






Chapter 4 Part B: Bosch K-Jetronic and KE-Jetronic mechanical fuel injection systems

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Degrees of difficulty

Easy , suitable for novice with little experience 	Fairly easy , suitable for beginner with some experience 	Fairly difficult , suitable for competent DIY mechanic 	Difficult , suitable for experienced DIY mechanic 	Very difficult , suitable for expert DIY or professional 
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Specifications

General

System type	Bosch mechanical continuous injection system
Application:	
XR3i and XR3i Cabriolet models up to 1990	Bosch K-Jetronic
RS Turbo models	Bosch KE-Jetronic

K-Jetronic system specification

Fuel pump type	12 volt electric roller cell type
Fuel pump delivery quantity (minimum)	0.7 litre (1.32 pints) in 30 seconds
Idle speed (cooling fan on)	750 to 850 rpm
Idle mixture CO content	1.0 to 1.5%
Main system pressure	4.7 to 5.5 bar (68 to 80 lbf/in ²)
Control pressure (warm engine)	3.4 to 3.8 bar (39 to 45 lbf/in ²)
Injector valve opening pressure	3.2 to 4.0 bar (46.4 to 51.5 lbf/in ²)

KE-Jetronic system specification

Fuel pump type	12 volt electric roller cell type
Fuel pump delivery quantity (minimum):	
1985 models	1.1 litres (1.9 pints) in 60 seconds
1986 models onwards	2.5 litres (4.4 pints) in 60 seconds
Idle speed (cooling fan on):	
1985 models	800 to 900 rpm
1986 models onwards	920 to 960 rpm
Idle mixture CO content:	
1985 models	0.25 to 0.75%
1986 models onwards	0.5 to 1.1%
Main system pressure	5.6 to 6.0 bar (82 to 87 lbf/in ²)
Injector valve opening pressure	3.0 to 4.1 bar (43.5 to 59.5 lbf/in ²)

Turbocharger

Type	Garrett AiResearch T3
Maximum boost pressure	0.45 to 0.55 bar (6.5 to 7.9 lbf/in ²)
Solenoid control valve operating range	2500 to 6000 rpm (approximately)

Fuel requirement

Fuel octane rating	97 RON (four-star)
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Torque wrench settings

	Nm	lbf ft
K-Jetronic system		
Air cleaner retaining bolts	4 to 5	3 to 4
Fuel distributor-to-sensor plate screws	32 to 38	24 to 28
Sensor plate-to-air cleaner screws	8 to 11	6 to 8
Warm-up regulator bolts	3 to 5	2 to 4
Cold start valve bolts	3 to 5	2 to 4
Auxiliary air device bolts	3 to 5	2 to 4
Inlet manifold nuts	16 to 20	12 to 15
Throttle housing nuts	8 to 11	6 to 8
Exhaust manifold nuts	14 to 17	10 to 13
Exhaust downpipe to manifold	35 to 40	25 to 29
Banjo union bolts:		
Fuel distributor inlet and return	16 to 20	11 to 15
Fuel distributor injector pipes	5 to 8	4 to 6
Fuel distributor cold start valve feed pipe	5 to 8	4 to 6
Fuel distributor warm-up regulator feed and return pipes	5 to 8	4 to 6
Warm-up regulator inlet (M10)	11 to 15	8 to 11
Warm-up regulator outlet (M8)	5 to 8	4 to 6
Fuel pump, filter and accumulator	16 to 20	11 to 15
KE-Jetronic system		
Air cleaner bolts	8 to 11	6 to 8
Fuel distributor-to-sensor plate screws	32 to 38	24 to 28
Cold start valve bolts	8 to 11	6 to 8
Auxiliary air device bolts	8 to 11	6 to 8
Inlet manifold nuts	16 to 20	11 to 15
Throttle housing nuts	8 to 11	6 to 8
Thermo-time switch	20 to 25	15 to 18
Charge air temperature sensor	20 to 25	15 to 18
Air inlet duct to rocker cover	14 to 18	10 to 13
Cold start valve fuel supply pipe	5 to 8	4 to 6
Auxiliary air valve vacuum connection	4	3
Fuel pressure regulator unions	14 to 20	10 to 15
Fuel distributor unions	11 to 15	8 to 11
Fuel pump, filter and accumulator unions	16 to 20	11 to 15
Fuel injector pipe unions	10 to 12	7 to 9
Exhaust manifold to cylinder head	14 to 17	10 to 13
Turbocharger to exhaust manifold	21 to 26	15 to 19
Exhaust downpipe to turbocharger	35 to 40	25 to 29

1 General information and precautions

General information

The fuel system comprises a centrally mounted fuel tank, electrically-operated fuel pump and Bosch K-Jetronic or KE-Jetronic continuous injection system according to model. The system is used in conjunction with a turbocharger on RS Turbo models.

A more detailed description of the various system components is given in the following paragraphs.

Bosch K-Jetronic system

The Bosch K-Jetronic fuel-injection system is of the continuous injection type and supplies a precisely controlled quantity of atomised fuel to each cylinder under all operating conditions.

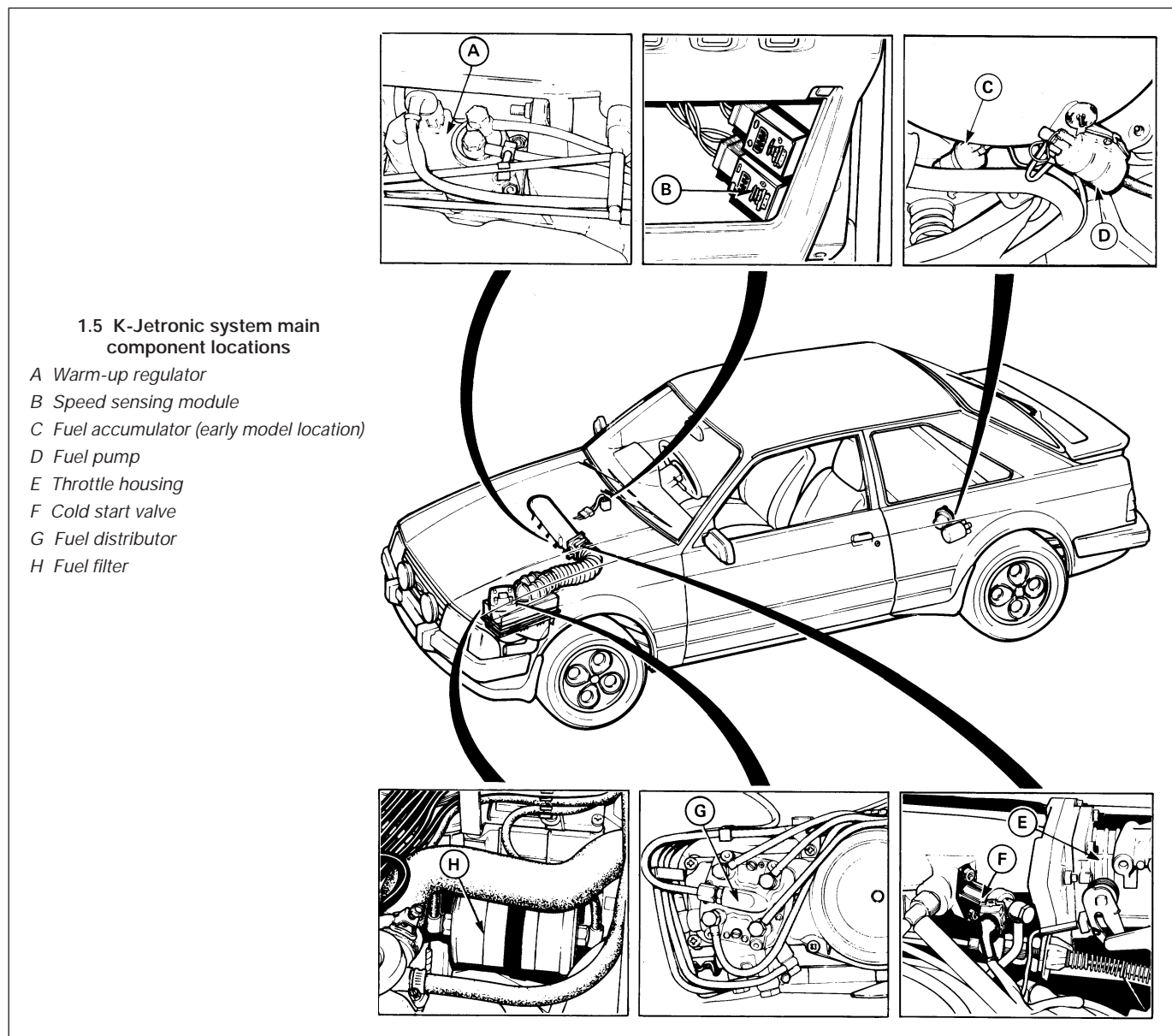
This system, when compared with conventional carburettor arrangements, achieves a more accurate control of the air/fuel mixture resulting in reduced emission levels and improved performance.

The main components of the fuel injection system are as follows (see illustration).

- a) Fuel tank
- b) Fuel pump

- c) Fuel accumulator
- d) Fuel filter
- e) Fuel distributor/mixture control assembly
- f) Throttle valve (plate)
- g) Injector valves
- h) Air box (plenum chamber)
- i) Warm-up regulator
- j) Auxiliary air device
- k) Cold start valve
- l) Thermo-time switch
- m) Safety module
- n) Fuel shut-off valve
- o) Speed sensor module

The fuel pump is of electrically-operated, roller cell type.



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The fuel accumulator has two functions, (i) to dampen the pulsation of the fuel flow, generated by the pump and (ii) to maintain fuel pressure after the engine has been switched off. This prevents a vapour lock developing with consequent hot starting problems.

The fuel filter incorporates two paper filter elements to ensure that the fuel reaching the injection system components is completely free from dirt.

The fuel distributor/mixture control assembly. The fuel distributor controls the quantity of fuel being delivered to the engine, ensuring that each cylinder receives the same amount. The mixture control assembly incorporates an air sensor plate and control plunger. The air sensor plate is located in the main airstream between the air cleaner and

the throttle butterfly. During idling, the airflow lifts the sensor plate which in turn raises a control plunger which allows fuel to flow past the plunger and out of the metering slits to the injector valves. Increases in engine speed cause increased airflow which raises the control plunger and so admits more fuel.

The throttle valve assembly is mounted in the main air inlet between the mixture control assembly and the air box.

The injector valves are located in the inlet manifold.

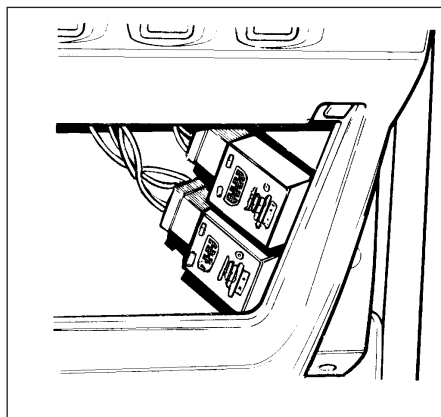
The air box is mounted on the top of the engine and functions as an auxiliary inlet manifold directing air from the sensor plate to each individual cylinder.

The warm-up regulator is located on the inlet manifold and incorporates two coil springs, a bi-metal strip and a control

pressure valve. The regulator controls the fuel supplied to the control circuit which provides pressure variations to the fuel distributor control plunger. When the coil springs are pushing against the control pressure valve there is a high control pressure and this gives a weak mixture. The coil spring pressure application is controlled by the bi-metal strip which in turn is activated in accordance with engine temperature and an electrical heat coil.

The auxiliary air device is located on the inlet manifold. It consists of a pivoted plate, bi-metal strip and heater coil. The purpose of this device is to supply an increased volume of fuel/air mixture during cold idling.

The start valve system consists of an electrical injector and a thermo-time switch. Its purpose is to spray fuel into the air box to assist cold starting, the thermo-time switch regulating the amount of fuel injected.



1.16 K-Jetronic system speed sensing module and fuel pump safety module locations

The **safety module** is located under the fascia panel on the driver's side and is coloured purple (see illustration). Its purpose is to shut off the power supply to the fuel pump should the engine stall or the vehicle be involved in an accident. The module senses ignition pulses, and cuts the fuel supply if the ignition pulses stop.

The **fuel shut-off valve** system is an economy device whereby air is drawn from within the air cleaner unit through the shut-off valve and directed into the ducting chamber above the air sensor plate causing a depression. This then causes the sensor plate to drop which, in turn, shuts off the fuel supply. The valve is operated by signals from a coolant temperature sensor and a throttle position sensor. The shut-off valve will only operate under the following circumstances:

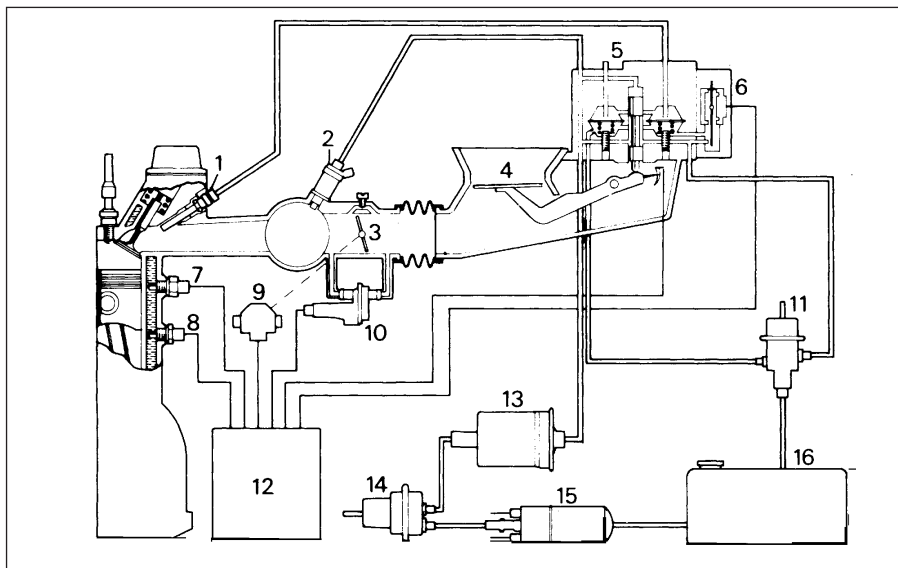
- a) When the engine coolant temperature is at or above 35°C (95°F)
- b) When the throttle is closed and with the engine speed decelerating from speeds above 1600 rpm

The engine speed is sensed by a speed sensing module which is coloured black and located beneath the fascia panel on the driver's side.

Bosch KE-Jetronic system

The Bosch KE-Jetronic fuel-injection system is fitted to Escort RS Turbo models and is a further development of the K-Jetronic system.

Apart from minor alterations the basic principles of the hydraulics and mechanics used on the K-Jetronic system are unchanged on the KE-Jetronic system. The main difference between the two types is that on the KE-Jetronic system all mixture corrections are controlled electronically by an electromagnetic pressure actuator incorporated in the fuel distributor. The pressure actuator is directly controlled by a variable electric current delivered by the fuel-injection control module.



1.19 KE-Jetronic fuel-injection system layout and components

- | | |
|--------------------------------------|----------------------------|
| 1 Injector | 9 Throttle position switch |
| 2 Cold start valve | 10 Auxiliary air device |
| 3 Throttle plate | 11 Pressure regulator |
| 4 Sensor plate | 12 Control module |
| 5 Fuel distributor | 13 Fuel filter |
| 6 Electro-magnetic pressure actuator | 14 Fuel accumulator |
| 7 Thermo-time switch | 15 Fuel pump |
| 8 Temperature sensor | 16 Fuel tank |

This module receiver inputs from the various engine sensors concerning engine temperature, engine load, throttle shift, throttle position and starter actuation. This information modifies a program stored in the module memory so that the electromagnetic pressure actuator, on receiving the signal from the module, can alter the mixture to suit all engine operating conditions. This renders the control pressure circuit and warm-up regulator of the K-Jetronic system unnecessary, and also undertakes the functions of the fuel shut-off valve, safety module and speed sensing module (see illustration).

Precautions

Due to the complexity of the fuel-injection system, and the need for special tools and test equipment, any work should be limited to the operations described in this Chapter. Other adjustments and system checks are beyond the scope of most readers and should be left to a Ford dealer.

Before disconnecting any fuel lines, unions or components thoroughly clean the component or connection and the adjacent area.

Place any removed components on a clean surface and cover them with plastic sheet or paper. Do not use fluffy rags for cleaning.

The system operates under pressure at all times and care must be taken when disconnecting fuel lines. Relieve the system pressure as described in the relevant Section before disconnecting any fuel lines under

pressure. Refer to the warning note at the end of this Section, and always work with the battery negative lead disconnected and in a well ventilated area.

When working on the KE-Jetronic system the following additional precautions must be observed:

- a) Never start the engine when the battery is not firmly connected.
- b) Never disconnect the battery when the engine is running.
- c) If the battery is to be rapid charged from an external source it should be completely disconnected from the vehicle electrical system.
- d) The KE-Jetronic control unit must be removed from the car if temperatures are likely to exceed 80°C (176°F) as would be experienced, for example, in a paint spray oven or if any electric welding is being carried out on the car.
- e) The ignition must be switched off when removing the control unit.



Warning: Many of the procedures in this Chapter entail the removal of fuel pipes and connections which may result in some fuel spillage. Before carrying out any operation on the fuel system refer to the precautions given in Safety First! at the beginning of this manual and follow them implicitly. Petrol is a highly dangerous and volatile liquid and the precautions necessary when handling it cannot be overstressed

2 Air cleaner - removal and refitting

K-Jetronic system

Removal

- 1 Remove the air cleaner element as described in Chapter 1.
- 2 Detach the fuel filter from the side of the cleaner casing (leave the fuel lines attached to the filter) and the air inlet hose from the front end of the case.
- 3 Unscrew and remove the casing retaining nuts from the inner wing panel and lift out the casing.

Refitting

- 4 Refitting is the reversal of the removal procedure. Refit the air cleaner element as described in Chapter 1.

KE-Jetronic system

Removal

- 5 Undo the two bolts securing the air cleaner assembly to the air sensor plate unit and remove the air cleaner assembly (see illustration).

Refitting

- 6 Refit the unit to the air sensor plate and secure with the two bolts.

3 Fuel tank - removal and refitting

The procedures are the same as described in Part A of this Chapter for carburettor engines, but in addition disconnect the fuel tank-to-fuel pump hose from the rear face of the tank.

4 Throttle cable - adjustment, removal and refitting

Adjustment

The procedure is the same as described in Part A of this Chapter for carburettor engines, except that the cable adjuster is situated in a bracket alongside the throttle housing.

Removal and refitting

The procedure is the same as described in Part A of this Chapter for carburettor engines, except that it is not necessary to remove the air cleaner, and the location of the mounting bracket is alongside the throttle housing.

5 Accelerator pedal - removal and refitting

The procedure is the same as described in Part A of this Chapter for carburettor models.



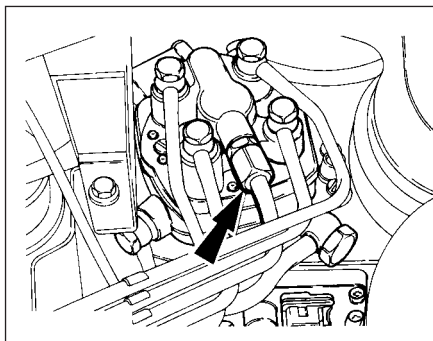
2.5 KE-Jetronic air cleaner retaining bolts (arrowed)

6 Fuel pump - removal and refitting

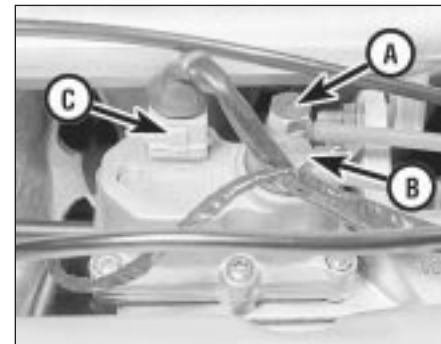
Note: Refer to the precautions at the end of Section 1 before proceeding.

Removal

- 1 The fuel pump is bolted to the underside of the car just to the rear of the fuel tank. For access raise and support the car securely at the rear.
- 2 Disconnect the battery earth lead.
- 3 On the K-Jetronic system relieve the system pressure by slowly loosening the fuel feed pipe union at the warm-up regulator (see illustration). Absorb the fuel leakage in a cloth.
- 4 On the KE-Jetronic system relieve the system pressure by slowly loosening the cold start valve union on the top of the fuel distributor (see illustration). Absorb fuel leakage in a cloth.
- 5 Clamp the fuel inlet hose midway between the tank and the pump using a brake hose clamp, self-locking grips or similar. If the fuel level in the tank is low you may prefer to drain the fuel from the tank into a suitable container once the inlet hose is disconnected.
- 6 Disconnect the fuel inlet and outlet pipes from the pump, catching fuel spillage in a suitable container (see illustration). Once disconnected do not allow dirt to enter the



6.4 KE-Jetronic system cold start valve pipe union (arrowed) on fuel distributor



6.3 Warm-up regulator fuel feed pipe (A), outlet pipe (B) and wiring multi-plug (C)

pipes, temporarily plug or seal them if necessary.

- 7 Note the electrical connections to the pump and disconnect them.
- 8 Loosen the pump bracket retaining bolt and then withdraw the pump unit with rubber protector sleeve.

Refitting

- 9 Refitting of the fuel pump is a reversal of the removal procedure. Renew the feed pipe from the tank if it is damaged or defective.
- 10 Check that the rubber protector sleeve is correctly positioned round the pump before tightening the clamp nut.
- 11 On completion, tighten the warm-up regulator or cold start valve fuel unions, reconnect the battery earth lead, start the engine and check for any fuel leaks.

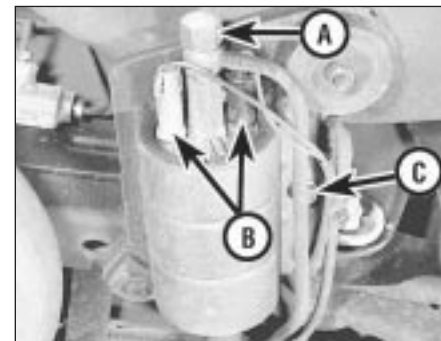
7 Fuel accumulator - removal and refitting

Note: Refer to the precautions at the end of Section 1 before proceeding.

Pre-1986 models

Removal

- 1 The fuel accumulator is mounted adjacent to the fuel pump, above the rear left-hand suspension arm.
- 2 Disconnect the battery negative lead.



6.6 Fuel pump outlet pipe (A), electrical connections (B) and pump bracket retaining bolt (C)



7.5 Fuel pipe connections (arrowed) at the underbody mounted fuel accumulator

3 Raise the rear of the car and support it on axle-stands (see "Jacking and Vehicle Support").

4 Relieve the system pressure by slowly loosening the fuel feed pipe at the warm-up regulator. Absorb fuel leakage in a cloth.

5 Disconnect the fuel pipes from the fuel accumulator and catch the small quantity of fuel which will be released (see illustration).

6 Remove the clamp screw and remove the accumulator.

Refitting

7 Refitting is a reversal of removal. Check for leaks on completion (with the engine restarted).

1986 models onwards

Removal

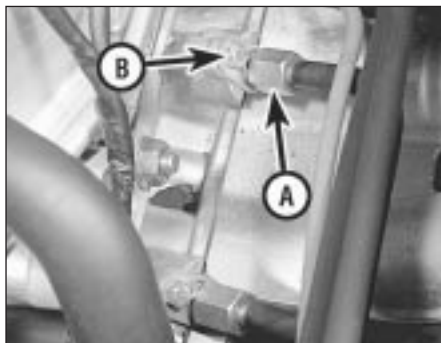
8 On later models with K-Jetronic and KE-Jetronic systems the fuel accumulator is located in the engine compartment behind the fuel distributor.

9 Disconnect the battery negative lead.

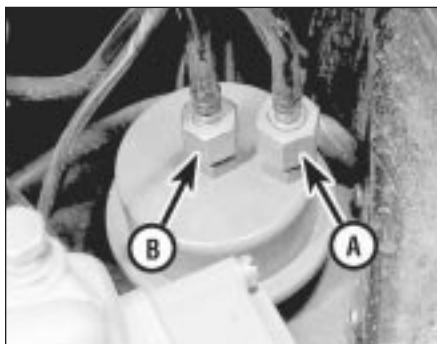
10 For access remove the air cleaner as described in Section 2.

11 Relieve the system pressure by slowly loosening the cold start valve union on the top of the fuel distributor (see illustration 6.4). Absorb fuel leakage in a cloth.

12 Disconnect the fuel pipes from the



8.3 Injector fuel pipe union (A) and retaining bracket bolt (B)



7.12 Fuel inlet pipe (A) and outlet pipe (B) at the engine compartment mounted fuel accumulator

accumulator and catch the small quantity of fuel which will be released (see illustration).

13 Remove the clamp screw and remove the accumulator.

Refitting

14 Refitting is a reversal of removal. Check for leaks on completion (with the engine restarted).

8 Fuel injectors and injector delivery pipes - removal and refitting

Note: Refer to the precautions at the end of Section 1 before proceeding. It is important to note that each injection supply pipe connection in the distributor head has a screw adjacent to it. These four screws are not for adjustment and must not be removed or have their settings altered. New O-ring seals must be used on refitting.

Removal

1 Disconnect the battery earth lead.

2 Detach the four supply pipes from the injectors, and use a rag to collect any spilled fuel.

3 Unscrew and remove the respective injector retaining bracket bolts, then withdraw the injectors and their O-ring seals (see illustration).



9.2 Disconnecting the cold start valve wiring multi-plug

4 The injector fuel delivery pipes can be removed by unscrewing and removing the four banjo bolts at the distributor head. Note the respective pipe connections as they are detached and remove the pipes complete with the plastic hoses and the injector harness. **Do not** separate the pipes or hoses from the injector harness.

5 Before reassembling the fuel delivery pipes, or the injectors, clean all pipe connections thoroughly and use new O-ring seals on the injectors. Use new seal washers on the banjo connections fitting two washers (one each side) per union. Do not overtighten the banjo bolts, or the washers may fracture.

Refitting

6 Refitting of the injectors and the fuel delivery pipes is otherwise a reversal of the removal procedure. On completion check that the pipes and hoses are not distorted and when the engine is restarted check for any signs of leaks.

9 Cold start valve - removal and refitting



Note: Refer to the precautions at the end of Section 1 before proceeding.

K-Jetronic system

Removal

1 Disconnect the battery earth lead.

2 Detach the electrical wiring multi-plug from the valve (see illustration).

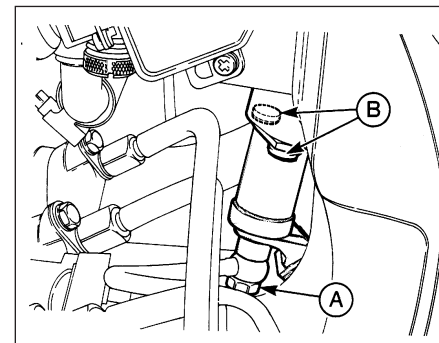
3 Slowly unscrew and remove the fuel supply pipe banjo bolt. Take care on removal, as the system will be under pressure. Soak up fuel spillage with a cloth.

4 Unscrew and remove the two socket-head mounting bolts using an Allen key or Torx type key or socket bit on later models, and remove the valve.

Refitting

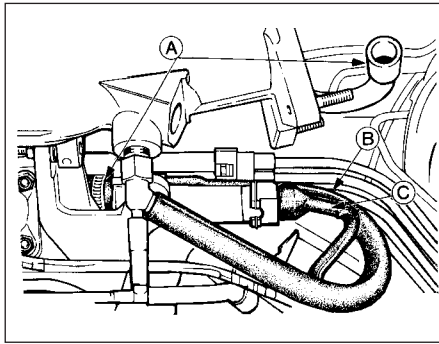
5 Refitting is a reversal of the removal procedure. Do not overtighten the banjo bolt or the washers may fracture (use a new one each side of the union).

6 On completion restart the engine and check for signs of fuel leakage.



9.8 KE-Jetronic system cold start valve location

A Fuel pipe union B Retaining bolts



10.2 K-Jetronic system auxiliary air device connections

- A Throttle housing hose
- B Cold start valve hose
- C Wiring multi-plug

KE-Jetronic system

Removal

- 7 Disconnect the battery earth lead.
- 8 Disconnect the wiring multi-plug from the valve which is located underneath the throttle housing (see illustration).
- 9 Slowly unscrew and remove the fuel supply pipe banjo union. Take care on removal, as the system will be under pressure. Soak up fuel spillage with a cloth.
- 10 Unscrew and remove the two Torx type mounting bolts using a Torx key or socket bit. Remove the valve from under the throttle housing.

Refitting

- 11 Refitting is a reversal of removal. Do not overtighten the banjo bolt or the washers may fracture (use a new one each side of the union).
- 12 On completion restart the engine and check for leaks.

10 Auxiliary air device - removal and refitting

K-Jetronic system

Removal

- 1 Disconnect the battery earth lead.
- 2 Disconnect the wiring multi-plug and the two air hoses from the device which is located beneath the cold start valve (see illustration).
- 3 Undo the two Torx type retaining bolts using a Torx key or socket bit and lift the unit away (see illustration).

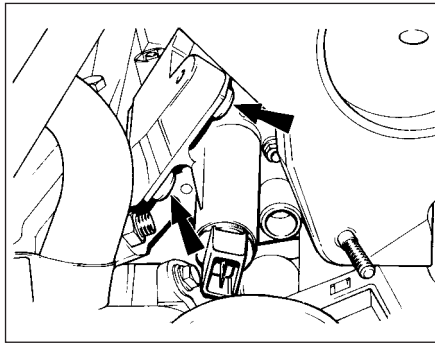
Refitting

- 4 Refitting is a reversal of removal.

KE-Jetronic system

Removal

- 5 Apply the handbrake, jack up the front of the car and support it on axle stands (see "Jacking and Vehicle Support").



10.3 K-Jetronic system auxiliary air device retaining bolt locations

- 6 Disconnect the battery negative lead.
- 7 Disconnect the auxiliary air device wiring multi-plug and the two air hoses.
- 8 Undo the two Torx type retaining bolts using a Torx key or socket bit and remove the unit from under the inlet manifold (see illustration).

Refitting

- 9 Refitting is a reversal of removal.

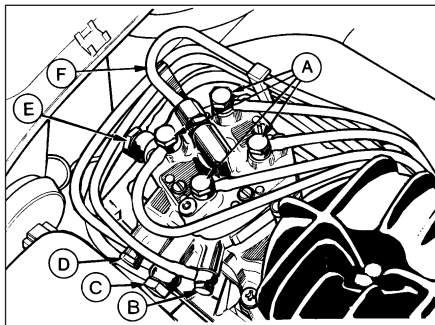
11 Fuel distributor - removal and refitting

Note: Refer to the precautions at the end of Section 1 before proceeding. It is important to note that each injection supply pipe connection in the distributor head has a screw adjacent to it. These four screws are not for adjustment and must not be removed or have their settings altered. A new O-ring and new banjo union sealing washers will be required on refitting.

K-Jetronic system

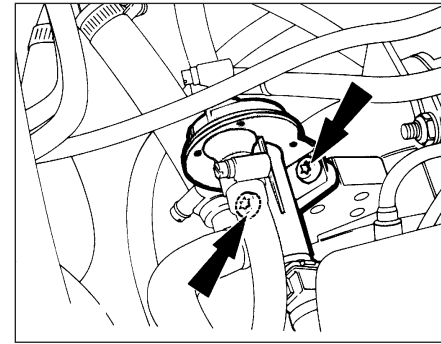
Removal

- 1 Disconnect the battery negative lead.
- 2 Relieve the system pressure by slowly loosening the fuel feed pipe union at the



11.3 K-Jetronic fuel distributor pipe connections

- A To injectors
- B To cold start valve
- C Fuel return
- D From warm-up regulator
- E Fuel inlet
- F To warm-up regulator



10.8 KE-Jetronic system auxiliary air device retaining bolts

- warm-up regulator (see illustration 6.3). Absorb the fuel leakage in a cloth.
- 3 Disconnect the four injector feed pipes, the fuel inlet and return pipes, and the warm-up regulator feed and return pipe banjo unions at the fuel distributor (see illustration). Note the sealing washers on each side of the banjo unions which must be renewed on reconnection of the pipes. Take care not to allow dirt to enter the pipes or their connection ports.
 - 4 Unscrew the three retaining screws from the fuel distributor top face and remove the unit from the car (see illustration). Recover the sealing O-ring.

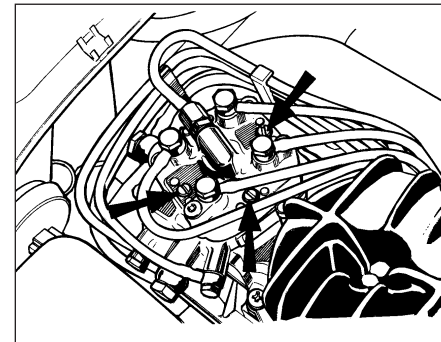
Refitting

- 5 Refitting is a reversal of removal, but ensure perfectly clean mating faces and use a new sealing O-ring and new washers for the banjo unions. Check for any signs of leaks on completion and adjust the idle speed and mixture settings as described in Chapter 1.
- 6 The main system fuel pressure should be checked and if necessary adjusted by a Ford dealer to ensure satisfactory running of the system.

KE-Jetronic system

Removal

- 7 Disconnect the battery negative lead.
- 8 Relieve the system pressure by slowly loosening the cold start valve union on the top of the fuel distributor (see illustration 6.4). Absorb fuel leakage in a cloth.



11.4 K-Jetronic system fuel distributor retaining screws (arrowed)



11.11 KE-Jetronic fuel distributor retaining screws (arrowed)

9 Disconnect the four injector feed pipes, the cold start valve pipe and union adapter, the fuel inlet pipe and pressure regulator return pipe from the fuel distributor. Note the sealing washers on each side of the banjo unions which must be renewed on reconnection of the pipes. Take care not to allow dirt to enter the pipes or their connection parts.

10 Disconnect the wiring multi-plug from the pressure actuator on the side of the fuel distributor.

11 Undo the retaining screws and remove the fuel distributor (see illustration). Recover the sealing O-ring.

Refitting

12 Refitting is a reversal of removal, but ensure perfectly clean mating faces and use a new sealing O-ring and new washers for the banjo unions. Check for any signs of leaks on completion and adjust the idle speed and mixture settings as described in Chapter 1.

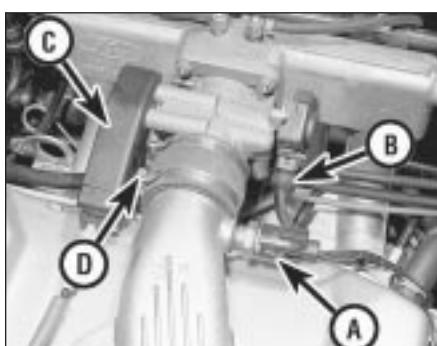
12 Throttle housing - removal and refitting

Note: During manufacture the throttle plate is adjusted so that it is fractionally open, to avoid the possibility of it jamming shut, and it **must not** be repositioned. Idle speed adjustment is provided for by means of a screw which, according to its setting, restricts the airflow through the air bypass channel in the throttle housing.

K-Jetronic system

Removal

- 1 Disconnect the battery negative lead.
- 2 Slacken the retaining screw and detach the inlet air hose from the throttle housing.
- 3 Disconnect the accelerator cable at the housing linkage with reference to Section 4.
- 4 Disconnect the distributor vacuum hose and auxiliary air hose from the underside of the throttle housing.
- 5 Undo the four nuts and carefully withdraw the throttle housing from the manifold studs.



12.9 Component attachments at the KE-Jetronic throttle housing

- A Charge air temperature sensor multi-plug
 B Throttle position sensor wiring multi-plug
 C Throttle cable bracket
 D Connecting hose retaining clip

Refitting

6 Refitting is a reversal of removal, but ensure that the mating faces are perfectly clean. Renew the gaskets, one on each side of the insulator block, if necessary.

7 On completion adjust the idle speed as described in Chapter 1.

KE-Jetronic system

Removal

8 Disconnect the battery negative terminal.
 9 Disconnect the charge air temperature sensor and throttle position sensor wiring multi-plugs (see illustration).

10 Slacken the hose clip and detach the air inlet hose from the inlet duct.

11 Undo the two bolts securing the inlet duct to the rocker cover slacken the throttle housing connecting hose clip and remove the inlet duct (see illustration).

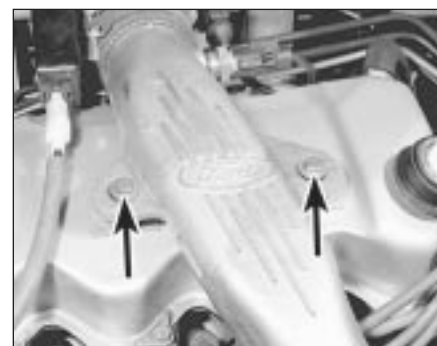
12 Extract the retaining clip and disconnect the throttle cable end from the linkage ball-stud.

13 Undo the two bolts and remove the throttle cable bracket from the throttle housing.

14 Disconnect the auxiliary air hose, then undo the four nuts and remove the throttle housing.



13.1 KE-Jetronic fuel pressure regulator location (arrowed) behind fuel distributor



12.11 Air inlet duct retaining bolts (arrowed)

15 Do not remove the throttle position sensor from the throttle housing unless absolutely necessary. If it must be removed, mark its position for refitting and then have it accurately adjusted by a Ford dealer on completion. This will also be necessary if the sensor or throttle housing are renewed.

Refitting

16 Refitting is the reversal of removal, but use a new gasket and ensure clean mating faces. After refitting adjust the idle speed as described in Chapter 1.

13 Fuel pressure regulator - removal and refitting

Note: Refer to the precautions at the end of Section 1 before proceeding.

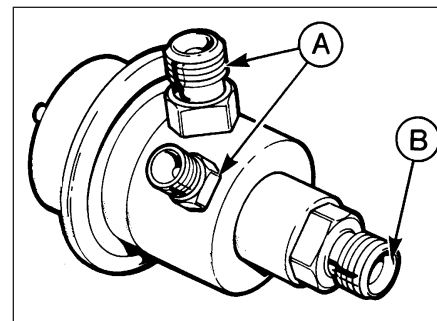
Removal

1 The fuel pressure regulator is only used on KE-Jetronic systems and is located behind the fuel distributor (see illustration).

2 Disconnect the battery negative lead.

3 Relieve the system pressure by slowly loosening the cold start valve union on the top of the fuel distributor (see illustration 6.4). Absorb fuel leakage in a cloth.

4 Place absorbent cloth beneath the regulator and undo the two fuel feed unions and the fuel return union. Note the pipe locations to ensure correct refitting.



13.6 KE-Jetronic fuel pressure regulator pipe connections

A Fuel feed

B Fuel return

5 Remove the securing tie and withdraw the regulator from its bracket.

Refitting

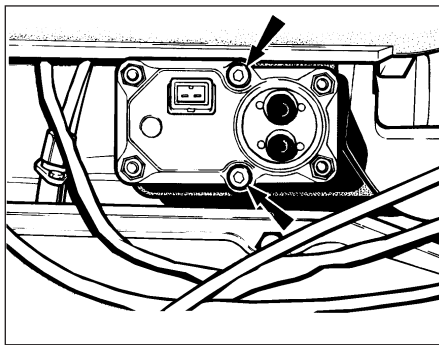
6 Refitting is a reversal of removal. Ensure that all unions are correctly reconnected and secure, and on completion check for fuel leaks with the engine running (see illustration).

14 Warm-up regulator - removal and refitting

Note: Refer to the precautions at the end of Section 1 before proceeding. New banjo union sealing washers must be used on refitting.

Removal

- 1 The warm-up regulator is only used on K-Jetronic systems and is situated on the inlet manifold just to the rear of the rocker cover.
- 2 Disconnect the battery negative lead.
- 3 Relieve the system pressure by slowly loosening the fuel feed pipe union at the warm-up regulator (see illustration 6.3). Absorb the fuel leakage in a cloth.
- 4 After relieving the system pressure disconnect the fuel feed union completely, followed by the outlet union. Recover the sealing washers used on each side of the unions.
- 5 Disconnect the regulator wiring multi-plug.
- 6 Undo the two Torx type screws using a suitable Torx key or socket bit and remove the regulator from its location (see illustration).



14.6 K-Jetronic system warm-up regulator retaining screws



16.4a Release the retaining clips . . .

Refitting

7 Refitting is a reversal of removal, but use new sealing washers on each side of the banjo unions and apply a thread-locking compound to the Torx retaining bolts. On completion check for leaks with the engine running.

15 Electro-magnetic pressure actuator - removal and refitting

Note: Refer to the precautions at the end of Section 1 before proceeding. New O-rings must be used on refitting.

Removal

- 1 The electro-magnetic pressure actuator is only used on KE-Jetronic systems and is located on the side of the fuel distributor.
- 2 Disconnect the battery negative lead.
- 3 Remove the air cleaner as described in Section 2.
- 4 Relieve the system pressure by slowly loosening the cold start valve union on the top of the fuel distributor (see illustration 6.4). Absorb fuel leakage in a cloth.
- 5 Disconnect the wiring multi-plug, then undo the two screws securing the actuator to the fuel distributor (see illustration). Remove the unit and the sealing O-rings.

Refitting

6 Refitting is the reverse sequence to removal, but ensure both mating faces are



15.5 Pressure actuator wiring multi-plug (arrowed)



16.4b . . . and lift off the plenum chamber top cover

clean. New O-rings must be used and care taken not to displace them when fitting. On completion check for fuel leaks with the engine running.

16 Fuel-injection control module - removal and refitting

Removal

- 1 The fuel-injection control module is only used on KE-Jetronic systems and is located in the engine compartment behind the heater plenum chamber and fan motor.
- 2 Disconnect the battery negative lead.
- 3 Remove the plenum chamber top cover rubber seal (see illustration).
- 4 Release the five retaining clips and lift off the plenum chamber top cover (see illustrations).
- 5 Undo the two nuts securing the heater fan motor assembly to the bulkhead. Lift the unit off the studs and place it on the engine, but avoid straining the wiring (see illustrations).
- 6 Disconnect the module wiring multi-plug, then undo the three screws and remove the unit from its location (see illustration).

Refitting

7 Refitting is the reversal of removal. Take care not to trap the motor wiring when refitting the fan motor assembly and ensure that it is engaged in the slot provided in the housing (see illustration).



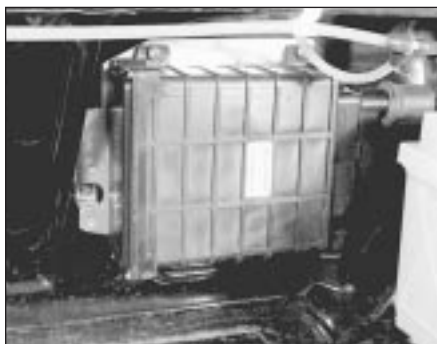
16.3 Remove the plenum chamber rubber seal



16.5a Heater fan motor retaining nut



16.5b Removing the heater fan motor assembly . . .



16.6 . . . for access to the fuel-injection control module



16.7 Fan motor wiring engaged in housing slot (arrowed)

17 Charge air temperature sensor - removal and refitting

Removal

- 1 The charge air temperature sensor is only used on KE-Jetronic systems and is located in the air inlet duct (see illustration).
- 2 Disconnect the battery negative lead.
- 3 Disconnect the wiring multi-plug and unscrew the sensor from its location.

Refitting

- 4 Refitting is the reversal of removal.



17.1 Charge air temperature sensor location (arrowed)

18 Thermo-time switch - removal and refitting

Removal

- 1 Disconnect the battery negative lead.
- 2 Drain the cooling system as described in Chapter 1.
- 3 Raise the front of the car and support it on axle stands (see "Jacking and Vehicle Support").
- 4 Disconnect the wiring multi-plug from the thermo-time switch located on the inlet manifold intermediate flange and accessible from under the car (see illustration).
- 5 Unscrew the unit and remove it from its location.

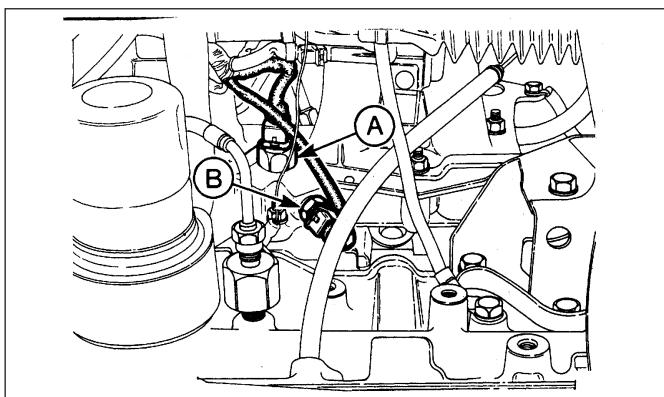
Refitting

- 6 Refitting is a reversal of removal. Refill the cooling system as described in Chapter 1.

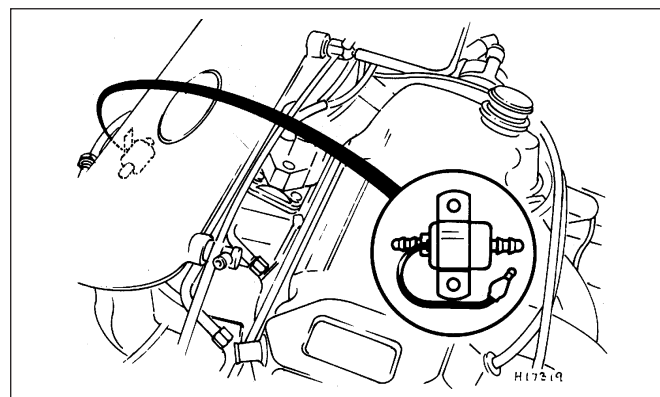
19 Idle speed compensator - removal and refitting

Removal

- 1 The idle speed compensator is only fitted to K-Jetronic systems from 1986 onwards and is located in the centre of the engine compartment bulkhead (see illustration).



18.4 Thermo-time switch (A) and temperature sensor (B) on the KE-Jetronic system (viewed from under the car)



19.1 K-Jetronic system idle speed compensator location

- 2 Disconnect the battery negative lead.

- 3 Disconnect the electrical lead, undo the two screws and withdraw the unit. Detach the air hoses from each end and remove the compensator.

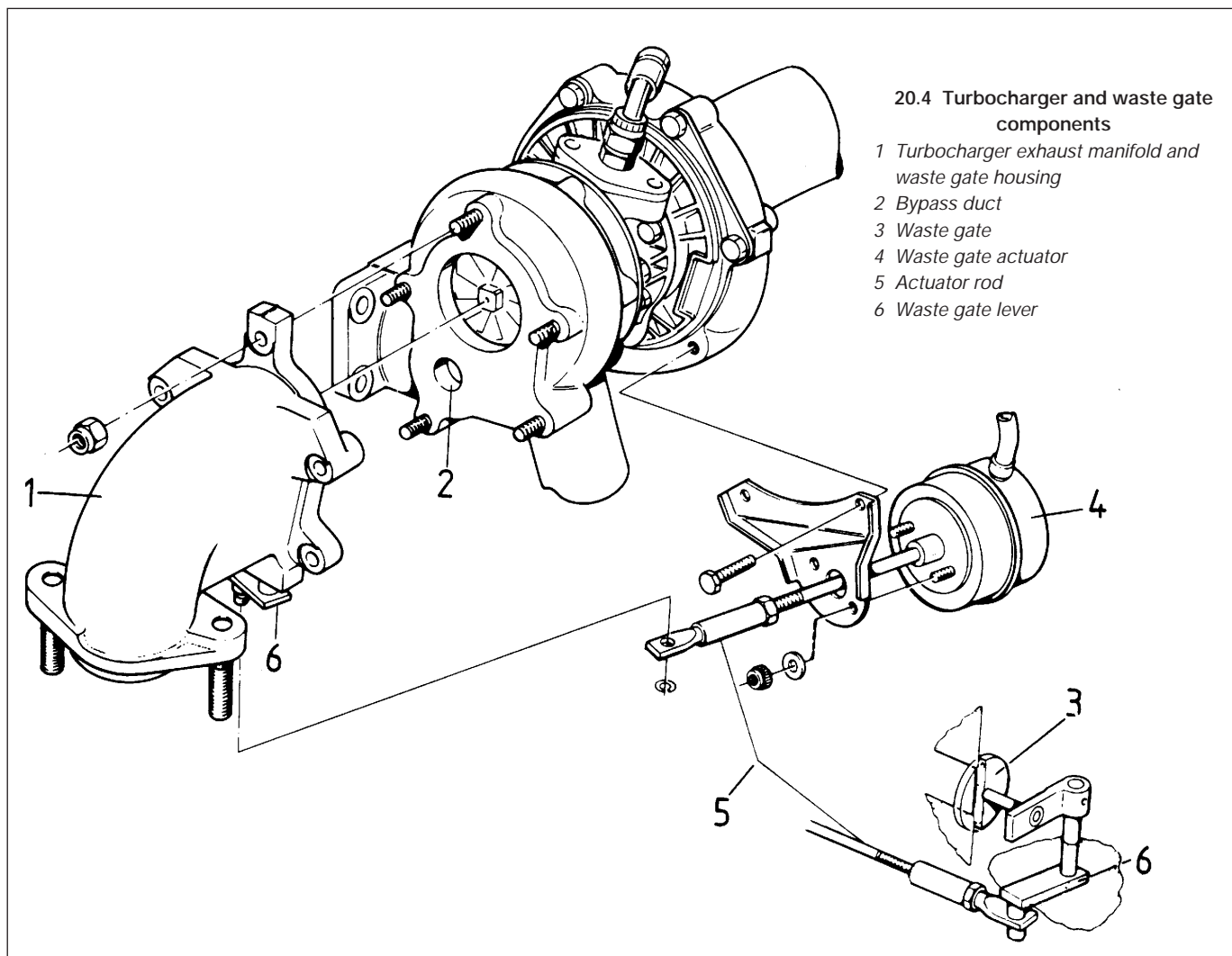
Refitting

- 4 Refitting is a reversal of removal. The air hoses can be connected to either end and the arrows on the unit can be ignored.

20 Turbocharger - general description

Escort RS Turbo models are equipped with an exhaust driven turbocharger, which is a device designed to increase the engine's power output without increasing exhaust emissions or adversely affecting fuel economy. It does so by utilising the heat energy present in the exhaust gases as they exit the engine.

Basically the turbocharger consists of two fans mounted on a common shaft. One fan is driven by the hot exhaust gases as they rush through the exhaust manifold and expand. The other draws in fresh air and compresses it before it enters the inlet manifold. By compressing the air, a larger charge can be let into each cylinder and greater power output is achieved.



4B

The temperature of the inlet air is reduced, thus increasing its density, by passing it through an intercooler, mounted alongside the radiator, prior to it entering the manifold.

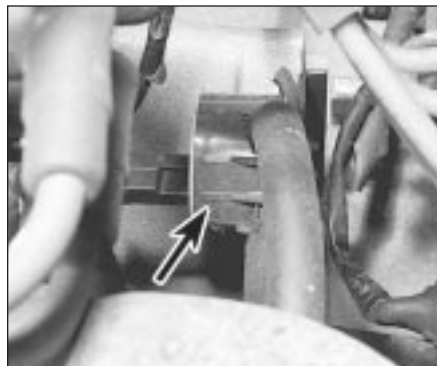
The boost pressure generated by the turbocharger is controlled by a waste gate which when open allows a high proportion of the exhaust gases to bypass the turbocharger and directly enter the exhaust system (see illustration). The turbocharger therefore loses speed and boost pressure is reduced.

The waste gate is opened and closed by the waste gate actuator through an actuator rod. The waste gate actuator is in turn controlled by the solenoid control valve which receives signals in the form of a pulsed voltage from the ignition system. Electronic Spark Control module (see Chapter 5, Part B). The Electronic Spark Control module receives data from various engine sensors, particularly the charge air temperature sensor in the inlet air duct, which modify the module program to suit all operating conditions. The module then signals the solenoid control valve to open or close the waste gate via the waste gate actuator.

Lubrication oil for the turbocharger is taken from the engine lubricating circuit via a special branch line. The turbocharger shaft rotates in plain bearings through which a relatively large amount of oil is allowed to pass. Therefore when rotating, the shaft floats on a thick film of lubricating oil.

The turbocharger is a close tolerance,

expensive component and servicing or repairs should be left to a dealer service department or specialist with turbocharger repair experience. Apart from the information in the following Sections, any other work on the turbocharger or its related components is beyond the scope of the average reader.



21.1 Waste gate solenoid control valve location (arrowed)

21 Waste gate solenoid control valve - removal and refitting



Removal

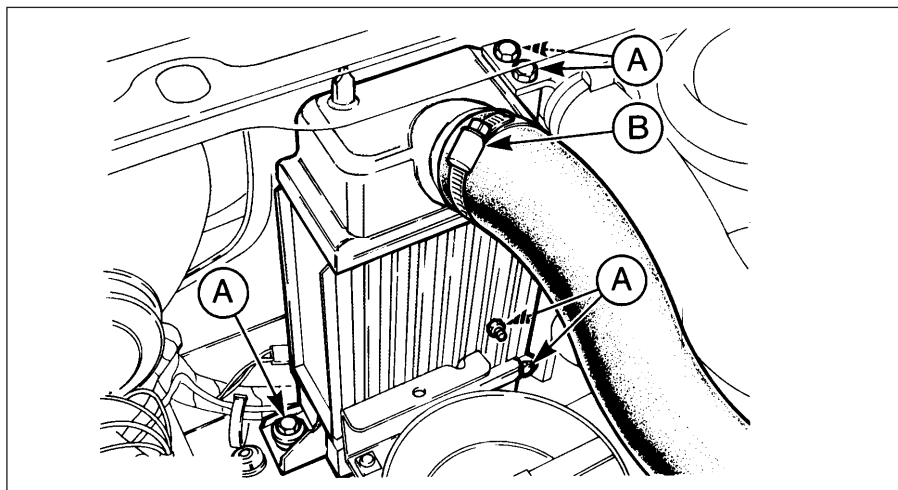
- 1 The solenoid control valve is mounted on a bracket located underneath the ignition distributor (see illustration).
- 2 Disconnect the battery negative lead.
- 3 Disconnect the solenoid wiring multi-plug.
- 4 Identify and mark the hose locations at the solenoid connections, then remove the hoses.
- 5 Undo the retaining screws and remove the unit from its location.

Refitting

- 6 Refitting is a reversal of removal.



22.3 Intercooler upper air hose attachment (arrowed)



22.7 Intercooler mountings and attachments - 1986 models onwards

A Retaining bolts

B Upper air hose

22 Intercooler - removal and refitting

1985 models

Removal

- 1 Disconnect the battery negative lead.
- 2 Remove the air cleaner as described in Section 2.
- 3 Remove the intercooler upper and lower air hoses (see illustration).
- 4 Undo the upper retaining bolt, tilt the intercooler towards the engine at the top and lift up to disengage the lower retaining pins. Remove the unit from the engine compartment.

Refitting

- 5 Refitting is a reversal of removal.

1986 models onwards

Removal

- 6 Proceed as described in paragraphs 1 to 3.
- 7 Undo the two radiator and intercooler lower retaining bolts (see illustration).
- 8 Move the radiator and intercooler assembly towards the engine and undo the four bolts securing the intercooler to the radiator.
- 9 Undo the retaining bolt and move the horn nearest to the intercooler to one side.
- 10 Withdraw the intercooler from the engine compartment.

Refitting

- 11 Refitting is a reversal of removal.

23 Turbocharger- removal and refitting

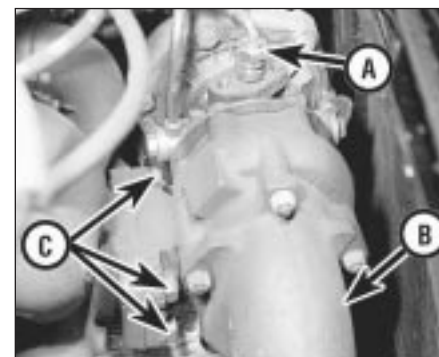
Note: New gaskets and new tabwashers must be used on refitting.

Removal

- 1 Disconnect the battery negative lead.
- 2 Disconnect the turbocharger inlet and outlet air hoses and the hoses from the waste gate actuator and solenoid control valve at their turbocharger connections. Tape over all the disconnected unions and outlets to prevent dirt ingress.
- 3 Support the exhaust system and disconnect it from the turbocharger exhaust manifold.
- 4 Disconnect the oil feed union on the top of the turbocharger and the oil return line from underneath the unit (see illustration). Tape over all disconnected pipes and unions.
- 5 Bend up the tabwashers, then unscrew the nuts securing the turbocharger to the exhaust manifold. Remove the unit and store it in a clean plastic bag while removed from the car.

Refitting

- 6 Before refitting the turbocharger ensure that all mating faces are clean and obtain new gaskets and a set of new tabwashers. It is also advisable to renew the engine oil and filter, particularly if a new turbocharger is being fitted or if there was any sign of previous oil contamination.



23.4 Turbocharger oil feed union (A), turbocharger exhaust manifold (B) and retaining nuts (C)

7 Refitting is a reversal of removal, but bearing in mind the following points:

- a) Tighten all retaining nuts to the specified torque and secure with the tabwashers.
- b) Before connecting the oil feed union, prime the turbocharger bearings by injecting clean engine oil into the union orifice.
- c) Crank the engine over on the starter with the ignition LT lead at the coil disconnected until the oil pressure warning light goes out.