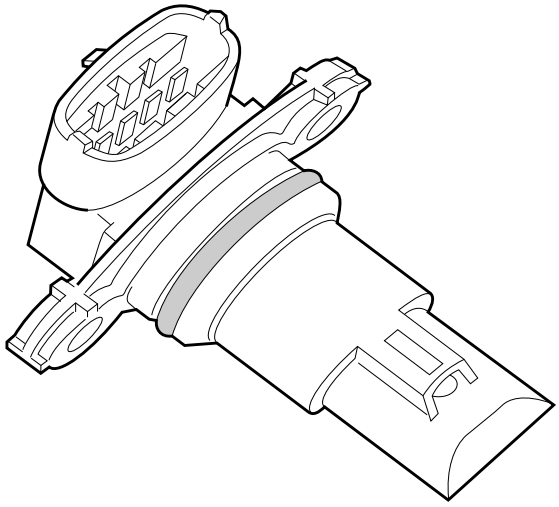
Humidity sensor (F852)

The humidity sensor (F852) incorporates three different sensors, and is located in the air intake circuit. The sensor measures the relative humidity, pressure, and temperature of the precompressor intake air. The output data of the humidity sensor is transferred via CAN.



i401603

Humidity

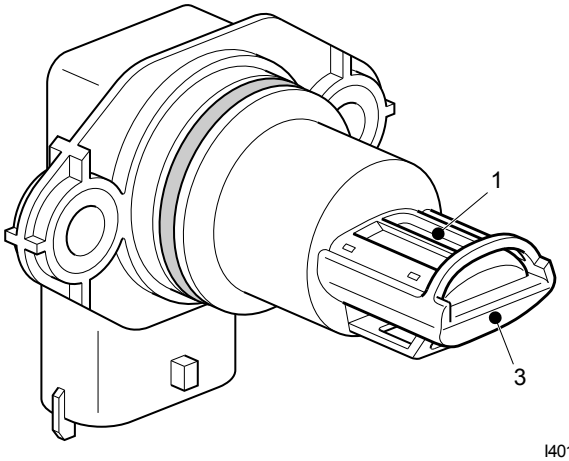
Humidity refers to the mass of water in a unit volume of moist air at a given temperature and pressure.

The relative humidity refers to the percentage moisture content of the air compared to the saturated moisture level at the same temperature and pressure.

The humidity sensor determines relative air humidity using capacitive measurement technology. For this principle, the sensor element is built out of a film capacitor on different substrates (glass, ceramic, etc.). The dielectric is a polymer that absorbs or releases water proportional to the relative environmental humidity, thus changing the capacitance of the capacitor, which is measured.

Effect of output signal on the system

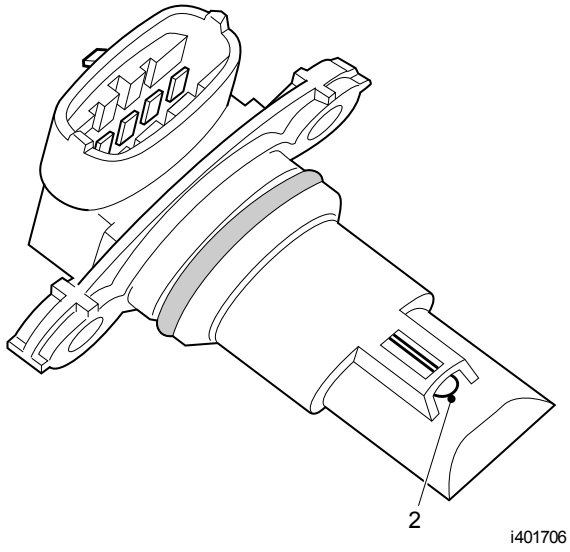
- The humidity sensor is used to control the emissions of NOx.



I401709

Precompressor temperature

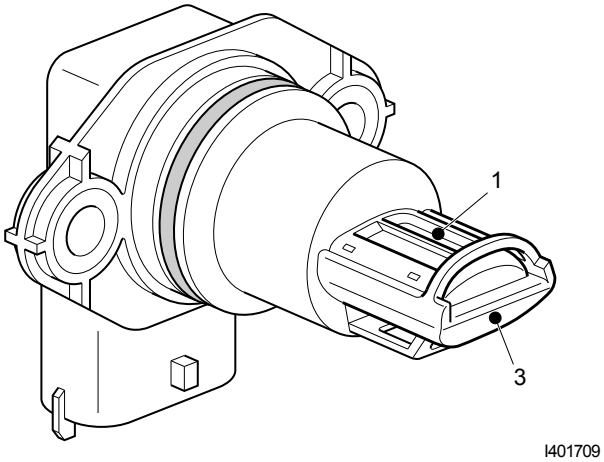
The sensor element is location (2) on the humidity sensor. The temperature sensor is used to measure the precompressor temperature. This value is used for:



Effect of output signal on the system

- Calculation of the turbo speed.
- Limitation of maximum engine torque as a function of precompressor temperature. For example, to limit the cylinder pressures during cold ambient conditions.
- To determine compressor flow and thus the detection of VGT surge. Surge can typically occur at high compressor pressure ratios and low compressor mass flows.

Precompressor pressure



Effect of output signal on the system

- Calculation of the turbo speed.
- The sensor in VGT surge detection is used to determine the compressor pressure ratio. Surge can typically occur at high compressor pressure ratios and low compressor mass flows.

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