OBD – On-board diagnostics and Pierburg products

Diagnostic trouble codes – often caused by the system

MOTORSERVICE
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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)

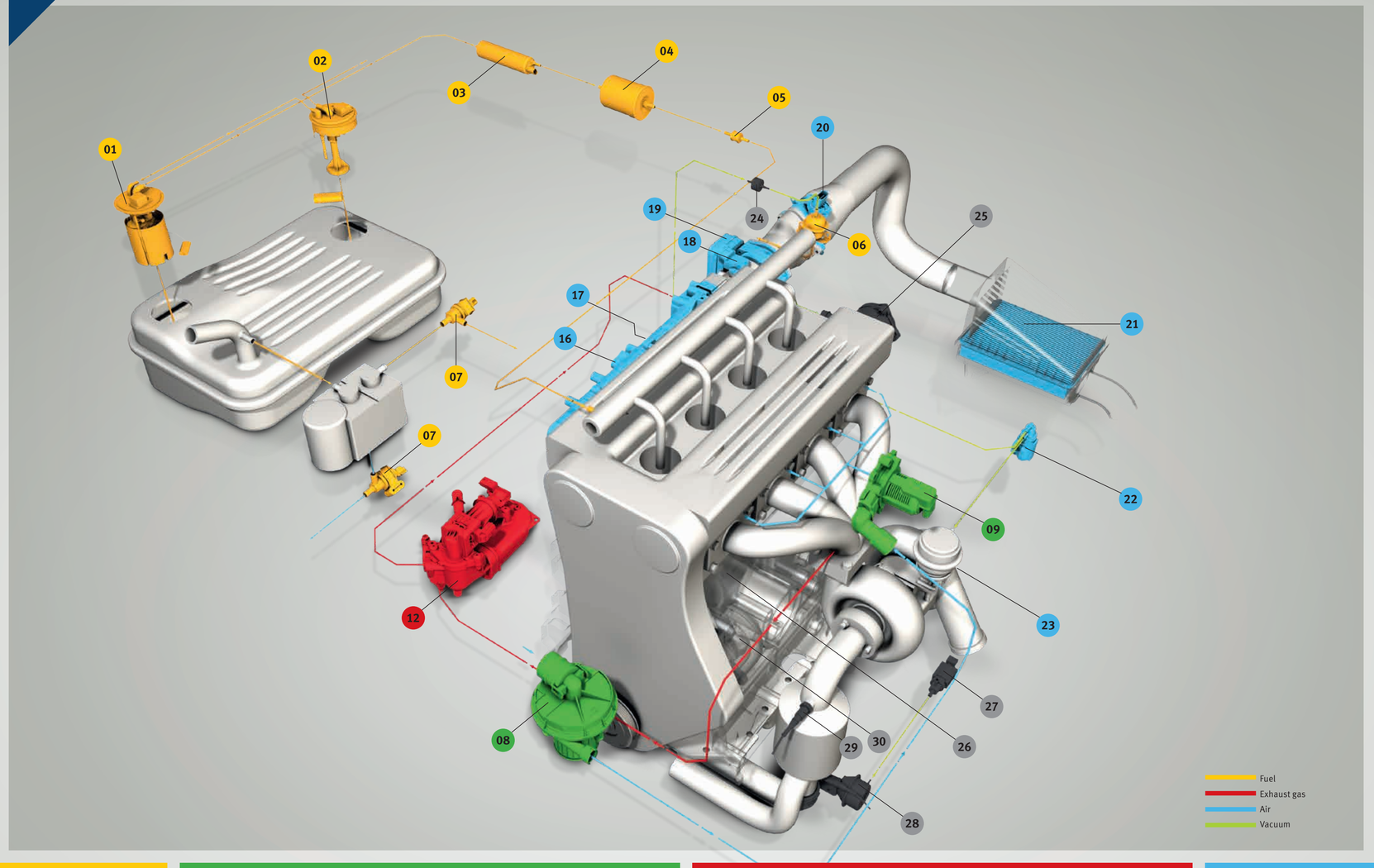
B – Which fault group is displayed?
0 = Manufacturer independent code
1 = Manufacturer specific code (not stipulated)

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

Secondary air
08 Secondary air pump
09 Secondary air valve (electrical)
10 Secondary air valve (pneumatic)
11 Electric switchover valve

Exhaust gas recirculation (EGR)
12 EGR cooler with EGR valve
13 EGR valve (electrical/electromotive)
14 EGR valve (pneumatic)
15 Electropneumatic pressure transducer for pneumatic EGR valves

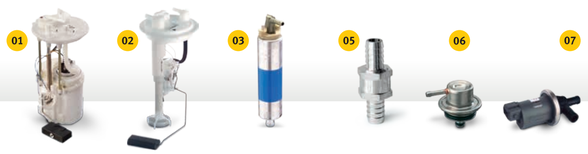
Air supply
16 Intake manifold
17 Electromotive drive module
18 Intake manifold pressure sensor
19 Throttle valve/regulating throttle (with attachments such as idling actuator)
20 Air mass sensor
21 Air filter (Kolbenschmidt)
22 Electropneumatic pressure transducer (for actuating the VTG turbocharger)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

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

Details on the subject of OBD and emission control are provided in the brochure "Emission control and OBD"

PIERBURG

Fuel supply



Example

Diagnostic trouble code	Displayed fault	Possible causes
P0170	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

Possible diagnostic trouble codes:
P0170 – P0179
P0190 – P0194
P0200 – P0212
P0263 – P0296
P0301 – P0314
P0440 – P0469
P0100 – P0114 (indirect)

Secondary air system

Example

Diagnostic trouble code	Displayed fault	Possible causes
P0410	Secondary air – malfunction	Engine control unit
		Wiring harness
		Relay
		Leaking vacuum lines
		Condensation/splash water
		Secondary air valve
		Secondary air system solenoid valve

Possible diagnostic trouble codes:
P0410 – P0419
P0100 – P0114 (indirect)

Exhaust gas recirculation

Example

Diagnostic trouble code	Displayed fault	Possible causes
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

Possible diagnostic trouble codes:
P0400 – P0409
P0100 – P0114 (indirect)

Air supply

Example

Diagnostic trouble code	Displayed fault	Possible causes
P0505	Idle control – malfunction	Engine control unit
		Wiring harness
		Sticking or carbon deposits
		Idling actuator
		Idle setting valve
		Throttle valve
		Throttle actuator

Possible diagnostic trouble codes:
P0033 – P0035
P0105 – P0109
P0120 – P0124
P0220 – P0229
P0234 – P0235
P0243 – P0250
P0505 – P0510
P0638, P0639
P0100 – P0114 (indirect)

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