






Chapter 3

Cooling, heating and ventilation 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
Maximum system pressure 1.4 bars

Thermostat
Opening temperatures:
Starts to open 89°C
Fully-open 101°C

Electric cooling fan(s)
Cooling fan(s) cut in:
Single-speed cooling fan:
1998 cc 8-valve models 95°C
All other models 97°C
Twin-speed cooling fan(s):*
Slow speed 97°C
Fast speed 101°C

Cooling fan(s) cut out:
Single-speed cooling fan:
1998 cc 8-valve models 86°C
All other models 92°C
Twin-speed cooling fan(s):*
Slow speed 92°C
Fast speed 96°C

**Twin-speed cooling fans are fitted to all models with air conditioning, and to models supplied to countries with a hot climate.*

Torque wrench settings	Nm	lbf ft
Coolant pump bolts:		
1124 cc and 1360 cc models:		
Lower bolt	7	5
Upper bolt	16	12
1580 cc and larger-engined models	15	11
Temperature switches/sensors:		
Screwed into radiator	35	26
Screwed into cylinder head/coolant outlet housing	18	13

1 General information and precautions

General information

The cooling system is of pressurised type, comprising a coolant pump driven by the timing belt, an aluminium crossflow radiator with integral expansion tank, electric cooling fan(s), a thermostat, heater matrix, and all associated hoses and switches.

The system functions as follows. Cold coolant in the bottom of the radiator passes through the bottom hose to the coolant pump, where it is pumped around the cylinder block and head passages, and through the oil cooler(s) (where fitted). After cooling the cylinder bores, combustion surfaces and valve seats, the coolant reaches the underside of the thermostat, which is initially closed. The coolant passes through the heater, and is returned via the cylinder block to the coolant pump.

When the engine is cold, the coolant circulates only through the cylinder block, cylinder head, and heater. When the coolant reaches a predetermined temperature, the thermostat opens, and the coolant passes through the top hose to the radiator. As the coolant circulates through the radiator, it is cooled by the inrush of air when the car is in forward motion. The airflow is supplemented by the action of the electric cooling fan(s) when necessary. Upon reaching the bottom of the radiator, the coolant has now cooled, and the cycle is repeated.

When the engine is at normal operating temperature, the coolant expands, and some of it is displaced into the expansion tank. Coolant collects in the tank, and is returned to the radiator when the system cools.

On models with automatic transmission, a proportion of the coolant is recirculated from the bottom of the radiator through the transmission fluid cooler mounted on the transmission. On 16-valve models, the coolant is also passed through the engine oil cooler.

The electric cooling fan(s) mounted in front of the radiator are controlled by a thermostatic switch. At a predetermined coolant temperature, the switch/sensor actuates the fan.

Precautions



Warning: Do not attempt to remove the expansion tank filler cap, or to disturb any part of the cooling system, while the engine is hot, as there is a high risk of scalding. If the expansion tank filler cap must be removed before the engine and radiator have fully cooled (even though this is not recommended), the pressure in the cooling system must first be relieved. Cover the cap with a thick layer of cloth, to avoid scalding, and slowly unscrew the filler cap

until a hissing sound is heard. When the hissing has stopped, indicating that the pressure has reduced, slowly unscrew the filler cap until it can be removed; if more hissing sounds are heard, wait until they have stopped before unscrewing the cap completely. At all times, keep well away from the filler cap opening, and protect your hands.



Warning: Do not allow antifreeze to come into contact with your skin, or with the painted surfaces of the vehicle. Rinse off spills immediately, with plenty of water. Never leave antifreeze lying around in an open container, or in a puddle in the driveway or on the garage floor. Children and pets are attracted by its sweet smell, but antifreeze can be fatal if ingested.



Warning: If the engine is hot, the electric cooling fan may start rotating even if the engine is not running. Be careful to keep your hands, hair, and any loose clothing well clear when working in the engine compartment.



Warning: Refer to Section 11 for precautions to be observed when working on models equipped with air conditioning.

2 Cooling system hoses - disconnection and renewal



Note: Refer to the warnings given in Section 1 of this Chapter before proceeding. Hoses should only be disconnected once the engine has cooled sufficiently to avoid scalding.

1 If the checks described in Chapter 1 reveal a faulty hose, it must be renewed as follows.

2 First drain the cooling system (see Chapter 1). If the coolant is not due for renewal, it may be re-used, providing it is collected in a clean container.

3 To disconnect a hose, proceed as follows, according to the type of hose connection.

Conventional hose connections - general instructions

4 On conventional connections, the clips used to secure the hoses in position may be either standard worm-drive clips or disposable crimped types. The crimped type of clip is not designed to be re-used and should be replaced with a worm drive type on reassembly.

5 To disconnect a hose, use a screwdriver to slacken or release the clips, then move them along the hose, clear of the relevant inlet/outlet. Carefully work the hose free (see illustration). The hoses can be removed with relative ease when new - on an older car, they may have stuck.

6 If a hose proves to be difficult to remove, try to release it by rotating its ends before attempting to free it. Gently prise the end of the hose with a blunt instrument (such as a

flat-bladed screwdriver), but do not apply too much force, and take care not to damage the pipe stubs or hoses. Note in particular that the radiator inlet stub is fragile; do not use excessive force when attempting to remove the hose.



If all else fails, cut the hose with a sharp knife, then slit H so that it can be peeled off in two pieces. Although this may prove expensive if the hose is otherwise undamaged, it is preferable to buying a new radiator. Check first, however, that a new hose is readily available.

7 When fitting a hose, first slide the clips onto the hose, then work the hose into position. If crimped-type clips were originally fitted, use standard worm-drive clips when refitting the hose. If the hose is stiff, use a little soapy water as a lubricant, or soften the hose by soaking it in hot water. Do not use oil or grease, which may attack the rubber.

8 Work the hose into position, checking that it is correctly routed, then slide each clip back along the hose until it passes over the flared end of the relevant inlet/outlet, before tightening the clip securely.

9 Refill the cooling system with reference to Chapter 1.

10 Check thoroughly for leaks as soon as possible after disturbing any part of the cooling system.

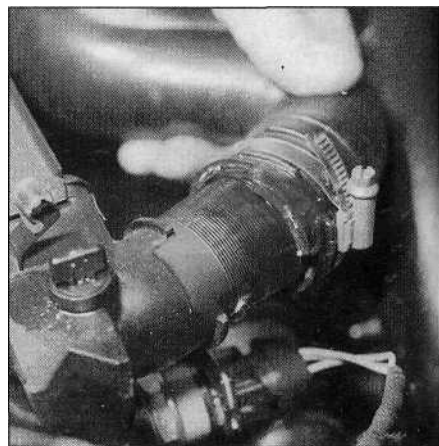
Radiator bottom hose

Removal

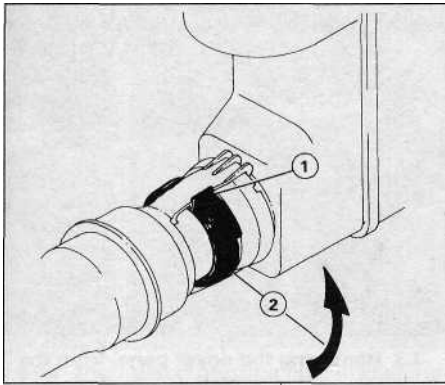
11 Turn the locking ring ("2") anti-clockwise until it contacts the stop ("1") (see illustration).

12 Press the connector away from the hose, to ensure that the two retaining lugs are free (see illustration).

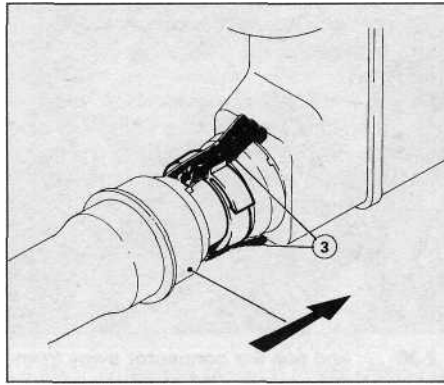
13 Pull the hose, complete with the connector, from the radiator.



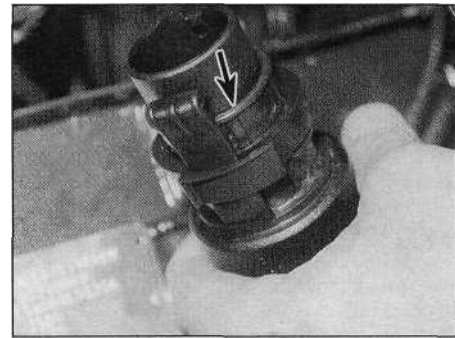
2.5 Disconnecting the radiator top hose



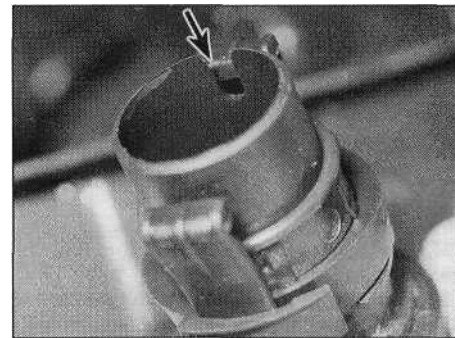
2.11 To release the radiator bottom hose connection, turn the locking ring (2) until it contacts the stop (1)



2.12 Press the connector away from the hose, to ensure that the two retaining lugs (3) are free



2.16 On refitting, fit a new O-ring (arrowed) to the hose union



2.18 Offer the hose to the radiator, with the cut-out (arrowed) at the bottom

14 Recover the O-ring from the connector, and discard it; a new one must be used on refitting.

Refitting

15 Wipe the connector and the stub on the radiator thoroughly with a clean, lint-free cloth.

16 Fit a new O-ring to the male half of the connector, ensuring that it is correctly seated (see illustration).

17 Turn the locking ring clockwise until it clicks.

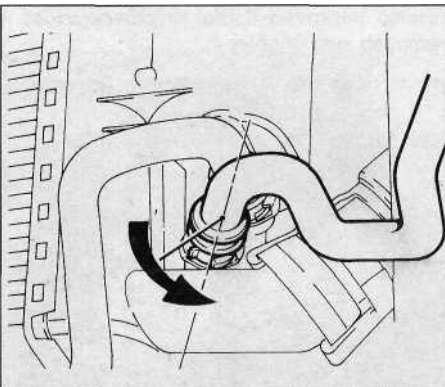
18 Offer the hose to the stub on the radiator, with the locating cut-out in the male part of the connector located at the bottom (see illustration).

19 Push the connector into the stub until both the retaining lugs click into position. Make sure that the O-ring is not trapped.

20 Pull the connector rearwards (away from the stub) to adjust the position of the retaining lugs if necessary.

21 Refill the cooling system with reference to Chapter 1.

22 Check thoroughly for leaks as soon as possible after disturbing any part of the cooling system.



2.24 To release the radiator bypass hose, turn the connector on the end of the hose anti-clockwise

Radiator bypass hose connection Removal

23 The hose is secured by means of a bayonet-fit connector.

24 Turn the connector on the end of the hose anti-clockwise as far as it will go (see illustration).

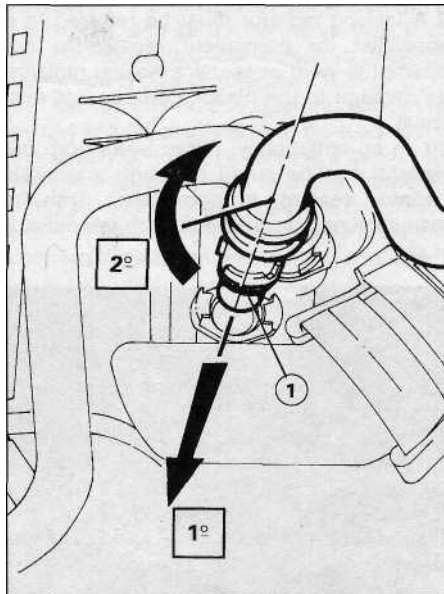
25 Rock the connector back and forth to release it from the radiator outlet. Remove the O-ring, and discard it; a new one must be used on refitting.

Refitting

26 Wipe the connector and the stub on the radiator thoroughly with a clean, lint-free cloth.

27 Fit a new O-ring to the male half of the connector.

28 Offer the connector to the outlet on the radiator, and twist anti-clockwise to engage



2.28 On refitting, engage the guide rails (1) with the lugs on the radiator, then twist the hose end in a clockwise direction

the guide rails on the connector with the lugs on the radiator (see illustration).

29 Push the connector fully home to compress the O-ring.

30 Turn the connector clockwise as far as the stop.

31 Refill the cooling system with reference to Chapter 1.

32 Check thoroughly for leaks as soon as possible after disturbing any part of the cooling system.

Heater matrix hose connections

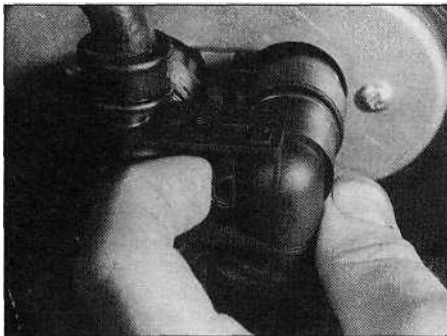
Removal

33 The two hoses are connected to the matrix by means of a single connector.

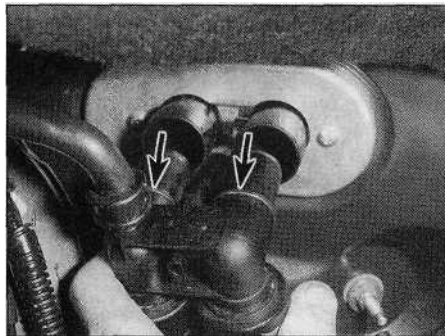
34 Prise the metal retaining clip from the top of the connector (see illustration).



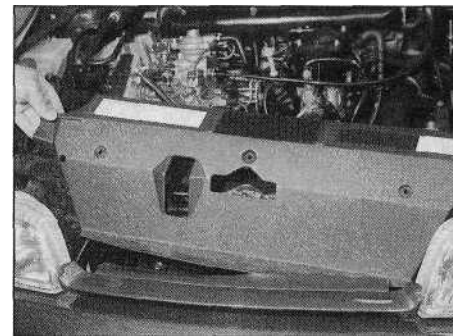
2.34 Remove the metal clip from the top of the heater matrix connector on the engine compartment bulkhead ...



2.35 ... then release the plastic retaining clip ...



2.36 ... and pull the connector away from the bulkhead - recover the O-rings (arrowed)



3.3 Removing the cover panel from the radiator

35 Release the plastic retaining clip by pushing it towards the left-hand hose connection (**see illustration**).

36 Pull the connector assembly from the heater matrix. Recover the O-ring seals from the connector, and discard them; new ones should be used on refitting (**see illustration**).

Refitting

37 Refitting is a reversal of the removal procedure, using new O-rings.

38 Refill the cooling system with reference to Chapter 1.

39 Check thoroughly for leaks as soon as possible after disturbing any part of the cooling system.

3 Radiator - removal, inspection and refitting

Note: New sealing rings must be used when reconnecting the radiator lower hoses - see Section 2. If leakage is the reason for removing the radiator, bear in mind that minor leaks can often be cured using a radiator sealant with the radiator *in situ*.

Removal

1 Disconnect the battery negative lead.

2 Drain the cooling system as described in Chapter 1.

3 Undo the three retaining screws, and remove the plastic cover panel from above the radiator (**see illustration**).



3.4 Disconnecting the cooling fan switch wiring plug

4 Disconnect the wiring plug from the cooling fan switch (where fitted) on the left-hand side of the radiator (**see illustration**).

5 Disconnect the radiator upper hose(s) (left-hand side), and the lower hoses (right-hand side), with reference to Section 2.

6 Depress the two retaining clips, located at the top ends of the radiator, then carefully lift the radiator from the vehicle. Note the locating lugs at the bottom of the radiator, which locate in the mounting rubbers in the lower body panel (**see illustrations**).

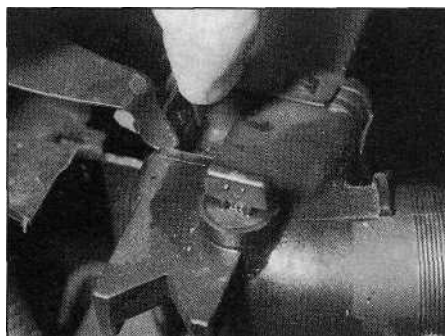
Inspection

7 If the radiator has been removed due to suspected blockage, reverse-flush it as described in Chapter 1. Clean dirt and debris from the radiator fins, using an air line (in which case, wear eye protection) or a soft brush. Be careful, as the fins are sharp, and easily damaged.

8 If necessary, a radiator specialist can perform a "flow test" on the radiator, to establish whether an internal blockage exists.

9 A leaking radiator must be referred to a specialist for permanent repair. Do not attempt to weld or solder a leaking radiator, as damage to the plastic components may result.

10 In an emergency, minor leaks from the radiator can be cured by using a suitable radiator sealant, in accordance with its manufacturer's instructions, with the radiator *in situ*.



3.6a Depress the retaining clips ...

11 If the radiator is to be sent for repair or renewed, remove all hoses, and the cooling fan switch (where fitted).

12 Inspect the condition of the radiator mounting rubbers, and renew them if necessary.

Refitting

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

- Ensure that the lower lugs on the radiator are correctly engaged with the mounting rubbers in the body panel.
- Reconnect the hoses with reference to Section 2, using new O-rings where applicable.
- On completion, refill the cooling system as described in Chapter 1.

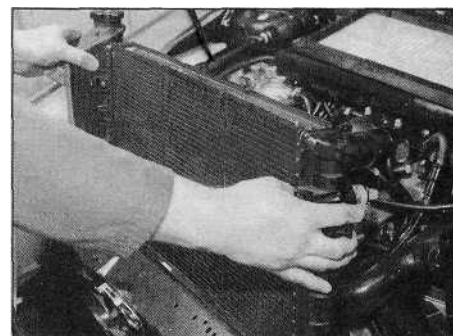
4 Thermostat - removal, testing and refitting

Removal

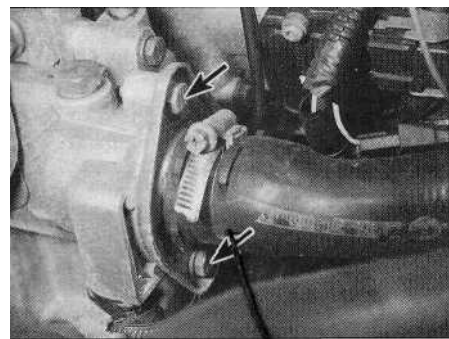
1 Disconnect the battery negative lead.

2 Drain the cooling system as described in Chapter 1.

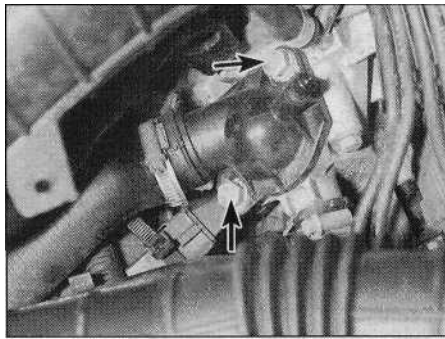
3 Where necessary, release any relevant wiring and hoses from the retaining clips, and position clear of the thermostat housing to improve access. On 1905 cc models, access is also improved if the air cleaner duct is removed (see Chapter 4).



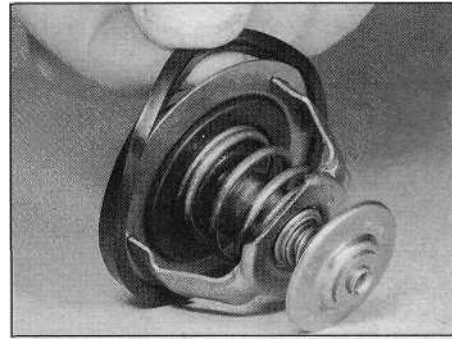
3.6b ... and withdraw the radiator



4.4a Thermostat housing cover retaining bolts (arrowed) - 1360 cc models



4.4b Thermostat housing cover retaining bolts (arrowed) - 1905 cc models



4.5 Removing the sealing ring from the thermostat flange

4 Unscrew the retaining bolts, and carefully withdraw the thermostat housing cover to expose the thermostat. Take care not to strain the coolant hoses connected to the cover (see illustrations).

5 Lift the thermostat from the housing, and recover the sealing ring(s) (see illustration).

Testing

6 A rough test of the thermostat may be made by suspending it with a piece of string in a container full of water. Heat the water to bring it to the boil - the thermostat must open by the time the water boils. If not, renew it.

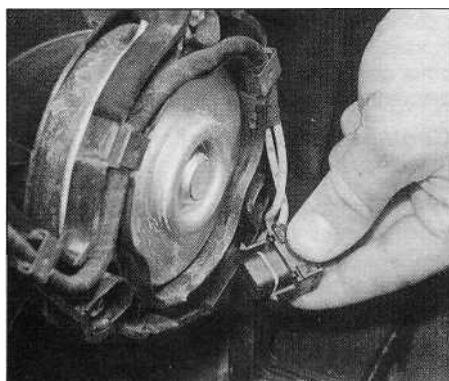
7 If a thermometer is available, the precise opening temperature of the thermostat may be determined; compare with the figures given in the Specifications. The opening temperature is also marked on the thermostat.

8 A thermostat which fails to close as the water cools must also be renewed.

Refitting

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

- (a) *Examine the sealing rings for signs of damage or deterioration, and if necessary, renew.*
- (b) *Ensure that the thermostat is fitted the correct way round, with the spring(s) facing into the housing.*
- (c) *On completion, refill the cooling system as described in Chapter 1.*



5.6 Disconnecting the wiring plug from a cooling fan

5 Electric cooling fan(s) - testing, removal and refitting

Testing

1 Current supply to the cooling fan(s) is via the ignition switch (see Chapter 5) and a fuse (see Chapter 12). The circuit is completed by the cooling fan thermostatic switch, which (on most models) is mounted in the left-hand side of the radiator. On models with air conditioning, the cooling fans are controlled by the "Bitron" sensor - see Section 6.

2 If a fan does not appear to work, run the engine until normal operating temperature is reached, then allow it to idle. The fan should cut in within a few minutes (before the temperature gauge needle enters the red section, or before the coolant temperature warning light comes on). If not, switch off the ignition and disconnect the wiring plug from the cooling fan switch. Bridge the two contacts in the wiring plug using a length of spare wire, and switch on the ignition. If the fan now operates, the switch is probably faulty, and should be renewed.

3 If the fan still fails to operate, check that battery voltage is available at the feed wire to the switch; if not, then there is a fault in the feed wire (possibly due to a fault in the fan motor, or a blown fuse). If there is no problem with the feed, check that there is continuity between the switch earth terminal and a good

earth point on the body; if not, then the earth connection is faulty, and must be re-made.

4 If the switch and the wiring are in good condition, the fault must lie in the motor itself. The motor can be checked by disconnecting it from the wiring loom, and connecting a 12-volt supply directly to it.

Removal

5 Remove the radiator as described in Section 3.

6 Disconnect the wiring plug from the rear of the motor (see illustration).

7 On models with a plastic radiator shroud (both single- and twin-fan arrangements), unscrew the three motor retaining nuts, rotating the fan blades as necessary so that the bolts can be counterheld from the front as the nuts are unscrewed. Withdraw the motor assembly, complete with the fan, from the front of the vehicle (see illustration).

8 On models with a single cooling fan where the motor is secured to the body by a metal frame, undo the retaining bolts, then remove the motor and mounting frame from the vehicle.

9 If desired, the fan blades can be removed from the motor shaft, after its retaining screw or clip (as applicable) has been removed.

10 If the motor is faulty, the complete unit must be renewed, as no spares are available.

Refitting

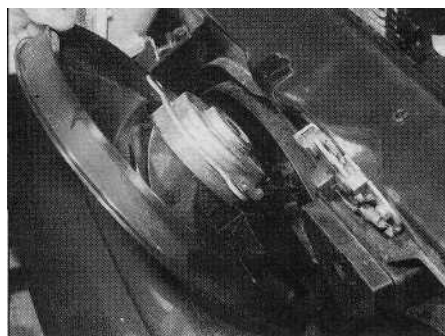
11 Refitting is a reversal of removal. Refit the radiator as described in Section 3.

6 Cooling system electrical switches and sensors - testing, removal and refitting

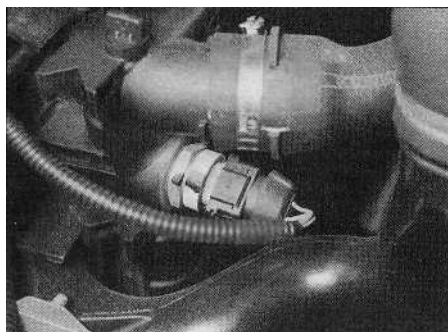
Electric cooling fan thermostatic switch - models without air conditioning

Testing

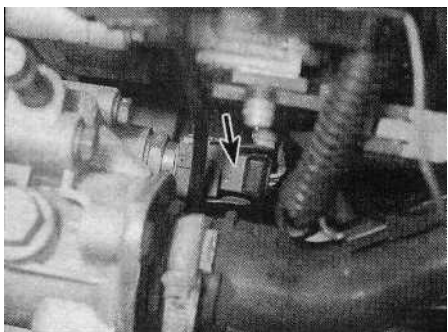
1 Testing of the switch is described in Section 5, as part of the electric cooling fan test procedure.



5.7 Withdrawing a cooling fan motor assembly - twin-fan arrangement



6.2 Electric cooling fan thermostatic switch - models without air conditioning



6.12 Coolant temperature gauge/warning light sender (arrowed) -1360 cc models

Removal

2 The switch is located in the left-hand side of the radiator (**see illustration**). The engine and radiator should be cold before removing the switch.

3 Disconnect the battery negative lead.

6 Partially drain the cooling system to just below the level of the switch (as described in Chapter 1). Alternatively, have ready a suitable bung to plug the switch aperture in the radiator when the switch is removed. If this method is used, take great care not to damage the radiator, and do not use anything which will allow foreign matter to enter the radiator.

5 Disconnect the wiring plug from the switch. **6** Carefully unscrew the switch from the radiator, and recover the sealing ring (where applicable). If the system has not been drained, plug the switch aperture to prevent further coolant loss.

Refitting

7 If the switch was originally fitted using sealing compound, clean the switch threads thoroughly, and coat them with fresh sealing compound.

8 If the switch was originally fitted using a sealing ring, use a new sealing ring on refitting.

9 Refitting is a reversal of removal. Tighten the switch to the specified torque, and refill (or top-up) the cooling system as described in Chapter 1.

10 On completion, start the engine and run it until it reaches normal operating temperature. Continue to run the engine, and check that the cooling fan cuts in and out correctly.

Electric cooling fan thermostatic switch - models with air conditioning

11 The cooling fans are controlled by the "Bitron" sensor. This is located in the thermostat housing, which is bolted onto the left-hand end of the cylinder head - see paragraphs 20 to 22.

Coolant temperature gauge/temperature warning light sender

Testing

Note: On models with air conditioning, the sender provides a signal to the gauge only. The coolant temperature warning light is operated by the "Bitron" temperature sensor described later in this Section.

12 The coolant temperature gauge/warning light sender is screwed into the thermostat housing, which is bolted onto the left-hand end of the cylinder head. The sender can be identified by its blue wiring connector (**see illustration**).

13 The temperature gauge (where fitted) is fed with a stabilised voltage from the instrument panel feed (via the ignition switch and a fuse). The gauge earth is controlled by the sender. The sender contains a thermistor - an electronic component whose electrical resistance decreases at a predetermined rate as its temperature rises. When the coolant is cold, the sender resistance is high, current flow through the gauge is reduced, and the gauge needle points towards the blue (cold) end of the scale. As the coolant temperature rises and the sender resistance falls, current flow increases, and the gauge needle moves towards the upper end of the scale. If the sender is faulty, it must be renewed.

14 On models with a temperature warning light, the light is fed with a voltage from the instrument panel. The light earth is controlled by the sender. The sender is effectively a switch, which operates at a predetermined temperature to earth the light and complete the circuit. If the light is fitted in addition to a gauge, the senders for the gauge and light are incorporated in a single unit, with two wires, one each for the light and gauge earths. On models with air conditioning, the light is operated via the "Bitron" sensor - see paragraphs 20 to 22.

15 If the gauge develops a fault, first check the other instruments; if they do not work at all, check the instrument panel electrical feed. If the readings are erratic, there may be a fault in the voltage stabiliser, which will necessitate renewal of the stabiliser (the stabiliser is integral with the instrument panel printed circuit board - see Chapter 12). If the fault lies in the temperature gauge alone, check it as follows.

16 If the gauge needle remains at the "cold" end of the scale when the engine is hot, disconnect the sender wiring plug, and earth the relevant wire to the cylinder head. If the needle then deflects when the ignition is switched on, the sender unit is proved faulty, and should be renewed. If the needle still does not move, remove the instrument panel (Chapter 12) and check the continuity of the wire between the sender unit and the gauge, and the feed to the gauge unit. If continuity is shown, and the fault still exists, then the gauge is faulty, and the gauge unit should be renewed.

17 If the gauge needle remains at the "hot" end of the scale when the engine is cold, disconnect the sender wire. If the needle then returns to the "cold" end of the scale when the ignition is switched on, the sender unit is proved faulty, and should be renewed. If the needle still does not move, check the remainder of the circuit as described previously.

18 The same basic principles apply to testing the warning light. The light should illuminate when the relevant sender wire is earthed.

Removal and refitting

19 The procedure is similar to that described previously in this Section for the electric cooling fan thermostatic switch. On some models, access to the switch is very poor, and other components may need to be removed before the sender unit can be reached.

"Bitron" temperature sensor - models with air conditioning

Testing

20 The sensor forms part of the air conditioning "Bitron" control system (see Section 11). Testing of the sensor should be entrusted to a Citroen dealer.

Removal and refitting

21 The "Bitron" temperature sensor is screwed into the thermostat housing, which is bolted onto the left-hand end of the cylinder head. The sensor can be identified by its brown wiring connector.

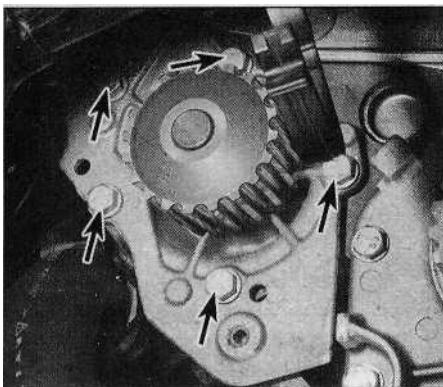
22 The procedure is similar to that described previously in this Section for the electric cooling fan thermostatic switch. On some models, access to the switch is very poor, and other components may need to be removed before the sender unit can be reached.

Coolant temperature sensor - fuel injection models

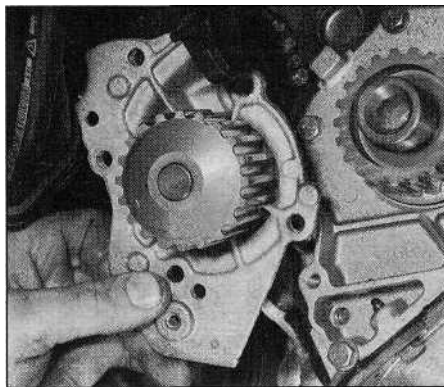
Testing

23 The fuel injection system coolant temperature sensor is screwed into the thermostat housing, which is bolted onto the left-hand end of the cylinder head. The sensor can be identified by its green wiring connector.

24 The sensor is a thermistor (see paragraph 13). The fuel injection/engine management ECU supplies the sensor with a



7.3a On 1580 cc and larger-engined models, unscrew the retaining bolts (arrowed)...



7.3b ... and remove the coolant pump

set voltage and then, by measuring the current flowing in the sensor circuit, it determines the engine's temperature. This information is then used, in conjunction with other inputs, to control the injector opening time (pulse width). On some models, the idle speed and/or ignition timing settings are also temperature-dependent.

25 If the sensor circuit should fail to provide adequate information, the ECU's back-up facility will override the sensor signal. In this event, the ECU assumes a predetermined setting which will allow the fuel injection/engine management system to run, albeit at reduced efficiency. When this occurs, the warning light on the instrument panel will come on, and the advice of a Citroen dealer should be sought. The sensor itself can only be tested using special Citroen diagnostic equipment. *Do not* attempt to test the circuit using any other equipment, as there is a high risk of damaging the ECU.

Removal and refitting

26 The procedure is similar to that described previously in this Section for the electric cooling fan thermostatic switch. On some models, access to the switch is very poor, and certain components may need to be removed before the sensor can be reached.

7 Coolant pump - removal and refitting

Removal

1 Drain the cooling system as described in Chapter 1.
2 Remove the timing belt as described in Chapter 2.
3 Slacken and remove the retaining bolts, and withdraw the pump from the cylinder block (*see illustrations*). Recover the pump O-ring (1124 cc and 1360 cc models) or gasket (1580 cc and larger-engined models). A new O-ring or gasket should be used on refitting.

Refitting

4 Ensure that the mating surfaces of the

pump and the cylinder block are clean and dry.

5 On 1124 cc and 1360 cc models, fit a new O-ring to the rear of the pump. Refit the pump to the engine, and tighten its retaining bolts to the specified torque.

6 On 1580 cc and larger-engined models, position a new gasket on the rear of the pump. Offer the pump to the engine, ensuring that the gasket remains correctly positioned. Install the pump retaining bolts, and tighten them to the specified torque.

7 Refit the timing belt as described in Chapter 2.

8 Refill the cooling system as described in Chapter 1.

8 Heating and ventilation system - general information

1 The heating/ventilation system consists of a four-speed blower motor (housed behind the fascia), face level vents in the centre and at each end of the fascia, and air ducts to the front footwells.

2 The control unit is located in the fascia, and the controls operate flap valves to deflect and mix the air flowing through the various parts of the heating/ventilation system. The flap valves

are contained in the air distribution housing, which acts as a central distribution unit, passing air to the various ducts and vents.

3 Cold air enters the system through the grille at the rear of the engine compartment. If required, the airflow is boosted by the blower, and then flows through the various ducts, according to the settings of the controls. Stale air is expelled through ducts at the rear of the vehicle. If warm air is required, the cold air is passed over the heater matrix, which is heated by the engine coolant.

4 On models fitted with air conditioning, a recirculation switch enables the outside air supply to be closed off, while the air inside the vehicle is recirculated. This can be useful to prevent unpleasant odours entering from outside the vehicle, but should only be used briefly, as the recirculated air inside the vehicle will soon become stale.

9 Heater/ventilation components - removal and refitting

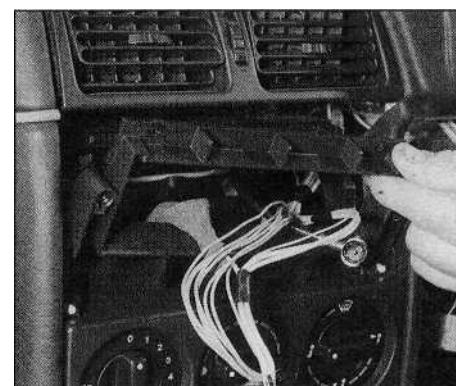
Heater/ventilation control unit

Removal

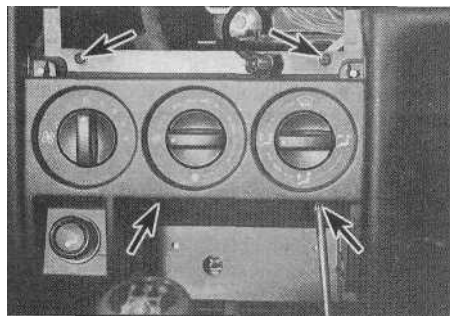
1 Disconnect the battery negative lead.
2 Remove the centre console as described in Chapter 11. On lower-specification models where no centre console is fitted, undo the retaining screws and remove the heater duct cover (where fitted) from the centre of the fascia assembly.
3 Where a radio/cassette player is fitted, remove it as described in Chapter 12, then undo the two retaining screws and remove the mounting bracket from the radio aperture (*see illustrations*). Where no radio/cassette player is fitted, carefully prise out the storage box from the centre of the fascia panel.
4 Undo the four centre vent panel retaining screws (two located above the heater controls, and two directly below), then unclip the panel and withdraw it from the fascia. Disconnect the wiring connectors from the cigarette lighter and ashtray illumination bulb,



9.3a Undo the two retaining screws (arrowed)...



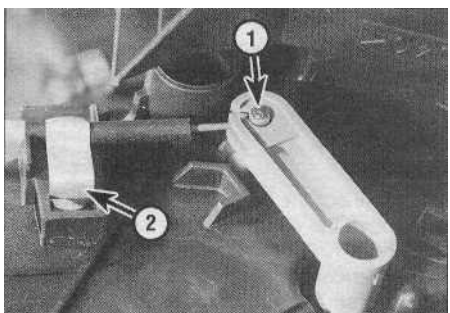
9.3b ... and remove the mounting bracket from the radio aperture



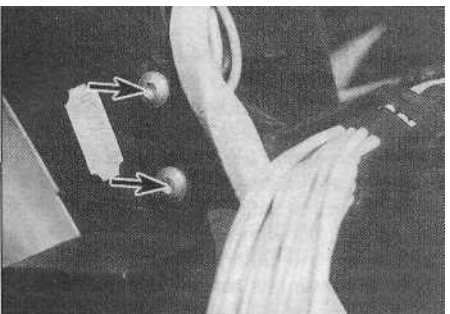
9.4a Undo the four centre vent panel retaining screws (arrowed)...

and remove the centre vent panel assembly from the vehicle (**see illustrations**).

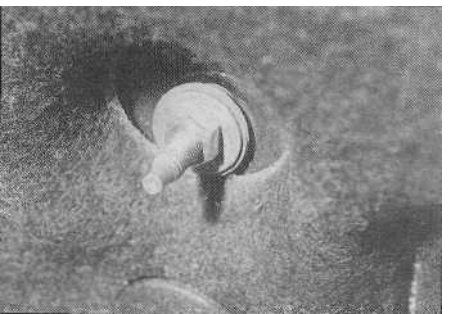
5 Undo the two heater control panel retaining screws, then release the lower panel retaining clip and manoeuvre the panel out from the centre of the facia (**see illustration**).



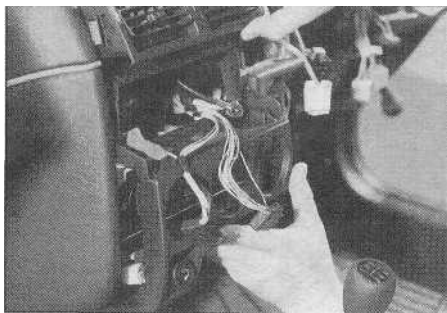
9.9 Control cable connection (1) and retaining clip (2) at heater assembly



9.12 Heater unit wiring bracket retaining screws (arrowed)



9.15 Heater unit retaining nut on engine compartment bulkhead



9.4b ... and withdraw the panel from the facia

6 Disconnect the control cables and the wiring connector(s) from the rear of the heater control panel, noting their locations, and withdraw the panel from the vehicle.

Refitting

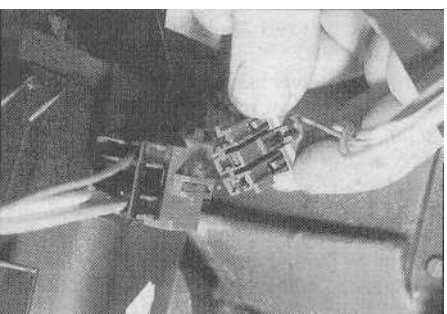
7 Refitting is reversal of removal, bearing in mind the following points:

- Ensure that the control cables are correctly reconnected to the control panel, as noted before removal.
- Refit the radio/cassette player with reference to Chapter 12.

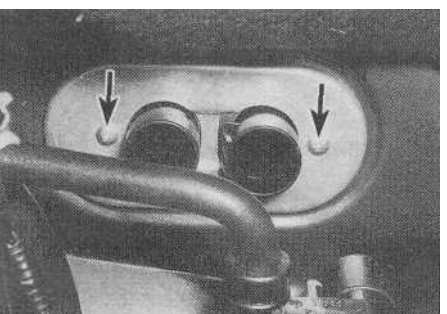
Heater/ventilation control cables Removal

8 Remove the complete heater assembly as described later in this Section.

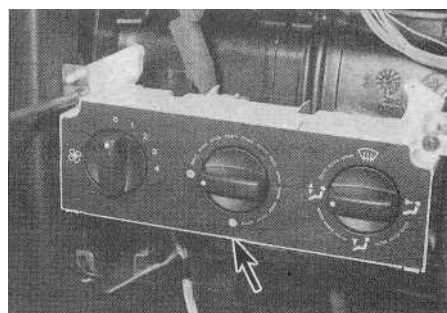
9 The cables can now be disconnected from the heater assembly and the heater control panel (**see illustration**). Note the locations of the cables before disconnecting them.



9.13 Disconnect the wiring plug from the right-hand side of the heater



9.17a Remove the two retaining screws (arrowed)...



9.5 Undo the heater panel retaining screws, and release the clip (arrowed)

Refitting

10 Refitting is a reversal of removal.

Heater matrix Removal

11 Remove the facia assembly as described in Chapter 11.

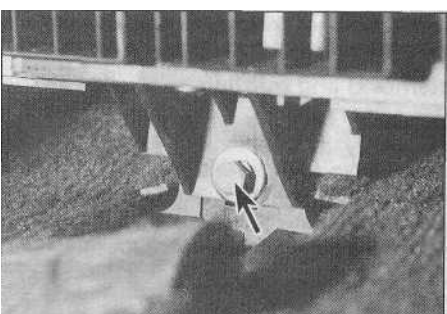
12 Remove the retaining screws, and release the wiring retaining brackets from the top of the heater unit, noting their locations (**see illustration**).

13 Working inside the vehicle, disconnect the wiring plug from the right-hand side of the heater unit (**see illustration**).

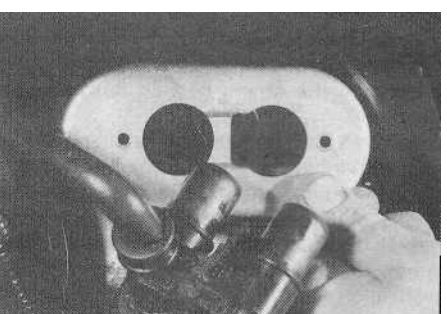
14 Remove the heater assembly lower retaining bolt (**see illustration**).

15 Working in the engine compartment, remove the two heater unit retaining nuts from the bulkhead (below the heater matrix hose connector), and recover the washers (**see illustration**).

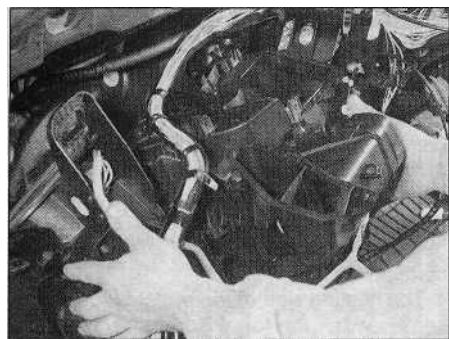
16 Drain the cooling system as described in



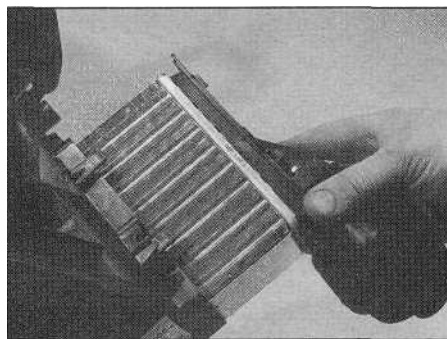
9.14 Heater assembly lower retaining bolt (arrowed)



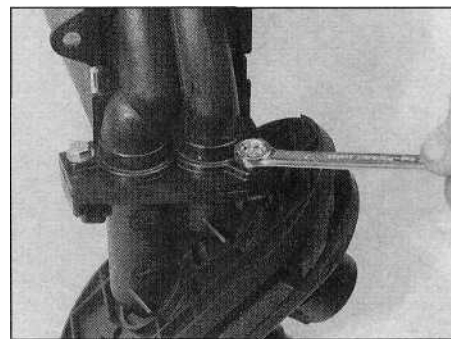
9.17b ... and withdraw the retaining plate from the bulkhead



9.18 Withdrawing the heater unit



9.19 Withdrawing the heater matrix from the heater assembly



9.20a Undo the retaining bolts .

Chapter 1. Disconnect the heater hose connector from the heater matrix, with reference to Section 2.

17 Remove the two retaining screws, and withdraw the retaining plate from the heater matrix hose connector (**see illustration**).

18 Working inside the vehicle, withdraw the heater unit, complete with the control panel (**see illustration**). Be careful not to spill coolant inside the car.

19 Remove the retaining screws, where applicable, then release the clips and withdraw the heater matrix from the heater assembly (**see illustration**).

Refitting

20 Refitting is a reversal of the removal procedure, bearing in mind the following points:

- (a) *If a new matrix is to be fitted, unbolt the hose connector elbow from the old matrix, and fit it to the new matrix using new O-rings (**see illustrations**).*
- (b) *Reconnect the heater hoses to the matrix with reference to Section 2.*
- (c) *Refit the fascia assembly as described in Chapter 11.*
- (d) *Refill the cooling system as described in Chapter 1.*

Heater blower motor

Removal

21 Working inside the vehicle, remove the fascia felt undercover and the driver's side

lower fascia panel (left-hand-drive models) or the glovebox (right-hand-drive models), as applicable, with reference to Chapter 11.

22 Unscrew the three blower motor retaining screws, and lower the assembly from the fascia (**see illustration**).

23 Pull off the cover and disconnect the two wiring plugs, then withdraw the assembly from the vehicle (**see illustration**).

Refitting

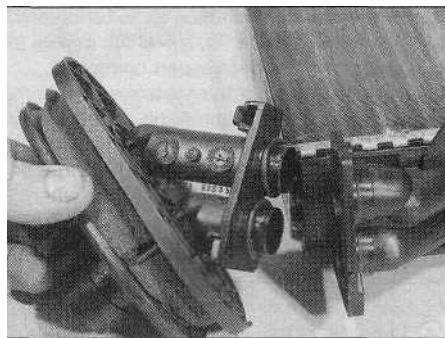
24 Refitting is a reversal of removal.

Heater blower motor resistor

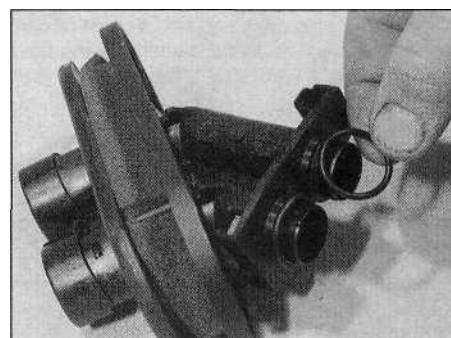
Removal

25 Disconnect the battery negative lead.

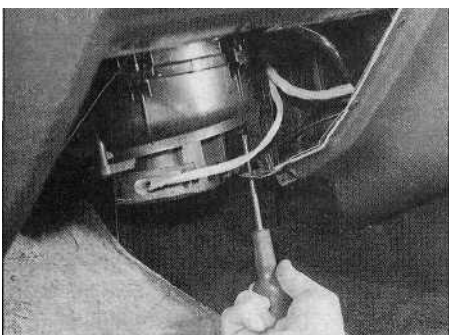
26 Remove the wiper arm as described in Chapter 12.



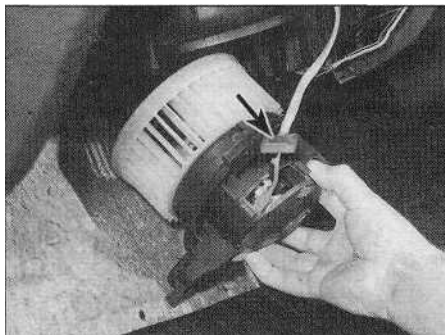
9.20b ... and remove the hose connector elbow from the old heater matrix



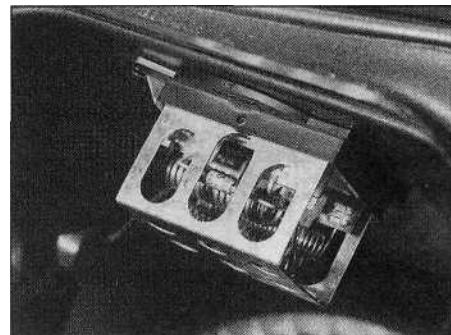
9.20c Fit the elbow to the new matrix, using new O-rings



9.22 Unscrewing a heater blower motor retaining screw



9.23 Pull off the cover (arrowed) and disconnect the wiring plugs



9.29a To remove the heater blower motor resistor...

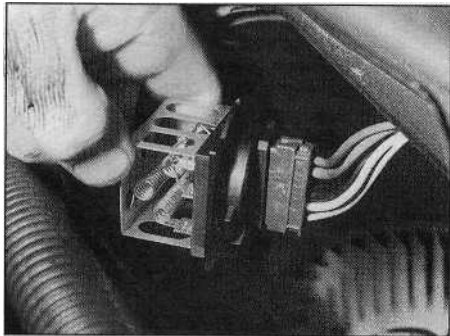
27 Open the bonnet, and remove the six wiper motor cover/vent panel retaining screws. Carefully ease the cover out from behind the windscreen sealing strip. Disengage its front locating pegs, and manoeuvre the panel away from the vehicle.

28 Remove the plastic cover from the heater blower motor intake duct.

29 Twist the resistor anti-clockwise to release it from the bracket, then disconnect the wiring plug and withdraw the unit (**see illustrations**). Tie a piece of string to the wiring connector, to prevent it falling back out of the duct.

Refitting

30 Refitting is a reversal of removal, refitting the wiper arm with reference to Chapter 12.



9.29b ... twist the unit anti-clockwise and disconnect the wiring plug

Complete heater assembly


Removal

31 Removal of the complete heater assembly is described in paragraphs 11 to 18, as part of the heater matrix removal and refitting procedure.

Refitting

32 Refitting is a reversal of removal, with reference to paragraph 20.

10 Heater vents -
removal and refitting



Facia side vents

Removal

1 Carefully release the relevant vent from the facia, using a screwdriver (with a piece of card under the blade to avoid damage to the facia trim), then withdraw the vent (see illustration).

Refitting

2 Simply push the nozzle into its housing in the facia, ensuring that it is correctly engaged with the heater duct, until the retaining lugs click into place.



10.1 Withdrawing a facia side vent

Facia centre vents

Removal


3 Remove the centre vent panel from the facia as described in Section 9, paragraphs 1 to 4.

4 Working at the rear of the centre vent panel, remove the retaining screws, then withdraw the vent assembly from the panel.

Refitting

5 Refitting is a reversal of removal.

11 Air conditioning system -
general information and
precautions



General information

1 An air conditioning system is available on certain models (see illustration). It enables the temperature of incoming air to be lowered, and also dehumidifies the air, which makes for rapid demisting and increased comfort.

2 The cooling side of the system works in the same way as a domestic refrigerator. Refrigerant gas is drawn into a belt-driven compressor, and passes into a condenser mounted on the front of the radiator, where it loses heat and becomes liquid. The liquid passes through an expansion valve to an

evaporator, where it changes from liquid under high pressure to gas under low pressure. This change is accompanied by a drop in temperature, which cools the evaporator. The refrigerant returns to the compressor, and the cycle begins again.


3 Air blown through the evaporator passes to the air distribution unit, where it is blown through the heater matrix to achieve the desired temperature in the passenger compartment.

4 The heating side of the system works in the same way as on models without air conditioning (see Section 8).

5 The operation of the system is controlled electronically by the "Bitron" control unit, which controls the electric cooling fan(s), the compressor, and the facia-mounted warning light. Any problems with the system should be referred to a Citroen dealer.

Precautions

6 When an air conditioning system is fitted, it is necessary to observe special precautions whenever dealing with any part of the system, or its associated components. If for any reason the system must be disconnected, entrust this task to your Citroen dealer or a refrigeration engineer.





Warning: The refrigeration circuit contains a liquid refrigerant (Freon), and it is therefore dangerous to disconnect any part of the system without specialised knowledge and equipment.

7 The refrigerant is potentially dangerous, and should only be handled by qualified persons. If it is splashed onto the skin, it can cause frostbite. It is not itself poisonous, but in the presence of a naked flame (including a cigarette) it forms a poisonous gas. Uncontrolled discharging of the refrigerant is dangerous, and potentially damaging to the environment.

8 Do not operate the air conditioning system if it is known to be short of refrigerant, as this may damage the compressor.

12 Air conditioning system
components -
removal and refitting





Warning: Do not attempt to open the refrigerant circuit. Refer to the precautions given in Section 11.

1 The only operation which can be carried out easily without discharging the refrigerant is renewal of the compressor drivebelt. This is described in Chapter 1, Section 21. (The "Bitron" temperature sensor may be renewed using the information in Section 6.) All other operations must be referred to a Citroen dealer or an air conditioning specialist.

2 If necessary, the compressor can be unbolted and moved aside, without disconnecting its flexible hoses, after removing the drivebelt.

