The Oxygen Sensor Evolution

Exhaust emissions standards are becoming stricter and stricter. It is therefore increasingly important to monitor the exhaust emissions closely and to adjust the engine control accordingly. This is exactly what an oxygen sensor does.

There are around 11 million vehicles registered in Australia with a petrol engine, and an increasing number of these have more than one oxygen sensor. Oxygen sensors are now also being used more and more in diesel engine applications. This is one of the reasons behind an increase in the demand of oxygen sensors in the aftermarket.

As the inventor and leading manufacturer Bosch paves the way when it come to quality and product diversity. With over 30 years of experience and a total production output of over 500 million units, Bosch is the leading global player for original equipment and the aftermarket.

Only Bosch quality oxygen sensors can...
- Save you up to 15% in fuel costs
- Provide optimum control of exhaust emissions
- Prevent damage to the catalyst

Bosch is the No.1 for oxygen sensors!
1976 saw the first Original Equipment application of the Bosch oxygen sensor. In 2006 we celebrated the 30th anniversary of oxygen sensor production.

- Bosch is the largest producer in the world with a total of more than 500 million oxygen sensors.
- Bosch has the greatest level of manufacturing know-how with an output of 33 million sensors per year.
- Bosch is the driving force behind development with the innovations it is constantly creating.
- Bosch is the market leader in original equipment and aftermarket.
- All oxygen sensors delivered by Bosch meet original equipment quality standards.
- The Bosch product range is unique in its diversity.

All vehicle manufacturers throughout the globe place their trust in oxygen sensors form Bosch. Bosch oxygen sensors give you that decisive edge over the competition and are environmentally-friendly, fuel efficient and long-living spare parts.
Oxygen Sensor Evolution

Original or universal? Bosch offers both.
With its wide range of original sensors for accurate solutions and the award-winning universal product range*, Bosch can offer you the right sensor whatever your requirements.

*Bosch has won two innovation prizes for its Universal Oxygen Sensors: "Innovation Award" at the Automechanika, Frankfurt, 2004 and “Silver Trophy” at the Equip Auto, Paris, 2003

The Bosch original product range

• Original oxygen sensors always have the original connector.
• They can fit into the vehicle precisely with no need for further work (plug and play)
• The vehicle manufacturer’s requirements are met 100%.
• The Bosch original oxygen sensors cater for over 75% of the vehicle population in Australia.

The Bosch universal product range

• A small range of universal sensors are required to replace around 1,000 original oxygen sensors.
• The range of universal sensors cater for different sensor elements and heating powers.
• The benefits for you: low storage costs and very high availability rates.
• No special tools are required for installation.
• Universal oxygen sensors have one universal connector. It is patented, guarantees a secure, electrical contact and connects the wiring harness in the vehicle without any problems. It can resist extreme vibration, temperature and moisture.
• A comprehensive installation manual is included with all universal sensors.
Cause and Effect of Oxygen Sensor Failure

Whilst there are many factors that will contribute to accelerated oxygen sensor failure, it should be remembered that an oxygen sensor is a wearing part with a specific service life, not unlike a platinum spark plug.

The oxygen sensor should have a service life ranging from 50,000km – 160,000km dependant on sensor design, however this can be dramatically reduced by various conditions including overheating of the sensor, chemical poisoning and impact damage.

Excluding physical damage, the majority of these conditions will result in the failure of the ceramic thimble by affecting its porous nature. This will result in a sensor that is slow to react to mixture change as shown below. A slow sensor will tend to make the air/fuel ratio of the vehicle drift rich.

**Sensor Voltage Output**

Normal Sensor – Voltage “cycles” between 100 & 900 mV. The average output from the oxygen sensor will be ~ 450mV.

Slow, contaminated or “Tired” Sensor

Voltage slowly builds up and then rapidly drops off. The effect is that the average will drop causing a rich condition.
Oxygen Sensors

Engine Computer (ECM)
Based on various inputs including the oxygen sensor’s signal, the ECM sends a signal to the fuel injectors.

Oxygen Sensor (Control)
This oxygen sensor monitors the oxygen content of the vehicle’s exhaust gases and sends a voltage signal to the ECM.

Oxygen Sensor (Diagnosis)
A post catalyst oxygen sensor is used on many newer vehicles to monitor the performance of the catalytic converter.

Injector
Based on the ECM’s signal, just the right amount of fuel is delivered to the combustion chamber, resulting in the optimal air/fuel mixture.

Catalytic Converter
Without the proper air/fuel mixture, the converter cannot eliminate harmful pollutants from the exhaust gases.