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P1115**Oxygen sensor heating 1 ahead of catalytic converter - below lower threshold.****P1119****Oxygen sensor heating 2 ahead of catalytic converter - below lower threshold.****Function**

The oxygen sensor generates a voltage signal at approximately 300 °C that determines the fuel/air mixture. This signal is used for the regulation of the fuel injection. The oxygen sensor is heated to bring it quickly to operating temperature to start oxygen sensing earlier.

Diagnosis Conditions

During a cold start (sensor readiness after 20 seconds) the time t_1 is measured. t_1 is the time from switching the oxygen sensor heating on until the time an oxygen sensor is operational. Then a time t_2 is calculated ($t_2=2.5*t_1$). t_3 is the time from switching the oxygen sensor heating on until the time the other oxygen sensor is operational. When t_3 is larger than t_2 a fault is recognised.

When a fault is recognised, the resistance comparison of the oxygen sensor heating is blocked. If no fault is recorded, the calculated resistance of the oxygen sensor heating is compared to a threshold after 450 seconds. If the resistance is too high, a fault is recognised for both oxygen sensor heatings.

DTC No.	Fault conditions	Fault area
P1115	Heating current too low	- Transition resistance
P1119		- Heating resistance too high - Interruption in the heating circuits - Interruption in the sensor signal wire - Short circuit to plus (final stage disconnected)

Note

Heating of oxygen sensors (1 and 2) ahead of catalytic converters is supplied by a final stage. It may occur that both heating circuits are stored in memory as faulty although only one heating circuit is actually faulty. If a sensor signal fault is stored **in addition**, this fault must be remedied first. Then road-test the car. When all the four heating circuits are stored in memory as faulty, check common plus supply.

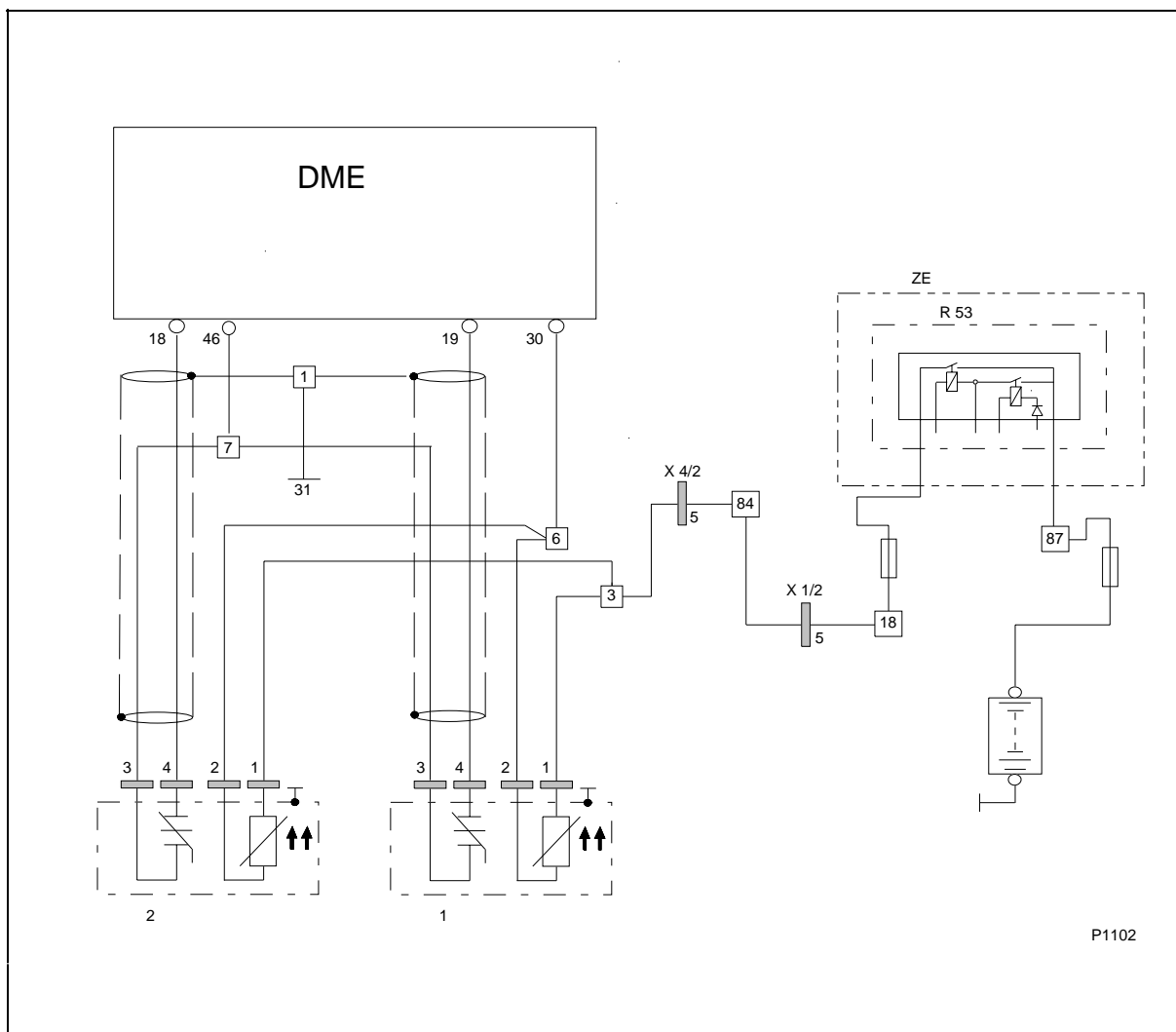
Oxygen sensor 1 - cylinders 1 to 3

Oxygen sensor 2 - cylinders 4 to 6

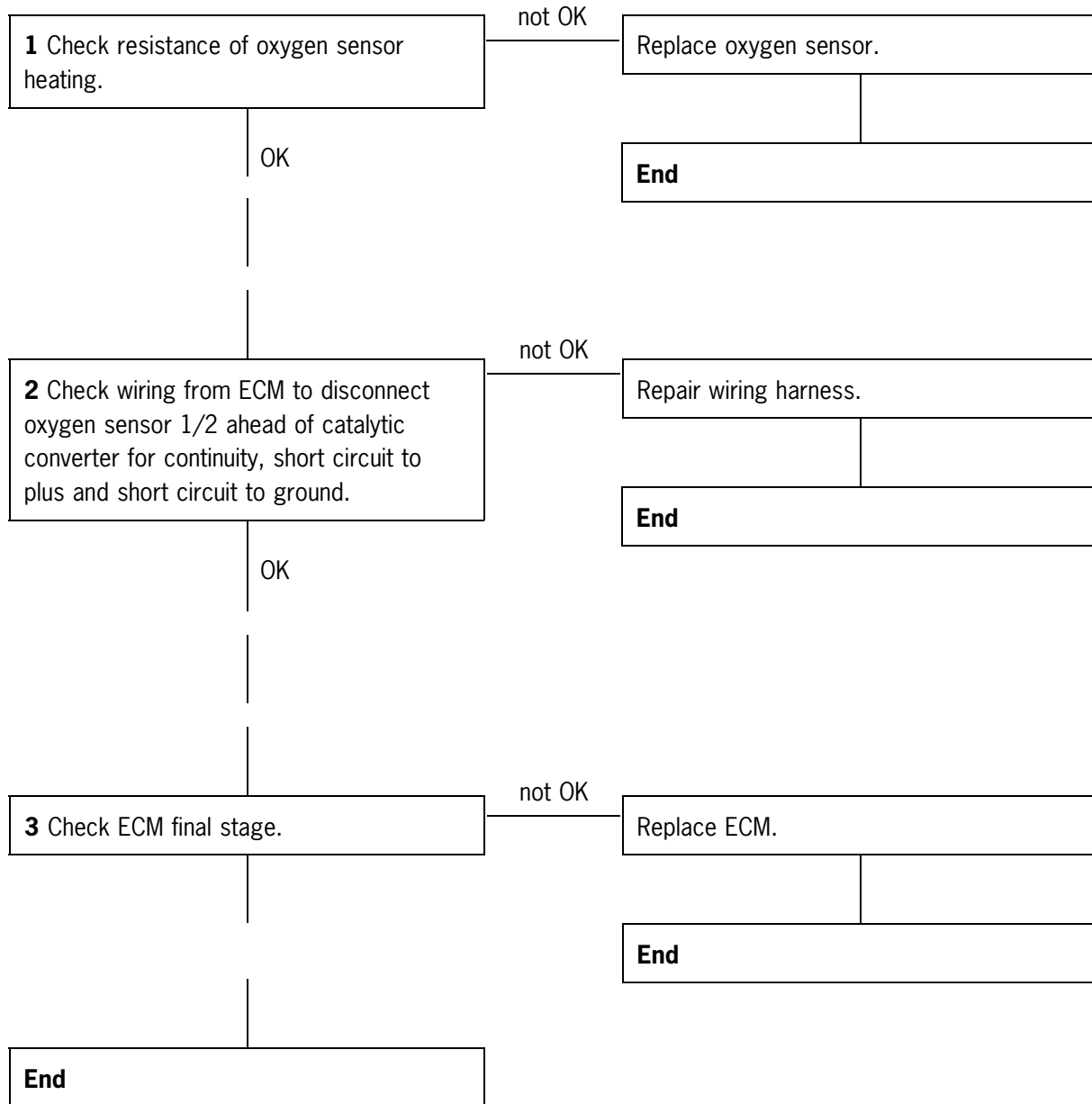
Connector color grey - behind catalytic converter

Connector colour black - ahead of catalytic converter

Wiring Diagram



Diagnosis Procedure



1 Check resistance of oxygen sensor heating.

1. Remove connector of oxygen sensor 1/2 ahead of catalytic converter.
2. Connect ohmmeter on pin side to pins 1 and 2.
Specified value: 1.8 - 2.5 Ω at 20 °C
3. Connect ohmmeter on pin side to pin 1 and the oxygen sensor housing.
Specified value: $\infty \Omega$

2 Check wiring from ECM to disconnect oxygen sensor 1/2 for continuity, short circuit to plus and short circuit to ground.

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|--|---|
| <ol style="list-style-type: none"> 1. Remove connector for oxygen sensors 1 and 2 ahead of catalytic converter. 2. Remove ECM connector. 3. Connect ohmmeter to ECM connector pin 30 and disconnect of oxygen sensors 1/2 behind catalytic converter pin 2.

Specified value: < 1 Ω 4. Connect ohmmeter at sleeve to connector, pin 2, and ground.

Specified value: $\infty \Omega$ | <ol style="list-style-type: none"> 5. Remove ECM relay and bridge terminals 30 and 87b. 6. Connect voltmeter at sleeve to connector, pin 2, and ground.
Specified value: 0 Volt |
|--|---|

3 Check ECM final stage.

1. Remove connectors for oxygen sensors.
2. Start engine and run engine at high speed for three minutes.
3. Connect voltmeter at sleeve to pins 1 (plus) and 2.

Specified value: battery voltage