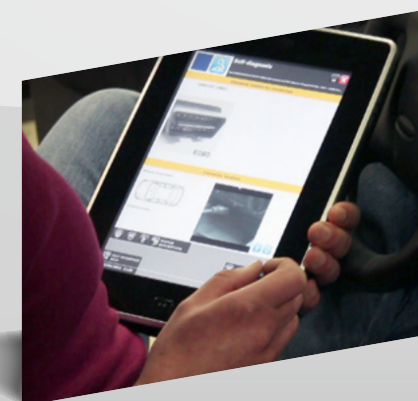
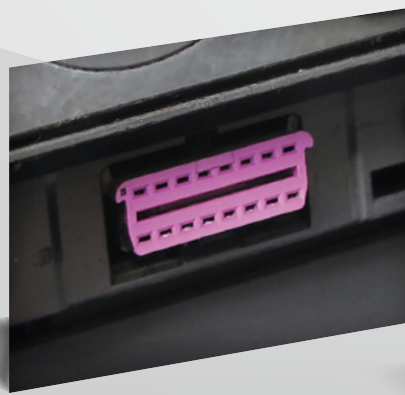
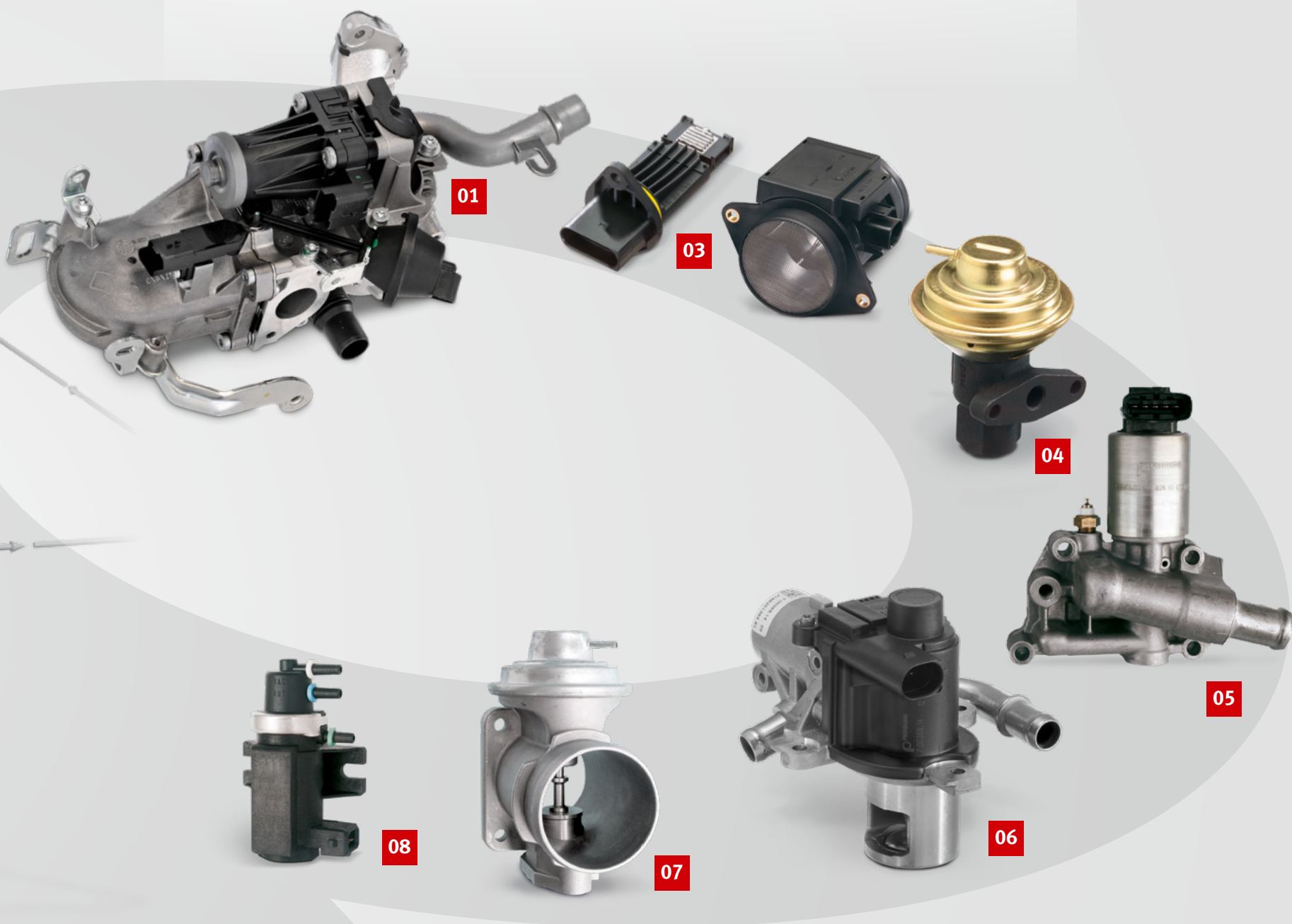
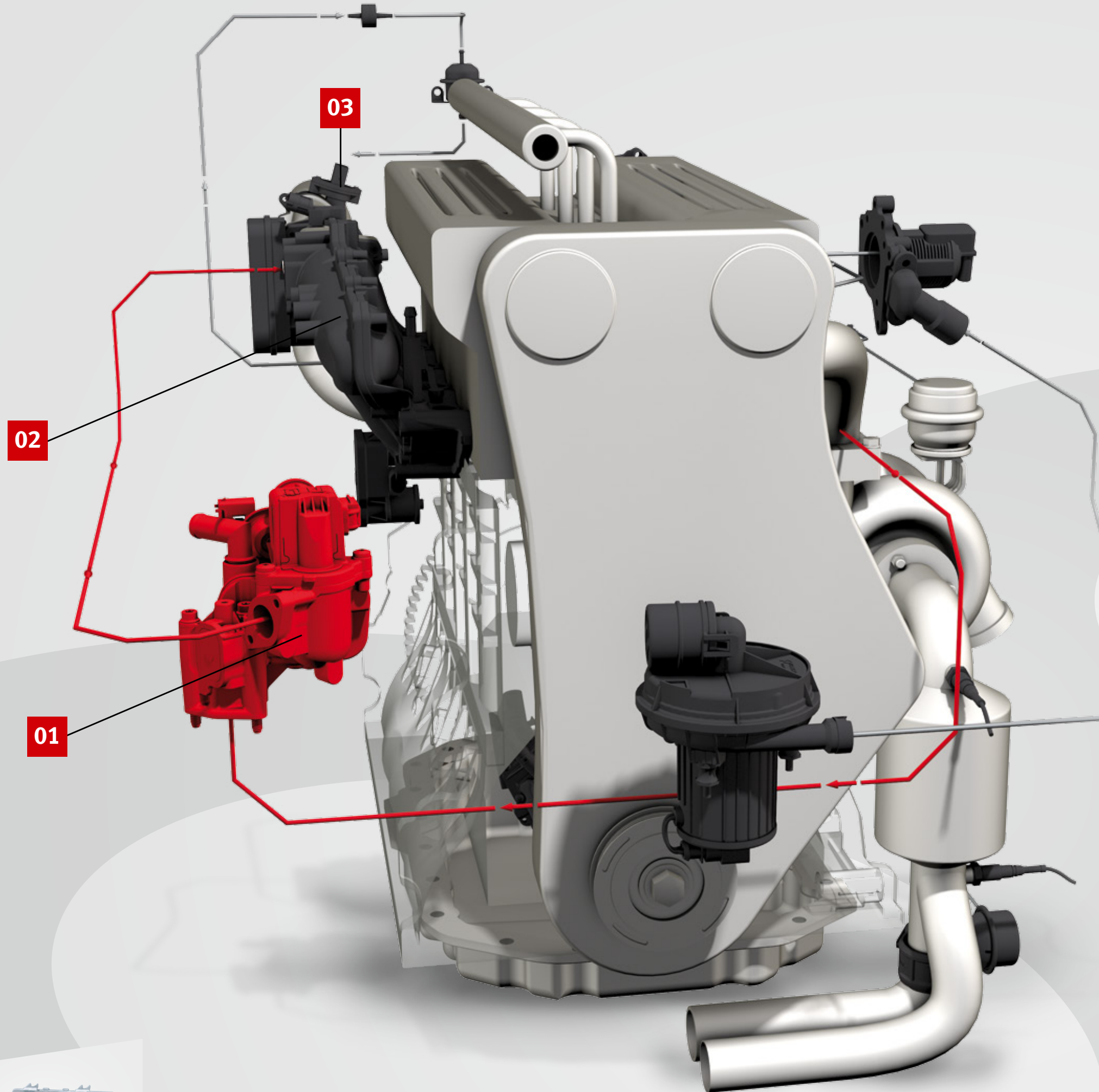




PIERBURG PRODUCTS

- 01 EGR coolers
- 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

OBD SYSTEM

EXHAUST GAS RETURN SYSTEM

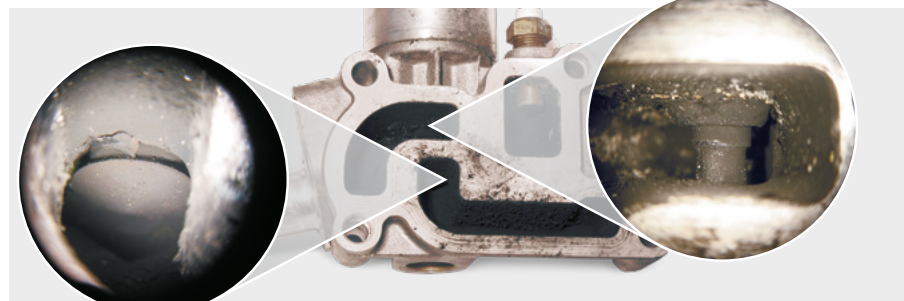
FROM PRACTICAL USE



Blocked air mass sensor (LMS)



Stuck EGR valve (diesel) and in new condition



Carbonised EGR valve (petrol) with zoom

FINDING AND REMEDYING FAULTS

DIAGNOSTIC TROUBLE CODE	P0400	P0401	P0402	P0403	P0404	P0405 – P0408
DISPLAYED FAULTS	EGR system – flow malfunction The EGR valve does not open: - There is no exhaust gas recirculation, or it is not detected - Output not reached - Engine goes into limp home function - Driving behaviour is deficient - Uneven idling	EGR system – insufficient flow rate Not enough exhaust gas is being recirculated: - EGR valve does not open wide enough - Cross section restricted by impurities (carbon deposits) - EGR valve opening time too short - Air mass sensor defective or soiled	EGR system – excessive flow rate Too much exhaust gas is being recirculated: - EGR valve opens to an extent that deviates from the set-point values - Valve does not close completely - Air mass sensor defective or soiled	EGR system – control loop malfunction EGR signals incorrect or implausible: Wear / soiling of the potentiometer in the EGR valve, temperature sensor	EGR System – control loop measurement / power problem - Exhaust gas recirculation outside set-point range - EGR signals incorrect or implausible - Wear / soiling of potentiometer in the EGR valve, pressure sensor, temperature sensor, air mass sensor, electrical plug-in connections and lines	EGR system – sensor A / B circuit too small / large - EGR signals incorrect or implausible - Wear / soiling of potentiometer in the EGR valve, pressure sensor, temperature sensor, air mass sensor, electrical plug-in connections and lines
NEXT STEPS / POSSIBLE REMEDIES	- Check pneumatic EGR valve with vacuum hand pump: If the vacuum is not maintained, replace the EGR valve; check the vacuum lines for free flow / tightness - Examine the EGR valve for visible damage or discolouration: - Exhaust gas back pressure could be too high or the actuation could be incorrect - Check the exhaust system for free flow - If there is sticking, replace the EGR valve and check the fuel injection system and the oil vapour separator (blow-by separator) - Check the power supply to the EGR valve and electropneumatic pressure transducer	- Check electric actuators - Check pneumatic actuators (vacuum) - If there is sticking, replace the EGR valve and check the fuel injection system and the oil vapour separator (blow-by separator) - Especially for electric EGR valves, check actuators and sensors - Check the air mass sensor and replace if necessary	- Check sensors and actuators - If there is sticking, replace the EGR valve and check the fuel injection system and the oil vapour separator (blow-by separator) - Check the air mass sensor and replace if necessary	Check signals and compare with set-point values	- Check signals and compare with set-point values - Check lines, plug-in connections and components	- Check signals and compare with set-point values - Check lines, plug-in connections and components

