



BRIEF INFORMATION

Engine Coolant Temperature Sensor

PRODUCT FEATURES

HELLA is among the leading providers in the area of sensor systems - our coolant temperature sensor also meet the highest functional and quality demands. Coolant temperature sensors are an integral part of the cooling circuit. It detects the engine operating temperature. Should it exceed a fixed target value, a respective warning message is triggered. This allows avoiding greater engine damage early, e.g. a defective cylinder head gasket.

1. COOLANT TEMPERATURE SENSOR FUNCTION: FUNCTIONAL PRINCIPLE

Coolant temperature sensors are used by the fuel management system to detect the engine's operating temperature. Depending on the sensor information, the control unit adapts the injection time and firing angle to the operating conditions. The sensor is a temperature sensor with a negative temperature coefficient. This means that the internal resistance reduces as the temperature increases.

The resistance of the temperature sensor changes depending on coolant temperature. As the temperature increases, the resistance is reduced, which reduces the voltage at the sensor. The control unit evaluates these voltage values, since they are directly related to the coolant temperature (low temperatures result in high voltage values at the sensor, and high temperatures result in low voltage values).

2. COOLANT TEMPERATURE SENSOR FAULTY: SYMPTOMS

A faulty coolant temperature sensor can manifest itself in different ways through fault detection by the control unit and the resulting emergency program strategy.

Frequent fault symptoms are:

- Higher idle speed
- Increased fuel consumption
- Poor starting behaviour

In addition, problems may also occur with the exhaust gas test cycle through increased CO values or intermission of the lambda control. The following entries can be stored in the fault memory of the control unit:

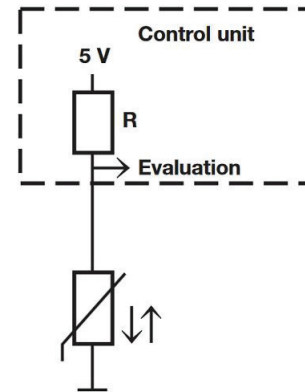
- Short circuit to frame in the wiring or short circuit in the sensor
- Positive fault or break in wiring
- Implausible changes in signal (signal jump)
- Engine does not reach the minimum coolant temperature
- The last fault code can also occur if the coolant thermostat is faulty.

Engine Coolant Temperature Sensor

3. CHECKING THE COOLANT TEMPERATURE SENSOR: TROUBLESHOOTING

Troubleshooting:

- Read out the fault memory
- Check the electrical connections of the sensor wiring, the plug, and the sensor for correct connection, breaks, and corrosion



Checks are carried out using the multimeter

Test step 1

The internal resistance of the sensor is determined. The resistance is temperature-dependent. When the engine is cold it is high-impedance, and when the engine is hot it is low-impedance. Depending on the manufacturer: 25°C 2.0 – 6 KOhm or 80°C approx. 300 Ohm. Please note the special reference value specification

Test step 2

Check the wiring to the control unit by checking continuity and short circuit to frame for every wire to the control unit plug.

- Connect ohmmeter between temperature sensor plug and removed control unit plug. Reference value: approx. 0 Ohm (circuit diagram required for pin assignment on control unit).
- Check the respective pin at the sensor plug against ground using an ohmmeter and with the control unit plug removed. Reference value: >30 MOhm

Test step 2

Check the supply voltage at the removed sensor plug using the voltmeter. This is done with the control unit plugged in and the ignition turned on. Reference value: approx. 5 V. If the voltage value is not reached, the voltage supply of the control unit and the ground supply must be checked according to the circuit diagram. If these are OK, a control unit fault comes into question

HELLA ELECTRONICS ONLINE



HELLA TECH WORLD

- Vehicle specific repair instructions
- Technical Information
- Technical videos



HELLA PARTNER WORLD

- Monthly product news list for download
- Compact information on highlight products
- Marketing Support