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SERVICE BULLETIN D-MOTOR

Service Bulletin NO. 2019-019

SUBJECT : Position of the Oxygen (Lambda) sensor(s)

MODELS AFFECTED : All models

TIME OF COMPLIANCE : new mounting / new service / muffler change

AFFECTED SERIAL NUMBER(S) : All engines

The Oxygen Sensor (Lambda sensor) is a important sensor in your Electronic Controlling system (ECU) of your D-Motor!

The lambda sensor position in the exhaust or muffler is not Random.

The position of the sensor is also important !

Sensor Handling Precautions

During operation the sensor runs at very high internal temperatures. * **WARNING** * When operating a sensor, be aware it can get **too hot to touch** in a very short time, and will continue to get hotter, possibly becoming a **fire risk** in a non-engine environment. Treat the operating sensor as you would a **naked flame** as there is an explosion risk if the sensor is used near flammable substances.

The sensor is manufactured from high temperature ceramic substances (modified Zirconium Oxides, etc.) and, although quite robust when used correctly, it is susceptible to thermal shock. This can occur if droplets of a liquid are sprayed onto the hot surface, as can occur during engine startup when water (that is produced during combustion) condenses on cool exhaust components.

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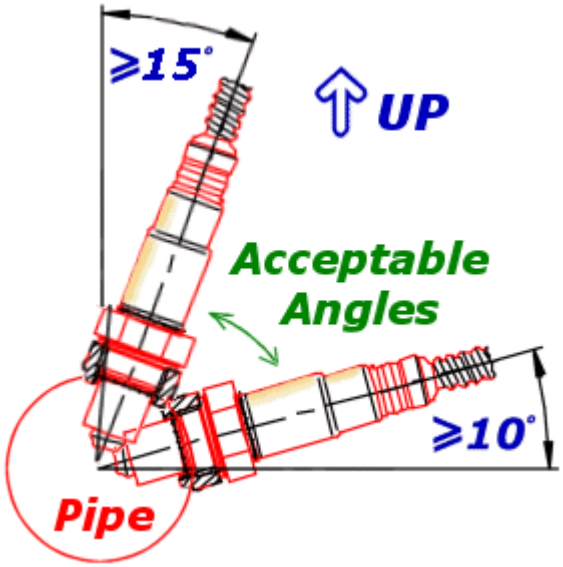
Sensor Placement

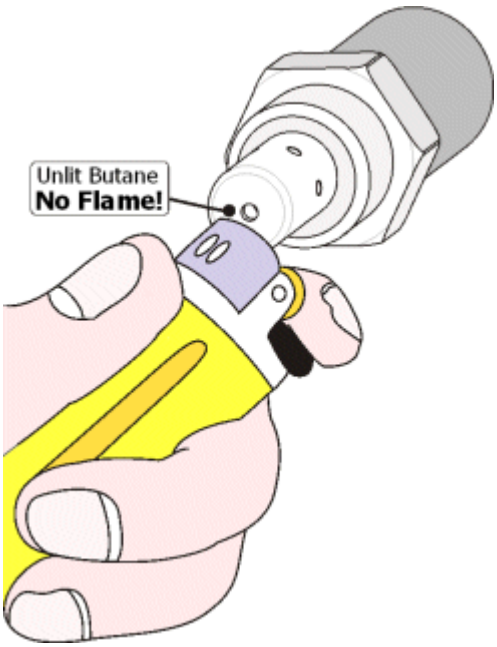


Sensor **operating temperature** should be attained in **20** to **30** seconds when the control unit is attached to a 12 Volts (and up to 19.5 volt) supply. A longer warm up phase indicates either a problem with the sensor, the controller, or where the sensor is positioned.

The image shows the range of acceptable mounting positions. A vertical position can get too hot in confined spaces, so we recommend at least 15 degrees from the vertical. The horizontal position can cause condensation to drip onto the sensor, so we recommend at least 10 degrees from the horizontal. In all cases the sensor should be perpendicular to the gas flow, ie. the bung should sit square over the pipe - this ensures adequate but not an excessive amount of gas enters the sensor.

We recommend placing the sensor around 2 cm from the closest exhaust valve. Where this cannot be achieved then spacing the sensor away from the direct exhaust by using a longer M18x1.5 bung, or a nut welded over a standard bung, is recommended. As far as possible to the exhaust tube !

Basic Confidence Tests



A basic test of the sensor and controller is easily performed with a low cost butane cigarette lighter. Simply squirt **unlit** butane down the nozzle of the sensor. Some of the air inside the sensor will be displaced and you should see a **rich** indication on the logger or display. As air slowly enters the sensor, and the butane escapes, the sensor will indicate increasingly leaner conditions. Blowing sharply on the sensor when it has been filled with butane will show a rapidly changing reading, demonstrating the speed of the sensor's response.

While the sensor is sitting in free-air* you will expect to see a very lean indication on the display.

**free-air* *is what we call clean ambient air with an oxygen concentration of around 20.9% and without any combustible hydrocarbons present.*

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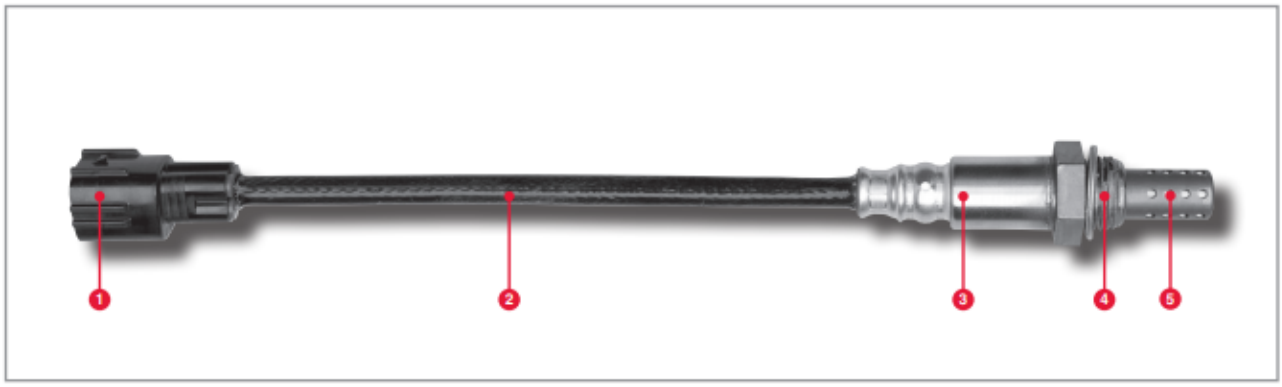
Correct Lambda Sensor handling and usage



1. Connector

Keep clean and dry:

> Do not use grease or contact spray of any kind.
> Moisture and other foreign substances will easily influence the Sensor.

2. Cable

Avoid heat:

> Keep free from the exhaust-pipe or other hot vehicle parts.

Avoid stress:

> Keep free from moving parts.
> Avoid cable tension.
> Avoid long, free-hanging cabling: it could start to swing or even get caught by other parts or objects.

3. Sensor body

Keep clean:

> The back end of the Sensor contains holes, through which it breathes to sample the outside air. These holes need to stay open to enable the Sensor to function.
> Keep the Sensor body protected from dirt and sudden cold water splashes.
> Do not spray the Sensor with high-pressure water.
> Keep the Sensor free from all types of coatings.

4. Sensor body thread

Grease the thread:

> Grease the thread with the supplied copper grease before installation.

5. Sensor nose

Avoid sudden impact:

> Avoid any sudden knocks to prevent damage to the sensitive ceramic element inside.

Avoid contamination:

> Avoid all possible contamination, by keeping the Sensor nose free from foreign substances.
> Do not spray anything on the Sensor nose.
> Do not put grease on the Sensor nose.
> Avoid the use of leaded fuel.
> Avoid the use of fuel additives

Part Number : 185001

Cable length : 45 cm / 17.71 inch

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