

# OBD and exhaust gas return system

## Finding and remedying faults



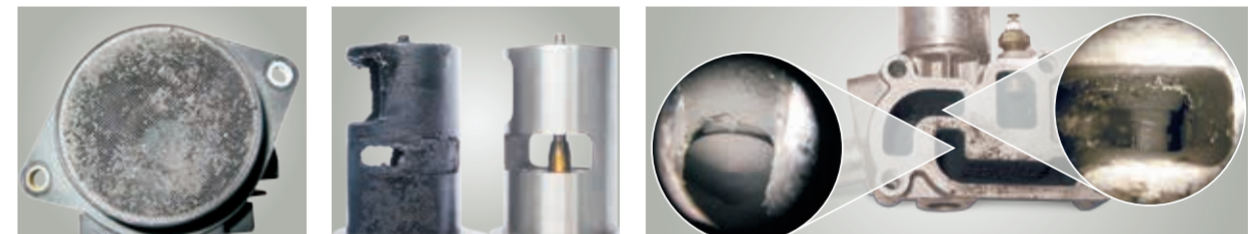
**Pierburg products**

- 01 EGR cooler
- 02 Intake manifold
- 03 Air mass sensor (LMS)
- 04 Pneumatic EGR valve (petrol)
- 05 Electric EGR valve (petrol)
- 06 Electromotive EGR valve (diesel)
- 07 Pneumatic EGR valve (diesel)
- 08 Electropneumatic pressure transducer (EPW) for pneumatic EGR valves

**On-board diagnostics**

- 09 Engine control unit
- 10 Malfunction indicator lamp (MIL)
- 11 Diagnostic plug
- 12 OBD data scan tool

**From practical use**



Blocked air mass sensor (LMS)

Stuck EGR valve (diesel) and in new condition

Carbonised EGR valve (petrol) with zoom

Code	P0400	P0401	P0402	P0403	P0404	P0405/P0406 P0407/P0408
<b>Fault</b>	<p><b>EGR system – flow malfunction</b></p> <p>The EGR valve does not open:</p> <ul style="list-style-type: none"> <li>• There is no exhaust gas recirculation, or it is not detected</li> <li>• Output not reached</li> <li>• Engine goes into limp home function</li> <li>• Driving behaviour is deficient</li> <li>• Uneven idling</li> </ul>	<p><b>EGR system – insufficient flow rate</b></p> <p>Not enough exhaust gas is being recirculated:</p> <ul style="list-style-type: none"> <li>• EGR valve does not open wide enough</li> <li>• Cross section restricted by impurities (carbon deposits)</li> <li>• EGR valve opening time too short</li> <li>• Air mass sensor defective or soiled</li> </ul>	<p><b>EGR system – excessive flow rate</b></p> <p>Too much exhaust gas is being recirculated:</p> <ul style="list-style-type: none"> <li>• EGR valve opens to an extent that deviates from the set-point values</li> <li>• Valve does not close completely</li> <li>• Air mass sensor defective or soiled</li> </ul>	<p><b>EGR system – control loop malfunction</b></p> <p>EGR signals incorrect or implausible:</p> <ul style="list-style-type: none"> <li>• Wear/soiling of the potentiometer in the EGR valve, temperature sensor</li> </ul>	<p><b>EGR System – control loop measurement/power problem</b></p> <ul style="list-style-type: none"> <li>• Exhaust gas recirculation outside set-point range</li> <li>• EGR signals incorrect or implausible</li> <li>• Wear/soiling of potentiometer in the EGR valve, pressure sensor, temperature sensor, air mass sensor, electrical plug-in connections and lines</li> </ul>	<p><b>EGR system – sensor A/B circuit too small/large</b></p> <ul style="list-style-type: none"> <li>• EGR signals incorrect or implausible</li> <li>• Wear/soiling of potentiometer in the EGR valve, pressure sensor, temperature sensor, air mass sensor, electrical plug-in connections and lines</li> </ul>
<b>Next steps/ Possible remedies</b>	<ul style="list-style-type: none"> <li>• Check pneumatic EGR valve with vacuum hand pump: <ul style="list-style-type: none"> <li>- If the vacuum is not maintained, replace the EGR valve</li> <li>- If it is not actuated, check the vacuum lines for free flow/tightness</li> </ul> </li> <li>• Examine the EGR valve for visible damage or discoloration: <ul style="list-style-type: none"> <li>- Exhaust gas back pressure could be too high or the actuation could be incorrect</li> <li>- Check the exhaust system for free flow</li> <li>- Check the boost pressure control valve for functioning and actuation</li> </ul> </li> <li>• If there is sticking, replace the EGR valve and check the fuel injection system and the oil vapour separator (blow-by separator)</li> <li>• Check the power supply to the EGR valve and electropneumatic pressure transducer, replace any defective parts</li> </ul>	<ul style="list-style-type: none"> <li>• Check electric actuators</li> <li>• Check pneumatic actuators (vacuum)</li> <li>• If there is sticking, replace the EGR valve and check the fuel injection system and the oil vapour separator (blow-by separator)</li> <li>• Especially for electric EGR valves, check actuators and sensors</li> <li>• Check the air mass sensor and replace if necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Check sensors and actuators</li> <li>• If there is sticking, replace the EGR valve and check the fuel injection system and the oil vapour separator (blow-by separator)</li> <li>• Check the air mass sensor and replace if necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Check signals and compare with set-point values</li> </ul>	<ul style="list-style-type: none"> <li>• Check signals and compare with set-point values</li> <li>• Check lines, plug-in connections and components</li> </ul>	<ul style="list-style-type: none"> <li>• Check signals and compare with set-point values</li> <li>• Check lines, plug-in connections and components</li> </ul>

Further details on this subject can be found in our brochure "Service Tips & Info – Emission control and OBD".  
Further information can be obtained directly from your local Motorservice partner or at [www.ms-motorservice.com](http://www.ms-motorservice.com)

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