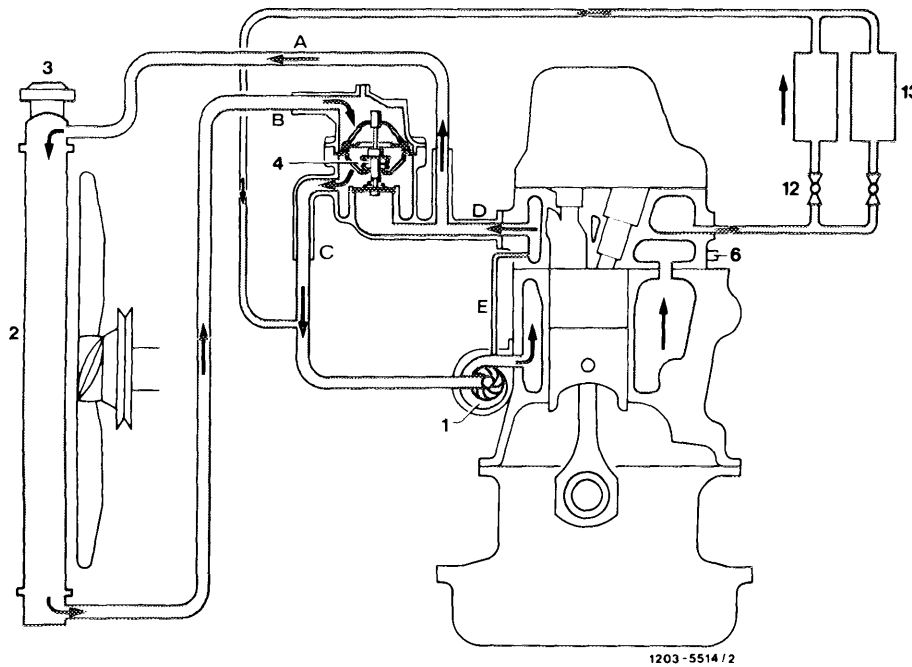


A. Model 115.1 and 123.1 (version up to February 1979)

Coolant circuit



Circuit at coolant temperatures above approx. 94°C

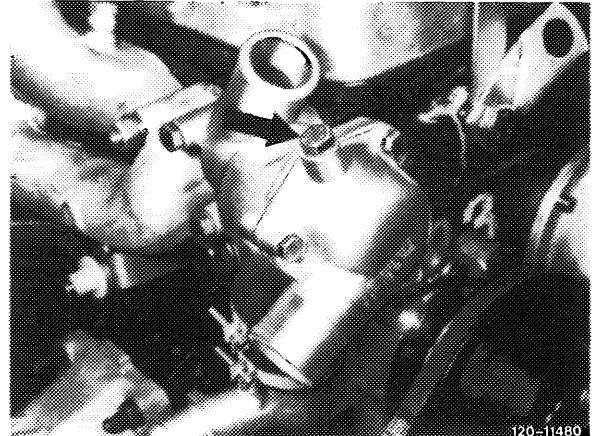
- |  |                                  |
|--|----------------------------------|
| 1 Water pump                                     | A to radiator                    |
| 2 Radiator                                       | B from radiator                  |
| 3 Radiator cap,<br>code No. 100                  | C to water pump<br>(bypass line) |
| 4 Thermostat                                     | D from engine                    |
| 6 Temperature transmitter<br>for telethermometer | E vent line                      |
| 12 Regulating valve for<br>valve heater          |                                  |
| 13 Heat exchanger                                |                                  |

## Thermostats

Engine	Thermostat begins to open at	Up to engine No.	Starting engine No.	Starting begin of series
615.912	79°	323 903	—	—
615.913		185 880	—	—
615.912	80°	—	323 904	—
615.913		—	185 881	—
615.94		—	—	x
616.617		—	—	x

The thermostat layout on model 123.1 (1st version) differs. On vehicles without air conditioning system, the thermostat housing with thermostat is located horizontally and on vehicles with air conditioning system vertically for reasons of space.

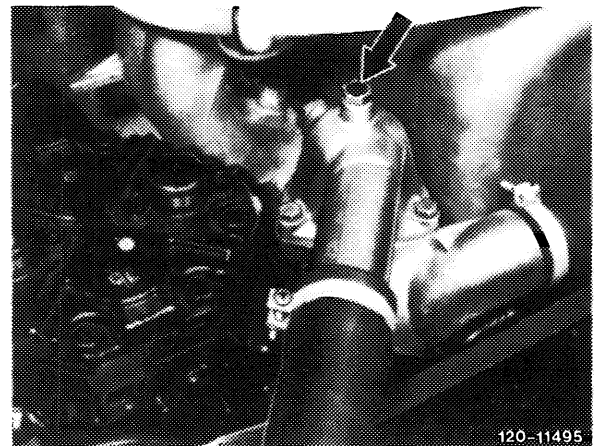
Layout on vehicles without air conditioning



The ID's of connections in direction of radiator were reduced from 35 mm to 29 mm.

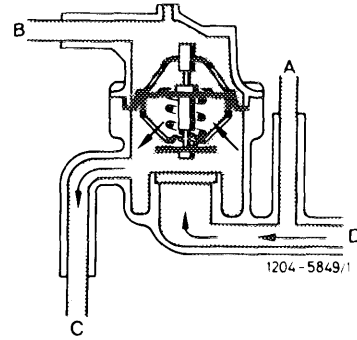
When filling, unscrew vent screw (arrows) on thermostat housing cover until coolant flows out.

Layout on vehicles with air conditioning



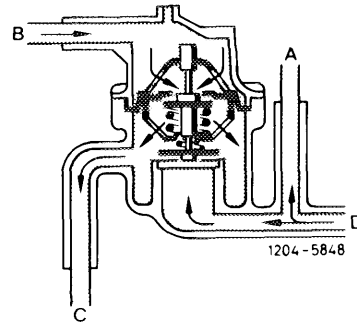
The main valve is closed up to a coolant temperature of approx. 80°C and the bypass disc is fully opened. The flow (B) from radiator is thereby interrupted and the coolant flows via bypass line (C) directly to water pump.

- A to radiator
- B from radiator
- C bypass line
- D from cylinder head



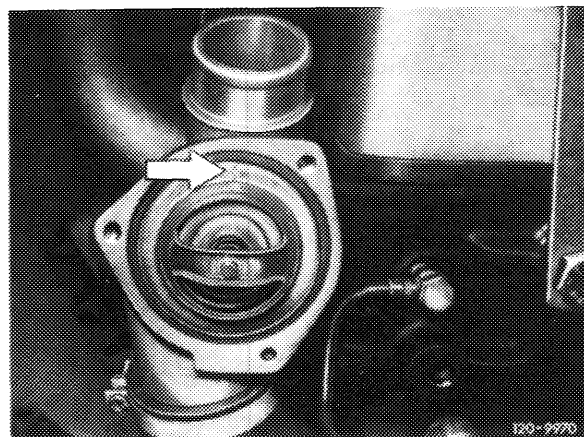
At coolant temperatures of approx. 80°C to 94°C, the main valve as well as the bypass valve are more or less opened, depending on engine load. The coolant flows via radiator (A) and bypass line (C) to water pump.

- A to radiator
- B from radiator
- C bypass line
- D from cylinder head

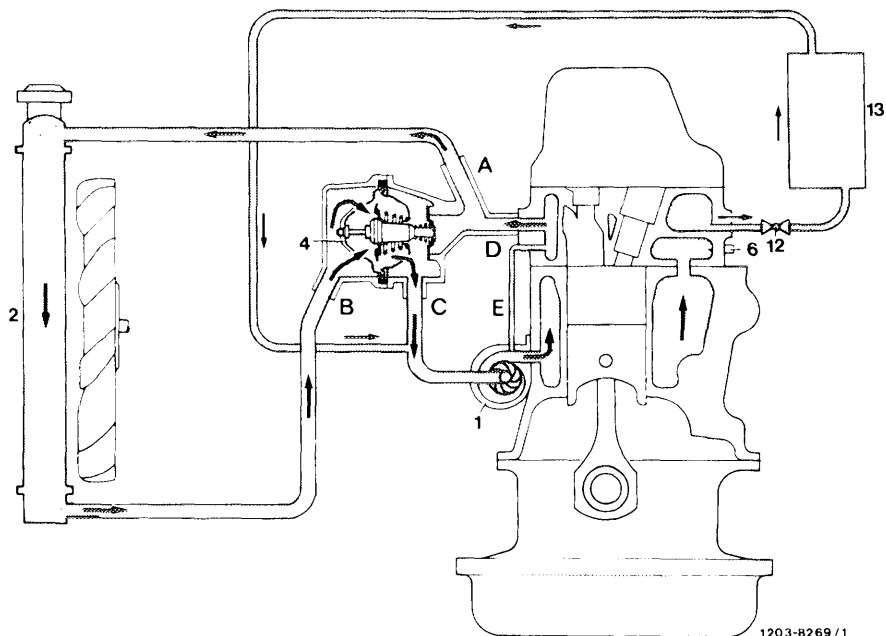


At coolant temperatures above approx. 94°C, the bypass line (C) is closed by the bypass disc. The entire coolant volume should flow through radiator (refer to overall diagram). It is therefore wrong to remove thermostat for better cooling of engine.

If the thermostat is replaced, make sure during installation that the punched-on arrow is pointing upwards or in driving direction toward the rear.



Coolant circuit



Circuit at coolant temperatures above approx. 94°C.

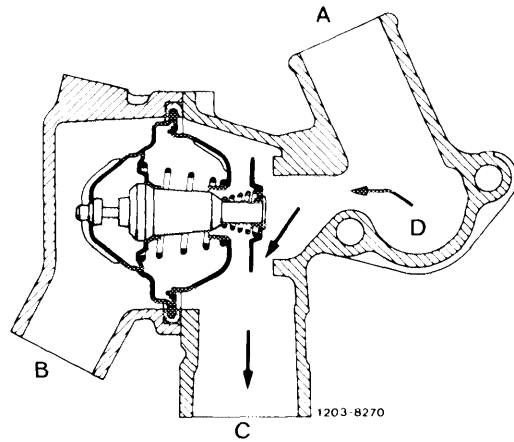
- |   |                               |
|---|-------------------------------|
| 1 Water pump                                  | A to radiator                 |
| 2 Radiator                                    | B from radiator               |
| 4 Thermostat                                  | C to water pump (bypass line) |
| 6 Temperature transmitter for telethermometer | D from engine                 |
| 12 Regulating valve for vehicle heater        | E vent line                   |
| 13 Heat exchanger                             |                               |

Thermostat

The thermostat installed on all engines begins to open at 80°C.

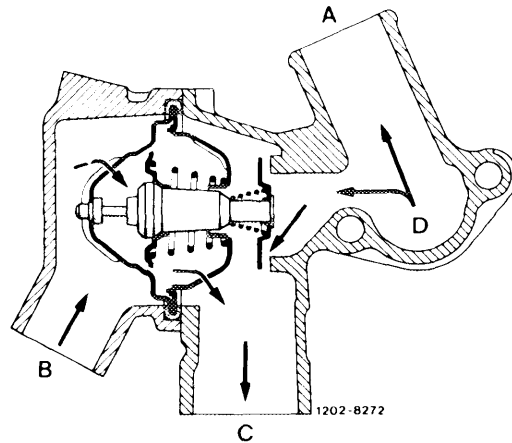
The main valve is closed up to a coolant temperature of approx. 80°C and the bypass disc is fully opened. The flow (B) from radiator is thereby interrupted and the coolant flows via bypass line (C) directly to water pump.

- A to radiator
- B from radiator
- C bypass line
- D from cylinder head

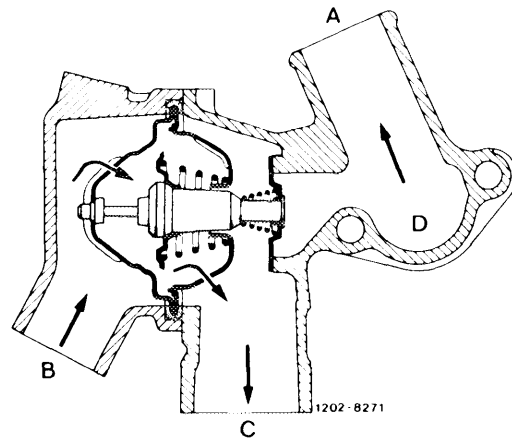


At coolant temperatures of approx. 80°C to 94°C, the main valve as well as the bypass valve are more or less open, depending on engine load. The coolant flows via radiator (A) and bypass line (C) to water pump.

- A to radiator
- B from radiator
- C bypass line
- D from cylinder head



At coolant temperatures above approx. 94°C, the bypass line (C) is closed by the bypass disc. The entire coolant volume should flow through radiator (refer to overall diagram). It is therefore wrong to remove thermostat for better cooling of engine.

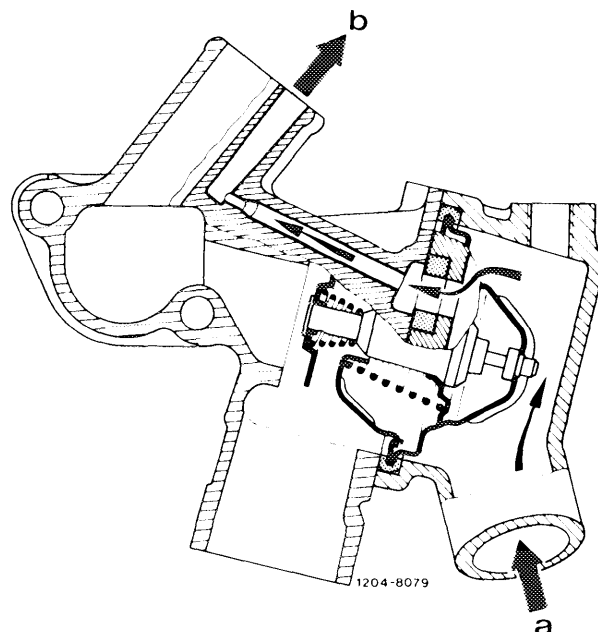


**Venting of thermostat housing**

The thermostat housing is suspended and has an integrated, independent venting system.

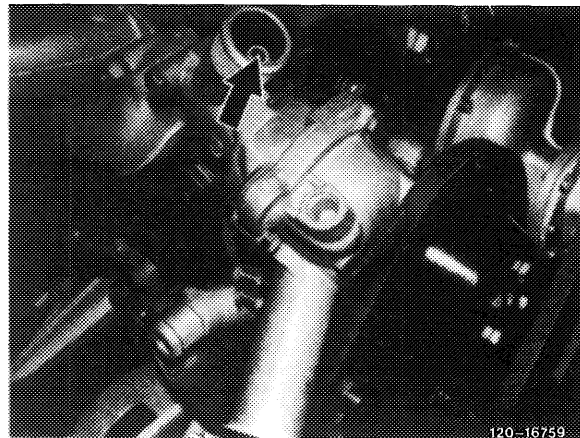
The air in the cooling system can flow to the radiator and the expansion tank through a bore which bypasses the thermostat.

- a from radiator
- b to radiator



This venting method has the following advantages:

- a) When filling-in the coolant, the coolant circuit will be independently vented.
- b) Better continuous venting of coolant circuit when engine is operating.

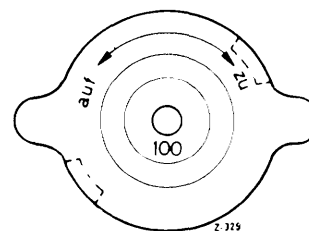


### Engine cooling

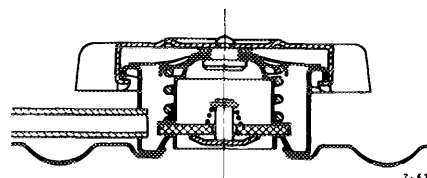
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The spring-loaded cap (code No. 100) on radiator establishes a gauge pressure of approx. 1 bar (atü) in the cooling system.

The cooling system is filled ex factory for use throughout the year with a coolant which comprises approx. 55 % by volume of water and 45 % by volume of anti-freeze.



The anti-freeze provides protection down to  $-30^{\circ}\text{C}$  and by means of additives in anti-freeze prevents corrosion in cooling system. Since the additives are subject to ageing, the coolant should be changed every two years.



If no anti-freeze is available and only water is filled in, be sure to add 1 % of treating compound (anti corrosion oil) (10 cc/l water).

On model 115.1 always add 1 % = 10 cc/l of treating compound for lubricating heater valves, also when using anti-freeze.

The anti-freeze increases the boiling point, which amounts to approx.  $118^{\circ}\text{C}$  for water at 1 bar (atü) gauge pressure, to approx.  $125^{\circ}\text{C}$  by the mixture filled-in at the factory.

The red mark on telethermometer begins at 122°C (since the middle of May 1975, formerly at 115°C).

This point must be specially observed when only water and treating agent are filled in. In such a case, water may be thrown out before the indicator of the coolant thermometer is at the red mark.

When driving under full load, on mountain roads and bumper to bumper, or following a fast ride on an express highway with subsequent traffic congestion, or when driving in areas with high outside temperatures, the coolant temperature indicator may rise up to the red mark if an anti-freeze of at least  $-30^{\circ}\text{C}$  is filled in, without any ejection of coolant or faulty running of engine.

When the engine is operated for an extended period with the vehicle stopped, e.g. vehicle congestion, it will be of advantage on vehicles with automatic transmission to move the selector lever into position „N“. This will reduce the heat development in transmission and thereby additional heating up of coolant by way of the transmission oil cooler.

When coolant is lost by leaks in cooling system or by ejection as a result of overheating, add a pertinently prepared coolant.

Losses caused by evaporation can be compensated by adding tap water.