

# Bosch tips

## Correct assessment and handling of lambda sensors

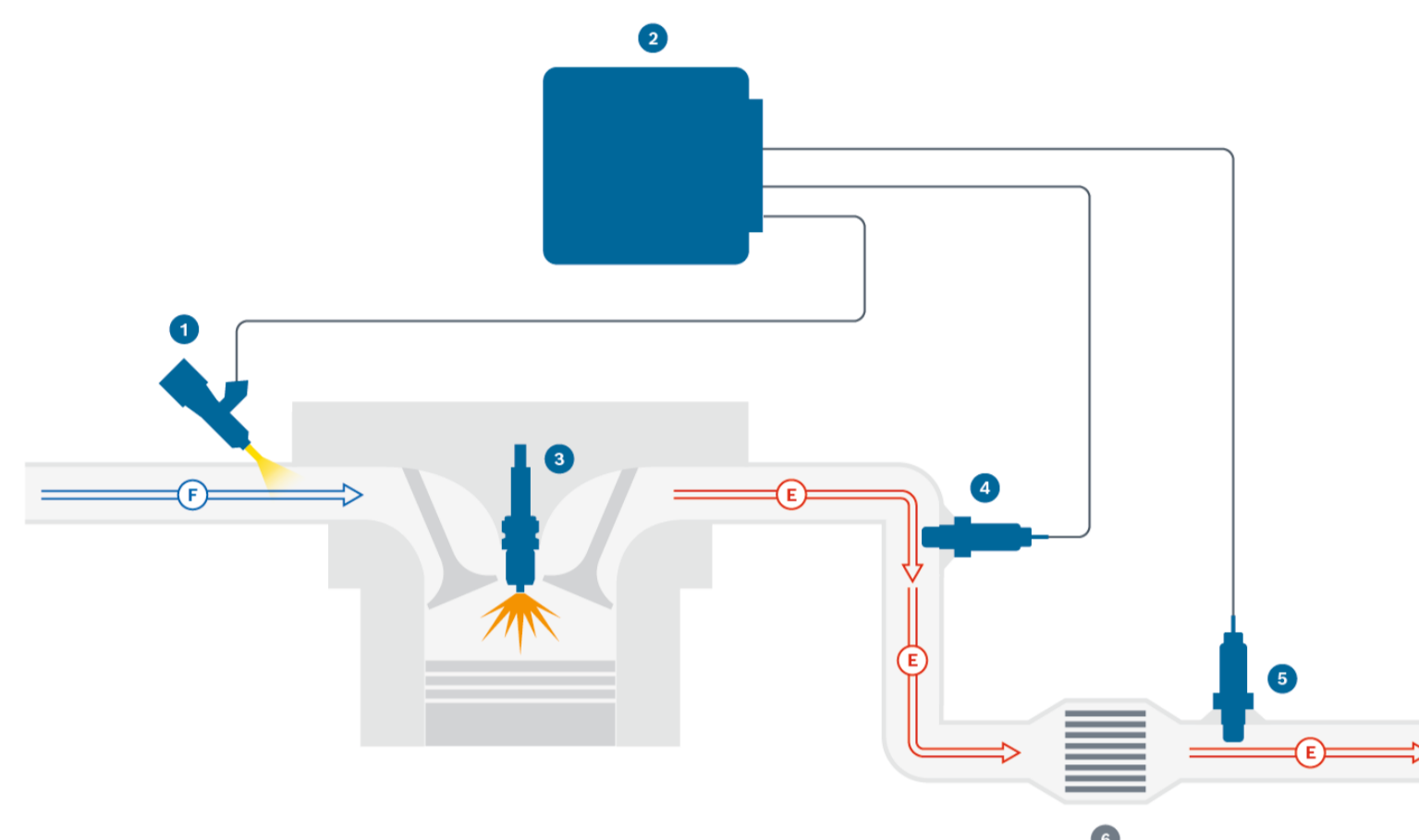


**BOSCH**  
Invented for life

### Bosch lambda sensors within the injection system

Modern exhaust-gas systems feature at least two lambda sensors: upstream (control sensor) and downstream (diagnostic sensor) of the catalytic converter. The first one ensures optimum air/fuel mixture while the second one monitors the effectiveness of the first one.

The engine control unit (ECU) determines the mixture composition (lean or rich) based on the lambda sensor voltage. It controls the amount of fuel injected in order to ensure an optimum composition of the air/fuel mixture ( $\lambda = 1$ ). This creates ideal conditions for exhaust-gas treatment at the catalytic converter. Downstream of the catalytic converter, the second lambda sensor (the diagnostic sensor) checks if the control sensor is working properly.



**Bosch components**

- 1 Injector
- 2 Electronic engine control unit
- 3 Spark plug
- 4 Control sensor (upstream of catalytic converter)
- 5 Diagnostic sensor (downstream of catalytic converter)

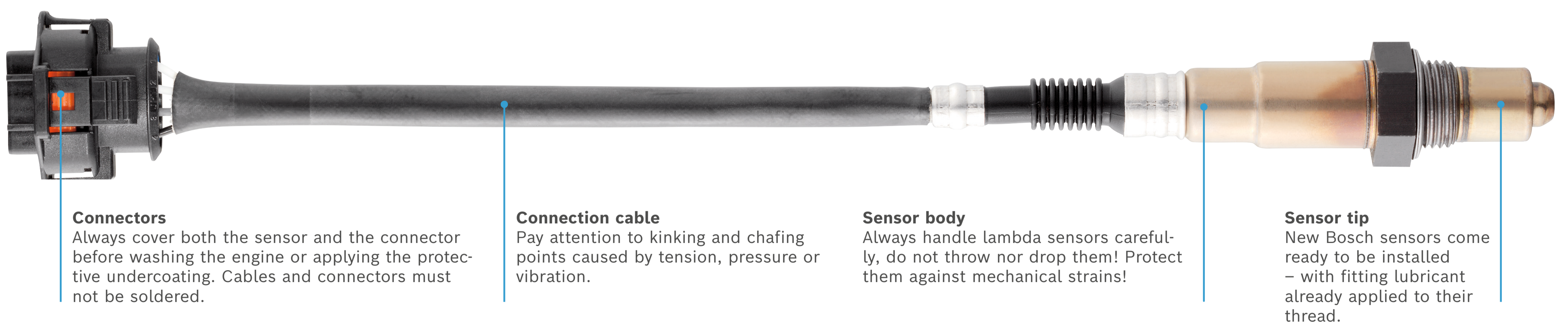
**Other components**

- 6 Catalytic converter
- F Fuel
- E Exhaust gas
- A Fresh air
- Electrical connection

### Signal measurement on a Bosch lambda sensor

OBD (on-board-diagnosis) reference image using a Bosch KTS tester		Reference image for measurement right on the sensor	
Switching type sensor	Wideband sensor	Switching type sensor	Wideband sensor
		<p>*LSF-4.2: 450 mV LSF-Xfour: 550 mV</p>	<p>Can only be measured via on-board-diagnosis (OBD) using a Bosch KTS tester. It is impossible to measure the current right on the sensor.</p>

### Proper handling of Bosch lambda sensors



**Connectors**

Always cover both the sensor and the connector before washing the engine or applying the protective undercoating. Cables and connectors must not be soldered.

**Connection cable**

Pay attention to kinking and chafing points caused by tension, pressure or vibration.

**Sensor body**

Always handle lambda sensors carefully, do not throw nor drop them! Protect them against mechanical strains!

**Sensor tip**

New Bosch sensors come ready to be installed – with fitting lubricant already applied to their thread.

**Simple, but highly effective precautions**

- ▶ Do not apply contact spray nor grease as ambient air is required for the operation of lambda sensors.
- ▶ Avoid hot resting and contact points on or at the exhaust system.
- ▶ Protect the sensor against impacts and do not clean using high-pressure cleaners.
- ▶ Do not use leaded fuels. Do not apply thread grease to the protective tube. Keep the engine mechanically flawless as residues – e.g. combustion residues – may cause deposits on the lambda sensor.