

## Section L1

## General information

**Introduction**

The cooling system must be filled with a 50% mixture of 'Prestone Anti-freeze and Summer Coolant' UT 184 and water. The coolant mixture should be renewed annually.

A thermostat valve is fitted in the coolant outlet pipe between the engine and radiator header tank. This valve prevents circulation of the coolant through the radiator until the engine has reached normal operating temperature.

On all cars other than the Camargue, coolant temperature is detected by a transmitter mounted on the thermostat housing and recorded on the 'four in one' gauge mounted on the fascia when the ignition is switched on. A coolant level probe situated in the header tank illuminates a warning panel on the fascia when the coolant drops below the required level.

Three drainage points are provided in the system. A tap at the bottom of the radiator (see Fig. L1) and a drain plug on each side of the cylinder block (see Fig. L2).

**Important**

The cooling system is pressurized. **Do not** remove the radiator filler cap while the engine is running or when the engine is hot, otherwise internal pressure will blow out the hot coolant. If it is necessary to check the level of the coolant when the engine is hot, muffle the filler cap with a thick cloth. Gradually turn the cap anti-clockwise until the pressure is reduced, then remove the cap.

**Corrosion and freeze protection**

For protection against frost and corrosion, the cooling system must be filled with a solution of 50% prescribed anti-freeze and 50% water.

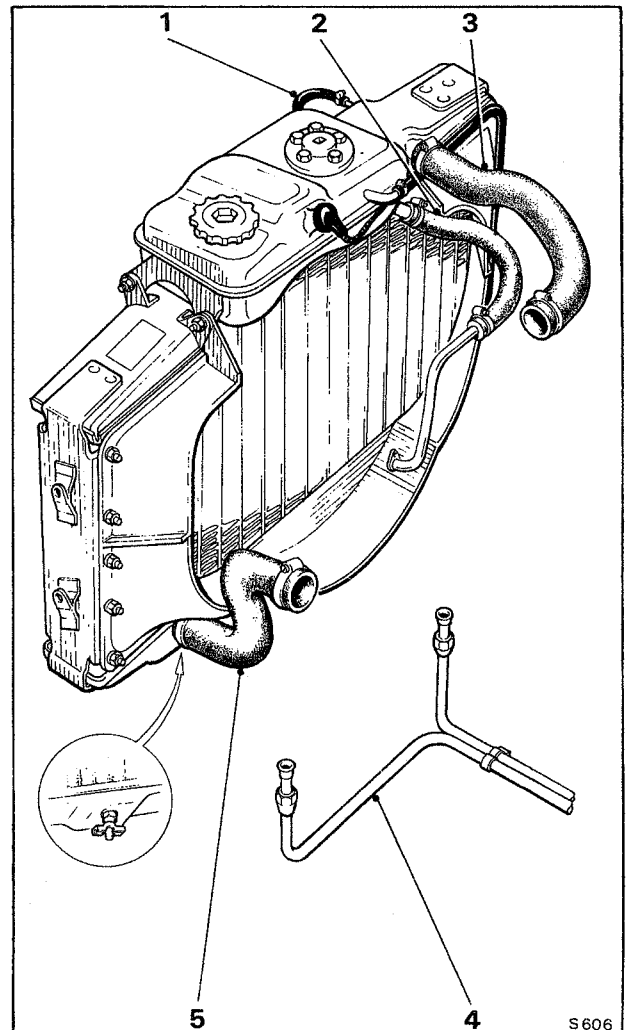
The mixture should be renewed annually.

The trade names of the anti-freezes that may be used are UT184 (BP - Hythe Chemicals) or Prestone II. The former is used predominantly in Europe and the latter in North America. Both are summer coolant/anti-freeze solutions and are miscible, but **must not** be mixed with any other brand of anti-freeze.

As a visual aid to identifying the two types of anti-freeze 'Prestone Anti-freeze and Summer Coolant' UT 184 is coloured turquoise blue and 'Prestone II Winter/Summer Concentrate' is coloured fluorescent green.

**Cooling system - To drain**

1. Drive the car onto a ramp.



**Fig. L1 Radiator and connecting pipework**

- 1 Header tank to radiator
- 2 Pump to header tank
- 3 Radiator to thermostat
- 4 Gearbox oil cooler pipe
- 5 Radiator to pump

2. Firmly apply the parking brake and remove the gear range selector thermal cut-out from the fuseboard. Disconnect the oil pressure switch situated behind the fan on the 'B' bank side of the engine to allow the use of the air conditioning system to operate without starting the engine.
3. Switch on the ignition and rotate the air conditioning system function switch to the DEF (defrost) position.

## L1-2

Ensure that the fan motors are operating at maximum speed.

Wait approximately 20 seconds for the lower servo to reach the full hot position and observe that all the air is diverted to the windscreen.

This procedure opens the heater water tap ensuring the water system can be completely drained.

4. Switch off the ignition and carefully remove the radiator filler cap.
5. Raise the car to a convenient working height.
6. Place containers under the car to collect the coolant. Attach a length of rubber hose from the radiator drain tap to direct the coolant into the containers.
7. Open the radiator drain tap and drain the coolant from the radiator. When completed, remove the drain plugs to drain the residue from the crankcase.

**Cooling system - To flush**

1. Drain the cooling system as described previously under the heading, Cooling system - To drain.
2. Lower the ramp. Remove the inlet and outlet coolant hoses.
3. Fit a waste pipe to the upper (inlet) connection of the radiator.
4. Apply mains water under pressure through the lower (outlet) connection of the radiator. This should remove all loose sediment in approximately 30 minutes.

**Do not under any circumstances use a strong alkaline compound or detergent to clean the cooling system. Such compounds have a detrimental chemical action on aluminium alloys.**

5. Examine all rubber coolant hoses and renew any which show signs of deterioration.

**Engine**

1. Remove the outlet hose and drain plugs from each cylinder bank.

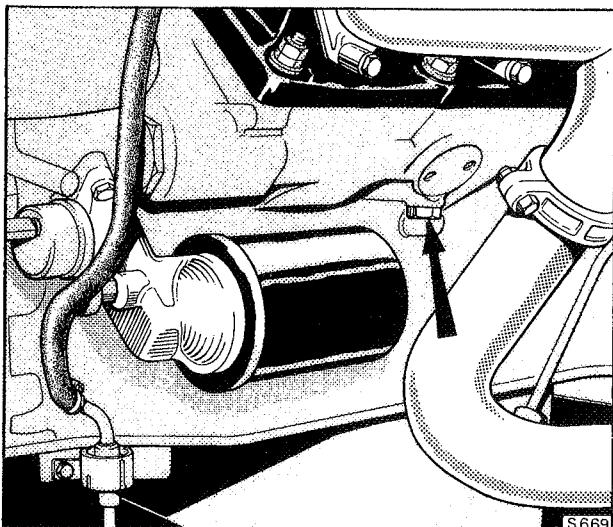


Fig. L2 Cylinder block coolant drain plug

2. Remove the thermostat cover, withdraw the thermostat and replace the cover.
3. Fit a suitable pipe to the drain plug aperture and apply mains water pressure to each aperture in turn. Flush for approximately 30 minutes, or until the water runs clear.
4. Fit the drain plugs, thermostat and thermostat cover using a new gasket.

If the engine is being flushed as part of the two year schedule maintenance, the thermostat should be discarded and a new one fitted.

5. Examine all rubber coolant hoses and renew any which show signs of deterioration.

**Heater matrix**

1. To flush the heater system, detach the matrix hose at the electrically operated water tap and disconnect the return hose at the coolant pump.
2. Fit a waste pipe to the inlet connection of the heater matrix.
3. Flush the matrix for approximately 30 minutes.
4. Examine the cylinder head to heater tap hose and matrix inlet hose for deterioration. Renew if necessary.

**Removal and fitting of heater and matrix**

Refer to Chapter C - Air Conditioning System

**Cooling system - To fill**

1. Check that the air conditioning system function switch is in the DEF (defrost) position.
2. Ensure all hose connections and drain plugs are fitted and secure. Check that the radiator drain tap is closed.
3. Using the correct anti-freeze/water mixture, fill the system by pouring slowly to avoid the possibility of air locks.
4. Reconnect the oil pressure switch.
5. Start the engine and allow time for the system to reach normal operating temperature ensuring uniform distribution of the coolant.
6. Stop the engine and check the coolant level. Top-up if necessary. The correct level is when the coolant reaches the rubber seal in the filler neck.
7. Fit the radiator filler cap.
8. Check the tightness of all hose clips.
9. Examine all disturbed hoses and joints for leaks.

**Coolant - To check**

In the majority of cases hydrometers, used for checking anti-freeze concentrations, are inaccurate above a 40% figure.

As the acceptable range of concentration is between 45% and 55%, a refractometer, similar to the 'AO Duo-check' instrument, is more suitable for measuring a 50% solution.

The graph (see Fig. L3) shows the degrees of frost protection converted to a percentage concentration. Should the system be less than the acceptable limit, the graph indicates the necessary amount of coolant to be drained from a full system before replacing with 100% anti-freeze.

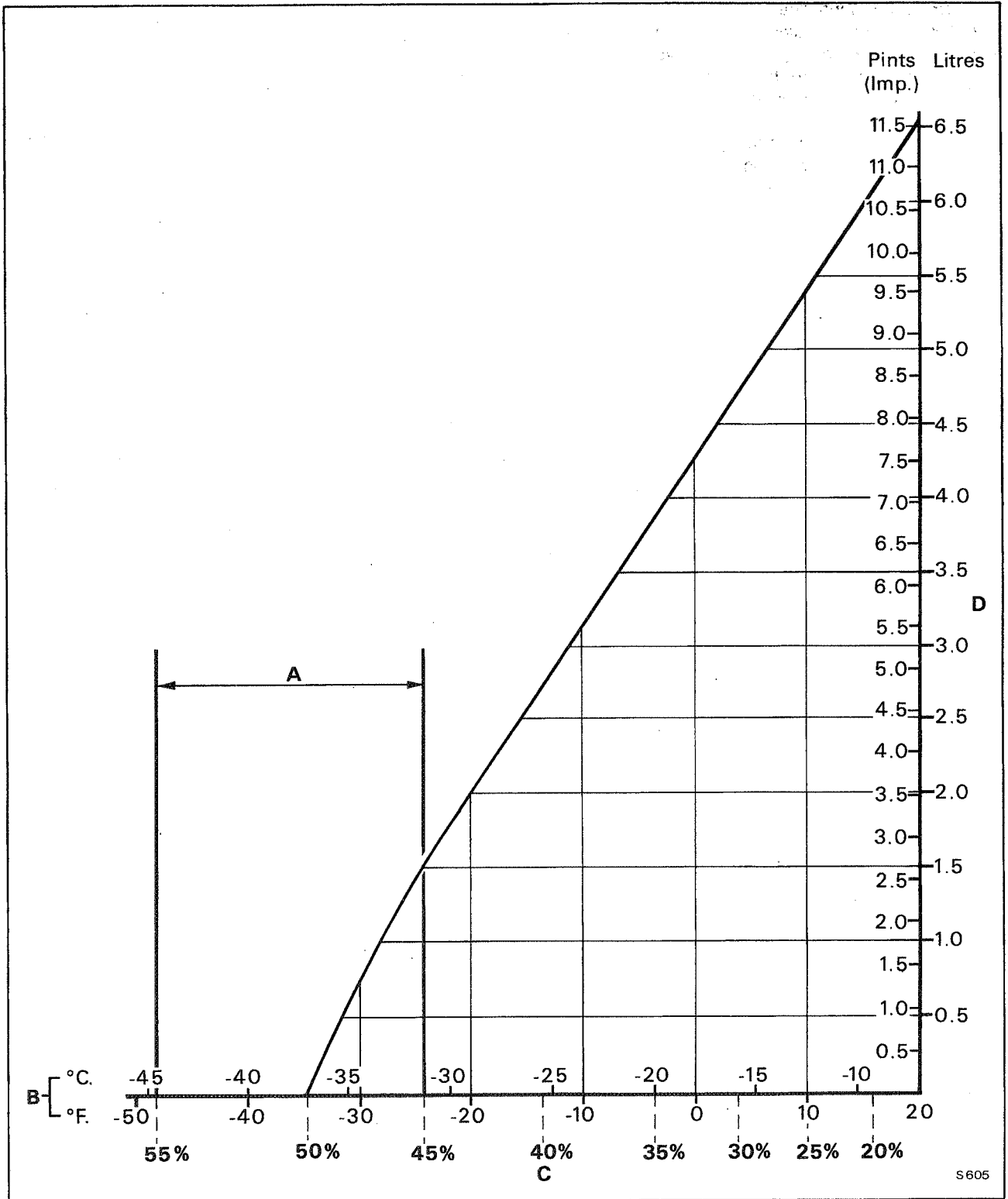


Fig. L3 Anti-freeze concentration correction chart to give a 50% solution

- A Acceptable service range of concentration.
- B Freezing point of coolant.
- C Percentage concentration

- D Volume of 100% anti-freeze to be added to maintain a 50% solution after removal of the same volume of old coolant first.

## L1-4

1. After pouring into the system the correct amount of 100% anti-freeze, replace the filler cap, then run the engine on fast idle for approximately five minutes to enable a complete mix with the existing solution. Failure to circulate the new anti-freeze will result in an incorrect reading.
2. Remove the filler cap and check that the solution now measures within the range shown on the graph (see Fig. L3). Rectify if necessary.