



Workshop Manual

e-up! 2017 ➤

e-up! 2020 ➤

up! 2017 ➤

up! 2020 ➤

Communication

Edition 10.2019





List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

91 - Communication

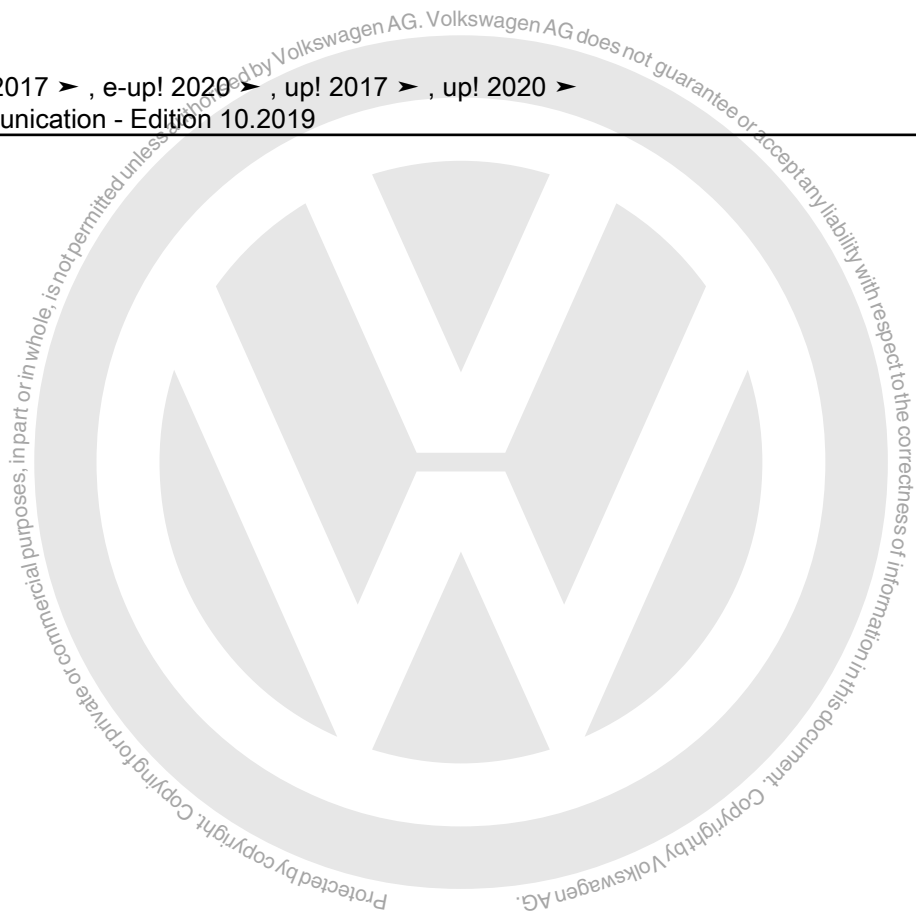


Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.



Contents

00 - Technical data	1
1 Notes on operating mobile telephones and two-way radios	1
1.1 General information	1
1.2 Notes on performing repair work	2
1.3 Overview of battery, transmitter and receiver unit, fuse and wiring harness	3
1.4 Transmitting power and aerial fitting locations	5
2 Suppression measures	6
2.1 Implementation of suppression measures	6
91 - Communication	7
1 Radio / radio navigation systems	8
1.1 Components of radio/radio navigation systems	8
1.2 Overview of fitting locations - radio/radio navigation systems	11
1.3 Removing and installing radio and radio/navigation systems	12
2 Multifunction steering wheel	15
2.1 Components of multifunction steering wheel	15
2.2 Assembly overview - multifunction steering wheel	15
2.3 Removing and installing steering wheel multifunction buttons E441 / E440	16
2.4 Removing and installing Tiptronic switch in steering wheel E439 / E438	19
3 Sound system	21
3.1 Overview of fitting locations - sound system	21
3.2 Removing and installing front bass loudspeakers	23
3.3 Removing and installing rear bass loudspeakers	24
3.4 Removing and installing front treble loudspeakers	25
3.5 Removing and installing subwoofer R211	25
3.6 Removing and installing digital sound package control unit/amplifier	26
4 Aerial systems	28
4.1 General information	28
4.2 Overview of fitting locations - aerial systems	28
4.3 Removing and installing roof aerial	29
4.4 Removing and installing aerial amplifier	30
4.5 Repairing aerial wires	31
5 Reversing camera system	32
5.1 Components of reversing camera system	32
5.2 Overview of fitting locations - reversing camera system	32
5.3 Removing and installing reversing camera R189	33
6 Car-Net	35
6.1 General information	35
6.2 Overview of fitting locations - Car-Net services	35
6.3 Removing and installing emergency call module control unit and communication unit J949	36
6.4 Renewing control unit for emergency call module and communication unit J949	36





00 – Technical data

1 Notes on operating mobile telephones and two-way radios

(VRL013533; Edition 10.2019)

⇒ [“1.1 General information”, page 1](#)

⇒ [“1.2 Notes on performing repair work”, page 2](#)

⇒ [“1.3 Overview of battery, transmitter and receiver unit, fuse and wiring harness”, page 3](#)

⇒ [“1.4 Transmitting power and aerial fitting locations”, page 5](#)

1.1 General information

⇒ [“1.1.1 Mobile telephones or portable two-way radios may not be used in the vehicle without a separate external aerial”, page 1](#)

⇒ [“1.1.2 The installation and operation of two-way radios with a transmitting power above 10 watts for the radio communication services listed in the table are permitted only under the following conditions:”, page 1](#)

1.1.1 Mobile telephones or portable two-way radios may not be used in the vehicle without a separate external aerial

- ◆ Remote controls (e.g. for garage door opener) and cordless units (e.g. keyboard or PC mouse) may only be used in the vehicle if the transmitted output is max. 100 mW.
- ◆ An “e identification” is required for mobile two-way radios (applies for Europe only).
- ◆ Mobile telephones or other transmitting equipment (business equipment) which are not original vehicle equipment parts must have “CE identification” (applies to Europe only).
- ◆ It is absolutely necessary to observe the manufacturer's operating and installation instructions for mobile telephones, two-way radios and aerials.
- ◆ The optimum unit range can be attained only by using an external aerial.
- ◆ When telephone and two-way radio systems are properly installed, there is no danger to safety systems like, for example, ABS or airbags. However, it is a prerequisite that there has been no modification of their installation. Routing wiring parallel to such systems must be avoided.
- ◆ When mobile telephones or two-way radios are used, excessive electromagnetic fields may occur in the vehicle interior whether or not the external aerial has been properly installed.

In this case, detrimental effects to health as well as malfunctions of vehicle electronics cannot be ruled out.

1.1.2 The installation and operation of two-way radios with a transmitting power above 10 watts for the radio communication services listed in the table are



permitted only under the following conditions:

- The transmitting power at the point of the aerial base (see unit manufacturer's specifications) must not exceed the relevant maximum values.
- No deviation from aerial locations listed in the table is permitted.

Transmitting power and aerial fitting locations table

⇒ [page 5](#) .

1.2 Notes on performing repair work

⇒ ["1.2.1 Transmitting power and possible fitting locations", page 2](#)

⇒ ["1.2.2 Voltage supply", page 2](#)

⇒ ["1.2.3 Aerial and aerial wiring", page 3](#)

⇒ ["1.2.4 Further additional installations", page 3](#)

Batteries must be disconnected before repair work is begun! ⇒ Electrical system; Repair Group 27; Starter, current supply; Battery; Disconnecting and reconnecting batteries

Use valid current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

For removing and installing trims ⇒ workshop manuals General body repairs, interior or ⇒ General body repairs, exterior.

Observe manufacturer's operating and installation instructions for mobile telephones, two-way radios and aerials.

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

1.2.1 Transmitting power and possible fitting locations

Volkswagen permits the installation and operation of radio transmitter units if the transmitted power at the point of the aerial base listed in the table is not exceeded. Prescribed aerial fitting locations can also be found in the table.

The limits according to VDE 0848 part 2 (maximum permitted radiation strength for human safety) must be adhered to, if necessary by reducing the transmitting power.

1.2.2 Voltage supply

If a transceiver is retrofitted in the vehicle, the battery is used to connect the positive and negative wires.

In addition, the wiring harness must be manufactured:

- ◆ Positive voltage supply via a red wire with 2.5 mm² cross section.
- ◆ Negative voltage supply via a brown wire with 2.5 mm² cross section.

The positive wire must have a fuse located in the immediate vicinity of the battery. For this purpose, a fuse holder must be secured next to the battery. Both wires must be enclosed in an insulating sleeve.

Appropriate connections must be attached to wires on the battery side.



Proceed according to unit's operating instructions on side of unit.

The additional wiring must be routed separately from vehicle wiring, and a distance of at least 10 cm must be maintained.



Note

- ◆ *Some telephone systems and two-way radios require an additional terminal 15 (ignition). In this case, a black wire with 1.5 mm² cross section must be routed from the transceiver to terminal 15a. → Current flow diagrams, Electrical fault finding and Fitting locations*
- ◆ *When laying the wiring, ensure that wiring is not routed parallel to factory wiring.*

1.2.3 Aerial and aerial wiring

A shielded wire must be used between the transceiver and the aerial. The shield must contact both the unit and the aerial.

At the same time, ensure a good and continuous earth connection between the aerial base point cable and the vehicle body.

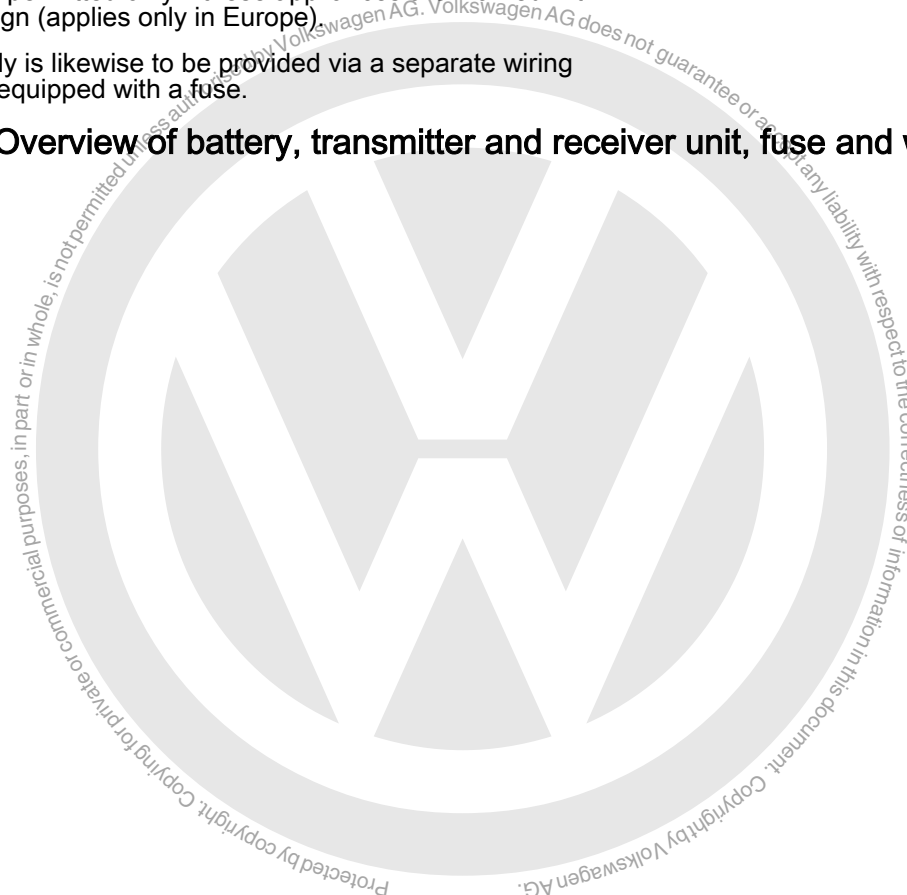
The transmitter must be used only when all components are properly matched with each other to prevent interference in the aerial wiring. To be sure, perform an output test to check and to match the system.

1.2.4 Further additional installations

The installation of additional electronic devices such as business equipment (e.g. TV, fax) or household equipment (e.g. electric cooler box) is permitted only if these appliances are marked with a CE or "e" sign (applies only in Europe).

Voltage supply is likewise to be provided via a separate wiring harness and equipped with a fuse.

1.3 Overview of battery, transmitter and receiver unit, fuse and wiring harness





1 - Positive connection

- ❑ Red wire with appropriate connection

2 - To terminal 15a

- ❑ Connection to terminal 15a: ➔ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Ensure that this wire is protected by a fuse.
- ❑ Fuse maximum 15 A

3 - Aerial earth

- ❑ Ensure good earth connection to body.
- ❑ Treat fitting location of aerial with appropriate corrosion protection.

4 - Transmitter and receiver aerial

- ❑ Fitting locations ➔ Table on page ➔ [page 5](#)

5 - Shielded aerial cable

- ❑ Cable with coaxial connector

6 - Telephone or 2-way radio transceiver

7 - Wiring harness

- ❑ Positive voltage supply via a red wire with 2.5 mm² cross section.
- ❑ Negative voltage supply via a brown wire with 2.5 mm² cross section.
- ❑ If necessary, black wire with 1.5 mm² cross section to terminal 15a.

8 - Fuse holder

- ❑ Install in immediate vicinity of battery

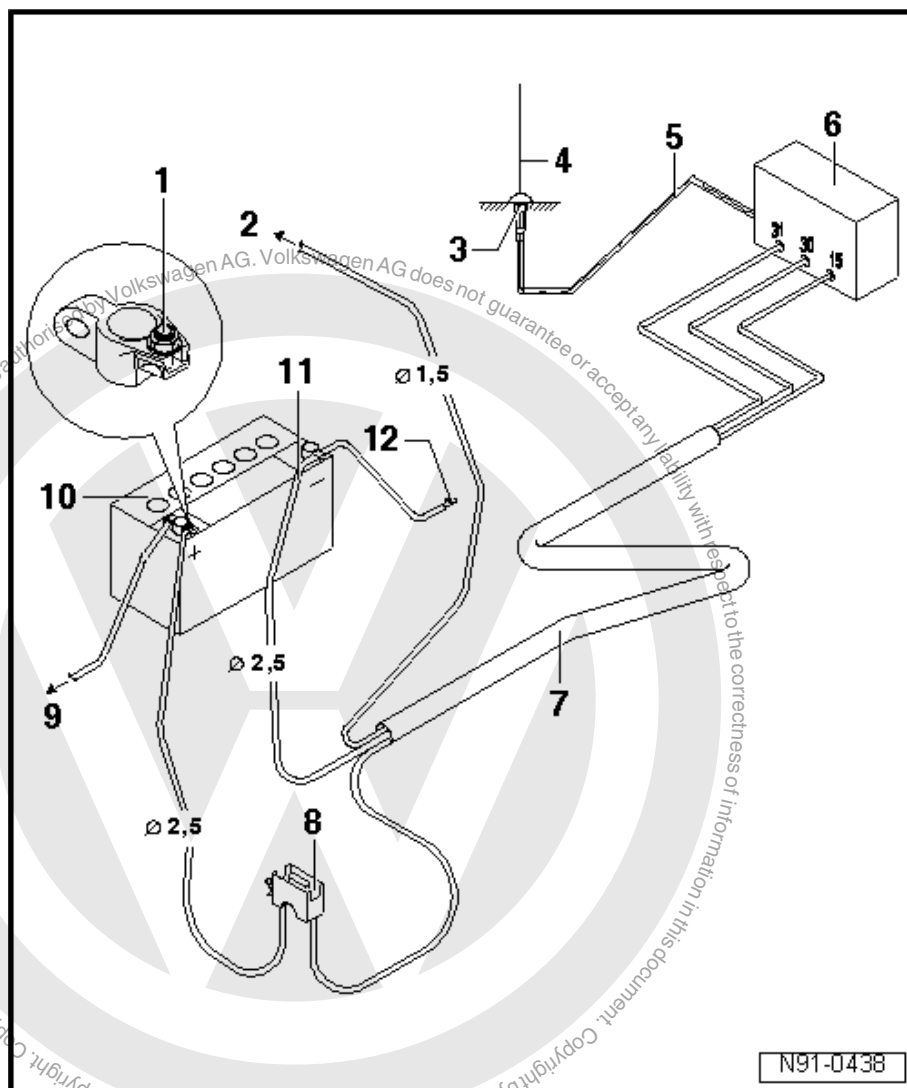
9 - To starter

10 - Battery

- ❑ Fitting location in engine compartment

11 - Negative wire

12 - Body earth





1.4 Transmitting power and aerial fitting locations

⇒ "1.4.1 Up➤", page 5

1.4.1 Up➤



Note

Installation of aerials on bumpers is now prohibited by law. This improves pedestrian protection during accidents.

Designation	Pmax (watts)	Prescribed aerial fitting locations
Short wave < 54 MHz	100 (Peak) ¹⁾	All locations on roof
4 m frequency band	20 (effective) ²⁾	All locations on vehicle exterior
2 m frequency band	20 (effective)	Front wing Front centre of roof Centre of roof Rear centre of roof
2 m frequency band	50 (effective)	Centre of roof Rear centre of roof
70 cm	50 (effective)	Front centre of roof Centre of roof Rear centre of roof
23 cm	20 (effective)	All locations on vehicle exterior
TETRA/ TETRAPOL	25 (effective)	All locations on vehicle exterior
D network GSM 900	20 (Peak)	All locations on vehicle exterior
E network GSM 1800 GSM 1900 UMTS	10 (Peak)	All locations on vehicle exterior

1) PEAK = peak envelope power (max. carrier power)

2) effective = effective transmitting power



Note

- ◆ *Deviations from these specifications (aerial fitting location, frequency, power) are permitted only in specially justified exceptions following a single-case test performed by the EMC Centre of the VW AG in Wolfsburg*
- ◆ *EMC = electromagnetic compatibility*



2 Suppression measures

⇒ **"2.1 Implementation of suppression measures", page 6**

2.1 Implementation of suppression measures

All electrical consumers in the vehicle are individually suppressed at factory.

This includes sensors, actuators and electric motors. As well as the controller in the control unit, these can cause high-frequency interference.

To suppress interference, electrical components such as capacitors, coils and diodes are installed directly in the electrical components.

Interference-suppressing components are also installed in the connector housings of electrical consumers.

The earth cables formerly employed to suppress interference are no longer used because interference suppression measures must be applied as close as possible to the sources of interference.



91 – Communication





1 Radio / radio navigation systems

⇒ [“1.1 Components of radio/radio navigation systems”, page 8](#)

⇒ [“1.2 Overview of fitting locations - radio/radio navigation systems”, page 11](#)

⇒ [“1.3 Removing and installing radio and radio/navigation systems”, page 12](#)

1.1 Components of radio/radio navigation systems

⇒ [“1.1.2 Composition Phone radio system”, page 10](#)

⇒ [“1.1.1 Composition radio system”, page 8](#)

1.1.1 “Composition” radio system

View of “Composition” radio system

The “Composition” radio system consists of the radio and the loudspeakers. For further information, refer to the chapter entitled Sound system ⇒ [page 21](#)

◆ “Composition” features ⇒ [page 8](#)

◆ Anti-theft coding ⇒ [page 9](#)



Note

- ◆ *When faced with complaints, it is absolutely necessary to understand the function and the operation of the radio.*
- ◆ *Additional information ⇒ Operating manual*
- ◆ *The anti-theft coding uses a fixed code ⇒ [page 9](#).*
- ◆ *In the event of repair work or for fault finding, use the vehicle diagnostic tester in “Guided fault finding” or “Guided functions” mode.*
- ◆ *⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *When the battery is reconnected, check operation of electrical equipment (radio, clock, convenience electronics etc.) according to the workshop manual and/or operating manual.*



“Composition” features

The “Composition” radio has the following features:

- ◆ Display: monochrome
- ◆ FM simple tuner
- ◆ CD drive
- ◆ Universal preparation for mobile telephone (UTP) - Low (mono input)
- ◆ Mp3 with ID3 tag
- ◆ FM/AM European radio
- ◆ 2 or 4 x 20 watt output power
- ◆ AUX-IN connection
- ◆ External CD changer connection without mp3
- ◆ Support for multifunction steering wheel



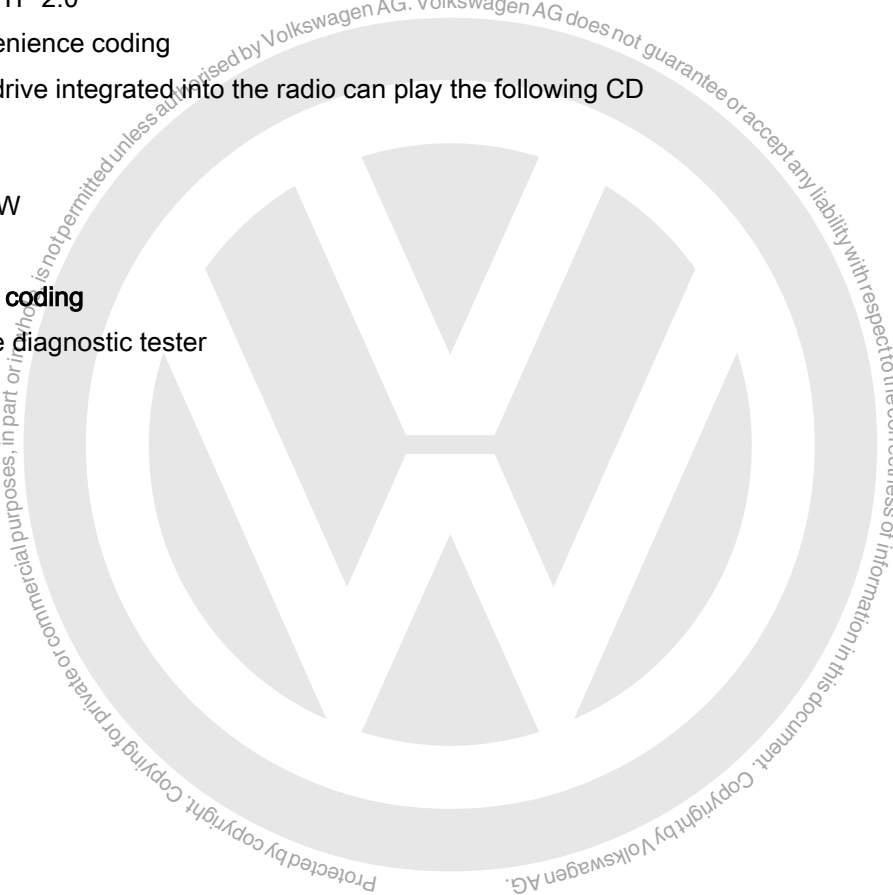
- ◆ Speed-dependent volume control (GALA)
- ◆ Self-diagnosis, including loudspeaker diagnosis
- ◆ CAN, TP 2.0
- ◆ Convenience coding

The CD drive integrated into the radio can play the following CD formats:

- ◆ CD-R
- ◆ CD-RW
- ◆ mp3

Anti-theft coding

⇒ Vehicle diagnostic tester





1.1.2 “Composition Phone” radio system

View of “Composition Phone” radio system

The “Composition Phone” radio system consists of the radio and the loudspeakers. For further information, refer to the chapter entitled Sound system ➔ [page 21](#)

- ◆ “Composition Phone” features ➔ [page 10](#)
- ◆ Anti-theft coding ➔ [page 10](#) .



Note

- ◆ *When faced with complaints, it is absolutely necessary to understand the function and the operation of the radio.*
- ◆ *Additional information ➔ Operating manual*
- ◆ *The anti-theft coding uses a fixed code ➔ [page 10](#) .*
- ◆ *In the event of repair work or for fault finding, use the vehicle diagnostic tester in “Guided fault finding” or “Guided functions” mode.*
- ◆ *➔ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *When the battery is reconnected, check operation of electrical equipment (radio, clock, convenience electronics etc.) according to the workshop manual and/or operating manual.*



“Composition Phone” features

The “Composition Phone” radio has the following features:

- ◆ Colour display
- ◆ Bluetooth
- ◆ AUX IN on front of unit via jack connector
- ◆ SD memory card reader
- ◆ MP3 play function
- ◆ TV tuner
- ◆ Universal preparation for mobile telephone (UTP) - Low (mono input)
- ◆ FM/AM European radio
- ◆ 2 or 4 x 20 watt output power
- ◆ Support for multifunction steering wheel
- ◆ Speed-dependent volume control (GALA)
- ◆ Self-diagnosis, including loudspeaker diagnosis
- ◆ CAN, TP 2.0
- ◆ Convenience coding

Anti-theft coding

➔ Vehicle diagnostic tester



1.2 Overview of fitting locations - radio/radio navigation systems

⇒ **"1.2.1 Overview of fitting locations - radio systems", page 11**

1.2.1 Overview of fitting locations - "radio systems"

1 - Front right treble loudspeaker - R22-

- ☐ Installed in A-pillar trim on right
- ☐ For further information, refer to chapter entitled Sound system ⇒ [page 21](#)

2 - Front right bass loudspeaker - R23-

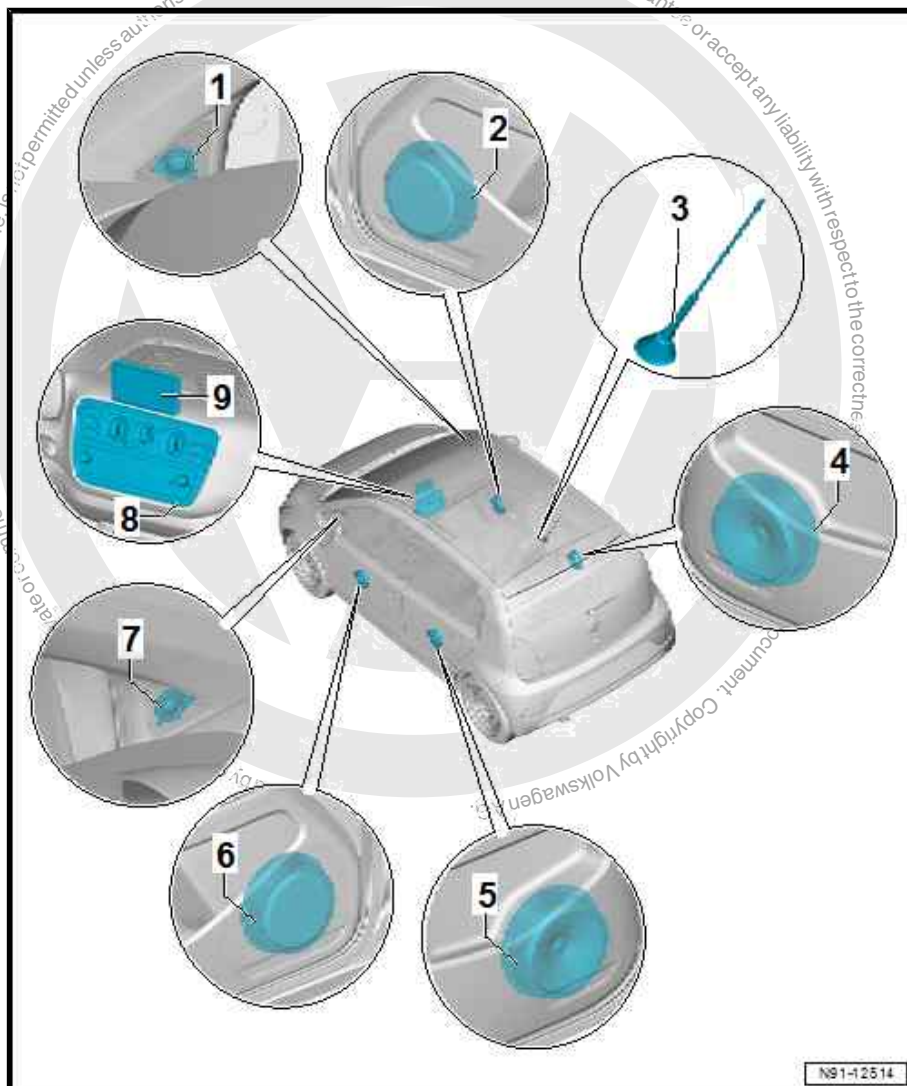
- ☐ Installed in right door
- ☐ Mid-range sounds are handled by the bass and treble loudspeakers.
- ☐ For further information, refer to chapter entitled Sound system ⇒ [page 21](#)

3 - Aerial - R11-

- ☐ Installed as a simple short-rod aerial on the roof at the rear
- ☐ For further information, refer to chapter Aerial systems ⇒ [page 28](#)

4 - Bass loudspeaker, rear right - R17-

- ☐ Installed in right side panel trim in passenger compartment.
- ☐ Mid-range sounds are handled by the bass and treble loudspeakers.
- ☐ For further information, refer to chapter entitled Sound system ⇒ [page 21](#)



5 - Bass loudspeaker, rear left - R15-

- ☐ Installed in left side panel trim in passenger compartment
- ☐ Mid-range sounds are handled by the bass and treble loudspeakers.
- ☐ For further information, refer to chapter entitled Sound system ⇒ [page 21](#)

6 - Front left bass loudspeaker - R21-

- ☐ Installed in left door
- ☐ Mid-range sounds are handled by the bass and treble loudspeakers.
- ☐ For further information, refer to chapter entitled Sound system ⇒ [page 21](#)

7 - Front left treble loudspeaker - R20-

- ☐ Installed in A-pillar trim on left.
- ☐ For further information, refer to chapter entitled Sound system ⇒ [page 21](#)



8 - Radio - R-

- ☐ Composition Phone
- ☐ Removing and installing ⇒ [page 12](#)
- ☐ Overview of connectors
- ☐ Anti-theft coding

9 - Maps and More Dock

- ☐ The portable navigation system has been discontinued. The functions are controlled via a smartphone app.

1.3 Removing and installing radio and radio/navigation systems

⇒ ["1.3.1 Removing and installing radio", page 12](#)

1.3.1 Removing and installing radio

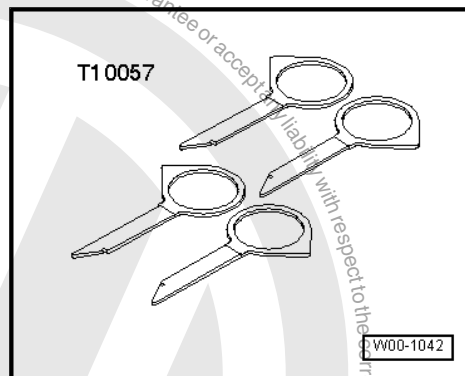


Note

Removal is the same for all equipment.

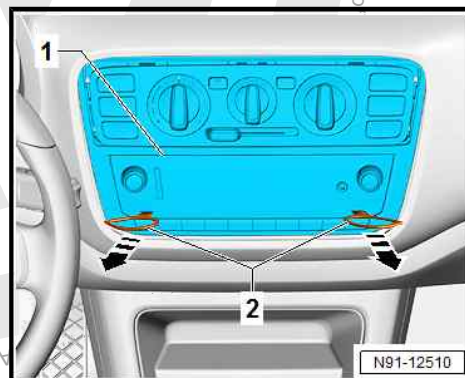
Special tools and workshop equipment required

- ◆ Radio release tool - T10057-



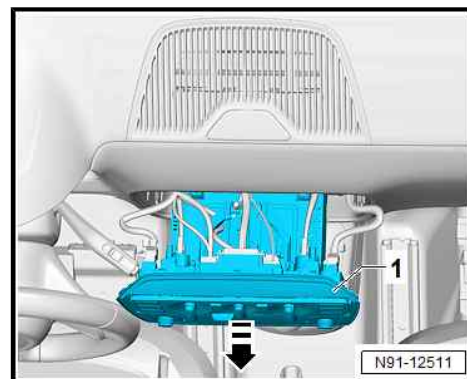
Removal (with Climatronic):

- Insert radio release tools - T10057- into openings provided -arrows- until they engage.





- Pull out entire radio unit.
- Remove air conditioner controls ⇒ Air conditioning system; Rep. gr. 87 ; Operating and display unit .
- Remove switch module on left and right ⇒ Lights, bulbs, switches - interior; Rep. gr. 96 ; Controls; Overview of fitting locations - controls in dash panel
- Disconnect aerial wire connectors.

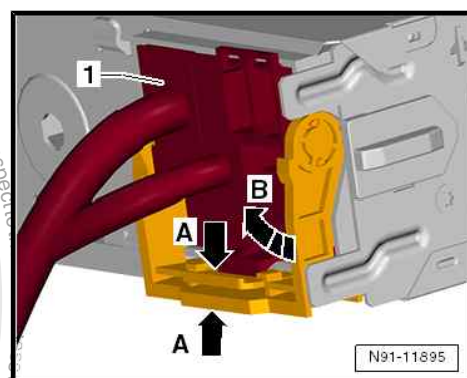


- Squeeze connector locking mechanism -A- and swivel locking latch in direction -B-.

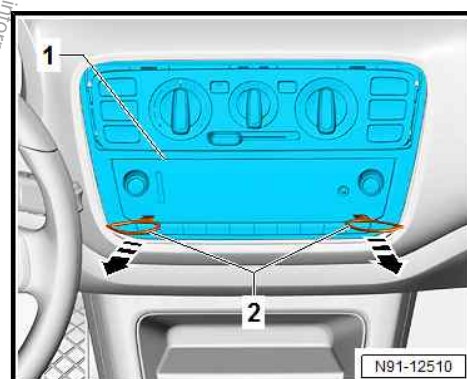
Installing (with Climatronic):

Install in reverse sequence of removal.

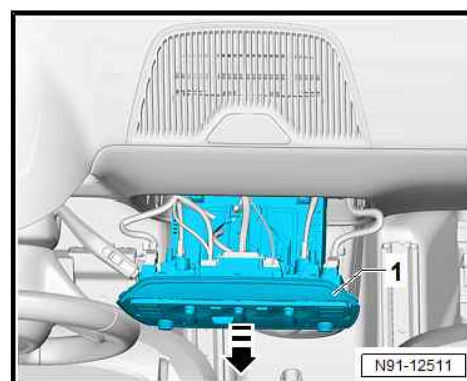
Removing (with manually operated air conditioning system):



- Insert radio release tools - T10057- into openings provided -arrows- until they engage.
- Remove air conditioner controls ⇒ Air conditioning system; Rep. gr. 87 ; Operating and display unit .
- Remove switch module on left and right ⇒ Lights, bulbs, switches - interior; Rep. gr. 96 ; Controls; Overview of fitting locations - controls in dash panel



- Pull radio out.
- Disconnect aerial wire connectors.

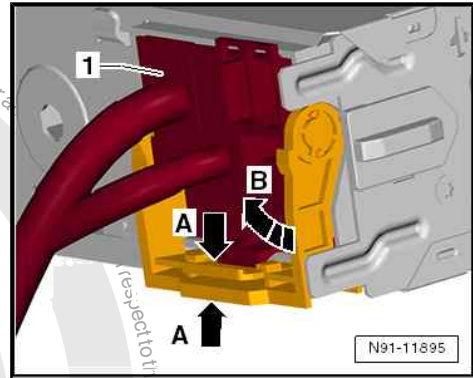




- Squeeze connector locking mechanism -A- and swivel locking latch in direction -B-.

Installing (with manually operated air conditioning system):

Install in reverse sequence of removal.





2 Multifunction steering wheel

⇒ [“2.1 Components of multifunction steering wheel”, page 15](#)

⇒ [“2.2 Assembly overview - multifunction steering wheel”, page 15](#)

⇒ [“2.3 Removing and installing steering wheel multifunction buttons E441 / E440”, page 16](#)

⇒ [“2.4 Removing and installing Tiptronic switch in steering wheel E439 / E438”, page 19](#)

2.1 Components of multifunction steering wheel

For a better usability of infotainment, telephone, navigation, cruise control system and vehicle menu, buttons are integrated in steering wheel. For Tiptronic, additional rocker switches are provided to the right and to the left.

The control unit for multifunction steering wheel - J453- (multifunction buttons on left in steering wheel - E440-) reads the button information and transfers them to control unit for steering column electronics - J527- via LIN data bus. From control unit for steering column electronics - J527- the data are transferred to the individual devices via CAN bus (comfort) and data bus diagnostic interface - J533- .

Fault finding is done via Guided fault finding ⇒ Vehicle diagnostic tester.

2.2 Assembly overview - multifunction steering wheel



1 - Tiptronic switch in steering wheel to shift down - E439-

- ❑ Removing and installing
⇒ [page 19](#)

2 - 3-spoke steering wheel

3 - Tiptronic switch in steering wheel to shift up - E438-

- ❑ Removing and installing
⇒ [page 19](#)

4 - Bolt

- ❑ 1.2 Nm

5 - Trim panel

6 - Multifunction buttons on right in steering wheel - E441-

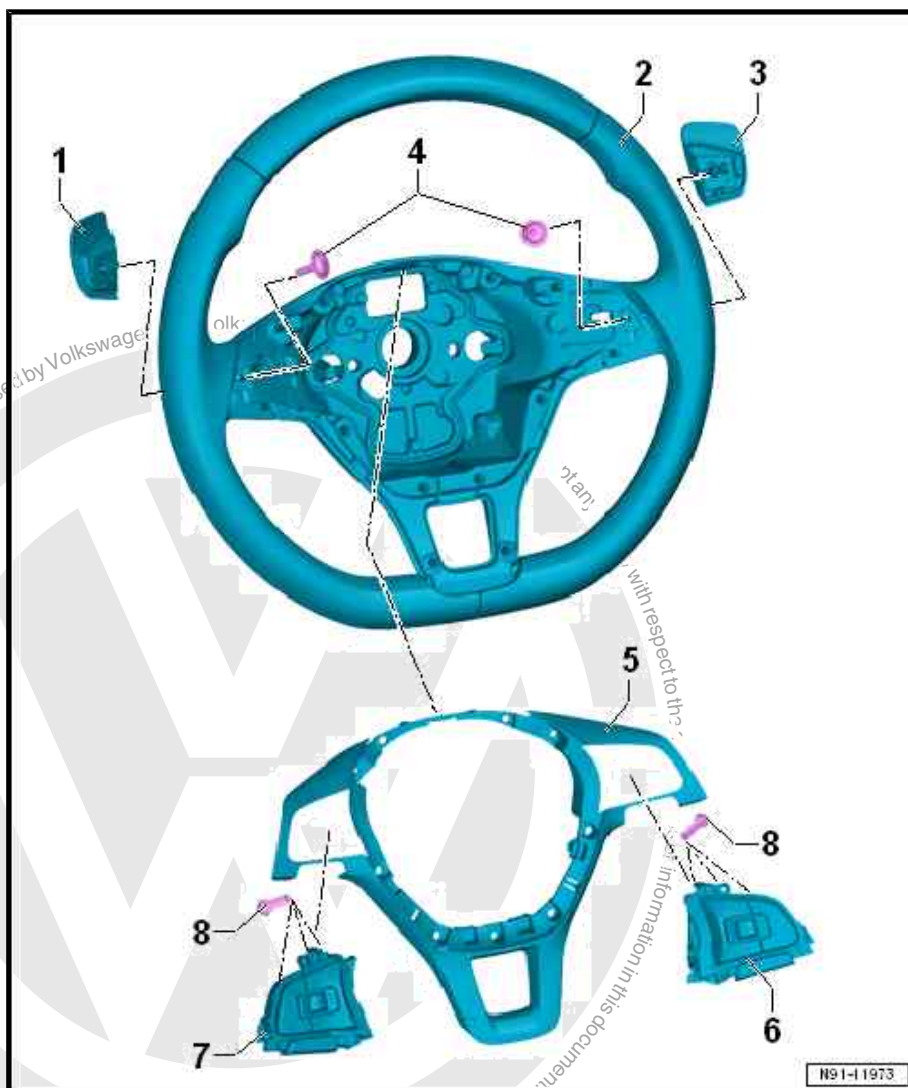
- ❑ Removing and installing
⇒ [page 16](#)

7 - Multifunction buttons on left in steering wheel - E440-

- ❑ Removing and installing
⇒ [page 16](#)

8 - Bolt

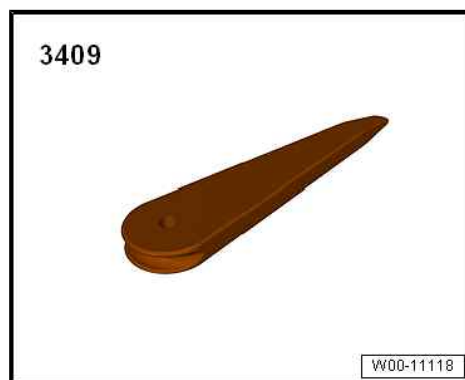
- ❑ Qty. 6



2.3 Removing and installing steering wheel multifunction buttons -E441- / -E440-

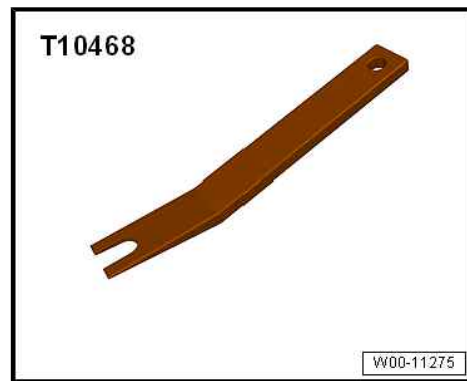
Special tools and workshop equipment required

- ◆ Removal wedge - 3409- , qty. 2

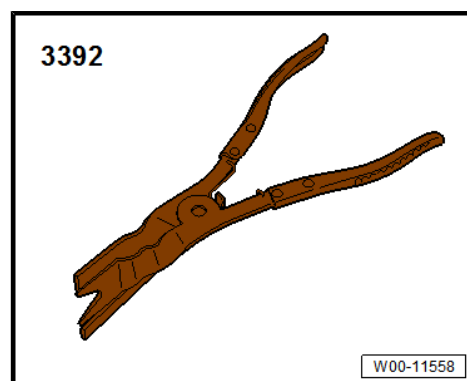




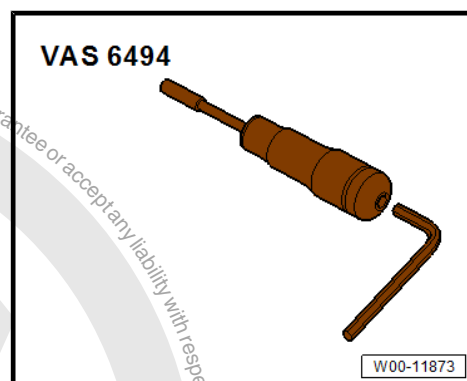
◆ Lever - T10468-



◆ Removal pliers - 3392-



◆ Torque screwdriver - VAS 6494-



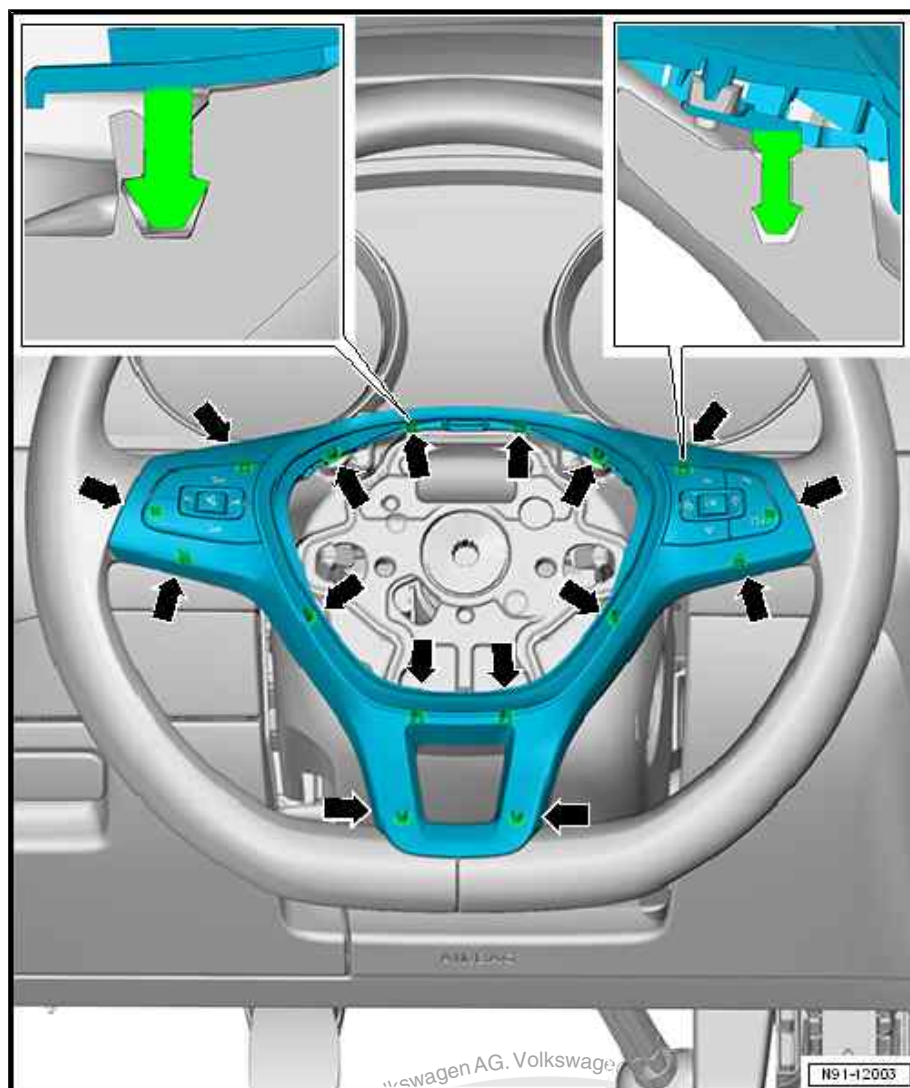
Removing



Note

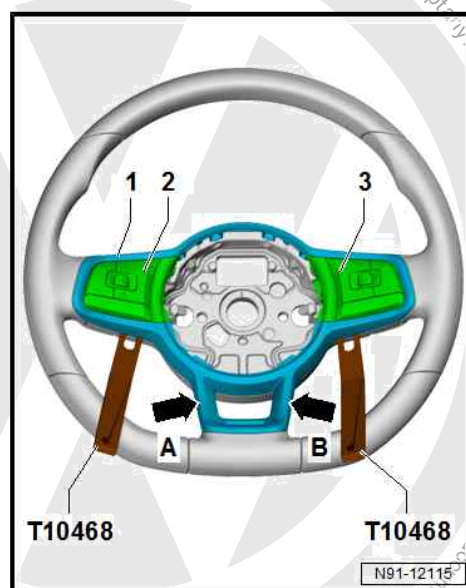
The multifunction buttons are screwed to the trim panel. The trim panel is engaged in the steering wheel together with the multifunction buttons. It is easier to remove the trim using two removal wedges - 3409-.

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove airbag on driver side ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag; Assembly overview - driver side airbag .



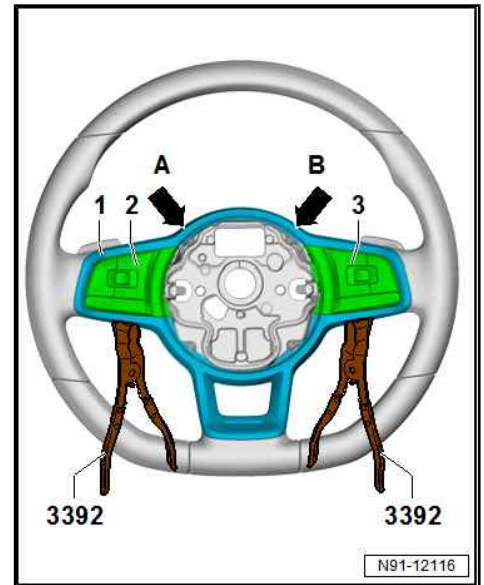
The trim is engaged in the multifunction steering wheel in areas indicated by the -arrows-.

- Using removal wedge - 3409- , release trim -1- from steering wheel in areas indicated by arrows -A- and -B-.
- Using lever - T10468- , release trim panel -1- in area of multifunction buttons on left in steering wheel - E440- -2- and multifunction buttons on right in steering wheel - E441- -3-.





- Using removal pliers - 3392- , release trim -1- in area of multifunction buttons on left in steering wheel - E440- -2- and multifunction buttons on right in steering wheel - E441- -3-.
- Pull trim -1- off steering wheel in areas indicated by arrows -A- and -B-.
- Release and detach connectors.
- Remove trim panel -1- together with multifunction buttons on left in steering wheel - E440- -2- and multifunction buttons on right in steering wheel - E441- -3-.
- Unscrew bolts for multifunction buttons on left in steering wheel - E440- -2- and multifunction buttons on right in steering wheel - E441- -3- on back of trim panel -1-.
- Remove multifunction buttons on left in steering wheel - E440- -2- and multifunction buttons on right in steering wheel - E441- -3- from trim panel -1-.



Installing

Installation is performed in the reverse order of removal; when doing this, note the following:



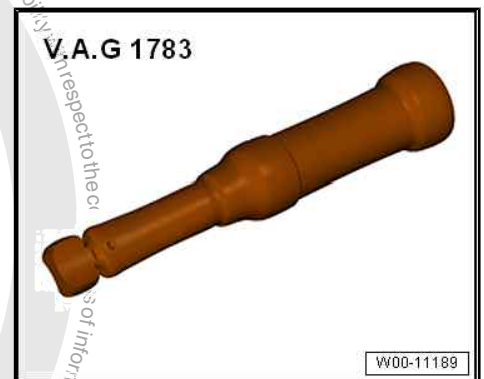
Note

Clip in trim from below for easier installation.

2.4 Removing and installing Tiptronic switch in steering wheel -E439- / -E438-

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



Removing



Note

Removal and installation are described for the left side. Removal and installation on the right side are carried out as a mirror image.

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove multifunction buttons in steering wheel -E441- / -E440- ➔ [page 16](#) .



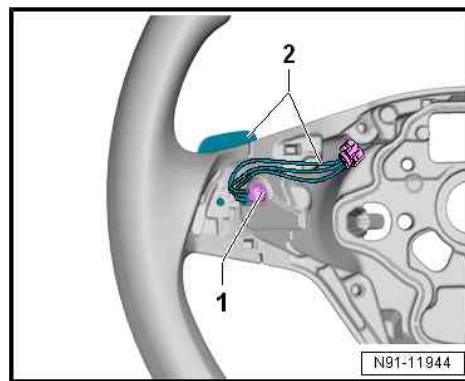
- Remove bolt -1- on steering wheel.
- Remove switch for Tiptronic -2- with connector wiring backwards.

Installing

Installation is performed in the reverse order of removal; when doing this, note the following:

Torque settings

- ♦ ➔ [“2.2 Assembly overview - multifunction steering wheel”, page 15](#)





3 Sound system

⇒ [“3.1 Overview of fitting locations - sound system”, page 21](#)

⇒ [“3.2 Removing and installing front bass loudspeakers”, page 23](#)

⇒ [“3.3 Removing and installing rear bass loudspeakers”, page 24](#)

⇒ [“3.4 Removing and installing front treble loudspeakers”, page 25](#)

⇒ [“3.5 Removing and installing subwoofer R211”, page 25](#)

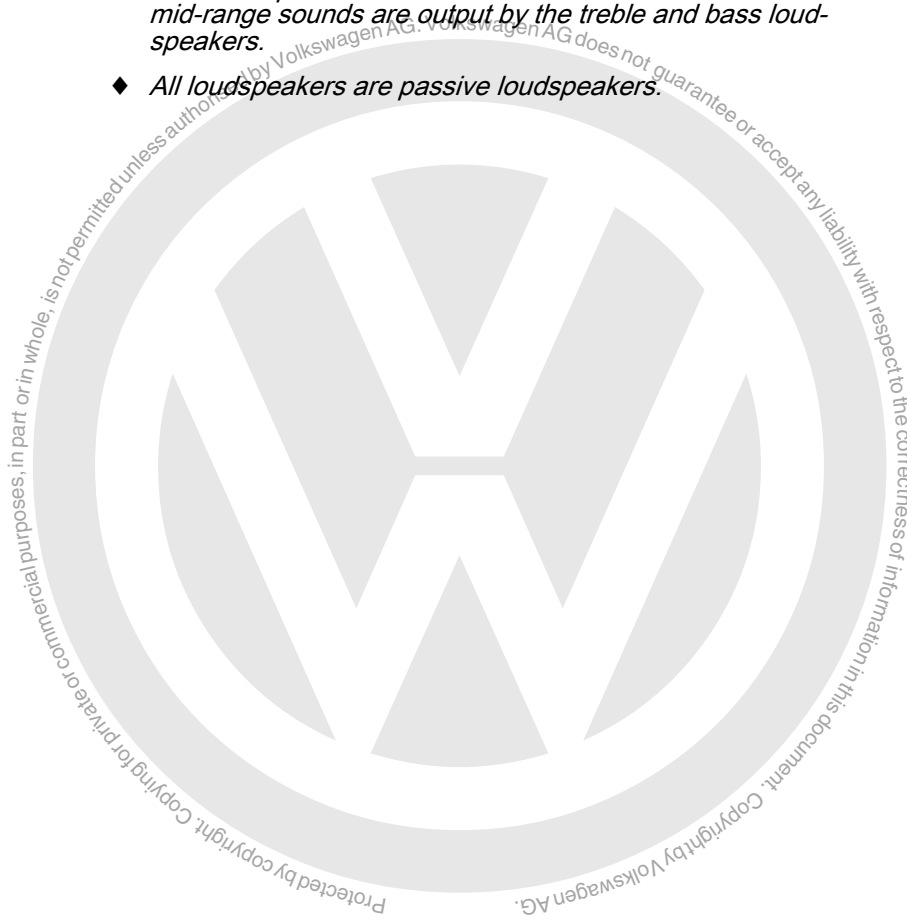
⇒ [“3.6 Removing and installing digital sound package control unit/amplifier”, page 26](#)

3.1 Overview of fitting locations - sound system



Note

- ◆ *In conjunction with the radio, the front loudspeaker system consists of a 2-way system with one bass loudspeaker and one treble loudspeaker in the left and right front doors and one treble loudspeaker in the left and right front A-pillar trims. One bass loudspeaker is installed on each side at the rear. The mid-range sounds are output by the treble and bass loudspeakers.*
- ◆ *All loudspeakers are passive loudspeakers.*



1 - Front right treble loudspeaker - R22-

- ☐ Installed in A-pillar trim on right
- ☐ ➤ [“3.4 Removing and installing front treble loudspeakers”, page 25](#)

2 - Front right bass loudspeaker - R23-

- ☐ Installed in right door
- ☐ ➤ [“3.2 Removing and installing front bass loudspeakers”, page 23](#)

3 - Control unit/digital sound package amplifier

- ☐ Installed as an option
- ☐ Installed under right front seat
- ☐ ➤ [“3.6 Removing and installing digital sound package control unit/amplifier”, page 26](#)

4 - Aerial - R11-

- ☐ Installed as a simple short-rod aerial on the roof at the rear
- ☐ For further information, refer to chapter Aerial systems ➤ [page 28](#)

5 - Bass loudspeaker, rear right - R17-

- ☐ Installed in right side panel trim in passenger compartment.
- ☐ ➤ [“3.3 Removing and installing rear bass loudspeakers”, page 24](#)

6 - Subwoofer - R211-

- ☐ Installed as an option
- ☐ Installed in spare wheel well
- ☐ ➤ [“3.5 Removing and installing subwoofer R211”, page 25](#)

7 - Bass loudspeaker, rear left - R15-

- ☐ Installed in left side panel trim in passenger compartment.
- ☐ ➤ [“3.3 Removing and installing rear bass loudspeakers”, page 24](#)

8 - Front left bass loudspeaker - R21-

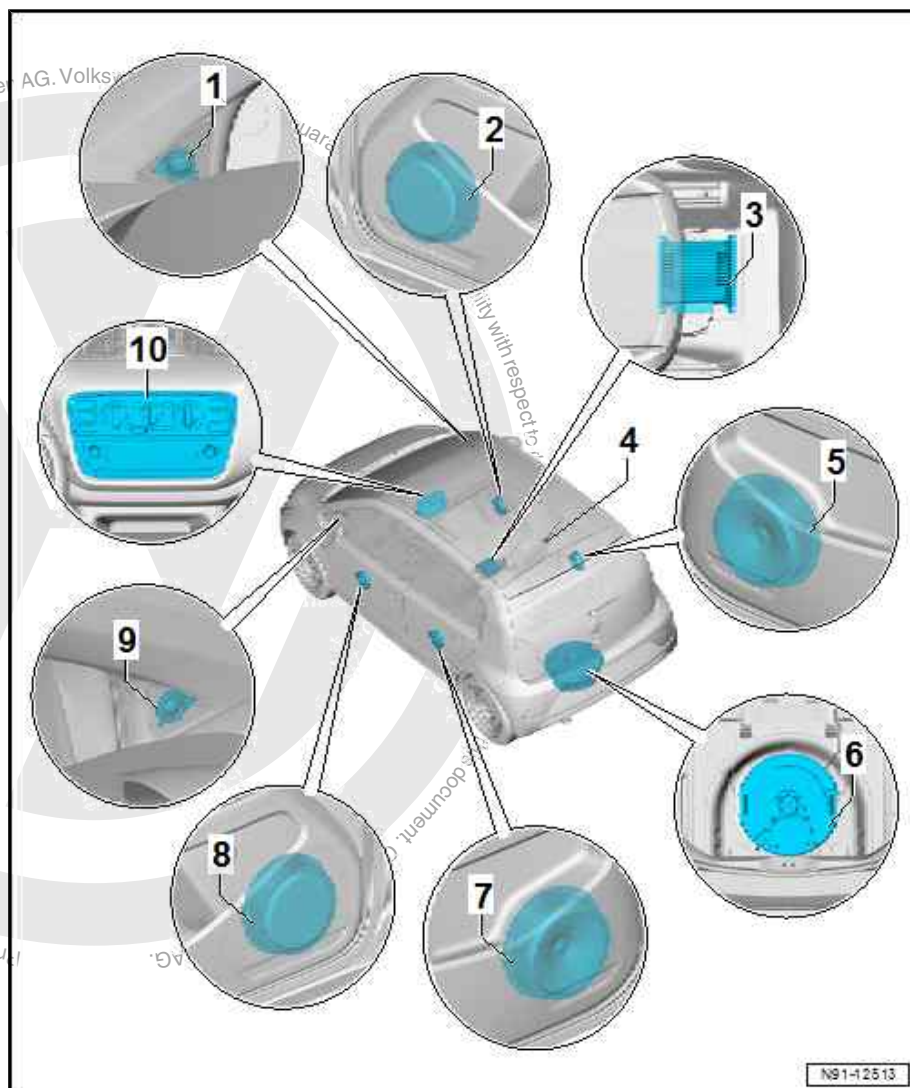
- ☐ Installed in left door
- ☐ ➤ [“3.2 Removing and installing front bass loudspeakers”, page 23](#)

9 - Front left treble loudspeaker - R20-

- ☐ Installed in A-pillar trim on left
- ☐ ➤ [“3.4 Removing and installing front treble loudspeakers”, page 25](#)

10 - Radio - R-

- ☐ Optional “Maps and More Dock”





3.2 Removing and installing front bass loudspeakers



Note

Removal and installation is performed in the same manner on the left and right sides.

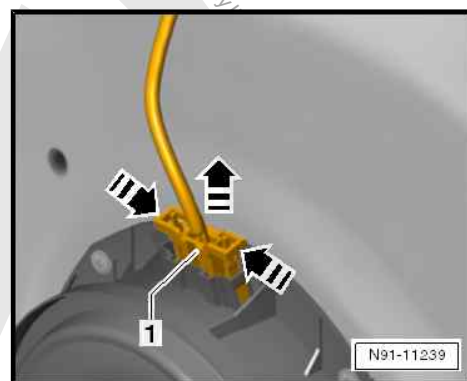
Removing

Before beginning work, perform the following steps:

- Switch off ignition and all electrical consumers, and withdraw ignition key.

In order to replace a loudspeaker, the door trim must first be removed ⇒ Trims/insulation; Rep. gr. 70 ; Door trims

- Squeeze connector lock at loudspeaker in -direction of arrows- and pull out connector -1-.

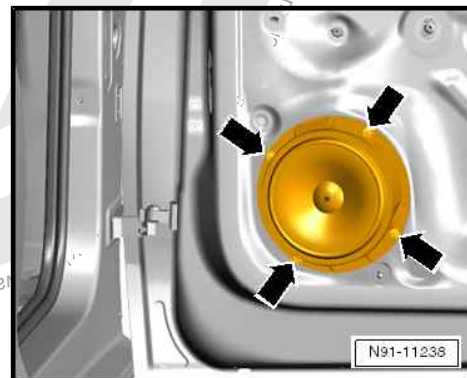


- Drill out rivets -arrows- using a suitable drill bit (< 4.5 mm). Remove loudspeaker.



Note

- ♦ *It is essential that all swarf be removed from the door because otherwise corrosion damage will occur.*
- ♦ *Immediately rectify any damage to paintwork caused when drilling out rivets.*



Installing

- Insert loudspeaker in -direction of arrow- and secure with 4 rivets -1-.

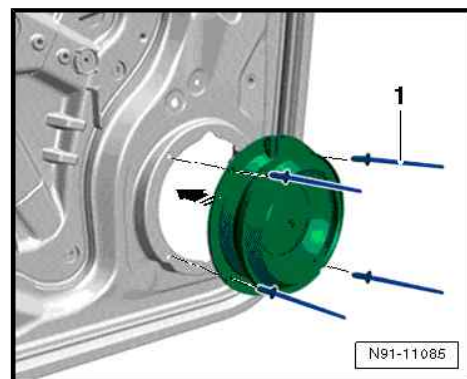


Note

When installing new loudspeaker, secure with special pop rivets (note part number!)

- Push connector back onto loudspeaker.

Further installation is carried out in the reverse sequence.





3.3 Removing and installing rear bass loudspeakers



Note

Removal and installation is performed in the same manner on the left and right sides.

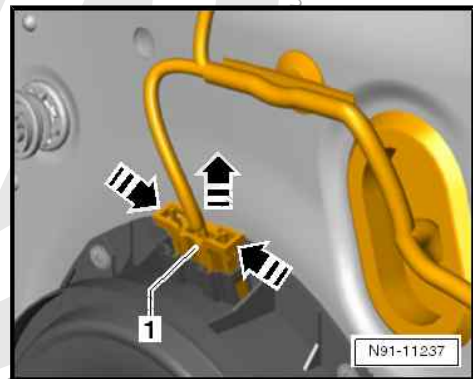
Removing

Before beginning work, perform the following steps:

- Switch off ignition and all electrical consumers, and withdraw ignition key.

To renew a loudspeaker, the side wall trim must first be removed
⇒ Trims/insulation; Rep. gr. 70 ; Interior trims

- Squeeze connector lock at loudspeaker in -direction of arrows- and pull out connector -1-.

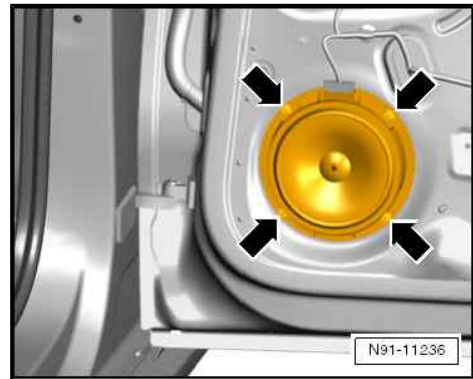


- Drill out rivets -arrows- using a suitable drill bit (< 4.5 mm). Remove loudspeaker.



Note

- ♦ It is essential that all swarf be removed from the door because otherwise corrosion damage will occur.
- ♦ Immediately rectify any damage to paintwork caused when drilling out rivets.



Installing

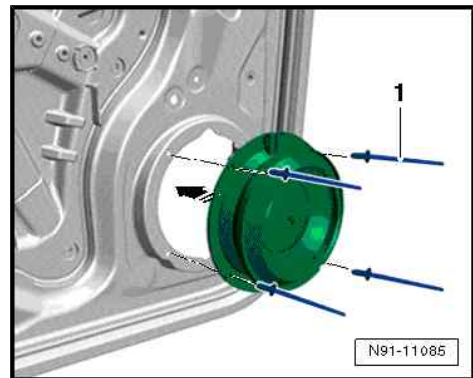
- Insert loudspeaker into trim and secure with 4 rivets.



Note

When installing the new loudspeaker, secure it with special blind rivets (note part number).

Further installation is carried out in the reverse sequence.





3.4 Removing and installing front treble loudspeakers



Note

Removal and installation is performed in the same manner on the left and right sides.

Removing

Before beginning work, perform the following steps:

- Switch off ignition and all electrical consumers, and withdraw ignition key.

To renew a loudspeaker, the A-pillar trim must first be removed
⇒ Trims/insulation; Rep. gr. 70 ; Interior trims

- Detach connector -1- from treble loudspeaker -2-.

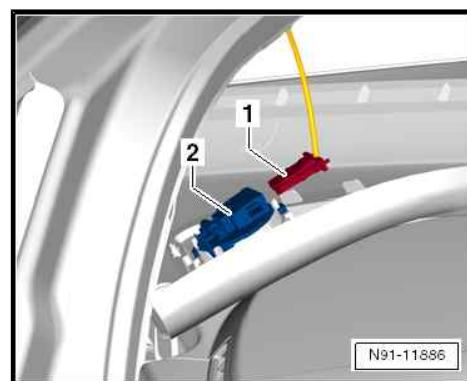
Installing



Note

The treble loudspeaker and the A-pillar trim are installed as a unit and therefore can only be renewed together. Note trim colour number when ordering spare part.

Installation is carried out in the reverse sequence of removal.



3.5 Removing and installing subwoofer - R211-

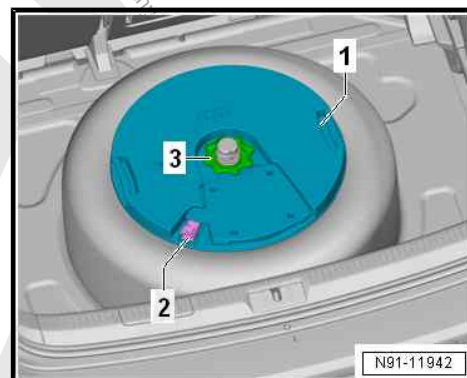
The subwoofer - R211- is located in the spare wheel well.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Take out luggage compartment floor.
- Release and unplug connector -2- on subwoofer - R211- -1-.
- Remove bolt -3- from subwoofer - R211- -1-.
- Lift out subwoofer - R211- -1-.

Installing

Installation is basically carried out in the reverse sequence; note the following when doing this:



Torque settings

Component	Specified torque
Bolt -3- on subwoofer - R211-	3 Nm



3.6 Removing and installing digital sound package control unit/amplifier

⇒ **"3.6.1 Removing:", page 26**

⇒ **"3.6.2 Installing:", page 27**

3.6.1 Removing:

View of 8-channel amplifier:

The amplifier is installed under the front right seat.

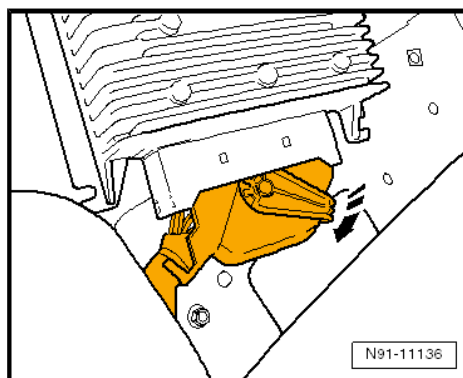
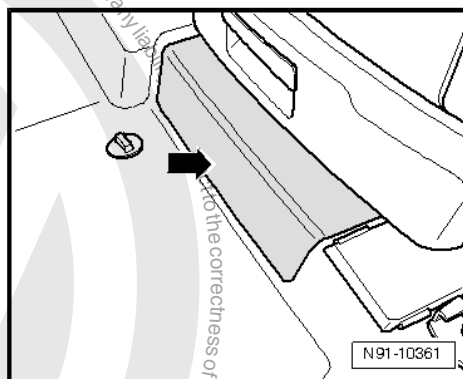
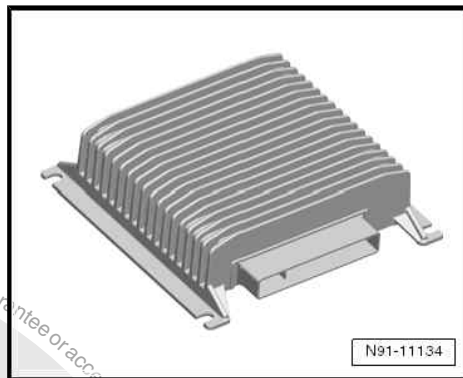
Before beginning work, perform the following steps:

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Move the seat as far back and as far up as possible.

- Unclip cover in -arrow- underneath seat.

- Unscrew bolts -arrows- on amplifier.

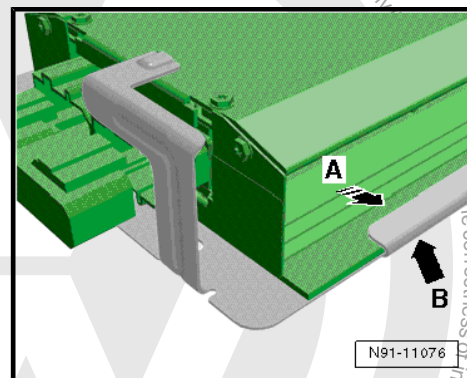
- Release connector on amplifier in -direction of arrow- and pull out.
- Remove amplifier.





3.6.2 Installing:

- Push amplifier in direction of arrow -A- into fold -B- of retainer.
- Further installation is carried out in reverse order!





4 Aerial systems

⇒ [“4.1 General information”, page 28](#)

⇒ [“4.2 Overview of fitting locations - aerial systems”, page 28](#)

⇒ [“4.3 Removing and installing roof aerial”, page 29](#)

⇒ [“4.5 Repairing aerial wires”, page 31](#)

4.1 General information

For radios without diversity function, the aerial system consists of a roof aerial.



Note

- ◆ *When faced with complaints, it is absolutely necessary to understand the functions and operation of the radio systems.*
- ◆ *Additional information ⇒ Operating instructions*
- ◆ *When the battery is reconnected, check operation of electrical equipment (radio, clock, convenience electronics and so on) according to the workshop manual or the operating manual.*

For repair work or fault finding, use the vehicle diagnostic tester in “Guided fault finding” or “Guided functions” mode.

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

4.2 Overview of fitting locations - aerial systems

⇒ [“4.2.1 Composition Phone aerial system”, page 28](#)

4.2.1 “Composition Phone” aerial system



1 - Radio - R-

- ❑ ⇒ ["1.1 Components of radio/radio navigation systems", page 8](#)

2 - Aerial wire

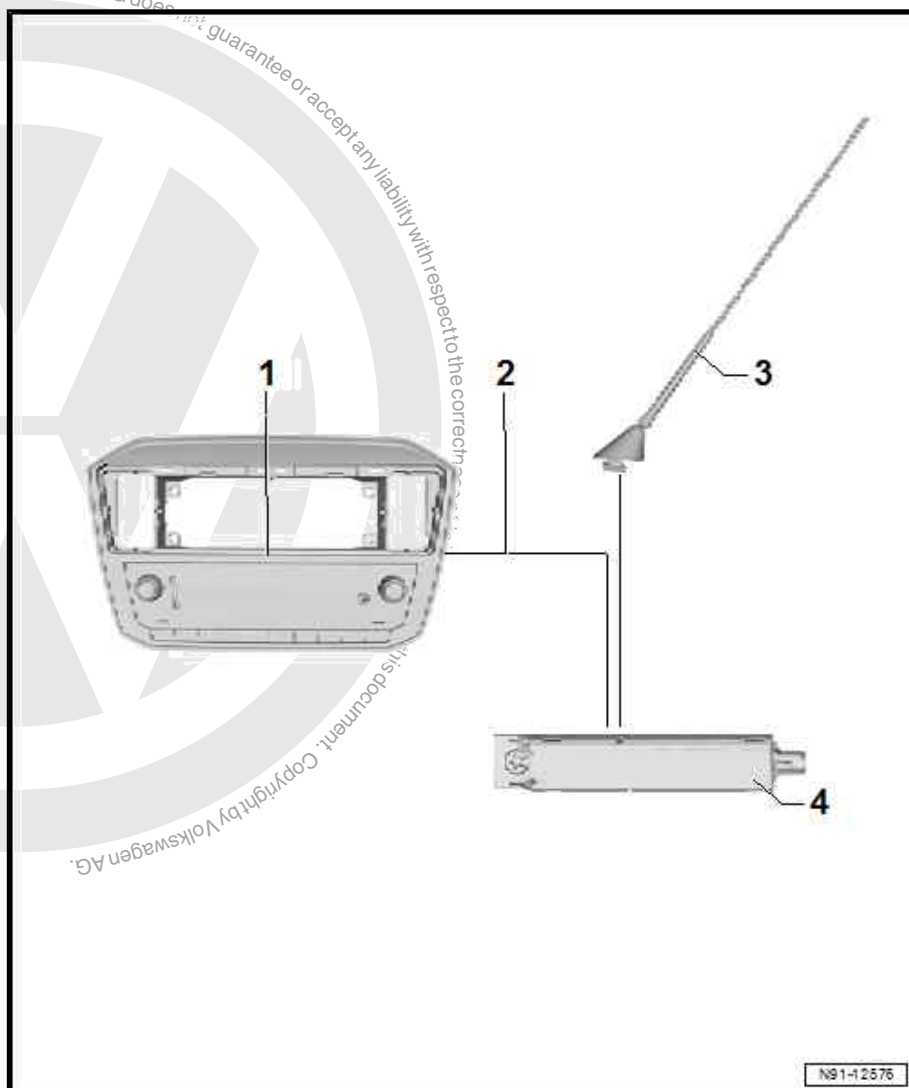
3 - Aerial - R11-

- ❑ ⇒ ["4.3 Removing and installing roof aerial", page 29](#)

4 - Left aerial module - R108-

- ❑ Installed on left in rear lid
- ❑ ⇒ ["4.4 Removing and installing aerial amplifier", page 30](#)

5 -



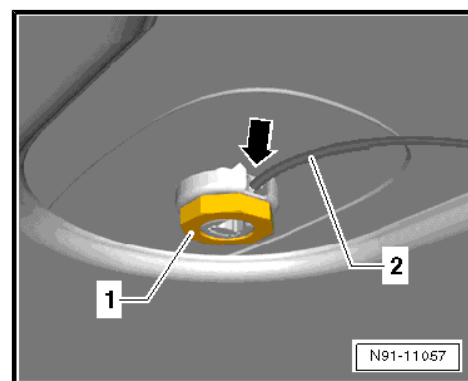
4.3 Removing and installing roof aerial

Removing:

- Remove moulded headliner and place it on head restraints ⇒ Trim and insulation; Rep. gr. 70 ; Roof trims; Removing and installing moulded headliner
- Unplug aerial cable connector.
- Unscrew nut -1- securing roof aerial.
- Take roof aerial out upwards.

Installing:

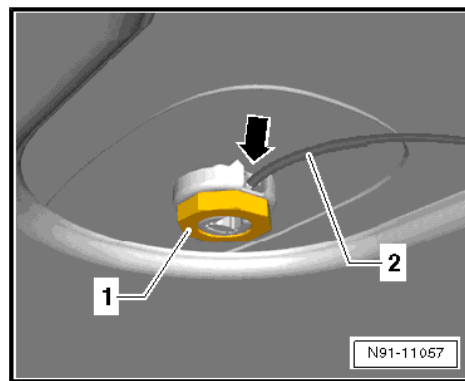
Install in reverse sequence of removal.





Note

- ◆ When positioning the aerial for installation, ensure that the seal is seated correctly. The two guide lugs of the seal must be located in the relevant holes -arrows- of the aerial base.
- ◆ After installing the aerial, ensure that the aerial wiring -2- is routed correctly through the hole -arrow- in the securing nut -1-.



4.4 Removing and installing aerial amplifier

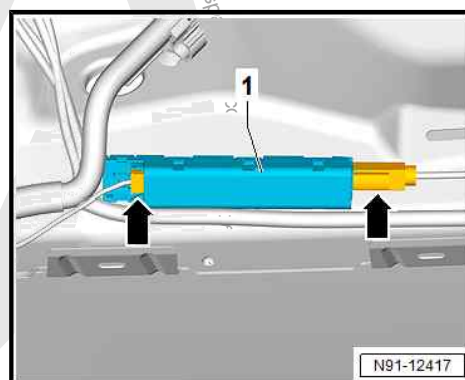
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



Removing

- Switch off ignition and all electrical consumers.
- Keep the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.
- Remove rear lid trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Removing and installing lower rear lid trim .
- Release and separate electrical connectors -arrows- on left aerial module - R108- -1-.





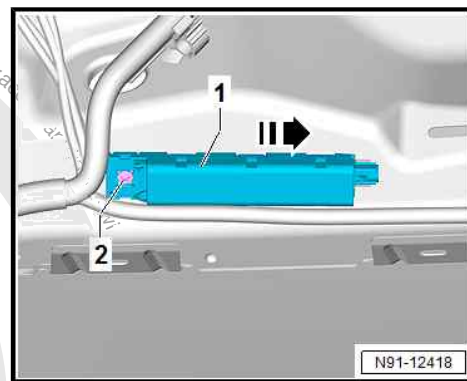
- Loosen bolt -2- on left aerial module - R108- -1-.
- Pull out bolt -2- with panel clip and left aerial module - R108- -1- from rear lid slightly.
- Push left aerial module - R108- -1- in direction of -arrow B- and remove.

Installing

Install in reverse order of removal.

Torque settings

Component	Specified torque
Bolt on left aerial module - R108-	2 Nm



4.5 Repairing aerial wires

⇒ Electrical System, General Information; Rep. gr. 97 ; Wiring;
Renewal of aerial wiring .



5 Reversing camera system

⇒ ["5.1 Components of reversing camera system", page 32](#)

⇒ ["5.2 Overview of fitting locations - reversing camera system", page 32](#)

⇒ ["5.3 Removing and installing reversing camera R189", page 33](#)

5.1 Components of reversing camera system

The reversing camera system helps the driver when reversing by providing an image of the traffic situation behind the vehicle via the radio or radio navigation system display.

The system is activated when reverse gear is engaged, even if the radio or radio/navigation system is switched off.

The reversing camera system consists of the following components:

- ◆ Reversing camera - R189-
- ◆ Control unit with display for radio and navigation - J503-

5.2 Overview of fitting locations - reversing camera system



Note

The vehicle is not the one in question but similar for purposes of illustration.

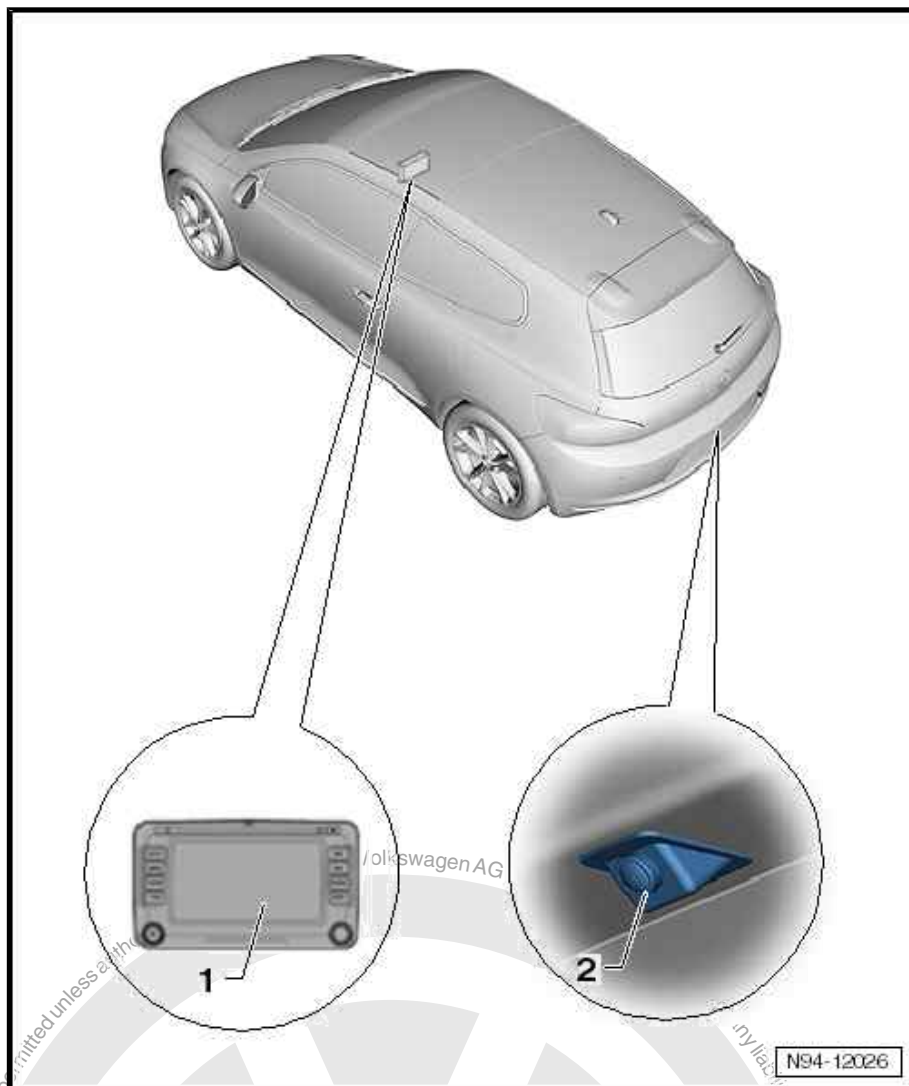


1 - Display unit for front information display and operating unit control unit - J685-

- ❑ Fitting location: at front of centre console
- ❑ Removing and installing
⇒ [page 12](#)

2 - Reversing camera - R189-

- ❑ Fitting location: in bumper cover between number plate lights.

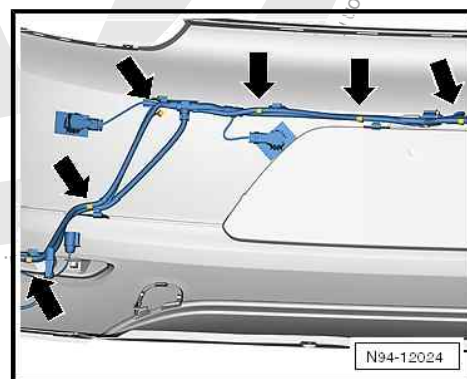


5.3 Removing and installing reversing camera - R189-

The reversing camera is located in rear bumper between number plate lights. Removal of camera from camera housing is not provided for.

Carry out the following procedure:

- Remove rear bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Rear bumper; Removing and installing bumper cover .
- Cut cable ties -arrows- of wiring harness and mark places where they were attached.



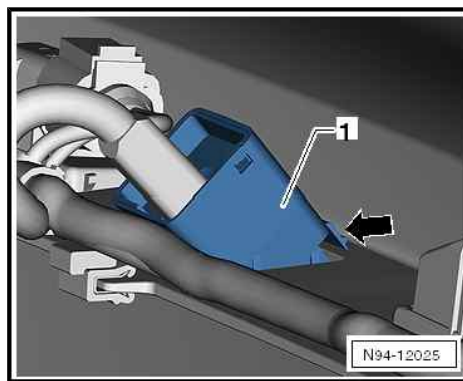


- Unclip reversing camera -1- by pressing locking mechanism -arrow- and then remove from bumper cover.

Installing:

Installation is basically carried out in the reverse sequence; note the following when doing this:

Attach all cable ties where they were originally attached before.





6 Car-Net

⇒ **"6.1 General information", page 35**

⇒ **"6.2 Overview of fitting locations - Car-Net services", page 35**

⇒ **"6.3 Removing and installing emergency call module control unit and communication unit J949", page 36**

⇒ **"6.4 Renewing control unit for emergency call module and communication unit J949", page 36**

6.1 General information

Mobile online services are available only in conjunction with a radio/RNS - RX1- .

Fault finding

The mobile online services system is capable of self-diagnosis.

For fault finding ⇒ Vehicle diagnostic tester use "Guided Fault Finding" mode.

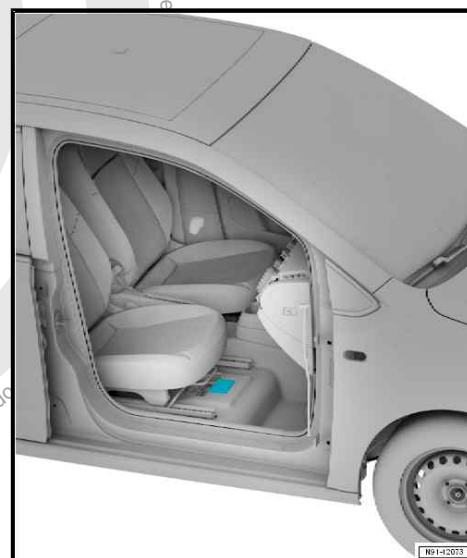


Note

- ◆ *In order to deal with complaints, it is absolutely necessary to understand the functions of the mobile online services system.*
- ◆ *Additional information can be found in the ⇒ Operating manual and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *When the battery is connected, check operation of electrical equipment (clock, convenience electronics and so on) according to the workshop manual ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery and/or to the ⇒ Operating manual .*

6.2 Overview of fitting locations - Car-Net services

6.2.1 Overview of fitting locations - Car-Net services

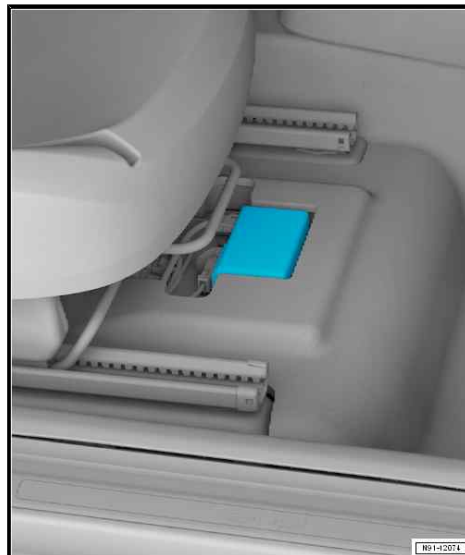




6.3 Removing and installing emergency call module control unit and communication unit - J949-

Removing:

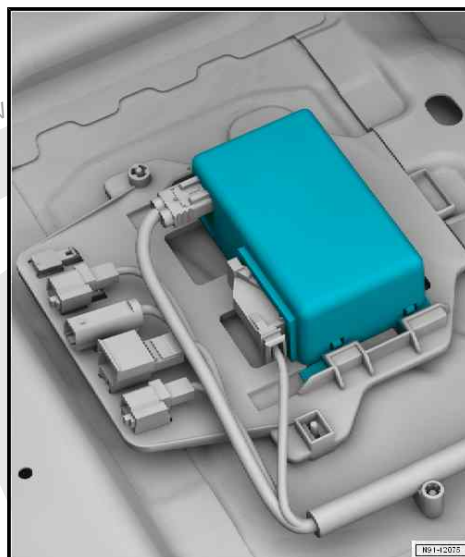
- Remove seat ⇒ Trim/insulation; Rep. gr. 70 ; Front seat; Removing and installing front seat
- Remove plastic screw and fold carpet.



- Pull emergency call module control unit and communication unit - J949- out of bracket and separate connectors.

Installing:

- Install in reverse sequence of removal.



6.4 Renewing control unit for emergency call module and communication unit - J949-

Renewing and adapting control unit for emergency call module and communication unit - J949-

- Data for "Guided Fault Finding" is current.
- Using ⇒ Vehicle diagnostic tester in Guided fault finding or Guided functions mode, select Renew function for emergency call module control unit and communication unit - J949- .
- Remove control unit for emergency call module and communication unit - J949- ⇒ [page 36](#) .



- Install new control unit for emergency call module and communication unit - J949- ➔ [page 36](#) .
- Using⇒ Vehicle diagnostic tester in Guided fault finding or Guided functions mode, select Code function for emergency call module control unit and communication unit - J949- .
- Using⇒ Vehicle diagnostic tester in Guided fault finding or Guided functions mode, select Adapt immobiliser function for emergency call module control unit and communication unit - J949- .
- Using⇒ Vehicle diagnostic tester in Guided fault finding or Guided functions mode, select Activate function for emergency call module control unit and communication unit - J949- .
- Exit Guided functions or Guided fault finding.
- Switch off ignition.

