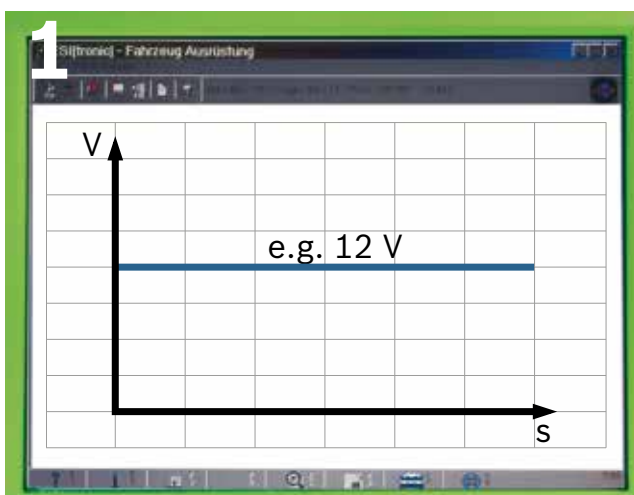


Lambda sensors diagnosis

Test routine: lambda sensor heating



Check the power supply of the lambda sensor heater

Check the actual values of the lambda sensor heater using a diagnostic tester. Testing via OBD is possible too. Power is to be supplied. Please observe the switch-on conditions of the sensor heater.

There must be a constant power supply of 10.5 to 13.5 V.

Is the power supply OK?

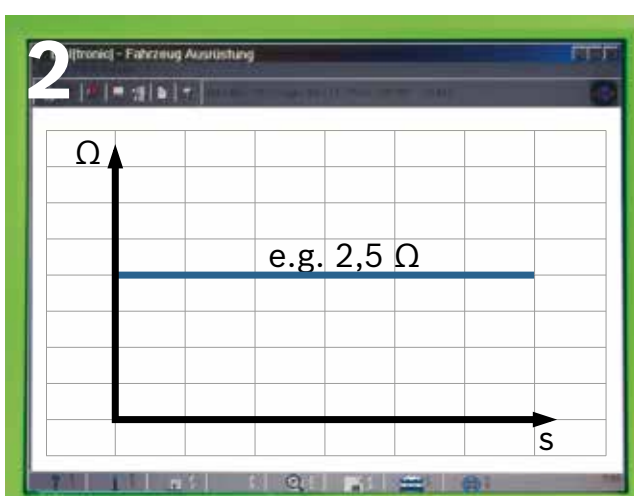
No

Possible causes:

- ▶ Use the diagnostic tester to check if the lambda sensor heating is activated. Note: In case the lambda sensor (diagnostic sensor) is installed afar from the engine, the control unit will only activate the heater after driving a certain distance.
- ▶ Relay does not switch to „continuous positive“
- ▶ Open circuit, short circuit to ground or positive. Check cable harness and connector for possible defects or corrosion.

Determine the cause and remedy.
For additional detailed tests: ESI[tronic] 2.0

Yes



Check heater resistor at ambient temperature

Note: The higher the temperature of the lambda sensor, the higher the heating resistance and vice versa.

Test value: < 30 ohms
(component temp.: 20°C)

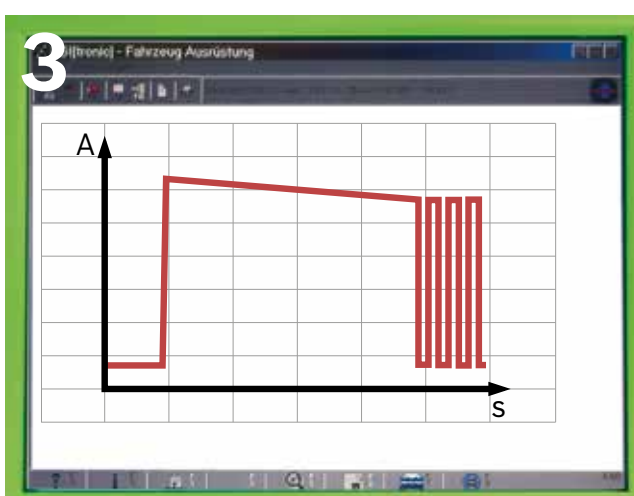
See ESI[tronic] 2.0 for a description of this test.

Are the test values OK?

No

Defective lambda sensor

Yes



Measure the heating current

To ensure quick operational readiness of the lambda sensor, the current supplied is higher at first and then decreased turning on and off the ground supply.

Note: Shortly after starting the engine and until exceeding the exhaust-gas dew point, no current is applied to the heater.

Is the heating current decreasing as the temperature rises?

No

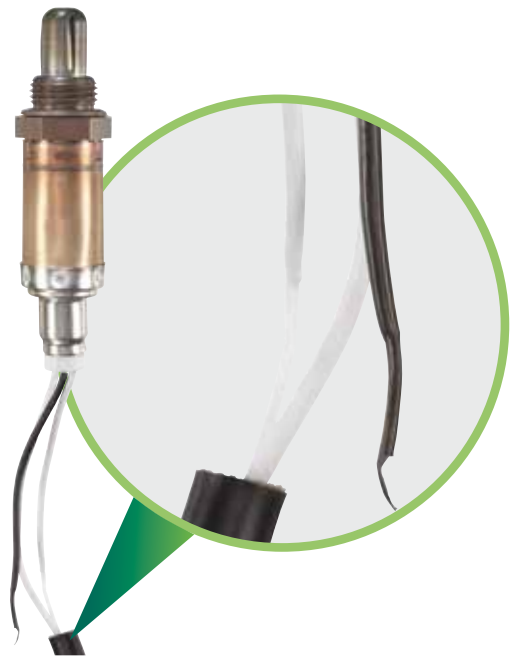
Use the **diagnostic tester to check if the lambda sensor heater is activated.**

Note: In case the lambda sensor is installed afar from the engine, the control unit will only activate the heater once the vehicle drove a certain distance.

Yes



4



Yes

Check vehicle cable harness for:

- ▶ Damage
- ▶ Corrosion
- ▶ Contact faults at the connectors
- ▶ Open circuit, short to ground, short to positive and transfer resistances

Is the cable harness between lambda sensor and control unit OK?

No

Defective cable harness

5



Yes

Check control unit:

- ▶ Check multi-point connector for damage, corrosion or faulty contacts.

Is the control unit OK?

No

Faulty control unit

Yes

Lambda sensor heating is okay.

- ▶ Delete fault memory ▶ Perform a test drive ▶ Check the fault memory



If the error remains, please continue with the following steps:

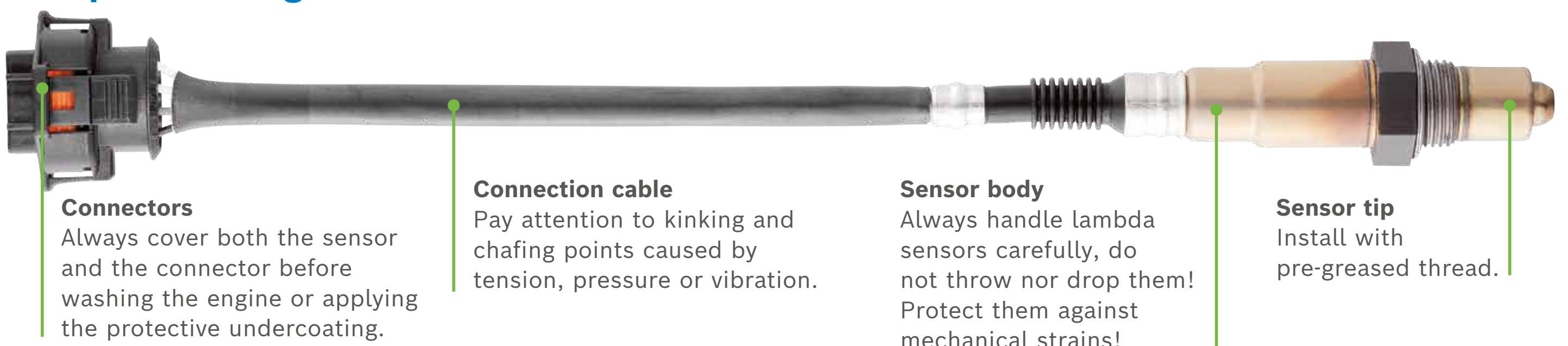
- ▶ Delete the fault memory
- ▶ Perform a test drive
- ▶ Check the fault memory

Other possible error causes:

- ▶ Interrupted cables or short circuits (short to positive or to ground)
- ▶ Occasionally poor connection or non-conductive connectors (loose contact caused by vibrations or temperature variations).
- ▶ Insufficient power supplied to the engine control unit (ECU)

A detailed description of the test can be found at ESI[tronic] 2.0!

Proper handling of lambda sensors



Connectors

Always cover both the sensor and the connector before washing the engine or applying the protective undercoating.

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

Install with pre-greased 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 points and contact surfaces 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.

