01-1

On Board Diagnostic (OBD)

Function

The Multiport Fuel Injection (MFI) system is equipped with an Engine Control Module (ECM) -J220- with On Board Diagnostic (OBD) capability.

When malfunctions occur in sensors or components monitored by OBD, Diagnostic Trouble Codes (DTC) are stored in DTC memory.

Stored DTCs are identified using the VAG 1551 Scan Tool (ST) ⇒ Page 01-15 .

After the necessary repairs are completed, DTC memory must be erased ⇒ Page 01-40 .

OBD II legal regulations require a display (readiness code) that shows inspection readiness for the annual exhaust emissions test. The readiness code shows that every component and/or system that affects exhaust emissions, which can lead to the Malfunction Indicator Lamp (MIL) being switched on, has been operated at least once with positive results.

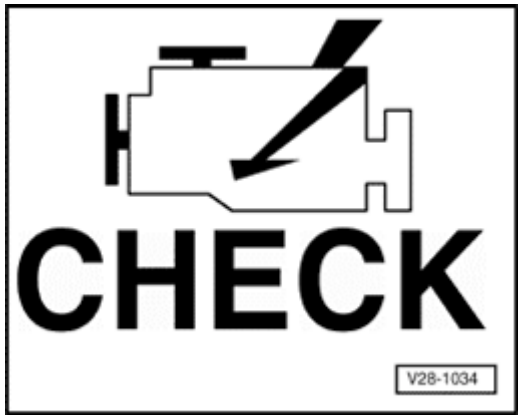
The readiness code is reset and/or erased and must be regenerated every time DTC memory is erased, the power supply to the ECM -J220- is interrupted (example: when connecting test box

VAG 1598/19), or the battery has been disconnected ⇒ Page 01-62 .

01-2

Malfunction Indicator Lamp (MIL) function, checking

If a malfunction is recognized by the Engine Control Module (ECM), this is indicated by the MIL coming on.



Malfunction Indicator Lamp (MIL)

Note:

When a recognized malfunction switches on the MIL, it will either blink or light continuously. In either case, DTC memory must be checked ⇒ Page 01-15 .

- *If the MIL starts to blink, there is a malfunction that can lead to damage of the Three Way Catalytic Converter (TWC). In this case, driving should only continue using reduced power. The malfunction must be rectified as quickly as possible.*
- *If the MIL lights continuously, there is a malfunction that affects exhaust emissions. In this case, DTC memory must be checked, and the malfunction must be rectified as quickly as possible.*
- *Some malfunctions may occur without causing the MIL to come on. When driveability or performance problems are reported, and there is no indication from the MIL, the operation of the MIL must be checked. In addition, DTC memory must be checked, as there may be malfunctions stored that do not switch the MIL on immediately.*

01-3

Checking function

- Switch ignition on.

  MIL must light up.

- If MIL does not light when ignition is switched on, check wiring to MIL as follows:

Cause:	Remedy:
MIL is not triggered, or does not light, due to faulty wiring or open circuit.	- Switch ignition off. - Connect VAG 1598/22 test box. - Connect jumper wire to bridge test box sockets 2 and 17. - Switch ignition on. • MIL must light up. If MIL does not light: - Switch ignition off. - Check bulb for MIL. If bulb is OK: - Check wiring for open circuit between MIL and Motronic ECM - J220- using applicable wiring diagram.

	If wiring is OK:
Malfunction: ▶	Motronic ECM -J220- is faulty; replace ⇒ Page 01-57 . - Check and erase Diagnostic Trouble Code (DTC) memory and generate new readiness code.

01-4

If MIL lights up when ignition is switched on, continue checking as follows:

- Start engine and let run at idle.

  MIL must go out after a few seconds.

If MIL does not go out:

- Check Diagnostic Trouble Code (DTC) memory
  ⇒ Page 01-15 .

If there are no malfunctions stored in DTC memory:

Cause:	Remedy:
MIL is triggered continuously due to short circuit to Ground.	- Switch ignition off. - Connect VAG 1598/22 test box. - Check resistance between test box socket 17 and vehicle Ground, specified value: ∞ Ω (no continuity) If the specified value is not obtained: - Check for short circuit to Ground in wiring from Motronic Engine Control Module (ECM) -J220- to MIL. - Trace malfunction using applicable wiring diagram and repair as necessary.

	If there is no continuity, and no short circuit to Ground:
Malfunction: ▶	Motronic ECM -J220- is faulty; replace ⇒ Page 01-57 . - Check and erase Diagnostic Trouble Code (DTC) memory and generate new readiness code.

01-5

On Board Diagnostic (OBD) technical data

Memory

- Temporary memory and permanent memory (If the engine control module is disconnected from the Battery Positive Voltage (B+) supply, the readiness code and learning values will be erased. Any malfunctions stored in DTC memory are not erased)

Data output

- Rapid data transfer

- Additional malfunction indication by Malfunction Indicator Lamp (MIL) lighting up

ECM identification

⇒ Page 01-7 ; VAG 1551 Scan Tool (ST), connecting and selecting "Engine Electronics" address word 01

ECM functions

- The Motronic ECM -J220- performs different OBD functions, carried out with the ignition switched on or with the engine running. Following are the conditions required to carry out each of the specific functions.

Address words:

Address word 00: Automatic Test Sequence	r Ignition switched on -or- Engine running at idle
Address word 01: Engine Electronics	r Ignition switched on -or- Engine running at idle
Address word 33: OBD II (generic scan tool)	r Ignition switched on -or- Engine running at idle

Functions under "Engine Electronics" address word 01:

Function 01: Check Control Module Version	Ignition switched on -or- Engine running at idle
Function 02: Check DTC Memory	Engine running at idle, otherwise crank engine with starter motor for at least 5 sec., then do not switch ignition off

01-6

Function 03: Output Diagnostic Test Mode	Ignition switched on
Function 04: Basic Setting	Engine running at idle
Function 07: Code Control Module	Ignition switched on
Function 08: Read Measuring Value Block	Ignition switched on -or- Engine running at idle -or- Driving

Modes under address word 33:

Mode 1: Transfer diagnostic data	Ignition switched on -or- Engine running at idle
Mode 2: Transfer operating conditions	Ignition switched on -or- Engine running at idle
Mode 3: Check DTC memory	Ignition switched on -or- Engine running at idle
Mode 4: Erase diagnosis information	Ignition switched on -or- Engine running at idle
Mode 5: Output of HO2S signals	Ignition switched on -or- Engine running at idle
Mode 6: Transfer measuring values	Ignition switched on -or- Engine running at idle
Mode 7: Check DTC memory	Ignition switched on -or- Engine running at idle

- Under Address word 33, Mode 1 to Mode 7 can be addressed.
- Under Mode 1 individual measuring values can be displayed. Mode 1 is not recommended for use in an Audi Service department, because these values can be displayed much more precisely using address word 01 and "Basic Setting" function 04 or "Read Measuring Value Block" function 08.
- Mode 2 shows the operating conditions under which the stored malfunctions were recognized.
- With Mode 3, DTC memory is checked-with Mode 4, DTC memory is erased.

- Mode 5 shows the statistical value of the oxygen sensors as mandated by law. As these values have no direct bearing on oxygen sensor diagnosis, Mode 5 is of no particular value in an Audi Service department.

- Under Mode 6, values can be checked for components and systems that are not continuously monitored.

- *With Mode 7 all malfunctions can be checked, even if they have not switched on the Malfunction Indicator Lamp (MIL) (if the MIL has not been switched on, there is no malfunction recognized under Mode 3)*

01-7

VAG 1551/ VAG 1552 Scan Tool (ST), connecting and selecting "Engine Electronics" address word 01

Required special tools and test equipment

- VAG 1551 Scan Tool (ST) with VAG 1551/3 adapter cable

Note:

VAG 1552 scan tool can be used instead of VAG 1551, however there is no print-out capability.

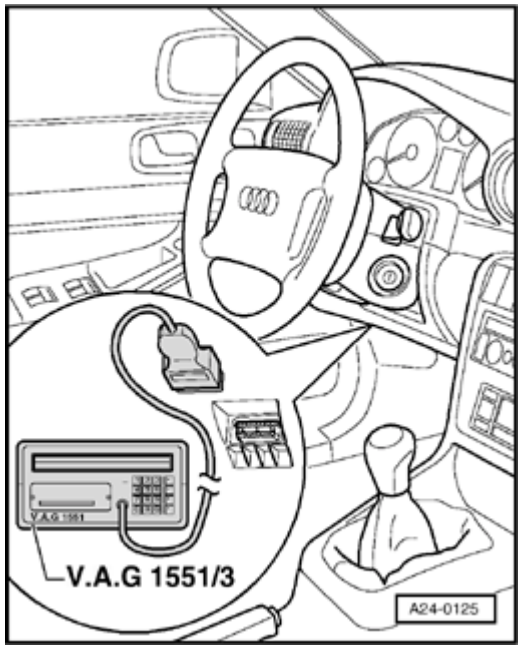
Requirements

- Fuses for engine electronics OK
- Battery Positive Voltage (B+) OK (at least 11 volts)
- Engine and transmission Ground connections OK

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

- Fuel pump relay OK

01-8



Connecting

- Locate Data Link Connector (DLC), under driver's knee bar to left side of steering wheel.
- Connect VAG 1551 Scan Tool (ST) with VAG 1551/3 adapter cable to DLC.
- Switch ignition on, or start engine, depending on function to be selected.

Notes:

- *If scan tool displays do not appear as indicated:*

⇒ *Scan tool operating instructions*

- *If "Error in communication link" is displayed, disconnect adapter cable at scan tool, reconnect, and repeat procedure.*
- Operate scan tool and advance through program sequence by following display:
- Press button -1- to select "Rapid data transfer" operating mode 01.
- Press buttons -0- and -1- to insert "Engine Electronics" address word 01, and press -Q- button to confirm input.

01-9

8D0907557 1,8L R4/5VT MOTR HS D02 →
Coding 06051 **WSC 00000**

➢ Indicated on display (ECM identification and coding)

8D0 _ _ _ _ _ _ _ _	Engine Control Module (ECM) Part No.
1.8 L	Engine displacement
R4 / 5VT	Engine type:
	In-line (Reihenmotor), 4-Cyl.
	5- Valve, Turbocharged
MOTR	Motronic
HS	Manual transmission
AT	Automatic transmission
D..	ECM software version
Coding	ECM coding:
	See coding table ⇒ page
WSC 12345	Plant number: indicates where the VAG 1551 scan tool was used for the last coding and/or adaptation (as long as factory coding has not been changed, WSC 00000 is displayed)

01-10

Notes:

If the ECM version that corresponds to the vehicle is not displayed, replace ECM ⇒ Page 01-57 . Incorrect ECM coding leads to:

- *Performance problems (e.g. jerky shifting, abrupt load changes, etc.*
- *Increased fuel consumption*
- *Elevated exhaust gas values*
- *Reduction in transmission service life*
- *Malfunctions not present are stored in DTC memory*
- *Necessary functions are not carried out (oxygen sensor control, actuation of EVAP canister system, etc.)*

- Press → button to advance program sequence.

Rapid data transfer HELP	
Select function XX	

Indicated on display

- Continue as specified in procedures for specific OBD functions.

01-11

Code Control Module (function 07)

If vehicle coding information is not as specified, or if the ECM has been replaced, the ECM must be coded as follows.

Required special tools and test equipment

- VAG 1551/ VAG 1552 Scan Tool (ST) with VAG 1551/3 adapter cable

Coding procedure

- Connect VAG 1551/ VAG 1552 Scan Tool (ST) and press buttons -0- and -1- to insert "Engine Electronics" address word 01 (ignition switched on) ⇒ Page 01-7 .

Rapid data transfer HELP **Select function XX**	Indicated on display

- Press buttons -0- and -7- to select "Code Control Module function 07, and press -Q- button to confirm input.

Code Control Module HELP **Input code number XXXXX (0-32000)**	Indicated on display

- Input applicable code number for vehicle, and press -Q- button to confirm input. ECM coding variations ⇒ Page 01-13 .

Function is unknown or →	If indicated on display:

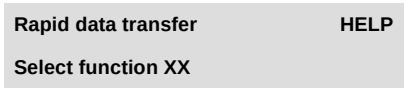
cannot be carried out at the moment

Incorrect code number has been entered.

01-12

Indicated on display (ECM identification and coding, e.g. 06051)

- Press →button to advance program sequence.



Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06, and press -Q- button to confirm input.

Note:

The Motronic ECM -J220- only uses the code that has been entered after the ignition has been switched off once. Incorrect coding leads to:

- *Performance problems (e.g. jerky shifting, abrupt load changes, etc.*
- *Increased fuel consumption*
- *Elevated exhaust gas values*
- *False malfunctions stored in DTC memory*
- *Reduction in transmission service life*

01-13

ECM coding variations

Country/Emissions	Drivetrain/Options	Transmission	Vehicle type
00 ---------- =	0 = Front-wheel-drive without traction control (ASR)	0 = 5-speed manual	0 = ---------- ------
01 ---------- =	1 = Front-wheel-drive with traction control (ASR)	1 = ----------	1 = A4
02 ---------- =	2 = All-wheel-drive without traction control (ASR)	2 = ----------	2 = ---------- ------
03 ---------- =	3 = All-wheel-drive with traction control (ASR)	3 = ----------	3 = ---------- ------
04 ---------- =	4 = ----------	4 = ----------	4 = ---------- ------
05 ---------- =	5 = ----------	5 = Automatic trans. 01V	5 = ---------- ------
06 = USA, equipped with EVAP system Leak Detection Pump (LDP)	6 = ----------	6 = ----------	6 = ---------- ------

01-14

Code number stucture (example)					
USA vehicle with Leak Detection Pump (LDP):	0	6			
Front-wheel-drive without traction control (ASR):			0		
Automatic transmission 01V:				5	
Audi A4:					1
Code number:	0	6	0	5	1

Note:

Vehicles with traction control (ASR) can be recognized by the ASR control light in the instrument cluster or by ABS/ASR On Board Diagnostic (OBD).

⇒ *Repair Manual, Brake System On Board Diagnostic (OBD), Repair Group 01*

01-15

Check Diagnostic Trouble Code (DTC) Memory (function 02)

Required special tools and test equipment

- VAG 1551/ VAG 1552 Scan Tool (ST) with VAG 1551/3 adapter cable

Checking

- Connect VAG 1551/ VAG 1552 Scan Tool (ST) and press buttons -0- and -1- to insert "Engine Electronics" address word 01 (engine running at idle) ⇒ Page 01-7 .

Note:

If engine does not start:

- Operate starter to crank engine for approx. 6 seconds, then do not switch ignition off.

- Press PRINT-button to switch scan tool printer on (indicator light in button lights up).

Rapid data transfer **HELP**	
Select function XX	

Indicated on display

- Press buttons -0- and -2- to select "Check DTC Memory" function 02, and press -Q- button to confirm input.

01-16

X DTC recognized	Indicated on display (number of stored malfunctions, or "No DTC recognized."

Note:

If scan tool displays do not appear as indicated:

⇒ *Scan tool operating instructions*

If one or more malfunctions are stored:

Stored malfunctions are displayed one after another, and are printed out along with applicable DTCs.

Rapid data transfer HELP **Select function XX**	Indicated on display (after all stored malfunctions)

If no DTCs are recognized:

- Press →button to advance program sequence.
- Press buttons -0- and -6- to select "End Output" function 06, and press -Q- button to confirm input.
- Repair malfunctions according to Diagnostic Trouble Code (DTC) table ⇒ Page 01-17 .
- Erase DTC memory ⇒ Page 01-40 .

01-17

Diagnostic Trouble Code (DTC) table

Notes:

- *The DTC table is organized according to SAE and VAG diagnostic trouble codes.*
- *The "MIL" column labeled specifies the MIL switching condition associated with that DTC.*
- *DTCs that do not switch on the MIL after the malfunction is recognized by the ECM are identified by the MIL switching condition "Off."*
- *DTCs that do switch on the MIL immediately after the malfunction is recognized by the ECM are identified by the MIL switching condition "Immed."*
- *DTCs that are recognized by the ECM and switch on the MIL after two consecutive driving cycles (Dcy) are identified by the MIL switching condition "2 Dcy."*
- *Always correct malfunctions that are designated "immediately" as soon as possible, followed by those malfunctions that are designated "2Dcy."*
- *When all repairs have been completed, erase DTC memory (⇒ Page 01-40) and then generate new readiness code ⇒ Page 01-62*
- *DTCs that are recognized as a result of intermittent malfunctions, or DTCs that are not erased after repairs, are classified as sporadic malfunctions. These are identified by the designation "SP" appearing in the display.*
- *A sporadic malfunction will be erased if it no longer occurs after 50 driving cycles during which the engine reaches*

operating temperature.

01-18

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P0102	16486	Mass or Volume Air Flow Circ. Low Input	2 Dcy	- Check Mass Air Flow (MAF) sensor -G70- ⇒ Page 24-57
P0103	16487	Mass or Volume Air Flow Circ. High Input		
P0107	16491	Manifold Abs. Pressure or Bar. Pressure Low Input	2 Dcy	- Check Manifold Absolute Pressure (MAP) sensor -G71- ⇒ Page 24-131
P0108	16492	Manifold Abs. Pressure or Bar. Pressure High Input		
P0112	16496	Intake Air Temp. Circ. Low Input	2 Dcy	- Check Intake Air Temperature (IAT) sensor -G42- ⇒ Page 24-69
P0113	16497	Intake Air Temp. Circ. High Input		
P0116	16500	Engine Coolant Temp. Circ. Range/Performance	2 Dcy	- Check Engine Coolant Temperature (ECT) sensor -G62- ⇒ Page 24-63
P0117	16501	Engine Coolant Temp. Circ.		

		Low Input		
P0118	16502	Engine Coolant Temp. Circ. High Input		

01-19

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P0121	16505	Throttle/Pedal Pos. Sensor A Circ. Range/Performance	2 Dcy	- Check Throttle Position (TP) sensor -G69- ⇒ Page 24-99
P0122	16506	Throttle/Pedal Pos. Sensor A Circ. Low Input		
P0123	16507	Throttle/Pedal Pos. Sensor A Circ. High Input		
P0130	16514	O2 Sensor Circ., Bank1-Sensor1 Malfunction	2 Dcy	- Check Heated Oxygen Sensor (HO2S) -G39- and O2S control ⇒ Page 24-17
P0131	16515	O2 Sensor Circ., Bank1-Sensor1 Low Voltage		
P0132	16516	O2 Sensor Circ., Bank1-Sensor1 High Voltage		

P0133	16517	O2 Sensor Circ., Bank1-Sensor1 Slow Response	2 Dcy	- Check Heated Oxygen Sensor (HO2S) aging ⇒ Page 24-51
P0134	16518	O2 Sensor Circ., Bank1-Sensor1 No Activity Detected	2 Dcy	- Check HO2S -G39- and O2S control ⇒ Page 24-17

01-20

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P0136	16520	O2 Sensor Circ., Bank1-Sensor2 Malfunction	2 Dcy	- Check Oxygen Sensor (O2S) behind Three Way Catalytic Converter (TWC) -G130- ⇒ Page 24-35
P0137	16521	O2 Sensor Circ., Bank1-Sensor2 Low Voltage		
P0138	16522	O2 Sensor Circ., Bank1-Sensor2 High Voltage		
P0140	16524	O2 Sensor Circ., Bank1-Sensor2 No Activity Detected		

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P0300	16684	Random/Multiple Cylinder Misfire Detected	2 Dcy / blink	- Fuel level too low, check fuel level and add if necessary - Check misfire detection ⇒ Page 28-12 - Check fuel injectors ⇒ Page 24-87 - Output Diagnostic Test Mode (DTM) ⇒ Page 01-42 - Check engine speed (RPM) sensor -G28- ⇒ Page 24-75
P0301	16685	Cyl. 1 Misfire Detected		
P0302	16686	Cyl. 2 Misfire Detected		
P0303	16687	Cyl. 3 Misfire Detected		
P0304	16688	Cyl. 4 Misfire Detected		
P0321	16705	Ign./Distributor Eng. Speed Inp. Circ.	2 Dcy	- Check engine speed (RPM) sensor -G28-

		Range/Performance		⇒ Page 24-75
P0322	16706	Ign./Distributor Eng. Speed Inp. Circ. No Signal	Immed.	

Note on misfire malfunctions:

For malfunctions that may be caused by low fuel volume (i.e. combustion misfire) a low-fuel malfunction (DTC "P1250") is also stored when there is less than 2 gallons of fuel remaining in the tank.

01-22

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P0327	16711	Knock Sensor 1 Circ. Low Input	Immed.	- Check knock sensors and knock sensor control ⇒ Page 28-5
P0332	16716	Knock Sensor 2 Circ. Low Input		- Check knock sensors and knock sensor control ⇒ Page 28-5
P0422	16806	Main Catalyst, Bank1 Efficiency Below Threshold	2 Dcy	- Replace Three Way Catalytic Converter (TWC): ⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Engine Mechanical, Engine Code(s): AEB, ATW, Repair Group 26.*
P0441	16825	EVAP Emission Contr. Sys. Incorrect Purge Flow	2 Dcy	- Check Evaporative Emissions (EVAP) canister purge regulator valve ⇒ output Diagnostic Test Mode (DTM), page ⇒ Page 01-42

01-23

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P0442	16826	EVAP Emission Contr. Sys. (Small Leak) Leak Detected	➢ m.y. 1997: Off	- Check EVAP system ⇒ Page 24-136 - Checking EVAP system for leaks using KLI9210 EVAP tester ⇒ *Repair Manual, Fuel Supply System, Repair Group 20;*
P0455	16839	EVAP Emission Contr. Sys. (Gross Leak) Leak Detected	m.y. 1998 ➢: 2 Dcy	
P0456	16840	EVAP Emission Contr. Sys. (Small Leak) Leak Detected		- Checking EVAP system for leaks using KLI9210 EVAP tester ⇒ *Repair Manual, Fuel Supply System, Repair Group 20;*
P0501	16885	Vehicle Speed Sensor Range/Performance	2 Dcy	- Check vehicle speed signal ⇒ Page 24-149
P0506	16890	Idle Control System RPM Lower Than Expected	2 Dcy	- Check throttle body and throttle valve control module ⇒ Page 24-99
P0507	16891	Idle Control System		

		RPM Higher Than Expected		

01-24

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P0560	16944	System Voltage Malfunction	2 Dcy	- Check Engine Control Module (ECM) power supply ⇒ Page 24-77
P0562	16946	System Voltage Low Voltage		
P0563	16947	System Voltage High Voltage		
P0601	16985	Internal Contr. Module Memory Check Sum Error	2 Dcy	Replace ECM ⇒ Page 01-57
P0604	16988	Internal Contr. Module Random Access Memory (RAM) Error		
P0707	17091	Transm. Range Sensor Circ. Low Input	Off	- Check transmission driving range signal -F125- ⇒ Page 24-153
P0708	17092	Transm. Range Sensor Circ. High Input		
P1102	17510	O2 Sensor Heating Circ., Bank1-Sensor1	2 Dcy	- Check Oxygen Sensor (O2S) heater -Z19- ⇒

		Short to B+		Page 24-27
P1105	17513	O2 Sensor Heating Circ., Bank1-Sensor2 Short to B+		- Check Oxygen Sensor (O2S) heater -Z29- ⇒ Page 24-43

01-25

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1127	17535	Long Term Fuel Trim mult., Bank1 System too Rich [1)]	2 Dcy	- Check Mass Air Flow (MAF) sensor -G70- ⇒ Page 24-57
				- Check HO2S -G39- and O2S control ⇒ Page 24-17
				- Check Oxygen Sensor (O2S) behind Three Way Catalytic Converter (TWC) -G130- ⇒ Page 24-35
				- Check fuel pressure regulator and residual fuel pressure ⇒ Page 24-93
				- Check fuel injectors ⇒ Page 24-87 - Output Diagnostic Test Mode (DTM) ⇒ Page 01-42

[1)] The term "mult." = multiplicative; applies to entire engine speed (RPM) and load range.

01-26

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1128	17536	Long Term Fuel Trim mult., Bank1 System too Lean [1)]	2 Dcy	- Check HO2S -G39- and O2S control ⇒ Page 24-17
				- Check Oxygen Sensor (O2S) behind Three Way Catalytic Converter (TWC) -G130- ⇒ Page 24-35
				- Check fuel pressure regulator and residual fuel pressure ⇒ Page 24-93
				- Check fuel injectors ⇒ Page 24-87 - Output Diagnostic Test Mode (DTM) ⇒ Page 01-42
				- Check EVAP canister purge regulator valve ⇒ output Diagnostic Test Mode (DTM), page ⇒ Page 01-42

[1)] The term "mult." = multiplicative; applies to entire engine speed (RPM) and load range.

01-27

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1136	17544	Long Term Fuel Trim Add. Fuel, Bank1 System too Lean [2)]	2 Dcy	- Check intake air system for leaks ("false air") ⇒ Page 24-97
				- Check HO2S -G39- and O2S control ⇒ Page 24-17
				- Check Mass Air Flow (MAF) sensor -G70- ⇒ Page 24-57
				- Check fuel pressure regulator and residual fuel pressure ⇒ Page 24-93
				- Check fuel injectors ⇒ Page 24-87 - Output Diagnostic Test Mode (DTM) ⇒ Page 01-42

[2)] The term "Add." = additive; applies only with engine running at idle speed.

01-28

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1137	17545	Long Term Fuel Trim Add. Fuel, Bank1 System too Rich [2)]	2 Dcy	- Check HO2S -G39- and O2S control ⇒ Page 24-17
				- Check fuel pressure regulator and residual pressure ⇒ Page 24-93
				- Check exhaust system for leakage: ⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Engine Mechanical, Engine Code(s): AEB, ATW, Repair Group 26.*
P1171	17579	Throttle Actuation Potentiometer Signal 2 Range/Performance [1)]	Immed.	- Check throttle actuation potentiometer ⇒ Page 24-107 .

[1)] With this malfunction the exhaust Malfunction Indicator Light (MIL) is switched on by the ECM, immediately after the malfunction has been recognized. Significance of MIL ⇒ Page 01-2 .

[2)] The term "Add." = additive; applies only with engine running at idle speed.

01-29

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1176	17584	O2 Correction Behind Catalyst, B1 Limit Attained	2 Dcy	- Check intake air system for leaks ("false air") ⇒ Page 24-97
				- Check Heated Oxygen Sensor (HO2S) aging ⇒ Page 24-51
				- Check Oxygen Sensor (O2S) heater -Z29- ⇒ Page 24-43
				- Check O2S behind TWC ⇒ Page 24-35
P1196	17604	O2 Sensor Heater Circ., Bank1-Sensor1 Electrical Malfunction	2 Dcy	- Check Oxygen Sensor (O2S) heater -Z19- ⇒ Page 24-27
P1198	17606	O2 Sensor Heater Circ., Bank1-Sensor2 Electrical Malfunction		- Check Oxygen Sensor (O2S) heater -Z29- ⇒ Page 24-43
P1213	17621	Cyl.1-Fuel Inj. Circ. Short to B+	Immed.	- Check fuel injectors ⇒ Page 24-87 - Output Diagnostic Test Mode (DTM) ⇒ Page 01-42
P1214	17622	Cyl.2-Fuel Inj. Circ.		

		Short to B+		

01-30

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1215	17623	Cyl.3-Fuel Inj. Circ. Short to B+	Immed.	- Check fuel injectors ⇒ Page 24-87 - Output Diagnostic Test Mode (DTM) ⇒ Page 01-42
P1216	17624	Cyl.4-Fuel Inj. Circ. Short to B+		
P1225	17633	Cyl.1-Fuel Inj. Circ. Short to Ground		
P1226	17634	Cyl.2-Fuel Inj. Circ. Short to Ground		
P1227	17635	Cyl.3-Fuel Inj. Circ. Short to Ground		
P1228	17636	Cyl.4-Fuel Inj. Circ. Short to Ground		
P1237	17645	Cyl.1-Fuel Inj. Circ. Open Circuit		
P1238	17646	Cyl.2-Fuel Inj. Circ. Open Circuit		

P1239	17647	Cyl.3-Fuel Inj. Circ. Open Circuit		
P1240	17648	Cyl.4-Fuel Inj. Circ. Open Circuit		

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Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1250	17658	Fuel Level Too Low	Off	- Fuel volume less than 2 gallons, add fuel. - Check wiring between ECM and instrument cluster ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations* - Check signal from fuel gauge, and fuel gauge ⇒ *Repair Manual, Electrical Equipment, Repair Group 01*
P1297	17705	Connection charger-throttle valvle Pressure drop		- Check air pressure system using VAG 1687 charge air system tester ⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Engine Mechanical, Engine Code(s): AWM, Repair Group 21; Charge Pressure, Leak test with VAG 1687*

Note on misfire malfunctions:

For malfunctions that may be caused by low fuel volume (i.e. combustion misfire) a low-fuel malfunction (DTC "P1250") is also stored when there is less than 2 gallons of fuel remaining in the tank.

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Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1325	17733	Cyl.1-Knock Contr. Limit Attained	Off	- Check knock sensors and knock sensor control ⇒ Page 28-5
P1326	17734	Cyl.2-Knock Contr. Limit Attained		
P1327	17735	Cyl.3-Knock Contr. Limit Attained		
P1328	17736	Cyl.4-Knock Contr. Limit Attained		
P1337	17745	Camshaft Pos. Sensor, Bank1 Short to Ground	2 Dcy	- Check Camshaft Position (CMP) sensor -G40- ⇒ Page 28-2
P1338	17746	Camshaft Pos. Sensor, Bank1 Open Circ./Short to B+		
P1386	17794	Internal Control Module Knock Control Circ. Error	Off	- Replace ECM ⇒ Page 01-57

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Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1410	17818	Tank Ventilation Valve Circ. Short to B+	2 Dcy	- Check Evaporative Emissions (EVAP) canister purge regulator valve ⇒ output Diagnostic Test Mode (DTM), page ⇒ Page 01-42
P1425	17833	Tank Vent Valve Short to Ground		
P1426	17834	Tank Vent Valve Open		
P1471	17879	EVAP Emission Contr. LDP Circ. Short to B+	➢ m.y. 1997: Off m.y. 1998 ➢: 2 Dcy	- Check EVAP system ⇒ Page 24-136
P1472	17880	EVAP Emission Contr. LDP Circ. Short to Ground		
P1473	17881	EVAP Emission Contr. LDP Circ. Open Circ.		

P1475	17883	EVAP Emission Contr. LDP Circ. Malfunction/Signal Circ. Open		
P1476	17884	EVAP Emission Contr. LDP Circ. Malfunction/Insufficient Vacuum		
P1477	17885	EVAP Emission Contr. LDP Circ. Malfunction		

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1500	17908	Fuel Pump Relay Circ. Electrical Malfunction	Immed.	- Check fuel pump relay and relay actuation ⇒ Page 24-81
P1501	17909	Fuel Pump Relay Circ. Short to Ground		
P1502	17910	Fuel Pump Relay Circ. Short to B+		
P1505	17913	Closed Throttle Pos. Switch Does Not Close/Open Circ.	2 Dcy	- Check throttle body and throttle valve control module ⇒ Page 24-99
P1506	17914	Closed Throttle Pos. Switch Does Not Open/Short to Ground		
P1543	17951	Throttle Actuation Potentiometer Signal too Low	Immed.	
P1544	17952	Throttle Actuation Potentiometer		

		Signal too High		
P1545	17953	Throttle Pos. Contr. Malfunction	2 Dcy	

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Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1546	17954	Boost Pressure Contr. Valve Short to B+	Off	- Check intake air boost (charge pressure) regulation ⇒ Page 24-123
P1547	17955	Boost Pressure Contr. Valve Short to Ground		
P1548	17956	Boost Pressure Contr. Valve Open		

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Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1555	17963	Charge Pressure Upper Limit Exceeded	Off	- Check intake air boost (charge pressure) ⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Engine Mechanical, Engine Code(s): AEB, ATW, Repair Group 21* - Check intake air boost (charge pressure) regulation ⇒ Page 24-123 - Check air pressure system using VAG 1687 charge air system tester ⇒ *Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Engine Mechanical, Engine Code(s): AWM, Repair Group 21; Charge Pressure, Leak test with VAG 1687*
P1556	17964	Charge Pressure Negative Deviation		
P1557	17965	Charge Pressure Positive Deviation		
P1558	17966	Throttle Actuator Electrical	2 Dcy	- Check throttle body and throttle valve control module ⇒ Page 24-99

		Malfunction		

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Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1559	17967	Idle Speed Contr. Throttle Pos. Adaptation Malfunction (Adaptation of throttle valve control module -J338- to Motronic ECM has been interrupted, e.g. the accelerator pedal was depressed or the engine was started during throttle valve control module adjustment)	Off	- Check throttle body and throttle valve control module ⇒ Page 24-99
P1560	17968	Maximum Engine Speed Exceeded	Off	- Carry out engine mechanical repairs as necessary
P1564	17972	Idle Speed Contr. Throttle Pos. Low Voltage During Adaptation (Voltage less than 10 volts during adaptation of throttle valve control module -J338-)	Off	- Check throttle valve control module power supply voltage ⇒ Page 24-101
P1602	18010	Power Supply (B+) Terminal 30 Low Voltage	Off	- Check Engine Control Module (ECM) power supply ⇒ Page 24-77
P1606	18014	Rough Road Spec Engine Torque ABS-ECU Electrical Malfunction	Off	- Check ABS control module signal for rough road recognition ⇒ Page 24-161

Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1611	18019	MIL Call-up Circ./Transm. Contr. Module Short to Ground	2 Dcy	- Check wiring between TCM and ECM ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*
P1612	18020	Electronic Control Module Incorrect Coding	Off	- Code Motronic ECM ⇒ Page 01-11
P1613	18021	MIL Call-up Circ. Open/Short to B+	2 Dcy	- Check DTC memory for Transmission Control Module (TCM) and correct malfunctions ⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V On Board Diagnostic (OBD), Repair Group 01* - Check wiring between TCM and ECM ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

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Diagnostic Trouble Code (DTC)		Malfunction text	MIL	Corrective action
SAE	VAG			
P1624	18032	MIL Request Sign. active	Immed.	- Check DTC memory for Transmission Control Module (TCM) and correct malfunctions ⇒ *Repair Manual, 5 Spd. Automatic Transmission 01V On Board Diagnostic (OBD), Repair Group 01*
P1640	18048	Internal Contr. Module (EEPROM) Error	2 Dcy	- Replace ECM ⇒ Page 01-57

Note for DTC P1624/18032:

If this malfuncti