

1. Engine — Cooling System

coolant hoses for porosity or other damage. Suspect hoses should always be replaced. Refit the drain plug. If the radiator has been replaced, transfer the rubber mountings to the new radiator. The thread of the temperature switch is coated with sealing compound.

The remaining installation is a reversal of the removal procedure. Finally refill the cooling system as described in 1.8.1.

1.8.3. WATER PUMP — REMOVAL AND INSTALLATION

The water pump cannot be repaired or serviced. If the pump is faulty or leaking, it should be replaced with a new unit.

The water pump is driven by a separate drive belt from the crankshaft pulley. The belt has no tensioning device, i.e. it must be "forced" off the pulleys and fitted in a similar manner. The layout of the belt is shown in Fig. 1.82.

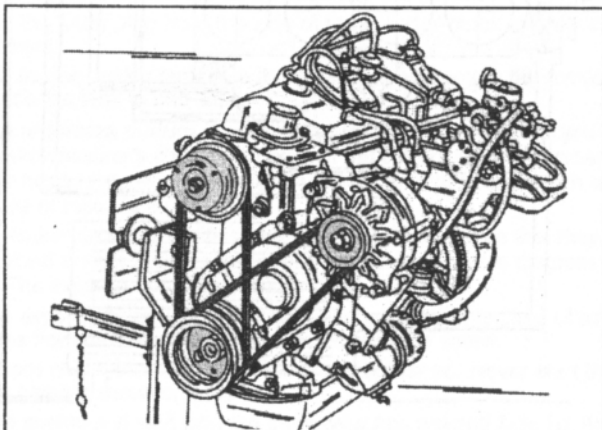


Fig. 1.82. — The water pump drive belt is fitted vertically between the crankshaft pulley and the water pump. The other belt drives the alternator.

As the water pump is connected to the R.H. engine mounting you will have to support the engine in suitable manner from below or use a lifting tackle and ropes or chains to lift the engine out of its mountings. Remove the water pump as follows:

- Disconnect the battery earth cable.
- Drain the cooling system as described in Section 1.8.1. If the anti-freeze is still in good condition, collect it in a container.
- Jack up the front end of the vehicle and place on chassis stands, to gain access to the water pump drive belt. First remove the alternator drive belt to have this one out of the way. To remove the drive belt, use a screwdriver and insert it underneath the drive belt as shown in Fig. 1.83. Apply a 35 mm socket to the crankshaft pulley nut and slowly rotate the crankshaft until the belt slips off the lower pulley (towards the inside). Take care not to damage the belt. Take off the belt after it is free.

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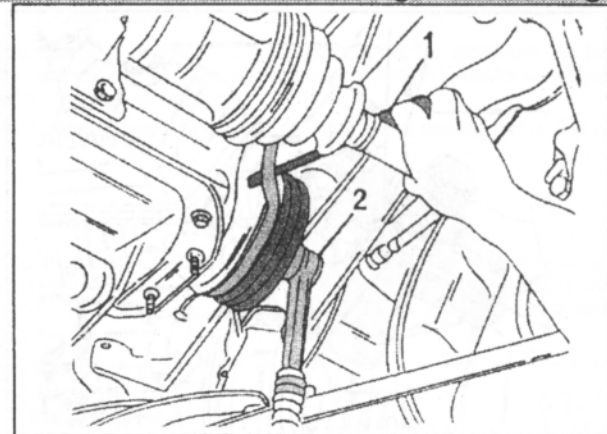


Fig. 1.83. — Insert a screwdriver (1) as shown and rotate the crankshaft with a socket (2) until the water pump drive belt is free.

- The engine must now be lifted out of the engine mountings. Either place a jack underneath the oil sump (wooden block between jack head and oil sump) or lift the timing side of the engine with a tackle or hand crane. Remember, however, not to obstruct the access to the cylinder head.
- Remove the nut (1) in Fig. 1.84, followed by the bolts (2) to remove the mounting carrier from the water pump. Remove the carrier. Make absolutely sure that the engine is well supported before the parts are removed.
- Remove the water pump securing bolts and lift off the pump at an inclined position as shown in Fig. 1.85. Not all nuts have the same size and must be tightened to the torque values given below. Remove the sealing rings from the sealing face. They must be replaced.

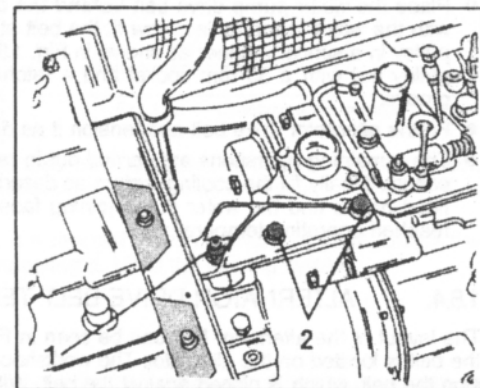


Fig. 1.84. — The engine mounting on the water pump side.
1 Nut, 5.5 kgm 2 Bolts, 5.0 kgm

The installation of the water pump is a reversal of the removal procedure, noting the following points:

- Fit new rubber seals to the pump sealing face and lift the pump against the cylinder head face. Observe the angle shown in Fig. 1.85, otherwise it may be difficult to fit the pump over the studs in the cylinder head. Tighten the nuts and bolts to the following torques, depending on the thread size:

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Opening pressure of expansion tank cap: 1.0 kg/sq.cm. (14.5 psi.)

Cooling Fan:

Number of fans: 1
Performance: 80 kW
Speed: 2700 rpm
Diameter: 280 mm
Direction of rotation: Clockwise

1.8.1. DRAINING AND REFILLING

Two separate drain points are provided and both must be opened to drain the system. First unscrew the expansion tank cap, then remove the drain plug at the bottom of the radiator. Make sure the engine is not hot when the expansion tank cap is removed. The anti-freeze can be collected if still in good condition.

If new anti-freeze is to be filled in, place a suitable container underneath the drain point and collect it. It should not be emptied into the ground.

- Remove the drain plug from the side of the cylinder block to drain the remaining coolant.
- Remove the expansion tank from its attachment and empty the remaining coolant. Place the tank to one side.

Prepare the anti-freeze mixture in accordance with the temperatures you expect in your area. Manufacturer's charts will give you the correct ratio, but remember that the cylinder head is made of aluminium and only an anti-freeze which will not attack this type of metal is suitable.

Refit the cylinder block and radiator drain plugs and make sure that they are tight. Open the bleed screws in accordance with the cooling system diagram shown in Figs. 1.81. The expansion tank cap must not be fitted.

- Refit the expansion tank and fill it completely until the water, free of air bubbles, emerges from the bleeder screw bore. Tighten the screw.
- Once more check that both drain plugs are tightened. Never start the engine with the bleeder screw opened.
- Start the engine and wait until the thermostat has opened fully, i.e. the fan has switched on. Re-check the coolant level and add more anti-freeze if necessary. When the engine has cooled down, wait approx. 10 minutes and re-check the level. The coolant must be at the "Max" mark on the expansion tank.

1.8.2. RADIATOR — REMOVAL AND INSTALLATION

The radiator is made of aluminium. Make sure that only anti-freeze suitable for aluminium is used in the cooling system. Remove the radiator as follows:

- Disconnect the battery earth cable.
- Drain the cooling system as described in the last section. Disconnect the upper and lower radiator hoses and withdraw all hoses between radiator and other parts.
- Remove the front section of the vehicle and disconnect the cables from the following connectors: Headlamps and flasher lamps, cooling fan motor, radiator temperature switch. Free the cable clamps as applicable (see also Fig. 1.9).

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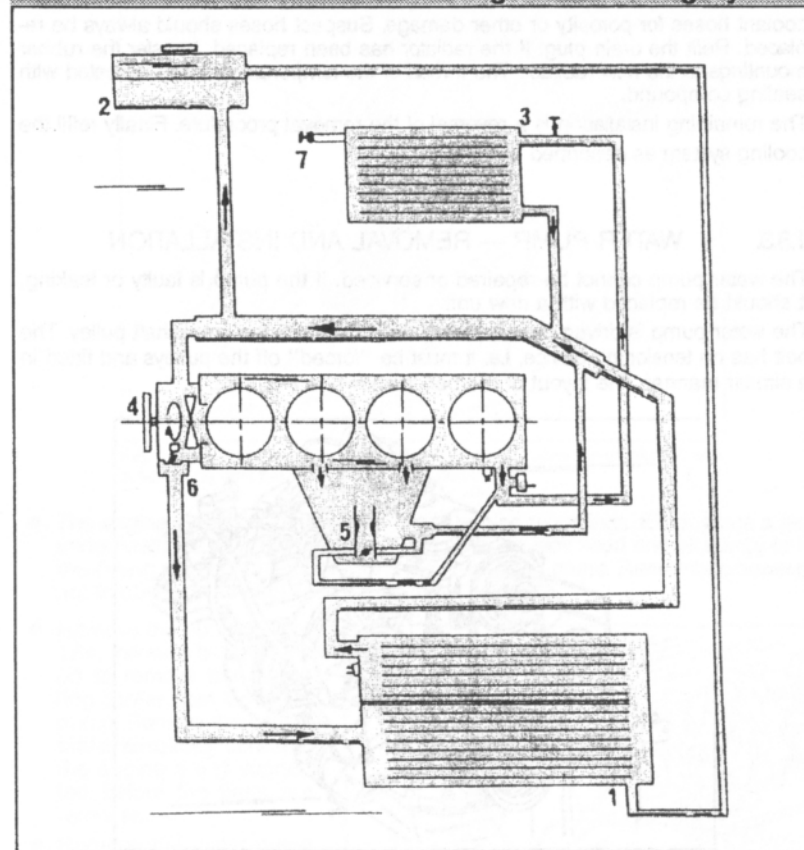


Fig. 1.81. — Cooling system diagram.

- | | |
|-------------------|--------------------------------|
| 1 Radiator | 5 Manifold pre-heating element |
| 2 Expansion tank | 6 Thermostat |
| 3 Heater radiator | 7 Bleeder screw |
| 4 Water pump | |

- Disconnect a small hose leading to the expansion tank (R.H. side of engine compartment).
- Remove two screws securing the bonnet lock and remove the lock.
- Remove two bolts at the top and the further bolts at the bottom of the front panel and remove the complete radiator grille together with the radiator and the cooling fan assembly. The two water hoses are pulled at the same time from their connectors on the engine. The help of a second person could be appreciated. The radiator can now be removed from the front panel.

The installation of the radiator is a reversal of the removal procedure. Check all

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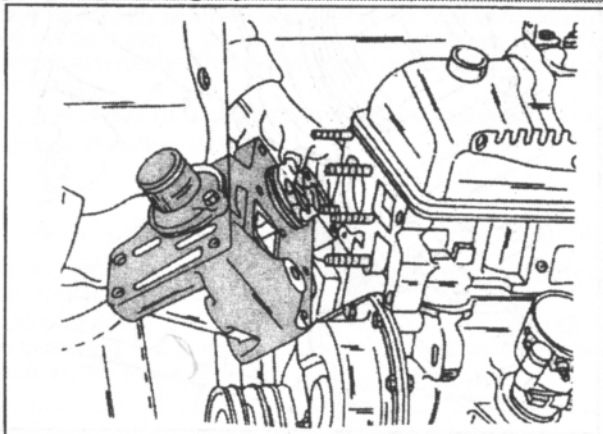


Fig. 1.85. — The water pump must be removed or installed at the angle shown.

M8 nuts:	2.3 kgm (16.5 ft.lb.)
M10 nuts:	4.3 kgm (31 ft.lb.)
M10 bolts:	2.8 kgm (20 ft.lb.)

- Place the water pump drive belt **behind** the crankshaft pulley and engage it with the water pump pulley. Now fit the belt at the bottom over the crankshaft pulley in a similar manner as shown in Fig. 1.82, again rotating the crankshaft pulley nut with a 35 mm socket and a ratchet until the belt jumps into the groove.
- Fit the alternator drive belt and tension it as described in the next section.
- The remaining operations are carried out in reverse order to the removal procedure. Finally fill the cooling system as described earlier on and check all refitted hoses and the water pump joining face for leaks after the engine has reached operating temperature.

1.8.4. ALTERNATOR DRIVE BELT TENSION

The layout of the alternator belt can be seen in Fig. 1.82. The adjusting point for the belt is located on the alternator. The workshop will use a special gauge to tension the belt, which is placed against the belt. Without this tension checking gauge proceed as follows:

- Check the deflection of the belt between forefinger and thumb. This should be around 5 mm (0.2 in.) or perhaps a little more.
- To tension the belt, slacken the alternator securing bolts and push the alternator towards the outside using a strong screwdriver or a tyre lever until the belt can be deflected on its longest run by the amount given above. Hold the alternator in this position and re-tighten the mounting bolts.

Note: A slipping alternator belt can normally be recognised by a squealing noise during quick acceleration.

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1.8.5. COOLING FAN

To check the operation of the cooling fan disconnect the lead from the temperature switch in the side of the radiator and connect it with the electrical system, using a bridging wire. The fan must rotate.

The radiator cowling must be removed to replace the cooling fan or the cooling fan motor.

1.8.6. THERMOSTAT

The thermostat is located inside the water outlet on the cylinder head at the location shown in Fig. 1.81. To remove the thermostat, drain the cooling system and disconnect the hose from the water outlet. Unscrew the thermostat cover and lift out the thermostat.

The thermostat cannot be repaired or adjusted and must be replaced if faulty. The opening temperature of the thermostat is the same on all engines. The opening temperature is stamped into the thermostat and can be used as a guide during the following test.

A thermostat can be tested by immersing it in a container of cool water and gradually raising the temperature to check that it opens smoothly.

Suspend the thermostat on a piece of wire so that it does not touch the sides of the bottom of the container. A thermometer must also be suspended in the same manner. Check the temperature when the thermostat opens. A difference of plus or minus 1° C is permissible.

The installation of the thermostat is a reversal of the removal procedure. Check the condition of the hose before connecting it. Refill the cooling system.

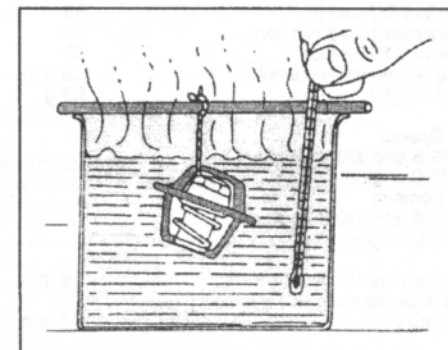


Fig. 1.86. — Checking a thermostat.

1.8.7. ANTI-FREEZE

The cooling system is filled with an anti-freeze solution and this mixture should be left in the system throughout the year. If a fresh mixture is prepared, use anti-freeze and mix with water. 50% anti-freeze and 50% water will protect the system to very low temperatures. Use less anti-freeze if lower temperatures are anticipated. We advise you only to use the anti-freeze marketed by Citroën, Fiat or Peugeot Dealers, as this solution has been specially formulated for use with your engine. If the system is topped-up with plain water, remember that the anti-freeze solution will be diluted. Make sure to check the strength of the mixture before the cold temperatures are expected and correct if necessary.