



Electric EGR Valves (e.g. Renault, Opel)

Stickiness at the valves

Vehicle	Product	Electric EGR valve
	PIERBURG NO.	Replacement for
Various vehicles with following engines 1.5 ... 2.5 dCi/DTi/TDi/TD/CDTi 16V Assignment and usage, refer to the each case current catalogues, TecDoc CD respectively systems based on TecDoc.	7.22818.59.0	7.22818.06.0/ .17.0/ .29.0/ .32.0/ .34.0/ .39.0/ .41.0/ .51.0
	7.22818.57.0	7.22818.02.0/ .23.0/ .30.0/ .37.0/ .38.0/ .43.0
	7.22818.58.0	7.22818.01.0/ .03.0/ .16.0/ .26.0/ .45.0/ .49.0/ .50.0
	7.22818.62.0	7.22818.18.0/ .33.0/ .36.0/ .42.0/ .53.0/ .55.0/ .61.0
	7.22818.63.0	7.22818.35.0



Possible complaints:

- Idle operation is not smooth
- Jerkiness
- Insufficient power
- Engine reverts to emergency operation

Through checks in the workshop the diagnosis "Malfunctioning EGR valve" was determined. The built-in electrical EGR valves suffer through oil-containing deposits.

The results of this are:

- The valve is stiff.
- The valve is stuck and does not open.
- Due to the deposits the opening cross-section is reduced.
- The valve does not close fully.



Hinweis:

The causes can generally not be attributed to the EGR valve itself.

For diagnosis information and possible causes → following pages



EGR valve with sticky deposits and EGR valve as new



Product view (extract)

The right of changes and deviating pictures is reserved. For assignment and replacement parts, refer to the current catalogues, TecDoc CD or respective systems based on TecDoc.



Possible causes

Exceptionally thick deposits may be due to several causes:

- The intake or charge air contains large quantities of oil
- Bad, dirty combustion
- Fault affecting engine management
- Wrong software revision for the engine controller
- Frequent short distance operation (especially during the cold period of the year, formation of an oil and water emulsion which enters into the engine vent)

Malfunctions of this kind are, within the OBD, only in part detected and in part incorrectly assigned.

Here possible EOBD error codes can be:

- P0172 Fuel Trim too Rich - Bank 1
- P0175 Fuel Trim too Rich - Bank 2
- P0400 Exhaust Gas Recirculation - Flow Malfunction
- P0401 Exhaust Gas Recirculation - Flow Insufficient Detected
- P0402 Exhaust Gas Recirculation - Flow Excessive Detected
- P0403 Exhaust Gas Recirculation - Circuit Malfunction
- P0404 Exhaust Gas Recirculation - Circuit Range/Performance

Possible manufacturer specific error codes can be:

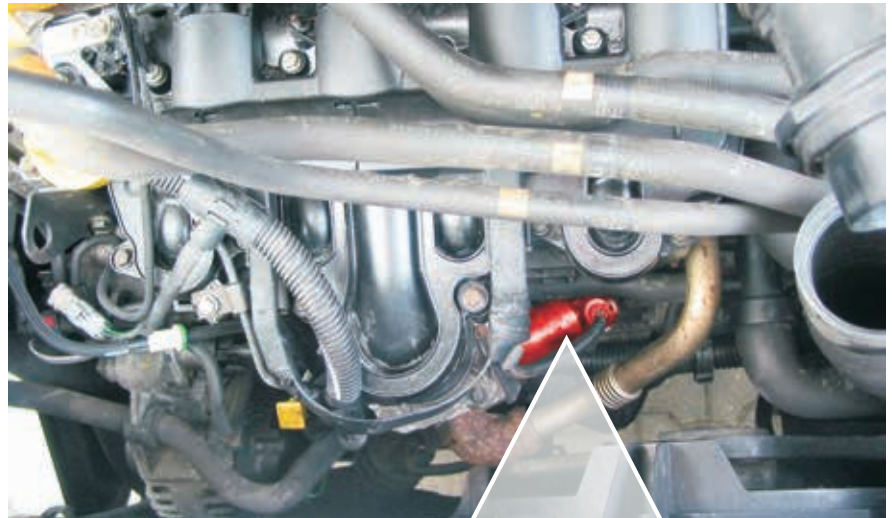
- DF077
- DF084
- DF241

Note:

The high soot share in the exhaust gas from Diesel engines promotes the formation of deposits.

The cause for large quantities of oil in the intake or charge air can be, for example:

- Malfunctions in the crankcase vent (oil separator, engine ventilation valve, for example)
- Increased blow-by¹ gas quantity due to increased wear at the pistons and cylinders
- Malfunctions at the turbocharger (worn out bearings, clogged oil return line, for example)
- Exceeding of the specified maintenance intervals (inadequate oil and oil filter change)
- Use of an engine oil quality which is not suited for the specific application
- Engine oil level which is too high
- Worn out valve piston seals respectively guides, thereby increasing the oil transfer into the intake channel.



EGR valve in the Renault Master JD1M (highlighted)

¹ Blow-by: Quantity of leaking gas which during normal combustion passes past the piston rings into the crankcase. Due to the presence of the crankcase vent, these gases are returned to the engine for combustion.



Diagnosis information

In the case of complaints, malfunctions and damage to the EGR system, it will be required to check, besides the components of the EGR system, also the surroundings.

Note:
Malfunctioning sensors can influence the way in which the exhaust gas return system operates.

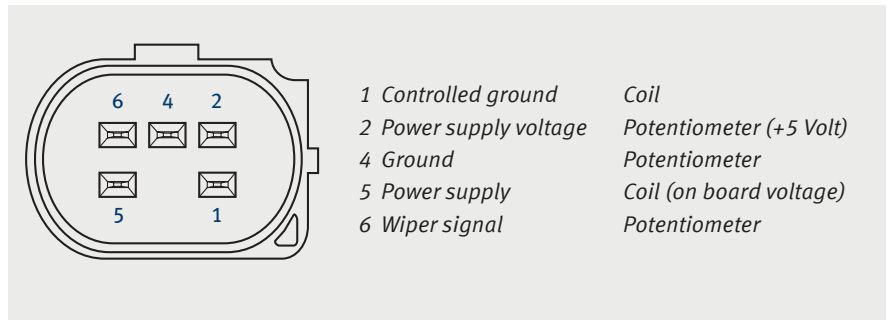
In the case of the EGR valves mentioned here, the most frequent causes of malfunctions are deposits at the valve disk or the valve seat. The EGR valve must be checked and replaced as required.

We do not recommend cleaning the EGR valve; when doing so, it might be damaged.

Quick test

- Pull the plug off from the EGR valve
- Measure the voltage at the plug between pin 5 and vehicle ground. Nominal value: Battery voltage
- Connect to pins 1 and 5 a DC voltage of 12 V and switch on and off alternately

Do not inadvertently connect the voltage to pins 2 to 4.



Pin assignment (view onto the EGR valve)

Checking the EGR signal from the controller

- Plug connected
 - Engine at operating temperature and running idle
 - Measure the voltage between pin 1 and pin 5. Nominal value: 0 V when idle
 - Operate the accelerator and when doing so, the voltage must increase. Nominal value: Up to approximately 5 V
- If the nominal value is not reached, troubleshoot according to the electric circuit diagram supplied by the vehicle manufacturer.

Checking the wiper voltage from the EGR potentiometer for the controller

- Plug connected
- Engine at operating temperature and running idle
- Measure the voltage between pin 6 and engine ground. Nominal value: less than 1.1 V (when idle)
- If the voltage exceeds 1.1 V, then there is a leak at the valve seat of the EGR valve and the EGR valve must be replaced.
- Operate the accelerator. When doing so, the voltage must increase to approximately 3 V or more.

If the voltage increase is less, then the EGR rate is too low, i.e. the EGR opening is too small due to deposits and the EGR valve must be replaced.

If no voltage increase can be measured, then the plunger of the EGR valve has seized and the EGR valve must be replaced.

Note:
In many cases an update for the controller software can remedy problems related to excessive stickiness.

Please note:

- When removing the EGR valve turn it slightly within the flange
- When fitting the EGR valve, use new gaskets
- Do not use any liquid sealants
- Note the specified torque levels (8 Nm)

Checking the resistance values

- Pull the plug off from the EGR valve
- Measure the coil resistance at the EGR valve between pin 1 and pin 5. Nominal value: $8 \pm 0.5 \text{ Ohm}$
- Measure the total resistance of the potentiometer between pin 2 and pin 4. Nominal values:
 - 7.22818.57.0/.59.0/.62.0/.63.0 $4 \text{ k}\Omega \pm 40\%$
 - 7.22818.58.0 $3.7 \text{ k}\Omega \pm 30\%$
- If a nominal value is not reached, the EGR valve must be replaced.