

Exhaust gas recirculation system (EGR)

General

To achieve exhaust emission reductions, some vehicles, are fitted with an exhaust gas recirculation system. This system is controlled by the ECU and the EGR valve.

Function

Due to the recirculation of a part of the exhaust gas the NOx concentration can be reduced. The recirculated exhaust gas, supplied to the air intake, will not combust, it absorbs a part of the combustion heat and warms up. This causes a drop in the combustion temperature. A lower combustion temperature causes a lower NOx concentration. To ensure that always the right quantity is recirculated the control follows the engine performance maps of the ECU. There are two control possibilities: The direct connection between the ECU and the EGR valve or via a switching valve. In this case, the ECU controls the switching valve that open and close a vacuum line. The vacuum then opens and closes the EGR valve.

Causes of failure

A faulty exhaust recirculation system can produce the following fault symptoms:

- Engine control light illumination, storing a fault code
- Black smoke (diesel engine)
- Rough idling

Causes for a faulty exhaust recirculation system:

- EGR valve plugged or permanently open
- Missing control of the ECU / ground

- Faulty, plugged lines
- Faulty, plugged vacuum lines
- Faulty switching valve
- Faulty wires, bad contact of the connectors

Fault diagnosis

For the fault recognition consider the following steps:

- Visual check of all relevant components for damage
- Check of all lines and connectors for damage, correct fitting and size
- Read out the fault memory (if possible)
- Check the EGR valve and lines for clogging and fouling
- Check for supply voltage from the ECU at the switching valve and/or at the EGR valve