Lucas

ENGINE MANAGEMENT COMPONENTS GUIDE

A quick reference guide to our most popular engine management components, their function and how to spot common faults.

TECHASSIST

AIR MASS METER

Air Mass Meters (AMM) also known as Mass Air Flow Sensors (MAFS) are fitted after the air filter but before the engine for smooth and fuel efficient operation. The sensor determines how much air is coming into the engine, helping it to decide the level of fuel needed for proper ignition.

Poor performance and rough idle are common symptoms of a faulty Air Mass Meter.

AIR TEMPERATURE SENSOR

The Air Temperature Sensor is a thermistor that monitors the temperature of the air flowing into the engine. The sensor can also be used to monitor interior and exterior air temperature as part of the vehicle comfort settings.

A faulty sensor can lead to increased cranking time when the engine is cold, poor fuel economy and a high nitrogen oxide reading.

COOLANT TEMPERATURE SENSOR

The Coolant Temperature Sensor ensures that the engine does not overheat by measuring the temperature of the engine coolant. By varying resistance and therefore output voltage, it is able to provide information to the engine.

Should this sensor fail, the temperature gauge may be incorrect. Fuel economy may rapidly decrease and engine backfires and cut outs are common symptoms.

CRANKSHAFT/CAMSHAFT SENSOR

The Camshaft Sensor monitors the positions of the camshaft to allow for correct ignition timing. The Crankshaft Sensor detects the position of the crankshaft allowing the ECU to calculate its position in relation to the pistons in the engine.

A weak signal from a faulty sensor results in loss of engine power or misfires. If the sensor has no output then the car will fail to start.

EGR VALVE

The Exhaust Gas Recirculation Valve helps the engine to more efficiently and completely burn fuel by recirculating a portion of the exhaust gas and running it through the combustion process again. Resulting in a cooler, more complete burn of the fuel which decreases harmful emissions.

A faulty EGR can result in loss of engine power, stuttering, jumping, black smoke from the exhaust or the car falling into 'limp mode'.

IDLE AIR CONTROL VALVE

The Idle Air Control Valve is fitted onto the throttle body to bypass air around the throttle valve, controlling the speed of the engine at idle. The ECU controls the idle valve and lets more air in without the accelerator being pressed, warming the engine. This is useful for cold starts.

Symptoms of failure include erratic revving when idling, misfiring or stalling.

IGNITION COIL

The Ignition Coil is essentially wire wrapped around a core to make a transformer. This transforms the battery's low voltage to the thousands of volts needed to create an electric spark in the spark plugs and ignite the fuel. A low voltage input on the primary winding then creates a high voltage output on the secondary winding.

Look for misfires, stalling or failure to start.

KNOCK SENSOR

The Knock Sensor is mounted on the engine block and acts like a microphone, transforming the vibrations caused by the sound waves from knocking into a voltage signal that can be read by the ECU. Knocking is continually monitored and ignition timing is retarded when required to prevent possible engine damage.

A faulty Knock Sensor can result in poor acceleration and reduced fuel economy.

MAP SENSOR

The Manifold Absolute Pressure Sensor (MAP Sensor) determines the correct air/fuel ratio in vehicles which do not have an Air Mass Meter. They use air temperature and engine speed to determine air density and in some vehicles, measure EGR valve performance or monitor air pressure in turbo applications.

A faulty sensor could result in irregular engine RPM due to incorrect readings or turbo failure.

THROTTLE POTENTIOMETER

The Throttle Potentiometer is a variable resistor fitted onto the throttle body on the shaft of the throttle valve. It monitors the position of the valve and therefore how much air is being drawn into the engine. Allowing correct operation of the Idle Air Control Valve when the accelerator is not being pressed.

Poor idling, misfires, stalling or hesitation could be symptoms of failure.

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