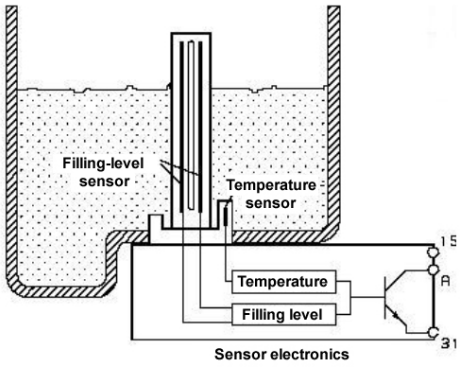
Thermal oil-level sensor

General points

The thermal oil-level sensor has the task of monitoring the oil level and the oil temperature. It is installed in the oil pan from below. The oil-level sensor components (level sensor, temperature sensor and sensor electronics) are located in a housing.

Function

The filling-level sensor is made up of two parallel printed-conductor structures which cover the motor-oil measuring range. These temperature-dependent resistor elements are operated in a bridge circuit, where one is used as a reference element and the other as a measuring element. Controlled by the electronics, the measuring element is heated up briefly (at output = high) and then cools down again (at output = low). This process is repeated continuously. The high times are dependent on the oil temperature and the low times proportional to the filling level.
The oil temperature is measured by a sensor. This is installed at the lower end in a plastic housing insulated from oil and completely submersed (see diagram).



Schematic diagram

Effects of failure

Reasons for the oil-level sensor to fail:

- Internal short-circuits
- Failure of the measuring elements
- Failure of the sensor electronics
- Penetration of motor oil through damage to the housing
- Lack of voltage and earth connection

If the oil-level sensor fails, this can become noticeable as follows:

- Oil control-lamp illuminates
- Warning message in the multi-function display
- A fault code is stored

Troubleshooting

The following tests should be taken into account during troubleshooting.

Visual test:

If there is visible damage to the housing of the thermal oil-level sensor, the wiring or the plug, the sensor should be replaced or the wiring repaired.

Testing the voltage supply and earth connection

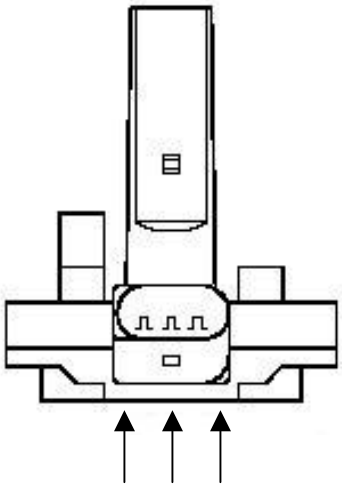
The voltage supply (observe manufacturer's notes) and the earth connection should be checked at the sensor plug.

Test with the oscilloscope:

The oscilloscope can be used to tap and display the signal at the signal cable (A). Note: This measurement can be used only to establish whether a signal is transmitted to the control unit. It is not possible to use the signal displayed to make a statement about correct sensor function.

Test with diagnosis equipment:

Suitable diagnosis equipment should be used to take a readout of the fault memory. Sensor-related faults should be eliminated and the fault memory erased.



Pin assignment

Signal pattern

Installation note:

The torque of the fastening screws of 9.5 +/- 1 Nm must not be exceeded during installation.