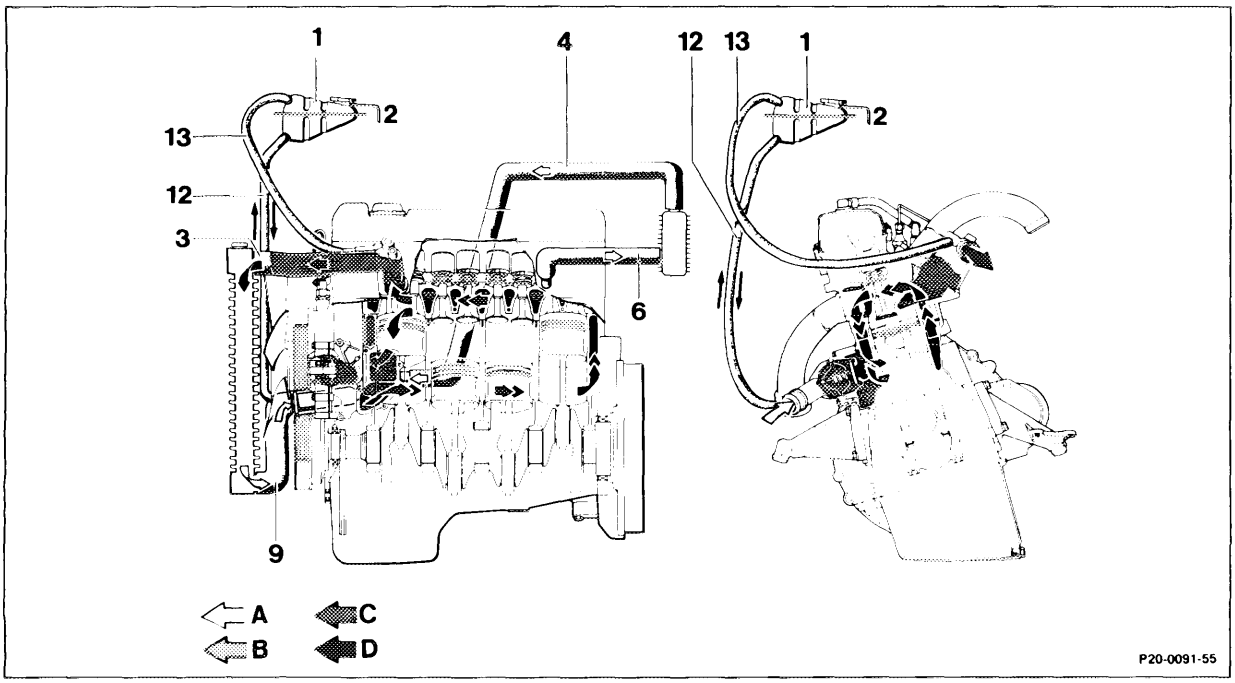
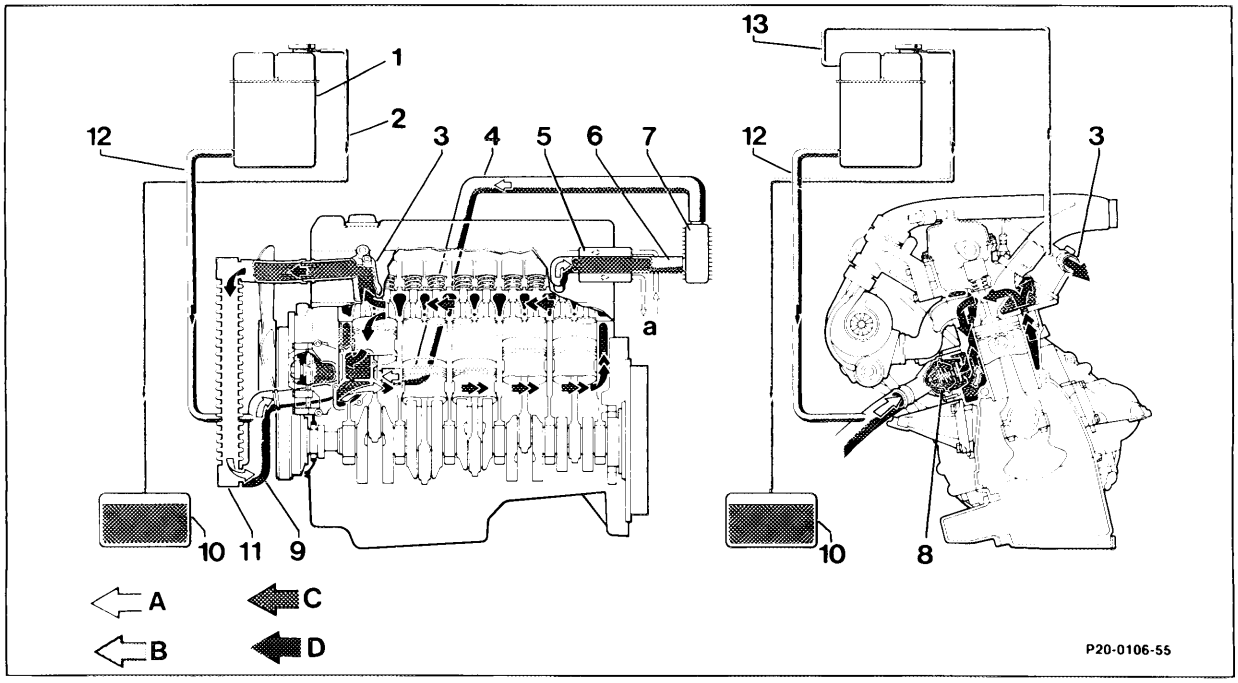
Coolant circuit engine 602.91



1	Expansion tank	9	From radiator to coolant pump via thermostat
2	Overflow line	12	Filling hose
3	From cylinder head to radiator	13	Vent line
4	Return from heating system (heat exchanger)		
6	Feed to heating system (heat exchanger)	A.	Radiator circuit above 100 °C
		B.	Bypass circuit up to 85 °C
		C.	Cool water
		D.	Heating

Coolant circuit engine 602.96, 603.96



1	Expansion tank	9	From radiator to coolant pump via thermostat
2	Overflow line	10	Overflow tank (engine 603.96)
3	From cylinder head to radiator	11	Radiator
4	Return from heating system (heat exchanger)	12	Filling hose
5	Fuel heat exchanger	13	Vent line
6	Feed to heating system (heat exchanger)		
7	Heat exchanger	A.	Radiator circuit above 100 °C
8	Thermostat	B.	Bypass circuit up to 85 °C
		C.	Cooled water
		D.	Heating

Note

Engine 603.96 has an overflow tank (10) in addition to the expansion tank. The overflow tank is installed in the wheelhouse of the right front fender.

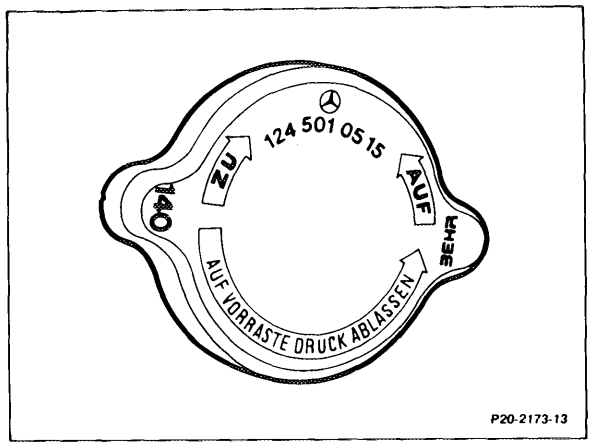
Function of overflow tank

The overflow tank protects the engine from loss of coolant at high outside temperatures. Coolant may flow out along the overflow line after shutting off the engine at high outside temperatures.

The coolant overflow is collected in the overflow tank.

After the engine and the coolant has cooled down, a vacuum is produced in the cooling system which causes the coolant which has flowed into the overflow tank to flow back into the expansion tank.

To enable the vacuum to build up after cooling down, the cap of the expansion tank must provide a tight seal.
The cap (1.4 bar) is fitted with a rubber seal for this purpose.



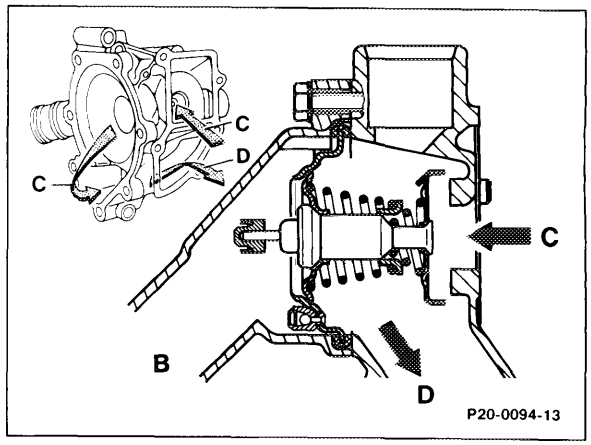
Function of coolant thermostat

Engine	Start of opening °C	Fully open °C
602	85 ± 2	100
602.96, 603.96	80 ± 2	94

Note
The function of the coolant thermostat is outlined in the description below, using, as an example, a naturally aspirated engine.

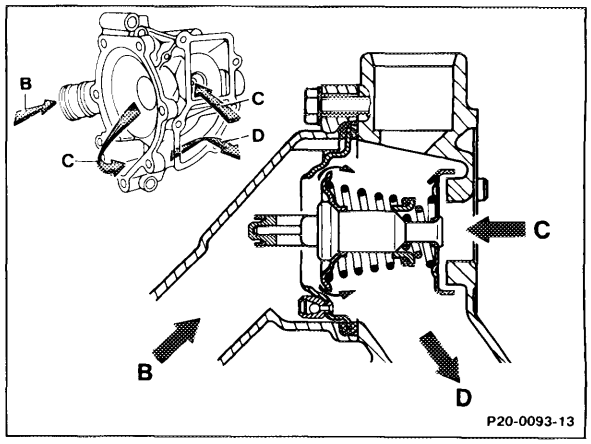
Warm-up period – coolant temperature up to approx. 85 °C
Up to a coolant temperature of approx. 85 °C the main valve is closed and the bypass plate is fully open. The flow (B) from the radiator is thus interrupted. The coolant flows through the bypass passage (C) directly through the coolant pump into the crankcase (D).

C From crankcase (bypass passage)
D To crankcase



Part-load operation – coolant temperature approx. 85 °C up to maximum 100 °C
At coolant temperatures above approximately 85 – 100 °C the main valve and bypass plate are mostly open, depending on engine load. The coolant flows from the radiator (B) through the bypass passage (C) through the coolant pump into the crankcase (D).

B From radiator
C From crankcase (bypass passage)
D To crankcase



Full-load operation – high outside temperature (coolant at above 100 °C)
At coolant temperatures above approx. 100 °C the main valve is fully open. The bypass passage (C) is sealed off by the bypass plate. The entire quantity of coolant flows through the radiator.

The cooling system is automatically bled through a ball valve in the coolant thermostat when it is filled during engine operation.