

FUEL SUPPLY

- 01 Fuel delivery unit (in-tank)
- 02 Fuel level sensor
- 03 Fuel pump (in-line)
- 04 Fuel filter (Kolbenschmidt)
- 05 Fuel check valve
- 06 Fuel pressure regulators
- 07 Activated carbon filter valve

SECONDARY AIR

- 08 Secondary air pump
- 09 Secondary air valve (electrical)
- 10 Secondary air valve (pneumatic)
- 11 Switchover valve

EXHAUST GAS RECIRCULATION (EGR)

- 12 EGR cooler with EGR valve
- 13 EGR valve (electrical / electromotive)
- 14 EGR valve (pneumatic)
- 15 Pressure transducer for pneumatic EGR valves

AIR SUPPLY

- 16 Intake manifold
- 17 Electromotive drive module
- 18 Pressure sensor
- 19 Throttle valve / regulating throttle (with attachments such as idle controller)
- 20 Air mass sensor
- 21 Air filter (Kolbenschmidt)
- 22 Pressure transducer (for actuating the VTG turbocharger)
- 23 Recirculating air valve

FURTHER PIERBURG PRODUCTS

- 24 Non-return valve (vacuum)
- 25 Vacuum pump
- 26 Oil pump
- 27 Switchover valve
- 28 Exhaust gas flap
- 29 Lambda sensor
- 30 Water pump / coolant pump

OBD SYSTEM

ON-BOARD DIAGNOSTICS AND PIERBURG PRODUCTS

THE MALFUNCTION INDICATOR LAMP LIGHTS UP / FLASHES



- The malfunction indicator lamp lights up continuously**
- when the ignition is switched on (lamp function check),
 - when a fault is detected during the self test of the control unit,
 - after an emissions-relevant fault, when permissible emission values are exceeded.



- The malfunction indicator lamp flashes**
- when faults occur that lead to cylinder shut-off or to damage / destruction of the catalytic converter (e.g. misfiring).

The malfunction indicator lamp is also known as the MIL.

THE P0 CODE

A – Which system set the fault code?

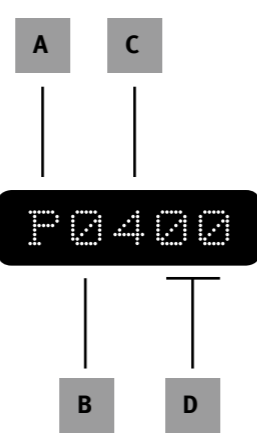
- P = Powertrain (drive)
- B = Body
- C = Chassis
- U = Network (data bus system)

B – Which fault group is displayed?

- 0 = Manufacturer independent code
- 1 = Manufacturer specific code (not stipulated)

C – Which assembly group does the fault refer to?

- 1/2 = Fuel and air metering
- 3 = Ignition system / Ignition misfires
- 4 = Exhaust gas purification systems
- 5 = Cruise control and idle control systems
- 6 = Control unit and its output signals
- 7/8 = Transmission



D – Which component is affected by which fault?

Refer to troubleshooting chart (here: exhaust gas recirculation – malfunction)

THE NINE OPERATING MODES OF THE SCAN TOOL

- Mode 1:** Read out the diagnostic values (actual data) of the system
- Mode 2:** Read out the operating conditions under which the fault occurred (freeze frame)
- Mode 3:** Read out the emissions-relevant faults which caused the malfunction indicator lamp to light up
- Mode 4:** Delete the emissions-relevant diagnostic trouble codes and reset the freeze frames
- Mode 5:** Display the test values and signal curves of the lambda sensors
- Mode 6:** Display the measured values of intermittently monitored systems
- Mode 7:** Read out the stored faults which have not yet caused the malfunction indicator lamp to light up
- Mode 8:** Status display of the OBD test functions (readiness code, component testing)
- Mode 9:** Display vehicle information data (engine code, chassis number, etc.)

FUEL SUPPLY



POSSIBLE DIAGNOSTIC TROUBLE CODES
P0170 – P0179, P0190 – P0194, P0200 – P0212, P0263 – P0296, P0301 – P0314, P0440 – P0469, P0100 – P0114 (indirect)

POSSIBLE CAUSES FOR DIAGNOSTIC TROUBLE CODE P01A70

Fuel mixture, cylinder line 1 – malfunction

- Leakage on intake side
- Fuel pressure
- Injection valves
- Injection nozzles
- Heated lambda sensor
- Activated carbon filter solenoid valve
- Blowing in of secondary air
- Fuel pump

EXHAUST GAS RECIRCULATION (EGR)



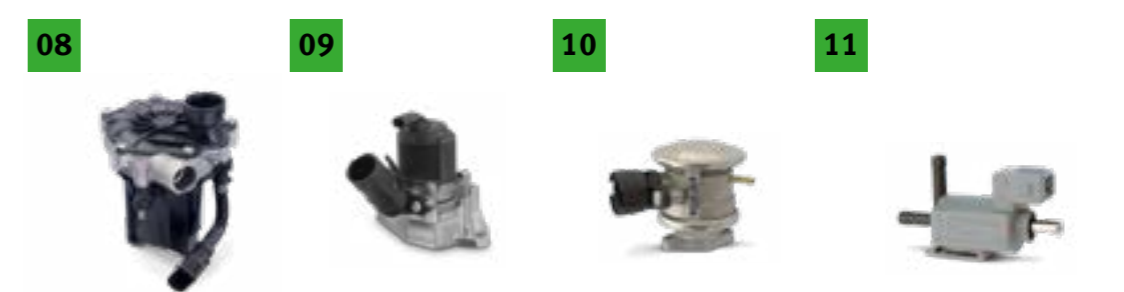
POSSIBLE DIAGNOSTIC TROUBLE CODES
P0400 – P0409, P0100 – P0114 (indirect)

POSSIBLE CAUSES FOR DIAGNOSTIC TROUBLE CODE P0400

Exhaust gas recirculation (EGR) – flow malfunction

- Engine control unit
- Wiring harness
- Fuel injection system
- Sticking or carbon deposits
- Basic setting not performed
- Hoses leaking or blocked
- EGR valve
- EGR control valve

SECONDARY AIR



POSSIBLE DIAGNOSTIC TROUBLE CODES
P0410 – P0419, P0100 – P0114 (indirect)

POSSIBLE CAUSES FOR DIAGNOSTIC TROUBLE CODE P0410

Secondary air – malfunction

- Engine control unit
- Wiring harness
- Relay
- Leaking vacuum lines
- Condensation / splash water
- Secondary air valve
- Secondary air system solenoid valve

AIR SUPPLY



POSSIBLE DIAGNOSTIC TROUBLE CODES
P0033 – P0035, P0105 – P0109, P0120 – P0124, P0220 – P0229, P0234 – P0235, P0243 – P0250, P0505 – P0510, P0638, P0639, P0100 – P0114 (indirect)

POSSIBLE CAUSES FOR DIAGNOSTIC TROUBLE CODE P0505

Idle control – malfunction

- Engine control unit
- Wiring harness
- Sticking or carbon deposits
- Idle controller
- Idle setting valve
- Throttle valve
- Throttle actuator