

Engine Sensors

Oxygen sensor Lean mixture causes low voltage, since there is an oxygen excess. Modern spark-ignited combustion engines use oxygen sensors and catalytic An oxygen sensor is an electronic component that detects the concentration of oxygen molecules in the air or a gas matrix such as in a combustion engine exhaust gas. through the sensor layer

Engines that use a MAP sensor are typically fuel injected. The manifold absolute pressure sensor provides instantaneous manifold pressure information to the engine's electronic control unit (ECU). The data is used to calculate air density and determine the engine's air mass flow rate, which in turn determines the required fuel metering for optimum combustion (see stoichiometry) and influence the advance or retard of ignition timing. A fuel-injected engine may alternatively use a mass airflow sensor (MAF sensor) to detect the intake airflow. A typical naturally aspirated engine configuration employs one or the other, whereas forced induction engines typically...

Engine knocking The shock wave creates the characteristic metallic "pinging" sound, and cylinder pressure increases dramatically. The fuel-air charge is meant to be ignited by the spark plug only, and at a precise point in the piston's stroke. Effects of engine knocking range from inconsequential to completely destructive. Knock occurs when the peak of the combustion process no longer occurs at the optimum moment for the four-stroke cycle. combustion engine contains mechanisms to detect and prevent knocking. A control loop is permanently monitoring the signal of one or more knock sensors (commonly In spark-ignition internal combustion engines, knocking (also knock, detonation, spark knock, pinging or pinking) occurs when combustion of some of the air/fuel mixture in the cylinder does not result from propagation of the flame front ignited by the spark plug, but when one or more pockets of air/fuel mixture explode outside the envelope of the normal combustion front

Related to the TPS are accelerator pedal sensors, which often include a wide open throttle (WOT) sensor. The accelerator pedal sensors are used in electronic...

Engine control unit Systems commonly controlled by an ECU include the fuel injection and ignition systems. knock sensors inlet manifold pressure sensor (MAP sensor) intake air temperature intake air mass flow rate sensor (MAF sensor) oxygen (lambda) sensor throttle An engine control unit (ECU), also called an engine control module (ECM), is a device that controls various subsystems of an internal combustion engine

Throttle position sensor More advanced forms of the sensor are also used. contact TPS include Hall effect sensors, inductive sensors, magnetoresistive and others. For example, an extra "closed throttle position sensor" (CTPS) may be employed to indicate that the throttle is completely closed. In the potentiometric type sensors, a multi-finger metal brush/rake A throttle position sensor (TPS) is a sensor used to monitor the throttle body valve position for the ECU of an engine. The sensor is usually located on the butterfly spindle/shaft, so that it can directly monitor the position of the throttle

environment pollutant concentrations in... intake air and fuel consumption rates, often detected using volumetric and/or gravimetric measurement methods The earliest ECUs (used by aircraft engines in the late 1930s) were mechanical-hydraulic units; however, most 21st-century ECUs operate using digital electronics. There are two common types of mass airflow sensors in use on automotive engines. These are the vane meter and the hot wire. Neither design employs technology that measures air mass directly. However, with additional...

Mass flow sensor forced induction, which means that mass flow sensors are more appropriate than volumetric flow sensors for determining the quantity of intake air in A mass (air) flow sensor (MAF) is a sensor used to determine the mass flow rate of air entering a fuel-injected internal combustion engine

Nitrogen oxide sensor The drive to develop a NOx sensors arises from A nitrogen oxide sensor or NOx sensor is typically a high-temperature device built to detect nitrogen oxides in combustion environments such as an automobile, truck tailpipe or smokestack. Advances of sensor technology enable people to monitor air quality through widely distributed low-cost sensors

The air mass information is necessary for the engine control unit (ECU) to balance and deliver the correct fuel mass to the engine. Air changes its density with temperature and pressure. In automotive applications, air density varies with the ambient temperature, altitude and the use of forced induction, which means that mass flow sensors are more appropriate than volumetric flow sensors for determining the quantity of intake air in each cylinder. The crank sensor can be used in combination with a similar camshaft position sensor (CMP) to monitor the relationship between the pistons and valves in the engine, which is particularly important in engines with variable valve timing. This method is also used to "synchronise" a four stroke engine upon starting, allowing the management system to know... Some engine control units (ECUs) also control the throttle position by electronic throttle control (ETC) or "drive by wire" systems, and if that is done, the position sensor is used in a feedback loop to enable that control. air-fuel ratio for the intake mixture, often detected using an exhaust gas oxygen sensor

Engine test stand sophisticated engine test stand houses several sensors (or transducers), data acquisition features and actuators to control the engine state. The sensors would An engine test stand is a facility used to develop, characterize and test engines. The facility, often offered as a product to automotive OEMs, allows engine operation in different operating regimes and offers measurement of several physical variables associated with the engine operation

Crankshaft position sensor This information is used by engine management systems to control the fuel injection or the ignition system timing and other engine parameters. crankshaft itself. As the fuel injection A crank sensor (CKP) is an electronic device used in an internal combustion engine, both petrol and diesel, to monitor the position or rotational speed of the crankshaft.

Engine Sensors

Before electronic crank sensors were available, the distributor would have to be manually adjusted to a timing mark on petrol engines. This sensor is one of the two most important sensors in modern-day engines, together with the camshaft position sensor

crankshaft torque and angular velocity

MAP sensor Engines that use a MAP sensor are typically The manifold absolute pressure sensor (MAP sensor) is one of the sensors used in an internal combustion engine's electronic control system. pressure sensor (MAP sensor) is one of the sensors used in an internal combustion engine's electronic control system

For automotive applications, an oxygen sensor is referred to as a lambda sensor, where lambda refers to the air-fuel equivalence ratio, usually denoted by λ). It was developed by Robert Bosch GmbH during the late 1960s under the supervision of Günter Bauman. The original sensing element is made with a thimble-shaped zirconia ceramic coated on both the exhaust and reference sides with a thin layer of platinum and comes in both heated and unheated forms. The planar-style sensor entered the market in 1990 and significantly reduced the mass of the ceramic sensing element, as well as incorporating the heater within the ceramic structure... A sophisticated engine test stand houses several sensors (or transducers), data acquisition features and actuators to control the engine state. The sensors would measure several physical variables of interest which typically include:

List of sensors Crankshaft position sensor (CKP) Curb feeler Defect detector Engine coolant temperature sensor Hall effect sensor Wheel speed sensor Airbag sensors Automatic transmission This is a list of sensors sorted by sensor type

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