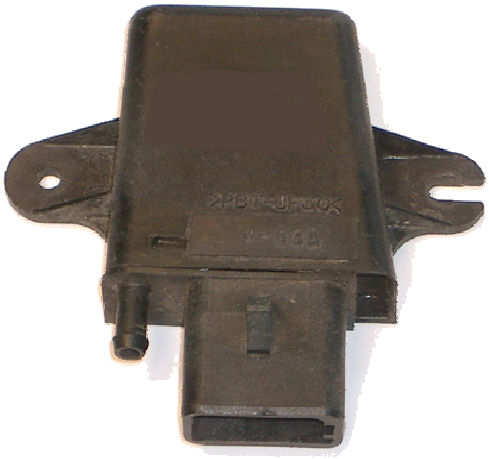
Manifold air pressure sensor (MAP)

General

The manifold air pressure sensor measures the vacuum in the induction pipe after the throttle valve. The readings taken by the MAP sensor and the intake air sensor are used to compute the volume of air intake. The result is combined with the lambda probe signal to make up a closed control loop. The MAP sensor installs either immediately in the induction pipe or somewhere outside in the near vicinity.



Function

The MAP sensor housing contains the logic analyser and a measuring head. Inside the measuring head there is a diaphragm which encloses a reference pressure chamber carrying four bridge-connected strain resistors. Two of these strain resistors are located at the centre of the diaphragm to act as measuring resistors. The other two resistors are installed on the outside of the diaphragm where they serve as reference resistors for temperature compensation. Pressure changes produce changes in the diaphragm shape which, in turn, modifies the conductivity of the measuring resistors and with it the measuring voltage. The logic analyser processes the measuring voltage and outputs it to the engine control device.

Effects of a failure

The following signs may be indicative of a MAP sensor failure:

- Massive loss of power
- Misfiring during acceleration
- Instable idle speed
- Lighting up of the engine control lamp

The following may be causes of MAP sensor failures:

- Damaged measuring elements
- Internal short circuits
- No power supply, earth connection
- Vacuum connector clogged up; vacuum pipe ripped or damaged.

Troubleshooting

Troubleshooters should check the following points:

- Visual inspection: check if all connectors are properly plugged in and all cables connected and undamaged. Check that the vacuum connector and/or vacuum tube are clean inside and properly attached.
- In vehicles equipped with a diagnostic system connector, check the error memory and perform a comparison of target and actual values (if possible).
- Use a suitable instrument to check the power and earth connections.