

01-84

Multi-function steering wheel, On Board Diagnostic (OBD)

General notes

Technical features of the multi-function steering wheel

The multi-function steering wheel enables the radio to be operated from the steering wheel (the most important functions) and contains an extensive On Board Diagnostic (OBD).

The control module for the multi-function steering wheel is equipped with a DTC memory. When malfunctions occur in monitored components or wiring, Diagnostic Trouble Codes (DTCs) are stored in DTC memory with a description of the malfunction type.

On Board Diagnostic (OBD), initiating program

Additional information

- ◆ Electrical Wiring Diagrams, Troubleshooting & Component Locations binder

- ◆ Technical service handbook.

- ◆ Parts catalog

Safety precautions

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

WARNING!

- ◆ *To reduce the risk of accidents observe the following:*
- ◆ *During a road test in an airbag-equipped vehicle, the VAS5051 tester or the VAG1551 scan tool must always be fastened to and operated from the rear seat by a second technician.*

To reduce the risk of injury to people and or damage to the electrical system and components, observe the following:

- ◆ Always switch ignition off before connecting or disconnecting test/measurement tools.
- ◆ It is possible that the control module will recognize a malfunction and store a DTC during some tests. Therefore, after completing all tests and repairs, check and if necessary erase the DTC memory.
- ◆ Always switch ignition off before disconnecting or connecting the battery. Failure to do so may damage a control module.

Test requirements

- ◆ Check fuse for function according to wiring diagram.
- ◆ Connect VAS5051 tester or VAG1551 scan tool
⇒ [page 01-108](#) .
- ◆ Switch ignition on.

Notes:

- ◆ *If nothing is indicated on display, check voltage supply for VAG 1551 scan tool according to wiring diagram.*
- ◆ *Additional instructions can be called up via the HELP button on the scan tool.*
- ◆ *The → button is used for advancing through the program sequence.*
- ◆ *An incorrect entry can be canceled using the C button.*
- ◆ *Function 00 "Automatic test sequence" can be performed in operating mode 1 "Rapid data transfer". This automatically checks all control*

modules installed in the vehicle.

- Switch ignition on.
- Switch printer on via the PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Rapid data transfer HELP
Insert address word XX



Indicated on display

Address word for steering wheel electronics: 16

- Press buttons -1- and -6-.

Rapid data transfer Q
16 - Steering wheel electronics



Indicated on display

- Press -Q- button to confirm input.

4B0907487E Steering whl. electronics D00 →

⚡ Indicated on display after approx. 5 seconds:

- ◆ 4B0907487 E: Part number of steering wheel electronics - radio operation (see also parts catalog)
 - ◆ Steering wheel electronics: component marking
 - ◆ D00: Software version of control module
- Press → button.

Rapid data transfer HELP
Control module does not answer

⚡ If one of these messages is displayed, carry out trouble shooting procedures according to the wiring diagram.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

Rapid data transfer HELP
Error in communication link

Rapid data transfer HELP
K wire not switching to Ground

Rapid data transfer HELP
K wire not switching to B+

Rapid data transfer

HELP

Select function XX



Indicated on display

- Pressing the HELP button will print out an overview of all of the possible functions.
- Press the → button to continue program sequence.

On Board Diagnostic (OBD) functions

The following functions are possible:

01 - Check Control Module Versions ⇒ [page 01-92](#) .

02 - Check DTC Memory ⇒ [page 01-93](#) .

03 - Output Diagnostic Test Mode ⇒ [page 01-97](#) .

05 - Erase DTC Memory ⇒ [page 01-100](#) .

06 - End Output ⇒ [page 01-102](#) .

08 - Read Measuring Value Block ⇒ [page 01-103](#) .

Check Control Module Versions (scan tool function 01)

Rapid data transfer HELP
Select function XX

↖ Indicated on display

- Press buttons -0- and 1-. This selects "Check control module" function 01.

Rapid data transfer Q
01 - Check Control Module Versions

↖ Indicated on display

- Confirm input using the -Q- button.

4B0907487E steering whl. electronics D00 →

↖ Indicated on display after approx. 5 seconds:

- ◆ 4B0907487 E: Part number of steering wheel electronics - radio operation (see also parts catalog)
- ◆ Steering wheel electronics: component marking
- ◆ D00: Software version of control module
- Press → button.

Check DTC Memory (scan tool function 02)

Note:

The displayed DTC information is updated only when initiating OBD or with "Erase DTC Memory" function 05.

- Switch printer on via the PRINT button (indicator lamp in button lights up).

Rapid data transfer HELP
Select function XX

⬅ Indicated on display

- Press buttons -0- and -2-. This selects "Check DTC memory", function 02.

Rapid data transfer Q
02 - Check DTC Memory

⬅ Indicated on display

- Confirm input using the -Q- button.

X DTC recognized

⬅ The number of stored malfunctions appears in the display.

The stored malfunctions are displayed and printed out one after the other.

- Check printout against DTC table and repair all malfunctions as necessary ⇒ [page 01-95](#) .

No DTC recognized 

⏪ If "No DTC recognized" is displayed, the program will return to "Select function XX" after the → button is pressed.

Rapid data transfer **HELP**
Select function XX

⏪ Indicated on display

If something else is displayed:

⇒ *Scan Tool operating instructions*

- End output (Function 06) ⇒ [page 01-102](#)
- Switch off ignition and disconnect diagnostic connector.

Diagnostic Trouble Code (DTC) table

Notes:

- ◆ *The following list contains all malfunctions that can be recognized by the multi-function steering wheel and printed out by the VAG1551 scan tool. The malfunctions are listed in order according to their 5-digit numbers.*
- ◆ *DTC numbers appear only on the print-out.*
- ◆ *Before replacing a component shown as faulty, check the wiring and connections to the component as well as the Ground (GND) connections according to wiring diagram.*
- ◆ *After repairs and function test of the system, DTC memory must always be checked again using the VAG1551 scan tool and erased.*
- ◆ *DTC memory stores all static and sporadic malfunctions: If a malfunction occurs and persists for at least 2 seconds, it is identified as a static malfunction. If a malfunction does not occur again, it is registered as sporadic. "/SP" will appear at the right of the scan tool display.*
- ◆ *When the ignition is switched on, all existing malfunctions are automatically re-classified as sporadic malfunctions and will only register as static malfunctions if they still occur after testing.*
- ◆ *Sporadic malfunctions which no longer occur during 50 driving cycles (ignition on at least 5 minutes, vehicle speed 30 km/h) are erased automatically.*
- ◆ *The three digit malfunction type number appearing next to the DTC is a data code and can be ignored.*

01-96

DTC	Possible cause	Corrective action
VAG1551 scan tool display 01426 Control unit in steering wheel -E221 ♦ No communication ♦ Implausible signal	♦ Open circuit in wiring - no connection between interface and steering wheel ♦ Unintelligible messages on CAN-bus (interface and buttons in steering wheel are connected via a CAN-bus)	- Locate malfunction using wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Repair open circuit - Check wires between interface and steering wheel
65535 Control module malfunctioning ♦ Faulty	♦ Control module for multi-function steering wheel - J453- faulty	- Replace control module for multi-function steering wheel -J453-

Output Diagnostic Test Mode (DTM) (scan tool function 03)

Notes:

- ◆ Output Diagnostic Test Mode is only possible when vehicle is stationary and engine is not running!
- ◆ If malfunctions are found during output Diagnostic Test Mode, determine cause of malfunction and repair if necessary.

In the function " output Diagnostic Test Mode (DTM)" functions of the system are checked

Perform Output Diagnostic Test Mode

- Switch ignition on.
- Switch on radio.
- Press buttons -0- and -3-. This selects "output Diagnostic Test Mode (DTM)", function 3.

Rapid data transfer

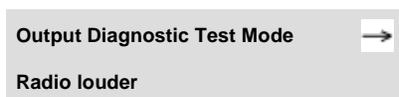
Q

03 - Output Diagnostic Test Mode



Indicated on display

- Press -Q- button to confirm input.

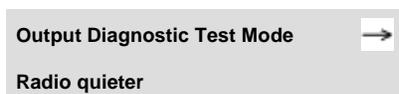


- Press the → button.

↖ Indicated on display

The radio volume is increased audibly.

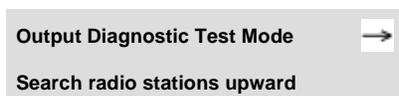
- Press the → button.



↖ Indicated on display

The radio volume is decreased audibly.

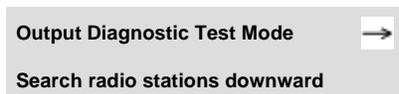
- Press the → button.



↖ Indicated on display

The next station will be searched and displayed in combination center display.

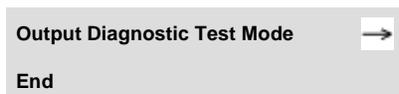
- Press the → button.



← Indicated on display

The previous station will be adjusted again and will be displayed in combination center display.

- Press the → button.



← Indicated on display

- Press the → button.
- The tester returns to the "Select function" mode.



← Indicated on display

Erase DTC Memory (scan tool function 05)

Note:

If DTC memory cannot be erased, check DTC memory again and repair malfunction.

Requirements

- ◆ DTC memory checked ⇒ [page 01-93](#)
- ◆ All malfunctions repaired

After successful DTC memory check:



Indicated on display

- Press buttons -0- and -5-. This selects "Erase DTC memory", function 05.

Rapid data transfer

HELP

Select function XX

01-101

Rapid data transfer Q
05 Erase DTC Memory

- ↖ Indicated on display
- Confirm input using the -Q- button.

Rapid data transfer →
DTC Memory is erased!

- ↖ Indicated on display
- DTC memory is erased.
- Press the → button.

Rapid data transfer HELP
Select function XX

- ↖ Indicated on display

Notes:

Attention! →
DTC Memory was not interrogated

- ↖
- ◆ *This message indicates an error in the test sequence.*

Rapid data transfer →
DTC Memory was not interrogated

- ↖
- ◆ *This message indicates an error in the test sequence.*

Follow test sequence exactly: first check DTC memory, repair malfunction (s) if necessary, then erase.

End Output (scan tool function 06)

- Press buttons -0- and -6-. This selects "End Output", function 06.

Rapid data transfer Q
06 - End output



Indicated on display

- Confirm input using the -Q- button.

Rapid data transfer HELP
Insert address word XX



Indicated on display

- Switch ignition off.
- Disconnect harness connectors for the VAG1551 scan tool

Read Measuring Value Block (scan tool function 08)

Initiating "Read Measuring Value Block"

Rapid data transfer HELP
Select function XX

↖ Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer Q
08 - Read Measuring Value Block

↖ Indicated on display

- Confirm input using the -Q- button.

Read Measuring Value Block
Input display group number XXX

↖ Indicated on display

- Input display group number (from table ⇒ [page 01-104](#)) and press -Q- button to confirm input.

The selected measuring value block is now displayed in standard form.

Display group overview

Display group number	Indicated on display
001	1 = Lower button 2 = Louder button 3 = Memory downward button 4 = Memory upward button
002	1 = Station buttons (preset) backward 2 = Station buttons (preset) forward 3 = Unassigned 4 = Unassigned

Measuring value block 001

Read Measuring Value Block 1



◀ Indicated on display:

lower louder Memory backward Memory upward

Memory upward button

- not operated
- Memory upward

Memory downward button

- not operated
- Memory downward

Louder-button (increasing volume)

- not operated
- louder

Lower button (decreasing volume)

- not operated
- lower

Measuring value block 002

Read Measuring Value Block 2 → ◀ Indicated on display:

activated

activated

Station buttons (preset) forward

- not operated
- operated

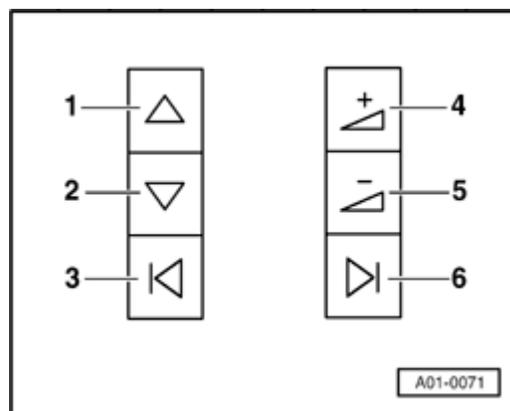
Station buttons (preset) backward

- not operated
- operated

01-107

Multi-function steering wheel button assignment

Radio button assignment



A

1 - Radio: Forward search function; Cassette: Fast forward; CD: Title forward

2 - Radio: Backward search function; Cassette: Rewind; CD: Title backward

3 - Station buttons (preset) backward

4 - Increase volume

5 - Decrease volume

6 - Station buttons (preset) forward