On Board Diagnostic (OBD)

On Board Diagnostic (OBD), technical data

Equipment

♦ Data is transmitted between the control module and the VAS5051 tester or VAG1551 Scan Tool (ST) via operating mode "Rapid Data Transfer".

♦ DTC memory is designed for permanent memory and is therefore not dependent on voltage supply.

♦ Display of stored DTCs occurs after initiation of display mode ⇒ Page 01-16 .

♦ DTC memory must be erased after malfunction is repaired ⇒ Page 01-16 .

Important:

♦ Readiness code must be re-generated after every time DTC memory is erased ⇒ Page 01-73 .
If the ECM recognizes malfunctions that lead to a worsening of emissions values, it indicates them by lighting the Malfunction Indicator Lamp (MIL) -K83- in the instrument cluster. Meaning of Malfunction Indicator Lamp (MIL) -K83- ⇒ [Page 01-3].

"E-Gas"-relevant malfunctions are also indicated by the warning lamp for Electronic Power Control ("EPC warning lamp").
Malfunction Indicator Lamp (MIL), significance

If the ECM recognizes malfunctions that lead to a worsening of emissions values, it indicates them by lighting the Malfunction Indicator Lamp (MIL).

Installation location of Malfunction Indicator Lamp (MIL)

The Engine Control Module (ECM) switches on the Malfunction Indicator Lamp (MIL) after ignition is switched on. Shortly after engine is started, the exhaust MIL will go out. This requires, first of all, that the Engine Control Module (ECM) does not detect a malfunction that worsens the emissions values and, secondly, that activation of the lamp by the Engine Control Module (ECM) is OK.

If malfunctions that worsen emissions are recognized during operation of the engine, the ECM switches on the exhaust MIL in instrument cluster. (These malfunctions are listed in the DTC table). An entry is made in DTC memory at the same time.

The Malfunction Indicator Lamp (MIL) can blink or remain lit continuously. DTC memory should be checked in either case ⇒ Page 01-16.
Continuously lit:
There is a malfunction that causes increased emissions. Check DTC memory for Motronic ECM and automatic transmission (if installed).

Check DTC memory if there is a driveability problem or a customer complaint, but the Malfunction Indicator Lamp (MIL) is not lit. There may be DTCs stored that do not cause the exhaust MIL to light up immediately, but only after engine is started again and malfunction is recognized again.

Blinking:
There is a malfunction that causes damage to the catalytic converter in this driving condition (e.g. combustion misfire). In this case, vehicle must only be driven at reduced power!

Note:
*Catalytic converter must be checked after malfunction is repaired.*
Malfunction Indicator Lamp (MIL), checking

Special tools and equipment

- VAG1594A
- VAG1598/31
Function test of warning lamp

- Switch ignition on.

♦ Exhaust MIL must light up

A- Exhaust MIL does not light up

- Connect VAG1598/31 test box at wiring harness to Engine Control Module (ECM), do not connect ECM ⇒ Page 24-19 .

- Bridge sockets 1 and 47 of test box.

- Switch ignition on.

♦ Warning lamp must light up.

If warning lamp does not light up:

- Switch ignition off.

- Remove instrument cluster:

⇒ Repair Manual, Electrical Equipment, Repair Group 90; Instrument cluster, removing and
installing
- Check following wire connection for open circuit and short circuit to B+:

<table>
<thead>
<tr>
<th>Test box</th>
<th>Instrument cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAG1598/31</td>
<td>Terminal</td>
</tr>
<tr>
<td>Socket</td>
<td>47</td>
</tr>
</tbody>
</table>

- Repair open circuit or short circuit if necessary.

If wire connection is OK:

- Replace Engine Control Module (ECM) ⇒ Page 24-23
B- Exhaust MIL remains constantly lit

- Check DTC memory of Engine Control Module (ECM) ⇒ Page 01-16.

If no DTCs are stored:

- Connect VAG1598/31 test box at wiring harness to Engine Control Module (ECM), do not connect ECM ⇒ Page 24-19.

- Remove instrument cluster:

⇒ Repair Manual, Electrical Equipment, Repair Group 90: Instrument cluster, removing and installing

- Check following wire connection for short circuit to Ground (GND):

<table>
<thead>
<tr>
<th>Test box</th>
<th>Instrument cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAG1598/31</td>
<td></td>
</tr>
<tr>
<td>Socket</td>
<td>Terminal</td>
</tr>
<tr>
<td>47</td>
<td>⇒ Electrical Wiring Diagrams, Troubleshooting &amp; Component</td>
</tr>
</tbody>
</table>
- Repair short circuit if necessary.

If wire connection is OK:

- Replace Engine Control Module (ECM) ⇒ Page 24-23
Safety precautions

If special testing equipment is required during road test, note the following:

**WARNING!**

- Test equipment must always be secured to the rear seat and operated from there by a second person.

- If test and measuring equipment is operated from the passenger seat, the person seated there could be injured in the event of an accident involving deployment of the passenger-side airbag.
VAS5051 tester or VAG1551 scan tool, connecting and selecting functions

Test requirements:

- Fuses for engine electronics OK

⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations

- Fuel Pump (FP) relay OK; checking ⇒ Page 24-53.

- Battery voltage at least 12.7 V

- Ground (GND) connections at engine and transmission OK

Procedure

- Connect VAS5051 tester to vehicle with VAS5051/1 diagnostic wire. Alternately, VAG1551 Scan Tool (ST) can also be attached using VAG1551/3A adapter.

Note:

Data Link Connector (DLC) is located in front left knee bolster.
WARNING!

Observe safety precautions ⇒ Page 01-9.

Note:

The following description only explains implementation of On Board Diagnostic using VAG1551 Scan tool. When using the VAS5051 tester, observe instructions in the tester's user manual.

Indicated on display

1) Operating modes 1 and 2 are displayed alternately

Note:

If nothing appears in display:

- Perform troubleshooting procedure after "troubleshooting procedure leak test":

⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations
Depending on desired function ⇒ Table "Selectable functions", ⇒ Page 01-15:

- Switch ignition on.

or

- Start engine.

- Press -Print- button to turn on Scan Tool (ST) printer. Indicator lamp in button must light up.

- Press button 1 to select "Rapid data transfer" operating mode 1.

When indicated on display

Note:

*The address word 00 initiates the automatic test sequence, i.e. it results in a DTC check on all OBD capable systems in the vehicle via rapid data transfer.*

- Press buttons -0- and -1- to select "engine electronics" and press -Q- button to confirm input.

VAG1551 Scan Tool (ST) display indicates control module identification, e.g.
Note:

Control module identification can be printed by pressing the PRINT key on the VAG1551 scan tool.

Control module identification (example)

- 4B0906018Q  
  part number; allocation

- 1.8L  
  Engine displacement

- R4/5VT  
  Inline engine, 4 cylinders / 5 valve turbo

- "G" i.e. no indication  
  Vehicle with or without cruise control system

- 0008  
  Data version (software version) of control module

- Coding 07551  
  Control module coding

- WSC 12345  
  Factory identification of VAG1551, with which the last coding was performed

- Press button.

Indicated on display (function selection)
Select function XX
Note:

- It will be possible to display the control module identification again after pressing buttons -0- and -1- to select "Check Control Module Versions" and confirming with the -Q- button.

👀 When indicated on display

- Perform troubleshooting procedure after "troubleshooting procedure leak test":

⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations
## Selectable functions

<table>
<thead>
<tr>
<th>VAS5051 vehicle diagnostic, testing and information system or VAG1551 Scan Tool (ST)</th>
<th>Ignition on, engine off</th>
<th>Engine running at idle</th>
<th>Vehicle in drive mode</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Address words</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01 Engine electronics</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page 01-10</td>
</tr>
<tr>
<td>00 Automatic test sequence</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page 01-12</td>
</tr>
<tr>
<td><strong>Functions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01 Check Control Module Versions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page 01-14</td>
</tr>
<tr>
<td>02 Check DTC Memory</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page 01-16</td>
</tr>
<tr>
<td>03 Output Diagnostic Test Mode (DTM)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>⇒ Page 01-49</td>
</tr>
<tr>
<td>04 Basic Setting</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page 01-58</td>
</tr>
<tr>
<td>05 Erase DTC Memory</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page 01-16</td>
</tr>
<tr>
<td>06 End Output</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page 01-18</td>
</tr>
<tr>
<td>07 Code Control Module</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>⇒ Page 01-62</td>
</tr>
<tr>
<td>08 Read measuring value block</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>⇒ Page</td>
</tr>
</tbody>
</table>