

TYPES OF ENGINE SENSORS

Engine sensors in a vehicle are incorporated to provide the correct amount of fuel for all operating conditions. A large number of input sensors are monitored by the engine control unit. Today, sensor technology has become common in modern vehicles. Sensors enhance safety of the people - both on board and on road, control vehicle emissions and make vehicles more efficient. In this article, we will discuss different types of engine sensors used in modern vehicles.

Mass Air Flow Sensor (MAF)

The MAF sensor (electric sensor) is an integral part of the engine system. It is controlled by a computer. It is located in a plastic covering between the engine and the air filter. The purpose of MAF is to calculate the amount of air intake by the engine, in terms of volume and density. For measuring the volume and density of air, the sensor uses either a hot wire or a heated filament. After the measurement, it sends a voltage signal to the computer. With this, the computer can calculate the right amount of fuel needed to maintain the correct fuel mixture for every operating condition. If there is any fault in the MAF sensor, it may result in rough idle, stalling and poor fuel economy.

Throttle Position Sensor (TPS)

The Throttle Position Sensor (TPS) is a variable resistor attached or mounted on the throttle body and is operated by moving along with the throttle shaft or spindle. The TPS changes the resistances as the throttle opens and closes, and sends a voltage signal to the computer showing the angle or position of the throttle. Thus, the TPS causes the Electronic Control Unit (ECU) to use the data to measure the engine load, fuel delivery adjust timing, acceleration, deceleration when the engine is idle or in wide open throttle, and then makes the changes according to the operating conditions. Fuel rate is either increased or decreased to achieve this.

Coolant Temperature Sensor (CTS)

The Coolant Temperature Sensor (CTS) is a temperature dependent variable resistor located on the cylinder head or intake manifold. The CTS is an important sensor and the operating strategy of the engine depends on the signal it sends. So, it is called the “master” sensor.

The CTS measures the internal temperature of the engine coolant. It also senses the changes in temperature and sends a voltage signal to the Power train Control Module (PCM) for determining whether the engine is cold or warming up, is at normal operating temperature or is overheating.

Oxygen Sensor

The oxygen sensor is located on the exhaust manifold. This sensor monitors the amount of unburned oxygen present in the exhaust. When the fuel mixture is rich, most of the oxygen is exhausted during the combustion. So, only a little unburned oxygen will be left out in the exhaust. Difference in the oxygen levels creates an electrical potential, which causes the sensor to generate a voltage signal. This helps the ECU to check the quality of fuel mixture to make the changes accordingly. The sensor output will be high if the fuel mixture is rich, and the sensor output will be low if the fuel mixture is lean.

Manifold Absolute Pressure Sensor (MAP)

The MAP is a key sensor as it senses the engine load. It is mounted on the intake manifold. It monitors the difference between the air pressure in the intake manifold and outside. This sensor responds to the vacuum in the intake manifold and generates a voltage signal accordingly. It then sends the signal to the PCM. The input of the sensor is used for adjusting the fuel mixture and ignition timing, according to the changes.

Engine Speed Sensor (ESS)

The ESS is a sensor attached to the crankshaft of the car's engine. It is different from vehicle speed sensor. The ESS is used for monitoring the engine speed. In other words, it is meant for assessing the speed at which the crankshaft spins.

Voltage Sensor

The voltage sensor monitors the system voltage of the vehicle and reports it to PCM so that it can rise the idle speed of the vehicle, if the voltage is dropping.

Engine sensors are an important technological innovation. They lead to better performance, better quality and more years of driving experience.

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