

E 139411

The **MAP** sensor is installed on the intake manifold. The sensor provides a voltage signal to the ECM relative to the intake manifold pressure. The **MAP** sensor has a three pin connector that provides a 5V reference supply from the ECM, a signal output to the ECM and a ground.

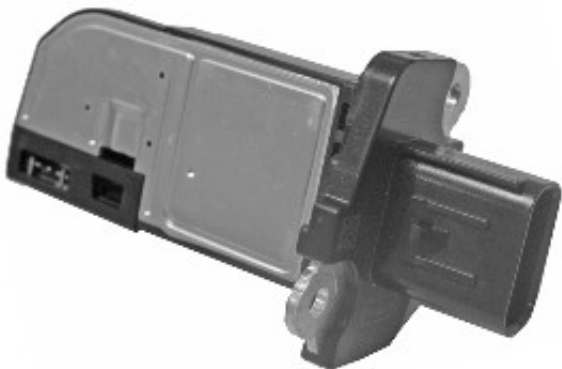
The **MAP** sensor uses a diaphragm transducer to measure pressure. The ECM uses the sensor signal for the following functions:

- Maintain manifold boost pressure
- Reduce exhaust smoke emissions when driving at high altitude
- Control of the EGR system.

If the **MAP** sensor fails, the ECM uses a default pressure of 1013 mbar (14.7 lbf/in²) absolute and may illuminate the **MIL**. In the event of a **MAP** sensor failure, the following symptoms may be observed:

- Engine speed restricted
- Rough running, engine hesitates.
- **MIL** illuminated.

MASS AIR FLOW AND TEMPERATURE SENSOR



E 139410

The **MAFT** sensor is located in the outlet of the air cleaner.

The **MAFT** sensor receives a 12V supply from the power relay in the **BJB (battery junction box)** and a ground connection via the **ECM**. Two further connections to the **ECM** supply the **MAF (mass air flow)** and the temperature signals.

The temperature sensor is a **NTC** thermistor. The **ECM** uses the temperature signal to correct the fueling map for intake air temperature.

The **MAF** sensor works on the hot film principle. The sensor output is a digital signal proportional to the mass of the incoming air. The **ECM** uses this data, in conjunction with signals from other sensors, and information from stored fueling maps, to determine the precise fuel quantity to be injected into the cylinders. The signal is also used as a feedback signal for the **EGR** system.

The **ECM** checks the calculated air mass against the engine speed. If the calculated air mass is not plausible, the **ECM** uses a default air mass figure which is derived from the average engine speed compared to a stored characteristic map. The air mass value will be corrected using values for boost pressure, atmospheric pressure and ambient air temperature.

In the event of an air sensor signal failure, any of the following symptoms may be observed:

- Difficult starting
- Engine stalls after starting
- Delayed engine response
- Emission control inoperative