

Tips & Technology

For Bosch business partners

Current topics for successful workshops No. 39/2011



BOSCH

Invented for life

Gasoline injection

Service information: Hot film air mass meter - air filter

Use of hot film air mass meter

To comply with the emission limits for motor vehicles set down by law, the pollutant levels in the exhaust gas of internal combustion engines must be minimized and the combustion process optimized. This involves mixing the air and fuel in a precisely defined ratio. It is therefore necessary to exactly record the air mass flow and transmit this in the form of an electrical signal to the control electronics. The hot film air mass meter is used to measure the air mass flow in internal combustion engines for precise adaption of the injected fuel quantity to the current power requirement, atmospheric pressure and air temperatures.

Design of hot film air mass meter

Air mass meters consist of a measurement tube into which the plug-in sensor with the sensor element is inserted. The dimensions of the measurement tube vary depending on the measuring range requirements. There are measurement tubes of different sizes and design to suit the required air throughput. It is basically also possible to integrate the plug-in sensor directly in the intake tract, for example in the air filter housing or intake connection. The sensor element is located in the air flow (measurement duct) of the plug-in sensor and forms part of a Wheatstone bridge. The configuration is such that the inevitable contamination does not affect the flow of air around the sensor. This obviates the need for a self-cleaning process as always used to be necessary with earlier hot wire air mass meters prior to starting.

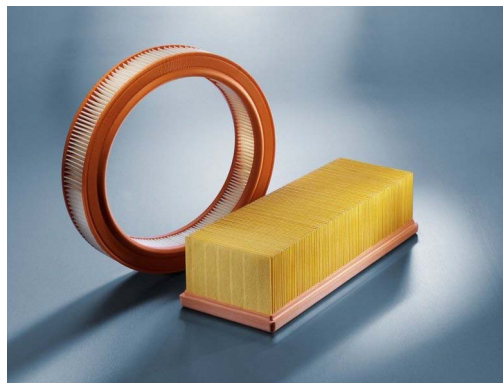


After fitting a new air mass meter, Bosch also recommend changing the air filter:

The air filter cleans the combustion air drawn in and thus guards all the engine components behind it against dirt deposits and damage (caused by hard particles). The hot film air mass meter is generally installed in the intake duct directly downstream of the air filter and requires the following to operate properly

- Clean air
- A uniform flow of air without any turbulence

This is largely ensured by the air filter.

**In addition to a reduced flow of air, a worn air filter may be responsible for:**

The admission of dirt particles, either on account of a damaged filter medium or leakage due to poor sealing action between the filter housing and the sealing lip of the filter element, leading to

- Contamination of or damage to the sensor
- Incorrect measurement of the air mass

An uncontrolled flow of air due to leakage on account of poor sealing action of the sealing lip, leading to

- Air turbulence
- Incorrect measurement of the air mass

So: Always change the air filter element when replacing the hot film air mass meter and at the same time make sure the air filter housing is absolutely clean.