



Workshop Manual up! 2017 ➤

Electrical system

Edition 01.2019





List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
- 27 - Starter, current supply, CCS
- 90 - Gauges, instruments
- 92 - Windscreen wash/wipe system
- 94 - Lights, bulbs, switches - exterior
- 96 - Lights, bulbs, switches - interior
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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.



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00 – Technical data

1 Safety information

(VRL012562; Edition 01.2019)

⇒ [“1.1 Safety measures when working on vehicles with a start/stop system”, page 1](#)

⇒ [“1.2 Safety precautions when using testing and measuring instruments during a road test”, page 1](#)

1.1 Safety measures when working on vehicles with a start/stop system



WARNING

Risk of injury due to automatic start of engine on vehicles with a start/stop system.

- ◆ *If the start/stop system of a vehicle is activated, the engine can start automatically, if required. A message will appear in the dash panel insert.*
- ◆ *When working on the vehicle, make sure that the start/stop system is deactivated (switch off the ignition; switch the ignition on again if necessary).*

1.2 Safety precautions when using testing and measuring instruments during a road test

Observe the following if test and measuring equipment is required during a road test:



WARNING

Risk of accident due to distraction and inadequate securing of test and measuring equipment.

Danger as a result of activation of front passenger airbag in event of an accident.

- *Operation of test and measuring equipment while driving results in distraction.*
- *The risk of injuries increases significantly when test and measuring equipment is not secured.*
- ◆ *Always strap test and measuring equipment in place on rear seat, and have a 2nd person operate them.*



2 Repair instructions

⇒ ["2.1 Contact corrosion", page 2](#)

⇒ ["2.2 Routing and attachment of lines", page 2](#)

2.1 Contact corrosion

Contact corrosion can occur when unsuitable fasteners (bolts, nuts, washers, etc.) are used.

For this reason, only fasteners with a special surface coating are used.

In addition, rubber, plastic and adhesives are made of non-conductive materials.

If there is any doubt about the suitability of parts, a general rule is to use new parts ⇒ Electronic parts catalogue .

Please note:

- ◆ Only use genuine replacement parts which are tested and compatible with aluminium.
- ◆ Only use Volkswagen Genuine Accessories.
- ◆ Damage resulting from contact corrosion is not covered by the warranty.

2.2 Routing and attachment of lines

- ◆ Mark lines prior to removal to prevent them from being interchanged and to ensure that they are fitted in their original positions. This applies for fuel, hydraulic and vacuum lines as well as lines for activated charcoal filter system and electrical wiring. Where necessary, make sketches or take photographs.
- ◆ To avoid damaging pipes and wires, ensure adequate clearance from all moving or hot components in the engine compartment on account of the confined space.



3 Battery

⇒ **"3.1 Battery - general notes", page 3**

⇒ **"3.2 Types of battery", page 3**

3.1 Battery - general notes

All instructions and notes regarding this chapter are available under ⇒ Electrical system, General information; Rep. gr. 27 ; Battery

3.2 Types of battery

All instructions and notes regarding this chapter are available under ⇒ Electrical system, General information; Rep. gr. 27 ; Battery; Battery types



27 – Starter, current supply, CCS

1 Battery

- ⇒ [“1.1 Assembly overview - battery”, page 4](#)
- ⇒ [“1.2 Removing and installing battery”, page 6](#)
- ⇒ [“1.3 Disconnecting and connecting battery”, page 7](#)
- ⇒ [“1.4 Removing and installing battery tray”, page 10](#)
- ⇒ [“1.5 Checking battery”, page 11](#)
- ⇒ [“1.6 Charging battery”, page 11](#)
- ⇒ [“1.7 Removing and installing earth wire with battery monitor control unit J367”, page 11](#)
- ⇒ [“1.8 Adapting battery monitor control unit J367”, page 12](#)

1.1 Assembly overview - battery

Warning notices and safety regulations

All the instructions and information for this manual are found in the workshop manual “Electrical System, General Information”. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual “Electrical System, General Information” manually in ELSA.

Battery terminal connection

All the instructions and information for this manual are found in the workshop manual “Electrical System, General Information”. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual “Electrical System, General Information” manually in ELSA.



1 - Earth wire battery terminal clamp

- ☐ Comply with the instructions regarding threaded connections of the battery terminals
⇒ [page 4](#)
- ☐ Depending on vehicle equipment, the battery monitor control unit - J367- may be installed instead.
- ☐ Removing and installing battery monitor control unit - J367-
⇒ [page 11](#)
- ☐ Specified torque for nut securing wire to body: 20 Nm

2 - Securing nut for earth wire battery terminal clamp

- ☐ Specified torque: 6 Nm

3 - Earth wire cover

4 - electronics box with holder

- ☐ Removing and installing
⇒ [page 137](#)
- ☐ Specified torque for nut securing electronics box to battery terminal clamp for positive cable: 6 Nm

5 - Positive wire battery terminal clamp

- ☐ Specified torque for nut securing electronics box to battery terminal clamp for positive cable: 6 Nm

6 - Securing nut for positive wire battery terminal clamp

- ☐ Comply with the instructions regarding threaded connections of the battery terminals ⇒ [page 4](#)
- ☐ Specified torque: 6 Nm

7 - Clamping plate securing nut

- ☐ Specified torque: 9 Nm

8 - Clamping plate

- ☐ Observe assembly note

9 - Battery

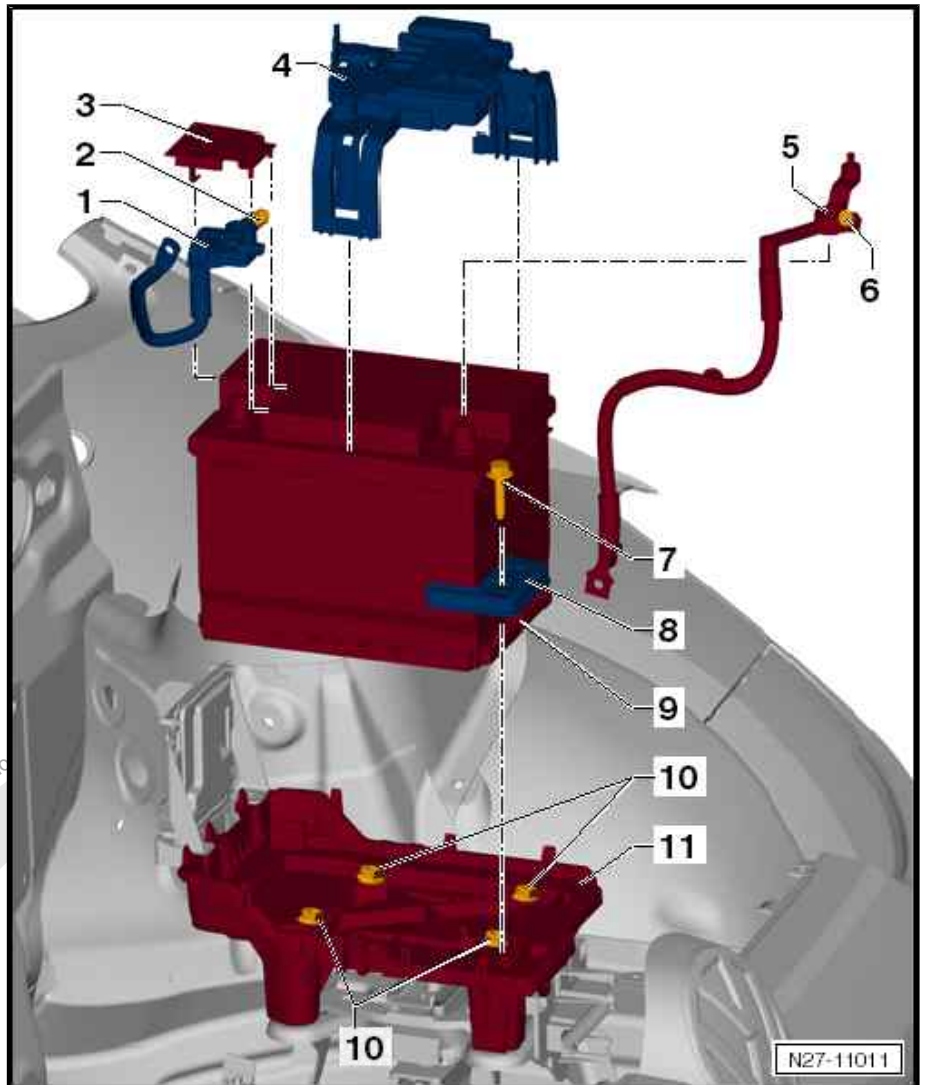
- ☐ In the case of vehicles with start/stop system, observe instructions for replacement of battery
⇒ [page 6](#).
- ☐ Removing and installing ⇒ [page 6](#)

10 - Nuts for securing battery tray

- ☐ Specified torque: 9 Nm

11 - Battery tray

- ☐ Removing and installing ⇒ [page 10](#)
- ☐ Nuts for securing battery tray to body: 15 Nm
- ☐ Bolts for securing bracket of engine control unit to battery tray: 8 Nm



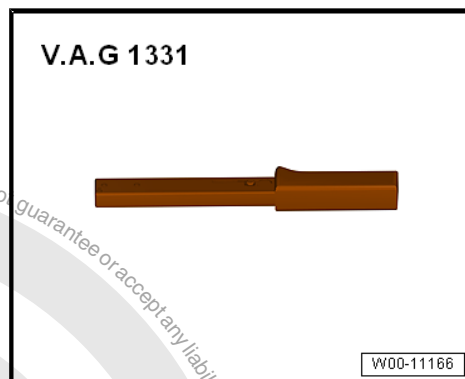
N27-11011



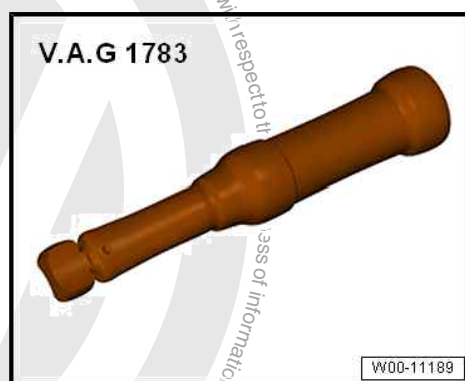
1.2 Removing and installing battery

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Torque wrench - V.A.G 1783-



WARNING

Danger of injury! Comply with the warning notices and safety regulations ⇒ [page 4](#)!



Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ [page 7](#).

Replacing battery on vehicles with start/stop system:

Because of its higher deep-cycle resistance, only a special starter battery is used in vehicles with a start/stop system.

When renewing the starter battery, note correct part designation in ⇒ ETKA (electronic parts catalogue). Starter batteries for use in vehicles with a start/stop system are marked with "AGM" (Absorbent Glass Mat) or "EFB" (Enhanced Flooded Battery).



Note

- ◆ In vehicles with a battery sensor (start/stop system), the battery has to be parametrised after a new starter battery has been installed.
- ◆ The battery parametrisation sends the technical data of the new battery to the battery monitor.
- ◆ Performing battery parametrisation ⇒ [page 12](#).

Removing

- Disconnect battery ⇒ [page 7](#).
- Undo and remove bolt -1- and remove clamping plate -2-.
- Remove battery -4-.

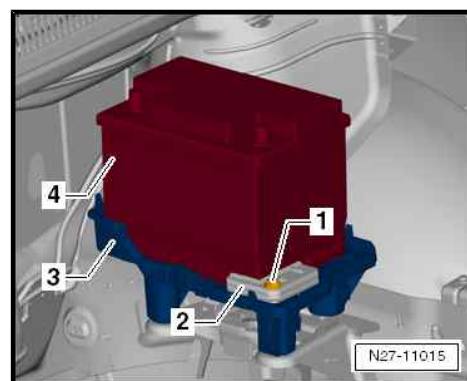
Installing



Caution

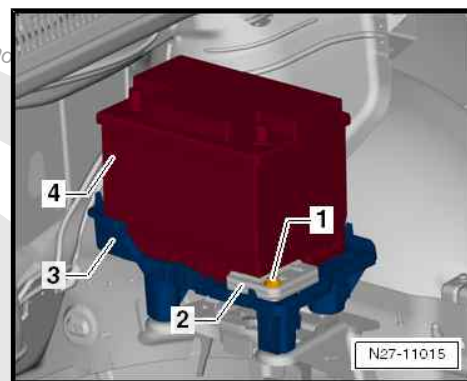
A loosely fitted battery creates the following dangers:

- ◆ Reduced service life due to damage from vibration (danger of explosion).
- ◆ Damage to the grid plates of the battery.
- ◆ Damage to battery casing by clamping bracket (possible leakage of acid with high consequential costs).
- ◆ Poor crash safety.



Install in the reverse order of removal, observing the following:

- Place battery -4- on battery tray -3- and push towards rear.
- Put clamping plate -2- on and secure with bolt -1-.
- Check battery is firmly seated after installation.
- Connect battery ⇒ [page 7](#).



Note

If the battery is renewed, the battery monitor control unit - J367- must be adapted ⇒ [page 12](#).

Specified torques

- ◆ ⇒ [“1.1 Assembly overview - battery”, page 4](#)

1.3 Disconnecting and connecting battery

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1783-



Recharging battery or jump start on vehicles with start/stop system:

When recharging or jump starting vehicles with start/stop system, note the following: first connect charging cable to battery positive terminal then body earth. This ensures that the battery sensor is not bridged. The direct charging of the battery on the negative terminal clamp means that the battery sensor is shunted and the battery data are not registered by the sensor while charging. The values concerning the battery state saved in the data bus diagnostic interface do not then correspond to the values of the charged battery.



WARNING

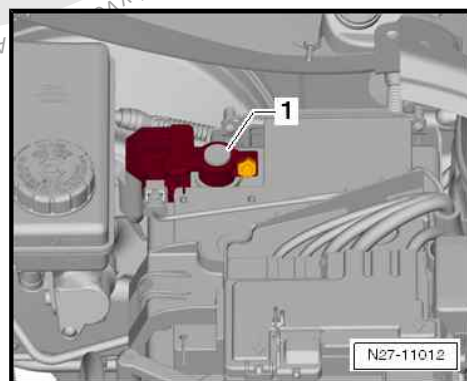
Danger of injury! Comply with the warning notices and safety regulations ➔ page 4!

Disconnecting battery



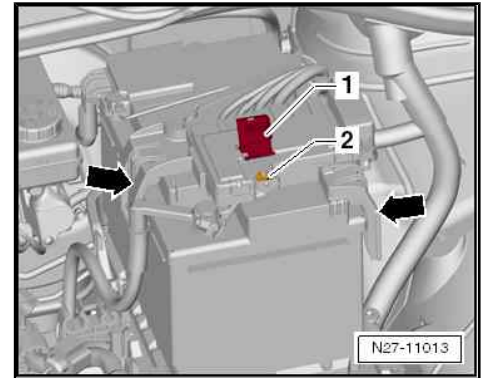
Note

- ◆ *By disconnecting the battery earth wire (open circuit), safety is ensured when carrying out work on the electrical system.*
- ◆ *The battery positive wire need only be disconnected for removal of the battery.*
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Fold up cover (if fitted) of earth wire on battery terminal clamp.
- First, undo the nut of earth wire battery terminal clamp -1- and pull terminal clamp off battery negative terminal.





- Fold up cover of electronics box -1- and remove nut -2-.
- Release the catches -arrows- on each side of the electronics box holder and remove electronics Box together with holder upwards off the battery.



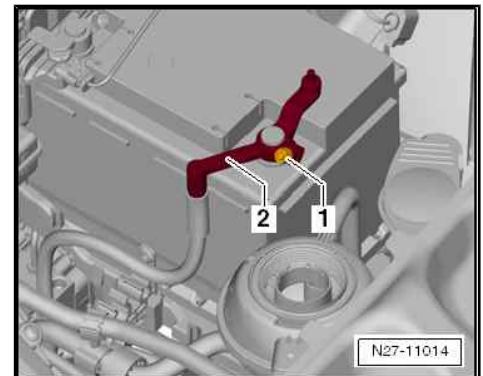
- Then undo the nut of battery terminal clamp for positive cable -1- and pull terminal clamp -2- off battery positive terminal.

Connecting battery

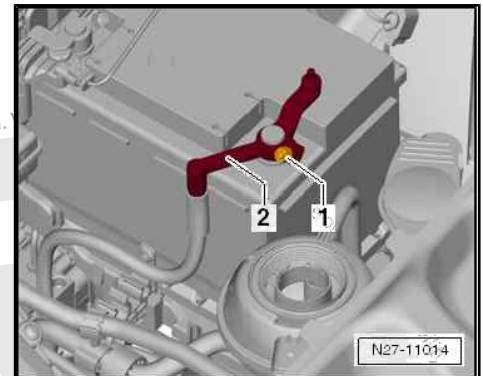


Caution

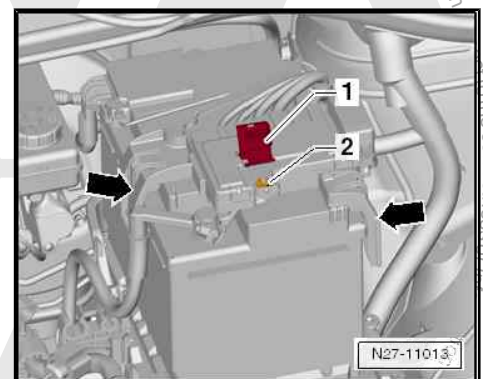
Comply with instructions regarding threaded connections of the battery terminals ⇒ [page 4](#) .



- Connect battery terminal clamp of positive cable -2- to positive terminal of battery. Tighten securing nut -1- to specified torque as per assembly overview ⇒ [page 4](#) .



- Place electronics box together with holder onto battery and secure with latches -arrows-.
- Screw on nut -2- and tighten to torque prescribed in assembly overview ⇒ [page 4](#) .
- Close cover -1- and secure with latch.





- Connect battery terminal clamp of earth wire -1- to negative terminal of battery.
- Tighten securing nut.
- Switch on ignition.
- Check time and adjust, if necessary.
- Completely open windows, and then completely close them.
- Then, with windows closed, pull window regulator switches until relay can be heard to switch.
- Check convenience mode of the window regulators.

With convenience closing activated, windows must close fully without the need for holding the window regulator switch.

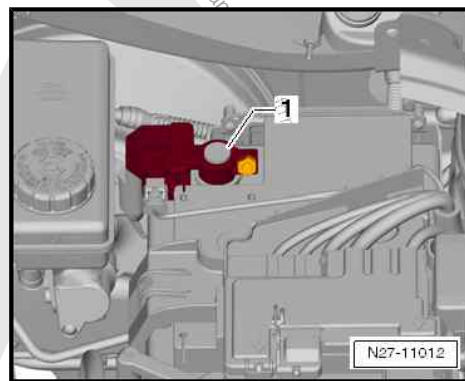
Specified torques

- ♦ ➔ ["1.1 Assembly overview - battery", page 4](#)

1.4 Removing and installing battery tray

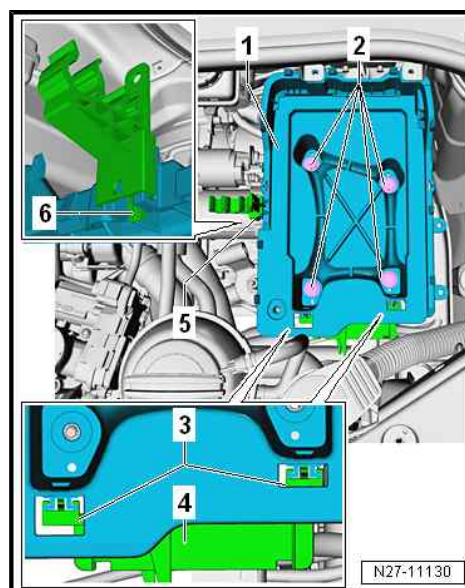
Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



Removing

- Remove battery ➔ [page 6](#).
- Unscrew securing nuts and bolts -2-.
- Release the two catches -3-, and pull refrigerant line holder -4- off battery tray.
- Unclip all lines from refrigerant line retainer -5-.
- Pull catch -6- at bottom of refrigerant line retainer -5-, and pull holder upwards off battery tray.
- Lift battery tray -1-.





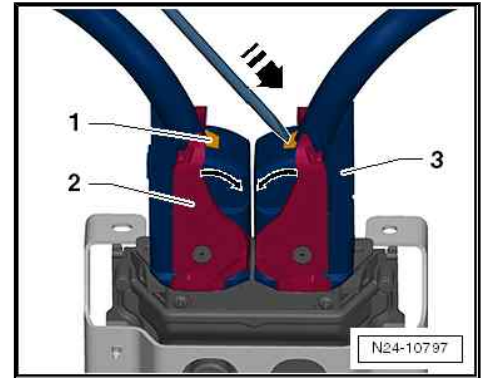
- Disconnect connectors from engine control unit. To do this, press catch -1- with a screwdriver in -direction of arrow-.
- Swing locking bar -2- in -direction of arrow-, and pull connector -3- off engine control unit.

Installing

Install in the reverse order of removal, observing the following:

Specified torques

- ♦ ⇒ [“1.1 Assembly overview - battery”, page 4](#)



1.5 Checking battery

Check battery ⇒ Electrical system, General information; Rep. gr. 27 ; Checking battery .

With self-diagnosis, the battery - A- is monitored by the data bus diagnostic interface - J533- in “Guided Fault Finding” mode ⇒ Vehicle diagnostic tester, [Guided Fault Finding](#).

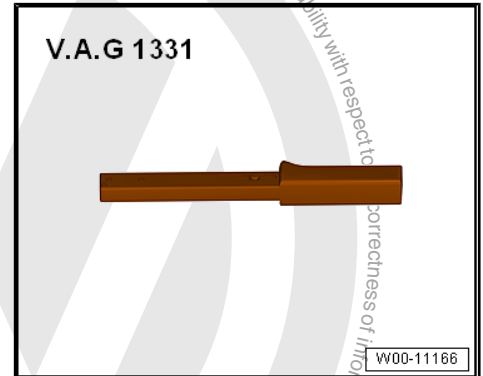
1.6 Charging battery

Charging battery ⇒ Electrical System, General Information; Rep. gr. 27 ; Charging battery .

1.7 Removing and installing earth wire with battery monitor control unit - J367-

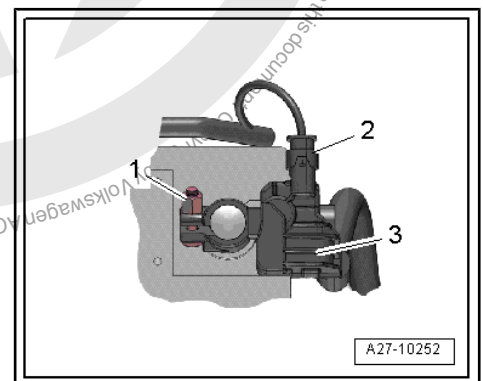
Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



Removing

- Separate electrical connector -2- on battery monitor control unit - J367- -3-.
- Remove battery - A- ⇒ [page 6](#) .
- Remove engine control unit ⇒ Rep. gr. 23 ; Engine control unit; Removing and installing engine control unit - J623- .





- Unscrew nut -1-.
- Remove earth wire with battery monitor control unit - J367-
-2-.

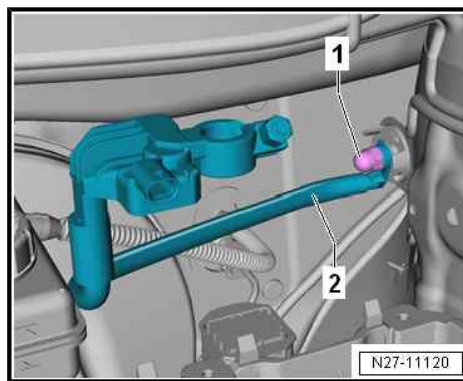
Installing

Install in the reverse order of removal, observing the following:

- Adapt battery monitor control unit - J367- ➔ [page 12](#) .

Specified torques

- ♦ ➔ [“1.1 Assembly overview - battery”, page 4](#)



1.8 Adapting battery monitor control unit - J367-

After the installation of a new starter battery or a new battery monitor control unit - J367- , the battery monitor control unit - J367- must be adapted.

- Adapt battery monitor control unit - J367- ➔ Vehicle diagnostic tester.



2 Alternator

⇒ [“2.1 Assembly overview - alternator”, page 13](#)

⇒ [“2.2 Removing and installing alternator”, page 14](#)

⇒ [“2.3 Checking alternator”, page 17](#)

⇒ [“2.4 Removing and installing poly V-belt pulley”, page 17](#)

⇒ [“2.5 Removing and installing voltage regulator”, page 25](#)

2.1 Assembly overview - alternator

1 - Alternator

- ☐ Removing and installing alternator ⇒ [page 14](#)
- ☐ Checking alternator ⇒ [page 17](#)
- ☐ Removing and installing poly V-belt pulley on alternator ⇒ [page 17](#)
- ☐ Removing and installing voltage regulator ⇒ [page 25](#)

2 - Sliding bush

- ☐ Make sure that the sliding bushes slide freely to obtain the specified torque when securing the alternator

3 - Electrical connector

4 - Cap

- ☐ For securing nut of battery positive cable

5 - Nut for securing battery positive cable

- ☐ Specified torque: 20 Nm
- ☐ Securing B+ cable on alternator

6 - Terminal 30/B+

7 - Sliding bush

- ☐ Make sure that the sliding bushes slide freely to obtain the specified torque when securing the alternator

8 - Poly V-belt pulley

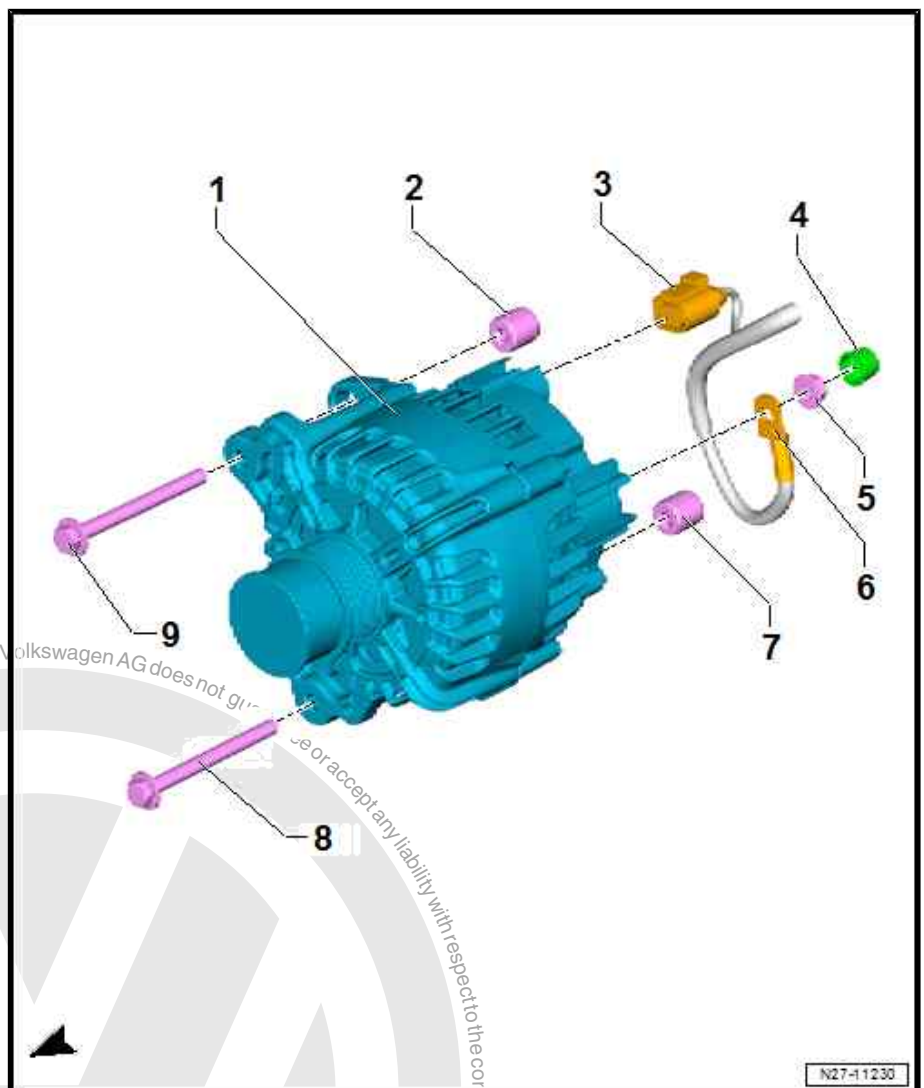
- ☐ Specified torque: 65 Nm, without freewheel on alternator
- ☐ Specified torque: 80 Nm, with freewheel on alternator

9 - Hexagon flange bolt

- ☐ M8
- ☐ Specified torque: 23 Nm

10 - Hexagon flange bolt

- ☐ M8





- ❑ Specified torque: 23 Nm

2.2 Removing and installing alternator

⇒ **"2.2.1 Removing and installing alternator, petrol engine", page 14**

⇒ **"2.2.2 Removing and installing alternator, natural gas engine", page 15**

2.2.1 Removing and installing alternator, petrol engine



Caution

*To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ **page 7**.*

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

V.A.G 1331



W00-11166

Removing

- Disconnect battery ⇒ **page 7**.
- Move lock carrier to service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Moving to and from service position .
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .
- Remove tensioner for poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .

Vehicles with air conditioning system



Caution

Risk of damage to air conditioner compressor, refrigerant lines and refrigerant hoses:

- ◆ ***Do NOT stretch, kink or bend refrigerant lines and hoses.***

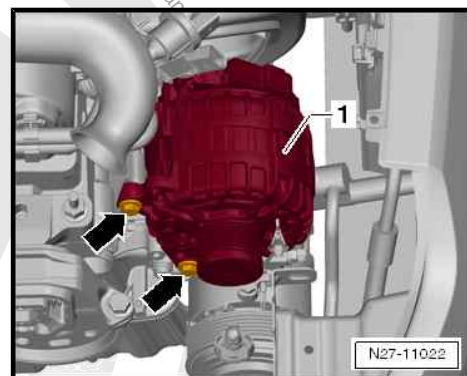
- Remove air conditioner compressor from bracket ⇒ Heating, air conditioning system; Rep. gr. 87 ; Air conditioner compressor; Removing air conditioner compressor from and installing on bracket .



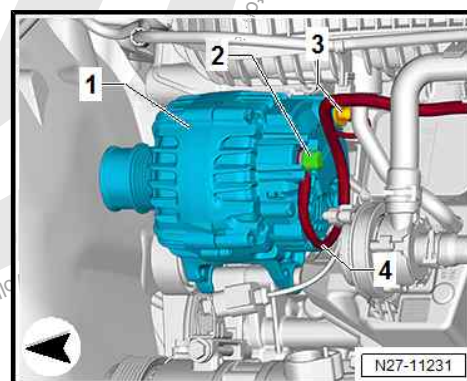
- Secure air conditioner compressor to lock carrier so that refrigerant lines are not under tension.

Continued for all vehicles

- Unscrew the two securing bolts -arrows- of alternator - C- .
- Detach alternator - C- -1- and turn it over, taking into account the lengths of attached wires.



- Release and pull off DF cable connector -3-.
- Unscrew securing nut -2-, and detach positive cable -4- from connection thread.
- Remove alternator -C- -1- by taking it downwards out of the vehicle.



Installing

Install in the reverse order of removal observing the following:



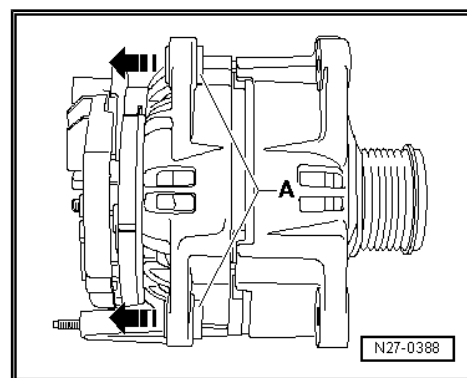
Caution

- ◆ *When fitting used poly V-belts, take note of the direction of rotation as marked during removal!*
- ◆ *Before installing poly V-belt, ensure that all ancillaries (alternator, air conditioner compressor) are secure.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

- Drive threaded bushes -A- approx. 4 mm in direction of arrow out of housing of alternator - C- .
- Connect battery ⇒ [page 7](#) .
- Start engine and check belt running.

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - alternator”, page 13](#)



2.2.2 Removing and installing alternator, natural gas engine



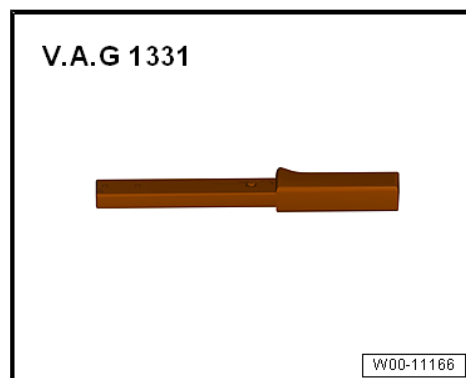
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ [page 7](#) .



Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

- Disconnect battery ⇒ [page 7](#) .
- Move lock carrier to service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Moving to and from service position .
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .
- Remove tensioner for poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .

Vehicles with air conditioning system



Caution

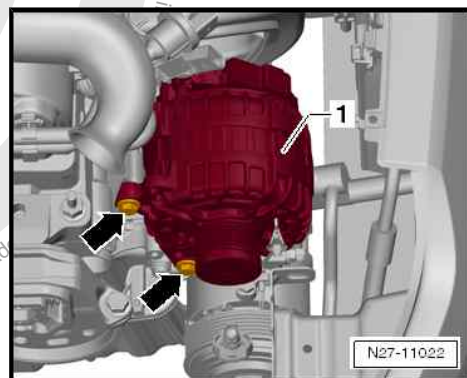
Risk of damage to air conditioner compressor, refrigerant lines and refrigerant hoses:

- ◆ ***Do NOT stretch, kink or bend refrigerant lines and hoses.***

- Remove air conditioner compressor from bracket ⇒ Heating, air conditioning system; Rep. gr. 87 ; Air conditioner compressor; Removing air conditioner compressor from and installing on bracket .
- Secure air conditioner compressor to lock carrier so that refrigerant lines are not under tension.

Continued for all vehicles

- Unscrew the two bolts -arrows- of alternator - C- .
- Detach alternator - C- -1- and turn it over, taking into account the lengths of attached wires.





- Release and disconnect electrical connector -3-.
- Unscrew securing nut -2-, and detach battery positive cable -4- from connection thread.
- Remove alternator - C- -1- by taking it downwards out of vehicle.

Installing

Install in the reverse order of removal observing the following:



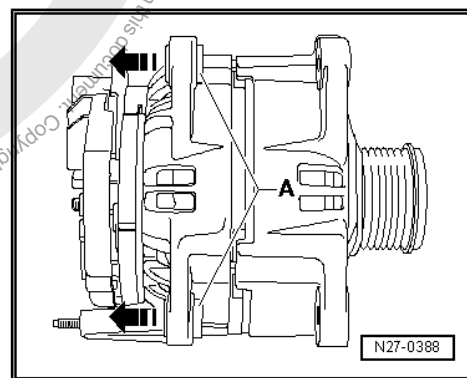
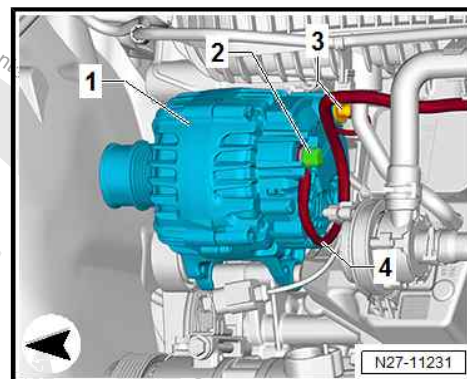
Caution

- ◆ *When fitting used poly V-belts, take note of the direction of rotation as marked during removal!*
- ◆ *Before installing poly V-belt, ensure that all ancillaries (alternator, air conditioner compressor) are secure.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

- Drive threaded bushes -A- approx. 4 mm in direction of arrow out of housing of alternator - C- .
- Connect battery ⇒ [page 7](#) .
- Start engine and check belt running.

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - alternator”, page 13](#)



2.3 Checking alternator

- Connect vehicle diagnostic tester ⇒ [page 153](#) .
- Check alternator - C- ⇒ Vehicle diagnostic tester.

2.4 Removing and installing poly V-belt pulley

⇒ [“2.4.1 Removing and installing poly V-belt pulley without free-wheel”, page 17](#)

⇒ [“2.4.2 Removing and installing poly V-belt pulley with free-wheel, manufacturer: Bosch”, page 18](#)

⇒ [“2.4.3 Removing and installing poly V-belt pulley with free-wheel, manufacturer: Valeo”, page 20](#)

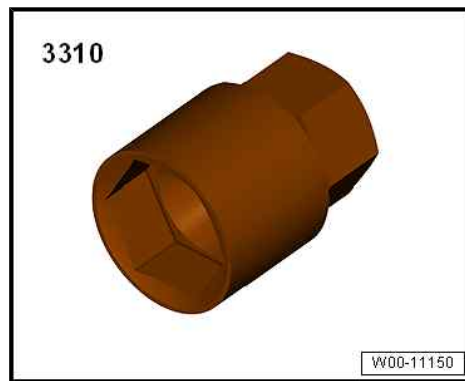
⇒ [“2.4.4 Removing and installing decoupler pulley with free-wheel”, page 22](#)

2.4.1 Removing and installing poly V-belt pulley without freewheel

Special tools and workshop equipment required



◆ Socket - VAS 3310-



◆ Torque wrench - V.A.G 1332-



Removing

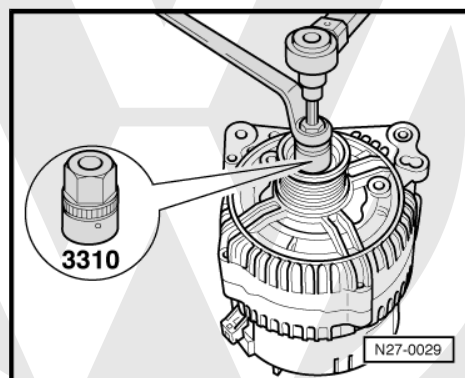
- Remove alternator ⇒ [page 13](#) .
- Clamp alternator in a vice at securing points.
- Use socket - VAS 3310- to unscrew poly V-belt pulley securing nut from alternator shaft.

Installing

Install in the reverse order of removal, observing the following:

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - alternator”, page 13](#)

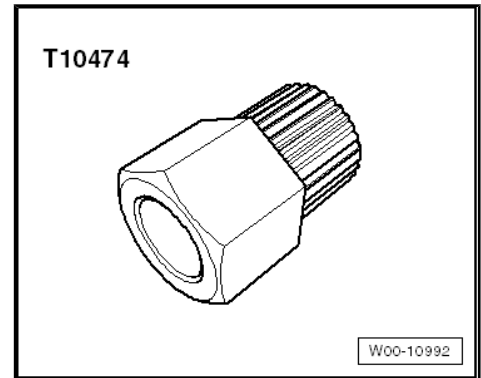


2.4.2 Removing and installing poly V-belt pulley with freewheel, manufacturer: Bosch

Special tools and workshop equipment required



◆ Multipoint adapter - T10474-



◆ Torque wrench - V.A.G 1332-



◆ Socket drive with 8 mm hexagon socket or TORX T50

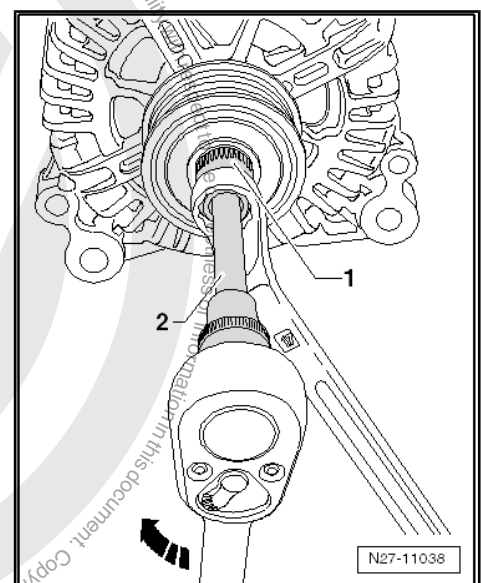
Removing

- Remove alternator ⇒ [page 13](#).
- Clamp alternator in a vice at securing points.
- Remove protective cap (where there is one) from poly V-belt pulley with freewheel.
- Insert multipoint adapter - T10474- -1- into poly V-belt pulley and fit an open-end spanner (width across flats 17 mm) to it.
- Insert hexagon socket or TORX socket -2- into alternator shaft.
- Turn generator shaft clockwise (left-handed thread) to loosen it, counterholding it with the open-end spanner.
- Hold poly V-belt pulley with freewheel stationary with your hand and turn alternator shaft until poly V-belt pulley with free-wheel can be removed.

Installing

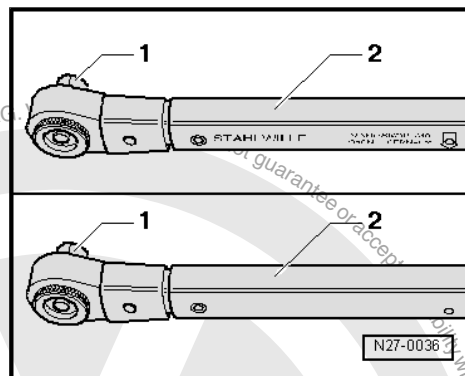
Install in the reverse order of removal observing the following:

The torque wrench - V.A.G 1332- must be modified for assembly of poly V-belt with freewheel as follows:





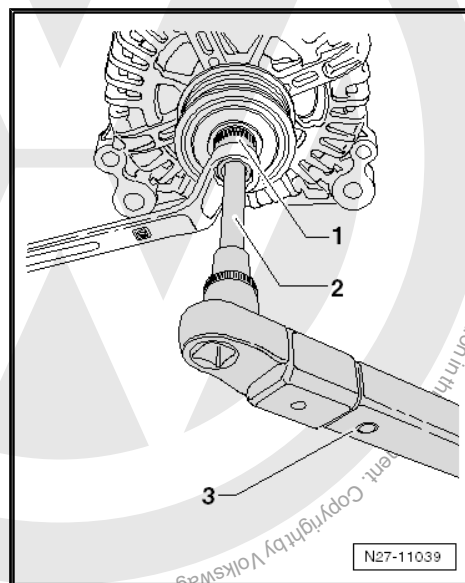
- Release socket drive -1- and pull off grip -2-.
- Turn torque wrench grip -2- 180° and reinsert socket drive.
- Set turning direction of torque wrench to anti-clockwise at socket drive.
- First screw poly V-belt pulley with freewheel onto alternator shaft by hand as far as possible.
- Insert multipoint adapter - T10474- -1- into poly V-belt pulley and fit an open-end spanner (width across flats 17 mm) to it.



- Insert hexagon socket or TORX socket -2- into alternator shaft.
- Turn alternator shaft anti-clockwise using torque wrench - V.A.G 1332- -3- in order to tighten poly V-belt pulley with freewheel.

Specified torques

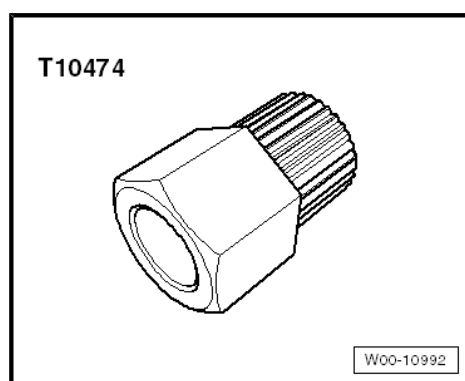
- ♦ ⇒ ["2.1 Assembly overview - alternator", page 13](#)



2.4.3 Removing and installing poly V-belt pulley with freewheel, manufacturer: Valeo

Special tools and workshop equipment required

- ♦ Multipoint adapter - T10474-





- ◆ Torque wrench - V.A.G 1332-



- ◆ Socket drive with 8 mm hexagon socket or TORX T50

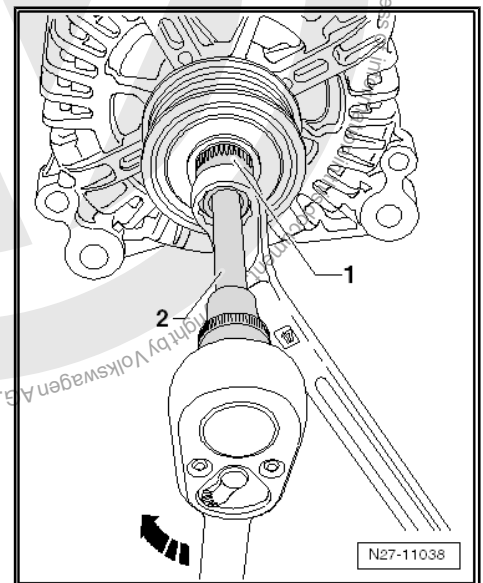
Removing

- Remove alternator → [page 13](#) .
- Clamp alternator in a vice at securing points.
- Remove protective cap (where there is one) from poly V-belt pulley with freewheel.
- Insert multipoint adapter - T10474- -1- into poly V-belt pulley and fit an open-end spanner (width across flats 17 mm) to it.
- Insert hexagon socket or TORX socket -2- into alternator shaft.
- Turn generator shaft clockwise (left-handed thread) to loosen it, counterholding it with the open-end spanner.
- Hold poly V-belt pulley with freewheel stationary with your hand and turn alternator shaft until poly V-belt pulley with freewheel can be removed.

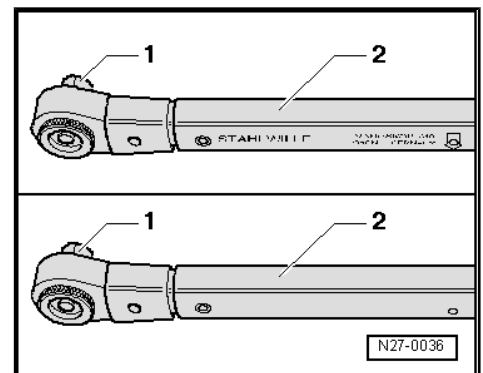
Installing

Install in the reverse order of removal observing the following:

The torque wrench - V.A.G 1332- must be modified for assembly of poly V-belt with freewheel as follows:



- Release socket drive -1- and pull off grip -2-.
- Turn torque wrench grip -2- 180° and reinsert socket drive.
- Set turning direction of torque wrench to anti-clockwise at socket drive.
- First screw poly V-belt pulley with freewheel onto alternator shaft by hand as far as possible.
- Insert multipoint adapter - T10474- -1- into poly V-belt pulley and fit an open-end spanner (width across flats 17 mm) to it.

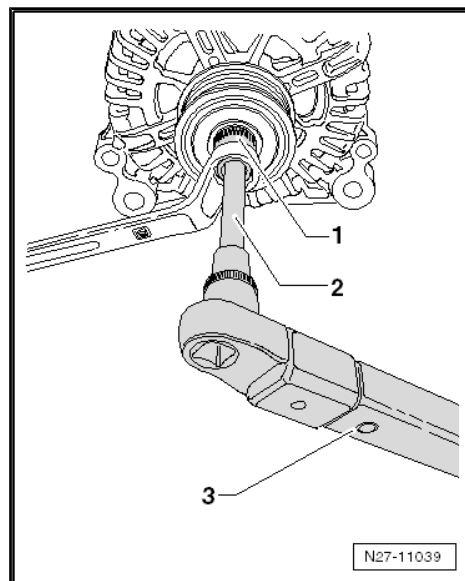




- Insert hexagon socket or TORX socket -2- into alternator shaft.
- Turn alternator shaft anti-clockwise using torque wrench - V.A.G 1332- -3- in order to tighten poly V-belt pulley with freewheel.

Specified torques

- ♦ ⇒ [“2.1 Assembly overview - alternator”, page 13](#)



2.4.4 Removing and installing decoupler pulley with freewheel

General description

There are different types of decoupled pulleys with freewheel.

Before removing the decoupler pulley with freewheel, it must be determined which special tool must be used.



Caution

The length of the poly V-belt depends on the version of decoupler pulley with freewheel installed.

Check which version of decoupler pulley with freewheel is installed in order to ensure installation of the correct poly V-belt. Refer to ETKA for proper allocation of the poly V-belt.

Distinguishing between different versions of decoupler pulleys with freewheel:

- A- decoupler pulley with freewheel, small; use adapter -T10474-

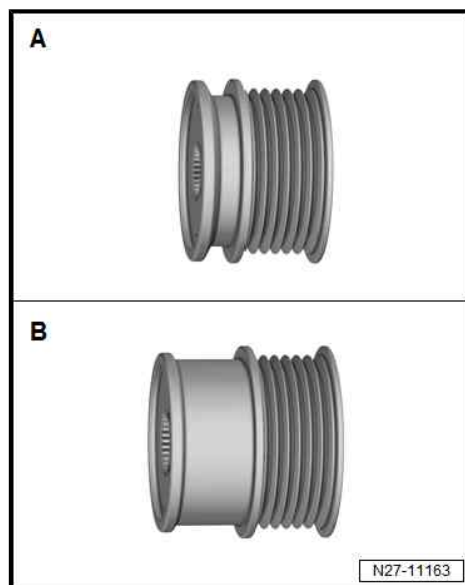


-B- decoupler pulley with freewheel, large; use adapter -3400-



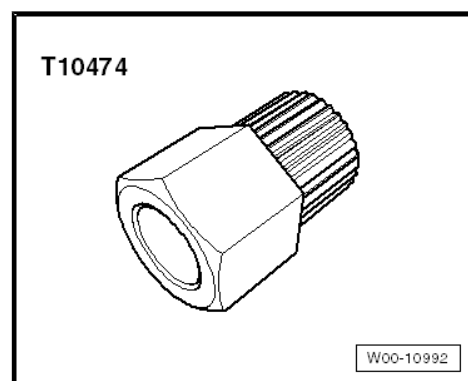
Note

The poly V-belt for the large decoupler pulley with freewheel must be longer owing to the fact that the decoupler pulley with freewheel has a larger diameter.

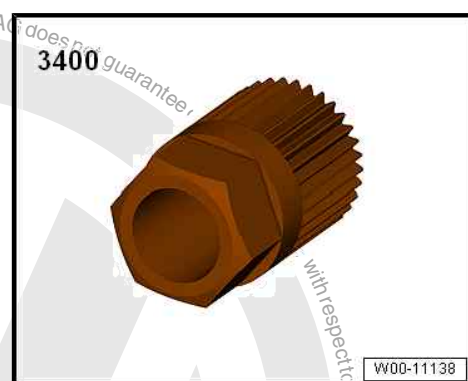


Special tools and workshop equipment required

- ◆ Multipoint adapter - T10474-



- ◆ Multipoint adapter - 3400-





- ◆ Torque wrench - V.A.G 1332-



- ◆ Socket drive with 8 mm hexagon socket or TORX T50

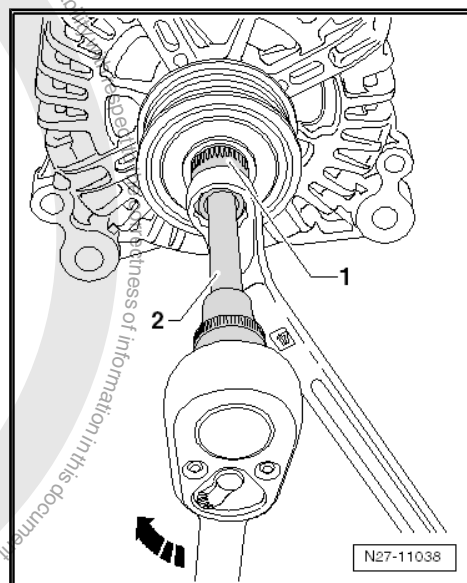
Removing:

- Remove alternator - C- ➔ [page 14](#) .
- Clamp alternator - C- in vice at mounting points.
- Remove protective cap (where present) from decoupler pulley with freewheel.
- Insert multipoint adapter - T10474- or multipoint adapter - 3400- -1- into pulley, and fit a ring spanner.
- Insert suitable tool -2- into alternator shaft.
- Turn alternator shaft clockwise to loosen it, counterholding with ring spanner while doing so.
- Hold decoupled pulley with freewheel stationary with your hand, and turn alternator shaft until decoupled pulley with freewheel can be removed.

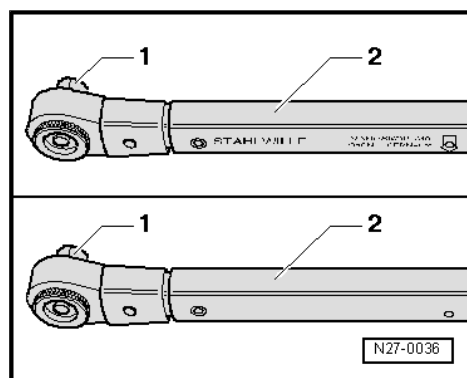
Installing:

Install in the reverse order of removal, observing the following:

Modify the torque wrench - V.A.G 1332- as follows to assemble decoupled pulley with freewheel:



- Release socket drive -1- and pull off grip -2-.
- Turn torque wrench grip -2- 180° and reinsert socket drive.
- Set turning direction of torque wrench - V.A.G 1332- to anti-clockwise at socket drive.
- First screw poly V-belt pulley with freewheel onto alternator shaft by hand to stop.

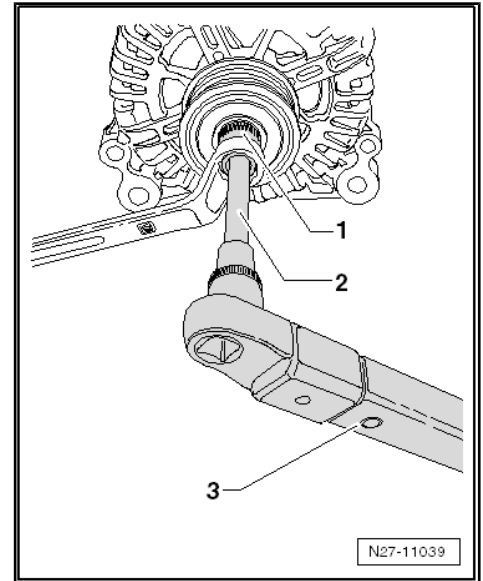




- Insert multipoint adapter - T10474- -1- into decoupler pulley with freewheel, and fit a ring spanner.
- Insert suitable tool -2- into alternator shaft.
- Turn alternator shaft anti-clockwise using torque wrench - V.A.G 1332- -3- in order to tighten decoupled pulley with freewheel.

Specified torques

Component	Specified torque
Securing nut for poly V-belt pulley	80 Nm



2.5 Removing and installing voltage regulator

⇒ ["2.5.1 Removing and installing voltage regulator, Bosch, version 1", page 25](#)

⇒ ["2.5.2 Removing and installing voltage regulator, Bosch, version 2", page 26](#)

⇒ ["2.5.3 Removing and installing voltage regulator, manufacturer: Valeo", page 27](#)

2.5.1 Removing and installing voltage regulator, Bosch, version 1

Special tools and workshop equipment required

- ◆ Torque screwdriver - V.A.G 1624-

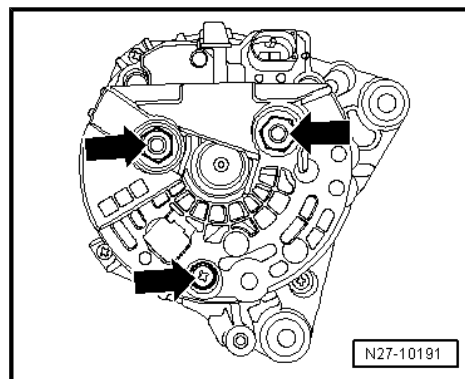


Removing

- Remove alternator ⇒ [page 14](#) .



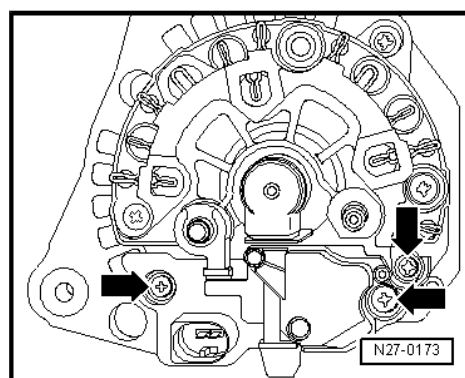
- Remove securing bolt and nuts -arrows- and remove deflector cap from alternator.



- Unscrew securing bolts of voltage regulator -arrows-.
- Remove voltage regulator from alternator.

Installing

Install in the reverse order of removal observing the following:



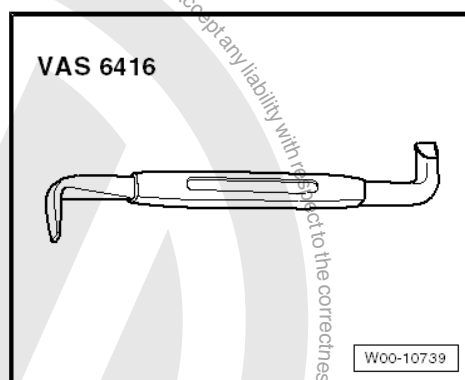
Specified torques

Component	Specified torque
M5 securing bolt securing protective cap to alternator	4.5 Nm
M4 securing bolt securing voltage regulator to alternator	2 Nm

2.5.2 Removing and installing voltage regulator, Bosch, version 2

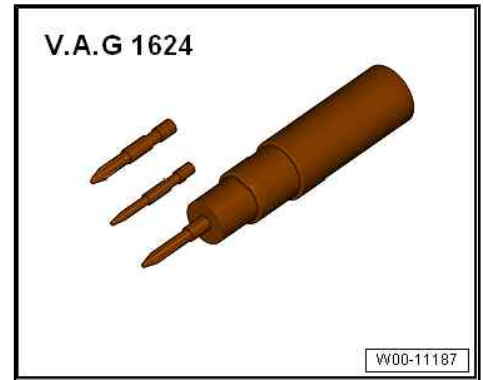
Special tools and workshop equipment required

- ◆ Offset screwdriver for slotted screws - VAS 6416-



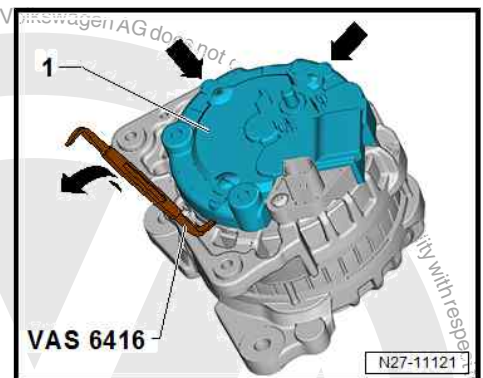


- ◆ Torque screwdriver - V.A.G 1624-



Removing

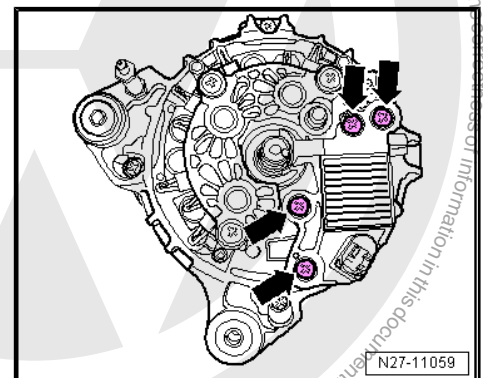
- Remove alternator - C- ⇒ [page 14](#) .
- Using offset screwdriver for slotted-head screws - VAS 6416- carefully lever off protective cap -1- at fasteners -arrows-.



- Unscrew securing bolts -arrows- for voltage regulator - C1- .
- Detach voltage regulator - C1- from alternator - C- .

Installing

Install in the reverse order of removal observing the following:



Specified torques

Component	Specified torque
Bolts for voltage regulator - C1-	2 Nm

2.5.3 Removing and installing voltage regulator, manufacturer: Valeo

Special tools and workshop equipment required

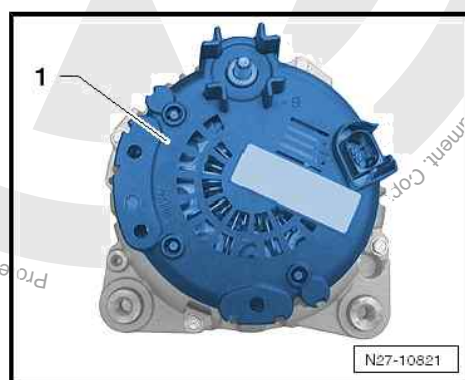


◆ Torque wrench - V.A.G 1783/-



Removing

- Remove alternator - C- ➔ [page 14](#) .
- Carefully lever protective cap -1- off alternator - C- .

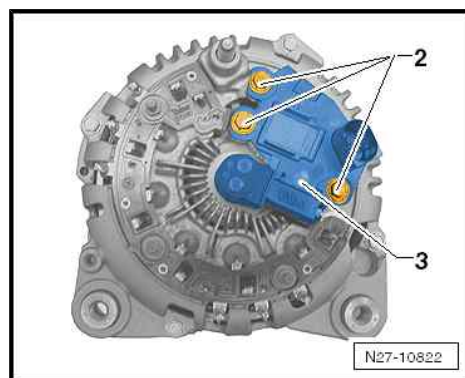


- Unscrew bolts -2- of voltage regulator - C1- -3-.
- Remove voltage regulator - C1- -3- from alternator - C- .

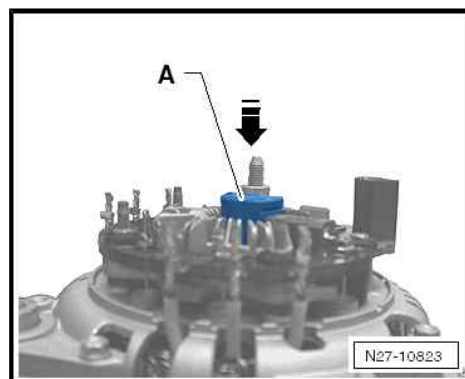
Installing

Install in the reverse order of removal, observing the following:

- Install voltage regulator - C1- .

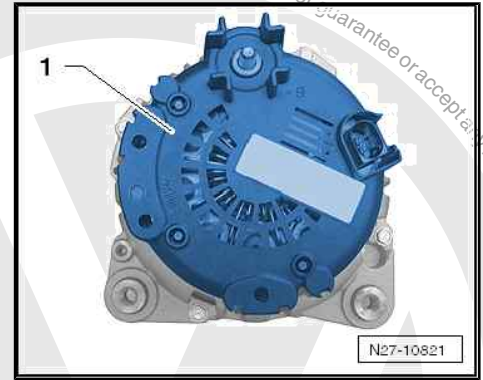


- Press down protective cap for carbon brushes -A- -arrow- until it is flush with the voltage regulator housing.





- Fit new protective cap -1- to alternator - C- .



Specified torques

Component	Specified torque
Bolts for voltage regulator - C1-	4 Nm

3 Starter motor

⇒ [“3.1 Assembly overview - starter”, page 30](#)

⇒ [“3.2 Removing and installing starter motor”, page 30](#)

3.1 Assembly overview - starter

1 - Starter motor

- ☐ Removing and installing
⇒ [page 30](#)

2 - Battery positive wire connection to starter

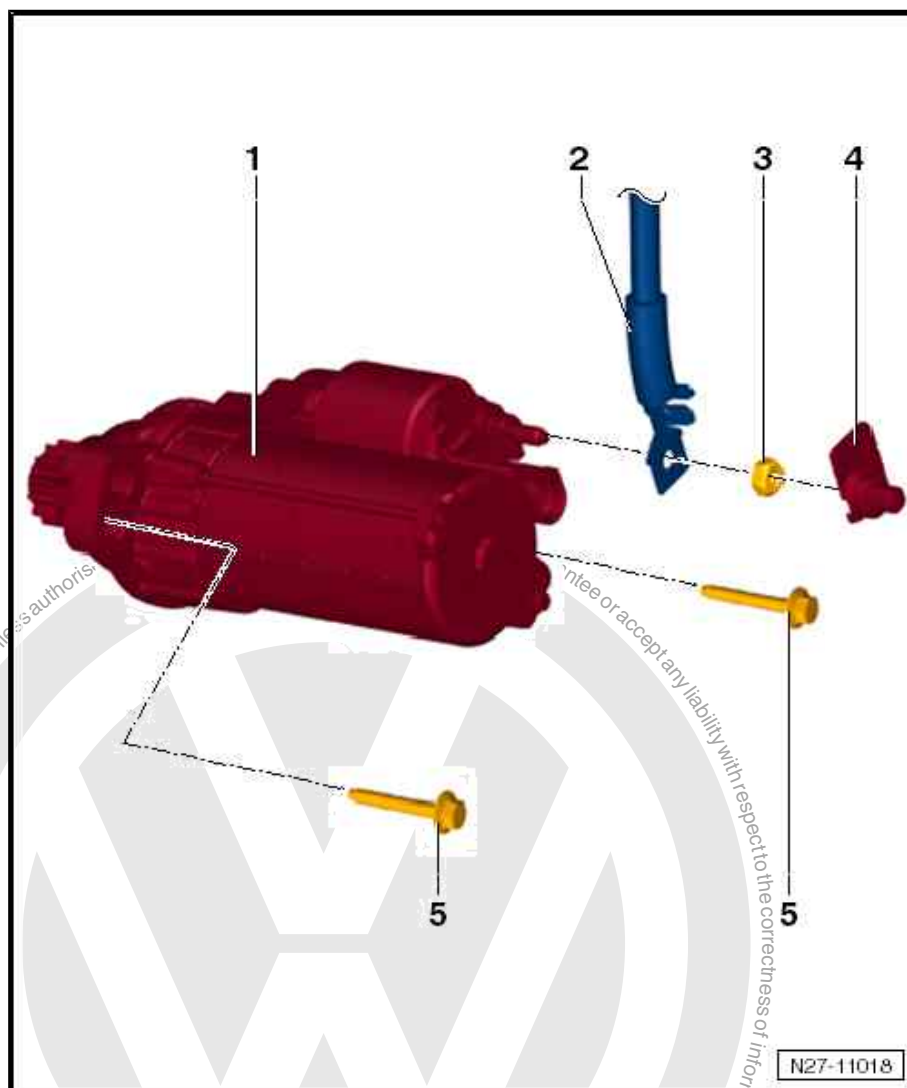
3 - Battery positive wire securing nut to starter

- ☐ Specified torque: 15 Nm

4 - Protective cap

5 - Starter securing bolts

- ☐ Specified torque: 40 Nm



3.2 Removing and installing starter motor

⇒ [“3.2.1 Removing and installing starter, manual gearbox”, page 30](#)

⇒ [“3.2.2 Removing and installing starter, automated manual gearbox”, page 31](#)

3.2.1 Removing and installing starter, manual gearbox

Renewing starter on vehicles with start/stop system:

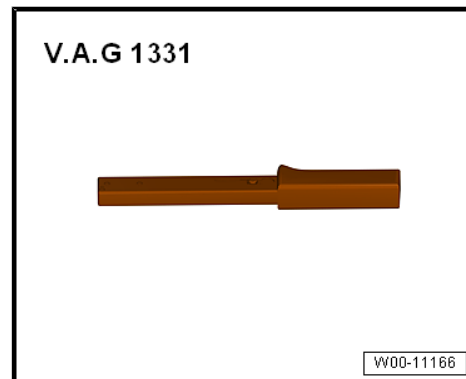
Due to the higher requirements on the starter when the start/stop system is activated, e.g. in urban traffic/driving, the deep-cycle resistance has been increased and the ring gear reinforced.



When renewing starter, make sure the new one with the correct part designation as shown in ⇒ Electronic parts catalogue (ETKA) is used. Components adapted to start/stop system are not identified separately and are not or barely different from normal components in their appearance.

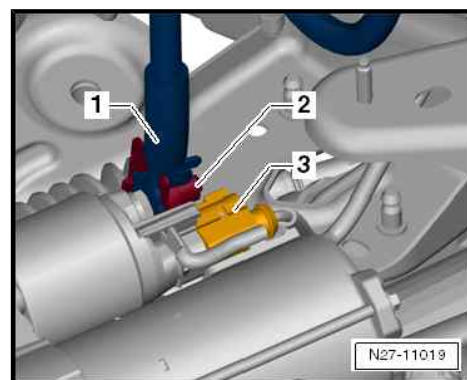
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

- Remove battery tray ⇒ [page 10](#) .
- Unclip gear selector cables from gearbox ⇒ Rep. gr. 34 ; Selector mechanism; Overview - selector mechanism .
- Lever off cover -2- and undo nut beneath it.
- Detach positive cable -1- from connection thread.
- Release and disconnect electrical connector -3-



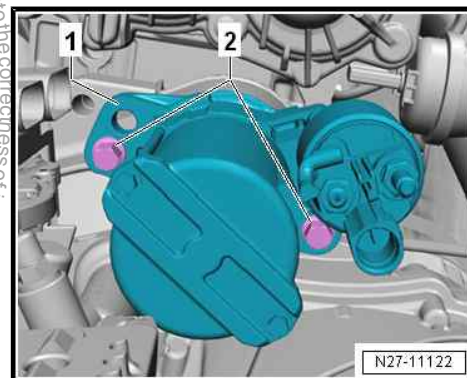
- Unscrew starter securing bolts -2-.
- Remove starter -1- by taking it upwards out of the vehicle.

Installing

Install in the reverse order of removal observing the following:

Specified torques

- ◆ ⇒ ["3.1 Assembly overview - starter", page 30](#)



3.2.2 Removing and installing starter, automated manual gearbox

Renewing starter on vehicles with start/stop system:

Due to the higher requirements on the starter when the start/stop system is activated, e.g. in urban traffic/driving, the deep-cycle resistance has been increased and the ring gear reinforced.

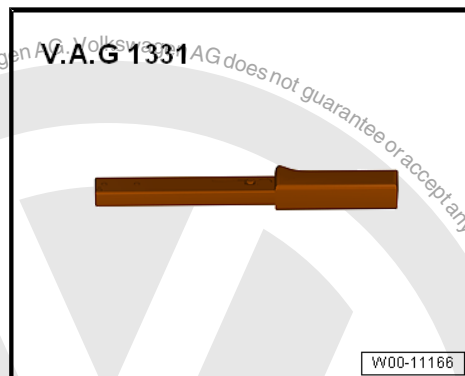
When renewing starter, make sure the new one with the correct part designation as shown in ⇒ Electronic parts catalogue (ETKA)



is used. Components adapted to start/stop system are not identified separately and are not or barely different from normal components in their appearance.

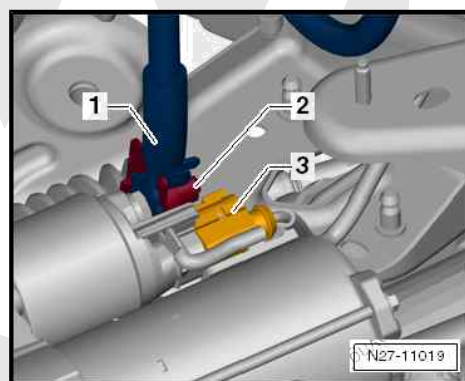
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

- Remove battery tray ⇒ [page 10](#) .
- Lever off cover -2- and undo nut beneath it.
- Detach positive cable -1- from connection thread.
- Release and disconnect electrical connector -3-.



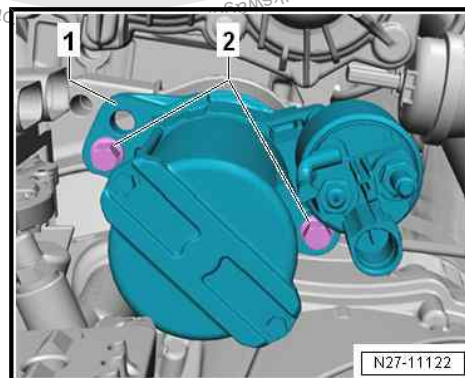
- Unscrew starter securing bolts -2-.
- Remove starter -1- by taking it upwards out of the vehicle.

Installing

Install in the reverse order of removal observing the following:

Specified torques

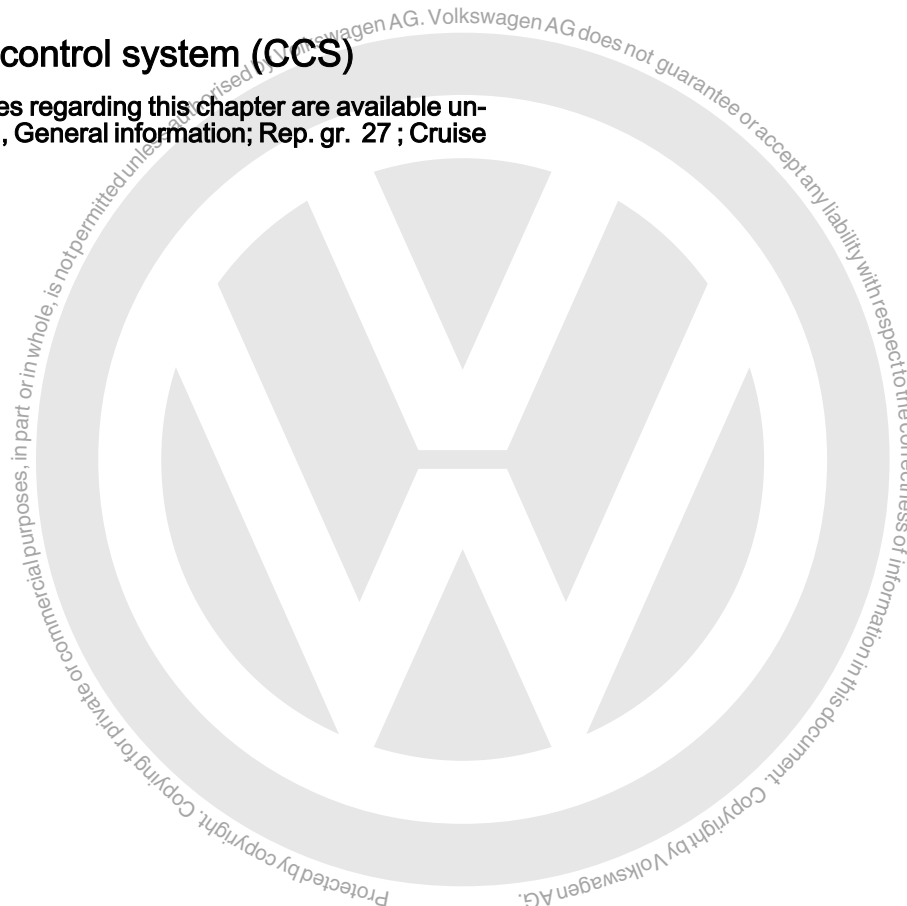
- ◆ ⇒ [“3.1 Assembly overview - starter”, page 30](#)





4 Cruise control system (CCS)

All instructions and notes regarding this chapter are available under ➔ Electrical system, General information; Rep. gr. 27 ; Cruise control system (CCS)





5 Start/stop system

⇒ **"5.1 General description - start/stop system", page 34**

⇒ **"5.2 Removing and installing voltage stabiliser", page 35**

5.1 General description - start/stop system

General description:

The start/stop system is used for reducing fuel consumption by automatically switching off the engine when the vehicle is stationary and automatically starting it when the driver wants the vehicle to move on. The start/stop mode is automatically activated when, after starting to move, the vehicle is driven for about 4 seconds at a minimum speed of 3 km/h.

Following control units are involved in the start/stop system:

- ◆ Data bus diagnostic interface - J533- in the onboard power supply control unit - J519-
- ◆ Engine control unit - J623-
- ◆ ABS control unit - J104-

Recharging battery or jump start on vehicles with start/stop system:

When recharging or jump starting vehicles with start/stop system, note the following: first connect charging cable to battery positive terminal then body earth. This ensures that the battery sensor is not bridged. The direct charging of the battery on the negative terminal clamp means that the battery sensor is shunted and the battery data are not registered by the sensor while charging. Then, the values concerning the battery state and saved in the data bus diagnostic interface would not correspond to the values of the charged battery.

Replacing battery on vehicles with start/stop system:

Because of its higher deep-cycle resistance, only a special starter battery is used in vehicles with a start/stop system.

When renewing the starter battery, note correct part designation in ⇒ ETKA (electronic parts catalogue) . Starter batteries for use in vehicles with a start/stop system are marked with "AGM" (Absorbent Glass Mat) or "EFB" (Enhanced Flooded Battery).

Fault detection and fault display:

The start/stop system as a function is integrated in the engine control unit - J623- software.

The engine control unit - J623- features self-diagnosis to facilitate fault finding.

To localise faults, refer to chapter entitled "Vehicle diagnosis, testing and information system" and use "Guided fault finding" function.

The voltage stabiliser - J532- is secured on the floor covering under the left front seat. It has the task of stabilizing to 12 volts the high voltage fluctuations generated in the onboard supply by the start/stop operation.

Effects in case of voltage stabiliser failure:

If the voltage stabiliser is defective, devices such as the radio, radio navigation or telephone will perform a reset if their own voltage supply is not sufficient when the starter is operated. If, in start/stop mode, the mentioned electrical consumers are identified as causing a reset for each motor start, this indicates a defective voltage stabiliser. At present, no direct entries can be made concerning malfunction of the voltage stabiliser, e.g. in the event



memory of the diagnostic interface or in the onboard supply control unit. If radio, radio/navigation and telephone units have failed together, first check fuse of voltage stabiliser.

5.2 Removing and installing voltage stabiliser

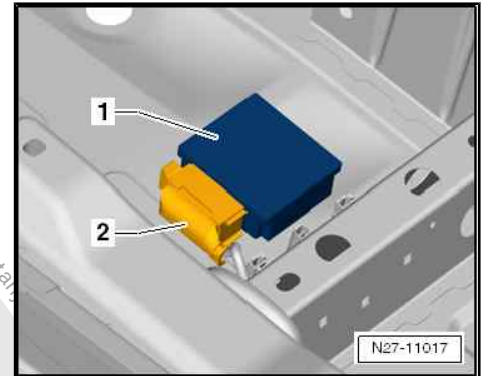
Removing

- Push driver's seat as far back as possible.
- Detach Velcro strip of voltage stabiliser - J532- -1- from floor covering.
- Release and pull off connector -2-, and remove voltage stabiliser - J532- from vehicle.

Installing

Install in the reverse order of removal observing the following:

- During installation, first attach and lock the connector, and then attach the stabiliser in its original position on the floor covering by means of the Velcro strip.





90 – Gauges, instruments

1 Dash panel insert

⇒ [“1.1 Assembly overview - dash panel insert”, page 36](#)

⇒ [“1.2 Removing and installing dash panel insert KX2”, page 40](#)

1.1 Assembly overview - dash panel insert

⇒ [“1.1.1 Assembly overview - dash panel insert, indicator lamps, petrol engine”, page 36](#)

⇒ [“1.1.2 Assembly overview - dash panel insert, indicator lamps, natural gas engine”, page 38](#)

⇒ [“1.1.3 Assembly overview - dash panel insert, rear”, page 40](#)

1.1.1 Assembly overview - dash panel insert, indicator lamps, petrol engine



Note

Depending on the equipment, different dash panel inserts are used and, as a result, the arrangement of the indicator lamps can deviate from the illustration.



1 - Indicator lamp for left turn signal

2 - Electronic stabilisation programme (ESP) warning lamp

- ☐ Flashes: electronic stabilisation programme (ESP) regulating
- ☐ Lights up: ESP fault or ESP switched off

3 - Anti-lock brake system (ABS) warning lamp

- ☐ Fault

4 - Warning lamp for airbag system and belt tensioner

- ☐ Airbag and/or belt tensioner defective

5 - Seat belt warning lamp

- ☐ Fasten seat belts!

6 - Indicator lamp for tyre pressure monitor

- ☐ Pressure of one particular tyre too low or system fault occurred

7 - Main beam warning lamp

8 - Rear fog light warning lamp

9 - Indicator lamp for electromechanical power steering (EPS = Electronic Power Steering)

- ☐ Lights up yellow: reduced electromechanical power steering
- ☐ Lights up red: electromechanical power steering failure

10 - Cruise control system (CCS) warning lamp

11 - Indicator lamp for "Operate foot brake"

- ☐ Request from automated manual gearbox (SQ)
- ☐ Indicator lamp only fitted in vehicles with automated manual gearbox

12 - Coolant temperature warning lamp

- ☐ Coolant temperature too high or
- ☐ Engine coolant level too low

13 - Oil pressure warning lamp

- ☐ Oil pressure too low
- ☐ Switch off engine and check oil level

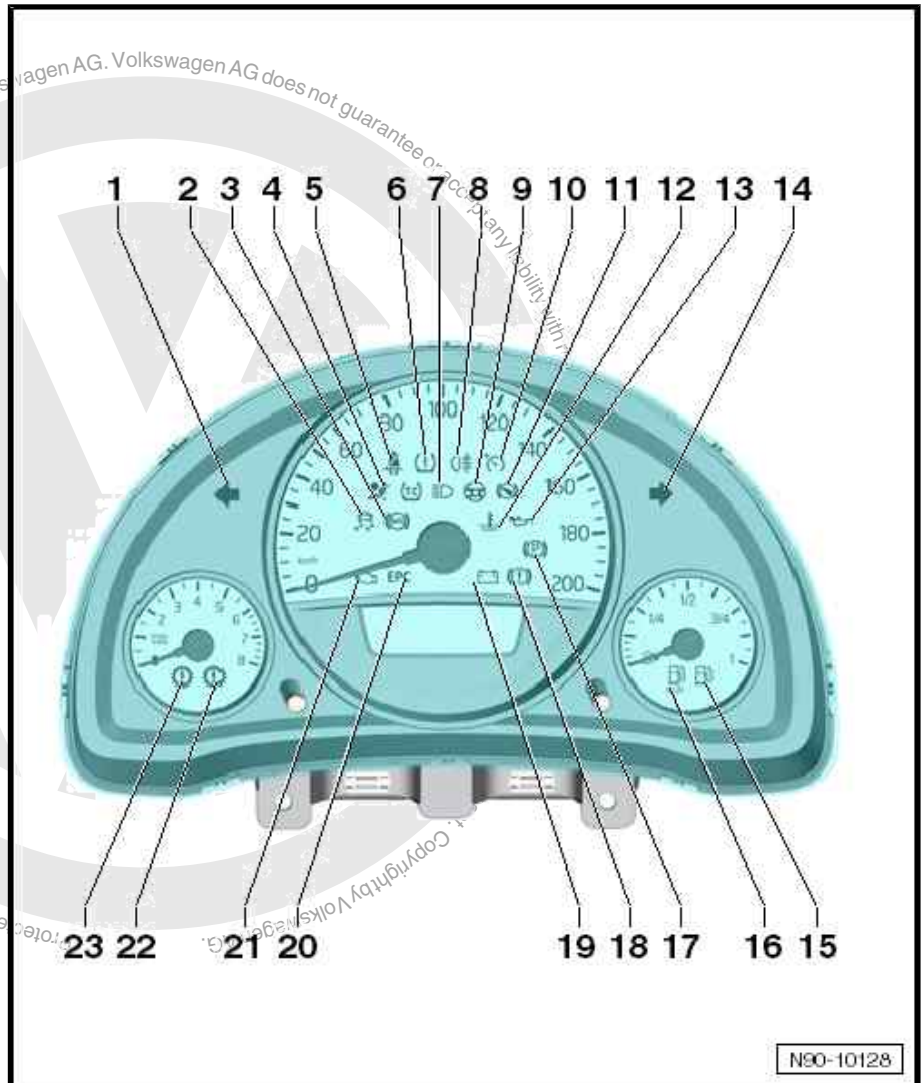
14 - Indicator lamp for right turn signal

15 - Fuel level warning lamp

- ☐ Fuel level too low (reserve)

16 - Indicator lamp for natural gas level

- ☐ Indicator lamp only fitted in natural gas vehicles
- ☐ Fuel level too low (reserve)





17 - Parking brake indicator lamp

- ☐ Parking brake applied

18 - Brake system warning lamp

- ☐ Lights up: fault in brake system
- ☐ Lights up: brake fluid low - stop engine, and check brake fluid level

19 - Alternator warning lamp

- ☐ Fault in alternator

20 - Indicator lamp for engine fault EPC (electric throttle)

- ☐ Fault

21 - Indicator lamp for Electric On Board Diagnosis (EOBD)

- ☐ Fault in exhaust system

22 - Indicator lamp for fault in automated manual gearbox (red)

- ☐ Indicator lamp only fitted in vehicles with automated manual gearbox

23 - Indicator lamp for fault in automated manual gearbox (yellow)

- ☐ Indicator lamp only fitted in vehicles with automated manual gearbox

1.1.2 Assembly overview - dash panel insert, indicator lamps, natural gas engine

1 - Indicator lamp for left turn signal

2 - Electronic stabilisation programme (ESP) warning lamp

- ☐ Flashes: electronic stabilisation programme (ESP) regulating
- ☐ Lights up: ESP fault or ESP switched off

3 - Anti-lock brake system (ABS) warning lamp

- ☐ Fault

4 - Warning lamp for airbag system and belt tensioner

- ☐ Airbag and/or belt tensioner defective

5 - Seat belt warning lamp

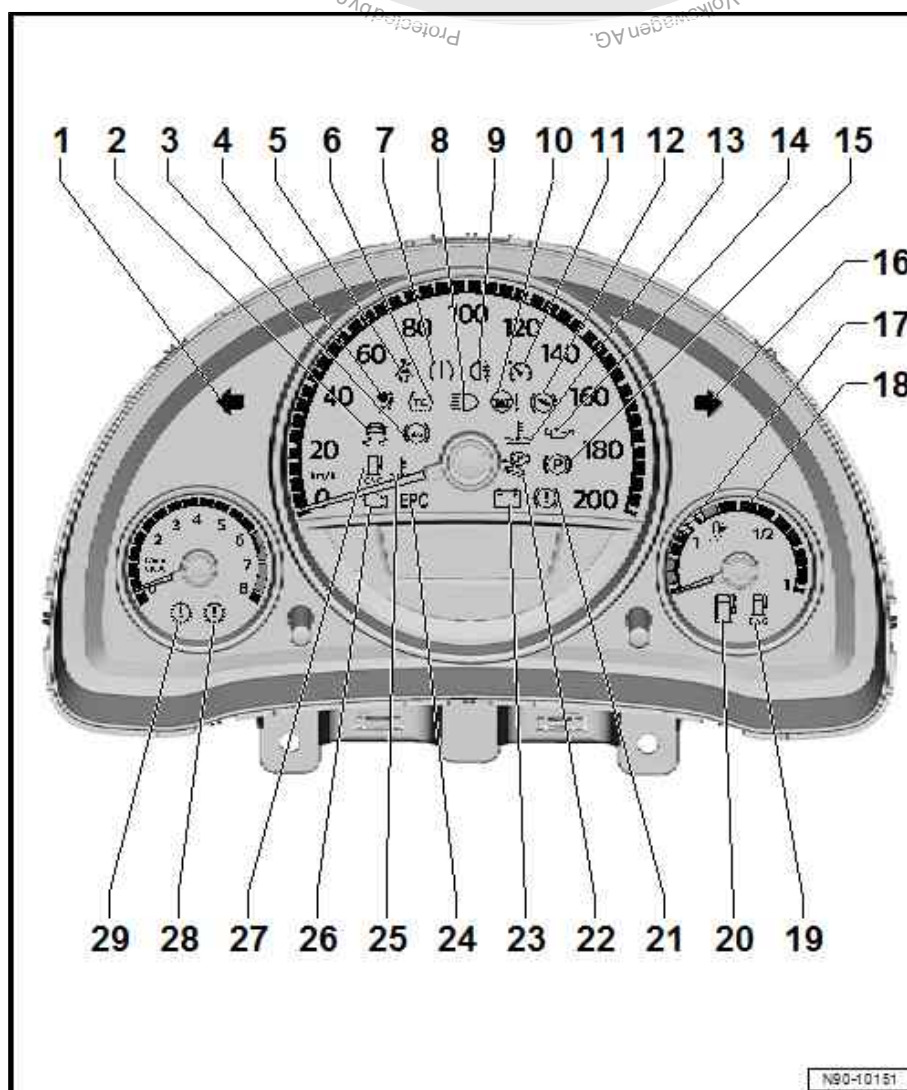
- ☐ Fasten seat belts!

6 - Indicator lamp for traction control

- ☐ Flashes: regulating
- ☐ Lights up: faulty or switched off by system

7 - Indicator lamp for tyre pressure monitor

- ☐ Pressure of one particular tyre too low or system fault occurred





8 - Main beam warning lamp

9 - Rear fog light warning lamp

10 - Indicator lamp for electro-mechanical power steering (EPS = Electronic Power Steering)

- ☐ Lights up yellow: reduced electromechanical power steering
- ☐ Lights up red: electromechanical power steering failure

11 - Cruise control system (CCS) warning lamp

12 - Indicator lamp for "Operate foot brake"

- ☐ Indicator lamp only fitted in vehicles with automated manual gearbox
- ☐ Request from automated manual gearbox (SQ)

13 - Coolant temperature indicator lamp (red)

- ☐ Coolant temperature too high or
- ☐ Coolant level too low.

14 - Oil pressure warning lamp

- ☐ Oil pressure too low
- ☐ Switch off engine and check oil level

15 - Parking brake indicator lamp

- ☐ Parking brake applied

16 - Indicator lamp for right turn signal

17 - Fuel gauge for petrol

18 - Fuel gauge for natural gas

19 - Indicator lamp for natural gas level

- ☐ Fuel level too low (reserve)

20 - Indicator lamp for fuel level

- ☐ Fuel level too low (reserve)

21 - Brake system warning lamp

- ☐ Lights up: fault in brake system
- ☐ Lights up: brake fluid low - stop engine, and check brake fluid level

22 - Indicator lamp for automated manual gearbox

- ☐ Flashes: vehicle is not secured against rolling away

23 - Indicator lamp for alternator

- ☐ Fault in alternator

24 - Indicator lamp for engine fault EPC (electric throttle)

- ☐ Fault

25 - Coolant temperature indicator lamp (blue)

- ☐ Coolant temperature too low

26 - Indicator lamp for Electric On Board Diagnosis (EOBD)

- ☐ Fault in exhaust system

27 - Indicator lamp for natural gas level

- ☐ Natural gas tank almost empty

28 - Indicator lamp for fault in automated manual gearbox (red)

- ☐ Indicator lamp only fitted in vehicles with automated manual gearbox
- ☐ Fault in automated manual gearbox

29 - Indicator lamp for fault in automated manual gearbox (yellow)

- ☐ Indicator lamp only fitted in vehicles with automated manual gearbox



- ❑ Automated manual gearbox overheated or gears cannot be shifted properly

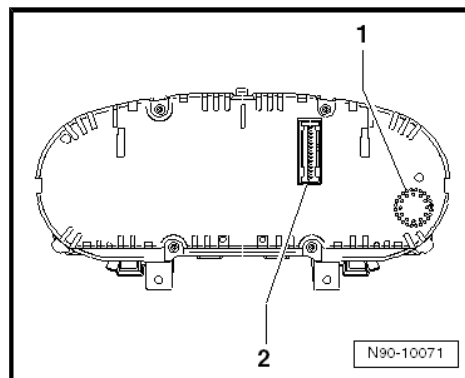
1.1.3 Assembly overview - dash panel insert, rear



Note

The dash panel insert must not be dismantled. If necessary, the dash panel insert is renewed as a unit.

- 1 - Warning buzzer
- 2 - Connector



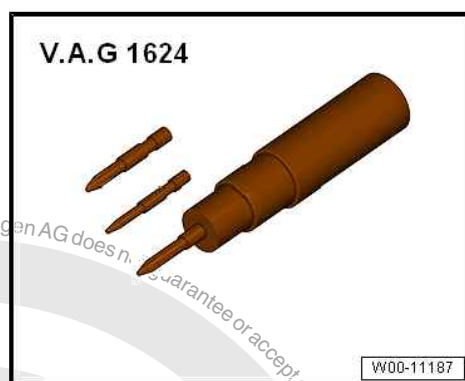
Note

Pin assignment of connectors on dash panel insert: ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

1.2 Removing and installing dash panel insert - KX2-

Special tools and workshop equipment required

- ◆ Torque screwdriver - V.A.G 1624-



- ◆ Protective film - VAS 6773-



Note

- ◆ *If one of the components is defective, the dash panel insert - K- must be renewed as a complete unit.*
- ◆ *All indicator lamps in the dash panel insert - K- are equipped with light-emitting diodes. Light-emitting diodes cannot be renewed separately if defective.*
- ◆ *The dash panel insert - K- must not be dismantled.*
- ◆ *For greater clarity, the steering wheel is not shown. However, it is not necessary to remove the steering wheel before removing the dash panel insert - K- .*

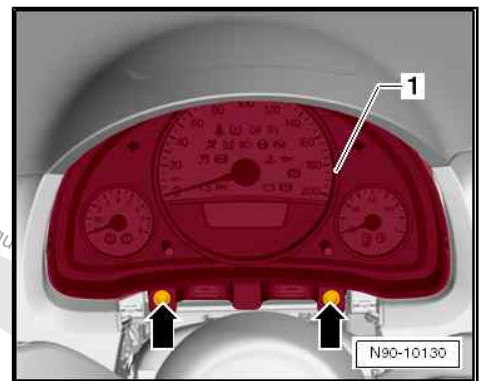


Note

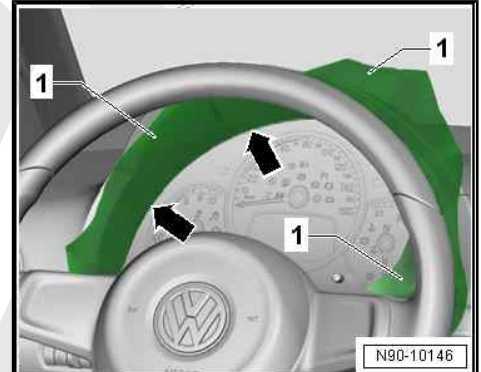
If the dash panel insert - K- with the control unit in dash panel insert - J285- is to be renewed, start the respective function → Vehicle diagnostic tester.

Removing

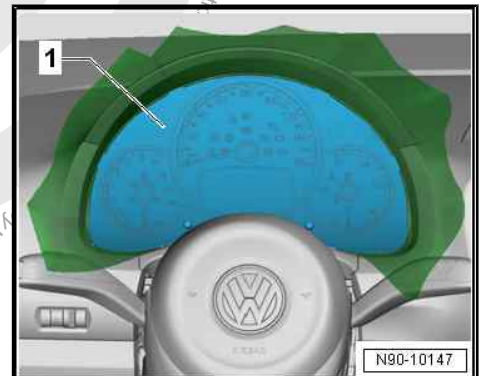
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Lock steering wheel in lowest position.
- Loosen and remove gap cover of the steering column trim from dash panel → General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers; Removing and installing gap cover in dash panel insert .
- Undo and remove bolts -arrows- securing dash panel insert -1-.
- Push protective films -1- on left and right into gap -arrows- between dash panel insert and dash panel cowl.



- If the protective film is not used, the dash panel cowl and the edge of the dash panel will be scratched near the dash panel insert.



- Pull out dash panel insert - KX2- so that connectors become accessible.
- Disconnect electrical connector.





- Press locking detent -1- to disconnect connector.
- Swing retainer in -direction of arrow- and pull off connector.
- Remove dash panel insert from vehicle.

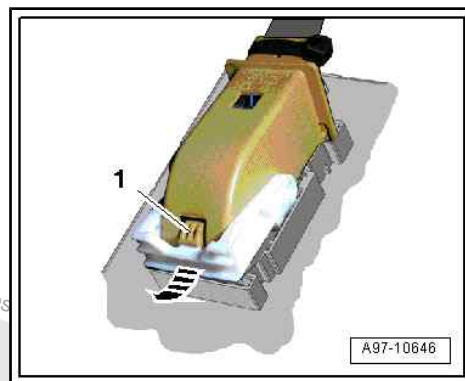
Installing

Install in the reverse order of removal observing the following:

- Perform functional check.

Specified torques

Component	Specified torque
Securing bolts for securing dash panel insert to dash panel	1.5 Nm





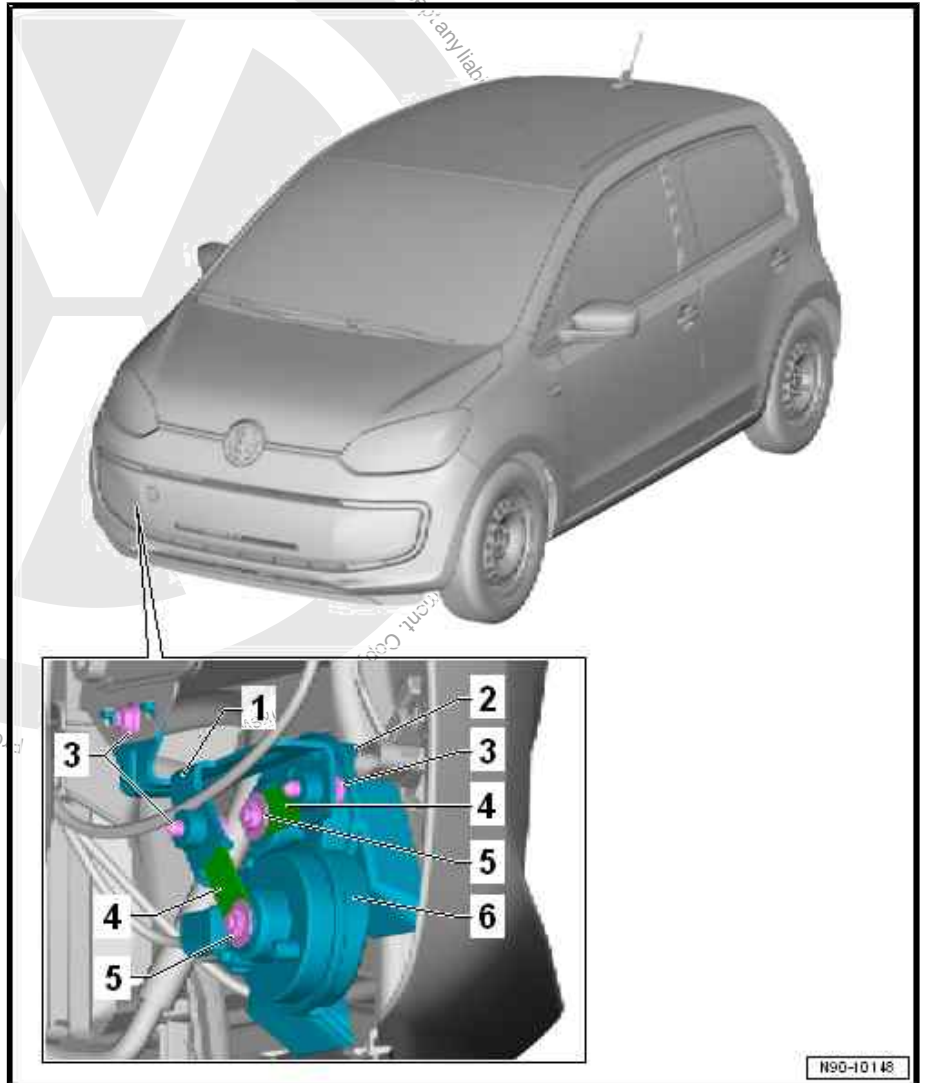
2 Horn

⇒ [“2.1 Assembly overview - horn”, page 43](#)

⇒ [“2.2 Removing and installing treble horn H2 and bass horn H7”, page 44](#)

2.1 Assembly overview - horn

- 1 - **Bracket**
 - ☐ For horn
- 2 - **Bass tone horn - H7-**
 - ☐ Removing and installing
⇒ [page 44](#) .
- 3 - **Bolt**
 - ☐ 20 Nm
- 4 - **Bracket**
 - ☐ For horn
- 5 - **Nut**
 - ☐ 9 Nm
- 6 - **Treble tone horn - H2-**
 - ☐ Removing and installing
⇒ [page 44](#) .





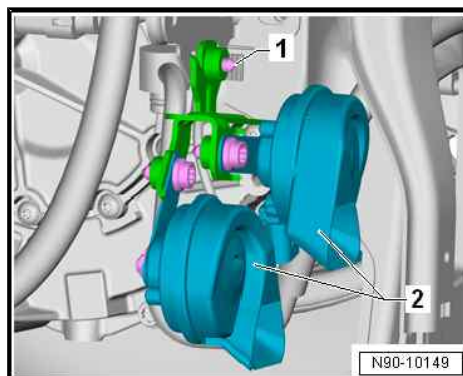
2.2 Removing and installing treble horn - H2- and bass horn - H7-

Removing

- Unscrew bolt -1-.
- Remove bracket together with horns -2-.
- Disconnect electrical connector.

Removing horns from bracket

- Remove horns together with bracket ⇒ [page 44](#) .



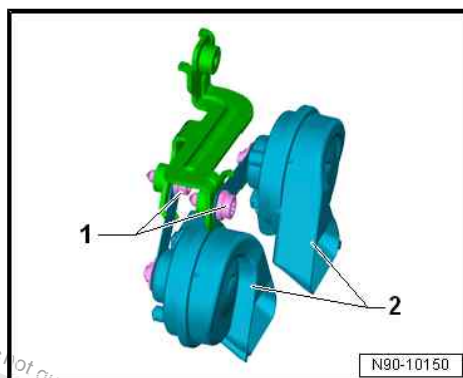
- Unscrew bolts -1-.
- Remove horns -2-.

Installing

Install in the reverse order of removal, observing the following:

Specified torques

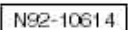
- ♦ ⇒ ["2.1 Assembly overview - horn", page 43](#)



1 windscreen wiper system.

⇒ “1.9 Removing and installing rain and light sensor”, page 54

Renewing ⇒ page 51





1.2 Moving wipers to service position



Caution

Risk of damaging the bonnet when moving wipers back into the park position.

- ◆ *Do not manoeuvre the vehicle with wiper arms folded out.*
- ◆ *The wipers automatically move back to the park position when the wiper switch is operated or when road speed exceeds 6 km/h.*



Caution

Risk of damage to wiper blades due to freezing.

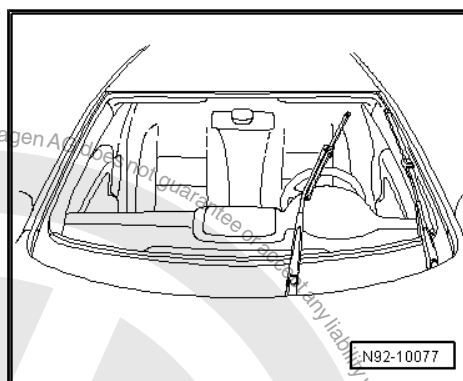
- ◆ *In the event of frost, check if wiper blades are frozen.*



Note

If it is necessary for the windscreen wiper motor to run during the working procedure, the bonnet must be closed completely, as otherwise the power supply to the wiper motor will be interrupted.

- Switch on ignition briefly, then switch it off again.
- Actuate “flick wipe” function within 10 seconds. The wipers are moving to “service position”.



1.3 Removing and installing wiper blade

Removing

- Move wipers to service position ⇒ [page 46](#) .



Caution

Risk of damage to the wiper blade.

- ◆ *Joint-free wipers are very flexible. To lift the wiper blades off the windscreen, touch them only in the area in which the wiper blades are attached to the wipers.*

- Lift wiper arm off the windscreen.



- Press retaining clip -arrow A- and push wiper blade -1- off wiper arm -2- -arrow B-.
- Remove wiper blade -1-.

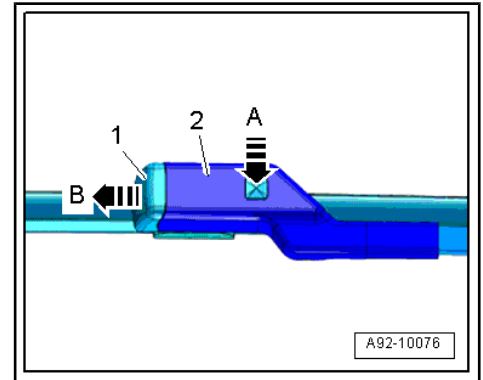
Installing



Caution

Risk of damage to the vehicle body.

- ◆ *Wiper blades for driver and front passenger sides each have a different length.*

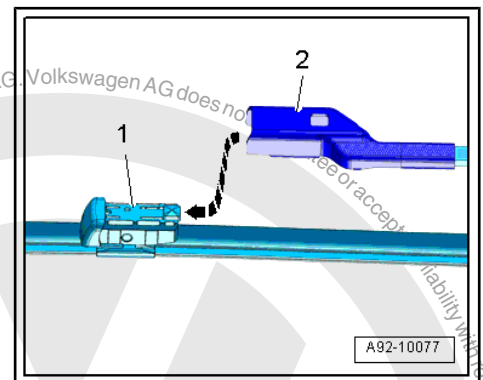


Install in the reverse order of removal, observing the following:

- Insert wiper blade -1- in parallel movement into wiper arm -2- -arrow-. Ensure that wiper blade -1- is pushed into wiper arm -2- until retaining clip is heard to engage.

To leave the “service position”:

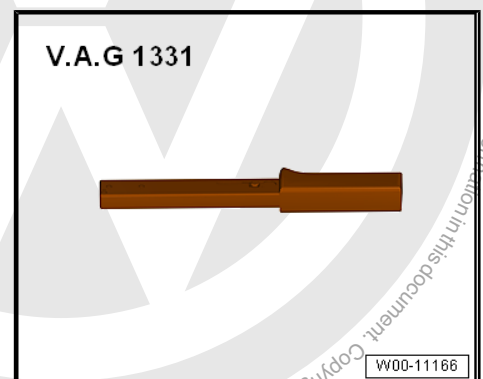
- Operate windscreen wiper switch. Or
- Drive vehicle faster than 6 km/h.



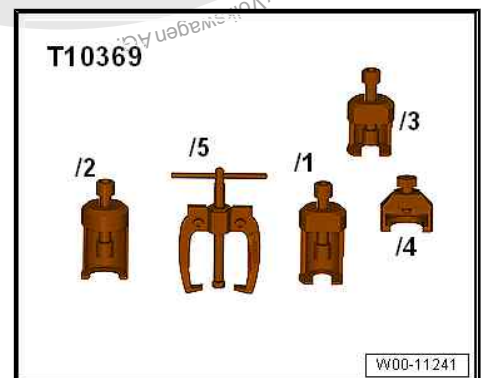
1.4 Removing and installing wiper arms

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Puller - T10369-





Removing



Caution

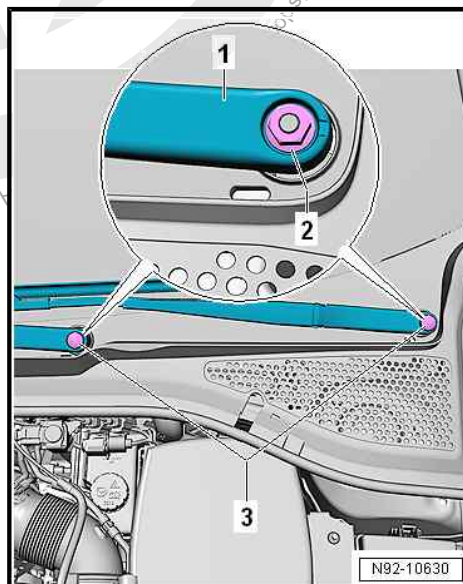
Risk of damage to wiper shafts.

- ◆ ***There is a risk of damage to the wiper shafts when trying to release the wiper arms without using the puller - T10369/1-.***

If it is necessary for the wiper motor - V- to run during the working procedure, the bonnet must be closed, as otherwise the power supply to the wiper motor - V- will be interrupted.

The removal and installation procedure is described for left-hand drive vehicles. Removal and installation are carried out in the same manner in RHD vehicles.

- Move wipers to service position ➔ [page 46](#) .
- Using a screwdriver, lever caps -3- off wiper arms -1-.
- Loosen nuts -2- a few turns.

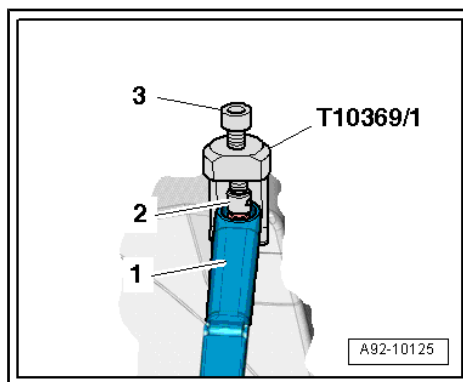


- Fit puller - T10369/1- to wiper arm -1- as shown in illustration.
- Fit thrust piece -2- to wiper arm shaft.
- Turn bolt -3- clockwise until wiper arm -1- has been pulled off wiper shaft.
- Unscrew nut completely and remove wiper arm -1-.

Installing

Install in the reverse order of removal, observing the following:

- Deactivate APP function ➔ [page 53](#) .
- Operate wiper motor - V- until park position is reached by switching the wipers on and off with the ignition switched on.

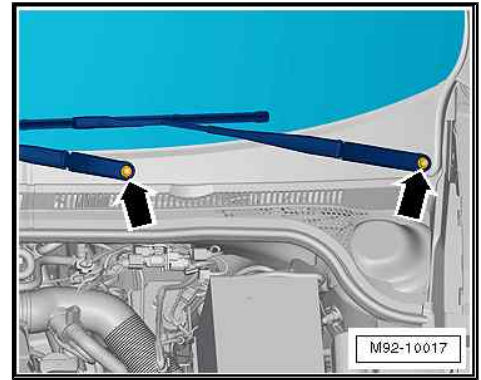




- Fit both wiper arms in approximate park position on wiper arm shafts and tighten nuts -arrows- by hand.
- Adjust wiper arms ⇒ [page 49](#) .
- Mount cover and trim.

Specified torques

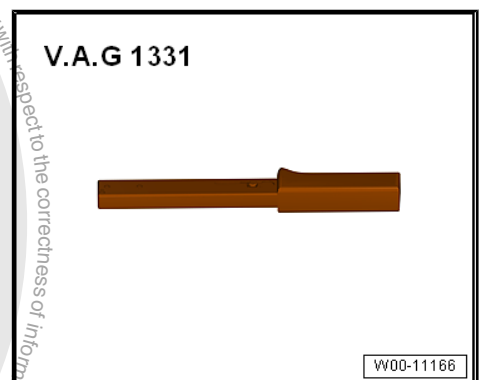
- ◆ ⇒ [“1.1 Assembly overview - windscreen wiper system”, page 45](#)



1.5 Adjusting wiper arms

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Note

Removal and installation are described for left-hand drive vehicles. Removal and installation for right-hand drive vehicles is similar.

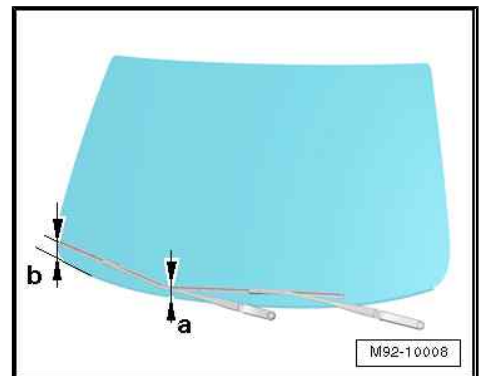
Procedure

- Deactivate APP function ⇒ [page 53](#) .
- Move wipers to park position and then switch off ignition.
- Adjust wiper arms.

Driver side

Distance -a- between end of wiper blade and upper edge of pleum chamber cover must be 30 mm.

- Adjust wiper blade park position by repositioning wiper arm if necessary.





Passenger side

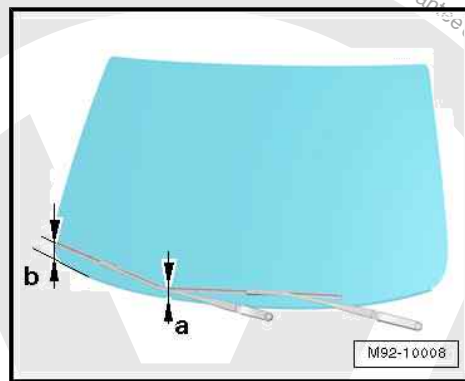
Distance -b- between end of wiper blade and upper edge of plenum chamber cover must be 30 mm.

- Adjust wiper blade park position by repositioning wiper arm if necessary.



Specified torques

- ♦ ➔ [“1.1 Assembly overview - windscreen wiper system”, page 45](#)



1.6 Removing and installing wiper motor - V-



Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ➔ [page 7](#).

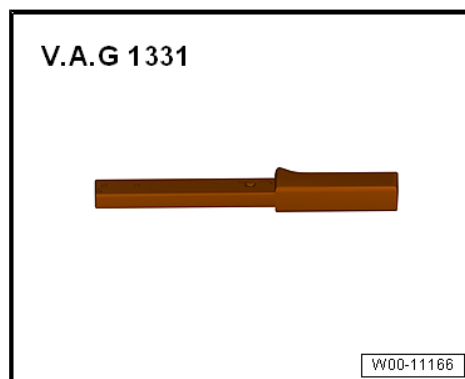


Note

- ♦ *The wiper motor control unit - J400- and the wiper motor - - are combined to form one unit. If the wiper motor control unit - J400- is renewed, the coding must be read out first and the new wiper motor control unit - J400- must be code with this value.*
- ♦ *The illustrations show removal and installation of the windscreen wiper system in an LHD vehicle.*
- ♦ *Removal and installation of the windscreen wiper system in an RHD vehicle are analogous.*

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-

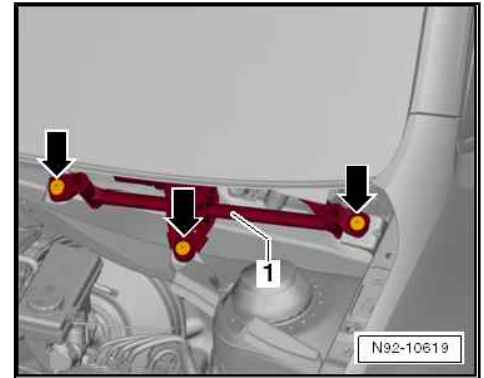


Removing

- All wiper arms to move to park position and then switch off ignition.
- Disconnect battery ➔ [page 7](#).
- Remove wiper arms ➔ [page 47](#).
- Remove plenum chamber cover ➔ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Assembly overview - plenum chamber cover.



- Undo screws -arrows- and pull wiper frame together with linkage and motor -1- sideways so that they come out of the plenum chamber a little, taking connected wiring lengths into consideration.

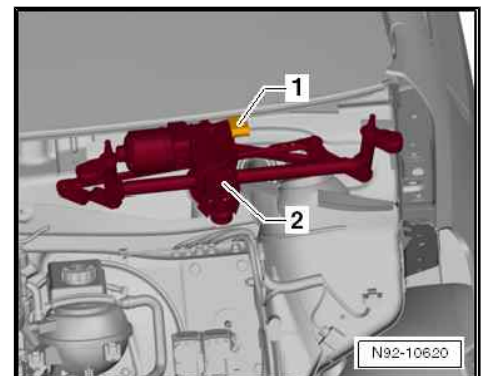


- Release and pull off connector -1-, and remove wiper frame together with linkage and motor -2- from vehicle.

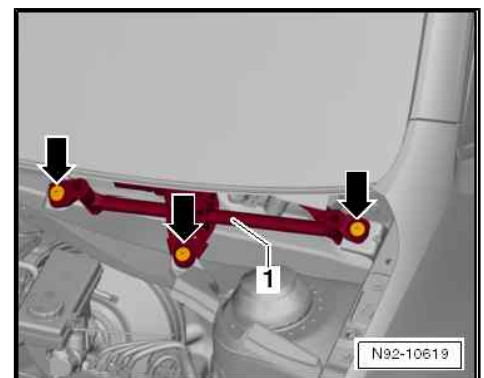
Installing

Install in the reverse order of removal observing the following:

- Insert wiper frame together with linkage and wiper motor -1- into plenum chamber.



- Screw in securing bolts -arrows-.
- Push connector onto connection on wiper motor so that connector latches into place.
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Assembly overview - plenum chamber cover.
- Connect battery ⇒ [page 7](#) .
- Installing wiper arms ⇒ [page 47](#) .



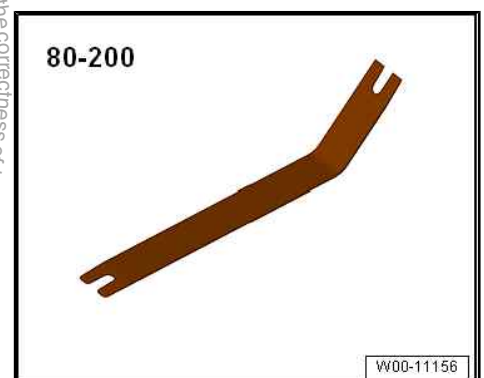
Specified torques

- ♦ ⇒ ["1.1 Assembly overview - windscreen wiper system", page 45](#)

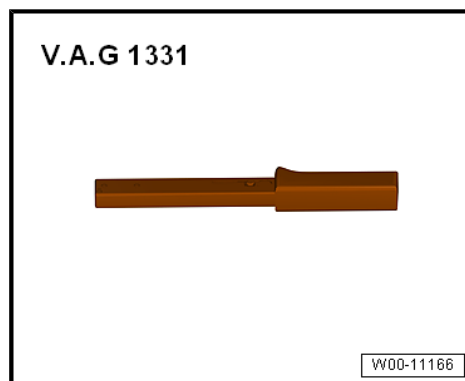
1.7 Renewing wiper motor

Special tools and workshop equipment required

- ♦ Removal lever - 80-200-

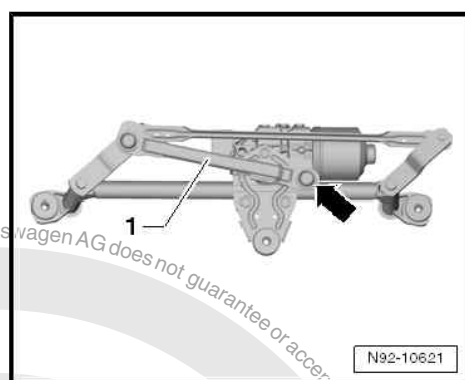


- ◆ Torque wrench - V.A.G 1331-

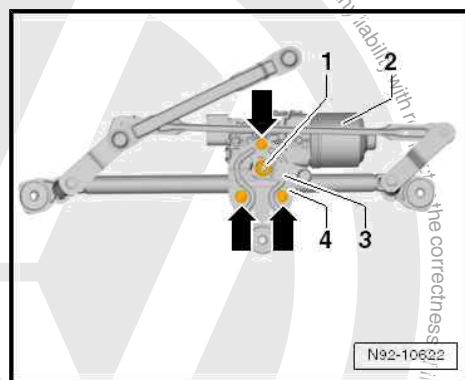


Removing

- Remove windscreen wiper motor ➔ [page 50](#) .
- Lever linkage -1- off ball head of motor crank arm -arrow- using removal lever - 80-200- .



- Unscrew securing nut -1-, and pull motor crank -3- off wiper motor shaft.
- Undo screws -arrows-, then pull retaining plate -4- and wiper motor together with control unit -2- out of the wiper frame.



Installing



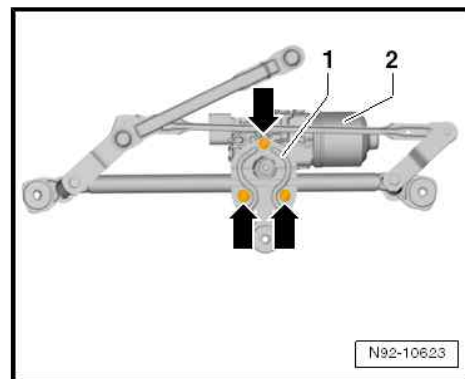
WARNING

- ◆ ***Danger from pinching!***
- ◆ ***Danger of becoming caught/pinched in the rotating parts***
- ◆ ***Do not hold wiper motor near rotating parts after it has been removed.***

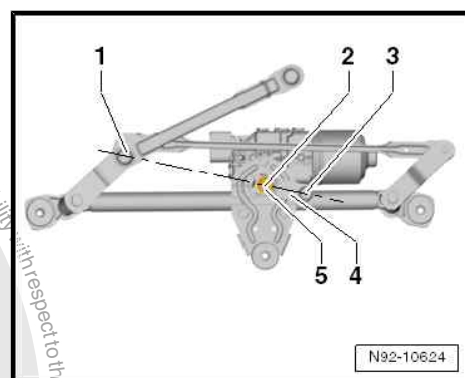
- Operate wiper motor briefly until park position is reached:
- ◆ Reconnect battery.
- ◆ Attach connector to wiper motor.
- ◆ Briefly press the windscreen wiper switch (flick wipe) with the ignition switched on and allow the wiper motor to return to the park position.
- ◆ Switch off ignition.
- ◆ Release connector and pull it off the wiper motor.
- ◆ Disconnect battery.



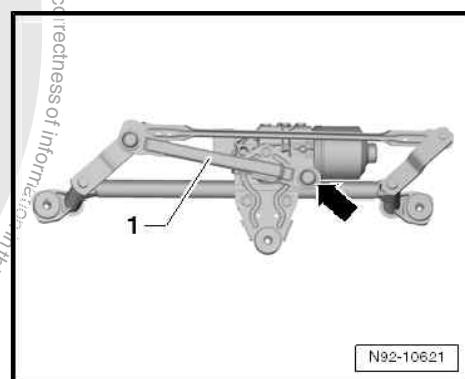
- Insert wiper motor with control unit -2- into wiper frame, place retaining plate -1- in position, and secure it with 3 bolts -arrows-.
- Screw in the 3 securing bolts -arrows-.



- Fit motor crank -4- onto shaft of wiper motor -2- so that the 3 illustrated points -1-, -2- and -3- are in line with each other.
- Screw on securing nut -5-.



- Press ball head -arrow- of linkage -1- onto motor crank until it latches into place.
- Install windscreen wiper motor ⇒ [page 50](#).



Specified torques

⇒ ["1.1 Assembly overview - windscreen wiper system", page 45](#)

1.8 Deactivating APP function of wiper motor

The windscreen wiper system is equipped with an APP function (alternating park position).

With the APP function, the wiper is moved up slightly once it has reached the lowest position. This occurs every second time the wiper system is switched off.

To fit the motor crank on the wiper motor, it is necessary for the motor to be in the lowest park position. To ensure this position is reached, the APP function must be deactivated.



Note

- ◆ The APP function cannot be activated.
- ◆ After 100 cycles of wiper movement, the APP function is activated automatically. This applies to wiper motors on which the APP function has been deactivated and also to new wiper motors.



- Connect vehicle diagnostic tester ➔ [page 153](#) .
- Deactivate APP function of wiper motor ➔ Vehicle diagnostic tester.



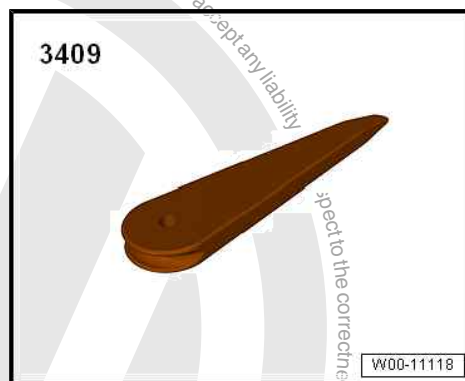
Note

Following successful completion of APP function coding / deactivation, the wiper motor is located in the lower park position after the next wipe cycle.

1.9 Removing and installing rain and light sensor

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



Note

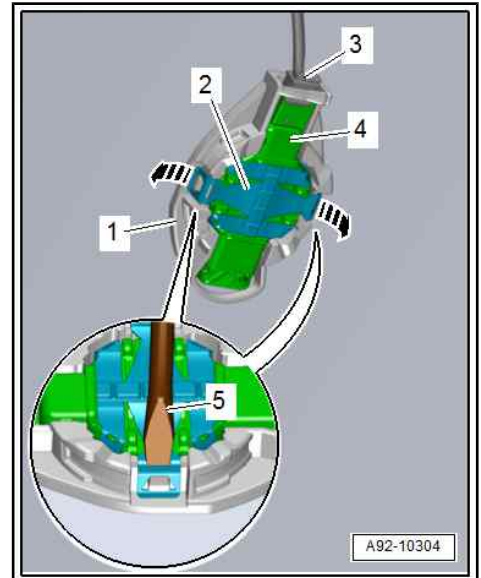
- ◆ *The rain and light sensor has a silicon layer (coupling pad) which forms the contact surface to the windscreen.*
- ◆ *If a rain and light sensor - G397- is renewed with a rain and light sensor - G397- having a different part number, the new rain and light sensor - G397- has to be coded ➔ Vehicle diagnostic tester.*
- ◆ *The rain and light sensors - G397- cannot be fitted arbitrarily. Determine the correct rain and light sensor - G397- using the Electronic parts catalogue (ETKA).*

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 interior mirror ➔ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .



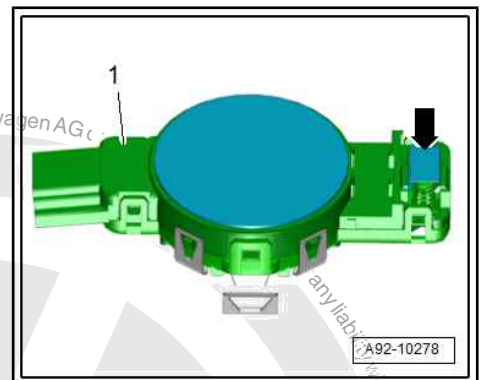
- Release and disconnect electrical connector -3-.
- Insert a narrow screwdriver -5- in the hole as shown in illustration, and release catches of retaining spring -2- -arrows-.
- Wait 1 minute until silicone pad has fully expanded so that it can be detached without leaving any residue.
- Detach rain and light sensor - G397- -4- by moving it back and forth, and remove it from mounting -1-.



Caution

Risk of damage to humidity sender.

- ◆ **The humidity sender -arrow- on the rain and light sensor - G397- -1- is very sensitive and must not be damaged.**
- ◆ **If the humidity sender is damaged -arrow-, the rain and light sensor - G397- -1- must be renewed.**



Installing

Install in the reverse order of removal, observing the following:

- Prior to installation, thoroughly clean the surface of the windscreen in the area of the retaining frame for rain and light sensor - G397- . Make sure to completely remove any remains of the coupling pad adhering to the windscreen.
- Thoroughly clean windscreen within retaining plate using cleaning solution (⇒ Electronic parts catalogue "ETKA").

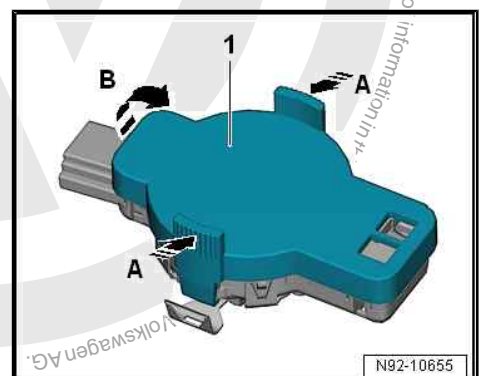
If installing new rain and light sensor

- Lightly press together grip surfaces on protective cap -1- in direction of -arrow A-.
- Remove protective cap -1- from rain and light sensor - G397- in direction of -arrow B-.



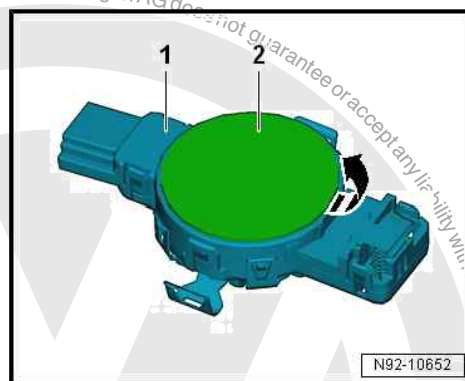
Note

To prevent the coupling pad from being soiled, only remove the protective cap immediately before installing the sensor.

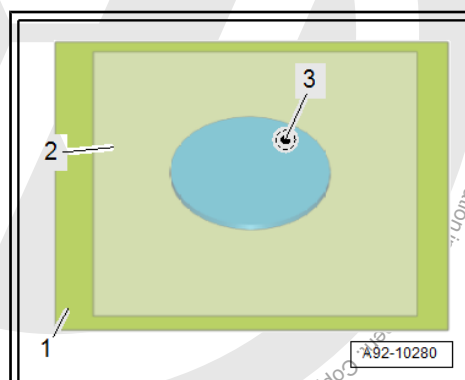


If installing used rain and light sensor

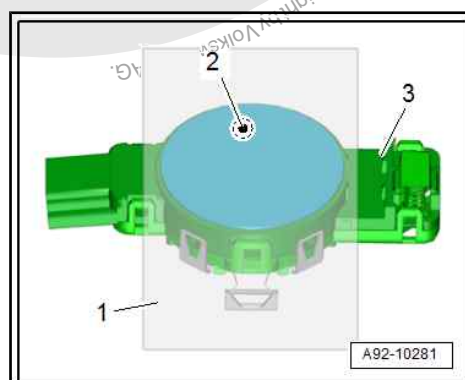
- Remove coupling pad -2- in direction of -arrow- from sensor -1- without leaving any residue.
- Surface of sensor must be completely free of coupling pad residue.
- Clean bonding surface on sensor -1- using lint-free cloth.



- Pull silicone paper -1- off coupling pad -3-.
- The transparent protective film -2- remains on the coupling pad as an assembly aid.



- With the aid of transparent protective film -1-, position coupling pad -2- centrally on rain and light sensor - G397- -3-.
- Press coupling pad -2- via protective film -1- onto rain and light sensor - G397- -3-, avoiding any bubbles.

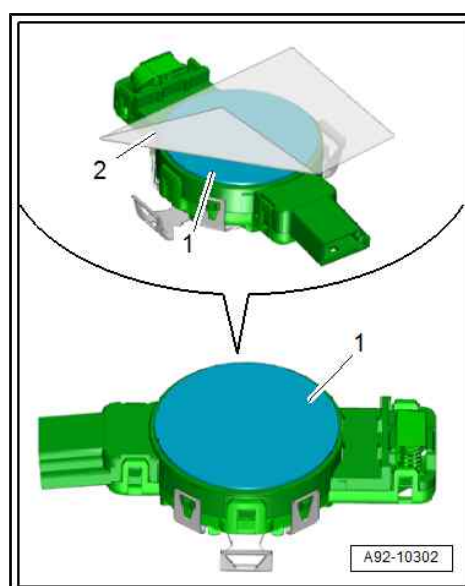


- Pull protective film -2- off coupling pad -1-.



Note

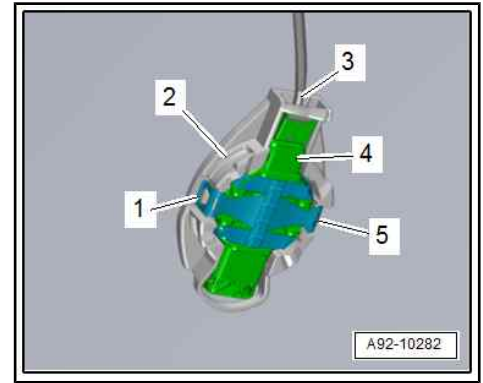
To prevent the coupling pad from being soiled, only remove the protective film immediately before installing the sensor.





Continued for all versions

- Insert rain and light sensor - G397- -4- in mounting -2-.
- To ensure proper operation the rain and light sensor - G397- -4- must rest against the windscreen without any inclusions or bubbles.
- Press on retaining clips -1- and -5- until they can be heard to engage.
- Connect electrical connector -3-.
- If the rain and light sensor - G397- was renewed, perform coding ⇒ Vehicle diagnostic tester.



2 Windscreen washer system

⇒ [“2.1 Assembly overview - windscreen washer system”, page 58](#)

⇒ [“2.2 Removing and installing washer fluid reservoir”, page 59](#)

⇒ [“2.3 Removing and installing windscreen washer pump”, page 60](#)

⇒ [“2.4 Removing and installing washer jets”, page 61](#)

⇒ [“2.5 Adjusting spray jets”, page 62](#)

2.1 Assembly overview - windscreen washer system

1 - Angled piece

- ☐ Connection to right windscreen washer system spray jet
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 70](#)

2 - Right windscreen washer system spray jet

- ☐ Removing and installing ⇒ [page 61](#)
- ☐ Adjusting ⇒ [page 62](#)

3 - Angled piece

- ☐ Connection to left windscreen washer system spray jet
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 70](#)

4 - Left windscreen washer system spray jet

- ☐ Removing and installing ⇒ [page 61](#)
- ☐ Adjusting ⇒ [page 62](#)

5 - Y-piece

- ☐ Distribution of wash water line to windscreen washer system spray jets

6 - Hose

- ☐ Repairing washer fluid lines ⇒ [page 70](#)

7 - Connecting pipe with filler neck to reservoir

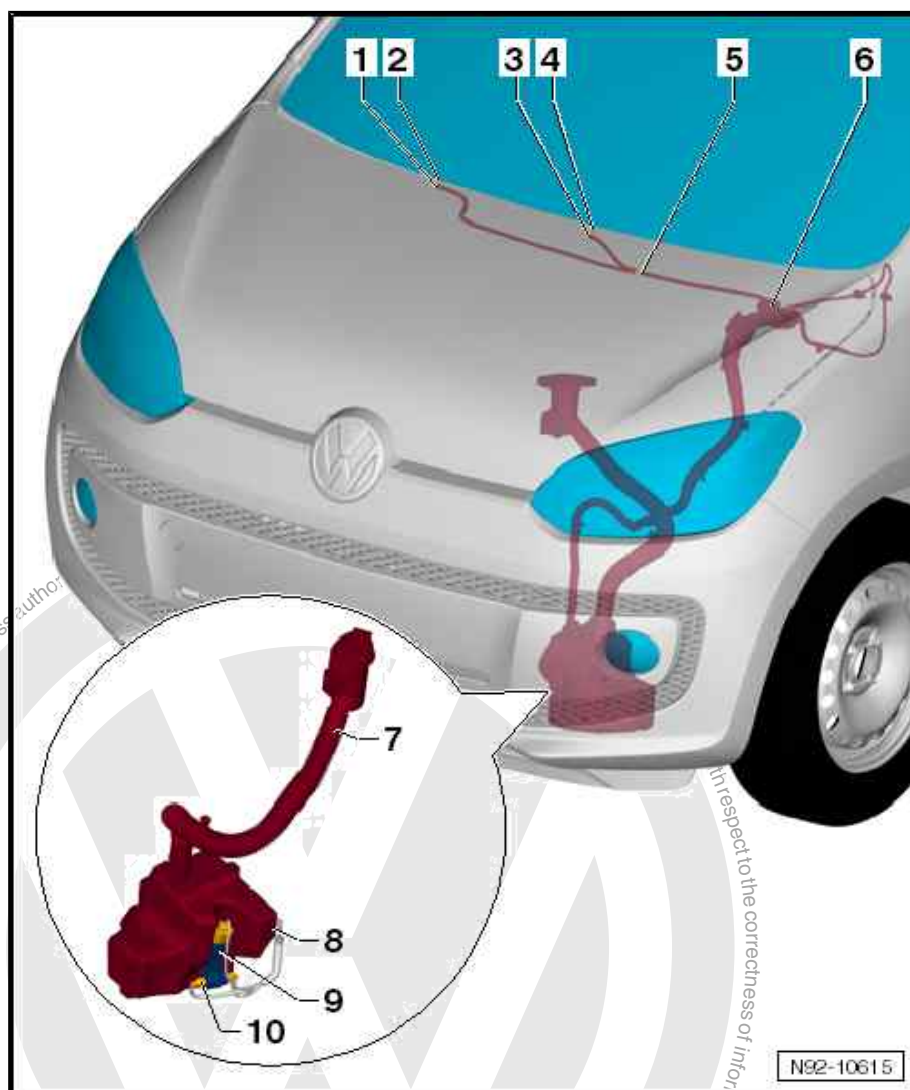
- ☐ Removed and installed together with reservoir ⇒ [page 59](#)

8 - Washer fluid reservoir

- ☐ Removing and installing ⇒ [page 59](#)
- ☐ Specified torque of bolt for securing reservoir to body - 8 Nm

9 - Windscreen and rear window washer pump - V59-

- ☐ Removing and installing ⇒ [page 60](#)





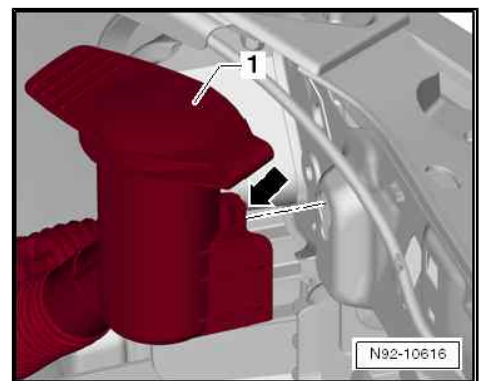
10 - Windscreen and rear window washer pump - V59-

- ❑ Connection to windscreen and rear window washer pump - V59-
- ❑ Overview of hose couplings for washer fluid lines ⇒ [page 70](#)

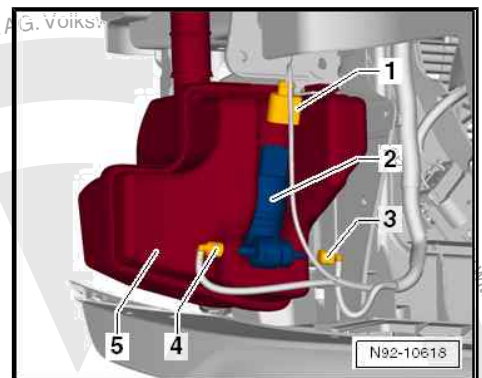
2.2 Removing and installing washer fluid reservoir

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper cover .
- Press locking mechanism -arrow- and pull filler neck -1- upwards out of mounting on lock carrier.



- Pull windscreen and rear window washer pump - V59- -2- together with connected lines upwards out of reservoir -5-.
- Collect any escaping washer fluid in a suitable container.





- Release connecting pipe clip together with filler neck -2- from body.
- Undo and remove securing bolt -5- and pull reservoir -4- out of guide -3- in -direction of arrow- towards the rear.
- Remove reservoir -4- together with connecting pipe and filler neck -1- from vehicle.

Installing

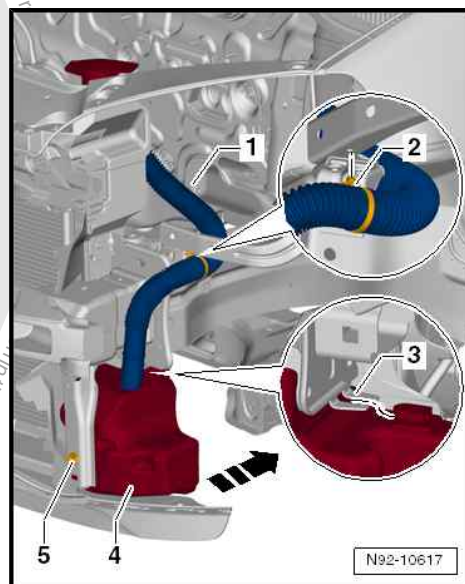
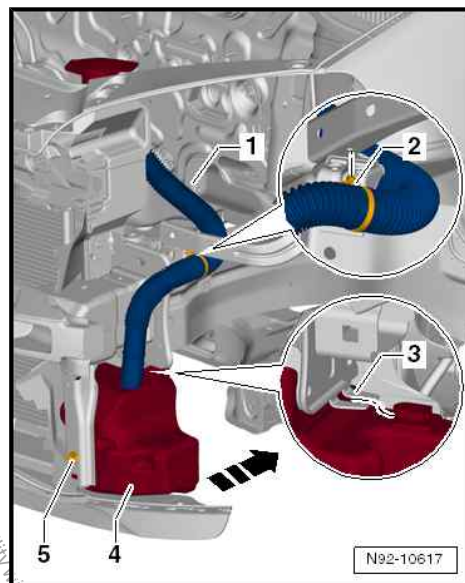
Install in the reverse order of removal observing the following:

Guide connecting pipe clip together with filler neck -1- upwards through body.

- Push reservoir -4- onto guide -3- and secure with bolt -5-.
- Secure connecting pipe together with filler neck -1- in body -2- and push filler neck into mounting on lock carrier until filler neck audibly engages.

Specified torques

- ◆ ⇒ [“2.1 Assembly overview - windscreen washer system”, page 58](#)



2.3 Removing and installing windscreen washer pump

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Detach front left wheel housing liner in front area ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - front wheel housing liner .

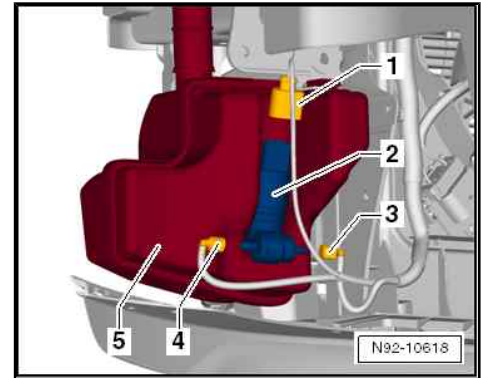


- To release, twist securing clips on angled connection pieces -3- and -4-, and pull connection pieces off windscreen and rear window washer pump - V59- -2-.
- Collect any escaping washer fluid in a suitable container.
- Pull windscreen and rear window washer pump - V59- -2- upwards out of reservoir -5-.
- Release and pull off connector -1-.



Note

The connections to the pump and hose lines are colour-coded in order to prevent the washer fluid lines being incorrectly connected to the front and rear washer fluid pump - V59- . The hose connections must be connected to the correct colour-coded pump connections during installation.



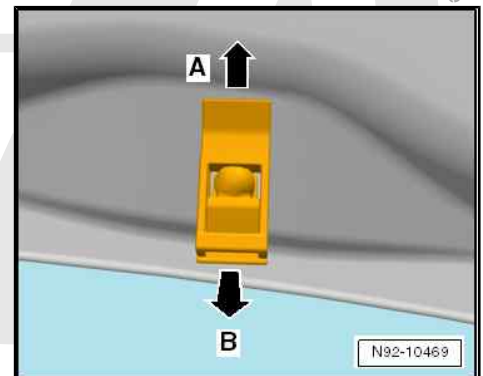
Installing

Install in the reverse order of removal.

2.4 Removing and installing washer jets

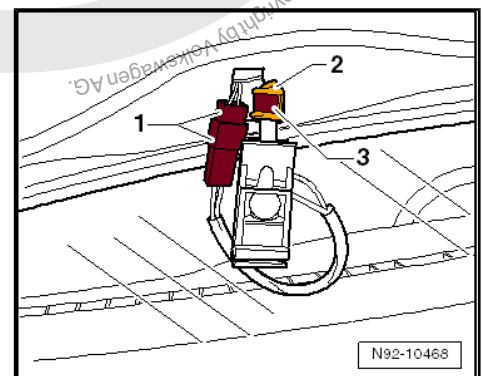
Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Push spray jet upwards -arrow A- and pull out of front flap -arrow B-.



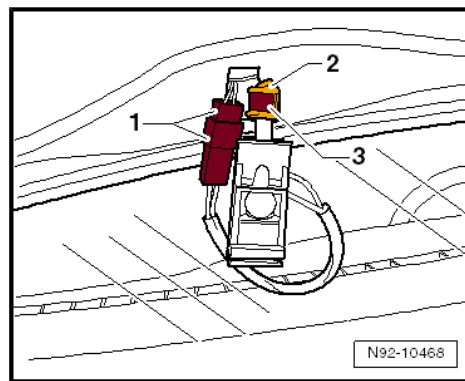
- Release securing clip -3- and pull hose connection -2- off spray jet.
- Depending on the equipment, release and pull off connector -1- and then remove spray jet.

Installing





- Depending on the equipment, reconnect plug-in connection -1-.
- Fit hose connection -2- onto spray jet and lock hose clip -3-.
- Starting at the top, push spray jet into mounting hole until it locks in place audibly.
- Adjusting spray jets ⇒ [page 62](#) .



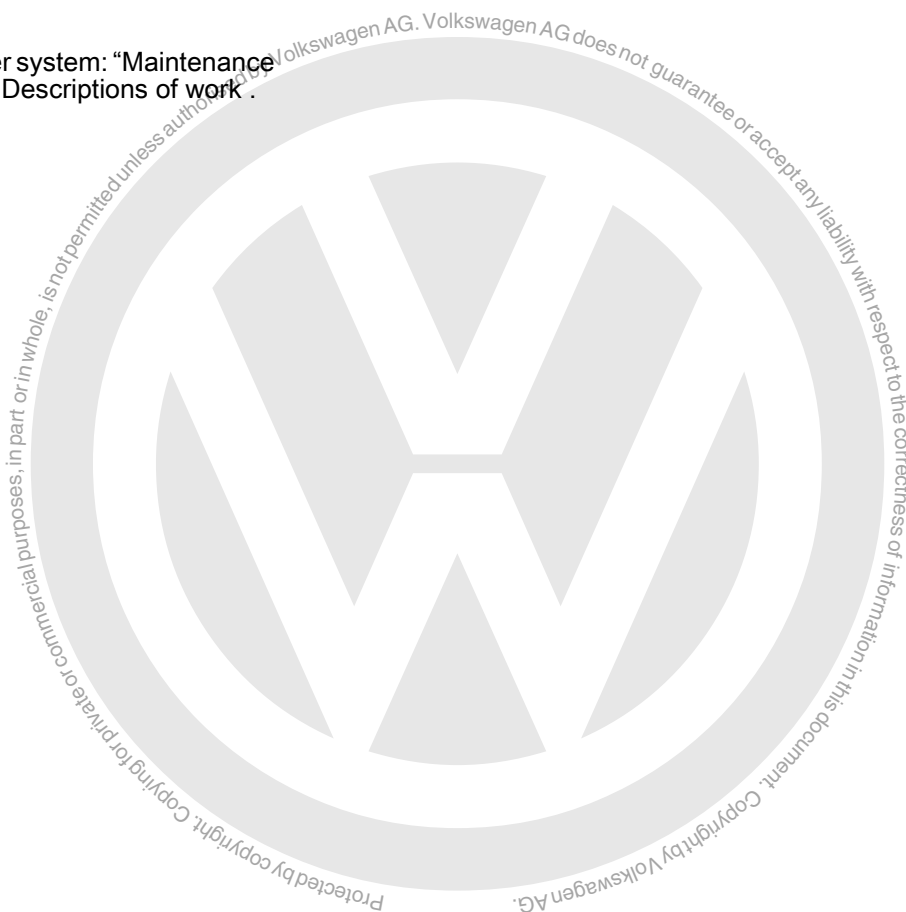
2.5 Adjusting spray jets



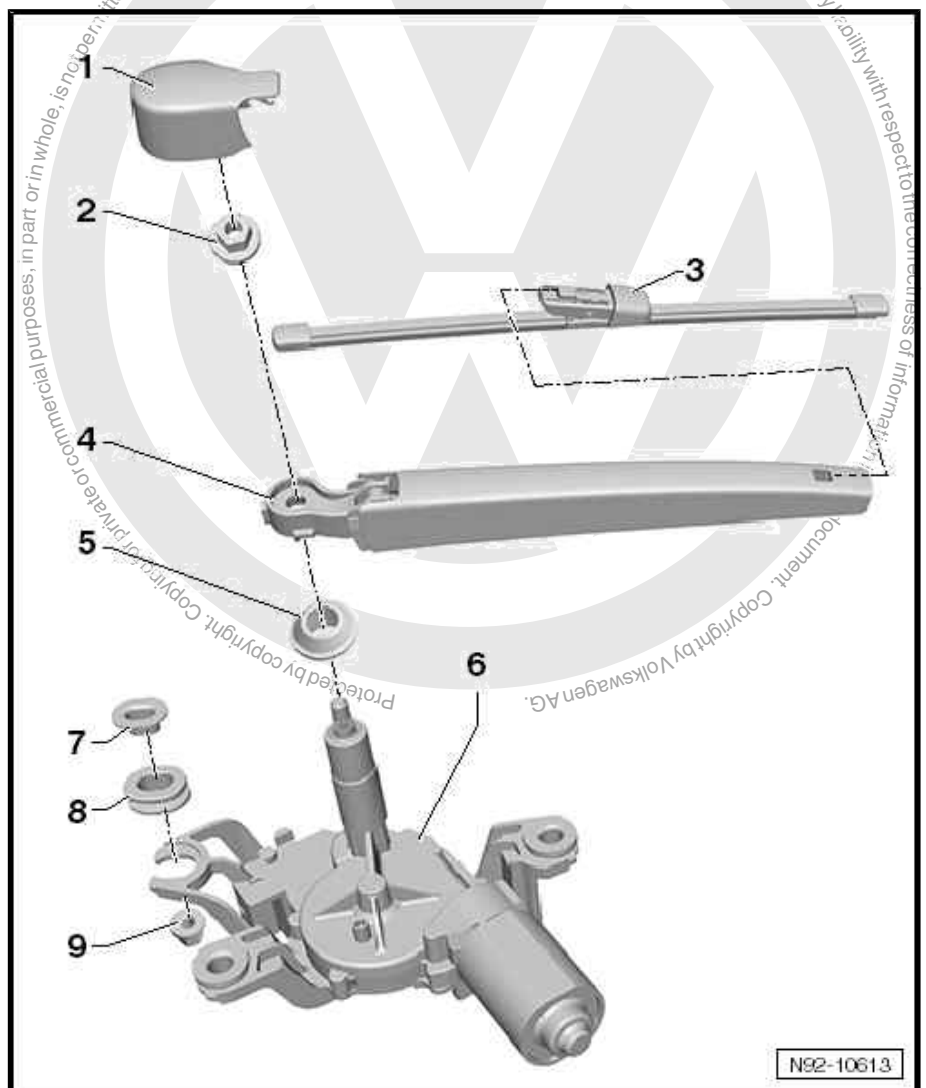
Note

In case of uneven spray field due to soiling in the spray jet, remove spray jet and rinse it through with water counter to spraying direction. Subsequent blowing through with compressed air against the spraying direction is permitted. Never use items to clean the washer jets!

Adjusting spray jets for windscreen washer system: "Maintenance manual" ⇒ Maintenance ; Booklet 35.1 ; Descriptions of work .



⇒ “3.5 Removing and installing rear window wiper motor V12”, page 66





3.2 Removing and installing wiper blade

Removing



Caution

Risk of damage to the wiper blade.

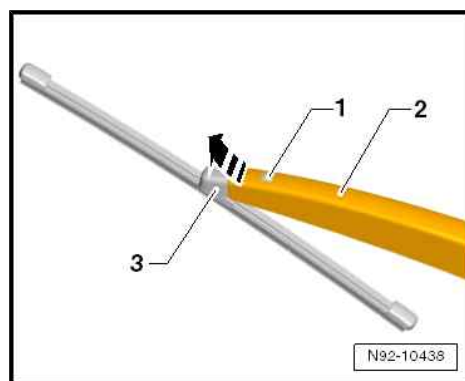
- ◆ *Joint-free wipers are very flexible. To lift the wiper blades off the rear window, touch them only in the area in which the wiper blades are attached to the wipers.*

- Fold up wiper arm -2-.
- Press button -1- and push wiper blade -3- out of mounting in -direction of arrow-.

Installing

Install in the reverse order of removal, observing the following:

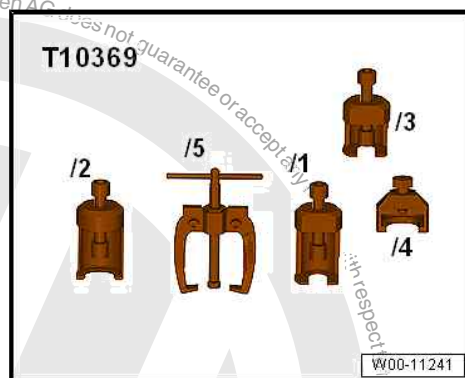
The wiper blade should be heard to engage in the wiper arm.



3.3 Removing and installing wiper arm

Special tools and workshop equipment required

- ◆ Puller - T10369-



- ◆ Torque wrench - V.A.G 1410-

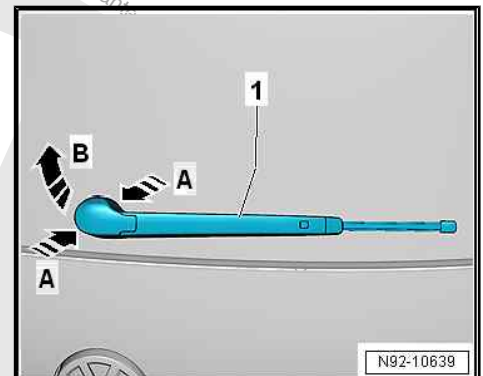


Removing

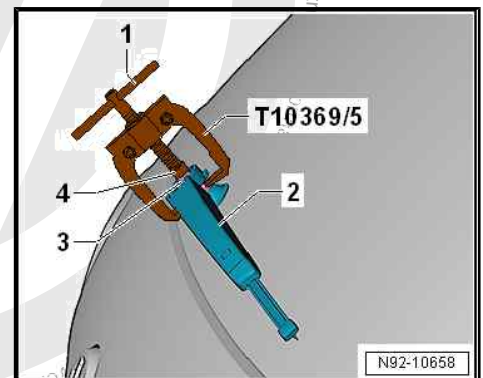
- Switch on ignition.



- Actuate “rear window wipe” function and allow wiper arm to move to its end position.
- Switch off ignition.
- Press together cap of rear window wiper -1- in direction of -arrow A-.
- Fold up cap in direction of -arrow B-.



- Loosen nut -3- a few turns.
- Fit puller - T10369/5- to wiper arm -2-.
- Fit thrust piece -4- to wiper arm shaft.
- Screw in bolt -1- until wiper arm has been pulled off the wiper shaft.
- Completely unscrew nut -3-.
- Remove wiper arm -2-.



Installing

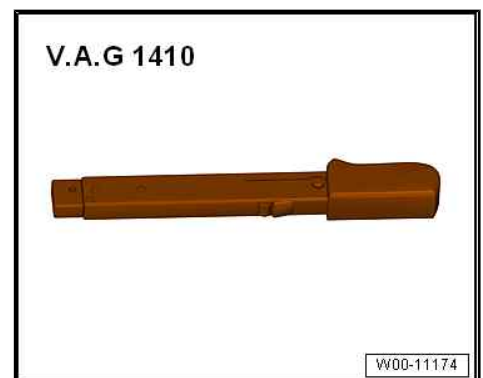
Install in the reverse order of removal, observing the following:

- Adjust wiper arm [= page 65](#) .

3.4 Adjusting wiper arm

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



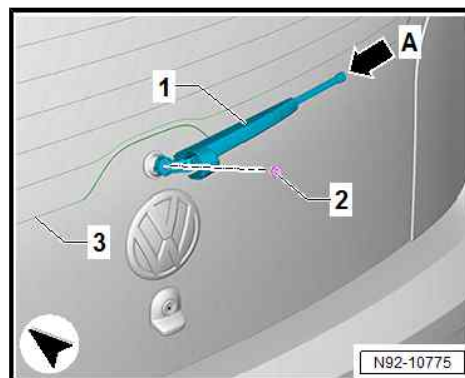


Adjusting

- To set the park position, align tip of the wiper blade -A- with the lowest heating wire -3- of the rear window heating.
- Adjust park position of rear window wiper by moving wiper arm if necessary -1- ➔ [page 64](#) .
- Tighten nut -2-.

Specified torques

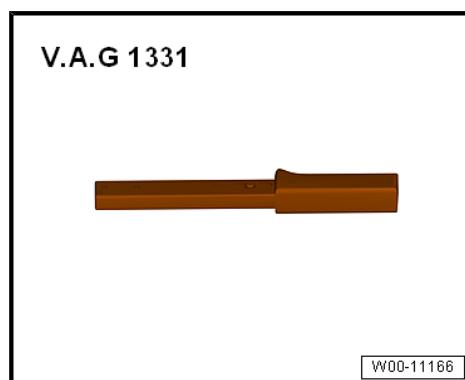
- ♦ ➔ [“3.1 Assembly overview - rear window wiper system”, page 63](#)



3.5 Removing and installing rear window wiper motor - V12-

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



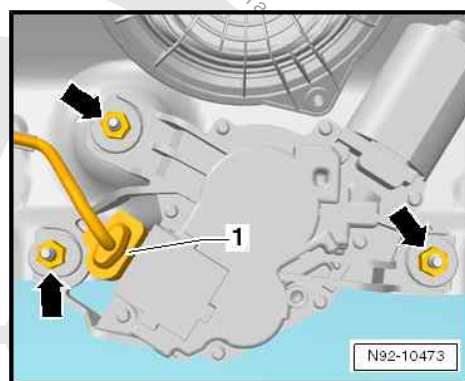
Removing

- Remove wiper arm ➔ [page 64](#) .
- Remove rear lid trim ➔ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Fitting locations overview – luggage compartment trims .
- Release and pull off connector -1-
- Remove securing nuts -arrows-
- Remove rear window wiper motor - V12- -4-.

Installing

Install in the reverse order of removal observing the following:

- If necessary, moisten inner side of rear window seal with rubber and plastic compatible lubricant (e.g. polyethylene glycol).

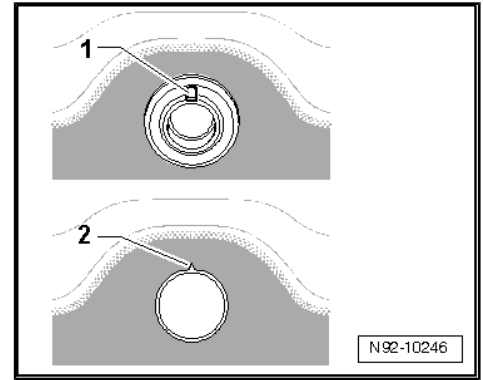




- Check seal is seated correctly in opening of rear window. Mark -1- on seal must align with mark -2- on rear window.

Specified torques

- ◆ ⇒ ["3.1 Assembly overview - rear window wiper system", page 63](#)



4 Rear window washer system

⇒ [“4.1 Assembly overview - rear window washer system”, page 68](#)

⇒ [“4.2 Removing and installing washer jet”, page 68](#)

⇒ [“4.3 Adjusting spray jet”, page 69](#)

4.1 Assembly overview - rear window washer system

1 - Filler pipe with filler neck for reservoir for windscreen washer system

- ☐ Removing and installing
⇒ [page 59](#)

2 - Windscreen and rear window washer pump - V59-

- ☐ Removing and installing
⇒ [page 60](#)

3 - Washer fluid reservoir

- ☐ Removing and installing
⇒ [page 59](#)
- ☐ Specified torque of bolt for securing reservoir to body - 8 Nm

4 - Angled connection piece

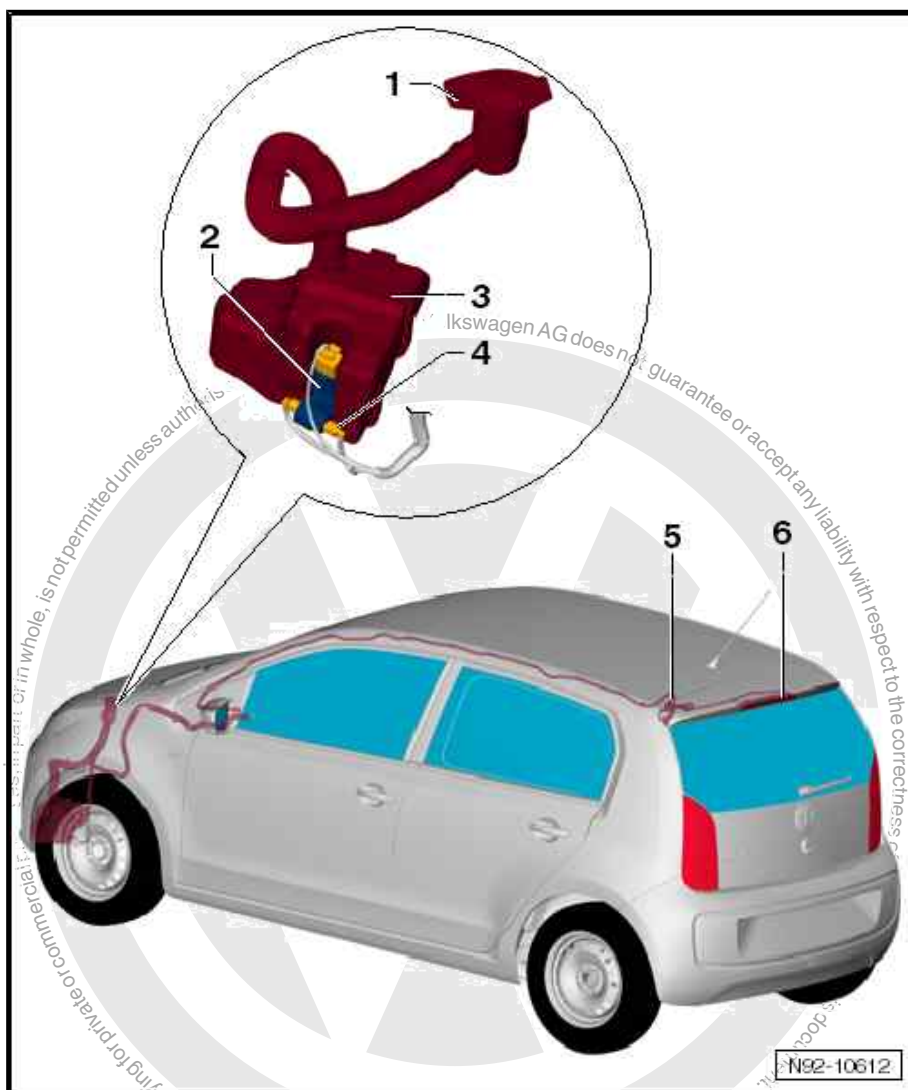
- ☐ Connection to windscreen and rear window washer pump - V59-

5 - Connection piece

- ☐ Point of separation, interior wiring harness to rear lid wiring harness

6 - Spray jet for rear window washer system

- ☐ In high-level brake light
- ☐ Removing and installing
⇒ [page 68](#)
- ☐ Adjusting ⇒ [page 69](#)



4.2 Removing and installing washer jet

The spray jet for rear window washer system is installed in high-level brake light - M25- .

Removing

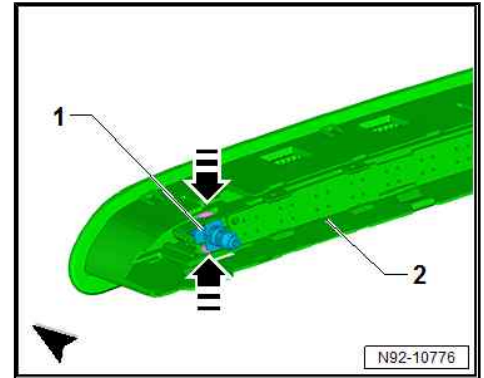
- Remove high-level brake light - M25- ⇒ [page 95](#) .



- Release both catches -arrows- and pull spray jet -1- to rear out of high-level brake light - M25- .

Installing

- Install in reverse order of removal.
- Adjusting spray jet ⇒ [page 69](#) .



4.3 Adjusting spray jet



Note

In case of uneven spray field due to impurities within the spray jet: remove spray jet and rinse it through with water, opposite to direction of spray. Subsequent blowing through with compressed air against the spraying direction is permitted. Never use items to clean the washer jets!

Adjusting rear window washer system spray jets "Maintenance manual" ⇒ Maintenance ; Booklet 35.1 ; Descriptions of work .



5 Washer fluid lines

⇒ ["5.1 Repairing washer fluid lines", page 70](#)

5.1 Repairing washer fluid lines

All instructions and notes regarding this chapter are available under ⇒ Electrical System, General Information; Rep. gr. 92 ; Hose repair .





94 – Lights, bulbs, switches - exterior

1 Headlights

- ⇒ [“1.1 Assembly overview - headlight”, page 71](#)
- ⇒ [“1.2 Removing and installing headlight”, page 72](#)
- ⇒ [“1.3 Adjusting headlights”, page 74](#)
- ⇒ [“1.4 Adjusting headlight installation position”, page 74](#)
- ⇒ [“1.5 Removing and installing front turn signal bulb M5 / M7 ”, page 75](#)
- ⇒ [“1.6 Installing repair kit for headlight housing”, page 77](#)
- ⇒ [“1.7 Converting headlights from driving on right to driving on left”, page 80](#)
- ⇒ [“1.8 Converting headlights from driving on left to driving on right”, page 80](#)
- ⇒ [“1.9 Removing and installing headlight range control motor V48 / V49 ”, page 80](#)
- ⇒ [“1.10 Removing and installing dipped beam bulb”, page 81](#)
- ⇒ [“1.11 Removing and installing LED modules for daytime running light and side light L176 / L177”, page 83](#)
- ⇒ [“1.12 Removing and installing control unit for daytime running light and side light J860 / J861 ”, page 83](#)

1.1 Assembly overview - headlight

1 - Inner bolt securing headlight to body

- ☐ Specified torque: 4 Nm

2 - Bracket securing bolts to body

- ☐ Specified torque: 8 Nm

3 - Bracket

4 - Rear bolt securing headlight to body

- ☐ Specified torque: 4 Nm

5 - Adapter

6 - Upper bolt securing headlight to bracket

- ☐ Specified torque: 4 Nm

7 - Front left turn signal bulb - M5- or front right turn signal bulb - M7-

- ☐ Bulb 12V, PY21W
- ☐ Removing and installing
⇒ [page 75](#)

8 - Bulb holder with grip element

- ☐ For front left turn signal bulb - M5- or front right turn signal bulb - M7-

9 - Left headlight range control motor - V48- or right headlight range control motor - V49-

- ☐ Removing and installing
⇒ [page 80](#)

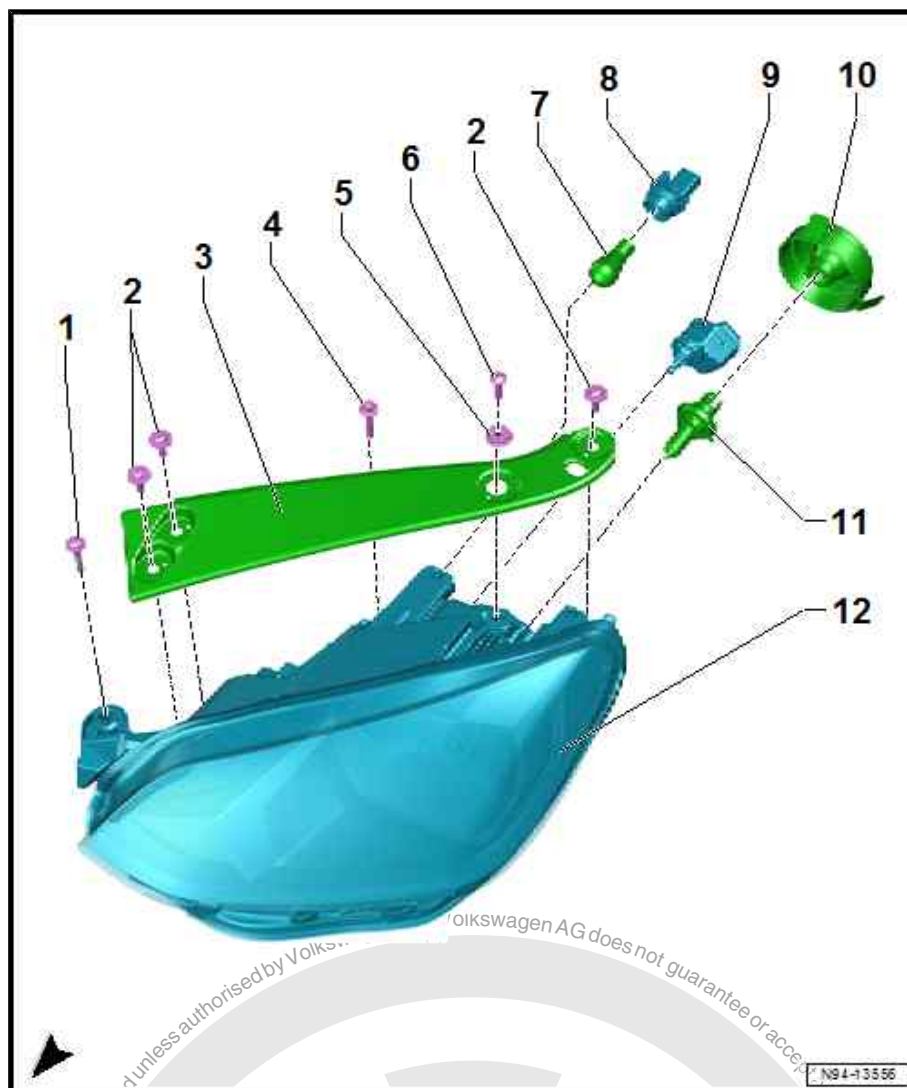
10 - Cap

11 - Bulb for dipped beam and main beam

- ☐ Left bulb which functions as bulb for left dipped beam - M29- and bulb for left main beam - M30-
- ☐ Right bulb which functions as bulb for right dipped beam - M31- and bulb for right main beam - M32-
- ☐ Bulb H4 12V, 60/55W
- ☐ Removing and installing ⇒ [page 81](#)

12 - Front left headlight - MX1- or front right headlight - MX2-

- ☐ With LED module for daytime running light and side light -L176- / -L177-
- ☐ With control unit for left/right daytime running light and side light -J860- / -J861-
- ☐ Removing and installing headlight ⇒ [page 72](#)
- ☐ Removing and installing control unit for daytime running light and side light -J860- / -J861-
⇒ [page 83](#)
- ☐ Correcting installation position of headlight ⇒ [page 74](#)
- ☐ Installing repair kit for headlight housing ⇒ [page 77](#)
- ☐ Changing headlights over from driving on right to driving on left ⇒ [page 80](#)
- ☐ Changing headlights over from driving on left to driving on right ⇒ [page 80](#)

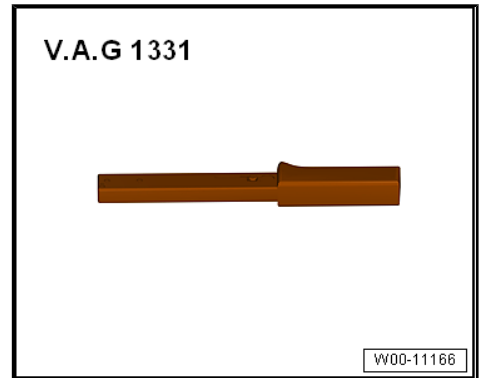


1.2 Removing and installing headlight

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-

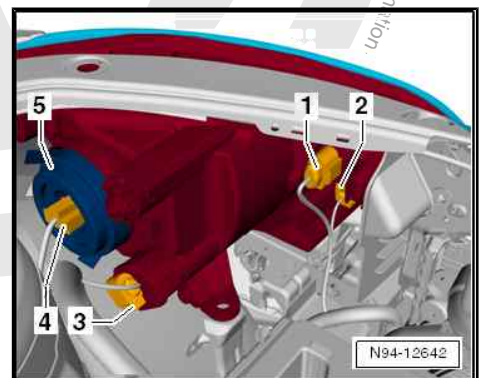


Note

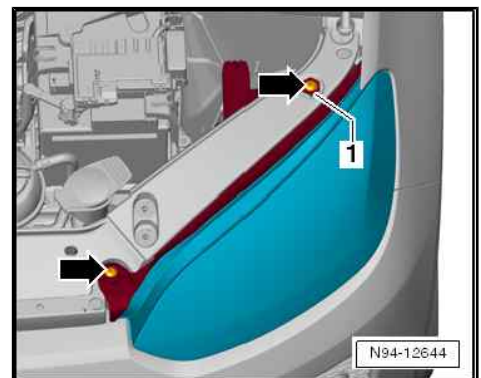
- ◆ *It is not necessary to disconnect the battery earth wire.*
- ◆ *The illustrations show removal and installation of the left headlight. The removal and installation of the right headlight follows the same principle.*
- ◆ *If a headlight is removed, it should always be adjusted following installation ⇒ Maintenance ; Booklet 35.1 ; Description of work .*

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover .
- Release connectors -1-, -2-, -3- and -4- and pull them off.



- Undo and remove inner bolt and upper bolt -arrows- and remove adapter -1- under the upper bolt.





- Undo and remove rear bolt -arrow-.
- Remove headlight forwards out of body aperture.

Installing

Install in the reverse order of removal, observing the following:

- Check installation position so that shut lines/gaps around headlight are even. If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted
⇒ [page 74](#) .
- Check functions of headlight.
- Checking headlight settings and adjusting headlight if necessary "Maintenance manual" ⇒ Maintenance ; Booklet 35.1 ; Descriptions of work



Specified torques

- ♦ ⇒ ["1.1 Assembly overview - headlight", page 71](#)

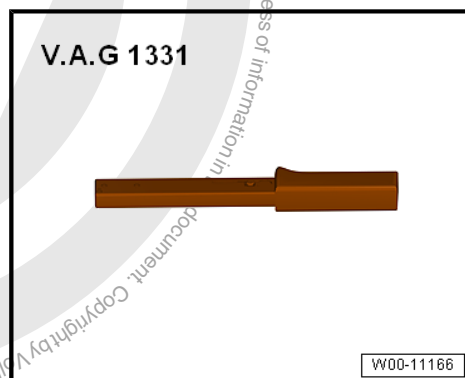
1.3 Adjusting headlights

Adjusting headlights ⇒ Maintenance ; Booklet 35.1 ; Descriptions of work

1.4 Adjusting headlight installation position

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-

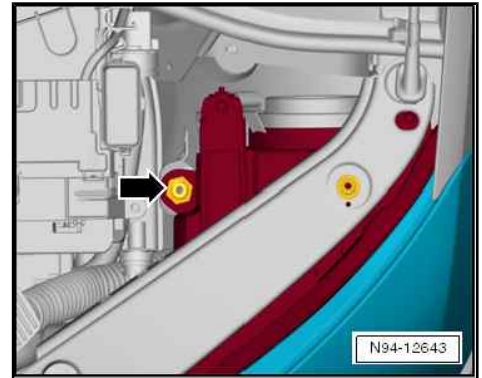


Note

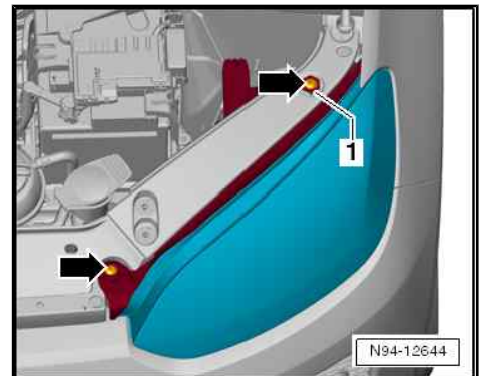
- ♦ *If the shut lines/gaps around the headlight are uneven after installation, the installation position must be adjusted.*
- ♦ *To adjust the installation position of the headlight, the front bumper does not have to be removed.*
- Switch off ignition and all electrical consumers, and withdraw ignition key.



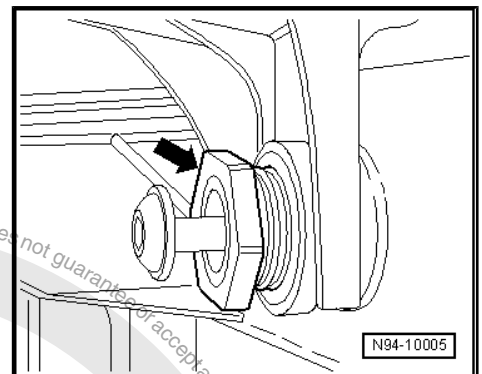
- Loosen rear securing bolt -arrow-.



- Loosen inner and upper securing bolt -arrows-.



- Adjust shut lines/flushness to body by pushing in or pulling out alignment bush -arrow- on headlight.
- Tighten bolts.
- Check headlight installation position to ensure gaps are even; correct if necessary.
- Check functions of headlight.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 35.1 ; Descriptions of work



Specified torques

- ◆ ⇒ ["1.1 Assembly overview - headlight", page 71](#)

1.5 Removing and installing front turn signal bulb -M5- / -M7-



Caution

Filament bulbs and gas discharge bulbs under pressure!

Danger of injury due to bursting filament lamps and gas discharge bulbs!

- ◆ Remove filament bulbs and gas discharge bulbs carefully.
- ◆ Always wear safety goggles and gloves when removing and installing filament bulbs or gas discharge bulbs!
- ◆ Avoid contact with burst glass bulbs.

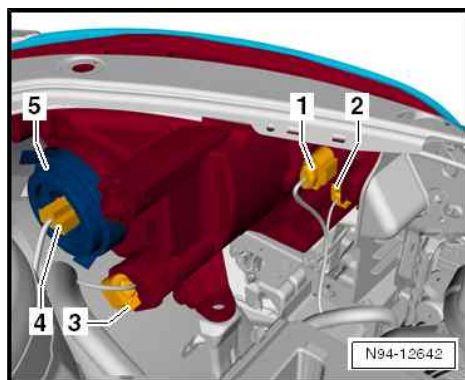


Note

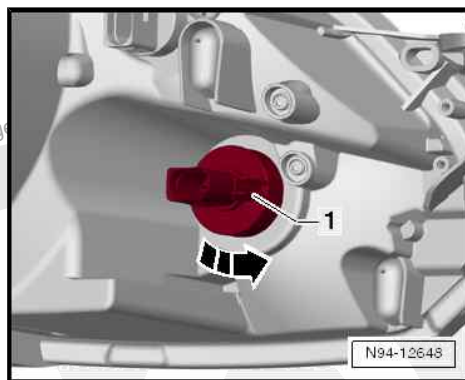
Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Release and pull off connector -2-.



- Turn bulb holder -1- in -direction of arrow- as far as stop and remove it together with bulb for front turn signal towards the rear and out of headlight.





- Push front turn signal bulb -2- into holder and, at the same time, turn it in -direction of arrow- and pull it out of holder -1-.

Front turn signal bulb : 12V, PY21W

Installing

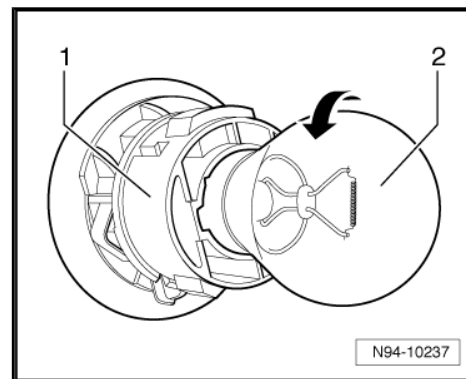
Install in the reverse order of removal, observing the following:



Caution

Risk of damage to the headlight.

- ◆ *Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.*
- ◆ *Wear e.g. clean fabric gloves when inserting bulbs.*
- ◆ *Make sure the bulb holder is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.*



- Check functions of headlight.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 35.1 ; Descriptions of work

1.6 Installing repair kit for headlight housing

⇒ ["1.6.1 Repairing upper fastening points", page 77](#)

⇒ ["1.6.2 Repairing inner retaining tab", page 78](#)

⇒ ["1.6.3 Repairing rear retaining tab", page 79](#)

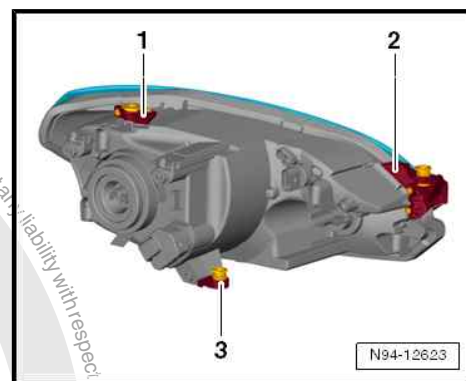
1.6.1 Repairing upper fastening points

If the upper fastening point -1- is damaged or broken off, it can be repaired by installing a repair kit. There is therefore no need to replace the entire headlight.



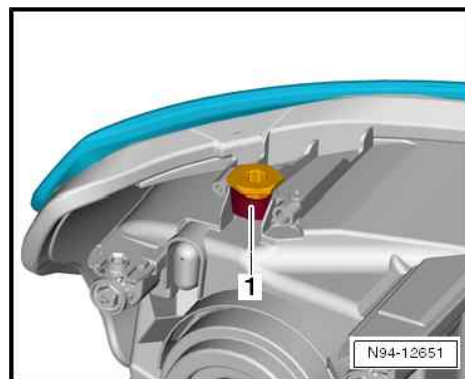
Note

- ◆ *Check that there is no further damage to the headlight that would make installation of the repair kit unnecessary.*
- ◆ *The repair kits for the left and right headlights ⇒ ETKA (electronic parts catalogue) are different.*
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove headlight ⇒ [page 72](#) .

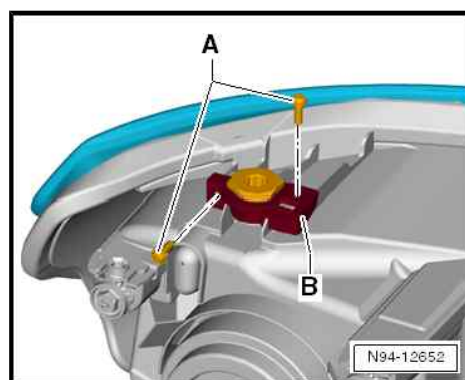




- Remove old fastening point -1- as far as necessary until new fastening point is lying evenly on the surface.



- Slot new retaining tab -B- onto base of old retaining tab on headlight, ensuring a positive fit, and tighten the two screws -A-.
- Install headlight ➔ [page 72](#) .
- Check headlight settings and adjust if necessary "Maintenance Manual" ➔ Maintenance ; Booklet 35.1 ; Descriptions of work



Specified torques

Component	Specified torque
Securing bolts	1 Nm

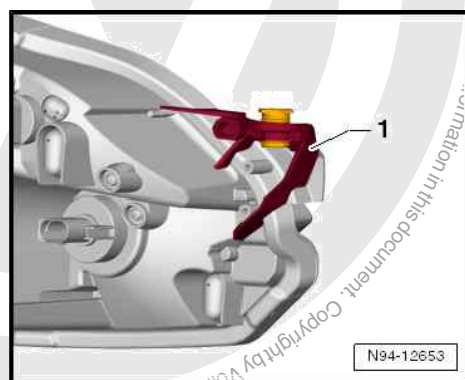
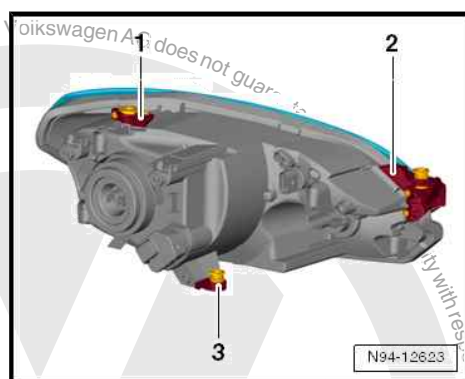
1.6.2 Repairing inner retaining tab

If the inner retaining tab -2- is damaged or broken off, it can be repaired by installing a repair kit. There is therefore no need to replace the entire headlight.



Note

- ♦ Check that there is no further damage to the headlight that would make installation of the repair kit unnecessary.
- ♦ The repair kits for the left and right headlights ➔ ETKA (electronic parts catalogue) are different.
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove headlight ➔ [page 72](#) .
- Remove old retaining tab -1- as far as necessary until repair tab can be attached.

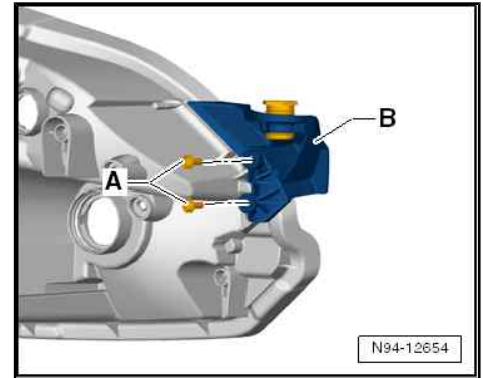




- Slot new retaining tab -B- onto base of old retaining tab on headlight, ensuring a positive fit, and tighten the two screws -A-.
- Install headlight ⇒ [page 72](#) .
- Check headlight settings and adjust if necessary “Maintenance Manual” ⇒ Maintenance ; Booklet 35.1 ; Descriptions of work

Specified torques

Component	Specified torque
Securing bolts	1 Nm



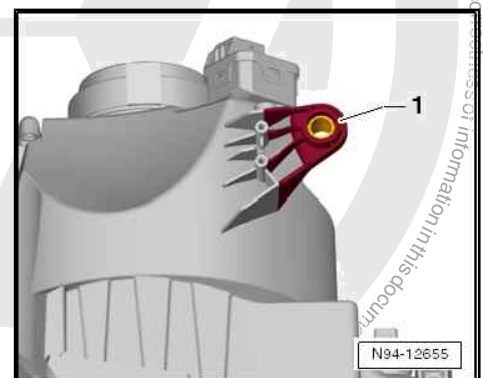
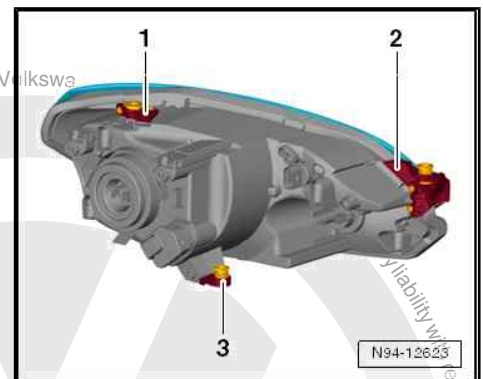
1.6.3 Repairing rear retaining tab

If the rear retaining tab -3- is damaged or broken off, it can be repaired by installing a repair kit. There is therefore no need to replace the entire headlight.



Note

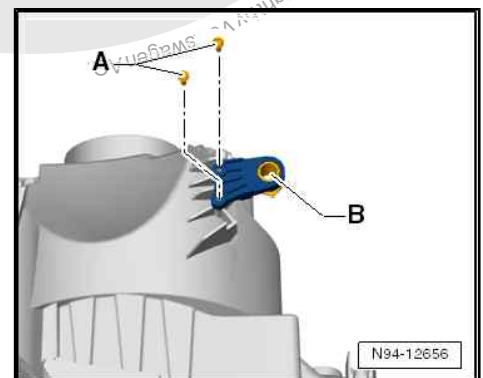
- ◆ Check that there is no further damage to the headlight that would make installation of the repair kit unnecessary.
- ◆ The repair kits for the left and right headlights ⇒ ETKA (electronic parts catalogue) are different.
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove headlight ⇒ [page 72](#)
- Remove old retaining tab -1- as far as necessary until repair tab can be attached.



- Slot new retaining tab -B- onto base of old retaining tab on headlight, ensuring a positive fit, and tighten the two screws -A-.
- Install headlight ⇒ [page 72](#) .
- Check headlight settings and adjust if necessary “Maintenance Manual” ⇒ Maintenance ; Booklet 35.1 ; Descriptions of work

Specified torques

Component	Specified torque
Securing bolts	1 Nm





1.7 Converting headlights from driving on right to driving on left



Note

- ♦ To avoid dazzling oncoming traffic with the asymmetrical lights, both headlights should normally be converted relevant to the country (driving on the left or right) in which the vehicle is being driven.
- ♦ The asymmetrical dipped beam of the headlights in the up! remains below the legally prescribed dazzle values even if the headlight lens is masked.
- ♦ Converting the headlights temporarily for use in countries where vehicles drive on the other side of the road is therefore unnecessary.

1.8 Converting headlights from driving on left to driving on right



Note

- ♦ To avoid dazzling oncoming traffic with the asymmetrical lights, both headlights should normally be converted relevant to the country (driving on the left or right) in which the vehicle is being driven.
- ♦ The asymmetrical dipped beam of the headlights in the up! remains below the legally prescribed dazzle values even if the headlight lens is masked.
- ♦ Converting the headlights temporarily for use in countries where vehicles drive on the other side of the road is therefore unnecessary.

1.9 Removing and installing headlight range control motor -V48- / -V49-



Note

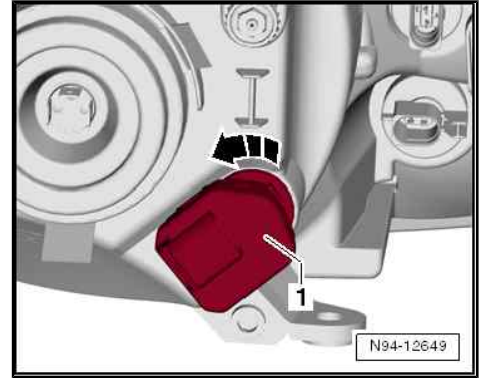
Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

- Remove headlight ⇒ [page 72](#) .



- Turn headlight range control motor -1- in -direction of arrow- as far as it will go.



- Swing ball head of actuator -2- towards the right out of mounting in headlight -1- and remove actuator -3- from headlight housing.

Installing

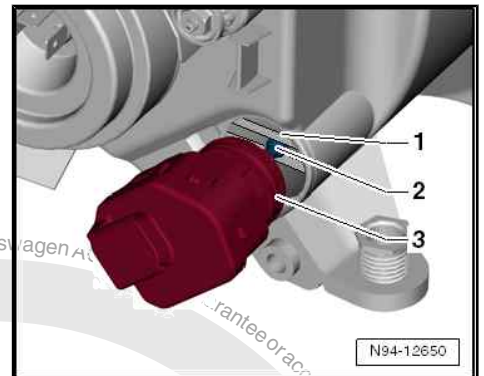
Install in the reverse order of removal, observing the following:



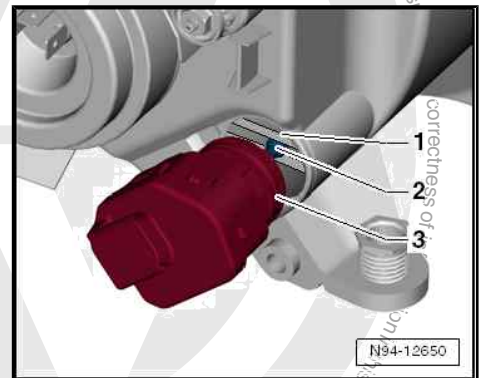
Caution

Risk of damage to the headlight.

- ◆ **Make sure the left headlight range control motor - V48- is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.**



- Insert headlight range control motor into headlight in position it was in before it was removed.
- Swing ball head of headlight range control motor -2- into mounting in headlight -1- from the right, while pulling the reflector towards the rear.
- Insert the actuator -3- into its mounting on headlight housing and lock it in place by turning it clockwise as far as it will go.
- Check functions of headlight.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 35 1 ; Descriptions of work



1.10 Removing and installing dipped beam bulb



Caution

Filament bulbs and gas discharge bulbs under pressure!

Danger of injury due to bursting filament lamps and gas discharge bulbs!

- ◆ **Remove filament bulbs and gas discharge bulbs carefully.**
- ◆ **Always wear safety goggles and gloves when removing and installing filament bulbs or gas discharge bulbs!**
- ◆ **Avoid contact with burst glass bulbs.**



The bulb for the dipped beam and main beam is a single component and functions as the bulb for the left dipped beam headlight - M29- and bulb for the left main beam headlight - M30- or, respectively, the bulb for the right dipped beam headlight - M31- and bulb for right main beam headlight - M32- .

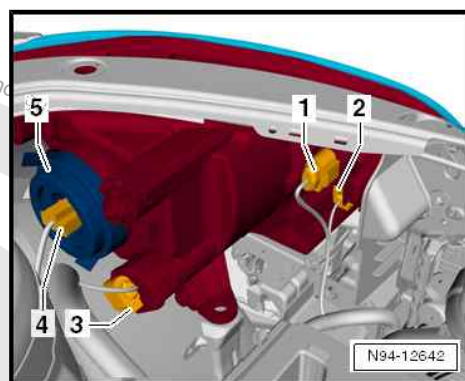


Note

- ♦ *The illustrations show removal and installation of the bulb for dipped beam and main beam of left headlight. Removal and installation of the bulb for dipped beam and main beam of right headlight are analogous.*
- ♦ *The headlight does not need to be removed in order to install or remove bulb for dipped beam and main beam.*

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Release and pull off connector -4-.
- Pull cover -5- off rear of headlight.



- Release retaining clip -2- and pull it to one side.
- Remove bulb for dipped beam and main beam -1- from reflector.

Bulb for dipped beam and main beam: H4 12V, 60/55W

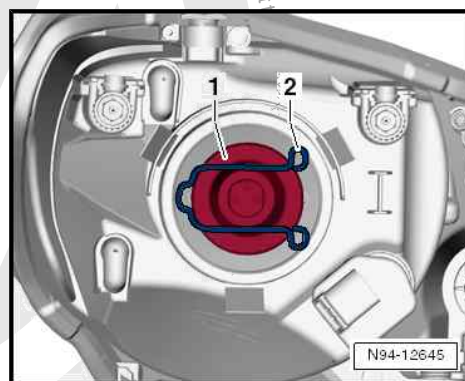
Installing

Install in the reverse order of removal, observing the following:



Caution

Make sure cover cap is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.



Note

Do not touch bulb glass when installing a bulb. Fingers leave traces of grease on the glass, which evaporate when the bulb is switched on and cause the glass to cloud over.

- Check functions of headlight.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 35.1 ; Descriptions of work



1.11 Removing and installing LED modules for daytime running light and side light - L176- / -L177-



Note

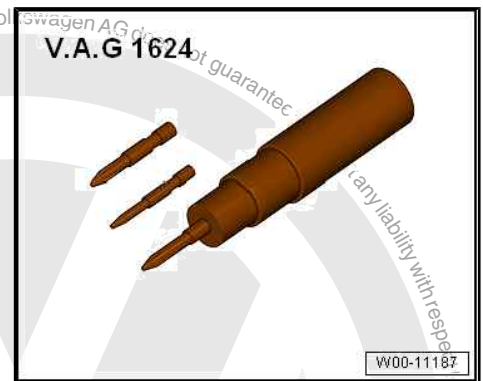
The left LED module for daytime running light and side light - L176- / right LED module for daytime running light and side light - L177- are LEDs integrated into the headlight. These LEDs cannot be renewed. The headlight can be renewed only as a complete unit.

- Removing and installing headlights ⇒ [page 72](#) .

1.12 Removing and installing control unit for daytime running light and side light - J860- / -J861-

Special tools and workshop equipment required

- ◆ Torque screwdriver - V.A.G 1624-



Note

Removal and installation are described for the left side. Removal and installation on the right side are analogous.

Removing

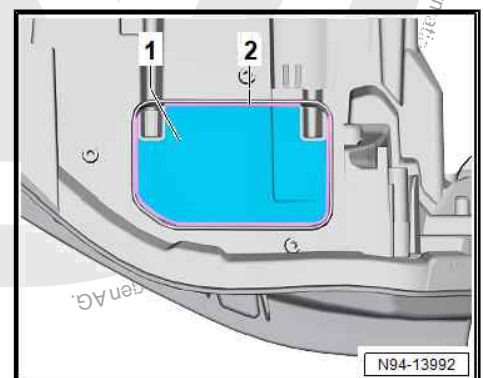
- Remove headlight ⇒ [page 72](#) .



Caution

Risk of damage to the headlight.

- ◆ **When removing the housing cover, make sure not to damage the sealing edge on the headlight housing. The ingress of water will cause permanent damage to the headlight.**



- Use a utility knife to carefully cut into bottom of headlight housing cover -1- along predetermined break line -2-.
- Then, use a hammer to carefully release housing cover -1- along predetermined break line -2-.
- Remove housing cover -1- from headlight.



- Unscrew bolt -1- for control unit for left daytime running light and side light - J860- -2-.
- Carefully swing control unit for left daytime running light and side light - J860- -2- out of headlight.
- Release and disconnect electrical connector -3- on control unit for left daytime running light and side light - J860- -2-.

Installing

Install in the reverse order of removal, observing the following:



Caution

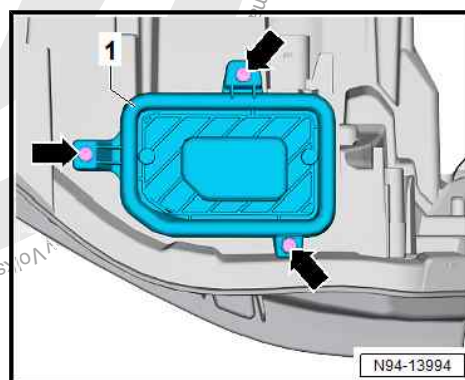
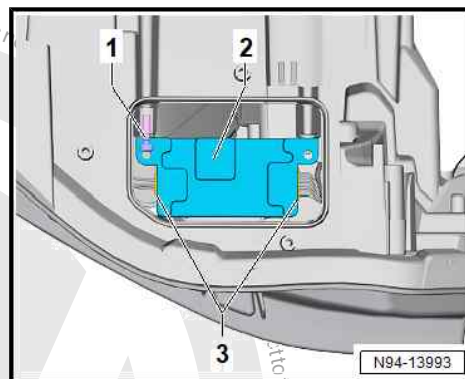
Risk of damage to the headlight.

- ◆ **Make sure the housing cover is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.**

- Position new housing cover -1- onto headlight.
- Screw in and tighten bolts -arrows-.
- Perform functional check.
- Checking headlight settings and adjusting headlight if necessary "Maintenance manual" ➤ Maintenance ; Booklet 35.1 ; Descriptions of work

Specified torques

Component	Specified torque
Control unit for daytime running light and side light to headlight	2 Nm
Housing cover to headlight	2 Nm





2 Fog lights

⇒ [“2.1 Assembly overview - fog lights”, page 85](#)

⇒ [“2.2 Removing and installing fog light”, page 85](#)

⇒ [“2.3 Removing and installing fog light bulb L22 / L23”, page 86](#)

⇒ [“2.4 Adjusting fog lights”, page 87](#)

2.1 Assembly overview - fog lights

1 - Electrical connector

2 - Left fog light bulb - L22- or right fog light bulb - L23-

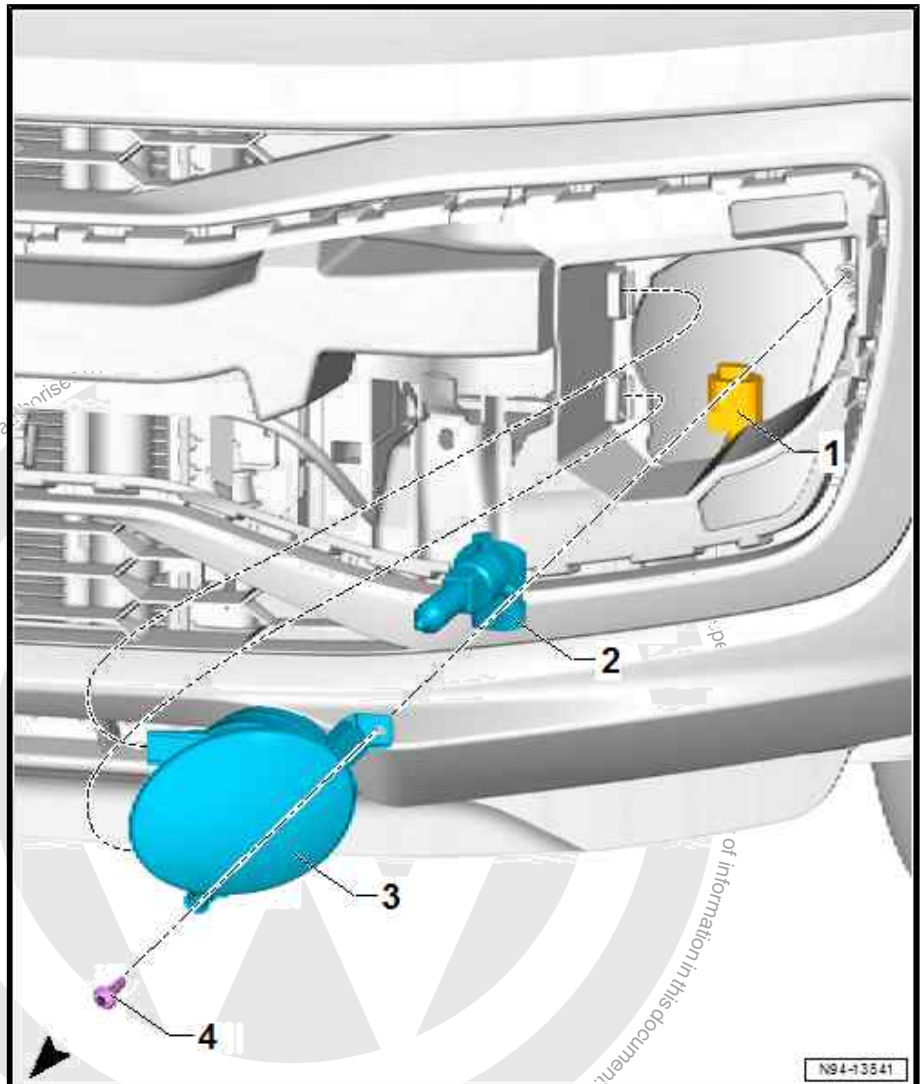
- ☐ Bulb HB4 12V, 51 W
- ☐ Removing and installing
⇒ [page 86](#)

3 - Fog light housing

- ☐ Removing and installing
⇒ [page 85](#)

4 - Securing bolts

- ☐ Specified torque:
1.5 Nm



2.2 Removing and installing fog light



Note

Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.



Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove trim of front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Assembly overview - bumper cover .
- Remove securing bolt -2-.
- Remove fog light housing -1- from ventilation grille -4- -arrow-.
- Release and pull off connector -3-.

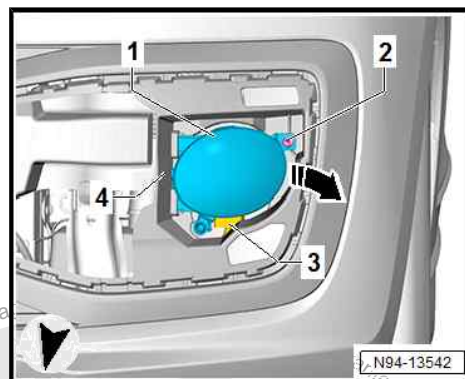
Installing

Install in the reverse order of removal, observing the following:

- Check functioning of fog light.
- Adjusting fog lights ⇒ [page 87](#) .

Specified torques

- ♦ ⇒ [“2.1 Assembly overview - fog lights”, page 85](#)



2.3 Removing and installing fog light bulb - L22- / -L23-



Note

Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Detach front left wheel housing liner in front area ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - front wheel housing liner



- Release and pull off connector -3-.
- Turn bulb holder -2- together with fog light bulb in -direction of arrow-, and remove it from fog light housing -1-.



Note

The fog light bulb is permanently attached to the bulb holder and cannot be renewed separately.

Fog light bulb : HB4 12 V, 51 W

Installing

Install in the reverse order of removal, observing the following:



Caution

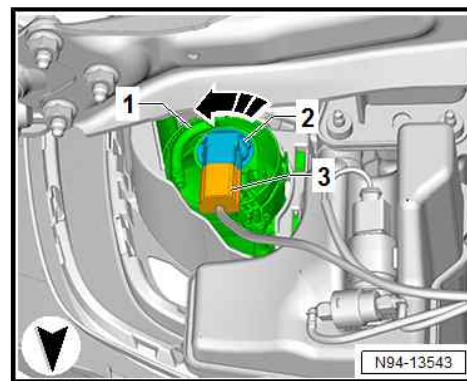
Risk of damage to the headlight.

- ◆ ***Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.***
- ◆ ***Wear e.g. clean fabric gloves when inserting bulbs.***
- ◆ ***Make sure the bulb holder is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.***

- Check function of headlight.
- Adjusting fog lights ⇒ [page 87](#) .

2.4 Adjusting fog lights

Adjusting fog lights ⇒ Maintenance ; Booklet 35.1 ; Descriptions of work





3 Lights in exterior mirror

⇒ [“3.1 Removing and installing turn signal”, page 88](#)

⇒ [“3.2 Removing and installing turn signal repeater bulb L131 / L132”, page 88](#)

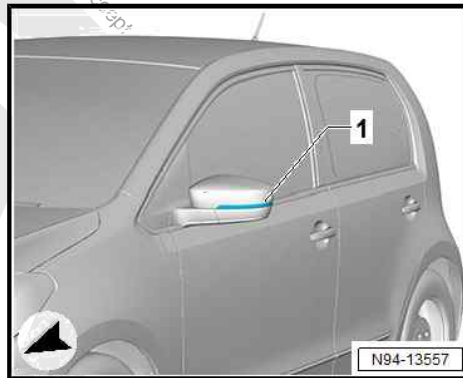
3.1 Removing and installing turn signal



Note

The turn signal repeater -1- is integrated in the lower mirror cover and cannot be removed and installed individually.

- Removing and installing lower mirror cover ⇒ General body repairs, exterior; Rep. gr. 66 ; Exterior mirror; Removing and installing mirror cover



3.2 Removing and installing turn signal repeater bulb -L131- / -L132-



Note

The turn signal repeater bulbs -L 131- / -L 132- are LEDs and are integrated in the turn signal. These LEDs cannot be renewed. The turn signal must be renewed completely.

- Removing and installing turn signal ⇒ [page 88](#) .



4 Tail lights

- ⇒ [“4.1 Assembly overview - tail lights in body”, page 89](#)
- ⇒ [“4.2 Removing and installing bulb carrier”, page 90](#)
- ⇒ [“4.3 Removing and installing tail light cluster”, page 90](#)
- ⇒ [“4.4 Removing and installing tail light bulb M2 / M4 ”, page 91](#)
- ⇒ [“4.5 Removing and installing rear fog light”, page 92](#)
- ⇒ [“4.6 Removing and installing rear fog light bulb L46 / L47”, page 92](#)
- ⇒ [“4.7 Removing and installing brake and tail light bulb M21 / M22”, page 93](#)
- ⇒ [“4.8 Removing and installing reversing light bulb”, page 93](#)
- ⇒ [“4.9 Removing and installing turn signal bulb”, page 94](#)

4.1 Assembly overview - tail lights in body

1 - Left tail light - MX3- or right tail light - MX4- in side panel

- ☐ Removing and installing
⇒ [page 90](#)

2 - Tail light bulb carrier in side panel

- ☐ Removing and installing
⇒ [page 90](#)

3 - Bulb carrier seal

4 - Securing nut

- ☐ Specified torque: screw on by hand as far as stop (max. 2 Nm)

5 - Left reverse light bulb - M16- or right reverse light bulb - M17-

- ☐ Bulb 12 V, RY16W
- ☐ Removing and installing
⇒ [page 93](#)

6 - Left brake and tail light bulb - M21- or right brake and tail light bulb - M22-

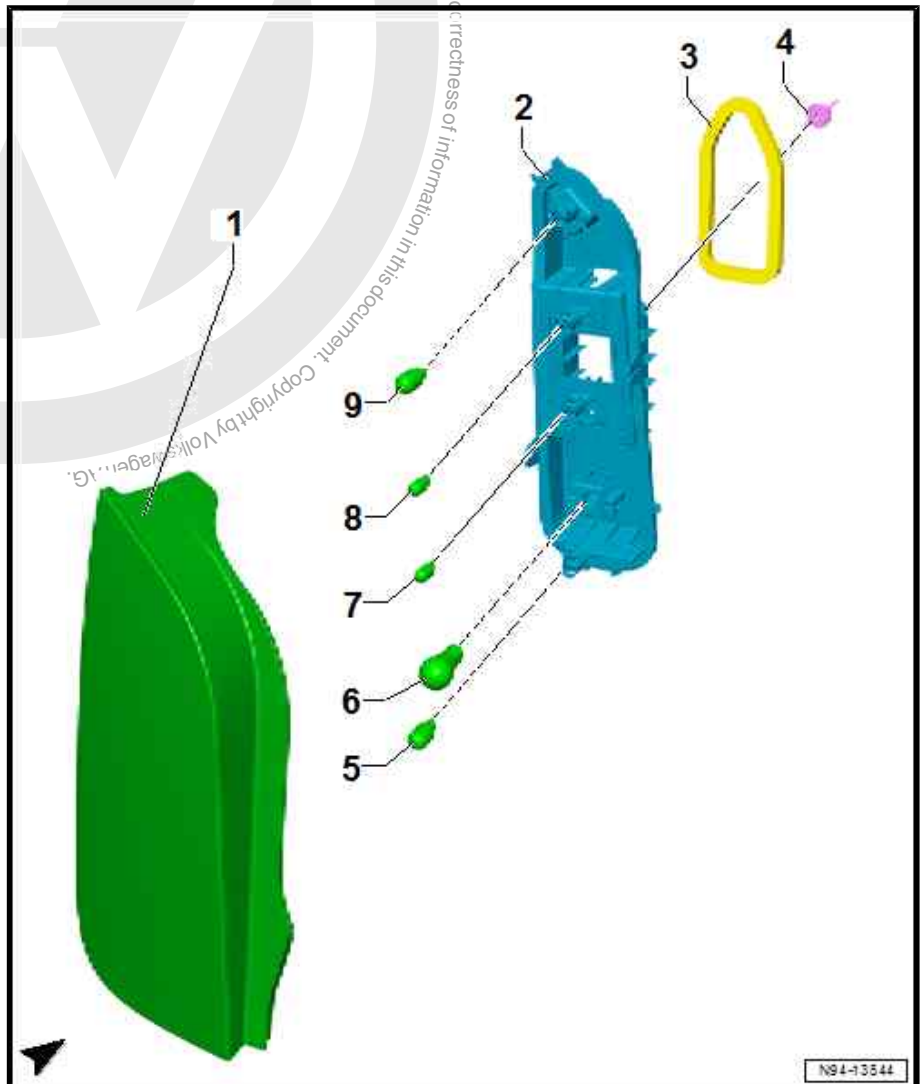
- ☐ Filament bulb 12V, P21/4W
- ☐ Removing and installing
⇒ [page 93](#)

7 - Left tail light bulb - M4- or right tail light bulb - M2-

- ☐ Bulb 12V, RY5W
- ☐ Removing and installing
⇒ [page 91](#)

8 - Left tail light bulb - M4- or right tail light bulb - M2-

- ☐ Bulb 12V, RY5W
- ☐ Removing and installing ⇒ [page 91](#)





9 - Rear left turn signal bulb - M6- or rear right turn signal bulb - M8-

- ☐ Bulb 12V, RY16W
- ☐ Removing and installing ⇒ [page 94](#)

4.2 Removing and installing bulb carrier



Note

Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove tail light cluster in side panel ⇒ [page 90](#).
- Push catches -arrows- outwards and remove bulb carrier -1- from tail light housing.

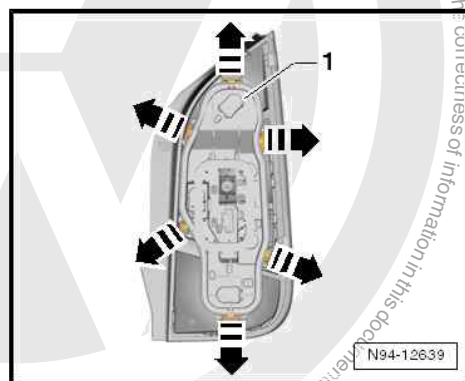
Installing

Install in the reverse order of removal, observing the following:



Note

When installing bulb carrier, make sure that all catches engage audibly.



4.3 Removing and installing tail light cluster

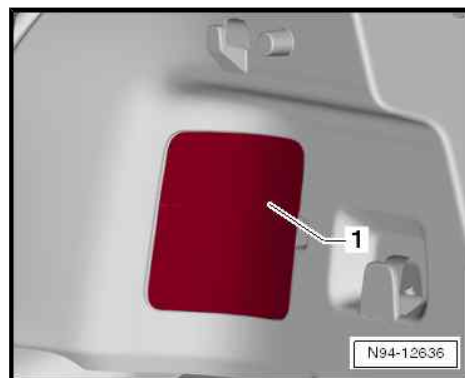


Note

Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

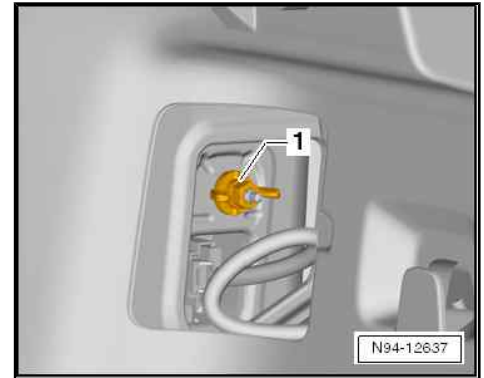
Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove service flap -1- from side panel trim in luggage compartment.





- Undo and remove nut -1- and remove tail light backwards out of body aperture in side panel, taking connected wiring lengths into consideration.



- Release and pull off connector -arrow- and then remove tail light.

Installing

Install in the reverse order of removal, observing the following:

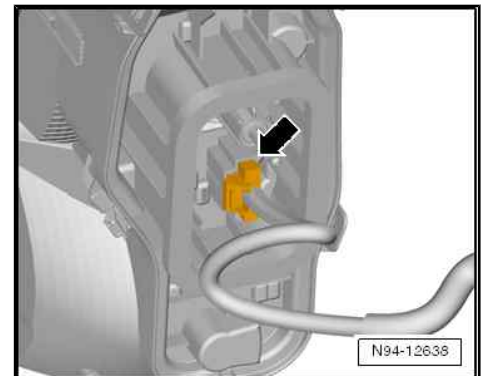


Caution

Risk of wiring damage.

The wiring harness for the tail lights could become trapped when installing.

Once the electrical connector has been fitted, the wiring harness must be fed through the aperture to the inside without it getting trapped.



- Screw on securing nut by hand as far as stop.
- When installation is complete, check gap/shut lines to body and functions of tail light.

Specified torques

- ♦ ⇒ [“4.1 Assembly overview - tail lights in body”, page 89](#)

4.4 Removing and installing tail light bulb - M2- / -M4-



Note

Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

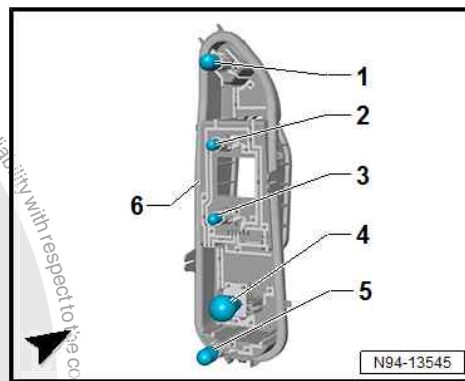
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove tail light bulb carrier in side panel ⇒ [page 90](#).



- Pull tail light bulb -2- or tail light bulb -3- in a straight line out of bulb carrier -6-.

Installing

Install in reverse order of removal.



4.5 Removing and installing rear fog light



Note

Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

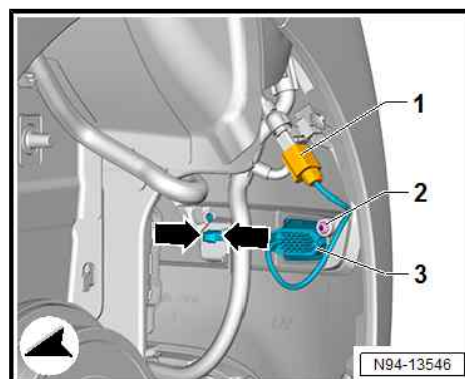
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Detach rear left wheel housing liner in rear area ➔ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing rear wheel housing liner .
- Release and pull off connector -1- of rear fog light -3-.
- Unscrew bolt -2-.
- Release fasteners -arrows-, and remove rear fog light -3- towards rear from bumper.

Installing

Install in the reverse order of removal.

Specified torques

Component	Specified torque
Securing bolt	1.5 Nm



4.6 Removing and installing rear fog light bulb -L46- / -L47-



Note

The rear fog light bulbs are LEDs -L46- / -L47- and are integrated in the rear fog light. These LEDs cannot be renewed. The rear fog light must be renewed completely.

- Removing and installing rear fog light ➔ [page 92](#) .



4.7 Removing and installing brake and tail light bulb -M21- / -M22-



Note

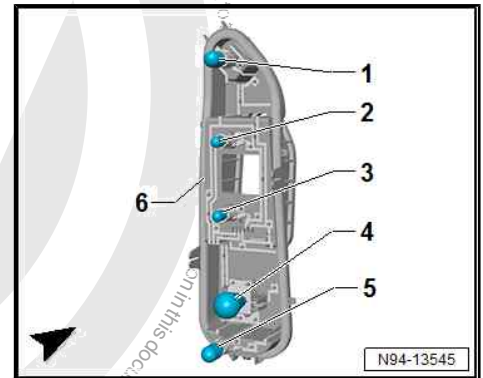
Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove tail light bulb carrier in side panel ➔ [page 90](#) .
- Push brake and tail light bulb -4- into holder, turn anti-clockwise, and pull in a straight line out of bulb carrier -6-.

Installing

Install in reverse order of removal.



4.8 Removing and installing reversing light bulb



Note

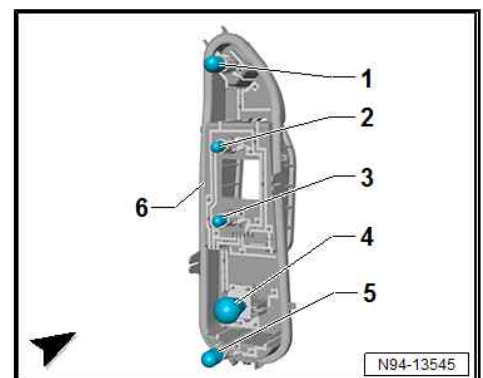
Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove tail light bulb carrier in side panel ➔ [page 90](#) .
- Pull tail light bulb -5- in a straight line out of bulb carrier -6-.

Installing

Install in reverse order of removal.





4.9 Removing and installing turn signal bulb



Note

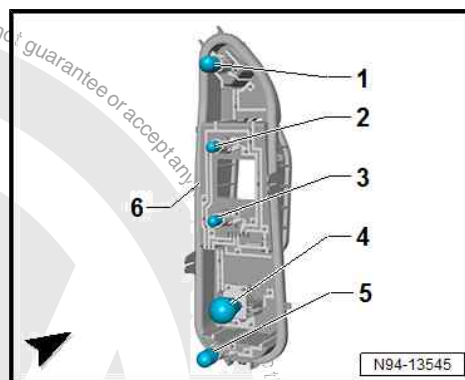
Removal and installation are described for the left side. The removal and installation procedure for the right-hand side is basically the same.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove tail light bulb carrier in side panel ⇒ [page 90](#).
- Pull tail light bulb -1- in a straight line out of bulb carrier -6-.

Installing

Install in reverse order of removal.





5 High-level brake light

⇒ [“5.1 Assembly overview - high-level brake light”, page 95](#)

⇒ [“5.2 Removing and installing high-level brake light”, page 95](#)

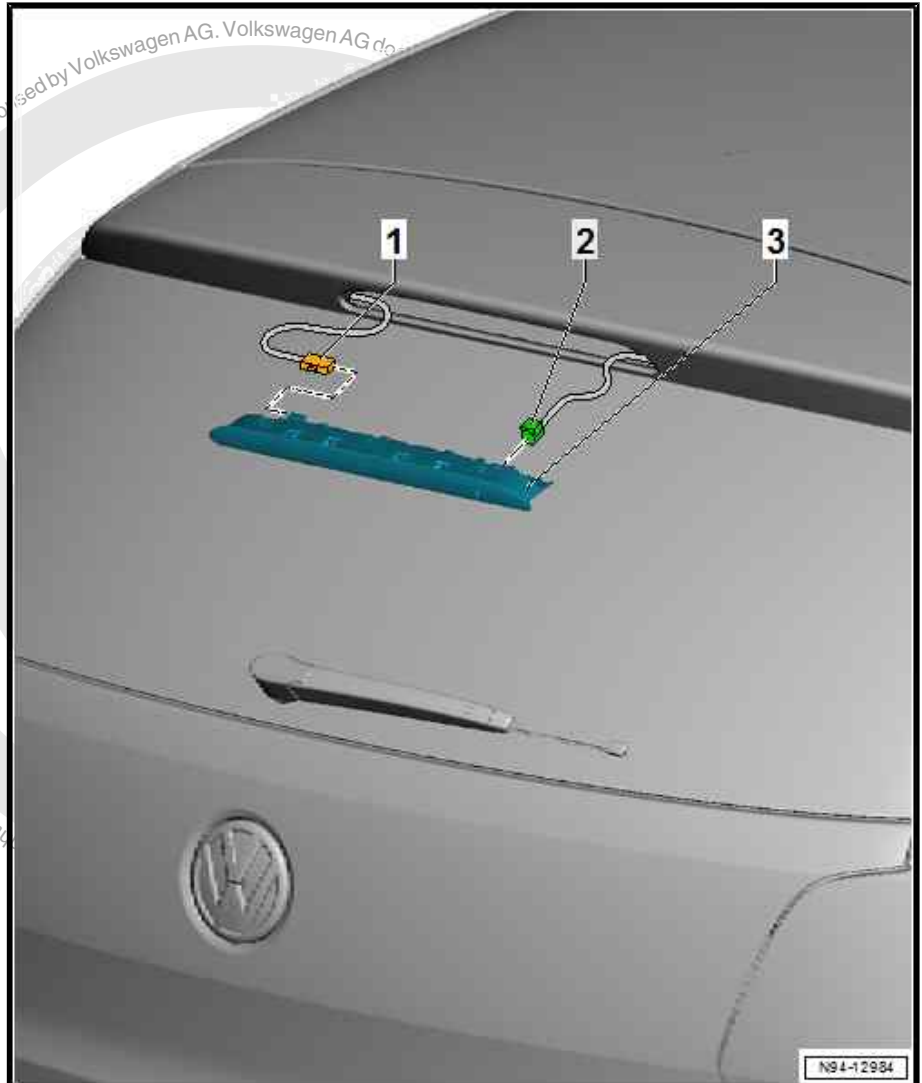
5.1 Assembly overview - high-level brake light

1 - Connector for brake light

2 - Connection for washer fluid hose

3 - High-level brake light

- ☐ With high-level brake light bulb - M25-
- ☐ Removing and installing
⇒ [page 95](#)

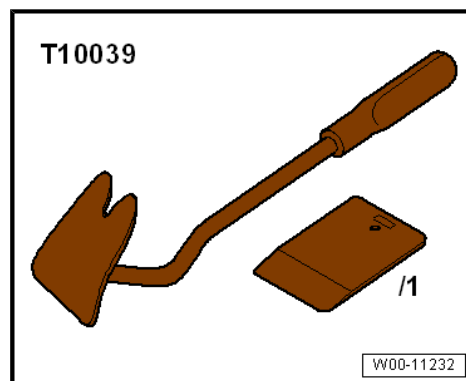


5.2 Removing and installing high-level brake light

Special tools and workshop equipment required



◆ Plastic wedge - T10039/1-



Removing

- Switch off ignition and all electrical consumers.
- Keep the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.



Caution

Danger of damage to component surfaces.

- ◆ ***When using leverage tools, mask visible areas of the component with commercially available adhesive tape.***

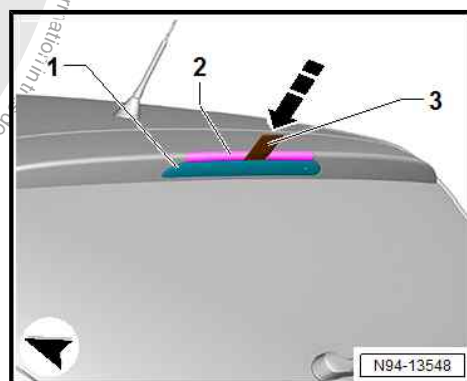
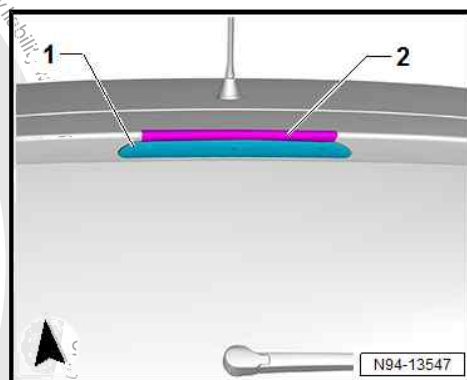
- Attach a strip of adhesive tape -2- to rear lid area above high-level brake light -1-.



Caution

Make sure the seal is not damaged when removing the high-level brake light.

- Insert wedge - T10039/1- -3- at top between high-level brake light -1- and rear lid.
- Release catch of bulb for high-level brake light - M25- by pushing assembly wedge in direction of front of vehicle.
- Take high-level brake light bulb - M25- out of rear lid, taking connected wiring lengths into account.





- Pull out hose lock, and pull hose connection -2- off high-level brake light bulb - M25- .
- Release and pull off connector -1-, and detach high-level brake light bulb - M25- -3-.

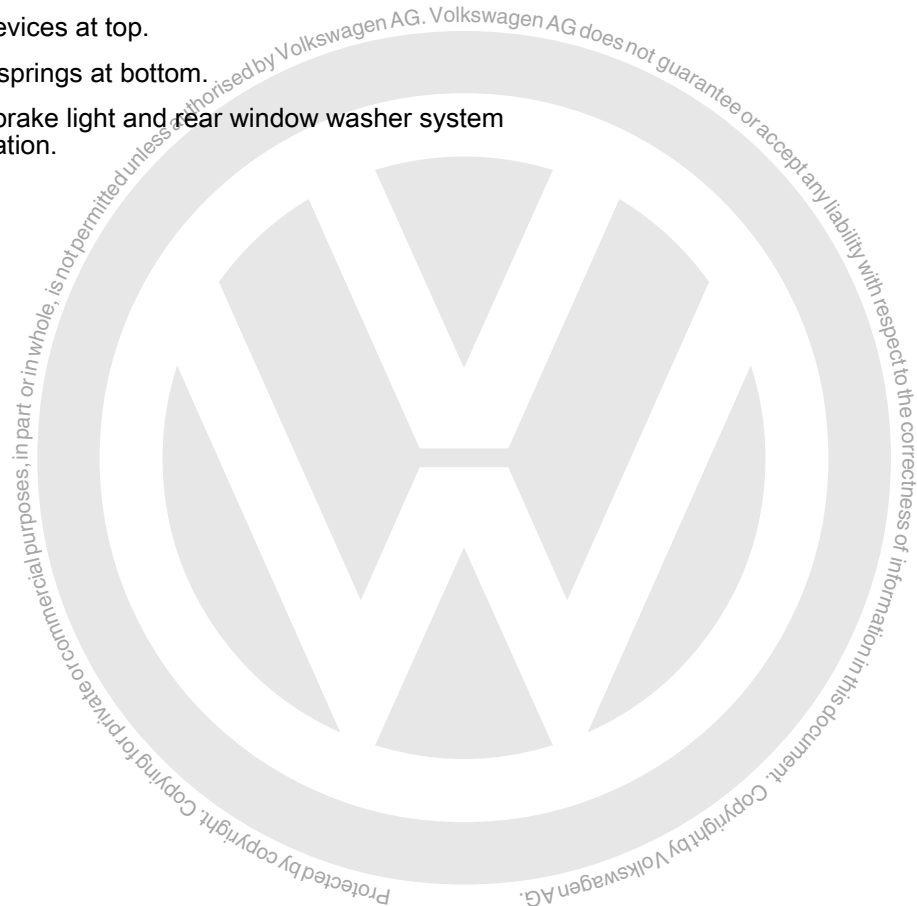
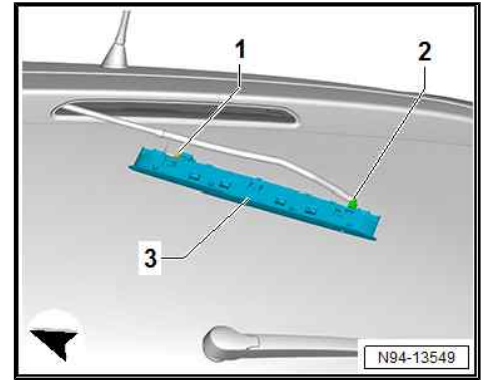
Installing

Install in the reverse order of removal, observing the following:



Note

- ◆ *If the event of a defective LED, the entire high-level brake light needs to be renewed.*
 - ◆ *When installing high-level brake light, make sure seal is correctly seated. The seal must not form loops or be damaged.*
 - ◆ *When connecting the washer fluid line, ensure that the securing clip engages audibly in the connection.*
- Connect hose connection and connectors.
 - Guide high-level brake light into rear lid.
 - Engage locking devices at top.
 - Engage retaining springs at bottom.
 - Check high-level brake light and rear window washer system for fault-free operation.



6 Number plate light

⇒ "6.1 Removing and installing number plate light X4 / X5", page 98

⇒ "6.2 Removing and installing bulb for number plate light X4 / X5", page 98

6.1 Removing and installing number plate light - X4- / -X5-

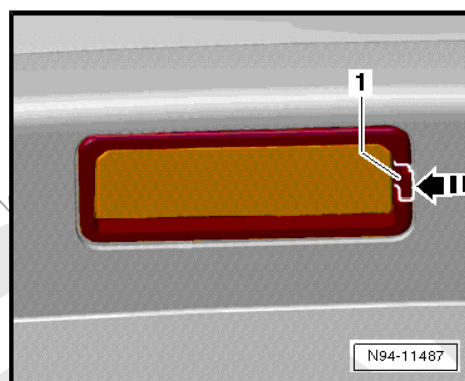


Note

If an LED number plate light is faulty, the entire number plate light must be renewed.

Removing

- Turn light switch to "0" position.
- Press retaining lug in -direction of arrow- and take number plate light downwards out of the bumper cover.



- Release and disconnect connector -arrow-.

Installing

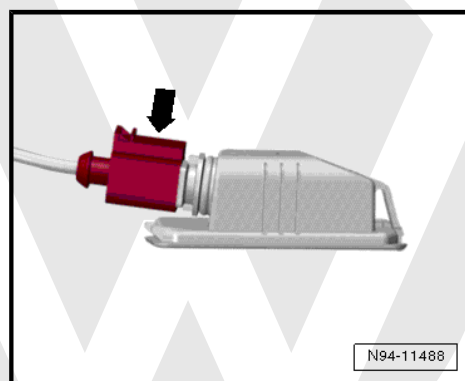
Install in the reverse order of removal, observing the following:



Note

Insert number plate light into bumper cover so that connector is oriented to left side of vehicle.

- Perform functional check.



6.2 Removing and installing bulb for number plate light - X4- / -X5-



Note

The bulbs for the number plate light are LEDs and are integrated in the number plate light. These LEDs cannot be renewed. The entire number plate light must be renewed.

- Removing and installing number plate light - X4- / -X5-
⇒ page 98 .



7 Steering column switch module

⇒ [“7.1 Assembly overview - steering column switch module”, page 99](#)

⇒ [“7.2 Removing and installing steering column switch module”, page 100](#)

⇒ [“7.3 Removing and installing steering column electronics control unit J527”, page 102](#)

⇒ [“7.4 Removing and installing base for steering column combination switch”, page 104](#)

⇒ [“7.5 Removing and installing turn signal switch E2”, page 104](#)

⇒ [“7.6 Removing and installing cruise control system switch E45”, page 104](#)

⇒ [“7.7 Removing and installing intermittent wiper switch E22”, page 104](#)

⇒ [“7.8 Removing and installing ignition/starter switch”, page 105](#)

⇒ [“7.9 Removing and installing lock cylinder”, page 106](#)

⇒ [“7.10 Removing and installing steering lock housing”, page 108](#)

⇒ [“7.11 Removing and installing ignition key withdrawal lock solenoid N376”, page 110](#)

7.1 Assembly overview - steering column switch module

1 - Grommet

2 - Steering column combination switch

- ☐ With turn signal switch - E2- , intermittent wiper switch - E22-
- ☐ Removing and installing ➔ [page 100](#)

3 - Steering column electronics control unit - J527-

- ☐ With airbag coil connector and return ring with slip ring - F138-
- ☐ Removing and installing ➔ [page 102](#)

4 - Bolt

- ☐ Qty. 3
- ☐ 1.1 Nm

5 - Plate base

- ☐ For steering column combination switch

6 - Bolt

- ☐ 1.5 Nm

7 - Steering lock housing

- ☐ Removing and installing ➔ [page 108](#)

8 - Ignition/starter switch - D-

- ☐ Removing and installing ➔ [page 105](#)

9 - Ignition key withdrawal lock solenoid - N376-

- ☐ Only on vehicles with automatic gearbox or dual clutch gearbox
- ☐ Removing and installing ➔ [page 110](#)

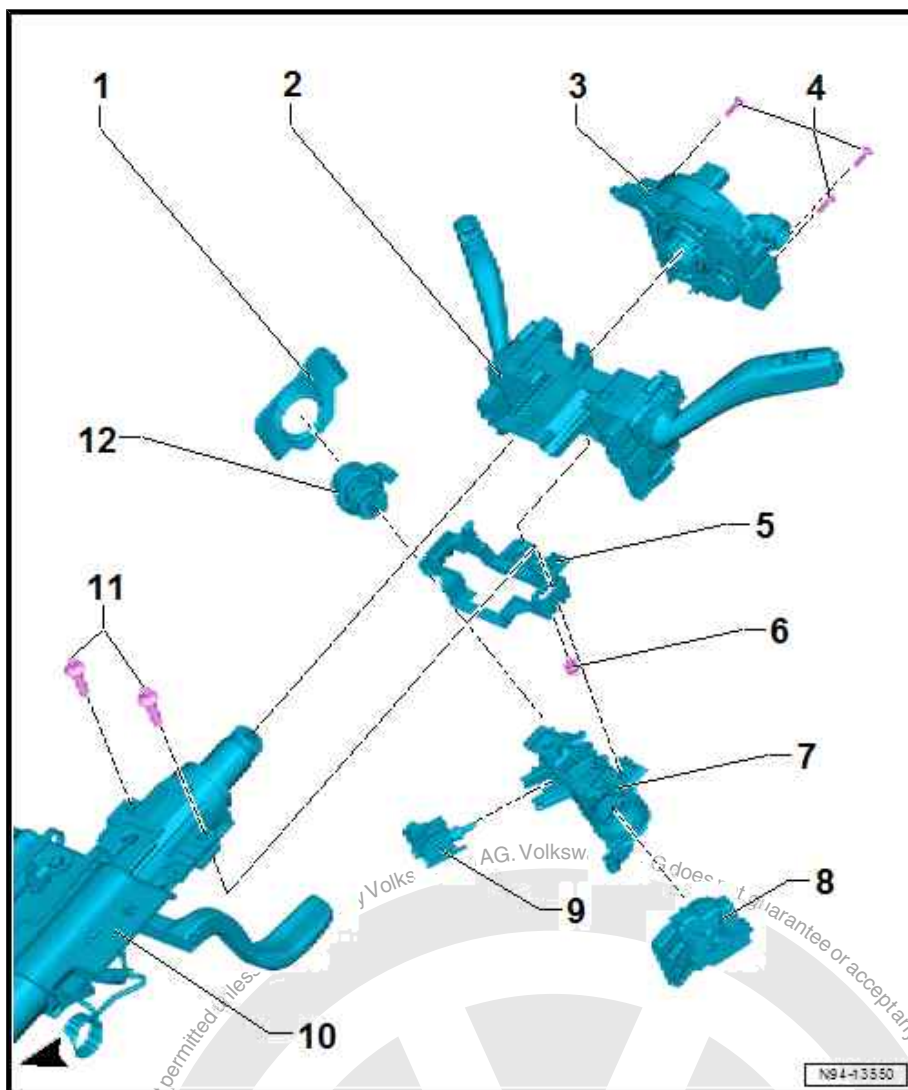
10 - Steering column

11 - Shear bolt

- ☐ For steering lock housing
- ☐ Qty. 2

12 - Lock cylinder

- ☐ Removing and installing ➔ [page 106](#)
- ☐ With immobiliser reader coil - D2-
- ☐ Removing and installing immobiliser reader coil - D2- ➔ [page 135](#)

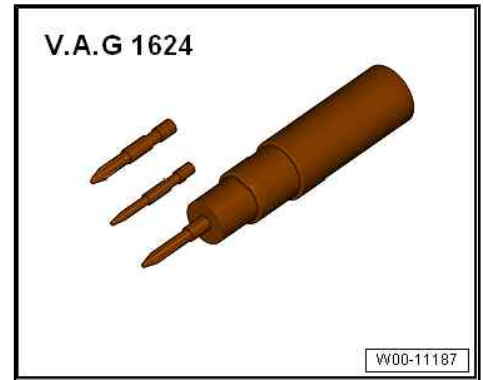


7.2 Removing and installing steering column switch module

Special tools and workshop equipment required



- ◆ Torque screwdriver - V.A.G 1624-



Depending on vehicle equipment, the following components are integrated into the steering column combination switch - E595- as one unit:

- ◆ Turn signal switch - E22-
- ◆ Headlight dipper and flasher switch - E4-
- ◆ Parking light switch - E19-
- ◆ Intermittent wiper switch - E22-
- ◆ Rear window wiper switch - E34-
- ◆ Intermittent wiper regulator - E38-
- ◆ Cruise control system switch - E45-
- ◆ Cruise control system (CCS) SET button - E227-



Note

If one of the components is defective, the steering column combination switch - E595- must be renewed as a complete unit.

Removing

- Align front wheels to straight-ahead position – steering wheel in zero position.
- Move steering wheel to rearmost and lowest position. Use the full range of the steering column adjustment for this purpose.
- Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering wheel; Removing and installing steering wheel .
- Remove lower steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing lower steering column trim .



WARNING

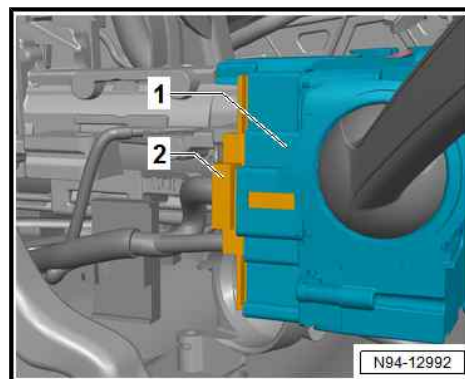
Risk of damage to the electronic components due to electrostatic discharge.

- ◆ ***Before disconnecting the electrical connector, the mechanic must electrostatically discharge himself or herself by briefly grasping hold of door striker plate or similar.***

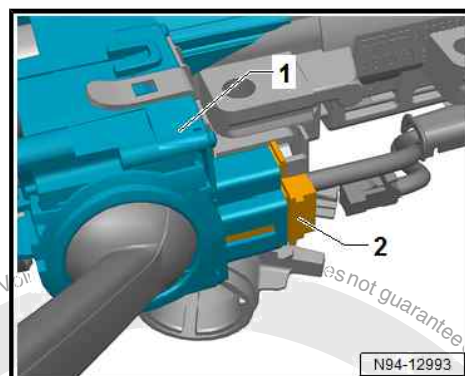
- Remove steering column electronics control unit - J527-
⇒ [page 102](#) .



- Disconnect left connector -2- from steering column combination switch - E595- -1-.



- Disconnect right connector -2- from steering column combination switch - E595- -1-.



- Unscrew bolt -2- from retaining plate -3- for steering column combination switch - E595- .
- Pull steering column combination switch - E595- -1- in direction of -arrow- off retaining plate.

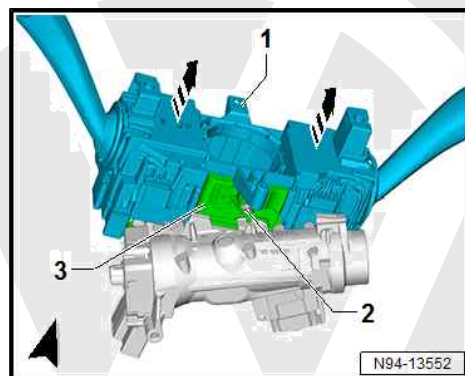
Installing

Install in the reverse order of removal, observing the following:

- If a new steering column electronics control unit - J527- is installed, do not remove transport protection until steering wheel is mounted.

Specified torques

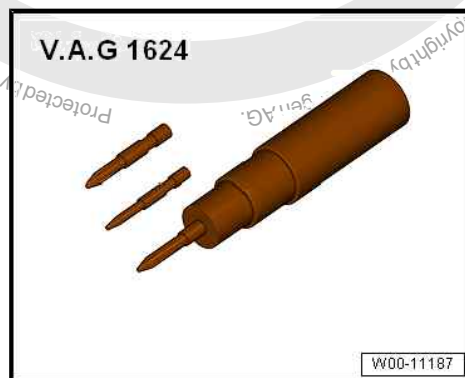
- ♦ ➔ ["7.1 Assembly overview - steering column switch module", page 99](#)



7.3 Removing and installing steering column electronics control unit - J527-

Special tools and workshop equipment required

- ♦ Torque screwdriver - V.A.G 1624-





Note

- ◆ *Airbag coil connector and return ring with slip ring - J527- is integrated in steering column electronics control unit - F138-.*
- ◆ *If the control unit is renewed, perform the adaptation routines using → Vehicle diagnostic tester.*

Removing

- Align front wheels to straight-ahead position – steering wheel in zero position.
- Move steering wheel to rearmost and lowest position. Use the full range of the steering column adjustment for this purpose.
- Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering wheel; Removing and installing steering wheel .
- Remove lower steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing lower steering column trim .



WARNING

Risk of damage to the electronic components due to electrostatic discharge.

- ◆ ***Before disconnecting the electrical connector, the mechanic must electrostatically discharge himself or herself by briefly grasping hold of door striker plate or similar.***

- Disconnect connector -2- on airbag coil connector and return ring with slip ring - F138- -1-.
- Unscrew bolts -arrows- of airbag coil connector and return ring with slip ring - F138- -1-.
- Remove airbag coil connector and return ring with slip ring - F138- -1- from steering column combination switch - E595- .

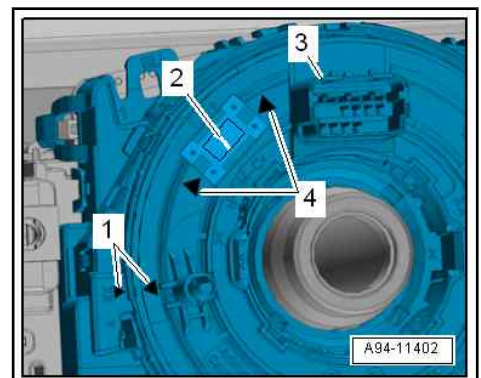
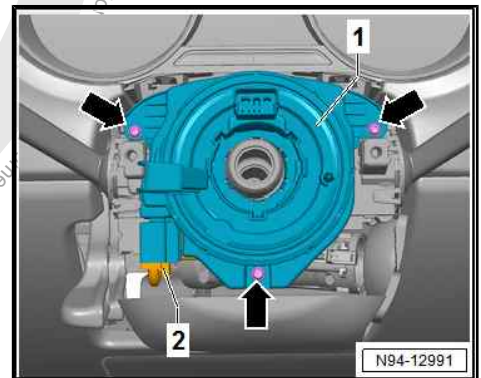
Installing

Install in the reverse order of removal, observing the following:

- The arrows -1- must align.
- The airbag coil connector and return ring -2- must be visible through the window between the -arrows 4-.

Specified torques

- ◆ ⇒ **“7.1 Assembly overview - steering column switch module”, page 99**





7.4 Removing and installing base for steering column combination switch



Note

The base for steering column combination switch is removed and installed together with the steering lock housing.

- Removing and installing steering lock housing ⇒ [page 108](#) .

7.5 Removing and installing turn signal switch - E2-



Note

- ♦ *The turn signal switch - E2- , cruise control system switch - E45- and intermittent wiper switch - E22- are combined to form the steering column combination switch - E595- .*
- ♦ *These switches cannot be separated.*
- ♦ *If one of the switches is defective, the steering column combination switch - E595- must be renewed as a complete unit.*

Removing and installing steering column switch module
⇒ [page 100](#) .

7.6 Removing and installing cruise control system switch - E45-



Note

- ♦ *The turn signal switch - E2- , cruise control system switch - E45- and intermittent wiper switch - E22- are combined to form the steering column combination switch - E595- .*
- ♦ *These switches cannot be separated.*
- ♦ *If one of the switches is defective, the steering column combination switch - E595- must be renewed as a complete unit.*

- Removing and installing steering column switch module
⇒ [page 100](#) .

7.7 Removing and installing intermittent wiper switch - E22-



Note

- ♦ *The turn signal switch - E2- , cruise control system switch - E45- and intermittent wiper switch - E22- are combined to form the steering column combination switch - E595- .*
- ♦ *These switches cannot be separated.*
- ♦ *If one of the switches is defective, the steering column combination switch - E595- must be renewed as a complete unit.*

- Removing and installing steering column switch module
⇒ [page 100](#) .



7.8 Removing and installing ignition/starter switch

Special tools and workshop equipment required

- ◆ 2 jeweller screwdrivers, 2 mm in diameter

Removing

- With ignition switched off, disconnect earth cable from battery ⇒ [page 7](#).
- Remove lower steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing lower steering column trim .
- Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .
- Turn ignition key to “Ignition ON” position.

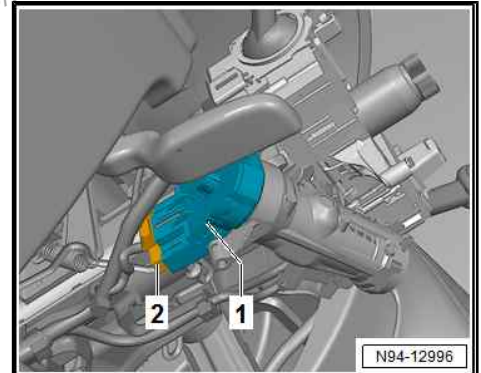


WARNING

Risk of damage to the electronic components due to electrostatic discharge.

- ◆ ***Before disconnecting the electrical connector, the mechanic must electrostatically discharge himself or herself by briefly grasping hold of door striker plate or similar.***

- Disconnect connector -2- on ignition/starter switch - D- -1-.
- Remove sticker from ignition/starter switch - D- -1-.





- Insert 2 jeweller screwdrivers (2 mm in diameter) as far as stop in holes -arrows-, and release ignition/starter switch - D- -1-.
- Pull ignition/starter switch - D- -1- out of steering lock housing.
- The jeweller's screwdrivers must remain inserted while doing so.

Installing

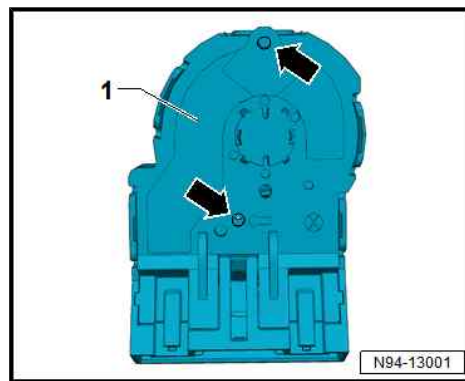
Install in the reverse order of removal, observing the following:



Caution

Risk of damage to the ignition/starter switch - D- .

- ◆ *When delivered as a replacement part, the ignition/starter switch - D- is set to "On" position.*
- ◆ *Never set the ignition/starter switch - D- to another position than the "On" position.*

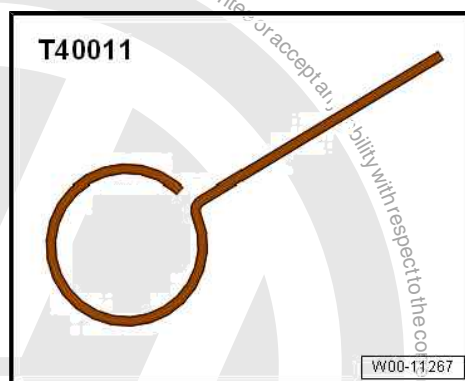


- Make sure that ignition/starter switch - D- is set to "On" position, and insert it in steering lock housing until it engages audibly.
- Connect battery ➔ [page 7](#) .

7.9 Removing and installing lock cylinder

Special tools and workshop equipment required

- ◆ Locking pin - T40011- or suitable welding wire



Note

- ◆ *The immobiliser reader coil - D2- is integrated into the lock cylinder and cannot be renewed individually.*
- ◆ *If it is defective, the complete lock cylinder must be renewed.*

Removing

- Remove lower steering column trim ➔ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing lower steering column trim .

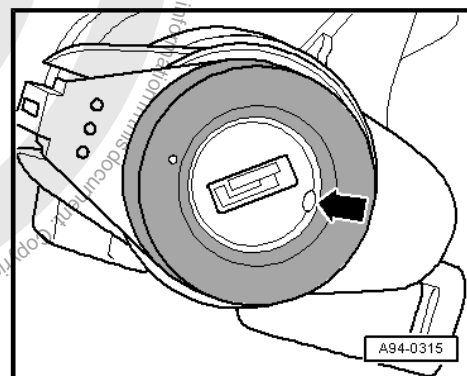
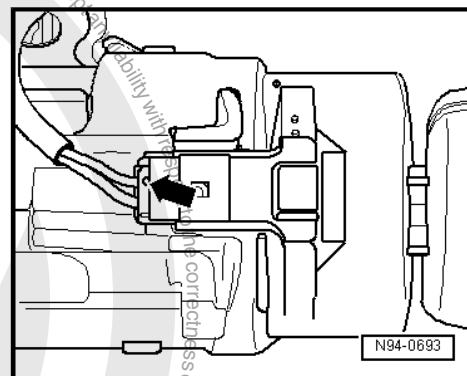


- Disconnect connector -arrow- from immobiliser reader coil - D2- .



Note

- ◆ *To remove the lock cylinder, it might be necessary to fold aside the ignition key.*
- ◆ *For reasons of clarity, the ignition lock is illustrated in the correct position without the ignition key.*
- Turn ignition key to “Ignition ON” position. This will align the recess in trim -arrow- with hole in ignition lock.



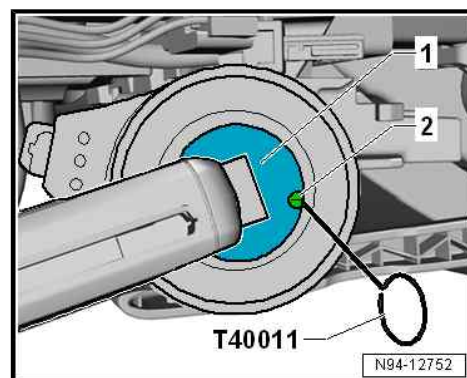
- Fold aside ignition key as far as possible.
- Insert locking pin - T40011- or suitable welding wire as far as stop in hole -2-, and release lock cylinder -1-.
- Pull lock cylinder -1- together with immobiliser reader coil - D2- out of steering lock housing.



WARNING

Risk of seized steering lock.

- ◆ *The steering lock must not be actuated without lock cylinder.*



Note

- ◆ *A seized steering lock must be renewed.*
- ◆ *The reader coil is integrated in the lock cylinder and cannot be renewed individually.*
- ◆ *The entire lock cylinder must be renewed if the reader coil is defective.*
- ◆ *A new lock cylinder can be ordered from the responsible distribution centre or the importer. When ordering, the vehicle-specific locking number according to the VIN must be provided.*

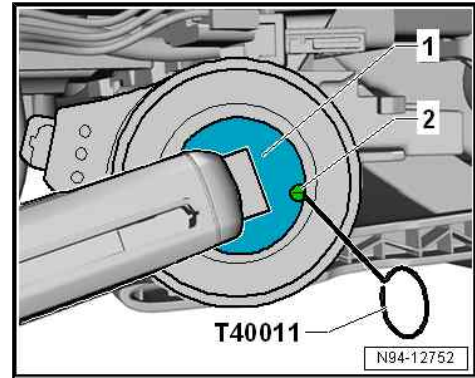
Installing

Install in the reverse order of removal, observing the following:

- Insert ignition key into lock cylinder and turn it to position “Ignition On”.



- Insert locking pin - T40011- or suitable welding wire as far as stop into hole -2- again.
- Insert lock cylinder -1- together with immobiliser reader coil - D2- in steering lock housing -3-.
- Pull locking pin - T40011- or suitable welding wire out of hole -2-.
- Press in lock cylinder tightly until locking mechanism can be heard to engage.
- Connect electrical connector to immobiliser reader coil.

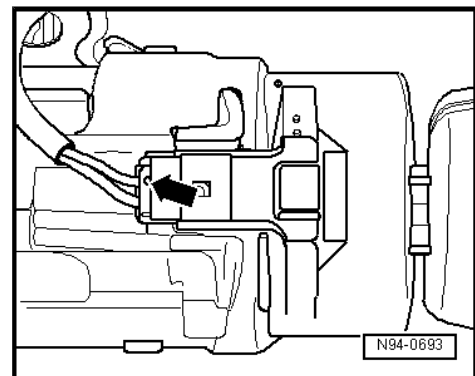
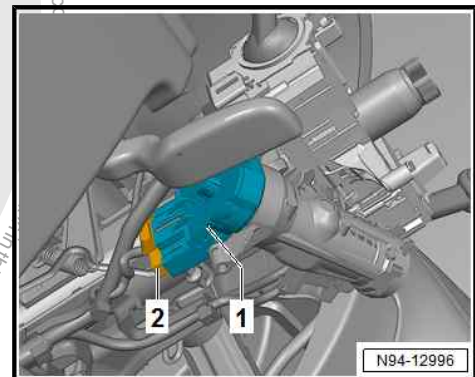


7.10 Removing and installing steering lock housing

Removing

- Remove steering column switch module ➔ [page 100](#) .
- Disconnect connector -2- on ignition/starter switch - D- -1-.
- Disconnect connector -arrow- from immobiliser reader coil - D2- .

Vehicles with dual clutch gearbox





- Disconnect connector -2- from ignition key withdrawal lock solenoid - N376- -1-.

Continued for all vehicles



WARNING

Danger of eye injury from drilling swarf.

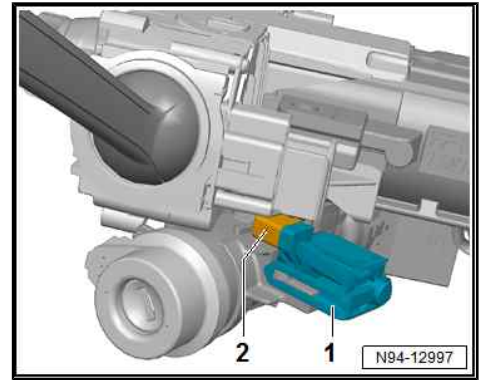
- ◆ *When drilling out, swarf may fly off and cause eye injury.*
- ◆ *Wear eye protection.*



Caution

Risk of damage to adjacent components.

- ◆ *The drilling operation can cause swarf to penetrate the adjacent components resulting in damage and/or mal-function!*
- ◆ *Thoroughly remove any swarf.*



- Drill out shear heads -arrows- using an angle drill and an 8.5 mm drill bit.
- Remove steering lock housing from steering column.

The following components must be removed to renew the steering lock housing:

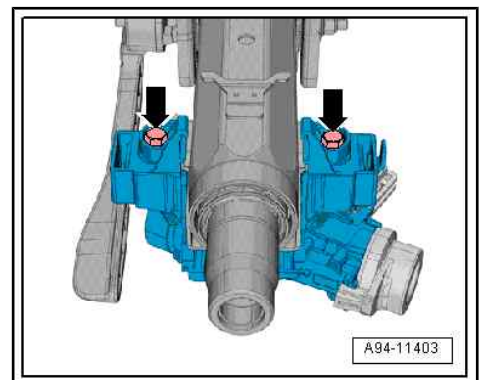
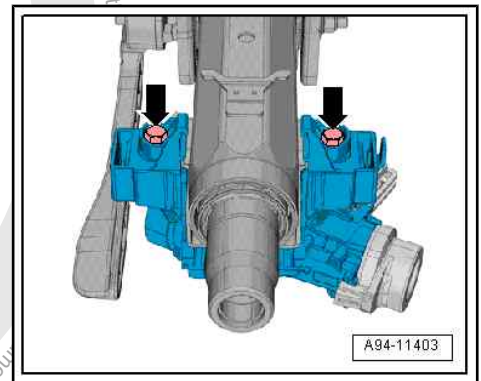
- ◆ Ignition/starter switch - D- ⇒ [page 105](#)
- ◆ Lock cylinder ⇒ [page 106](#)
- ◆ Ignition key withdrawal lock solenoid - N376- (vehicles with dual clutch gearbox) ⇒ [page 110](#)

Installing

- Ignition/starter switch installed ⇒ [page 105](#)
- Lock cylinder installed ⇒ [page 106](#)

Install in the reverse order of removal, observing the following:

- Tighten new bolts -arrows- until shear heads break off.





7.11 Removing and installing ignition key withdrawal lock solenoid - N376-

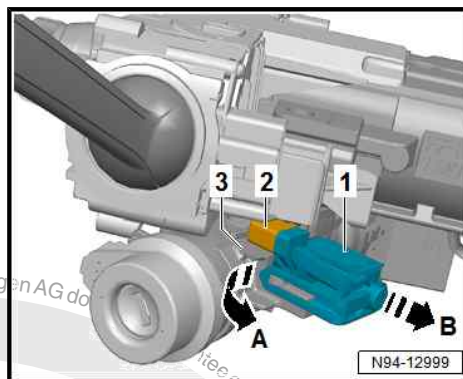
Removing

- Remove lower steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing lower steering column trim .
- Disconnect connector -2- from ignition key withdrawal lock solenoid - N376- -1-.
- Push retaining tab in -direction of arrow A-, and pull ignition key withdrawal lock solenoid - N376- -1- in -direction of arrow B- off steering lock housing -3-.

Installing

Install in the reverse order of removal, observing the following:

- Perform functional check.





8 Parking aid

⇒ ["8.1 Assembly overview – parking aid", page 111](#)

⇒ ["8.2 Removing and installing parking aid control unit J446 ", page 111](#)

⇒ ["8.3 Removing and installing rear parking aid warning buzzer H15 ", page 112](#)

⇒ ["8.4 Removing and installing rear parking aid senders", page 112](#)

8.1 Assembly overview – parking aid

1 - Parking aid senders in rear bumper cover

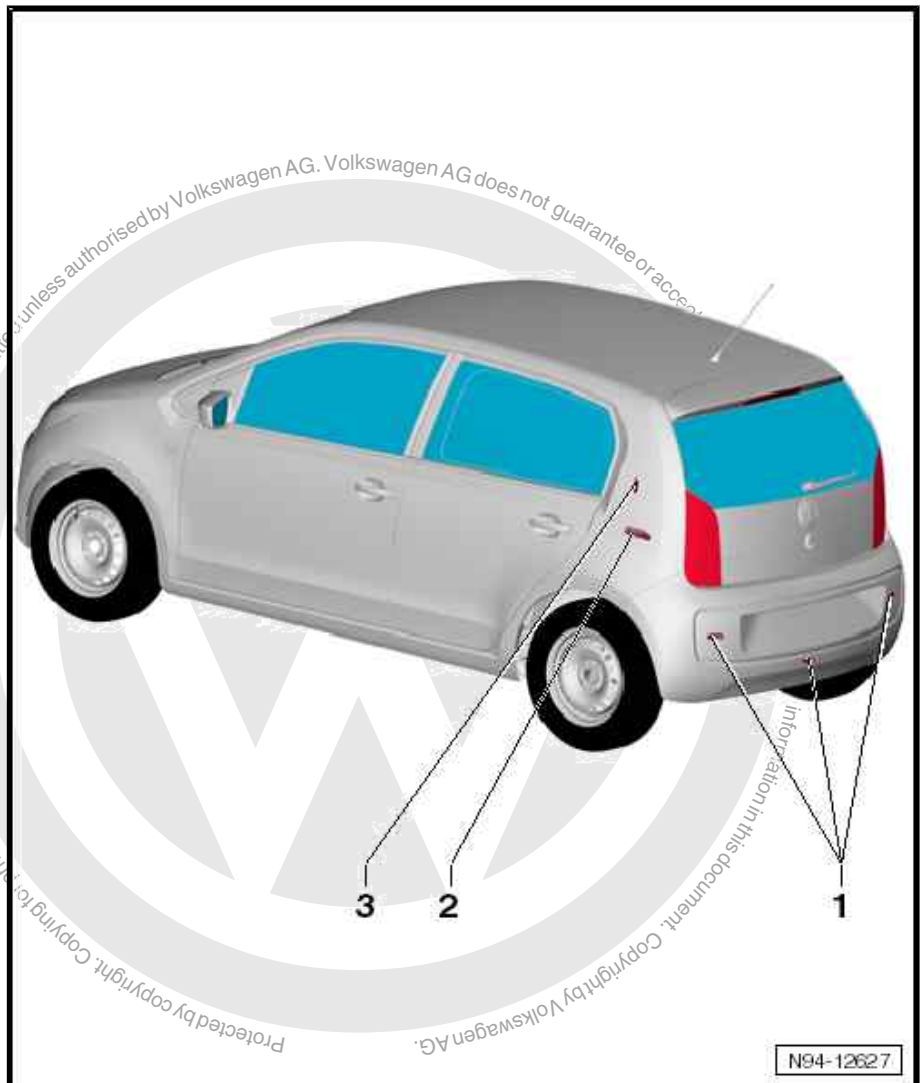
- ☐ Rear left parking aid sender - G203-
- ☐ Rear centre parking aid sender - G796-
- ☐ Rear right parking aid sender - G206-
- ☐ Removing and installing
⇒ [page 112](#)

2 - Parking aid control unit - J446-

- ☐ Removing and installing
⇒ [page 111](#)
- ☐ 4 Nm

3 - Parking aid warning buzzer - H15-

- ☐ Removing and installing
⇒ [page 112](#)



8.2 Removing and installing parking aid control unit - J446-

The parking aid control unit - J446- is located under the left side panel trim in the luggage compartment.

Removing

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



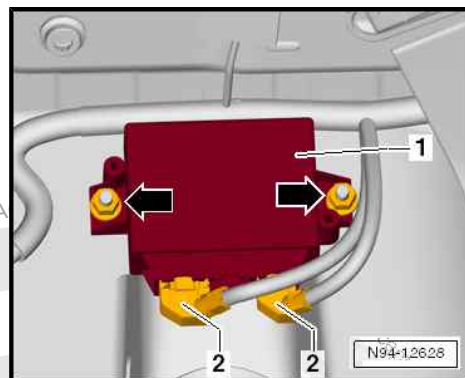
- Remove left luggage compartment side trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Assembly overview - luggage compartment side trim .
- Release and pull off connector -2-.
- Undo the two nuts -arrows- and remove parking aid control unit - J446- -1-.

Installing

Installation is carried out in the reverse sequence of removal:

Specified torques

- ♦ ⇒ [“8.1 Assembly overview – parking aid”, page 111](#)



8.3 Removing and installing rear parking aid warning buzzer - H15-

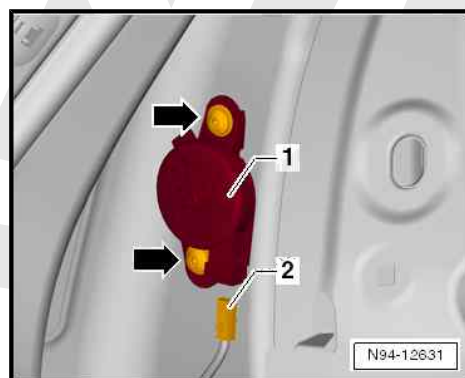
The rear parking aid warning buzzer - H15- is under the right side panel trim in the luggage compartment.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove left luggage compartment side trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Assembly overview - luggage compartment side trim .
- Unscrew pins of spreader rivets, and release spreader rivets -arrows-.
- Release and pull off connector -2- and then remove warning buzzer -1-.

Installing

Install in the reverse order of removal.



8.4 Removing and installing rear parking aid senders

The following parking aid senders are built into the rear bumper cover:

- ♦ Rear left parking aid sender - G203-
- ♦ Rear centre parking aid sender - G796-
- ♦ Rear right parking aid sender - G206-



Note

- ◆ 3 parking aid senders are built into the rear bumper cover:
- ◆ To remove and install the two outer parking aid senders, the bumper cover must not be removed. The senders can be reached through the wheel housing.
- ◆ Removal and installation of the rear parking aid senders from and in the sender retainers is carried out in the same way for all senders and is described as follows for just one sender.

Removing

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



Caution

The order for removing the senders must be adhered to under all circumstances.

The sender may otherwise be damaged. Fractures may occur if too much pressure is applied to the sender, and this may cause the sender to fail.

First, remove sender from holder and then release and pull off connector of sender.

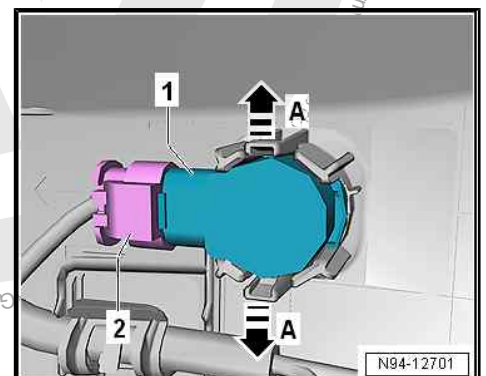
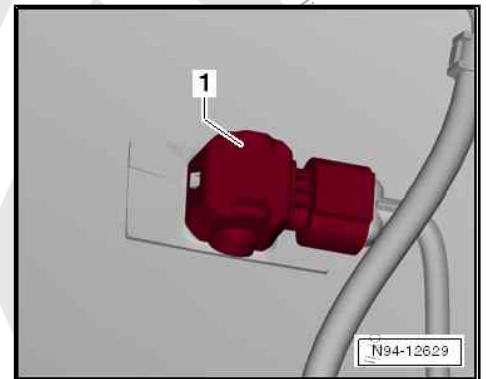
Only for removing and installing the sender in the middle:

- Remove rear bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Rear bumper; Assembly overview - bumper cover .

Removal and installation of all senders, continued:

- Unclip rubber cap -1- from sender retainer.

- Press both locking lugs in direction of -arrow A- while, at the same time, pressing in sender -1- from the outside in.
- Pull sender -1- with wire connected towards rear and out of sender retainer.





- Release connector -2- and then pull it off sender -1-.

Installing

Install in the reverse order of removal observing the following:

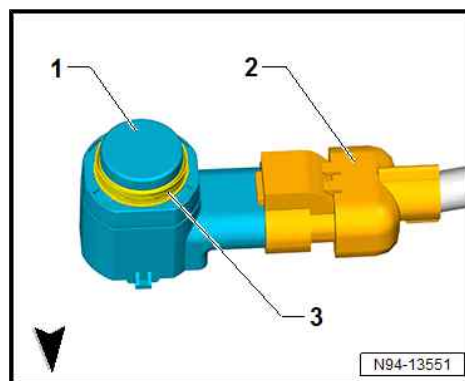


Caution

Function problems could occur if an incorrect or damaged isolation ring is used.

Stretching the isolation ring must be avoided under all circumstances.

Replace any damaged isolation rings and make sure that the right isolation ring is fitted in each case.

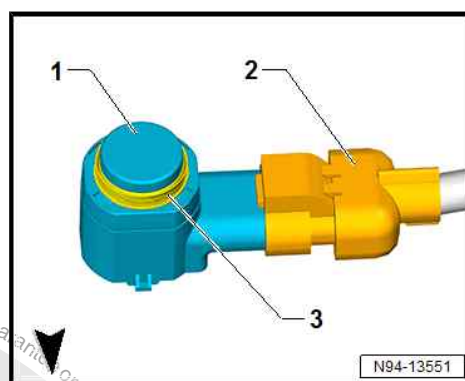


- Check isolation ring -3- of sender for damage, and renew it if necessary.



Note

- ◆ *When inserting the sender in the sender retainer, make sure that the isolation ring (black silicone ring) is seated correctly on the sender head.*
- ◆ *Both locking lugs of sender retainer must audibly engage when installing the sender.*
- ◆ *Attach rubber cap to sender retainer so that it latches into place securely.*





9 Emergency braking function

⇒ **"9.1 Removing and installing City Emergency Braking System", page 115**

9.1 Removing and installing City Emergency Braking System

General description ⇒ **page 115**

Removing ⇒ **page 116**

Installing ⇒ **page 116**

General description

The emergency braking function detects the traffic situation by means of the emergency braking function sensor unit - J939- attached to the interior mirror up to a distance of around 10 metres in front of the vehicle in a speed range of approximately 5 km/h to 30 km/h.

If the system detects a possible collision with a vehicle driving in front, the vehicle is prepared for possible emergency braking. If the driver does not react to the threat of a collision, the system can brake the vehicle automatically in order to reduce the speed for a possible collision. If the emergency braking function determines that the driver does not brake sufficiently when faced with the threat of a collision, the system can increase the braking force in order to reduce the speed for a possible collision.

In the following situations, it is possible that the emergency braking function will not react:

- ◆ In tight curves
- ◆ When accelerator pedal is fully depressed
- ◆ If emergency braking function has been switched off or is faulty
- ◆ If the laser sensor is dirty, is covered or has overheated
- ◆ During a snowfall, in heavy rain or in dense fog
- ◆ If vehicle is offset in relation to other vehicles
- ◆ When other vehicles cut across the driving direction
- ◆ When there are oncoming vehicles in the same lane
- ◆ If vehicles are dirty with a low degree of reflection
- ◆ When there is a lot of dust in the air



Note

- ◆ *When the emergency braking function triggers a braking process, the pedal travel of the brake pedal decreases. As a result, the brake pedal feels "harder".*
- ◆ *During automatic braking carried out by the emergency braking function, it is possible that unusual noises will occur. These are normal and are caused by the brake system.*
- ◆ *Automatic braking triggered by the emergency braking function can be cancelled by depressing the clutch pedal or the accelerator pedal, or by turning the steering wheel.*

The sensor unit for the emergency braking function - J939- is located under a cover next to the interior mirror.



Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove cover from interior mirror ➔ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Assembly overview - interior mirror .
- Release and pull off connector -1-.
- Pull catch -arrow- and remove sensor unit for emergency braking function - J939- -2- from holder on windscreen.

Installing

Install in the reverse order of removal observing the following:



Note

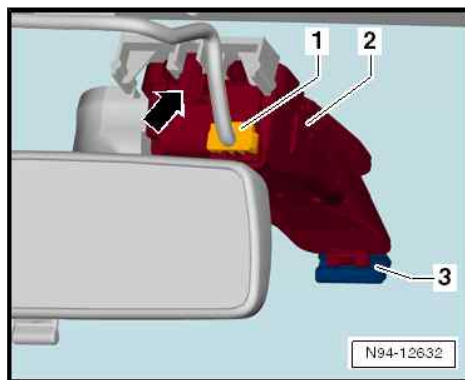
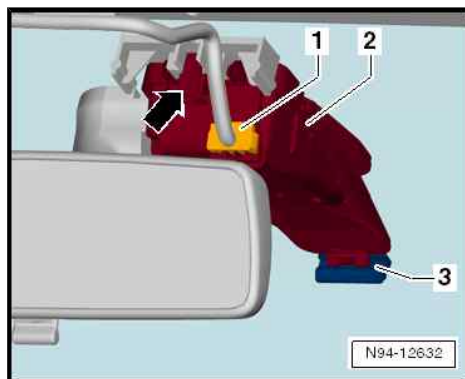
Before installing, make sure that the sensor unit lenses and the windscreen in the installation area are clean in order to avoid malfunctions.

- When installing the sensor unit -2-, first push it into the mounting -3- and then lock it securely into place with the catch -arrow-.



Note

If the sensor unit for the emergency braking function - J939- is removed, installed or replaced, coding or adaptation is not necessary.





96 – Lights, bulbs, switches - interior

1 Lights

⇒ [“1.1 Removing and installing Central locking SAFELOCK function warning lamp K133”, page 117](#)

⇒ [“1.2 Renewing front interior light bulb W1”, page 117](#)

⇒ [“1.3 Removing and installing bulb for front reading light W13 / W19”, page 120](#)

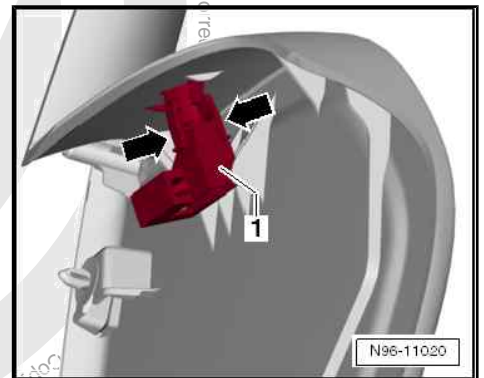
1.1 Removing and installing Central locking SAFELOCK function warning lamp - K133-

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove door trim cover in mirror triangle ⇒ General body repairs, interior; Rep. gr. 70 ; Front door trims; Removing and installing mirror cover trim .
- Press locking lugs -arrows- together, and pull central locking deadlock function warning lamp -SAFE- - K133- -1- out of cover of door trim.

Installing

Install in the reverse order of removal.



1.2 Renewing front interior light bulb -W1-

⇒ [“1.2.1 Removing and installing bulb for front interior light W1, vehicles without panorama sunroof”, page 117](#)

⇒ [“1.2.2 Removing and installing bulb for front interior light W1, vehicles with panorama sunroof”, page 119](#)

1.2.1 Removing and installing bulb for front interior light - W1- , vehicles without panorama sunroof

Special tools and workshop equipment required



◆ Removal wedge - VAS 3409-



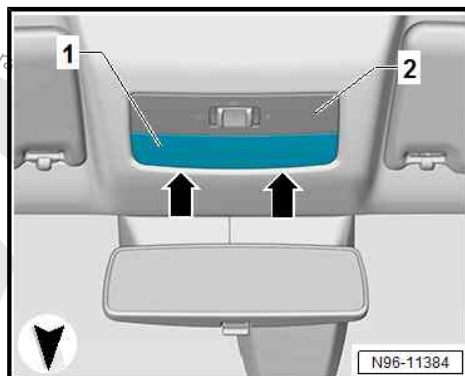
Caution

Danger of damage to component surfaces.

- ◆ *When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.*

Removing

- Switch off ignition and all electrical loads, and pull out ignition key.
- Lever off lens -1- of front interior light - W1- -2- at positions indicated by -arrows- using removal wedge - 3409- .



- Remove bulb -2- from holder -1-.

Bulb for front interior light - W1- : festoon bulb 12V, 10W

Installing

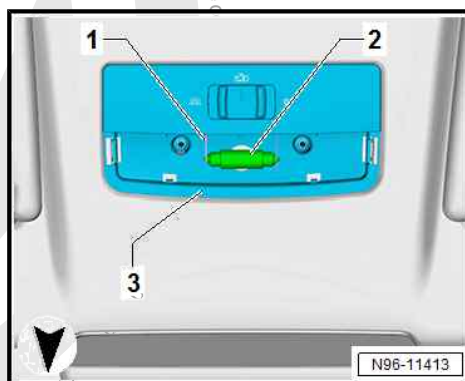
Install in the reverse order of removal, observing the following:



Caution

Risk of damage to the bulb.

- ◆ *Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.*
- ◆ *Wear e.g. clean fabric gloves when inserting bulbs.*



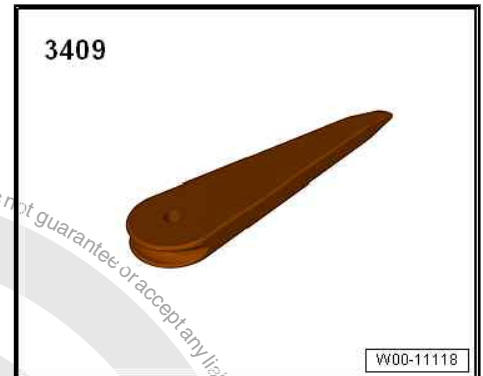
- Perform functional check.



1.2.2 Removing and installing bulb for front interior light - W1- , vehicles with panorama sunroof

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-



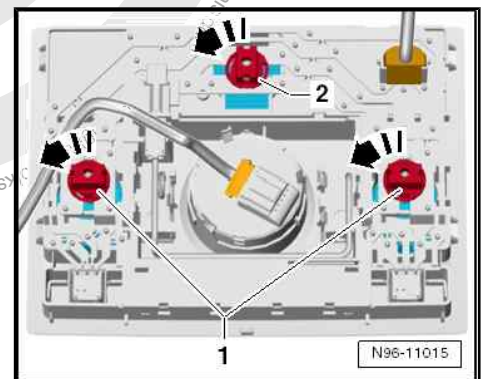
Caution

Danger of damage to component surfaces.

- ◆ *When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.*

Removing

- Switch off ignition and all electrical loads, and pull out ignition key.
- Remove front interior and reading light ⇒ [page 131](#) .
- Turn bulb holder -2- together with bulb of front interior light - W1- in -direction of arrow- and then remove.





- Pull bulb -1- in -direction of arrow- out of bulb holder -2-.

Bulb for front interior light - W1- : glass base bulb 12V, 5W.

Installing

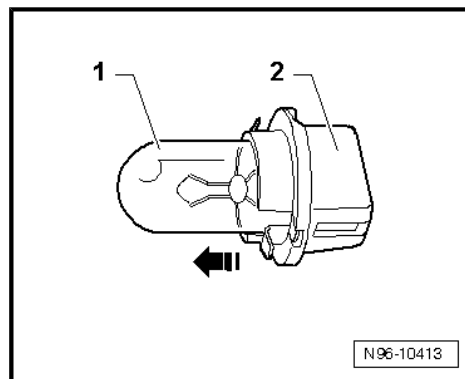
Install in the reverse order of removal, observing the following:



Caution

Risk of damage to the bulb.

- ◆ **Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.**
- ◆ **Wear e.g. clean fabric gloves when inserting bulbs.**

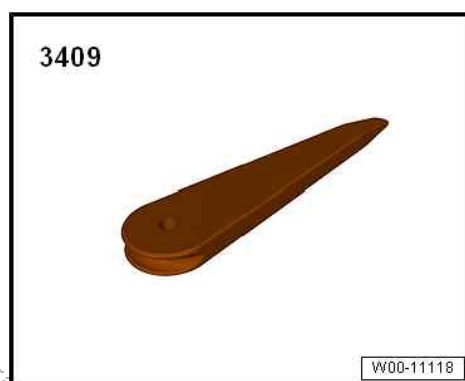


- Perform functional check.

1.3 Removing and installing bulb for front reading light -W13- / -W19-

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-



Caution

Danger of damage to component surfaces.

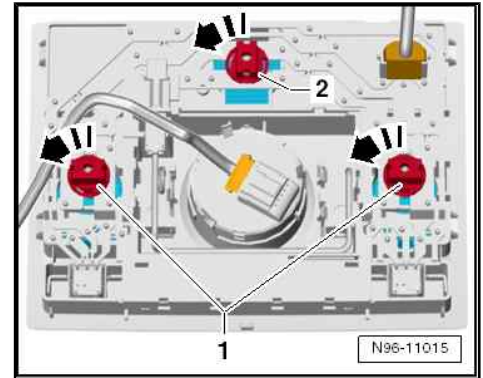
- ◆ **When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.**

Removing

- Switch off ignition and all electrical loads, and pull out ignition key.
- Remove front interior and reading light ➔ [page 133](#) .



- Turn bulb holder -1- together with bulb of reading light in -direction of arrow- and then remove.



- Pull bulb -1- in -direction of arrow- out of bulb holder -2-.

Renewing bulb for front passenger reading light - W13- or driver side reading light - W19- : glass base bulb 12V, 5W

Installing

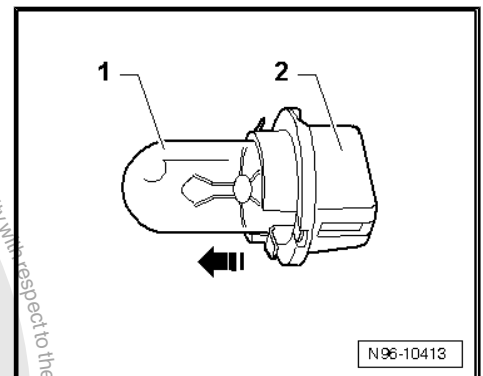
Install in the reverse order of removal, observing the following:



Caution

Risk of damage to the bulb.

- ◆ **Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.**
- ◆ **Wear e.g. clean fabric gloves when inserting bulbs.**



Perform functional check.



2 Controls

- ⇒ "2.1 Removing and installing rotary light switch EX1", page 122
- ⇒ "2.2 Removing and installing headlight range control regulator E102", page 123
- ⇒ "2.3 Removing and installing switch module in middle of dash panel", page 123
- ⇒ "2.4 Removing and installing Start/Stop operation button E693", page 125
- ⇒ "2.5 Removing and installing hazard warning light button E229", page 125
- ⇒ "2.6 Removing and installing heated rear window button", page 125
- ⇒ "2.7 Removing and installing buttons for seat heating E653 / E654", page 125
- ⇒ "2.8 Removing and installing mirror adjustment switch E43 / E168", page 126
- ⇒ "2.9 Removing and installing operating unit for window regulator in driver door E512", page 126
- ⇒ "2.10 Removing and installing front window regulator switch", page 128
- ⇒ "2.11 Removing and installing driver side interior locking button for central locking system E308", page 128
- ⇒ "2.12 Removing and installing centre console switch module", page 129
- ⇒ "2.13 Removing and installing button for emergency braking function", page 130
- ⇒ "2.14 Removing and installing sliding sunroof adjustment regulator", page 130
- ⇒ "2.15 Removing and installing front interior light/reading light", page 131
- ⇒ "2.16 Removing and installing warning lamp for airbag deactivated on front passenger side", page 134

2.1 Removing and installing rotary light switch - EX1-



Note

Removal and installation are described for left-hand drive vehicles. Removal and installation for right-hand drive vehicles is similar.

Removing

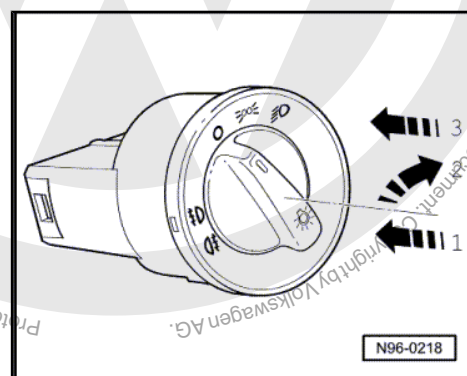
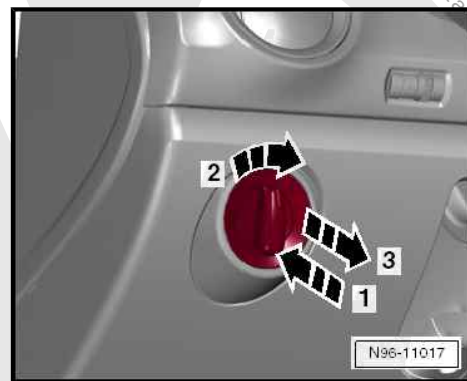
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Turn light switch to zero position.



- Push rotary knob of rotary light switch - EX1- inwards -1-, and turn it slightly towards right -2-.
- Hold rotary knob in this position while pulling rotary light switch - EX1- out of dash panel -3- by the rotary knob, taking into consideration the connected wire lengths.
- Release and pull off connector.

Installing

- Attach connector so that it latches into place.
- Hold light switch, and press rotary knob of rotary light switch - EX1- firmly into dash panel -1- and turn it clockwise a little -2-.
- Hold rotary knob in this position and insert rotary light switch - EX1- into dash panel -3-.
- Turn light switch to zero position, release it, and engage rotary light switch - EX1- .



2.2 Removing and installing headlight range control regulator - E102-

Removing

- Switch off ignition and all electrical loads, and pull out ignition key.
- Remove footwell trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers; Assembly overview - dash panel cover on driver side .



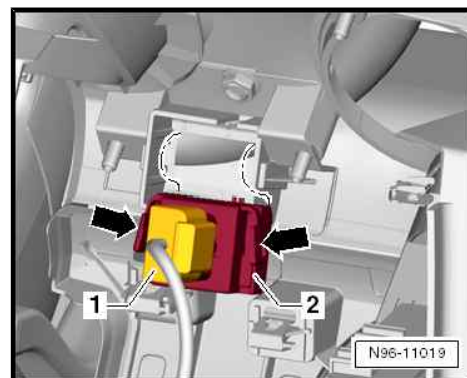
Note

For reasons of clarity, the following illustration shows the installed headlight range control regulator - E102- from the rear.

- Reach behind the dash panel and press together the two catches -arrows- on headlight range control regulator - E102- .
- Press headlight range control regulator - E102- -2- out of dash panel towards interior of vehicle.
- Release and pull off connector -1-.

Installing

Installation is carried out in reverse order of removal.



2.3 Removing and installing switch module in middle of dash panel

Depending on vehicle equipment, the following buttons and lights are integrated in the 2 switch modules on the left and right of the heating/air-conditioning controls. The procedure for removal and

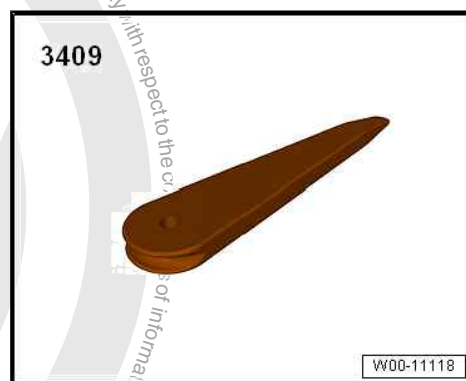


installation is identical for both switch modules and is therefore described for one switch module only. The removed switch modules cannot be dismantled further.

- ◆ Warning lamp button - E229-
- ◆ Front passenger side airbag deactivated warning lamp - K145-
- ◆ Heated rear window button - E230-
- ◆ Right seat heating button - E654-
- ◆ Left seat heating button - E653-
- ◆ Start/stop operation switch - E693-

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-



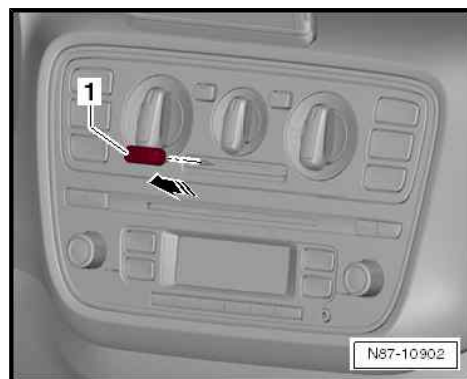
Caution

Danger of damage to component surfaces.

- ◆ ***When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.***

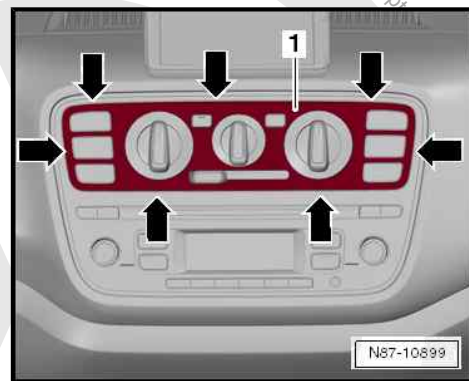
Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove sliding control for fresh and recirculated air -1- in -direction of arrow-.





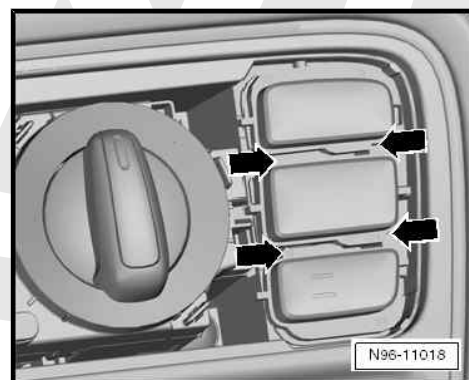
- Unclip trim -1- using removal wedge - 3409- at locations marked by -arrows-, and remove trim -1-.



- Prise out the switch module in the middle of the dash panel, using the removal wedge - VAS 3409- to release the catches -arrows-.
- Release and pull off connector and then remove switch module.

Installing

Installation is carried out in reverse order of removal.



2.4 Removing and installing Start/Stop operation button - E693-

The Start/Stop operation button - E693- is an integral part of the switch module in middle of dash panel and cannot be replaced separately.

- Removing and installing switch module in middle of dash panel
⇒ [page 123](#) .

2.5 Removing and installing hazard warning light button - E229-

The hazard warning light switch - E229- is an integral part of the switch module in middle of dash panel and cannot be replaced separately.

Removing and installing switch module in middle of dash panel
⇒ [page 123](#) .

2.6 Removing and installing heated rear window button

The heated rear window button - E230- is an integral part of the switch module in middle of dash panel and cannot be renewed separately.

Removing and installing switch module in middle of dash panel
⇒ [page 123](#) .

2.7 Removing and installing buttons for seat heating -E653- / -E654-

The button for right seat heating - E654- and the button for left seat heating - E653- are integral parts of the switch module in middle of dash panel and cannot be replaced separately.

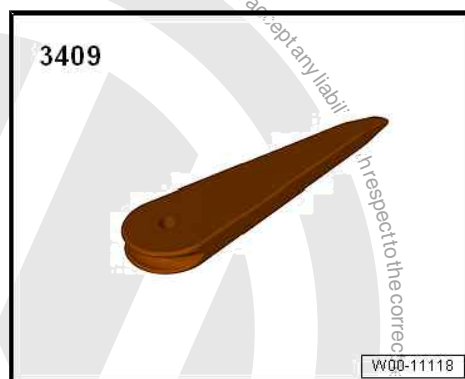
Removing and installing switch module in middle of dash panel
⇒ [page 123](#) .



2.8 Removing and installing mirror adjustment switch -E43- / -E168-

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-

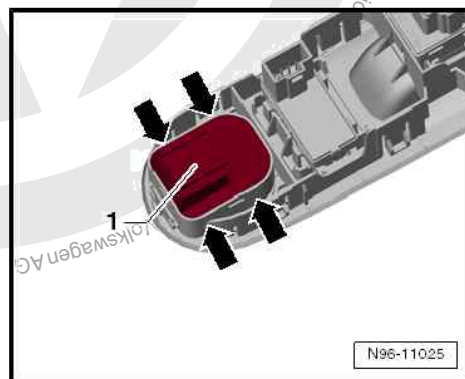


Removing

- Remove switch element on driver side ➔ [page 126](#) .
- Release the two catches -arrows-, and push mirror adjustment switch - E43- -1- out of operating unit for window regulator in driver door - E512- .

Installing

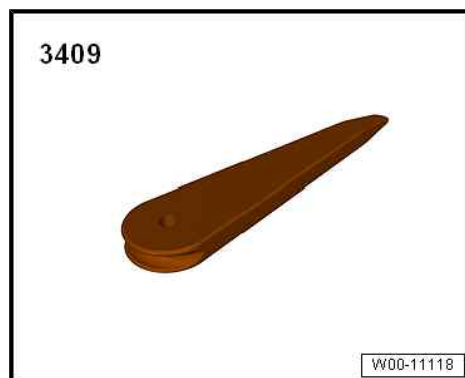
Install in the reverse order of removal.



2.9 Removing and installing operating unit for window regulator in driver door - E512-

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-



Depending on vehicle equipment, the operating unit for window regulator in driver door - E512- comprises the following buttons:

Driver side:

- ◆ Front left window regulator switch - E40-
- ◆ Driver side interior locking button for central locking system - E308-



◆ Mirror adjustment switch - E43-

Front passenger side:

◆ Front right window regulator switch - E41-



Note

- ◆ *The operating unit for window regulator in driver door - E308- must be removed before the driver side interior locking button for central locking system - E43- and the mirror adjustment switch - E512- can be removed or installed.*
- ◆ *The front left window regulator switch - E40- or the front right window regulator switch - E41- can be removed without the operating unit for window regulator in driver door - E512- having to be removed first.*



Caution

Danger of damage to component surfaces.

- ◆ ***When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.***

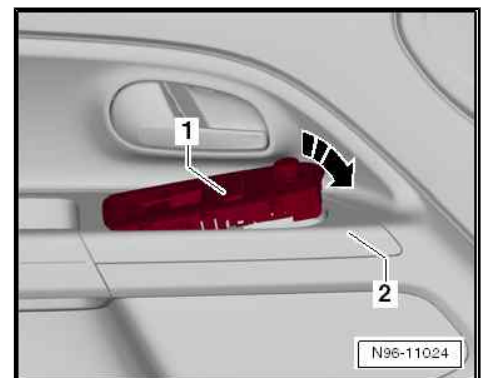
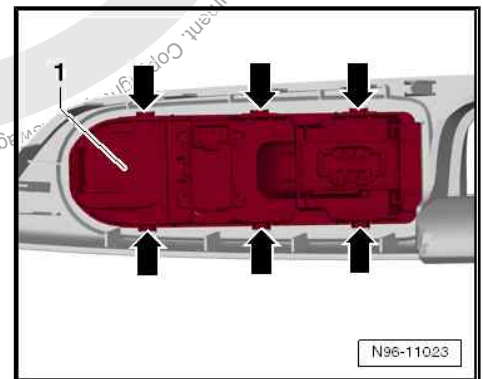
Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove door trim on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Front door trims; Removing and installing front door trim .
- Release catches -arrows- of operating unit for window regulator in driver door - E512- -1- using the removal wedge - VAS 3409- or a suitable screwdriver.
- Pull operating unit for window regulator in driver door - E512- -1- out of door trim.
- Release and disconnect electrical connector on operating unit for window regulator in driver door - E512- .

Installing

Install in the reverse order of removal, observing the following:

- Connect electrical connector to operating unit for window regulator in driver door - E512- .
- Starting at rear, insert operating unit for window regulator in driver door - E512- -1- into door trim -2-, and engage it at front.
- Perform functional check.





2.10 Removing and installing front window regulator switch

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-



Note

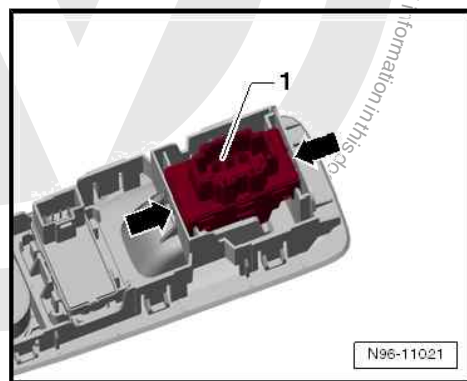
- ◆ The following illustrations show removal and installation of the front left window regulator switch - E40- .
- ◆ Removal and installation of the front right window regulator switch - E41- are carried out in the same way.
- ◆ The operating unit for window regulator in driver door - E40- must not be removed in order to remove the front left window regulator switch - E512- .

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove door trim on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Front door trims; Removing and installing front door trim .
- Release the two catches -arrows-, and remove front left window regulator switch - E40- 1- from operating unit for window regulator in driver door - E512- .

Installing

Install in the reverse order of removal.



2.11 Removing and installing driver side interior locking button for central locking system - E308-

Special tools and workshop equipment required

◆ Removal wedge - VAS 3409-

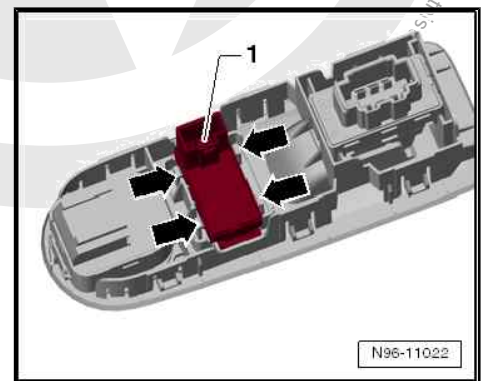


Removing

- Remove operating unit for window regulator in driver door - E512- ⇒ [page 126](#) .
- Release the two catches -arrows-, and push driver side interior locking button for central locking system - E308- -1- out of operating unit for window regulator in driver door - E512- .

Installing

Install in the reverse order of removal.



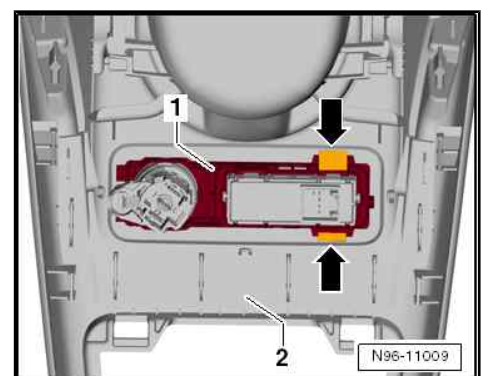
2.12 Removing and installing centre console switch module

The centre console switch module - EX23- is located in the centre console in front of the gear lever and, depending on the equipment in the vehicle, contains the following components:

- ◆ Tyre pressure monitor display button - E492-
- ◆ Button for emergency braking function - E773-
- ◆ Socket - U- or cigarette lighter - U1-

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove cover of centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Assembly overview - centre console .
- Release the two catches -arrows- and pull the mounting frame -1- outwards out of centre console -2-.



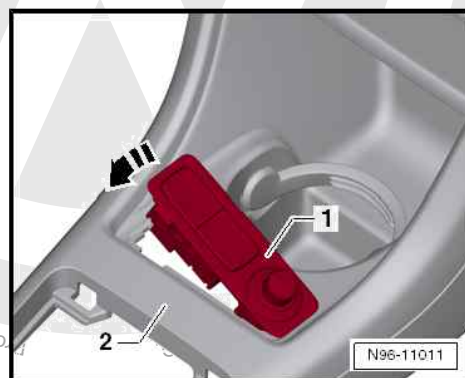
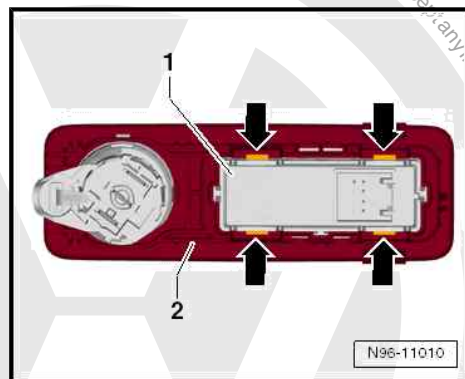


- Release the catches -arrows- with a suitable screwdriver and push centre console switch module - EX23- -1- out of mounting frame -2-.

Installing

Install in the reverse order of removal observing the following:

- First insert right side of mounting frame -1- into cover of centre console -2- and then push mounting frame in on left side to ensure it locks into place securely.



2.13 Removing and installing button for emergency braking function

The button for emergency braking function - E773- is an integral part of centre console switch module 1 - EX23- in the centre console in front of the gear lever.

Removing and installing centre console switch module - EX23- ➔ [page 129](#) .

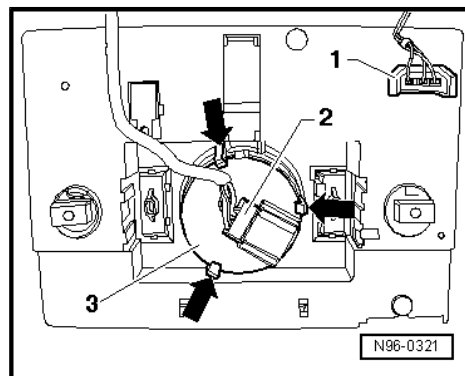
2.14 Removing and installing sliding sunroof adjustment regulator

Removing

- Switch off ignition and all electrical loads, and pull out ignition key.
- Remove front interior and reading light ➔ [page 131](#) .
- Release catches -arrows- and remove sliding sunroof adjustment regulator - EX4- -3- from interior and reading light.

Installing

Installation is carried out in reverse order of removal.





2.15 Removing and installing front interior light/reading light

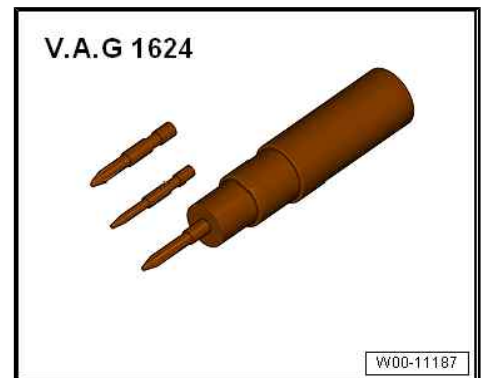
⇒ "2.15.1 Removing and installing front interior light/reading light, vehicles without panoramic sunroof", page 131

⇒ "2.15.2 Removing and installing front interior light/reading light, vehicles with panoramic sunroof", page 133

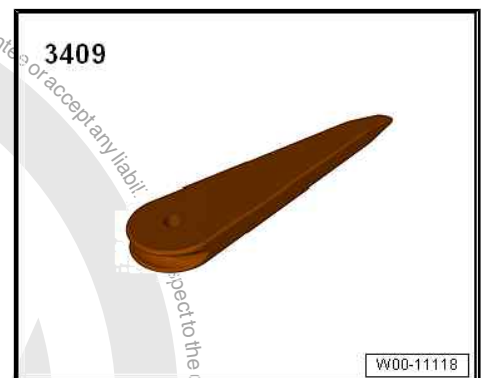
2.15.1 Removing and installing front interior light/reading light, vehicles without panoramic sunroof

Special tools and workshop equipment required

- ◆ Torque screwdriver - V.A.G 1624-



- ◆ Removal wedge - VAS 3409-



Caution

Danger of damage to component surfaces.

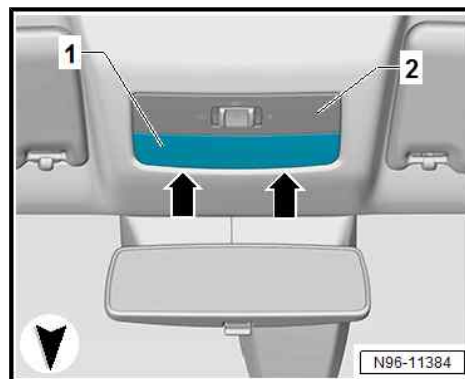
- ◆ ***When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.***

Removing

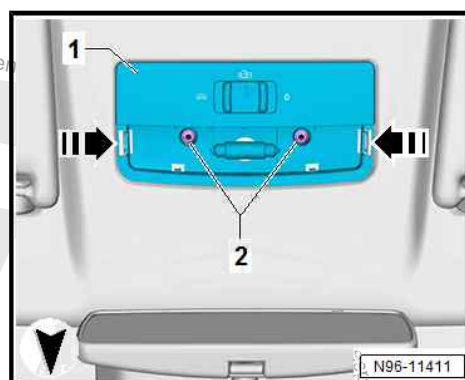
- Switch off ignition and all electrical loads, and pull out ignition key.



- Lever off lens -1- of front interior light - W1- -2- at positions indicated by -arrows- using removal wedge - 3409- .



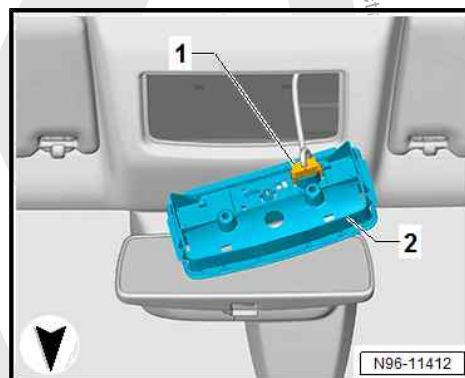
- Unscrew securing bolts -2-.
- Release locking lugs in -direction of arrows-, and remove front interior light - W1- -1- from roof trim, taking connected wiring lengths into consideration.



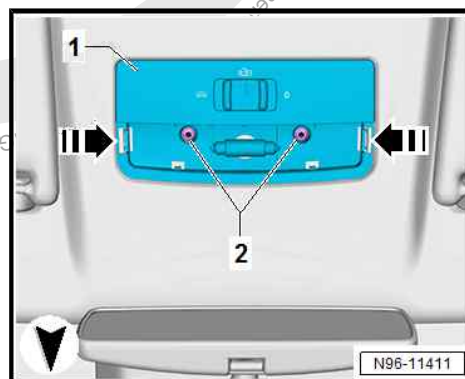
- Release and pull off connector -1-.

Installing

Install in the reverse order of removal, observing the following:



- Screw in securing bolts -2-.
- Perform functional check.



Specified torques

Component	Specified torque
Securing bolts	1.5 Nm



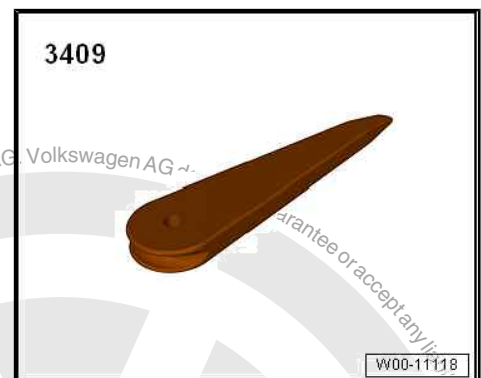
2.15.2 Removing and installing front interior light/reading light, vehicles with panoramic sunroof

The front interior and reading light contains the following components:

- ◆ Front interior light - W1-
- ◆ Front passenger reading light - W13-
- ◆ Driver side reading light - W19-
- ◆ Sliding sunroof adjustment regulator - EX4- ⇒ [page 130](#)

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-



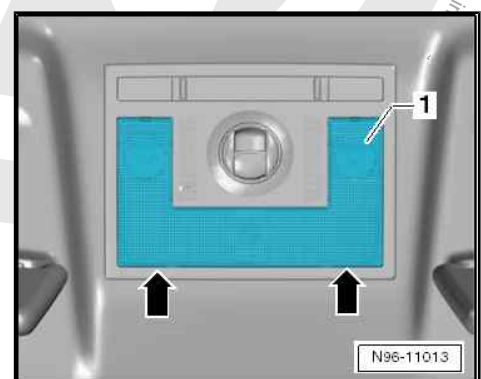
Caution

Danger of damage to component surfaces.

- ◆ ***When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.***

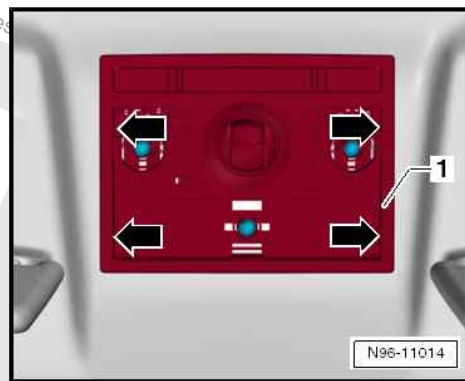
Removing

- Switch off ignition and all electrical loads, and pull out ignition key.
- Using removal wedge - VAS 3409- , carefully lever off front interior and reading light lens -1- at catches -arrows-.





- Release the locking lugs by pushing them in -direction of arrows- and remove front interior and reading light -1- from roof trim, taking connected wiring lengths into consideration.
- Release and pull off connectors -1- and -2-.

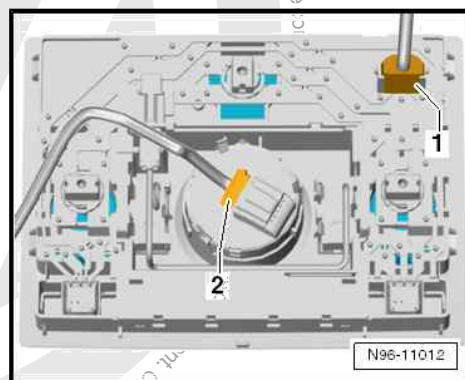


- Detach front interior and reading light.

Installing

Install in the reverse order of removal, observing the following:

- Perform functional check.



2.16 Removing and installing warning lamp for airbag deactivated on front passenger side

The warning lamp for airbag deactivated on front passenger side - K145- is an integral part of the switch module in middle of dash panel and cannot be replaced separately.

Removing and installing switch module in middle of dash panel
⇒ [page 123](#) .



3 Immobiliser

⇒ [“3.1 Removing and installing immobiliser control unit”,
page 135](#)

⇒ [“3.2 Removing and installing immobiliser reader coil”,
page 135](#)

3.1 Removing and installing immobiliser control unit



Note

- ◆ *The immobiliser control unit - J362- is integrated into the dash panel insert - K- and cannot be renewed individually.*
 - ◆ *If it is defective, the dash panel insert - K- must be renewed.*
 - ◆ *If the dash panel insert - K- with the immobiliser control unit - J362- is to be renewed, start the respective function ⇒ Vehicle diagnostic tester.*
- Removing and installing dash panel insert - K- ⇒ [page 40](#) .

3.2 Removing and installing immobiliser reader coil

The immobiliser reader coil - D2- is joined to the ignition switch lock cylinder and cannot be renewed individually.

- Removing and installing lock cylinder ⇒ [page 106](#) .



4 Cigarette lighter, socket

⇒ "4.1 Removing and installing cigarette lighter U1 ", page 136

⇒ "4.2 Removing and installing electric socket U ", page 136

⇒ "4.3 Removing and installing bulb for illuminating cigarette lighter", page 136

4.1 Removing and installing cigarette lighter - U1-

All instructions and notes regarding this chapter are available under ⇒ Electrical system, General information; Rep. gr. 96 ; Cigarette lighter - U1-

4.2 Removing and installing electric socket - U-

All instructions and notes regarding this chapter are available under ⇒ Electrical system, General information; Rep. gr. 96 ; 12 V socket ; Removing and installing 12 V socket

4.3 Removing and installing bulb for illuminating cigarette lighter

The bulb for illuminating the cigarette lighter - L28- is an integral part of the cigarette lighter - U1- and can only be installed or removed together with the cigarette lighter - U1- .

– Removing and installing cigarette lighter - U1- ⇒ page 136 .



97 – Wiring

1 Relay carriers, fuse holders, electronics boxes

⇒ “1.1 Removing and installing electronics box (E-box)”,
page 137

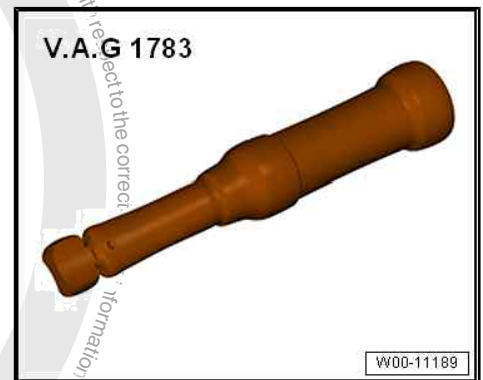
⇒ “1.2 Removing and installing relay and fuse holder in electronics
box”, page 139

⇒ “1.3 Removing and installing relay and fuse holder behind dash
panel on driver side”, page 141

1.1 Removing and installing electronics box (E-box)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 7.

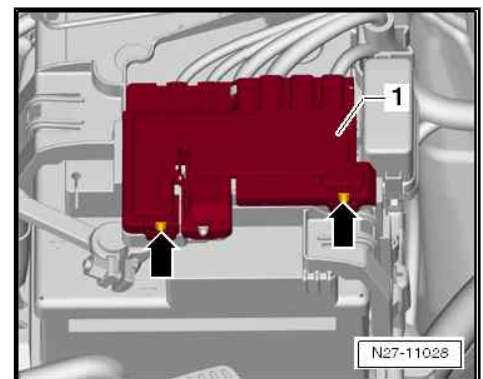
Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Disconnect battery ⇒ page 7 .
- Release catches -arrows- and remove lid of electronics box -1-.
- Make a note of the assignment of electronics box connections.



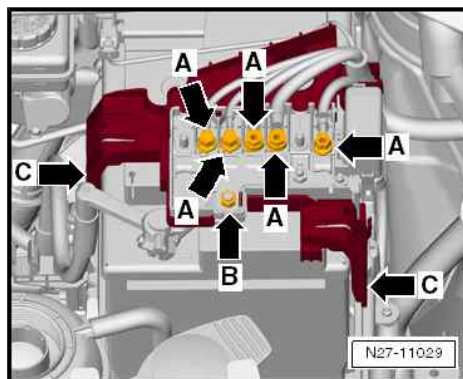
Caution

- ◆ **Electrical components protected by the multiple fuse can fail!**
- ◆ **When the nuts for the wiring connections are undone, the multiple fuse will be damaged!**
- ◆ **The multiple fuse must be renewed after any loosening of the connections!**

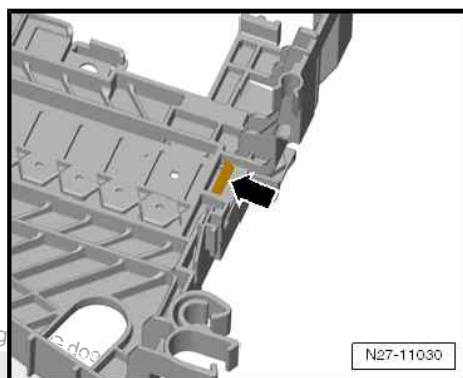




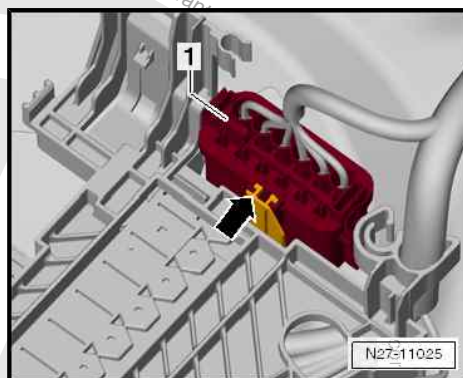
- Undo and remove all nuts of the wiring connections -arrows A- and remove wires from the connecting threads.
- Unscrew nut -arrow B-.
- Release the catches -arrow C- on each side of the electronics box holder and remove electronics Box together with holder upwards off the battery.



- Turn the electronics box holder over, release the catch -arrow- and remove electronics box from its holder.



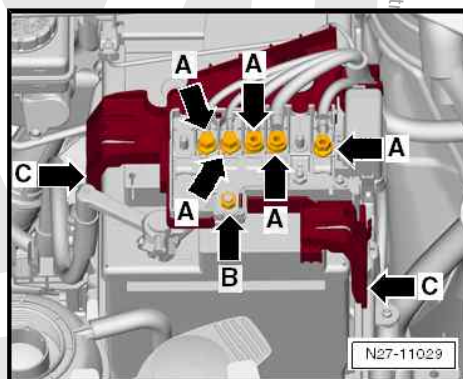
- Release locking lug -arrow- and pull fuse holder -1- upwards off the electronics box.
- Remove electronics box from vehicle.



Installing

Install in the reverse order of removal observing the following:

- Insert a new multiple fuse, and screw on nuts -arrows A- and -arrow B-.
- Connect battery ⇒ [page 7](#).



Specified torques

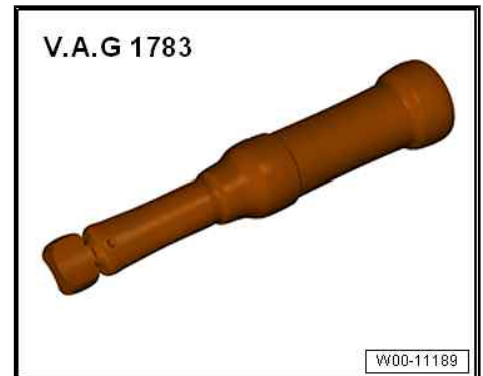
Component	Specified torque
Nuts -arrows A- and -arrows B-	6 Nm



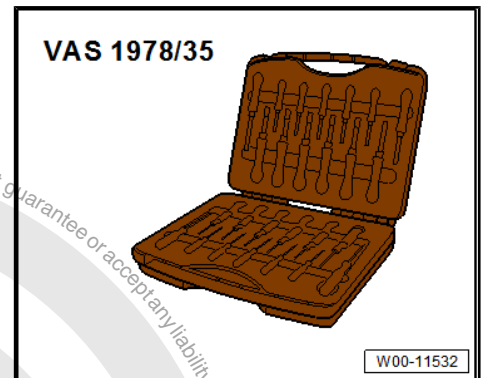
1.2 Removing and installing relay and fuse holder in electronics box

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



- ◆ Release tool set - VAS 1978/35-



Note

The fuse holder in the electronics box is attach to the side of the electronics box on the battery.



Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ [page 7](#).

Removing

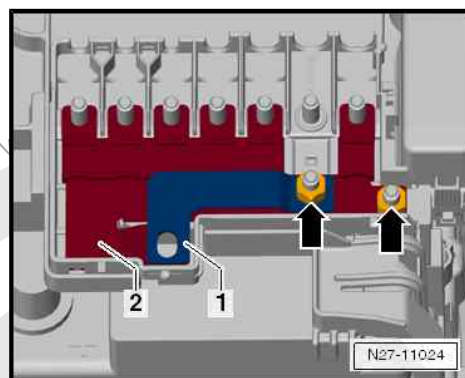
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Disconnect battery ⇒ [page 7](#).
- Remove electronics box on battery ⇒ [page 137](#).



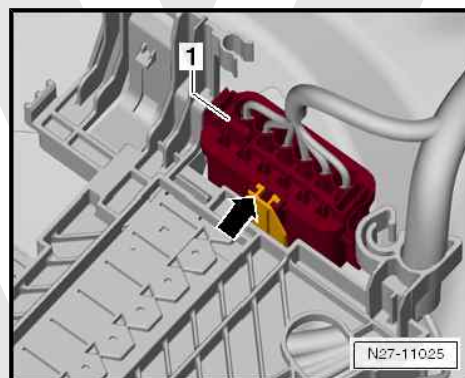
Caution

- ◆ *Electrical components protected by the multiple fuse can fail!*
- ◆ *When the nuts for the wiring connections are undone, the multiple fuse will be damaged!*
- ◆ *The multiple fuse must be renewed after any loosening of the connections!*

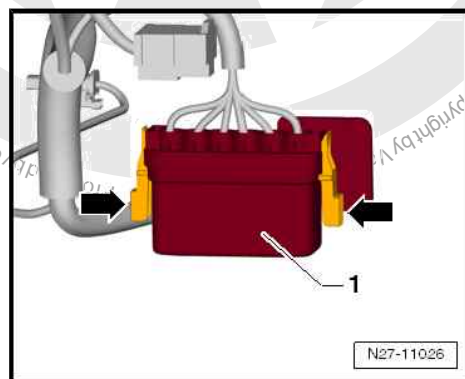
- Undo and remove the 2 nuts -arrows- and remove electroconductive plate -1- and multiple fuse -2- from electronics box.



- Turn electronics box over, release locking lug -arrow- and pull fuse holder -1- upwards off the electronics box.



- Press catches at sides -arrows- and remove lid of fuse holder -1-.
- Make a note of the fuse assignment and remove all fuses from the fuse holder.





- Pull primary locking element -1- in -direction of arrow-, release all plug-in contacts with the correct release tool from the release tool set - VAS 1978/35- and then pull downwards out of the fuse holder.

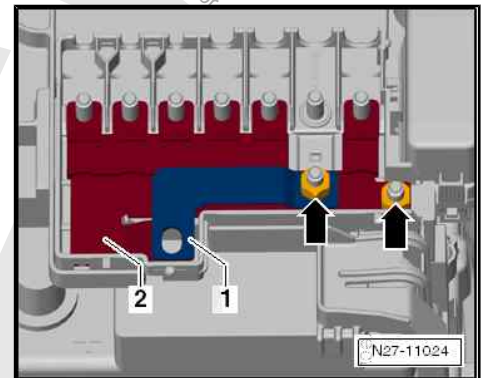
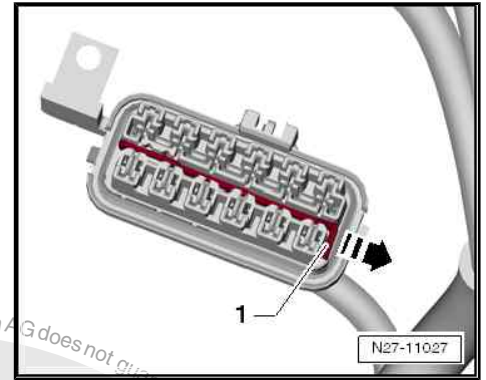
i Note

The assignment of the correct release tool is shown in the table in the ⇒ operating instructions for the -VAS 1978/35-

Installing

Install in the reverse order of removal observing the following:

- Insert a new multiple fuse -2-, and screw on nuts -arrows-.
- Connect battery ⇒ [page 7](#).



Specified torques

Component	Specified torque
Nuts -arrows-	6 Nm

1.3 Removing and installing relay and fuse holder behind dash panel on driver side

⇒ [“1.3.1 Removing and installing fuse holder behind dash panel on driver side”, page 141](#)

⇒ [“1.3.2 Removing and installing fuse carrier on relay carrier”, page 143](#)

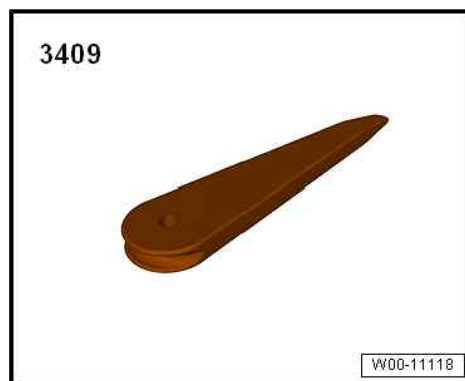
⇒ [“1.3.3 Removing and installing dash panel relay carrier”, page 144](#)

1.3.1 Removing and installing fuse holder behind dash panel on driver side

Special tools and workshop equipment required



◆ Removal wedge - VAS 3409-



◆ Torque wrench - V.A.G 1783-



Note

- ◆ The illustrations show removal and installation of the fuse holder in an LHD vehicle.
- ◆ Removal and installation of the fuse holder in an RHD vehicle are analogous.

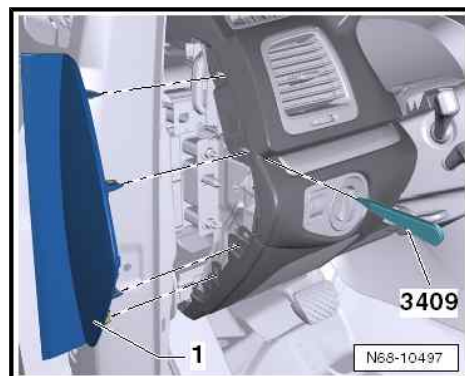


Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ [page 7](#).

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Disconnect battery ⇒ [page 7](#).
- Lever off dash panel trim -1- using removal wedge - VAS 3409- .

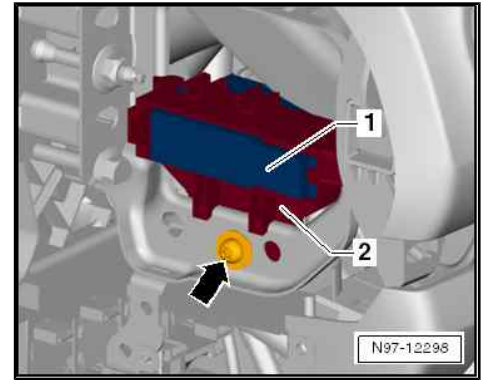




- Undo and remove screw -arrow- and pull fuse holder -1- together with carrier -2- upwards off the body.

Installing

Installation is carried out in the reverse sequence of removal:



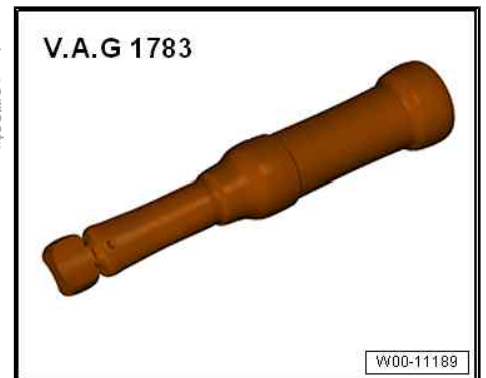
Specified torques

Component	Specified torque
Securing bolt	1.5 Nm

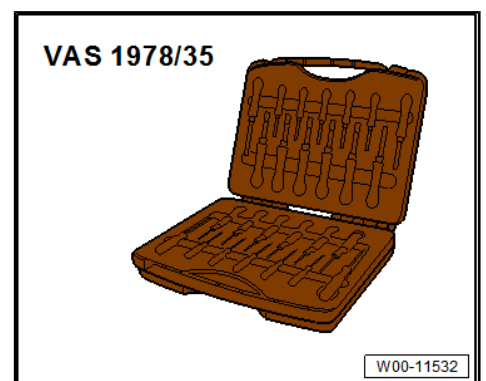
1.3.2 Removing and installing fuse carrier on relay carrier

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



- ◆ Release tool set - VAS 1978/35-



Note

- ◆ The illustrations show removal and installation of the fuse carrier in an LHD vehicle.
- ◆ Removal and installation of the fuse carrier in an RHD vehicle are analogous.

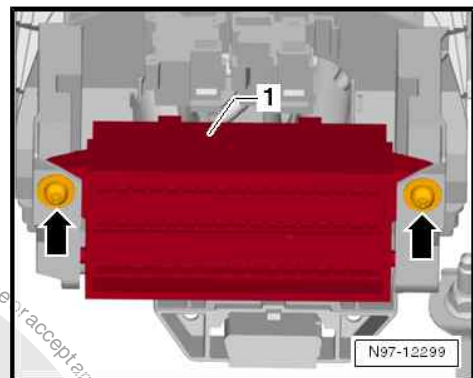


Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ [page 7](#).

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Disconnect battery ⇒ [page 7](#).
- Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .
- Remove lower A-pillar trim on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Trims, interior; Removing and installing A-pillar trim .
- Undo screws -arrows- and pull fuse carrier -1- out of relay carrier, taking connected wiring lengths into consideration.
- Make a note of the fuse assignment and remove all fuses from the fuse carrier.



- Pull primary locking elements -1-, release all plug-in contacts with the correct release tool from the release tool set - VAS 1978/35- and then pull downwards out of the fuse carrier.

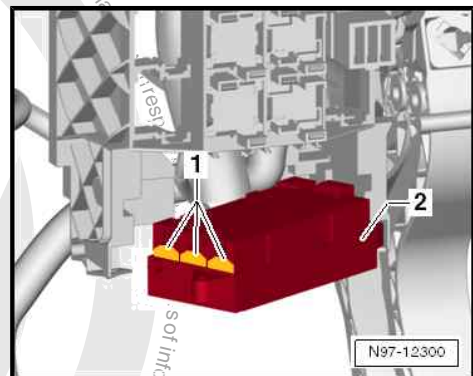


Note

The assignment of the correct release tool is shown in the table in the ⇒ operating instructions for the -VAS 1978/35-

Installing

Installation is carried out in the reverse sequence of removal:



Specified torques

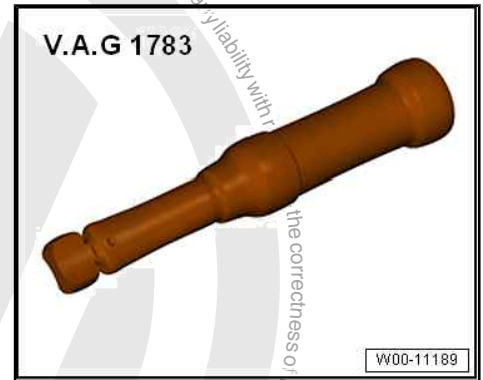
Component	Specified torque
Securing bolts securing fuse carrier to relay carrier	4 Nm

1.3.3 Removing and installing dash panel relay carrier

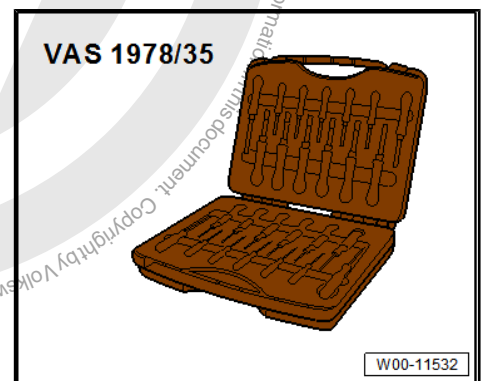
Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1783-



◆ Release tool set VAS 1978/35-



Note

- ◆ *The illustrations show removal and installation of the relay carrier in an LHD vehicle.*
- ◆ *Removal and installation of the relay carrier in an RHD vehicle are analogous.*



Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ [page 7](#).

Removing

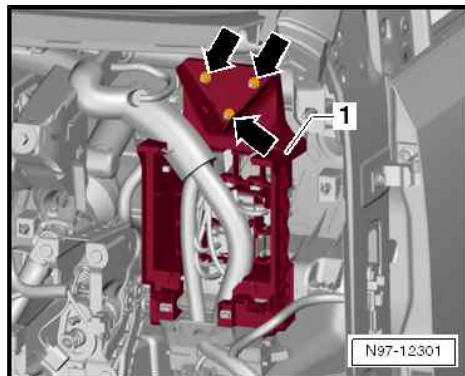
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Disconnect battery ⇒ [page 7](#).
- Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .
- Remove lower A-pillar trim on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Trims, interior; Removing and installing A-pillar trim .
- Remove fuse holder from relay carrier ⇒ [page 143](#) .
- Remove onboard supply control unit - J519- ⇒ [page 148](#) .



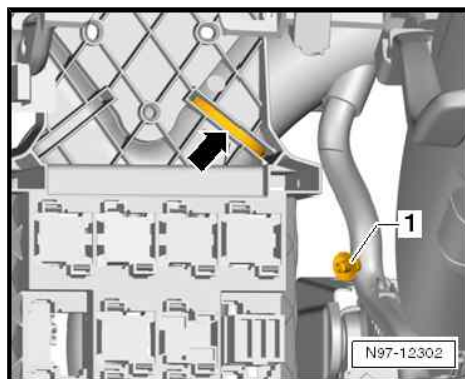
Note

For reasons of clarity, the relay carrier is shown from the rear in the following illustrations.

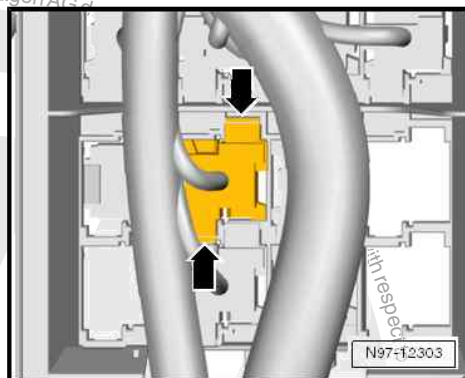
- Remove the 3 nuts (width across flats 10 mm) -arrows- and pull relay carrier -1- off threaded pins, taking connected wiring lengths into consideration.



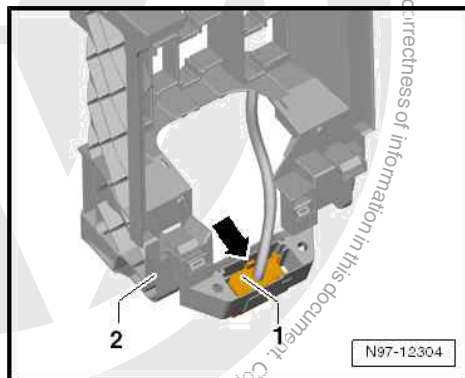
- Cut the cable tie -arrow- and unclip cable fuse -1- from relay carrier.
- Make a note of the assignment of the relays in the holder.



- Release all the connectors on rear of relay carrier -arrows- and pull them towards the rear out of the relay carrier together with the plugged-in relays.



- Release diagnostic connector -1- in -direction of arrow-, and pull it out of relay carrier -2-.
- Remove relay carrier -2- from vehicle.



Installing

Install in the reverse order of removal observing the following:



Note

Attach all cable ties cut during removal and all cable fuses in their original positions



Specified torques

Component	Specified torque
Securing bolts securing relay carrier to body	4.5 Nm





2 Select Control units

⇒ **"2.1 Removing and installing onboard supply control unit J519"**, page 148

⇒ **"2.2 Removing and installing data bus diagnostic interface J533"**, page 149

2.1 Removing and installing onboard supply control unit - J519-

General description:

The onboard supply control unit - J519- is fastened to the rear of the relay carrier in the driver side footwell and performs the following functions in the vehicle.

- ◆ EFP relay
- ◆ Electrical load management
- ◆ Driver door contact
- ◆ Transfer of dimming information on the CAN bus
- ◆ Windscreen wiper speeds I, II and intermittent wipe
- ◆ Reading in of sender unit button for emergency braking function
- ◆ Operation of hazard warning flasher, turning signals, emergency braking warning flasher
- ◆ Horn
- ◆ Brake lights
- ◆ Terminal detection, terminal 15; S-contact
- ◆ Heated rear window
- ◆ Rear lid release without central locking
- ◆ Terminal 30, interior light
- ◆ CAN bus drive
- ◆ CAN diagnosis
- ◆ CAN gateway

The following functions can be adapted:

- ◆ Adapting remote control unit key
- ◆ Checking remote control unit key
- ◆ Deactivating factory mode



Note

- ◆ *The following illustrations show removal on a LHD vehicle. Removal and installation of onboard supply control unit on an RHD vehicle are performed using the corresponding mirror-image procedure.*
- ◆ *If the onboard supply control unit - J519- is renewed, start the respective function ⇒ Vehicle diagnostic tester.*

Removing

- Switch off ignition and all electrical consumers.
- Withdraw ignition key.



- Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing dash panel trim on driver side .
- Remove lower A-pillar trim on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Trims, interior; Removing and installing A-pillar trim .



Note

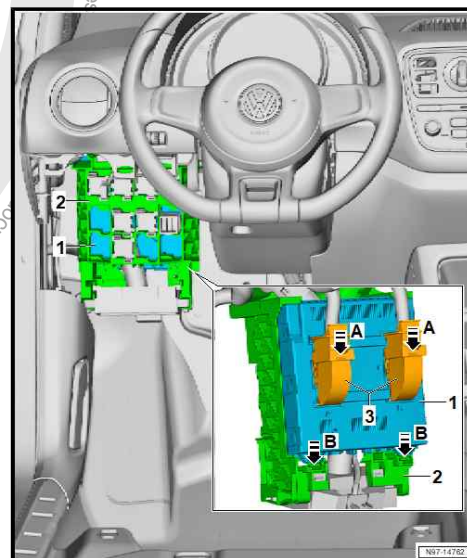
The following illustration shows the installed onboard supply control unit on the rear of the relay carrier.

- Swing down the two tabs of primary locking element -3- in direction of -arrow A-, and pull the two connectors off onboard supply control unit - J519- -1-.
- Release retaining springs of bracket -2- in direction of -arrow B-, swing out onboard supply control unit - J519- -1-, and remove it downwards.

Installing

Install in the reverse order of removal, observing the following:

- First insert onboard supply control unit - J519- -1- into upper mountings on bracket, and then clip it into lower fasteners of bracket -2- until it engages audibly.



2.2 Removing and installing data bus diagnostic interface - J533-



Note

- ◆ *The data bus diagnostic interface - J533- is integrated into the onboard supply control unit - J519- and cannot be renewed individually.*
- ◆ *If it is defective, the onboard supply control unit - J519- must be renewed.*
- Removing and installing onboard supply control unit - J519- ⇒ [page 148](#) .



3 Connectors

⇒ **"3.1 Repairing electrical wiring harnesses and plug-in connections", page 150**

3.1 Repairing electrical wiring harnesses and plug-in connections

⇒ **"3.1.1 Repairs to wiring harnesses and connectors", page 150**

⇒ **"3.1.2 Repairing connector housings and electrical connectors", page 150**

3.1.1 Repairs to wiring harnesses and connectors

All instructions and notes regarding this chapter are available under ⇒ Electrical System, General Information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems .

3.1.2 Repairing connector housings and electrical connectors

All instructions and notes regarding this chapter are available under ⇒ Electrical system, General information; Rep. gr. 97 ; Repairs to wiring harnesses and connectors; Repairs to connector housings and connectors



4 Releasing and dismantling connector housings

All instructions and notes regarding this chapter are available under ➔ Electrical system, General information; Rep. gr. 97 ; Repairs to wiring harnesses and connectors; Releasing and dismantling connector housings





5 Repairing aerial wires

All instructions and notes regarding this chapter are available under ⇒ Electrical system, General information; Rep. gr. 97 ; Repairs to wiring harnesses and connectors; Repairs to aerial wires





6 Vehicle diagnosis, testing and information systems

All instructions and notes regarding this chapter are available under ➔ Electrical system, General information; Rep. gr. 97 ;
Vehicle diagnosis, testing and information systems

