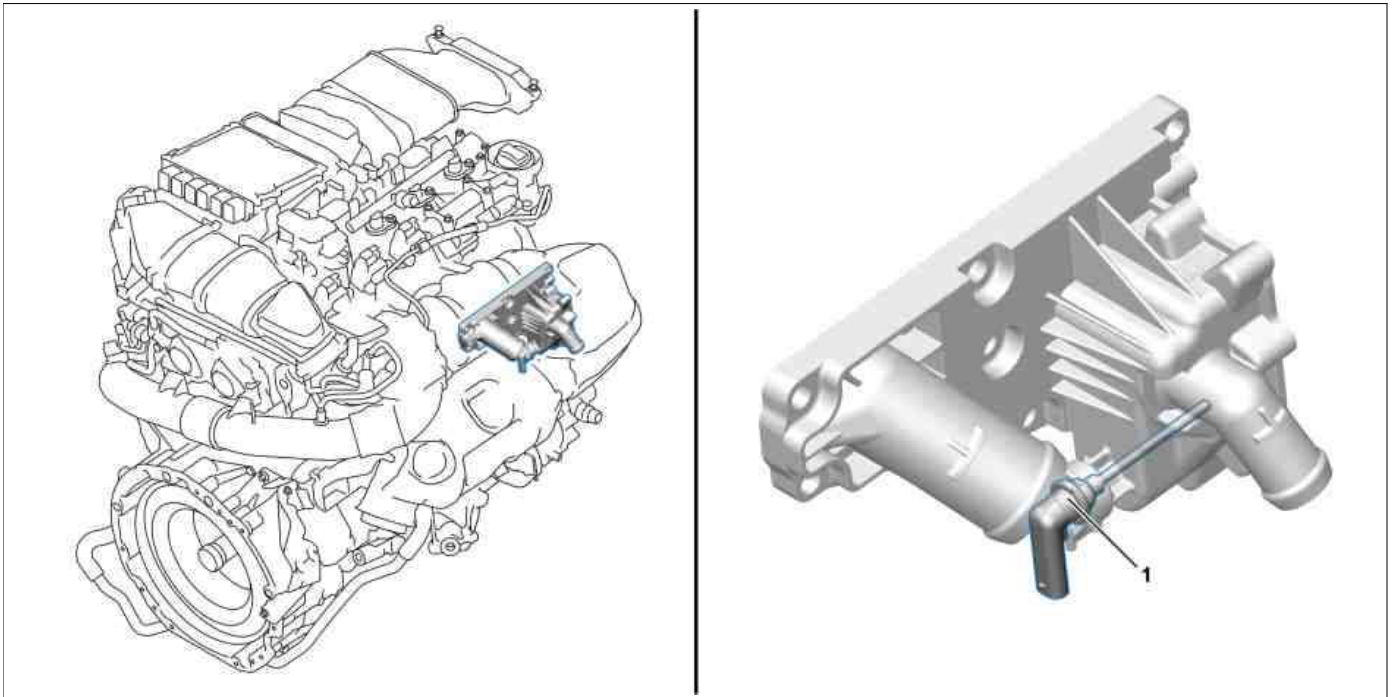


Engine all (CAR)



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Example illustration

1 Coolant thermostat heating element

Overview

This document contains information on:

- General
- Function

General

The coolant thermostat heating element serves as the actuator for the electronic control of the coolant thermostat for the heat management.

1 The coolant thermostat mechanically regulates the coolant temperature for the heat management in the range from approx. 102 °C to approx. 118 °C.

Electronic regulation of the engine's coolant temperature results in the following advantages:

- Operating temperature is reached faster
- Emissions reduced
- Improved heating comfort

Function

The actuation of the coolant thermostat heating element is realized via a pulse width modulated signal with a frequency of 141 Hz from the combustion engine control unit. The power supply occurs via "circuit 87 M".

The coolant thermostat is opened and closed by temperature-specific expansion or contraction of the expandable wax element.

The actuation of the coolant thermostat heating element also enables fully variable opening and closing of the coolant thermostat and regardless of the engine-related requests.

The function of the coolant thermostat is subdivided into the following partial functions:

- Closed position
- Position opening (mixed-fuel mode)
- Open position (radiator mode)

Closed position

Coolant temperature below 102 °C:

The coolant is only circulated in the engine, the engine oil heat exchanger and the exhaust gas turbocharger.

Position opening (mixed-fuel mode)

Coolant temperature between 102 °C and 118 °C

The coolant thermostat opens, the coolant flows partly through the radiator.

Open position (radiator mode)

Coolant temperature at 118 °C:

The coolant thermostat is fully opened and coolant flows through the radiator.

Dependent on the motoric requests, a higher or a lower coolant target temperature is adjusted.

For a higher coolant temperature (from approx. 106 °C), the mechanical regulation is supported by additional heating of the wax expansion element. At 110 °C, the coolant thermostat heating element is fully energized; this results in the full opening of the coolant thermostat and contributes to reducing the coolant temperature.

The low specified coolant temperature lies at approx. 85 °C. In doing so the heating element is subject to a pre-control, which is variably adapted to the ambient conditions. To avoid critical temperature ranges, the coolant thermostat heating element is already fully energized at 80 °C. At low outside temperatures the heating element is energized with 30 to 50 % of maximum output.