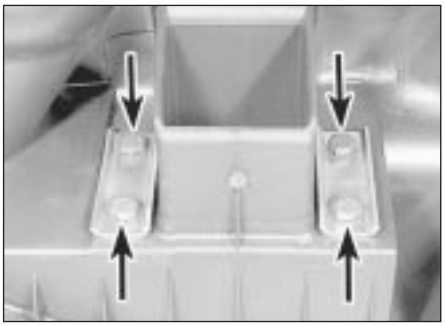


12.14 Airflow meter securing bolts (arrowed)

12.36a Removing the control relay and bracket

12.36b Unplugging the control relay

18 Remove the footwell trim panel.
19 Make sure that the ignition is switched off, then release the multi-plug spring clip and disconnect the multi-plug.
20 Remove the three securing screws and withdraw the control unit.
21 Refit in the reverse order to removal, but make sure that the ignition is switched off before reconnecting the multi-plug.

Later (1990 on) models

22 Remove the airflow meter as described earlier.
23 Remove the four screws which secure the cover to the top of the airflow meter (these may be hidden by blanking plugs). Remove the cover and insert, then the control unit.
24 Refitting is the reverse of removal.

Coolant temperature sensor

25 The coolant temperature sensor for the fuel injection system is located near the alternator. Because it is additional to the temperature gauge sensor, it is known as temperature sensor ll.
26 Partially drain the cooling system - about 3 litres should be sufficient.
27 Disconnect the electrical lead and unscrew the sensor.
28 Refit in the reverse order to removal. Use a little sealant on the sensor threads, and refill the cooling system on completion.

12.38 Fuel pressure regulator

Auxiliary air valve

29 The auxiliary air valve is bolted to the side of the camshaft housing.
30 Disconnect the wiring plug from the valve.
31 Release the hose clips and disconnect the air hoses from the valve.
32 Unbolt and remove the valve.
33 The function of the valve may be checked by looking through the hose connecting stubs. A clear passage should exist between the stubs when the valve is cold. As the valve is heated (achieved by connecting its terminals to a 12 volt battery) the regulator disc should move round and block the hole.
34 Refit in the reverse order to removal, using new hose clips if necessary. An air leak on the intake side of the valve will raise the idle speed.

Control relay

35 The control relay is located on the front suspension strut turret. Unplugging the relay disables the fuel pump - this is necessary when performing a compression test.
36 Slacken the securing bolt, remove the relay and its bracket from the turret, and withdraw the relay from the plug **(see illustrations)**.
37 Refit in the reverse order to removal.

Fuel pressure regulator

38 The fuel pressure regulator is located between injectors 3 and 4 **(see illustration)**.
39 Disconnect the battery earth lead and take appropriate fire precautions.
40 Clamp the fuel hoses to minimise fuel loss, using self-locking grips with suitably protected jaws.
41 Disconnect the fuel and vacuum hoses form the pressure regulator and remove it. Be prepared for fuel spillage.
42 Refit in the reverse order to removal.

2.0 litre models

43 Refer to the information given earlier for the 1.8 litre models, information for additional components is as follows

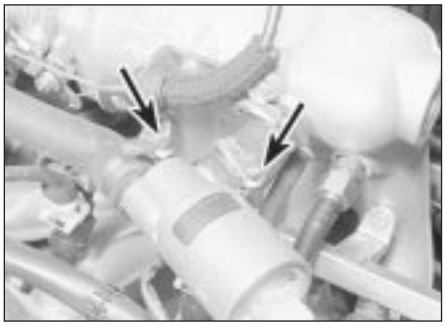
Idle speed adjuster

44 Note the routing and positioning of the air hoses, then disconnect the multi-plug and the air hoses from the idle speed adjuster **(see illustrations)**. On the 16-valve engine the adjuster is located below the inlet manifold; access is not good but is easier from below.
45 Refitting is the reverse of the removal procedure.

Control unit

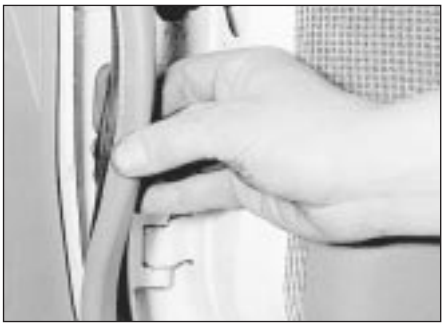
46 The control unit is located behind the side trim panel in the driver's footwell. To remove the trim panel, first remove the front two screws from the driver's 'kick plate' and peel back the door surround strip in the area next to the side trim panel **(see illustrations)**.

12.44a Disconnect the idle speed adjuster multi-plug . . .



12.44b . . . and the air hoses (arrowed)

12.46a Remove the kick plate screws . . .



12.46b . . . and peel back the door surround strip

12.47 Prise out the clips to release the trim panel

12.48 Motronic control unit location

47 Open the access panel in the side trim. Prise out the plastic retaining clips and withdraw the side trim panel **(see illustration)**.
48 Remove the retaining screws to release the control unit **(see illustration)**. Release the multi-plug catch and disconnect the multi-plug. Handle the control unit with care if it is to be re-used.
49 Refitting is the reverse of the removal procedure.

Inductive pulse sensor

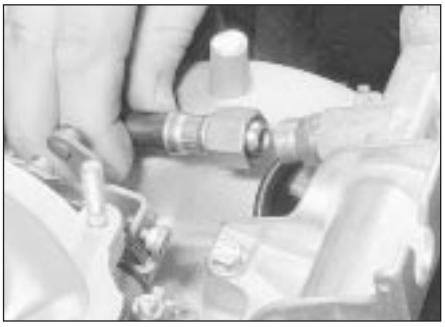
50 Refer to Chapter 5.

Fuel injectors - Motronic ML4.1 and M1.5

51 Remove the idle speed adjuster.
52 Disconnect the wiring plugs from the fuel injectors.
53 Unbolt the fuel rail from the inlet manifold, bearing in mind the information in Section 6.
54 Remove the clips which secure the injectors to the fuel rail by prising them out.
55 Disconnect the brake servo hose from the throttle body housing.
56 Unbolt the fuel supply hose bracket.
57 Carefully lift the fuel rail away from the manifold and pull out the injectors.
58 Refitting is the reverse of the removal procedure. If the old injectors are being refitted, use new sealing rings.

Fuel injectors - Motronic M2.5

59 Remove the pre-volume chamber as described earlier.
60 Bearing in mind the information in Section 6, clean around the unions on the fuel rail, then disconnect the supply and return hoses from it **(see illustration)**. Be prepared for fuel spillage.
61 Disconnect the two crankcase ventilation hoses from the camshaft cover. To improve access, remove the larger of the two hoses completely.
62 Disconnect the vacuum hose from the fuel pressure regulator.
63 Disconnect the multi-plugs from the air mass meter and from the throttle valve switch.
64 Unbolt the throttle cable bracket and move it aside.
65 Remove the nuts securing the earth straps at each end of the fuel rail **(see illustration)**.
66 The injector multi-plugs must now be disconnected. Each plug is secured by a spring clip, which must be levered out with a small screwdriver or long-nosed pliers. With all the multi-plugs released, cut or undo cable ties as necessary and move the wiring rail forwards so that it rests on the camshaft cover **(see illustrations)**.
67 Remove the two bolts which secure the fuel rail to the inlet manifold.
68 Pull the rail and injectors away from the manifold.
69 Individual injectors may now be removed from the rail by removing their retaining clips and pulling them from the rail **(see illustrations)**.



12.60 Disconnecting the fuel supply line from the fuel rail

12.65 One of the earth straps on the fuel rail

12.66a Removing the spring clip from an injector multi-plug

12.66b Lifting the wiring rail off the injectors

12.69a Remove the retaining clip

12.69b . . . and pull out the injector

12.73 Disconnecting the fuel return line from the fuel pressure regulator

12.74 Disconnecting the vacuum hose

12.77 Removing a pre-volume chamber screw

70 Refitting is the reverse of the removal procedure. If the old injectors are being refitted, use new sealing rings.

Throttle valve potentiometer - Motronic M1.5

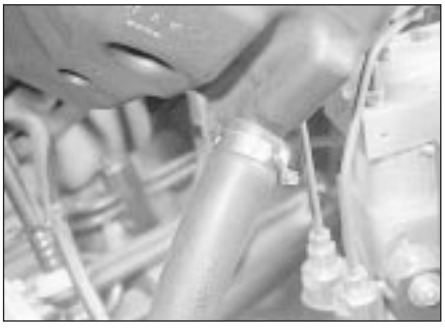
71 The throttle valve potentiometer is removed and refitted in the same way as the throttle valve switch (which it replaces) on earlier models. There is no need for adjustment.

Fuel pressure regulator - Motronic M1.5 and 2.5

72 On Motronic M2.5 systems, remove the pre-volume chamber.

73 Bearing in mind the information in Section 6, disconnect the fuel return union from the pressure regulator **(see illustration)**. Be prepared for fuel spillage.

74 Disconnect the vacuum hose from the regulator **(see illustration)**.



12.79 Idle speed adjuster hose attachment to pre-volume chamber

75 Remove the four Torx screws which secure the pressure regulator to the fuel rail. A small E6 Torx spanner will be needed for access to the screws. If this is not available the fuel rail will have to be removed so that the screws can be undone with a socket or (at a pinch) self-locking pliers. With the screws removed, the pressure regulator can be removed from the rail.

76 Refitting is the reverse the removal.

Pre-volume chamber - Motronic M2.5

77 Remove the four Allen screws which secure the pre-volume chamber to the throttle housing **(see illustration)**. On some models there is a fifth screw to the left which must also be removed.

78 Release the hose clip which secures the air mass meter to the pre-volume chamber.

79 Lift the pre-volume chamber slightly and disconnect the idle speed adjuster hose from the left-hand end **(see illustration)**. Remove the pre-volume chamber.

80 Refitting is the reverse of the removal procedure, but note that it is important that the ring which seals the throttle body to the pre-volume chamber is not displaced during fitting. Air leaks at this point will weaken the mixture and dirt may enter. Secure the ring to the chamber if necessary with a few dabs of sealant **(see illustration)**.

Throttle valve switch - Motronic M 2.5

81 Remove the pre-volume chamber and the air mass meter.

82 Disconnect the multi-plug from the switch **(see illustration)**. Remove the two screws and withdraw the switch.

83 Refitting is the reverse of the removal procedure. Adjust the switch before tightening the screws as described in paragraph 4 of this Section.

Air mass meter - Motronic M2.5

84 Disconnect the multi-plug from the air mass meter **(see illustration)**.

85 Release the hose clips from each end of the meter and remove it. Do not drop it, it is fragile.

86 Refitting is the reverse of the removal procedure.

Coolant temperature sensor - Motronic M2.5

87 Partially drain the cooling system at the radiator bottom hose to bring the coolant level below the level of the thermostat housing.

88 Disconnect the multi-plug from the sensor on the thermostat housing. The Motronic sensor is the larger of the two the smaller one feeds the temperature gauge. Unscrew the sensor and remove it.

89 Refitting is the reverse of the removal procedure, noting the following points:

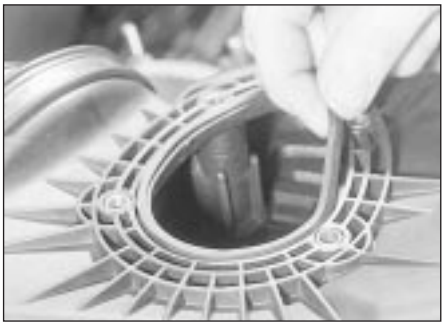
a) Use a new sealing ring on the sensor, and apply a little sealant to its threads.

b) Refill the cooling system as described in Chapter 1.

Knock sensor - Motronic M2.5

90 The knock sensor is on the rear of the cylinder block. Unless the inlet manifold has been removed, access is easiest from below.

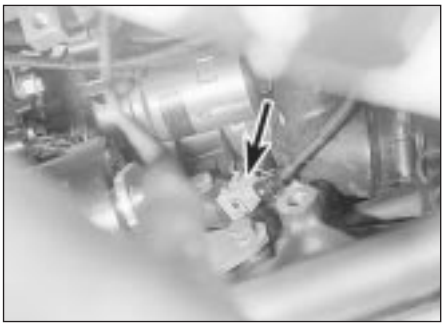
91 Disconnect the multi-plug (coloured red or orange) from the knock sensor. Remove the securing screw and the sensor **(see illustration)**.



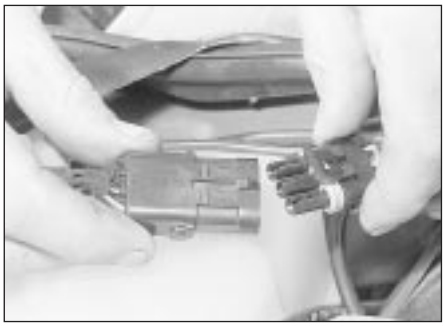
12.80 Pre-volume chamber sealing ring

12.82 Disconnecting the throttle valve switch multi-plug

12.84 Disconnecting the multi-plug from the air mass meter

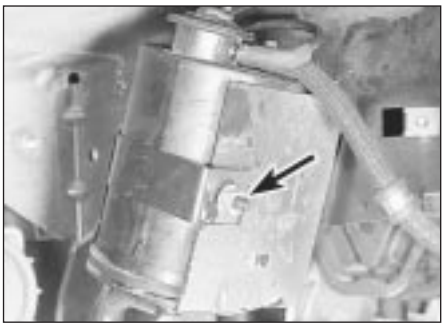


12.91 Knock sensor multi-plug (arrowed) seen from below



12.94 Disconnecting the oxygen sensor multi-plug

12.95 Removing the oxygen sensor



12.98a Canister clamp nut (arrowed)

12.98b Disconnecting a hose from the canister

12.100 Disconnecting the vent valve multi-plug

92 Refitting is the reverse of the removal procedure, but make sure that the sensor and its seat are perfectly clean and that the sensor is secured firmly. Failure to observe these points could lead to damage to the engine, because a poorly mounted sensor will not pick up knocking (pinking) and the appropriate ignition correction will not be applied.

Oxygen sensor - models with a catalytic converter

93 Bring the engine to operating temperature, then switch it off and disconnect the battery.

94 Disconnect the oxygen sensor multi-plug, which is located near the right-hand suspension turret **(see illustration)**. Free the wiring leading to the sensor.

95 Working under the vehicle, unscrew the sensor from the exhaust manifold **(see illustration)**.

96 Refitting is the reverse of the removal procedure. Note that the makers specify the use of a special anti-seize compound made of graphite and glass beads. New sensors are provided with their threads already coated with this compound. When refitting a used sensor, obtain some of the special compound from a Vauxhall dealer.

Carbon canister - 16-valve models with a catalytic converter

97 Raise the front of the vehicle and remove the left-hand roadwheel.

98 Slacken the canister clamp nut. Release the canister from the clamp, disconnect the hoses from it and remove it **(see illustrations)**. Treat the canister with the same precautions as would apply to a fuel tank - it may be full of vapour.

99 Refitting is the reverse of the removal procedure.

Vent valve - 16-valve models with a catalytic converter

100 Disconnect the multi-plug and the hoses from the vent valve **(see illustration)**. Unbolt the valve bracket and remove the valve and bracket.

101 Refitting is the reverse of the removal procedure.

13 Inlet manifold - removal and refitting

Removal

1.4 and 1.6 litre models

1 Refer to the information given in Section 11, Chapter 4A, for information on the various electrical components which must be disconnected.

1.8 litre models

2 Disconnect the battery earth lead.

3 Disconnect the injection wiring harness plugs and earth connections as follows:

a) Airflow meter plug.
b) Coolant temperature sensor **(see illustration)**.
c) Fuel injectors **(see illustration)**.
d) Throttle valve switch **(see illustration)**.
e) Auxiliary air valve **(see illustration)**.
f) Cam cover earth tags.

4 Disconnect the distributor vacuum hose from the throttle valve housing **(see illustration)**.

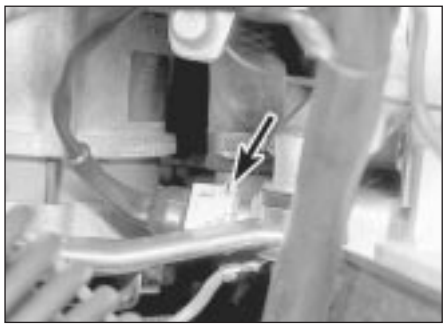
5 Depressurise the cooling system by unscrewing the expansion tank cap, taking precautions against scalding if the system is hot. Disconnect and plug the coolant hoses from the throttle valve housing.

6 Disconnect the air inlet duct from the housing.

7 Disconnect the brake servo and crankcase ventilation hoses from the housing.

8 Disconnect and plug the fuel hoses from the fuel rail stubs. The hoses are different sizes and one of them carries a white band for identification. Be prepared for fuel spillage.

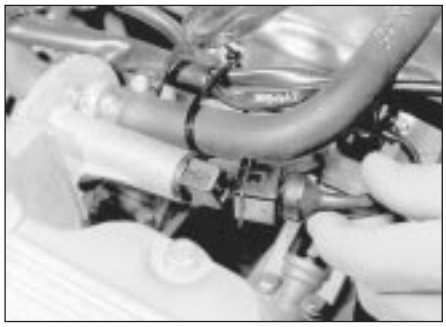
9 Disconnect the accelerator cable from the throttle levers. The cable inner is secured by a



13.3a Coolant temperature sensor plug (arrowed)

13.3b Disconnecting a fuel injector plug

13.3c Unplugging the throttle valve switch lead connector



13.3d Unplugging the auxiliary air valve

wire clip, and the outer is retained in its bracket by an E-clip **(see illustration)**.

10 Unscrew the nuts which secure the inlet manifold to the cylinder head. The lower nuts are different to reach: a small socket or ring spanner will be needed.

11 Lift away the manifold and recover the gasket **(see illustrations)**.

2.0 litre 8-valve models

12 Refer to the information given above in paragraphs 2 to 11, noting the hose connections shown **(see illustration)**.

2.0 litre 16-valve models

13 Disconnect the battery earth (negative) lead.

14 Drain the cooling system (see Chapter 1).

15 Remove the pre-volume chamber, the air mass meter and its trunking as described in Section 12.

16 Remove the alternator drivebelt and the adjuster strap nut and bolt (see Chapter 1).

17 Disconnect the throttle cable from the throttle housing. Pull the cable out of the retainer and move it aside **(see illustration)**.

18 Remove the 9 nuts which secure the manifold to the cylinder head. These are all stiff and some are not easily accessible; a socket with a “wobble drive” or universal joint will be needed. Once the nuts are removed, slide the manifold back on its studs to improve access to the injector wiring rail.

19 Disconnect the two breather hoses from the camshaft cover.

20 Disconnect the injector wiring rail from the injectors as described earlier.

21 Release the earth straps from each end of the fuel rail.

22 If a vent valve is fitted, disconnect the multi-plug and the hose from it.

23 Disconnect the throttle position switch multi-plug.

24 Bearing in mind the information given in Section 6, disconnect the fuel supply and return unions from the fuel rail. Be prepared for fuel spillage.

25 Release the fuel supply hose bracket from the throttle housing.

26 Release the cable tie which secures the coolant hoses to the right-hand side of the manifold.

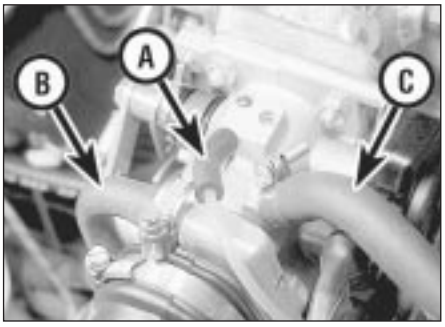
27 Disconnect the brake servo vacuum hose and the large coolant hose from the base of the manifold **(see illustrations)**.

28 Unhook the clutch cable from the bracket behind the manifold.

29 Disconnect the small coolant hose from the expansion tank.

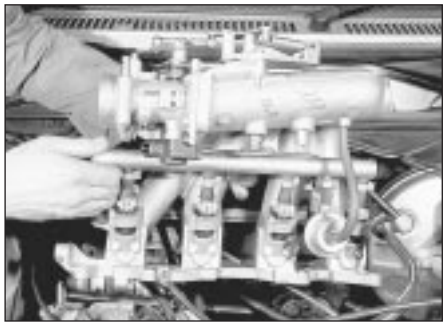
30 Disconnect the air hose which connects the idle speed adjuster to the base of the manifold.

31 With the help of an assistant, lift the manifold to gain access to the idle speed

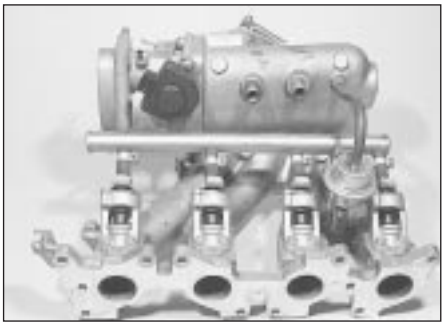


13.4 Distributor vacuum hose (A), coolant hose (B) and breather (C) on throttle housing

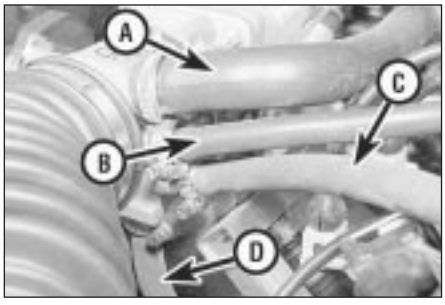
13.9 Accelerator cable at engine end



13.11a Removing the inlet manifold - 1.8 litre model

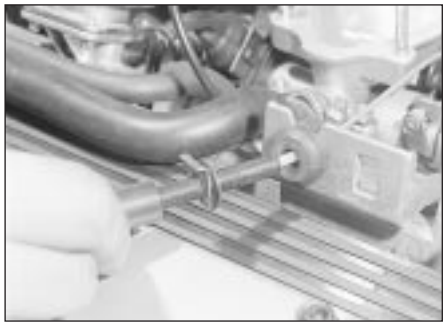


13.11b Inlet manifold showing injectors fuel rail and associated components



13.12 Throttle valve housing - ML4.1

A Hose from idle speed adjuster
B Crankcase ventilation hose
C Coolant hose
D Coolant hose



13.17 Pulling the throttle cable out of the retainer