

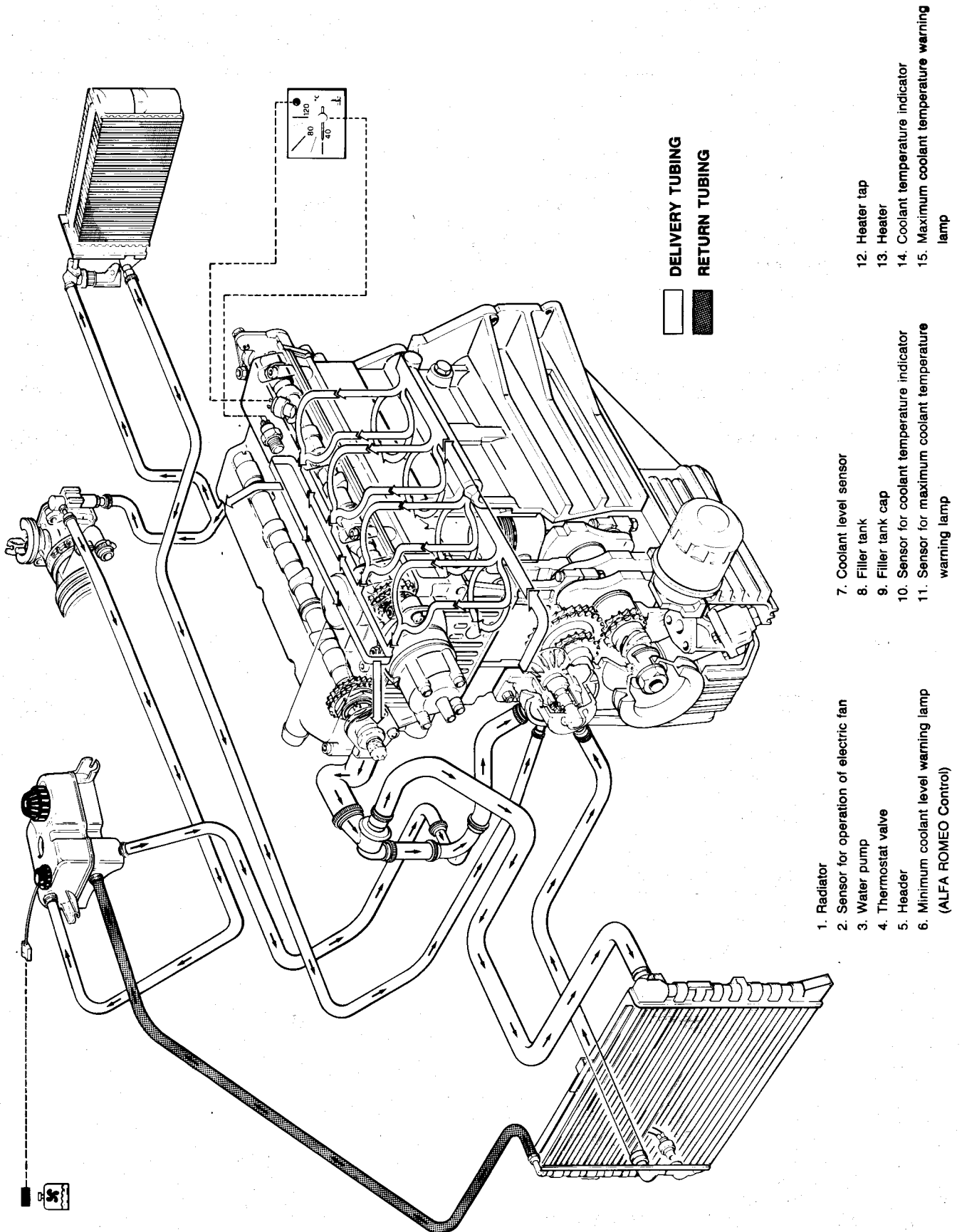
# GROUP 07

## CONTENTS

COOLING SYSTEM .....	07-2	THERMOSTAT .....	(•)
General description .....	07-3	Removal .....	(•)
Test tightness of cooling system .....	07-4	Inspection and adjustment .....	(•)
RADIATOR .....	07-5	Refitting .....	(•)
Removal .....	07-5	TECHNICAL DATA AND	
Refitting .....	07-5	SPECIFICATIONS .....	(•)
Tightness test .....	07-5	Checks and adjustments .....	(•)
ELECTRIC FAN THERMAL CONTACT		General specifications .....	(•)
CONTROL .....	(•)	Tightening torques .....	(•)
Check .....	(•)	FAULT FINDING AND CORRECTIVE	
PRESSURISED FILLER CAP .....	(•)	OPERATIONS .....	(•)
Tightness test .....	(•)		
WATER PUMP .....	(•)		
Removal .....	(•)		
Inspection and adjustment .....	(•)		
Refitting .....	(•)		

(•) SEE WORKSHOP MANUAL FOR PETROL ENGINES — GR. 07

# COOLING SYSTEM



## ENGINE COOLING SYSTEM

### GENERAL DESCRIPTION

The cooling system is of the sealed type with circulation effected by means of a centrifugal pump driven from the drive shaft by means of a «V» belt.

The rotation of the water pump (3) creates a suction pressure in the return circuit which draws in the coolant, coming from the cylinders through the header tube (5) or from the heater-radiator (13) when the re-

lative control tap (12) is open (circulation of coolant in the heater-radiator).

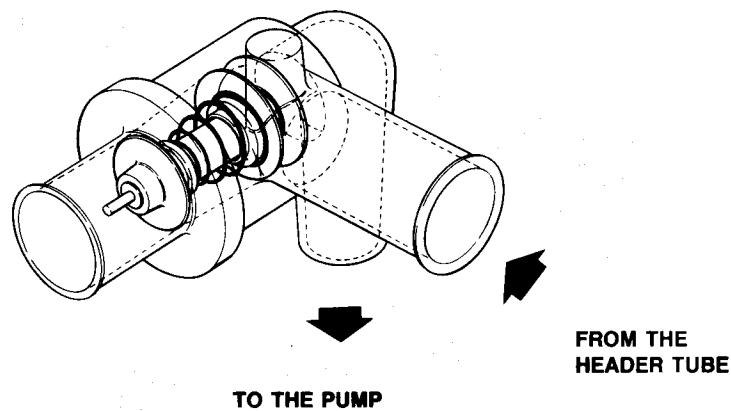
A thermostat (4) is mounted at the exit of the header tube (5). The function of this is to ensure that the engine reaches normal running temperature in the shortest possible time and subsequently to maintain the engine temperature within the optimum values for engine functioning.

The thermostat valve remains closed, deviating the coolant directly towards the

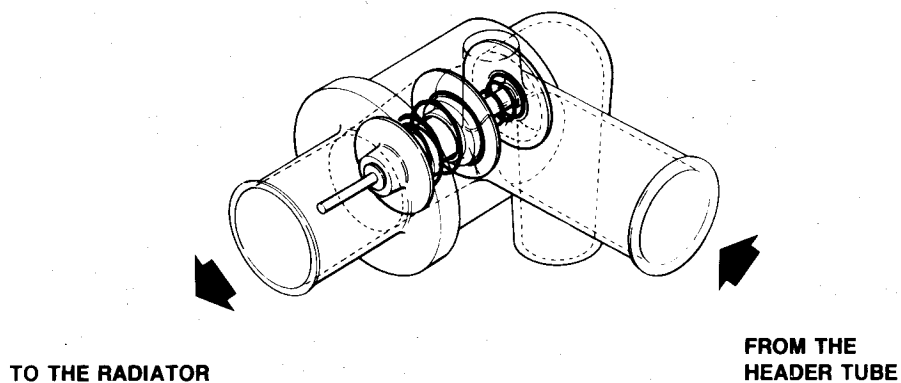
pump (3), until the engine reaches a temperature of  $81 \div 95^{\circ}\text{C}$ .

At higher temperatures the opening of the valve permits the passage of the coolant to the radiator (1).

### THERMOSTAT VALVE CLOSED



### THERMOSTAT VALVE OPEN



Apart from the natural air cooling during driving, the radiator is cooled by the electric fan, which is switched on by the thermal contact (2) whenever the coolant in the lower part of the radiator itself reaches  $\sim 88^{\circ}\text{C}$ .

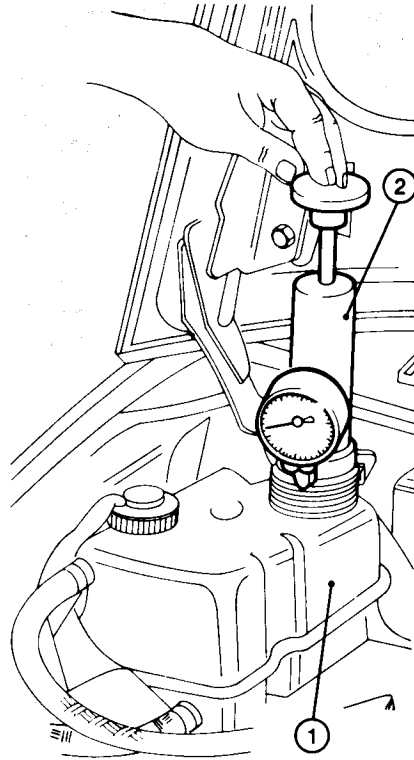
The circulation of coolant in the heater-radiator (13) is regulated by the tap (12) controlled by the heater control knob.

### COOLING SYSTEM TIGHTNESS TEST

- a. Unscrew the pressurised cap of the filler tank (1).
- b. Screw the instrument (2) onto the inlet of the filler tank to test the tightness of the coolant system.
- c. Pressurise the system and check that the value indicated on the testing instrument remains at the specified value.
- d. If the pressure does not remain constant at the specified value, check the system for leaks from the hoses or from the radiator.

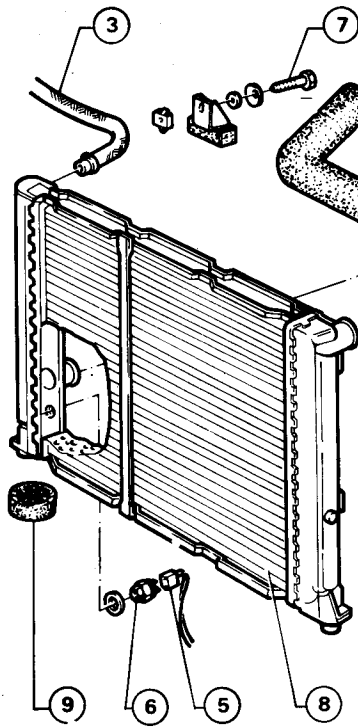
If necessary proceed to the removal and inspection as described in the paragraph «Radiator».

**Pressure for cooling system test**  
**107.9 kPa (1.08 bar; 1.1 kg/cm<sup>2</sup>)**

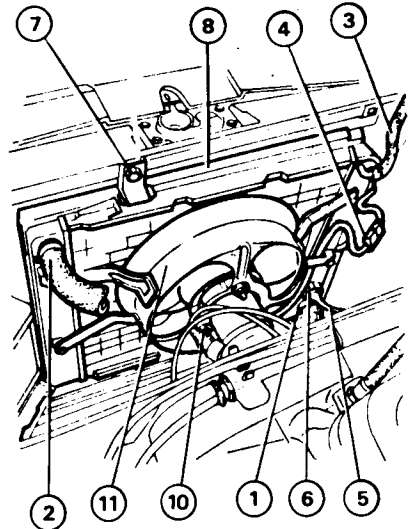
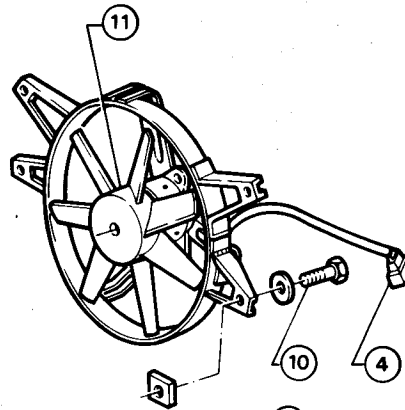


1. Filler tank
2. Testing instrument

# RADIATOR



- 1. Hose for the delivery of coolant to the pump
- 2. Hose for the delivery of coolant to the radiator
- 3. Radiator breather tube



- 4. Electric fan power supply lead
- 5. Thermal contact connector
- 6. Thermal contact
- 7. Radiator securing screws
- 8. Radiator
- 9. Elastic pad
- 10. Screw for securing of electric fan to radiator
- 11. Radiator

## REMOVAL

1. Disconnect the battery.
2. Detach the hose (1) from the radiator, drain off the coolant and collect it in a container.

### WARNING:

To avoid scolds, take care not to drain off the coolant when the engine is hot.

3. Detach the hose (2) and the tube (3) from the radiator.
4. Disconnect the electric fan power supply leads connector (4) and the connector (5) from the thermal contact (6).
5. Unscrew the screw (7) securing the radiator to the body, remove the radiator (8) from the engine compartment and extract support pads (9).
6. If necessary unscrew the screw (10) and remove fan (11).

## REFITTING

1. Proceed to the refitting of the radiator by reversing the order of removal and then carry out the refilling with coolant liquid by operating as follows:
  - Remove the cap of the filler tank and carry out the refilling of the system with the specified coolant.

### Refilling of the cooling system

Minimum external temperature	°C	-30	-45
Concentrated antifreeze Std No. 3681-69956	l	1.2	2.65
Distilled water for dilution	l	6.8	5.35
Ready to use antifreeze Std No. 3681-69958	l	8	8

### WARNING:

Products are damaging to paintwork. Avoid contact with painted parts.

2. Start the engine, run it to normal running temperature so as to allow the coolant to circulate through the system and switch the heater on in order to open the heater-radiator tap.
3. With the engine cold, carry out the topping up of the system up to the level of the maximum reference mark in the filler tank.

## TIGHTNESS TEST

1. Remove the radiator from the vehicle (see: «Removal and Refitting»).
2. Seal the coolant inlet and outlet apertures of the radiator.
3. Immerse the radiator in tank filled with water and locate any leaks by blowing compressed air in through the breather tube until a pressure of:

**107.9 kPa  
(1.08 bar; 1.1 kg/cm<sup>2</sup>)**

is reached.

4. In the presence of leaks, replace the radiator by operating as described in «Removal and refitting».