

Cooling system



Brief description

The coolant circuit is designed to provide long-term protection against frost and corrosion. The design of the M57 is identical to that of the M51 and in the M67 to that of the M62.

The cooling system has been adapted to the new requirements concerning the cooling capacity and the modified environment (common rail, injection system).

Requirements and Objectives

The following requirements and objectives apply to the cooling system:

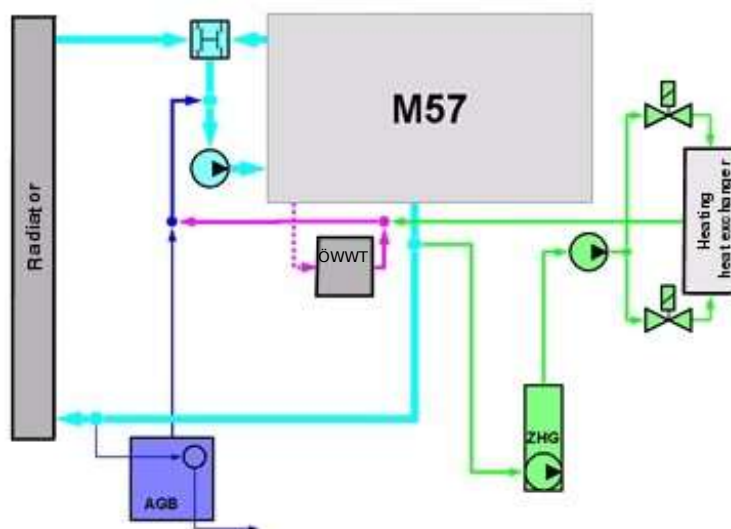
- Requirements
 - Adaptation to injection system (common rail)
 - Simple design (same concept as M51 and M62)
 - All connection points for water-carrying hoses designed as plug-in connections as on the M47
 - Further reduction of emissions and fuel consumption
- Objectives
 - Provision of optimum cooling capacity under all operating conditions
 - Easy-to-service layout

System structure



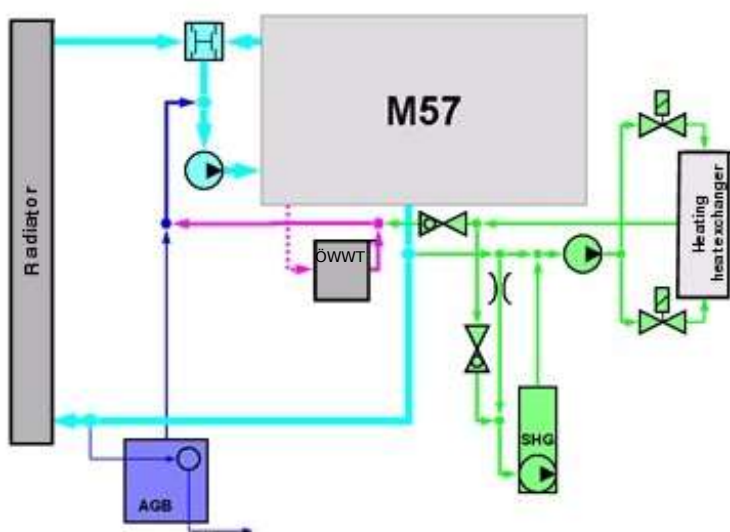
The cooling system consists of following components:

- Water pump
- Thermostat
- Radiator
- Fan/shroud
- Auxiliary heater
- Independent park heating option



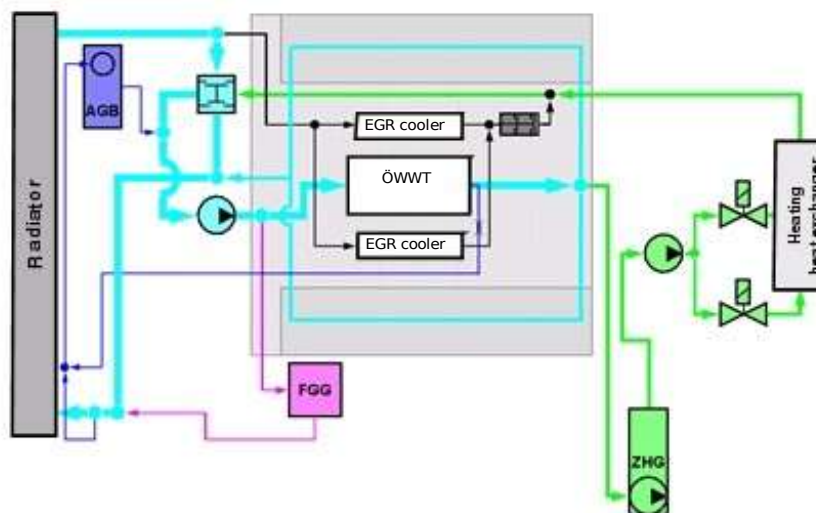
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Fig. 43: M57 - Coolant circuit with auxiliary heater



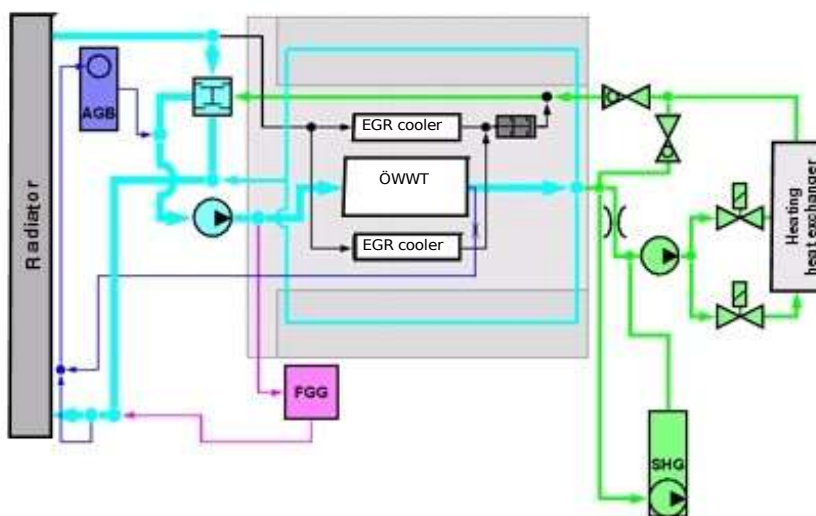
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Fig. 44: M57 - Coolant circuit with independent park heating option



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Fig. 45: M67 - Coolant circuit with auxiliary heater



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Fig. 46: M67 - Coolant circuit with independent park heating option

The various coolant circuits can be subdivided into several part circuits:

- Engine
- Heating
- Expansion tank
- Engine oil cooler (M57 only)
- Alternator (M67 only)
- EGR cooler (M67 only)

Component description



Water pump

The water pumps for the M57 and M67 are arranged on the end face of the crankcase.

- Thermostat integrated in water pump housing
- Leakage is directed through drainage tubes into the pulley



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Fig. 47: Water pump - M57

Thermostat

The following features apply both to the M57 and M67:

- Thermostat integrated in water pump housing
- Opening temperature 88 °C
- No characteristic map cooling, i.e. no characteristic map thermostat

The thermostat is correspondingly adapted to the M57 and M67. The thermostat on the M67 is a common part with the M62.

Radiator

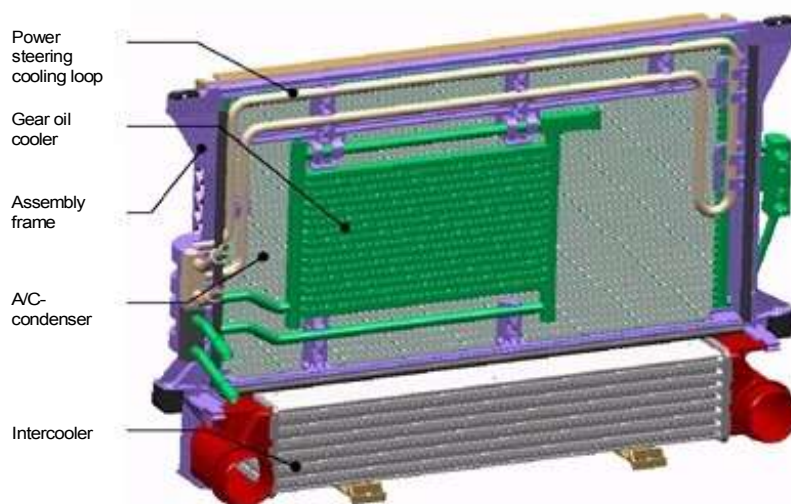


The cooling concept of the M47 has been adapted and further developed for this engine.

The gear oil cooler is integrated in the cooling assembly. The capacity of the intercooler has been adapted to the increased volume and is integrated in the centre of the cooling assembly.

The coolant change interval is every 4 years. When changing, the different filling capacities should be borne in mind:

- M57 E38/E39 approx. 9.2 litre
- M67 E38 approx. 16.0 litre



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Fig. 48: Arrangement of cooling assembly - rear view M57 E39/E38

M57-specific features



- The AUC sensor is located below the centre of the fan shroud.
- The expansion tank is mounted behind the headlights

Vehicle-specific fan shrouds with different apertures are installed in the E39 and E38. This is necessary due to the fan displacement by approx. 20 mm. The fan will be damaged if interchanged.

For differentiation purposes, an identification code is cast in the top inside of the fan shroud:

- E39M57 Identification code "A"
- E38M57 Identification code "B"

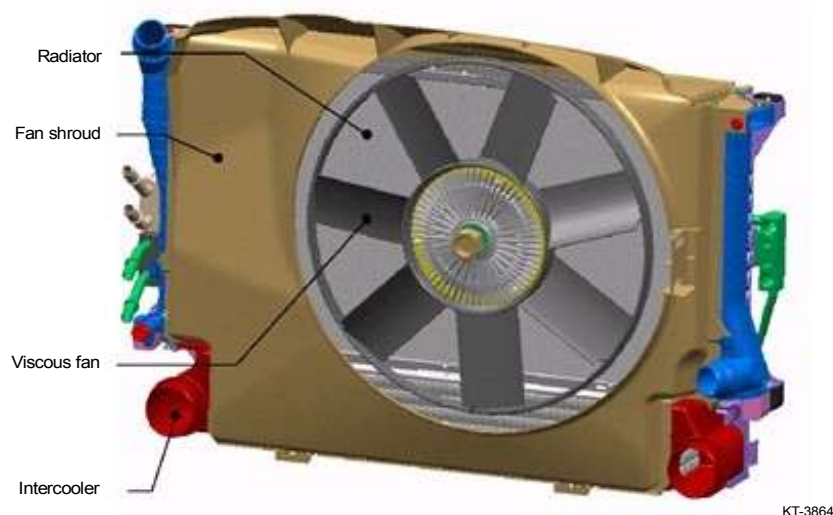


Fig. 49: Arrangement of cooling assembly - rear view M57

M67-specific features

- Expansion tank integrated in fan shroud
- 5 back-up flaps integrated in fan shroud
- The AUC sensor located above the centre of the fan shroud.
- Brush seal installed in cutout of fan shroud to improve uphill driving cooling properties

In the E38, the water level (level switch) for the expansion tank is indicated as standard in the instrument cluster.

Exhaust hood/shutter

No radiator shutters are currently installed in the M57 and M67.



Fan

The M57 and M67 feature a 7-blade plastic fan driven by a viscous clutch. Compared to an electric fan, the viscous fan provides better cooling capacity.

In addition to the viscous fan, an electric fan that is activated by the DDE is arranged in front of the radiator assembly.

Auxiliary heater

An auxiliary heater with connection to the heating circuit is installed as standard in the M57 E38/E39 and in the M67 E38 (as on the M47). It is installed instead of the independent park heating in the vehicle.

The separate auxiliary heater is dropped if the independent park heating option is installed. The independent park heating then assumes the function of the auxiliary heater.