

TEMPERATURE SENDER

TECHNICAL INFORMATION

Operation

They are "Thermometers" that convert temperature into electric signals in order to be interpreted by on-board electronic systems.

Application

Engine Temperature: Measures the cooling fluid's temperature in engines cooled by water and the oil temperature in engines cooled by air.

Operation Principle

The main component used on Temperature Sensors for automotive systems are thermistors (NTC type resistors). These Sensors are composed by a capsule or support, where the NTC element is assembled (Fig. 1).

As showed the (Fig. 2), the main feature of the thermistor (NTC: Negative Temperature Coefficient) is presenting an accentuated variation of its electric resistance in relation to its the temperature.

Temperature increase → resistance reduction
 Temperature reduction → resistance increase

The Sensor assembly depends on the application intended. When intended for engine's temperature measurement, the NTC element is located inside a protection capsule, isolating it from the cooling fluid.

Important: Some vehicle models use a Temperature Sender in conjunction with a thermostich, called DUPLEX. This sensor not only activates the gauge that informs the cooling fluid temperature increase, but also informs the temperature excess to the instrument panel bay (warning lamp or alarm). (For more information please refer to the Thermostich chapter).

Location

Engine Temperature Sender: In the thermostatic valve, in the engine block or in the intake manifold base, in cases where the cooling fluid flows through it (engines powered by alcohol).

Use

Engine Temperature sender - Used to:

- Indicate through a gauge the engine cooling fluid temperature.
- Control the gasoline injection of cold start in ethanol powered vehicles.

When it does not work

- Engine Temperature sender: Indicates temperature incorrectly, possibly allowing the engine to overheat.

Maintenance

Important actions when to changing the plug:

- Avoid excessive tightening.
- Bleed the air (remove air bubbles) from the cooling system.

Diagnostic

For these senders there are three failure types:

1. The sender sends the wrong information, but inside the working range.
2. The sender sends the wrong information out of the working range. (Sender in hort or open).
3. The information is wrong (short or open) for certain temperatures (intermittent failure). In all cases, the diagnostic can be accomplished with the use of test equipment ("scanner") or voltmeter.

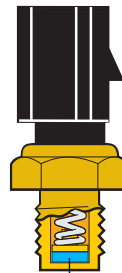
For case 1: Using the correct scale in the voltmeter, compare the reading with the actual engine temperature.

For case 2: Sender in short: Zero value on screen - Opened Sender: No value on the screen.



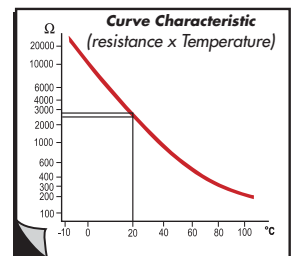
Fig. 1

TEMPERATURE SENDER



NTC THERMISTOR

Fig. 2



For case 3: With the sender connected and using a voltmeter, check the presence of eventual non continuity (tension peaks) in the sensor's signal measurement, while the engine heats from environment temperature until normal working temperature. To check the calibration, in addition to the ohmmeter, it is indispensable to have in hands the calibration schedule supplied by the manufacturer.

Cares

- Always check the correct Temperature Sender for each vehicle model.
- Never perform a maintenance repair while the cooling system is hot. There is a great risk of burning traumas.
- At any symptom of excessive temperature, park the vehicle in a safe place and turn off the engine immediately.
- Check the cooling fluid level weekly, with the engine cold.
- Always use the specified cooling fluid and the correct rate.
- Do not complete the cooling system with pure water, because this will dilute the ethylene glycol concentration.
- Any reduction in the cooling fluid level indicates a leaking in the cooling system.
- Perform the preventive maintenance of the temperature sender every 30.000 Km.

Warranty

- The MTE-THOMSON products are warranted by 01 year against manufacture or material defects, starting from the purchase date, by the final user.
- The warranty is not valid for parts damaged due to installation errors, wrong application or accident.
- The replacement will occur in the purchase place, by means of the presentation of the purchase bill, according to the description on the Warranty Procedures.
- This warranty is valid only for MTE-THOMSON products.