






# Chapter 3

## Cooling, heating and ventilation systems

### Contents

Air conditioning system - general information and precautions . . . . .	10	Cooling system - flushing . . . . .	See Chapter 1
Air conditioning system components - removal and refitting . . . . .	11	Cooling system hoses - disconnection and renewal . . . . .	2
Antifreeze mixture . . . . .	See Chapter 1	Electric cooling fan(s) - testing, removal and refitting . . . . .	5
Coolant pump - removal and refitting . . . . .	7	General information and precautions . . . . .	1
Coolant level check . . . . .	See "Weekly checks"	Heating and ventilation system - general information . . . . .	8
Cooling system electrical switches and sensors - testing, removal and refitting . . . . .	6	Heater/ventilation components - removal and refitting . . . . .	9
Cooling system - draining . . . . .	See Chapter 1	Pollen filter renewal . . . . .	See Chapter 1
Cooling system - filling . . . . .	See Chapter 1	Radiator - removal, inspection and refitting . . . . .	3
		Thermostat - removal, testing and refitting . . . . .	4

### Degrees of difficulty

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

#### Thermostat

##### Opening temperatures:

##### Starts to open:

1360 cc engines . . . . .	88°C
1580 cc engines:	
All except B2A (XU52C) and BDY (XU5M) engines . . . . .	88°C
B2A (XU52C) and BDY (XU5M) engines . . . . .	82°C
1761 cc engines . . . . .	88°C
1905 cc engines:	
All except D2H (XU92C), D5A (XU92C) and D6D (XU9J2) engines . . . . .	88°C
D2H (XU92C), D5A (XU92C) and D6D (XU9J2) engines . . . . .	82°C
1998 cc engines:	
RFX (XU10J2C) and RFX (XU10J4) engines . . . . .	89°C
RGZ (XU10J4) engine . . . . .	88°C

##### Fully open:

1360 cc engines . . . . .	100°C
1580 cc engines	
All except B2A (XU52C), B3B (XU51C) and BDY (XU5M) engines . . . . .	100°C
B2A (XU52C) engine . . . . .	93°C
B3B (XU51C) engine . . . . .	102°C
BDY (XU5M) engine . . . . .	94°C
1761 cc engines . . . . .	100°C
1905 cc engines:	
All except D2H (XU92C), D5A (XU92C) and D6D (XU9J2) engines . . . . .	100°C
D2H (XU92C) and D5A (XU92C) engines . . . . .	93°C
D6D (XU9J2) engine . . . . .	94°C
1998 cc engines	
RFX (XU10J2C) and RFX (XU10J4) engines . . . . .	101°C
RGZ (XU10J4) engine . . . . .	100°C

#### Torque wrench settings

	Nm	lbf ft
Coolant pump housing bolts (aluminium block engine):		
Smaller bolts . . . . .	30	22
Larger bolts . . . . .	65	48
Coolant pump securing bolts (iron block engine) . . . . .	15	11

## 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, incorporated in the side of the radiator. 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 models fitted with an engine oil cooler, the coolant is also passed through the 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.**

**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.**

**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.**

**Refer to Section 10 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. 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 it 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 hose(s) - bayonet-type connection

**Note:** A new O-ring should be used when reconnecting the hose.

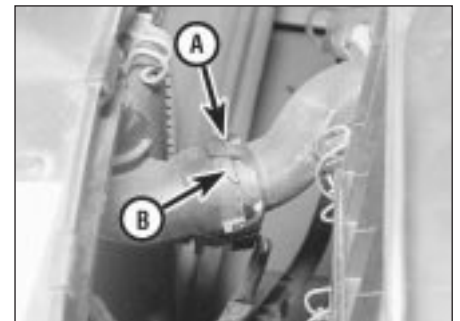
#### Removal

**11** On later models, the radiator hoses are connected to the radiator using a plastic bayonet-type connection. To disconnect this type of connector, proceed as follows.

**12** Twist the end of the hose (with the connector) anti-clockwise until the clips on the connector are clear of the retaining lugs on the radiator stub, then pull the end of the hose from the radiator. Recover the O-ring from the end of the hose connector (see illustrations).

#### Refitting

**13** Fit a new O-ring to the hose connector, then reconnect the hose using a reversal of



**2.12a** Twist the connector until the clips (A) are clear of the lugs (B)



2.12b Recover the O-ring (arrowed) from the end of the hose connector

the removal procedure. Twist the end of the hose fully clockwise to ensure that the retaining clips are engaged with the lugs on the radiator stub.

### 3 Radiator - removal, inspection and refitting

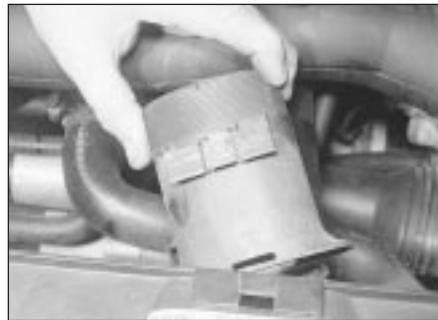


#### Removal

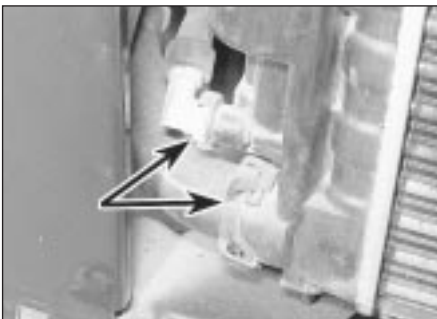
- 1 Disconnect the battery negative lead.
- 2 Where applicable, disconnect the wiring from the coolant level sensor, mounted in the right-hand side of the radiator.
- 3 Similarly, where applicable disconnect the wiring from the cooling fan switch, mounted left-hand side of the radiator.
- 4 Drain the cooling system as described in Chapter 1.
- 5 Where applicable, depress the securing



3.5a Depress the securing clip . . .



3.5b . . . and withdraw the air intake tube



3.8 Lower radiator hose connections viewed with body front panel removed



3.10 Releasing a radiator upper securing clip



3.11 Lifting out the radiator

clip, and release the air inlet tube from the body front panel, above the radiator (see illustrations).

6 Where applicable, disconnect the wiring plug and the vacuum hose from the MAP sensor, located above the radiator, then unscrew the two bolts securing the sensor mounting bracket to the body front panel, and remove the sensor.

7 Disconnect the upper radiator hose from the left-hand end of the radiator, with reference to Section 2.

8 It is now necessary to disconnect the lower radiator hose(s) from the right-hand side of the radiator. On some models, particularly those where conventional hose clips are used, this is a straightforward task. On other models (where bayonet connectors are used on a large-capacity radiator), it is impossible to gain access to the lower radiator hose connections without removing the body front panel assembly, as described in Chapter 11 (see illustration).

9 Once all the radiator hoses have been disconnected, proceed as follows.

10 If not already done, working at the top of the radiator, release the two securing clips, and tilt the radiator back towards the engine (see illustration).

11 Lift the radiator from the engine compartment (see illustration).

#### Inspection

12 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.

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

14 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.

15 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*.

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

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

#### Refitting

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

- a) Ensure that the lower lugs on the radiator are correctly engaged with the mounting rubbers in the body panel.
- b) Reconnect the hoses with reference to Section 2, using new O-rings where applicable.
- c) Where applicable, refit the body front panel assembly, referring to Chapter 11.
- d) On completion, refill the cooling system as described in Chapter 1.

### 4 Thermostat - removal, testing and refitting



3

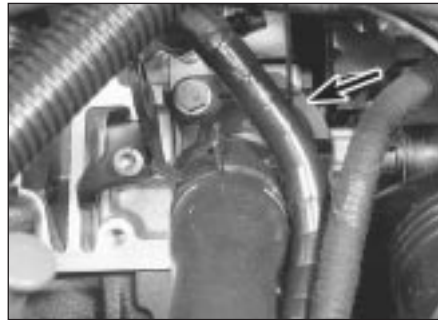
#### Removal

**Note:** A new sealing ring may be required on refitting.

- 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 some models, access is



**4.4a** Thermostat housing cover retaining bolts (arrowed) - 1.4 litre engine



**4.4b** Thermostat housing cover (arrowed) - 2.0 litre engine



**4.5** Removing the sealing ring from the thermostat flange

also improved if the air cleaner ducting is removed (see Chapter 4).

**4** Unscrew the retaining bolts, and carefully withdraw the thermostat housing cover to expose the thermostat. Take care not to strain the coolant hose(s) 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 ring(s) 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 Electric cooling fan(s) - testing, removal and refitting



### Testing

**1** Current supply to the cooling fan(s) is via the ignition switch (see Chapter 10) and a fuse (see Chapter 12). The circuit is completed by the cooling fan thermostatic switch, which (on most models) is mounted in 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.

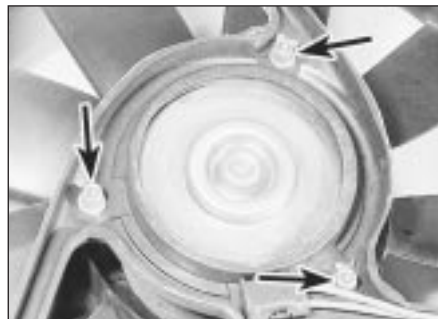
**4** If the switch and the wiring are in good condition, the fault must lie in the motor itself. The motor can be checked by disconnecting it from the wiring loom, and connecting a 12-volt supply directly to it.

### Removal

**5** Remove the radiator (see Section 3).

**6** Remove the front grille panel (Chapter 11).

**7** Working behind the fan blades, unscrew the three motor securing bolts, and withdraw the motor/fan assembly forwards from the shroud (see illustration). The plug on the motor will be released from the wiring connector as the motor is pulled forwards.



**5.7** Fan motor securing bolts (arrowed) - viewed from rear (grille panel side)

### Refitting

**8** Refitting is a reversal of removal, but refit the radiator with reference to 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.

#### Removal

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

**3** Disconnect the battery negative lead.

**4** Partially drain the cooling system to just below the level of the switch (see 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. If the system has not been drained, plug the switch aperture to prevent further coolant loss.

#### Refitting

**7** Refitting is a reversal of removal, using a new sealing ring. Tighten the switch, and refill (or top-up) the cooling system (see Chapter 1).

**8** 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

**9** On most models fitted with air conditioning, the cooling fans are controlled by the "Bitron" sensor. This is located in the thermostat

housing, and is described in more detail later in this Section.

10 On some later models with air conditioning, the cooling fan(s) is/are controlled by a switch mounted in the radiator, as described previously for models without air conditioning. It will be self-evident which type of switch is used. If no switch is fitted to the radiator, the "Bitron" sensor is used to control the fan(s).

### **Coolant temperature gauge/ temperature warning light sender**

#### **Testing**

11 The coolant temperature gauge/warning light sender is screwed into the thermostat housing.

12 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.

13 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 19 to 21.

14 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.

15 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.

16 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.

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

#### **Removal and refitting**

18 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**

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

#### **Removal and refitting**

20 The "Bitron" temperature sensor is screwed into the thermostat housing, which is bolted onto the left-hand end of the cylinder head.

21 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**

22 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.

23 The sensor is a thermistor (see paragraph 12). The fuel injection/engine management electronic control unit (ECU) supplies the sensor with a 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.

24 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 Peugeot dealer should be sought. The sensor itself can only be tested using special Peugeot 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**

25 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**



**Note:** A new pump gasket or O-ring (as applicable) will be required on refitting.

### **Removal**

1 The coolant pump is driven by the timing belt, and is bolted to the cylinder block at the timing belt end of the engine. Note that on 1.4 litre aluminium cylinder block engines, the coolant pump is bolted to a separate housing which is in turn bolted to the side of the cylinder block.

2 Drain the cooling system as described in Chapter 1.

3 Remove the timing belt as described in Chapter 2.

4 Where necessary, for access to the coolant pump, remove the timing belt tensioner and/or the rear timing belt cover as described in Chapter 2.

5 On 1.4 litre engines, support the engine by placing a trolley jack and interposed block of wood under the sump, then remove the upper engine mounting as described in Chapter 2.

6 Remove the securing bolts, and withdraw the pump from the cylinder block (access is most easily obtained from under the wheel arch). Recover the gasket or the O-ring, as applicable (see illustrations).

7 On 1.4 litre aluminium cylinder block engines, if desired, the pump impeller housing can be removed from the rear of the coolant pump housing. Access is most easily obtained from underneath the vehicle (it may be necessary to remove the exhaust heat shield). Disconnect the coolant hoses from the impeller housing (be prepared for coolant spillage), then remove the securing bolts and withdraw the impeller housing. Again, recover the O-ring.

### **Refitting**

8 Ensure that all mating faces are clean.

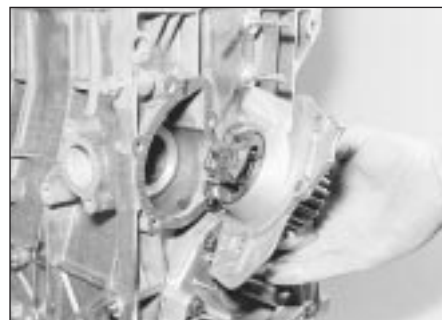
9 Where applicable, refit the impeller housing to the pump housing, using a new O-ring. Reconnect the coolant hoses.



7.6a Withdraw the coolant pump . . .



7.6b . . . and recover the O-ring - 1.4 litre engine shown



7.6c Removing the coolant pump (1.6 litre engine) - shown with engine removed

10 Refit the pump using a new gasket or O-ring, as applicable.

11 Where applicable, refit the upper engine mounting, with reference to Chapter 2, then remove the jack from under the sump.

12 Where applicable refit the rear timing belt cover and/or the timing belt tensioner with reference to Chapter 2.

13 Refit the timing belt (refer to Chapter 2).

14 Refill the cooling system (see Chapter 1).

## 8 Heating and ventilation system - general information

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

2 Two types of system are fitted to the model range. On basic specification models, the heating/ventilation system is manually-controlled. On higher specification models, the system is electronically-controlled. The components of both systems are identical, with the exception of the control unit. Additionally, on models with the electronically-controlled system, temperature sensors and a thermostat are fitted to automatically control the temperature of the air inside the vehicle according to the position of the temperature control knob.

3 The control unit is located in the facia, 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.

4 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.

5 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 - models up to 1992

#### Removal

1 Disconnect the battery negative lead.

2 Where applicable, remove the radio/cassette player as described in Chapter 12.

3 Move the steering column to its lowest position.

4 Remove the lighting control stalk switch (right-hand-drive models) or the wash/wipe

control stalk switch (left-hand-drive models), as described in Chapter 12. Note that there is no need to disconnect the switch wiring, but the switch must be moved to allow clearance for removal of the centre facia panel.

5 Unclip the trim panel from the lower edge of the instrument panel to expose the upper centre facia panel securing screw. Remove the screw (see illustration).

6 Unclip the oddsments tray from the front of the facia centre panel.

7 Unclip the ashtray and remove it from the facia.

8 Unscrew the five centre facia panel securing screws exposed by removal of the oddsments tray and ashtray (see illustration).

9 Pull the centre facia panel forwards from the facia, then reach behind the panel and disconnect the wiring from the switches, clock, and cigarette lighter, as applicable. Note the locations of the wiring connectors to ensure correct refitting, and remove the facia panel.

10 Unscrew the four heater control unit securing screws, then manipulate the unit from the facia, and disconnect the control cables and/or wiring plugs (see illustration). The cables can be disconnected after releasing the metal spring clips securing the cable sheaths to the control unit.

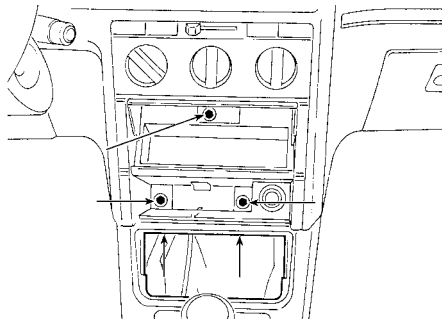
#### Refitting

11 Refitting is a reversal of removal, but note that the control cables must be reconnected in the order shown (see illustration).

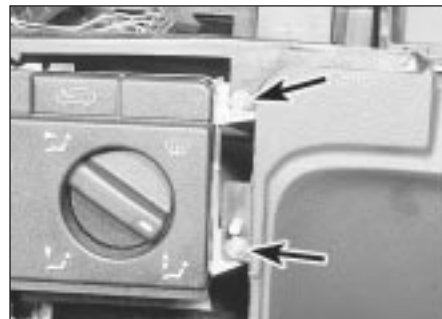
12 Refit the radio/cassette player with reference to Chapter 12.



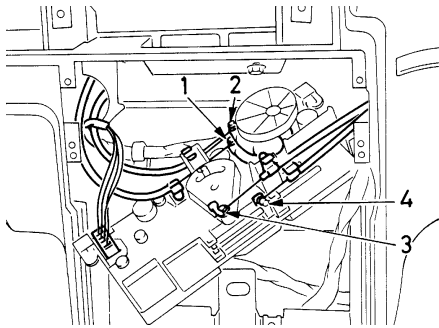
9.5 Removing the upper centre facia panel securing screw - models up to 1992



9.8 Centre facia panel securing screws (arrowed) - models up to 1992



9.10 Two heater control unit securing screws (arrowed) - models up to 1992



9.11 Heater control cables reconnection sequence - models up to 1992

### Heater/ventilation control unit - models from 1993

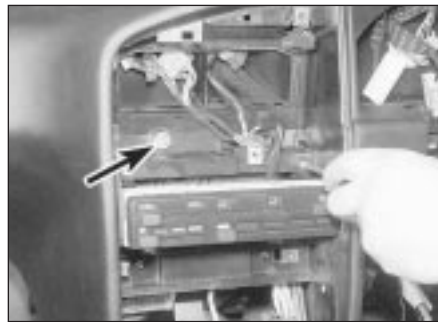
**Note:** Refer to the facia removal procedure in Chapter 11 for relevant illustrations of facia housing removal.

#### Removal

- 13 Disconnect the battery negative lead.
- 14 Remove the centre console (Chapter 11).
- 15 Open the ashtray cover, and unscrew the two screws located at the bottom of the ashtray housing.
- 16 Where applicable, remove the radio/cassette player with reference to Chapter 12. On models not fitted with a radio/cassette player, prise out the oddments tray.
- 17 Remove the two securing screws from the top of the radio/cassette player/oddments tray housing, then withdraw the housing from the facia. Where applicable, disconnect the wiring plug(s) from the rear of the housing.
- 18 Prise the blanking plate from the top corner of the facia centre ventilation nozzle housing. Remove the now-exposed securing screw.
- 19 Remove the four housing securing screws located under the heater control panel. Two screws are accessible from the front of the housing, and two screws from underneath.
- 20 Carefully prise the switches from below the centre facia ventilation nozzles to reveal the remaining housing securing screw. Remove the screw.
- 21 Pull the housing forwards, and disconnect the wiring from the clock, then withdraw the housing.



9.28 Heater control cable metal spring clip (arrowed) at heater unit



9.22 Remove the heater control unit securing screws - models from 1993

- 22 Remove the two securing screws located at the top of the heater control unit (see illustration).

23 Pull the control unit forwards from the facia.

24 Working at the top of the unit, disconnect the two control cables and the wiring plug. The cables can be disconnected after releasing the metal spring clips securing the cable sheaths to the control unit (see illustration). Note the cable locations to ensure correct refitting.

25 Working under the unit, disconnect the remaining control cable, then withdraw the unit.

#### Refitting

26 Refitting is a reversal of removal, ensuring that the cables are correctly routed and securely reconnected.

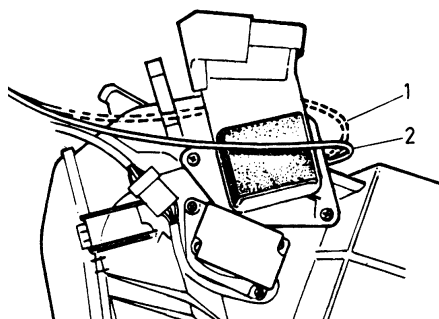
### Heater/ventilation control cables

#### Removal

27 Disconnect the cables from the heater control unit by removing the control unit as described previously in this Section.

28 With the heater control unit removed, access can be gained to the cable connections on the heater unit, behind the facia (see illustration). Access may be improved by removing surrounding panels with reference to Chapter 11.

29 Note the locations and routing of the cables to ensure correct refitting.



9.30 Correct routing of heater air inlet flap control cable - models up to 1992

1 Incorrect routing 2 Correct routing



9.24 Disconnect the control cables from the heater control unit - models from 1993

#### Refitting

30 Refitting is a reversal of removal, bearing in mind the following points.

- a) The cables are of a preset length, and no adjustment is required; small adjustments can be made by repositioning the cable sheaths in the securing clips.
- b) When reconnecting the air inlet flap cable, the cable must be routed around the air inlet duct, not behind it (see illustration).
- c) Refit the heater control unit as described previously in this Section.

### Heater matrix

#### Removal

31 Remove the complete facia assembly as described in Chapter 11.

32 Drain the cooling system (Chapter 1).



To avoid draining the cooling system, clamp the coolant hoses as close as possible to the heater matrix pipes, in the engine compartment.

3

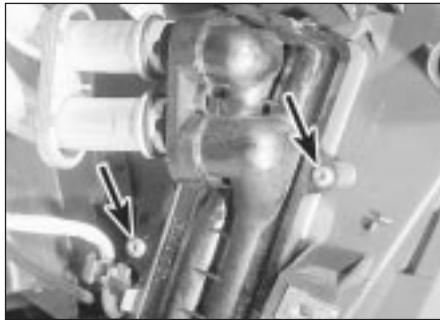
33 Place a tray under the heater pipe connections in the passenger compartment, and place absorbent cloths on the carpet, in case of coolant spillage.

34 Where applicable, unscrew the bolt securing the heater pipes.

35 Unscrew the screw(s) securing the heater pipes to the connector on the heater matrix (see illustration).



9.35 Remove the screw securing the heater pipes to the matrix connector



9.36a Remove the two securing screws . . .



9.36b . . . then withdraw the heater matrix . . .



9.36c . . . and recover the O-rings from the pipe connections

36 To remove the matrix from the heater assembly, unscrew the two securing screws, then carefully withdraw the matrix from its housing in the heater assembly, moving the heater pipes aside as the matrix is withdrawn. Recover the O-rings from the matrix pipe connections (see illustrations).

#### Refitting

37 Refitting is a reversal of removal, bearing in mind the following points.

- a) Use new O-rings when reconnecting the heater matrix pipes to the connector on the heater matrix.
- b) Refit the facia assembly (see Chapter 11).
- c) On completion, refill (or top-up) the cooling system as described in Chapter 1.

#### Complete heater assembly - models without air conditioning

#### Removal

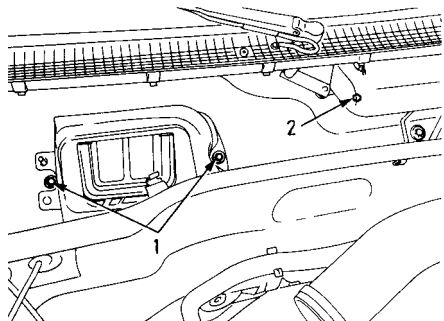
38 Remove the complete facia assembly as described in Chapter 11.



**To avoid draining the cooling system, clamp the coolant hoses as close as possible to the heater matrix pipes, in the engine compartment.**

39 Drain the cooling system (see Chapter 1).  
40 Working in the engine compartment, disconnect the coolant hoses from the heater matrix (it may be necessary to remove surrounding components for access on some models).

41 Where applicable, remove the securing



9.41 Plastic shield securing screws (1) and heater securing bolt (2)

screws, and remove the plastic shields from the heater air inlet, and the windscreen wiper motor in the scuttle at the rear of the engine compartment. This will expose the heater securing bolts (see illustration).

42 Working in the scuttle, unscrew the heater securing bolts.

43 Unclip the air ducts connecting the heater assembly to the floor heating.

44 Place a tray under the heater pipe connections in the passenger compartment, and place absorbent cloths on the carpet, in case of coolant spillage.

45 Where applicable, unscrew the bolt securing the heater pipes.

46 Unscrew the screw(s) securing the heater pipes to the connector on the heater matrix.

47 Unscrew the bolt from the lower right-hand corner of the heater unit (see illustration).

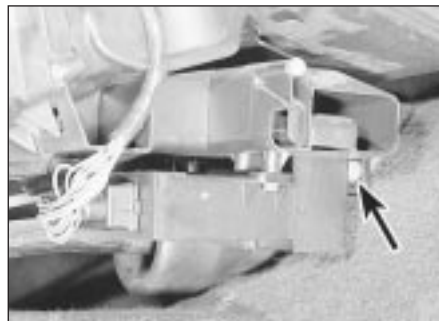
48 Disconnect the wiring plugs from the heater assembly, and release the wiring harnesses from any clips. Note the routing of the wiring to ensure correct refitting.

49 Pull the heater assembly back from the bulkhead to disengage the matrix connector from the heater pipes. Withdraw the heater assembly from the vehicle (complete with the control unit), being prepared for coolant spillage. Recover the O-rings from the matrix pipe connections.

#### Refitting

50 Refitting is a reversal of removal, bearing in mind the following points.

- a) Use new O-rings when reconnecting the heater matrix pipes to the connector on the heater matrix.



9.47 Heater unit lower right-hand securing bolt (arrowed)

- b) Ensure that the wiring harnesses are routed as noted before removal.
- c) Refit the facia assembly as described in Chapter 11.
- d) On completion, refill (or top-up) the cooling system as described in Chapter 1.

#### Complete heater assembly - models with air conditioning



**Warning: Do not attempt to remove the heater unit until the air conditioning refrigerant circuit has been discharged by a qualified expert.**

#### Removal

51 Before carrying out any work, have the air conditioning refrigerant circuit discharged by a qualified air conditioning specialist.

52 Working in the engine compartment, unscrew the nuts securing the clamp to the evaporator refrigerant pipes at the engine compartment bulkhead.

53 Slide the clamp back along the pipes, away from the bulkhead.

54 Pull the two refrigerant pipes from the relief valve on the bulkhead.

55 Proceed as described in paragraphs 38 to 49 inclusive, but note that it will be necessary to disconnect the wiring plugs from the air conditioning electrical components mounted on the heater assembly. Note the locations of the connectors, and the routing of the wiring harnesses.

56 Refitting is a reversal of removal, noting the following points.

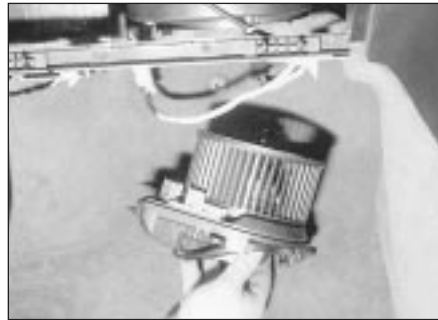
#### Refitting

57 Refitting is a reversal of removal, noting the following points.

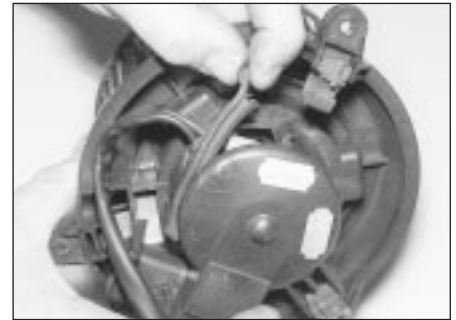
- a) Ensure that all wiring plugs are correctly reconnected, and that the wiring is routed as noted before removal.
- b) Use new O-rings when reconnecting the heater matrix pipes to the connector on the heater matrix.
- c) Use new O-rings when reconnecting the refrigerant pipes to the relief valve at the bulkhead.
- d) On completion, refill (or top-up) the cooling system as described in Chapter 1, and have the refrigerant circuit recharged by a qualified air conditioning specialist.



9.59 Disconnect the blower motor wiring plug



9.60 Withdrawing the heater blower motor



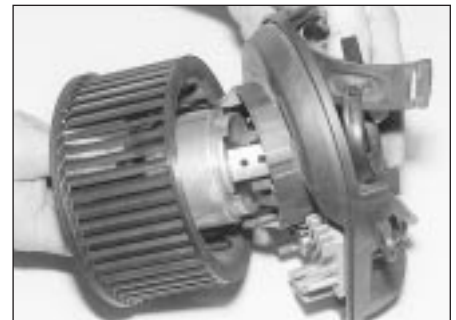
9.64 Pull the rubber grommet from the motor casing for access to the wiring



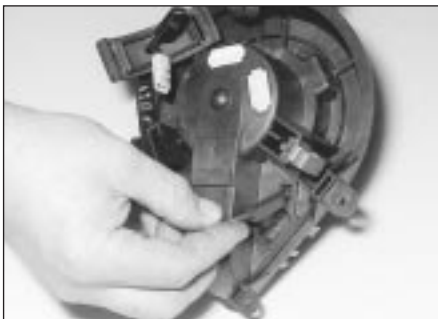
9.65a Remove the securing screws . . .



9.65b . . . and release the clips . . .



9.66 . . . then withdraw motor from casing



9.67 Disconnect the wiring plug . . .



9.68a . . . then remove the securing screws . . .



9.68b . . . and withdraw the control module

## Heater blower motor

### Removal

57 Working under the passenger's side of the fascia, release the securing clips and withdraw the carpet trim panel from under the fascia.

58 If desired, to improve access, remove the glovebox as described in Chapter 11.

59 Reach up under the fascia and disconnect the blower motor wiring plug. Where applicable, release the wiring from the clip(s) on the motor casing (see illustration).

60 Unscrew the three securing screws from the bottom of the motor casing, and withdraw the motor assembly (see illustration).

### Refitting

61 Refitting is a reversal of removal.

## Heater blower control module

### Removal

62 The control module assembly is located in the motor casing.

63 Remove the blower motor as described previously in this Section.

64 Where applicable, pull the rubber grommet from the motor casing, and disconnect the wiring from the motor (see illustration). Note the wire locations to ensure correct refitting.

65 Working through the fan blades, remove the screws, and/or release the clips securing the motor assembly to the casing (release the clips using a pair of pliers or a screwdriver, depending on the type of clip encountered) (see illustrations).

66 Withdraw the motor/fan blade assembly from the casing (see illustration).

67 Disconnect the wiring plug from the rear of the control module (see illustration).

68 Remove the two securing screws, and withdraw the control module (see illustrations).

### Refitting

69 Refitting is a reversal of removal.

## 10 Air conditioning system - general information and precautions

### General information

1 An air conditioning system is available on certain models up to 1992, and on all models from 1993. 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

## 3•10 Cooling, heating and ventilation systems

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 mixed with hot air 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 9).

**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 Peugeot 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 Peugeot dealer or a refrigeration engineer.



**Warning: The refrigeration circuit may contain 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.

## **11 Air conditioning system components - removal and refitting**



**Warning: Do not attempt to open the refrigerant circuit. Refer to the precautions given in Section 10.**

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. (The "Bitron" temperature sensor may be renewed using the information in Section 6.) All other operations must be referred to a Peugeot dealer or an air conditioning specialist.

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