.

Front passenger seat belts are fitted with tear loop buckles while drivers seat belts have the tear loop fitted to the out-board anchorage. The front seat belts are provided with height adjuster units which are attached one to each of the 'B' posts.

13.8.9 Emergency Locking Retractor / Automatic locking Retractor Seat Belts

Where emergency locking retractor/automatic locking retractor seat belts are provided, the belts have two operating modes:

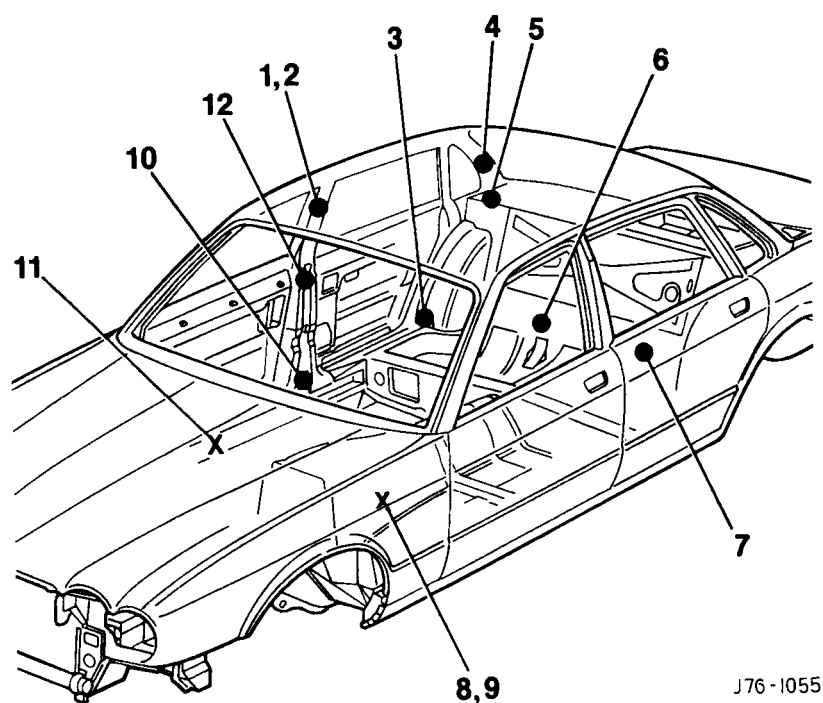
1. Inertia reel mode, emergency locking retractor, for adult passengers
2. Static reel mode, automatic locking retractor, for children (in child seats).

The inertia reel mode operates to allow the occupant some freedom of torso movement. The static reel mode prevents belt payout and thereby does not allow the occupant freedom of torso movement. When the seat belt is attached to a child seat which has its own independent harness, the static mode must be used.

The seat belt defaults to the inertia reel (adult passenger) mode when in the stowed (fully retracted) position.

To activate the static reel (child seat) mode, pay out the belt to its full extension. The ratchet mechanism is now engaged. When retracting the belt back into the reel, the ratchet operation may be felt. It can be noticed that the belt is unable to reverse direction.

To revert to the inertia reel mode, pay the belt back into the reel to the stowed position.



- | | |
|-----------------------------------------|------------------------------------------|
| 1. Height adj. to post | 7. Static/ inertia buckle bracket / body |
| 2. Height adj. to belt anchor | 8. Tear loop buckle bracket |
| 3. Inertia belt anchor | 9. Belt buckle bracket |
| 4. Inertia bracket/ body | 10. Reel bracket / body |
| 5. Inertia reel bracket/ body | 11. Belt anchor / body |
| 6. Inertia/ static buckle bracket/ body | 12. Upper guide / body |

Fig. 1 Seat Belt Location and Anchorages



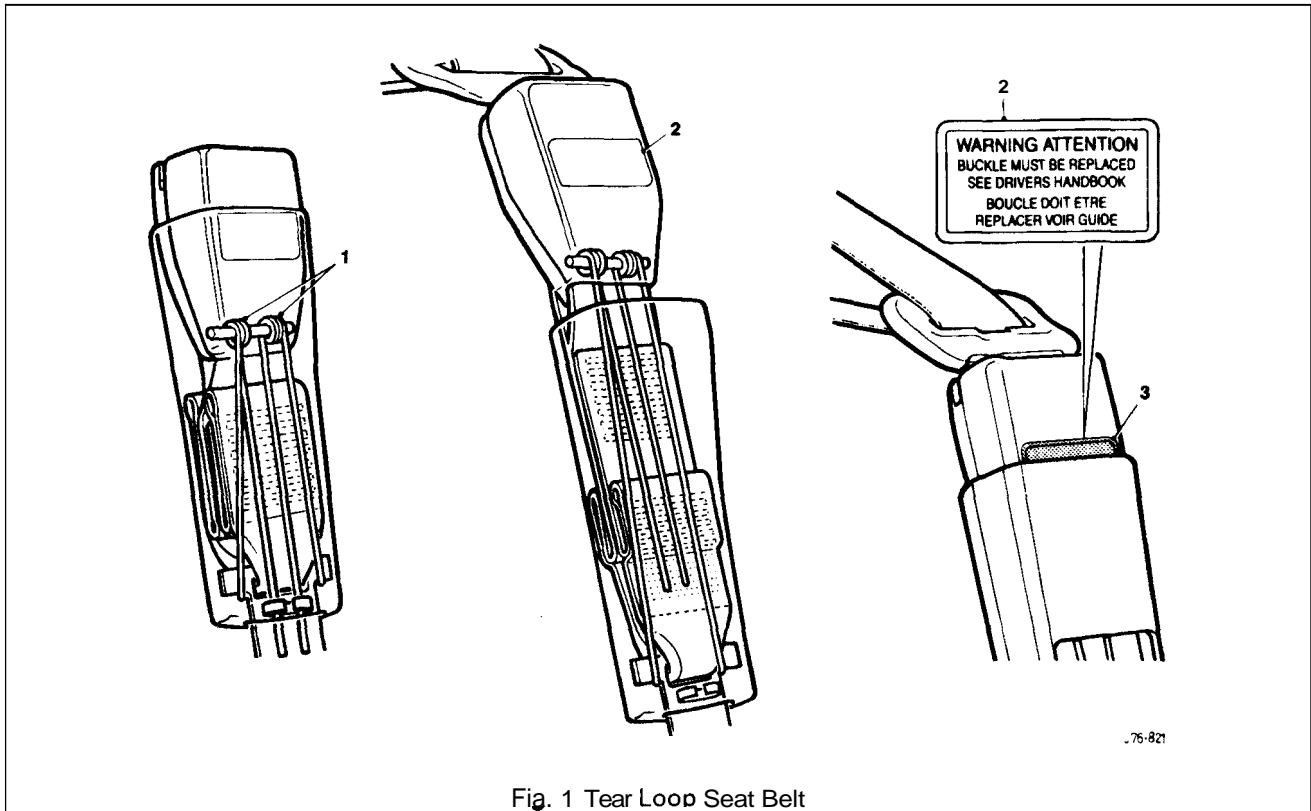
13.8.10 Tear loop Seat Belts, Description

The tear loop seat belt (Fig. 1) is used to control the rate of forward travel of the occupant towards the deployed airbag (the airbag is covered in Section 15, Electrical). The tear loop assembly is designed to release additional webbing when the stitching, which retains the webbing loops, breaks under a predetermined load. The wires (1 Fig. 1) within the assembly have the following functions:

- To protect the stitching from 'normal' loads such as heavy braking or cornering.
- To control the rate of deployment.
- To support the extended head following deployment.

When the passenger unit has been activated, the buckle will extend from the shroud and reveal a warning label (2 Fig. 1); the extent of deployment will depend upon the severity of the load.

WARNING: IF THE LABEL IS VISIBLE AT ALL (3 FIG. 3), THE COMPLETE ASSEMBLY MUST BE RENEWED, AS MUST ANY SEAT BELT WHICH HAS BEEN WORN IN AN ACCIDENT.





13.8.11 Front Seat Belt Buckle Unit, Renew

- Disconnect vehicle battery ground lead.
- Remove the front seat cushion.
- Disconnect cable connector and remove cable into seat frame.
- Remove securing bolt, buckle unit and wavy washer.
- To refit, carry out reversal of the above procedure.

13.8.12 Front Seat Belt, Renew

- Position the front seat for access.
 - Disconnect vehicle battery ground lead.
 - Release 'B' post upper trim and belt aperture cover.
 - Remove cover from seat belt upper fixing.
 - Remove seat belt upper fixing and release seat belt anchor from height adjuster; remove wavy washer.
 - Lower the upper trim pad with seat belt onto the seat.
 - Remove 'B' post lower trim.
 - Remove seat belt lower fixing, disconnect anchor plate and remove wavy washer.
 - Release upper trim pad from seat belt. Remove upper guide fixings at 'B' post.
 - Remove seat belt reel fixings and remove reel and belt assembly.
 - Refit seat cushion.
 - Secure seat belt reel to the specified torque.
 - Fit and secure upper guide plate to 'B' post.
 - Pass the seat belt through the upper trim pad.
 - Fit wavy washer to lower anchor, fit lower anchor plate and nut; tighten to specified torque.
 - Refit lower 'B' post trim panel.
 - Refit upper 'B' post trim panel.
- Place wavy washer on height adjuster stud, fit belt upper anchor and nut; tighten to specified torque.
- Fit plastic cover and split finisher.

13.8.13 Rear Inertia Seat Belt, Renew

- Remove seat cushion, rear seat squab and rear parcel tray.
- Remove foam pad from rear shelf and remove seat belt buckle bolt.
- Remove buckle assembly, washers and spacers.
- Remove side seat belt buckle and the lower anchorage belt.
- Move the belt aside and remove the upper spacer.
- Remove the seat belt bracket/ body fixing and remove reel / bracket assembly.
- Remove seat belt reel / securing bracket fixings.
- Remove the reel and belt assembly.
- To refit, carry out reversal of the above procedure.



13.8.14 Rear, Center, Static Seat Belt, Renew

- Remove rear seat cushion.
- Remove seat belt buckle bolt and remove buckle.
- Remove washers, spacers and side seat belt buckle.
- Remove center lap strap buckle and seat belt strap securing bolt.
- Remove the strap and buckle assembly.
- Remove washers, spacers and side seat belt buckle.
- To refit, carry out reversal of the above procedure.



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| Illustration | Jaguar Number | Description | Notes |
|-----------------|---------------|-----------------------------------------|---------------|
| not illustrated | | Recovery/ Recycling/ Recharging station | See standards |

II. TORQUE TIGHTENING SPECIFICATIONS

| Fixing | Tightening Torque (Nm) |
|--------------------------------------------|------------------------|
| Blower assembly to body | 4 - 7 |
| Condenser to receiver / drier (tube nut) | 14 - 18 |
| Discharge hose to condenser (tube nut) | 22 - 28 |
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| Hoses to evaporator plate | 7 - 10 |
| Liquid line to receiver / drier (tube nut) | 14 - 18 |
| Mounting strut to heater / cooler case | 5 - 7 |



111. SERVICE MATERIALS

| Description | Uses | Notes |
|-----------------------------------|----------------------|---------------------------------------------------------------|
| HFC 134A – ICI Klea or equivalent | Refrigerant | Recyclable. NOT compatible with CFC 12 |
| Polyalkyleneglycol (PAG) | Compressor lubricant | Absorbs water readily. NOT compatible with mineral based oils |

IV. SERVICE DATA

| Application | Specification |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Charge weight | 1100 g +/- 50 g |
| Lubricant capacity | 160 – 200 ml |
| Compressor pressure relief valve | Opening point 34 Bar. Closing point 27,6 Bar. Maximum leakage rate of 113 liters / minute @ 41 Bar |
| Drive belt 12 cylinder Drive belt tension All figures apply to a cold belt Special note Drive belt tension measuring point | 7 rib Poly-vee; 1450mm long Burroughs method – New belt 790 N; If tension falls below 270 N reset at 630 N Clavis method – New belt 114 to 120 Hz; If tension falls below 70 Hz reset at 87 to 93 Hz For new belt; rotate engine 3 revolutions minimum and retension Mid-way between crankshaft and compressor pulley |
| Drive belt 6 cylinder Drive belt tension All figures apply to a cold belt Drive belt tension measuring point | 4 rib Poly-vee X 1010 mm long Burroughs method – New belt 556 to 578 N; If tension falls below 245 N reset at 378 to 400 N Clavis method – New belt 167 to 173 Hz; If tension falls below 85 Hz reset at 127 to 133 Hz Mid-way between crankshaft and compressor pulley on the upper run |

| Standard for Recovery / Recycle / Recharge Equipment. | |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Feature | Requirement |
| Recovery rate | 0,014 – 0,062 m ³ / min. (1,36 kg in 20 minutes) |
| Cleaning capability | 15 parts per million (ppm) moisture; 4000 ppm oil; 330 ppm non condensable gases in air |
| Oil separator | With hermetic compressor and automatic oil return |
| Moisture indicator | Sight glass type, sensitive to 15 ppm minimum |
| Vacuum pump | 2 stage 0,07 – 0,127 m ³ / min. |
| Filter | Replaceable with moisture indicator |
| Charge | Selectable charge weight and automatic delivery |
| Hoses | Dedicated HFC 134A port connections. |
| Charge pressure | Heating element to increase pressure |



14.1 WORKING PRACTICES

14.1.1 General

- Be aware of, and comply with all health and safety requirements, whether they be legislative or common sense. This applies to conditions set both for the operator and workshop.
- Before commencing any repair or service procedure, disconnect the vehicle battery ground connection and protect the vehicle where appropriate, from dirt or damage.
- Work in a well ventilated, clean and tidy area (Fig. 1).
- Keep all components and tools clean.
- Recovery / Recycle and Recharge equipment must comply with, or exceed the standard detailed in the preliminary pages.

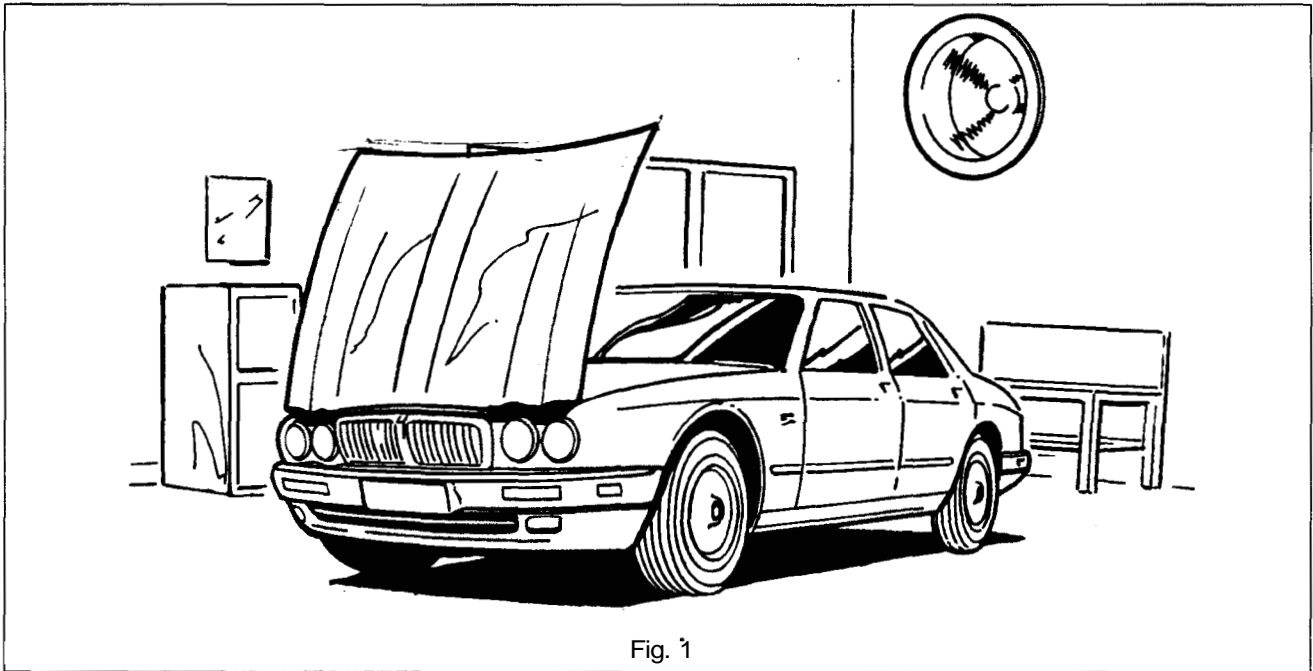


Fig. 1

14.1.2 Handling Refrigerant

- Wear eye protection at all times. Use gloves, keep skin that may come into contact with **HFC 134A** covered. Should refrigerant come into contact with your eyes or skin; wash the affected area with cool water and seek medical advice, do not attempt to treat yourself.
- Avoid breathing refrigerant vapour, it may cause irritation to your respiratory system.
- Never use high pressure compressed air to flush out a system. Under certain circumstances **HFC 134A** + compressed air + a source of combustion (welding and brazing operations in the vicinity), may result in an explosion and the release of potentially toxic compounds.
- **HFC 134A** and **CFC 12** must never come into contact with each other (Fig. 2), they will form an inseparable mixture which can only be disposed of by incineration.
- Do not vent refrigerant directly to atmosphere, always use Jaguar approved recovery equipment. Remember, **HFC 134A** is costly but recyclable.

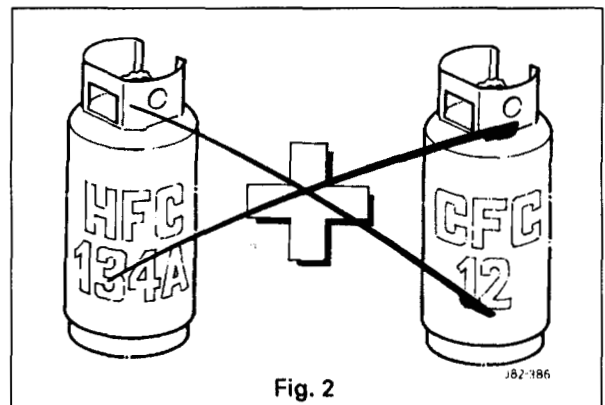


Fig. 2

continued



- Because **HFC 134A** is fully recycleable it may be 'cleaned' by the recovery equipment and re-used following removal from a system.
- Leak tests should only be carried out with an electronic analyzer which is dedicated to **HFC 134A**. Never use a CFC 12 analyzer or naked flame type.
- Do not attempt to 'guess' the amount of refrigerant in a system, always recover and recharge with the correct charge weight. In this context do not depress the charge or discharge port valves to check for the presence of refrigerant.

14.1.3 Handling Lubricating Oil

- Avoid breathing lubricant mist, it may cause irritation to your respiratory system.
- Always decant fresh oil from a sealed container and do not leave oil exposed to the atmosphere for any reason other than to fill or empty a system. PAG oil is very hygroscopic (absorbs water) and will rapidly become contaminated by atmospheric moisture. PAG oil is **NOT compatible** with previously used mineral based oils and must **NEVER** be mixed (Fig.1). Do not re-use oil when it has been separated from refrigerant, following a recovery cycle. Dispose of used oil safely.

14.1.4 System Maintenance

- When depressurizing a system do not vent refrigerant directly to atmosphere, always use Jaguar approved recovery equipment.
- Always decant compressor oil from a sealed container and do not leave oil exposed to the atmosphere for any reason other than to fill or empty a system. PAG oil is very hygroscopic and will rapidly become contaminated by atmospheric moisture.
- Plug pipes and units immediately after disconnection and only unplug immediately prior to connection. Do not leave the system open to atmosphere.
- It is not necessary to renew the receiver drier whenever the system has been 'opened' as previously advised - see note this page. However, if a unit or part of the system is left open for more than five minutes, it may be advisable to renew the receiver drier. This guidance is based on U.K average humidity levels; therefore, locations with lower humidity will be less critical to moisture contamination of the unit. It must be stressed that there is not a 'safe' period for work to be carried out in: **ALWAYS** plug pipes and units immediately after disconnection and only remove plugs immediately prior to connection.

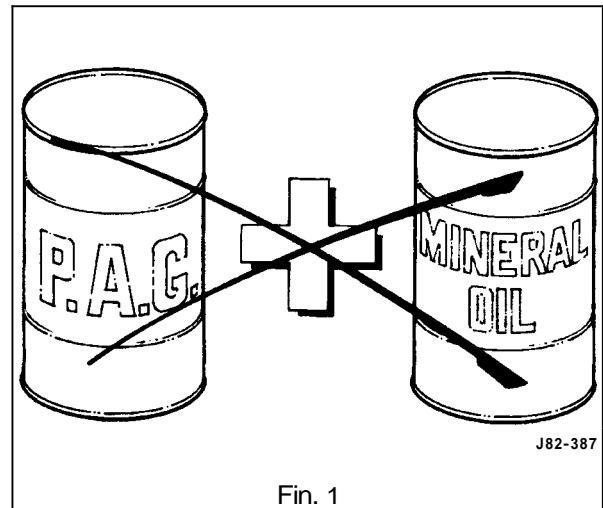


Fig. 1

Note: The receiver/ drier **MUST** be renewed if the compressor has failed or if it is suspected that debris may be in the system.

- If replacement parts are supplied without transit plugs and seals **DO NOT** use the parts. Return them to your supplier.
- Diagnostic equipment for pressure, mass and volume should be calibrated regularly and certified by a third party organization.
- Use extreme care when handling and securing aluminium fittings, always use a backing spanner and take special care when handling the evaporator.
- Use only the correct or recommended tools for the job and apply the manufacturer's torque specifications.



14.2 CLIMATE CONTROL SYSTEM

14.2.1 Description

The climate control system in the 1995 model year saloon has a centre mounted heater / cooler unit with separate blower assemblies, one LH and one RH. Heating temperature control is effected by means of a coolant flow valve and circulation pump.

For models fitted with air conditioning, cooling is provide by passing air through the evaporator, which is situated immediately behind the heater / cooler case inlet ducts.

Electric motors with integral potentiometers are used to position all flaps.

Note: There are no vacuum operated components in the system.

14.2.2 Features

- Self diagnostic control system with error codes.
- Actuator 'self check'.
- Display element check.

Note: These features will be helpful for initial trouble shooting and where Jaguar Diagnostic Equipment (JDE) is not available.

- 'Soft touch' logic controls.
- Serial link from panel to control module (A/CCM).
- LCD display for temperature, status and fan speed.
- Variable fan speed, whether in automatic or manual mode.
- Manual air flow distribution over-rides.
- Compensated air flow with regard to vehicle speed.
- Rear footwell outlets.
- Rear face outlets.
- Scavenge system closed circuit temperature control.
- Heated front screen (where fitted).



14.3 CLIMATE CONTROL PANEL

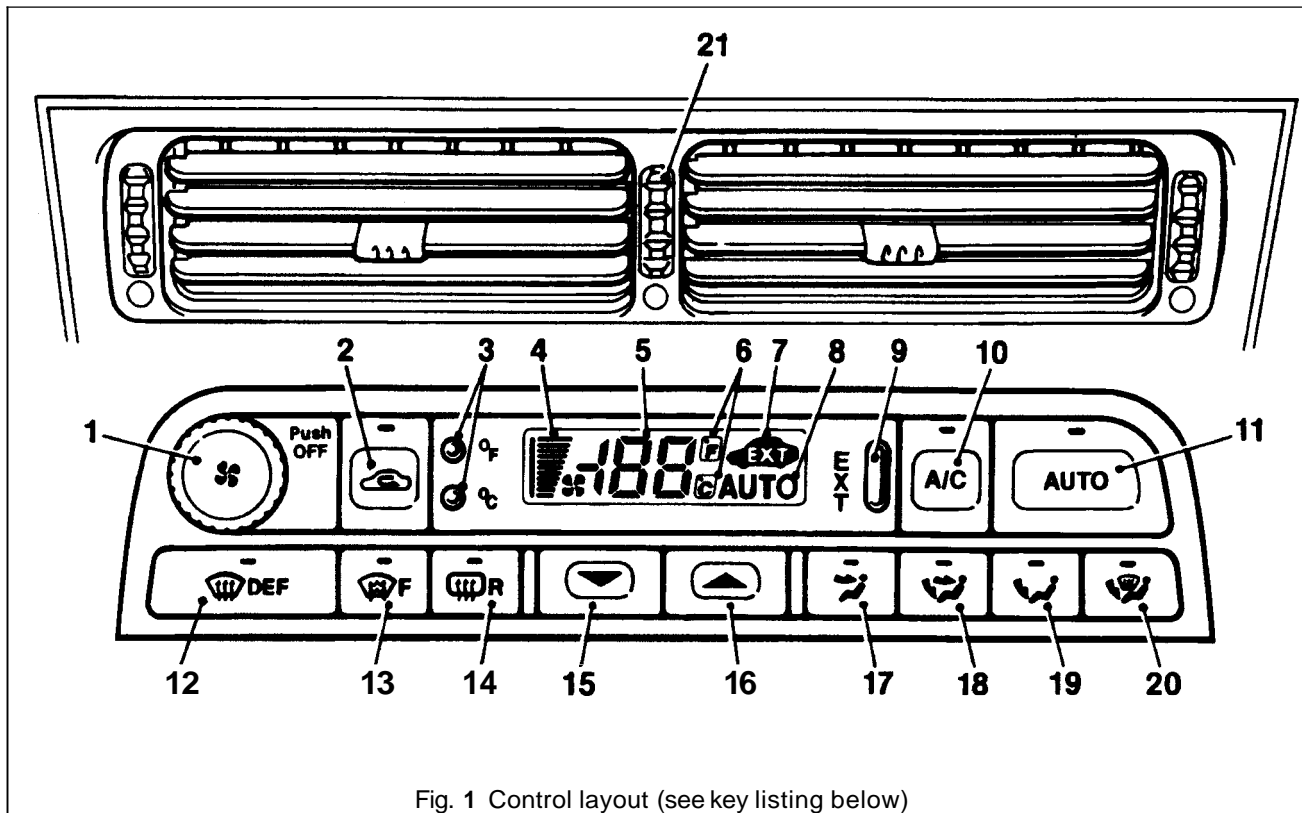


Fig. 1 Control layout (see key listing below)

The following description of the various control panel functions is provided as a brief over-view to assist in function checking. Further information concerning the control panel to component interface may be found in the fault finding procedures (this section) or the Electronic Diagnostic Manual (EDM).

Note: The system may be activated by any one of four commands. a) AUTO button item 11; b) DEFROST button item 12; c) A/C button item 10; d) OFF switch item 1.

1. Combined push for OFF and rotary FAN SPEED control. The speed of the **two** fans is changed by clockwise (to increase) or anti-clockwise rotation of the knob. Operation of the control, (push) OFF or (rotate) FAN over-rides the AUTO selection and cancels the 'AUTO' display.
2. RECIRCULATE AIR push-on / push-off button and state lamp, used to prevent outside air being drawn into the cabin. There are two modes:
 - a) Press and immediate release; provides timed recirculation of five (5) minutes.
 - b) Press and hold for two (2) seconds; 'latches' the mode until operator over-ride.
3. Temperature scale SELECTOR for Celsius or Fahrenheit.
4. FANS SPEED display bar graph.
5. TEMPERATURE numeric display for demand and exterior.
6. Selected temperature SCALE temperature numeric display.
7. EXTERIOR temperature option display.



8. AUTO selection display.
9. EXTERIOR temperature selection button. There are two modes:
 - a) Press and immediate release; provides timed display of four (4) seconds.
 - b) Press and hold for two (2) seconds; 'latches' the mode until operator over-ride.
10. A/C push-on / push-off button will either engage or disengage (as indicated by the state lamp) the refrigeration system compressor. The state lamp is also used as a compressor speed fault indicator, see System protection, this section.
11. AUTO push-on button and state lamp. When selected and the state lamp lit, the A/C mode is selected and control of demand temperature, fans speed, and air distribution is automatic. AUTO is cancelled by selection of any 'distribution' button, A/C off, or manual FANS SPEED.
12. DEFROST push-on/ push-off button and state lamp. When engaged, air is distributed to the screen at maximum fans speed and the heated front screen elements (where fitted) are energized. The heated front screen is automatically timed for a six (6) minute cycle but may be cancelled by pressing the HEATED FRONT SCREEN button. Automatic temperature control is retained and the fans speed may be manually reduced. Deselection will return the system to the previous state and selection of AUTO will resume automatic system control.
13. The push-on/ push-off (F) button with state lamp manually controls the HEATED FRONT SCREEN (where fitted). This facility allows rapid screen de-icing using laminated electrical heating elements to supplement the hot air defrost.
14. The push-on/ push-off (R) button with state lamp manually controls the HEATED REAR SCREEN and door mirror glass heating elements for a timed cycle of; screen twenty (20) minutes and mirrors eleven (11) minutes.

Note: The state lamp will remain lit after the mirror timer has gone through its 11 minute cycle and will not go out until either completion of the 20 minute screen cycle or manual override.

15. TEMPERATURE decrease button in 1°C or 1°F steps.
16. TEMPERATURE increase button in 1°C or 1°F steps.

Note: Automatic temperature control operates over the range 17°C to 31°C (61°F to 90°F). Extreme limits selected by items 15 and 16 ('Lo' and 'Hi') provide maximum cooling or heating at maximum fans speed.

17. FACE level manual distribution over-ride push-on / push-off button and state lamp.
18. Bi LEVEL (foot and face) manual distribution over-ride push-on / push-off button and state lamp.
19. FOOT level manual distribution over-ride push-on / push-off button and state lamp.
20. DEMIST (screen and foot) level manual distribution over-ride push-on / push-off button and state lamp.

Note: Selection of AUTO will over-ride any manual setting and deselection of any manual distribution will revert the system to AUTO distribution.

21. FACE VENT TEMPERATURE CONTROL thumb-wheel. Situated between dash centre face level vents to reduce face air outlet temperature relative to that of the foot-well.

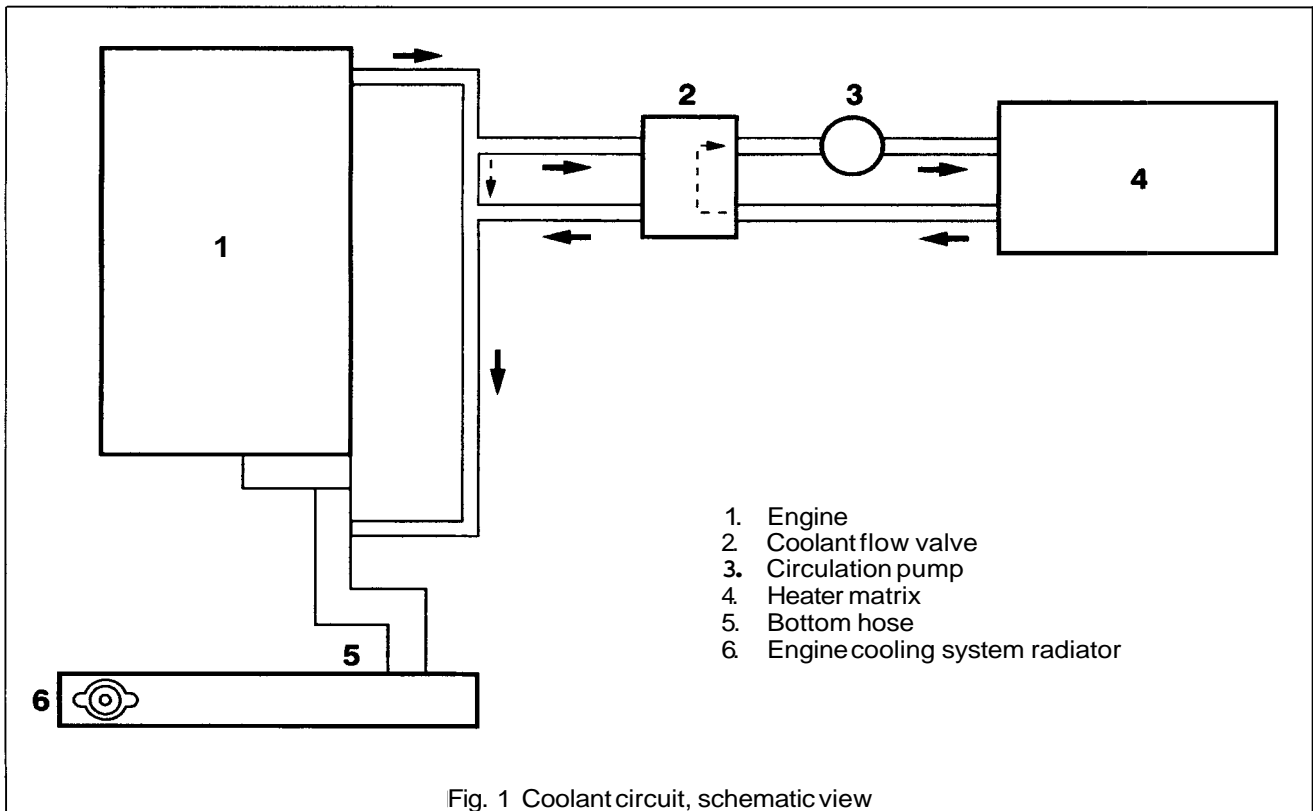


14.4 TEMPERATURE CONTROL

14.4.1 Coolant Circuit

The main coolant system supplies liquid at engine temperature to the heater matrix to provide heat to the vehicle interior. Unlike previous air blend / constant matrix temperature systems, in-car temperature is now controlled by mixing recirculated coolant in the heater circuit with engine-temperature coolant. Matrix temperature is controlled by a valve which opens to raise temperature (admit engine coolant) and closes to reduce it (recirculates coolant within the circuit). The coolant flow valve operates on a six (6) second 'duty cycle', during which it may be open for whatever period the control system dictates. FACE vent air temperature of however is controlled by the 'cool air by-pass damper' which allows incoming air to flow around the top of the heater matrix and thus remain unheated.

Because the engine coolant pump is driven proportionally to engine speed, the coolant delivery rate changes with engine revolutions thus causing temperature variations. To stabilize the flow through the matrix, and thus the temperature, an electrically driven circulation pump has been introduced into the system.





14.5 AIR CONDITIONING CONTROL MODULE (A/CCM)

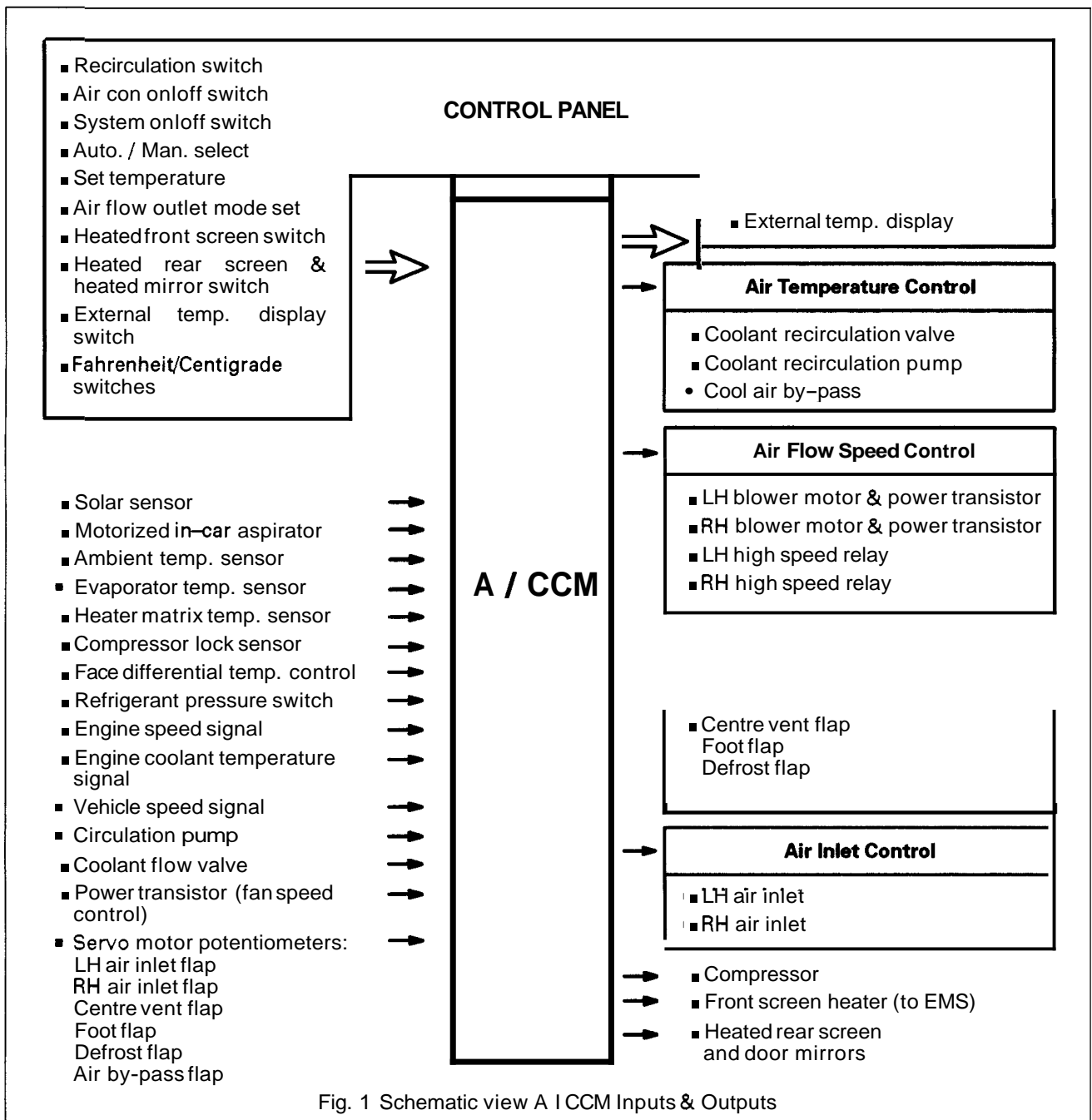
14.5.1 Description

The climate control system peripherals communicate with the A/CCM via three main device categories, plus the vehicle power supply and ground connections.

| | |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manual Inputs | Control panel Face Vent Temperature Control |
| Automatic inputs | Temperature and solar sensors Flap servo motor potentiometers Circulation pump & coolant flow valve Power transistor (fan speed control) Compressor lock sensor (12 cylinder only) Instrument pack (coolant temp & road speed) (engine revolutions via engine control module) |
| outputs | Blower motors (Left & Right) & associated relays Flap servo motors Heated front / rear screens & exterior mirror relays Motorized in-car aspirator Compressor clutch request to engine control module (not heater-only cars) Circulation pump relay Coolant flow valve |



14.5.2 Control Module Interfaces





14.6 CONTROL MODULE FAULT & CONDITION SELF-ANALYSIS

14.6.1 System Health

The climate control system has a 'self-test' facility, accessible from the control panel. The self test sequence has two basic modes:

- System error information is stored in the A/CCM up to a maximum of five faults. Should a fault occur there will be an audible 'beep' and the message 'Er' will be displayed on the control panel LCD for approximately five (5) seconds after ignition on. Please note that this will happen only once in any ignition switch cycle. The error source may be accessed by the procedure described in 'Self Test System Diagnosis', this section.
- Panel communication check may be initiated by following the instruction in 'Self Test System Diagnosis', this section.

Note: Displayed error codes are NOT directly related to Jaguar Diagnostic Equipment (JDE) but more detailed fault related information may be accessed using Portable Diagnostic Unit (PDU).

14.6.2 System Protection

Power to the compressor clutch may be cut should either the engine management or air conditioning control systems detect certain conditions; these conditions may be caused by Fault or Demand and can be classified thus:

Fault

- Engine coolant overheat,
- Refrigerant excessive pressure.
- Refrigerant, insufficient pressure or low charge weight.
- Speed differential between compressor and crankshaft caused by belt slippage or compressor seizure (indicated by A/C state lamp flashing once per second) – 12 cylinder engine only. This feature, 'lock sensing' is fully explained in the EDM.

Demand

- Engine maximum power requirement
- Electrical system drain at engine idle.

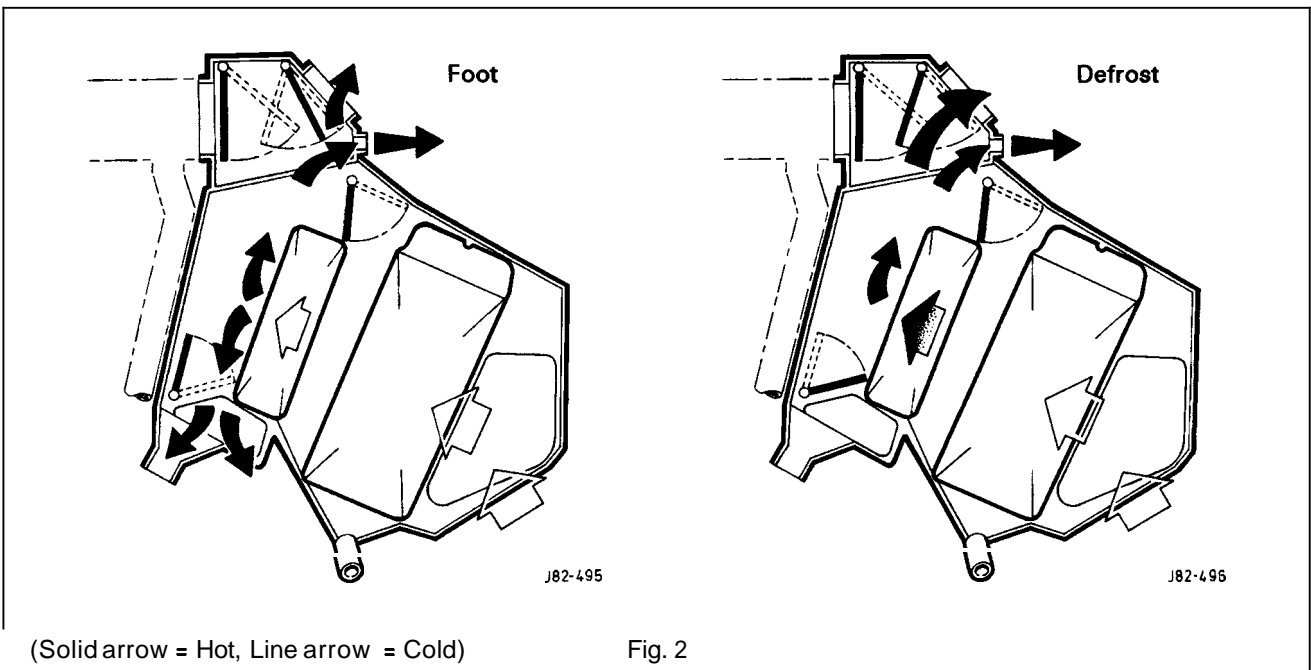
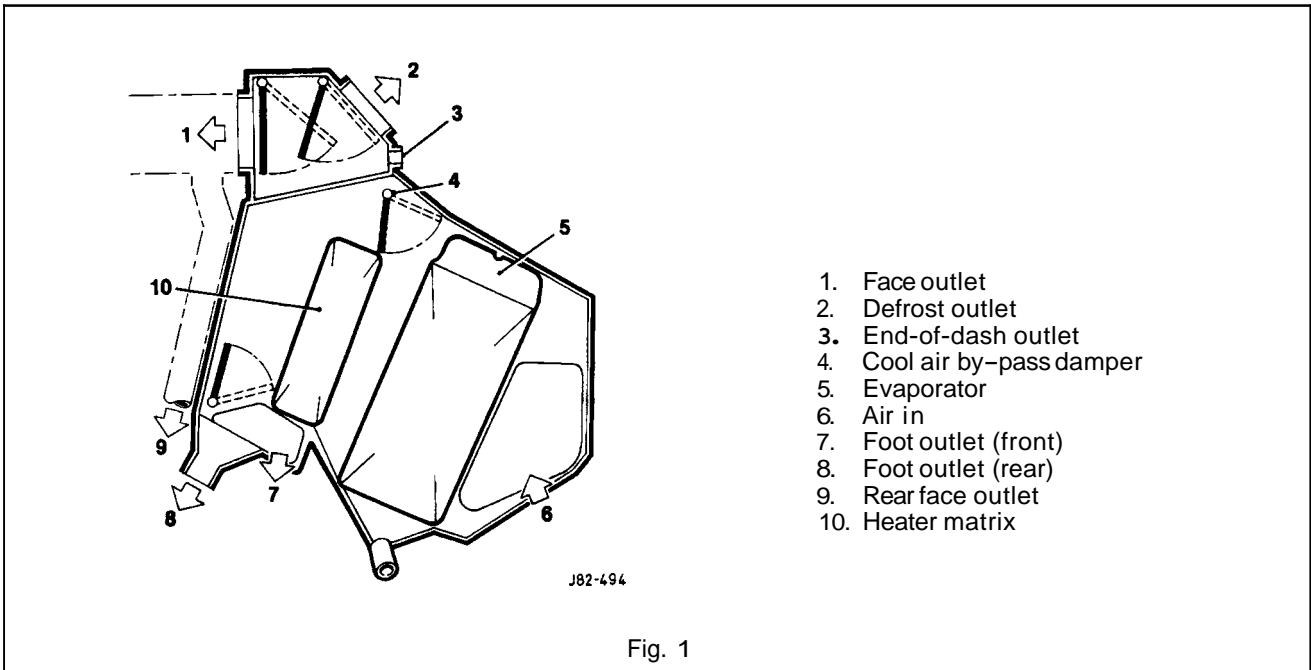
14.7 AIR DISTRIBUTION

(Refer to illustrations on this and next page)

Air is drawn from the plenum chamber into the heater / cooler case at the lower front right and left hand sides. All air must first pass through the evaporator (not fitted to heater only cars) and then through the heater matrix for in-car distribution.

When cooler air than that available from the other outlets is desired at the FACE vents, air by-passes the matrix via the 'cool air by-pass damper' within the range cold to hot.

The flaps for FOOT, COOL AIR, CENTRE VENT, RH & LH RECIRCULATION and DEFROST are electrically driven by individual motor / potentiometer units.



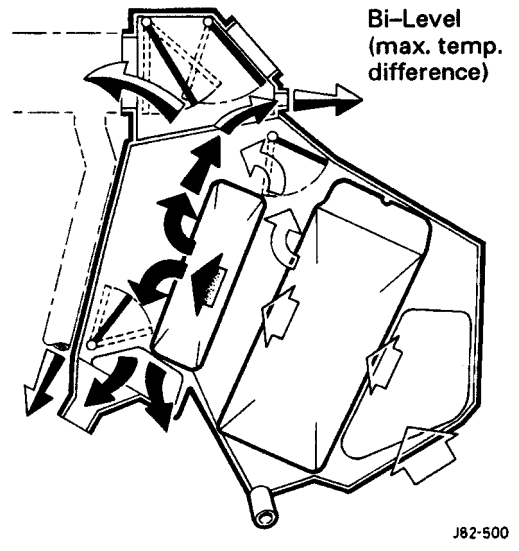
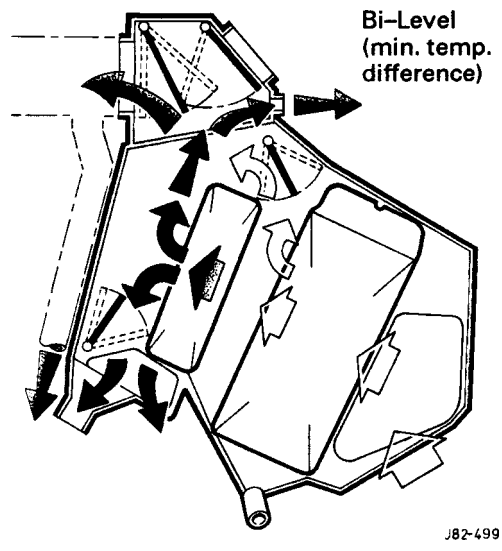
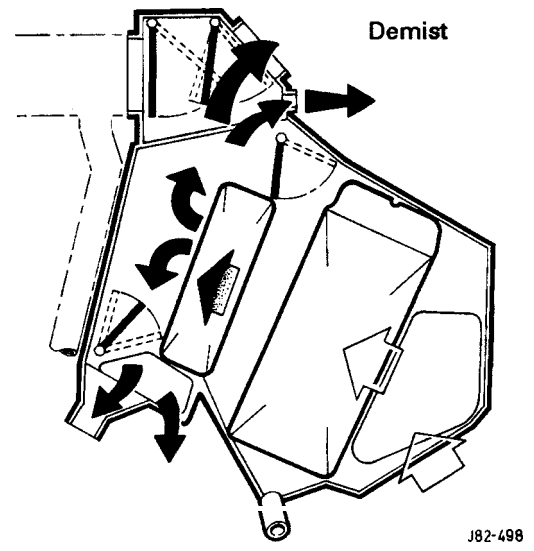
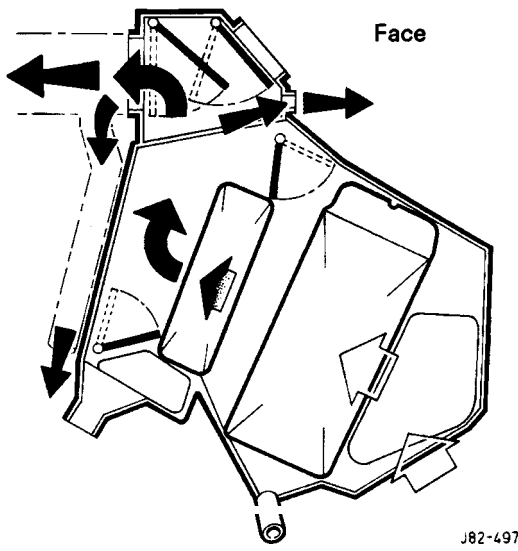


Fig. 1

14.8 REFRIGERATION CYCLE:

The Compressor draws low pressure, low temperature refrigerant from the evaporator and by compression, raises refrigerant temperature and pressure. High pressure, hot vaporized refrigerant enters the Condenser where it is cooled by the flow of ambient air. A change of state occurs as the refrigerant cools in the condenser and it becomes a reduced temperature high pressure liquid.

From the condenser the liquid passes into the Receiver / Drier which has three functions,

- Storage vessel for varying system refrigerant demand.
- Filter to remove system contaminants.
- Moisture removal via the desiccant.

With the passage through the receiver / drier completed the, still high pressure liquid refrigerant enters the Expansion Valve where it is metered through a controlled orifice which has the effect of reducing the pressure and temperature.

The refrigerant, now in a cold atomized state, flows into the evaporator and cools the air which is passing through the matrix.

As heat is absorbed by the refrigerant it once again changes state, into a vapour, and returns to the compressor for the cycle to be repeated (Fig. 1).

There is an automatic safety valve incorporated in the compressor which will operate should the system pressure be in excess of 41 bar. The valve will reseal when the pressure drops below 27,6 bar.

Note: The division of HIGH and LOW side is simply the system pressure differential created by the compressor discharge (pressure), suction (inlet) ports and the relative inlet and outlet ports of the expansion valve. This differential is critical to system fault diagnosis and efficiency checks.

Twelve Cylinder Vehicles only:

Dual pressure switch: This two-function pressure switch cuts electrical power to the compressor clutch if the system pressure is outside of the range of 2 Bar (1st Function) to 30 Bar (2nd Function).

Six Cylinder Vehicles only:

There are two switches incorporated into the high side of the system which have the following functions:

- Trinary;** This three function pressure switch, cuts electrical power to the compressor clutch should the system pressure not be in a range of 2 bar (1st function) to 30 bar (2nd function). The switch also provides a ground signal to operate the appropriate relay (within the 'Stribel,' unit) to energize both engine cooling fans when maximum A / C cooling is required. Operation pressure, 20 bar input (3rd function).
- Pressure Switch Slow Cooling Fans;** When the system pressure is 12 bar, medium A / C demand, the operation of this switch connects both engine cooling fans in series to operate at half battery voltage and so, half fan speed.

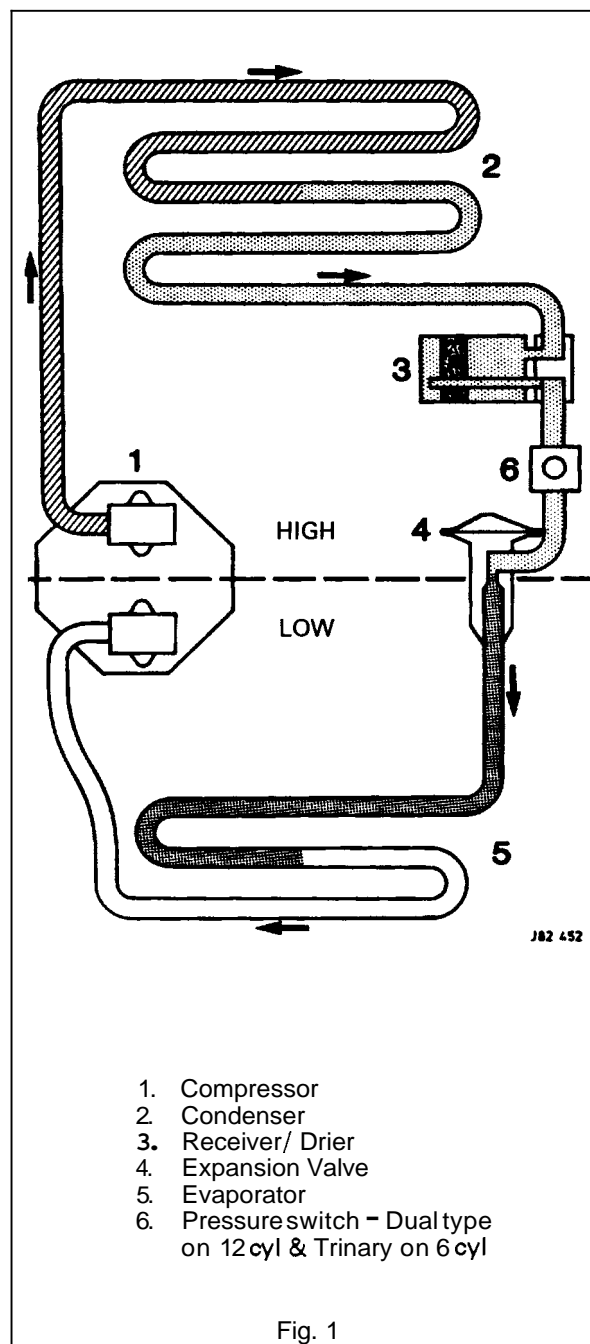


Fig. 1



14.9 GENERAL SYSTEM PROCEDURES

14.9.1 Leak Test

Faults associated with low refrigerant charge weight and low pressure may be caused by leakage. Leaks traced to mechanical connections may be caused by torque relaxation or joint face contamination. Evidence of oil around such areas is an indicator of leakage. When checking for non visible leaks use only a dedicated **HFC 134A** electronic analyzer and apply the probe all round the joint / connection.

Should a leak be traced to a joint, check that the fixing is secured to the correct tightening torque before any other action is taken.

Do not forget to check the compressor shaft seal and evaporator.

CAUTION: Never use a dedicated CFC 12 or naked flame type analyzer.

14.9.2 Charge Recovery (System depressurization)

The process of **HFC 134A** recovery will depend on the basic characteristics of your chosen recovery/ recycle/ recharge equipment, therefore, follow the manufacturer's instructions carefully.

Remember that compressor oil may be drawn out of the system by this process, take note of the quantity recovered so that it may be replaced.

CAUTION: Observe all relevant safety requirements.

Wear suitable eye and skin protection

Do not mix HFC 134A with CFC 12.

Do not vent refrigerant directly to atmosphere and always use Jaguar approved recovery / recycle / recharge equipment.

Take note of the amount of recovered refrigerant, it will indicate the state of the system.

14.9.3 Evacuating the System

This process, the removal of unwanted air and moisture, is critical to the correct operation of the air conditioning system. The specific procedures will vary depending on the individual characteristics of your chosen recovery/ recycle / recharge equipment and must be carried out exactly in accordance with the manufacturer's instructions. However, it is recommended that the initially only the HIGH side valve be opened at the start of the procedure. After a short time a small depression should be seen on the LOW side, at which point the LOW side valve may be opened and the evacuation process completed. If a vacuum is not registered on the LOW side it may indicate that the expansion valve is jammed closed or that the system is blocked. This simple check may save time and effort when the system is re-charged.

Moisture can be highly destructive and may cause internal blockages due to freezing, but more importantly, water suspended in the PAG oil will damage the compressor. Once the system has been opened for repairs, or the refrigerant charge recovered, all traces of moisture **MUST** be removed before recharging.

14.9.4 Adding Lubricating Oil - Compressor Related

The amount of oil drawn out during a recovery procedure will be dependent on the state of the system and the rate of recovery. The quantity will be approximately 30 to 40 ml; this may vary, and the figure is given only for guidance.

The oil separator vessel in the recovery equipment must be clean and empty at the start of the process so that the quantity of oil which is drawn out may be accurately measured.

Oil may be added by three methods, 1 and 2 being direct into the system and 3 with the compressor off the vehicle;

1. Via the recovery/ recycle/ recharge station.
2. Proprietary oil injector.

Note: Equipment manufacturer's instructions must be adhered to when using direct oil introduction.

3. Directly into the original, or new unit, because of rectification work to the existing compressor, or the need to fit a new compressor.

Original

From an existing compressor, drain the oil into a measuring cylinder and record the amount. Flush the unit out with fresh PAG oil and drain thoroughly. Replenish the compressor with the same amount of PAG oil that was originally drained out and immediately plug all orifices ready for refitting to the vehicle.



New

Drain and discard the transit lubricating oil from a new compressor before it is fitted. An adjustment must then be made to avoid over-filling the system, by taking into account;

- a) the quantity found in the original compressor.
- b) the quantity deposited in the recovery equipment oil separator from the charge recovery operation.

Typical example:

| | |
|--------------------------------------|------------------------|
| Drained from original compressor | 50 ml |
| Recovered from oil separator | 40 ml |
| Quantity to be put in new compressor | 50 + 40 = 90 ml |

Please note that the discrepancy between the cumulative figure of recovered and drained oil and the nominal capacity of **180 ml** is caused by normally unrecoverable oil being trapped in components such as the condenser, receiver/ drier or evaporator.

The previous statements apply even if a problem has occurred due to oil leakage. The amount of oil lost due to leakage is generally small, so to avoid over-filling please follow the example.

If however the recovery process has not been necessary because refrigerant has also been lost, then **ONLY** replace the quantity drained from the original compressor.

14.9.5 Adding Lubricating Oil – Component Related

Should a major component such as condenser, receiver / drier or evaporator be renewed then an adjustment to the system oil level must be made. This may be carried out in the same way as the examples for the compressor except for the fact that trapped oil within any one of these components cannot normally be drained. Therefore, a nominal amount of oil should be substituted in addition to that recovered from the recovery station separator.

| | |
|-----------------|------------------|
| Condenser | Add 40 ml |
| Evaporator | Add 40 ml |
| Receiver/ drier | NO adjustment |

CAUTION: Always decant fresh oil from a sealed container and do not leave oil exposed to the atmosphere. PAG oil is very hygroscopic (absorbs water) and will rapidly attract atmospheric moisture. PAG oil must NEVER be mixed with mineral based oils. Do not re-use oil following a recovery cycle, dispose of it safely.

14.9.6 Adding Refrigerant

In order that the air conditioning system may operate efficiently it must contain a full refrigerant charge. The indications of some system defects, and the results of certain tests, will show that a low charge is the most probable cause of the fault. In such cases the charge should be recovered from the system, the weight noted, and the correct amount installed.

Should refrigerant be added in liquid form, initial engine start-up revolutions must NOT exceed 2000 RPM for a period of (2) two minutes. If the engine speed is excessive, compressor damage may occur due to the lubricating oil and the liquid refrigerant being initially forced around the system as a 'slug', thus taking oil away from the compressor. These marginal lubrication conditions in the compressor will cease as the refrigerant becomes gaseous.

Never attempt to 'guess' the amount of refrigerant in a system, always recover and recharge with the correct charge weight; this is the only accurate method.

CAUTION: If oil was drawn out during the recovery process, the correct amount may be added directly from your recovery / recycle/recharge station (if so equipped) prior to the 'charging process'. It must be stressed that the need to protect compressor oil from moisture is vital, observe the procedures in HANDLING LUBRICATING OIL and those concerning excessive engine revolutions.



14.10 FAULT DIAGNOSIS

14.10.1 Introduction

It is very important to positively identify the area of concern before starting a rectification procedure. A little time spent with your customer to identify the conditions under which a problem occurs will be beneficial. Relevant criteria are: Weather conditions, ambient temperature, intermittent or continuous fault, airflow fault, temperature control fault, distribution fault and air inlet problem.

14.10.2 Functional Check

This simple 'first line check' will allow you to ascertain whether the system is operating within its design parameters, without recourse to (JDE). Please carry *out* the following, in order.

- Start engine and attain normal running temperature.
- Press AUTO to display selected temperature and illuminate AUTO & A/C state lamps.
- Rotate FAN to increase or decrease lower speed, verify bar graph representation.
- Operate A/C to toggle on or off. Because the compressor can be inhibited by the engine management system, ensure that the engine temperature is normal and that the ambient is above 5° C.
- Operate RECIRC, state lamp should be lit and the flap behind the blower grille open.
- Operate distribution buttons in turn, verify correct air distribution and relevant state lamp.
- Operate DEFROST, check max fans and air to front screen.
- Cycle TEMPERATURE to 'Hi' and 'Lo' to verify demanded variations and display operation. Note that extremes will provide max heat or cold independent of in-car temperature.
- Operate EXT to toggle between ambient and control temperatures.
- Operate HFS and HRW to note timer and mirror operation.
- Initiate System Self Test to check for, and extract, stored faults should any of the above not perform as stated.

14.10.3 System symptoms

There are five basic symptoms associated with air conditioning fault diagnosis. The following conditions are not in order of priority.

No Cooling

- Is the electrical circuit to the compressor clutch functional?
- Is the electrical circuit to the blower motor(s) functional?
- Slack or broken compressor drive belt.
- Compressor partially or completely seized.
- Compressor shaft seal leak.
- Compressor valve or piston damage (may be indicated by small variation between HIGH & LOW side pressures relative to engine speed).
- Broken refrigerant pipe (causing total loss of refrigerant).
- Leak in system (causing total loss of refrigerant) – possible code **23**.
- Blocked filter in the receiver drier.
- Evaporator sensor disconnected – possible code **13**.
- Pressure switch faulty – possible code **23**.



Insufficient Cooling

- Sluggish blower motor(s).
- Restricted blower inlet or outlet passage
- Blocked or partially restricted condenser matrix or fins.
- Blocked or partially restricted evaporator matrix.
- Blocked or partially restricted filter in the receiver drier.
- Blocked or partially restricted expansion valve.
- Partially collapsed flexible pipe.
- Expansion valve temperature sensor faulty (this sensor is integral with valve and is not serviceable).
- Excessive moisture in the system.
- Air in the system.
- Low refrigerant charge – possible code **23**.
- Compressor clutch slipping.
- Blower flaps or distribution vents closed or partially seized – possible codes **41** or **46**.
- Coolant flow valve not closed.
- Evaporator sensor incorrectly positioned

Note: Should a leak or low refrigerant be established as the cause of *INSUFFICIENT COOLING*, follow the procedures Recovery/ Recycle/ Recharge, this section, and observe all refrigerant and oil handling instructions.

Intermittent Cooling

- Is the electrical circuit to the compressor clutch consistent?
- Is the electrical circuit to the blower motor(s) consistent?
- Compressor clutch slipping?
- Motorized in-car aspirator or evaporator temperature sensor faulty, causing temperature variations – possible codes **11** or **13**.
- Blocked or partially restricted evaporator or condenser.

Noisy System

- Loose or damaged compressor drive belt.
- Loose or damaged compressor mountings.
- Compressor oil level low, look for evidence of leakage.
- Compressor damage caused by low oil level or internal debris.
- Blower motor(s) noisy.
- Excessive refrigerant charge, witnessed by vibration and 'thumping' in the high pressure line (may be indicated by high HIGH & high LOW side pressures).
- Low refrigerant charge causing 'hissing' at the expansion valve (may be indicated by low HIGH side pressure).
- Excessive moisture in the system causing expansion valve noise.
- Air-lock in water pump*.

Insufficient Heating

- Coolant flow valve stuck in the closed position.
- Motorized in-car aspirator seized.
- Cool air by-pass damper stuck or seized – possible code **43**.
- Blocked or restricted blower inlet or outlet.
- Low coolant level.
- Blower fan speed low.
- Coolant thermostat faulty or seized open.
- Water pump inoperative or blocked
- Air-lock in matrix*.

Note: * Please see Sections 4.1 and 4.2 for specific coolant fill / bleed procedures.
Electrical faults may be more rapidly traced using (JDE), please refer to the (EDM).



14.11 SYSTEM SELF-TEST

14.11.1 Interrogation Procedure via the Control Panel

| Action | Result |
|-------------------------------------------------------------|---------------------------------------------------------------------------|
| Simultaneously hold AUTO and RECIRC – Switch ignition to ON | Display element check |
| Press AUTO | Any stored fault NUMERIC code (If ZERO appears there are no stored codes) |
| Press FACE | Scroll through stored faults (maximum of 5) |
| Simultaneously press FACE and HRW | Clear stored fault codes (may need to be repeated for each fault) |
| Press RECIRC (Press FAN to skip actuator check) | Initiate actuator check (Actuator codes 20 through 27*) |
| Press FAN | Exit error check mode |

14.1.1.2 Control Panel Fault Code Key

| Fault Code | Item | Description |
|------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 | Normal Operation | No fault codes present, wait 30 seconds for system self-check. |
| 11 | Motorized In-car Aspirator | Open/short in sensor circuit. Panel fault codes are not stored for motorized in-car aspirator motor failure. |
| 12 | Ambient Temperature Sensor | Open / short circuits. |
| 13 | Evaporator Temperature Sensor | Open / short circuits. |
| 14 | Water Temperature Input | Instrument pack output. |
| 15 | Heater Matrix Temperature Sensor | Open / short circuits. |
| 21 | Solar Sensor | Open / short circuits. |
| 22 | Compressor Lock Signal – 12 cylinder and supercharged 6 cylinder engines only. | Open / short circuits. Low gas charge, low compressor oil, loose belt. |
| 23 | Refrigerant Pressure Switch | Open / short circuits. Low gas charge* |
| 24 | Face Vent Demand Potentiometer. | Open / short circuits |
| 31 | LH Fresh/ Recirc. Potentiometer | Open / short circuit in potentiometer. feed. Note: In certain circumstances, the motor can over-travel and log further faults. Cycling the ignition two or three times after rectification of the fault will cure this. |
| 32 | RH Fresh/ Recirc. Potentiometer | |
| 33 | Cool Air by-pass Potentiometer | |
| 34 | Defrost Vent Potentiometer | |
| 35 | Centre Vent Potentiometer | |
| 36 | Foot Vent Potentiometer | |
| 41 | LH Fresh/ Recirc. Motor | Check for short / open circuits in motor drive lines. Motor flap sticking / jammed. |
| 42 | RH Fresh/ Recirc. Motor | |
| 43 | Cool Air by-pass Motor | |
| 44 | Defrost Vent Motor | |
| 45 | Centre Vent Motor | |
| 46 | Foot Vent Motor | |

Note: In ambient temperatures below 0° C, the system may log fault code 23 because the low ambient causes a temporary low gas pressure. Where the ambient temperature rise above 40° C, and if the engine is close to over-heating, feed to the compressor clutch may be cut and code 23 registered.*



14.11.3 Associated Faults

Other symptoms that may exist without storing fault codes:

| | |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| No heat | Airlock in system. Electric water pump inoperative Coolant flow valve stuck closed Faulty engine coolant thermostat |
| One vent failing to open / close | Broken linkage. |
| Poor airflow | Blower motors – incorrect operation |

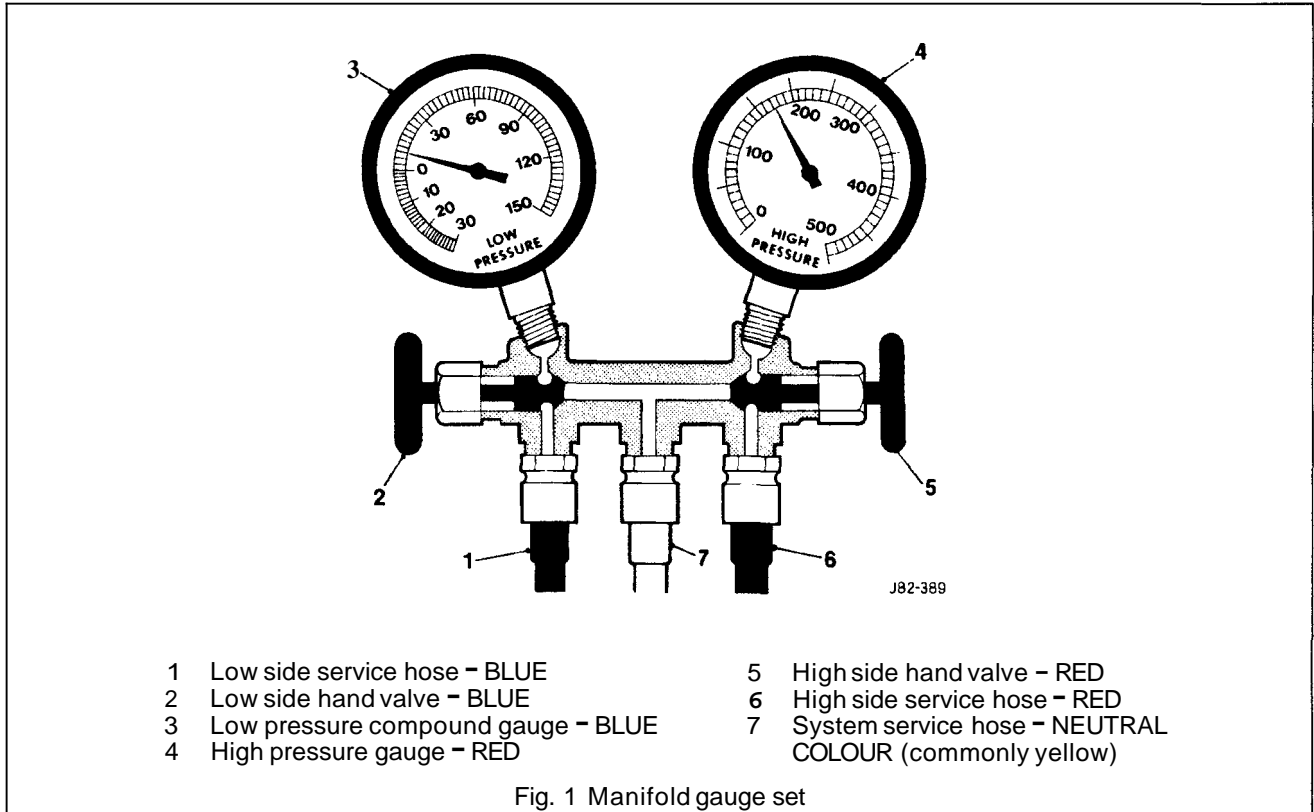
14.11.4 Panel Communication Check

| Action | Result |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Simultaneously hold FACE and FAN – Switch ignition to ON | Panel communication with FACE, FOOT & FACE, FOOT, SCREEN & FOOT, DEFROST, RECIRC lines checked – State lamps will illuminate if all is OK. Unlit state lamp means continuity fault for that specific link. See EDM for full check. |



14.12 MANIFOLD GAUGE SET

The manifold gauge set is a most important tool for tracing faults and system efficiency assessment. The relationship to each other of HIGH and LOW pressures and their correlation to AMBIENT and EVAPORATOR temperatures must be compared to determine system status (see Pressure/Temperature graphs in Sub-Sections 14.14 & 14.15). Because of the heavy reliance upon this piece of equipment for service diagnosis, ensure that the gauges are calibrated regularly and the equipment is treated with care.



Manifold.

The manifold is designed to control refrigerant flow. When connected into the system, pressure is registered on both gauges at all times. During system tests both the high and low side hand valves should be closed (rotate clockwise to seat the valves). The hand valves isolate the low and the high sides from the centre (service) hose.

Low Side pressure Gauge.

This compound gauge, is designed to register positive and negative pressure and may be typically calibrated - Full Scale Deflection, 0 to 10 bar (0 to 150 lbf/in²) pressure in a clockwise direction; 0 to 1000 mbar (0 to 30 in Hg) FSD negative pressure in a counter clockwise direction.

High Side Pressure Gauge.

This pressure gauge may be typically calibrated from 0 to 30 bar (0 to 500 lbf/in²) FSD in a clockwise direction. Depending on the manufacturer, this gauge may also be of the compound type.



14.13 SYSTEM CHECKING WITH MANIFOLD GAUGESET

14.13.1 Evacuating the Manifold Gauge Set

Attach the centre (service) hose to a vacuum pump and start the pump. Open fully both high and low valves and allow the vacuum to remove air and moisture from the manifold set for at least five minutes. Turn the vacuum pump off and isolate it from the centre service hose but do not open the hose to atmosphere.

CAUTION: It is imperative that the vacuum pump is not subjected to a positive pressure of any degree. Therefore the pump must be fitted with an isolation valve at the centre (service hose) connection and this valve must be closed before the pump is switched off. This operation replaces the 'purge' procedure used on previous systems. Observe the manufacturer's recommendation with regard to vacuum pump oil changes.

14.13.2 Connecting the Manifold Gauge Set

CAUTION: Only use hoses with connectors which are dedicated to HFC 134A charge ports.

Attachment of the hose quick release connectors to the high and low side system ports is straightforward, provided that the high and low valves are closed and the system is NOT operational. Assessment of system operating efficiency and fault classification may be achieved by using the facilities on your Recovery / Recharging / Recycling station, follow the manufacturer's instructions implicitly and observe all safety considerations.

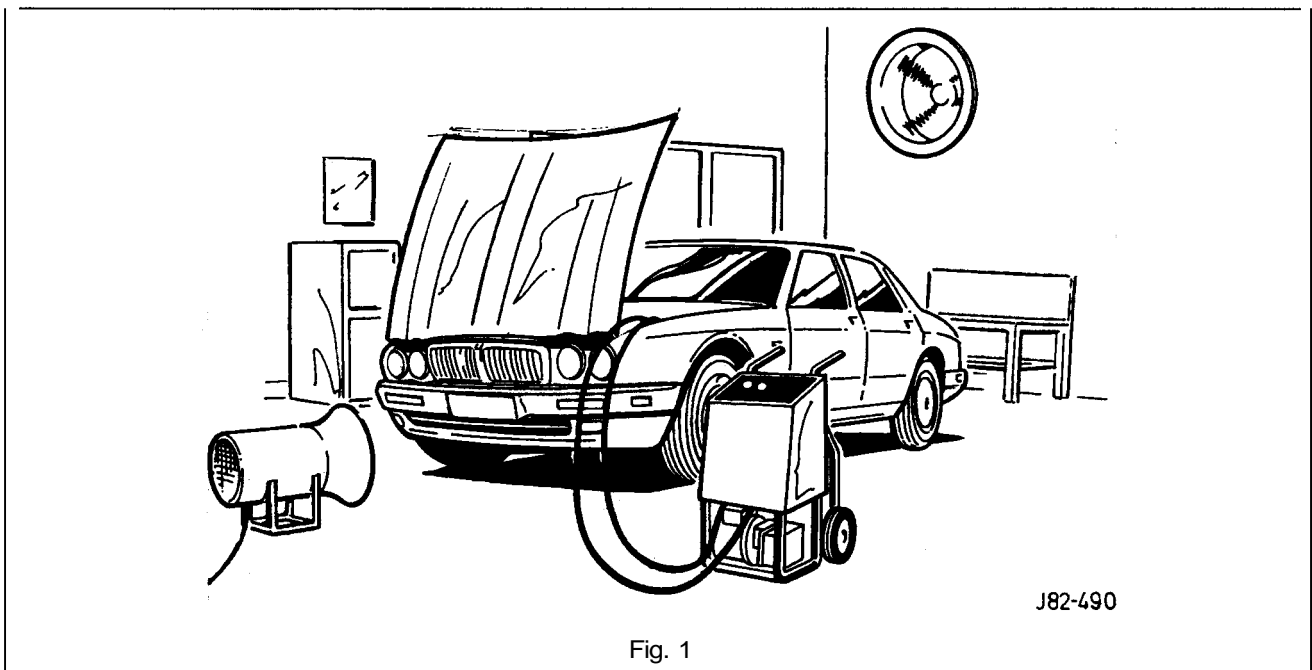
WARNING: UNDER NO CIRCUMSTANCES SHOULD THE CONNECTIONS BE MADE WITH THE SYSTEM IN OPERATION OR THE VALVES OPEN. SHOULD THE VALVES BE OPEN AND A VACUUM PUMP OR REFRIGERANT CONTAINER ATTACHED, AN EXPLOSION COULD OCCUR AS A RESULT OF HIGH PRESSURE REFRIGERANT BEING FORCED BACK INTO THE VACUUM PUMP OR CONTAINER.

14.13.3 Stabilizing the System

Accurate test gauge data will only be attained if the system temperatures and pressures are stabilized.

Ensure that equipment and hoses cannot come into contact with engine moving parts or sources of heat. It is recommended that a free standing air mover is placed in front of the vehicle to provide air flow through the condenser / cooling system, see illustration below.

Start the engine, allow it to attain normal working temperature and set at fast idle (typically 1200 to 1500rpm). Select full air conditioning performance. With all temperatures and pressures stable, or displaying symptoms of faults; begin relevant test procedures.





14.14 PRESSURE/ TEMPERATURE GRAPH, HIGH SIDE/AMBIENT TEMPERATURE

(To obtain lbf / in² from bar, multiply the figure by 14.5)

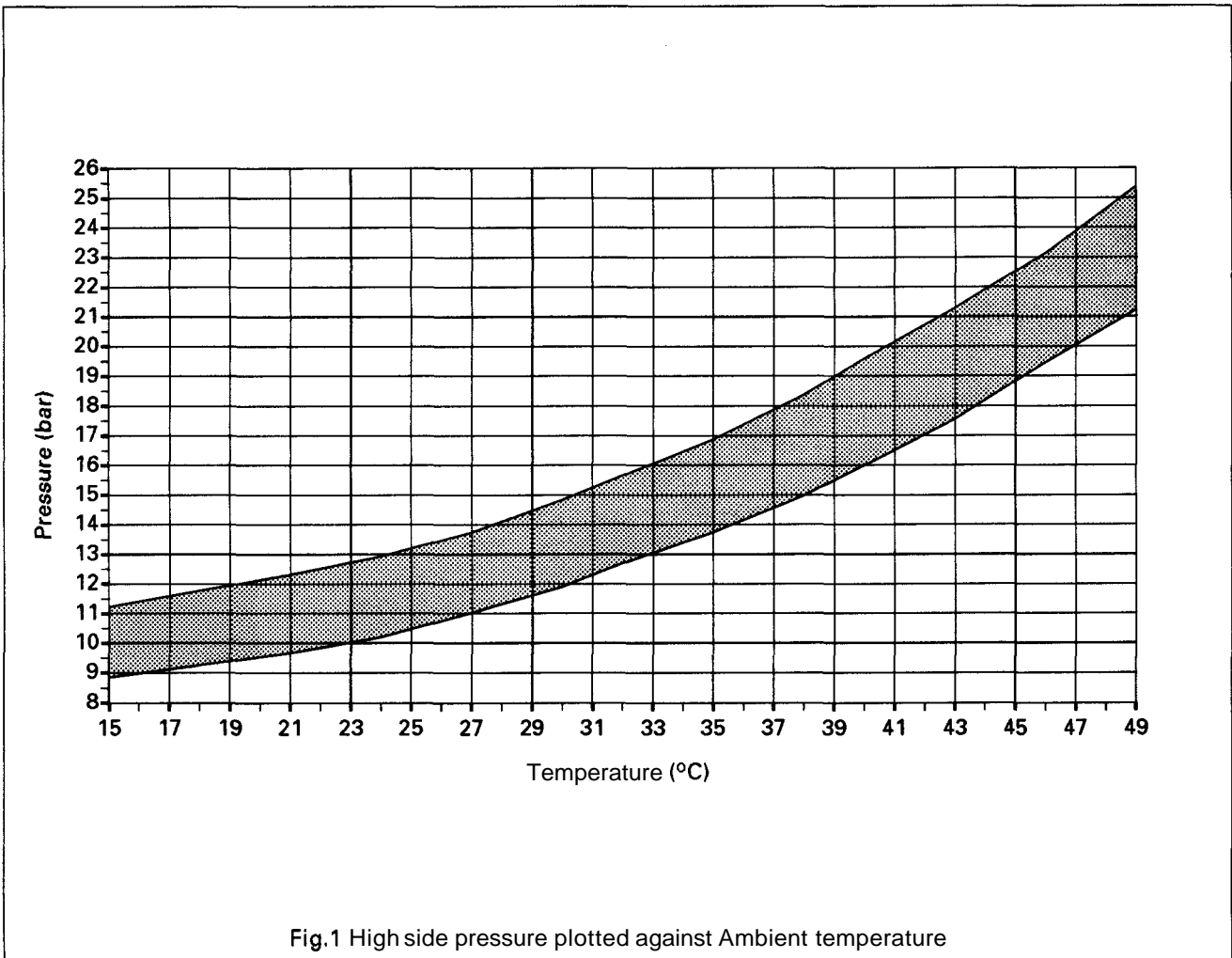


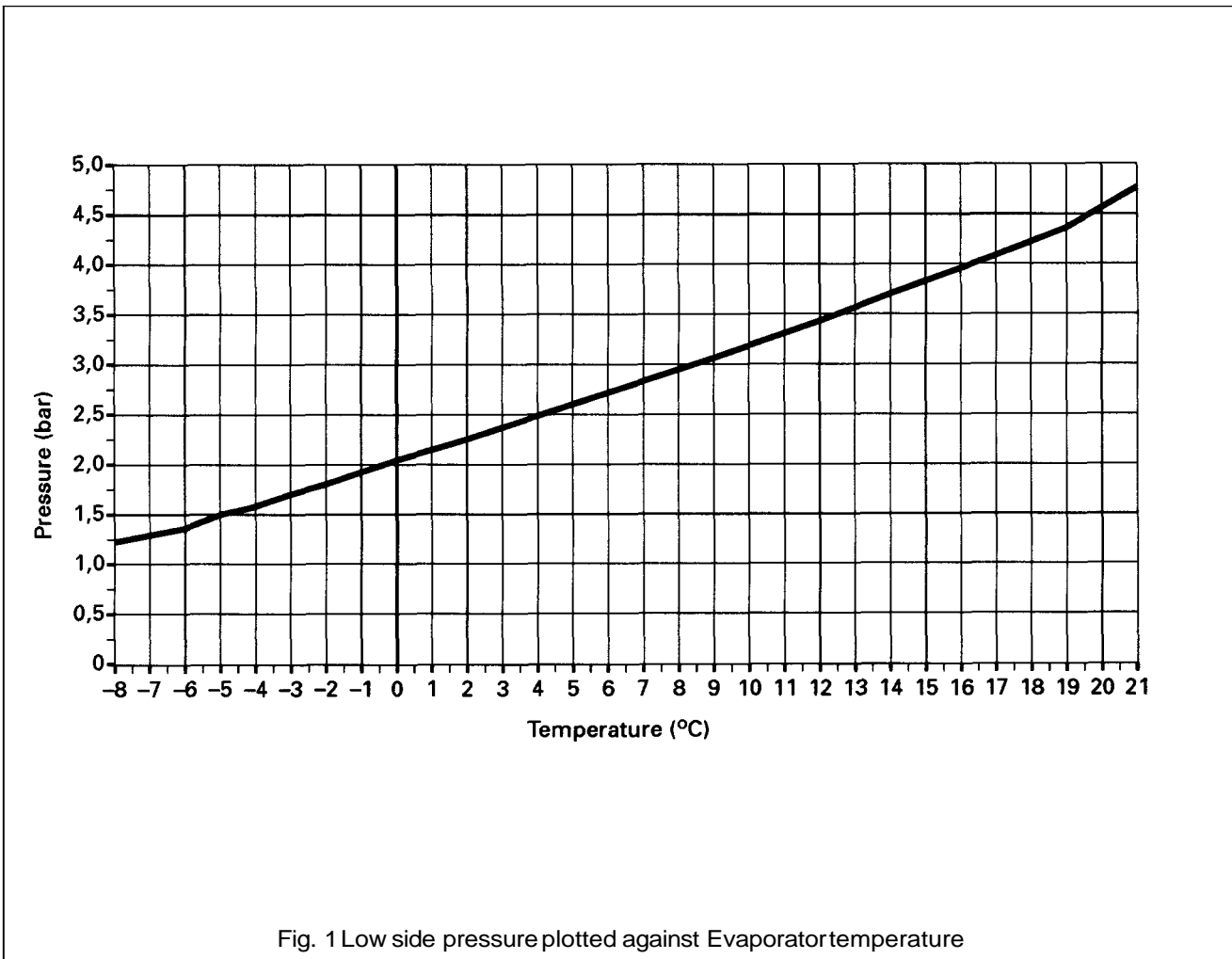
Fig.1 High side pressure plotted against Ambient temperature

Probable causes of faults may be found by comparing actual system pressures, registered on your manifold gauge set or recovery / recharge / recycle station, and the pressure to temperature relationship graph for 'high side' pressures plotted in Fig. 1. The chart in Sub-Section 4.16 shows the interpretation that may be made by this difference. The 'Normal' condition is that which is relevant to the prevailing ambient temperature.



14.15 PRESSURE/ TEMPERATURE GRAPH, LOW SIDE/EVAPORATOR TEMPERATURE

(To obtain lbf/ in² from bar, multiply the figure by 14.5)



Probable causes of faults may be found by comparing actual system pressures, registered on your manifold gauge set or recovery/ recharge/ recycle station, and the pressure to temperature relationship graph for 'low side' pressures plotted in Fig. 1. The chart in Sub-Section 14.16 shows the interpretation that may be made by this difference. The 'Normal' condition is that which is relevant to the prevailing evaporator temperature.

Note: The system controls will prevent the evaporator temperature from falling below 0°C. The graph is typical of HFC 134A

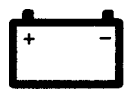


14.16 SYSTEM PRESSURE FAULT CLASSIFICATION

This table should be used in conjunction with the graphical representations of 'High side' pressure/ ambient temperature and 'Low side' pressure/ evaporator temperature, this section.

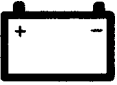
| Low Side Gauge | High Side Gauge | Fault | Cause |
|----------------|-----------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Normal | Normal | Discharge air initially cool then warms up | Moisture in system |
| Normal to low | Normal | As above | As above |
| Low | Low | Discharge air slightly cool | HFC 134A charge low |
| Low | Low | Discharge air warm | HFC 134A charge very low |
| Low | Low | Discharge air slightly cool or frost build up at expansion valve | Expansion valve stuck closed |
| Low | Low | Discharge air slightly cool, sweating or frost after point of restriction | Restriction in High side of system |
| High | Low | Compressor noisy | Defective compressor reed valve |
| High | High | Discharge air warm and high side pipes hot | HFC 134A charge high or inefficient condenser cooling due to air flow blockage or engine cooling fans not working |
| High | High | Discharge air warm Sweating or frost at evaporator | Expansion valve stuck open |

Note: If erratic or unusual gauge movements occur, check the equipment against a known (calibrated) manifold gauge set.



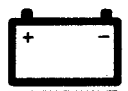
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111. SERVICE MATERIALS

| Description | Uses | Notes |
|--------------|------|-------|
| to be issued | | |



15.1 SUPPLEMENTAL RESTRAINT SYSTEMS (SRS)

15.1.1 SRS Airbags, General Description

One airbag assembly is fitted on the passenger side into an aperture of the fascia (see Fig. 1) and the second assembly is fitted to the steering wheel (see Fig. 1, next page).

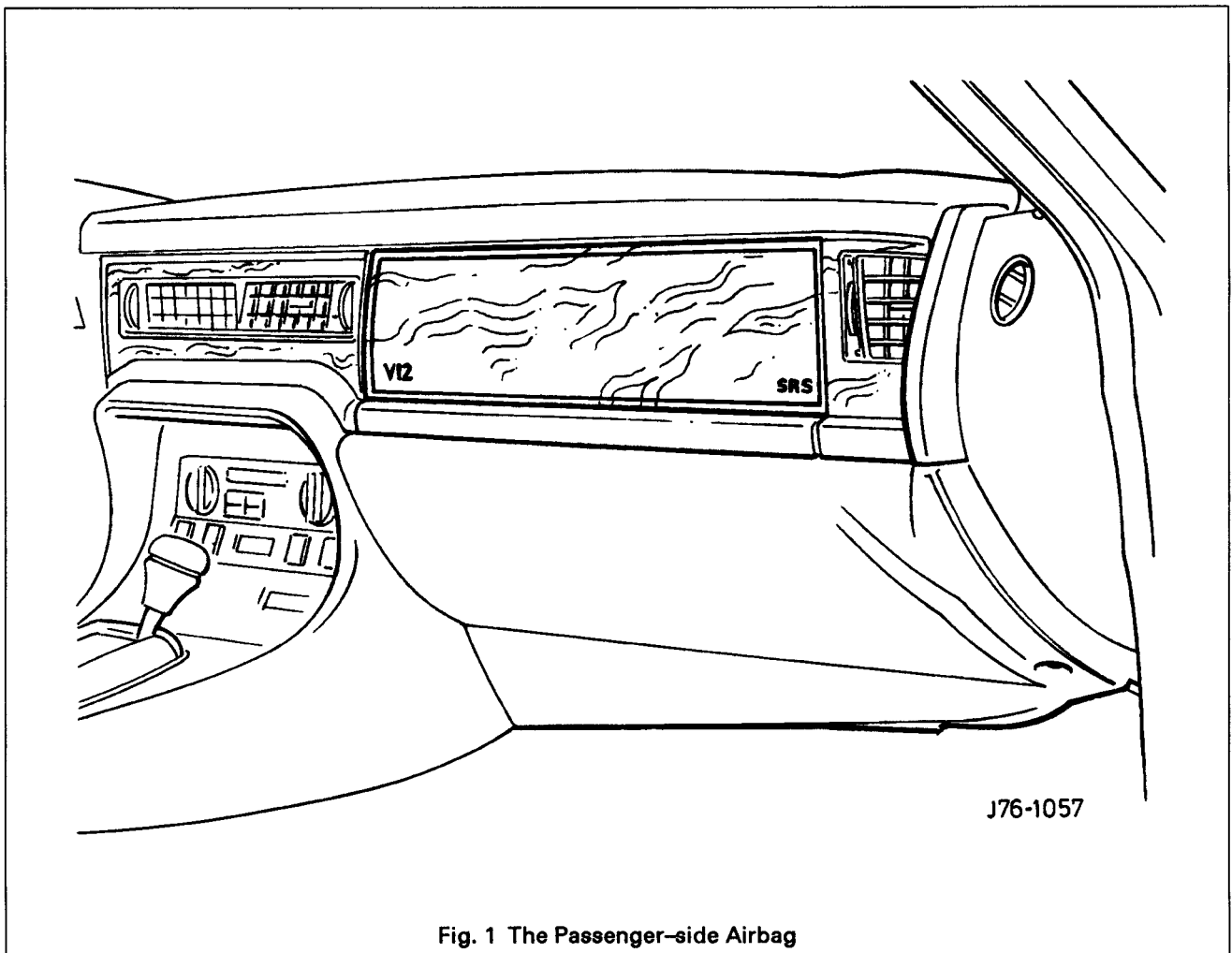


Fig. 1 The Passenger-side Airbag

The following procedures and precautions must be adhered to while handling, installing and testing airbag modules. Failure to adhere to these procedures could cause the airbag to inadvertently deploy, with the potential of personal injury.

The procedures and precautionary guidelines conform to the 'Handling & Storage - The Explosives Act of 1875 & 1923' and to the 'Health & Safety at work Act' of 1974, or local guidelines as appropriate.



15.1.2 Handling *Undeployed Modules*

The electrically-activated airbag module contains sodium azide and sodium nitrate which are poisonous and extremely flammable substances.

Their contact with acid, water or heavy metals may produce harmful and irritating gases or combustible compounds. The airbag module is **non-serviceable** and must not be dismantled, punctured, incinerated or welded.

WARNING: DO NOT ATTEMPT ANY REPAIRS TO THE AIRBAG MODULE.

Never measure the resistance of the airbag module, as this may cause the airbag to deploy. Suspect modules **must** be returned to Jaguar Cars Ltd. or their importer for replacement.

Tampering or mishandling can result in personal injury.

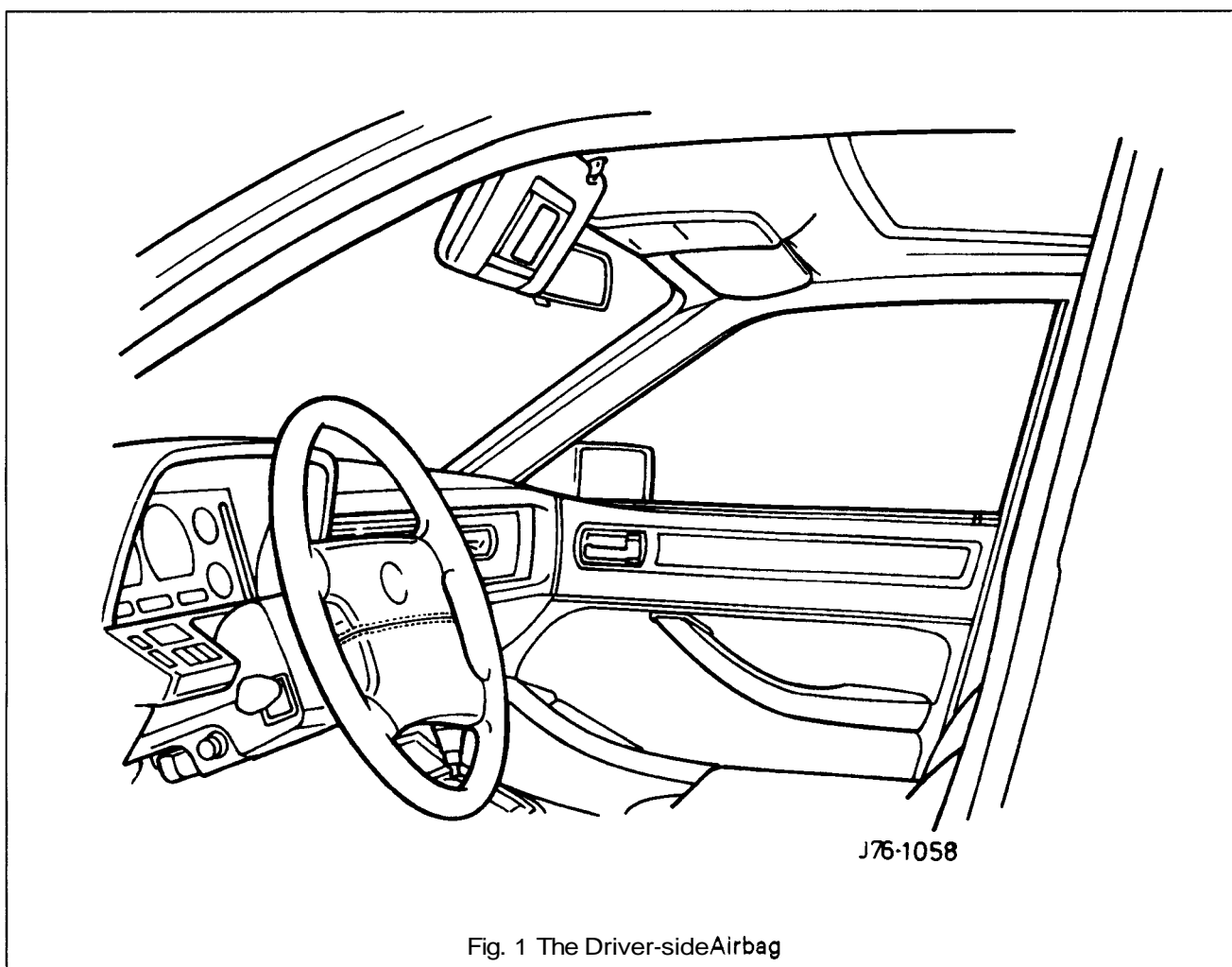
Keep away from heat, sparks and open flames. Do not store at temperatures exceeding 93° Celsius (200°F).

Keep away from electrical equipment as electrical contact may cause ignition.

Do not drop or impact airbag module.

Always position module 'cover-up'.

Ensure that the connector is protected to prevent damage.



Store modules in a secure lockable cabinet.

Never position projectile material over the undeployed airbag as this can cause injury in the event of inadvertent deployment.



Do not wrap arms around module when carrying and always carry module with cover and vents facing away from body to avoid personal injury in the event of inadvertent deployment.

Never carry airbag module by wires or the connector.

The chemical propellant mixture deploying the airbag is a solid and therefore inhalation exposure is unlikely even if module is ruptured without deployment.

As far as practicable, avoid skin contact with, or ingestion of, the materials present after combustion. Exposure to high concentrations of propellant mixture may cause headache, nausea, blurred vision, faintness, cyanosis, lowering of blood pressure, tachycardia and shortness of breath.

WARNING: SODIUM AZIDE HAS BEEN LISTED AS AN 'EXTRAORDINARY HAZARDOUS SUBSTANCE OR CARCINOGEN BY THE STATE OF MASSACHUSETTS, USA. SODIUM AZIDE HAS BEEN LISTED ON THE 'RIGHT TO KNOW HAZARDOUS SUBSTANCE LIST' BY THE STATE OF NEW JERSEY AND IS ALSO REGARDED AS A 'SPECIAL HEALTH HAZARD SUBSTANCE BY THE STATE. THE PROPELLANT MIXTURE IS SENSITIVE TO PREMATURE IGNITION BY ELECTRICAL SOURCES IF NOT PROPERLY PROTECTED AND ISOLATED.

15.1.3 *Emergency First Aid Procedures*

If the airbag is ruptured without deployment and exposure to the propellant mixture occurs, observe the following first-aid treatments:

- Ingestion – Do not induce vomiting and seek prompt medical attention.
- Skin contact – Immediately wash skin with soap and water and seek medical attention.
- Eyes – Immediately flush eyes with water for at least 20 minutes and seek prompt medical attention.
- Inhalation – Immediately move victim to fresh air and seek medical attention.
- Physical trauma, eg burns, abrasions, or impact due to premature ignition or deployment of the inflator assembly – Treat symptomatically and seek prompt medical attention.

15.1.4 *Safety Procedures For Handling Deployed (Fired) Modules*

See 'Emergency First Aid Procedures' above.

Prevent contact of the inflator with liquids, combustibles and flammable materials. Failure to follow these instructions could result in chemical burns and personal injury.

Ensure modules are cool before handling.

After deployment the airbag surface contains small deposits of sodium hydroxide which can cause irritation to the skin and eyes.

When handling deployed airbags, always wear rubber gloves to BS 1651 grade 2 or equivalent, and chemical resistant goggles to BS 2092 grade 2 or equivalent.

After handling deployed airbags, immediately wash hands and exposed skin surface areas with mild soap and water.

15.1.5 *Safety Procedures For Handling Undeployed Damaged Modules*

The material inside the module is hermetically sealed and is completely consumed during deployment.

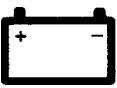
No attempt should be made to open the module as this leads to a risk of exposure to sodium azide.

In the unlikely event of a gas generator being damaged, it must be examined by trained personnel before any attempt is made to remove and/or deploy.

Full protective clothing must be worn when dealing with any spillage.

Ruptured units must be stored away from acids, halogens, heavy metals and metal salts. Damaged units may produce hydrazoic acid if exposed to liquids.

Failure to comply with these instructions may result in fire, noxious fumes and severe personal injury or death.



15.1.6 Fire Hazard Information

Thermal decomposition or combustion may produce dense smoke and other dangerous fumes which in fire situations form a highly toxic explosive.

In the event of fire the surrounding area must be evacuated and all personnel kept well upwind of the area.

Full fire fighting protective gear and a self contained breathing apparatus operating in the positive pressure mode must be worn for combating fire. Material near fires must be cooled with water spray to prevent ignition.

Fires should be allowed to burn themselves out if not threatening to life or property. If fire is threatening to life or property use copious quantities of water to extinguish.

15.1.7 Ventilation

Local exhaust ventilation designed by a professional engineer should be provided if vapours, fumes, or dusts are generated whilst working with airbag module.

The latest issue of the manual for recommended practices on 'Industrial Ventilation' is available from the ACGIH Committee on Industrial Ventilation, PO Box 16153, Lansing, MI 48910, USA.

The need for local exhaust ventilation should be evaluated by a professional industrial hygienist.

15.1.8 Respiratory Precautions

To prevent the inhalation of dangerous fumes and dusts, an approved mask should be worn.

15.1.9 Eye Protection

Chemical protective goggles are recommended where there is a possibility of eye contact with the propellant.

Safety glasses with side shields are recommended for all other operations.

15.1.10 Protective Clothing

Approved protective gloves, overalls and shoes / boots should be worn.

15.1.11 Handling and Storage Precautions

Do not store airbag module near live electrical equipment or circuitry. Store in a dry environment at ambient temperatures.

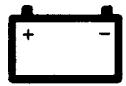
Good housekeeping and engineering practices should be employed to prevent the generation and accumulation of dusts. Store in compliance with all local state and federal regulations.

15.1.12 Driver And Passenger Airbag Modules Assembly / Removal / Service Instructions

Note: Before starting work, ensure ignition switch is in 'lock' position, key is removed and negative terminal cable is disconnected from the battery.

As the airbag is equipped with a back up power source and due to the risk of airbag being inadvertently deployed, wait one minute or longer before starting work.

- Disconnecting the battery cancels the memory for clock, radio, seats, mirrors, steering column and any other components using battery power. Reset memory after work is completed.
- Never use airbags from other vehicles, always use new parts.
- After work is completed, reconnect battery and perform warning light check see diagnostic manual.
- Never use electrical probes to check voltage or electrical resistance.
- Disconnect the airbag before carrying out any work on, or in the vicinity of module, or when using electric welding equipment.
- Always ensure that battery negative has been disconnected for one minute or longer before commencing any removal procedure.



15.1.13 Spillage and Leakage

If material is spilled or released, contact Jaguar Service for clean up procedures. All other personnel must be kept away from contaminated area.

Do not dispose contaminated propellant or water into storm or sanitary sewers, ground water or soil.

Spills may be reportable to local state, and/or federal authorities.

Materials should be disposed of by incineration or chemical oxidation under carefully controlled conditions by specially trained individuals in accordance with local State and Federal regulations.

15.1.14 Scrapping Vehicles With Live Airbag(s)

When scrapping a vehicle with a live airbag, first deploy the airbag in accordance with following procedures. This procedure assumes airbag wiring is undamaged.

See Handling/ Safety information.

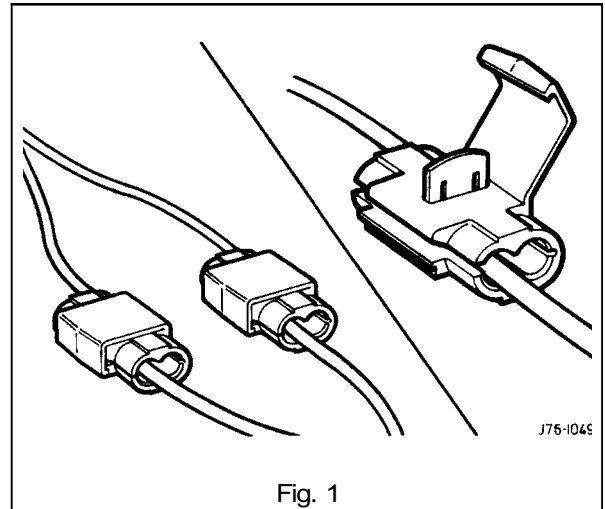
If the airbag is to be removed see Airbag Modules Assembly/ Removal/Service Instructions.

Equipment required: Insulation Displacement Connectors (IDC) (Scotchlocks) (two-off), battery, two-off ten meter lengths of 1mm² wire fitted with crocodile clips at one end. (See Fig. 1).

WARNING: THE DEPLOYMENT PROCEDURE SHOULD BE PERFORMED OUTDOORS AWAY FROM OTHER PERSONNEL.

Remove any loose debris from around airbag and ensure no flammable liquids are present.

Disconnect the vehicle battery.



Link harness connection & deployment method

WARNING: ALWAYS CONNECT TO AIRBAG FIRST, AS THE BAG WILL DEPLOY IMMEDIATELY ON CONNECTION TO THE BATTERY.

- Remove passenger side and driver side under-scuttles / knee bolster.
- Disconnect the airbag connector under the facia.
- Look for the yellow harness connectors and cut the wires originating from the airbag just above the mating plug.

Note: The harness connected between the driver's airbag and the yellow connector has one red/purple feed wire and one pink/brown return wire.
The harness connected between the passenger's airbag and the yellow connector has two red/purple feed wires and one pink/purple return wire.

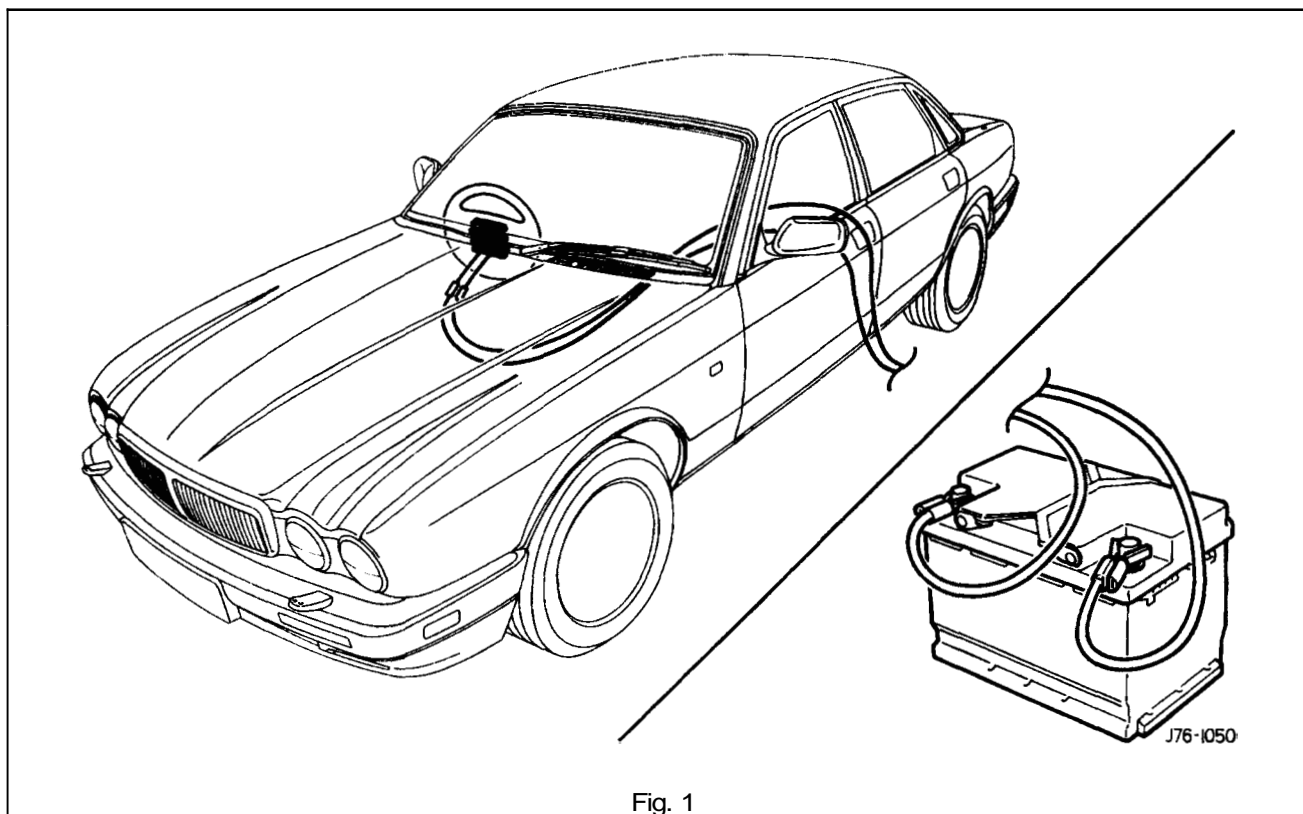
- Pass a 10 meter (33ft) link harness containing two 1mm² wires through the window aperture, and connect using an Insulation Displacement Connector (IDC) and two crocodile clips, to the airbag wires.
- Close all doors, leave window with lead open.
- Ensure no personnel are in the car or in the area around the car.
- Move back 10 meters (33ft) and connect harness crocodile clips to battery: the airbag will immediately deploy.
- Allow the unit to cool for at least 20 minutes. Cooling modules should be continuously monitored to ensure heat generated does not create a fire with spilled liquids or other debris.

(continued next page)



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- The vehicle is now to be scrapped in normal manner with module installed.



- In the event of any problems or queries, contact Jaguar Cars Ltd. or the importer.

15.1.15 Scrapping Vehicles With Deployed Airbag(s)

- Verify that all installed airbags have been deployed or removed.
- In the event of one airbag being deployed and one not deployed, it must be assumed that the undeployed airbag is still live, therefore it must first be deployed.
- The vehicle is now to be scrapped in a normal manner.

15.1.16 Disposal of Live Airbag Modules

Note: Modules removed/renewed by Jaguar Service are to be returned to the importer for deployment and disposal.

CAUTION: Never use a customer's vehicle to deploy airbags.

Equipment required: Deployment Cage, IDC link harness (see 15.1.14 for details of components required), Battery, Safety Goggles to BS 2092 grade 2 or equivalent, Rubber Gloves to PREN 374 class 2 or equivalent, Ear Protector to BS EN 24869 or equivalent, Particulate Respirator to EN 149 grade FFP 25 or equivalent.

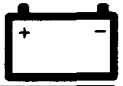
The deployment procedure should be performed outdoors away from other personnel.

Remove any loose debris from around airbag and ensure no flammable liquids are present.

Assemble the disposal cabinet as shown in Fig. 1 in line with the following procedures:

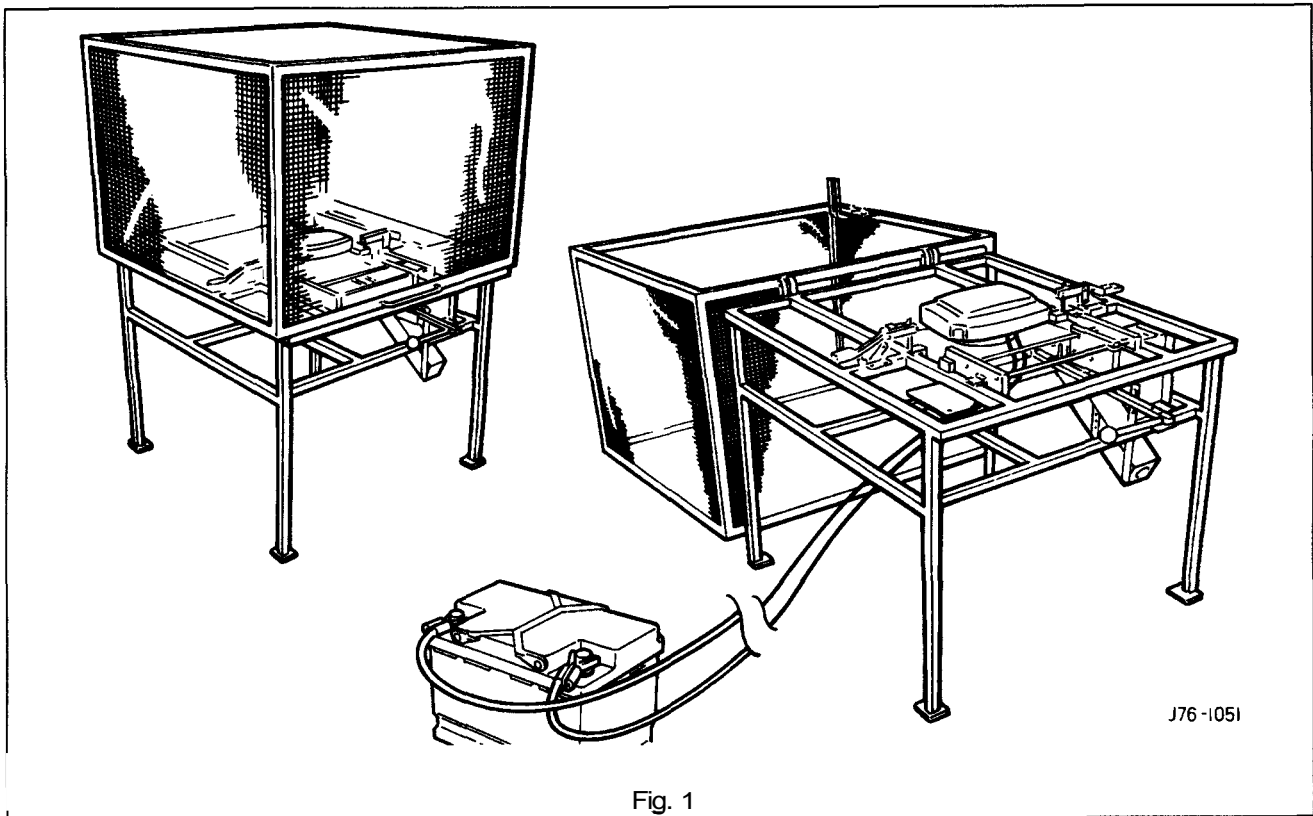
- Remove mesh guard from rig frame.
- Attach guard to frame by bolting hinges to the frame.

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- Ensure relevant plate is fitted and rotate into position.



- Fit and secure airbag module on to plate.
- Clamp plate down using the two toggle clamps.

WARNING: ALWAYS CONNECT TO AIRBAG FIRST, AS THE BAG WILL DEPLOY IMMEDIATELY ON CONNECTION TO THE BATTERY.

Note: The harness connected between the driver's airbag and the yellow connector has one red/purple feed wire and one pink/brown return wire.
The harness connected between the passenger's airbag and the yellow connector has two red/purple feed wires and one pink/purple return wire.

- Connect the 10 meter (33ft) link harness to the airbag wires.
- Ensure that no personnel are in the vicinity of the cabinet.
- Move back 10 meters (33ft) and connect the link harness crocodile clips to the battery; the airbag will immediately deploy.
- Allow the unit to cool for at least 20 minutes.
- Open guard and remove deployed module.
- Seal deployed module in plastic bag ready for disposal.
- In the event of any problems or queries, contact Jaguar Cars Ltd. or the importer.

15.1.17 Disposal Of Deployed Airbag Modules

Deployed airbag modules are to be disposed of as special waste and must comply with local environmental requirements. If in any doubt contact local authority for disposal instructions.

Note: The storage, transportation, disposal and/or recycling of airbag module components must be performed in accordance with all applicable federal, state and local regulations including, but not limited to, those governing building and fire codes, environmental protection, occupational health and safety and transportation. Modules removed and deployed by Jaguar Service are to be returned to the importer for disposal.



15.2 INSTRUMENTS

15.2.1 General Description

The instruments measure, monitor and display data relevant to the vehicle's performance. Data is received from sensors positioned at various locations around the vehicle via two multi-pin sockets located at the rear of the instrument panel and is then presented using three different visual display methods described as follows:

15.2.2 Analog Display

This is used to display road speed, engine speed, oil pressure, battery condition, fuel level and coolant temperature.

15.2.3 Indicator Lamps

These indicate the presence of any hazard/ fault conditions or operational actions.

15.2.4 LCD (Liquid Crystal Display)

This single line, six digit seven segment display is normally used to display the odometer reading but can also be used to display vehicle condition messages associated with particular warning lamps and trip computer information.

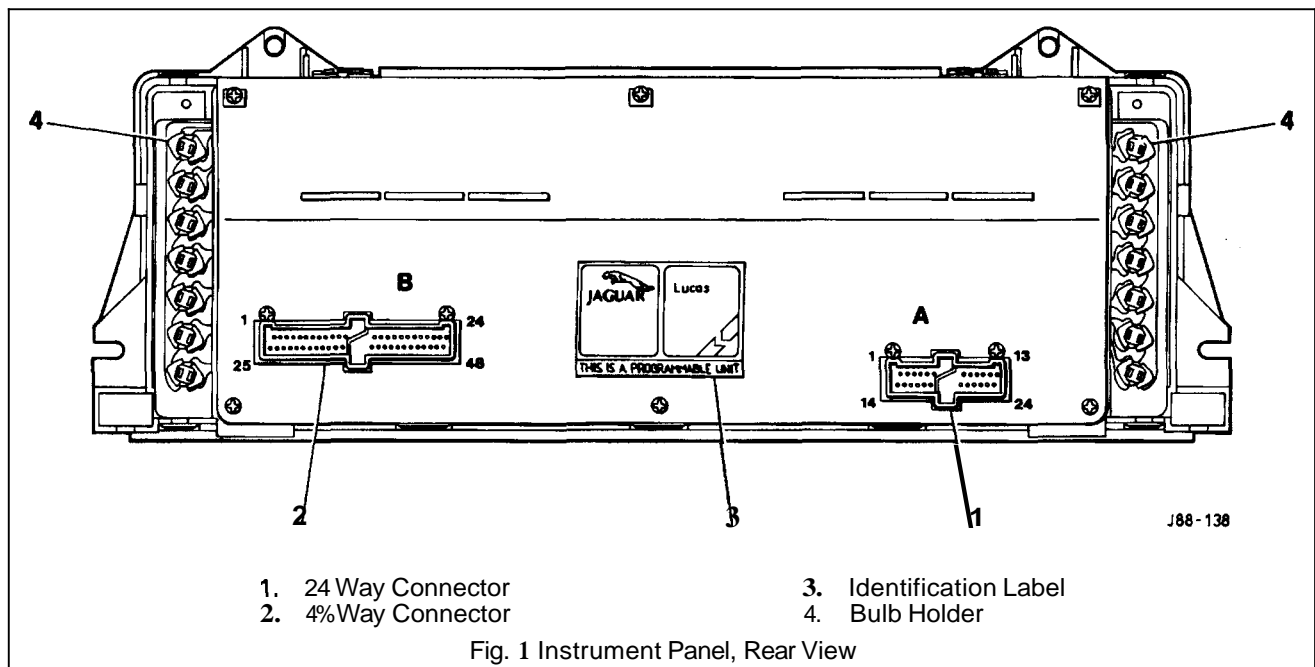
15.2.5 Transducers

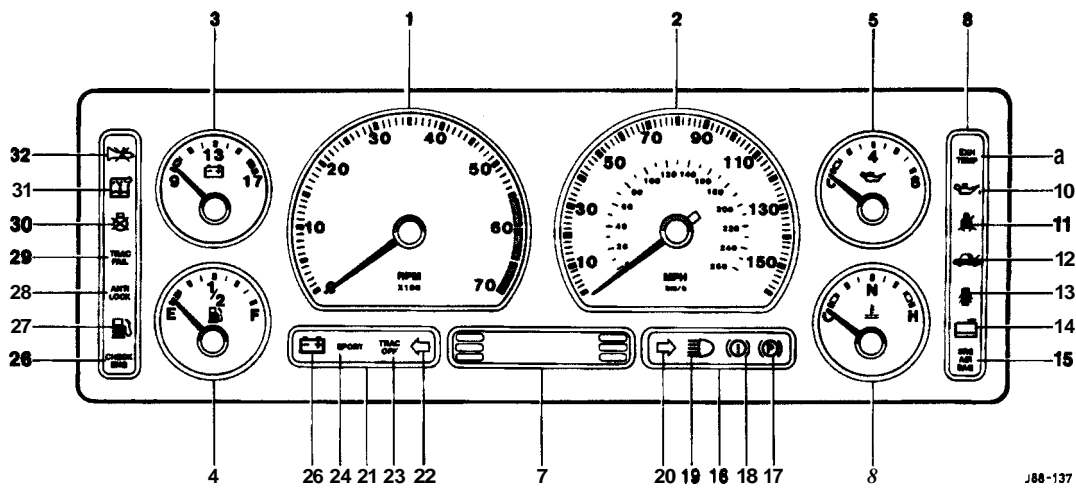
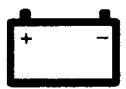
These devices listed as follows transmit vehicle condition to the instruments:

- Engine Coolant Temperature Transmitter
- Low Coolant Level Probe
- Oil Pressure Transmitter - AJ16/V12
- Fuel Gauge Tank Unit - AJ16/V12

Note: Fault conditions and their causes displayed by the instruments and warning lamps are covered in more detail by further information contained within the Electrical Diagnostic Manual.

15.2.6 Instrument Panel, General





- | | |
|-------------------------------------|-----------------------------------------|
| 1. Tachometer | 17. Hand Brake On (RED) |
| 2. Speedometer | 18. Brake System Fault (RED) |
| 3. Battery Condition | 19. Main Beam On (BLUE) |
| 4. Fuel Gauge | 20. Direction Indicator Right (GREEN) |
| 5. Oil Pressure | 21. Status / Warning Lamps |
| 6. Coolant Temperature | 22. Direction Indicator Left (GREEN) |
| 7. Odometer / Trip Computer Display | 23. Traction Control Off (GREEN) |
| 8. Primary Warning Indicators (RED) | 24. Transmission Sport Mode (GREEN) |
| 9. Exhaust Temperature | 25. Charging Fault (RED) |
| 10. Low Oil Pressure | 26. Check Engine (AMBER) |
| 11. Seat Belt Not Fastened | 27. Low Fuel Level (AMBER) |
| 12. Boot Open | 28. Anti - Lock Fault (AMBER) |
| 13. Door Open | 29. Traction Control Fail (AMBER) |
| 14. Coolant Level | 30. Bulb Fail (AMBER) |
| 15. Air Bag Fault | 31. Washer Fluid Level (AMBER) |
| 16. Status / Warning Lamps | 32. Transmission Fault (AMBER) |

Fig. 1 Instrument Panel, Front Mew

Note: The 'Premium Unleaded Fuel Only' caution is added to the Federal Market vehicles, also 'PARK BRAKE' and 'BRAKE' replace international symbols used in all other markets.

Note: Six cylinder vehicle version shown; the tachometer red-line on 12 cylinder vehicles starts at 6000 RPM.

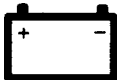
The front of the PECUS-programmable instrument panel features 6 analog gauges, 22 warning lamps / tell tales and a Liquid Crystal Display (LCD), the rear of the panel accommodates two PCB mounted connectors, one 24-way connector, one 48-way connector, one instrument panel identification label and 14 light bulbs arranged in groups of seven on either side. Three power inputs and two ground inputs are provided for 'POWER UP' and 'POWER DOWN' sequence, the three power inputs comprising battery, ignition and auxiliary. The instruments are protected by a housing / lens assembly.

1527 Gauges

The two major gauges are tachometer and speedometer, and the four minor gauges indicate battery condition, fuel level, oil pressure and coolant temperature.

Each gauge is contained in a sealed non-serviceable can and must be renewed as a complete unit in case of any damage.

CAUTION: Extreme care should be exercised when renewing instrument panel components to avoid damage to the delicate indicator needles.



15.2.8 Odometer

With the ignition 'OFF' the odometer is permanently displayed but not illuminated. With the ignition 'ON' the odometer is displayed and also illuminated.

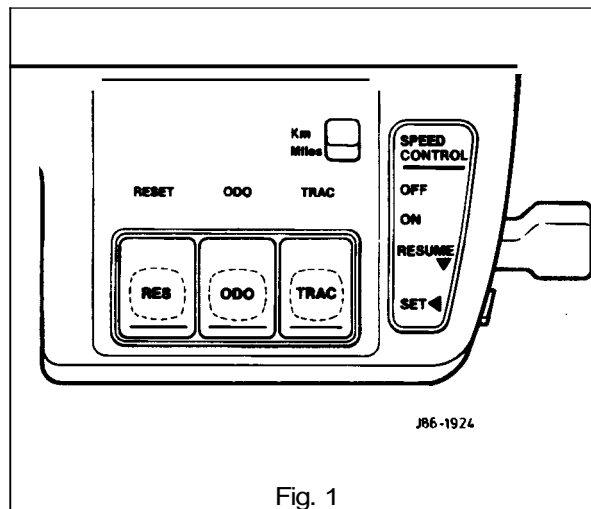
Trip information or driver information messages may be displayed instead of the 'ODO'. By pressing the 'ODO' button once or twice the trip and driver information messages can be deleted and the 'ODO' re-displayed.

Note: The odometer value is not stored within the LCD module.

15.2.9 Trip Computer

This provides information on the vehicle's speed, fuel usage and distance traveled all of which are calculated by a micro processor.

The controls, part of the fascia switch assembly, are located on the right-hand side pod positioned to the right-hand side of the steering column.



15.2.10 Driver Information Messages

Two fault messages, FLUID - AIRBAG are displayed via the LCD in conjunction with relevant warning lamps.

If an airbag fault exists or the brake fluid is low, a message will automatically be displayed on the LCD and the relevant warning lights illuminated. Should both faults exist at the same time, each message is displayed alternatively for approximately 2 seconds.

Messages may be cancelled by pressing the 'ODO' button which allows the LCD to return to its last displayed message. The warning lamps will not be extinguished. If the fault is not repaired the message(s) and the warning lamp(s) will be re-displayed when the ignition is switched on.

15.2.11 Illumination

Warning indicator lamp illumination is controlled by a microprocessor located inside the instrument panel.

The seven right-hand warning indicators are primary warning lamps illuminating 'RED' and the seven left-hand warning indicators are secondary warning lamps illuminating 'AMBER'

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

With the ignition 'OFF' the LCD is not illuminated.

With ignition 'ON' and side lights 'OFF' the LCD is illuminated at maximum brightness.

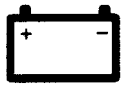
With the ignition on and side lights 'OFF' the LCD is dimmed as are the gauges.

The long life type bulbs are enclosed by orange and brown coloured bulb holders which must never be interchanged. Replacement bulbs must always be of the same colour.

CAUTION: Always disconnect the battery ground lead before commencing with any instrument renewal procedure.

15.2.12 General Repair Notes

- After lens removal do not rest instrument panel face down as this causes damage to the delicate gauge needles. Avoid scratching the gauge faces and ensure cleanliness when handling the panel.
- To minimize the risk of damage and contamination to the instrument panel, all repairs must be carried out in a non - static and dust - free environment. Avoid touching connector pins and pcb components to minimize risk of static damage.
- The instrument panel has two different types of bulb holders each of which must be located correctly when changing the bulbs.



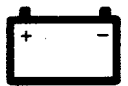
15.3 *SPEED CONTROL*

Information to be issued with Amendment 1



15.4 *DRIVER ERGONOMICS*

Information to be issued with Amendment 1

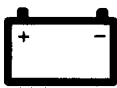


| | UK Market | Rest of World |
|---------------------------|--------------------|----------------------|
| Battery Capacity | 72A / 20hr | 92A / 20hr |
| Rapid discharge current | 590A at -18°C | 700A at -18°C |
| Rapid discharge voltage | 7.5V at -18°C | 7.5V at -18°C |
| Reserve capacity duration | 25A at 135 minutes | 25A at 170 minutes |

| | | | | | |
|---------------------------------------------------------------|--------|--------|--------|--------|--------|
| Open circuit voltage | 12.70V | 12.37V | 12.11V | 11.74V | 11.30V |
| Specific gravity voltage (temperature compensated hydrometer) | 1.280 | 1.225 | 1.180 | 1.120 | 1.050 |
| % Charged | 100 | 75 | 50 | 25 | 0 |

| Battery Condition | | Charge Rates | |
|-------------------------------------------------|-------------------|----------------------------|-------------------------|
| Specific gravity (temp. compensated hydrometer) | State of charge | Maximum charge rate/ times | Slow charge rate/ times |
| 1.180 to 1.225 | 50% to 75% | 20A/120 min. | 5A/ 240 min. |
| 1.120 to 1.180 | 25% to 50% | 30A/120 min. | 10A/ 240 min. |
| 1.050 to 1.120 | 0 to 20% | 40A/120 min. | 15A/ 240 min. |

| Test Load | Electrolyte Temperature (°C) | Min. Voltage Under 15sec. Load |
|-----------------------------------------------------|-------------------------------------|---------------------------------------|
| Load to half battery cold cranking amps (UK): 295A | 21.11 | 9.6V |
| | 15.55 | 9.5V |
| Load to half battery cold cranking amps (ROW): 295A | 10.00 | 9.4V |
| | 4.44 | 9.3V |
| | -1.11 | 9.1V |
| | -6.66 | 8.9V |
| | -12.22 | 8.7V |
| | -17.77 | 8.5V |



15.5.8 Specific Gravity Test

The specific gravity of the electrolyte determines the level of the float in the liquid. With the float in a high position the specific gravity is high and when the specific gravity is low the float sinks to the lower position.

Using a hydrometer the specific gravity readings are taken when the liquid level crosses the scale on float. This should give a **accurate** indication of the state charge of the battery.

The volume and the specific gravity of the electrolyte varies with the change in temperature.

15.5.9 Electrolyte Temperature Correction

For every 10°C below 15°C subtract 0.007 from the hydrometer reading, and for every 10°C above 15°C add 0.007 to the hydrometer reading.

Note: Use only distilled water for topping up electrolyte. The electrolyte must not exceed 51.66°C during charging. If after 30 minutes charging the battery current is not equal or greater than 3A, dispose of the battery.

15.5.10 Health and Safety Precautions

As batteries contain sulphuric acid and explosive mixtures of hydrogen and oxygen gases, it is strongly recommended that protective clothing is worn.

Avoid spilling acid to prevent damage to clothing and skin burns.

If **accidentally** spilled or splashed on clothing or skin, rinse with cold water. As a neutralizer, a solution of baking soda or ammonia and water may be used.

In the event of skin or eye contact rinse the affected areas with water and should this not be sufficient seek medical attention.

Any trace of acid spilled or splashed on the vehicle should be rinsed with clean water.

BEFORE AND WHILST WORKING WITH THE BATTERY BE AWARE OF THE FOLLOWING SAFETY PRECAUTIONS

- particularly during charging, highly explosive hydrogen is emitted.
- do not smoke when working near the battery.
- avoid sparks, short circuits or other sources of ignition.
- switch off current before connecting or disconnecting any electrical terminals.
- always disconnect battery ground lead first and reconnect last.
- ensure battery is charged in a well ventilated area.
- switch off the charger before disconnecting.

WARNING: WHEN PREPARING ELECTROLYTE OF A DESIRED SPECIFIC GRAVITY, ALWAYS POUR THE CONCENTRATED ACID SLOWLY INTO THE WATER AND NOT WATER INTO THE ACID. HEAT IS GENERATED WHEN MIXING ACID WITH WATER, HENCE ADD SMALL AMOUNTS OF ACID AND STIR SLOWLY INTO THE WATER. ALLOW TO COOL IF NOTICEABLE HEAT DEVELOPS. EXCEPT FOR LEAD LINED CONTAINERS, ALWAYS USE NON - METALLIC CONTAINERS AND / OR FUNNELS. DO NOT STORE ACID IN EXCESSIVELY WARM LOCATIONS OR DIRECT SUN LIGHT. FUEL VAPOUR IS EXTREMELY FLAMMABLE, HENCE GREAT CARE MUST BE TAKEN WHILST WORKING ON THE FUEL SYSTEM.



15.5.11 Battery, Remove & Refit

SRO 86.15.01

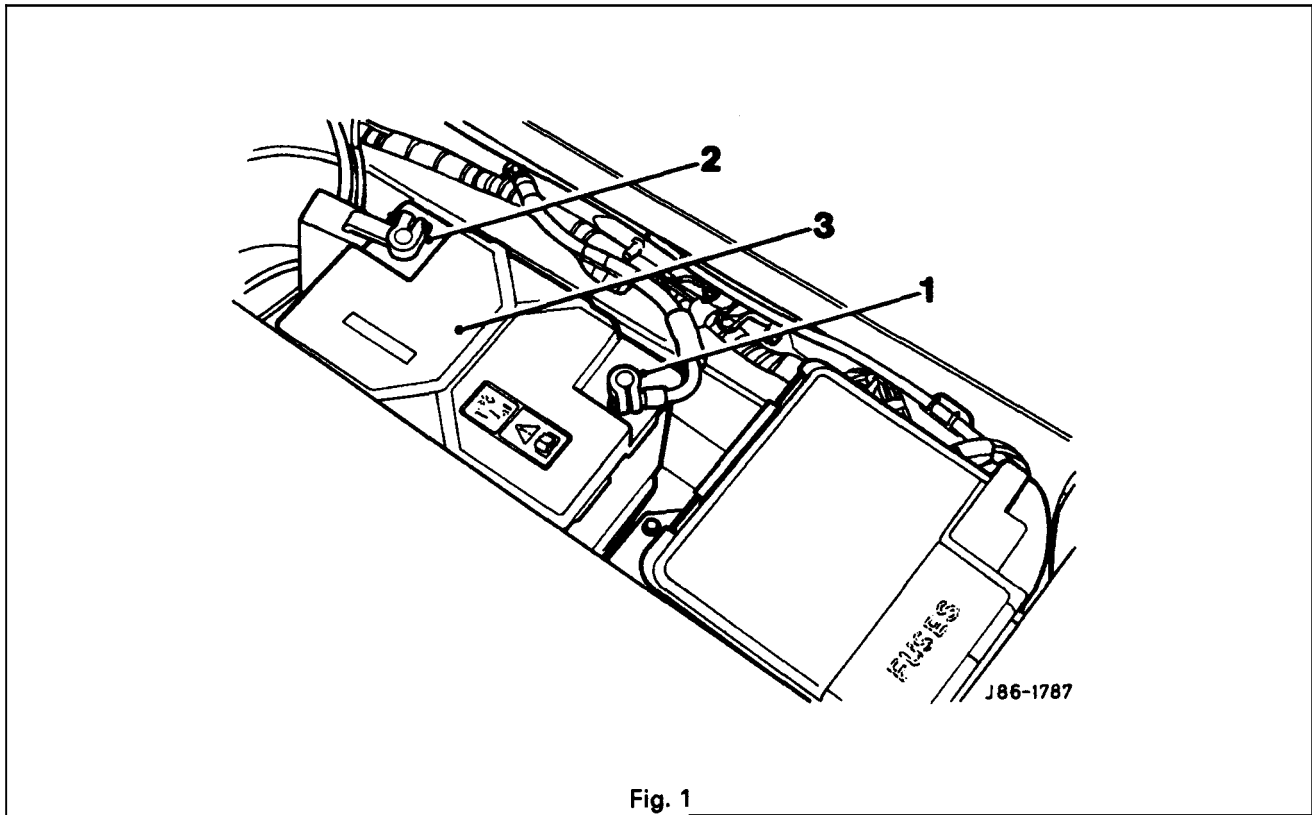


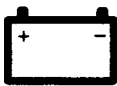
Fig. 1

Remove

- Open the trunk lid.
- Remove the battery cover.
- Disconnect and insulate the battery negative lead (1 Fig. 1).
- Disconnect and insulate the positive lead (2 Fig. 1).
- Remove the battery (3 Fig. 1).

Refit

Refitting is a reversal of the removal procedure.



15.6 POWER WASH & SCREEN WASH/ WIPE

15.6.1 Windscreen Washers & Wipers, General Description

The single windscreen wiper blade is controlled by a windscreen wiper/washer switch located on the right-hand side of the steering column switchgear (see Fig. 1).

The windscreen wiper motor, part of the wiper motor assembly operates at slow or fast speeds and drives the lever assembly, a single arm and blade via a crank.

On V12 engined vehicles the wiper motor assembly is mounted to the front of the bulkhead with the motor protruding into the plenum chamber, whilst on AJ16 engined vehicles the wiper motor assembly is mounted into the same position, but with the motor protruding into the engine compartment.

For wipe and wash operation a mixture of water and special 'Jaguar Windscreen Fluid' is drawn from the PVC reservoir assembly by two electrically controlled pumps and is then distributed via flexible feeder hoses interconnected using 'TEE' pieces to the screen wash jets and to heated power wash jets (where fitted). The ends of power wash hoses are fitted with 'quick fit' fluid connectors.

The two pumps, one for screen wash and one for headlamp power wash are externally fitted to the reservoir located at the front right-hand side of the engine compartment. Contained within the reservoirs pull-up neck is a serviceable filter.

The screen wash jets with independently adjustable eyeballs are mounted on the plenum chamber finisher and the temperature of the fluid passing through the jets is controlled from an ambient temperature sensor fitted near the inlet of the right-hand side air duct.

The fluid temperature for each of the headlamp wipe wash operation is controlled by self regulating, heated power wash jets mounted on to either side of the bumper.

Each power wash jet is protected by a cover supplied with an integral cover-to-bumper seal. The cover snap fixes into the bumper.

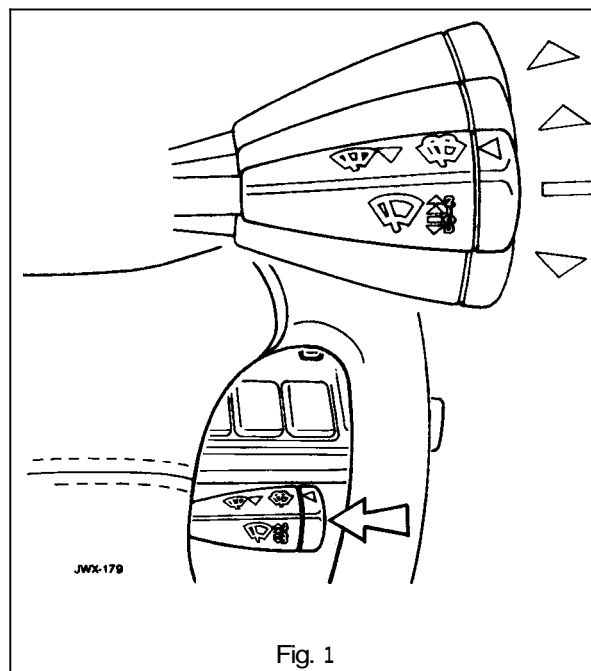


Fig. 1

15.6.2 windscreen Wiper and Washer Switch

This switch only operates with the ignition switch in position 'II' and has the following functions:

Position 0 The wind screen wiper is switched 'OFF' and parked.

Position 1: Normal speed wiper operation is obtained by pushing the switch lever up one position.

Position 2: High speed wiper operation is obtained by pushing the switch lever fully up.

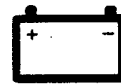
Position D: To obtain intermittent wiper operation the switch lever is pushed down and released.

The delay period will vary with vehicle speed. To cancel the function repeat the procedure.

15.6.2.1 Single Wipe Operation

To obtain a single sweep of the wiper blade, the lever is pulled towards the steering wheel and released.

Note: The intermittent/flick wipe operations are both at slow speed and they are controlled by a Central Control Module (CCM), which also controls the headlamp power wash operation.



15.6.2.2 Programmed Wash/ Wipe Operation

The end of the switch lever must be pressed inwards for the windscreen wash and wipe operation. Wash / wipe continues for as long as the lever is pressed.

When released, the windscreen wiper stops immediately and the wiper blades sweep for a further three wipes.

On pressing the end of the switch lever inward and then releasing it, the windscreen washers operate for approximately two seconds before stopping, whilst the wiper blade continues for a further three wipes.

Note: If the end of the switch lever is pressed while the washer fluid warning light is illuminated, the windscreen washers, but not the wiper blade continues to operate.

15.6.2.3 Headlamp Power Wash Operation (where fitted)

The headlamp power wash operates only when the programmed washer/ wipe function is selected and the side lights are 'ON'

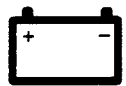
The headlamp power wash does not operate if the windscreen washer reservoir fluid level is low. This is indicated by the washer fluid level warning light illuminating.

Note: The headlamp power wash only operates on the 1st and every 6th succeeding cycle of the programme wash / wipe switch, after the ignition switch has been turned to position 'II'.

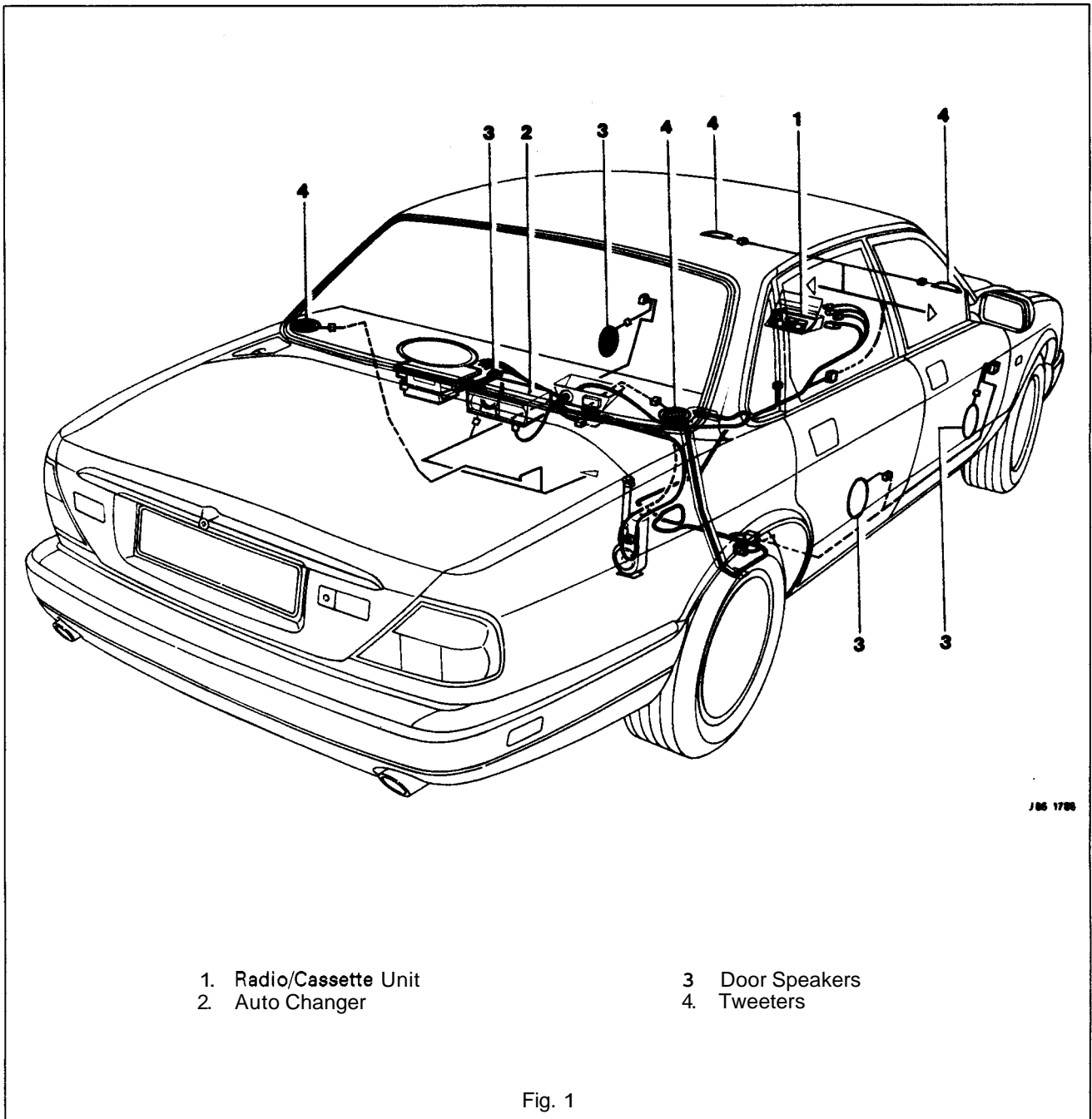


15.7 CLOSURES SWITCHING

Information to be issued with Amendment 1



15.8 IN - CAR ENTERTAINMENT (ICE)



15.8.1 General Description

The plan view in Fig.1 shows the locations of the In-Car Entertainment (ICE) equipment. This consists of a radio cassette player fitted inside an aperture of the centre console switch assembly, a compact disc auto-changer located inside the trunk, four speakers fitted to the front and rear doors and four tweeters of which two are located on either side of the crash - roll dash below the windscreen and two on either side of the rear shelf.

The vehicle has an electrically operated, retractable aerial fitted on the offside rear fender.



15.9 LAMPS & LIGHTING LOGIC

15.9.1 Exterior Lighting, General Description

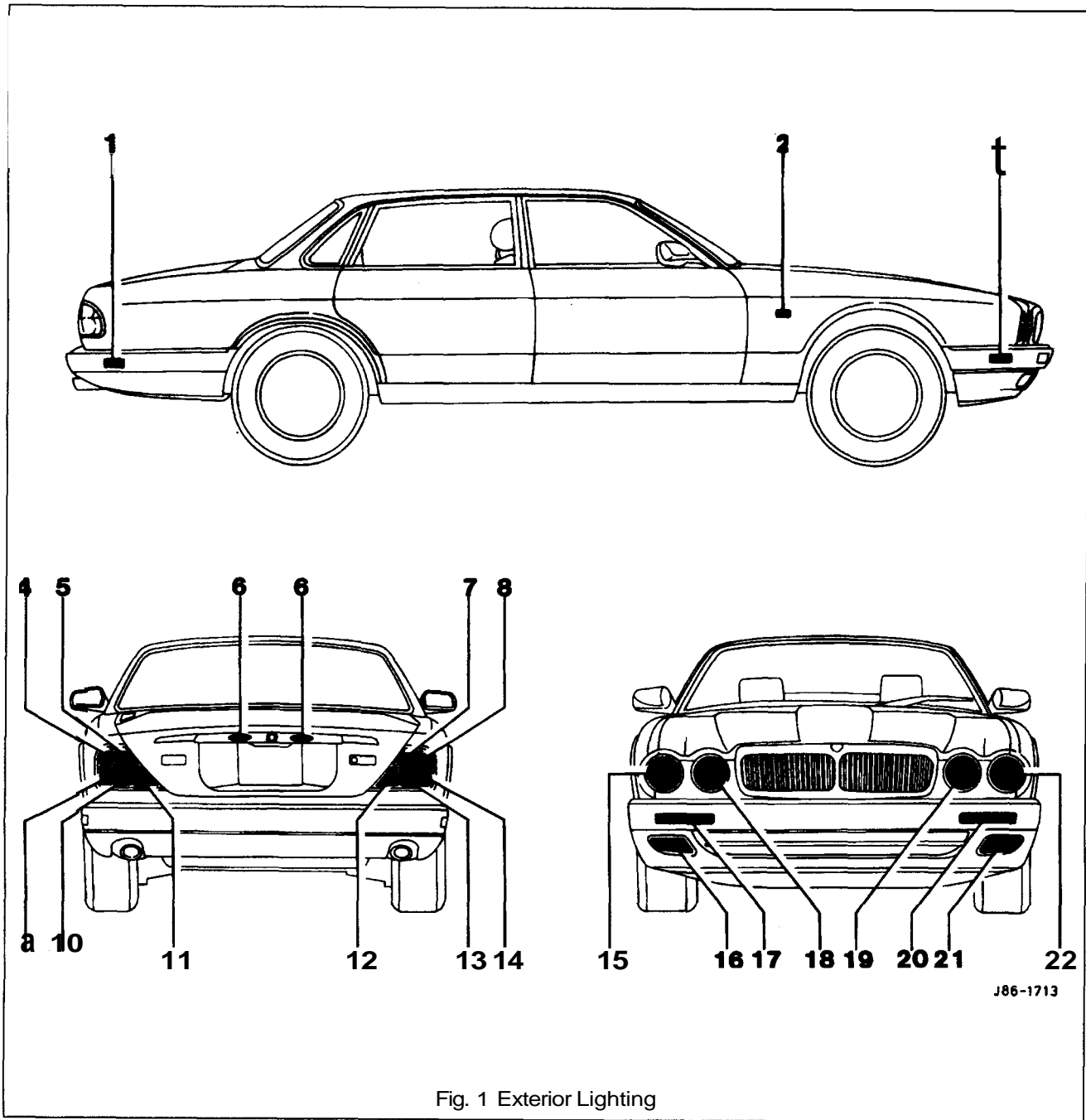
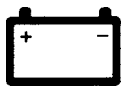


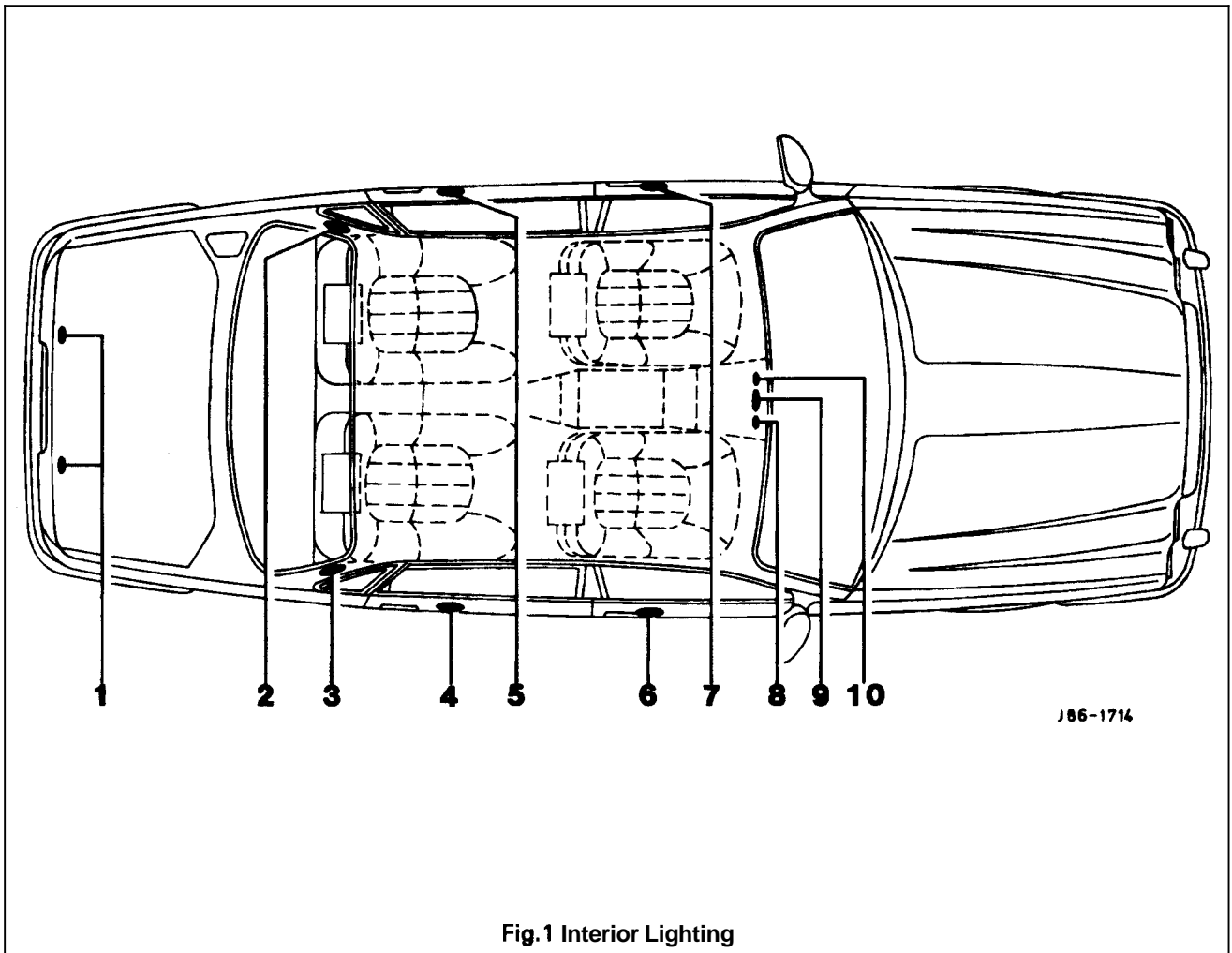
Fig. 1 Exterior Lighting

Figure 1 indicates all exterior lamps located at the front, the sides and the rear of the vehicle.

The exterior lamps consisting of two headlamp assemblies containing the inboard and outboard headlamp units incorporating the pilot bulbs, the fog lamps, the front direction indicator lamps and side marker lamps fitted through the front bumper, the repeater lamps positioned on the fenders, the number plate lamps and the rear lights incorporating tail, stop, flasher and fog lamps.



15.9.2 Interior Lighting, General Description



The interior lamps consist of E-Post lamps with or without map lights, a map light combined with switch fitted to the roof console, sun visor lamps, door courtesy / hazard lamps and a trunk lamp. Other interior illumination bulbs are fitted within the various switch assemblies.



15.10 **HARNESSES & CABLES**

15.10.1 **Battery Power Distribution Cables, General Description**

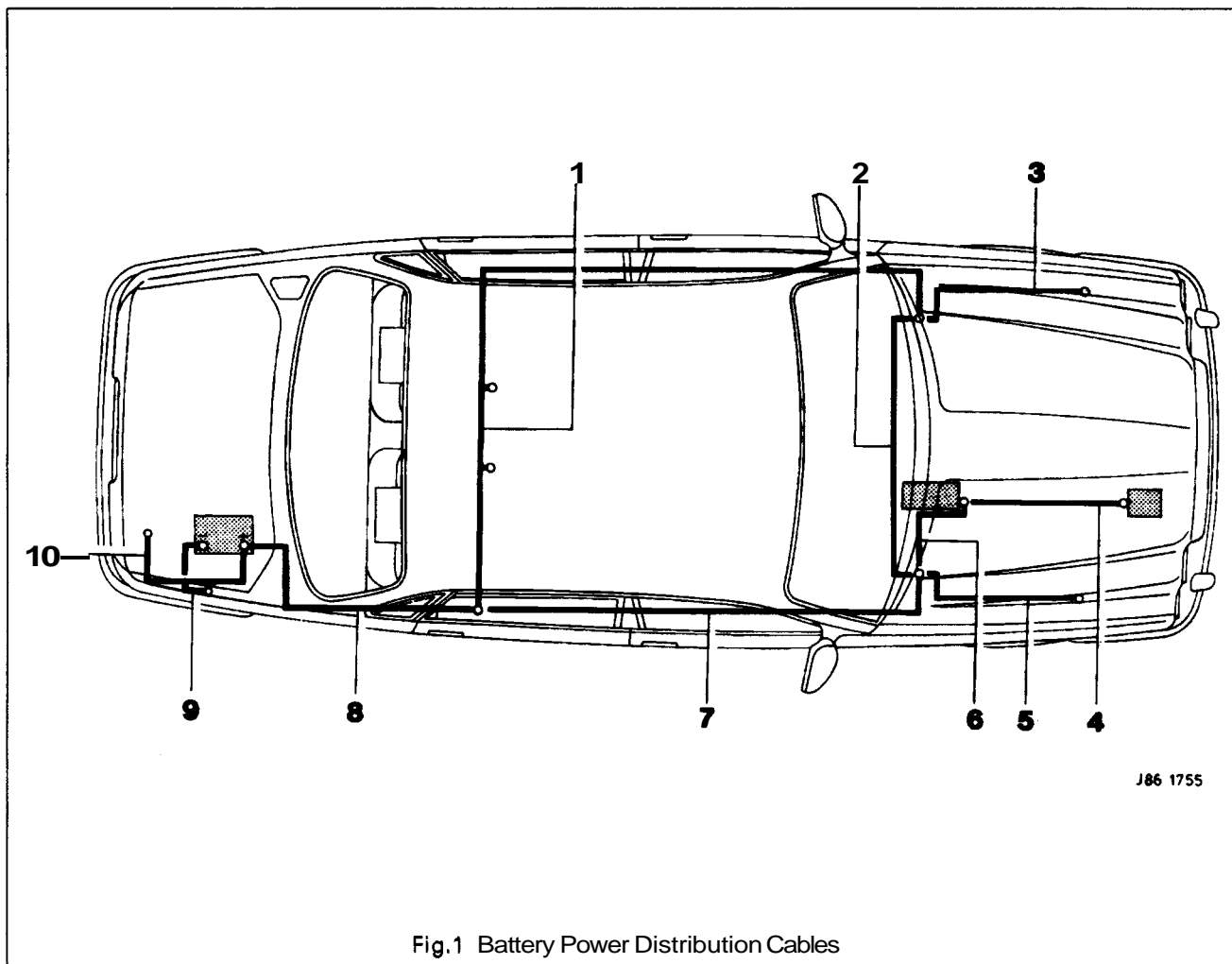
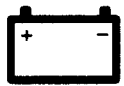


Figure 1 shows a plan view of the battery power distribution cables and their distribution points. This illustration is to be read in conjunction with the following table. To avoid any accidents such as electric shocks, always disconnect the battery negative lead from the battery negative terminal before disconnecting any of the listed cables.



Key to Fig. 1, Battery Power Distribution Cables, page 22.

| Battery Power Distribution Cable | Number |
|--------------------------------------|--------|
| Rear heel board/ Fuse box power lead | 1 |
| Terminal to terminal post link lead | 2 |
| Engine bay / fuse box power cable LH | 3 |
| Starter to alternator cable | 4 |
| Engine bay / fuse box power cable RH | 5 |
| Starter cable | 6 |
| Battery positive extension cable | 7 |
| Battery positive cable | 8 |
| Battery negative cable | 9 |
| Trunk fuse box power cable | 10 |



15.10.2 Main Harnesses, General Description

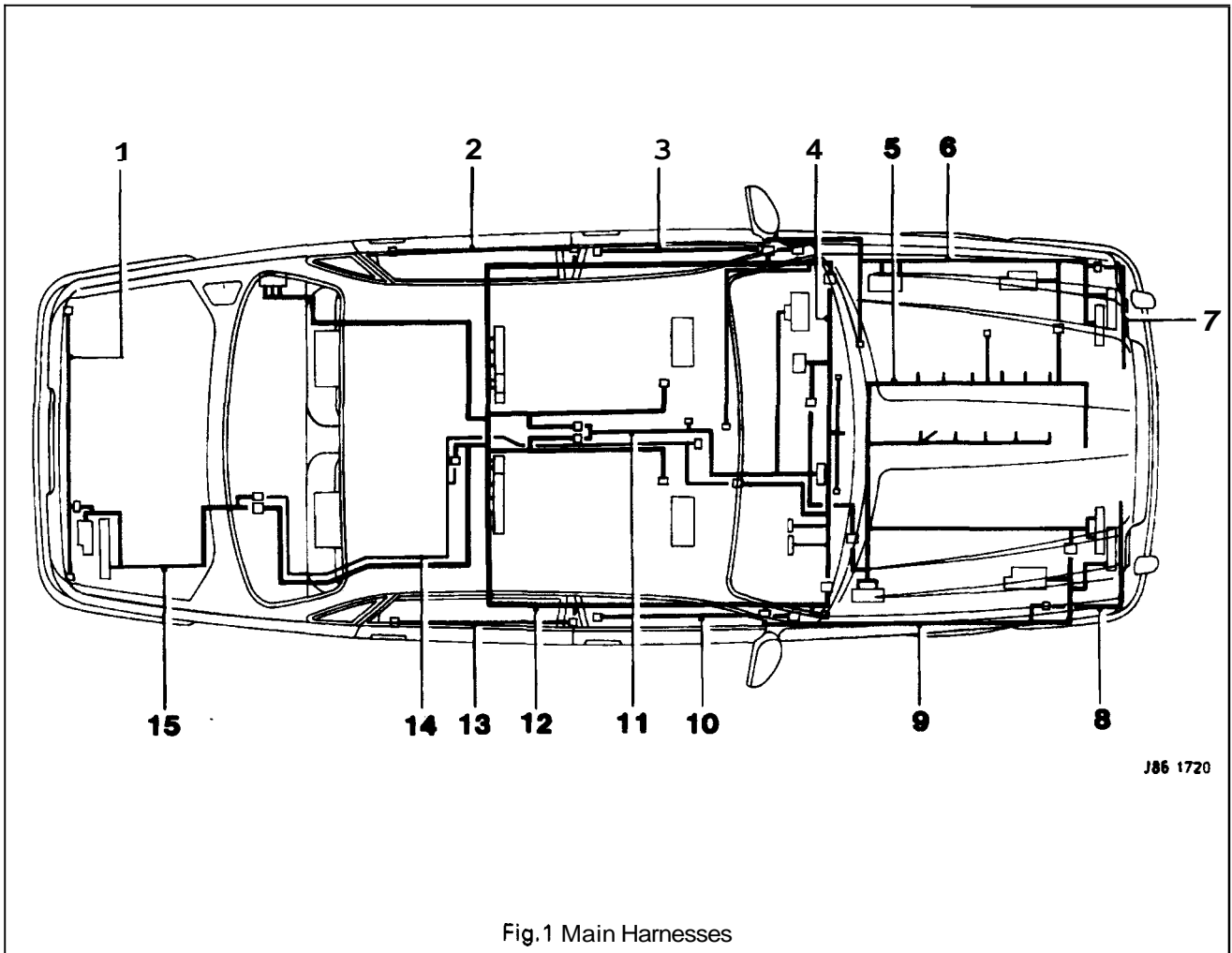
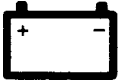


Fig.1 Main Harnesses

Fig. 1 shows a plan view of the main harness runs inside the trunk, the passenger compartment and the engine bay. The illustration is to be read in conjunction with the following table. To avoid any accidents such as electric shocks, always disconnect the battery negative lead from the battery negative terminal before disconnecting any of the listed cables.



| Main Harness | Number |
|--------------------------|---------------|
| Rear Lamp | 1 |
| LH Rear Door | 2 |
| LH Rear Door (Passenger) | 3 |
| Fascia | 4 |
| Enaine / PI | 5 |
| Left Forward | 6 |
| | |
| RH Front Bumper | 8 |
| Right Forward | 9 |
| RH Front Door | 10 |
| Console | 11 |
| Cabin | 12 |
| RH Rear Door | 13 |
| In-Car Entertainment | 14 |
| Trunk | 15 |



15.10.3 Link Harnesses, General Description

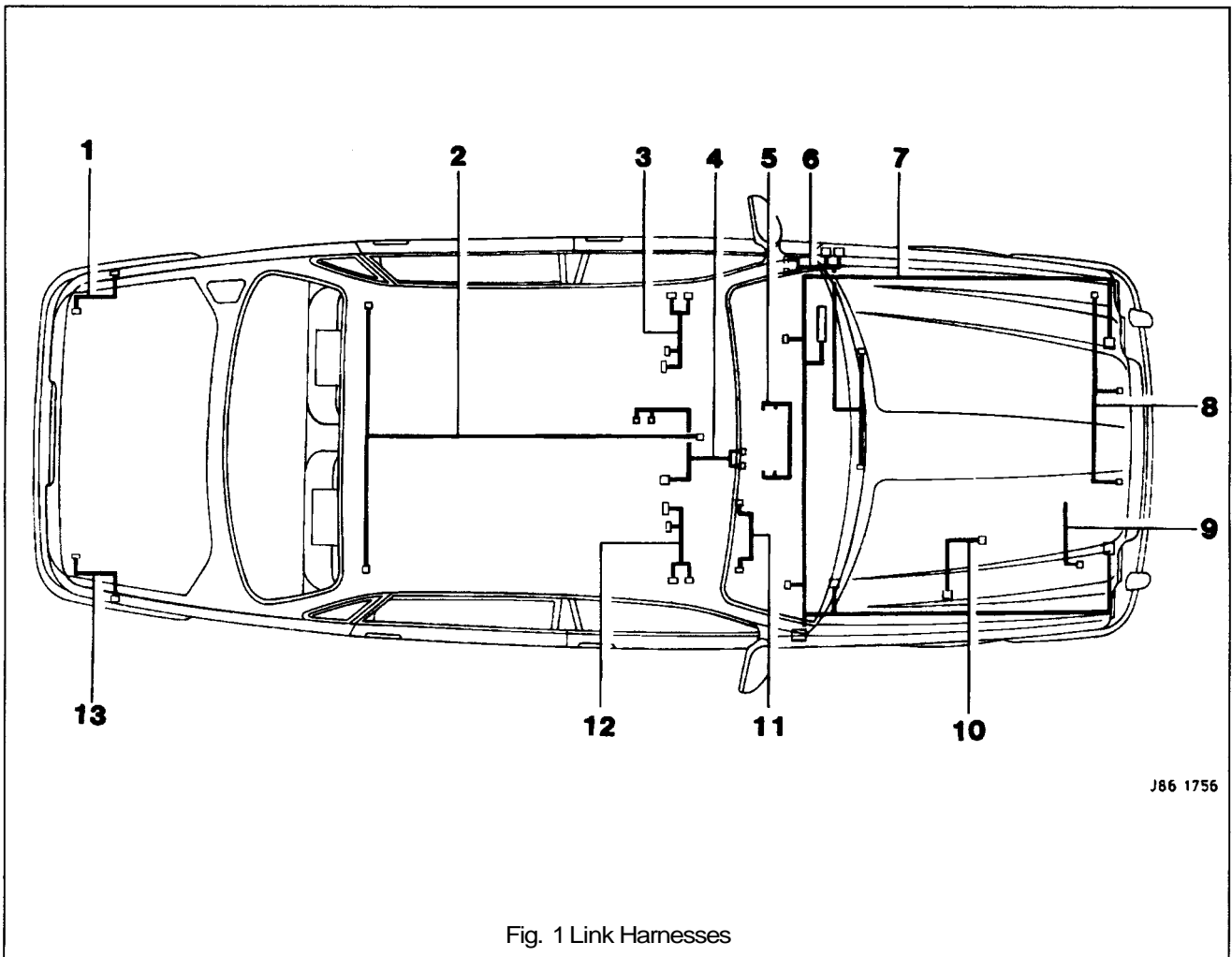


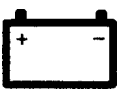
Fig. 1 Link Harnesses

Fig. 1 shows a plan view of the link harness runs inside the trunk, the passenger compartment and the engine bay. The illustration is to be read in conjunction with the following table. To avoid any accidents such as electric shocks, always disconnect the battery negative lead from the battery negative terminal before disconnecting any of the listed cables.



Key to Fig. 1, Link Harnesses, page 32.

| Link Harness | Number |
|--------------------------------------|---------------|
| Side Marker Link Harness (LH) | 1 |
| Roof Harness | 2 |
| Passenger Memory / Seat Harness Link | 3 |
| Electronic Gearbox | 4 |
| Air Condition Harness | 5 |
| Front Screen Heaters | 6 |
| Airbag | 7 |
| Cooling Fans | 8 |
| Alternator Suppression | 9 |
| Power steering Speed Sensor | 10 |
| Steering Column | 11 |
| Memory / Seat (Driver's) | 12 |
| Side Marker (RH) | 13 |



15.10.4 Harness Connectors, General Description

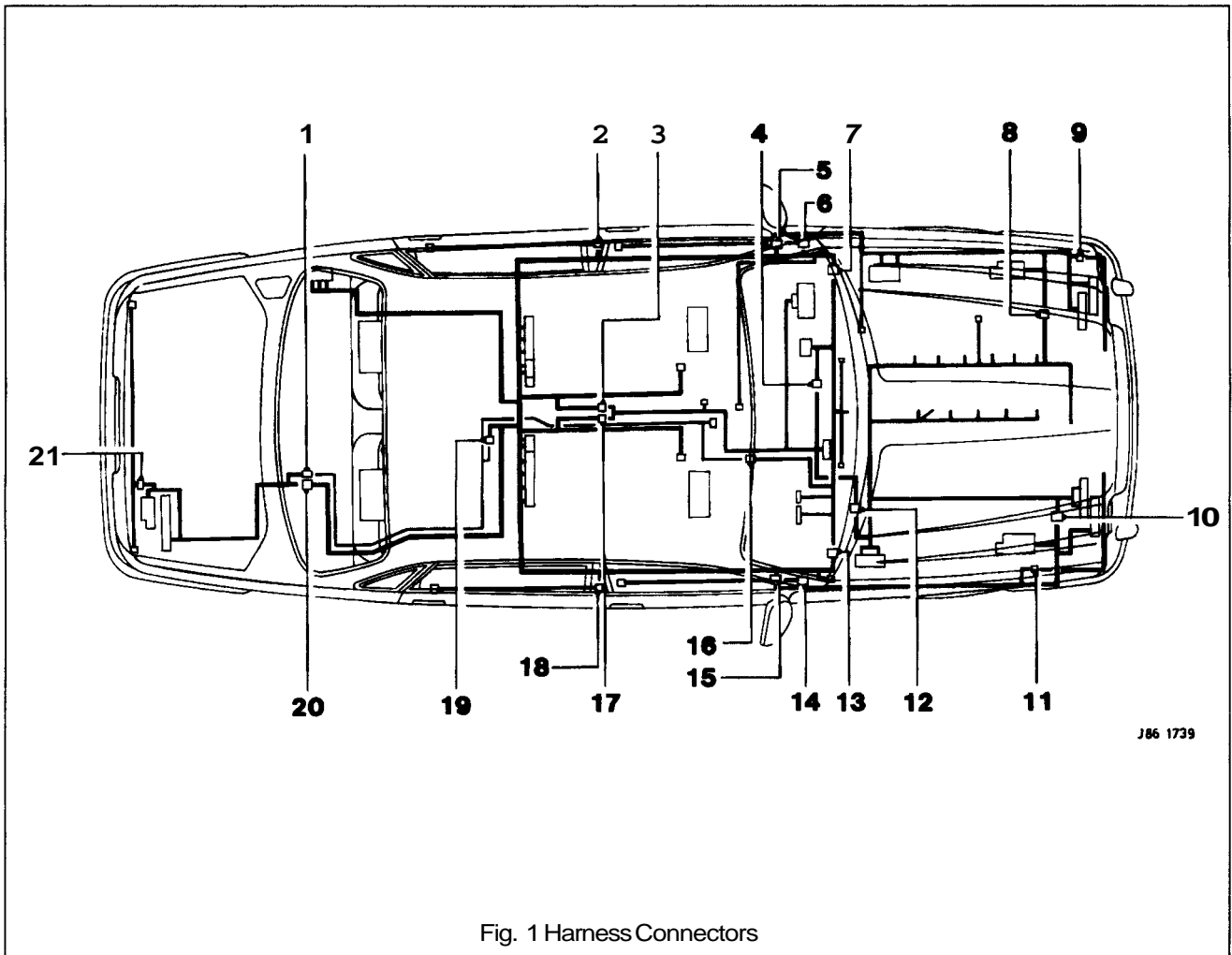


Fig. 1 Harness Connectors

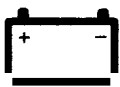
Fig. 1 shows a plan view of the harness connectors physically linking all the harnesses located in the trunk, the passenger compartment and the engine bay.

The illustration is to be read in conjunction with the following table. To avoid any accidents such as electric shocks, always disconnect the battery negative lead from the battery negative terminal before disconnecting any of the listed cables.



Key to Fig. 1, Harness Connectors, page 34.

| From Location | To Location | Connector No. | Number |
|----------------------|---------------------------|---------------|--------|
| In-Car Entertainment | Trunk | IC 002 | 1 |
| LH Rear Door | Cabin | CA 013 | 2 |
| Console | Cabin | CC 018 / 004 | 3 |
| Fascia | Console | FC 007 | 4 |
| Cabin | LH Forward | LS 003 | 5 |
| Cabin | LH Front Door (Passenger) | CA 001 | 6 |
| Fascia | Cabin | FC 005 | 7 |
| LH Forward | Engine | PI 059 / 066 | 8 |
| LH Forward | LH Front Bumper | BL 001 | 9 |
| RH Forward | Engine | PI 001 / 061 | 10 |
| RH Forward | RH Front Bumper | BR 001 | 11 |
| Console | Engine | PI 063 | 12 |
| Fascia | Cabin | FC 006 | 13 |
| Cabin | Door | CA 009 | 14 |
| Cabin | RH Forwards | RS 003 | 15 |
| ICE | Fascia | IC 007 | 16 |
| Console | Cabin | CC 003 / 005 | 17 |
| RH Rear Door | Cabin | CA 013 | 18 |
| ICE | Cabin | IC 022 | 19 |
| Cabin | Boot | BT 004 | 20 |
| Rear Lamp | Boot | BT 005 | 21 |



15.11 MOTORS & SOLENOIDS

15.11.1 General Description

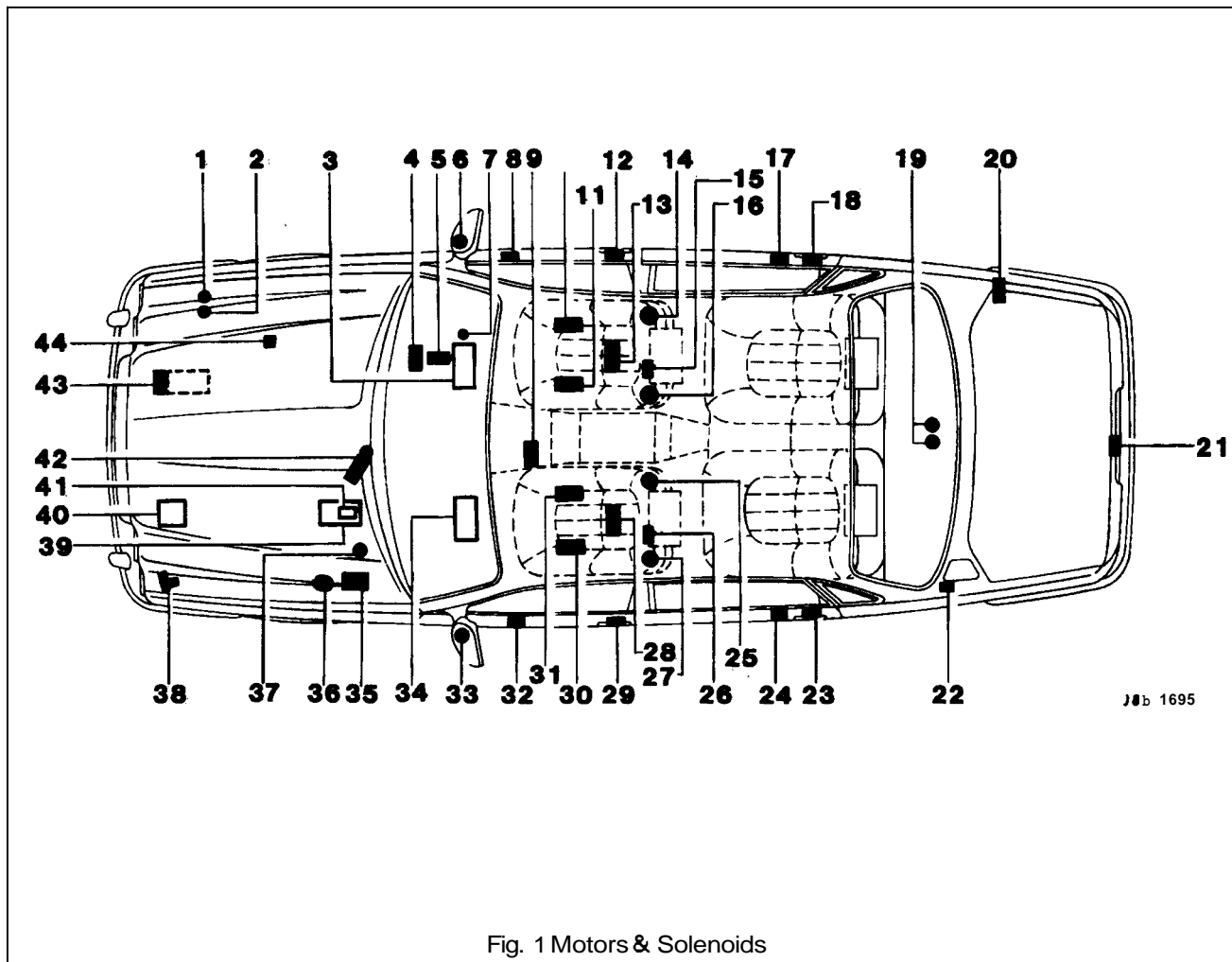


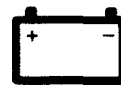
Fig. 1 Motors & Solenoids

Fig. 1 shows a plan view of all motors located inside the trunk, the passenger compartment and the engine bay. The motors drive various devices to perform certain functions such as wiper / wash operations, window lift operations, seat operations etc.

In order to carry out remove and refit operations, the annotated illustration is to be read in conjunction with the table shown on the following page. This lists all the motors and solenoids.

Some motors can be accessed by removing the various trims, the carpet, or carpet sections, other can be located through carrying out a visual inspection around the engine bay, the cab and the trunk.

To avoid any accidents such as electric shocks, always disconnect the battery negative lead from the battery negative terminal before disconnecting any of the listed cables.



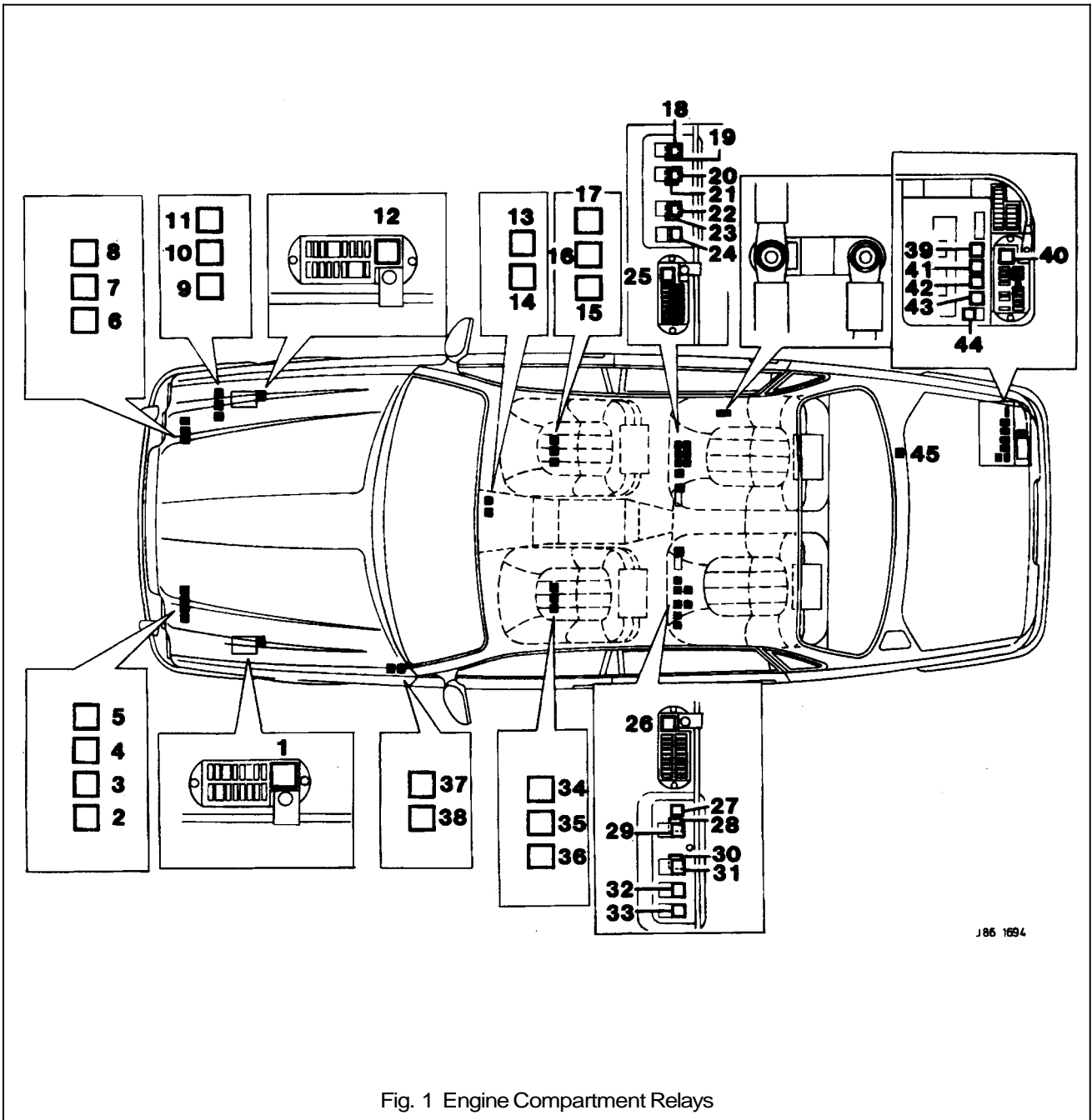
Key to Fig 1, Motors & Solenoids, page 36.

| Motors & Solenoids | Number |
|-----------------------------------------------|---------------|
| Power Wash | 1 |
| Power Wash | 2 |
| RH Blower (AC) | 3 |
| Steering – Tilt | 4 |
| Steering – Reach | 5 |
| Driver's Mirror | 6 |
| Ignition Key Solenoid | 7 |
| Window Lift | 8 |
| Sunshine Roof | 9 |
| Memory / Seat – Rise / Fall (Rear) | 10 |
| Memory / Seat – Rise / Fall (Front) | 11 |
| Key Lock (Door) | 12 |
| Memory / Seat – Fore / Aft | 13 |
| Memory / Seat – Recline | 14 |
| Lumbar Pump Motor | 15 |
| Memory / Seat – Head Rest | 16 |
| Rear Window Lift | 17 |
| Rear Door Lock | 18 |
| Fuel Pump (Double) | 19 |
| Electrical Aerial | 20 |
| Trunk Lock | 21 |
| Filler Cap (Solenoid) | 22 |
| Rear Door Lock | 23 |
| Window Lift | 24 |
| Passenger Seat – Recline | 25 |
| Passenger Seat – Head Rest | 26 |
| Lumbar Pump Motor | 27 |
| Passenger Memory / Seat – Fore / Aft | 28 |
| Passenger – Door Lock | 29 |
| Passenger Memory / Seat – Rise / Fall (Front) | 30 |
| Passenger Memory / Seat – Rise / Fall (Rear) | 31 |
| Passenger Window Lift | 32 |
| Mirror | 33 |
| LH Blower (AC) | 34 |
| ABS Pump / Motor Unit | 35 |
| Traction Control / Actuator | 36 |
| A / C Water Pump & Water Valve Solenoid | 37 |
| Cruise Control Pump | 38 |
| Starter Solenoid | 39 |
| Starter | 40 |
| Wiper | 41 |
| Alternator | 42 |
| A/ C Compressor Clutch | 43 |
| (SCM) Steering Control Module Transducer | 44 |



15.12 RELAYS

15.12.1 Engine Compartment Relays, General Description



J86 1694

Fig. 1 Engine Compartment Relays

In order to locate individual relays, Fig.1, showing all relay locations within the engine compartment, is to be read in conjunction with the following table. The numbers indicating the relays on the illustration correspond to the numbers in the right-hand column. To remove and refit individual relays, open the bonnet, locate the faulty relay, unplug and renew.



Key to Fig. 1, Engine Compartment Relays, page 14.

| SRO | Relays | Location | Color | AJ16 | V12 | Number |
|----------|--------------------------------------|----------------------------------------------------------------|--------------------|----------------------------|----------------------------|--------|
| B6.55.04 | Horn | Engine compartment, inside the left hand side fuse box. | Blue | All Models | All Models | 1 |
| | Starter Motor Solenoid | Engine compartment, behind left hand head lamp assembly. | Black | All models | All Models | 5 |
| 18.30.34 | Air-Conditioning Water Pump | see starter motor solenoid. | Black | All Models | All Models | 4 |
| | Wiper Motor On/Off | see starter motor solenoid. | Black | All Models | All Models | 2 |
| | Wiper Fast/Slow | see starter motor solenoid. | Black | All Models | All Models | 3 |
| 18.30.71 | EMS Engine Management System Control | Engine compartment, behind right hand head lamp assembly. | Black | All Models | - | 8 |
| | Ignition Coil | see EMS control. | Black | - | All Models | 9 |
| | PI Main Relay | see EMS control. | Black | - | All Models | 8 |
| 18.30.34 | Air Pump | see EMS control. | Black | Air Injection only | Air Injection only | 7 |
| 86.55.08 | Air Conditioning Compressor Clutch | see EMS control. | Black | Air Con- Model only | All Models | 6 |
| | Relay Case | | Black/White Stripe | Non Aircon. Models only | - | 6 |
| | Relay Case | Engine compartment, on the right hand side inner wing valance. | Black/White Stripe | Non Power Wash Models only | Non Power Wash Models only | 11 |
| | Power Wash | | Black | Optional | Optional | |
| | Screen Wash | | Black | All Models | All Models | 10 |
| | Ignition Relay | Engine compartment, inside right hand fuse box. | Blue | All Models | All Models | 12 |



5.12.2 Passenger Compartment Interior Relays, General Description

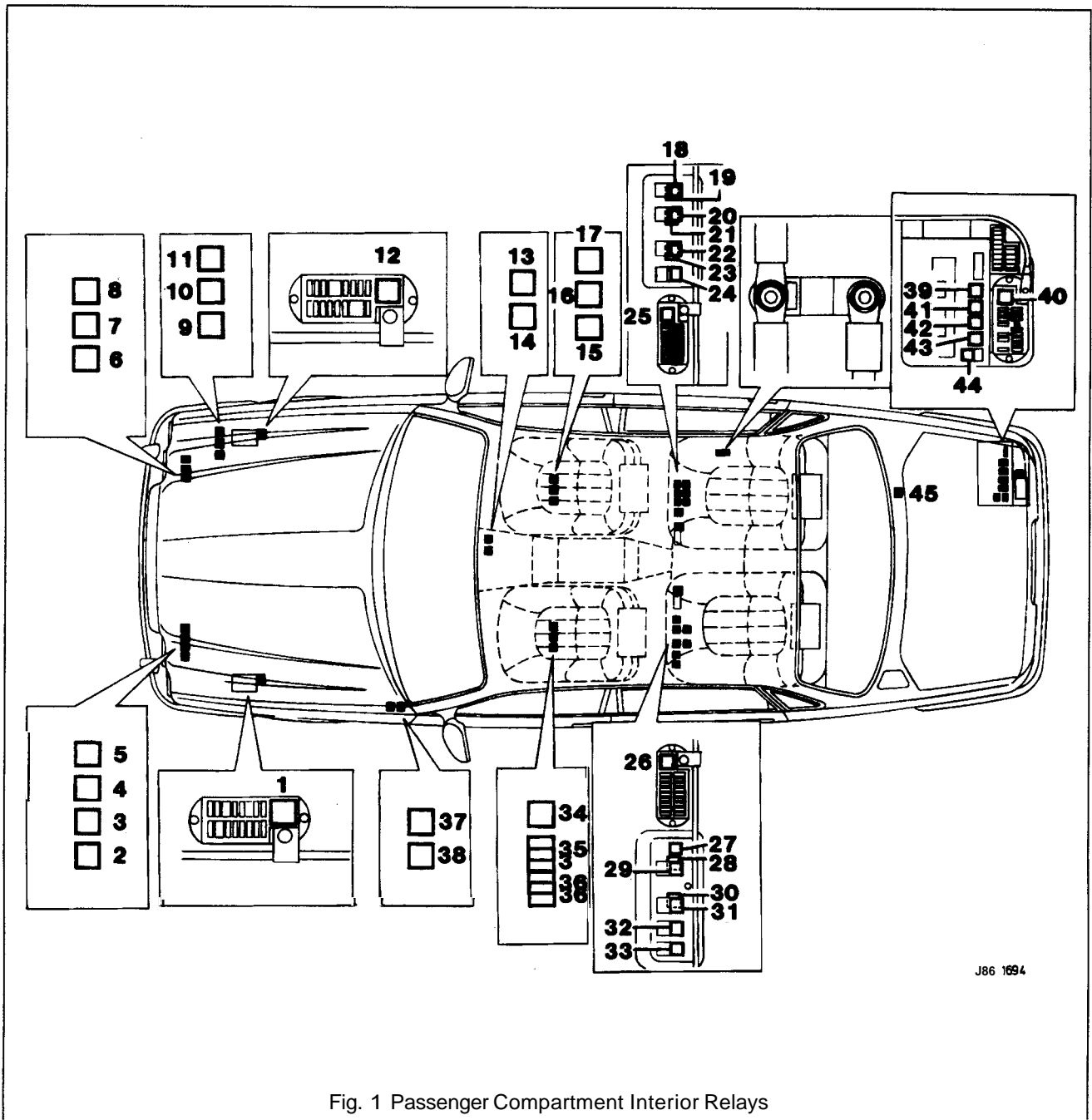


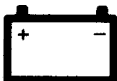
Fig.1 shows the relays inside the passenger compartment located under the rear seats behind the heel boards, under the centre console wood veneer, on the A-Post near the Servotronic Steering Module and under the driver's and the passenger's seats. To gain access to relevant relays, remove the heel boards, or the centre console wood veneer, or the seats, or the A-Post lower trim pad.



Electrical



| SRO | Relays | Location | Color | AJ16 | V12 | Number |
|----------|------------------------------------------|----------------------------------------------------------|--------|---------------------------|-----------------------|--------|
| 86.55.89 | Gear Shift Interlock | Below gear selector 'J' gate. | Blue | Automatic Models only | Automatic Models only | 13 |
| | Keylock | Below gear selector 'J' gate. | Blue | Automatic Models only | Automatic Models only | 14 |
| | Driver's Seat Height Control (Upward) | On seat panel below driver's seat. | Violet | UK & ROW Manual Seat only | - | 15 |
| | Driver's Seat Height Control (Downward) | On seat panel below driver's seat. | Violet | UK & ROW Manual Seat only | - | 16 |
| | Passenger Seat Height Control (Upward) | On seat panel below passenger's seat. | Violet | UK & ROW Manual Seat only | - | 34 |
| | Passenger Seat Height Control (Downward) | On seat panel below passenger's seat. | Violet | UK & ROW Manual Seat only | - | 35 |
| | Driver's Seat Heater | On seat panel below driver's seat. | Blue | UK & Manual Seat only | - | 17 |
| | Passenger Seat Heater | On seat panel below passenger's seat. | Blue | UK & Manual Seat only | - | 36 |
| | RH Front Screen Heater | Left hand side footwell on front 'A' post, behind cover. | Blue | Optional | Optional | 37 |
| | LH Front Screen Heater | Left hand side footwell on front 'A' post, behind cover. | Blue | Optional | Optional | 38 |
| | Ignition | Fuse box assembly RH side heelboard. | Blue | All Models | All Models | 25 |
| | Ignition | Fuse box assembly LH side heelboard. | Blue | All Models | All Models | 26 |
| | Air-conditioning Isolate | Behind RH side heelboard. | Blue | All Models | All Models | 23 |
| | LH Blower | Behind RH side heelboard. | Blue | All Models | All Models | |
| | RH Blower | Behind RH side heelboard. | Blue | All Models | All Models | |
| | LH Blower high speed | Behind RH side heelboard. | Blue | All Models | All Models | 18 |
| | RH Blower high speed | Behind RH side heelboard. | Blue | All Models | All Models | 20 |
| | Deadlock front left/rear right | Behind LH side heelboard. | Violet | Not NAS or Japan | Not NAS or Japan | 30 |
| | Deadlock front right/rear left | Behind LH side heelboard. | Violet | UK & Europe only | UK & Europe only | 31 |
| | Door Lock | Behind LH side heelboard. | Violet | All Models | All Models | 28 |
| | Door Unlock | Behind LH side heelboard. | Violet | All Models | All Models | 29 |
| | Driver's Door Unlock | Behind LH side heelboard. | Violet | USA & Canada only | USA & Canada only | 27 |
| | Mirror Heater | Behind RH side heelboard. | Violet | All Models | All Models | 24 |
| | Puddle Lamps | Behind LH side heelboard. | Blue | All Models | All Models | 33 |
| 86.55.78 | Cigar Lighter | Behind RH side heelboard. | Blue | All Models | All Models | 22 |
| 86.55.74 | Fuel Flap Lock | Behind LH side heelboard. | Violet | All Models | All Models | 32 |



15.12.3 Trunk Relays, General Description

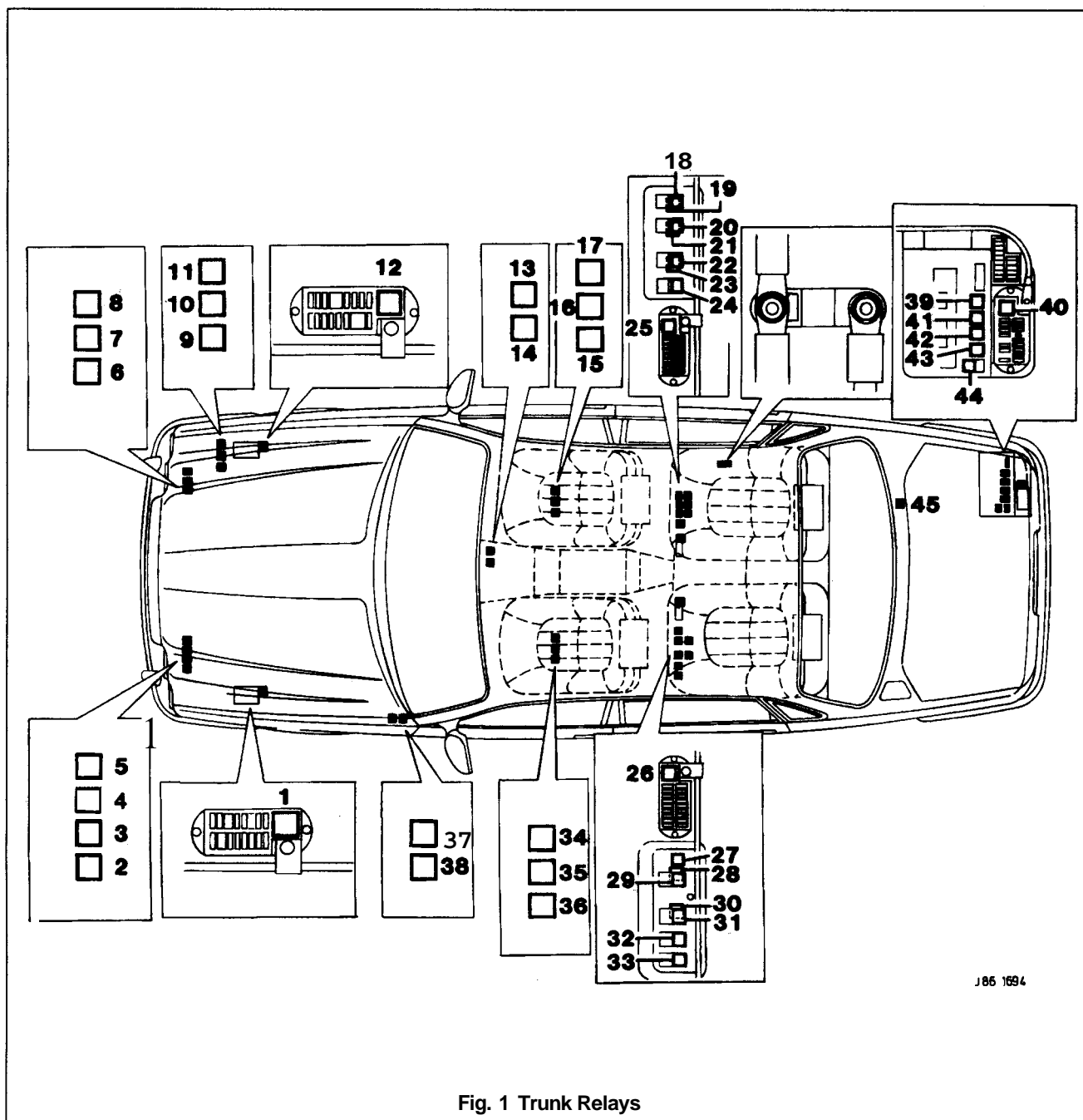
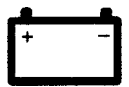


Fig. 1 Trunk Relays

Fig. 1 shows all relays located inside the trunk. To locate and renew relays, open the trunk lid, remove the wheel floor carpet board, followed by the carpeted battery/fuse cover and the back panel carpet board.



Key to Fig. 1, Trunk Relays, page 18.

| SRO | Relays | Location | Color | AJ16 | V12 | Number |
|----------|-------------------------------------|-----------------------------------|--------|-------------------|---------------------|--------|
| 18.30.70 | Fuel Pump Single | Trunk, inside electrical carrier. | Blue | All Models | All Models | 41 |
| | Fuel Pump | Trunk, inside electrical carrier. | Blue | Supercharged only | Secondary Fuel Pump | 45 |
| 86.55.19 | Rear Screen Heater | Trunk, inside electrical carrier. | Blue | All Models | All Models | 43 |
| 86.55.73 | Trunk Lid Release | Trunk, inside electrical carrier. | Violet | All Models | All Models | 44 |
| | Accessory Socket | Trunk, inside electrical carrier. | Blue | All Models | All Models | 42 |
| 86.56.10 | High Mount Step Lamp | Trunk, inside electrical carrier. | Blue | Where fitted | Where fitted | 39 |
| 86.56.11 | Fuse box Assembly/ Aux. Positive | Trunk, inside electrical carrier. | Blue | All Models | All Models | 40 |



15.13 CONTROL MODULES(CM)

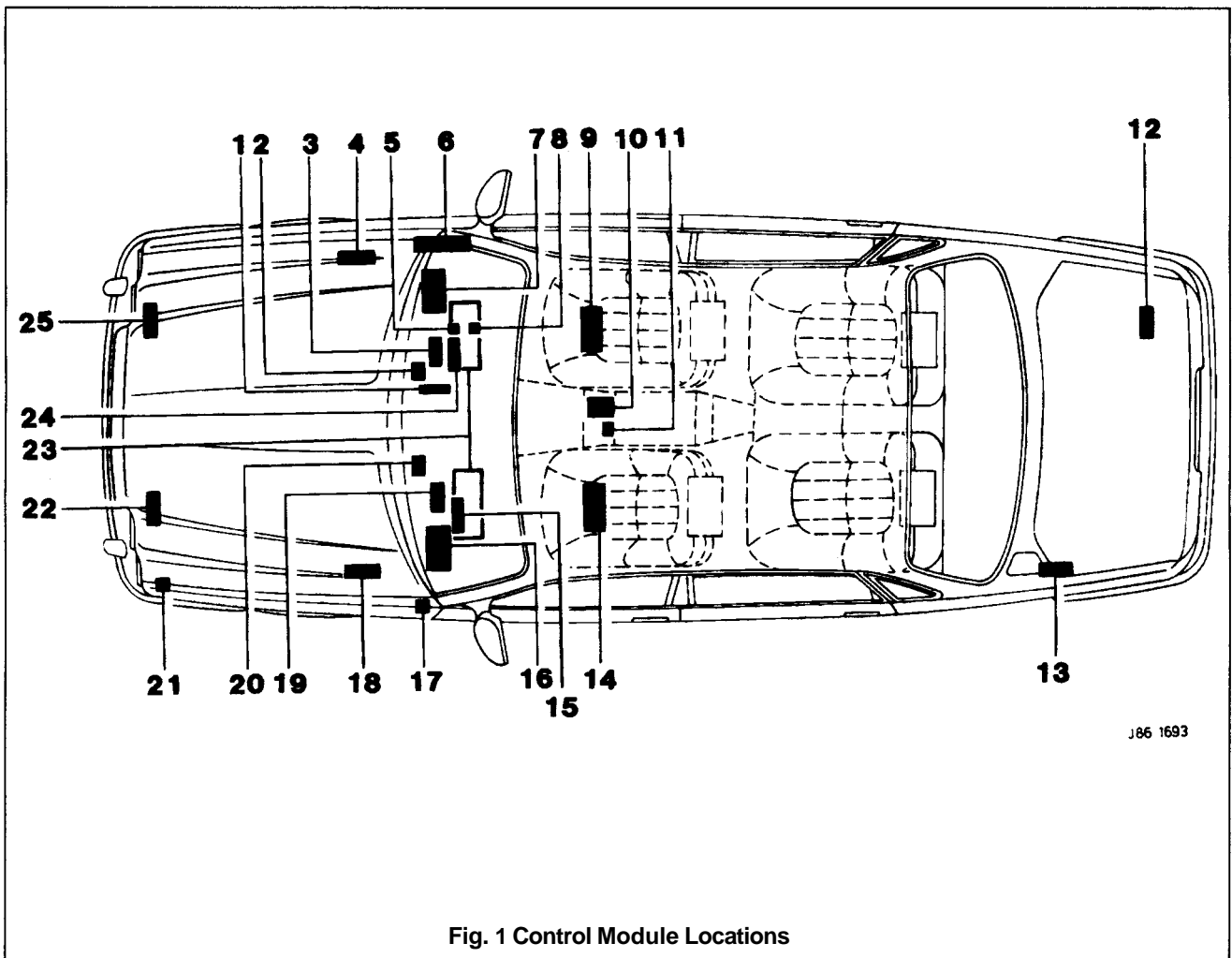


Fig. 1 Control Module Locations

15.13.1 General Description

Fig. 1 shows a plan view of the control module locations for the vehicle.

In order to locate and renew modules, the illustration should be read in conjunction with the following table indicating each module's location.



| | | Location | Number |
|-----------------|------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|
| | Universal garage door opener | Roof console panel | 11 |
| 86.52.01 | Security & Locking Control Module (SLCM) | LH side upper wheel arch, inside the trunk below fuel filler pipe | 13 |
| | Sunroof | Roof console panel. | 10 |
| 86.91.83 | Mirror memory control | Mounted inside driver's & passenger's seat. | 9 |
| | Seat / Mirror Memory (Passenger.) | | 14 |
| 19.75.21 | Speed control | Behind passenger knee bolster. | 2 RHD 20 LHD |
| 86.80.24 | Air conditioning (A/CCM) | RH side of air conditioning unit. | 1 |
| | Transmission control | Behind passenger knee bolster. | 16 RHD (12&6) 7 LHD (12&16) |
| | Engine Management | RH side footwell in front of 'A' post behind cover. | 6 (12&16) |
| | BPU (Body Processor Unit) | Behind passenger knee bolster. | 19 RHD 3 LHD |
| | ABS (Anti-lock Braking System & Traction Control (where fitted). (ABS/TC CM) | Engine compartment below anti-lock braking system modulator. | 18 RHD 4 RHD |
| | Bulb failure Rear | Trunk inside electrical carrier box, | 12 |
| | Front | Engine compartment behind each headlamp assembly. | 22 & 24 |
| | Power steering | LH side footwell on 'A' post, behind cover. | 17 |
| | Column / mirror ECM | On the side of steering column. | 5 |
| | Reader exciter | Around the lock barrel of steering column. | 8 |
| | Airbag (SRS diagnostic) | Behind passenger knee bolster below the airbag module. | 15 RHD 23 LHD |
| | Cooling fan (Striebel) unit | Behind bumper, LHS of vehicle | 21 |



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SPECIFICATION – 1995 MODEL YEAR VEHICLES

Engine See relevant engine service manual

Engine Management System

| | |
|-------------|-------------|
| V12 | Nippondenso |
| 6 cyl. | Lucas GEMS |

Cooling System

| | |
|--------------------------------------|------------------------------------------------------------------------------------------|
| Water pump | |
| type | Centrifugal |
| drive | Belt |
| Cooling fans – 6 cyl. | Two electric fans controlled by temperature sensor in radiator |
| Cooling fans – V12 | One engine driven fan and two electric fans controlled by temperature sensor in radiator |
| Cooling system control | Thermostat (two on V12) |
| Thermostat opening temperature | 88°C |
| Fully open at | 93,5 to 96°C |
| Filler cap pressure rating | 1,2 bar |

Fuel System Pump

| | |
|-------------------------------------------------------------------------|-------------------------|
| one fitted on 6 cyl. (3.2 Liter and 4.0 Liter normally aspirated) | |
| two fitted on 6 cyl. (4.0 Liter supercharged) and V12 | |
| Electrical, module type, fitted in the tank. Integral 70 micron filter. | |
| Make | Nippondenso |
| Pump type | Regenerative turbine |
| Fuel pressure (nominal) | 3,0 bar |
| Fuel pressure (supercharged) | 3,7 bar max. |
| Second pump switches at: | |
| 4.0 Liter supercharged | in at 4000 RPM |
| | out at 3200 RPM |
| V12 | load sensitiveswitching |

Clutch

| | |
|------------------------------|-------------------------|
| Plate diameter | 280mm single plate, LUK |
| Clutch hydraulic fluid | DOT 4 |

Manual Transmission Ratios (Getrag)

| | |
|-------------------|-----------|
| First gear | 3,553 : 1 |
| Second gear | 2,041 : 1 |
| Third gear | 1,400 : 1 |
| Fourth gear | 1,000 : 1 |
| Fifth gear | 0,755 : 1 |
| Reverse | 3,553 : 1 |



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Automatic Transmission Ratios (ZF)

| | |
|---------------|----------|
| First | 2.48.1 |
| Second | 1.48.1 |
| Third | 1.00.1 |
| Fourth | 0.73.1 |
| Reverse | 2,09 : 1 |

Automatic Transmission Ratios (Powertrain)

| | |
|---------------|-----------|
| First | 2.482.1 |
| Second | 1.482.1 |
| Third | 1.000.1 |
| Fourth | 0.750.1 |
| Reverse | 2.077 : 1 |

Final Drive Unit Ratios

| | |
|------------------------------|----------|
| 3.2 liter Manual | 3.77 : 1 |
| 3.2 liter Automatic | 4.08 : 1 |
| 4.0 liter Automatic | 3.54 : 1 |
| 4.0 liter Manual | 3.54 : 1 |
| 4.0 liter Supercharged | 3.27 : 1 |
| 6.0 liter | 3.54 : 1 |

Climate Control (air conditioning) System

| | |
|---------------------------------|---------------------|
| Compressor | Nippondenso 10PA17C |
| Compressor lubricant | ND Oil 8 |
| Refrigerant | R134A |
| Refrigerant Charge Weight | 1100g |



Braking System

| | |
|--------------------------------------|--------------------------------------------------------------------------|
| Front brakes: all vehicles.. | Power assisted, ventilated discs, sliding calipers: FN60 single piston |
| Caliper piston diameter: | 60mm |
| Rear brakes: all vehicles | Power assisted, ventilated discs, FN48 single piston sliding calipers |
| Caliper piston diameter | 48mm |
| Parking brake | Mechanical, operating on rear drums within bell of the rear brake discs. |
| Disc diameter: | |
| Front | 291mm |
| Rear | 305mm |
| Disc thickness: | |
| Front | 28mm, wear limit 27mm |
| Rear | 20mm, wear limit 18,5mm |
| Brake operation | Vacuum power, hydraulic operation |
| Master cylinder | Bore diameter: 25,4mm |
| Main brake friction pad material: | |
| Front | Jurid 518 |
| Rear | Jurid 101 |
| Parking brake friction shoe material | Ferodo 3612 |
| Brake servo booster assembly | |
| Boost ratio | 6,5:1 vacuum |

Anti-lock braking system (ABS)

| | |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wheel sensors | Electrical inductive sensors at the wheels which detect rotational speed. |
| ABS modulator | Hydraulic: vehicles with traction control – contains four solenoid valves, one for each wheel; vehicles without traction control – contains three solenoid valves, one for each front wheel and one for both rear wheels. |
| Control module type | Solid state digital unit (integral with hydraulic module). |

**A1**

Steering and Suspension

Note: When checking the steering geometry, use the pull-down tools front and rear to set the ride height front and rear to the following dimensions:

6 cyl.

| | |
|-------------------------|------------------------------------------------|
| Front ride height | 153 ± 5mm to underside of front crossbeam |
| Rear ride height | 160 ± 5mm to underside of rear edge of A frame |

V12

| | |
|-------------------------|------------------------------------------------|
| Front ride height | 143 ± 5mm to underside of front crossbeam |
| Rear ride height | 160 ± 5mm to underside of rear edge of A frame |

Note: Sportspack derivatives whose kerb height is below the above figures can have their geometry checked at that height.

Front Suspension

| | |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Type | Independent front suspension consisting of double wishbones with coil springs and separate dampers and anti-roll bar. |
| Dampers | Telescopic, gas pressurised |
| Caster angle | 3,0° to 6,0° and with opposing wheels within 1° of each other |
| Camber angle | 0,3° to -0,8° |
| Front wheel alignment | Total toe: 5 minutes in ± 10 minutes |

Rear Suspension

| | |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type | Fully independent rear suspension of double wishbone principle with axle shaft operating as upper wishbone incorporating coaxial springs and dampers with optional rear anti-roll bar. |
| Camber angle (at design ride height): | |
| all vehicles except supercharged | -0,75° ± 0,4° |
| supercharged only | -1,6° ± 0,4° |
| Rear wheel alignment | Total toe: 15 minutes in ± 20 minutes |
| Dampers | Telescopic, gas pressurised |

Power Assisted Steering

| | |
|------------------------------------|-------------------------------------------------|
| Type | ZF Servotronics speed-sensitive rack and pinion |
| Number of turns lock to lock | 2,768 |
| Turning circle: | |
| (wall to wall) | 12,9m (42ft 4in) |
| (curb to curb) | 12,4m (40ft 8in) |



Electrical Equipment

Battery

UK and Europe:

| | |
|------------------------|----------|
| Make | Varta |
| Nominal capacity | 72Ah |
| Earth polarity | Negative |

All Other Markets:

| | |
|------------------------|----------|
| Make | Varta |
| Nominal capacity | 92Ah |
| Earth polarity | Negative |

Generator

6 cyl. (3.2 Liter and 4.0 Liter normally aspirated):

| | |
|---------------------------------|---------------|
| Make | Nippondenso |
| Type | L3A/H |
| Part No. | DBC 6819 |
| Earth polarity | Negative |
| Maximum output | 120 Amps |
| Nominal regulated voltage | 14,4V at 25°C |

6 cyl. (4.0 Liter supercharged):

| | |
|---------------------------------|---------------|
| Make | Nippondenso |
| Type | L3A/H |
| Part No. | LNA 1800BA |
| Earth polarity | Negative |
| Maximum output | 120 Amps |
| Nominal regulated voltage | 14,4V at 25°C |

V12

| | |
|---------------------------------|---------------|
| Make | Nippondenso |
| Type | L3B/H(E) |
| Part No. | LNA 1800AA |
| Earth polarity | Negative |
| Maximum output | 120 Amps |
| Nominal regulated voltage | 14,4V at 25°C |



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Electrical Equipment (continued)

Starter

6 cyl.

| | |
|----------------------------|---------------|
| Make and type | Bosch DW 1,7K |
| Free spin speed | 3000 RPM |
| Free spin current | 90A maximum |
| Load running current | 420A maximum |
| Stall | 1050A |

V12

| | |
|----------------------------|----------------------|
| Make and type | Magneti Marelli M80R |
| Free spin speed | 2650 RPM |
| Free spin current | 75A maximum |
| Load running current | 375A maximum |
| Stall | 1000A |

Windshield Wiper Motor

| | |
|---------------------------------------------------|----------------|
| Make | Trico |
| Light running speed: (after 60 seconds from cold) | |
| Slowspeed | 40 - 48 cycles |
| Fast speed | 57 - 67 cycles |
| Light running current: | |
| Slow speed | 2.5A max. |
| Fastspeed | 5A max. |



LUBRICANTS AND FLUIDS

Engine Oil

| | |
|------------------------------|--------------------------------------------------------|
| Specification | A.P.I. SG / CD or A.P.I. SH (when available) |
| SAE Viscosity Range | 5w / 20 – 20w / 50 dependent on ambient temperature |
| Capacities | |
| 6 cyl. (3.2L and 4.0L) | 8 liters |
| V12 | 10 liters |

Manual Transmission (3.21 & 4.01)

| | |
|---------------------------|------------------------|
| Fluid Specification | Dexron IID, Dexron IIE |
| Capacity | 1,4 liters |

Rear Axle Fluid

| | |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Specification | A.P.I. GL5 |
| SAE Viscosity Rating | EP 90 |
| Fluid Make & Type | Shell Spirax Super 90 oil (alternative brands may be used for top-up only when Shell Spirax is not available) |
| Capacity (all vehicles) | 2,1 liters |

Power Assisted Steering

| | |
|-------------------------|-----------------------------------------------------------|
| Preferred fluid | Dexron IIE |
| Alternative fluid | Dexron IID (use only when Dexron IIE is not available) |
| Capacity | 1,0 liter approximately |

Cooling System

| | |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coolant Mixture Specification | 50% plain water, 50% Jaguar Anti – freeze, Coolant and Corrosion Inhibitor conforming to specification ESD-M97B49A (for frost protection down to –36°C (–33°F)) |
| Capacities: | |
| 6 cyl. (3.2L and 4.0L normally aspirated) | |
| initial fill | 12 liters |
| drain and refill | 7,7 liters |
| 6cyl. (4.0L SC) | |
| initial fill | 13,5 liters |
| drain and refill | 9,25 liters |
| V12 | |
| initial fill | 19,2 liters |
| drain and refill | 14,5 liters |



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Braking System and Clutch System

Fluid Specification Dot 4
 Make & Type Jaguar Brake Fluid

Grease Points

Grease Specification N.L.G.I. Consistency No.2
 Grease Type Multipurpose Lithium Grease

Fuel Tank

Capacity:
 total refill 81 liters
 indicated refill capacity 75 liters ('E' to 'F' on fuel gauge)



VEHICLE WEIGHTS

Note: Gross combination weight is the gross vehicle weight plus recommended trailer weight.
All weights approximate.

| | 3.2L | 4.0L (normally aspirated) | Daimler 4.0L | 4.0L SC | V12 |
|----------------------------|------|---------------------------------|--------------|---------|------|
| | kg | kg | kg | kg | kg |
| Kerb weight | 1800 | 1800 | 1825 | 1875 | 1975 |
| Front axle kerb weight | 912 | 912 | 925 | 970 | 1070 |
| Rear axle kerb weight | 888 | 888 | 900 | 905 | 905 |
| Gross vehicle weight (GVW) | 2220 | 2220 | 2245 | 2295 | 2395 |
| Gross front axle weight | 1019 | 1019 | 1032 | 1077 | 1177 |
| Gross rear axle weight | 1201 | 1201 | 1213 | 1218 | 1218 |
| Gross combination weight | 3720 | 3720 | 3745 | 3795 | 3895 |



A1

TIRES

Tire Replacement And Wheel Interchanging

WARNING: UNDER NO CIRCUMSTANCES SHOULD CROSS-PLY TIRES BE FITTED.

When renewal of tires is necessary, it is preferable to fit a complete set.

Should either front or rear tires only (i.e. not the full set) show a necessity for renewal, **new tires** must be fitted to replace the worn ones.

No attempt must be made to interchange tires from the front to the rear or vice-versa, as wear produces a characteristic pattern on each tire depending upon its position on the vehicle. If this position is changed after wear has occurred, the performance of the tire will be adversely affected.

It should be remembered that new tires must be balanced.

The radial ply tires specified here are designed to meet the high speed performance of this vehicle. Only tires of identical specification as shown in this section must be fitted as replacements. If two replacement tires are fitted to one axle, they must be of the same type and pattern as those on the other axle, i.e. tires must be used in sets of four of the same manufacturer and tread pattern, **not intermixed**.

Tire Fitments

| Tire Type | 3.2 Liter | 4.0 Liter (Normally Aspirated) | 4.0 Liter SC | 6.0 Liter (Daimler & Federal XJ12) | 6.0 Liter (UK, Euro, ROW XJ12) |
|-------------------------------|---------------|-----------------------------------|---------------|---------------------------------------|-----------------------------------|
| Standard | 225 / 60 ZR16 | 225 / 60 ZR16 | - | 225 / 60 ZR16 | |
| Sports | 225 / 55 ZR16 | 225 / 55 ZR16 | - | - | 225 / 55 ZR16 |
| Supercharged | - | - | 255 / 45 ZR17 | - | - |
| Space saver (where fitted) | 115 / 85 R18 | 115 / 85 R18 | 115 / 85 R18 | 115185 R18 | 115 / 85 R18 |

Recommended tires

The following tires are recommended:

| | |
|----------------------|----------------------|
| 225 / 60 ZR 16 | Pirelli P4000 E |
| 225 / 55 ZR 16 | Pirelli P6000 |
| 225 / 55 ZR 16 | Dunlop SP Sport 2000 |
| 255 / 45 ZR 17 | Pirelli P Zero |
| 115185 R 18 | Pirelli |

Recommended Winter (Snow) Tires

Tire designation:

| | |
|---------------------|------------------------|
| 225 / 60 R 16 | Goodyear Eagle GW M+S |
| 225 / 55 R 16 | Pirelli Winter 210 M+S |
| 225 / 55 R 16 | Michelin 330 M+S |

Only use winter tires in complete sets of the same type / size.

CAUTION: Tire directional indicators must rotate in a clockwise direction when viewed from the right-hand side of the vehicle, and in an anti-clockwise direction when viewed from the left-hand side.

The recommended pressures for winter tires are shown in the table of inflation pressures on the following page.



Table of inflation pressures (cold)

Recommended tires must be inflated to the following pressures:

| | Comfort Setting Speeds up to 160 km / h (100 mph) | | Normal Setting | |
|-------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------|----------------|-----------------------|
| | Bar | lbf / in ² | Bar | lbf / in ² |
| 225 / 60 ZR16 (plus winter tires) 3.2 Liter and 4.0 Liter Normally Aspirated | | | | |
| Front | 1,7 | 26 | 2,21 | 32 |
| Rear | 1,9 | 28 | 2,3 | 34 |
| 225 / 55 ZR16 (plus winter tires) 3.2 Liter and 4.0 Liter Normally Aspirated | | | | |
| Front | 1,7 | 26 | 2,21 | 32 |
| Rear | 1,9 | 28 | 2,3 | 34 |
| 225 / 60 ZR16 (plus winter tires) 6.0 Liter | | | | |
| Front | 1,9 | 28 | 2,3 | 34 |
| Rear | 1,9 | 28 | 2,3 | 34 |
| 225 / 55 ZR16 (plus winter tires) 6.0 Liter | | | | |
| Front | 1,9 | 28 | 2,3 | 34 |
| Rear | 1,9 | 28 | 2,3 | 34 |
| 255 / 45 ZR17 4.0 Liter SC | | | | |
| Front | 1,9 | 28 | 2,3 | 34 |
| Rear | 1,9 | 28 | 2,3 | 34 |
| 115 / 85 R18 (space saver wheel) - all vehicles (where fitted) | | | | |
| Front | not applicable | not applicable | 4,1 | 60 |
| Rear | not applicable | not applicable | 4,1 | 60 |

Note: Tires other than those recommended by Jaguar must be inflated to the following cold inflation pressure: 2,9 bar (44 lbf / in²) (both front and rear).

Snow Chains

- Snow chains may be fitted to rear wheels only.
- Use Jaguar snow chains.
- The chains must not be used on roads which are clear of snow.
- Maximum speed without snow chains fitted is **210 km / h. (131 mile / h).**
- Maximum speed with snow chains fitted is **48 km / h. (30 mile / h).**

**BULBS**

| Description | Capacity | Type |
|--------------------------------------------|---------------|---------------------------------|
| Door guard lamp. | 12V 5W | Capless long life |
| Flasher side repeater | 12V 5W | Capless long life |
| Fog lamp - Front. | 12v 55w | Halogen H3 |
| Fog lamp - Rear guard | 12v 21 w | Bayonet long life |
| Front turn indicator | 12V 21W | Bayonet long life |
| Pilot lamp | 12V 5W | Capless long life |
| Headlamp | 12V 55W | Halogen H I |
| High mounted stop lamp (wherefitted). | 12v 5 x 5W | Capless long life |
| Roof console central courtesy lamp | 12V 5W | Capless long life. |
| Roof console reading lamp | 12V 6W | Capless |
| Luggage compartment lamp | 12V 5W | Capless long life |
| License plate lamp | 12V 5W | Festoon |
| Rear turn indicator | 12v 21 w | Bayonet yellow long |
| Rear quarter courtesy lamp (lower section) | 12V 5W | Capless long life |
| Rear quarter reading lamp (upper section) | 12V 6W | Capless |
| Back-up lamp | 12v 21 w | Bayonet long life |
| Stop/ Tail lamp | 12V 21V 5W | Twin filament bayonet long life |
| Sun visor vanity mirror lamp | 12v 1,2W | Capless 286 |
| Tail lamp | 12V 5W | Bayonet long life |

Indicator bulbs

| Bulb Designation | Holder Colour | Rating |
|--------------------------------------------|---------------|------------|
| Exhaust temperature warning indicator bulb | Orange | 12,5V 1,2W |
| Low oil pressure indicator bulb | Orange | 12,5V 1,2W |
| Seat belt warning indicator bulb | Orange | 12,5V 1,2W |
| Boot open warning indicator bulb | Orange | 12,5V 1,2W |
| Door open warning indicator bulb | Orange | 12,5V 1,2W |
| Coolant level warning indicator bulb | Orange | 12,5V 1,2W |
| Air bag fault indicator bulb | Orange | 12,5V 1,2W |
| Parking brake 'on' indicator bulb | Orange | 12,5V 1,2W |
| Brake system warning indicator bulb | Orange | 12,5V 1,2W |
| Main beam 'on' indicator bulb | Orange | 12,5V 1,2W |
| Right turn indicator bulb | Orange | 12,5V 1,2W |
| LCD illumination bulb (right) | Orange | 12,5V 1,2W |
| LCD illumination bulb (left) | Orange | 12,5V 1,2W |
| Left turn indicator bulb | Orange | 12,5V 1,2W |
| Traction control 'off' indicator bulb | Orange | 12,5V 1,2W |
| Transmission sport mode indicator bulb | Orange | 12,5V 1,2W |
| Charging fault warning bulb | Orange | 12,5V 1,2W |
| Check engine warning indicator bulb | Orange | 12,5V 1,2W |

**Indicator bulbs (continued)**

| Bulb Designation | Holder Colour | Rating |
|--------------------------------------------------|---------------|------------|
| Low fuel level warning indicator bulb | Orange | 12,5V 1,2W |
| Anti-lock fault indicator bulb | Orange | 12,5V 1,2W |
| Traction control fail indicator bulb | Orange | 12,5V 1,2W |
| Bulb failure warning indicator bulb | Orange | 12,5V 1,2W |
| Washer fluid level warning indicator bulb | Orange | 12,5V 1,2W |
| Transmission fault indicator bulb | Orange | 12,5V 1,2W |
| Coolant temperature gauge illumination bulb | White | 13,5V 1,2W |
| Speedometer illumination bulbs (upper and lower) | White | 13,5V 1,2W |
| Tachometer illumination bulbs (upper and lower) | White | 13,5V 1,2W |
| Fuel gauge illumination bulb | White | 13,5V 1,2W |
| Battery condition indicator illumination bulb | White | 13,5V 1,2W |
| Oil pressure gauge illumination bulb | White | 13,5V 1,2W |



FUSES

The following tables list all fuses (in their locations) used in the vehicle.

Engine Bay Fuse Box - left-hand side

| Fuse No. | Fuse Colour Code | Value (amps) | Circuit |
|----------|------------------|--------------|----------------------------------------------------------------------------------------------------------------------|
| F1 | Clear | 25 | Heated front screen - right-hand side (where fitted) |
| F2 | Red | 10 | Main beam headlamp - left-hand side |
| F3 | Clear | 25 | Starter solenoid |
| F4 | Red | 10 | Lowered beam headlamp - left-hand side |
| F5 | Red | 10 | Side light - front left-hand side Turn indicator - front left-hand side Side repeater flasher - left-hand side |
| F6 | Yellow | 20 | Windshield wiper system |
| F7 | - | - | Not used |
| F8 | Light Blue | 15 | Water pump (air conditioning) |
| F9 | - | - | Not used |
| F10 | Red | 10 | Horn 1. |
| F11 | Light Green | 30 | Cooling fans (Series / Parallel) |
| F12 | - | - | Not used |
| F13 | - | - | Not used |
| F14 | Red | 10 | Horn 2. |
| F15 | Clear | 25 | Heated front screen - left-hand side (where fitted) |
| F16 | - | - | Not used |
| F17 | Light Green | 30 | Cooling fans (Series) |
| F18 | Red | 10 | Front fog lamp - left-hand side (where fitted) |



Engine Bay Fuse Box – right-hand side

| Fuse No. | Fuse Colour Code | Value (amps) | Circuit |
|----------|------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| F1 | - | - | Not used |
| F2 | Red | 10 | Main beam headlamp – right-hand side |
| F3 | - | - | Not used |
| F4 | Red | 10 | Lowered beam headlamp – right-hand side |
| F5 | Red | 10 | Side light – front right-hand side Turn indicator – front right-hand side Side repeater flasher – right-hand side |
| F6 | Tan | 5 | Engine control module (ECM) |
| F7 | Clear | 25 | Air pump (6 cyl. – where fitted) Ignition coils (V12) |
| F8 | Red | 10 | Air conditioning clutch |
| F9 | - | - | Not used |
| F10 | Tan | 5 | Generator Front lighting control module – right-hand Air conditioning clutch Windshield wash / headlamp power wash heaters and relays |
| F11 | Yellow | 20 | Engine management system relay supply Injectors |
| F12 | Red | 10 | Engine management system Starter relay Ignition coil sensing and air pump relay (6cyl.) Fuel injection relay Engine management sensing (V12) |
| F13 | Red | 10 | Windshield washer pump |
| F14 | Red | 10 | Lambda heaters Idle speed control valve |
| F15 | - | - | Not used |
| F16 | Red | 10 | Air pump control Solenoid vacuum valve (V12) Water pump (supercharged) |
| F17 | Light Green | 30 | Headlamp power wash pump |
| F18 | Red | 10 | Front fog lamp – right-hand side (where fitted) |

**Rear Compartment Fuse Box - left-hand side heelboard**

| Fuse No. | Fuse Colour Code | Value (amps) | Circuit |
|----------|------------------|--------------|----------------------------------------------------------------------------|
| F1 | - | - | Not used |
| F2 | Red | 10 | Heated door mirrors Instrument illumination dimmer |
| F3 | Light Blue | 15 | Seat motors - right-hand side |
| F4 | Light Blue | 15 | Seat motors - right-hand side |
| F5 | Red | 10 | Instrument pack |
| F6 | Tan | 5 | Seat control modules (SCMs) Low power door switch pack Mirror motors |
| F7 | Light Green | 30 | Anti-lock braking system pump (via ABS / TC Control Module) |
| F8 | - | - | Not used |
| F9 | Yellow | 20 | Cigar lighters |
| F10 | Tan | 5 | Speed (cruise) control (where fitted) |
| F11 | Yellow | 20 | Air conditioning blower motor - left-hand |
| F12 | Tan | 5 | Instrument pack |
| F13 | Light Blue | 15 | Steering column - electric power tilt / axial operation (where fitted) |
| F14 | Red | 10 | Automatic transmission ignition supply |
| F15 | Light Green | 30 | Window lift (front and rear) - left-hand side |
| F16 | Tan | 5 | Anti-lock braking system (ABS) ignition supply |
| F17 | - | - | Not used |
| F18 | Red | 10 | Air conditioning supply |



Rear Compartment Fuse Box – right-hand side heelboard

| Fuse No. | Fuse Colour Code | Value (amps) | Circuit |
|----------|------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F1 | Light Blue | 15 | Central door locking Deadlocking (where fitted) |
| F2 | Tan | 5 | Transmission interlock relay Key-switch solenoid relay Center console switch pack Interior lighting switch |
| F3 | Light Blue | 15 | Seat motors – left-hand side |
| F4 | Light Blue | 15 | Seat motors – left-hand side |
| F5 | Tan | 5 | Automatic transmission control module (TCM) |
| F6 | - | - | Not used |
| F7 | Light Green | 30 | Anti-lock braking system / traction control control module (ABS / TC CM) |
| F8 | Red | 10 | Interior lamps Luggage compartment lamps |
| F9 | Clear | 25 | Seat heaters (where fitted) |
| F10 | Tan | 5 | Data link connector Fuel pump relay coil |
| F11 | Yellow | 20 | Air conditioning blower motor – right-hand |
| F12 | Red | 10 | Air conditioning Seat control modules (SCMs) Mirror heaters relay Power assisted steering |
| F13 | - | - | Not used |
| F14 | Red | 10 | Mirrors, Heated rear window, Cigar lighter Rear lighting control module High mounted stop lamp (where fitted) |
| | Light Green | | Window lift (front and rear) – left-hand side |
| | Light Green | | Windshield wiper system Front screen heaters Front lighting control module – left-hand Water pump relay Headlamp levelling (where fitted) Clock |
| | Light Blue | | Airbag |
| F18 | Light Blue | 15 | Sunroof (where fitted) |