

# INSTRUCTIONS

## Lambda Sensors

### Please Read These First

These instructions are intended as a guide only and are not a substitute for a workshop manual. The fitter must have a degree of mechanical competence. If you are in any doubt as to your ability to fit the part, do not undertake the job.

For more Technical Tips and to register your warranty online visit

[www.smpe.co.uk](http://www.smpe.co.uk)

Contact technical sales on

**01527 839307**

[www.smpe.co.uk](http://www.smpe.co.uk)

## Lambda Sensors

### Safety

Lambda sensors are fitted into the exhaust system and operate at very high temperatures. Allow the vehicle to cool fully before attempting to remove the old sensor. Take proper precautions to prevent injuries from burns, etc. The old sensor will probably be very tight. Take proper precautions to prevent injuries when removing it. As with any work that involves working under a vehicle ensure that it is chocked before commencing.

### Removing the old sensor.

1. Disconnect the battery
2. Disconnect the oxygen sensor's electrical connector.
3. Unclip the lambda wire loom as necessary.
4. Unscrew and remove the oxygen sensor, the sensor may be very tight. Use the correct Lambda sensor removal toolsocket to help prevent injuries. (Fuel Parts UK part number 71193).

Fitting the new sensor.

### **WARNING**

Check for damage to the threads in the Lambda sensor boss on the exhaust. If these threads are damaged then damage to the new sensor will occur when fitting. Damage of this nature is not covered by Fuel Parts UK warranty.

If fitting a direct fit Lambda sensor please go to instruction - "Fitting the new sensor". The following section applies only to universal Lambda sensors

Universal Lambda sensors

### **WARNING**

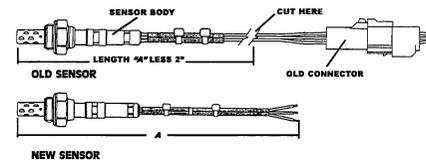
Universal Lambda sensors are not suitable for:

- Rover cars with MEMS engine management systems.

- Toyota Carina E (or other Toyota cars using same Lean Burn engine/control system).

There is more than one type of universal Lambda sensor. Ensure that you have the correct one for your vehicle, consult either Fuel Parts UK Lambda sensor catalogue or Fuel Parts UK web site [www.fbuk.co.uk](http://www.fbuk.co.uk)

1. Cut off the original Lambda sensor wires approximately 50mm closer to the Lambda sensor than the new universal sensor. That is, the wires of the old sensor, without the plug on, should be 50mm shorter than the wires on the new replacement sensor (see diagram).



2. Strip back 5mm of insulation from each of the connector wires.
3. Slip a heat shrink tube over each of the connector wires.
4. Using the crimp type connectors supplied, crimp the wires colour to colour.
5. Slide a heat-shrink tube over each of the exposed crimp connectors and shrink the tube, to weather seal the connections, with a heat source. A match or lighter will suffice but please take precautions to avoid fire risks.

### Note

An improvement can be made by staggering the connections, see the following diagram. Soldering the joints is also possible and recommended, ensure you use silver solder.

CONNECTION MADE WITH BUTT CONNECTOR & SHRINK TUBE



### **WARNING**

The wire colours should match the original sensor. If they are different please see the diagrams over the page. We are not responsible for incorrect wire connections.

### Fitting the new sensor.

### **WARNING**

The Lambda sensor may have a protective sleeve fitted over the threaded area, remove this cap before fitting the sensor. The threads will be coated with an anti-seize compound to assist later removal. Do not remove this coating. Do not allow this coating to get onto the sensor tip or damage may occur.

6. Clean the Lambda threads in exhaust.
7. Screw the sensor fully home until finger tight. Tighten to a maximum torque of 35lbs/ft or consult your service manual for vehicle specific data.

### **WARNING**

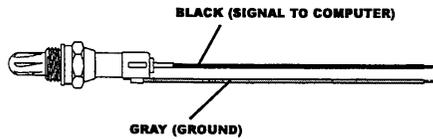
Do not exceed 35lb/ft or damage to the Lambda sensor may occur if this torque is exceeded. Damage of this type is not covered by the Fuel Parts UK warranty.

8. Reconnect the sensor's electrical connector.
9. Re-secure the Lambda sensor wiring loom as the original equipment loom.
10. Reconnect the battery.
11. Following the procedures outlined in your vehicle's service manual to clear any fault codes that may have been set (you may need to use a fault code reader).

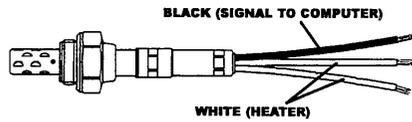
### Note

Failure to do this may cause the onboard computer to register a fault and stay in "limp home" mode which may damage the catalytic converter or other emission related equipment.

## 2 WIRE SENSOR

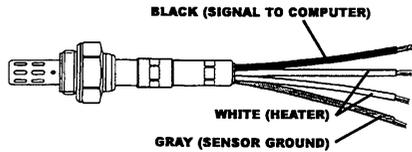


## 3 WIRE SENSOR



NOTE: HEATER IS NOT POLARITY DEPENDENT

## 4 WIRE SENSOR



NOTE: HEATER IS NOT POLARITY DEPENDENT

### NOTE

On some vehicles fitted with a four wire lambda sensor it may be necessary to make a small modification to the wiring loom on fitting the sensor.

If, when the sensor is fitted in accordance with the enclosed fitting instructions and the sensor fails to operate the following modifications will need to be carried out.

An additional parallel earth connection must be made to the grey wire. If you are unsure about this modification please contact your supplier.

### Trouble-shooting

If the Lambda sensor fails to operate;

- Check the connections, especially universal types. Lambda sensors operate at very low voltages, a high resistance connection can cause a voltage output error.

- Check for air leaks into the exhaust system

between the engine and Lambda sensor. This is a commonly overlooked fault that can cause a Lambda sensor miss-reading fault.

- Check the heater circuit supply voltage/return (if applicable).

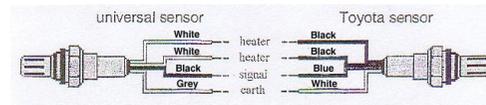
- Check the pre-catalyst emissions and compare this to the Lambda sensor output.

For more technical advice you can visit our technical support website at [www.fpuk.co.uk](http://www.fpuk.co.uk)

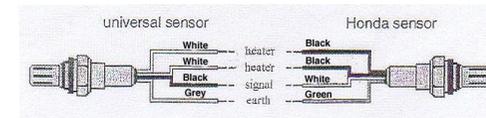
Alternatively call our technical help-line on (01527) 835555.

### Common Wire Colour Variations

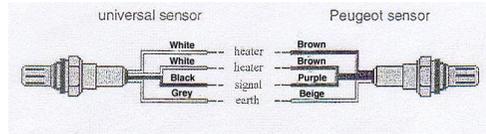
#### Toyota Applications



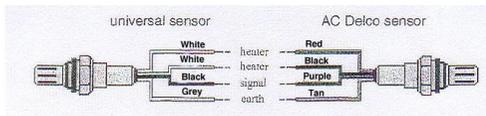
#### Honda Applications



#### Peugeot Applications



#### AC Delco Applications



### Periodic Maintenance

Lambda sensors should be replaced periodically following the vehicle manufacturer's recommendations, normally every 35,000 - 40,000 miles, because the working surface loses efficiency over time due to chemical contamination caused by combustion gases. The sensors become progressively less sensitive, even in correct engine running conditions. They should be considered a consumable item like spark plugs and cambelts, etc.

Missing periodical replacement causes increased fuel consumption, poor engine performance, environmental pollution and fast deterioration of the catalytic converter (much more expensive).

### Lambda Sensor Deterioration

As a general rule, all Lambda sensors are very sensitive to lead, coking, unburnt hydrocarbon, oil vapour, silicon and coolant contamination. Note that:

1. Lack of regular engine maintenance can damage the Lambda sensor.
2. Carbon coking and unburnt hydrocarbons (due to a rich mixture) damage the lambda sensor.
3. Lead contamination, due to poor quality petrol or erroneous use of leaded petrol, causes fast deterioration of the Lambda sensor.
4. Silicone contamination due to petrol additives causes lambda sensor deterioration.
5. Coolant contamination, due to leakage of engine gaskets, causes fast deterioration of the Lambda sensor.