01-1

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).
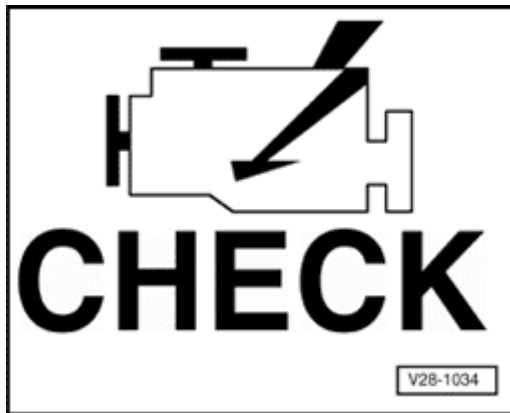
◄   Installation location of Malfunction Indicator Lamp (MIL)

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 ⇒ .

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!
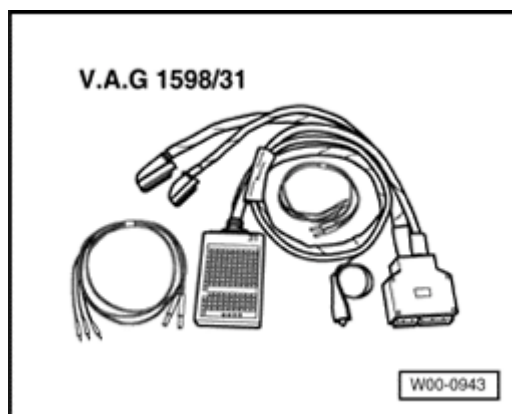
Note:

Catalytic converter must be checked after malfunction is repaired.

01-5

Malfunction Indicator Lamp (MIL), checking

Special tools and equipment

◄   ♦ VAG1594A

V.A.G 1594 A

W00-0477

◄   ♦ VAG1598/31

V.A.G 1598/31

W00-0943

01-6
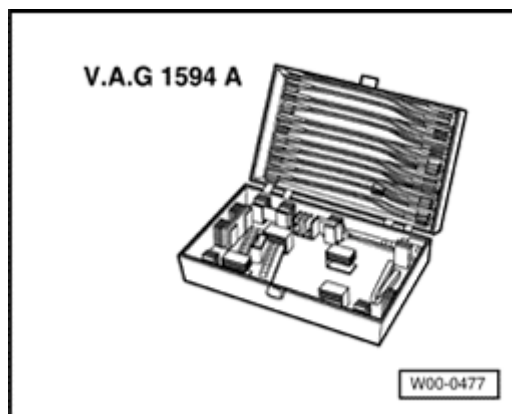
Function test of warning lamp

- 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

01-7

- Check following wire connection for open circuit and short circuit to B+:

Test box VAG1598/31 Socket	Instrument cluster Terminal
47	⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

- 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):

Test box VAG1598/31 Socket	Instrument cluster Terminal
47	⇒ *Electrical Wiring Diagrams, Troubleshooting & Component*

	Locations

- 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.*

01-10

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

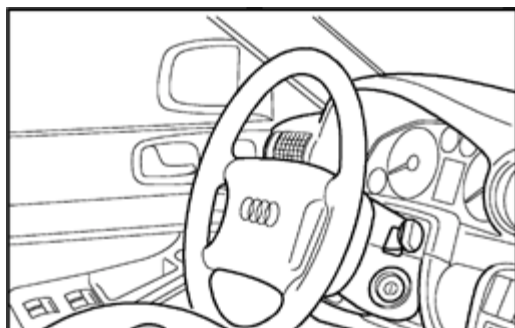* Ground (GND) connections at engine and transmission OK

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.

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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.

VAG - On Board Diagnostic (OBD) HELP

1- Rapid data transfer1)

2- Blink code output1)

◄ 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*

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Depending on desired function ⇒ Table
"Selectable functions", ⇒ :

- 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.

Rapid data transfer	**HELP**
Enter address word XX	

◄ 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.

4B0906018Q 1.8 L R4/5VT G 0008 →	
Coding 07551	**WSC 12345**

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

01-13

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
	⇒ *Parts Catalog*
♦ 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.

Rapid data transfer HELP	◄

Indicated on display (function selection)

Select function XX

01-14

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.*

Rapid data transfer	HELP
Control module not responding!	

◄

◆ *When indicated on display*

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

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

Rapid data transfer	HELP
K-wire does not switch to Ground	

Rapid data transfer	HELP
K-wire does not switch to B+	

Rapid data transfer	HELP
Malfunction in communication set-up	

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Selectable functions

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

				01-65