Ultrasonic interior monitoring On Board Diagnostic (OBD)

General Information

The ultrasonic interior monitoring system is only offered in conjunction with the anti-theft system.

The security provided by the anti-theft system is enhanced through addition of the ultrasonic interior monitoring option.

Interior monitoring activates the anti-theft alarm when unauthorized attempts are made to enter the vehicle through the side windows.

Function

The ultrasonic interior monitoring system consists of:

- Control module for ultra-sound sensors - J347-
- Ultra-sound sensor, left for anti-theft warning system -G170-
- Ultra-sound sensor, right for anti-theft warning system -G171-

- Sensor for broken window glass rear left -G183- (only for Avant)
- Sensor for broken window glass rear right -G184- (only for Avant)
- Switch for passenger compartment monitoring -E183-

01-109

The ultra-sound sensors in the right and left upper B-pillar trims monitor the side windows and send the monitoring signal to the control module for ultra-sound sensors.

If the monitoring signal deviates from the norm, the control module for interior monitoring activates the alarm via the control module for the anti-theft system.

In addition to the contact switches in the lock units, glass break sensors in side windows as well as the conductor loop in rear window, (only for Avant), serve for securing the exterior of the vehicle.

The control module for interior monitoring activates the warning lamps next to the door locking buttons. These warning lamps provide further information regarding the interior monitoring system.

⇒ *Repair Manual, Electrical Equipment*

Interior monitoring can be manually shut off for the duration of a door closing via the switch for interior monitoring.

⇒ *Owner's Manual*

The ultrasonic interior monitoring system is capable of extensive On Board Diagnostic (OBD). If malfunctions in component parts develop, DTCs are stored in the DTC memory of the control module. Malfunctions can then be identified using the VAG1551 or VAG1552 scan tools.

01-110

Ultrasonic interior monitoring On Board Diagnostic (OBD), initiating

Requirements

- Fuse OK according to wiring diagram
- VAG1551 Scan Tool (ST) connected ⇒ page 01-1
- Anti-theft system not armed

Notes:

- *If the display remains blank, check VAG1551 voltage supply according to wiring diagram.*
- *The scan tool HELP button can provide additional operating instructions.*
- *The → button is used to advance through the program sequence.*
- *If an incorrect entry is made, press the -C- button to escape.*

01-111

- Switch ignition on.

- Switch printer on by pressing 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 interior monitoring: 45

- Press buttons -4- and -5- to insert "Int. Monitoring" address word 45.

Rapid data transfer	**Q**
45 - Int. Monitoring	

Indicated on display

- Press -Q- button to confirm input.

4B0951173 Int. Monitoring	**D00** →
Coding 00101	**WSC 06812**

Indicated on display after about 5 seconds

- Press → button.

Note:

A list of available functions is printed out when the HELP button is pressed.

On Board Diagnostic (OBD) functions

The following functions are possible:

01 - Check Control Module Versions ⇒ page 01-123

02 - Check DTC Memory ⇒ page 01-113 .

03 - Output Diagnostic Test Mode ⇒ page 01-124 .

05 - Erase DTC Memory ⇒ page 01-137 .

06 - End Output ⇒ page 01-139 .

07 - Code Control Module ⇒ page 01-131 .

08 - Read Measuring Value Block ⇒ page 01-133 .

10 - Adaptation ⇒ page 01-135 .

01-113

Check DTC Memory (scan tool function 02)

Note:

The DTC display information is updated only when initiating the On Board Diagnostic (OBD) or "Erase DTC Memory" function 05.

- Switch printer on by pressing PRINT button (indicator lamp in button lights up).

Carrying out "Check DTC Memory" function 02

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

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

Rapid data transfer Q **02 - Check DTC Memory**	Indicated on display

- Press -Q- button to confirm input.

X DTC recognized →	Display indicates the number of stored malfunctions.

The stored malfunctions are shown and then printed in series.

- Using malfunction print-out, refer to DTC table and repair malfunctions ⇒ page 01-115 .

01-114

No DTC recognized →	If the message "No DTC recognized" is displayed, the program can be returned to the starting point by pressing the → button.
Rapid data transfer **HELP** **Select function XX**	Indicated on display If something else is displayed: ⇒ *Scan tool operating instructions* - Erase DTC Memory (function 05) ⇒ page 01-137 . - End Output (function 06) ⇒ page 01-139 . - Switch ignition off and Disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

01-115

Diagnostic Trouble Code (DTC) table, interior monitoring

Notes:

- *The following table lists all the DTCs that can be recognized by the control module for interior monitoring and printed out by the VAG1551 Scan Tool (ST). The DTCs are listed in order according to their 5-digit numbers.*
- *DTC 5-digit numbers appear only on the print-out from the scan tool.*
- *Before replacing a component shown as malfunctioning, check wiring and connections to the component as well as the Ground (GND) connections according to the relevant wiring diagram.*
- *When a repair has been completed, the system should be armed and then disarmed. Then check and erase DTC memory using the VAG1551 Scan Tool (ST).*
- *DTC memory records all static and sporadic malfunctions. When a malfunction occurs, it is first identified as a static malfunction. If it does not occur again it is registered as a sporadic malfunction, and the letters "/SP" appear at the right of the display.*
- *After system is armed, all existing malfunctions are automatically re-classified as sporadic malfunctions and will only be registered as static malfunctions if they still occur after testing.*
- *Sporadic malfunctions which no longer occur after 50 driving cycles are erased automatically.*
- *The three digit malfunction type number appearing next to the DTC is a data code which may be disregarded.*

01-116

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01377 Left Ultra-Sonic Sensor for ATW-G170		
♦ Short circuit to B+	♦ Short circuit between -G170- and control module -J347- ♦ -G170- faulty	- Repair wiring according to wiring diagram. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder* - Replace -G170-. ⇒ *Repair Manual, Body Interior, Repair Group 70*
♦ Open circuit/Short circuit to Ground	♦ Open circuit in wiring between -G170- and control module -J347- ♦ -G170- faulty	- Repair wiring according to wiring diagram. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder* - Replace -G170-. ⇒ *Repair Manual, Body Interior, Repair Group 70*
♦ Incorrect Signal	♦ Malfunctions during activation of ultrasonic interior monitoring	- Perform function test ⇒ page 01-128 .

01-117

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01378 Right Ultra-Sonic Sensor for ATW-G171		
♦ Short circuit to B+	♦ Short circuit between -G171- and control module for ultra-sound sensors -J347- ♦ -G171- faulty	- Repair wiring according to wiring diagram. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder* - Replace -G171-. ⇒ *Repair Manual, Body Interior, Repair Group 70*
♦ Open circuit/Short circuit to Ground	♦ Open circuit in wiring between -G171- and control module for ultra-sound sensors -J347- ♦ -G171- faulty	- Repair wiring according to wiring diagram. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder* - Replace -G171-. ⇒ *Repair Manual, Body Interior, Repair Group 70*

♦ Incorrect Signal	♦ Malfunctions during activation of ultrasonic interior monitoring	- Perform function test ⇒ page 01-128 .

01-118

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01379 Interior Monitor Switch-E183	♦ Wiring malfunction between switch for passenger compartment monitoring -E183- and control module for ultra-sound sensors -J347- ♦ -E183- faulty	- Repair wiring according to wiring diagram. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*
♦ Short circuit to Ground 1)		- Replace -E183-. ⇒ *Repair Manual, Body Interior, Repair Group 68*
01380 Alarm Via ATW Sensor rl	♦ Break in attempt at left-rear side window or after a function test ♦ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page 01-135 .
01381 Alarm Via ATW Sensor rr	♦ Break in attempt at right-rear side window or after a function test ♦ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page

		01-135 .
1) A malfunction is stored if the Ground is connected for more than 1 minute.		

01-119

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01382 Alarm Via ATW Sensor fl	♦ Break in attempt at left-front side window or after a function test ♦ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page 01-135 .
01383 Alarm Via ATW Sensor fr	♦ Break in attempt at right-front side window or after a function test ♦ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page 01-135 .

01-120

V.A.G 1551 Scan Tool display	Possible cause	Corrective action
01384 1) Alarm via glass break sensor (sensor for broken window glass rear left -G183-; sensor for broken window glass rear right -G184- and conductor loop for rear window heater)	♦ Short circuit or open circuit in harness connectors or in wire connections between glass break sensors and rear window heater to control module for ultra-Sound sensors -J347- ♦ ATS was triggered by a break-in attempt via one of the side windows or the rear window. ♦ Conductor loop in one of the side windows or rear window has an open circuit ♦ False alarm	- Erase DTC memory - Repair wiring according to wiring diagram ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder* - Replace side window with the interrupted conductor loop ⇒ *Repair Manual, Body Exterior; Repair Group. 64; Side window Avant, removing and installing* - Replace rear window with the interrupted conductor loop ⇒ *Repair Manual, Body Exterior; Repair Group. 64; Rear window Avant, removing and installing*

1) Only for Avant

01-121

V.A.G 1551 Scan Tool display	Possible cause	Corrective action
01403 1) Glass break sensors rear (sensor for broken window glass rear left -G183-; sensor for broken window glass rear right -G184- and conductor loop for rear window defroster)	♦ A short circuit or an open circuit occurs in the harness connectors or in the wire connections between glass break sensors and rear window heater to control module for ultra-sound sensors -J347- when setting ATS. ♦ A conductor loop of one of the side windows or the rear window is interrupted during setting of the ATS	- Erase DTC memory - Repair wiring according to wiring diagram ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder* - Check conductor loop in side windows and replace side window if necessary ⇒ *Repair Manual, Body Exterior; Repair Group. 64; Side window Avant, removing and installing* - Check conductor loop in rear window and replace rear window if necessary ⇒ *Repair Manual, Body Exterior; Repair Group. 64; Rear window Avant, removing and installing*
65535		

Control Module Malfunctioning		- Replace control module.

1) Only for Avant

01-122

Interior monitoring function test

- Open side window approx. 10 cm.
- Switch ignition off and remove ignition key.
- Close all doors.
- Lock vehicle, which will set the anti-theft warning system and the interior monitoring.
- Wait 30 seconds until all warning lamps in door trim blink slowly in 2 second intervals (f = 0,5 Hz).
- Insert hand through window opening and hold in proximity of sensor.
- If the interior monitoring is OK, alarm will be triggered. An entry into DTC memory of control module for central locking "1370; alarm via interior monitoring" as well as to ultra-sound control module "alarm via sensor for ATS, fl, fr, rl, rr".
- Switch off alarm by unlocking vehicle.
- DTC must be checked and erased in DTC

memory of the respective control module

Check Control Module Versions (scan tool function 01)

- Press buttons -0- and -1- to select "Check Control Module Versions" function 01.

Rapid data transfer Q
01 - Check Control Module Versions

Indicated on display

- Press -Q- button to confirm input.

4B0951173 Interior monitoring. D00 →
Coding 00101 WSC 06812

Indicated on display

Explanation of display

- 4B0951173: Part No. of control module
- Interior monitoring: system identification and variation
- D00: software version
- Coding 00101: coding ⇒ page 01-131
- WSC 06812: dealership number

- The program can be returned to the starting point by pressing the →button.

Rapid data transfer HELP
Select function XX

Indicated on display

01-124

Output Diagnostic Test Mode (scan tool function 03)

Notes:

- *The Output Diagnostic Test Mode may only be performed with the vehicle stationary and the engine not running.*
- *Any malfunctions identified by the Output Diagnostic Test Mode must be checked and repaired.*

Performing output Diagnostic Test Mode (DTM):

Rapid data transfer HELPSelect function XX

Indicated on display:

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode (DTM)" function 03.

Rapid data transfer Q03 - Output Diagnostic Test Mode

Indicated on display:

- Press -Q- button to confirm input.

The output DTM activates the following elements in sequence:

- Warning lamps next to door locking button on driver-side or passenger-side door

- An anti-theft warning system alarm
- Wiring for voltage supply to the ultra-sound sensors
- Wiring for pulse signal to the ultra-sound sensors

01-125

Note:

No "ATS alarm" can be triggered via this output Diagnostic Test Mode (DTM). To trigger a "ATS alarm", perform the actuator test via the control module for central locking ⇒ page 01-91 or a function test ⇒ page 01-122 .

01-126

Carrying out "Output Diagnostic Test Mode" function 03

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

Rapid data transfer Q **03 - Output Diagnostic Test Mode**	⮜	Indicated on display

- Press -Q- button to confirm input.

Output Diagnostic Test Mode → **Alarm System Indicator Light -K95**	⮜	Indicated on display

Warning lamps next to the door locking button at the driver-side or passenger-side door are activated.

- Press → button.

Output Diagnostic Test Mode → **Create active alarm**	⮜	Indicated on display

The control module sends an alarm signal to the anti-theft system control module for a signal test ⇒ page 01-128 .

- Press → button.

Output Diagnostic Test Mode → **Voltage supply wire**	⮜	Indicated on display

The control module sends a constant voltage of 8 V to test the wiring ⇒ page 01-129 .

- Press → button.

01-127

Output Diagnostic Test Mode → **Wire for cycle signal**	⮜ Indicated on display The control module sends a constant voltage of 5 V to test the wiring ⇒ page 01-130 . - Press → button.
Output Diagnostic Test Mode → **END**	⮜ Indicated on display - Press → button. The program is now back at its starting point.
Rapid data transfer **HELP** **Select function XX**	⮜ Indicated on display

01-128

Testing alarm signal

- Switch ignition off and remove ignition key.

- Connect VAG1551 Scan Tool (ST) (⇒ page 01-1), and press buttons -4- and -5- to select "Int. Monitoring" address word 45.

- Close all doors and open one side window.

- Lock vehicle by reaching through open window. The anti-theft system horn confirms this, but warning lamps do not light up.

- Wait 30 seconds until anti-theft system is armed.

- Perform Output Diagnostic Test Mode (⇒ page 01-124) and select control element test "Create active alarm."

Notes:

- *It is also possible to test the alarm activation signal without using the VAG1551 Scan Tool (ST). To do this, carry out the first, third, fourth and fifth procedure steps listed above.*

- *The independent repair shop and the customer can thereby test the functional capability of the ultrasonic interior monitoring system.*

Output Diagnostic Test Mode →

Create active alarm

➢ Indicated on display

Specification: anti-theft system (turn signals and anti-theft horn) is triggered.

01-129

- Shut off alarm by unlocking vehicle.

- End Output Diagnostic Test Mode (DTM).

- Initiate On Board Diagnostic (OBD) for anti-theft system.

- Erase DTC memory ⇒ page 01-137 .

Checking power supply wiring

- Remove both ultra-sound sensors.

⇒ *Repair Manual, Body Interior, Repair Group 70, B-pillar trim , removing and installing*

- Disconnect electronic harness connectors.

- Perform Output Diagnostic Test Mode (⇒ page 01-124) and select output test "Power supply wiring."

Output Diagnostic Test Mode →

Power supply wiring

Indicated on display

- Using multimeter (Fluke 83 or equivalent), measure voltage at wiring harness connector between terminal 2 (B+) and terminal 3 (GND).

Specification: 8 V

- End output Diagnostic Test Mode (DTM).
- Install ultra-sound sensors again
- Erase DTC memory (function 05) ⇒ page 01-137 .
- End output (function 06) ⇒ page 01-139 .

01-130

Checking wiring for pulse signal

- Remove both ultra-sound sensors.

⇒ *Repair Manual, Body Interior, Repair Group 70, B-pillar trim , removing and installing*

- Disconnect electronic harness connectors.

- Perform Output Diagnostic Test Mode (DTM) (⇒ page 01-124) and select control element test "Signal pulse wire."

Output Diagnostic Test Mode →

Signal pulse wire

Indicated on display

- Using multimeter (Fluke 83 or equivalent), measure voltage at wiring harness connector between terminal 1 (pulse signal) and terminal 3 (GND).

  Specification: 5 V

- End Output Diagnostic Test Mode (DTM).
- Re-install ultra-sound sensors.
- Erase DTC memory (function 05) ⇒ page 01-137 .
- End Output (function 06) ⇒ page 01-139 .

01-131

Code Control Module (scan tool function 07)

This function can be used to code the interior monitoring as follows:

- Vehicle type: Audi A4
- Arming mode of anti-theft system: dynamic (m.y. 1997), or static (as of m.y. 1998)
- Body version: Sedan/Avant

Notes:

- *The coding adjusts the control module for ultra-sound sensors -J347- to meet the specific requirements of the particular model version and anti-theft alarm system.*
- *The coding table gives only the coding applicable to the Audi A4.*

Carrying out "Code Control Module" function 07

Rapid data transfer	**HELP**
Select function XX	

Indicated on display

- Press buttons -0- and -7- to select "Code Control Module" function 07.

Rapid data transfer **Q**

07 - Code Control Module

➢ Indicated on display

- Press -Q- button to confirm input.

01-132

Code Control Module **Enter code number XXXXX (0-32000)**	Indicated on display - Enter code number: **Coding: 00101** 00 Place holders, disregard 1 Audi A4 0 Arming mode static 1 Sedan 2 Avant
Code Control Module Q **Enter code number 00101 (0-32000)**	- Indicated on display - Press -Q- button to confirm input.
4B0951173 Interior monitoring D02 → **Coding 00101 WSC 06812**	Indicated on display - End coding by pressing → button.
Rapid data transfer HELP **Select function XX**	Indicated on display - Press buttons -0- and -6- to select "End Output" function 06. This will end the function.
Rapid data transfer Q **06 - End Output**	Indicated on display - Press -Q- button to confirm input.

01-133

Read Measuring Value Block (scan tool function 08)

Carrying out "Read Measuring Value Block" function 08

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 - Press -Q- button to confirm input.
Read Measuring Value Block **Input display group number XXX**	Indicated on display - Press buttons -0-, -0- and -1- to input display group number 1 (001). - Press -Q- button to confirm input.

The selected measuring value block is now indicated in standard format. Evaluation ⇒ page 01-134 .

01-134

Read Measuring Value Block, overview

Display group 001

Indicated on Display	Display value	Identification
Read Measuring Value Block 1 1 2 3 4	0100 1)	1 = switch positions
	100% 1)	2 = sensitivity of the sensors
		3 = not assigned
		4 = not assigned

1) Example of display.

Display value table

1		2
Switch for Int. Monitoring:	: pressed = 1, not pressed = 0	50 ... 100% 3)
Driver-side door contact switch	: driver-side door open = 1, driver-side door closed = 0	
	: armed = 1, not armed = 0	
Anti-theft warning system:	: present = 1, not present = 0	
Glass breakage system 2):		

2) Avant only.

3) Refer to "Adaptation" function 10 ⇒ page 01-135 .

01-135

Adaptation (scan tool function 10)

The following changes can be implemented and saved using the adaptation function:

- Sensitivity settings of the ultra-sound sensors can be set so that the sensors react with less sensitivity.

Carrying out "Adaptation" function 10

Rapid data transfer HELP **Select function XX**	Indicated on display - Press buttons -1- and -0- to select "Adaptation" function 10.
Rapid data transfer Q **10 - Adaptation**	Indicated on display - Press -Q- button to confirm input.
Adaptation **Insert channel number XX**	Indicated on display - Press buttons -0- and -1- to insert channel number 1.
Adaptation Q **Channel display 1**	Indicated on display - Press -Q- button to confirm input.

01-136

Channel 1 Adaptation 100 → **Sensitivity in %** < - 1 3- >	⮜ Indicated on display (sensitivity of sensors is displayed: e.g. 100%) ***Note:*** *The factory adjusted maximum sensitivity of the ultra-sound sensors is designated as 100%. The sensor sensitivity can be reduced to 50 %.* - Press → button.
Channel 1 Adaptation 100 **Input adaptation value XXXXX**	⮜ Indicated on display - Enter sensitivity value (e.g. 75% = 00075).
Channel 1 Adaptation 100 Q **Input adaptation value 00075**	⮜ Indicated on display - Press -Q- button to confirm input.
Channel 1 Adaptation 75 Q **Sensitivity in %** (-1 3- >	⮜ Indicated on display - Press -Q- button to confirm input.
Channel 1 Adaptation 75 Q **Store changed value?**	⮜ Indicated on display - Press -Q- button to confirm input.
Channel 1 Adaptation 75 → **Changed value is stored**	⮜ Indicated on display - Press → button to end adaptation procedure for sensitivity.
Rapid data transfer HELP	⮜ Indicated on display

Insert address word XX

01-137

Erase DTC Memory (scan tool function 05)

Note:

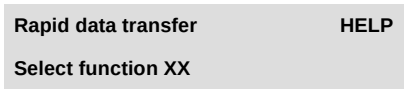
If DTC memory cannot be erased, check DTC memory again and repair malfunctions.

Requirements

- DTC memory checked
- All malfunctions repaired

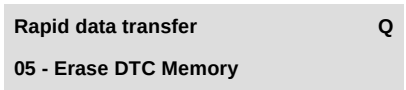
After successfully checking DTC memory:

Carrying out "Erase DTC Memory" function 05



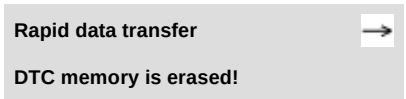
Indicated on display

- Press buttons -0- and -5- to select "Erase DTC Memory" function 05.



Indicated on display

- Press -Q- button to confirm input.



Indicated on display

DTC memory is now erased.

- Press → button.

Rapid data transfer	**HELP**
Select function XX	

➢ Indicated on display

01-138

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.*

Adhere exactly to the test sequence: first check DTC memory and, if necessary, repair malfunctions, then erase DTC memory.

After erasing DTC memory carry out function 06 "End Output" then switch ignition off and on again and check DTC memory again.

01-139

End Output (scan tool function 06)

Carrying out "End Output" function 06

Rapid data transfer HELP **Select function XX**	Indicated on display - Press buttons -0- and -6- to select "End Output" function 06.
Rapid data transfer Q **06 - End Output**	Indicated on display - Press -Q- button to confirm input.
Rapid data transfer HELP **Insert address word XX**	Indicated on display - Switch ignition off. - Disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).