



## Emission Control: Oxygen Sensor



**Description:** Located in the exhaust system at one or more points, an oxygen sensor converts the status of the engine's air/fuel mixture into a corresponding voltage signal. The oxygen sensor is sometimes referred to as a Lambda sensor on some European cars. The most common type of sensor uses a zirconia element to generate voltage. Titania oxygen sensors, on the other hand, use the technology of electrical resistance to produce similar voltage characteristics as zirconia sensors. Regardless of the technology used, changes in the air/fuel mixture result in a voltage change that is monitored by the vehicle's power train control module. Many oxygen sensors also have built-in heaters, to warm them to operating temperature more quickly. Prior to 1996, most cars had one oxygen sensor. In 1996, Onboard Diagnostics II (OBDII) became standard technology for all makes and models. OBD II systems use one oxygen sensor on the inlet to the catalytic converter and another one on the outlet. On cars with dual converters, there may be as many as four oxygen sensors.

**Purpose:** The oxygen sensor reports live information about the engine's air/fuel mixture to the power train control module. This information is used primarily to help calculate fuel delivery to the engine, which changes continuously while it is running. If the engine is running lean, the power train control module will sense this from the oxygen sensor's signal and increase the air/fuel mixture to the engine. Conversely, just the opposite occurs when the engine begins to run rich. On OBDII-equipped vehicles, the sensors are also used to help determine the efficiency of the catalytic converter. The power train control module does this by comparing the signal of the sensor located at the inlet of the catalytic converter with the signal of the sensor located at the outlet of the converter.

**Maintenance Tips/Suggestions:** Replace at the interval as recommended in the owner's manual or when other conditions dictate, such as failing an emissions test. Some cars have an oxygen sensor light that appears when oxygen sensor replacement is needed. Some symptoms of a faulty oxygen sensor include poor gas mileage, a failed emissions test, "rotten-eggs" smell from the exhaust, poor acceleration and more. Although a faulty oxygen sensor can cause the SERVICE ENGINE SOON or CHECK ENGINE light to appear, it's best to have the cause checked out immediately by a professional technician. This is especially true if the SERVICE ENGINE SOON or CHECK ENGINE light flashes rather than staying on steady. Neglecting these warning signs can cause expensive damage to the catalytic converter, requiring replacement.