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What is an air mass meter

Air mass meters are also commonly referred to as air flow meters. They measure the mass of the air flowing into the engine. The air mass information is necessary to calculate and deliver the right amount of fuel to the engine.

What do they look like ?
Usually situated directly after the airbox so that filtered air is measured.

Simply put, they are a plastic tube that air passes through. There will be sensors inside that are in the air stream. There will be a plug with electrical wires attached to it. These send the air mass meter information to the cars computer (ECU).

Here is a Bosch air mass meter, typically fitted to Audi, Seat & VW diesel engines.

Here is a Pierburg air mass meter, typically fitted to Audi, Seat & VW diesel engines.

Here is an internal photo of the type of air mass meter fitted to the Ford Probe.

What can go wrong with the air mass meter ?

Well, if you imagine that everytime your car is driven the vane or electrical wire inside is having air passed over it. Although this air has been filtered via the panel filter within the airbox, there will still be minute particles of dust and pollen etc. that will build up over time and reduce the air mass meters efficiency. Eventually it will stop working and this usually results in a significant affect on your cars power and its fuel economy. It is not a part that will last forever, and although there are people that state that you can clean the internal parts, it is probably better in the long run if you just get it changed when it finally does stop working.

There was an intermittent fault on my VW Sharan (turbo diesel) whereby on occasion after a long run or having a lot of people in it, the power would disappear and the turbo was virtually non-responsive. After a while or if I switched the ignition off, the problem would go away but it kept doing this for about 6 months. I had a search around on the internet and looked in many online forums and found that the most likely cause was the air mass meter was on its way out. I had the option of giving a clean to see if this would get rid of the problem, but because of the miles this car has done I decided that this would be a waste of time and would get round to replacing it at some point or to get it changed when it finally

gave up for good (whichever situation would come first).

With my VW Sharan when the air mass meter did not give any signal out to the ECU, the car would switch itself into 'limp mode'. This 'limp mode' was the cause of the lose of power and it was the ECU (cars computer) running in a mode that would minimise any damage to the engine.

Well the air mass meter (airflow meter) finally died for good in July 2006, having covered 108,000 miles. When we changed it (see article how to change an air mass meter) we noticed that it was the original meter as it had a date stamp on it. Not too bad then seeing as it has done all those miles, many of them with lead boots on.

It was a simple 15 minute job and we explain it in detain with photos in the article. Changing the air mass meter is an easy job which did not require any specialist tools.

We explained where we got the air mass meter from, how much it cost, how we fittd it and how the car felt afterwards - well worth a read.

A little more technical stuff if you want it ....

There are two common types of air mass meter. They are the vane meter and the hot wire. Both types use additional sensors to accurately determine the engine's air mass flow rate.

Vane meter sensor

A vane sits in the intake air stream on a spring-loaded arm. The vane moves in proportion to the airflow, and a voltage is generated based on the distance the vane is moved. The vane type air mass meter measures air volume and not mass. It relies on information from other sensors to help accurately calculate air mass.

Hot wire sensor

A wire which is heated by an electrical current sits in the intake air stream. The electrical resistance of the wire changes with it's temperature and thus changes the amount of electrical current being passed through it. Air passes the wire and cools it, decreasing its resistance thus allowing more electrical current to pass. As more current flows, the wire's temperature increases until the resistance reaches equilibrium again. The amount of current required to maintain the wire's electrical resistance is directly proportional to the mass of air flowing past the wire.

Typically the air mass meter outputs a 0 - 5.0 volt signal, proportional to the air mass flow rate. They also normally have a temperature sensor incorporated into their housings to measure the intake air temperature (IAT sensor).

If an Air Mass Meter is used in conjunction with an exhaust gas oxygen sensor (EGO), the engine's air/fuel ratio can be controlled very accurately. The air mass meter provides air flow information to the engine's ECU, and the EGO sensor provides information to make minor corrections.