

Engine all (CAR)

Overview

This document contains information on:

- **General**
- **Function requirements**
- **Mechanical coolant thermostat**
- **Electrically actuated coolant thermostat**

General

The coolant thermostat is responsible for the coolant temperature regulation in the high-temperature coolant circuit. Via the coolant thermostat regulation, the engine should quickly reach its optimal operating temperature and maintain this depending on the operating status.

An electrically actuated coolant thermostat in engine 276 is shown

- 1 Two-disk thermostat heating element
- 2 Coolant thermostat housing
- 3 Two-disk thermostat

The electrically actuated coolant thermostat facilitates the regulation of the coolant temperature depending on a characteristics map stored in the combustion engine control unit. The coolant temperature can be adapted to the load condition, engine speed and emission levels. Electronically controlled coolant thermostats are basically designed like mechanical coolant thermostats; however, they also have a heating element as the actuator.

The heating element is actuated by the combustion engine control unit and influences the expansion of the wax expansion element. The combustion engine control unit compares the specified and actual coolant temperatures so that it can regulate the desired coolant temperature. The opening time and the throughflow of the radiator are continuously determined by the combustion engine control unit.

The following advantages arise due to the regulation of the coolant temperature via an electrically actuated coolant thermostat:

- Low fuel consumption

	Additional basic functions	
	Coolant thermostat heating element, basic function	GF20.10-P-2004A

Function requirements

- Engine management ON (circuit 87M)
- Engine runs

Mechanical coolant thermostat

A wax expansion element is located in the mechanical coolant thermostat. Coolant constantly flows around the wax expansion element; this changes its volume depending on the coolant temperature. Due to the volume changes, different routes are released or closed for the coolant depending on the thermostat housing design.

The mechanical coolant thermostat can basically adopt the following positions:

- Position for full throttling
To quickly bring the engine to operating temperature, the coolant thermostat is closed at temperatures below 83 °C. The coolant only flows through the engine. Depending on the cooling circuit, coolant may also flow through the heater core.
- Position for mixed-fuel mode
The coolant thermostat opens in the coolant temperature range between 83 °C and 93 °C. The throughflow of the coolant radiator is initiated by the opening of the coolant thermostat.
- Engine radiator mode position
At a coolant temperature above 93 °C, the thermostat is fully opened and the engine has reached its operating temperature. The coolant fully flows through the radiator and all coolant circuits.

i The indicated temperatures and temperature ranges differ depending on the coolant thermostat.

Electrically actuated coolant thermostat



P20.10-2529-81

- Improved emission levels
 - Lower wear in combustion engine
 - Improved heating comfort in vehicle interior
- The permanent regulation of the electrically actuated coolant thermostat by the combustion engine control unit ensures that the engine is always kept in the optimal temperature range.