

# Troubleshooting exhaust gas recirculation systems **si 0039/A GB**

## Diesel engines

MSI-PG 11.02

### Vehicle:

all with exhaust gas recirculation system

### Product:

diverse: refer to the catalogs, TECDOC-CD or systems basing on TECDOC-data.

To comply with the emission standards in effect since 1994, modern vehicles are also fitted with an exhaust gas recirculation system. These systems reduce NOx values by up to 50 % and soot particle by 10 %.

The AU only visually inspects the EGR components. This is insufficient as faults remain virtually undetected.

Far more sensible is a simple function test that any workshop can carry out for pneumatic EGR valves. In this test, the function and tightness of the EGR valve is tested mainly with a manual vacuum pump. Electric valves require the use of a multimeter.

Faults on EGR systems are mostly valves that do not open or close. Whilst a valve that does not close gives rise to faults that are noticed by the driver, valves that do not open usually go unnoticed. Engine damage is possible.

As EGR valves have a considerable influence on pollution emissions, they are also an integral part of homologation, i.e. changes to EGR valves or even their rendering inoperational are impermissible.

Although this may be common knowledge in any vehicle repair shop, that faulty EGR valves are not replaced.

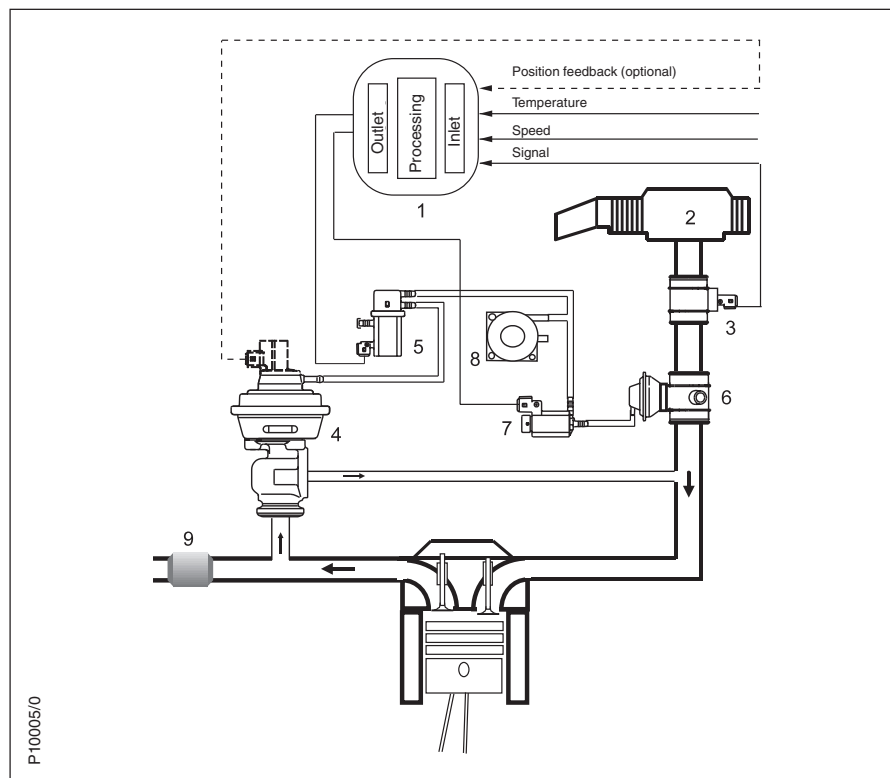
To enable you to work correctly and clear possible faults quickly and reliably, locate possible faults quickly and clear them reliably, please refer to the table overleaf.

Further information about working on AGR systems is provided in

**si 0002/A**, function testing of exhaust gas recirculation components

**si 0017/A**, exhaust gas recirculation system with air flow meter and

**si 0027**, electric pressure transformer.



**Diesel EGR system (pneumatic)**

- |  |                         |
|--|-------------------------|
| 1 Control unit                             | 6 Intake air throttling |
| 2 Air filter                               | 7 Electric switch valve |
| 3 Air flow meter (AFM)                     | 8 Vacuum pump           |
| 4 EGR valve with/without position feedback | 9 Particle filter       |
| 5 Electropneumatic pressure transformer    |                         |

Subject to change of illustrations and text.

## EGR system faults for diesel engines

Fault	Consequences/complaints	Possible causes	Remedial actions	Remarks
EGR valve does not open (1)	<p>Nitrogen oxides increase considerably</p> <p>For vehicles with OBD system, a fault code is set; the fault is possibly indicated via the fault lamp of glow control lamp</p> <p>Incorrect engine performance characteristics</p>	EGR valve is not energised or was inadmissible inoperational (2)	Check connections and control as well as electric or electropneumatic pressure transformer and clear faults	<p>(1) Unnoticed by drivers of older vehicles</p> <p>(2) Vehicle no longer complies with homologation</p> <p>(3) Cleaning only in emergencies</p> <p>(4) Diaphragm box of valve is discoloured</p> <p>(5) In some cases, actions were carried out to increase the boost pressure</p> <p>(6) Turbocharger has oil leak</p>
		EGR valve sticks/gummed	Renew and clean valve if necessary (3)	
		<p>Leakages on the vacuum side</p> <ul style="list-style-type: none"> <li>- Diaphragm faulty</li> <li>- Diaphragm box damaged</li> <li>- Vacuum connections leaky or disconnected</li> </ul>	Locate leakages and stem, renew valve if necessary	
	<p>Poor performance</p> <p>Top speed is not reached</p>	<p>EGR valve damaged through excessive temperature (4)</p> <ul style="list-style-type: none"> <li>- due to incorrect control</li> <li>- due to high exhaust back pressure</li> <li>- due to non-opening blow-off valve (for turbocharger)</li> </ul>	<p>Check and repair if necessary</p> <ul style="list-style-type: none"> <li>- control</li> <li>- exhaust system for continuity</li> <li>- blow-off valve (wastegate) of turbocharger (5)</li> </ul>	
EGR valve does not close	Poor acceleration	Heavy deposits on tappet or valve mushroom	Renew EGR valve	
	Black smoke	Wear in tappet guide	Renew EGR valve	
	Top speed is not reached	<p>EGR valve damaged through over heating</p> <ul style="list-style-type: none"> <li>- due to incorrect control</li> <li>- due to high exhaust back pressure</li> <li>- due to non-opening blow-off valve (for turbocharger)</li> </ul>	<p>Renew EGR valve</p> <ul style="list-style-type: none"> <li>- check control</li> <li>- check exhaust system for continuity and repair if necessary</li> <li>- check blow-off valve and control and repair if necessary</li> </ul>	
	For vehicles with OBD system, a fault is indicated and a fault code is set			
	Engine control assumes emergency operating conditions			
	Incorrect engine performance characteristics	Air flow meter or other sensor signal faulty	Check sensors for set values and renew if necessary	
		Intake pipe in the area of the exhaust gas recirculation system partly constricted by deposits (6)	Clean intake pipe or renew and check turbocharger according to manufacturer's specifications, replace if necessary	