

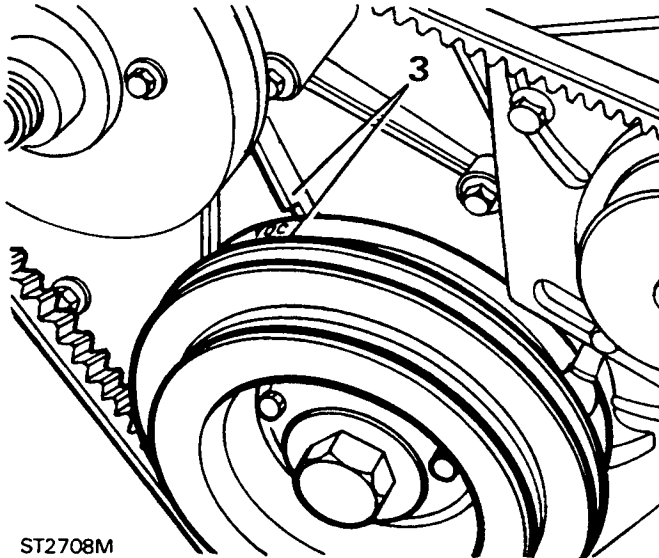
RENEWING FUEL INJECTOR PUMP

Special tools:

Flywheel timing pin	LST 128
Pump gear retaining tool	LST 129

Removing pump

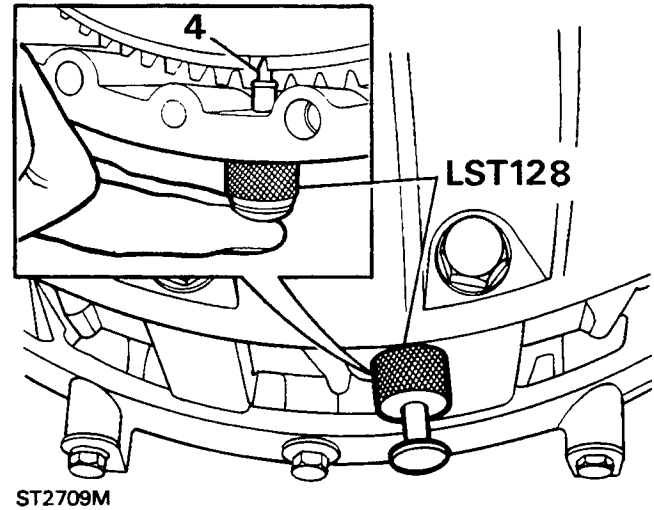
1. Disconnect the battery for safety.
2. Remove the oil filler cap so that the position of the rockers can be seen to assist in obtaining T.D.C.
3. Turn the crankshaft to align the T.D.C. mark on the crankshaft pulley with the web on the front cover plate. At the same time check that both valves of number one cylinder are closed. Refit the filler cap.



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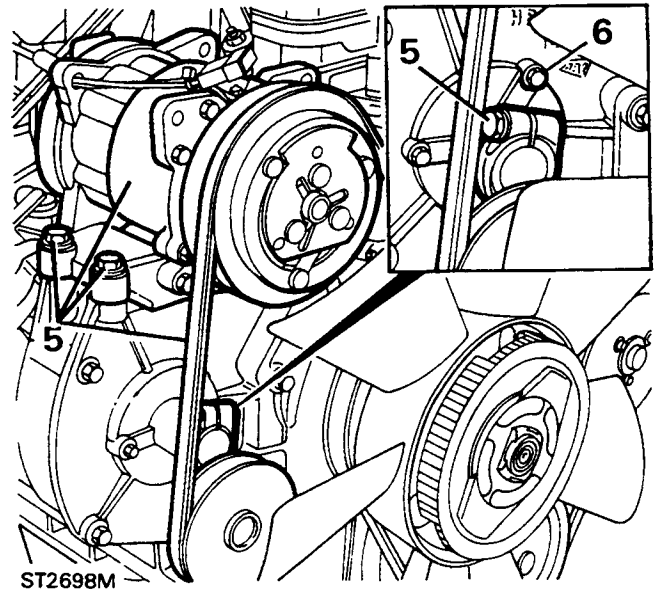
4. Remove the blanking plug from the bottom of the flywheel housing and fit the flywheel timing pin body LST 128. Check that the timing pin can be inserted into the appropriate slot in the flywheel. It should be noted that there are two slots in the flywheel the narrowest one being that which determines T.D.C. for this direct injection engine.

NOTE: If automatic gearbox - The same timing pin fits into a slot in the ring gear. Access is through a hole in engine backplate below the starter motor.



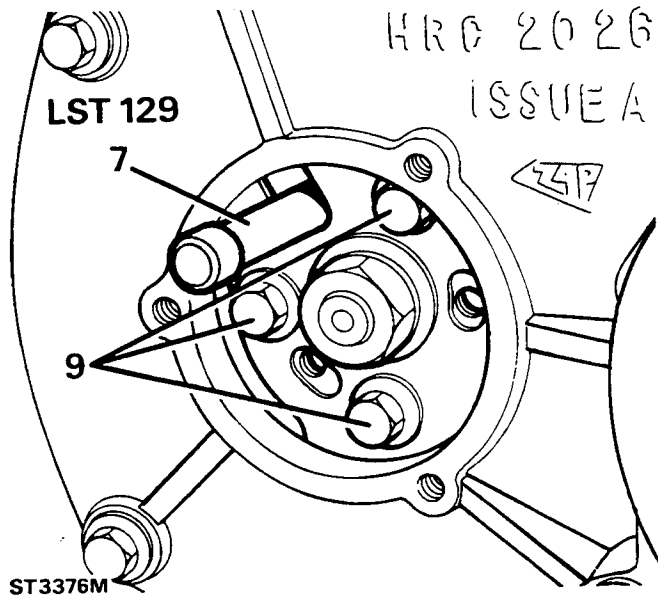
ST2709M

5. Vehicles with air conditioning, slacken and remove the compressor drive belt from the pulley, remove the four securing bolts and move the compressor aside.
6. Remove the three screws to release the injection pump hub blanking plate. On air conditioning vehicles this plate also provides a pivot for the compressor drive belt tensioning pulley.

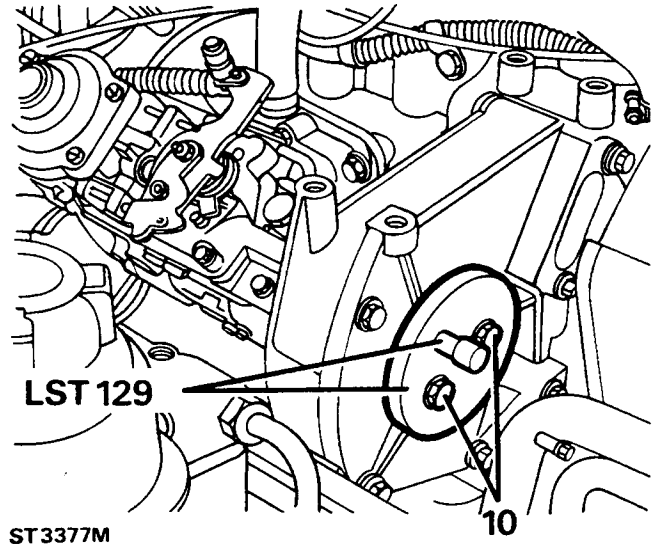


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7. Insert the injector pump timing pin LST 129 through the "U" shaped slot in the pump hub into the pump body. Ensure that the pin fits easily and is fully inserted.



9. Remove the pump drive gear three retaining bolts and remove the locking plate and timing pin.
10. Fit the pump gear retaining tool LST129 and align and tighten the two bolts. Insert the timing pin again, through the hole provided in the retaining tool.



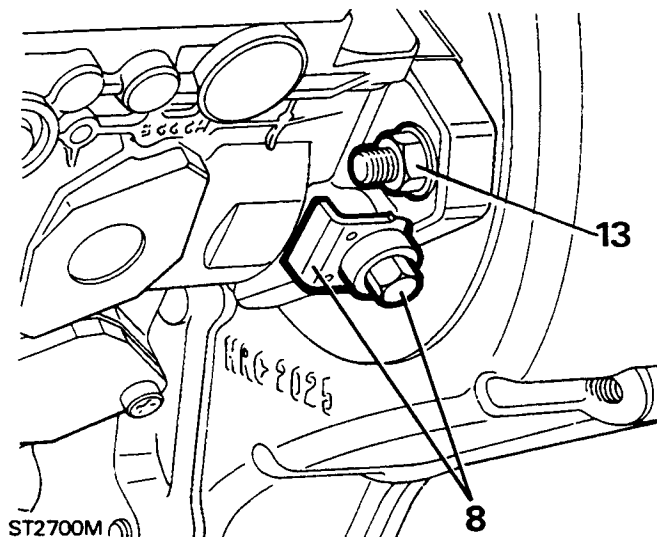
8. Slacken the pump locking screw and remove the keeper plate. Tighten the screw to lock the pump.

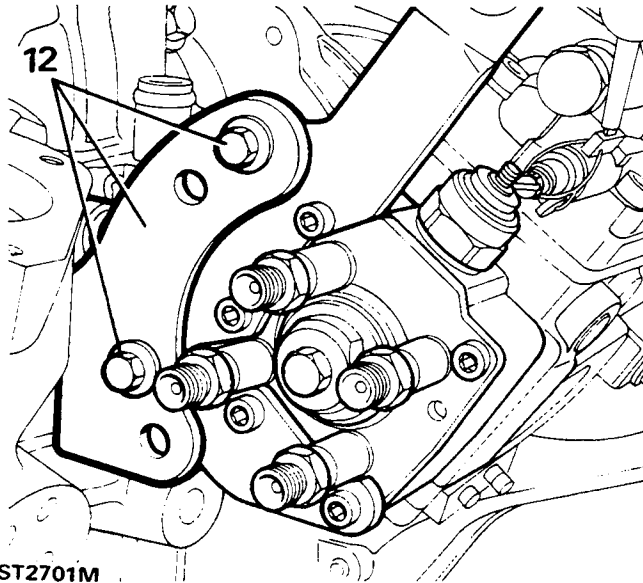
CAUTION: Once the timing pin LST 129 has been inserted and the pump shaft locked no attempt must be made to turn the crankshaft.

11. Remove the injector pipes and disconnect the following items from the injector pump:

- Throttle cable.
- Stop control solenoid lucar.
- Spill return pip.
- Turbo charger boost hose.
- Main fuel supply pipe.

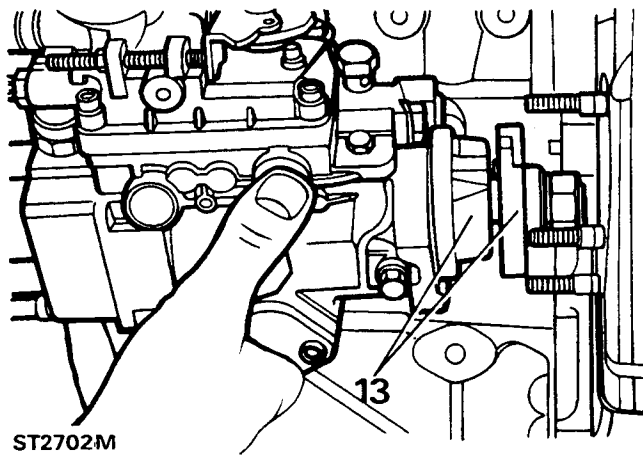
12. Remove the two bolts securing the pump to the rear support bracket and the bolts securing the bracket to the cylinder block and remove the bracket.





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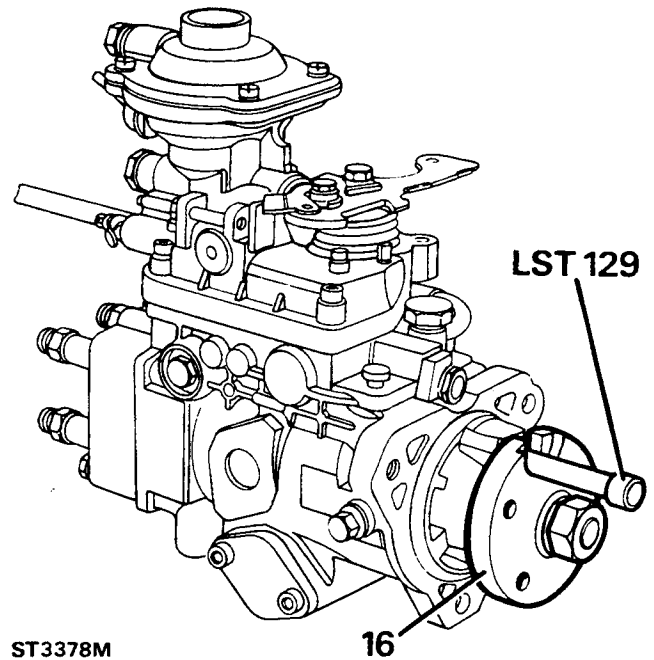
13. Remove the flange pump nuts and withdraw the pump and gasket from the front cover.
14. Fit blanks to the fuel pump inlet and outlets to prevent entry of dirt. Slacken the locking screw, fit the keeper plate and tighten the screw.



ST2702M

Fitting new pump

15. Clean the pump flange and front cover mating face and place a new gasket in position over the studs.
16. Fit the timing pin LST 129 to the pump, if necessary, rotate the pump to enable the pin to locate easily and fully.



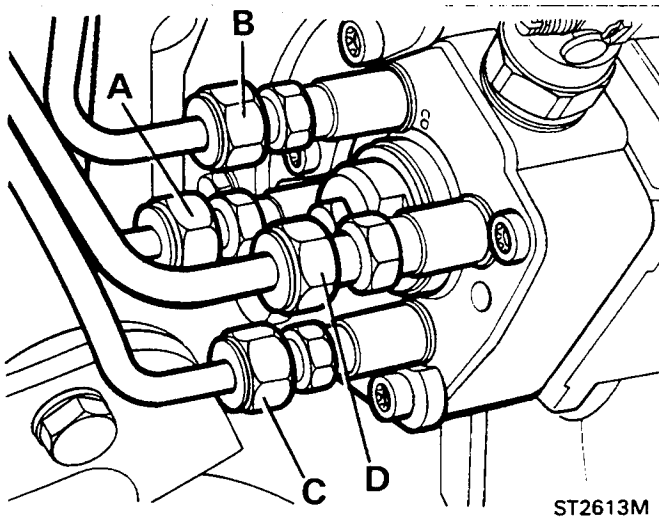
ST3378M

17. Slacken the pump locking screw remove the keeper plate and tighten the screw to lock the pump.
18. Fit the pump to the front cover and drive gear and secure with the three nuts tightening evenly to the correct torque **24 Nm**.
19. Fit the rear support bracket to the cylinder block and secure the pump to the bracket. Tighten all bolts to the correct torque **24 Nm**.
20. Connect the following:

Throttle cable.
 Stop control solenoid lucar.
 Spill return pipe.
 Turbo boost hose.
 main fuel supply pipe.

21. Fit the injector fuel supply pipes securing each end to their respective locations, loosely then tighten evenly but do not over tighten. Commencing at the front of the engine connect the pipes as follows.

A to number one injector.
 B to number two injector.
 C to number three injector.
 D to number four injector.



22. Remove the pump timing pin and the pump gear retaining tool LST 129/1.
23. Insert the pump timing pin again and fit the gear lock plate and secure with the three bolts and tighten to the correct torque.
24. Remove the timing pin. Unlock the pump, fit the keeper plate and tighten the bolt.

Injection pump timing check

25. To check that the pump timing is correct, turn the crankshaft two complete revolutions and check that the timing pin LST 129/2 can be inserted easily and fully into the pump. At the same time check that the flywheel timing pin can also be inserted in the flywheel slot.
26. If, with the flywheel timing pin located, the timing pin cannot be inserted cleanly into the pump, carry out the following instructions:

(1) Turn the crankshaft the small amount necessary to enable the timing pin to be inserted into the pump.

(2) Remove the keeper plate and lock the pump.

(3) Slacken the three pump gear retaining bolts.

(4) Turn the crankshaft to T.D.C.

(5) Check that the timing pin is an easy fit in the pump and that the flywheel timing pin locates.

(6) Tighten the pump gear retaining bolts to the correct torque.

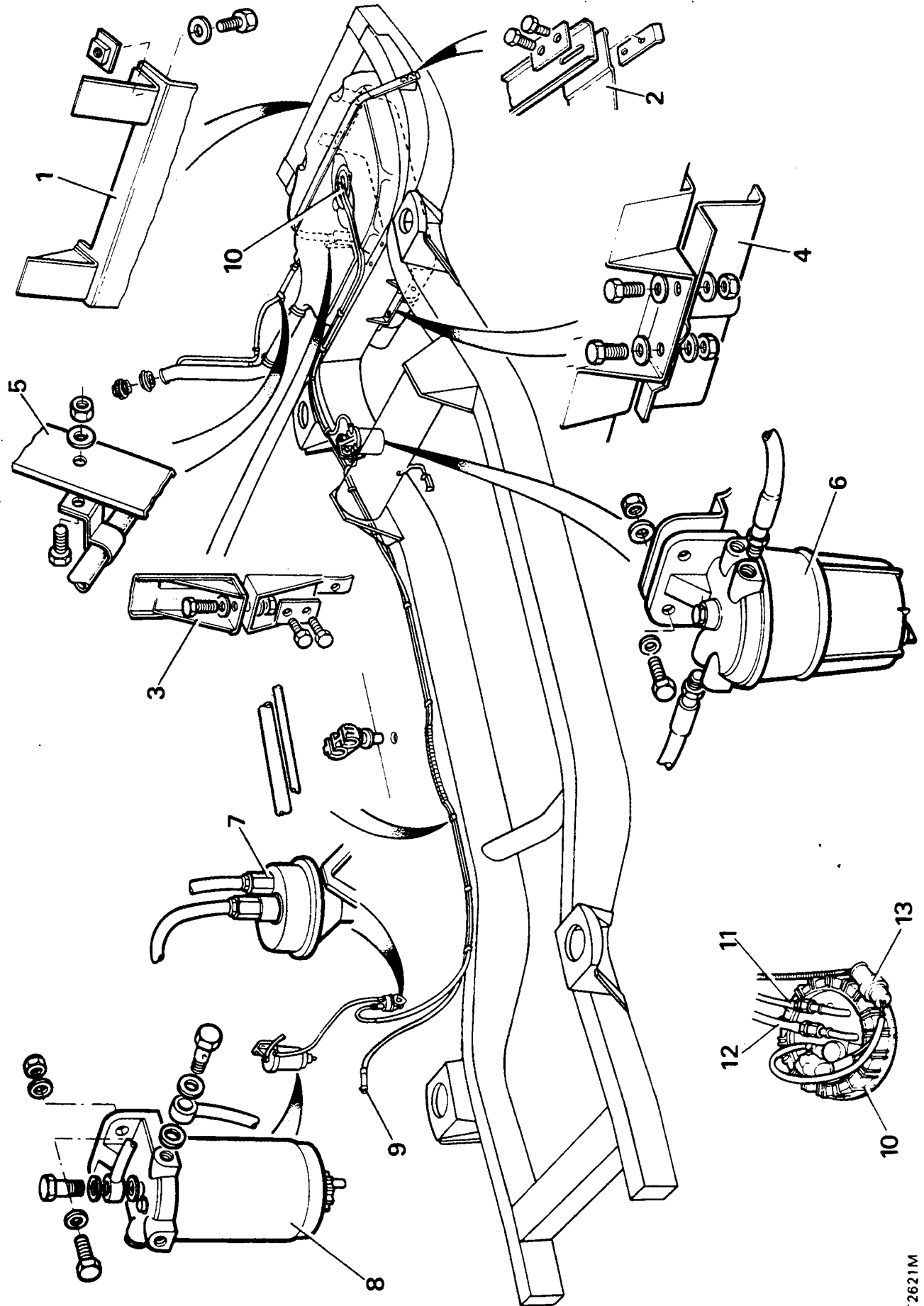
(7) Unlock the pump, fit the keeper plate and tighten the bolt. Remove the timing pin from the pump and the timing pin tool from the flywheel.

27. Fit the pump aperture cover plate with a new gasket and secure with the three screws.
28. Where appropriate, fit the air conditioning compressor and tension the drive belt. See Section 10 or 12.

NOTE: Pump timing may also be checked by following the procedure in the technical information bulletin number 099/92/EN

KEY TO DIESEL FUEL SYSTEM LAYOUT

1. Fuel tank rear support bracket.
2. Fuel tank retaining strap fixings left hand side.
3. Retaining strap fixing, right hand side.
4. Fuel tank front support bracket.
5. Fuel filler pipe vent hose support.
6. Fuel sedimenter.
7. Engine operated fuel lift pump.
8. Fuel filter located on engine compartment bulk head.
9. Spill return pipe from injectors via fuel injector pump.
10. Fuel tank unit.
11. Spill return pipe to fuel tank.
12. Fuel supply pipe to lift pump via the sedimenter.
13. Multiplug connector for fuel indicator sender unit.



TUNE AND ADJUST CARBURETTERS

Special tools:

Carburetter balancer 605330 or B89
Non-dispersive infra-red exhaust gas analyser.

General Requirements Prior to Tuning Carburetters

Accurate engine speed is essential during carburetter tuning, therefore the distributor pick up air gap and ignition timing must be checked together with the vacuum advance system.

Whenever possible the ambient air temperature of the tuning environment should be between 15° to 26°C (60° to 80°F). When checking engine speed, use an independent and accurate tachometer.

Idling adjustments should be carried out on a fully warmed up engine, that is, at least 5 minutes after the thermostat has opened. This should be followed by a run of one minute duration at an engine speed of approximately 2,500 rev/min before further adjustments or checks are carried out. This cycle may be repeated as often as required. It is important that the above cycle is adhered to, otherwise overheating may result and settings may be incorrect. The piston dampers must always be kept topped-up with the same grade of oil used in the engine.

Before any attempt is made to check settings a thorough check should be carried out to ensure that the throttle linkage between the pedal and carburetters is free and has no tendency to stick.

Ensure that the choke control lever is pushed fully down.

NOTE: References to left and right hand are as from the drivers seat.

TAMPER - PROOFING

To comply with E.C.E regulations the idle speed and mixture adjusting screws must be tamper - proofed following any adjustments. A red blanking plug; **Part number - JZX 1258** must be fitted into the mixture screw resess and a red cap; **Part number - JZX 1197** fitted over the idle adjustment screw (throttle adjustment screw).

TUNE AND ADJUST

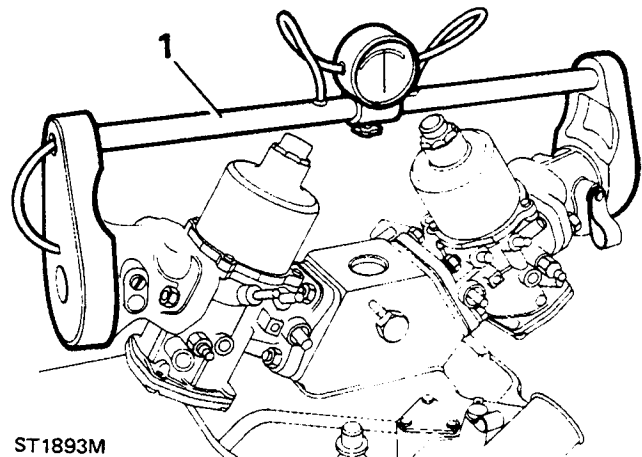
The following instructions apply to both carburetters unless otherwise stated.

Before commencing the following instructions, remove the air cleaner, air intake elbows, mixture adjustment screw plug and mixture screw cap.

CARBURETTER BALANCE

Using balancer 605330

1. Disconnect the inboard and outboard interconnecting throttle links between the two carburetters. Disconnect the inboard link from the left-hand carburetter and the outboard link from the right-hand one. Fit the balancer to the carburetter intakes and ensure that there are no air leaks, if necessary, zero the gauge with the adjustment screw.
2. Start the engine, and if necessary allow it to reach normal operating temperature. If the needle moves to the right, decrease the air flow through the left hand carburetter by unscrewing the idle screw. Alternatively, increase the air flow through the right hand carburetter by screwing down the idle screw. Reverse the procedure if the pointer moves to the left. Reconnect the carburetter interconnecting link.

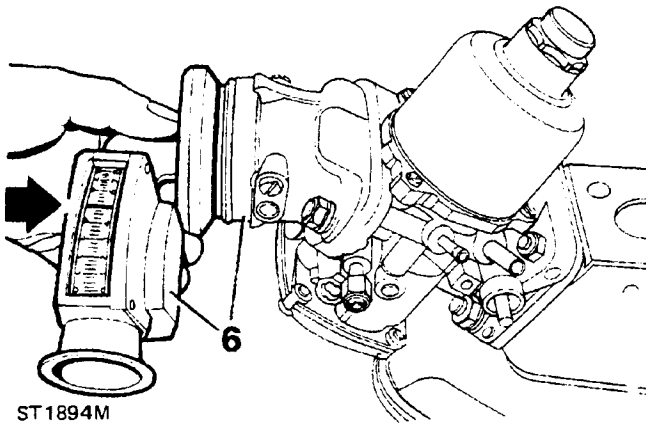


ST1893M

Using balancer B89

3. Disconnect the inboard and outboard inter-connecting throttle links between the two carburetters. Disconnect the inboard link from the left-hand carburetter and the outboard link from the right-hand one.
4. Back-off the idle adjusting screw on each carburetter, clear of the throttle lever.
5. Turn each throttle adjusting screw so that it touches the throttle lever, then turn the screws by equal amounts to achieve an approximate idle speed of 700 to 800 rev/min.

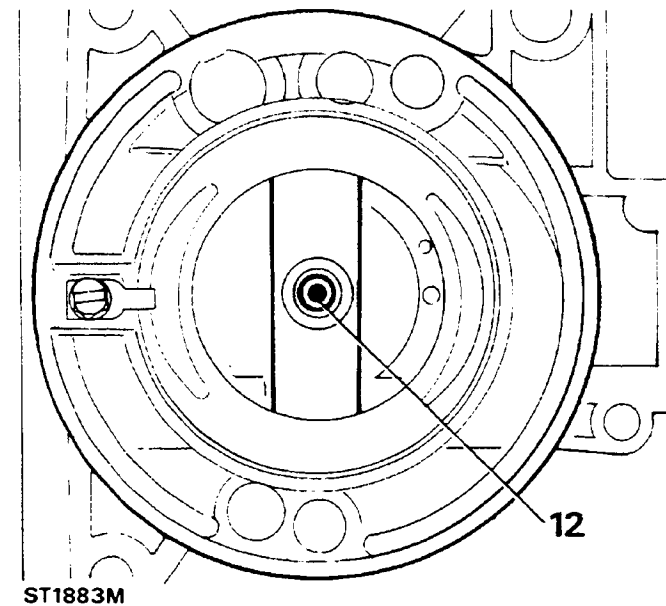
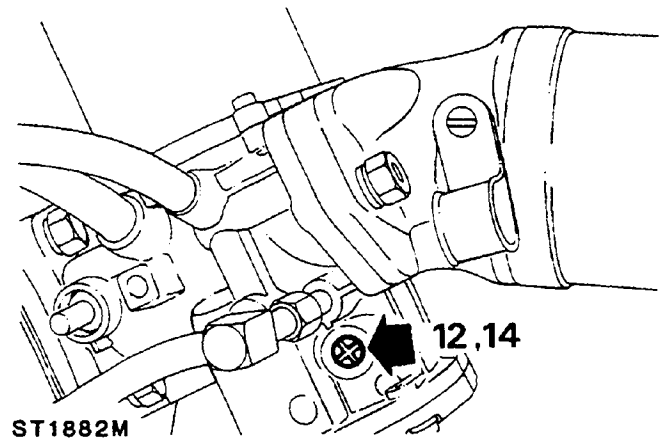
- Press the balancer firmly over the carburettor intake. Press or withdraw the control on the side of the balancer to adjust the meter needle reading to approximately half scale, and note the reading.



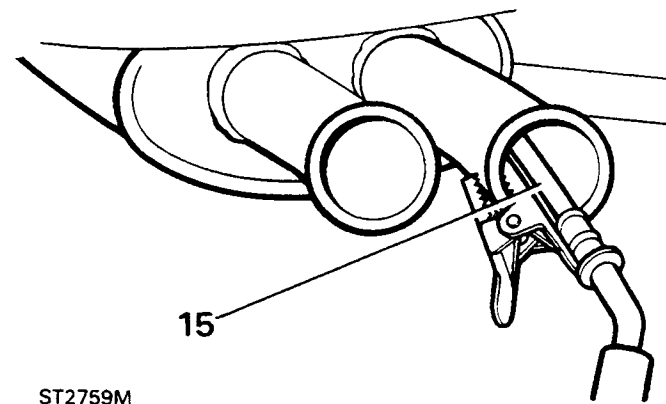
- Without altering the position of the balancer, place the balancer on the second carburettor intake and adjust the idle screw as necessary to achieve the same reading.
- Alternatively, adjust and check the balance of both carburettors until an idle speed of 700 to 800 rev/min is obtained.
- Reconnect both the throttle inter-connecting links, and again check the idle speed and balance.

Mixture setting

- Ensure that the engine is still at normal operating temperature.
- Mark the relationship of the suction chamber to the carburettor body, remove the retaining screws and lift off the suction chamber complete with pistons.
- To achieve a datum setting for the mixture screw, turn it anti-clockwise until the jet is level with the carburettor bridge. Check by placing a straight edge across the bridge and adjust as necessary so that the jet just touches the straight edge.
- Refit the suction chamber and piston, evenly tighten the retaining screws. Check that the piston moves freely without sticking. Top-up the piston damper with engine oil.
- Turn the mixture adjustment screw three and one half turns clockwise.



- Insert the probe of an infra-red exhaust gas analyser as far as possible up the exhaust pipe, start the engine and allow a one and one half minute stabilisation period.

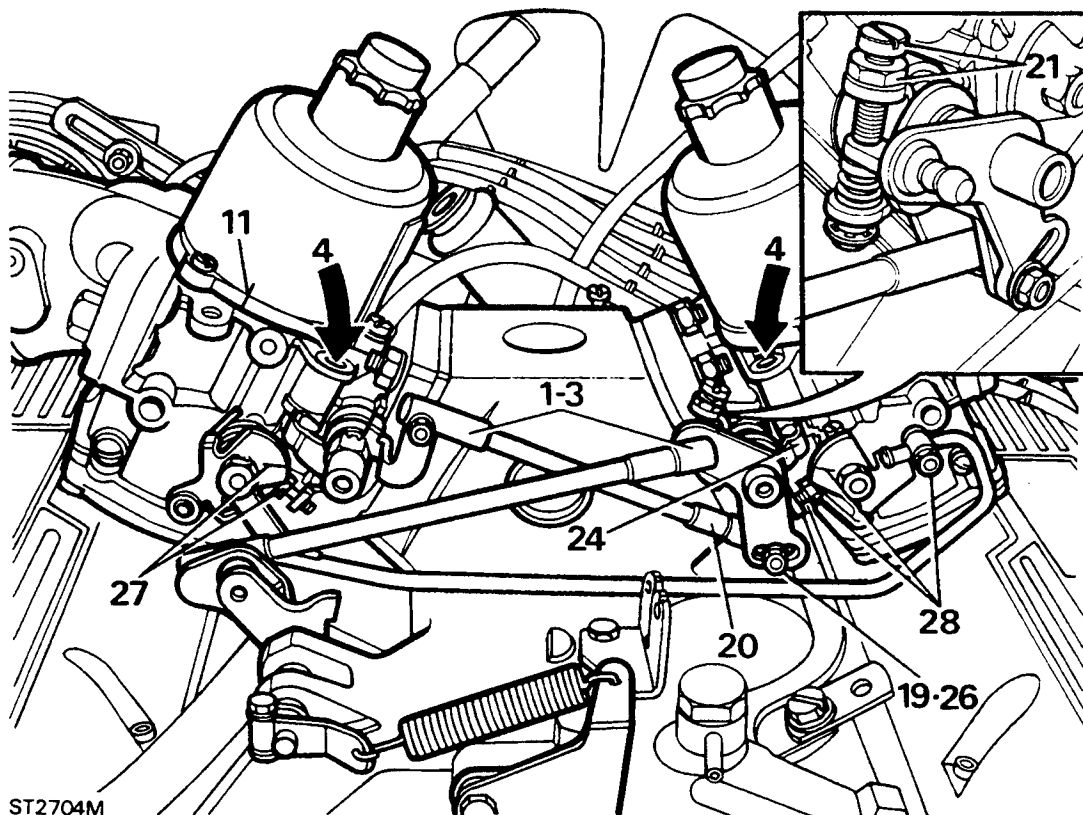


16. Adjust the mixture screw on both carburetters by equal amounts, rich or weak to achieve a CO reading of 0.5 to 2.5%.
17. If after approximately two minutes the CO level is not satisfactory run the engine at 2000 rev/min for one minute to stabilise the equipment, continue the setting procedure until a stable CO reading of 0.5 to 2.5% at an idle speed of 700-800 rev/min is obtained.
18. Check that the engine is at normal operating temperature.
19. Slacken the nut, at the right hand carburetter securing the inter-connecting link ball to the throttle lever.
20. Disconnect the inter-connecting throttle link between the carburetters at the right hand carburetter.
21. At the right hand carburetter, release the lock nut and slacken off the lost motion adjustment screw, until it is well clear of the spring loaded pad.
22. If necessary adjust the idle screw to maintain the correct idle speed. Check the CO level and carburetter balance, adjust if required.
23. Re-connect the inter-connecting throttle link to the right hand carburetter.
24. Hold the right hand throttle lever against the idle screw stop and adjust the lost motion screw until contact is made with the spring loaded pad, tighten the lock nut.

25. Check the idle speed and balance. Adjust the lost motion screw to restore balance if necessary.
26. Tighten the nut which secures the inter-connecting throttle link ball to the lever.

Fast idle adjustment

27. Pull out the cold start control (choke) until the scribed line on the left hand fast idle cam is in-line with the centre of the fast idle screw head.
28. Check the the scribed line on the right hand fast idle cam is similarly in-line with the fast idle screw head. If ther is mis-alignment, slacken the fast idle cam link rod screw at the right hand carburetter and move the cam until the scribed line coincides with the centre of the screw head. Tighten the cam rod screw.
29. Turn the fast idle screw clockwise, on each carburetter, until just clear of the cam.
30. Turn the fast idle screw of the leading (left hand) carburetter down (clockwise) until a slight change in engine speed is noted.
31. Similarly turn the fast idle screw of the second carburetter (right-hand) down until a further slight change of engine speed is noted.
32. Adjust the fast idle screws of both carburetters by equal amounts to achieve a fast idle speed of 1100 to 1150 rev/min.



33. Tighten the fast idle screw lock-nut on both carburetters. Push the cold start (choke) fully home then pull it out again to its full extent and re-check the fast idle speed.
34. Fit the appropriate blanking plug and cap to the mixture screw recess and idle adjusting screw.
35. Fit the carburetter air intake elbows and air cleaner.

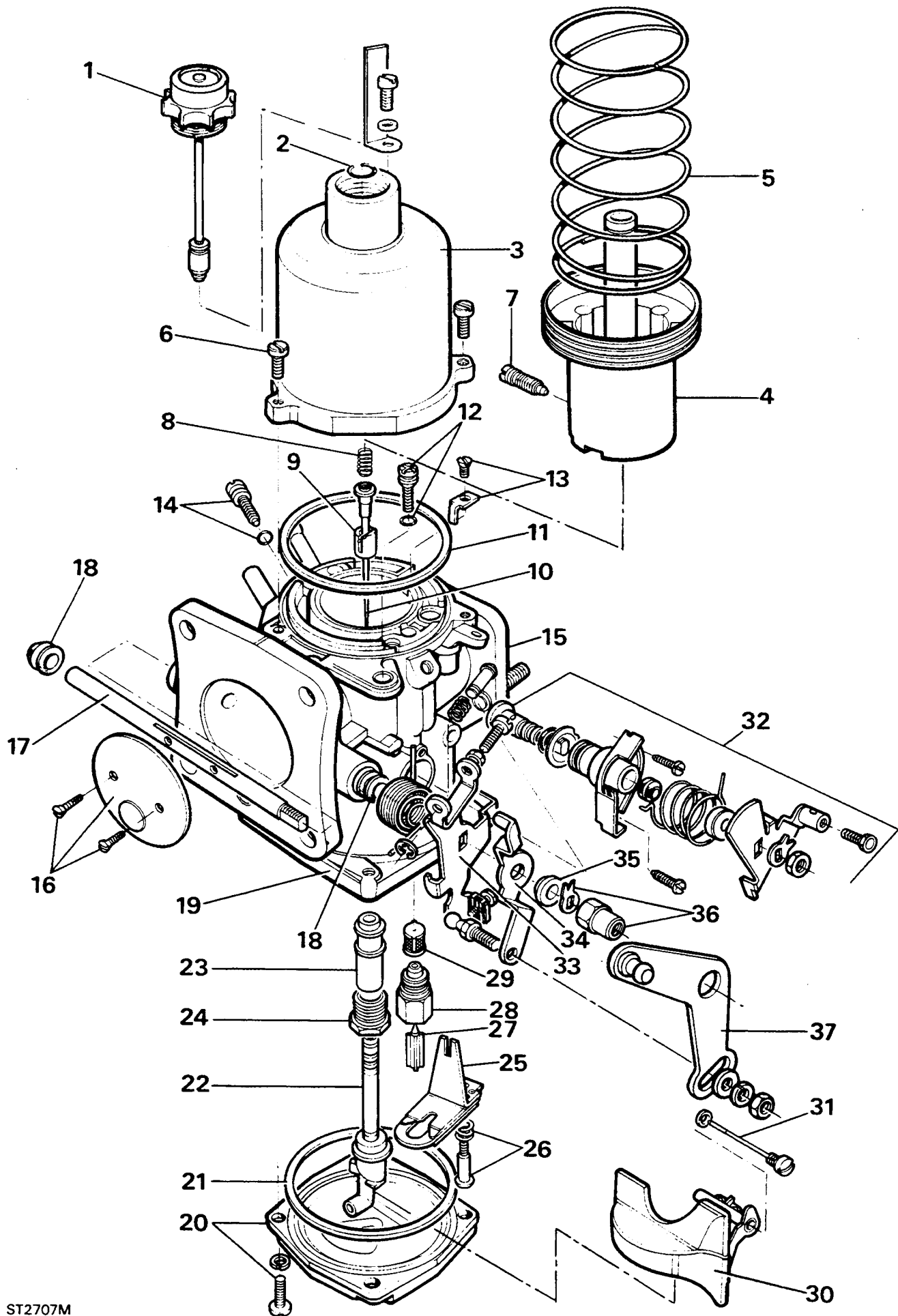
CARBURETTER OVERHAUL - S.U. HIF 44 - right hand

DISMANTLE

1. Remove the carburetters from the engine and clean the exteriors with a suitable solvent.
2. Remove the two nuts and spring washers and withdraw the air intake adaptor and joint washer.
3. Unscrew and remove the piston damper assembly and drain the oil.
4. Remove the three screws and lift-off the suction chamber complete with piston and spring.
5. Remove the spring clip from the top of the piston rod and withdraw the piston and spring.
6. Unscrew the fuel metering needle guide locking screw. If the needle cannot be removed from the piston with the fingers, hold the needle as close to the piston as possible, in a soft jawed vice and with a sharp pull withdraw the needle, guide and spring assembly.
7. Remove the four screws and withdraw the float chamber cover plate and sealing ring.
8. Remove the jet adjusting lever retaining screw and spring.
9. Withdraw the jet complete with the bi-metal lever and separate the lever from the jet.
10. Unscrew and remove the float pivot spindle and plain washer, and remove the float.
11. Lift-out the needle valve.
12. Unscrew and remove the needle valve and filter.
13. Unscrew and remove the jet bearing nut.
14. Invert the carburetter body to allow the jet bearing to fall out. If the bearing sticks, carefully tap it out from the bridge side.
15. Remove the piston guide peg.
16. Remove the suction chamber-to-body sealing ring.
17. Unscrew and remove the mixture adjusting screw and seal. Use thin nosed pliers to finally withdraw the screw.
18. Bend-back the cam lever nut lock tabs and remove the nut and lock washer.
19. Remove the cam lever and spring.
20. Remove the end seal cover and seal.
21. Remove the two screws and withdraw the cold start valve body and seal together with the valve spindle. Also collect the paper joint washer.
22. Note the position of the throttle levers and return spring.
23. Bend-back the lock washer tabs and remove the throttle lever nut.
24. Remove the lock washer, bush washer and throttle actuating lever.
25. Release the throttle return spring and remove the throttle adjusting lever from the throttle butterfly spindle and remove the return spring.
26. Hold the butterfly closed and mark the relationship of the butterfly to the carburetter flange.
27. Remove the butterfly two remaining screws and withdraw the butterfly from the spindle.
28. Withdraw the throttle butterfly spindle from the carburetter body together with the two seals.
29. Clean all components with petrol or de-natured alcohol ready for inspection. Do not use abrasives for the removal of stains or deposits.

INSPECTION

30. Examine the throttle spindle and bearings for excessive axial clearance.
31. Check the float needle and seating for wear and the float for punctures and renew if necessary.
32. Check the condition of all rubber seals. 'O' rings and joint washers and renew if necessary. The float cover plate seal must be renewed.
33. Examine the carburetter body for cracks and damage.
34. Ensure that the inside of the suction chamber is clean and fit the piston into the chamber without the spring. Hold the assembly horizontally and spin the piston. The piston should spin freely in the suction chamber without any tendency to stick.
35. Inspect the metering needle for wear, scores and distortion. Check also that it has the correct designation number - see Engine Tuning Data, Section 05.
36. Examine the bi-metal jet lever for cracks.
37. Check all springs for cracks and distortion.



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KEY TO S.U. CARBURETTER COMPONENTS

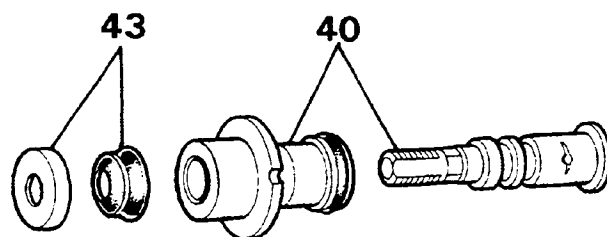
1. Piston damper.
2. Spring clip.
3. Suction chamber.
4. Piston.
5. Piston spring.
6. Suction chamber retaining screws - 3 off.
7. Needle retaining screw.
8. Needle bias spring.
9. Needle guide.
10. Needle
11. Suction chamber sealing ring.
12. Throttle adjusting screw and seal.
13. Piston key and retaining screw.
14. Mixture adjusting screw and seal.
15. Carburetter body.
16. Throttle butterfly and retaining screws.
17. Throttle spindle.
18. Throttle spindle seals - 2 off.
19. Float chamber.
20. Float chamber cover and retaining screws.
21. Float chamber cover seal.
22. Jet assembly.
23. Jet bearing.
24. Jet bearing nut.
25. Bi-metal jet lever.
26. Jet retaining and adjusting screw and spring.
27. Float needle.
28. Float needle seat.
29. Float needle seat filter.
30. Float.
31. Float pivot spindle.
32. Cold start and cam lever assembly.
33. Throttle adjusting lever and lost motion assembly.
34. Throttle actuating lever.
35. Bush washer.
36. Throttle lever assembly retaining nut and lock washer.
37. Throttle lever.

ASSEMBLE**Fit throttle butterfly**

38. Fit the throttle spindle to the carburetter body and insert the throttle disc into the spindle in its original position. Secure the disc with new screws and ensure that before tightening the throttle disc is correctly positioned and closes properly. Splay the split ends of the screws to prevent turning.
39. Fit new seals to both ends of the throttle spindle ensuring that they are fitted the correct way round.

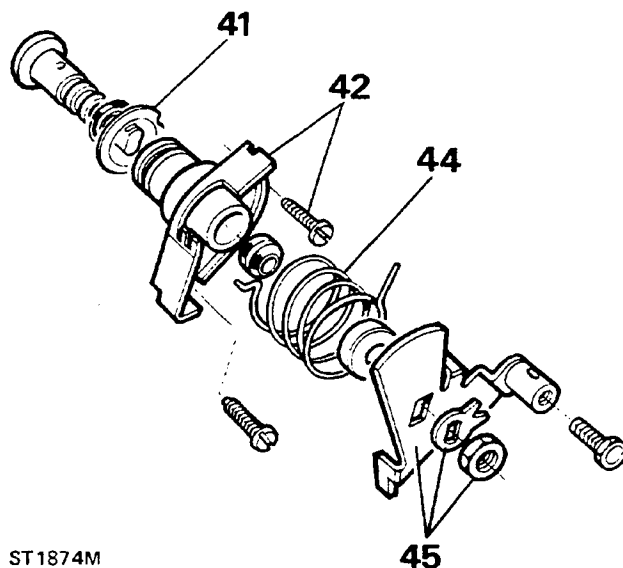
Fit cold start assembly

40. Fit a new 'O' ring to the valve body and assemble the valve spindle to the valve body.
41. Fit a new paper joint washer to the valve noting that the half-moon cut-out in the washer is clearance for the top retaining screw.
42. Fit the starter assembly to the carburetter body and secure with the two screws.
43. Fit the end seal and cover.



ST1873M

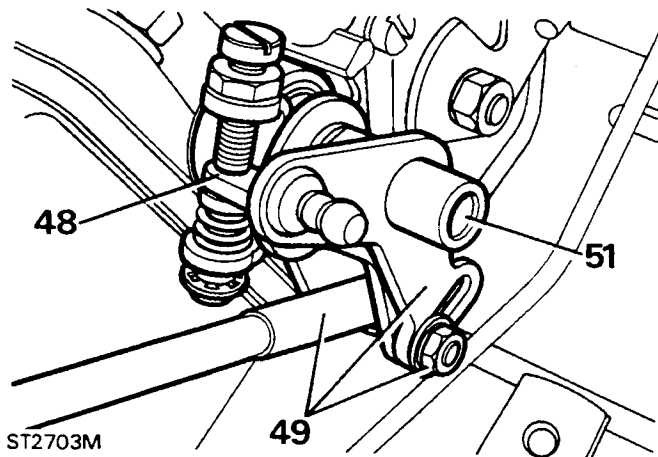
44. Fit the return spring.
45. Fit the cam lever and tension the spring. Fit a new lock washer and secure with the nut and bend the tabs over a convenient flat.
46. Adjust the coils of the spring, if necessary, to prevent coil binding.



ST1874M

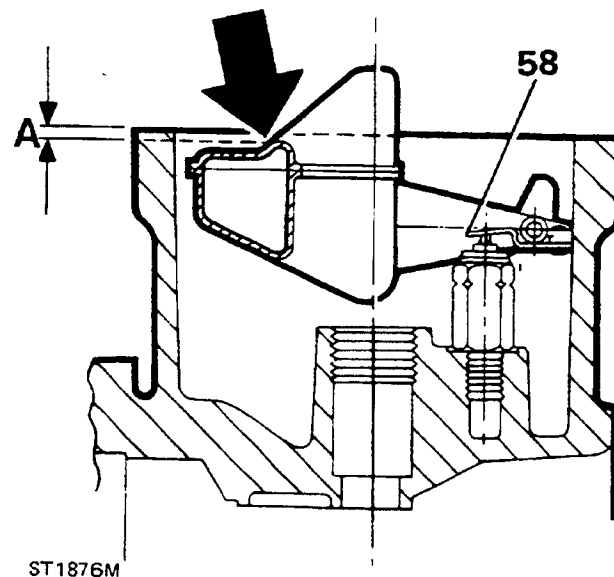
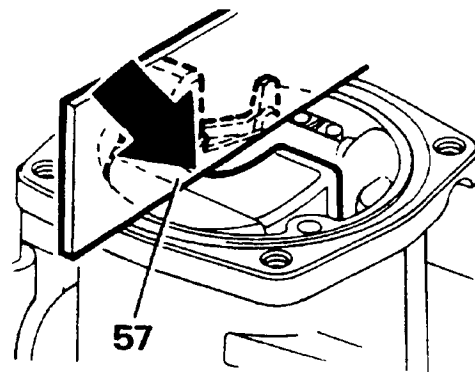
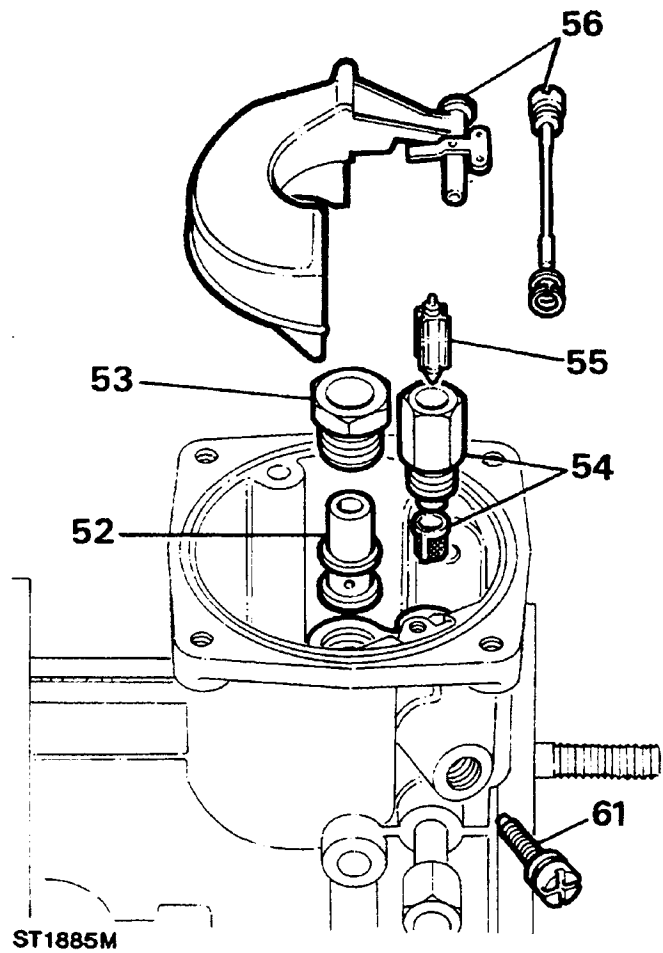
Fit throttle lever assembly

47. Fit the return spring so that the longest leg rests against the throttle adjusting screw housing.
48. Fit the throttle adjusting lever and lost motion assembly and tension the return spring.
49. Fit the throttle actuating lever and inboard inter-connecting link to the throttle lever.
50. Fit the bush washer and lock washer.
51. Fit and tighten the special nut and bend the lock tabs over a convenient flat.

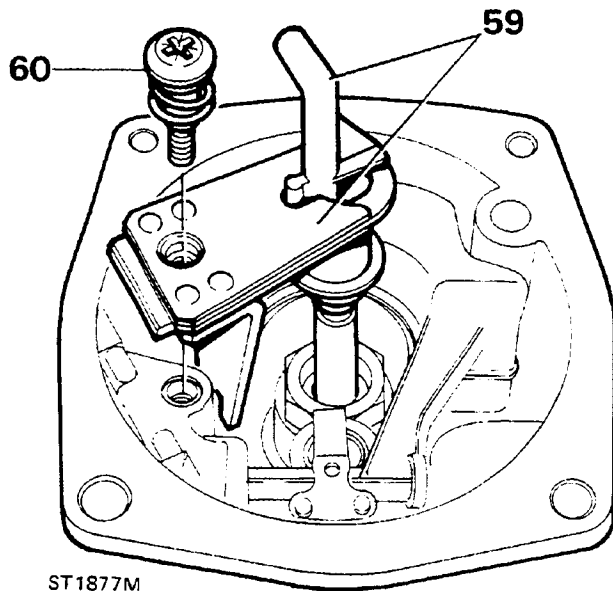


Fit jet and float assembly

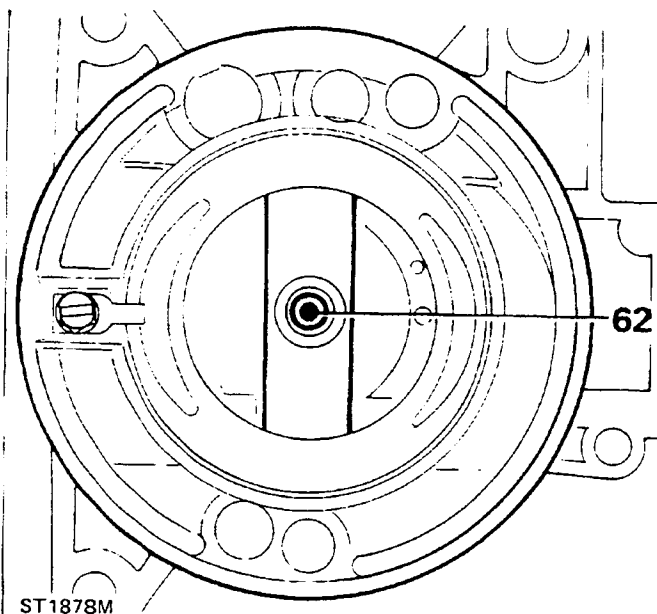
52. Fit the jet bearing, long end towards the float.
53. Fit the jet bearing nut.
54. Clean or renew the filter and fit the float needle seat.
55. Fit the needle valve, spring loaded pin uppermost.
56. Fit the float and secure with the pivot pin.
57. Hold the carburettor in the inverted position so that the needle valve is closed by the weight of the float only. Check using a straight edge that the point on the float, arrowed on the illustration, is 1.0 to 1.5 mm (0.04 to 0.062 in) below the level of the float chamber face, dimension 'A'.
58. Adjust the float position by carefully bending the brass pad until the correct dimension is achieved. After adjustment, check that the float pivots freely about the spindle.



59. Assemble the jet to the bi-metal jet lever and ensure that the jet head moves freely in the cut-out.
60. Fit the jet and bi-metal jet lever to the carburettor and secure with the spring loaded jet retaining screw.

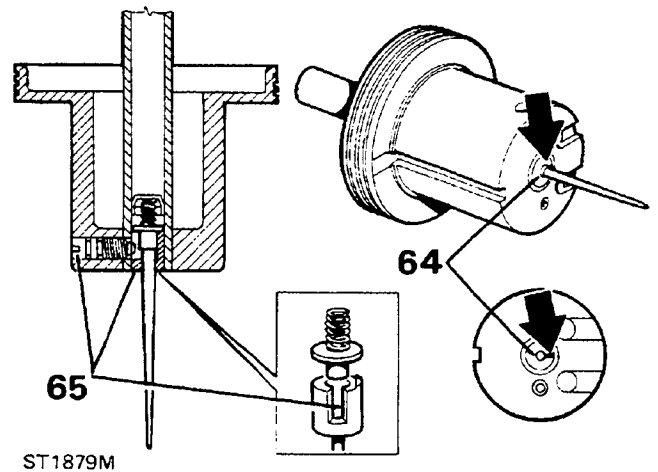


61. Fit the mixture adjusting screw.
62. Adjust the mixture screw until the jet is flush with the carburettor bridge, then turn the screw a further three and one half turns clockwise.
63. Using a new sealing ring, fit the float chamber cover, noting that it can only be fitted one way. Secure with the four screws and spring washers and evenly tighten.

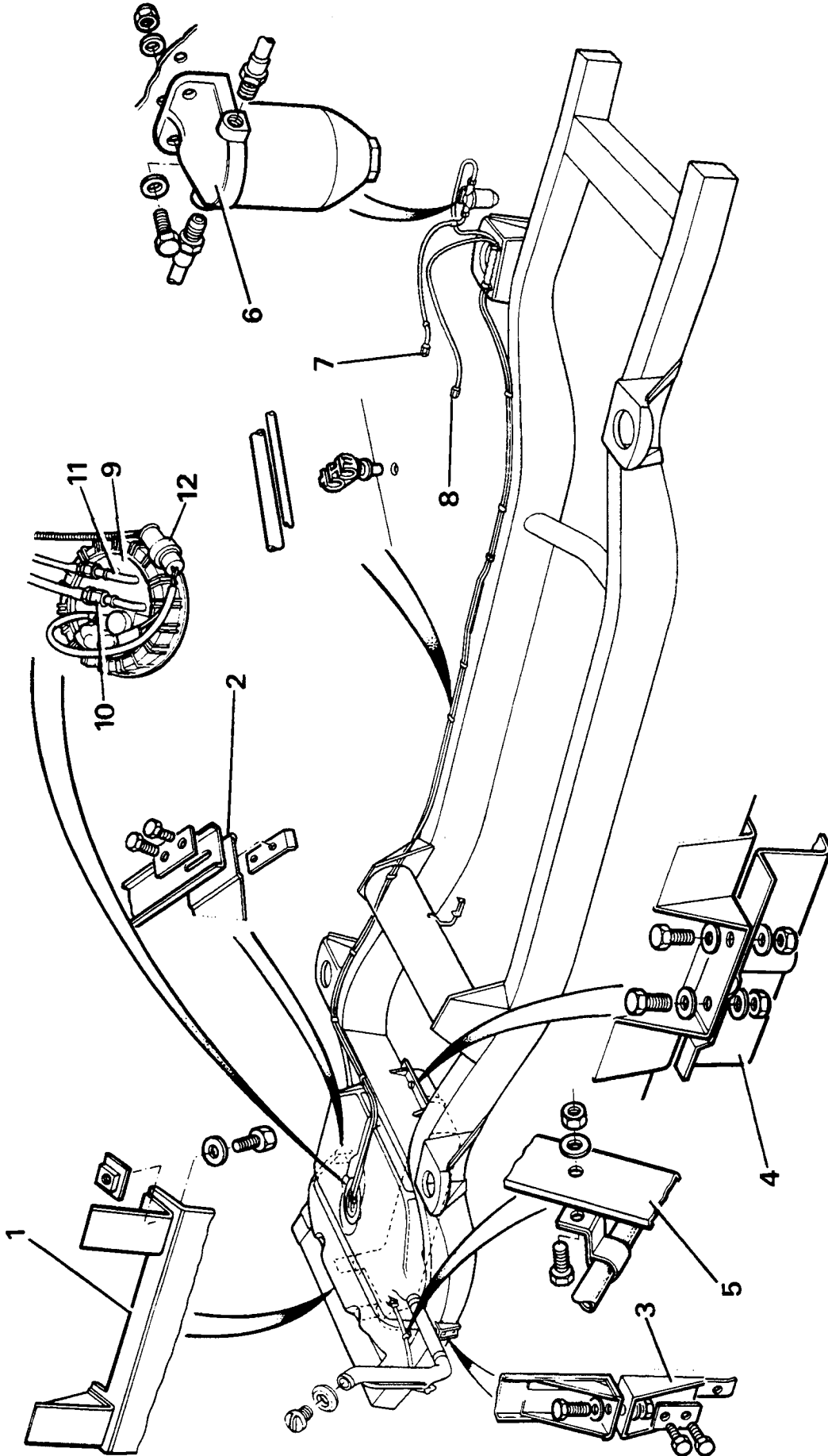


Fit piston and suction chamber

64. Fit the needle, spring and guide assembly to the piston ensuring that the etched arrow head on the needle locating guide is aligned between the piston transfer holes, as illustrated.
65. Secure and ensure that when the screw is tightened the guide is flush with the piston and that the screw locates in the guide slot.



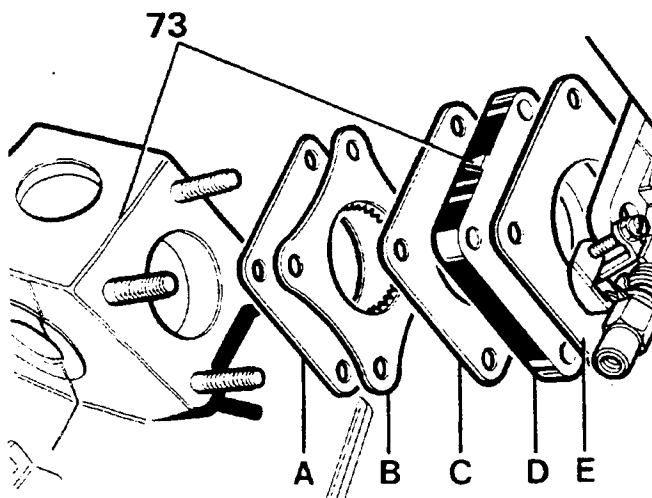
66. Fit the piston key to the carburettor body using a new screw. Tighten the screw and splay the end.
67. Fit a new suction chamber sealing ring to the groove in the carburettor body.
68. To prevent the piston spring being 'wound up' during assembly, temporarily fit the piston and suction chamber less the spring to the body, and pencil mark the relationship of the chamber to the body. Remove the suction chamber and fit the spring to the piston. Hold the suction chamber above the spring and piston, align the pencil marks and lower the chamber over the spring and piston, taking care not to rotate the suction chamber. Secure the chamber to the body with the three screws, tightening evenly and check that the piston moves freely.
69. Hold the piston at the top of its stroke and fit the spring clip.
70. Fit the piston damper.
71. Using a new joint washer, fit the air intake adaptor and secure with the two nuts and spring washers.



ST2622M

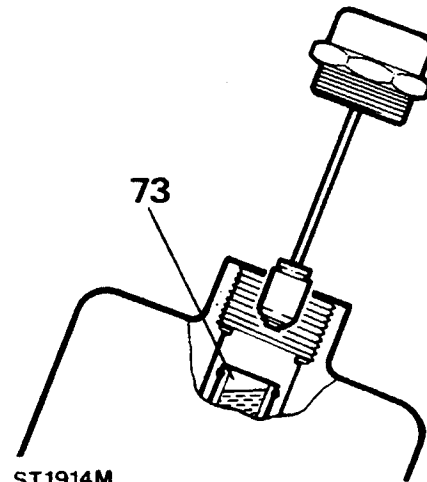
KEY TO PETROL FUEL SYSTEM LAYOUT

1. Fuel tank rear support bracket.
 2. Fuel tank retaining strap left hand side fixing.
 3. Fuel tank retaining strap right hand side fixing.
 4. Fuel tank front support bracket.
 5. Fuel filler pipe vent pipe support clip.
 6. Fuel filter.
 7. Fuel supply pipe to carburettors.
 8. Spill return pipe to fuel tank.
 9. In-tank fuel pump.
 10. Fuel supply pipe from pump to carburetters via filter.
 11. Spill return pipe.
 12. Multiplug connector for fuel electrical supply to pump for pump operation and fuel level indicator sender unit.
72. Fit the carburetters to the inlet manifold ensuring the the joint washers, deflector and insulator are fitted in the sequence illustrated. The insulator must be fitted with the arrow head uppermost and pointing inwards towards the manifold. Secure with the four nuts and spring washers and tighten evenly to the correct torque.
- A. Joint washer.
 - B. Deflector-teeth pointing inwards.
 - C. Joint washer.
 - D. Insulator.
 - E. Joint washer.



ST1880M

73. Connect the linkages and top-up the carburettor dampers with a recommended oil to the top of the hollow piston rod.
74. Tune and adjust the carburetters.



ST1914M

FUEL TANK LIFT PUMP AND SENDER UNIT

WARNING: Ensure that the **WARNINGS** and **FUEL HANDLING PRECAUTIONS** given in Section 01 are adhered to before carrying out the following instructions.

WARNING: Before commencing any operation requiring fuel to be drained from the fuel tank, the system must be vented by removing the fuel filler cap and the engine allowed to cool.

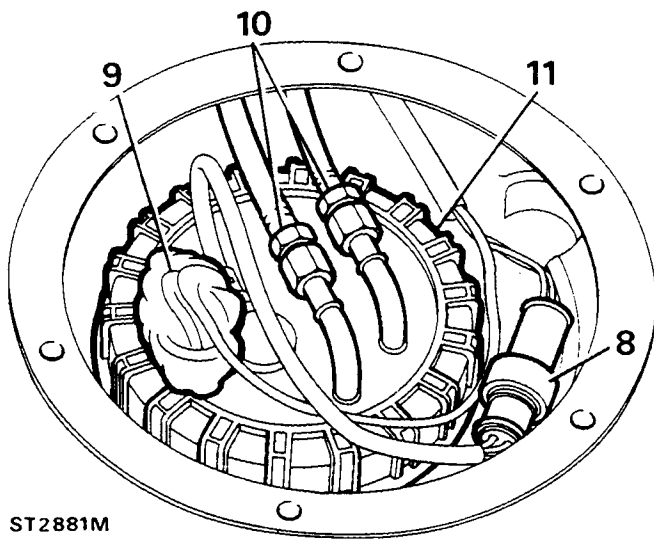
WARNING: Ensure that all the necessary precautions are taken against fuel spillage and fuel vapour to prevent fire or explosion.

Special tool:

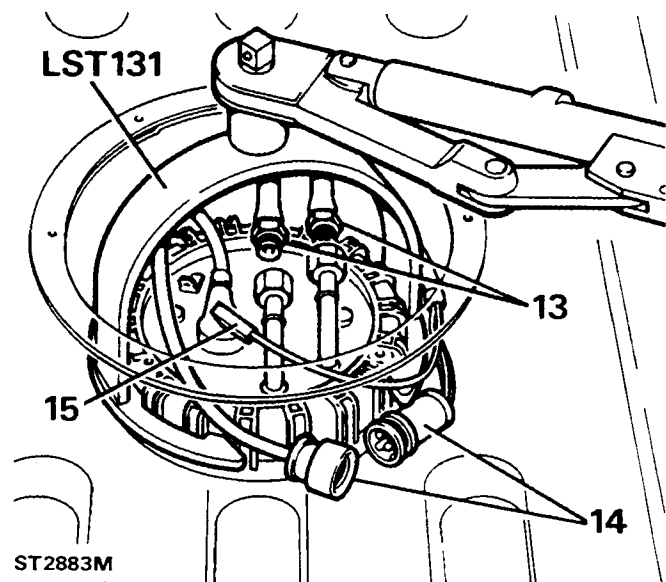
LST 131

Removal

1. Disconnect the battery negative lead.
2. Drain or syphon at least 9 litres (2 gallons) of fuel from the fuel tank using a suitable container that can be sealed afterwards.
3. Remove the rear carpet retainer.
4. Ease the carpet from under the lower trim panels at the rear of the fold down seats.
5. Raise the carpet to expose the sound insulation.
6. Fold back the sound insulation to reveal the access panel.
7. Remove the securing screws and detach the access panel from the floor.
8. Disconnect the electrical connections at the multi-plug.



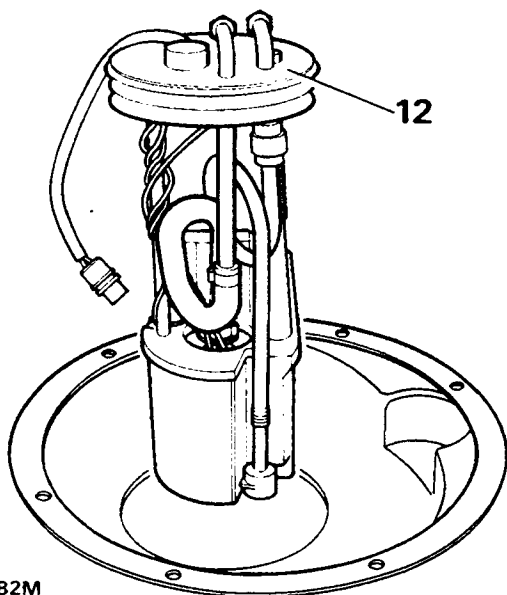
ST2881M



ST2883M

9. Remove the insulation sealant from the earth lead and disconnect the lead from the fuel pump.
10. Disconnect the fuel pipes from the fuel pump.
11. Using the special tool LST 131 remove the retaining ring anti-clockwise and withdraw the pump from the fuel tank.

16. When the fuel system has been reassembled check all fuel pipes, sealing rings and connections for security and run the engine to check for fuel leaks before final assembly.
17. Inspect the access panel seal to ensure that it is satisfactory for further use, renew as necessary.
18. Fit the access panel to the aperture in the floor and secure with the screws.
19. Reverse operations 1 to 5 to refit the sound insulation and carpet.



ST2882M

Refitting

12. Insert the fuel pump into the fuel tank and secure with the retaining ring tightened to a torque of 45 - 50 Nm (33.2 - 36.9 lbf ft).
13. Connect the fuel pipes to the fuel pump.
14. Connect the electrical leads at the multi-plug.
15. Connect the earth lead to the pump and insulate with suitable sealant. Connect the battery, run the engine and inspect the unions for fuel leaks.

INTRODUCTION

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

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

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

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

DESCRIPTION

ELECTRONIC CONTROL UNIT-ECU

The Electronic Fuel Injection system is controlled by the E.C.U. located on the panel to the right of the right-hand footwell. The control unit is a microprocessor with integrated circuits and components mounted on printed circuit boards. The E.C.U. is connected to the main harness by a 40 pin plug.

INJECTORS

The eight fuel injectors are fitted between the pressurized fuel rail and inlet manifold. Each injector comprises a solenoid operated needle valve with a movable plunger rigidly attached to the nozzle valve. When the solenoid is energized the plunger is attracted off its seat and allows pressurized fuel into the intake manifold.

TUNE RESISTOR

A 0.5 W tune resistor is located adjacent to the ECU, and plugged into the EFI cable assembly. The resistor value changes for different market applications as follows:

Red, 180 Ohms, Australia, Rest of the World.

Green, 470 Ohms, UK and Europe, non catalyst.

Yellow, 910 Ohms, Saudi non catalyst.

White, 3K9 Ohms, USA and Europe, catalyst.

ENGINE COOLANT TEMPERATURE THERMISTOR (SENSOR)

The coolant thermistor (sensor) is located by the front left hand branch of the intake manifold. The thermistor provides engine coolant information to the E.C.U. The E.C.U. on receiving the signal from the thermistor will lengthen slightly the time that the injectors are open, and reducing this time as the engine reaches normal operating temperature.

FUEL TEMPERATURE THERMISTOR (SENSOR)

The fuel temperature thermistor (sensor) is located in the fuel rail forward of the ram housing. The thermistor sends fuel temperature data to the E.C.U, the E.C.U on receiving the data will adjust the injector open time accordingly to produce good hot starting in high ambient temperatures.

BYPASS AIR VALVE (STEPPER MOTOR)

The bypass valve is screwed into a housing attached to the rear of the plenum chamber, between the plenum chamber and bulkhead. The bypass valve has two windings which enable the motor to be energised in both directions thus opening or closing the air valve as required by the E.C.U.

The bypass valve will open and allow extra air into the plenum chamber to maintain engine idle speed when the engine is under increased (Electrical and Mechanical) loads.

The bypass valve will control engine idle speed when the vehicle is stationary.

LAMBDA SENSORS (O₂ SENSORS)

Catalyst vehicles only

The two Lambda sensors are located forward of the catalysts mounted in the exhaust downpipes.

The sensors monitor the oxygen content of the exhaust gases and provide feedback information of the air/fuel ratio to the E.C.U. Each sensor is heated by an electrical element to improve its response time when the ignition is switched on. Further information concerning the Lambda sensors will be found in the Emission Section 17.

FUEL PRESSURE REGULATOR

The fuel pressure regulator is mounted in the fuel rail at the rear of the plenum chamber. The regulator is a mechanical device controlled by plenum chamber vacuum, it ensures that fuel rail pressure is maintained at a constant pressure difference of 2.5 bar above that of the manifold.

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

FUEL PUMP

The electric fuel pump is located in the fuel tank, and is a self priming 'wet' pump, the motor is immersed in the fuel within the tank.

AIR FLOW SENSOR

The hot-wire air flow sensor is mounted on a bracket attached to the left hand valance, rigidly connected to the air cleaner and by hose to the plenum chamber inlet neck.

The air flow sensor consists of a cast alloy body through which air flows. A proportion of this air flows through a bypass in which two wire elements are situated: one is a sensing wire and the other is a compensating wire. Under the control of an electronic module which is mounted on the air flow sensor body, a small current is passed through the sensing wire to produce a heating effect. The compensating wire is also connected to the module but is not heated, but reacts to the temperature of the air taken in, as engine intake air passes over the wires a cooling effect takes place.

The electronic module monitors the reaction of the wires in proportion to the air stream and provides output signals in proportion to the air mass flow rate which are compatible with the requirements of the E.C.U.

THROTTLE POTENTIOMETER

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

The potentiometer is a resistive device supplied with a voltage from the E.C.U.. Movement of the throttle pedal causes the throttle valve to open, thus rotating the wiper arm within the potentiometer which in turn varies the resistance in proportion to the valve position. The E.C.U. lengthens the injector open time when it detects a change in output voltage (rising) from the potentiometer.

In addition the E.C.U. will weaken the mixture when it detects the potentiometer output voltage is decreasing under deceleration and will shorten the length of time the injectors are open.

When the throttle is fully open, the E.C.U. will detect the corresponding throttle potentiometer voltage and will apply full load enrichment. This is a fixed percentage and is independent of temperature. Full load enrichment is also achieved by adjusting the length of the injector open time.

When the throttle is closed, overrun, fuel cut off or idle speed control may be facilitated dependant on other inputs to the E.C.U.

The throttle potentiometer is 'self adaptive', which means that adjustment is not possible. It also means that the potentiometer setting is not lost, for example, when throttle stop wear occurs.

ROAD SPEED TRANSDUCER

The road speed transducer is mounted on a bracket located on the left hand chassis side member adjacent to the rear engine mounting. The transducer provides road speed data to the ECU. The ECU in turn detects vehicle movement from the road speed input and ensures that idle speed control mode is disengaged. Should the speed transducer fail in service the ECU idle speed control would become erratic.

INERTIA SWITCH

The inertia switch is a mechanically operated switch located under the fascia beside the heater, on the drivers side.

The switch is normally closed and is in the ignition feed (fuse to fuel pump). In the event of a sudden impact the switch opens, and disconnects the electrical feed to the fuel pump. The switch is reset by pressing down the button.

RELAYS

The two electronic fuel injection relays are located adjacent to the E.C.U. The main relay is energized via the E.C.U when the ignition is switched on and supplies current to the fuel injection system. The fuel pump relay is energized by the E.C.U. which in turn operates the fuel pump to pressurize the fuel system.

MICRO PROCESSOR POWER CHECK (Instrument binnacle - Service use only)

As part of the engine starting procedure, this symbol will illuminate momentarily.

CONDENSER FANS

It should be noted that under high coolant temperatures, when the engine is switched off, the condenser fans will be activated and will run for approximately ten minutes.

PURGE VALVE

The operation of the charcoal canister purge valve is checked during the fuel injection system test. see TESTS 9 and 10 Section 19.

FUEL INJECTION SYSTEM

CAUTION: The fuel system incorporates fine metering components that would be affected by any dirt in the system; therefore it is essential that working conditions are scrupulously clean. If it is necessary to disconnect any part of the fuel injection system, the system **MUST** be depressurized. All openings left open after the removal of any component from the fuel system, **MUST** be sealed off to prevent ingress of dirt.

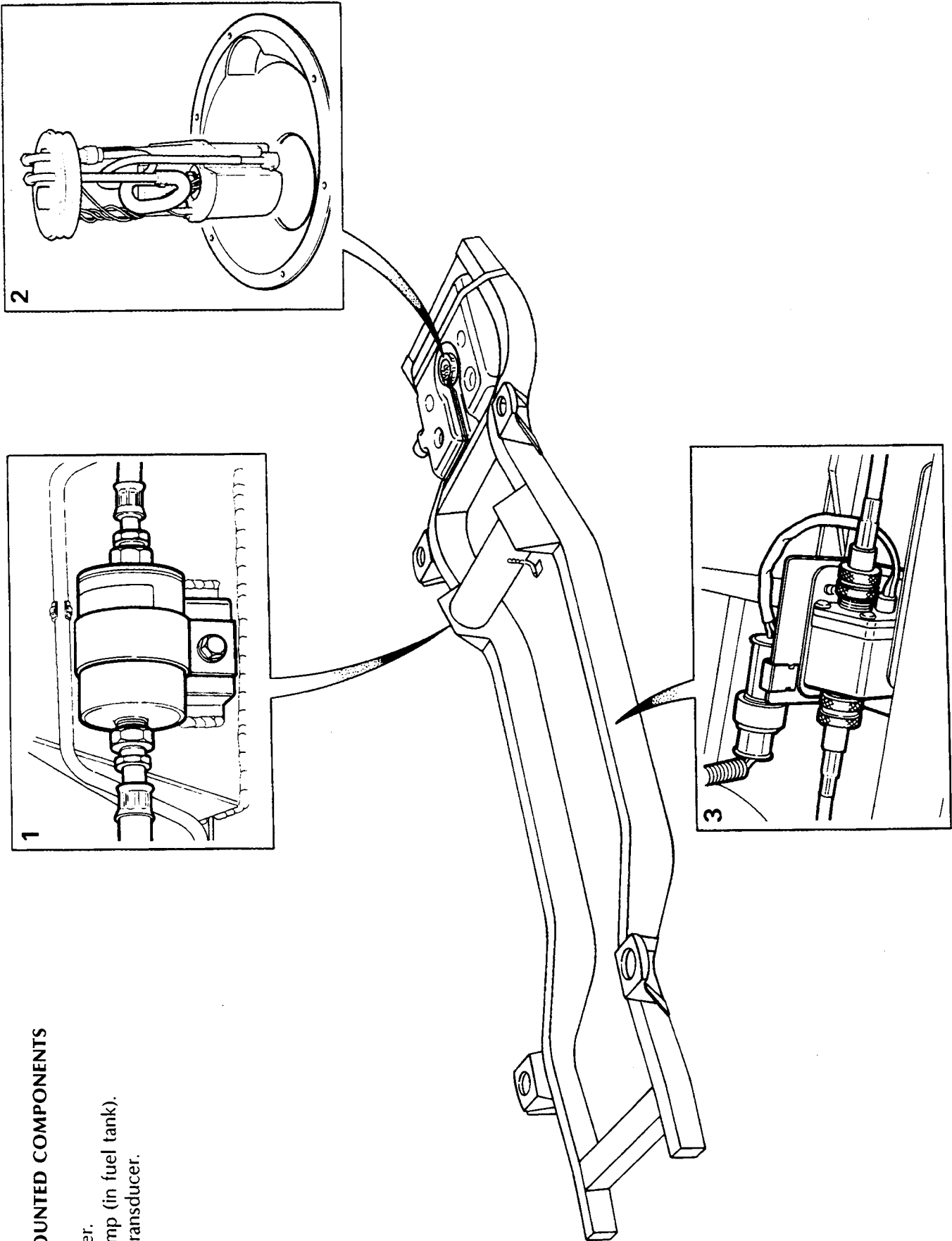
ENGINE SETTING PROCEDURE

If a major overhaul has been undertaken on the fuel injection/engine system, the following check and adjustments must be carried out before attempting to start the engine.

1. **Spark plug gaps** - see 'Section 05 Engine tuning data'.
2. **Ignition timing** - static - see 'Section 86 Electrical', of main Workshop Manual.

CAUTION: Catalyst vehicles - if the engine is misfiring, it should be immediately shut down and the cause rectified. failure to do so will result in irreparable damage to the catalysts.

NOTE: If the previous checks and adjustments are satisfactory but the engine will not start, the ignition and fuel injection electrical circuitry must be checked using the appropriate recommended equipment.

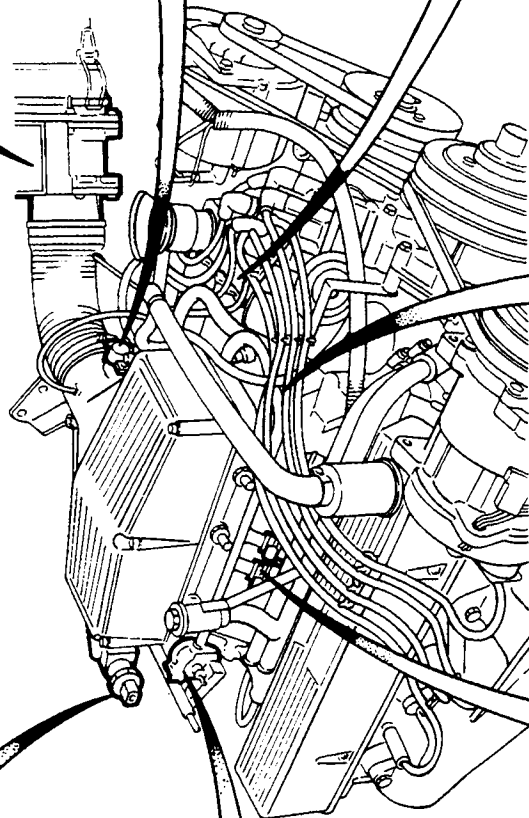
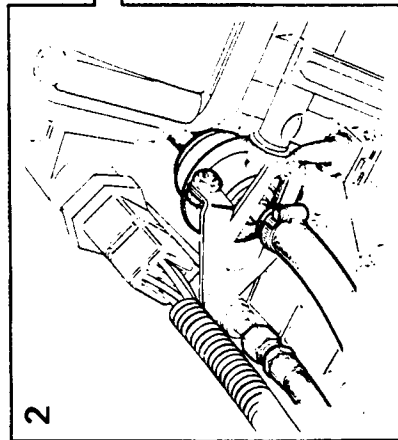
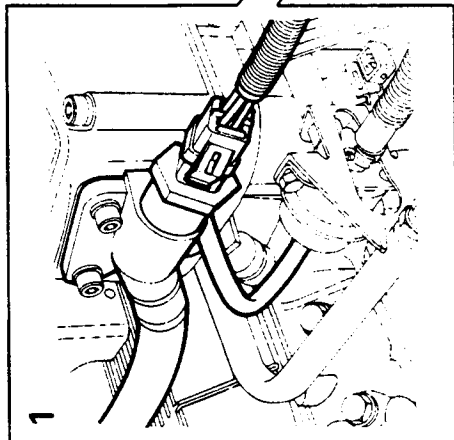
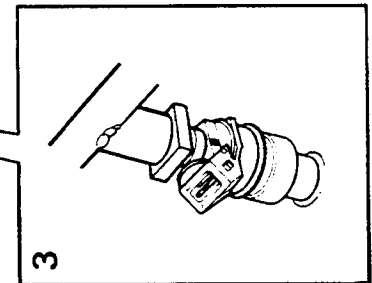
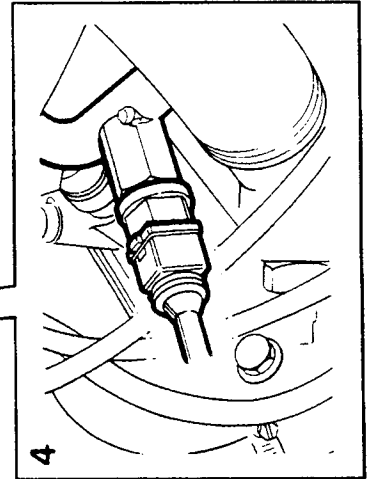
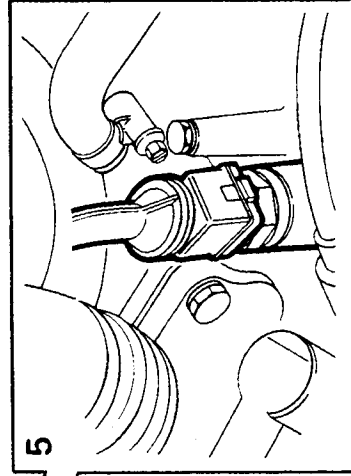
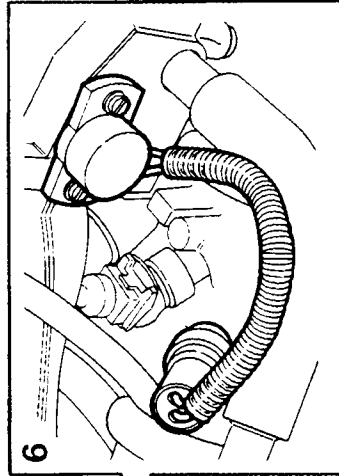
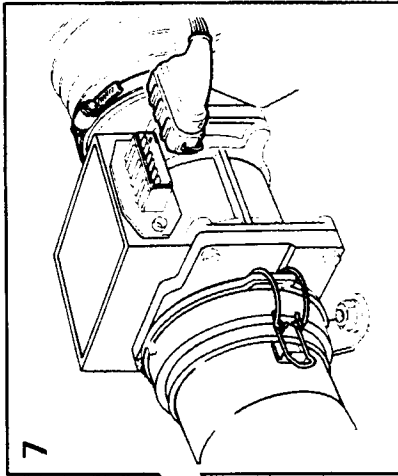


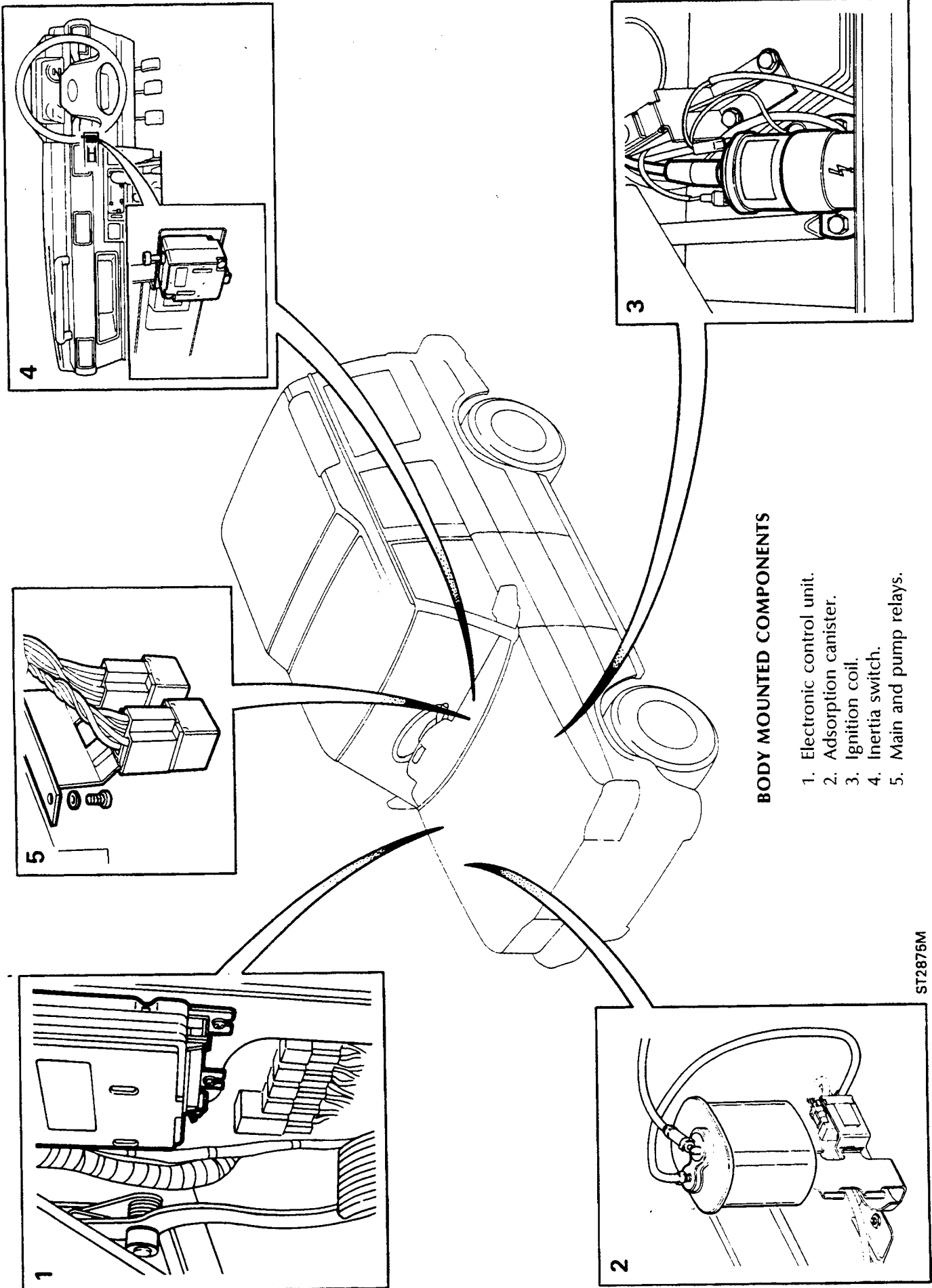
CHASSIS MOUNTED COMPONENTS

- 1. Fuel filter.
- 2. Fuel pump (in fuel tank).
- 3. Speed transducer.

ENGINE MOUNTED COMPONENTS

1. By-pass air valve (stepper motor).
2. Fuel pressure regulator.
3. Fuel injector.
4. Fuel temperature sensor.
5. Coolant temperature sensor.
6. Throttle potentiometer.
7. Air flow meter.





BODY MOUNTED COMPONENTS

- 1. Electronic control unit.
- 2. Adsorption canister.
- 3. Ignition coil.
- 4. Inertia switch.
- 5. Main and pump relays.

ST2875M

Recommended Equipment -

Lucas 'Electronic Ignition Analyser'
Lucas Part Number - YWB 119.

Lucas Diagnostic Equipment - E.F.I.
Land Rover Part Number - RTC 6834 (complete kit)

The memory card and part number for use with diagnostic kit are as follows:-

Memory Card	Part No.
UK	STC 331
French	STC 190
Germany	STC 191
Italy	STC 192
Spain	STC 332
Dutch	STC 333
Japan	STC 787

NOTE: The diagnostic equipment can be connected to the diagnostic plug located by the E.C.U. Use in conjunction with the Operating Instruction Manual.

If the above equipment is unavailable the tests can be carried out using a multi-meter, following the instructions given in the charts.

CAUTION: Ensure the multi-meter is correctly set to volts or ohms, dependent upon which test is being undertaken.

STATIC CHECKS

Carry out the following static checks before undertaking the continuity procedure:-

- A. **Fuse B8** - in main fuse panel - is intact.
- B. **Inertia switch** - not tripped.
- C. **Fuel** - ample fuel in fuel tank.
- D. **Battery Condition** - state of charge.
- E. **Air Leaks** - no unmetered air entering engine system.
- F. **Electrical Connections** - dry, clean and secure.

CONTINUITY TEST PROCEDURE

The continuity procedure and instructions on the following pages must be followed precisely to prevent damage occurring to any of the fuel system components.

To enable the tests to be carried out when the 40 way multi-plug is connected to the E.C.U., it is necessary to remove the two screws securing the shroud to the plug to enable the multi-meter probes to be inserted into the back of the appropriate pin.

CAUTION: Tests that require the plug to be removed from the E.C.U., must also have the meter probes inserted into the back of the plug. If the probes are inserted into the plug sockets, damage will occur to the sockets resulting in poor connections when the plug is reconnected.

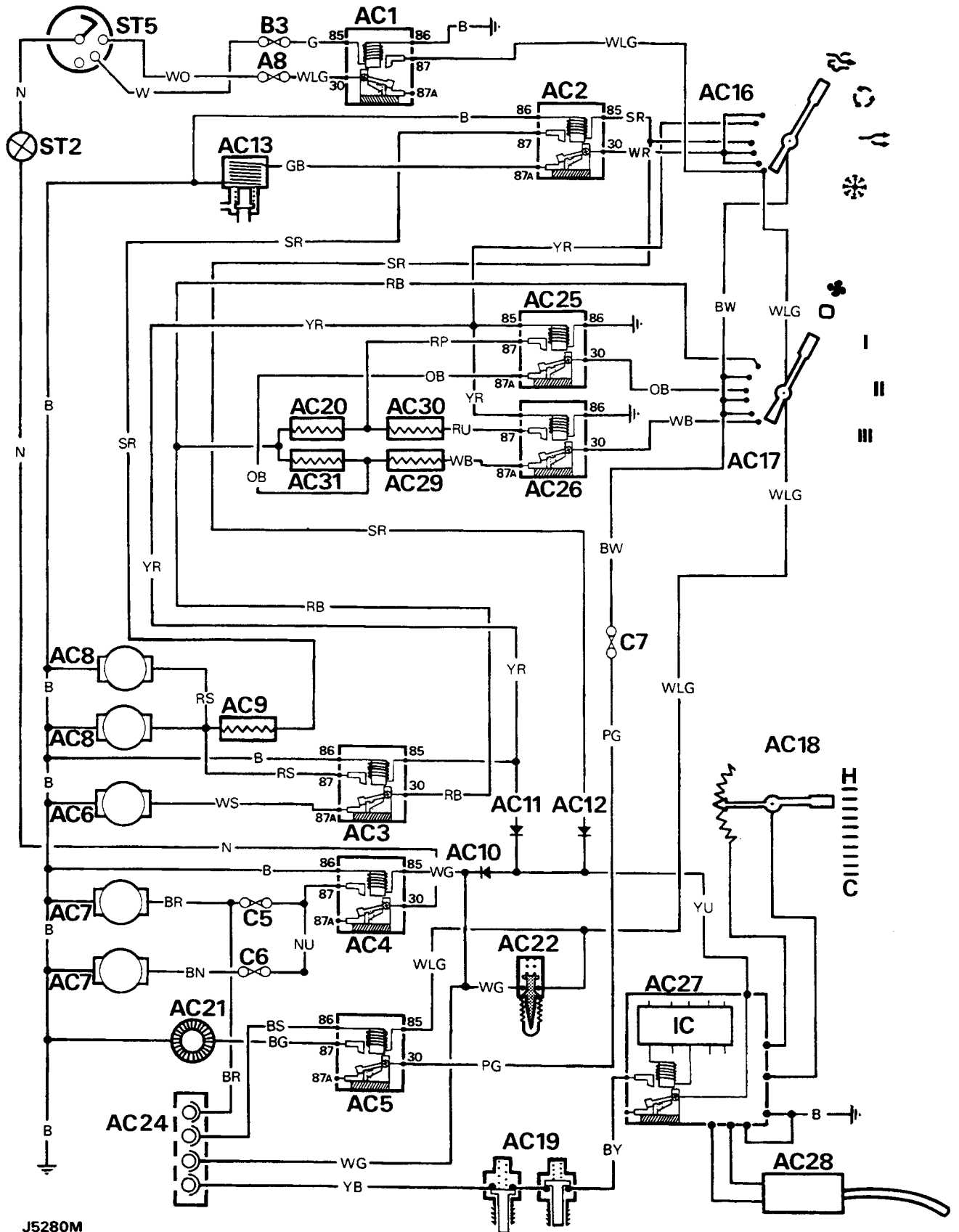
KEY TO E.F.I. AIR CONDITIONING CIRCUIT PRE 93 MODEL YEAR

AC1	Air conditioning/heater ignition relay
AC2	Fresh air solenoid relay
AC3	Air conditioning/heater relay
AC4	Fan control relay
AC5	Compressor clutch relay
AC6	Heater blower motor
AC7	Condenser fans
AC8	Evaporator fans
AC9	Evaporator fan half speed resistor
AC10	Diode
AC11	Diode
AC12	Diode
AC13	Vacuum valve
AC16	Control switch vacuum valve and ventilation selection
AC17	Blower motor speed selection
AC18	Thermostat control
AC19	Refrigerant over and under pressure switches
AC20	Resistor
AC21	Compressor clutch
AC22	Engine water temperature switch
AC24	Connector to E.F.I. E.C.U.
AC25	Medium speed relay
AC26	Low speed relay
AC27	Thermostat control box
AC28	Temperature probe
AC29	Resistor
AC30	Resistor
AC31	Resistor
ST2	Terminal post
ST5	Start/ignition switch
A8	Fuse
B3	Fuse
C5	Fuse
C6	Fuse
C7	Fuse

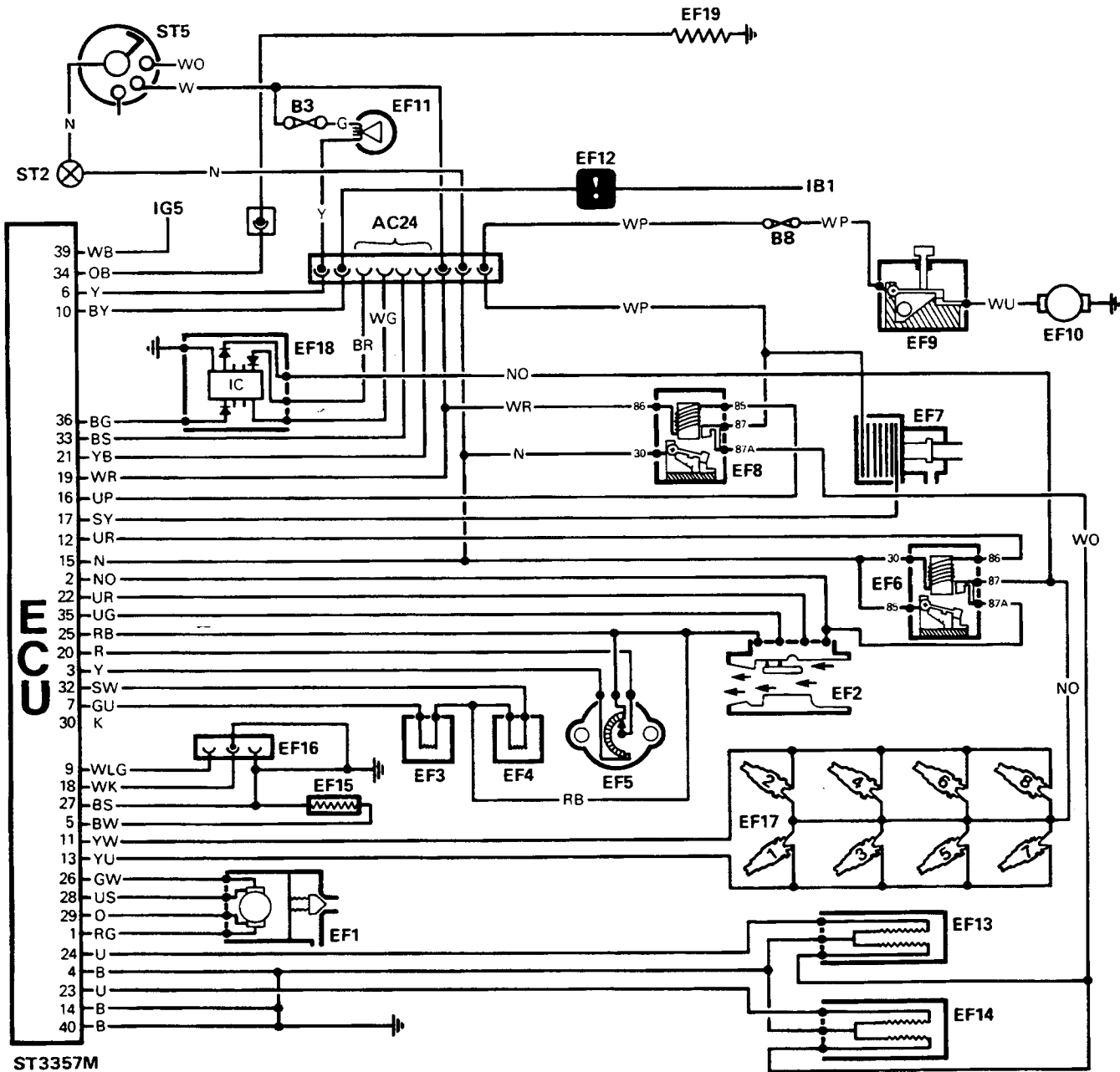
Cable colour code

B	Black	G	Green	R	Red	S	Grey
U	Blue	O	Orange	W	White	K	Pink
N	Brown	P	Purple	Y	Yellow	LG	Light green

E.F.I. AIR CONDITIONING CIRCUIT PRE 93 MODEL YEAR



J5280M



Hot Wire EFI - Circuit Diagram

- | | |
|--|-------------------------------------|
| EF1 Stepper motor | EF14 Lambda sensor |
| EF2 Air flow meter | EF15 Tune resistor |
| EF3 Coolant temperature sensor | EF16 Diagnostic socket |
| EF4 Fuel temperature sensor | EF17 Injectors |
| EF5 Throttle potentiometer | EF18 Fan timer |
| EF6 Main relay | EF19 Resistor (manual transmission) |
| EF7 Purge valve | IB1 Instrument binnacle |
| EF8 Fuel pump relay | IG5 Coil |
| EF9 Inertia switch | ST2 Battery connection |
| EF10 Fuel pump | ST5 Ignition switch |
| EF11 Road speed transducer | AC24 Air conditioning connection |
| EF12 Micro processor power check light | B8 Fuel pump fuse |
| EF13 Lambda sensor | B3 Speed transducer fuse |

Cable colour code

- | | | | |
|---------|----------|----------|----------------|
| B Black | G Green | R Red | S Grey |
| U Blue | O Orange | W White | K Pink |
| N Brown | P Purple | Y Yellow | LG Light green |

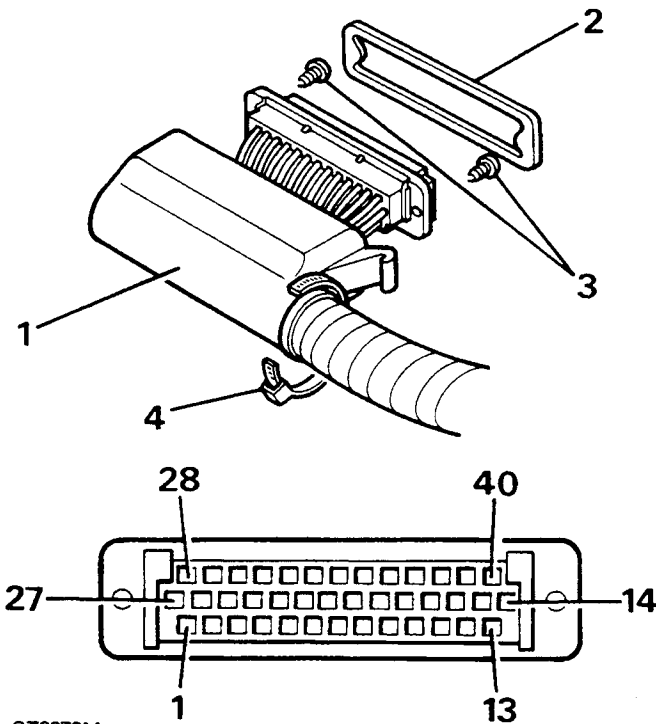
CONTINUITY TEST PROCEDURE

1. Remove the E.C.U., and harness plug from beneath the facia to the right of the right-hand footwell. See ECU remove and refit.

NOTE: To prevent damage to the plug pins, the meter probes must be inserted from the back of the plug when performing tests involving the ECU plug.

2. Using a thin blade screwdriver lever the rubber seal from the plug to reveal two retaining screws.
3. Remove the two screws.
4. Release the cable clip and push the plug along the harness until there is enough clearance enabling meter probes to be inserted into the back of the plug.

There are 6 pin numbers, 1, 13, 14, 27, 28, 40 moulded into the rear of the plug. For pin position identification as shown in the illustration below, the electrical leads have been omitted.



ST2878M

Pins 1 to 13 bottom row.
 Pins 14 to 27 centre row
 Pins 28 to 40 top row.

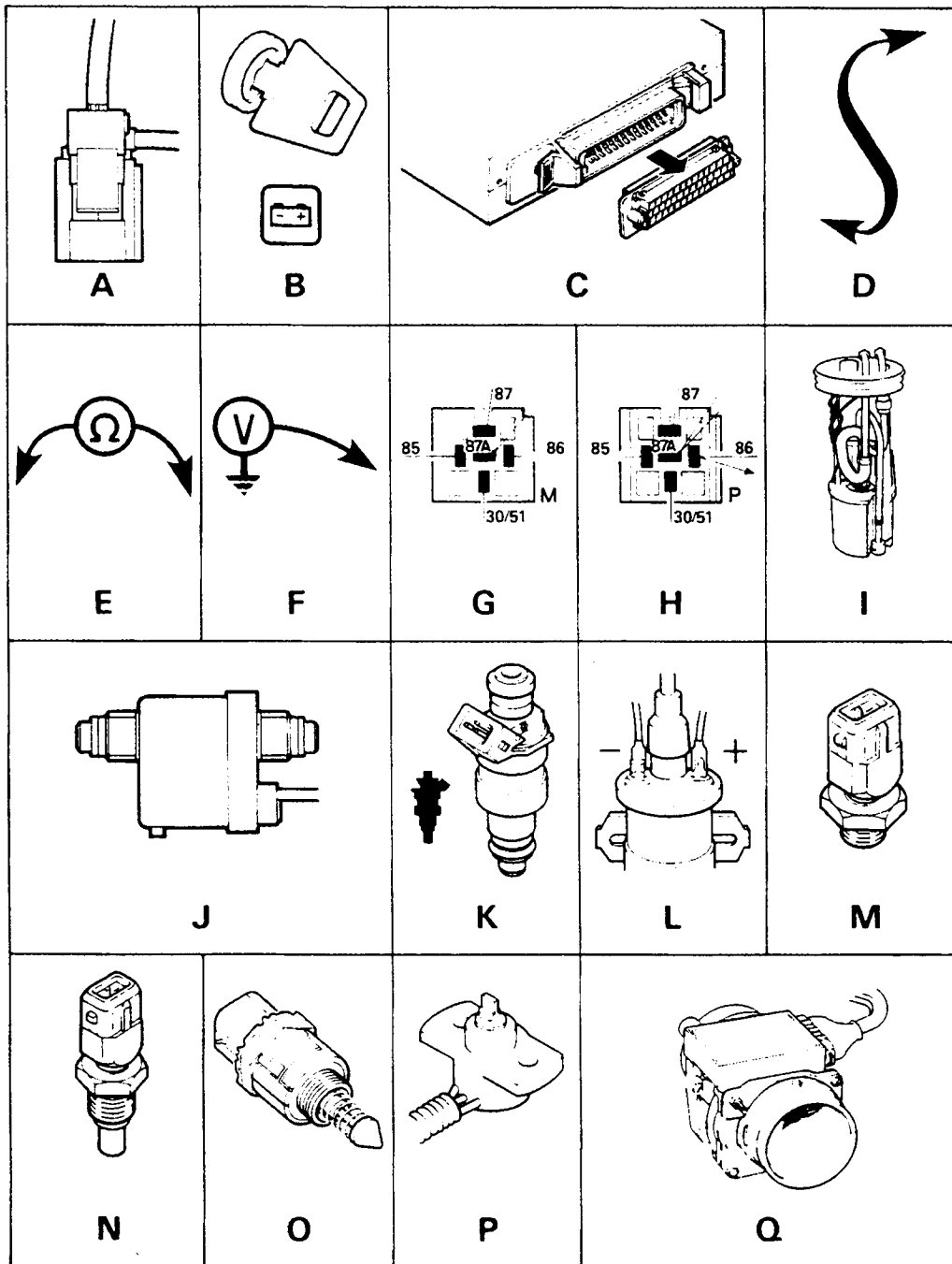
PIN NOS. CABLE COLOUR

- | | |
|-----|-------------------|
| 1. | Red/green |
| 2. | Brown/orange |
| 3. | Yellow |
| 4. | Black |
| 5. | Grey/black |
| 6. | Yellow |
| 7. | Green/blue |
| 8. | Purple/yellow |
| 9. | White/light green |
| 10. | Black/yellow |
| 11. | Yellow/white |
| 12. | Blue/red |
| 13. | Yellow/blue |
| 14. | Black |
| 15. | Brown |
| 16. | Blue/purple |
| 17. | Grey/yellow |
| 18. | White/pink |
| 19. | White/grey |
| 20. | Red |
| 21. | Yellow/black |
| 22. | Blue/red |
| 23. | Blue |
| 24. | Blue |
| 25. | Red/black |
| 26. | Green/white |
| 27. | Black/grey |
| 28. | Blue/grey |
| 29. | Orange |
| 30. | Not used |
| 31. | Black/green |
| 32. | Grey/white |
| 33. | Black/grey |
| 34. | Orange/Black |
| 35. | Blue/green |
| 36. | Black/green |
| 37. | Not used |
| 38. | Not used |
| 39. | White/black |
| 40. | Black |

The last colour denotes the wire tracer colour.

TESTS - Using a Multi-Meter - 14CUX system - Key to Symbols

The following continuity tests are intended as a guide to identifying where a fault may be within a circuit; reference should be made to the fuel injection circuit diagram for full circuit information.

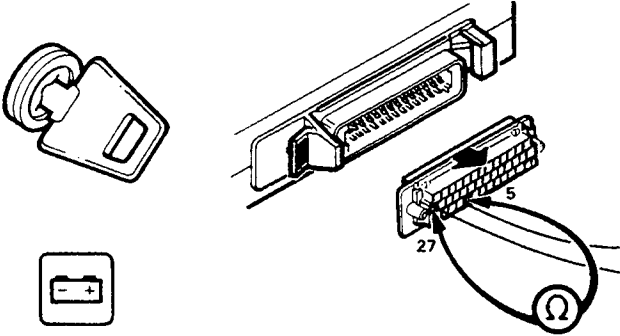
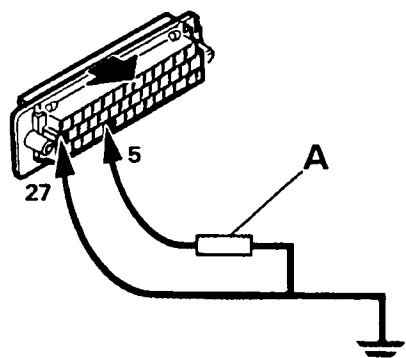


ST2820M

- | | |
|--|--|
| <ul style="list-style-type: none"> A Purge valve B Ignition switch C ECU D Temporary connection E Ohmmeter connections F Voltmeter connections G Main relay H Pump relay | <ul style="list-style-type: none"> I Fuel pump J Road speed transducer K Fuel injector L Ignition coil M Fuel temperature sensor N Coolant temperature sensor O Air by-pass valve (stepper motor) P Throttle potentiometer Q Air flow meter |
|--|--|

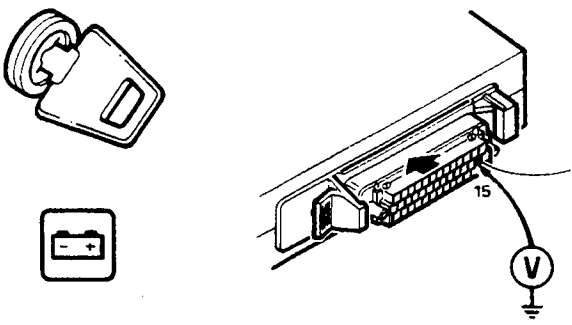
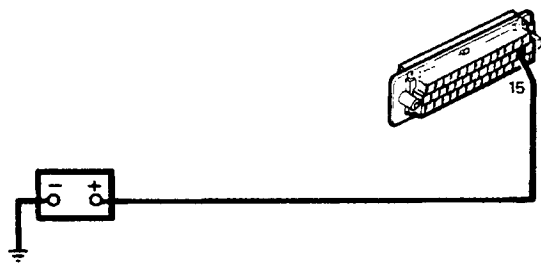
Tune select resistor test

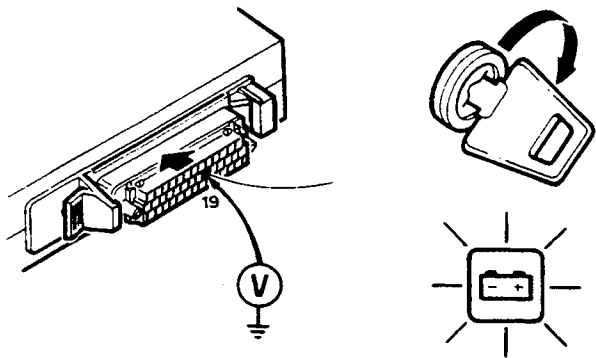
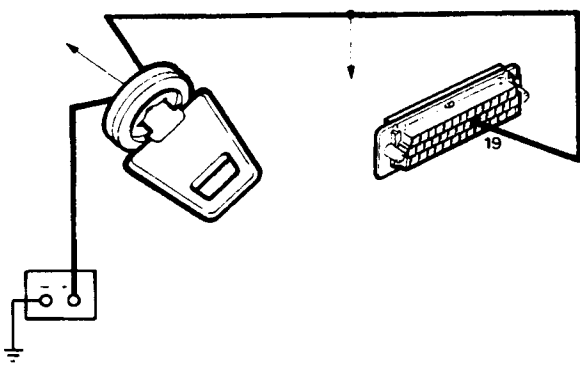
It is recommended that this is carried out before Test 1, of Continuity Test Procedure.

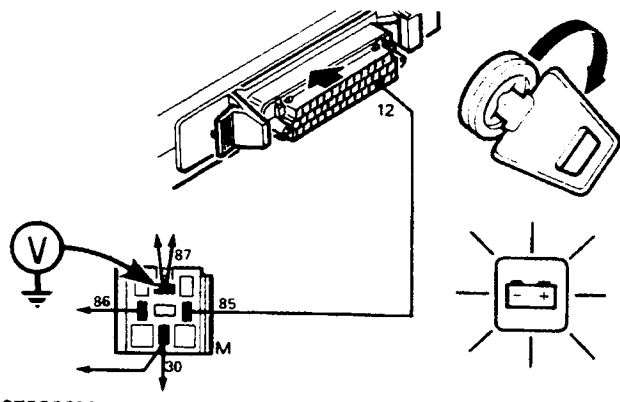
TEST PROCEDURE	RESULTS - Check cables and units shown in bold												
<p>Tune select resistor - component A IGNITION ON</p>	<p>CORRECT READING</p> <table border="0"> <tr> <td>AUSTRALIAN</td> <td>171 - 189</td> <td>Ohms - RED</td> </tr> <tr> <td>EUROPEAN (NON CAT.)</td> <td>446 - 494</td> <td>Ohms - GREEN</td> </tr> <tr> <td>EUROPEAN (CAT.)/USA</td> <td>3700 - 4100</td> <td>Ohms - WHITE</td> </tr> <tr> <td>SAUDI</td> <td>864 - 956</td> <td>Ohms - YELLOW</td> </tr> </table> <p>INCORRECT OHMMETER READING CHECK:</p>	AUSTRALIAN	171 - 189	Ohms - RED	EUROPEAN (NON CAT.)	446 - 494	Ohms - GREEN	EUROPEAN (CAT.)/USA	3700 - 4100	Ohms - WHITE	SAUDI	864 - 956	Ohms - YELLOW
AUSTRALIAN	171 - 189	Ohms - RED											
EUROPEAN (NON CAT.)	446 - 494	Ohms - GREEN											
EUROPEAN (CAT.)/USA	3700 - 4100	Ohms - WHITE											
SAUDI	864 - 956	Ohms - YELLOW											
 <p>ST2825M</p>	 <p>ST2826M</p>												

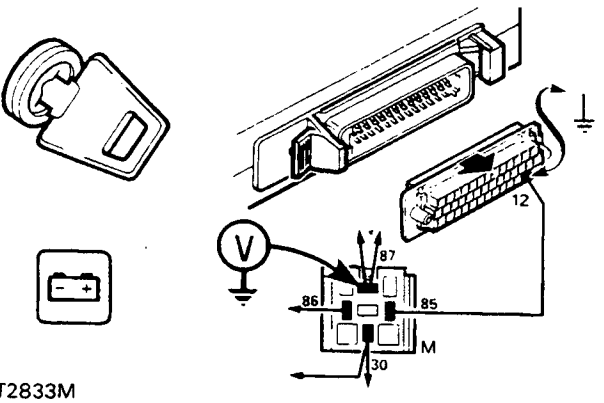
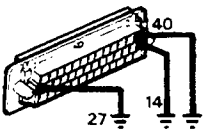
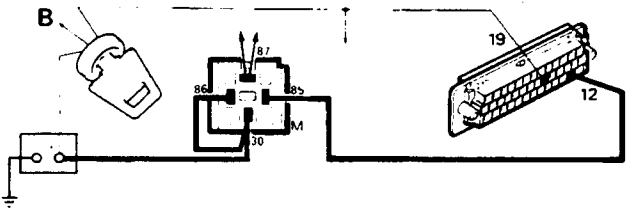
CONTINUITY TESTS

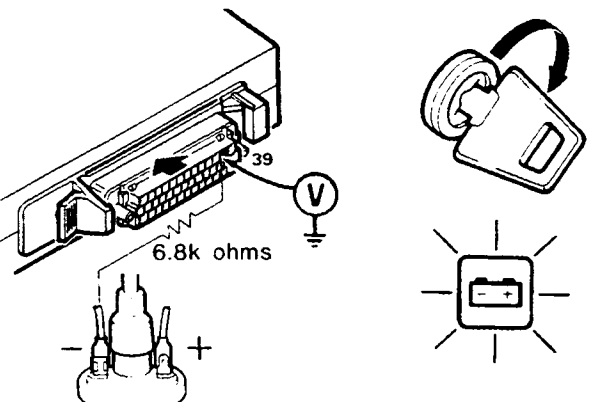
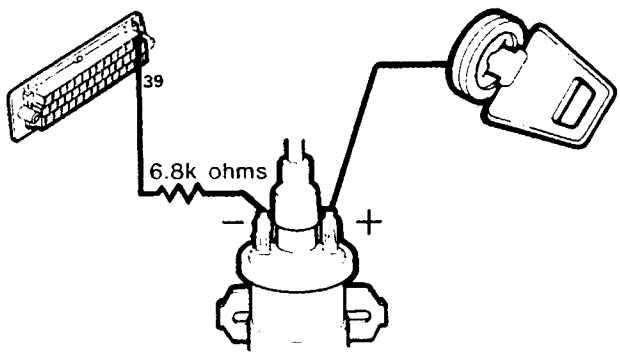
NOTE: All tests are carried out from the electronic control unit (ECU) harness multi-plug unless stated otherwise in the test procedure.

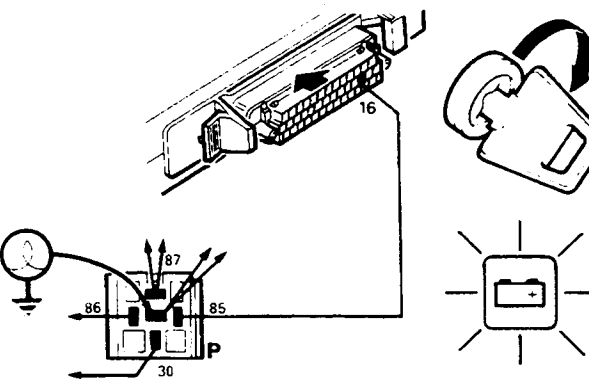
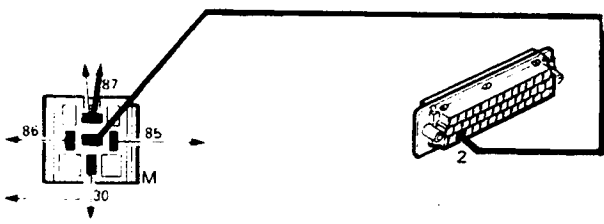
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>1. Check battery supply to ECU IGNITION OFF</p>	<p>Voltmeter reading of battery volts - (minimum battery voltage 10 volts) Proceed to Test 2 Voltmeter reading of zero volts Check:-</p>
<p>1</p>  <p>ST2830M</p>	

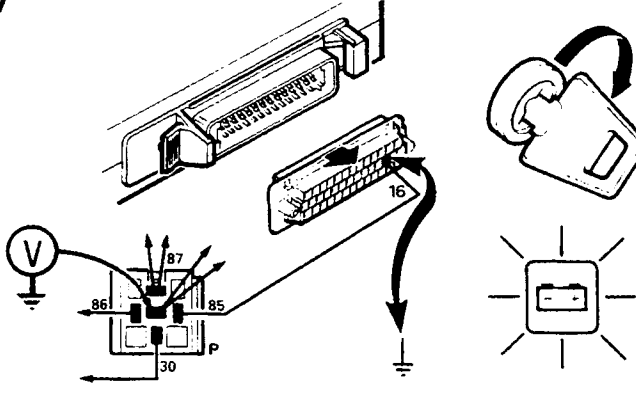
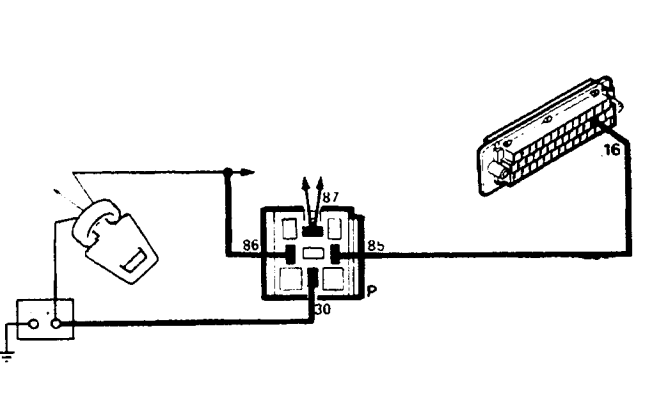
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>2. Check ignition supply to ECU IGNITION ON</p>	<p>Voltmeter reading of battery volts - (minimum battery voltage 10 volts) Proceed to Test 3 Incorrect reading check:-</p>
<p>2</p>  <p>ST2831M</p>	

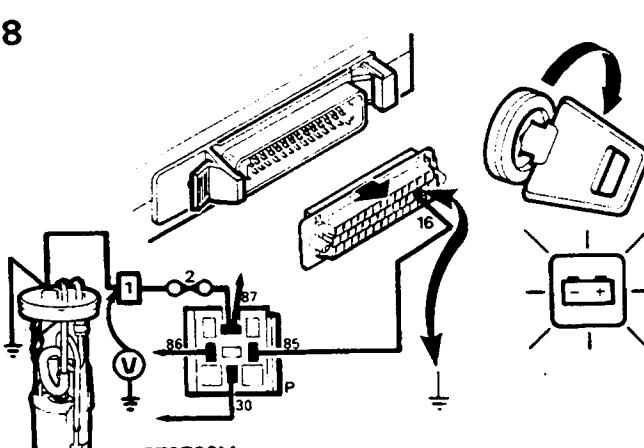
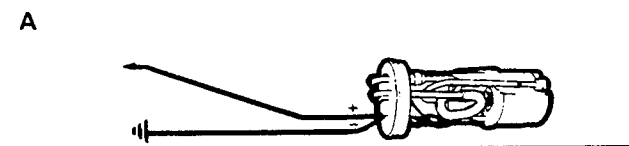
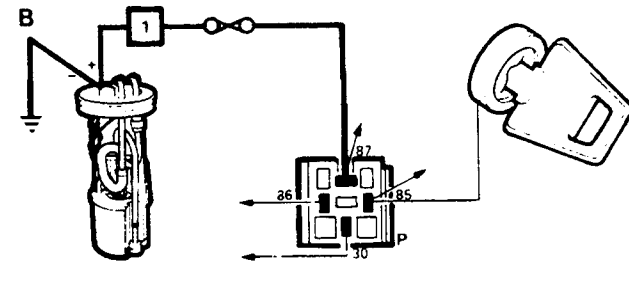
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>3. Check operation of Main relay IGNITION ON</p>	<p>Voltmeter reading of battery volts - Proceed to Test 5</p>
<p>3</p>  <p>ST2832M</p>	<p>Voltmeter reading of zero volts - Proceed to Test 4</p>

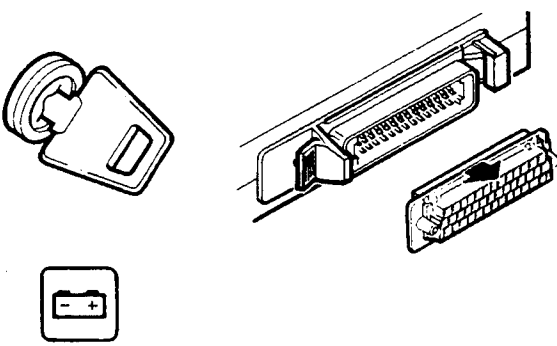
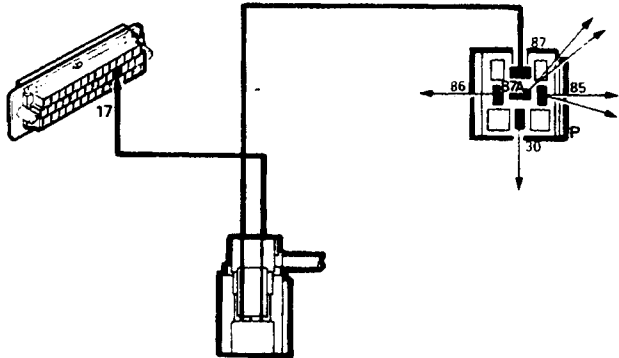
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>4. Fault Diagnosis Main relay circuits IGNITION OFF</p>	<p>A. Voltmeter reading of battery volts - Check:- If OK Suspect ECU</p>
<p>4</p>  <p>ST2833M</p>	<p>A</p>  <p>B</p> 

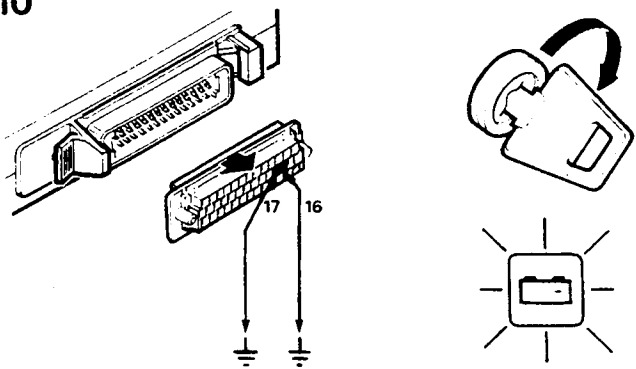
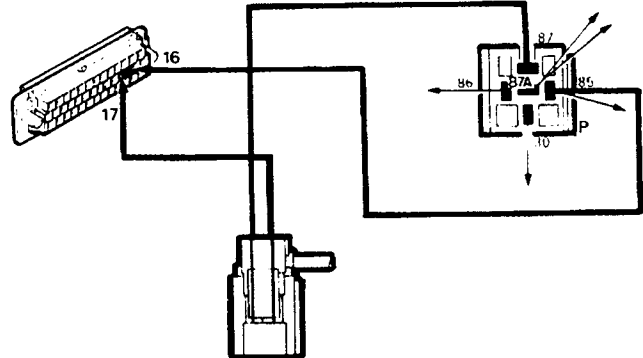
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>5. Check engine speed signal Cable and resistor IGNITION ON</p>	<p>Voltmeter reading of 9.5 volts \pm 1 volt Proceed to Test 6</p> <p>Voltmeter reading of zero volts Check:-</p>
<p>5</p>  <p>ST2834M</p>	

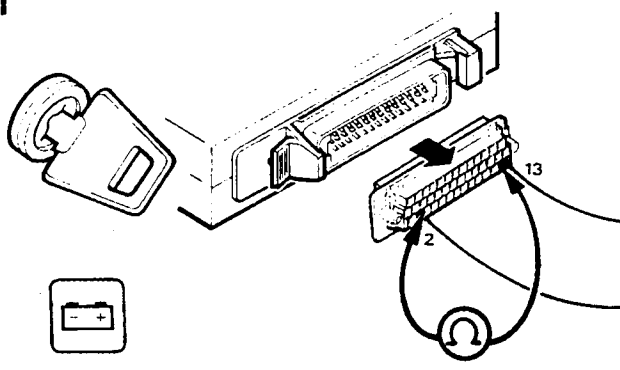
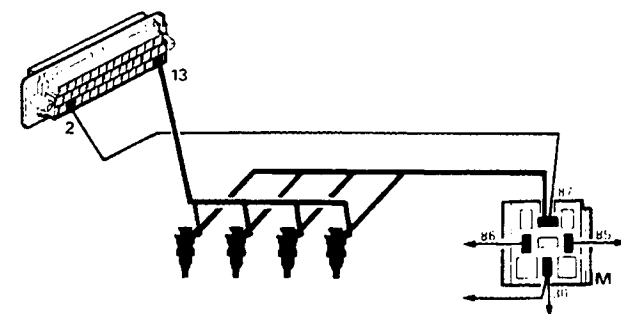
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>6. Check operation of pump relay IGNITION ON</p>	<p>Test lamp will illuminate for approximately 1 second when ignition is switched on If O.K - Proceed to Test 8</p> <p>Lamp does not illuminate Check:- If OK proceed to Test 8</p>
<p>6</p>  <p>ST2835M</p>	

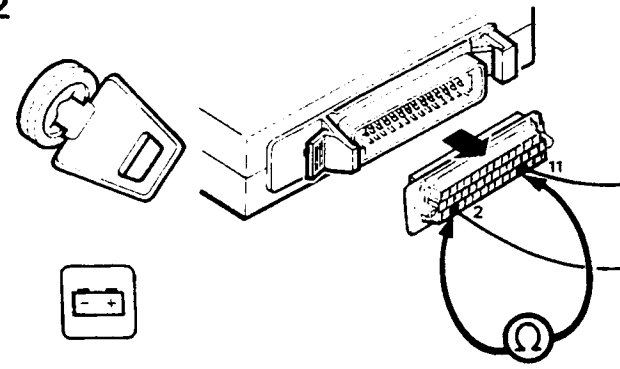
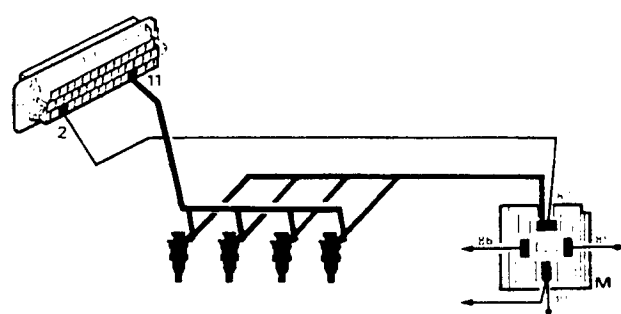
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>7. Fault diagnosis Pump relay circuits IGNITION ON</p>	<p>Voltmeter reading of battery volts - Suspect ECU</p>
<p>7</p>  <p>ST2836M</p>	

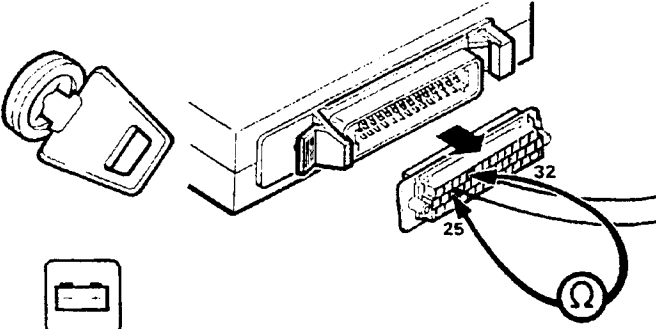
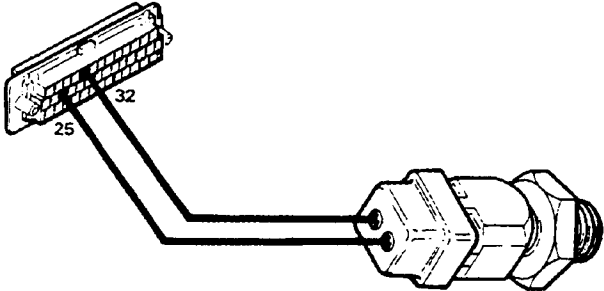
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>8. Check operation of Fuel pump IGNITION ON NOTE: It is not possible to place the multi-meter probes directly onto the pump terminals. A link lead attached to the pump is accessible behind the rear left hand wheel located between the chassis and stowage area floor panel.</p> <p>KEY: 1. Inertia switch 2. Fuse 18</p>	<p>Voltmeter reading of battery volts - Pump operating - Proceed to Test 10</p> <p>(A) Voltmeter reading of battery volts - Pump not operating Check:-</p> <p>(B) Voltmeter reading of zero volts Check:-</p>
<p>8</p>  <p>ST2786M</p>	<p>A</p>  <p>B</p> 

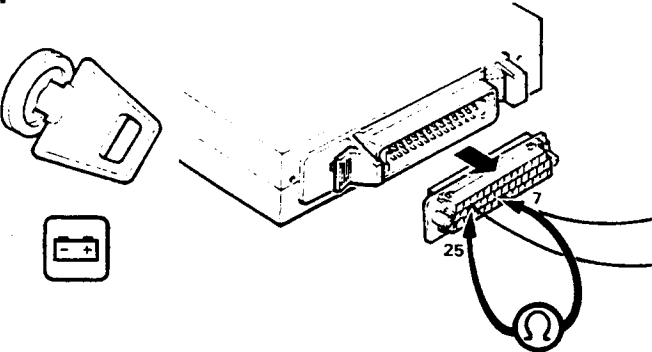
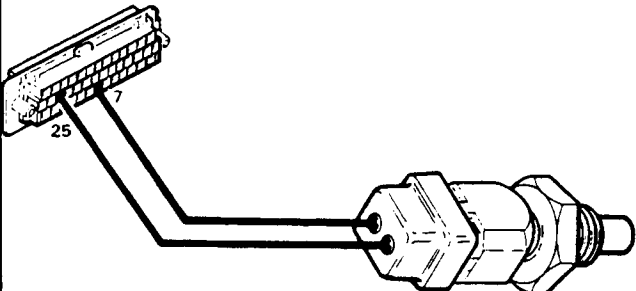
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>9. Check purge valve. Part 1 - seating - if fitted IGNITION OFF</p> <ol style="list-style-type: none"> 1. Disconnect pipe from purge valve to plenum (at plenum) 2. Connect vacuum pump to pipe to purge valve 3. Apply vacuum of 2.5 in/Hg 	<p>Vacuum should hold for 2.5 minutes If vacuum correct proceed to test 10</p> <hr/> <p>If vacuum incorrect check:</p>
<p>9</p>  <p>ST2837M</p>	

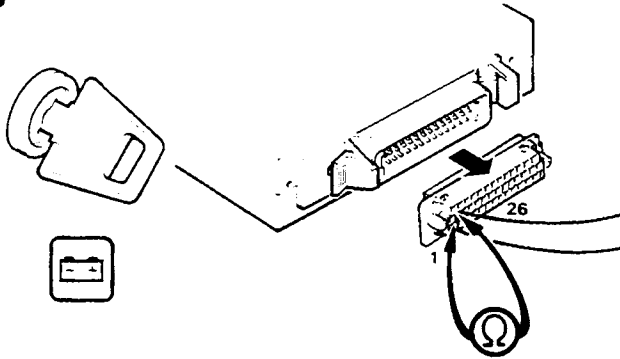
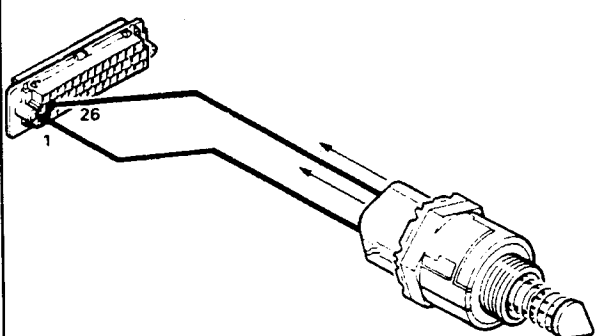
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>10. Check purge valve. Part 2 - operation - if fitted IGNITION ON</p> <ol style="list-style-type: none"> 1. Apply vacuum - 2.5 in/Hg, switch ignition on 2. Connect pins 16 and 17 to earth to energise pump relay. 	<p>Vacuum should be released If OK proceed to test 11</p> <hr/> <p>If vacuum not released check:</p>
<p>10</p>  <p>ST2838</p>	

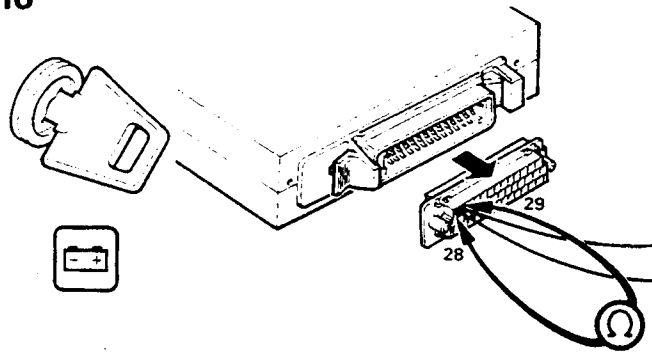
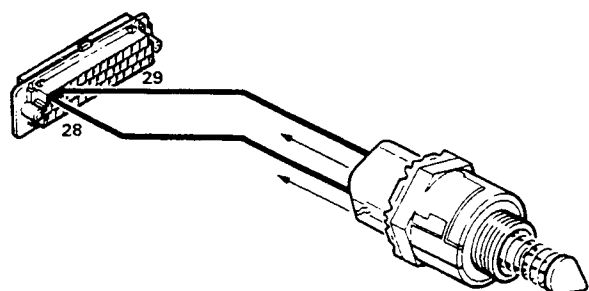
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>11. Check injectors, Injector circuit IGNITION OFF</p> <p>(Pin 13 left bank 'A' injectors 1,3,5,7).</p>	<p>Ohm-meter reading of 4-4.5 Ohms - Proceed to Test 12</p> <p>Ohm-meter reading of 5-6 Ohms - Suspect 1 injector Ohm-meter reading of 8-9 Ohms - Suspect 2 injectors Ohm-meter reading of 16-17 Ohms - Suspect 3 injectors Check for open circuit injector(s) or wiring faults.</p> <p>Ohm-meter reading of Infinity Check:</p>
<p>11</p>  <p>ST2839M</p>	

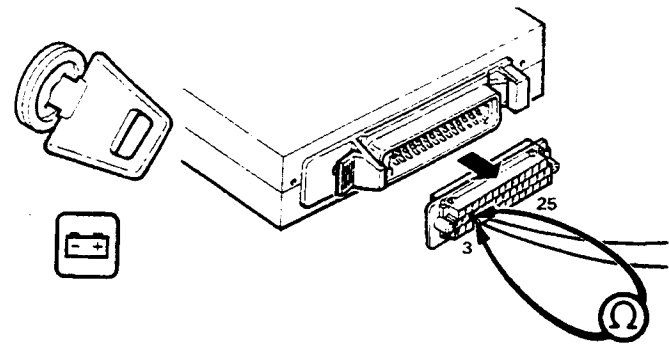
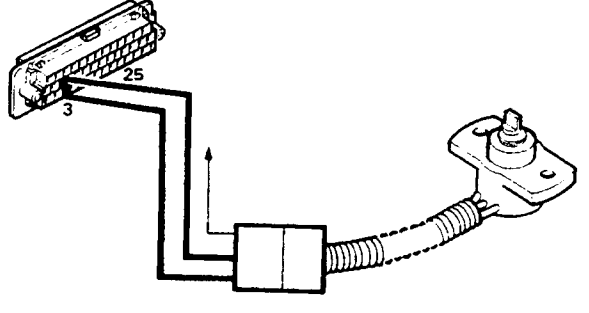
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>12. Check injectors, Injector circuit IGNITION OFF</p> <p>(Pin 11 rightbank 'B' injectors 2,4,6,8)</p>	<p>Ohm-meter reading of 4-4.5 Ohms - Proceed to Test 13</p> <p>Ohm-meter reading of 5-6 Ohms - Suspect 1 injector Ohm-meter reading of 8-9 Ohms - Suspect 2 injectors Ohm-meter reading of 16-17 Ohms - Suspect 3 injectors Check for open circuit injector(s) or wiring faults.</p> <p>Ohm-meter reading of Infinity Check:</p>
<p>12</p>  <p>ST2840M</p>	

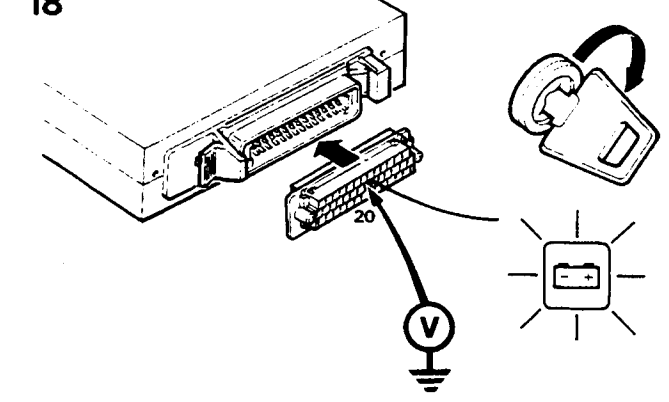
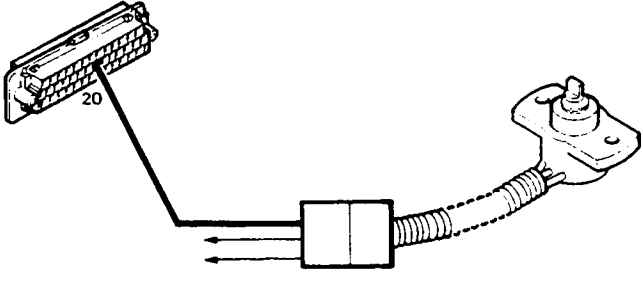
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>13. Check fuel temperature thermistor (sensor) IGNITION OFF</p>	<p>Correct reading-temperature to resistance - Proceed to Test 14 (Refer to Temperature Conversion Charts in Test 14)</p>
<p>13</p>  <p>IGNITION OFF</p> <p>RR2638E</p>	

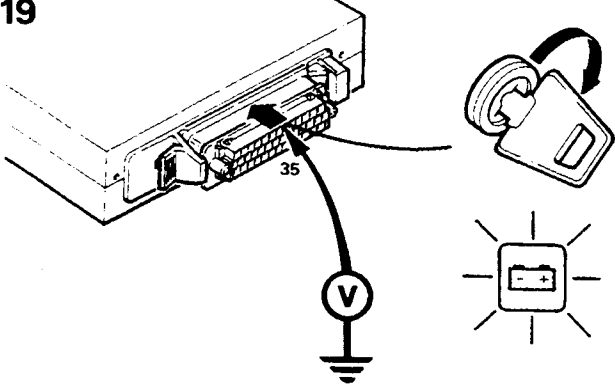
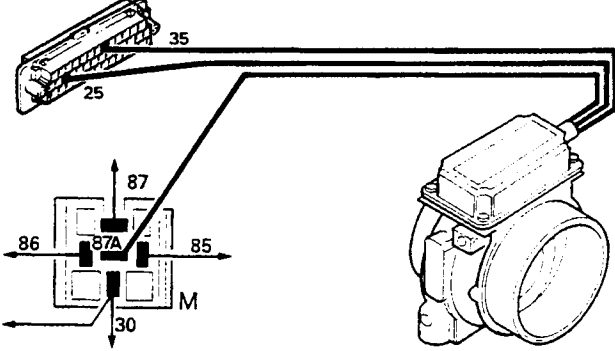
TEST PROCEDURE	RESULTS - Check cables and units shown in bold																										
<p>14. Check coolant temperature thermistor (sensor) IGNITION OFF</p>	<p>Correct reading-Temperature to resistance - Proceed to Test 15 (Refer to Temperature Conversion Chart below.)</p> <table border="1" data-bbox="821 1243 1428 1556"> <thead> <tr> <th colspan="2">Fuel and Coolant Temperature</th> <th rowspan="2">Ohm-meter Reading Should be Ohms</th> </tr> <tr> <th>°C</th> <th>°F</th> </tr> </thead> <tbody> <tr> <td>-10°</td> <td>14°</td> <td>9100 - 9300</td> </tr> <tr> <td>0°</td> <td>32°</td> <td>5700 - 5900</td> </tr> <tr> <td>20°</td> <td>68°</td> <td>2400 - 2600</td> </tr> <tr> <td>40°</td> <td>104°</td> <td>1100 - 1300</td> </tr> <tr> <td>60°</td> <td>140°</td> <td>500 - 700</td> </tr> <tr> <td>80°</td> <td>176°</td> <td>300 - 400</td> </tr> <tr> <td>100°</td> <td>212°</td> <td>150 - 200</td> </tr> </tbody> </table> <p>Incorrect Ohm-meter reading Check:-</p>	Fuel and Coolant Temperature		Ohm-meter Reading Should be Ohms	°C	°F	-10°	14°	9100 - 9300	0°	32°	5700 - 5900	20°	68°	2400 - 2600	40°	104°	1100 - 1300	60°	140°	500 - 700	80°	176°	300 - 400	100°	212°	150 - 200
Fuel and Coolant Temperature		Ohm-meter Reading Should be Ohms																									
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80°	176°	300 - 400																									
100°	212°	150 - 200																									
<p>14</p>  <p>IGNITION OFF</p> <p>ST2842M</p>																											

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>15. Check air bypass valve - Part 1 IGNITION OFF</p>	<p>Ohm-meter reading of 40-60 Ohms - Proceed to Test 16</p> <p>Incorrect reading Check:-</p>
<p>15</p>  <p>ST2843M</p>	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>16. Check air bypass valve - Part 2 IGNITION OFF</p>	<p>Ohm-meter reading of 40-60 Ohms - Proceed to Test 17</p> <p>Incorrect reading Check:-</p>
<p>16</p>  <p>ST2844M</p>	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
17. Check throttle potentiometer - Part 1 IGNITION OFF	Ohm-meter reading of 4000-6000 Ohms - Proceed to Test 18 Incorrect reading of Infinity Check:-
17  ST2845M	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
18. Check throttle potentiometer - Part 2 IGNITION ON	Correct voltmeter readings- Proceed to Test 18 Throttle closed: 0.085-0.545 volts) smooth) swing) between) closed) and Throttle open: 4.2-4.9 volts) open Incorrect voltmeter readings Check:-
18  ST2846M	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>19. Check output of Airflow sensor IGNITION ON</p>	<p>Voltmeter reading of 0.2-0.7 volts- Proceed to Test 20</p> <p>Incorrect voltmeter reading Check:-</p>
<p>19</p>  <p>ST2847M</p>	

When performing the following tests, 20 to 23 in the interests of safety, follow the instructions under FUEL HANDLING PRECAUTIONS at the beginning of this section.

PRECAUTION:

Depressurize the fuel system when fitting the fuel pressure gauge or disconnecting/replacing fuel system components. Depressurize after test before removing gauge.

CAUTION: Thoroughly clean the immediate area around the fuel filter and hose connections before disconnecting the fuel feed line from the filter. Failure to do so could cause foreign matter to be present in the fuel system which would be detrimental to the fuel system components.

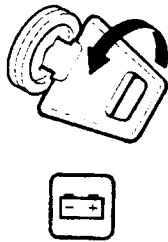
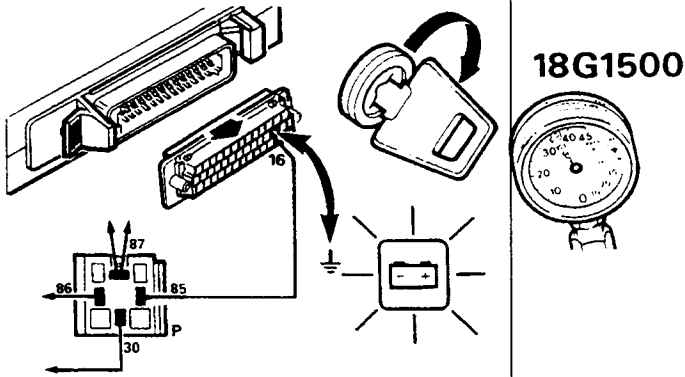
WARNING: The spillage of fuel from the fuel filter is unavoidable when disconnecting the fuel feed line, ensure that all necessary precautions are taken to prevent fire and explosion due to fuel vapour and fuel seepage.

DEPRESSURIZING PROCEDURE

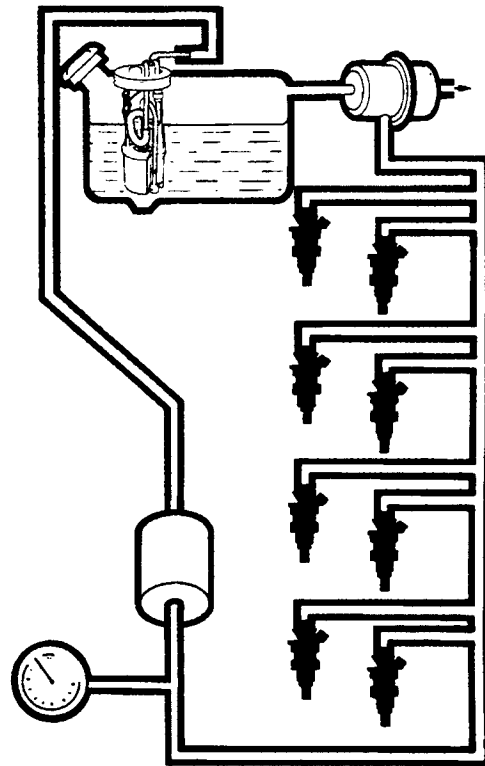
- Ignition off, pull pump relay off its terminal block.
- Crank engine for a few seconds - engine may fire and run until fuel pressure is reduced.
- Switch off the ignition.
- Connect fuel pressure gauge in the fuel supply line between the fuel rail and the fuel filter, adjacent to the filter (see Test 20).
- Reconnect the pump relay.

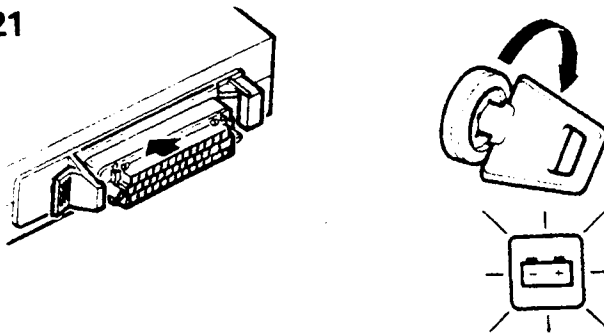
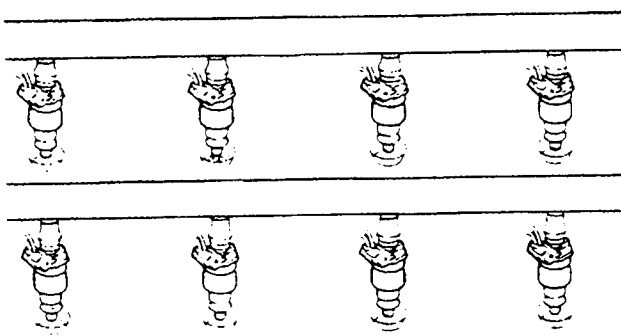
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>20. Check fuel system pressure using Service tool 18G 1500</p> <p>IGNITION ON</p> <p>WARNING: Ensure that all the necessary precautions are taken against fuel spillage and fuel vapour to prevent fire or explosion.</p> <p>CAUTION: Before disconnecting any part of the fuel system it is imperative that all dust, dirt and debris is removed from around the components to be removed to prevent ingress of foreign matter into the fuel system.</p> <p>Depressurize the system and insert the pressure gauge in the fuel feed line immediately after the fuel line filter. The filter is located on the right-hand side of the chassis at the rear. Depressurize system before removing gauge IGNITION OFF after test.</p>	<p>(A) Expected reading 2,39-2,672 kgf/cm² (34.0-38.0 p.s.i.)</p> <p>(B) Pressure drop-max 0.7 kgf/cm² (10 p.s.i.) in one minute Proceed to Test 21</p>

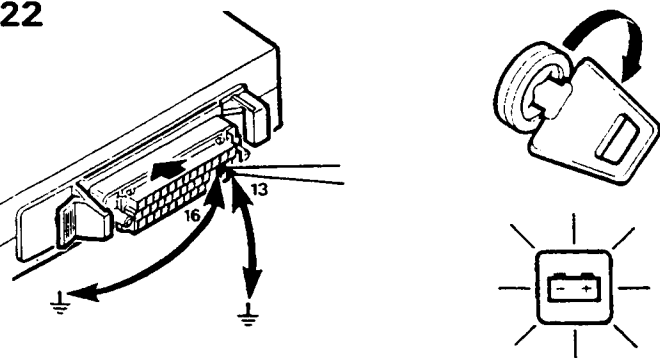
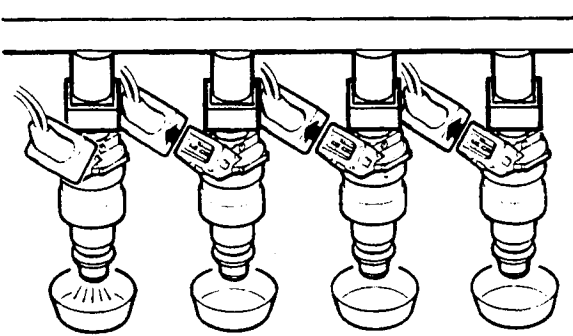
20

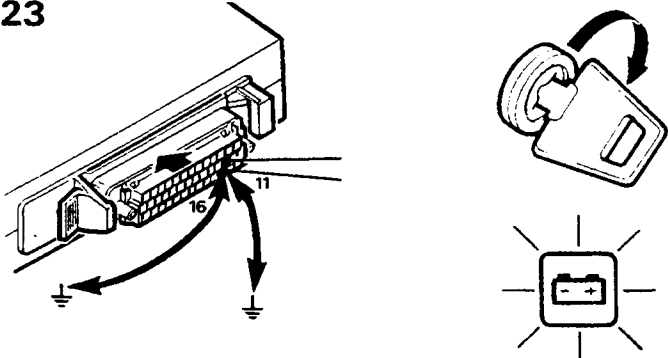
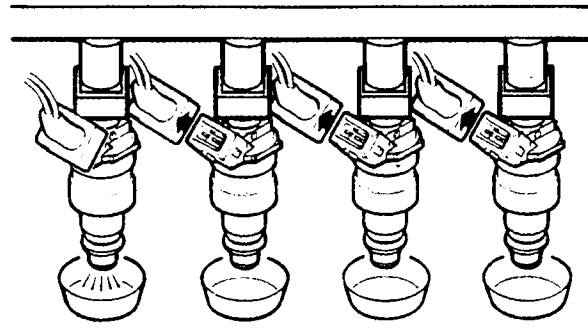


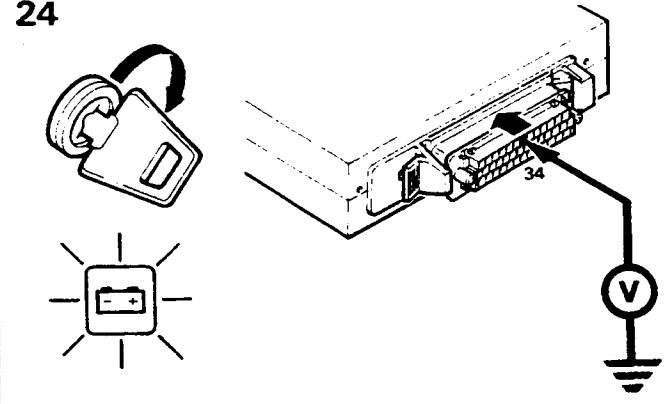
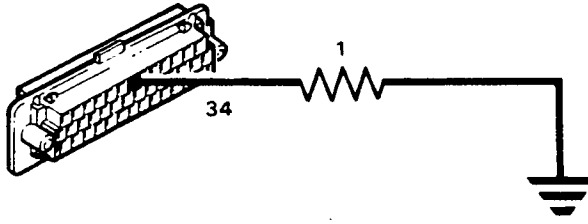
ST2848M

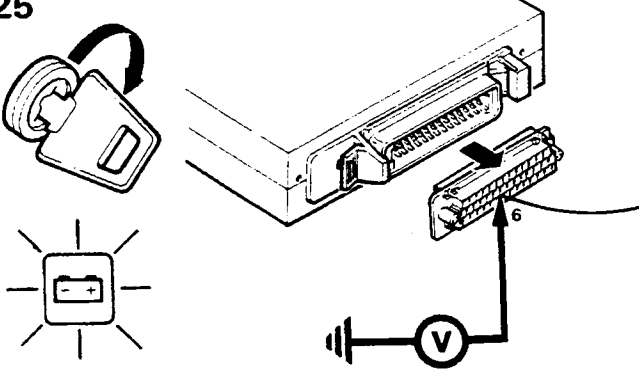
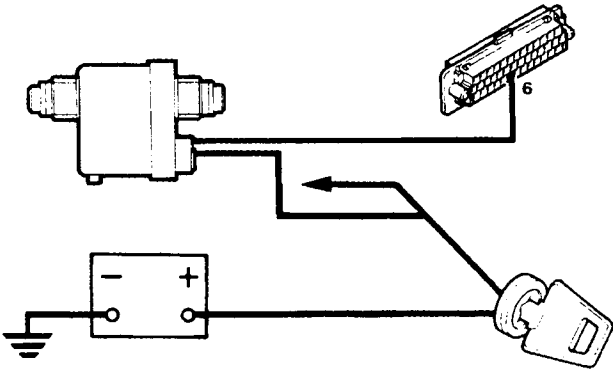


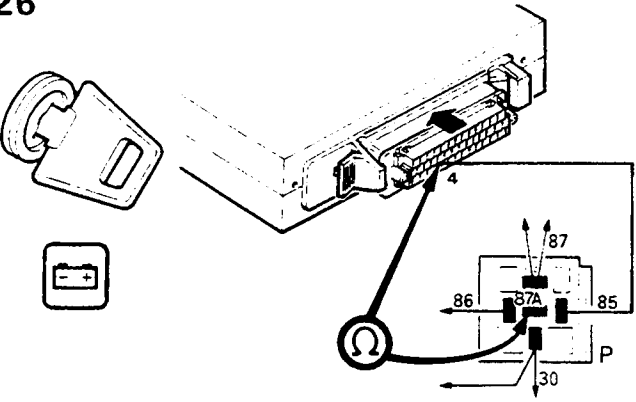
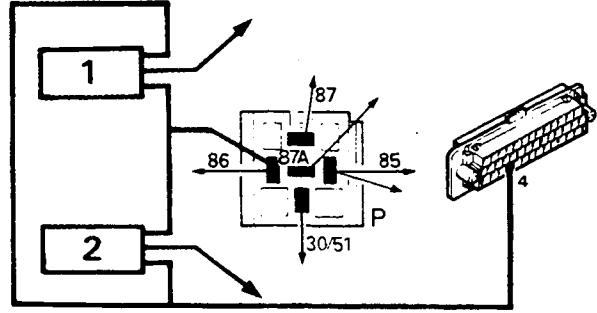
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>21. Check for leaking injector IGNITION ON NOTE: Before removing any of the injectors, remove and examine the spark plugs, check for consistent colouration of plugs. A leaking injector will result in the corresponding spark plug being 'sooted up'.</p> <p>Remove all injectors from manifold but do not disconnect from fuel rail</p>	<p>WARNING: Ensure that all necessary precautions are taken to prevent fire and explosion. See Fuel Handling Precautions</p> <p>Replace any injector which leaks more than 2 drops of fuel per minute.</p>
<p>21</p>  <p>ST2849M</p>	

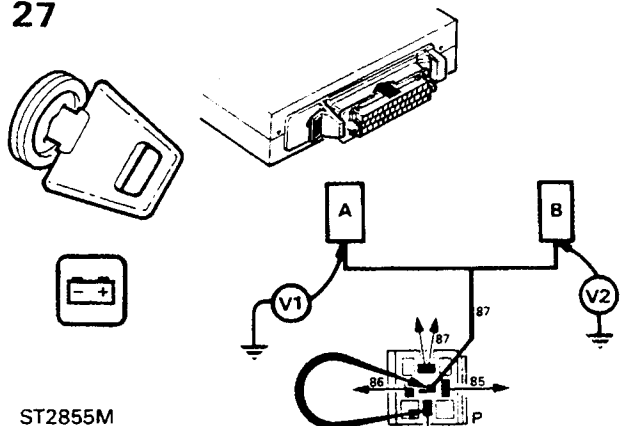
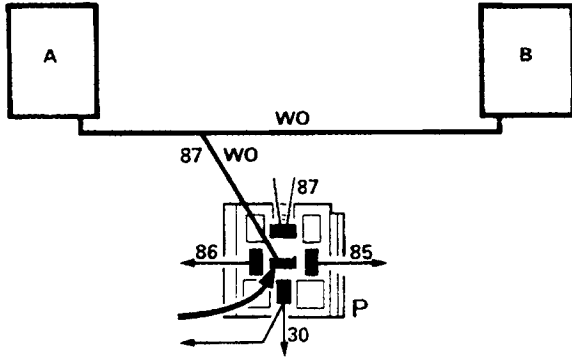
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>22. Check for injector operation Left bank 'A' injectors 1,3,5,7</p>	<p>WARNING: Ensure that all necessary precautions are taken to prevent fire and explosion. See Fuel Handling Precautions</p> <p>Repeat test for other injectors</p> <p>Replace any injector which does not operate.</p> <p>NOTE: Fuel flow is 160-175 cc (using white spirit) or 180-195 cc (using petrol) (minimum) per minute per injector, at 2.54 kg/cm² (36.25 psi) system pressure at 20°C ± 2°C</p>
<p>22</p>  <p>ST2850M</p>	

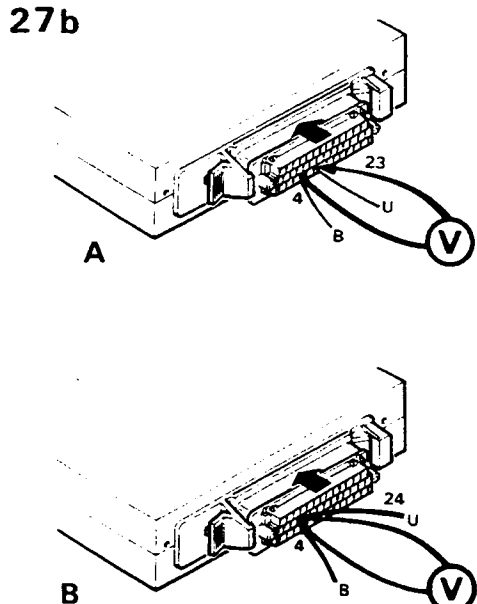
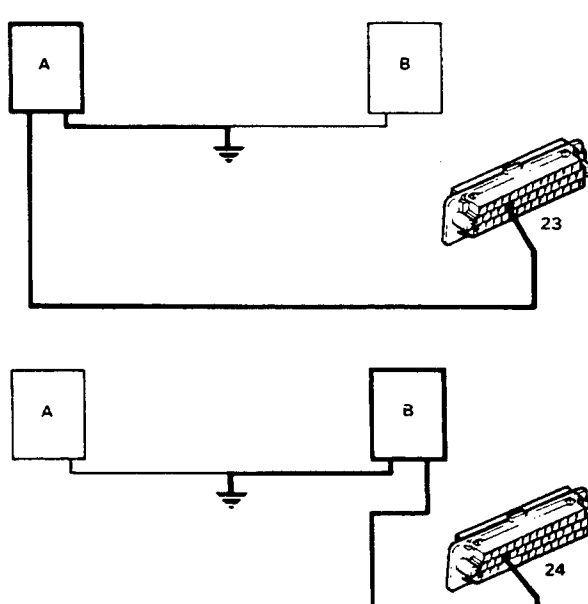
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>23. Right bank 'B' injectors 2,4,6,8 IGNITION ON</p>	<p>WARNING: Ensure that all necessary precautions are taken to prevent fire and explosion See Fuel Handling Precautions Repeat test for other injectors Replace any injector which does not operate NOTE: Fuel flow is 160-175 cc (using white spirit) or 180-195 cc (using petrol) (minimum) per minute per injector, at 2.54 kgf/cm² (36.25 psi) system pressure at 20°C ± 2°C</p>
<p>23</p>  <p>ST2851M</p>	

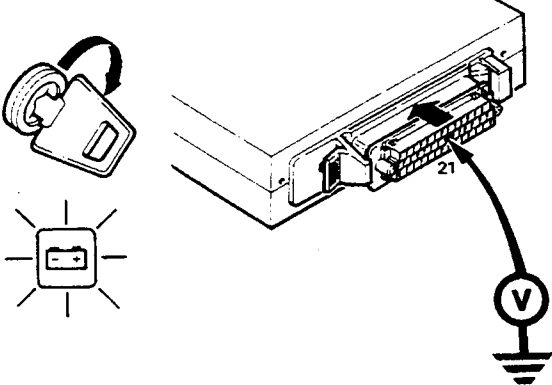
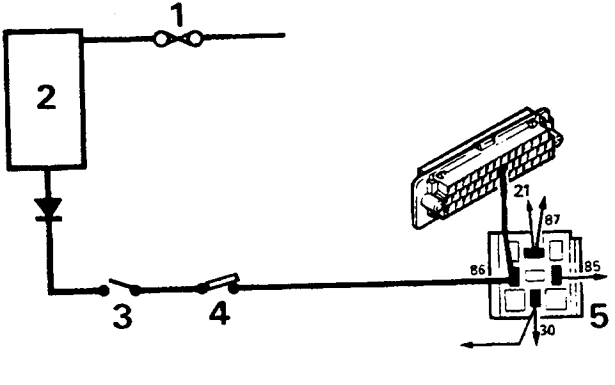
TEST PROCEDURE	RESULTS -
<p>24. Check gear switch signal IGNITION ON KEY: 1. Gearbox resistor 510 Ohms</p>	<p>Correct reading 1.5 - 3.5 Volts Proceed to test 25</p>
<p>24</p>  <p>ST2852M</p>	

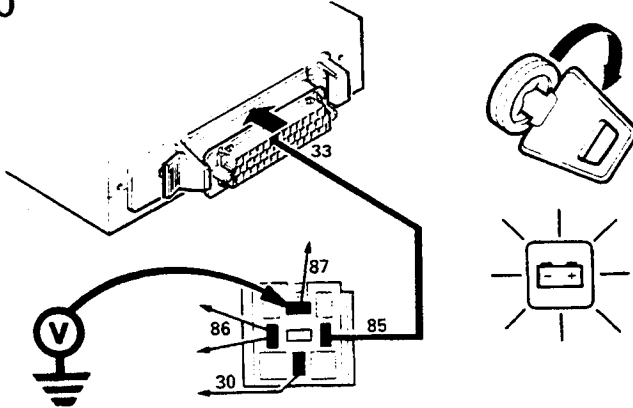
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>25. Check road speed input IGNITION ON NOTE: Roll the vehicle forward slowly</p>	<p>Voltmeter reading of 0 to 12V fluctuating 6 times per revolution - Proceed to Test 26</p> <p>Incorrect reading Check:</p>
<p>25</p>  <p>ST2853M</p>	

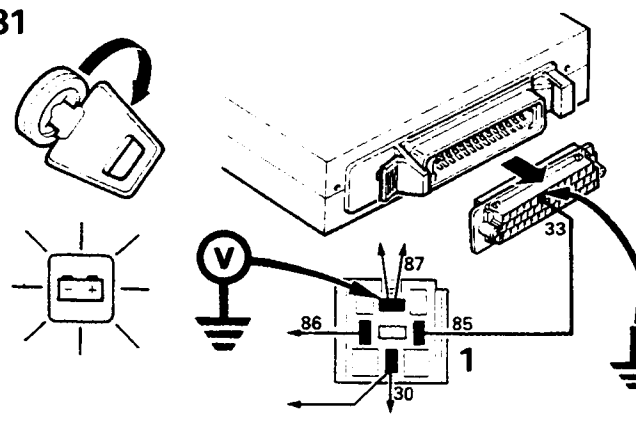
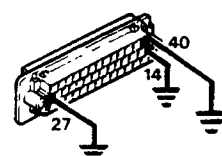
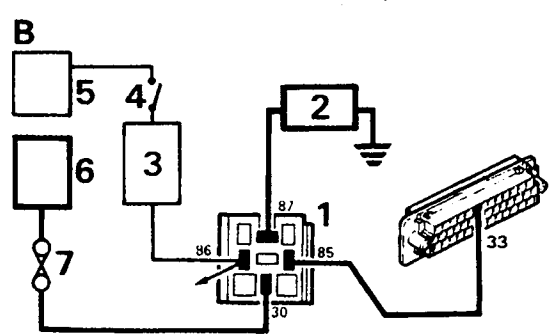
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>26. Check Lambda sensor heater coils - Catalyst vehicles IGNITION OFF NOTE: Remove pump relay from its connector KEY 1. and 2 Lambda sensors</p>	<p>Ohm-meter reading of 2.5-6.0 Ohms Proceed to Test 27a</p> <p>Incorrect reading Check:</p>
<p>26</p>  <p>ST2854M</p>	

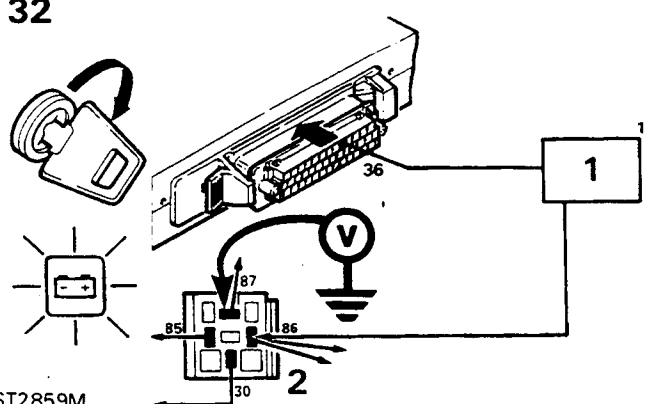
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>27 Check Lambda sensor supply IGNITION OFF</p> <p>A. LH Lambda sensor B. RH Lambda sensor</p>	<p>Correct V1 and V2 - 12 volts Proceed to Test 28</p> <p>Incorrect reading Check:</p>
<p>27</p>  <p>ST2855M</p>	

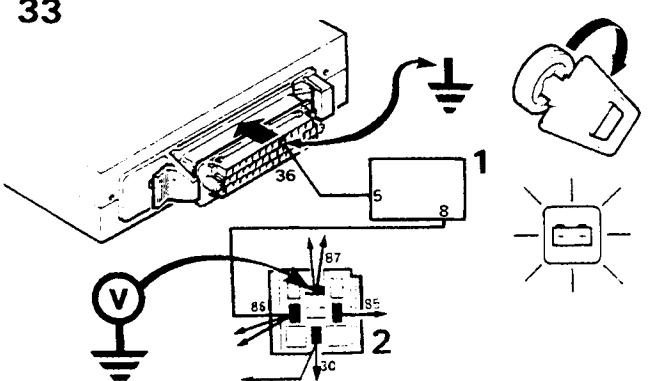
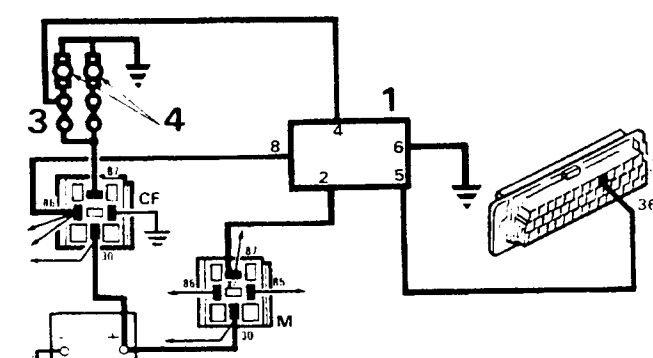
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>28. Check Lambda sensor operation</p> <p>Note: Select neutral in main gearbox and run engine at 1000 rev/min, normal operating temperature</p> <p>A. LH Lambda sensor B. RH Lambda sensor</p>	<p>Correct 0.50V - 1.00V fluctuating</p> <p>Incorrect 0.050 V - Check: Air leaks, faulty or contaminated injectors, low fuel pressure - if OK fit new Lambda sensor</p> <p>Incorrect 1.00V (not fluctuating) - Check: High fuel pressure, leaking injectors, saturated carbon canister - if OK fit new Lambda sensor.</p> <p>Incorrect approx. 0.0V - check:</p>
<p>27b</p>  <p>RR2708E</p>	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>29. Check air conditioning thermostat input - if fitted NOTE: Select air conditioning position and move thermostat switch to cold IGNITION ON KEY: 1. Fuse 8 2. Air conditioning switch 3. Air conditioning thermostat 4. High pressure switch - air conditioning 5. Compressor clutch relay</p>	<p>Voltmeter reading of battery volts - Proceed to Test 30</p> <p>Incorrect reading Check:</p>
<p>29</p>  <p>ST2856M</p>	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>30. Check operation of compressor clutch relay - air con. vehicles IGNITION ON NOTE: Select air conditioning position, thermostat cold, and fan speed I, II, or III</p>	<p>Voltmeter reading of 12 volts - Proceed to Test 32</p> <p>Incorrect reading of zero volts Proceed to Test 31</p>
<p>30</p>  <p>ST2857M</p>	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>31. Fault diagnosis - compressor clutch relay - air con. vehicles IGNITION ON NOTE: Select air conditioning position, thermostat cold, and fan speed I, II or III</p> <p>KEY:</p> <ol style="list-style-type: none"> 1. Compressor clutch relay 2. Compressor clutch 3. High pressure switch 4. Thermostat 5. Air conditioning switch 6. Fan speed switch 7. Fuse A3 	<p>Voltmeter reading of 12 volts - Check A</p> <hr/> <p>Voltmeter reading of zero volts Check B</p>
<p>31</p>  <p>ST2858M</p>	<p>A</p>  <p>B</p> 

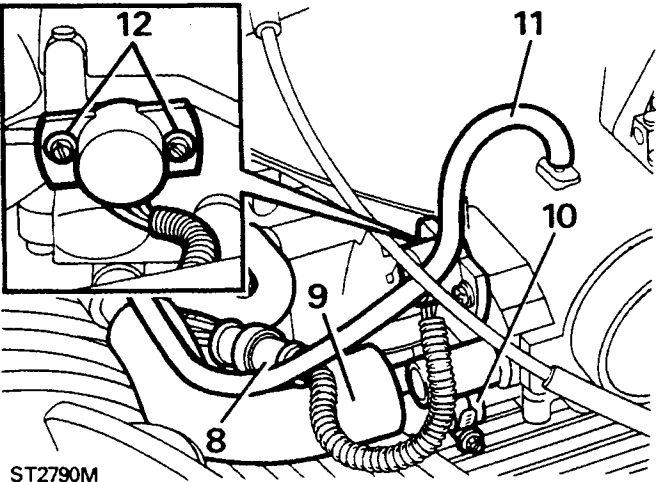
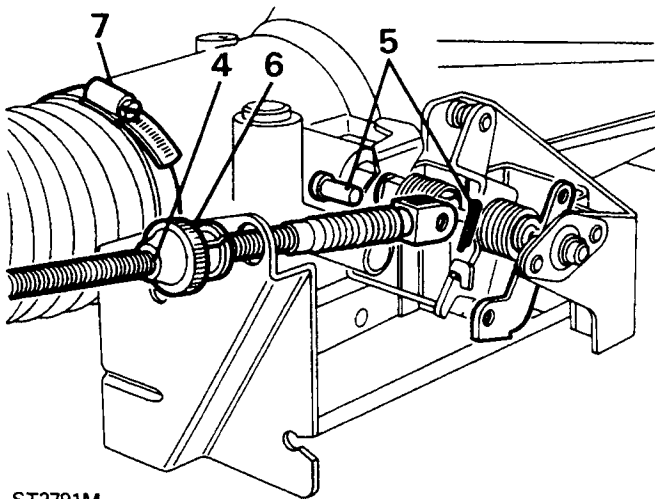
TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>32. Check operation of condenser fan output - air con. vehicles IGNITION ON Disconnect coolant temperature sensor and fuel temperature sensor and bridge plug connectors NOTE: Switch ignition 'ON' for 5 seconds, switch ignition 'OFF' The fan timer will operate the fans for approximately 10 minutes unless it is disconnected</p> <p>KEY:</p> <ol style="list-style-type: none"> 1. Condenser fan timer 2. Condenser fan relay 	<p>Voltmeter reading of 12 volts - end of tests</p> <hr/> <p>Voltmeter reading of zero volts</p> <hr/> <p>Proceed to Test 33</p>
<p>32</p>  <p>ST2859M</p>	

TEST PROCEDURE	RESULTS - Check cables and units shown in bold
<p>33. Fault diagnosis - condenser fan output - air con. vehicles IGNITION ON</p> <p>KEY: 1. Condenser fan timer 2. Condenser fan relay 3. Fuses A1 and A2 4. Condenser fans</p>	<p>Voltmeter reading of 12 volts - Suspect ECU</p> <p>Incorrect reading Check:</p>
<p>33</p>  <p>ST2860M</p>	

After completing the tests with either the 'Diagnostic' equipment or multi-meter, re-test the vehicle to ensure the faults have been rectified. If faults still persist, recheck using the Lucas diagnostic equipment.

OVERHAUL THROTTLE LEVERS AND THROTTLE VALVE

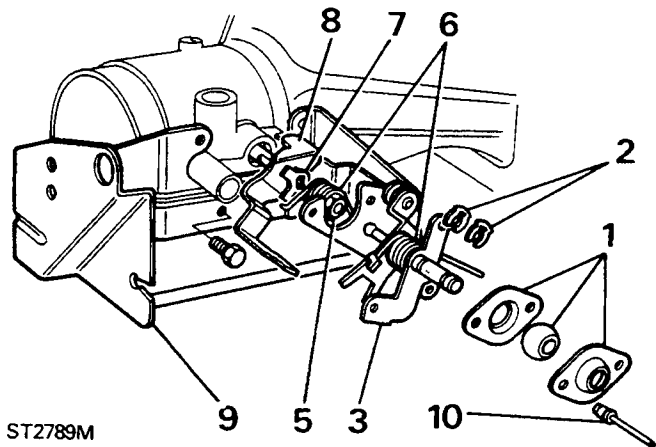
1. Disconnect the battery negative terminal.
2. Disconnect the electrical multi-plug from the bypass air valve (stepper motor).
3. Disconnect the small vacuum hose at the rear of the plenum chamber, located below the bypass air valve and the hose from the air valve housing.
4. To assist re-assembly mark an identification line on the throttle cable outer covering directly behind the adjustment thumb wheel before disconnecting the throttle cable from the throttle lever.
5. Remove the cotter pin and clevis pin securing the throttle cable to the lever.
6. Carefully prise the adjustment thumb wheel from the throttle bracket. Lay the cable aside.
7. Remove the large hose from the neck of the plenum chamber.



ST2790M

KEY TO THROTTLE LINKAGE ASSEMBLY

1. Spherical bearing
2. Retaining clips (2)
3. Countershaft assembly
4. Bracket securing bolts
5. Throttle spindle nut
6. Throttle return spring (2)
7. Tab washer
8. Throttle stop lever
9. Throttle bracket assembly
10. Pop rivets (2)



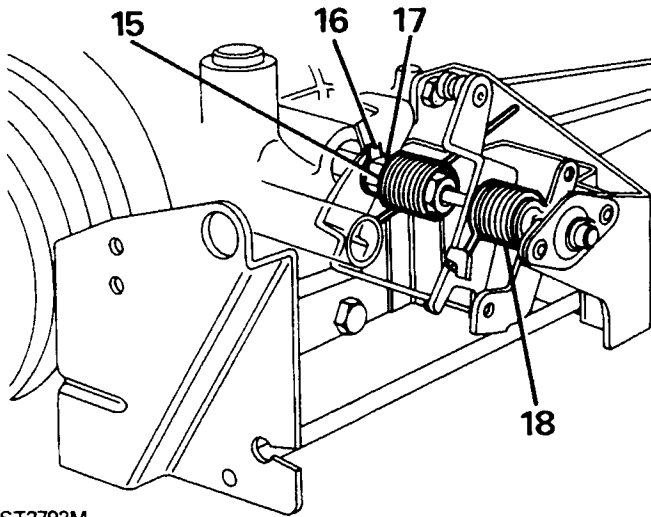
ST2789M

Remove throttle lever assembly

13. Remove the six screws securing the plenum chamber to the ram housing. Lift off the plenum chamber.
14. Remove the hose from the plenum chamber air inlet pipe.

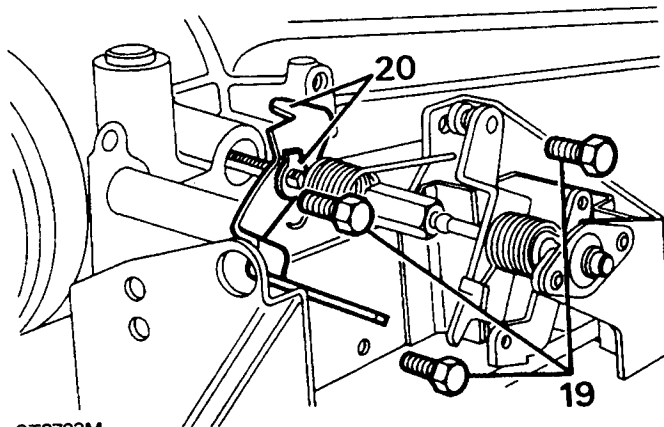
8. Disconnect the multi-plug to the throttle potentiometer.
9. Remove the breather hose.
10. Disconnect the two coolant hoses in turn and immediately plug the end of each hose to prevent excessive loss of coolant. Identify each hose for re-assembly.
11. Remove the distributor vacuum hose.
12. Release the two screws and remove the potentiometer.

15. Release the tension on the inboard throttle return spring and slide the spring along the countershaft assembly to give access to the throttle shaft nut.
16. Bend back the tabs of the lock washer.
17. While holding the throttle stop lever in the closed position, release the nut until it is free of the throttle valve shaft.
18. Release the tension on the outboard throttle return spring.



ST2792M

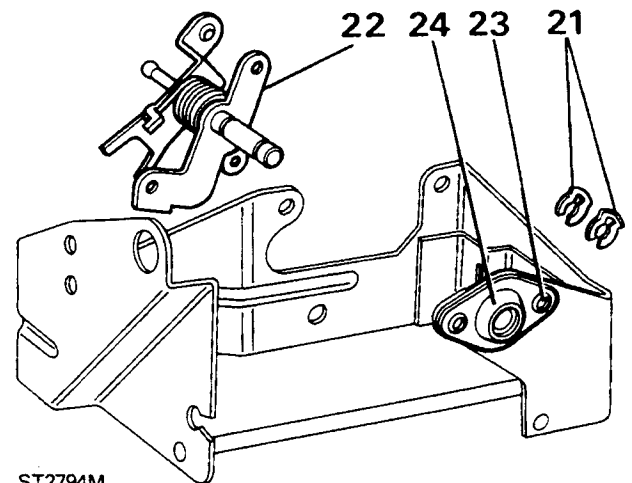
19. Remove the three bolts securing the throttle bracket to the plenum chamber and withdraw the bracket assembly.
20. Remove the tab washer and throttle stop lever from the throttle valve shaft.



ST2793M

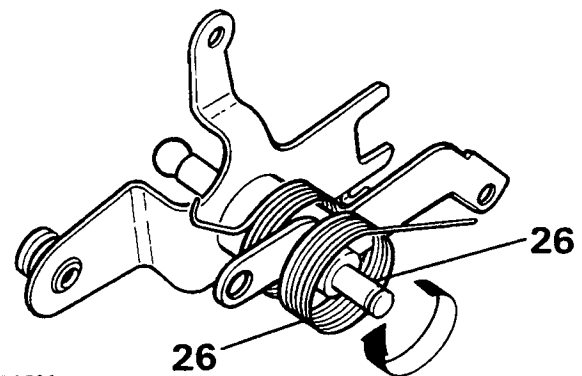
Inspect and overhaul throttle lever assembly

21. Remove the two retaining clips from either side of the spherical bearing.
22. Remove the countershaft assembly from the bearing.
23. If the spherical bush appears to be worn, dismantle as follows. Using a 4,7 mm (3/16 in) diameter drill, drill out the two pop rivets securing the spherical bearing to the throttle bracket assembly.
24. Split the bearing assembly and discard the bearing bush.



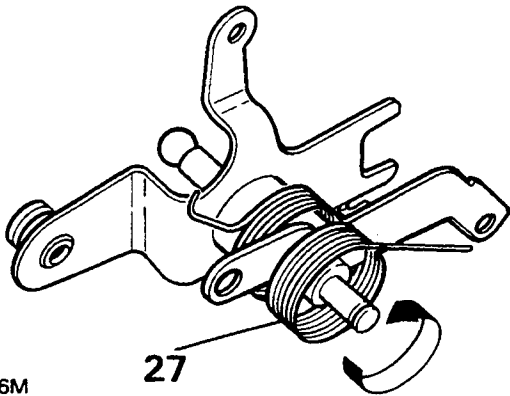
ST2794M

25. Pre-grease a new bush with Admax L3 or Energrease LS3 assemble the bush into the bearing retaining plates and pop-rievet the assembly to the throttle bracket with two 4.7 mm (3/16 in) diameter domed head rivets 9 mm (0.361 in) long.
26. Examine the bearing surface of the countershaft assembly. If worn fit a new assembly, otherwise wind the throttle return spring off the levers.



ST2795M

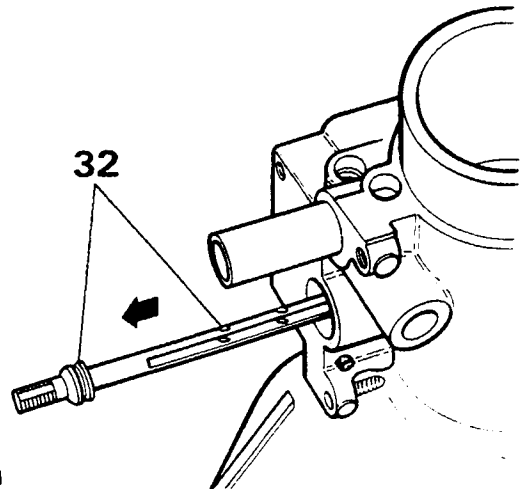
27. Wind a new spring onto the countershaft assembly noting that the small hooked end of the spring is wound on first.



ST2796M

28. Pre-grease the shaft with Admax L3 or Energrease LS3 and fit the countershaft assembly to the spherical bearing and secure with the two clips.
29. Examine the throttle stop lever for wear, fit a new lever if necessary.

32. Remove the shaft and air seal from the plenum chamber.



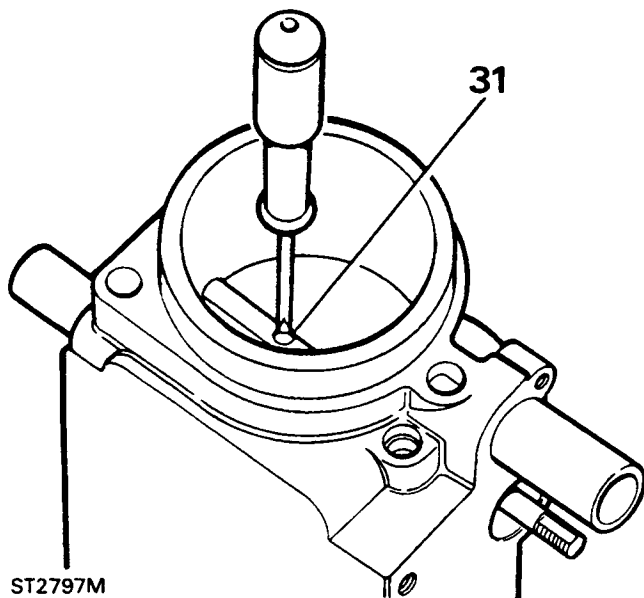
ST2801M

33. Using a suitable drift, drive out the bushes taking care not damage the bores in the plenum chamber.
34. Press in new bushes until they are flush with the throttle valve bore.

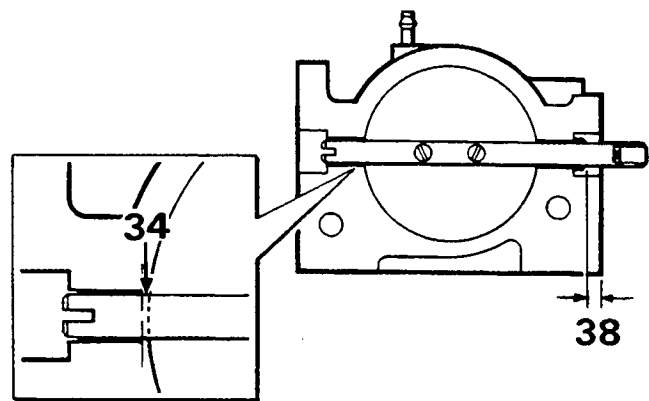
Inspect and overhaul throttle valve

30. Examine the throttle valve shaft for excessive wear between the bearing bushes in the plenum chamber and the shaft. A small amount of clearance is permissible. If excessive wear is evident fit new shaft and bushes as follows.
31. Remove the two split screws securing the throttle valve disc and withdraw the disc, taking care not to damage the shaft.

CAUTION: Ensure that the bushes do not protrude into the bore as they will interfere with the movement of the throttle valve disc.



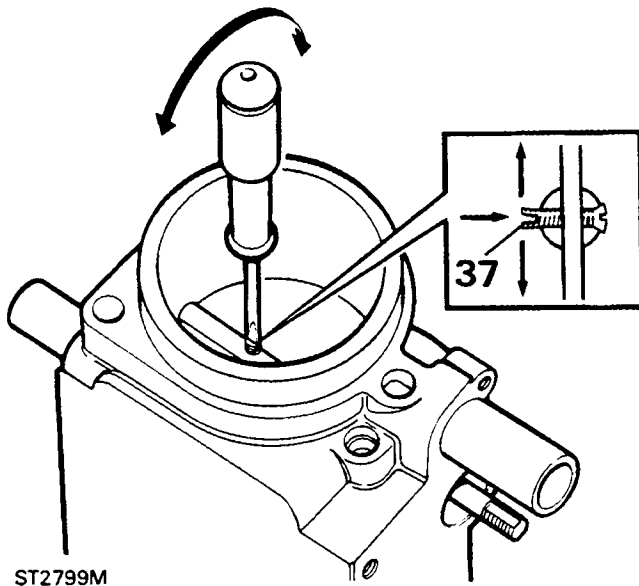
ST2797M



ST2798M

35. Fit the throttle valve shaft and disc, secure in position with the two split screws. Do not fully tighten the screws at this stage.
36. Rotate the throttle shaft 360° once or twice to centralise the disc in the bore. Tighten the two screws.

37. Rotate the shaft until the split end of the screws are accessible. Using the blade of a screw driver spread the split to secure the screws in the shaft.



ST2799M

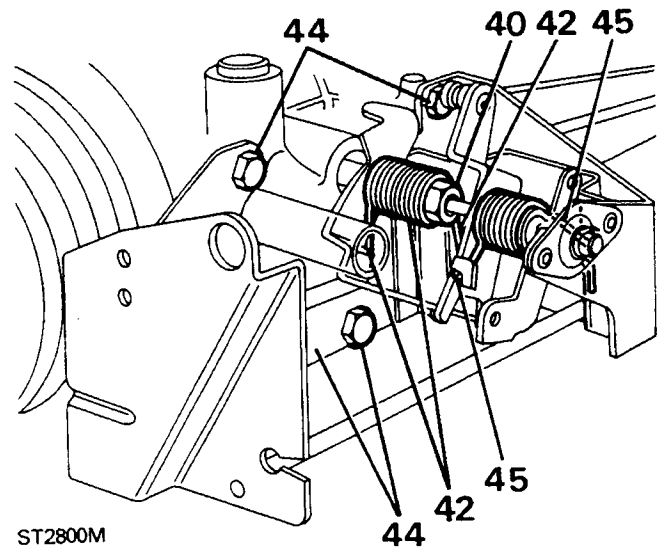
NOTE: If a new throttle disc is fitted smear Molybdenum disulphide grease round the edge of the disc to assist "bedding-in".

38. Pre-grease a new air seal with Admax L3 or Energrease LS3. Fit the seal pushing it down the shaft and into the counterbore until the seal is 6.0 mm (0.236 in) below the face of the plenum chamber.

Assemble throttle levers and bracket

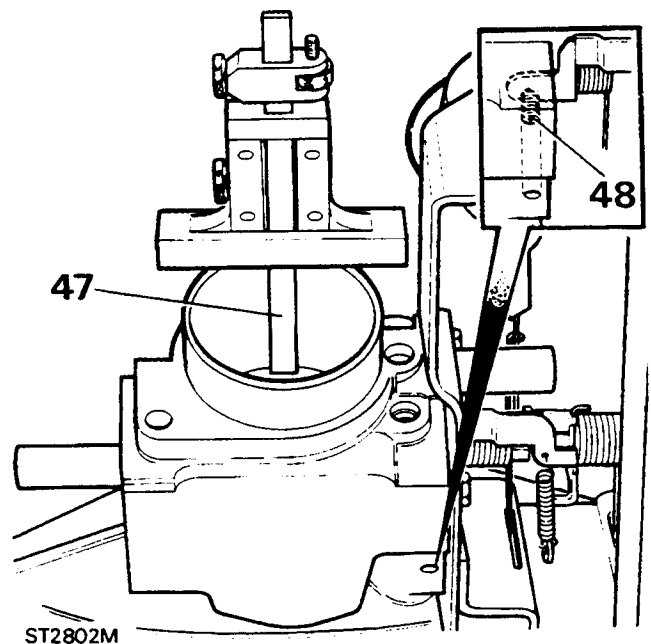
39. Fit the stop lever to the throttle valve shaft followed by a new tab washer and secure with the interconnecting nut.
40. Holding the stop lever on its stop, tighten the interconnecting nut securely and bend over the tabs of the tab washer to lock the nut in position.
41. Fit the inboard throttle return spring noting that the small hooked end of the spring is nearest the plenum chamber.
42. Locate the hooked end of the inboard spring on the stop lever and wind up the straight end one full turn and anchor it in the appropriate slot.
43. Fit the countershaft to the interconnecting nut of the throttle valve shaft.

44. Fit the throttle bracket assembly and secure with the three retaining bolts.
45. Ensuring that the hooked end of the outboard spring is anchored by the lever, wind the spring up one full turn and locate the free end in its appropriate slot.
46. Lightly grease the throttle return and overtravel spring with Admax L3 or Energrease LS3.



ST2800M

47. Using a depth vernier or depth micrometer from the mouth of the bore check the top and bottom of the valve disc. The disc must be within 0.5 mm (0.019 in) total indicator reading across the full diameter of the disc.
48. If the throttle disc is out of limits adjust the small set screw below the stop lever. Access to the screw is gained from the bottom of the plenum chamber neck adjacent to the throttle levers support bracket.



ST2802M

NOTE: If new throttle levers have been fitted the minimum throttle setting of the disc must be checked to ensure that it is 90° to the bore.

Refitting

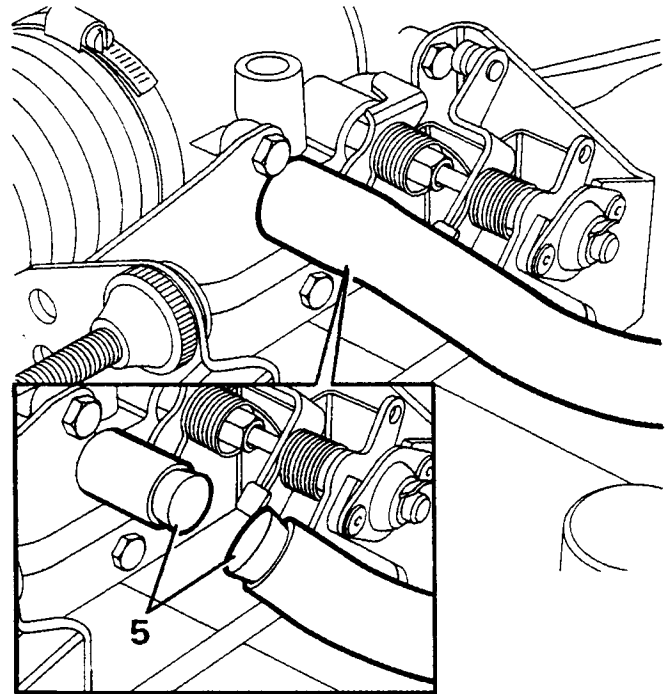
49. Clean any previous sealant from the joint face of the plenum chamber and ram housing. Apply 'Hylomar' sealant to the faces and refit the plenum chamber. Tighten the bolts evenly.
50. Reverse the remaining preparation instructions.

BASE IDLE SPEED SETTING

NOTE: The base idle speed is set at the factory and should not require further adjustment unless the plenum chamber is changed. The adjustment screw is sealed with a plug to prevent unauthorised alteration. Check the ignition timing before attempting the following procedure since this will effect the idle speed.

Checking Procedure.

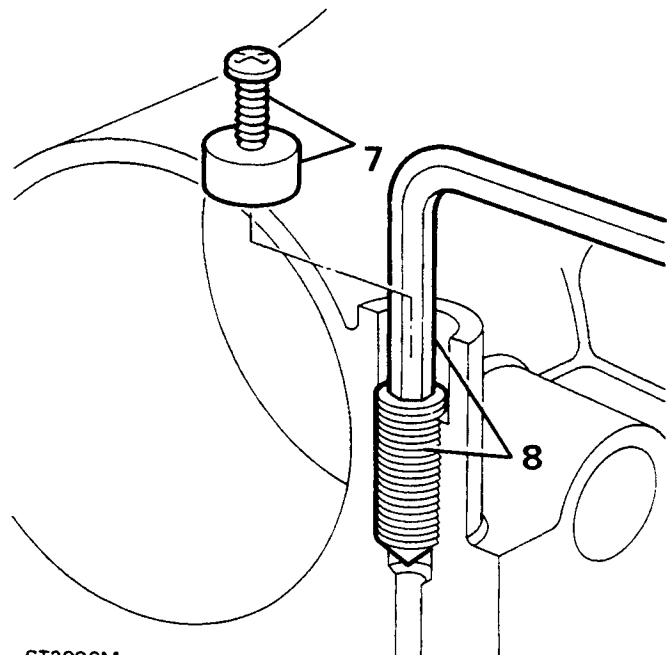
1. Drive the vehicle for at least two miles until the engine and transmission are hot and switch off the engine.
2. Connect the hand held test unit to the diagnostic plug and select test card "A" r.p.m. display. See "Recommended Equipment".
3. Ensure that the air by-pass valve (stepper motor) hose is securely fitted at the valve end.
4. Check that all electrical loads are off including the air conditioning.
5. Disconnect the air by-pass valve hose from the plenum chamber and securely plug both the plenum chamber and hose to prevent air leaks. Note that the throttle cable has been omitted from the illustration for clarity.
6. Start the engine and check that the idle speed is within the limits quoted in section 05.



ST2885M

Adjusting base idle speed.

7. To adjust the idle speed, remove the tamper-proof plug that protects the idle speed screw. Drill the plug and insert a self tapping screw to enable the plug to be pulled out.
8. Start the engine and using a suitable Allen key, (4,7mm) (3/16in) adjust the idle screw clockwise to decrease or anti-clockwise to increase the idle speed.



ST2886M

9. Stop the engine, remove the blanking plugs and reconnect the hose to the plenum chamber. Disconnect the hand-held tester.
10. Fit a new tamper-proof plug.

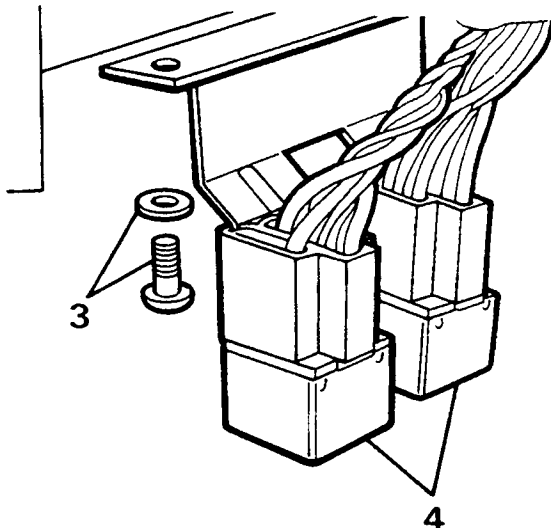
ELECTRONIC FUEL INJECTION-RELAYS

The following fuel injection relays are located beneath the fascia panel to the right of the centre console for both RHD and LHD vehicles. Also the white coloured diagnostic socket is situated in this area.

- A. Fuel pump relay (mounted on a blue terminal block).
- B. Main relay (mounted on a black terminal block).
- C. Diagnostic socket (white)

Removing

1. Disconnect the battery negative terminal.
2. Remove the fascia right-hand lower closing panel.
3. Remove the single screw to release the relay mounting bracket.
4. Pull the relay(s) from the terminal block(s).



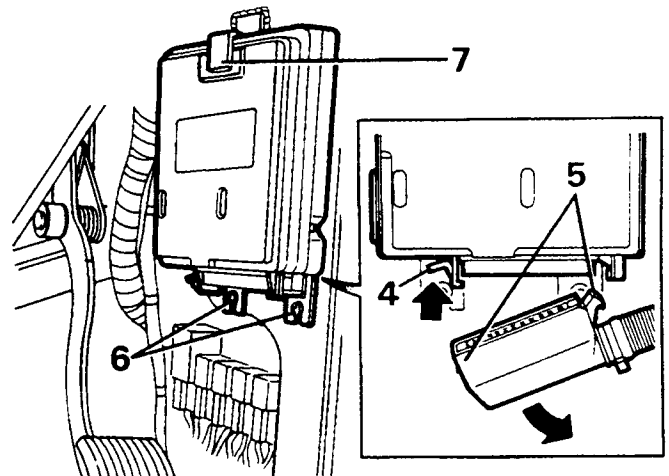
ST2879M

Fitting

5. Fit the relays to their respective terminal blocks.
6. Secure the bracket to the fascia and refit the closing panel.

ELECTRONIC CONTROL UNIT (ECU)-14 CUX**Removing**

1. Remove the fascia right-hand closing panel.
2. Remove the right-hand footwell side panel trim.
3. Disconnect the battery negative terminal.
4. Release the ECU plug retaining clip.
5. Maneuvre the front of the plug (in the direction of the bold arrow) and detach the other end of the plug from the retaining peg.
6. Release the two screws securing the ECU to the right-hand footwell side panel.
7. Withdraw the ECU from the clip.



ST2818M

Refitting

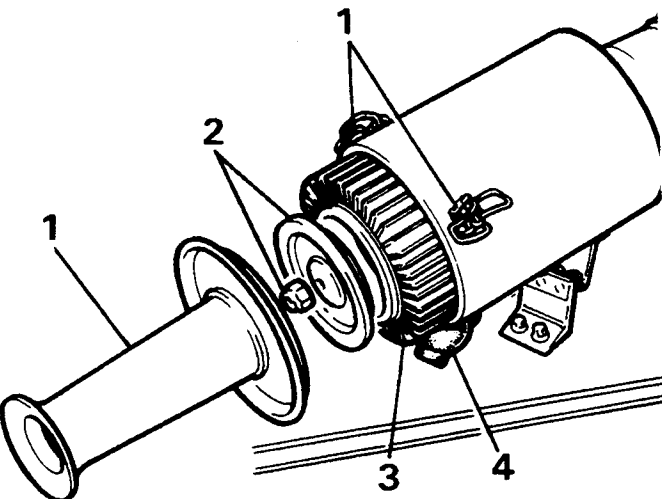
8. Refit the ECU securely in the clip and fit the two screws.
9. Reconnect the ECU harness plug. Ensure that the plug is pushed firmly into its location and that the retaining clip secures the plug in position.
10. Reverse remaining removal procedure.

NOTE: The ECU is not a serviceable item. In the event of a unit failure the ECU must be renewed.

AIR CLEANER ELEMENT

Removing

1. Unclip the three catches securing the inlet tube to the air cleaner canister and remove the inlet tube.
2. Remove the nut and end plate securing the air cleaner element in position.
3. Withdraw the air cleaner element and discard.
4. Inspect the dump valve for condition and that it is clear of obstructions.



ST2811M

Refitting

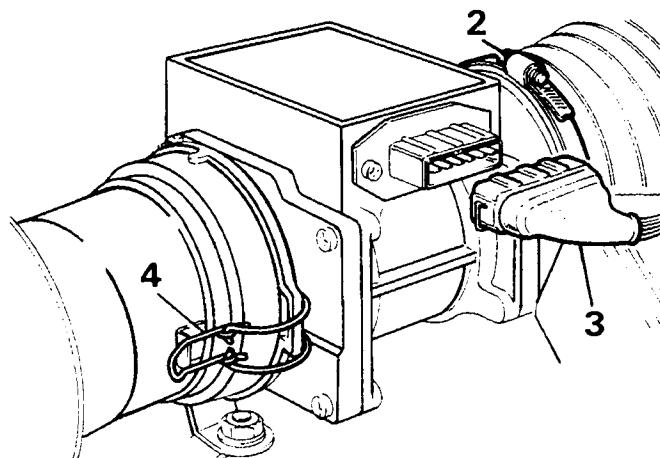
5. Fit a new element and secure in position.
6. Refit the inlet tube to the air cleaner canister.

AIR FLOW SENSOR

Removing

NOTE: The air flow sensor is not a serviceable item. In the event of failure or damage the complete unit is to be replaced.

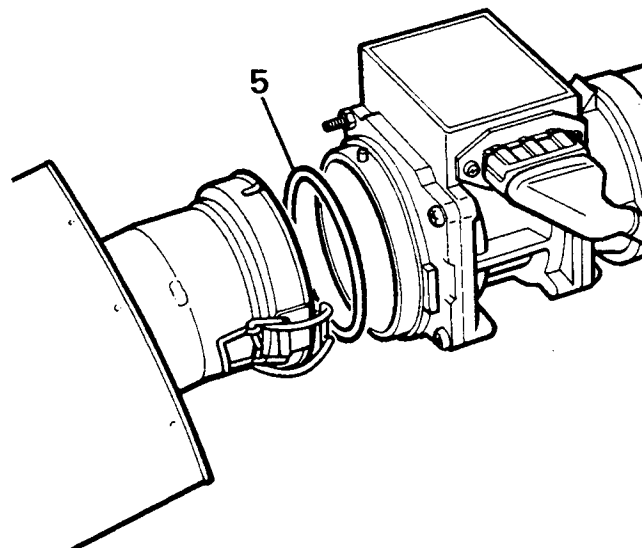
1. Disconnect the battery negative terminal.
2. Release the large hose clamp at the rear of the air flow meter and disconnect the hose from the sensor.
3. Disconnect the multi-plug.
4. Release the two clips securing the air flow sensor to the air cleaner case detach the sensor from the case and withdraw it from the engine compartment.



ST2812M

Refitting

5. Fit the sensor to the air cleaner case and check that the large 'O' ring between the case and sensor is in position and is in good condition.

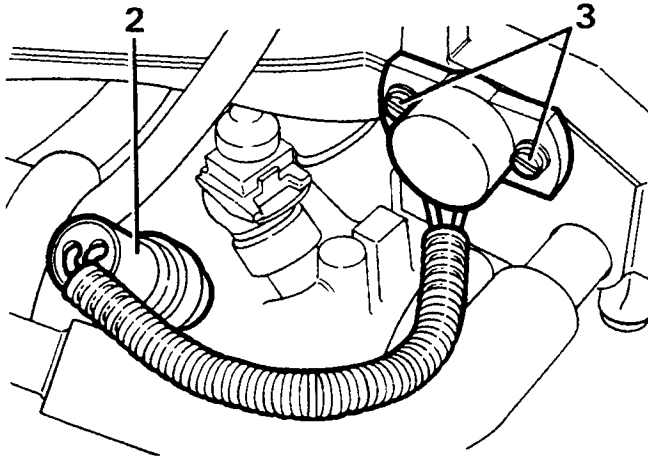


ST2810M

6. Reverse the remaining removal procedure ensuring that the multi-plug is firmly reconnected to the air flow sensor and that the hose clamp at the rear of the sensor is securely tightened, to prevent un-metered air entering the engine.

THROTTLE POTENTIOMETER**Remove**

1. Disconnect the battery negative terminal.
2. Disconnect the electrical three-pin plug from the harness socket.
3. Remove the two screws securing the potentiometer to the plenum chamber and carefully pull the switch from the throttle valve shaft.

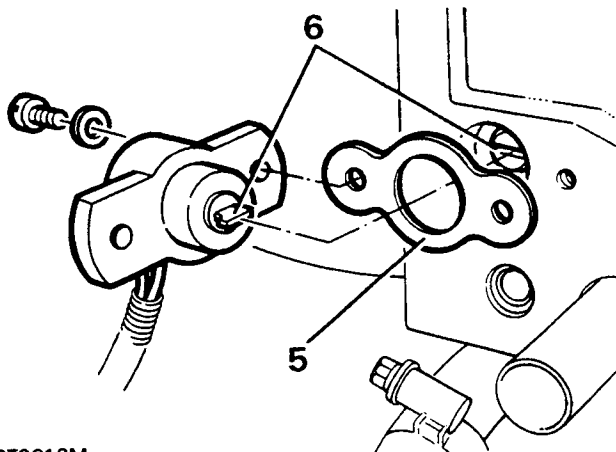


ST2861M

4. Remove the old gasket.

Refit

5. Fit a new gasket between the throttle potentiometer and plenum chamber.
6. Align the end of the potentiometer shaft with the groove end of the throttle shaft and secure the potentiometer to the plenum chamber with the two screws.

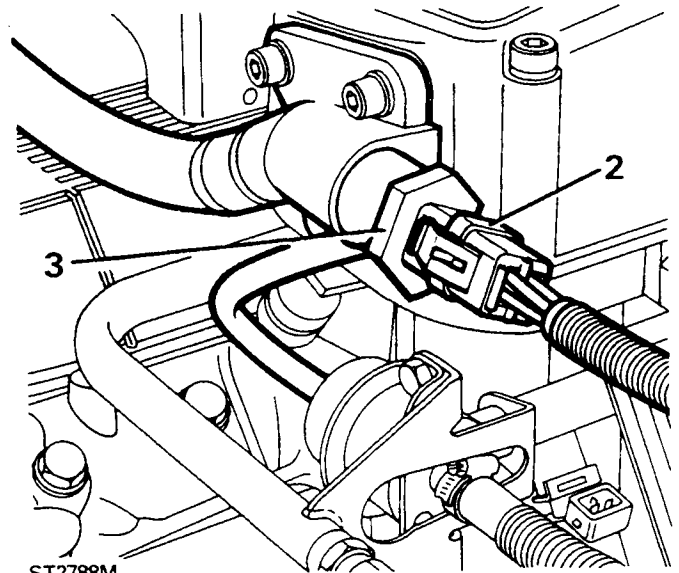


ST2813M

CAUTION: The throttle mechanism must not be operated while the potentiometer is loosely fitted, otherwise damage may be caused to the potentiometer wiper track.

BY-PASS AIR VALVE (STEPPER MOTOR)**Removing**

1. Disconnect the battery negative terminal.
2. Remove the multi-plug from the unit.
3. Unscrew the valve from its location at the rear of the plenum chamber.
4. Remove the captive washer.



ST2788M

Refitting

5. Fit a **NEW** sealing washer.

NOTE: If the same by-pass valve is being refitted clean any previous sealing compounds from the threads. Apply Loctite 241 to threads of the valve before reassembly.

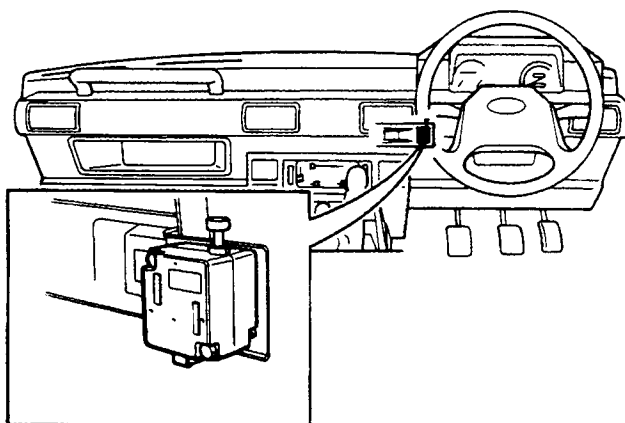
6. Tighten the valve to the specified torque 17-22 Nm (13-16 ft. lb.).
7. Reverse the remaining removal instructions.

INERTIA SWITCH

The inertia switch is located under the fascia panel to the left of the steering column, above the brake pedal, on RHD vehicles and to the right of the steering column above the throttle pedal on LHD vehicles. The switch is secured to a bracket by two screws.

Removing

1. Disconnect the battery negative terminal.
2. Remove the two screws securing the switch to the bracket.
3. Withdraw the switch and disconnect the electrical multi-plug.
4. Remove the switch from the vehicle.



ST2827M

Refitting

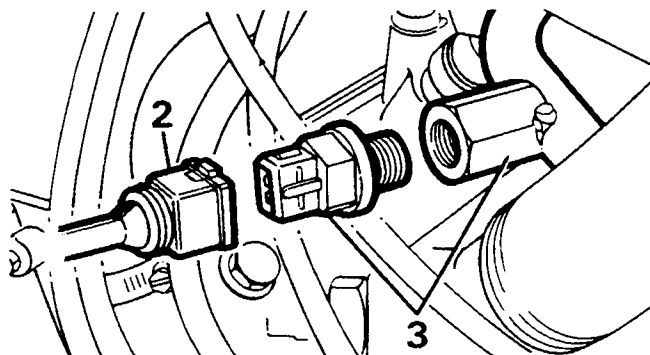
5. Reverse the removal procedure ensuring that the multi-plug clips firmly into position, and that the switch is reset so that the plunger is in the fully depressed position.

FUEL TEMPERATURE THERMISTOR (SENSOR)

Removing

NOTE: No fuel leakage will occur when the thermistor is removed from the fuel rail therefore it is not necessary to depressurize the fuel system before removal.

1. Disconnect the battery negative terminal.
2. Remove the electrical multi - plug from the thermistor.
3. Release the thermistor from the fuel feed rail.



ST2809M

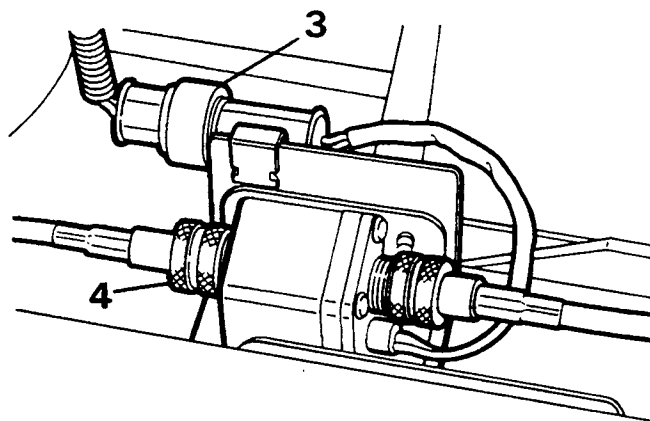
Refitting

4. Reverse the removal procedure, ensuring that the thermistor is tightened securely in the fuel rail.

SPEED TRANSDUCER - Electronic speedometer

Removing

1. Place the vehicle on a hydraulic hoist and apply the parking brake.
2. Disconnect the battery negative terminal.
3. Raise the hoist and disconnect the speed transducer electrical plug.
4. Disconnect the speedometer cable from the transducer.



ST2804M

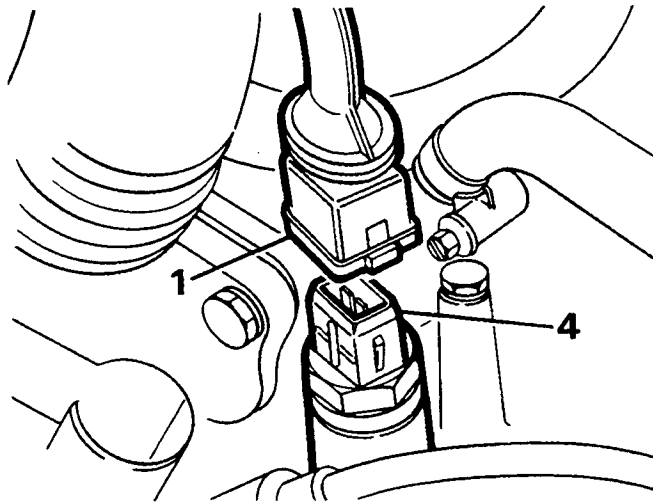
5. Do not remove the blanking cap.
6. Remove the single bolt securing the transducer to its mounting bracket and withdraw the unit from the vehicle.

Refitting

7. Reverse the removal instructions.

COOLANT TEMPERATURE THERMISTOR (SENSOR)**Removing**

1. Remove the multi-plug from the thermistor.
2. Release the radiator bottom hose and partially drain the cooling system.
3. Refit the hose and tighten the clamp securely.
4. Remove the thermistor from the left hand front branch of the intake manifold.
5. Remove the copper washer.



ST2808M

Refitting

6. Fit a NEW copper washer to the thermistor.
7. Fit the thermistor to the intake manifold and tighten securely.
8. Refill the cooling system.
9. Run the engine, check for water leaks around the coolant temperature thermistor.

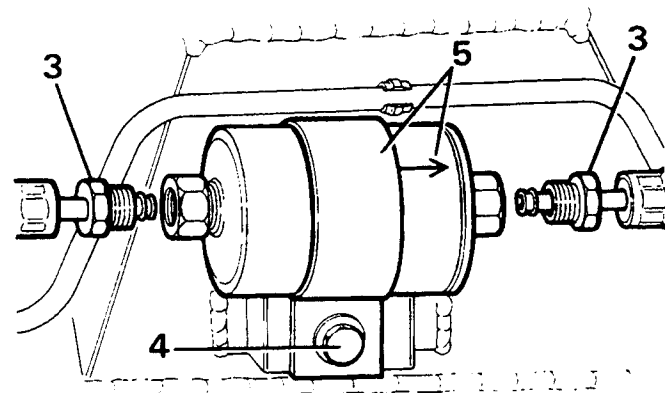
FUEL FILTER

The fuel filter for the E.F.I. system is located at the rear of the vehicle on the right-hand side, on the outside of the chassis, at the end of the round cross member.

WARNING: Ensure that all the necessary precautions are taken against fuel spillage and fuel vapour to prevent fire or explosion. In this connection, please read the FUEL HANDLING PRECAUTIONS Section 01.

CAUTION: Before disconnecting any part of the fuel system it is essential that all dust, dirt and debris of any kind, is removed from around the components to be removed, to prevent the ingress of foreign matter, into the fuel system.

1. Carry out the instructions to depressurize the fuel system.
2. Disconnect the battery negative lead.
3. Disconnect the inlet and outlet hoses from the filter and immediately cover the ends of the hoses.
4. Release the single nut and bolt securing the filter and clamp to the chassis and remove the filter.



ST2862M

Fitting new filter

5. Insert the filter into the clamp ensuring that it is fitted with the flow arrow pointing to the front of the vehicle.
6. Tighten the single nut and bolt.
7. Fit the inlet and outlet hoses and tighten to the correct torque.
8. Carry out instruction 7 and 8 under DEPRESSURIZING THE FUEL SYSTEM to restore the pressure.
9. Whilst the engine is running, check for fuel leaks from the filter connections.

DEPRESSURIZING THE FUEL SYSTEM

WARNING: Under normal operating conditions the fuel injection system is pressurized by a high pressure fuel pump, operating at up to 2.4 to 2.6 kgf/cm² (34 to 37 p.s.i.). When the engine is stationary this pressure is maintained within the system. To prevent pressurized fuel escaping and to avoid personal injury it is necessary to depressurize the fuel injection system before any service operations are carried out.

NOTE: If the vehicle has not been run there will still be a small amount of residual pressure in the fuel line. The depressurizing procedure must still be carried out before disconnecting the component within the fuel system.

WARNING: The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion.

1. The fuel pump relay is located beneath the fascia to the right of the centre console.
2. Pull the fuel pump relay off its multi-plug.
3. Start and run the engine.
4. When sufficient fuel has been used up causing the fuel line pressure to drop, the injectors will become inoperative, resulting in engine stall. Switch the ignition off.
5. Disconnect the battery negative terminal.

NOTE: Fuel at low pressure will remain in the system. To remove this low pressure fuel, place an absorbent cloth around the fuel feed hose at the fuel rail and release the fuel feed hose compression nut.

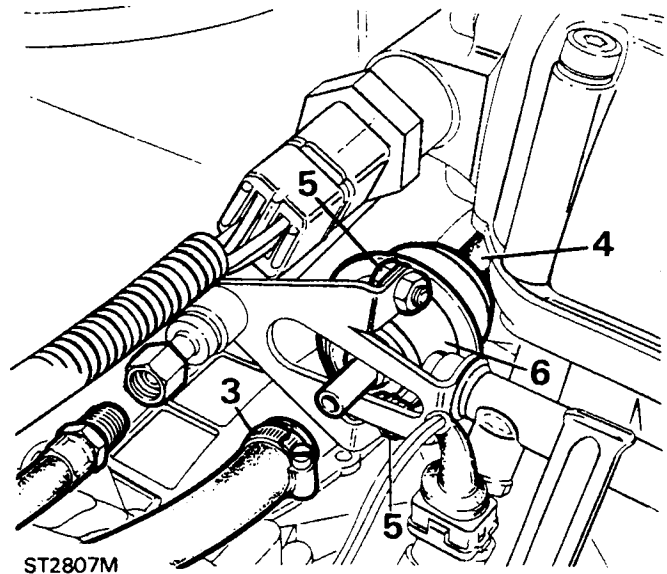
Refitting

6. Refit the fuel feed hose.
7. Refit the fuel pump relay, reconnect the battery.
8. Crank the engine (engine will fire within approximately 6 to 8 seconds).

FUEL PRESSURE REGULATOR

Removing

1. Depressurize the fuel system.
2. Disconnect the negative battery terminal.
3. Release the hose clamp securing the fuel return hose to the regulator and remove the hose.
4. Pull the vacuum hose from the rear of the regulator.
5. Remove the two nuts and bolts securing the regulator to the fuel rail, carefully ease the regulator fuel inlet pipe out of the fuel rail.
6. Withdraw the regulator from the engine compartment.



NOTE: If the original regulator is being refitted, fit a NEW 'O' ring to the fuel inlet pipe.

Refitting

7. Lightly coat the 'O' ring with silicon grease 300 before fitting the regulator to the fuel rail.
8. Reverse the removal procedure.
9. Reconnect the battery and pressurize the fuel system and check that there are no fuel leaks around the regulator connections.

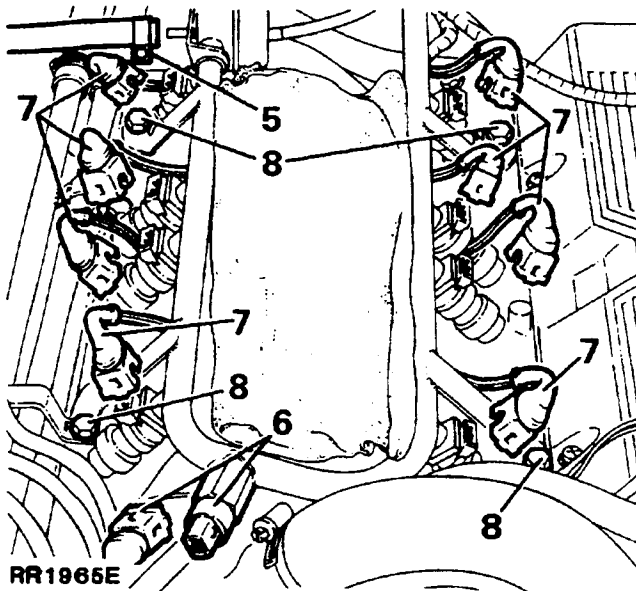
FUEL RAIL-INJECTORS R/H AND L/H

Removing

1. Depressurize the fuel system.
2. Disconnect the negative battery terminal.
3. Remove the plenum chamber. (See Plenum Chamber, remove and refit).
4. Remove the ram housing. (See Ram Housing remove and refit).

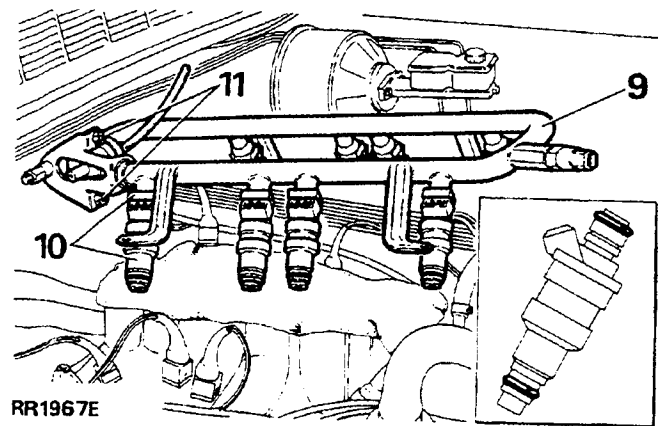
NOTE: Place a cloth over the ram tube openings to prevent ingress of dirt into the engine.

5. Release the hose clamp and remove the fuel return hose from the pressure regulator.
6. Disconnect the multi-plug from the fuel temperature thermistor (sensor).
7. Disconnect the multi-plugs from the eight injectors.
8. Remove the five bolts securing the fuel rail support and heater pipe brackets to the intake manifold. Place the heater pipes to one side.



9. Remove the fuel rail, complete with injectors, from the intake manifold.
10. Remove the retaining clips securing the injectors to the fuel rail, ease the injectors from the rail.

11. If necessary, remove the two nuts and bolts securing the regulator to the fuel rail, and carefully pull the regulator away from the rail.



Refitting

12. Fit **NEW** 'O' rings, protective cap and supporting disc to the injectors, lightly coat the 'O' rings with silicon grease 300 and insert the injectors into the fuel rail, multi-plug connections facing outwards.
13. Refit the retaining clips.

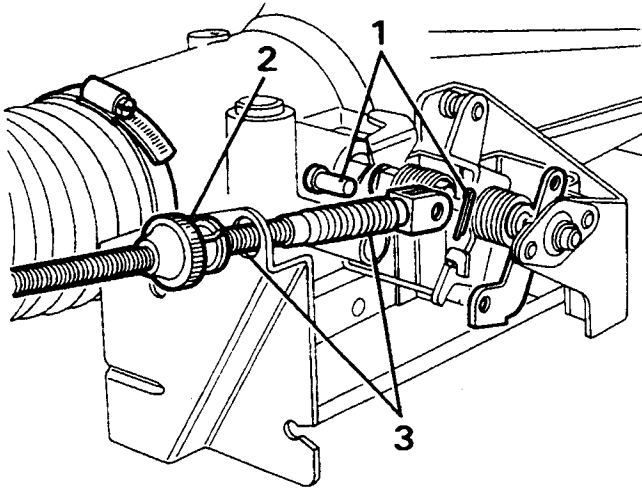
CAUTION: Care must be taken when refitting the fuel rail and injectors to the intake manifold to prevent damage occurring to the 'O' rings.

14. Fit a **NEW** 'O' ring to the pressure regulator lightly coat the 'O' ring with silicon grease 300 and secure the regulator to the fuel rail.
15. Fit the fuel rail and heater pipe assemblies to the intake manifold, secure the rail and pipes in position with the five bolts.
16. Reverse the remaining removal instructions.
17. Pressurize the fuel system and check for fuel leaks around the injectors and pressure regulator.

THROTTLE CABLE

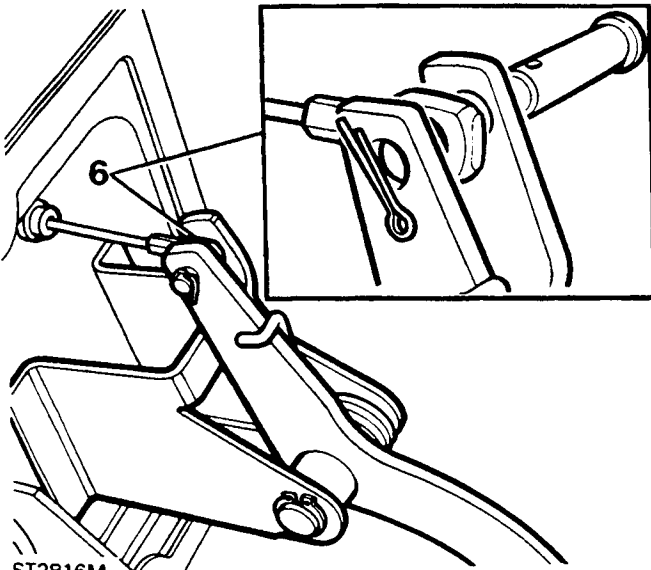
Removing

1. Remove the cotter pin and clevis pin securing the cable to the lever.
2. Carefully pry the throttle cable adjustment nut out of the linkage mounting bracket.
3. Withdraw the cable from the mounting bracket.



ST2815M

4. Release the outer cable from the retaining clips within the engine compartment.
5. Remove the lower dash panel from beneath the steering column.
6. Disconnect the cable from the throttle pedal.
7. Feed the cable through the bulkhead grommet and into the engine compartment.



ST2816M

FITTING

8. Feed the new cable from the engine compartment through the bulkhead grommet.
9. Connect the cable to the throttle pedal.
10. Connect the cable to the throttle linkage, fit a new cotter pin and secure in position.
11. Clip the outer cable adjustment nut into the mounting bracket.
12. Adjust the outer cable to give 1.57 mm (0.062 in) free play in the throttle cable and check the throttle operation.

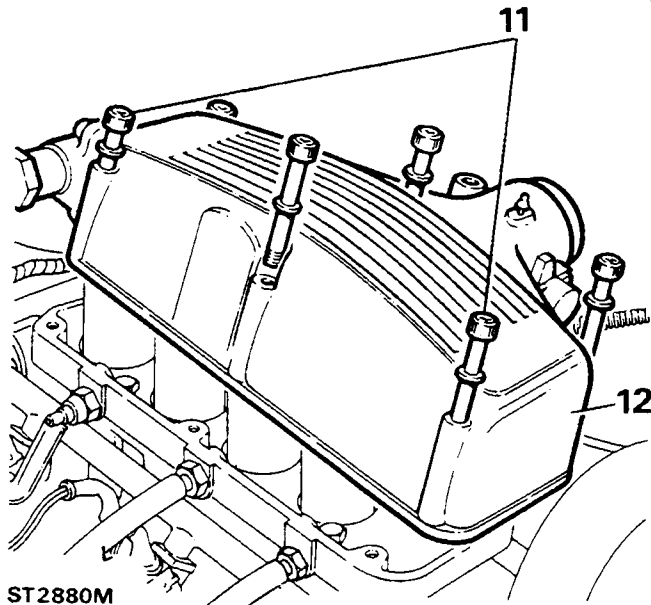
PLENUM CHAMBER

Removing

1. Disconnect the battery negative terminal.
2. Release the radiator bottom hose and partially drain the cooling system, reconnect the hose to the radiator and tighten the hose clip.
3. Remove the air flow sensor.
4. Release the clips and remove the two coolant hoses from the beneath the plenum chamber inlet neck. Identify each hose to aid re-assembly.
5. Remove the distributor vacuum hose, positive crankcase ventilation breather filter hose and servo hose.
6. Disconnect the throttle potentiometer multi-plug.
7. Disconnect the multi-plug from the air by-pass valve (stepper motor).
8. Disconnect the vacuum hose to the fuel pressure regulator.
9. Disconnect, from the plenum chamber neck, the hose to the air by-pass valve housing.
10. Remove the three bolts (with spring washers) securing the throttle lever assembly bracket to the plenum chamber and move the assembly aside.

11. Remove the six socket head bolts (with plain washers) securing the plenum chamber to the ram housing.
12. Lift the plenum chamber and remove it from the ram housing.

CAUTION: Cover the ram tubes with lint-free material to prevent ingress of dirt and moisture.



Refitting

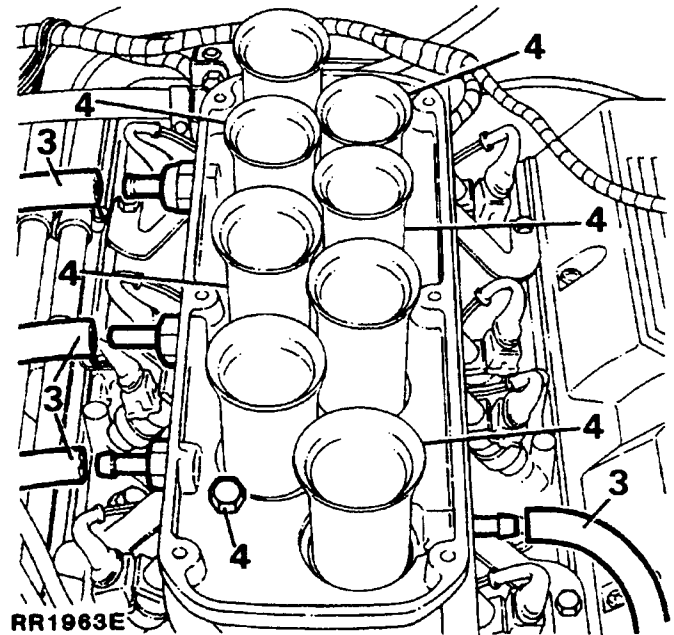
13. Ensure that the mating faces are free from previous sealing compound.
14. Coat the mating faces of the plenum chamber and ram housing with 'Hylomar' sealant.
15. Refit the plenum chamber and evenly tighten the six bolts to the specified torque of 22-28 NM (16-21 ft.lb).
16. Reverse the remaining removal instructions.

CAUTION: Ensure that all hoses are connected securely to prevent un-metered air entering the engine.

RAM HOUSING

Removing

1. Disconnect the battery negative terminal.
2. Remove the plenum chamber (see Plenum Chamber remove and refit).
3. Release the hoses from around the outer edges of the ram housing.
4. Remove the six through bolts (with plain washers) securing the ram housing to the intake manifold.



5. Lift the ram housing off the intake manifold and remove it from the engine compartment.
6. Place a protective cover over the top of the intake manifold inlet bores to prevent ingress of dirt.

Refitting

7. Ensure that all mating faces are clean and free from dirt and any previous sealing compounds.
8. Apply 'Hylomar' sealant to the intake manifold face before refitting the ram housing.
9. Fit the ram housing and retighten the bolts, working from the two centre bolts, diagonally towards the outer four bolts.
10. Tighten to the correct torque 20-27 Nm (15-20 ft.lb)

Mpi ENGINE TUNE & FAULT DIAGNOSIS

The Mpi Modular Engine Management System (MEMS) controls the fuel injection and programmed ignition systems.

A Electronic Control Unit (ECU) controls programmed ignition and fuel injection. The ECU incorporates short circuit protection and can store intermittent faults on certain inputs. Diagnostic equipment designed for use on MEMS can interrogate the ECU for these stored faults.

The ECU uses the speed/density method of air flow measurement to calculate fuel delivery. This method measures the inlet air temperature and inlet manifold pressure and assumes that the engine is a calibrated vacuum pump with its characteristics stored in the ECU

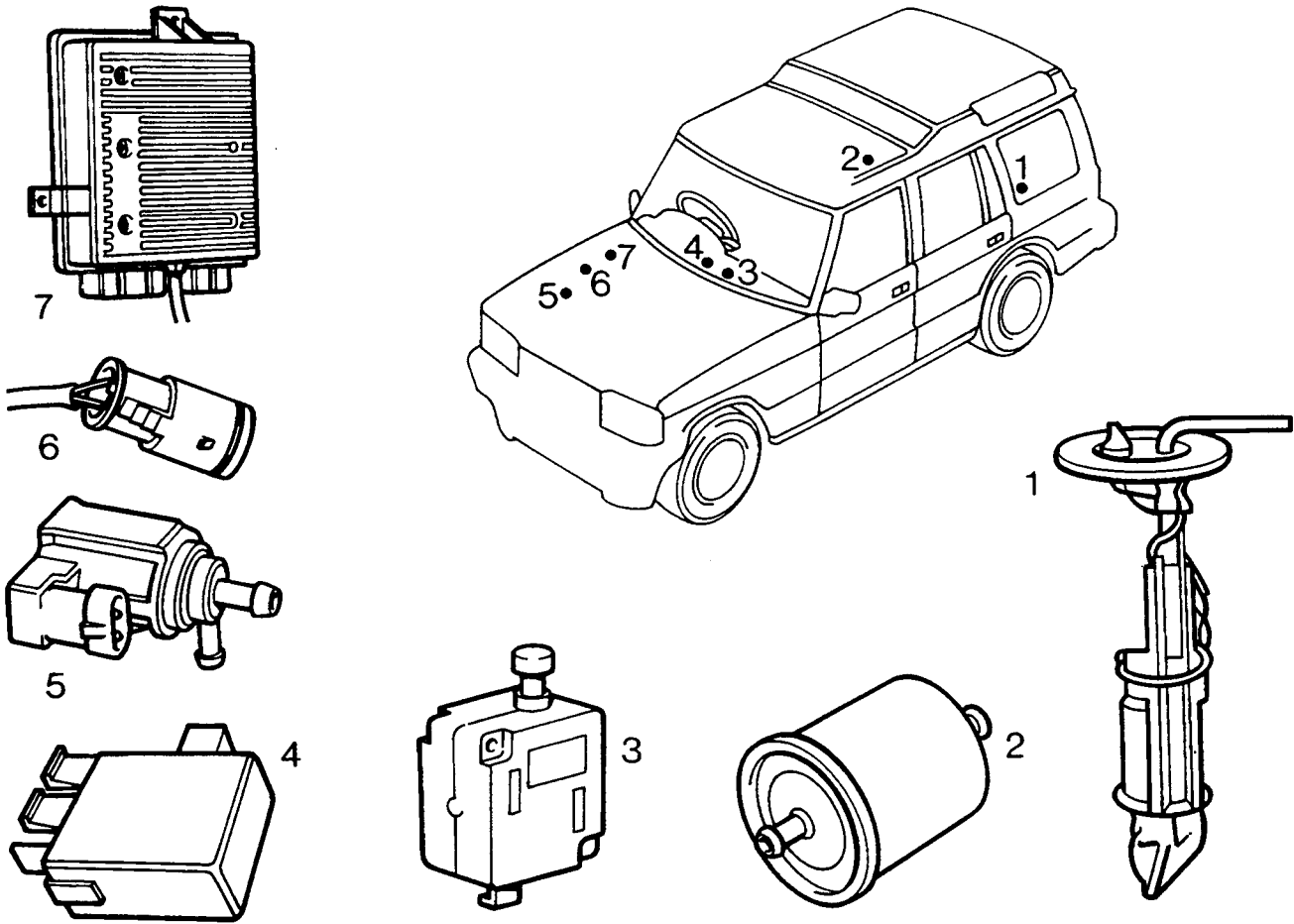
If certain system inputs fail, the ECU implements a back-up facility to enable the system to continue functioning, although at a reduced level of performance.

Diagnostic Equipment

A diagnostic connector located on right inner wing allows engine tuning and fault diagnosis to be carried out using the recommended equipment.

wj19trr

MEMS COMPONENTS & LOCATION ON VEHICLE

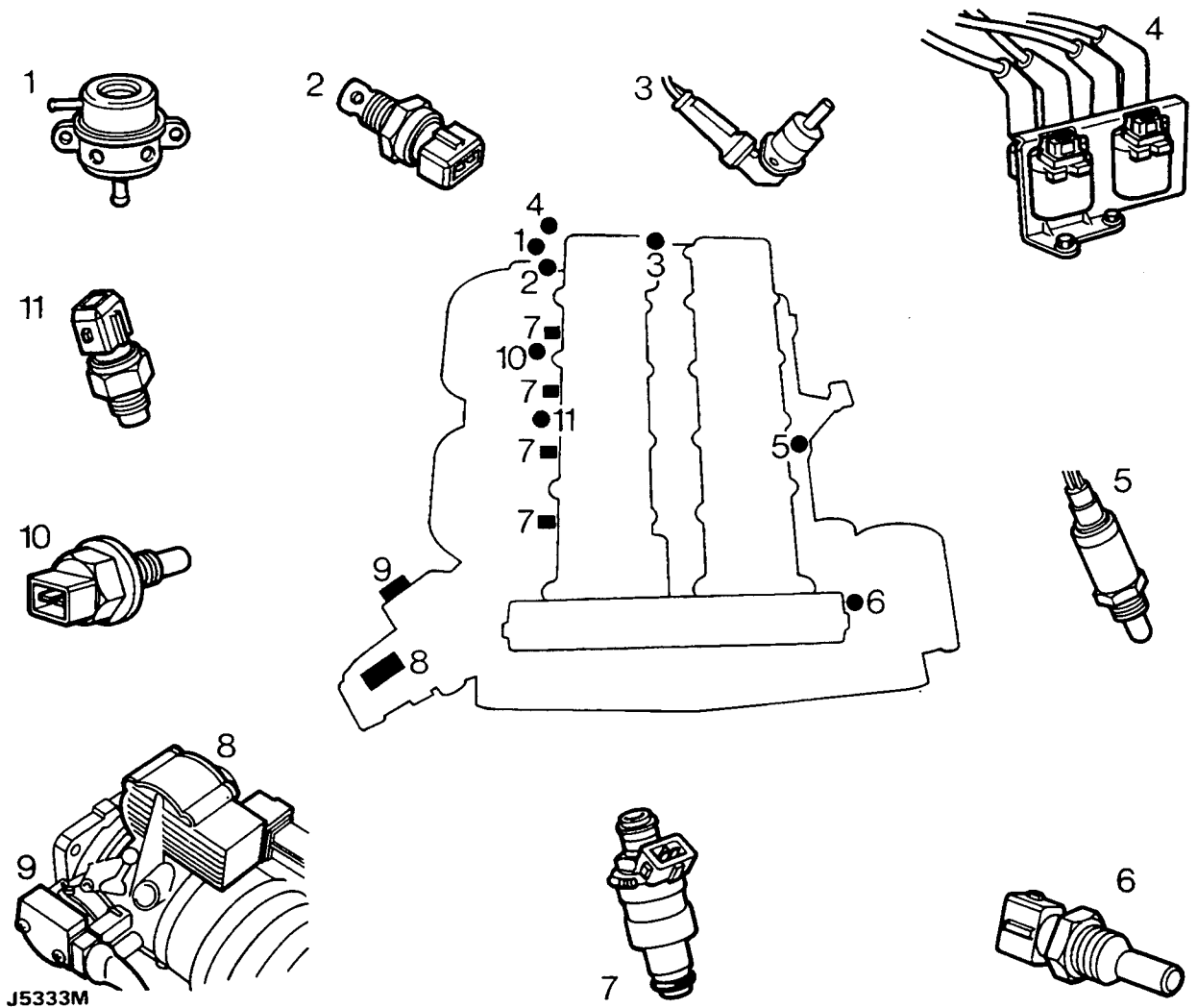


J5332M

Components	Location
1 Fuel pump	Fuel tank
2 Fuel filter	Right chassis rear
3 Fuel inertia switch	Under dash panel
4 Relay module	Under dash panel
5 Purge control valve	On charcoal can (If fitted)
6 Diagnostic connector	Right inner wing
7 MEMS ECU.	Right inner wing

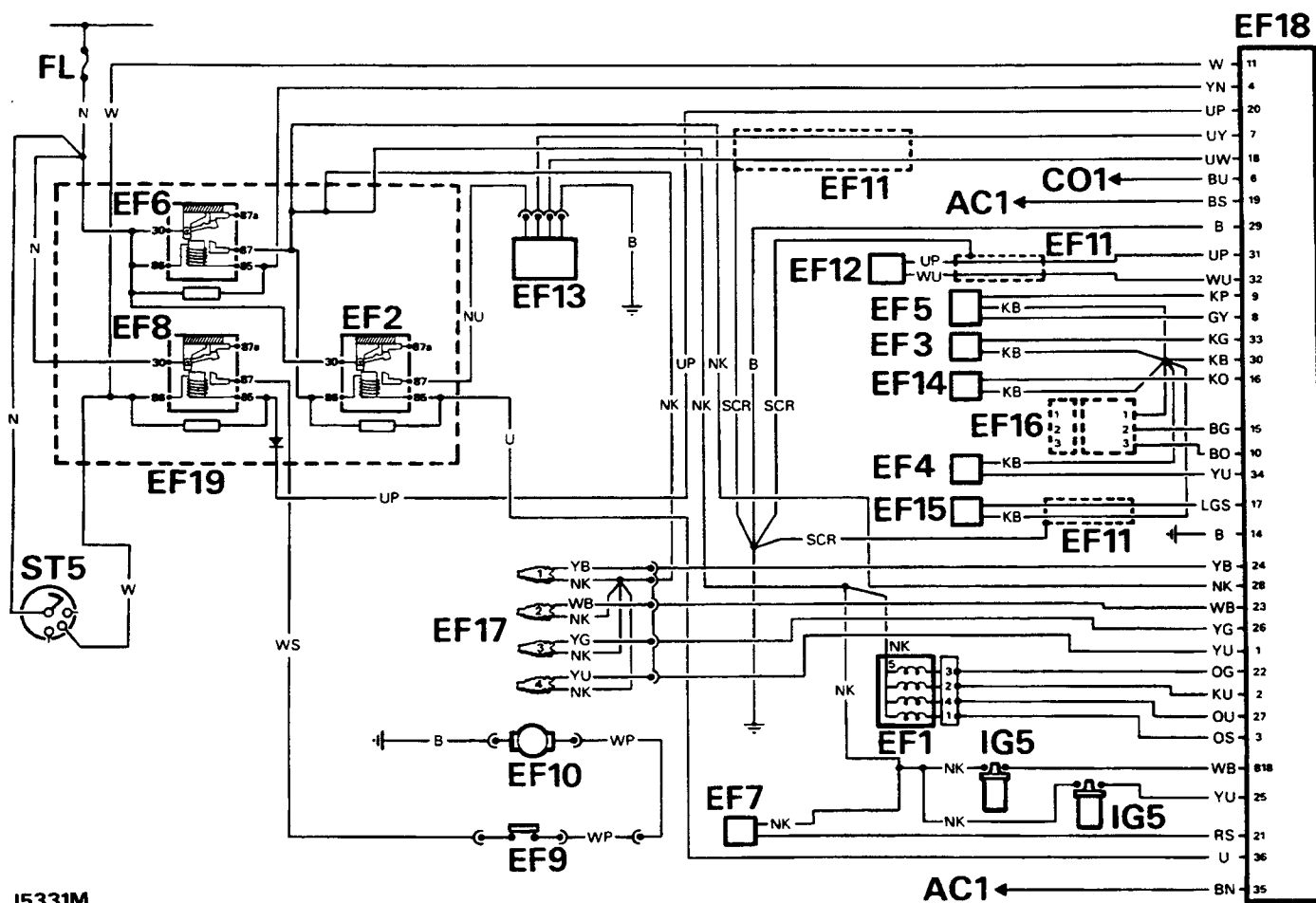
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MEMS COMPONENTS & LOCATION ON ENGINE



J5333M

Components	Location
1 Fuel pressure regulator	Engine rear
2 Intake air temperature sensor	Inlet manifold
3 Crankshaft sensor	Under starter motor on flywheel housing
4 Twin ignition coils	Engine rear
5 Oxygen sensor	Exhaust manifold
6 Coolant temperature sensor	Coolant chamber
7 Injectors	
8 Stepper motor	
9 Throttle potentiometer	
10 Fuel temperature sensor	Fuel rail
11 Knock sensor	Engine block



J5331M

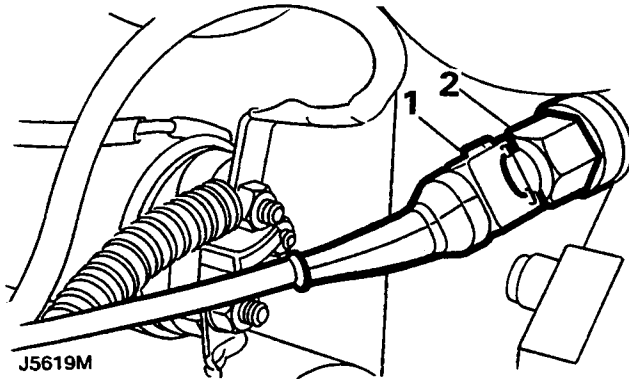
MEMS CIRCUIT DIAGRAM - Mpi

For component location: see MEMS components & location

- EF1 Stepper motor
- EF2 Oxygen sensor heater relay
- EF3 Coolant temperature sensor
- EF4 Fuel temperature sensor
- EF5 Throttle potentiometer
- EF6 Main relay
- EF7 Purge valve
- EF8 Fuel pump relay
- EF9 Inertia switch
- EF10 Fuel pump
- EF11 Screened
- EF12 Crankshaft sensor
- EF13 Oxygen sensor
- EF14 Inlet air temperature sensor
- EF15 Knock sensor
- EF16 Diagnostic connector
- EF17 Injector
- EF18 MEMS electronic control unit (ECU)
- EF19 Relay module
- IG5 Ignition coil
- ST5 Ignition switch
- FL Fusible link
- AC1 Air conditioning connection
- CO1 Cooling fan relay

KNOCK SENSOR**Remove**

1. Disconnect multiplug from knock sensor.
2. Remove knock sensor.

**Refit**

1. Clean mating face of cylinder block.
2. Fit knock sensor and tighten to the correct torque.
3. Connect multiplug.

IGNITION COILS**Remove**

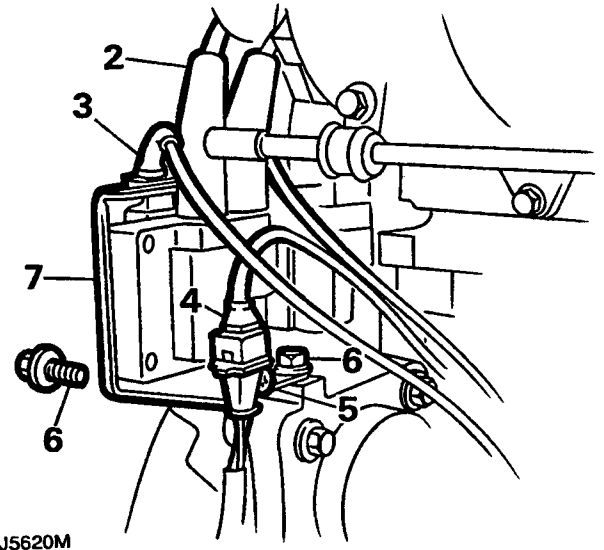
1. Disconnect the battery negative lead.
2. Disconnect 4 h.t. leads from coils.

NOTE: Mark the position of the h.t. leads to ensure correct refitment.

3. Disconnect 2 multiplugs from coils.
4. Disconnect crankshaft sensor multiplug.
5. Remove screw securing crankshaft sensor multiplug to coil bracket.
6. Remove 3 bolts securing coil bracket to bell housing.

NOTE: Access to the rear bolts is from under the vehicle.

7. Remove coil assembly.

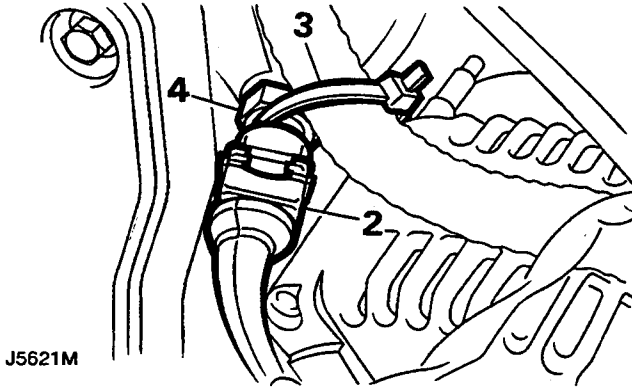
**Refit**

1. Position coil assembly to bell housing.
2. Fit 3 bolts and tighten to the correct torque.
3. Secure crankshaft sensor multiplug to coil bracket with screw.
4. Connect crankshaft sensor multiplug.
5. Connect multiplugs and h.t. leads to coils.
6. Connect battery earth lead.

COOLANT TEMPERATURE SENSOR

Remove

1. Position drain tin below coolant pump hose.
2. Disconnect sensor multiplug.
3. Release harness clip and harness.
4. Remove sensor.



J5621M

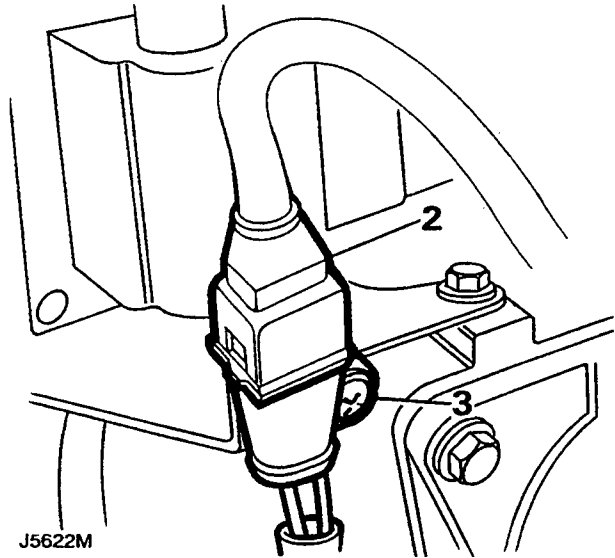
Refit

1. Clean sensor.
2. Fit sensor and tighten to the correct torque.
3. Position harness and secure with clip.
4. Connect multiplug.
5. Top-up cooling system.

CRANKSHAFT SENSOR

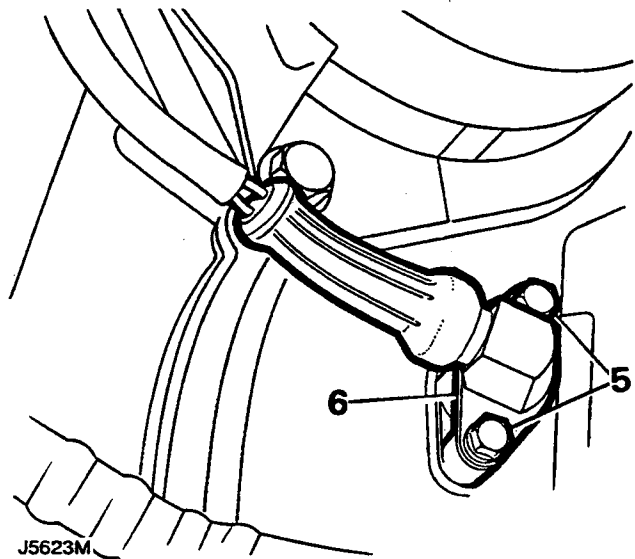
Remove

1. Position vehicle on '4' post ramp.
2. Disconnect multiplug from crankshaft sensor flylead.
3. Remove screw, release lead from bracket.



J5622M

4. Raise ramp.
5. Remove 2 bolts securing crankshaft sensor.
6. Remove crankshaft sensor.



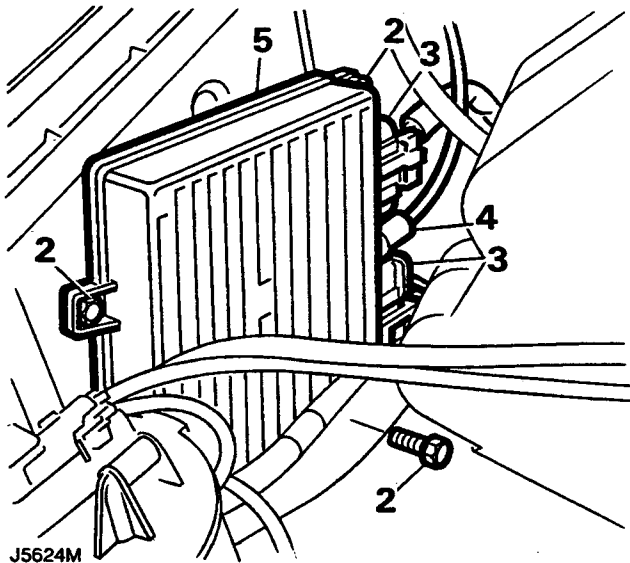
J5623M

Refit

1. Clean crankshaft sensor and mating surface of backplate.
2. Fit crankshaft sensor, fit bolts and tighten to the correct torque.
3. Lower vehicle.
4. Position lead to bracket, fit and tighten screw.
5. Connect multiplug

MEMS ELECTRONIC CONTROL UNIT (ECU)**Remove**

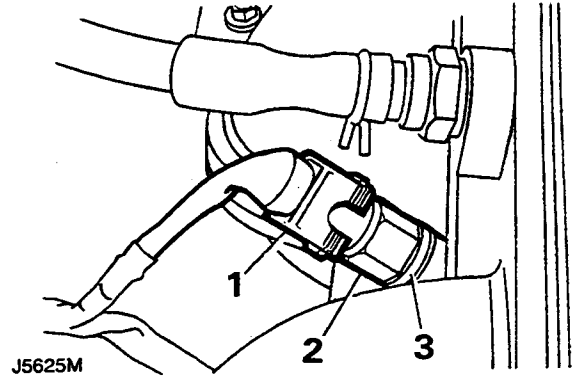
1. Remove washer reservoir.
2. Remove 3 bolts securing E.C.U.
3. Disconnect 2 multiplugs from E.C.U.
4. Disconnect vacuum hose from E.C.U.
5. Remove E.C.U.
6. Collect E.C.U. spacers (LHD only)

**Refit**

1. Position E.C.U. and spacers to wing.
2. Connect vacuum hose to E.C.U.
3. Connect multiplugs to E.C.U.
4. Position E.C.U. to mounting.
5. Fit bolts and tighten to the correct torque.
6. Fit washer reservoir.

FUEL TEMPERATURE SENSOR**Remove**

1. Disconnect fuel temperature sensor multiplug.
2. Remove fuel temperature sensor.
3. Discard sealing washer.

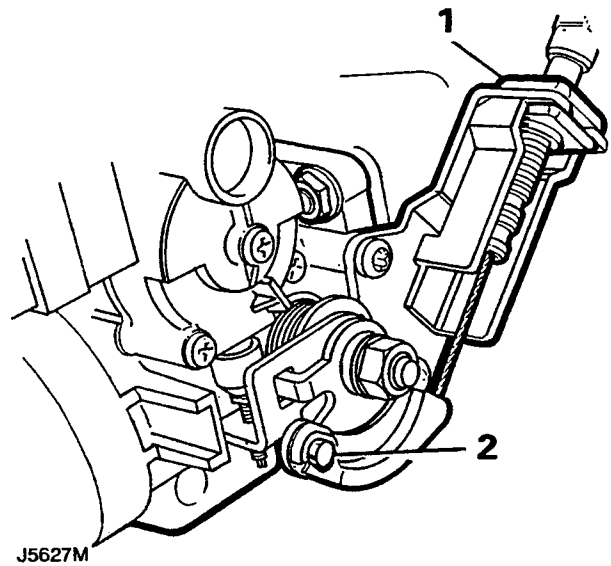
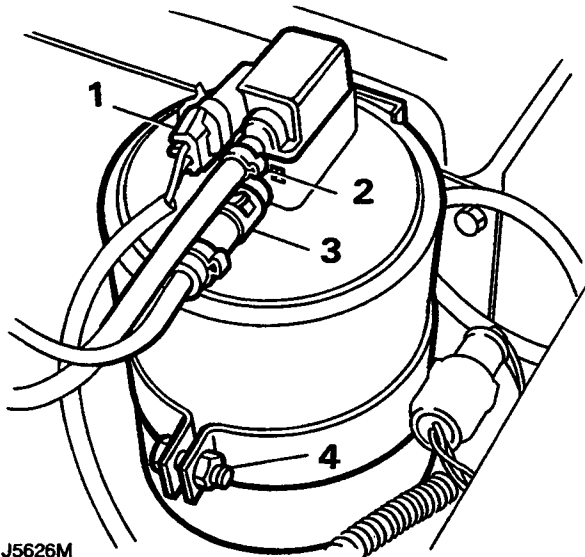
**Refit**

1. Clean mating face of fuel rail.
2. Fit a new sealing washer to sensor.
3. Fit temperature sensor and tighten to the correct torque.
4. Connect fuel temperature sensor multiplug.

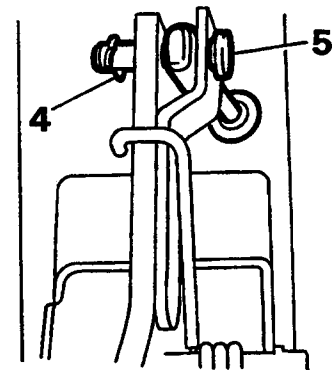
CHARCOAL CANISTER

Remove

1. Disconnect multiplug from purge valve.
2. Release clip and disconnect hose from purge valve.
3. Release clip and disconnect fuel tank hose from charcoal canister.
4. Unscrew bolt to release securing strap and remove charcoal canister.



3. Remove footwell closing panel.
4. Release split pin from throttle pedal clevis pin.
5. Remove clevis pin and release cable from throttle pedal.



Refit

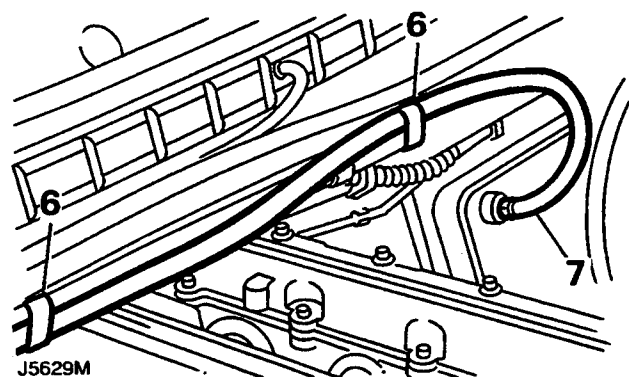
1. Fit charcoal canister and secure strap.
2. Connect fuel tank hose to charcoal canister and secure clip.
3. Connect hose to purge valve and secure clip.
4. Connect multiplug to purge valve.

6. Release cable from bulkhead clips.
7. Withdraw cable.

THROTTLE CABLE

Remove

1. Release cable from abutment bracket.
2. Release cable from cam.



Refit

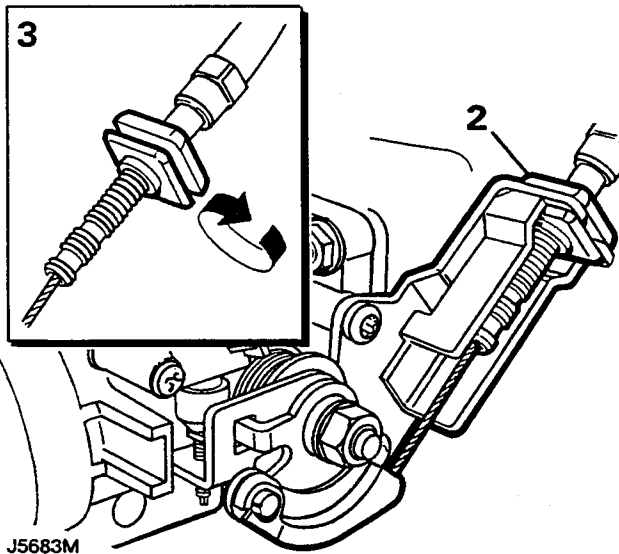
1. Locate cable in bulkhead.
2. Connect cable to throttle pedal.
3. Connect cable to cam.
4. Adjust throttle cable.

THROTTLE CABLE ADJUSTMENT**NOTE: Before adjusting cable:**

Use diagnostic equipment to ensure that throttle potentiometer and stepper motor are synchronised.

Ensure that cable is correctly routed and located.

1. Switch ignition on, wait 5 seconds and switch ignition off to ensure motor is in setting position.
2. Release cable adjusting nut from abutment bracket.
3. Unscrew cable adjusting nut until it is clear of abutment bracket and locate throttle outer cable in abutment bracket.

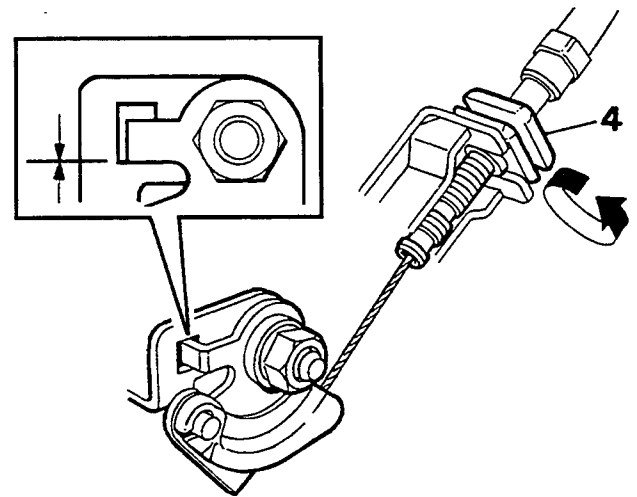


J5683M

4. Hold cam in "throttle closed" position and rotate cable adjusting nut until all slack is taken out of inner cable and lost motion gap is taken up without opening throttle, see inset.

CAUTION: Ensure all free play is removed from outer cable.

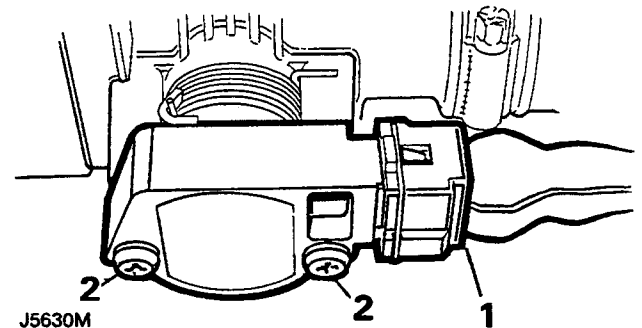
5. Locate groove in cable adjusting nut in abutment bracket.
6. Operate throttle pedal and ensure that throttle will open to its stop.



J5684M

THROTTLE POTENTIOMETER**Remove**

1. Disconnect throttle potentiometer multiplug.
2. Remove 2 screws securing throttle potentiometer, remove potentiometer.



J5630M

Refit

1. Clean mating faces of throttle potentiometer and throttle housing.
2. Fit throttle potentiometer, fit and tighten screws.

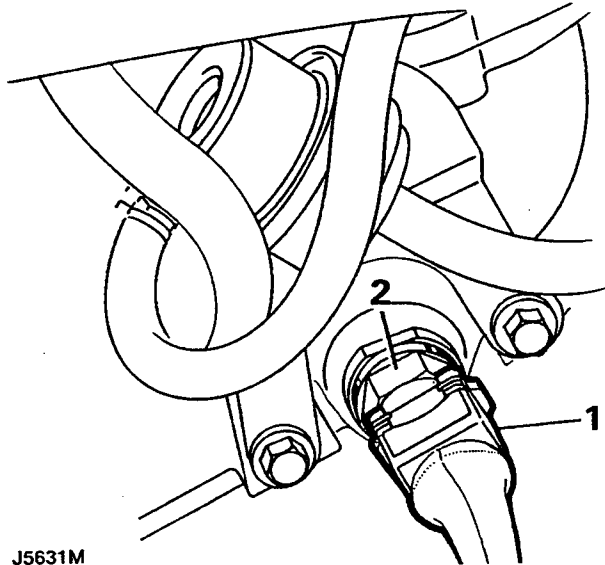
CAUTION: Ensure throttle potentiometer is correctly engaged with throttle cam and that wiring outlet faces downwards.

3. Connect multiplug.
4. Check with diagnostic equipment.

INTAKE AIR TEMPERATURE SENSOR

Remove

1. Disconnect multiplug from temperature sensor.
2. Remove sensor from inlet manifold.



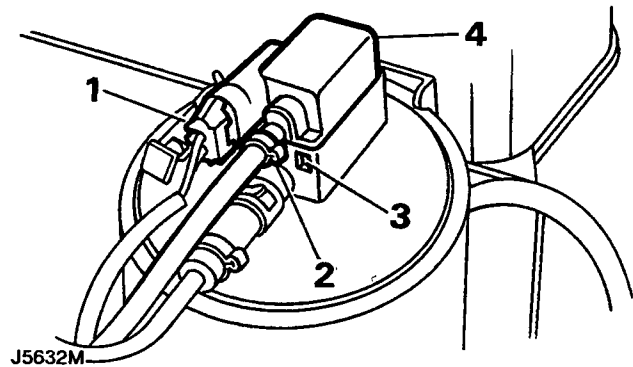
Refit

1. Clean sensor threads and mating face.
2. Fit sensor to inlet manifold and tighten to the correct torque.
3. Connect multiplug to sensor.

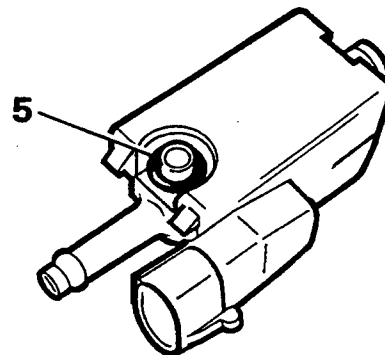
PURGE CONTROL VALVE

Remove

1. Disconnect multiplug from purge control valve.
2. Release clip and disconnect hose from valve.
3. Release valve from charcoal canister.
4. Remove valve.



5. Discard 'O' ring.

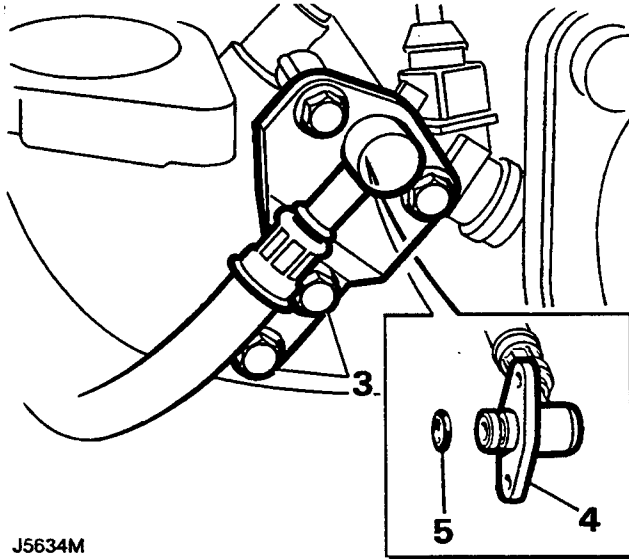


Refit

1. Clean valve and valve location.
2. Position and secure valve to charcoal canister.
3. Connect hose to purge valve and secure with clip.
4. Connect multiplug to valve.

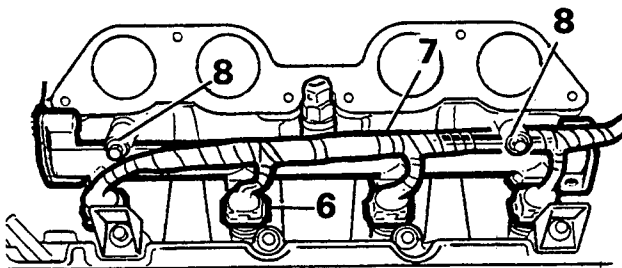
FUEL RAIL AND INJECTORS**Remove**

1. Remove inlet manifold chamber gasket see manifolds and exhaust section 30.
2. Remove pressure regulator.
3. Remove 4 bolts securing fuel feed hose flange stiffening bracket, remove stiffening bracket.
4. Release fuel feed hose from fuel rail.
5. Discard 'O' ring.



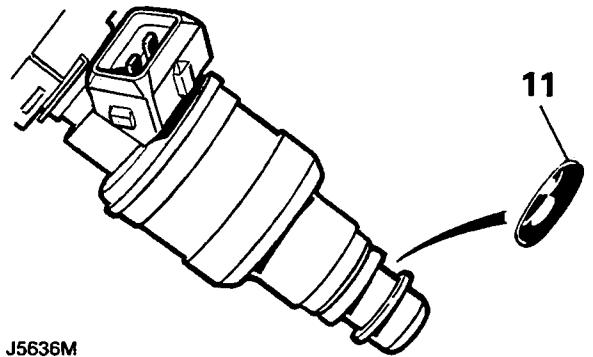
J5634M

6. Disconnect 4 injector multiplugs.
7. Move injector harness aside.
8. Remove 2 bolts securing fuel rail to inlet manifold.
9. Release 4 injectors from inlet manifold.
10. Remove fuel rail complete with injectors.



J5635M

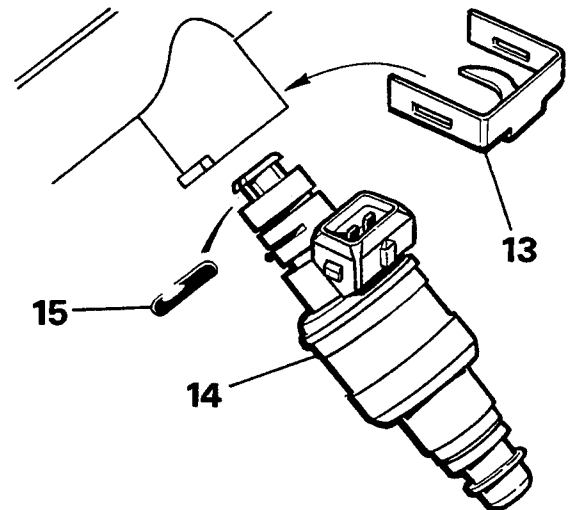
11. Discard outlet 'O' rings from injectors.
12. Fix protective cap to each injector.



J5636M

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

13. Remove clip(s) securing injector(s) to fuel rail.
14. Remove injector(s).
15. Discard inlet 'O' ring(s).

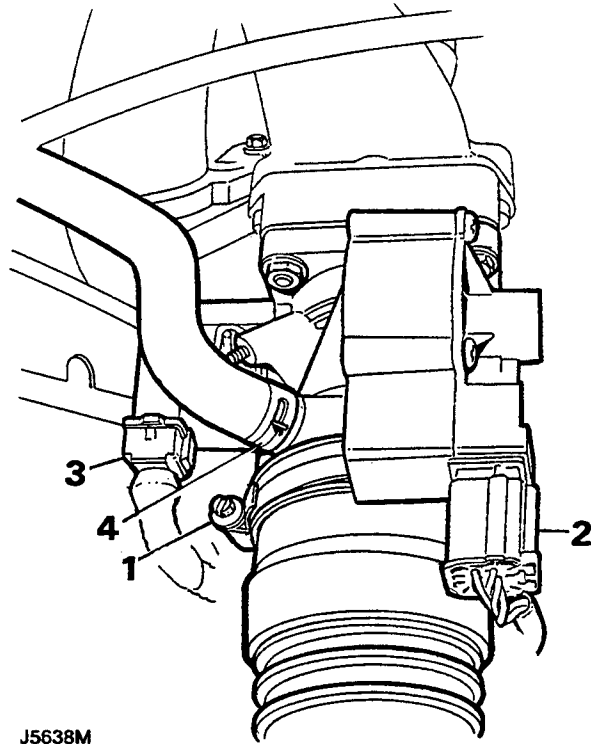


J5637M

16. Remove fuel temperature sensor.

Refit

1. Clean fuel rail, temperature sensor and pressure regulator mating surfaces.
2. Fit fuel temperature sensor and tighten to the correct torque.
3. Clean injectors and injector recesses in fuel rail and inlet manifold.
4. Fit new 'O' ring(s) to inlet end of injector(s).
5. Fit injector(s) to fuel rail, fit and secure clip(s).
6. Fit new 'O' rings to outlet ends of injectors.
7. Align injectors to inlet manifold and push fuel rail into position.
8. Fit fuel rail securing bolts and tighten to the correct torque.
9. Connect injector multiplugs.
10. Remove plugs from fuel feed hose and fuel rail.
11. Fit new 'O' ring to fuel feed hose.
12. Connect fuel feed hose to fuel rail.
13. Fit stiffening bracket.
14. Tighten stiffening bracket and feed hose bolts to the correct torque.
15. Fit pressure regulator.
16. Fit inlet manifold chamber.



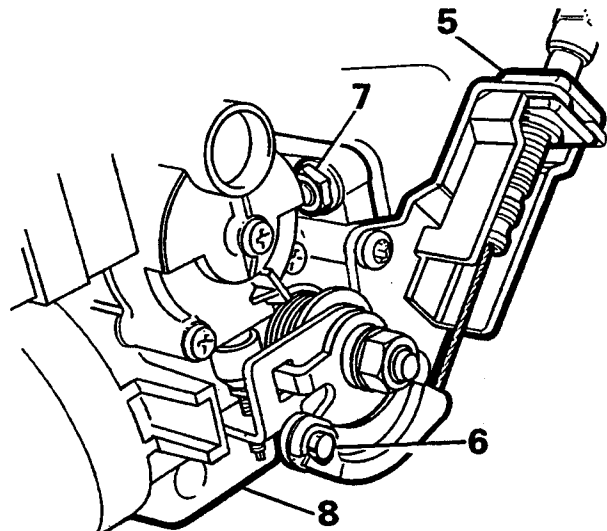
J5638M

THROTTLE HOUSING

Remove

1. Slacken clip, disconnect hose from throttle housing.
2. Disconnect multiplug from stepper motor.
3. Disconnect multiplug from throttle potentiometer.
4. Disconnect breather hose from throttle housing.

5. Release throttle cable from abutment bracket.
6. Release throttle cable from cam.
7. Remove 4 nuts securing throttle housing to flexible mounting.
8. Release throttle housing from studs.



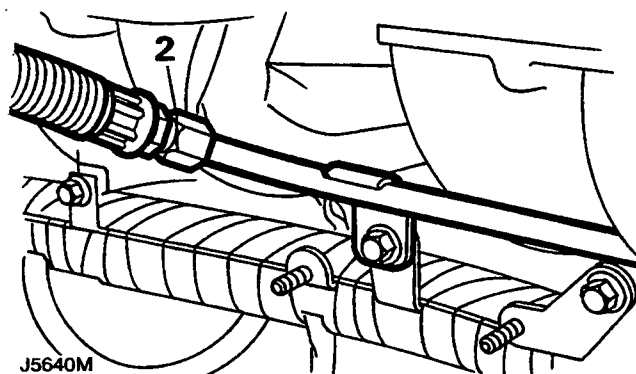
J5639M

Refit

1. Examine flexible mounting for splits or damage; renew as necessary.
2. Thoroughly clean throttle housing and mating face of flexible mounting.
3. Connect breather hose to throttle housing.
4. Position throttle housing to mounting studs, fit nuts and tighten to the correct torque.
5. Connect throttle cable to cam.
6. Adjust throttle cable.
7. Connect multiplug to stepper motor.
8. Connect multiplug to throttle potentiometer.
9. Connect hose to throttle housing, tighten clip.

FUEL PRESSURE REGULATOR**Remove**

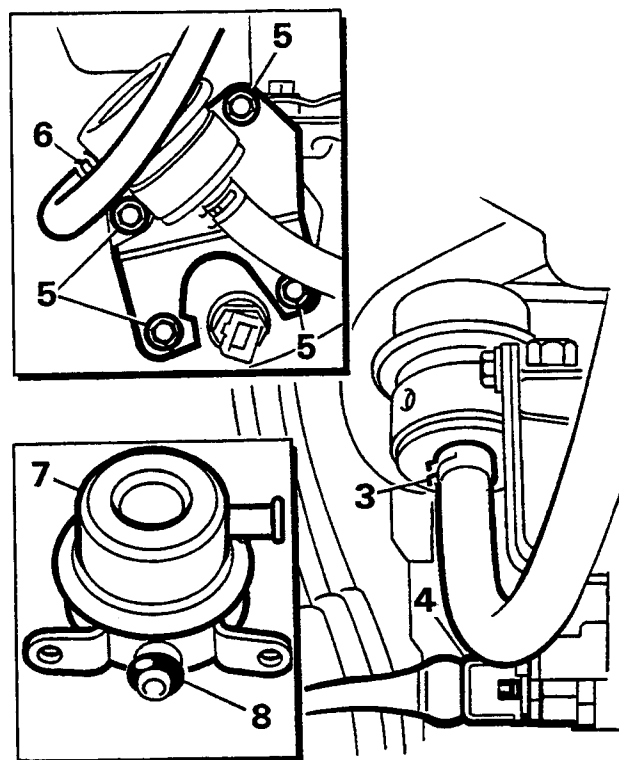
1. Disconnect the battery negative lead.
2. Position absorbant cloth around fuel pipe to fuel rail union. Slacken bolt to relieve pressure. Re-tighten bolt.



3. Release clip and disconnect fuel hose from pressure regulator.

CAUTION: Plug the connectors.

4. Disconnect intake air temperature sensor multiplug.
5. Remove 4 bolts securing pressure regulator steady bracket to fuel rail and manifold, remove steady bracket.
6. Disconnect vacuum hose from pressure regulator.
7. Manoeuvre pressure regulator from fuel rail.
8. Discard 'O' ring.



J5641M

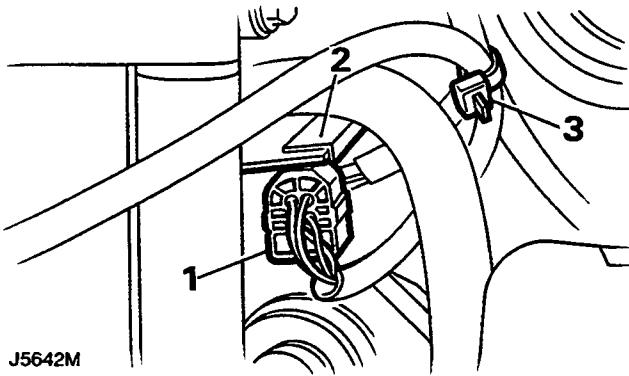
Refit

1. Clean pressure regulator and mating surfaces.
2. Fit new 'O' ring to pressure regulator.
3. Fit vacuum hose to pressure regulator.
4. Position pressure regulator.
5. Fit steady bracket.
6. Fit bolts and tighten them to the correct torque.
7. Connect multiplug to air temperature sensor.
8. Remove plugs, fit fuel hose to regulator and secure with clip.
9. Connect battery earth lead.

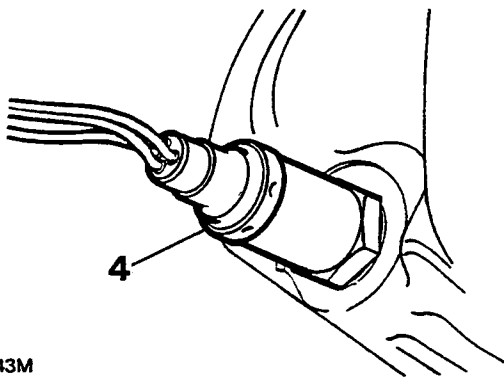
OXYGEN SENSOR

Remove

1. Disconnect oxygen sensor multiplug.
2. Release multiplug from bracket.
3. Release harness lead from cable tie.



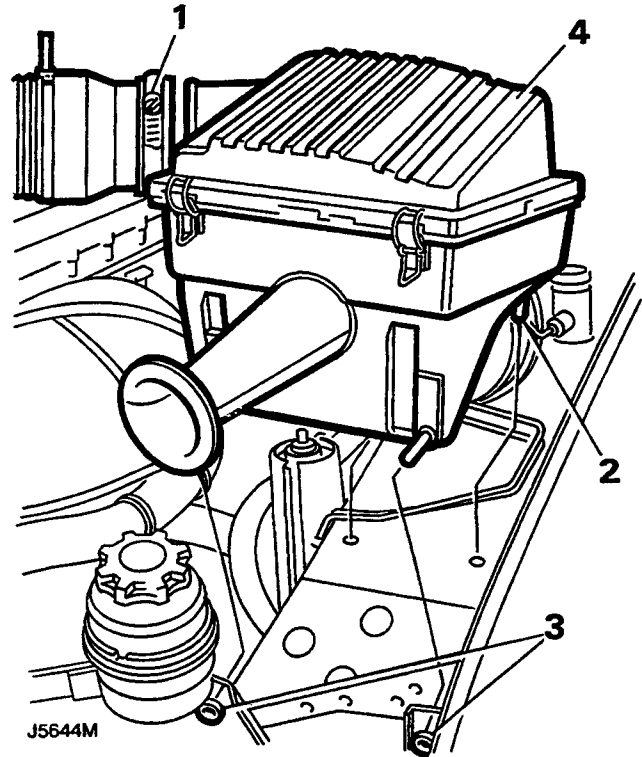
4. Remove oxygen sensor; recover sealing washer.



AIR CLEANER

Remove

1. Release clip and remove intake hose from air cleaner.
2. Ease air cleaner assembly bottom mounting rubbers from body.
3. Ease air cleaner from inner wing mounting rubbers.
4. Remove air cleaner.



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

5. Release 4 clips securing top cover.
6. Raise top cover.
7. Remove air cleaner element.

Refit

1. Fit sealing washer to oxygen sensor.
2. Fit oxygen sensor and tighten to the correct torque.
3. Secure multiplug to bracket, connect multiplug.
4. Secure harness lead with cable tie.

Refit

1. Clean assembly body and top cover.
2. Fit air cleaner element.
3. Position top cover and secure with clips.
4. Position air cleaner assembly to body ensuring front spigots locate securely in wing mounting rubbers and bottom mounting rubbers are located in the body.
5. Fit intake hose and secure with clip.

