PIERBURG

# Service information

si

## Electric EGR valve

### New product and new application

si 0047 GB

MSI-PG 10.00

| Vehicle: Opel / Vauxhall | | | | Product: Electric EGR valve | | |
|---|---|---|---|---|---|---|
| Type | Engine | Power kW / PS | Model year | Pierburg-No. | Replacement | O.E.-No.*) |
| Corsa B 1,0i 12V / Corsa CC 1,0i 12V | X10 XE | 40 / 55 | 11.96- | 7.22414.00.0 | **7.22414.50.0** | 90 543 031 |
| | | | | 7.22515.00.0 | **7.22414.50.0** | 90 570 475 |
| | | | | | | 90 570 476 |
| Corsa B 1,2i 16V | X12 XE | 48 / 65 | 03.98- | 7.22515.01.0 | **7.22414.51.0** | 90 117 397 |
| | | | | 7.22414.01.0 | **7.22414.51.0** | 90 570 477 |
| | | | | | | 90 570 478 |
| Astra G 1,2 16V / Astra Mk IV 1,2 16V | X12 XE | 48 / 65 | 02.98- | 7.22414.02.0 | **7.22414.52.0** | 90 571 101 |

From the new X10 XE series three cylinder engine, the above mentioned vehicles were fitted with an electromagnetically operated EGR valve.

Electric EGR valves function independent of vacuum and as they are controlled directly from the engine control unit, they operate rapidly and precisely.

The exhaust gas recirculation can accordingly be used over wide operating ranges.
This results in an increased reduction of the nitrogen oxides and consumption.

Electric EGR valves cannot be tested with a vacuum hand pump. For the above mentioned vehicles, fault codes are used for malfunctions or damage to the EGR valve. A fault indication is simultaneously given via the engine warning lamp.

Stored fault codes can be output with the diagnostic units TECH 2 and TECH 15 (Opel/GM) as well as commercially available devices.

| Fault-Codes | Possible display |
|---|---|
| P0403 | EGR valve voltage too high |
| | EGR valve voltage low |
| | Circuit open |
| P1405 | EGR valve actual value high |
| | EGR valve actual value low |
| | Sensor signal incorrect |

**Test values:**

| | | |
|---|---|---|
| Coil: | Resistance | 8 ± 0.5 Ω |
| | Permissible voltage | 13-16 V |
| Potentiometer total resistance | | 4 kΩ ± 40 % |

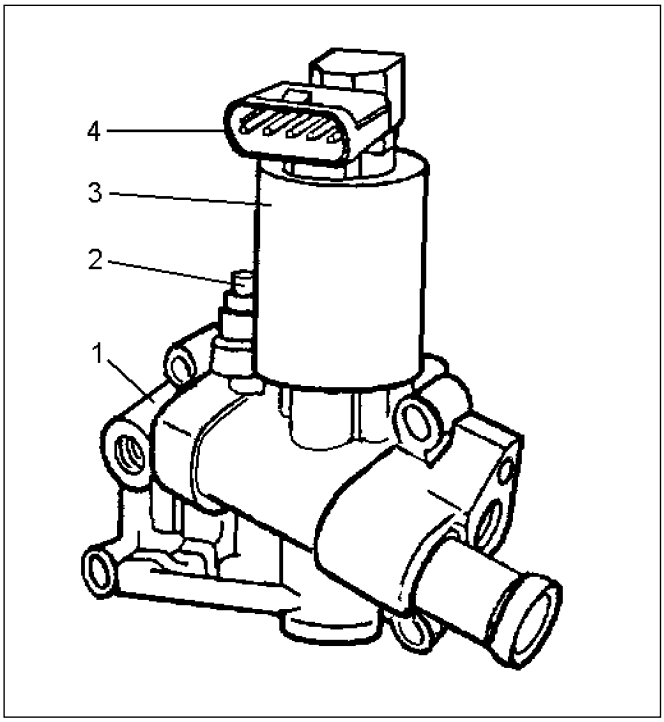


Fig. 1

1 Valve housing with exhaust and coolant duct
2 Sensor coolant temperature, instrument (only for .00.0/.50.0/.01.0/.51.0)
3 Solenoid coil
4 Connector

Emission control

Reg. Nr. 4/4 08-150.1 / GB

Subject to change of illustrations and text.
For changes with regard to respective matching and replacements, refer to the catalogs,TECDOC-CD or systems basing on TECDOC-data, which are currently in effect.

*) The listed reference numbers should be listed for comparison only. They may not be used on invoices sent to final users.

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**Test**
If one of the fault codes P0403 or P1405 are indicated, the cause may be due to the EGR valve or respective cable harness and should be localised as follows.

**Check resistance values**
**EGR valve, coil**
- Disconnect connector from EGR valve.
- Measure coil resistance at EGR valve between Pin 1 and Pin 5
  Required value: 8 ± 0.5Ω
  If the required value is not reached, renew the EGR valve.

**EGR valve, potentiometer**
- Disconnect connector from EGR valve.
- Measure potentiometer total resistance at the EGR valve between Pin 3 and Pin 2
  Required value: 4 kΩ ±40 %
  If the required value is not reached, renew the EGR valve.

**Check voltage supply to EGR valve**
**EGR valve, coil**
- Disconnect connector from EGR valve.
- Switch on the ignition.
- Measure voltage at connector between Pin 5 and ground
  Required value: Battery voltage
  If the required value is not reached, continue search based on circuit diagram of vehicle manufacturer.

**EGR valve, potentiometer**
- Disconnect connector from EGR valve.
- Switch on the ignition.
- Measure voltage at connector between Pin 3 and ground as well as between Pin 3 and Pin 2
  Required value: 4,5 - 5,2 V
  If the required value is not reached, continue search based on circuit diagram of vehicle manufacturer, control unit possibly faulty.

**Check EGR signal** (controlled ground) **from control unit**
- Connector connected.
- Engine at operating temperature and idling.
- Measure voltage between Pin 1 and Pin 5
  Required value: 0 V idling
- Act on accelerator, the voltage must rise
  Required value: Up to about 5 V
  If the required value is not reached, continue search based on circuit diagram of vehicle manufacturer, control unit possible faulty.

**Check wiper of EGR potentiometer to control unit**
- Connector connected.
- Engine at operating temperature and idling.
- Measure voltage between Pin 4 and engine ground
  Required value: > 1,1 V idling
  If the voltage is > 1,1 V, a leak is present at the EGR valve seat.
  Renew EGR valve.
- Act on the accelerator, the voltage must rise to > about 3 V.
  If the voltage rise is less, the EGR rate (EGR opening) is too low.
  Renew EGR valve.
  If no voltage rise is noticed, the EGR valve tappet is stuck.
  Renew EGR valve.

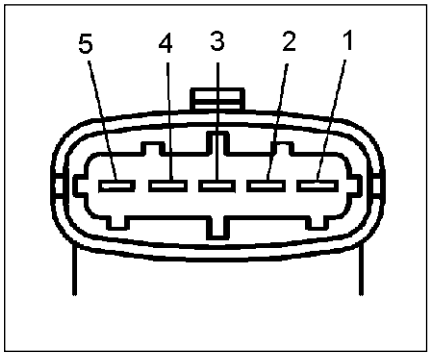

Fig. 2 Pin assignment

| | |
|---|---|
| Pin 1 Controlled ground | Coil |
| Pin 2 Ground | Potentio-meter |
| Pin 3 Voltage supply | Potentio-meter |
| Pin 4 Wiper signal | Potentio-meter |
| Pin 5 Voltage supply | Coil |

**Notes on removing and fitting the EGR valve (**Fig. 3).

- **Parts (**not included in scope of supply):

**For X10 XE engine:**
- Gasket (1 piece) from EGR valve (1) to cylinder head
  Opel No.: 90 529 609
  05 850 860

**For X12 XE engine:**
- Gasket (1 piece) from EGR valve (1) to cylinder head
  Opel No.: 90 529 609
  05 850 860
- Gasket (1 piece) from exhaust pipe (3) to EGR valve (1)
  Opel No.: 90 531 751
  05 850 62

- Before removing the EGR valve, render the cooling system pressureless. Subsequently disconnect coolant hose (2) from EGR valve (1). Collect discharging coolant.

- Do not use any liquid sealing compound.

- Use new gaskets. Clean sealing surfaces.

- Tightening torques:
  EGR valve (1) to cylinder head
  8 Nm
  Exhaust pipe (3) to EGR valve (1)
  8 Nm

- After fitting and connecting all parts, fill the cooling system and check for leaks.

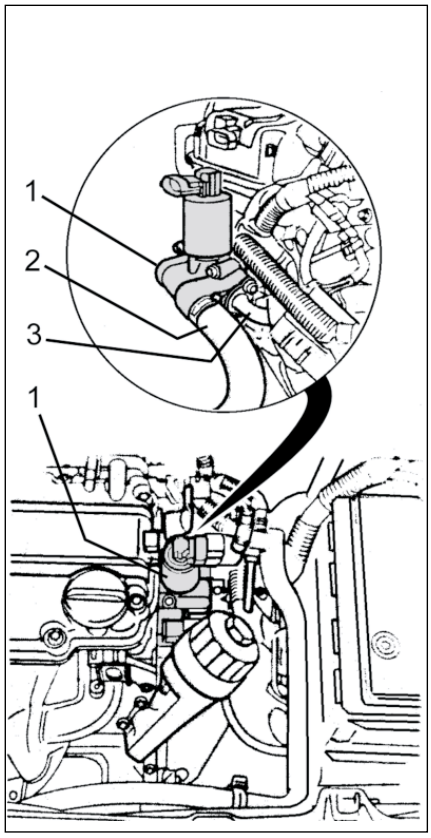

Fig. 3 Fitting position

1 EGR valve
2 Coolant hose
3 Exhaust pipe (only X12 XE)