



PIERBURG

Lambda sensors

from the specialist in emission control

PRODUCT
INFORMATION





Lambda sensors in OE quality

With a range of 250 lambda sensors Motor Service is completing its product range in the emission control field.

All the advantages at a glance:

- 100% compatibility to OE and to the competitive brands in the aftermarket
- For petrol and diesel engines
- High coverage of the European car fleet
- 250 types in our range
- 4 additional universal models (1 to 4 cores)

Everything from one source!

As a specialist in emission control, Motor Service now offers a wide range of lambda sensors in addition to the components for exhaust gas recirculation and secondary air systems.



- A** High operating temperatures and aggressive exhaust gas place high demands on lambda sensors
- B** Different plugs, one cable length: this reduces storage space



A lambda sensor measures the residual oxygen in the exhaust gas.

The lambda sensor before the catalytic converter is called a “control sensor”.

Lambda value (λ) is calculated from the signal of the control probe.

$$\lambda = \frac{\text{Supplied air mass}}{\text{Stoichiometric air mass}}$$

- $\lambda < 1$ (λ smaller than 1) means “air shortage” or “rich mixture”
- $\lambda > 1$ (λ larger than 1) means “excess air” or “lean mixture”

By means of the lambda value the engine management system regulates the mixture composition. This has great impact on the quality of combustion, and on the emission control through the catalytic converter.

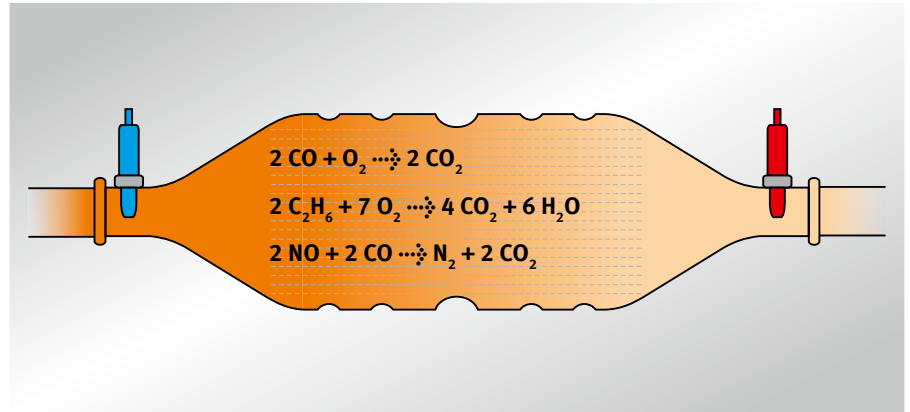
A defective catalytic converter causes increased pollutant emission. Therefore a second lambda sensor after the catalytic converter (“monitor probe”) monitors its condition.

With lambda sensors, a distinction is made between Nernst cells and wide range lambda probes.

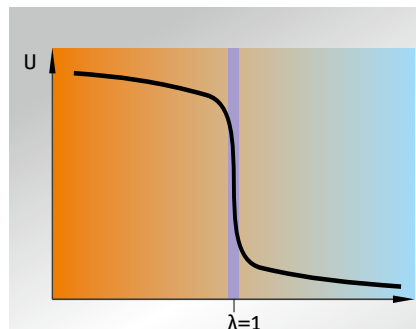
The operating point lies at approx. 550 – 700 °C.

Lambda sensors are available in different designs such as zirconium dioxide (zirconia), titanium dioxide or planar sensors.

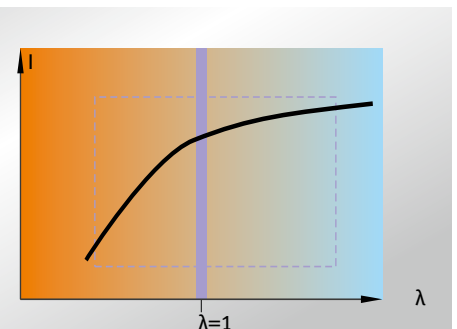
Often, several lambda sensors are used in modern vehicles in order to meet legal requirements regarding exhaust gas purification or self-diagnosis – e.g. one lambda sensor per cylinder bank in V engines, or one lambda sensor per cylinder in systems with selective cylinder control.



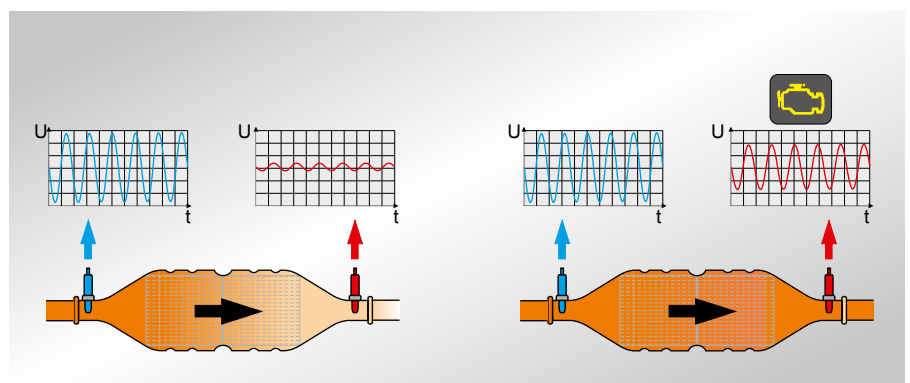
In regulated 3-way catalytic converters pollutants are rendered harmless by means of three chemical reactions.



In Nernst cells, the voltage changes abruptly by $\lambda = 1$.



Wide range probes continuously measure over a wide lambda range, from rich to lean.



Lambda sensor as “monitor probe”

Left: The lower signal from the monitor probe (red) indicates that the catalytic converter is functioning.

Right: The signals from the monitor probe (red) and from the control probe (blue) are almost identical. This indicates that no exhaust gas purification is taking place in the catalytic converter. The catalytic converter is defective.



Motor Service Group.

Quality and Service from a single source.

The Motor Service Group is the sales organisation for the worldwide aftermarket activities of Kolbenschmidt Pierburg. It is one of the leading suppliers of engine components for the independent aftermarket including the premium brands KOLBENSCHMIDT, PIERBURG and TRW Engine Components. Our comprehensive product range allows our customers to procure engine components from a single source. As a problem solver for dealers and repair shops, Motor Service offers extensive services and the technical expertise that you would expect from the subsidiary of one of the largest automotive suppliers.

KSPG (Kolbenschmidt Pierburg).

Renowned supplier to the international automotive industry.

As long-standing partners to the automotive industry, the companies in the KSPG Group develop innovative components and system solutions with acknowledged competence for air supply and emission control, for oil and water pumps, for pistons, engine blocks and engine bearings. The products comply with the high demands and quality standards of the automotive industry. Low emission, reduced fuel consumption, reliability, quality and safety – these are the forces that drive innovation at Kolbenschmidt Pierburg.

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KSPG AUTOMOTIVE GROUP

