Volkswagen Golf 5 2004-> VW Rabbit GTI 2006->

91 - 1

Communication

General information

Communication systems include:

- Radio "Premium Sound System" which consists of an MP3 readable radio head unit with integrated 6 disc CD changer
- Optional radio "Premium Sound System - Satellite Radio" which consists of the "Premium" radio head unit with Satellite Radio capability
- Optional "Radio - Navigation System" which consists of the "Premium" radio head unit with Navigation display and Satellite Radio capability
- From 06.06 production, radio and radio-navigation systems include a separate amplifier.
- From 06.06 production, radio and radio-navigation systems may also include iPod (R) connectivity via a device cradle (not confirmed at time of publication).
- Multi-function steering wheel
- Radio system-specific loudspeakers and rear window antenna systems
- Compass function of Multi-function Indicator (MFI)

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional communication system. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

.

On Board Diagnostic (OBD), functions

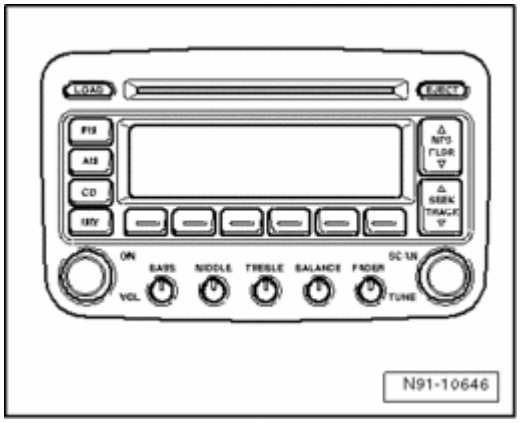
Communication systems have On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot communication system malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

91 - 2

Radio System - "Premium Sound System"

General information



Radio head unit - "Premium Sound System"

Radio system consists of the radio head unit with integrated 6-disc CD changer, loudspeakers located in front/rear doors and diversity antenna system integrated in rear window.

From 06.06 production, radio system is supplemented with a separate amplifier.

Features satellite radio capability (vehicle owner must subscribe to satellite radio service).

Radio head unit output performance: 4x20 watt

Front loudspeakers: 3-way system.

Rear loudspeakers: 2-way system.

Loudspeaker applications:

- Front doors - one bass loudspeaker, one mid-range loudspeaker and one treble loudspeaker on each side.

- Rear doors - one bass loudspeaker and one treble loudspeaker on each side.

Integrated CD player plays "MP3" , "CD-R" and "CD-RW" formats as well as normal audio CDs.

Note:

- *Do not use 8 cm diameter "mini disks". Should a "mini disk be inserted, it will not eject and CD player damage will result.*

- *Do not use CDs that contain a mix of computer and music data. Mixed data CDs cannot be played back.*

Radio reception in conjunction with a satellite tuner is only carried out via window antennas.

Without satellite tuner, radio reception takes place via a window antenna and the roof antenna. In both cases, the antenna system has diversity function which is controlled by the radio unit.

The satellite radio reception antenna is a roof antenna and is located at rear of roof.

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional radio system. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

.

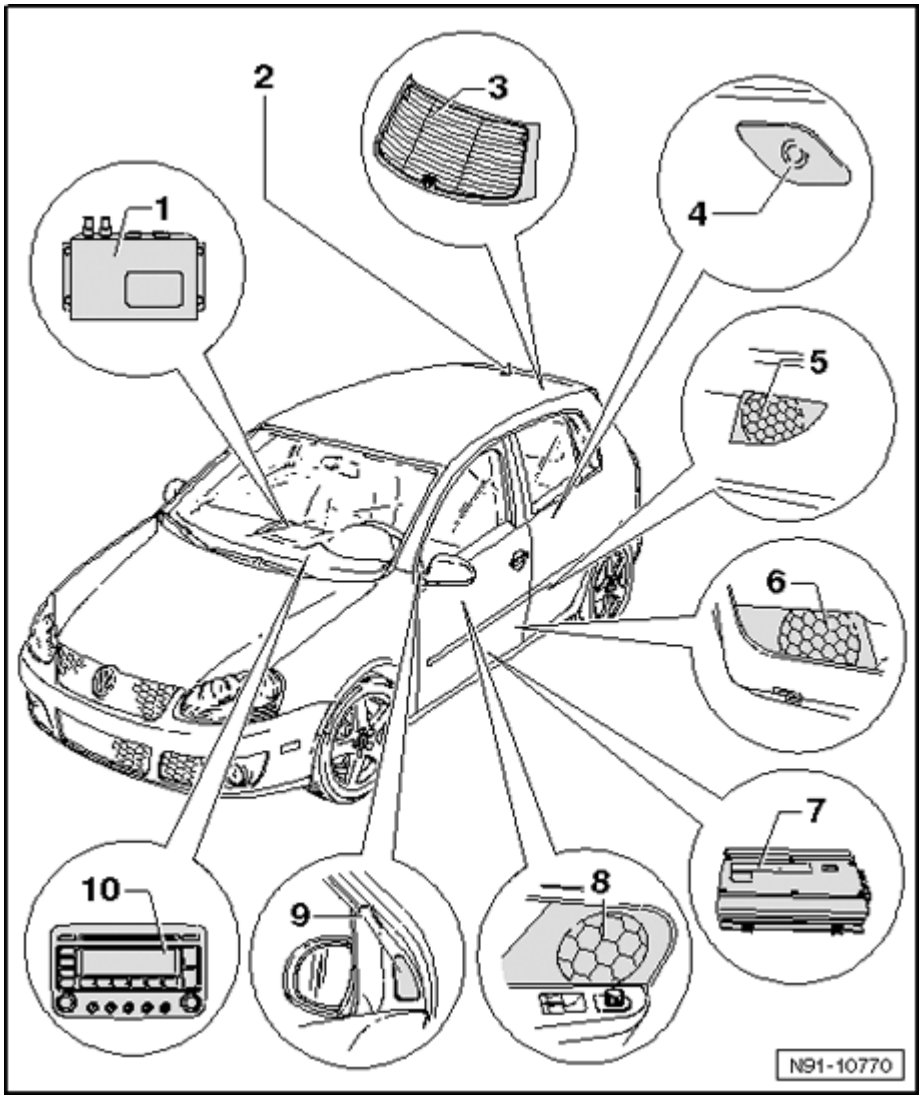
On Board Diagnostic (OBD), functions

Radio system "Premium Sound System" has On Board

Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot radio system malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

Radio System "Premium Sound System" , component overview



- **Digital Satellite Radio Tuner R190**
  - Optional
  - Installed below right front seat
  - Additional information ⇒ 91-6, Satellite Radio

- **Satellite Tuner Antenna R172**
  - Only with satellite radio
  - On roof at rear
  - Additional information ⇒ 91-9, Antenna Systems
- **Rear window antennas**
  - Diversity antennas for radio reception
  - Additional information ⇒ 91-9, Antenna Systems
- **Right Rear Treble Speaker R16 and Left Rear Treble Speaker R14**
  - Installed in left and right rear side/door trim
  - Additional information ⇒ 91-8, Loudspeaker System
- **Right Rear Bass Speaker R17 and Left Rear Bass Speaker R15**
  - Installed in left and right rear side/door trim
  - Additional information ⇒ 91-8, Loudspeaker System
- **Right Front Bass Speaker R23 and Left Front Bass Speaker R21**
  - Installed in left and right front door trim
  - Additional information ⇒ 91-8, Loudspeaker System
- **Amplifier R12**
  - From 06.06 production
  - Under drivers seat

- Additional information ⇒ 91-4, Amplifier

- **Right Front Midrange Speaker R104 and Left Front Midrange Speaker R103**
  - Installed in left and right front door trim
  - Additional information ⇒ 91-8, Loudspeaker System

- **Right Front Treble Speaker R22 and Left Front Treble Speaker R20**
  - Installed in both front door mirror triangles
  - Additional information ⇒ 91-8, Loudspeaker System

- **Radio R**
  - Removing and installing ⇒ 91-2, Radio Premium Sound System , removing and installing
  - Multi-pin electrical connection assignments ⇒ 91-2, Multi-pin electrical connection assignments

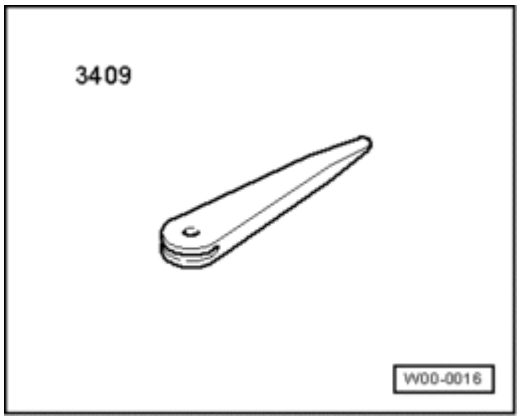
Radio "Premium Sound System" , removing and installing

Note:

- *The replacement part number is printed on a sticker on the unit housing. Always confirm proper application.*

- *Before removing radio unit, obtain anti-theft security code from customer. If unit is replaced, ensure anti-theft security code is activated (see owners manual) or, ⇒ 91-2, Electronic anti-theft system . Give new*

code number to customer.



Special tools, testers and auxiliary items required

- Trim removal wedge 3409

Removing:

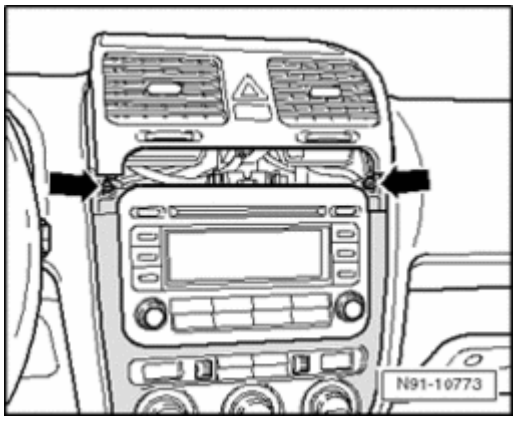
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***
- ***Remove any CDs which may have been left in CD player ⇒ Owners Manual .***

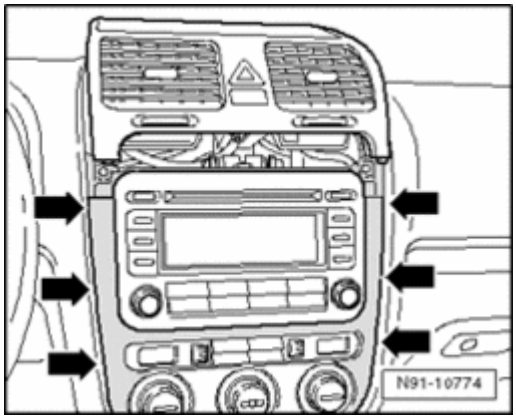
- Remove center instrument panel trim with air outlets so that radio panel screws are accessible,

⇒ Repair Manual, Body Interior, Repair Group 68, Storage compartments, covers and panels

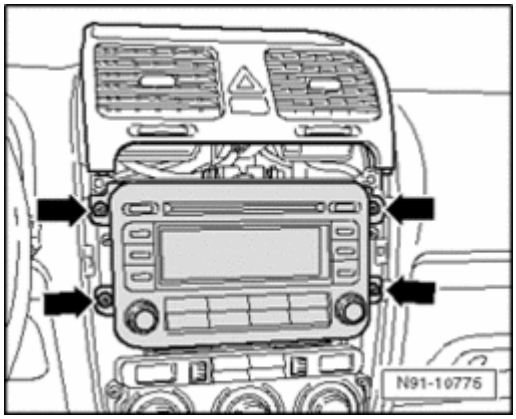
.



- Remove screws **- arrows -** .

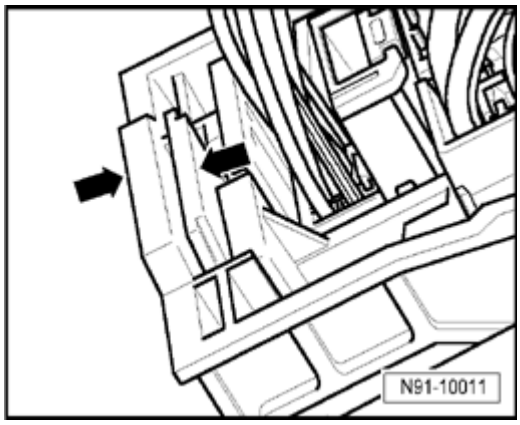


- Use trim removal wedge 3409 to carefully pry out center instrument panel trim in area of **- arrows -** and remove panel.

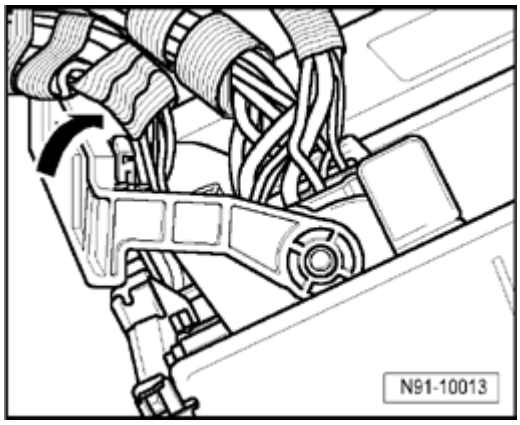


- Remove screws **- arrows -** .

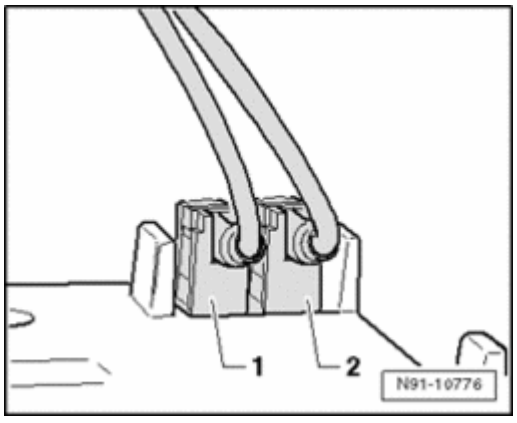
- Pull radio unit from opening until electrical connections on rear of unit are accessible.



- Disengage electrical connection lock. **- arrows -** .



- Rotate mounting bracket up **- arrow -** and disconnect electrical connection.



- Disengage antenna cable electrical connection locks **- 1 -** and **- 2 -** and disconnect.

Installing:

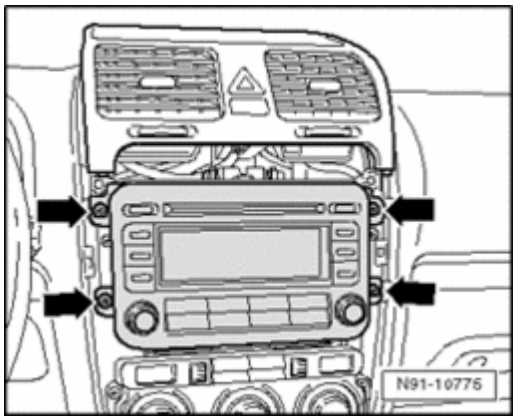
- Reconnect electrical/antenna connections and lock into position.

Caution!

In the event of a collision where occupants may make

contact with interior trim, some interior knobs and buttons are designed to break away in a controlled manner in order to protect the occupant. When installing the radio unit, do not press on control buttons or display. Damage will result.

- Slide radio unit straight into instrument panel.



- Install screws **- arrows -** .

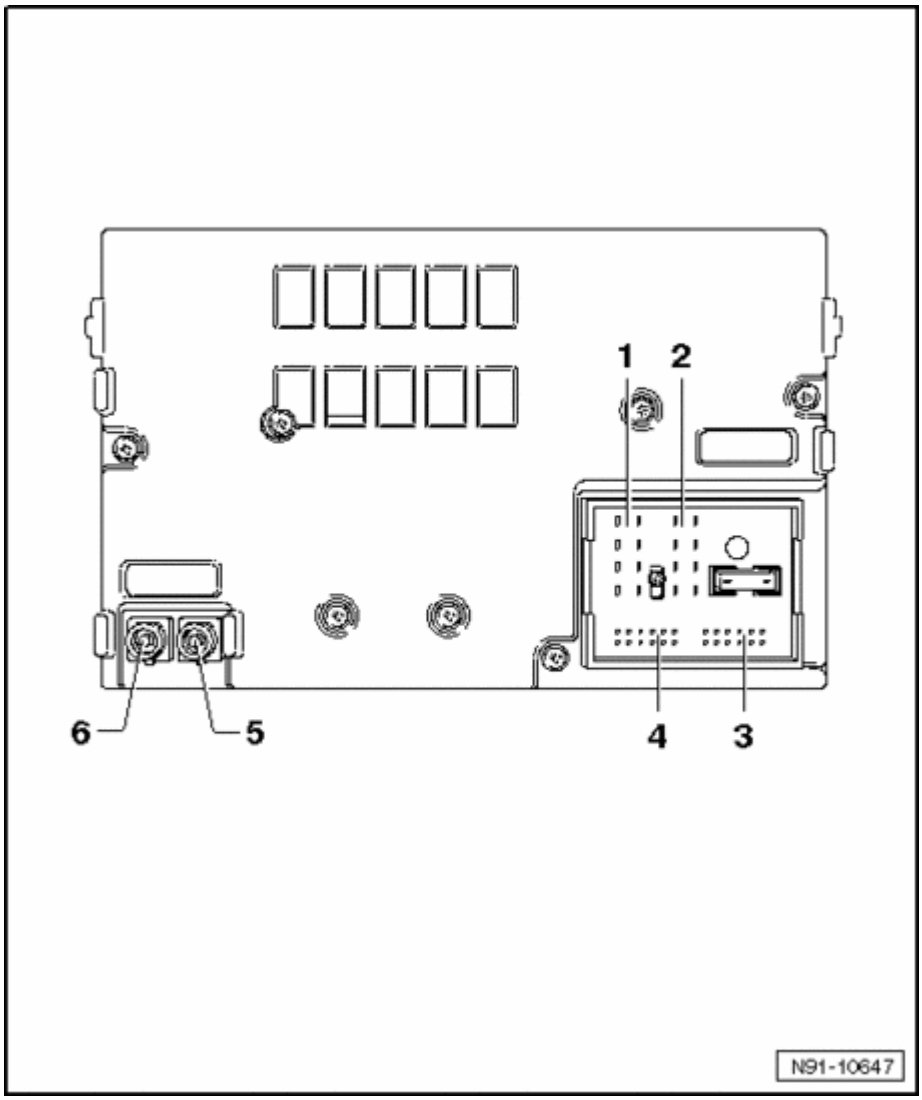
- Reinstall center instrument panel trim.

- If necessary, deactivate anti-theft coding, ⇒ 91-2, Electronic anti-theft system .

- Check radio coding, recode if necessary.

Radio coding ⇒ 91-2, Radio system components, adapting .

Multi-pin electrical connection assignments



- **8-pin multi-pin electrical connection 1, speaker outputs**
  - Terminal assignments ⇒ 91-2, 8-pin multi-pin electrical connection 1, speaker outputs .
- **8-pin multi-pin electrical connection 2, power supply, CAN-Bus, telephone muting (where applicable)**
  - Terminal assignments ⇒ 91-2, 8-pin multi-pin electrical connection 2, voltage supply, CAN-Bus, telephone muting .
- **12-pin multi-pin electrical connection 3, telephone signal**

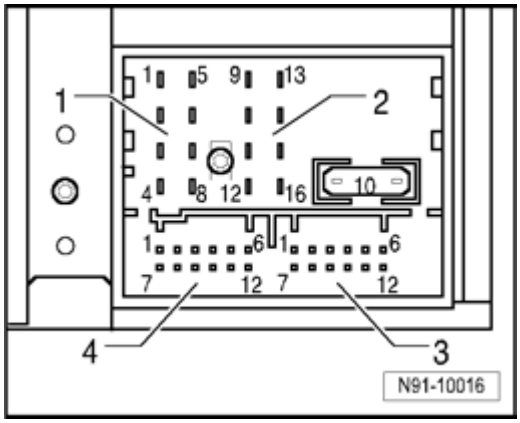
input (where applicable)

- Terminal assignments ⇒ 91-2, 12-pin multi-pin electrical connection 3, telephone signal input (where applicable) .

- **12-pin multi-pin electrical connection 4, satellite radio**
  - Terminal assignments ⇒ 91-2, 12-pin multi-pin electrical connection 4, satellite radio .

- **Electrical connection 5, antenna connection for terrestrial radio reception**
  - Beige electrical connection color
  - Terminal assignments ⇒ 91-2, Electrical connections 5 and 6, antenna connections .

- **Electrical connection 6, antenna connection for terrestrial radio reception**
  - Transparent electrical connection color
  - Terminal assignments ⇒ 91-2, Electrical connections 5 and 6, antenna connections .



8-pin multi-pin electrical connection 1, speaker outputs

Note:

- *On models from 06.06 production (with separate amplifier), audio signals of radio unit are utilized as input signal for amplifier.*

1 - Right rear speaker, positive

2 - Right front speaker, positive

3 - Left front speaker, positive

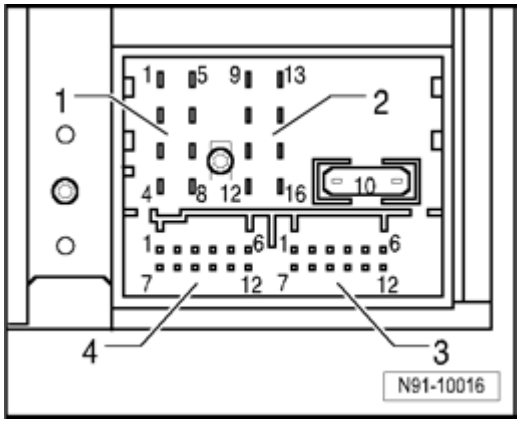
4 - Left rear speaker, positive

5 - Right rear speaker, negative

6 - Right front speaker, negative

7 - Left front speaker, negative

8 - Left rear speaker, negative



8-pin multi-pin electrical connection 2, voltage supply, CAN-Bus, telephone muting

9 - CAN-Bus, positive

10 - CAN-Bus, negative

11 - Telephone mute switch

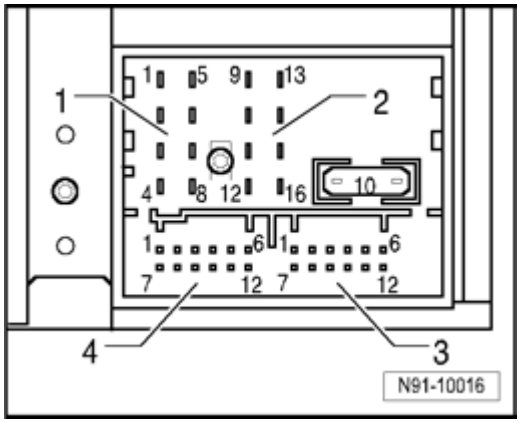
12 - Ground connection (Terminal 31)

13 - Radio on, control wire positive

14 - Alarm contact

15 - Positive connection (Terminal 30, B+)

16 - Anti-theft system control signal, SAFE



12-pin multi-pin electrical connection 3, telephone signal input (where applicable)

Note:

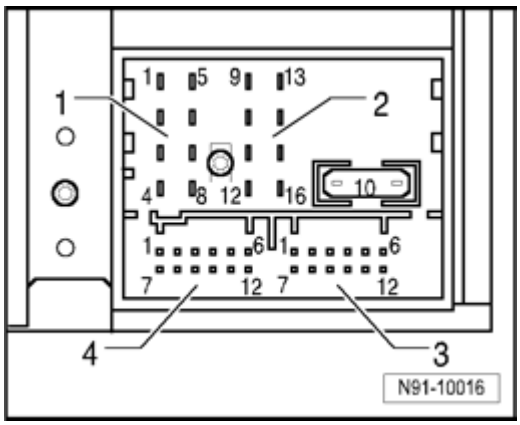
- *This electrical connection is only assigned when the corresponding special equipment for telephone system is installed.*

15 - Not assigned

6 - Telephone LF-signal input, negative

711 - Not assigned

12 - Telephone LF-signal input, positive



12-pin multi-pin electrical connection 4, satellite radio

This electrical connection is only assigned when the corresponding special equipment for digital satellite radio tuner is installed.

1 - Digital satellite radio tuner, input, audio signal left

2 - Not assigned

3 - Digital satellite radio tuner, input, audio signals negative

4 - Not assigned

5 - Digital Satellite Radio Tuner, input, continuous positive

6 - Not assigned

7 - Digital satellite radio tuner, input, audio signal right

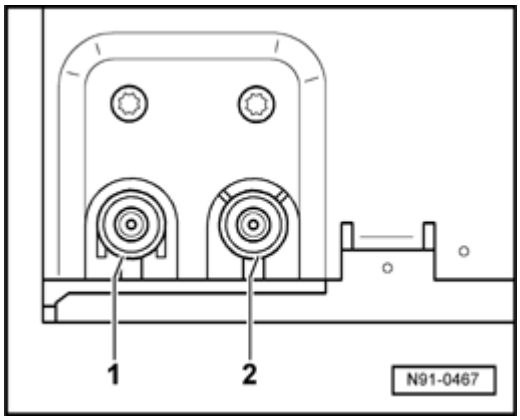
8 - Not assigned

9 - Not assigned

10 - Not assigned

11 - Not assigned

12 - Not assigned



Electrical connections 5 and 6, antenna connections

1 - Transparent connection for antenna input signal, FM from antenna

2 - Beige connection for antenna output signal FM to antenna (diversity, antenna selection)

Note:

- *The antenna signal input from connection 1 is checked in the radio and the result sent via connection 2 to the antenna. If the antenna signal is too weak, the radio then switches to another antenna (diversity). This process is not audible to the customer.*

Electronic anti-theft system

Radio - "Premium Sound System" is equipped with an electronic Comfort anti-theft system which operates in

conjunction with radio unit identification data stored in the instrument cluster.

When an existing radio is removed (radio power supply disconnected) and reinstalled in the same vehicle, it is not necessary to input the anti-theft security code.

Electronic anti-theft system, function

After first activation of electronic anti-theft system, a numeric code is stored in both the radio unit and instrument cluster. When the radio power supply is restored (e.g. after removing and installing radio or battery), a data exchange takes place between the radio and instrument cluster.

The data exchange compares the numeric code of the radio unit to the numeric code stored in the instrument cluster. If numeric code is identical, the instrument cluster recognizes that the radio "belongs to the vehicle" and is ready for operation.

Should a radio be replaced, the anti-theft code must be entered.

Deactivating electronic anti-theft system, ⇒ 91-2, Electronic anti-theft system, deactivating .

Next, when the ignition key is inserted into the ignition switch ("S-contact" activated), the data exchange between the replacement radio and instrument cluster take place automatically.

The data exchange lasts about 5 seconds. During this time a VAS 5051/5052 must not be connected or remain connected.

After successful data exchange, the replacement radio unit is ready for operation without renewed input of anti-theft code (should power supply subsequently be disconnected and reconnected).

The electronic anti-theft system is activated and will lock the radio as soon as:

- radio unit is installed in a different vehicle
- instrument cluster is replaced

A radio which has been locked by the electronic anti-theft system will show "SAFE" and "1000" on display when switched on.

To cancel lock, deactivate electronic anti-theft warning system, ⇒ 91-2, Electronic anti-theft system, deactivating .

Electronic anti-theft system, deactivating

Reactivating a locked radio is only possible by entering correct code number for electronic anti-theft system.

Note:

- *Code number for electronic anti-theft system is listed along with radio serial number on radio card, ⇒ operating instructions .*
- *For reasons of safety, radio card should not be stored in the vehicle. Obtain the code number from the customer, if necessary.*
- *If a radio unit is replaced, code number of replacement unit must also be used.*
- *Inform the customer that the code number has changed.*

- Obtain unit code number.

- Switch on radio unit.

Radio displays "SAFE" and then "1000" . No operating of buttons is required for this.

- Using station buttons -1- to -4-, enter code number affixed to radio card. First digit of code number is entered with button 1, second with button 2, etc.

- Then press Stations button located beneath "OK" on display (is normally last station button) and hold firmly until anti-theft coding is activated. This is indicated by a short signal sound.

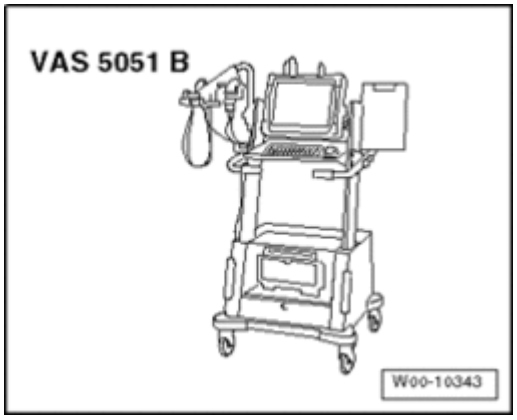
If code number has been entered correctly into radio unit, a radio frequency appears on display.

Note:

- *If the anti-theft code has been entered incorrectly, it can be corrected immediately in another attempt. If anti-theft code is entered incorrectly twice, then the radio unit is locked for an hour. Leave radio unit and ignition switched on. After one hour, then the procedure for deactivating the electronic anti-theft*

system can be repeated. Keep in mind: Always two attempts to input code, after that the radio unit is locked for one hour.

Radio system components, adapting



Special tools, testers and auxiliary items required

- Vehicle Diagnostic Testing and Information System VAS 5051/5052 (VAS 5051 B shown as example only)
- Diagnostic cable VAS 5051/5a or VAS 5051/6a or VAS 5052/3

- Select operating mode "Guided Functions" and follow tester prompts

or

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Press "Go to" button.

- Select "Function/component selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Electrical system int/ext (Repair Group 01; 27' 90-97)"

- Select "01 - Self diagnosis"

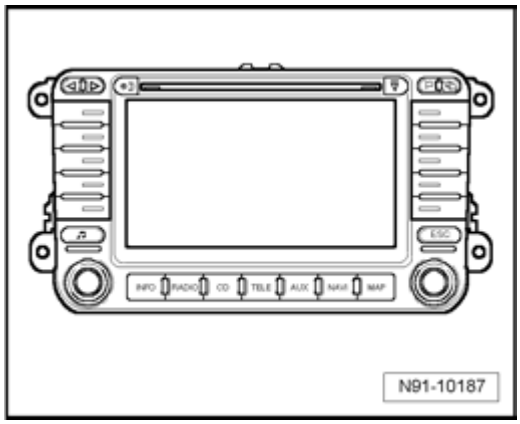
- Select "46 - Sound system"

- Select "Functions" .
- Select appropriate option
- Press ">" to confirm
- Follow tester prompts

91 - 3

Radio - Navigation System

General information



Head unit "Radio - Navigation system"

Radio - Navigation system available as optional equipment from model year 2006.

Radio - Navigation system consists of radio head unit with integrated DVD based navigation system, loudspeakers located in front/rear doors, diversity antenna system integrated in rear window and roof-mounted GPS antenna.

Radio system consists of the radio head unit with integrated single CD player,

From 06.06 production, radio system is supplemented with separate amplifier.

Radio - Navigation head unit includes:

- RDS radio receiver
- 6.5 inch color liquid crystal display in 16:9 format
- Navigation system with GPS satellite receiver
- DVD drive for navigation system

Additional features:

- External CD changer

- Satellite Radio capability (owner must subscribe to satellite radio service)

- Loudspeaker system same as "Premium Sound System" ⇒ 91-8, Loudspeaker System

- Dual diversity radio antenna system same as "Premium Sound System" and additional GPS antenna ⇒ 91-9, Antenna Systems

Note:

- *Radio - Navigation System head unit has Electronic anti-theft coding. Deactivating electronic anti-theft system, ⇒ 91-3, Electronic anti-theft system, deactivating .*

- *For optimum Navigation system operation, the turn angle sensor in the unit relies on a specific installation orientation in relation to the vehicle. Always note the part number when exchanging equipment. Incorrect installation will lead to Navigation system malfunctions.*

- *In the event that devices (such as additional antennas) that use a magnetic mounting fixture are attached to the roof, the residual magnetization of the roof sheet metal will adversely affect the operation of the roof antenna and compass module. Before proceeding with any diagnosis of the roof antenna or compass module, ask customer if such a device is/was used.*

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional radio system. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

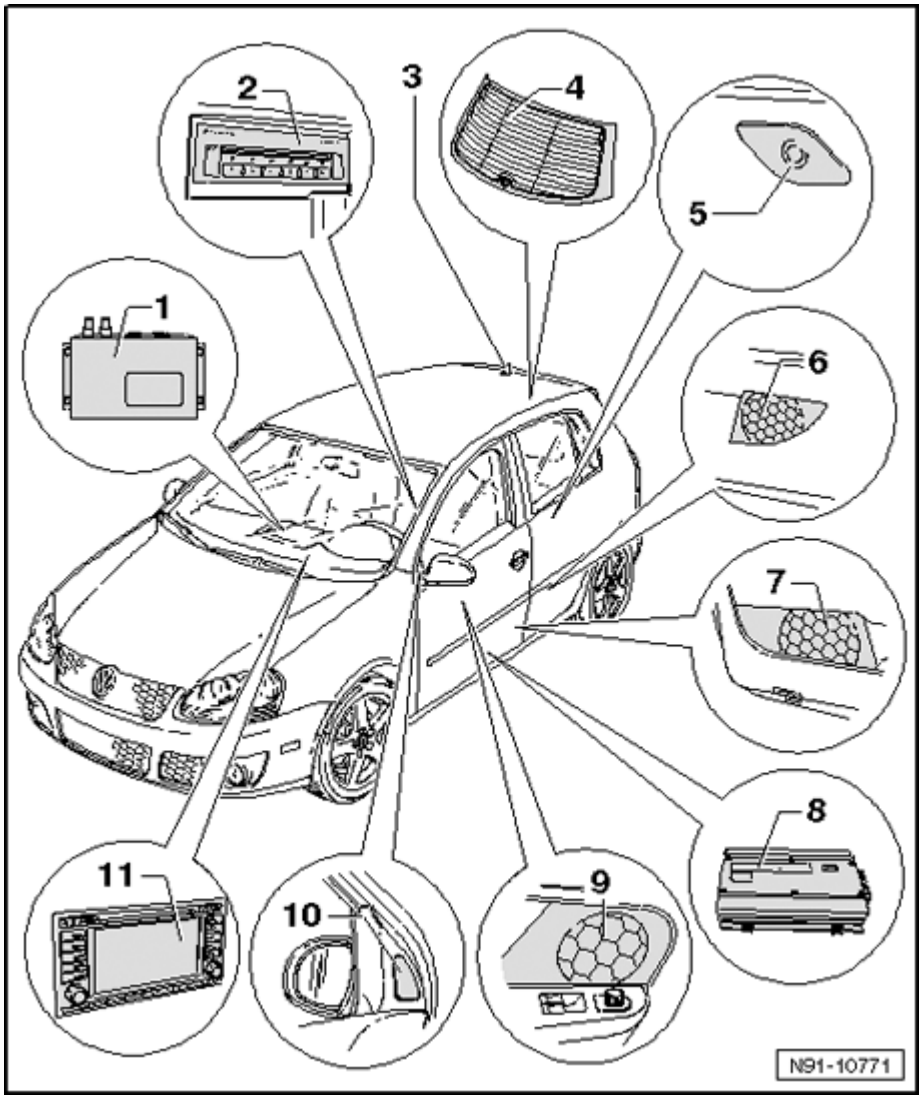
.

On Board Diagnostic (OBD), functions

"Radio - Navigation System" has On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot radio and navigation system malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

"Radio - Navigation system" , component overview



- **Digital Satellite Radio Tuner R190**
  - Optional
  - Installed below right front seat
  - Additional information ⇒ 91-6, Satellite Radio
- **CD Changer R41**
  - 6 disc CD changer
  - Installed in center console
  - Additional information ⇒ 91-5, CD Changer
- **Satellite Tuner Antenna R172**

- On roof at rear
- Additional information ⇒ 91-9, Antenna Systems

- **Rear window antennas**
  - Diversity antennas for radio reception
  - Additional information ⇒ 91-9, Antenna Systems

- **Right Rear Treble Speaker R16 and Left Rear Treble Speaker R14**
  - Installed in left and right rear side/door trim
  - Additional information ⇒ 91-8, Loudspeaker System

- **Right Rear Bass Speaker R17 and Left Rear Bass Speaker R15**
  - Installed in left and right rear side/door trim
  - Additional information ⇒ 91-8, Loudspeaker System

- **Right Front Bass Speaker R23 and Left Front Bass Speaker R21**
  - Installed in left and right front door trim
  - Additional information ⇒ 91-8, Loudspeaker System

- **Amplifier R12**
  - From 06.06 production
  - Under left front seat
  - Additional information ⇒ 91-4, Amplifier

- **Right Front Midrange Speaker R104 and Left Front Midrange Speaker R103**
  - Installed in left and right front door trim
  - Additional information ⇒ 91-8, Loudspeaker System
- **Right Front Treble Speaker R22 and Left Front Treble Speaker R20**
  - Installed in left and right front door mirror triangles
  - Additional information ⇒ 91-8, Loudspeaker System
- **Radio/Navigation Display Control Module J503**
  - Designation "RNS MFD 2 DVD"
  - Removing and installing ⇒ 91-3, Radio/Navigation Display Control Module J503 , removing and installing
  - Multi-pin electrical connection assignments ⇒ 91-3, Multi-pin electrical connection assignments

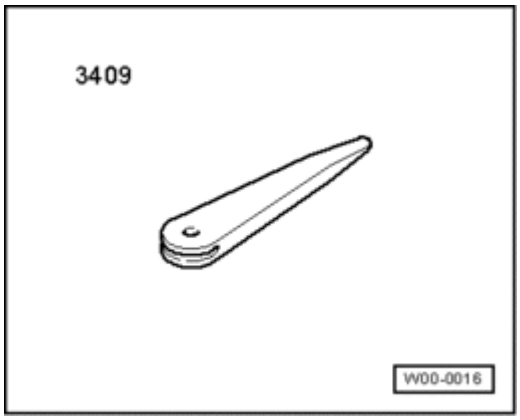
Radio/Navigation Display Control Module J503 , removing and installing

Note:

- *The replacement part number is printed on a sticker on the unit housing. Always confirm proper application.*
- *Before removing radio unit, obtain anti-theft security code from customer. If unit is replaced, ensure anti-theft security code is activated (see owners manual)*

or, ⇒ 91-3, Electronic anti-theft system . Give new code number to customer.

- *If a Radio/Navigation unit from a vehicle is installed into a different vehicle, it is essential that the part number of the replacement unit is the same as unit previously installed. Otherwise the Navigation system will malfunction due to turn angle sensor settings in the Radio/Navigation unit that are incompatible with the vehicle.*



Special tools, testers and auxiliary items required

- Trim removal wedge 3409

Removing:

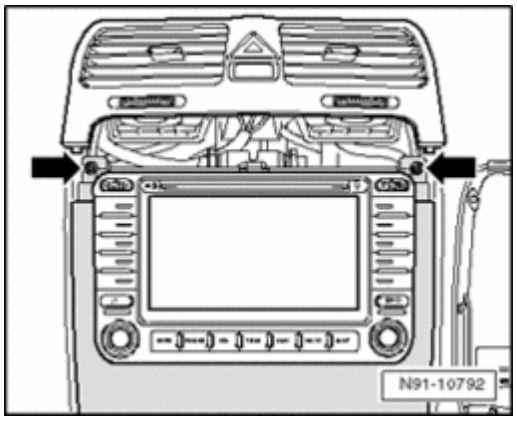
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***
- ***Remove any DVDs which may have been left in Navigation drive ⇒ Owners Manual .***

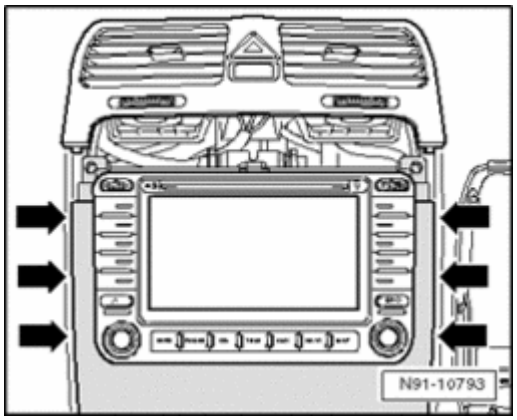
- Remove center instrument panel trim with air outlets so that radio panel screws are accessible,

⇒ Repair Manual, Body Interior, Repair Group 68, Storage compartments, covers and panels

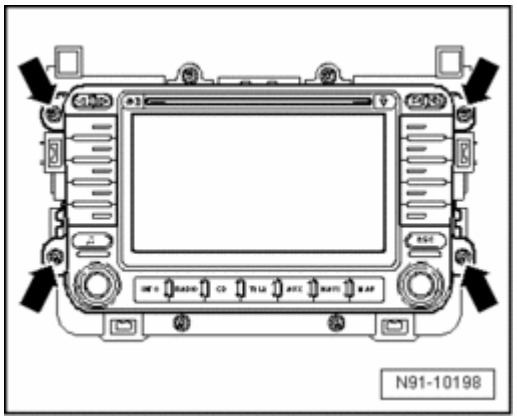
.



- Remove screws **- arrows -** .

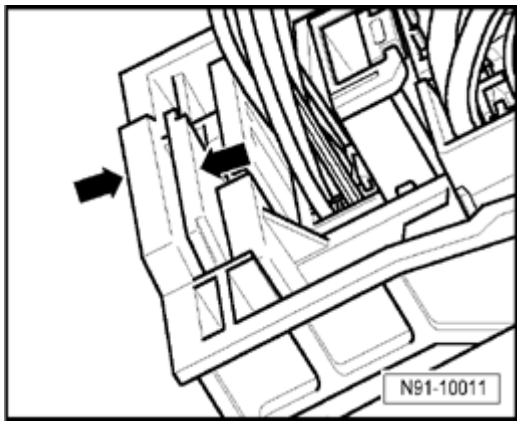


- Use trim removal wedge 3409 to carefully pry off center instrument panel trim in area of **- arrows -** and remove.

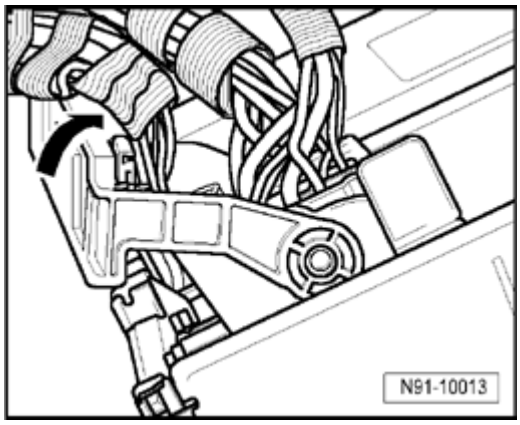


- Remove screws **- arrows -** on radio navigation system.

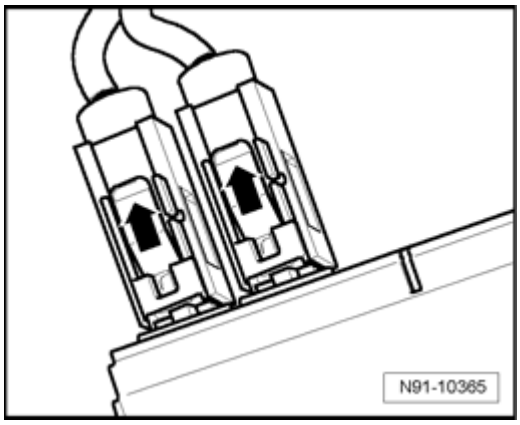
- Pull unit from opening until electrical connections on rear of unit are accessible.



- Disengage electrical connection lock **- arrows -** .



- Rotate mounting bracket up **- arrow -** and disconnect electrical connection.



- Disengage antenna cable electrical connection lock **- arrows -** and disconnect.

Installing:

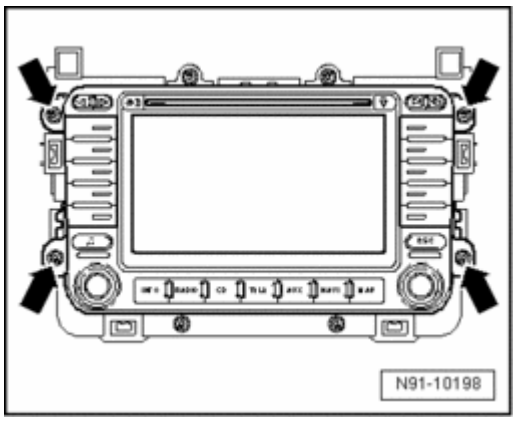
- Reconnect electrical/antenna connections and lock into position.

Caution!

In the event of a collision where occupants may make

contact with interior trim, some interior knobs and buttons are designed to break away in a controlled manner in order to protect the occupant. When installing the radio unit, do not press on control buttons or display. Damage will result.

- Slide unit straight into instrument panel opening until it engages in assembly frame.



- Install screws **- arrows -** .

- Reinstall center instrument panel trim.

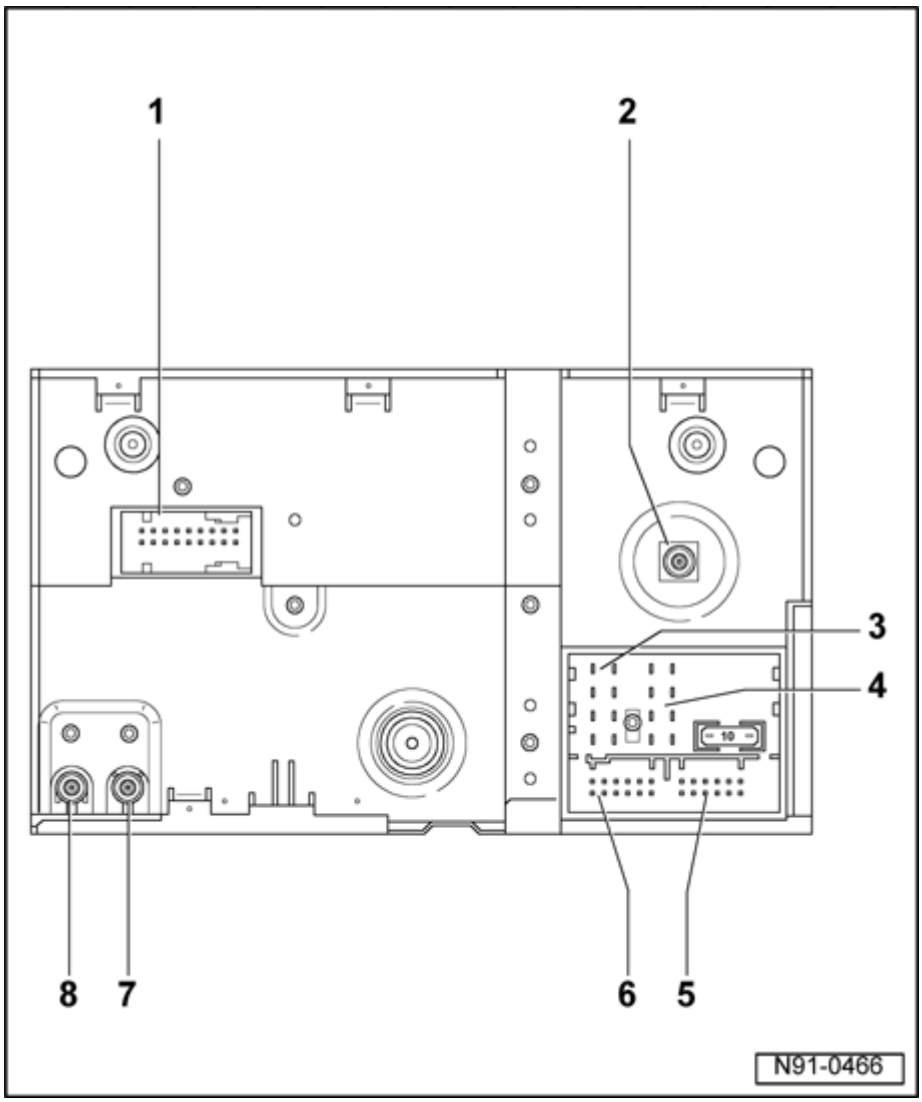
- If necessary, deactivate anti-theft coding, ⇒ 91-3, Electronic anti-theft system .

- Check radio-navigation system coding, recode if necessary.

- Radio coding ⇒ 91-3, Radio system components, adapting .

- Navigation system coding ⇒ 91-3, Navigation system components, adapting .

Multi-pin electrical connection assignments



1 - 18-pin multi-pin electrical connection 1

- Terminal assignments ⇒ 91-3, 18-pin multi-pin electrical connection 1, video and LF-input (not applicable to USA/CDN) .

2 - Multi-pin electrical connection 2

- Connection for navigation system antenna
- Terminal assignments ⇒ 91-3, Multi-pin electrical connection 2 .

3 - 8-pin multi-pin electrical connection 3

- Terminal assignments ⇒ 91-3, 8-pin multi-pin electrical connection 3, speaker outputs .

4 - Multiple electrical connection 4, 8-pin

- Terminal assignments ⇒ 91-3, 8-pin multi-pin electrical connection 4, power supply and CAN-Bus .

5 - 12-pin multi-pin electrical connection 5

- Terminal assignments ⇒ 91-3, 12-pin multi-pin electrical connection 5, telephone signals and pre-amplifier output signals .

6 - 12-pin multi-pin electrical connection 6

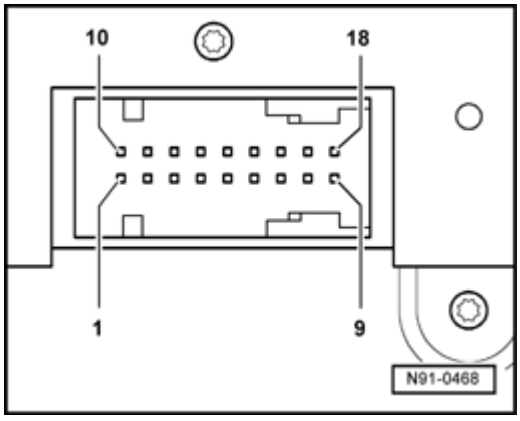
- Terminal assignments ⇒ 91-3, 12-pin multi-pin electrical connection 6, CD changer control, CD audio input signals and satellite radio .

7 - Electrical connection 7

- Antenna connection
- Antenna connection for terrestrial radio reception
- Terminal assignments ⇒ 91-3, Electrical connections 7 and 8, antenna connections .

8 - Electrical connection 8

- Antenna connection
- Antenna connection for terrestrial radio reception
- Terminal assignments ⇒ 91-3, Electrical connections 7 and 8, antenna connections .



18-pin multi-pin electrical connection 1, video and LF-input (not applicable to USA/CDN)

Note:

- *Electrical connection for TV Tuner not applicable to USA/CDN.*

1 - Not assigned

2 - Audio signal Ground (GND)

3 - Audio signal Ground (GND)

4 - Shielding Ground (GND)

5 - Video signal Ground (GND)

6 - Video switching signal

7 - Video signal Ground (GND)

8 - Video signal Ground (GND)

9 - Video signal Ground (GND)

10 - Not assigned

11 - Left audio signal, input

12 - Right audio signal, input

13 - Shielding Ground (GND)

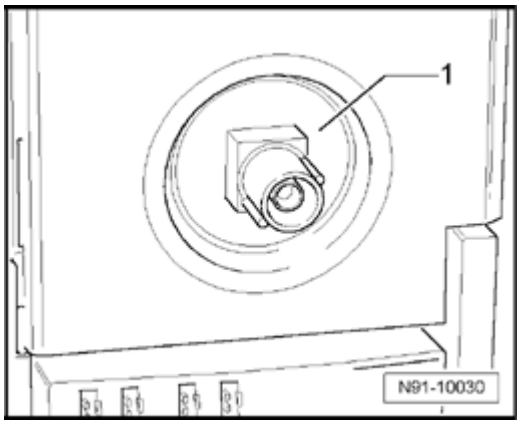
14 - Synchronization of vertical and horizontal picture signals

15 - 50 Hertz/ 60 Hertz

16 - Signal input for picture signal blue

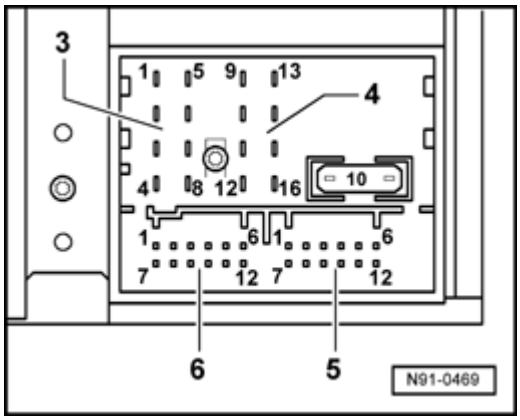
17 - Signal input for picture signal green

18 - Signal input for picture signal red



Multi-pin electrical connection 2

1 - Blue colored connection for antenna input signal navigation



8-pin multi-pin electrical connection 3, speaker outputs

Note:

- *On models from 06.06 production (with separate amplifier), audio signals of radio unit are utilized as input signal for amplifier.*

1 - Right rear speaker, positive

2 - Right front speaker, positive

3 - Left front speaker, positive

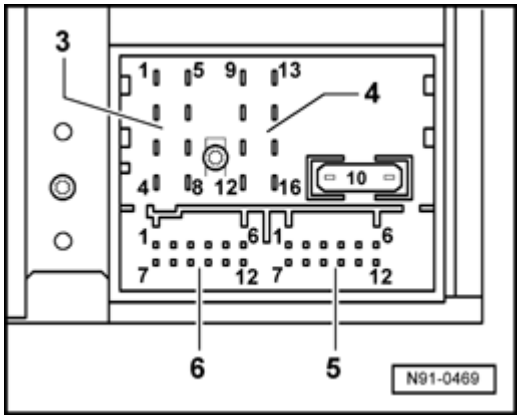
4 - Left rear speaker, positive

5 - Right rear speaker, negative

6 - Right front speaker, negative

7 - Left front speaker, negative

8 - Left rear speaker, negative



8-pin multi-pin electrical connection 4, power supply and CAN-Bus

9 - CAN-Bus - High

10 - CAN-Bus - Low

11 - Radio muting (during telephone use)

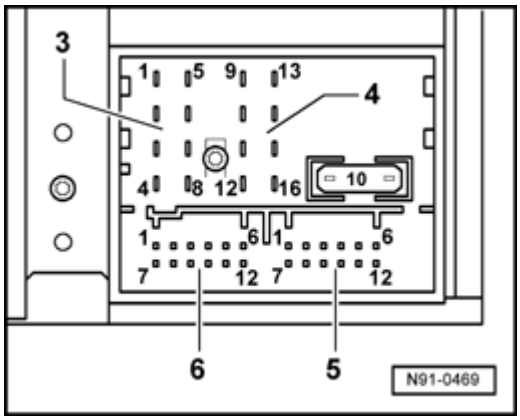
12 - Ground (Terminal 31)

13 - Radio on, control wire and booster

14 - Not assigned

15 - Plus connection (Terminal 30 B+)

16 - Control signal for anti-theft system, SAFE, terminal 30



12-pin multi-pin electrical connection 5, telephone signals and pre-amplifier output signals

Note:

- *Electrical connection where applicable.*

1 - Not assigned

2 - Not assigned

3 - Line Out, left

4 - Not assigned

5 - Navigation language, driving directions, positive

6 - Telephone audio input signal, TEL, negative

7 - Not assigned

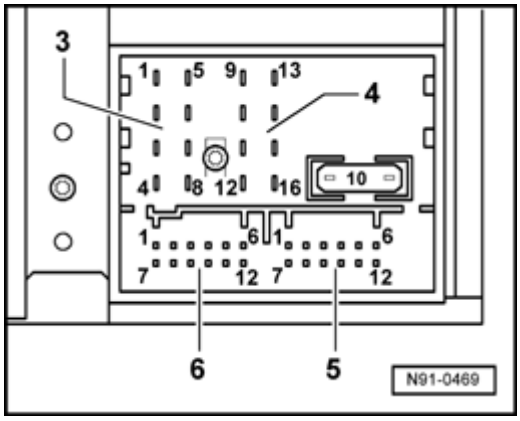
8 - Line out, negative

9 - Line Out, right

10 - Not assigned

11 - Navigation language, driving directions, negative

12 - Telephone audio input signal, TEL, positive



12-pin multi-pin electrical connection 6, CD changer control, CD audio input signals and satellite radio

Electrical connection where applicable.

1 - Satellite radio tuner input, audio left

2 - CD changer, left and right port, audio Ground (GND)

3 - Satellite radio tuner input, audio Ground (GND)

4 - CD changer, voltage supply, positive, terminal 30

5 - Satellite radio tuner input continuous positive, terminal 30

6 - CD changer, DATA OUT (data exchange for CD changer control from radio navigation system to CD changer)

7 - Satellite radio tuner input, audio right

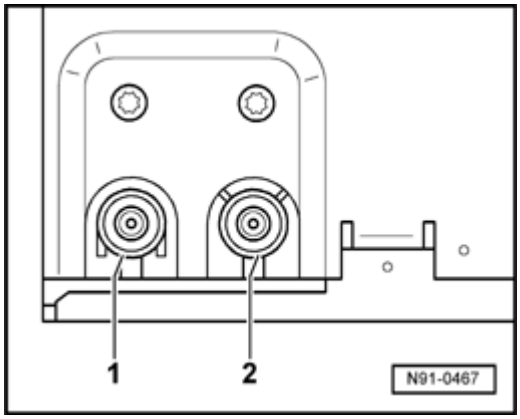
8 - CD changer, left port audio, CD/L

9 - CD changer, right port audio, CD/R

10 - CD Changer, control signal

11 - CD changer, DATA IN (data exchange for CD changer control from CD changer to radio navigation system)

12 - CD changer, CLOCK (internal test protocol for monitoring data flow)



Electrical connections 7 and 8, antenna connections

1 - Transparent connection for antenna input signal, FM from antenna

2 - Beige connection for antenna output signal FM to antenna (diversity, antenna selection)

Note:

- *The antenna signal input from connection 1 is checked in the radio and the result sent via connection 2 to the antenna. If the antenna signal is too weak, the radio then switches to another antenna (diversity). This process is not audible to the customer.*

Electronic anti-theft system

Radio - Navigation System is equipped with an electronic Comfort anti-theft system which operates in conjunction with radio unit identification data stored in the instrument cluster.

When an existing radio - navigation unit is removed (power supply disconnected) and reinstalled in the same vehicle, it is not necessary to input the anti-theft security code.

Electronic anti-theft system, function

After first activation of electronic anti-theft system, a numeric code is stored in both the radio unit and instrument cluster. When the radio power supply is restored (e.g. after removing and installing radio or battery), a data exchange takes place between the radio and instrument cluster.

The data exchange compares the numeric code of the radio unit to the numeric code stored in the instrument cluster. If numeric code is identical, the instrument cluster recognizes that the radio "belongs to the vehicle" and is

ready for operation.

Should a radio be replaced, the anti-theft code must be entered.

Deactivating electronic anti-theft system, ⇒ 91-3, Electronic anti-theft system, deactivating .

Next, when the ignition key is inserted into the ignition switch ("S-contact" activated), the data exchange between the replacement radio and instrument cluster take place automatically.

The data exchange lasts about 5 seconds. During this time a VAS 5051/5052 must not be connected or remain connected.

After successful data exchange, the replacement radio unit is ready for operation without renewed input of anti-theft code (should power supply subsequently be disconnected and reconnected).

The electronic anti-theft system is activated and will lock the radio as soon as:

- radio unit is installed in a different vehicle
- instrument cluster is replaced

A radio which has been locked by the electronic anti-theft system will show "SAFE" and "1000" on display when switched on.

To cancel lock, deactivate electronic anti-theft warning system, ⇒ 91-3, Electronic anti-theft system, deactivating .

Electronic anti-theft system, deactivating

Reactivating a locked radio navigation system is only possible by entering correct code number for electronic anti-theft system.

Note:

- *Code number for electronic anti-theft system is listed along with radio serial number on radio card, ⇒ operating instructions .*
- *For security reasons, radio card should not be stored in the vehicle. Obtain the code number from the customer, if necessary.*

- *If a radio navigation system is replaced, code number from replacement unit must be used.*

- *Inform the customer that the code number has changed.*

- Obtain radio code.

- Switch on radio navigation system.

The word "SAFE" and the number row "0000" appear in the display.

- Enter the code number listed on the radio card, do this by selecting and confirming characters on the selection screen for letters and numbers in succession.

Note:

- *With the entry of the first character, the number row "0000" is overwritten.*

- Confirm code by pressing the right rotary press button.

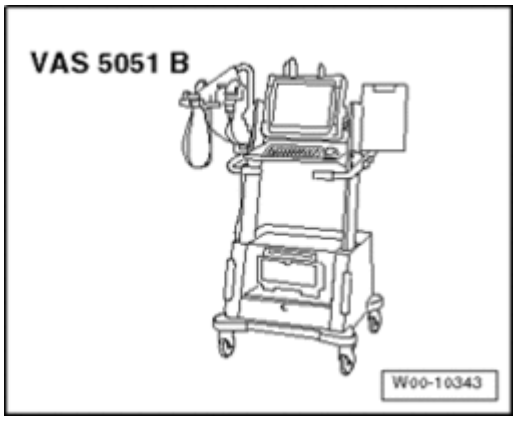
- When the anti-theft code has been entered, confirm with Taste located next to the word "OK" on the display.

The unit is enabled and ready for operation.

Note:

- *If the anti-theft code has been entered incorrectly, it can be corrected immediately in two subsequent attempts. If anti-theft code is entered incorrectly three times, then the radio navigation system is locked for an hour. Radio navigation system can then be switched on and insert ignition key in ignition lock. After one hour, then the procedure for deactivating the electronic anti-theft system can be repeated. Remember: Always three attempts to input code, after that the radio navigation system is locked for one hour.*

Navigation system components, adapting



Special tools, testers and auxiliary items required

- Vehicle Diagnostic Testing and Information System VAS 5051/5052 (VAS 5051 B shown as example only)
- Diagnostic cable VAS 5051/5a or VAS 5051/6a or VAS 5052/3

- Select operating mode "Guided Functions" and follow tester prompts

or

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Press "Go to" button.

- Select "Function/component selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Electrical system int/ext (Repair Group 01; 27' 90-97)"

- Select "01 - Self diagnosis"

- Select "Radio - Navigation system"

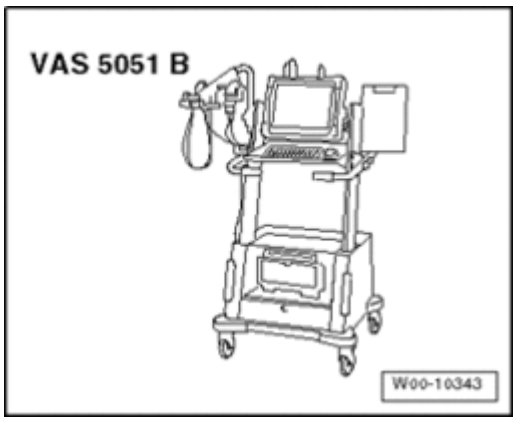
- Select "Functions" .

- Select appropriate option

- Press ">" to confirm

- Follow tester prompts

Radio system components, adapting



Special tools, testers and auxiliary items required

- Vehicle Diagnostic Testing and Information System VAS 5051/5052 (VAS 5051 B shown as example only)
- Diagnostic cable VAS 5051/5a or VAS 5051/6a or VAS 5052/3

- Select operating mode "Guided Functions" and follow tester prompts

or

- Select operating mode "Guided Fault Finding"

- Enter information as prompted and press ">" to confirm.

After the DTC memory of all control modules has been checked:

- Press "Go to" button.

- Select "Function/component selection"

- Select "Body (Repair Group 01; 27; 50-97)"

- Select "Electrical system int/ext (Repair Group 01; 27' 90-97)"

- Select "01 - Self diagnosis"

- Select "46 - Sound system"

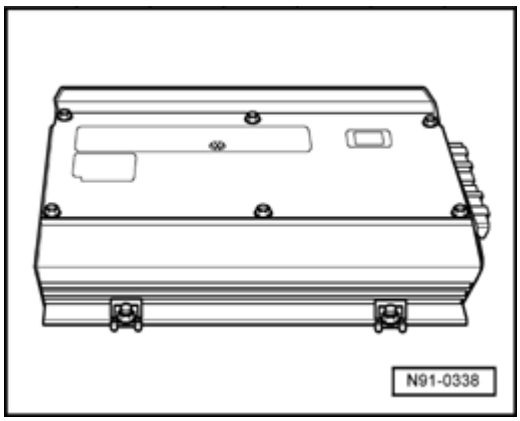
- Select "Functions" .

- Select appropriate option

- Press ">" to confirm

- Follow tester prompts

Amplifier



General information

From 06.06 production, radio systems "Premium Sound system" and "Radio - Navigation System" use Amplifier R12 to enhance sound output and quality.

The amplifier uses 8-channel technology.

The radio or radio - navigation head unit speaker output signals are used as input signals to Amplifier R12 .

Unit is installed under drivers seat.

Removing and installing, ⇒ 91-4, Amplifier R12 , removing and installing .

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional radio system or radio - navigation system where applicable. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing

OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

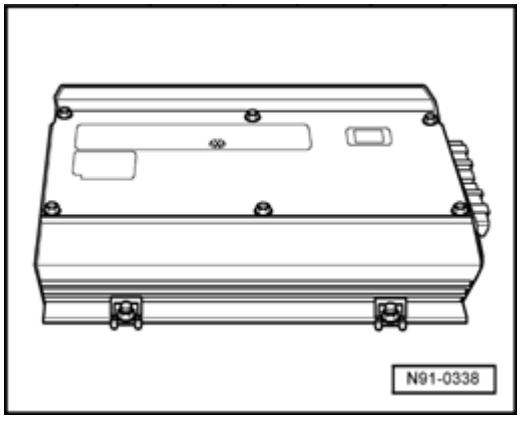
.

On Board Diagnostic (OBD), functions

Sound system amplifier has On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot radio system and amplifier malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

Amplifier R12 , removing and installing



Component view:

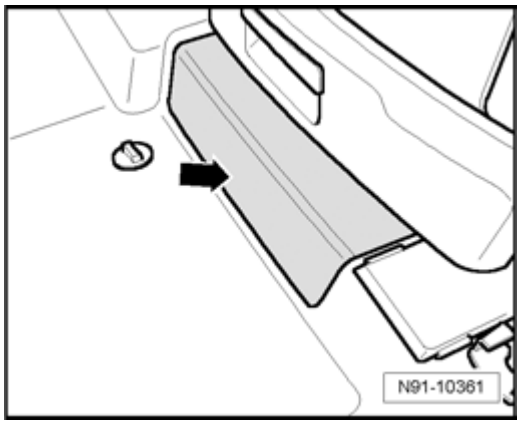
Removing:

From 06.06 production, Amplifier R12 is installed under drivers seat.

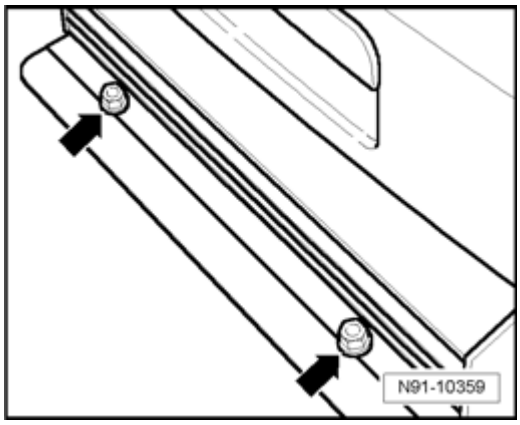
- Move drivers seat to uppermost and rearmost position.

Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

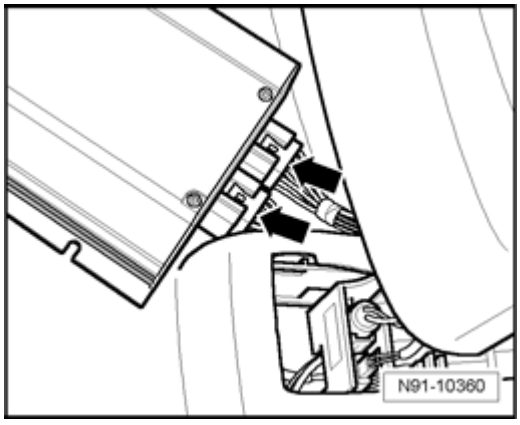


- Unclip lower seat trim **- arrow -** .



- Remove screws **- arrows -** .

- Pull control module from locating fixture under seat. Remove far enough until electrical connections are accessible.



- Disengage electrical connection locks **- arrows -** and disconnect.

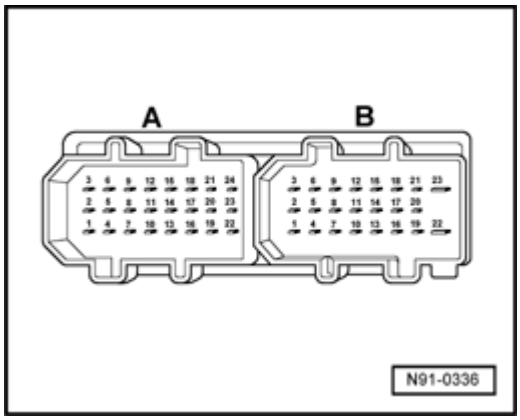
- Remove amplifier.

Installing:

Install in reverse order of removal, noting the following:

- Ensure amplifier engages with mounting fixture before reinstalling screws.

Amplifier R12 , multi-pin electrical connection assignments



24-pin multi-pin electrical connection A

1 - Left rear treble speaker, positive

2 - Right rear bass speaker, negative

3 - Right rear bass speaker, positive

4 - Left rear bass speaker, positive

5 - Right rear treble speaker, negative

6 - Right rear treble speaker, positive

7 - Left rear treble speaker, negative

8 - Left front bass speaker, negative

9 - Left front bass speaker, positive

10 - Left rear bass speaker, negative

11 - Right front mid-range speaker, negative

12 - Right front mid-range speaker, positive

13 - Not assigned

14 - Left rear audio signal input, negative

15 - Left rear audio signal input, positive

16 - Not assigned

17 - Right rear audio signal input, negative

18 - Right rear audio signal input, positive

19 - Control in (optional)

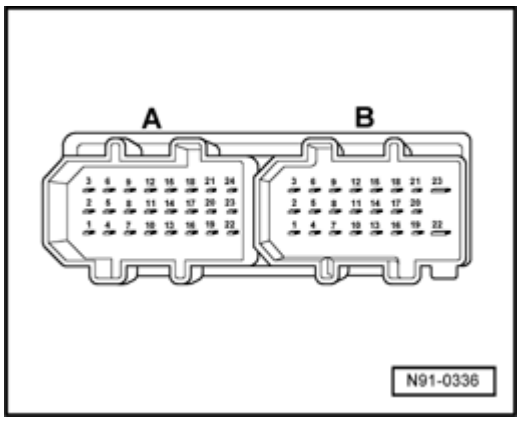
20 - Left front audio signal input, negative

21 - Left front audio signal input, positive

22 - Not assigned

23 - Right front audio signal input, negative

24 - Right front audio signal input, positive



23-pin multi-pin electrical connection B

1 - CAN-Bus, Low

2 - Left front mid-range speaker, negative

3 - Left front mid-range speaker, positive

4 - CAN-Bus, high

5 - Not assigned

6 - Left front treble speaker, negative

7 - Not assigned

8 - Not assigned

9 - Left front treble speaker, positive

10 - Not assigned

11 - Right front bass speaker, positive

12 - Right front bass speaker, negative

13 - Not assigned

14 - Not assigned

15 - Right front treble speaker, positive

16 - Voltage supply, negative

17 - Not assigned

18 - Right front treble speaker, negative

19 - Voltage supply, negative

20 - Voltage supply, positive

21 - Voltage supply, positive

22 - Voltage supply, negative

23 - Voltage supply, positive

CD Changer

General information

Optional, external CD Changer is available for use with "Radio - Navigation System" only (information available at time of publication).

External CD Changer is located under foldable front arm rest.

Note:

- *If the CD Changer plays commercially available CDs, but not home recorded CDs, the CD Changer is not malfunctioning. Replacement/exchange of CD Changer is not warranted for this reason.*
- *Do not use CDs that contain a mix of computer and music data. Mixed data CDs cannot be played back.*
- *Do not use 8 cm diameter "mini disks". Should a "mini disk be inserted, it will not eject and CD player damage will result.*
- *CD Changer does not have MP3 data capability.*
- *Radio - Radio/Navigation control head must be coded in order to support CD changer functions. After installing new CD unit, input appropriate coding using adaptation function with VAS 5051/5052.*

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional radio system and CD Changer. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

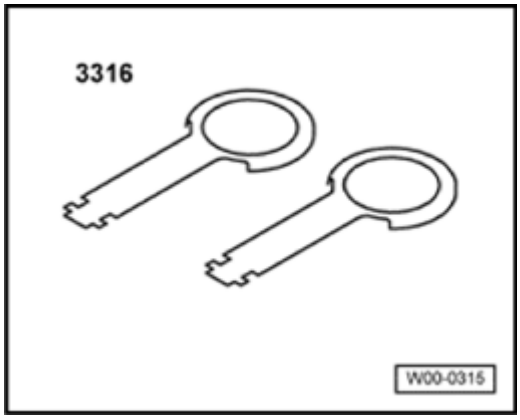
⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

.

CD Changer R41 , removing and installing

Note:

- *If the CD Changer plays commercially available CDs, but not home recorded CDs, the CD Changer is not malfunctioning. Replacement/exchange of CD Changer is not warranted for this reason.*
- *Do not use CDs that contain a mix of computer and music data. Mixed data CDs cannot be played back.*
- *Do not use 8 cm diameter "mini disks". Should a "mini disk be inserted, it will not eject and CD player damage will result.*
- *CD Changer does not have MP3 data capability.*
- *Radio - Radio/Navigation control head must be coded in order to support CD changer functions. After installing new CD unit, input appropriate coding using adaptation function with VAS 5051/5052.*



Special tools, testers and auxiliary items required

- 3316 Radio release tool (two identical pieces)

Removing:

Note:

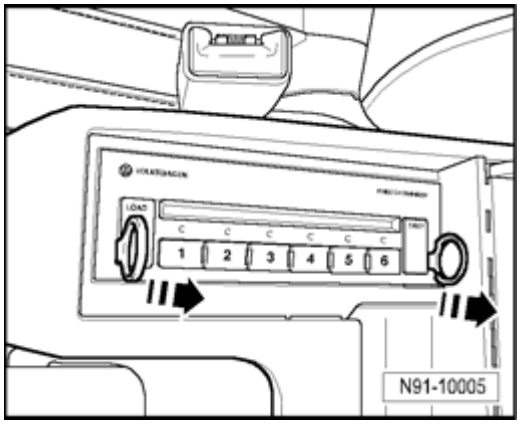
- *CD changer is installed under the foldable center armrest.*

Caution!

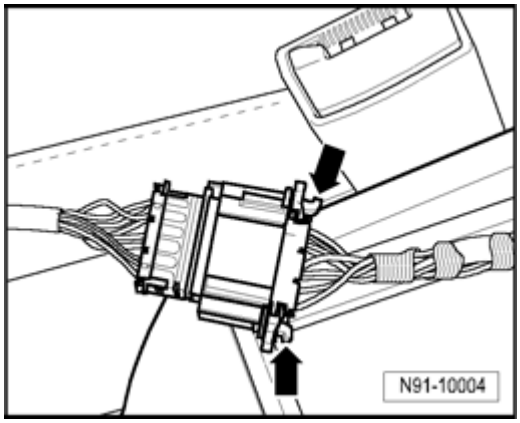
- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***
- ***Remove any CDs which may have been left in CD Changer ⇒ Owners Manual .***

- Open center armrest completely.

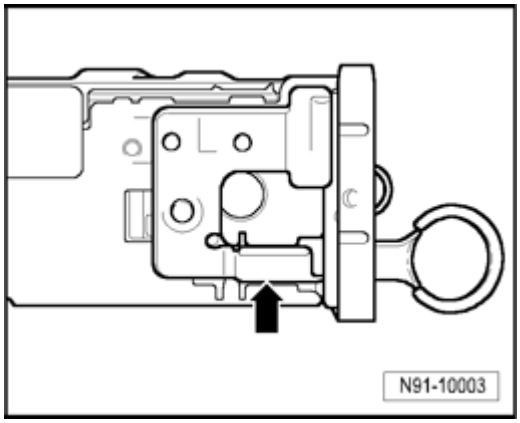
- Slide and engage radio release tools 3316 into slots on CD changer as illustrated.



- Lift CD Changer out of installation frame using radio release tools **- arrows -** .



- Disengage electrical connection locks **- arrows -** and disconnect.

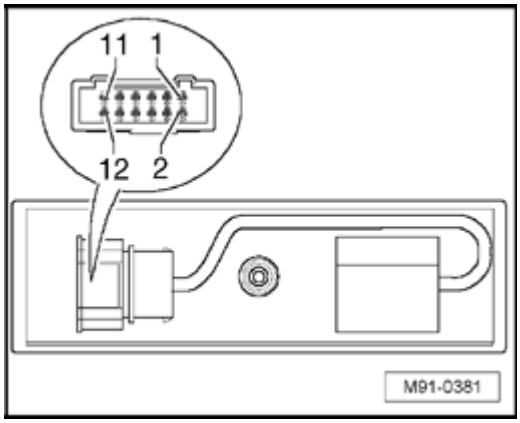


- Depress retaining clip **- arrow -** and remove release tools.

Installing:

Install in reverse order of removal.

CD Changer R41 , multi-pin electrical connection assignments



12-pin multi-pin electrical connection

1 - CD Changer - Data in
2 - CD Changer - Data clock
3 - CD Changer - Ground (GND)
4 - CD Changer - Data out
5 - Not assigned
6 - Plus connection (Terminal 30, B+)
7 - LINE OUT, right
8 - Control signal
9 - CD Changer - Ground (GND)
10 - LINE OUT, left
11 - Not assigned
12 - CD Changer illumination - Terminal 58d

91 - 6

Satellite Radio

General information

Satellite Radio is available as an optional feature of radio systems "Premium Sound System" and "Radio - Navigation System" .

Satellite radio functions are integrated with radio or radio - navigation head unit controls/display.

Satellite radio operation is contingent on market and vehicle owner subscription to a satellite radio service. For example: "XM" or "Sirius" are US satellite radio service providers applicable at time of publication.

Satellite radio service unavailable in Canada at time of publication.

Satellite reception takes place via antenna installed on roof.

Satellite Radio (tuner) is located under right front seat.

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional radio system and satellite radio system where applicable. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group***

27, Battery, disconnecting and reconnecting

.

On Board Diagnostic (OBD), functions

Satellite radio system has On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot satellite radio system malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

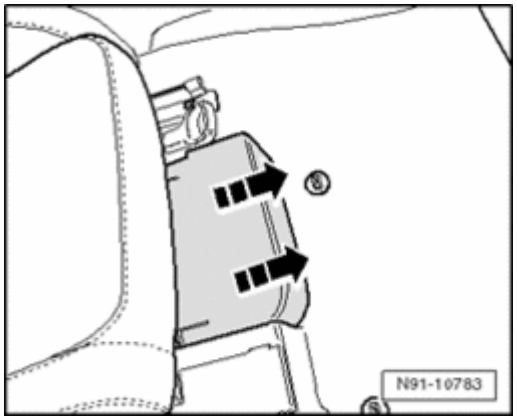
Digital Satellite Radio Tuner R190 , removing and installing

Removing:

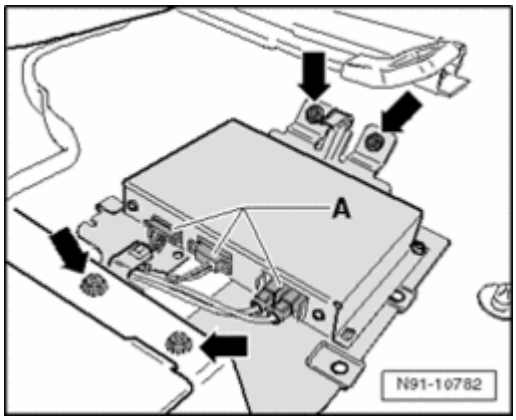
- Move right front seat to uppermost and rearmost position.

Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

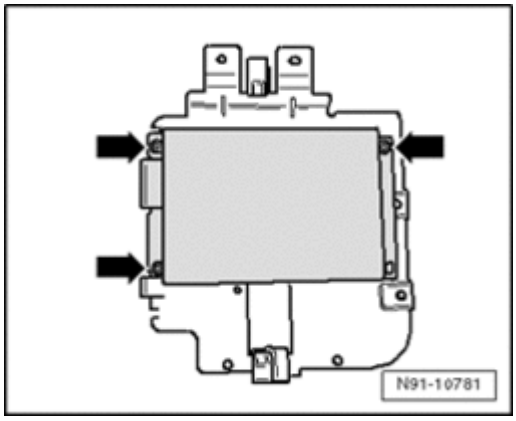


- Unclip lower seat trim in direction of **- arrow -** .



- Disconnect electrical connections **- A -** and remove fasteners **- arrows -** .

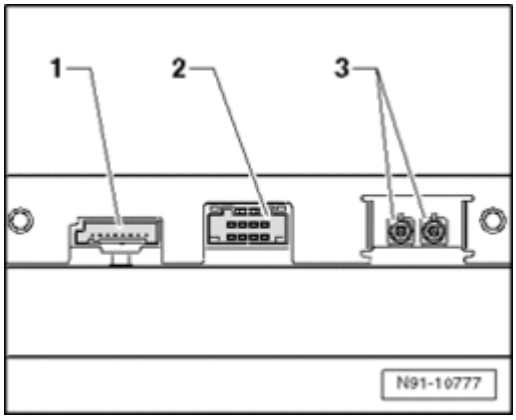
- Remove unit together with bracket.



- Remove screws **- arrows -** while holding nuts under bracket in place - otherwise, these will turn with screws.

Installing:

Install in reverse order of removal.

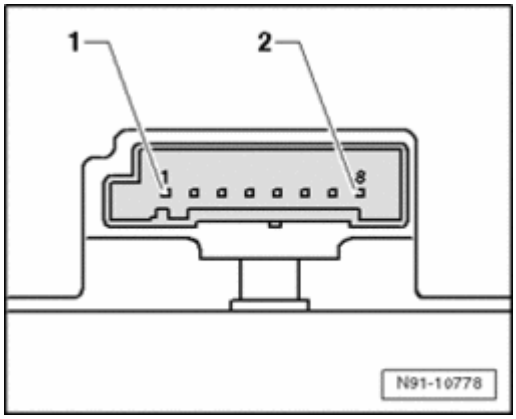


Digital Satellite Radio Tuner R190 , multi-pin connection assignments

1 - Data input and output information connection

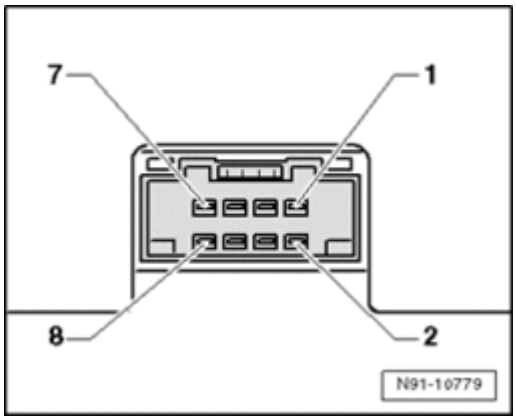
2 - Voltage supply connection

3 - Antenna line connections



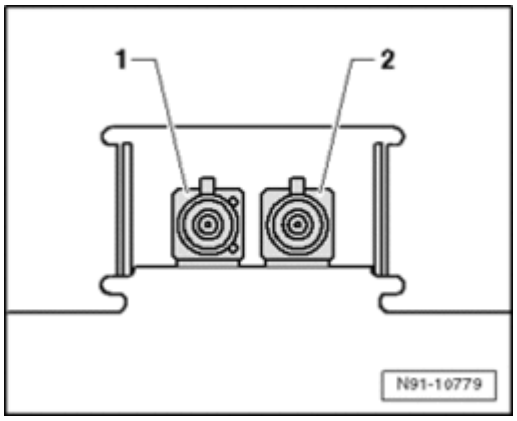
Multi-pin electrical connection 1, assignment

- CAN bus, low
- CAN bus, high
- CDX, left, input
- CDX, right, input
- Audi, negative
- Audio, output, left, positive
- Audio, output, right, positive
- CDX, negative



Multi-pin electrical connection 2, assignment

- Voltage supply, negative
- Voltage supply, positive
- Not assigned
- Not assigned
- Not assigned
- Not assigned
- Not assigned
- Not assigned



Antenna electrical connections, assignment

- Antenna, terrestrial, input, brown
- Antenna, satellite, input, green

On vehicles from 11/06, a connection is still available here.

91 - 7

iPod (R) Mobile Digital Device System from 06.06

General information

From 06.06 production, vehicles may be equipped with an iPod (R) mobile digital device cradle (not confirmed at time of publication).

If installed, the cradle supports the following units:

- Classic iPod (R) (3rd and 4th generation)
- iPod mini (R)
- iPod photo (R)

When device is inserted in cradle, contents of device drive can be displayed and selected via the radio or radio-navigation system display. Power is supplied to device via the cradle.

Audio data on device can be shown in the radio system display. However photo data and background audio data (ID3 tags) will not be displayed. The radio or radio-navigation system display shows files as "track XX" .

Selected files are preprocessed by the device and sent to radio or radio-navigation system for playback.

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional radio system and mobile device interface with radio system. Always read the owners manual, iPod (R) operators manual and review applicable system functions.

Note:

- *The following illustrates the mobile device cradle located in the center console. Information for the alternate mobile device cradle location (in the glove compartment) is not available at time of publication. Device cradle configuration is identical in both locations.*

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

.

On Board Diagnostic (OBD), functions

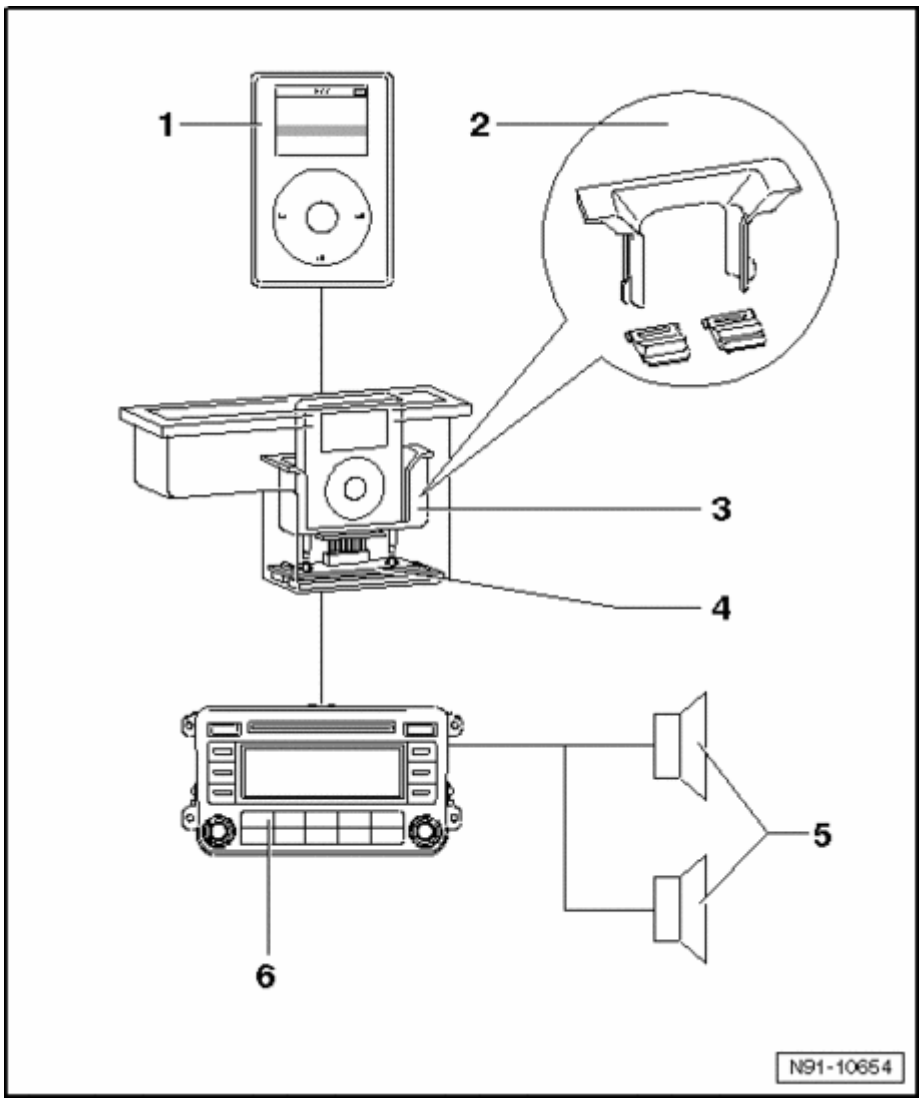
Mobile device cradle and data interface with radio or radio-navigation system does not have On Board Diagnostic (OBD) capability.

Troubleshooting ⇒ 91-7, Troubleshooting

iPod R mobile digital device system, layout

Note:

- *The following illustrates mobile device cradle located in center console. Information for alternate mobile device cradle location (in glove compartment) is not available at time of publication. Device cradle configuration is identical in both locations.*



- **iPod (R) mobile digital device**
- **Cradle adapter**
  - Adapts mount to different devices.
  - Removing and installing, ⇒ 91-7, Cradle adapter, removing and installing
- **Device cradle**
  - Integrated in storage compartment under center armrest
  - Removing and installing, ⇒ 91-7, iPod R mobile digital device system cradle, removing and installing

- **Device interface electronics**
  - Integrated with cradle
  - Electronics are not accessible or serviceable separately. in the event of malfunctions, replace complete cradle
  - Multi-pin connector assignments ⇒ 91-7, Multi-pin connector assignments
- **Radio system speakers**
- **Radio R or Radio/Navigation Display Control Module J503**

Cradle adapter, removing and installing

Note:

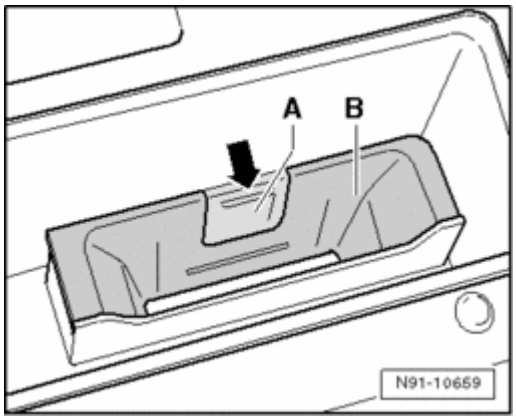
- *The following illustrates mobile device cradle located in center console. Information for alternate mobile device cradle location (in glove compartment) is not available at time of publication. Device cradle configuration is identical in both locations.*

An adapter is used to enable different iPod (R) sizes.

Installing:

Classic iPod (R) and iPod photo (R)

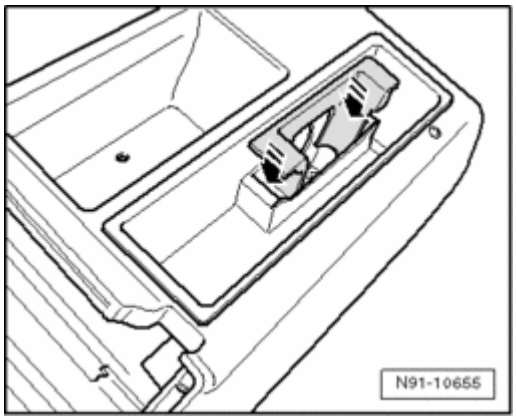
A small adapter is needed to compensate for the different thickness of the Classic iPod (R) and iPod photo (R) .



- Insert adapter - **A** - in direction of - **arrow** - into cradle -

B - as far as possible.

iPod mini (R)



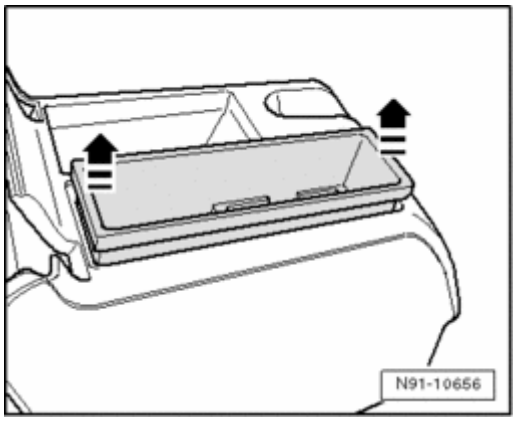
- Insert adapter in direction of **- arrow -** as far as possible.

Removing:

Remove in reverse order of removal.

iPod R mobile digital device system cradle, removing and installing

Removing:

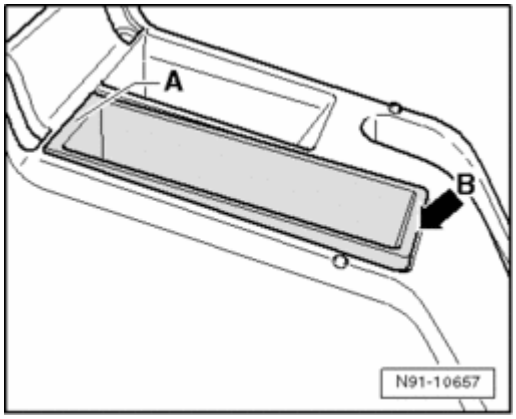


- Grasp inside storage compartment and lift out **- arrow -** from console.

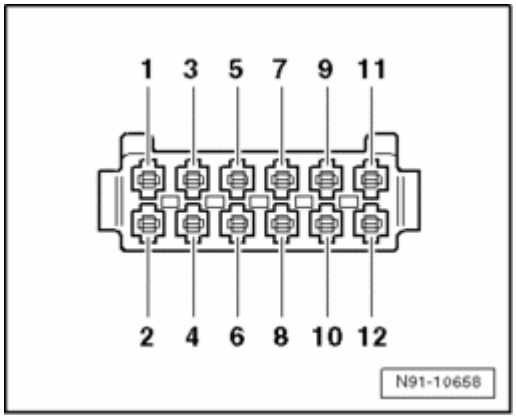
- Disconnect electrical connection on underside of compartment.

Installing:

- Reconnect electrical connection.



- First insert storage compartment at rear of opening **- A -** in center console and then press in direction **- arrow B -** until it engages.



Multi-pin connector assignments

- DATA (Data exchange between device and radio)
- DATA-CLOCK (internal test protocol for monitoring data flow)
- Ground (GND), terminal 31
- Radio control data (analog CD changer)
- not in use
- Voltage supply, positive (B+), terminal 30
- Audio signal output, right, positive
- Control wire from radio, positive (analog CD changer)
- Audio signal output, negative
- Audio signal output, left, positive
- not in use
- not in use

Troubleshooting

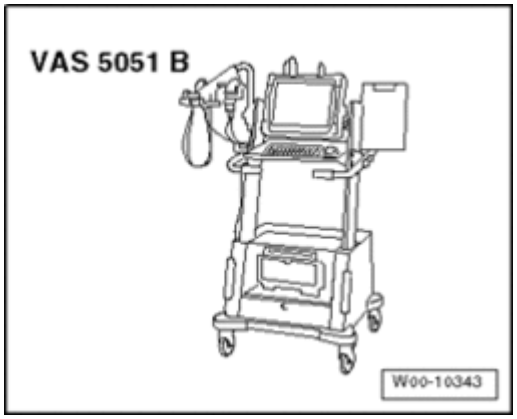
Mobile device cradle (with integrated electronics) and data interface with radio or radio-navigation system does not have On Board Diagnostic (OBD) capability.

If data transfer from mobile device to radio or radio-

navigation system does not work, check supply voltage and ground at cradle connection.

Test requirements:

- Ensure iPod (R) is functioning properly ⇒ *Device Operators Manual* .
- "RESET" the iPod (R) ⇒ *Device Owners Manual* .
- Cradle power supply fuse OK ⇒ *Wiring Diagrams* .
- Ensure radio or radio-navigation is functioning properly. Check radio or radio-navigation DTC memory using On Board Diagnostic (OBD) program ⇒ 91-1, On Board Diagnostic (OBD), functions .



Special tools, testers and auxiliary items required

- Vehicle Diagnostic Testing and Information System VAS 5051/5052 (VAS 5051 B shown as example only)
- Diagnostic cable VAS 5051/5a or VAS 5051/6a or VAS 5052/3

- Select operating mode "Test Instruments" and follow tester prompts

- Enter information as prompted and press ">" to confirm.

Proceed as follows:

- Remove device cradle ⇒ 91-7, iPod R mobile digital device system cradle, removing and installing .

- Disconnect electrical connection under storage compartment.

- Measure the following values at electrical connection wiring harness side using Vehicle Diagnostic, Testing and Information System VAS 5051/5052 .

  - at connector T12, terminal 6 = voltage supply, battery voltage, with radio switched on.

  - at connector T12, 1terminal 8 = voltage supply, battery voltage, control wire, with radio switched on.

  - at connector T12, terminal 3 = Ground (GND) terminal 31

If indicated values are not present, check wiring and connections between radio and device cradle using wiring diagram.

If no wiring fault is determined, replace complete device cradle.

91 - 8

Loudspeaker System

General information

Note:

- *From start of production through 05.06, loudspeakers on the standard "Premium Sound System" and optional "Radio - Navigation system" are powered directly by the radio head unit.*

- *From 06.06 production, loudspeakers on the standard "Premium Sound System" and optional "Radio - Navigation system" are powered directly by the Amplifier R12 (located under drivers seat).*

- *All radio system loudspeaker applications consist of a 3-way system with one bass loudspeaker, one mid-range and one treble loudspeaker respectively in left and right front doors. In vehicle rear, a 2-way system with one bass loudspeaker and one treble loudspeaker respectively are installed in each rear side panel/door.*

- *All loudspeakers are passive loudspeakers.*

Front Bass Loudspeakers R21 R23, removing and installing

Note:

- *Removal and installation of left or right side speakers is identical.*

Removing:

Caution!

- ***Switch off all electrical consumers.***

- ***Switch ignition off and remove ignition key.***

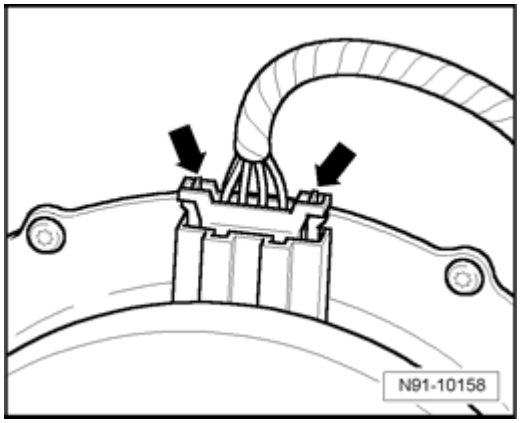
Remove left or right door trim as applicable,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; front drivers side trim, removing and installing*

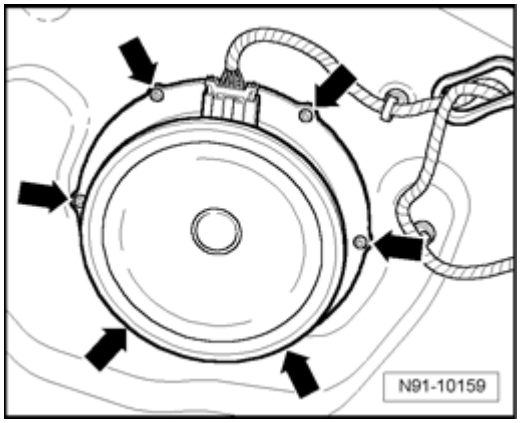
or,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; front passengers side trim, removing and installing*

.



- Disengage electrical connection lock **- arrows -** and disconnect.



- Drill out rivets **- arrows -** and remove loudspeaker from door opening.

Note:

- *To prevent corrosion, ensure that all metal particles from drilling are removed from inside the door.*
- *If paint on door frame is damaged during drilling, touch-up immediately.*

Installing:

Install in reverse order of removal, noting the following:

- Secure new loudspeaker with special pop rivets of suitable length and diameter ⇒ *Parts Catalog* .

Rear Bass Loudspeakers R15 R17 - 4-door models, removing and installing

Note:

- *Removal and installation of left or right side speakers is identical.*

Removing:

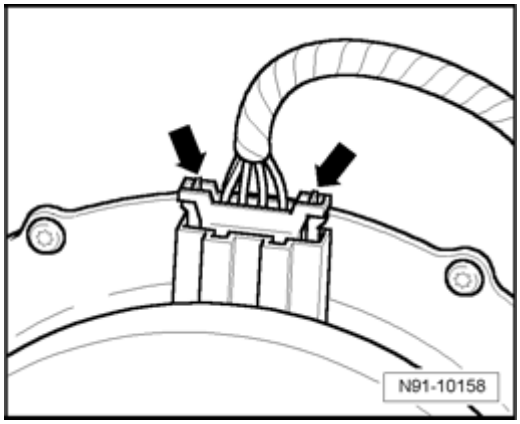
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

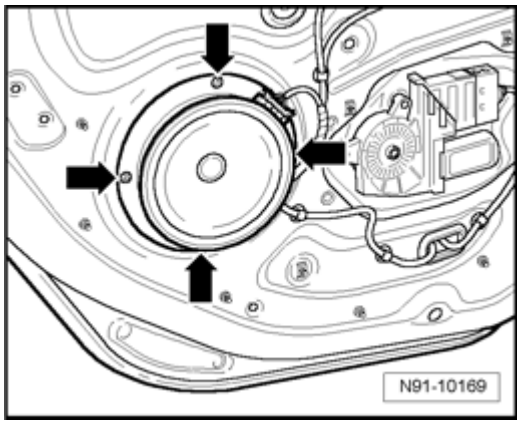
Remove left or right rear door trim as applicable,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; rear door trim, removing and installing; removing*

.



- Disengage electrical connection lock **- arrows -** and disconnect.



- Drill out rivets **- arrows -** and remove loudspeaker from door opening.

Note:

- *To prevent corrosion, ensure that all metal particles from drilling are removed from inside the door.*
- *If paint on door frame is damaged during drilling, touch-up immediately.*

Installing:

Instal in reverse order of removal, noting the following:

- Secure new loudspeaker with special pop rivets of suitable length and diameter ⇒ *Parts Catalog* .

Rear Bass Loudspeakers R15 R17 - 2-door models, removing and installing

Note:

- *Removal and installation of left or right side speakers is identical.*

Removing:

Caution!

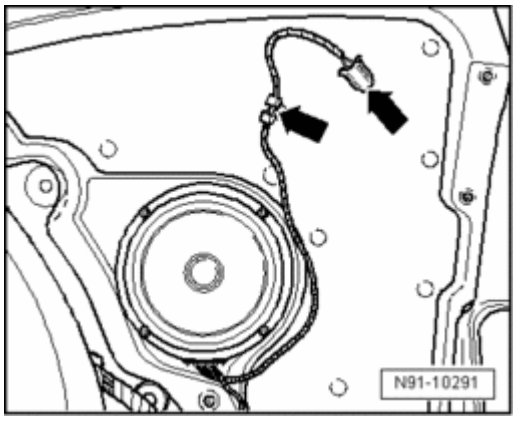
- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***
- ***When removing side trim in next step, treble speaker may break away from trim due to a short wire connection from wire mount to speaker***

connection. Heed cable length and carefully remove side trim.

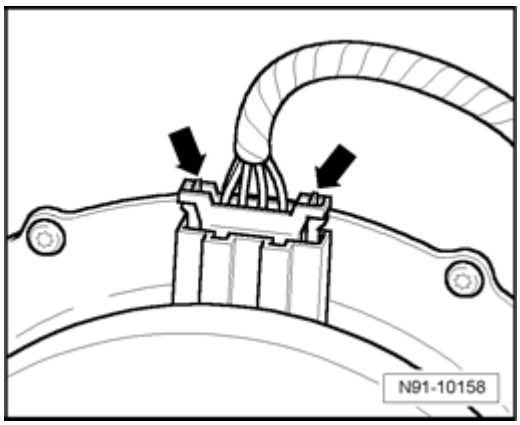
Remove left or right rear side trim as applicable,

⇒ *Repair Manual, Body Interior, Repair Group 70,*

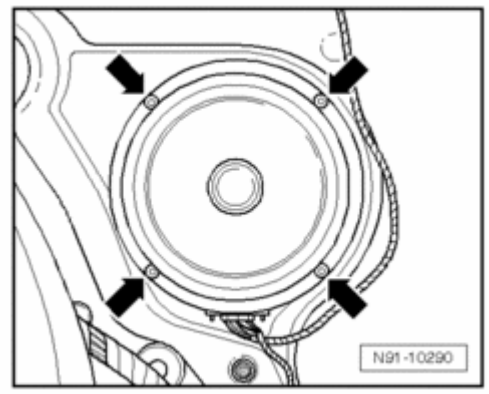
.



- Disconnect electrical connection at side trim **- arrows -** then remove side trim completely.



- Disengage electrical connection lock **- arrows -** and disconnect.



- Drill out rivets **- arrows -** and remove loudspeaker from side panel.

Note:

- *To prevent corrosion, ensure that all metal particles from drilling are removed from vehicle interior.*

Installing:

Instal in reverse order of removal, noting the following:

- Secure new loudspeaker with special pop rivets of suitable length and diameter ⇒ *Parts Catalog* .

Front Midrange Loudspeakers R103 R104, removing and installing

Note:

- *Mid-range speakers are secured to door trim from behind.*

- *Removal and installation of left or right side speakers is identical.*

Removing:

Caution!

- ***Switch off all electrical consumers.***

- ***Switch ignition off and remove ignition key.***

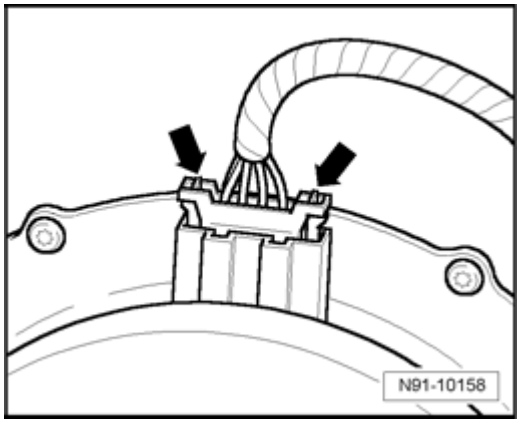
Remove applicable door trim,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; front drivers side trim, removing and installing*

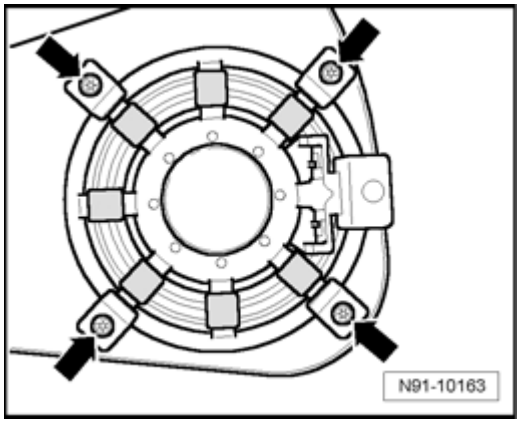
or,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; front passengers side trim, removing and installing*

.



- Disengage electrical connection lock **- arrows -** and disconnect.



- Remove screws **- arrows -** and remove loudspeaker.

Installing:

Install in reverse order of removal.

Front Treble Speakers R20 R22, removing and installing

Note:

- *Treble speaker is installed in mirror triangle at each*

front door.

- *Removal and installation of left or right side speakers is identical.*

Removing:

Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

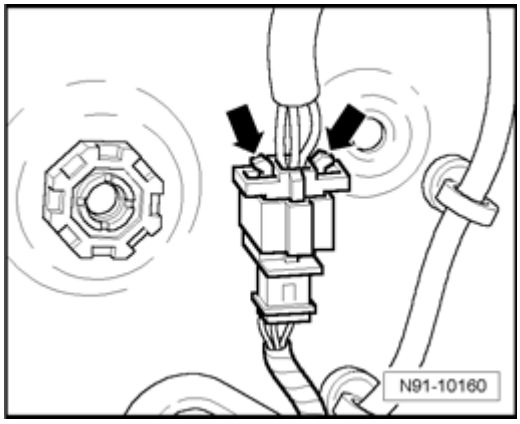
Remove applicable door trim,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; front drivers side trim, removing and installing*

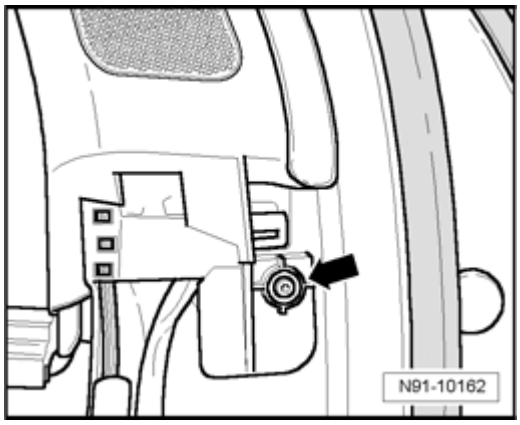
or,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; front passengers side trim, removing and installing*

.

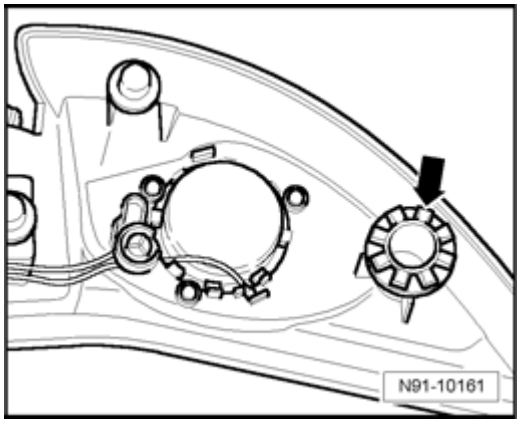


- Disconnect wiring harness electrical connection **- arrows -** .



- Remove screw **- arrow -** .

- Unclip trim together with speaker.



- If plastic clip **- arrow -** remains on trim after removing, then remove it and insert it in door at the installation location designed for it.

Otherwise trim of mirror triangle can no longer be installed correctly.

Loudspeaker is integrated with mirror trim triangle and cannot be serviced separately.

Installing:

Install in reverse order of removal.

Rear Treble Loudspeakers R14 R16 - 4 door models, removing and installing

Note:

- *Treble speakers are secured to door trim from behind.*

- *After removing treble speaker, speaker trim must always be replaced.*

- *Removal and installation of left or right side speakers is identical.*

Removing:

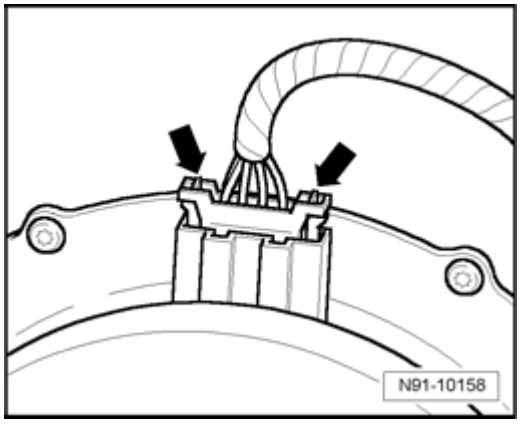
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

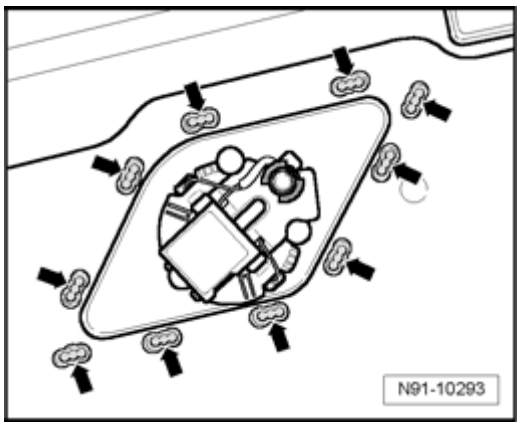
Remove applicable door trim,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim/insulation; door trim; removing and installing rear door trim*

.



- Disengage electrical connection lock **- arrows -** and disconnect.

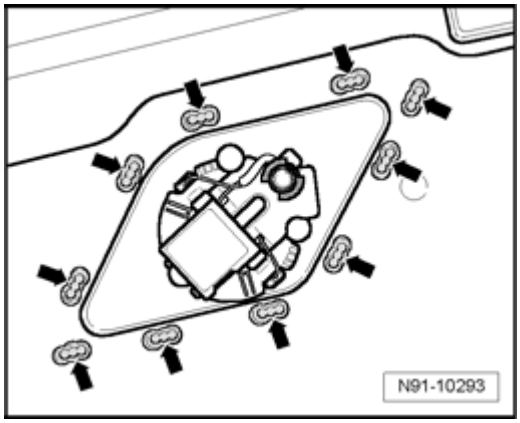


- Cut off heat-sealed plastic clips on loudspeaker panel **- arrows -** .

- Remove panel with loudspeaker together from door trim.

Installing:

- Insert loudspeaker panel together with loudspeaker into door trim.



- Heat-seal the plastic clips using soldering iron **- arrows -** .

Remaining installation in reverse order of removal.

Rear Treble Loudspeakers R14 R16 - 2 door models, removing and installing

Note:

- *Removal and installation of left or right side speakers is identical.*
- *After removing treble speaker, speaker trim must always be replaced.*
- *Treble speakers are secured to side trim from behind.*

Removing:

Caution!

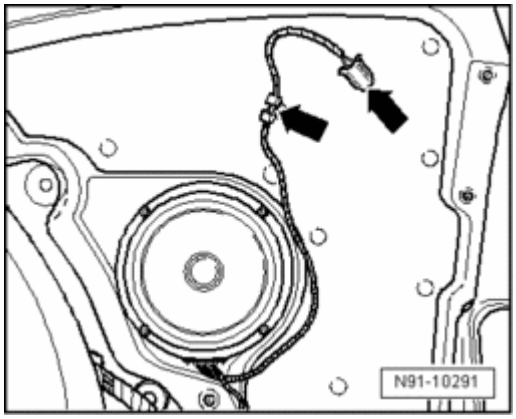
- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

- ***When removing side trim in next step, treble speaker may break away from trim due to a short wire connection from wire mount to speaker connection. Heed cable length and carefully remove side trim.***

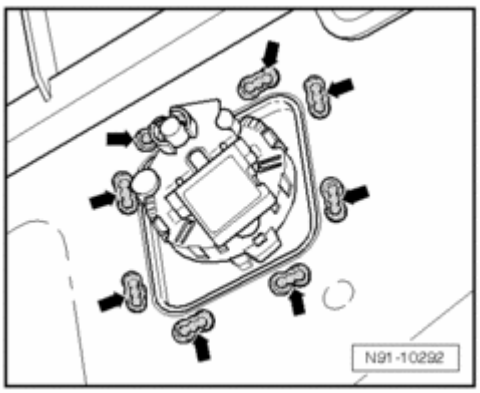
Remove left or right rear side trim as applicable,

⇒ *Repair Manual, Body Interior, Repair Group 70,*

.



- Disconnect electrical connection at side trim **- arrows -** then remove side trim completely.

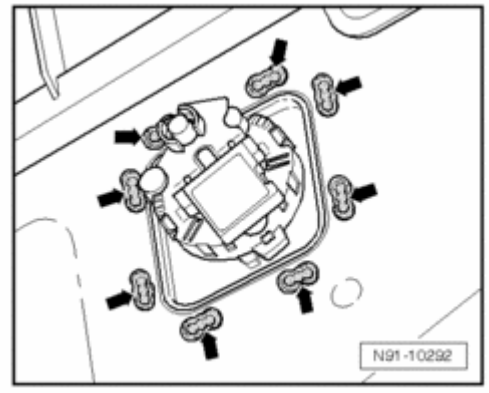


- Cut off heat-sealed plastic clips on speaker panel **- arrows -** .

- Remove trim and speaker from door trim.

Installing:

- Insert loudspeaker panel together with loudspeaker into door trim.



- Heat-seal the plastic clips using soldering iron **- arrows -**
.

Remaining installation in reverse order of removal.

91 - 9

Antenna Systems

General information

Antenna systems can consist of the following:

- Radio or Radio - Navigation head unit
- Antenna or antennas for radio operation integrated in rear window
- Optional: satellite radio with roof antenna
- FM frequency filters (Ground and Plus)

Vehicles with "Premium Sound System" and "Radio - Navigation System" use a diversity antenna system integrated into the rear window. Diversity function serves to improve and optimize the reception quality in the vehicle.

The strength and quality of the signals received by the two diversity system antennas is continuously monitored and evaluated by the radio unit. The evaluation data processed by the radio causes active selection of either system antenna that provides the best reception under the existing conditions (diversity function). The continuous, active switching between system antennas is not audible.

Note:

- *In the event that devices (such as additional antennas) that use a magnetic mounting fixture are attached to the roof, the residual magnetization of the roof sheet metal will adversely affect the operation of the roof antenna and compass module. Before proceeding with any diagnosis of the roof antenna or compass module, ask customer if such a device is/was used.*

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the standard or optional radio system. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

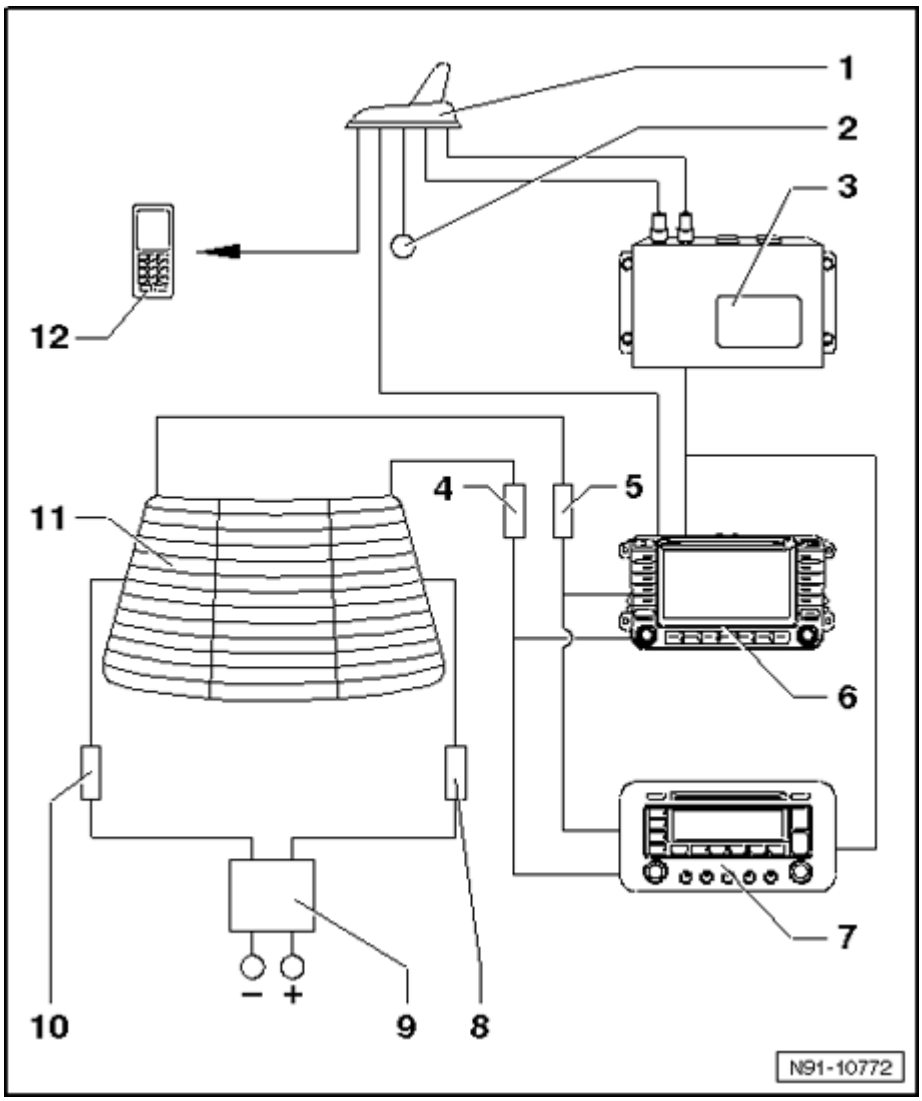
Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

.

Antenna systems, layout



- **Satellite Tuner Antenna R172**
  - Only with satellite radio.
  - Installed on roof at rear
  - from 11/06 production: only one antenna wire between satellite tuner and tuner antenna
  - Removing and installing ⇒ 91-9, Satellite Tuner Antenna R172 , removing and installing

- **Not applicable to USA/Canada**
- **Digital Satellite Radio Tuner R190**
  - Optional

- Installed below right front seat
- from 11/06 production: only one antenna wire between satellite tuner and tuner antenna
- Additional information ⇒ 91-6, Satellite Radio

- **Antenna Amplifier R24**
  - for FM reception
  - Removing and installing ⇒ 91-9, Antenna Amplifiers R24 R111, removing and installing

- **Antenna Amplifier 2 R111**
  - for FM/AM reception
  - Removing and installing ⇒ 91-9, Antenna Amplifiers R24 R111, removing and installing

- **Radio/Navigation Display Control Module J503**
  - Additional information ⇒ 91-3, Radio - Navigation System

- **Radio R**
  - Additional information ⇒ 91-2, Radio System - Premium Sound System

- **FM Frequency Filter (in positive wire) R179**
  - Installed in wiring harness
  - Function: Prevents antenna signals from shorting to Ground (GND)

- **AM Frequency Filter R177**
  - installed in rear lid, center
  - Function: Prevents antenna signals from shorting to Ground (GND)
  - Removing and installing ⇒ 91-9, AM Frequency Filter R177 , removing and installing
- **FM Frequency Filter (in negative wire) R178**
  - Installed in wiring harness
  - Function: Prevents antenna signals from shorting to Ground (GND)
- **Rear Window Antenna 1 R130**
- **Not applicable to USA/Canada**

Antenna Amplifiers R24 R111, removing and installing

Antenna amplifiers are installed at left and right of rear lid at rear window.

Removal and installation of left and right amplifiers is identical.

Removing:

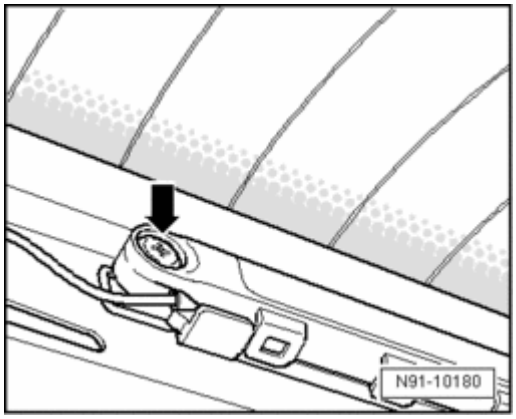
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

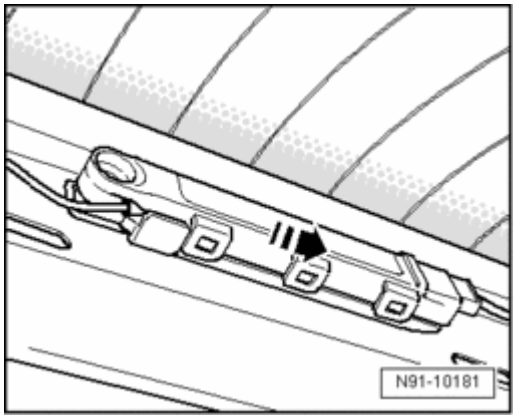
- Remove inner rear lid trim,

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim, insulation; Rear lid trim, removing and installing*

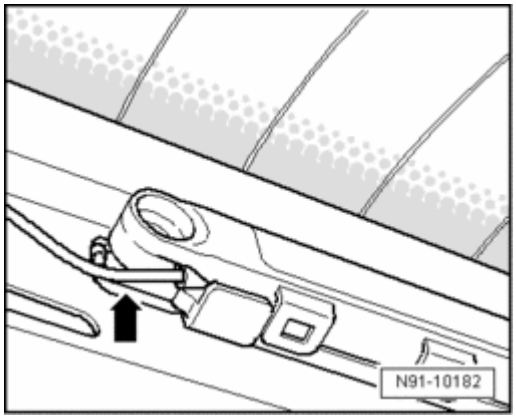
.



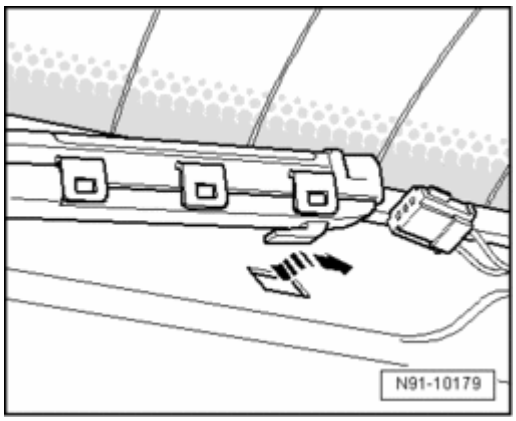
- Remove screws **- arrow -** .



- Slide antenna amplifier in direction of **- arrow -** .



- If this is not possible, expand nut slightly **- arrow -** .



- Remove antenna amplifier in direction of **- arrow -** .

Caution!

- ***Use caution when disconnecting wire connection from antenna amplifier to rear window antenna. Wire connection is very sensitive mechanically. Should antenna wire at rear window be damaged, do NOT perform repair. Replace rear window complete.***

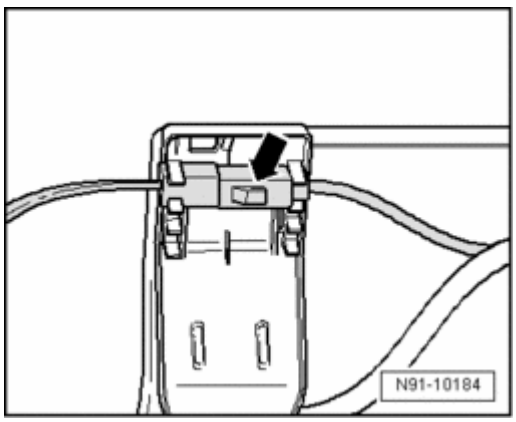
- ***Should both antenna amplifiers be removed for installation later, mark installation position of individual amplifiers and reinstall accordingly.***

-

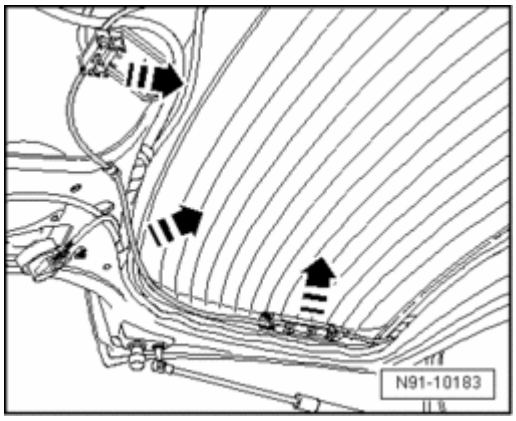
- Disconnect electrical connection at rear window antenna.

Note:

-



- Disconnect electrical connection in rear lid **- arrow -** .



- Completely remove antenna amplifier with wire connection **- arrows -** .

Installing:

Install in reverse order of removal, noting the following:

If both amplifiers were removed, install in locations noted prior to removal.

AM Frequency Filter R177 , removing and installing

Amplitude modulation (AM) frequency filter is installed in center of rear lid.

Function: Prevents antenna signals from shorting to Ground (GND)

Removing:

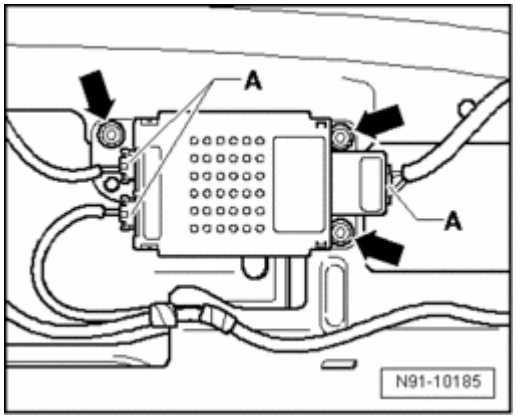
Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

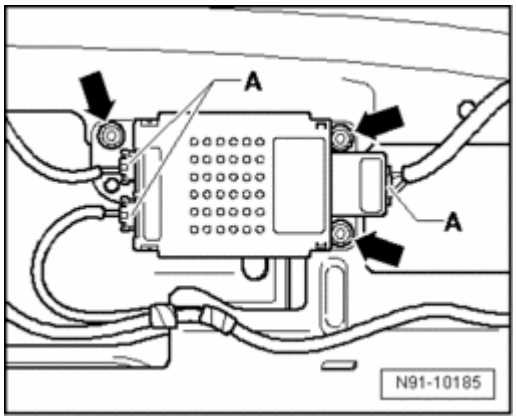
- Remove rear lid trim

⇒ *Repair Manual, Body Interior, Repair Group 70, Trim, insulation; rear lid trim, removing and installing*

.



- Remove screws **- arrows -** .



- Disengage electrical connection locks **- A -** and disconnect electrical connections.

- Remove frequency filter.

Installing:

Install in reverse order of removal.

Satellite Tuner Antenna R172 , removing and installing

Note:

- *Roof antenna applications: "Radio - Navigation system" , "Premium Sound System with Satellite Radio" or "Radio - Navigation system with Satellite Radio" .*

- *The following procedure is described for all roof antenna versions.*

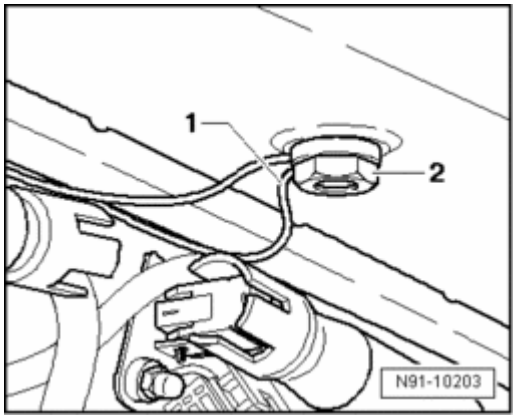
Removing

- Remove C-pillar trim,

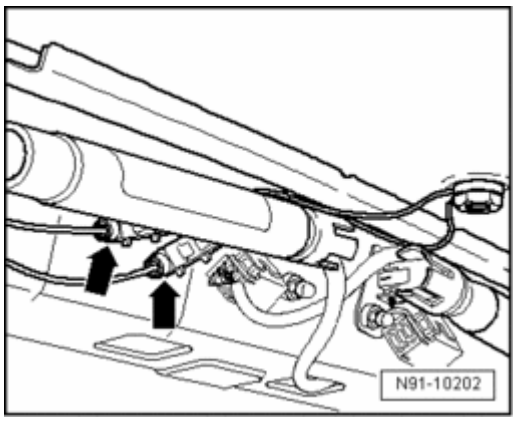
⇒ *Repair Manual, Body Interior, Repair Group 70,*

.

- Remove both rear interior grab handles as applicable.
- Carefully lower molded headliner slightly in rear area.



- Remove nut **- 2 -** .



- Disconnect electrical connections **- arrows -** .

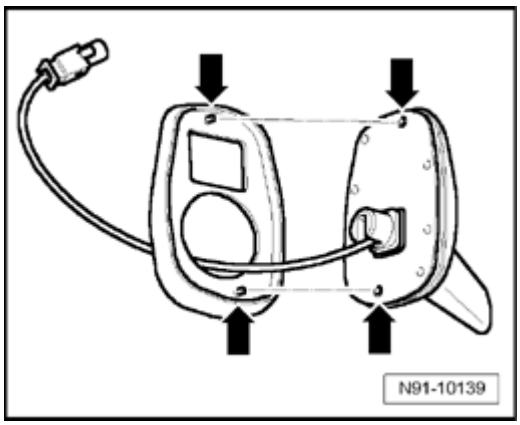
Note:

- *Depending on antenna and market version, there may be additional electrical connections.*

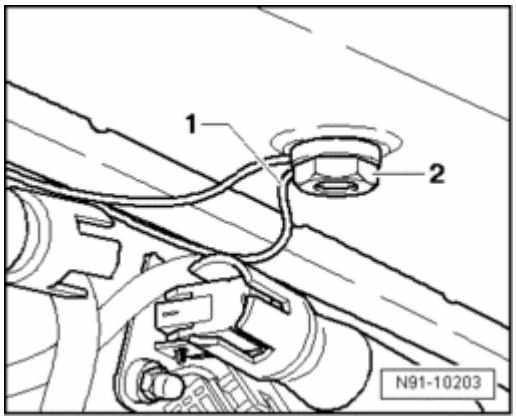
Installing

Install in reverse order of removal, noting the following:

Note:



- *When installing roof antenna, ensure seal is seated properly. Both guide tabs of seal must align with holes* ***- arrows -*** *in antenna base.*



- *When inserting roof antenna, make sure antenna wires* ***- 1 -*** *are routed correctly through the wire pass-through in mounting nut* ***- 2 -*** *.*

Antenna cables and connectors, replacing

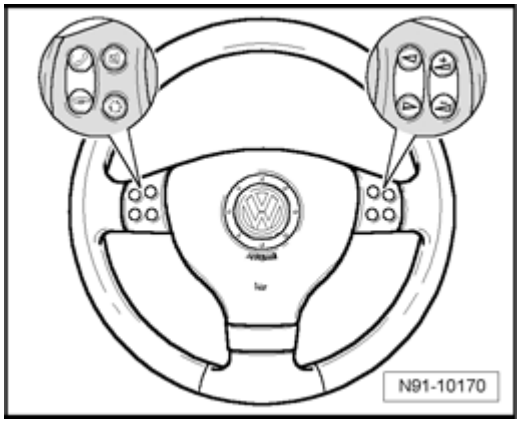
Detailed instructions for antenna cable/connector replacement

⇒ *Repair Manual, Electrical Equipment, Repair Group 97, Antenna cables and connectors, replacing*

.

Multi-Function Steering Wheel

General information



The multi-function steering wheel allows some functions of the Communication system to be operated from the steering wheel.

The control module for the multi-function steering wheel communicates only with the control module for steering column electronics where digital commands are prepared for system communications using the Convenience and Powertrain CAN Bus networks.

The multi-function steering wheel includes the following components:

- Operating unit with two sets of key pads and integrated electronics.
- A control module for the multi-function steering wheel.

Before troubleshooting or servicing, technicians must be familiar with the functions and operation specifics of the Multi-function Steering Wheel. Always read the owners manual and review applicable system functions.

Note:

- *Additional information:*

⇒ *Owners Manual*

⇒ *Self Study Program - Course Number 892503 "The 2006 new GTI Introduction"*

⇒ *Wiring Diagrams Component Locations*

Caution!

When disconnecting and reconnecting battery terminals, observe all applicable Notes and torque specifications, as well as instructions on performing OBD program and electrical system function checks as specified in

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting and reconnecting***

.

On Board Diagnostic (OBD), functions

Multi-function Steering Wheel Control Module has On Board Diagnostic (OBD) capability. If malfunctions occur in monitored components, Diagnostic Trouble Codes (DTC) will be stored in memory.

Troubleshoot Multi-function Steering Wheel Control Module malfunctions by performing OBD program using Vehicle Diagnosis, Testing and Information System VAS 5051/5052 in operating mode "Guided Fault Finding" .

Multi-function Buttons (on steering wheel) E440 E441, removing and installing, removing and installing

Removal and installation of left and right buttons is identical.

Removing:

Warning!

- ***Special safety precautions apply to vehicles equipped with airbags***

  ⇒ ***Repair Manual, Body Interior, Repair Group 69, Safety precautions***

  .

- ***Electrostatically discharge yourself before working on the airbag unit. This can be accomplished by touching an grounded metal object such as a water pipe, heater pipe or metal***

support.

Caution!

Before beginning repairs on electrical system

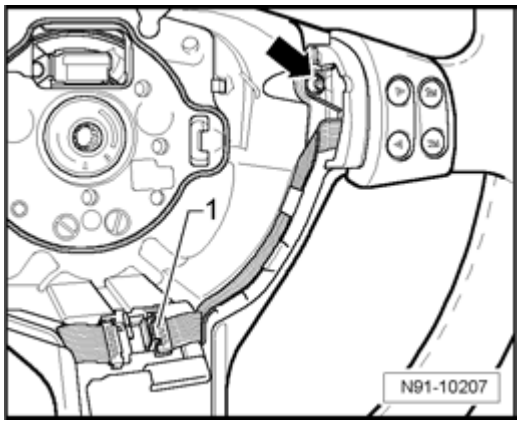
- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***
- ***Disconnect battery***

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting***

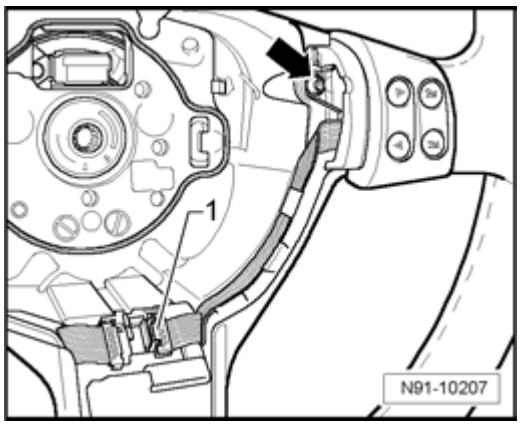
.

- Remove drivers airbag

⇒ *Repair Manual, Body Interior, Repair Group 69,*



- Disconnect electrical connection **- 1 -** .



- Remove screw **- arrow -** .
- Remove button block.

Installing:

Install in reverse order of removal.

Control Module in Steering Wheel E221 / Steering Column Electronic Systems Control Module J527 , removing and installing

Removing:

Warning!

- ***Special safety precautions apply to vehicles equipped with airbags***

  ⇒ ***Repair Manual, Body Interior, Repair Group 69, Safety precautions***

  .

- ***Electrostatically discharge yourself before working on the airbag unit. This can be accomplished by touching an grounded metal object such as a water pipe, heater pipe or metal support.***

Caution!

- ***Switch off all electrical consumers.***
- ***Switch ignition off and remove ignition key.***

- ***Disconnect negative (-) battery terminal***

  ⇒ ***Repair Manual, Electrical Equipment, Repair Group 27, Battery, disconnecting***

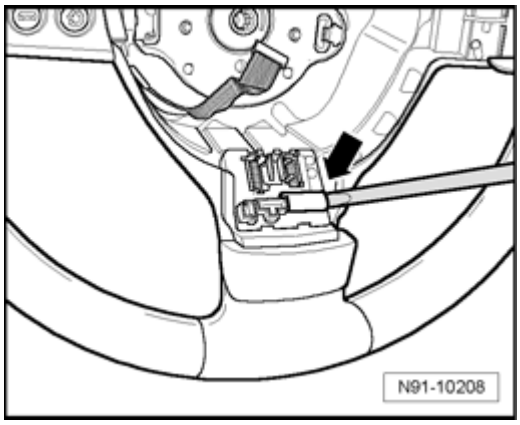
  .

- Remove drivers airbag

⇒ *Repair Manual, Body Interior, Repair Group 69,*

.

- Disconnect both electrical connections at control module.



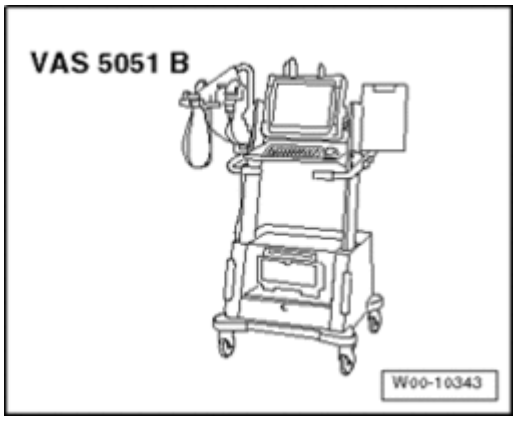
- Using a suitable screwdriver, carefully pry out the control module **- arrow -** .

Installing:

Install in reverse order of removal.

- Code control module ⇒ 91-10, Multi-Function Steering Wheel, adapting components .

Multi-Function Steering Wheel, adapting components



Special tools, testers and auxiliary items required

- Diagnostic Operation System VAS 5051/5052 (VAS 5051B shown as example only)
- Diagnostic cable VAS 5051/5a or VAS 5051/6a or VAS 5052/3

Select "Guided Functions" in Diagnostic Operation System VAS 5051/5052 or Vehicle Diagnosis and Service System VAS 5052 .

or

Select "Guided Fault Finding" in Vehicle Diagnosis, Testing and Information System VAS 5051/5052 or Vehicle Diagnosis and Service Information System VAS 5052 .

After all control modules have been checked:

- Press "Go to" button.
- Select "Function/component selection" .
- Select "Body" .
- Select "Electrical Equipment" .
- Select "01 - On Board Diagnostic (OBD) capable systems" .
- Select "steering column electronics" .
- Select "Code control module function" .

Mobile Telephone and Two-Way Radio Operation

General information

Cellular phones and portable two-way radios may not be used in the vehicle without a separate external antenna.

- Radio remote controls (e.g. for garage door opener) and wireless units (e.g. keyboard or PC mouse) may only be used in the vehicle if the transmitted output is max. 100mW.
- Installation of "e-marked units" is only permitted (Europe only).
- Cellular phones or other retrofitted two-way units (business equipment) must have "CE mark" (Europe only).
- It is absolutely necessary to observe the manufacturers operating and installation instructions for cellular telephones, two-way radios and antennas.
- The optimum unit range is only reached via an external antenna.
- When telephone and two-way radio systems are installed properly there is no danger to safety system e.g. ABS or airbag. A prerequisite is however that there has been no intervention in their installations. Parallel wiring to such systems must be prevented.
- The use of cellular telephones or two-way radios without or with an incorrectly installed external antenna results in increased electromagnetic fields in the vehicle interior.
- By the use of magnetically adhered antennae on vehicle roof, there is the hazard that the navigation system will malfunction due to magnetic influence and remaining magnetization of the vehicle roof. For complaints of inaccurate or faulty navigation system, ask the customer whether a magnetically adhered

antenna is being used before starting repair work.

In this case, detrimental affects to health or malfunctions of vehicle electronics could be the consequence.

Installation and operation of two-way radios with a transmitted output above 10 watts for the radio communication services listed in the table is only permitted regarding the following prerequisites:

- The transmitted output on antenna base (see manufacturers designations) must not exceed the relevant max. values.

- Antenna locations listed in the table must be maintained.

Transmitted output and antenna fitting locations table, ⇒ 91-11, Transmitted output and antenna installation locations

Performing repairs, notes

Before starting repair work, batteries must be disconnected

⇒ ***Repair Manual, Electrical Equipment, Repair Group 27,***

Use valid current wiring diagram. ⇒ *Electrical Wiring Diagrams, Troubleshooting and Component Locations binder* .

For removing and installing trim, Repair Manual Body Interior or Repair Manual Body Exterior.

Observe manufacturers operating and installation instructions for cellular telephones, two-way radios and antennas.

Secure wiring harnesses to cable ties. Wrap connectors with foam to avoid rattling noises.

Transmitted output and possible installation locations

Volkswagen permits the installation and operation of radio systems, as long as the transmitted power on antenna base, listed in table, is not exceeded. For prescribed antenna locations see table.

Limit according to VDE 0848, part 2 (max. permissible field intensity to protect persons) must be maintained even, if necessary, through reduction of transmission output.

Voltage supply

When retrofitting transmitter/receiver unit in the vehicle, the battery is used to connect the positive and negative wire.

The wiring harness must be manufactured additionally:

- Voltage supply positive via read wire, 2.5 mm ^{2} cross section
- Voltage supply negative via brown wire, 2.5 mm ^{2} cross section

The positive wire must have a fuse which must be located very close to the battery. Therefore, a fuse holder must be secured next to battery. Both wires must be encased in an insulating hose.

suitable connections must be attached on battery side.

Proceed on unit side according to operating instructions.

The additional wiring harness must be routed separately from vehicle wiring, distance must be at least 10 cm.

Note:

- *For some telephone systems and radio communication units an additional terminal 15 (ignition) is necessary. Then, a black wire connection of 1.5 mm ^{2} cross section must be connected from transmitter/receiver unit to terminal 15a. ⇒ Electrical Wiring Diagrams, Troubleshooting and Component Locations binder*
- *When installing, make sure wiring connections are not routed parallel to standard wiring.*

Antenna and antenna wiring

A shielded wire must be used between transmitter/receiver unit and antenna. Shielding must be grounded to unit and antenna.

At the same time, make sure Ground (GND) connection of antenna base wire to vehicle body is correct and continuous.

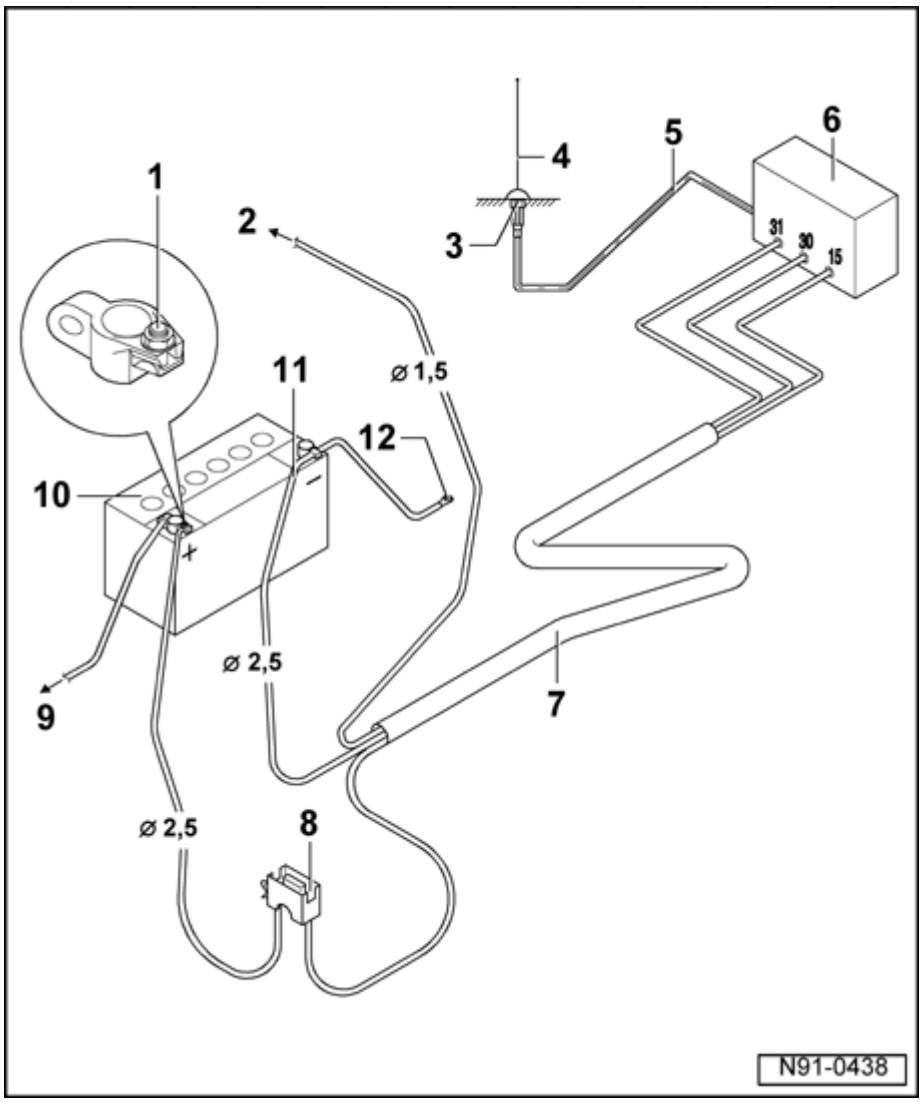
The transmitting system must only be used when shielded to avoid interference in antenna wiring. To be sure, system must be checked and tuned via performance test.

Other auxiliary installations

The installation of further electronic equipment like business equipment (e.g., TV, FAX) or household equipment (e.g. electrical cool box) is only permitted if these appliances are marked with a CE or e-sign (Europe only).

Voltage supply must also be routed via separate wiring set and secured by fuse.

Battery, transmitter/receiver unit, fuse and wiring harness, overview



1 - Positive connection

- red wire with suitable connection

2 - to terminal 15a

- connection to terminal 15a: ⇒ *Electrical Wiring Diagrams, Troubleshooting and Component Locations binder*
- ensure wire is protected by fuse
- Fuse max. 15A

3 - Antenna Ground (GND)

- ensure correct Ground (GND) connection to body
- Antenna location must be treated with suitable corrosion protection

4 - Transmitting/Receiving Antenna

- Component locations: Table page ⇒ 91-11, Transmitted output and antenna installation locations

5 - Shielded antenna wire

- Wire with coaxial connector

6 - Telephone or two-way radio transmitter/receiver unit

7 - Wiring harness

- Voltage supply positive via read wire, 2.5 mm ^{2} cross section
- Voltage supply negative via brown wire, 2.5 mm ^{2} cross section
- If necessary, wire to terminal 15a via black wire 1.5 mm ^{2} cross section

8 - Fuse holder

- Install next to battery

9 - To starter

10 - Battery

- Location in luggage compartment left and right behind side panels.

11 - Negative wire

12 - Body Ground (GND)

Transmitted output and antenna installation locations

Rabbit/GTI from 2006

Description	Pmax/Watt	Prescribed antenna installation locations
Shortwave 54 MHZ	100 (PEAK) [1)]	Front center of roof Center of roof Rear center of roof Center of rear lid Rear bumper
4 m-Band	20 (eff.) [2)]	all locations on vehicle exterior
2 m-Band	20 (eff.)	Front fender Front center of roof
2 m-Band	50 (eff.)	Center of roof Rear center of roof Center of rear lid
70 cm	50 (eff.)	Front center of roof Center of roof Rear center of roof Center of rear lid
23 cm	20 (eff.)	all locations on vehicle exterior
TETRA/ TETRAPOL	25 (eff.)	all locations on vehicle exterior
D-net GSM 900	20 (Peak)	all locations on vehicle exterior
E-net GSM 1800 GSM 1900 UMTS	10 (Peak)	all locations on vehicle exterior

1) PEAK = max. carrier power (Peak Envelope Power)

2) eff. = effective transmission output

Note:

- *Deviations from these guidelines (location of antenna, frequency, output) are only permitted in special isolated cases after a single-case test carried out by the EMV center of VW AG in Wolfsburg.*

- *EMV = Electromagnetic Compatibility*

Interference Suppression

Interference suppression

All standard and optional electrical consumers in the vehicle are shielded.

This includes all sensors, actuators and all electric motors as well as controllers in control modules, which may cause high-frequency interference.

For interference suppression, electrical parts e.g. capacitors, coils and diodes are installed directly in the electrical components.

There are also components for interference suppression installed in electrical connection housings of the electrical consumers.

The Ground (GND) wires used previously for purposes of interference suppression are no longer installed, since interference suppression measures are implement as near as possible to the interference sources.