



Workshop Manual

California 2016 ➤

Caravelle 2016 ➤

Multivan 2016 ➤

Transporter 2016 ➤

Electrical system

Edition 11.2016





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
- 97 - Wiring



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

(VRL009796; Edition 11.2016)


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

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

⇒ [“1.3 Operation and safety notes for gas discharge lamps”, page 2](#)

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

Observe the following when working on a vehicle with a start/stop system:


**DANGER!**

Injury hazard as a result of automatic engine start in vehicles with 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 testers and measuring instruments during a road test

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

**DANGER!**

Risk of accident as a result of 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 instruments and measuring equipment in place on rear seat and have them operated by a 2nd person sitting on the rear seat.*



1.3 Operation and safety notes for gas discharge lamps



Note

Never change bulbs if you are not familiar with the appropriate procedures, safety precautions or tools.



WARNING

Danger to life due to high voltage.

- ◆ ***It is essential that the battery earth cable is disconnected before any work on parts of the gas discharge headlight is performed. The parts are marked with a yellow high voltage symbol.***
- ◆ ***Then switch dipped beam on and off again. This will eliminate any possible residual voltage.***
- ◆ ***Switch off ignition and all electrical consumers, and withdraw ignition key.***
- ◆ ***The gas discharge lamp control unit must never be operated without a gas discharge lamp.***
- ◆ ***Due to the high voltage, the gas discharge lamp must only be operated in the headlight housing. Voltages above 28,000 V occur when igniting the gas discharge lamp.***



WARNING

Risk of injury due to burns, ultraviolet radiation, glare and explosion.

- ◆ ***Due to high temperatures, the absorption of ultraviolet radiation and risk of glare, the gas discharge lamp must only be operated in the headlight housing.***
- ◆ ***Avoid looking directly into the light beam; otherwise vision may be impaired for a substantial time.***
- ◆ ***Gas discharge lamps are under high internal pressure and can explode while being changed.***
- ◆ ***Always wear eye protection and gloves when removing and installing gas discharge lamps!***



WARNING

Risk of environmental pollution.

- ◆ ***Gas discharge lamps are classified as hazardous waste. They contain metallic mercury (Hg) and traces of thallium.***
- ◆ ***Gas discharge lamps must not be destroyed. Avoid contact with burst bulbs.***
- ◆ ***Observe relevant disposal regulations.***
- ◆ ***Only dispose of gas discharge lamps in containers intended for this purpose at an authorised collection point.***



Caution

- ◆ *Do not touch the bulb of the gas discharge lamp with bare fingers. When the light bulb is switched on, the heat would vaporise the oil of the finger prints which would then settle on the reflector, impairing the brightness of the headlight. Wear clean fabric gloves when inserting a gas discharge lamp.*
- ◆ *A defective gas discharge lamp must always be renewed with a new gas discharge lamp of the same type. The designation appears on the base of the bulb or on the bulb glass.*
- ◆ *Properly engage connectors during installation and the connection is seated tightly.*



2 Repair notes

⇒ **"2.1 Contact corrosion", page 4**

⇒ **"2.2 Pipe/wire routing and attachment", page 4**

2.1 Contact corrosion

Contact corrosion can occur if non-approved fasteners are used on the vehicle (bolts, nuts, washers etc.).

For this reason, only connecting elements with a special surface coating have been fitted.

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 Pipe/wire routing and attachment

- ◆ 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. Make sketches or take photographs if necessary.
- ◆ 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.
- ◆ Any wiring fasteners which have been released during removal must be of the same type and must be attached at the same locations when installing to prevent any rattling or damage.



3 Battery

⇒ **"3.1 Battery - general notes", page 5**

⇒ **"3.2 Types of battery", page 5**

3.1 Battery - general notes



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 27; Battery .

3.2 Types of battery



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 27; Battery; Battery types .



27 – Starter, current supply, CCS

1 Battery

- ⇒ [“1.1 Assembly overview - battery”, page 6](#)
- ⇒ [“1.2 Checking battery”, page 7](#)
- ⇒ [“1.3 Charging battery”, page 8](#)
- ⇒ [“1.4 Disconnecting and connecting battery”, page 8](#)
- ⇒ [“1.5 Removing and installing battery”, page 11](#)
- ⇒ [“1.6 Removing and installing battery partition”, page 14](#)
- ⇒ [“1.7 Removing and installing battery tray”, page 15](#)
- ⇒ [“1.8 Removing and installing battery isolator”, page 16](#)
- ⇒ [“1.9 Removing and installing earth wire with battery monitor control unit J367”, page 16](#)
- ⇒ [“1.10 Adapting battery monitor control unit J367”, page 17](#)

1.1 Assembly overview - battery

Warning notices and safety regulations

All instructions and information about this chapter are available in the workshop manual “Electrical system; General information” ⇒ Electrical system; General information; Rep. gr. 27 ; Battery; Warning notices and safety regulations .

Battery recharging 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.



1 - Battery earth terminal with integrated battery monitor control unit - J367-

- ☐ After replacing battery, adapt battery monitor control unit - J367- ➔ [page 17](#)
- ☐ Disconnecting battery - A- in engine compartment ➔ [page 8](#)
- ☐ Disconnecting second battery - A1- beneath front left seat ➔ [page 9](#)
- ☐ Comply with instructions regarding battery monitor control unit - J367- (battery sensor) ➔ [page 11](#)
- ☐ Removing and installing ➔ [page 16](#)
- ☐ Securing nut earth cable to body weld stud: 20 Nm

2 - Securing nut for earth wire battery terminal clamp

- ☐ M6
- ☐ 6 Nm

3 - Positive wire battery terminal clamp

- ☐ Disconnecting battery - A- in engine compartment ➔ [page 8](#)
- ☐ Disconnecting second battery - A1- beneath front left seat ➔ [page 9](#)

4 - Securing nut for positive wire battery terminal clamp

- ☐ M6
- ☐ 6 Nm

5 - Battery

- ☐ After replacing battery, adapt battery monitor control unit - J367- ➔ [page 17](#)
- ☐ Removing and installing battery - A- in engine compartment ➔ [page 11](#)
- ☐ Removing and installing second battery - A1- beneath front left seat ➔ [page 13](#)

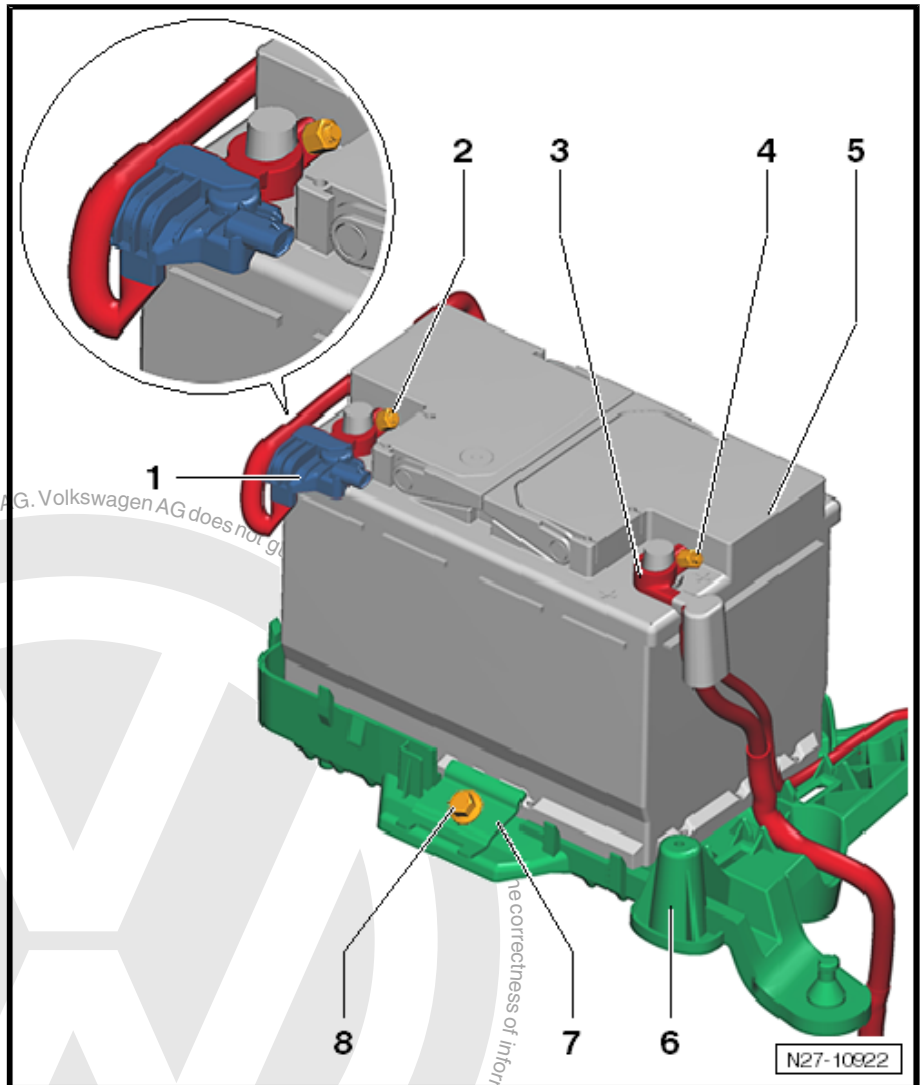
6 - Battery tray

- ☐ Removing and installing ➔ [page 15](#)

7 - Clamping plate

8 - Clamping plate securing nut

- ☐ 23 Nm.



1.2 Checking battery

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



1.3 Charging battery

Battery recharging 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 monitor control unit - J367- is not bridged. Charging the battery directly on the negative terminal causes the battery monitoring control unit to be bridged. The battery data is not collected by the battery monitoring control unit during the charging process. 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.

Charging battery ⇒ Electrical system; General information; Rep. gr. 27 ; Charging battery .

1.4 Disconnecting and connecting battery

⇒ ["1.4.1 Disconnecting and connecting battery, battery A in engine compartment", page 8](#)

⇒ ["1.4.2 Connecting and disconnecting second battery A1 beneath front left seat", page 9](#)

1.4.1 Disconnecting and connecting battery, battery - A- in engine compartment



WARNING

Danger of injury! Comply with the warning notices and safety regulations ⇒ [page 5](#) !

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-

V.A.G 1410



W00-11174

Disconnecting

- Switch off ignition and all electrical equipment and then remove ignition key.



- First loosen securing nut of battery earth cable a few turns and pull battery terminal clamp -1- of earth cable off battery terminal.
- Then loosen securing nut of battery positive cable a few turns and pull battery terminal clamp -2- of positive cable off battery terminal.

Connecting

Observe the following when connecting the battery - A- :

- Release and separate electrical connector -2- on battery monitor control unit - J367- -3-.
- Fit battery terminal clamp of earth cable to negative battery terminal by hand.



Note

To prevent noises, push the positive terminal cable against the battery body when tightening the terminal clamp.

- Tighten nut -1-.
- Reattach electrical connector -2- to battery monitor control unit J367- -3-.
- Connect battery terminal clamp of positive wire to battery positive terminal and tighten nut.
- Switch on ignition.
- Check time and adjust, if necessary.
- Completely open, then completely close windows.
- Check convenience mode of the window regulators.
- Read event memory ⇒ Vehicle diagnostic tester.
- Steering angle sender - perform zero compensation ⇒ Vehicle diagnostic tester.

Torque settings

- ◆ ⇒ ["1.1 Assembly overview - battery", page 6](#)

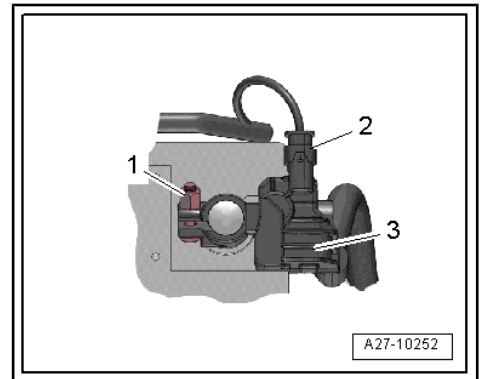
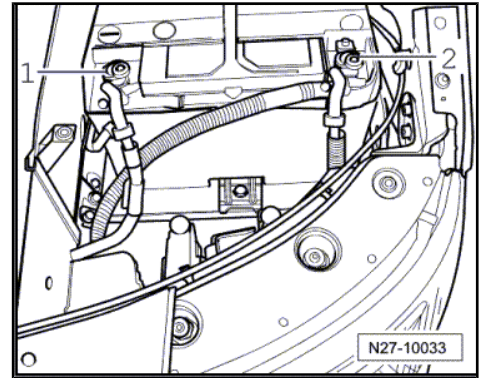
1.4.2 Connecting and disconnecting second battery - A1- beneath front left seat



WARNING

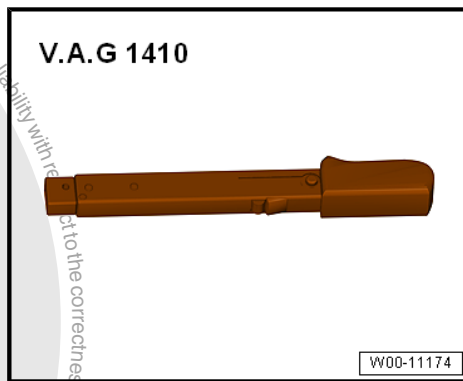
Danger of injury! Comply with the warning notices and safety regulations ⇒ [page 5](#)!

Special tools and workshop equipment required



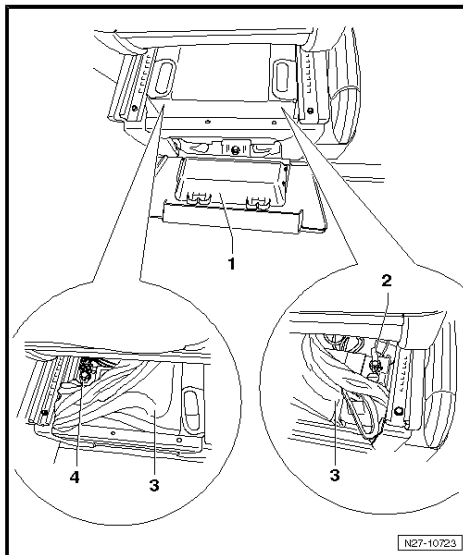


◆ Torque wrench - V.A.G 1410-



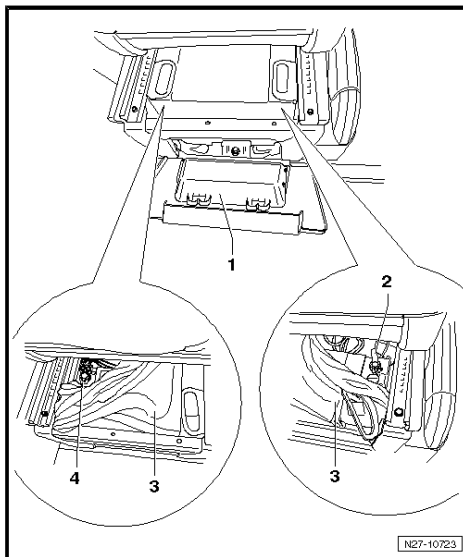
Disconnecting

- Switch off ignition and all electrical equipment and then remove ignition key.
- Move left front seat to foremost position.
- Disconnect negative battery terminal of battery - A- in engine compartment ⇒ [page 8](#) .
- Pull trim -1- off seat box.
- Remove battery cover -3- from second battery - A1-.
- First loosen securing nut of battery earth cable a few turns and pull battery terminal clamp -2- of earth cable off battery terminal.
- Then loosen securing nut of battery positive cable a few turns and pull battery terminal clamp -4- of positive cable off battery terminal.



Connecting

- First fit terminal clamp of positive wire -4- on battery positive terminal and tighten securing nut.
- Then fit battery negative terminal clamp -2- on negative terminal of battery and tighten securing nut.
- Install battery cover -3- and trim -1-.
- Connect negative battery terminal of battery - A- in engine compartment ⇒ [page 8](#) .



Torque settings

- ◆ ⇒ [“1.1 Assembly overview - battery”, page 6](#)



1.5 Removing and installing battery

⇒ ["1.5.1 Removing and installing battery A in engine compartment", page 11](#)

⇒ ["1.5.2 Removing and installing second battery A1 beneath front left seat", page 13](#)

1.5.1 Removing and installing battery - A- in engine compartment



WARNING

Observe safety precautions when working on vehicles with start/stop system ⇒ [page 1](#) .

Renewing battery on vehicles with start/stop system



Note

- ◆ Due to higher demands on the deep-cycle resistance, a special battery is used in vehicles equipped with a start/stop system.
- ◆ When renewing the battery, note the correct part designation ⇒ ETKA
- ◆ Batteries intended for use in vehicles with a start/stop system are marked "AGM" (Absorbent Glass Mat) or "EFB" (Enhanced Flooded Battery).
- ◆ If the battery is renewed, the battery monitor control unit - J367- must be adapted by means of a battery parametrisation ⇒ [page 17](#) .

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-

V.A.G 1410



WV00-11174

Removing

- Disconnect battery - A- ⇒ [page 8](#) .
- If fitted, pull hose for central venting off battery.



- Unscrew bolt -arrow- and remove together with clamp plate.



Note

- ◆ *Do not allow the loosened clamp plate with securing bolt to fall into the body aperture in front of the battery.*
- ◆ *To retrieve a clamp plate that has fallen into the body, the headlight must be removed.*

- Open heat guard and remove from battery.

- Swivel up battery handles -arrows-.

- Grab battery by handles and lift it out upwards.

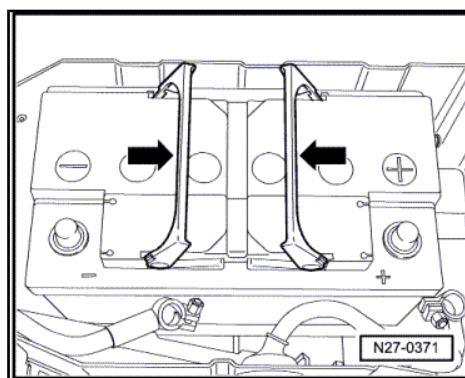
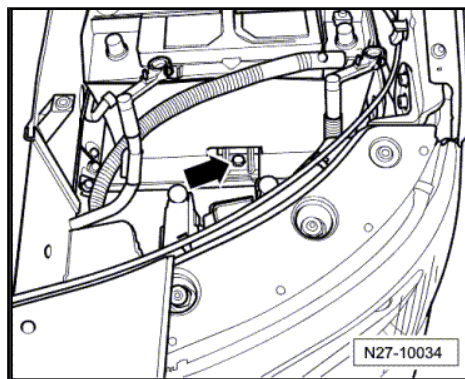
Installing



Caution

A loosely installed battery creates the following dangers:

- ◆ *Shortened service life caused by vibration damage (danger of explosion)*
- ◆ *The plates in the battery cells will be damaged if the battery is not secured correctly.*
- ◆ *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:

- Bring clamp plate into position and tighten bolt -arrow-.



Note

- ◆ *If fitted, connect the hose for central venting to the battery.*
- ◆ *The hose for central venting must not be pinched when installing. Otherwise the battery won't be able to vent freely.*

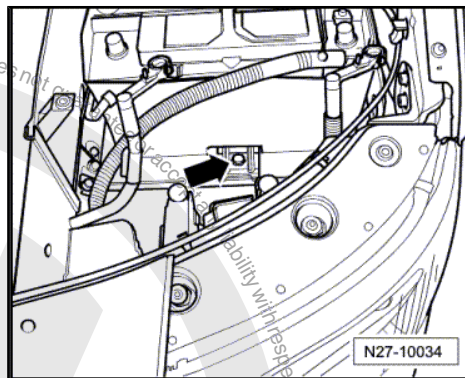
- Check battery is firmly seated after installation.

- Connect battery ➔ [page 8](#) .

After installing a new starter battery or a new battery monitor control unit - J367- , the battery monitor control unit - J367- must be adapted ➔ [page 17](#) .

Torque settings

- ◆ ➔ ["1.1 Assembly overview - battery", page 6](#)





1.5.2 Removing and installing second battery - A1- beneath front left seat



WARNING

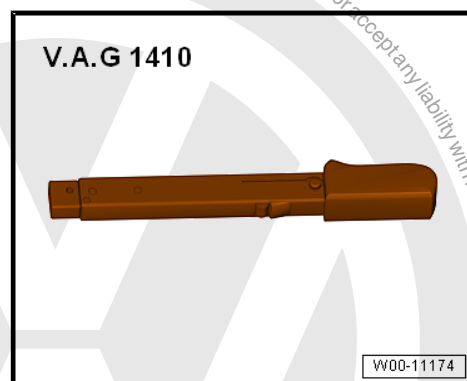
Danger of injury! Comply with the warning notices and safety regulations ➔ page 5!

An absorbent glass mat battery is also installed beneath the front left seat on some vehicles, depending on the equipment level. The electrolyte of the VRLA battery is not free and therefore cannot leak out, is cycle resistant and is absolutely maintenance free.

VRLA batteries are more resistant to climatic influences and vibrations than are common lead acid batteries. Further, VRLA battery will not develop leaks or be damaged by swinging or tipping.

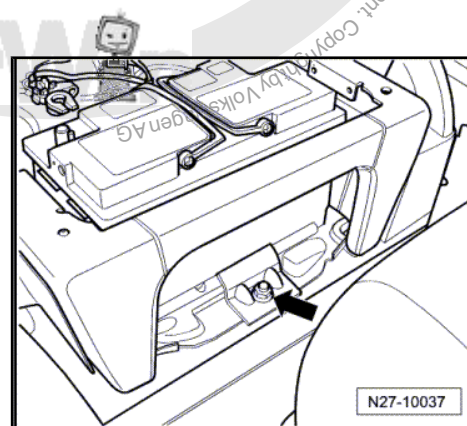
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



Removing

- Remove front left seat ➔ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .
- Disconnect battery - A- on left in engine compartment ➔ [page 8](#) .
- Disconnect second battery under left front seat ➔ [page 9](#) .
- If fitted, pull hose for central venting off battery.
- Unscrew bolt -arrow- and remove clamp plate.





- Swivel up battery handles -arrows-.
- Hold battery by handles and lift it out from bracket under seat.

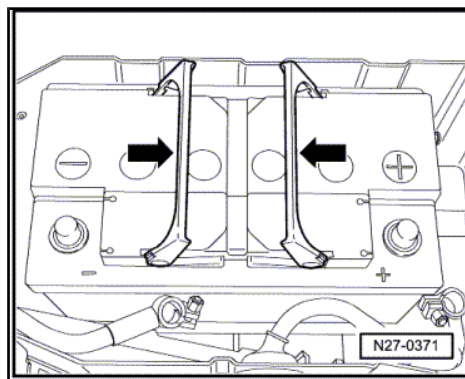
Installing



Caution

A loosely installed battery creates the following dangers:

- ◆ *Shortened service life caused by vibration damage (danger of explosion)*
- ◆ *The plates in the battery cells will be damaged if the battery is not secured correctly.*
- ◆ *Damage to battery casing by clamping bracket (possible leakage of acid with high consequential costs).*
- ◆ *Poor crash safety.*

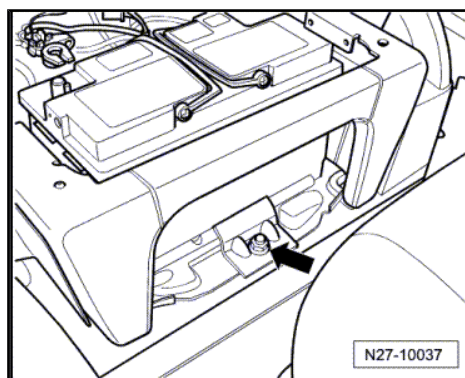


- Bring clamp plate into position and tighten bolt -arrow-.



Note

- ◆ *If fitted, connect the hose for central venting to the battery.*
- ◆ *The hose for central venting must not be pinched when installing. Otherwise the battery won't be able to vent freely.*
- After installing second battery - A1- , ensure it is firmly seated.
- Connect second battery under left front seat ➔ [page 9](#) .
- Install front seat ➔ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .
- Connect battery - A- on left in engine compartment ➔ [page 8](#) .



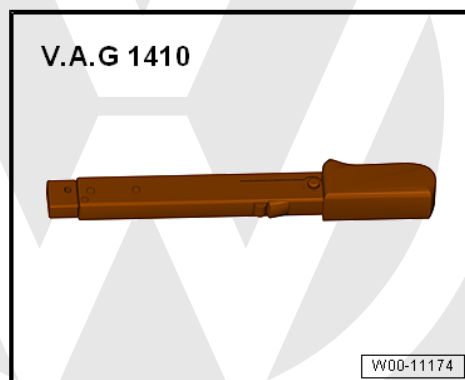
Torque settings

- ◆ ➔ ["1.1 Assembly overview - battery", page 6](#)

1.6 Removing and installing battery partition

Special tools and workshop equipment required

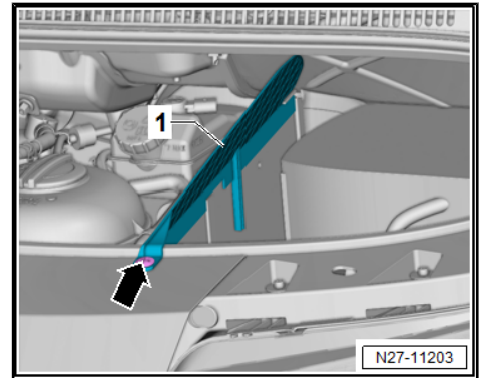
- ◆ Torque wrench - V.A.G 1410-



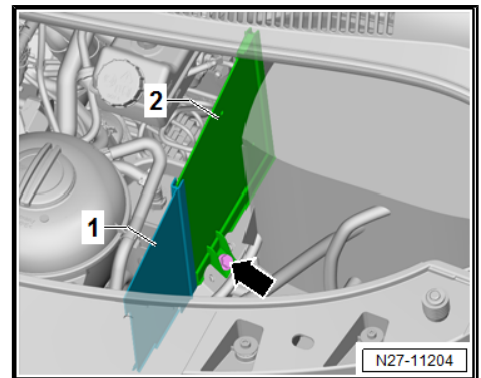


Removing

- Unscrew bolt -arrow- and remove upper part -1- of battery partition.



- Pull out front part of battery partition -1- upwards.
- Unscrew bolt -arrow- and remove middle part of battery partition -2- upwards.
- If rear part of battery partition is also to be removed, remove battery ⇒ [page 11](#) , unscrew securing bolt then unhook battery partition from battery tray and remove.



Installing

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

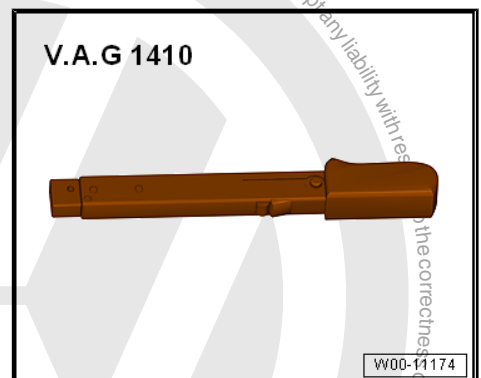
Torque settings

Component	Torque setting
Bolt securing middle battery partition to battery tray	20 Nm
Bolt securing upper battery partition to radiator grille cover	1.5 Nm

1.7 Removing and installing battery tray

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



Removing

- Remove battery - A- in engine compartment ⇒ [page 11](#) .
- Remove battery partition ⇒ [page 14](#) .



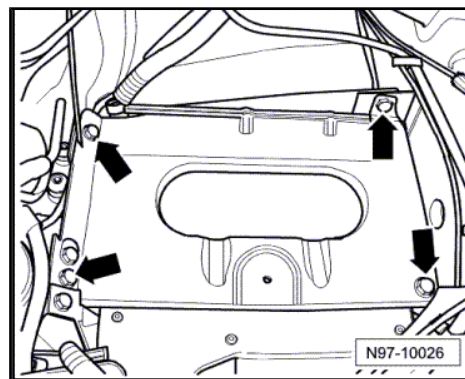
- Unscrew bolts -arrows- and remove battery tray.

Installing

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

Torque settings

Component	Torque setting
Battery tray bolts	8 Nm.



1.8 Removing and installing battery isolator

⇒ [“1.8.1 Checking battery isolation relay J7”, page 16](#)

⇒ [“1.8.2 Removing and installing battery isolation relay J7”, page 16](#)

1.8.1 Checking battery isolation relay - J7-

- Connect the vehicle diagnostic tester .
- Check battery isolation relay - J7- ⇒ Vehicle diagnostic tester.

1.8.2 Removing and installing battery isolation relay - J7-

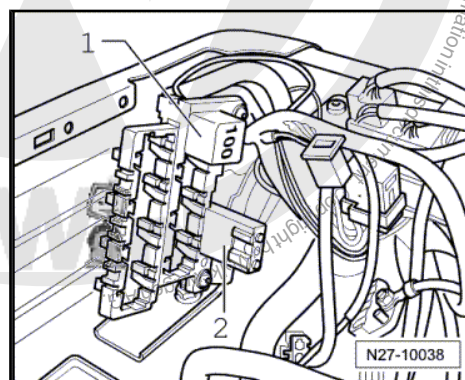
The battery isolation relay - J7- and associated battery isolation relay fuse - S171- can be found on relay carrier in the seat box beneath the front left seat ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Removing

- First disconnect battery - A- in engine compartment
⇒ [page 8](#) .
- Then disconnect second battery - A1- beneath front left seat
⇒ [page 9](#) .
- Pull battery isolation relay - J7- -1- or battery isolation relay fuse - S171- -2- out of relay carrier.

Installing

- Insert battery isolation relay - J7- -1- and battery isolation relay fuse - S171- -2- into intended location.
- First connect second battery - A1- beneath front left seat
⇒ [page 9](#) .
- Then connect battery - A- in engine compartment ⇒ [page 8](#)

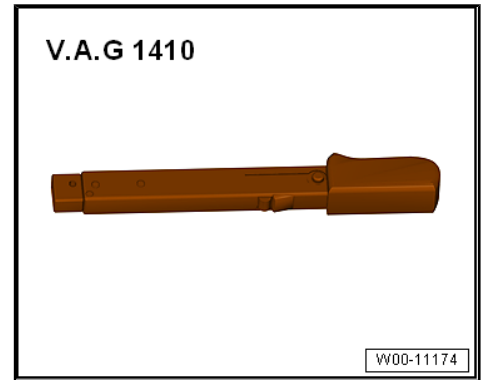


1.9 Removing and installing earth wire with battery monitor control unit - J367-

Special tools and workshop equipment required

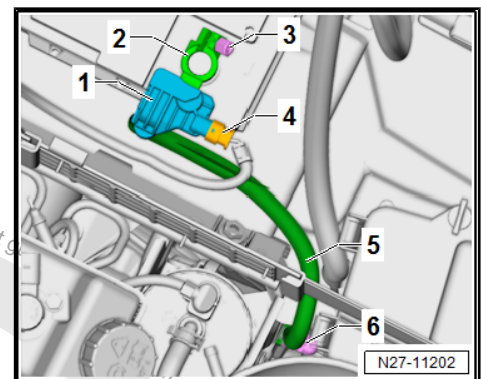


- ◆ Torque wrench - V.A.G 1410-

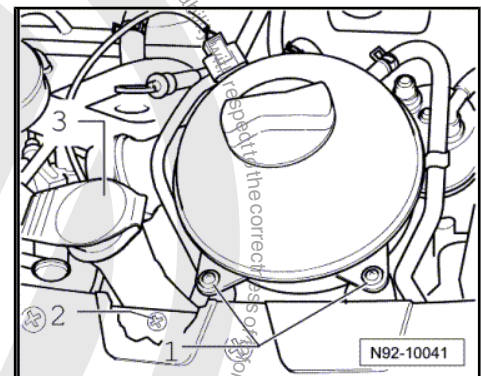


Removing

- Separate electrical connector -4- on battery monitor control unit - J367- -1-.
- Loosen securing nut -3- of battery earth cable a few turns and pull battery terminal clamp -2- of earth cable off battery terminal.



- Unscrew securing bolts -1- of coolant expansion tank and push tank with hoses connected to one side.



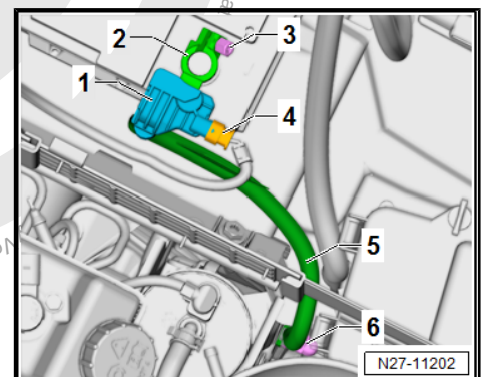
- Unscrew securing nut -6- from weld stud and remove earth cable -5- with battery monitor control unit - J367- -1-.

Installing

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

Torque settings

- ◆ ⇒ ["1.1 Assembly overview - battery" page 6](#)



1.10 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.



- Connect vehicle diagnostic tester ➔ [page 303](#) .
- Adapt battery monitor control unit - J367 ➔ Vehicle diagnostic tester.





2 Alternator

⇒ [“2.1 Assembly overview - alternator”, page 19](#)

⇒ [“2.2 Removing and installing alternator”, page 20](#)

⇒ [“2.3 Checking alternator”, page 24](#)

⇒ [“2.4 Checking poly V-belt”, page 24](#)

⇒ [“2.5 Removing and installing poly V-belt pulley”, page 24](#)

⇒ [“2.6 Removing and installing voltage regulator”, page 29](#)

2.1 Assembly overview - alternator

⇒ [“2.1.1 Assembly overview - alternator without sliding bushes”, page 19](#)

⇒ [“2.1.2 Assembly overview - alternator with sliding bushes”, page 20](#)

2.1.1 Assembly overview - alternator without sliding bushes

1 - Alternator - C-

- ☐ Removing and installing
⇒ [page 20](#)
- ☐ Checking ⇒ [page 24](#)
- ☐ Removing and installing
poly V-belt pulley
⇒ [page 24](#)
- ☐ Removing and installing
voltage regulator - C1-
⇒ [page 29](#)

2 - Connector

- ☐ Terminal 61

3 - Battery positive wire

- ☐ Terminal 30/B+

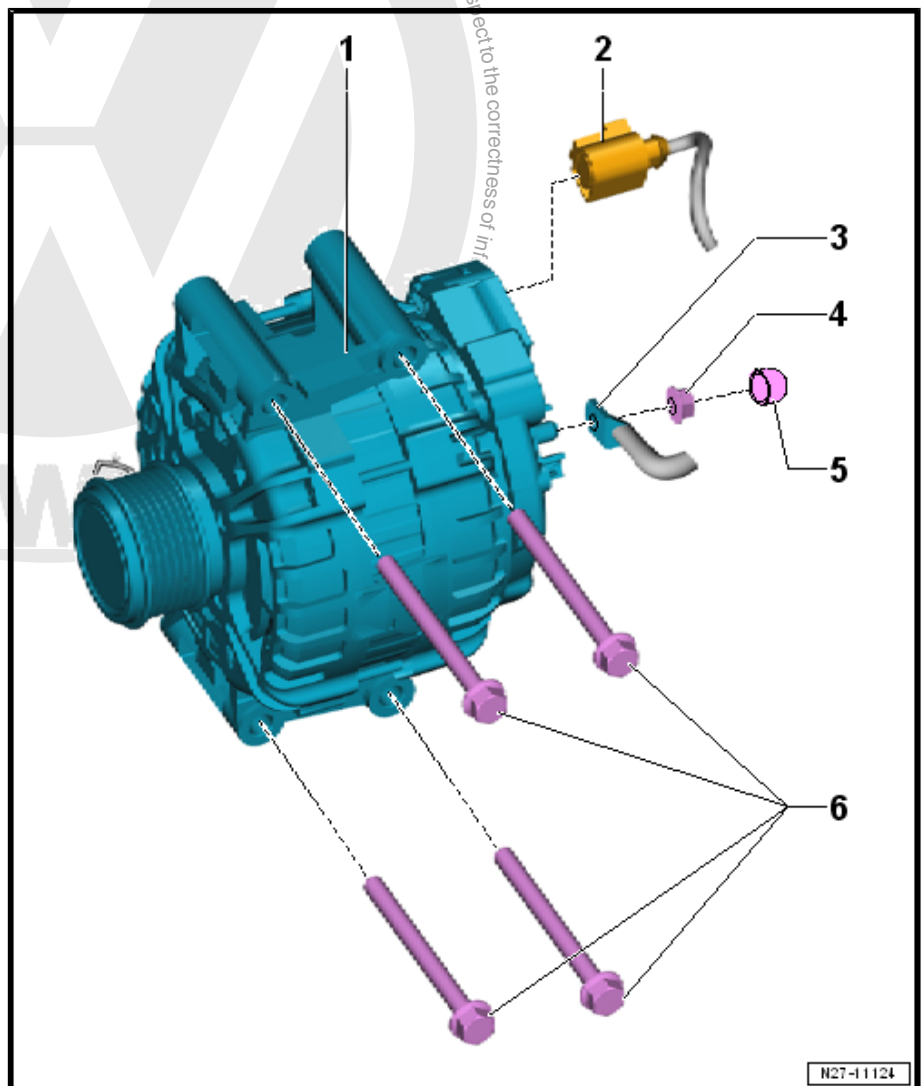
4 - Nut

- ☐ Battery positive cable to
alternator
- ☐ 15 Nm.

5 - Cover

6 - Alternator bolts

- ☐ Insert upper securing
bolts in alternator before
bringing alternator into
position on cylinder
block.
- ☐ 23 Nm.





2.1.2 Assembly overview - alternator with sliding bushes

1 - Alternator - C-

- ☐ Removing and installing
⇒ [page 20](#)
- ☐ Checking ⇒ [page 24](#)
- ☐ Removing and installing
poly V-belt pulley
⇒ [page 24](#)
- ☐ Removing and installing
voltage regulator - C1-
⇒ [page 29](#)

2 - Bolt

- ☐ Qty. 2
- ☐ 20 Nm.

3 - Sliding bush

- ☐ Qty. 2
- ☐ If a bush is stiff, its
clamping force will be in-
sufficient even though it
has been tightened to the
correct torque. Free
off sliding bushes if nec-
essary.

4 - Connector

- ☐ DF cable

5 - Cover

6 - Nut

- ☐ 20 Nm.

7 - Terminal 30/B+

8 - Nut

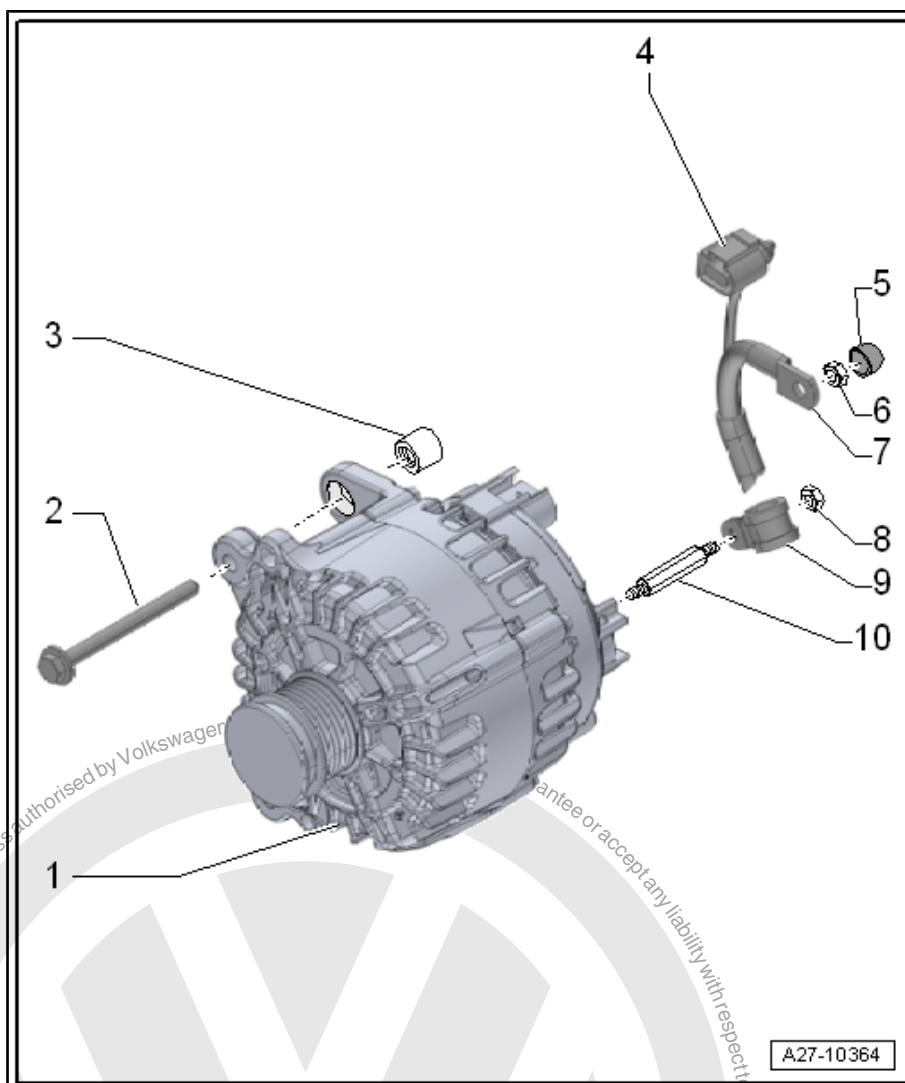
- ☐ Depending on equip-
ment
- ☐ 3.2 Nm.

9 - Clamp

- ☐ Depending on equipment

10 - Threaded pin

- ☐ Depending on equipment
- ☐ 3.2 Nm.



2.2 Removing and installing alternator

⇒ ["2.2.1 Removing and installing alternator, vehicles with TDI engine", page 20](#)

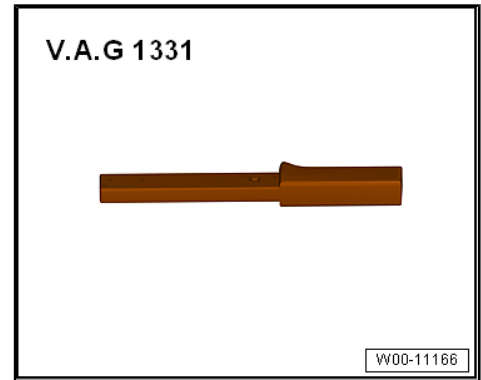
⇒ ["2.2.2 Removing and installing alternator, vehicles with TSI engine", page 22](#)

2.2.1 Removing and installing alternator, vehicles with TDI engine

Special tools and workshop equipment required

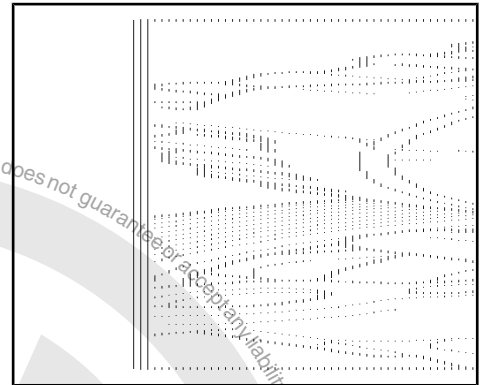


- ◆ Torque wrench - V.A.G 1331-



Removing

- Disconnect batteries ⇒ [page 8](#) .
- Move lock carrier to service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Moving to service position .
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .
- Release and disconnect connector of DF cable -1-.
- Lever off deflector cap -2-.
- Unscrew securing nut and detach the B+ wire under it from the connecting thread of the alternator.

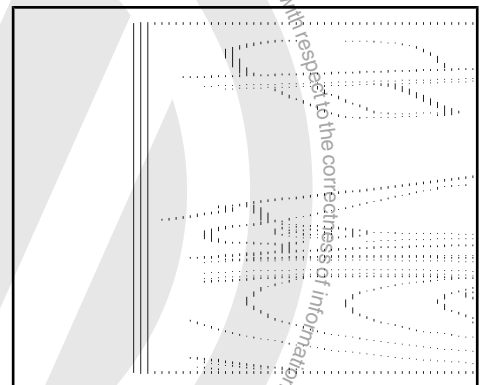


- Undo and remove the two bolts -arrows- securing the alternator.



Note

- ◆ *If the alternator - C- is stuck in its bracket, screw in bolts -arrows- again except for the last 2 turns.*
- ◆ *Carefully hit bolt heads with flat side of hammer to release sliding bushes of alternator mounting.*
- Remove alternator by taking it upwards out of the vehicle.



Installing

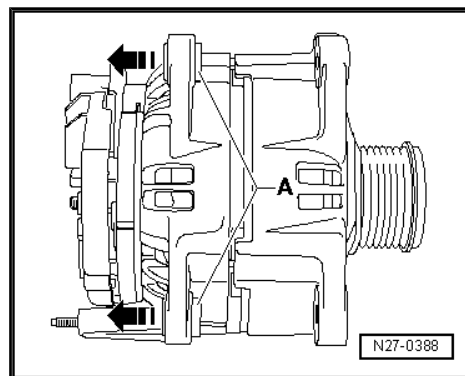
Install in reverse order of removal, observing the following:



- To facilitate positioning of alternator - C- , drive back bushes -A- of alternator mounting about 4 mm in direction of arrow.
- Start engine and check that belt runs properly after completing work.

Torque settings

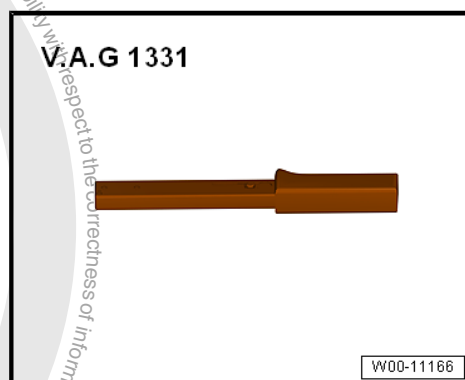
- ♦ ⇒ "2.1.2 Assembly overview - alternator with sliding bushes", page 20



2.2.2 Removing and installing alternator, vehicles with TSI engine

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



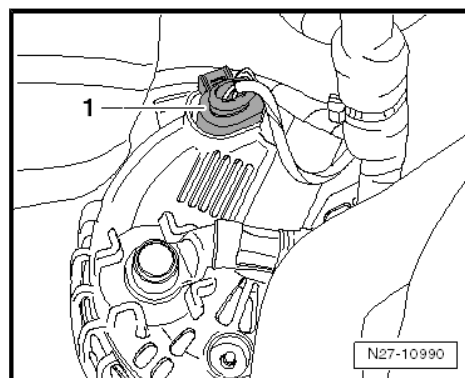
Removing

- Disconnect batteries ⇒ page 8 .
- Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block, pulley end; Removing and installing poly V-belt .
- Unscrew power steering vane pump from bracket ⇒ Running gear, axles, steering; Rep. gr. 48 ; Hydraulic power steering; Removing and installing vane pump .



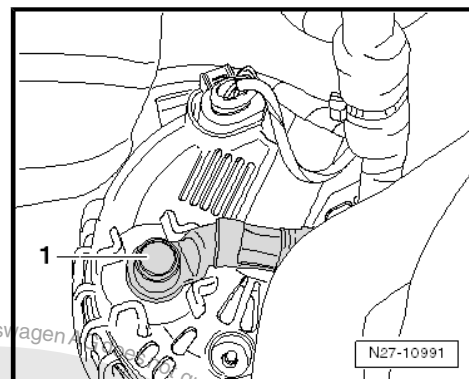
Note

- ♦ *The hoses attached to power steering vane pump do not have to be detached.*
- ♦ *When doing this, the hoses on the vane pump must not be kinked or stretched.*
- Release and disconnect connector of DF cable -1-.

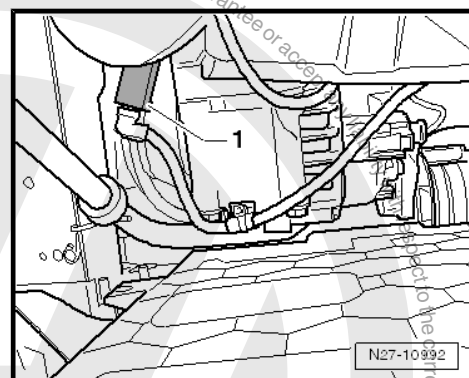




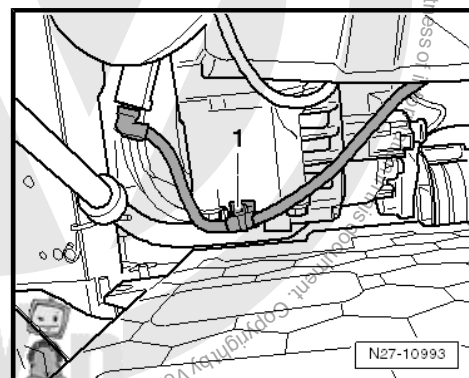
- Remove protective cap -1- and unscrew nut securing terminal 30 cable connection.



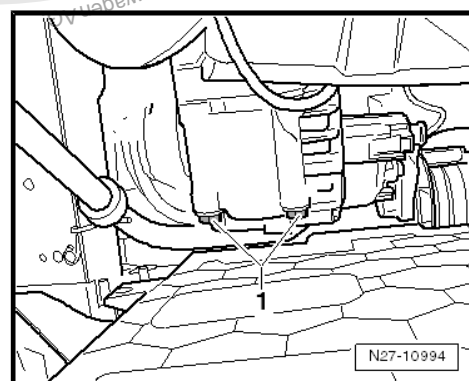
- If fitted, release and separate electrical connector -1- on oil filter housing.



- If fitted, detach cable connection from alternator -1- and push cable aside.



- Unscrew upper securing bolts -1- on alternator.





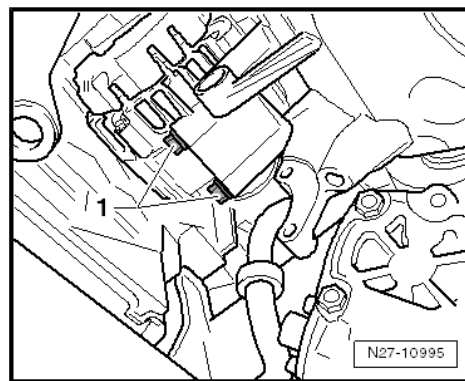
- Unscrew lower securing bolts -1- on alternator.
- Take alternator out downwards.

Install in reverse order of removal, observing the following:

- Start engine and check that belt runs properly after completing work.

Torque settings

- ♦ ⇒ [“2.1.1 Assembly overview - alternator without sliding bushes”, page 19](#)



2.3 Checking alternator

- Check alternator - C- ⇒ Vehicle diagnostic tester.

2.4 Checking poly V-belt

- Use a socket spanner to turn engine at vibration damper on pulley.
- Check poly V-belt for:
 - ♦ Sub-surface cracks (cracks, core ruptures, cross sectional breaks)
 - ♦ Layer separation (top layer, cord strands)
 - ♦ Eruptions on bottom cover
 - ♦ Fraying of carcass
 - ♦ Flank wear (material wear, frayed flanks, flank brittleness - glassy flanks-, surface cracks)
 - ♦ Oil and grease marks



Caution

In order to avoid failures and malfunctions, the poly V-belt must be replaced if it is damaged.

2.5 Removing and installing poly V-belt pulley

⇒ [“2.5.1 Removing and installing poly V-belt pulley without free-wheel”, page 24](#)

⇒ [“2.5.2 Removing and installing poly V-belt pulley with free-wheel, manufacturer: Bosch”, page 25](#)

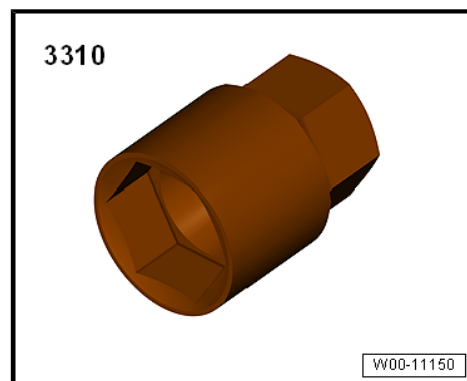
⇒ [“2.5.3 Removing and installing poly V-belt pulley with free-wheel, manufacturer: Valeo”, page 27](#)

2.5.1 Removing and installing poly V-belt pulley without freewheel

Special tools and workshop equipment required



- ◆ Hexagon bit, long reach - 3310-



- ◆ Torque wrench - V.A.G 1332-

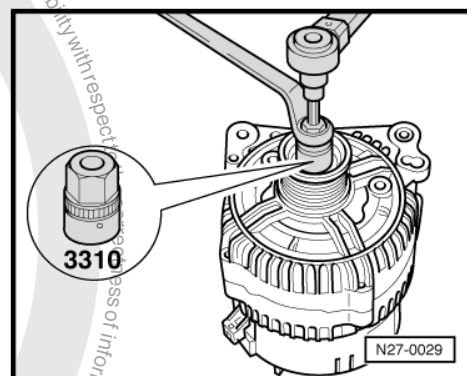


Removing

- Remove alternator - C- ➔ [page 20](#) .
- Clamp alternator - C- in vice at mounting points.
- Unscrew securing nut of poly V-belt pulley from alternator shaft using socket - 3310- .
- Remove poly V-belt pulley from alternator shaft.

Installing

Install in reverse order of removal, observing the following:



Torque settings

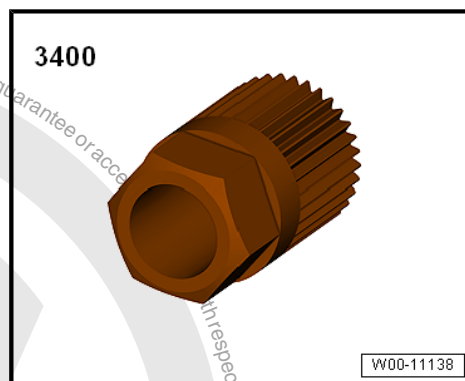
Component	Torque setting
Securing nut for poly V-belt pulley	65 Nm.

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

Special tools and workshop equipment required



◆ Multipoint adapter - 3400-



◆ Torque wrench - V.A.G 1332-



Removing

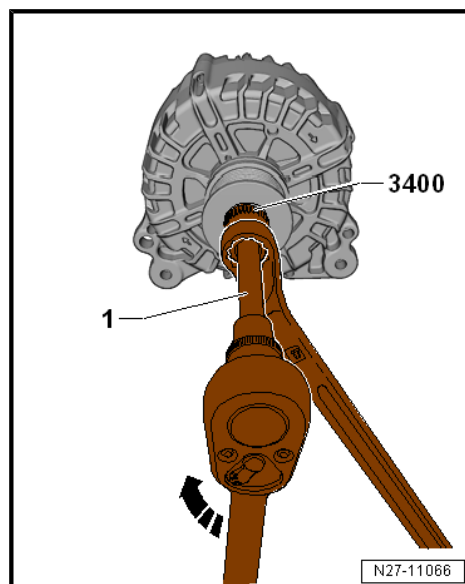
- Remove alternator - C- ➔ [page 20](#)
- Clamp alternator - C- in vice at mounting points.
- Lever off poly V-belt pulley cap.
- Insert adapter - 3400- into poly V-belt pulley using 17 mm ring spanner.
- Insert M10 multipoint bit -1- into alternator shaft.
- Counterhold alternator shaft whilst releasing poly V-belt pulley by turning it anti-clockwise with ring spanner.
- Hold poly V-belt pulley stationary by hand.
- Turn alternator shaft until poly V-belt pulley can be removed.

Installing

Install in reverse order of removal, observing the following:

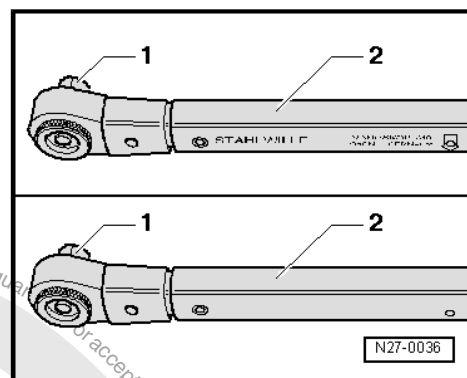
- Screw poly V-belt pulley by hand onto alternator shaft as far as stop.

To install poly V-belt pulley, the torque wrench - V.A.G 1332- needs to be set up as follows:

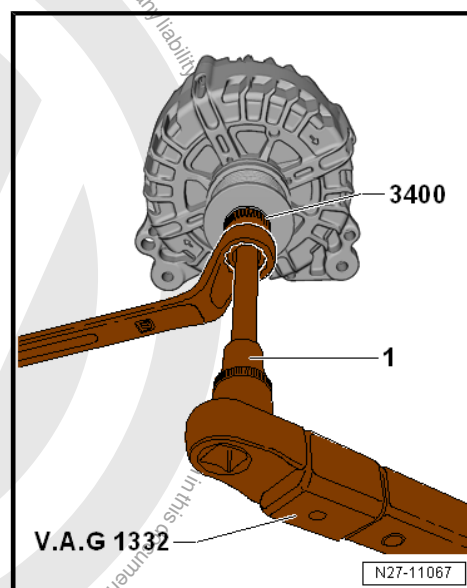




- Release socket drive -1- and pull off grip -2-.
- Turn grip -2- 180° and reinsert socket -1-.
- Set turning direction of torque wrench - V.A.G 1332- to anti-clockwise at socket drive.



- Insert M10 multipoint bit -1- into alternator shaft.
- Counterhold adapter - 3400- using 17 mm ring spanner.
- Tighten poly V-belt pulley by turning alternator shaft anti-clockwise using torque wrench - V.A.G 1332- .



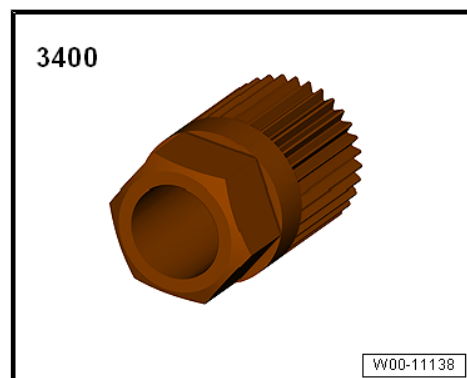
Torque settings

Component	Torque setting
Securing nut for poly V-belt pulley	80 Nm.

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

Special tools and workshop equipment required

- ◆ Multipoint adapter - 3400-

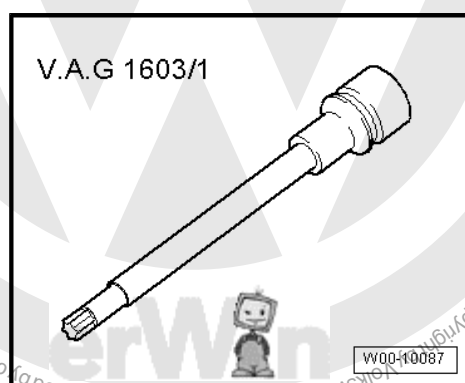




- ◆ Torque wrench - V.A.G 1332-



- ◆ TORX driver bit - V.A.G 1603/1-



Removing

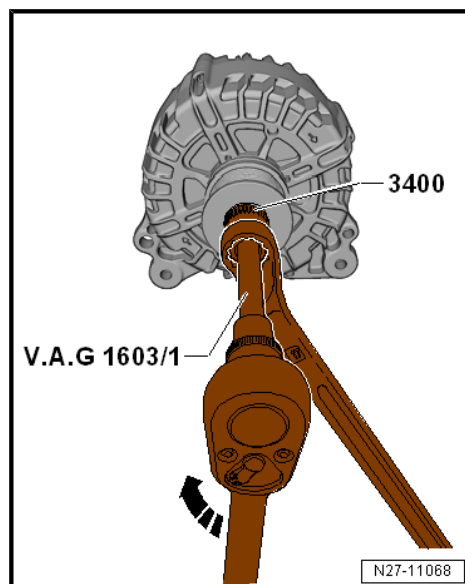
- Remove alternator - C- ➔ [page 20](#) .
- Clamp alternator - C- in vice at mounting points.
- Lever off poly V-belt pulley cap.
- Insert adapter - 3400- into poly V-belt pulley using 17 mm ring spanner.
- Insert TORX key - V.A.G 1603/1- into alternator shaft.
- Counterhold alternator shaft whilst releasing poly V-belt pulley by turning it anti-clockwise with ring spanner.
- Hold poly V-belt pulley stationary by hand.
- Turn alternator shaft until poly V-belt pulley can be removed.

Installing

Install in reverse order of removal, observing the following:

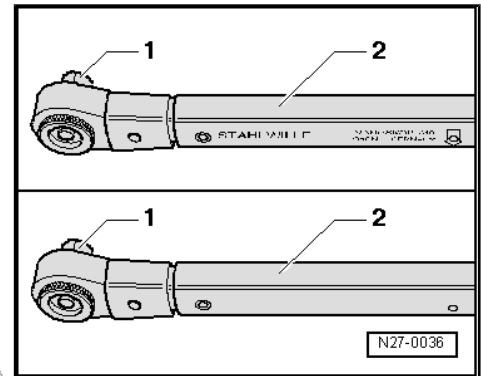
- Screw poly V-belt pulley by hand onto alternator shaft as far as stop.

To install poly V-belt pulley, the torque wrench - V.A.G 1332- needs to be set up as follows:

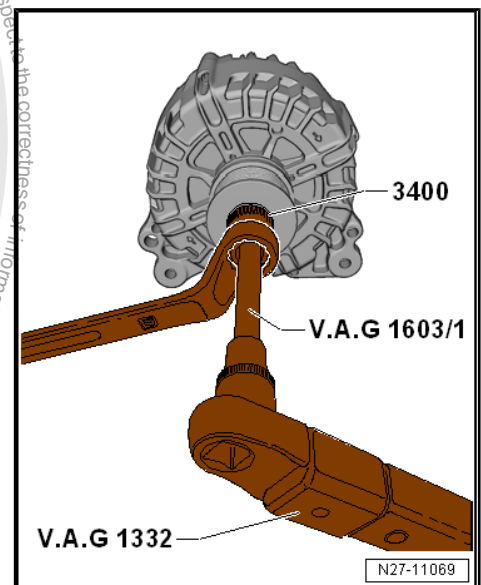




- Release socket drive -1- and pull off grip -2-.
- Turn grip -2- 180° and reinsert socket -1-.
- Set turning direction of torque wrench - V.A.G 1332- to anti-clockwise at socket drive.



- Insert TORX key - V.A.G 1603/1- into alternator shaft.
- Counterhold adapter - 3400- using 17 mm ring spanner.
- Tighten poly V-belt pulley by turning alternator shaft anti-clockwise using torque wrench - V.A.G 1332- .



Torque settings

Component	Torque setting
Securing nut for poly V-belt pulley	80 Nm.

2.6 Removing and installing voltage regulator

⇒ [“2.6.1 Removing and installing voltage regulator C1 , manufacturer: Bosch”, page 29](#)

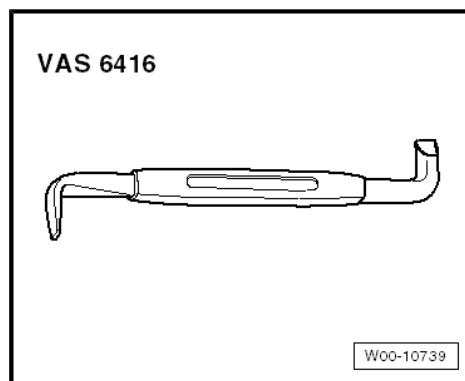
⇒ [“2.6.2 Removing and installing voltage regulator C1 , Valeo”, page 31](#)

2.6.1 Removing and installing voltage regulator - C1- , manufacturer: Bosch

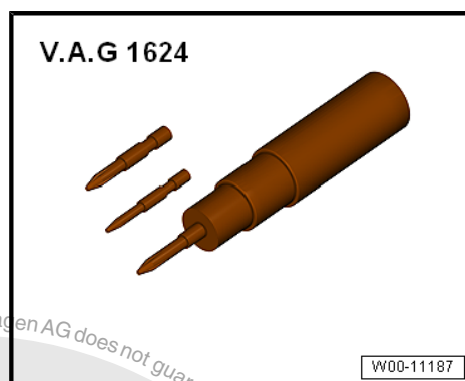
Special tools and workshop equipment required



- ◆ Offset screwdriver for slotted screws - VAS 6416-

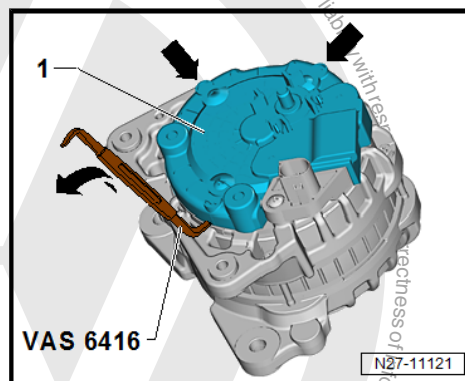


- ◆ Torque screwdriver - V.A.G 1624-



Removing

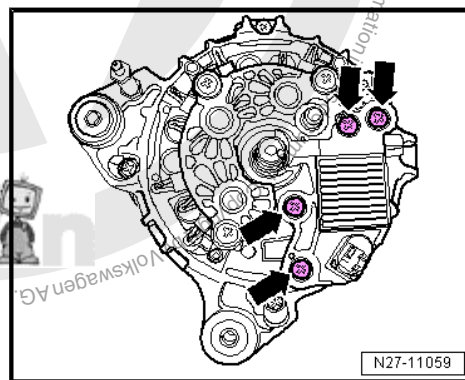
- Remove alternator - C- ➔ [page 20](#) .
- Using offset screwdriver for slotted-head screws - VAS 6416- , carefully lever off protective cap -1- at fasteners -arrows-.



- Remove bolts -arrows- for voltage regulator - C1- .
- Remove voltage regulator - C1- from alternator - C- .

Installing

Install in reverse order of removal, observing the following:



Torque settings

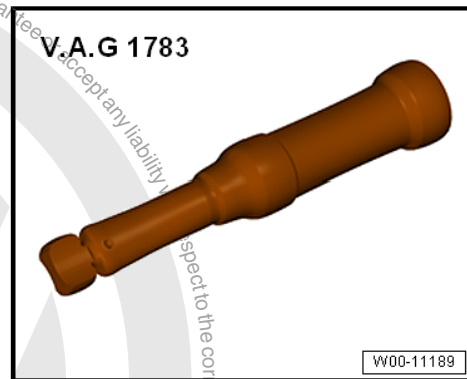
Component	Torque setting
Securing bolts of voltage regulator - C1-	2 Nm.



2.6.2 Removing and installing voltage regulator - C1- , Valeo

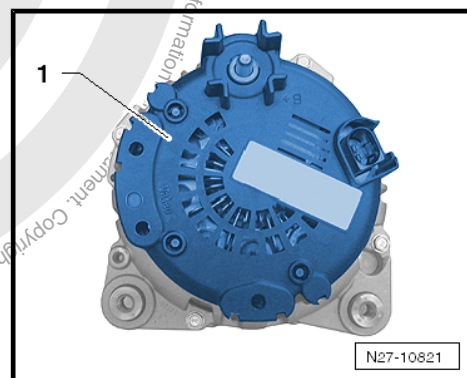
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



Removing

- Remove alternator - C- ➔ [page 20](#) .
- Carefully lever off protective cap -1- from alternator - C- .

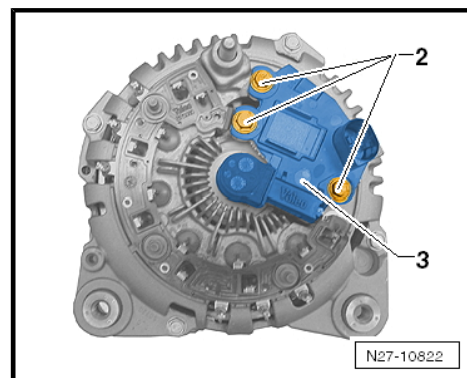


- Unscrew bolts -2- for voltage regulator - C1- -3-.
- Remove voltage regulator - C1- -3- from alternator - C- .

Installing

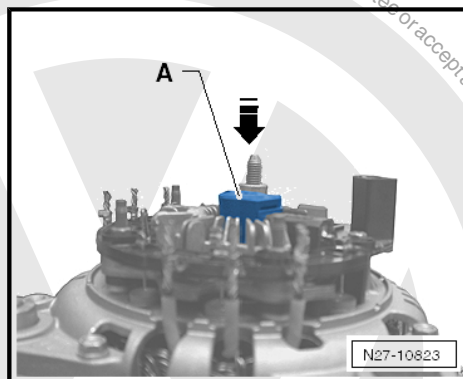
Install in reverse order of removal, observing the following:

- Install voltage regulator - C1- .

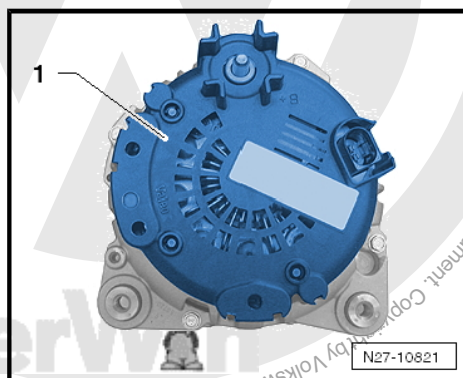




- Press down deflector cap for carbon brushes -A- -arrow- until it is flush with the voltage regulator housing.



- Fit new protective cap -1- to voltage regulator - C- .



Torque settings

Component	Torque setting
Securing bolts of voltage regulator - C1-	4 Nm.



3 Starter motor

⇒ [“3.1 Assembly overview - starter”, page 33](#)

⇒ [“3.2 Removing and installing starter motor”, page 34](#)

3.1 Assembly overview - starter

⇒ [“3.1.1 Assembly overview - starter, vehicles with manual gearbox MQ250, MQ500”, page 33](#)

⇒ [“3.1.2 Assembly overview - starter, vehicles with dual clutch gearbox DQ500”, page 34](#)

3.1.1 Assembly overview - starter, vehicles with manual gearbox MQ250, MQ500

1 - Starter motor - B-

- ☐ Removing and installing
⇒ [page 34](#)

2 - Double stud

- ☐ 80 Nm.

3 - Earth cable

- ☐ Depending on equipment

4 - Nut

- ☐ Depending on equipment
- ☐ 20 Nm.

5 - Connector

- ☐ Terminal 50

6 - Nut

- ☐ 20 Nm.

7 - Cover

8 - Terminal 30/B+

9 - Nut

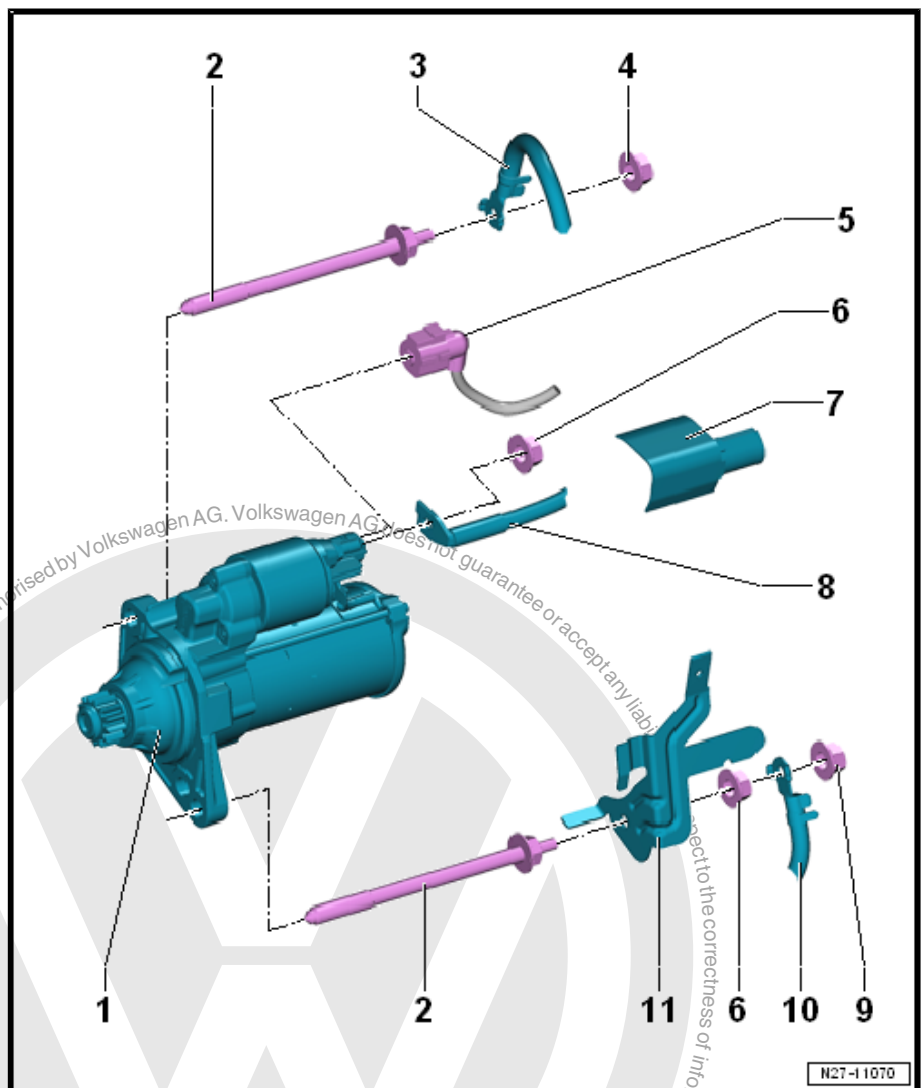
- ☐ Depending on equipment
- ☐ 20 Nm.

10 - Earth cable

- ☐ Depending on equipment

11 - Holder

- ☐ For wiring harness
- ☐ Depending on equipment





3.1.2 Assembly overview - starter, vehicles with dual clutch gearbox DQ500

1 - Starter motor - B-

- ❑ Removing and installing
⇒ [page 36](#)

2 - Bolt

- ❑ 40 Nm.

3 - Earth cable

- ❑ Depending on equipment

4 - Nut

- ❑ Depending on equipment
- ❑ 20 Nm.

5 - Connector

- ❑ Terminal 50

6 - Nut

- ❑ 20 Nm.

7 - Cover

8 - Line for terminal 30/B+

9 - Nut

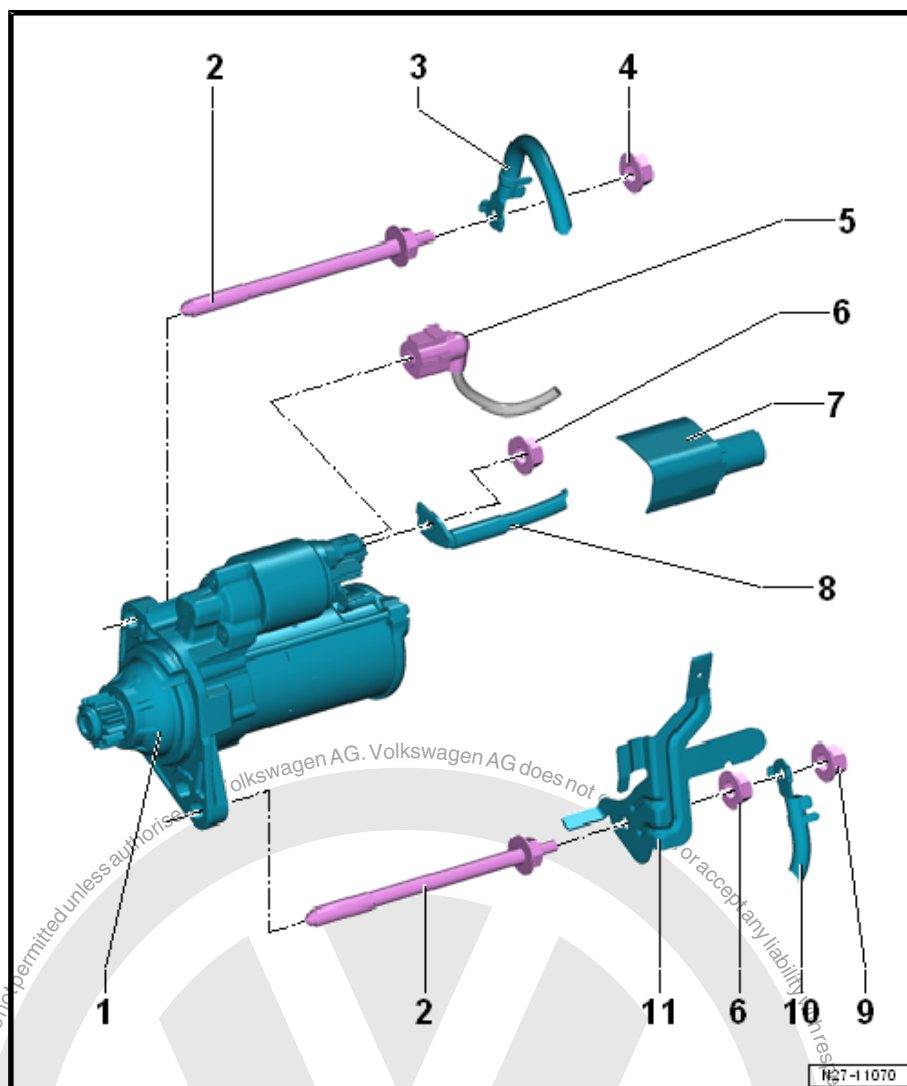
- ❑ Depending on equipment
- ❑ 20 Nm.

10 - Earth cable

- ❑ Depending on equipment

11 - Holder

- ❑ For wiring harness
- ❑ Depending on equipment



3.2 Removing and installing starter motor

⇒ [“3.2.1 Removing and installing starter, vehicles with manual gearbox MQ250, MQ500”, page 34](#)

⇒ [“3.2.2 Removing and installing starter, vehicles with 4-cyl. injection engine and dual clutch gearbox DQ500”, page 36](#)

⇒ [“3.2.3 Removing and installing starter, vehicles with 4-cyl. diesel engine and dual clutch gearbox DQ500”, page 38](#)

3.2.1 Removing and installing starter, vehicles with manual gearbox MQ250, MQ500

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-

V.A.G 1331



W00-11166

◆ Torque wrench - V.A.G 1332-

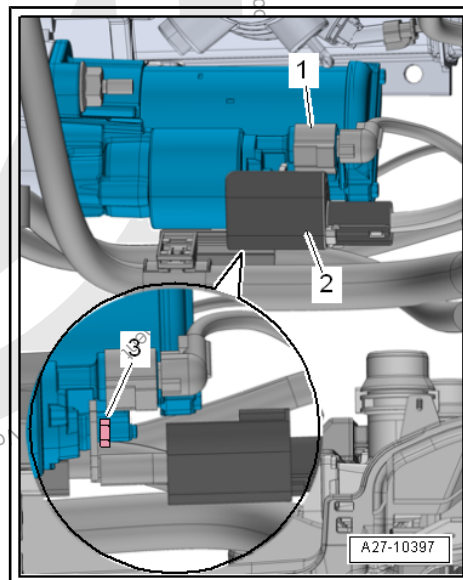
V.A.G 1332



W00-11165

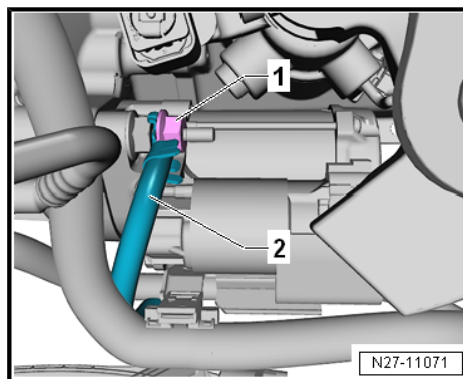
Removing

- Disconnect batteries ⇒ [page 8](#) .
- Remove noise insulation ⇒ General body repairs, exterior;
Rep. gr. 66 Noise insulation; Assembly overview – noise insulation .
- Release connector -1- and disconnect.
- Press off cap -2-.
- Unscrew securing nut -3- and remove terminal 30/B+.

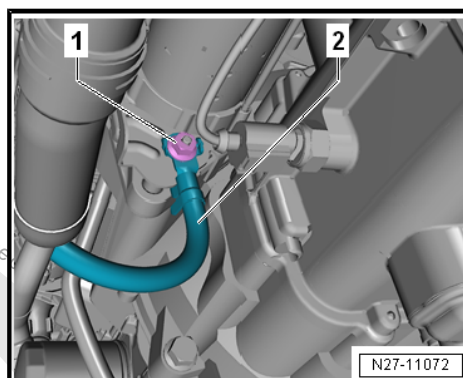




- If fitted, unscrew nut -1- from upper bolt of starter - B- .
- If fitted, remove earth cable -2-.



- If fitted, unscrew nut -1- from lower bolt of starter - B- .
- If fitted, remove earth cable -2-.



- Unscrew nut -4- and remove retainer -1- with wiring harness attached.
- Unscrew securing bolts -2- and -5- from starter - B- -3-.
- Remove starter - B- -3- downwards.

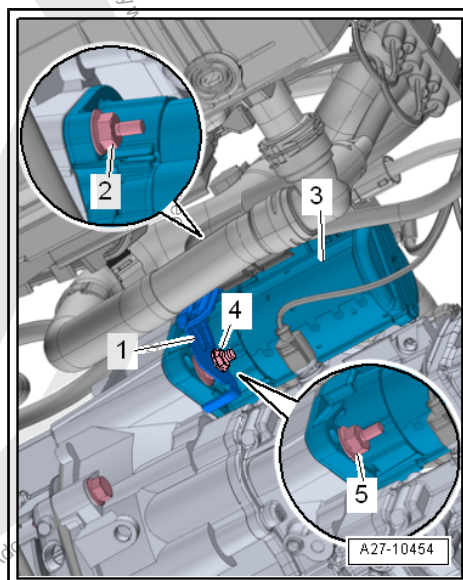
Installing

Install in reverse order of removal, observing the following:

- Connect batteries ⇒ [page 8](#) .

Torque settings

- ♦ ⇒ ["3.1.1 Assembly overview - starter, vehicles with manual gearbox MQ250, MQ500", page 33](#)

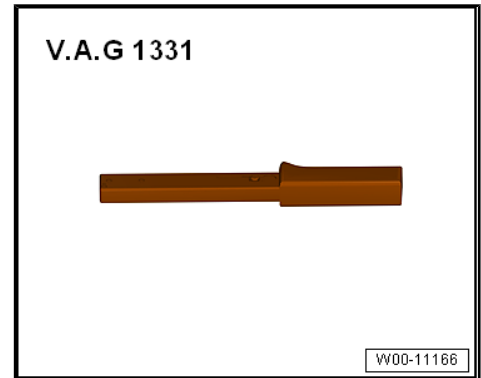


3.2.2 Removing and installing starter, vehicles with 4-cyl. injection engine and dual clutch gearbox DQ500

Special tools and workshop equipment required



◆ Torque wrench - V.A.G 1331-



◆ Torque wrench - V.A.G 1332-



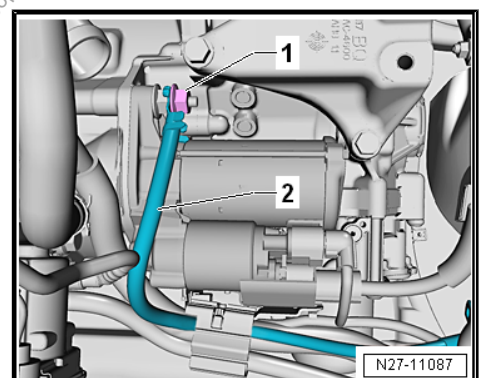
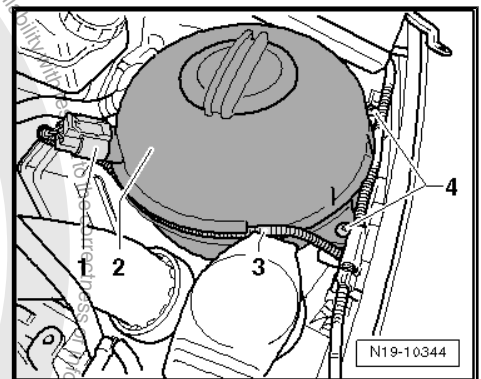
Removing

- Disconnect battery ➔ [page 8](#) .
- Release and disconnect connector -1-.
- Unclip wiring harness -3- from coolant expansion tank -2-.
- Remove securing bolts -4-.
- Lay coolant expansion tank -2- to one side with hoses still connected.



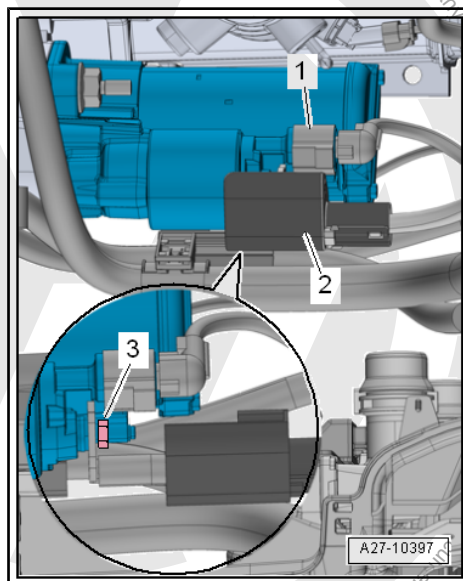
Note

- ◆ *To gain better access to the starter, the gearbox breather hose may have to be unclipped and the retainer for the charge pressure sender may have to be removed.*
- ◆ *Remove battery tray ➔ [page 15](#) and retainer for charge pressure sender.*
- Depending on vehicle equipment, unscrew nut -1- from upper bolt of starter - B- and remove earth cable -2-.





- Release and disconnect connector -1-.
- Press off cap -2-.
- Unscrew securing nut -3-, and remove line for terminal 30/B+.



- Unscrew nut -4- and remove retainer -1- with wiring harness attached.
- Unscrew securing bolts -2- and -5- from starter - B- -3-.
- Remove starter - B- -3- upwards.

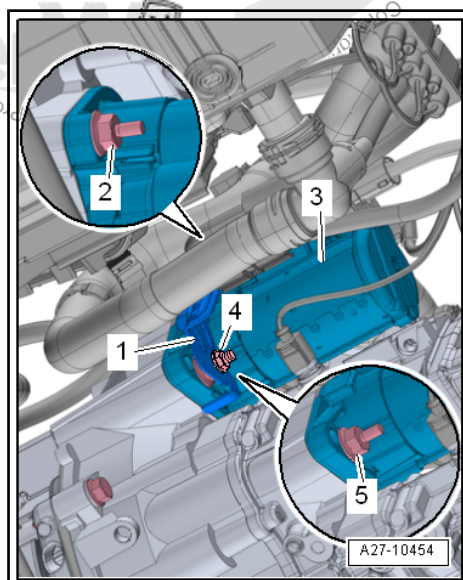
Installing

Install in reverse order of removal, observing the following:

- Connect batteries ⇒ [page 8](#) .

Torque settings

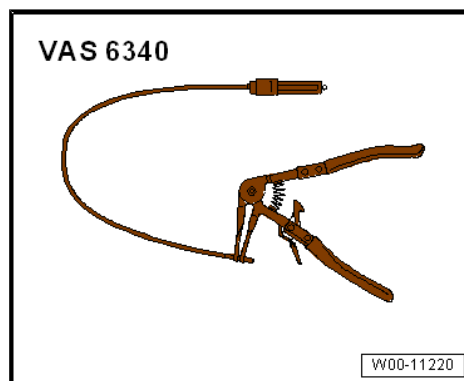
- ♦ ⇒ ["3.1.2 Assembly overview - starter, vehicles with dual clutch gearbox DQ500", page 34](#)



3.2.3 Removing and installing starter, vehicles with 4-cyl. diesel engine and dual clutch gearbox DQ500

Special tools and workshop equipment required

- ♦ Hose clamp pliers - VAS 6340-





- ◆ Torque wrench - V.A.G 1331-

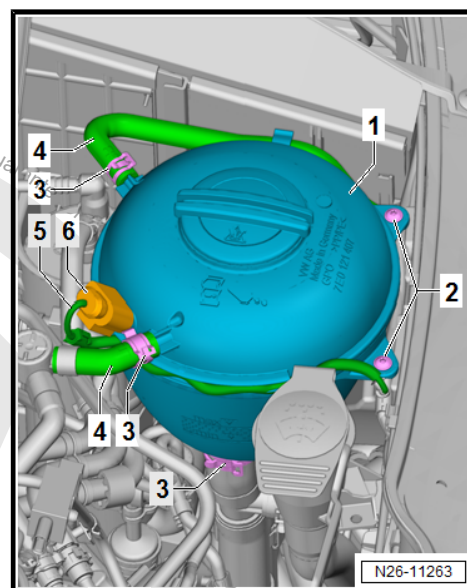
V.A.G 1331



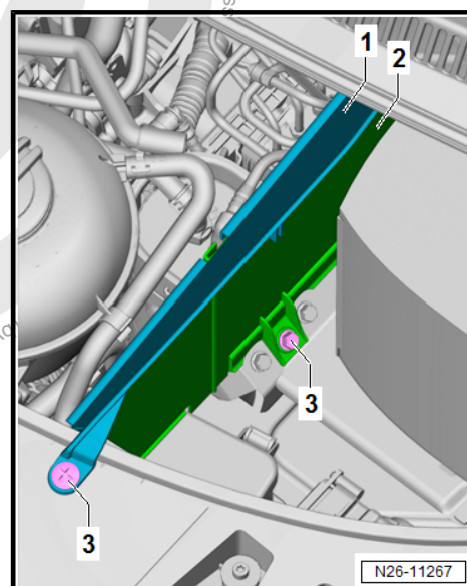
W00-11166

Removing

- Disconnect battery ➔ [page 8](#) .
- If fitted, remove engine cover panel ➔ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Drain coolant ➔ Rep. gr. 19 ; Cooling system/coolant; Draining and filling coolant .
- Unscrew bolts -2-.
- Separate connector -6-.
- Unclip wiring harness -5-.
- Loosen clips -3-.
- Pull off coolant hoses -4-.
- Remove coolant expansion tank -1-.



N26-11263



N26-11267



- Remove cover -1- and -2-.
- Detach coolant hose from retainer -5-.
- Pull off vacuum hoses -7- and place to one side.
- Separate connector -6-.



WARNING

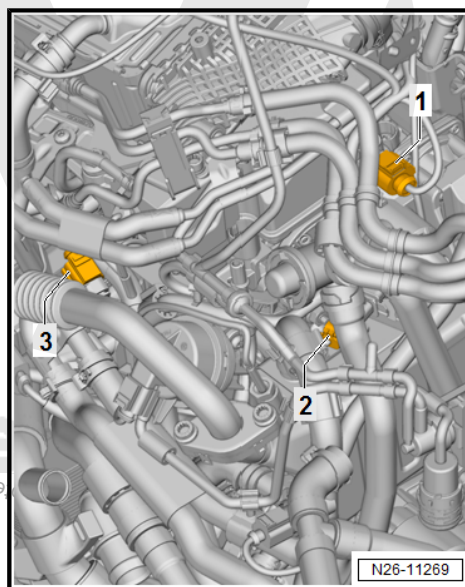
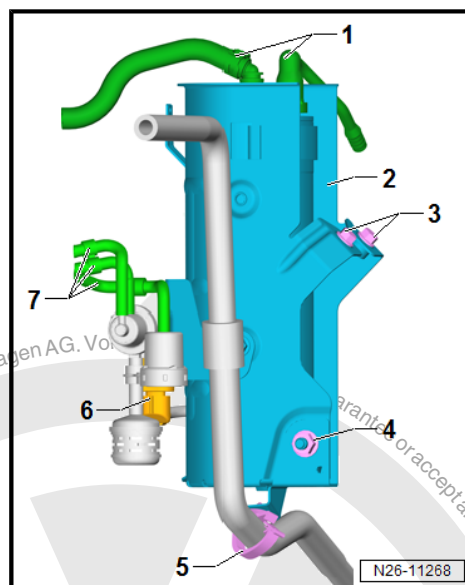
The fuel line is under pressure.

Fuel poses danger of injury to eyes and skin.

Wear protective goggles and protective clothing to avoid injury and contact with the skin. Wrap a cloth around the connection before loosening hose connections. Then reduce pressure by carefully opening the connection.

- Release fuel hoses -1-.
- Unscrew nut -4-.
- Unscrew bolts -3-.
- Remove fuel filter bracket -2- with fuel filter.
- Separate electrical connectors -1-, -2- and -3-.
- Lay wiring harnesses aside.

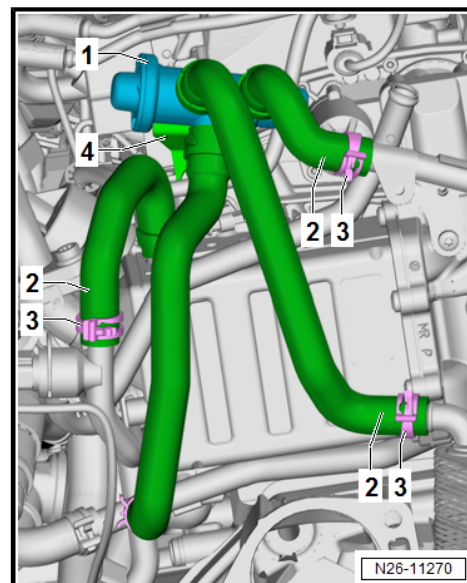
Vehicles with bi-turbo



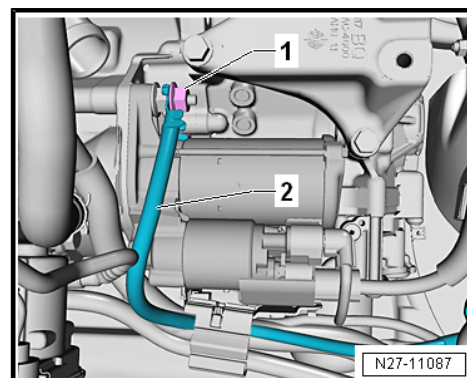


- Loosen clips -3-.
- Pull off coolant hoses -2-.
- Release valve -1- in bracket -4-.
- Move valve -1- with coolant hoses aside slightly.

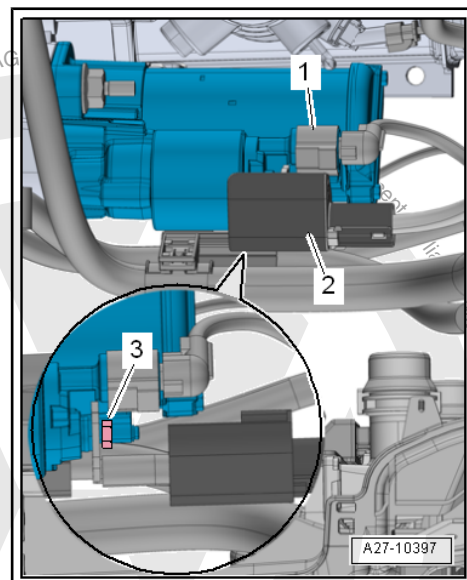
Continued for all vehicles:



- If fitted, unscrew nut -1- from upper bolt of starter - B- .
- Remove earth cable -2-.



- Separate connector -1-.
- Pull off cap -2-.
- Unscrew nut -3- and remove line for terminal 30/B+.





- Unscrew nut -4-.
- Remove retainer -1- with wiring harness still connected.
- Unscrew bolts -2- and -5- from starter - B- -3-.
- Remove starter - B- -3- upwards.

Installing

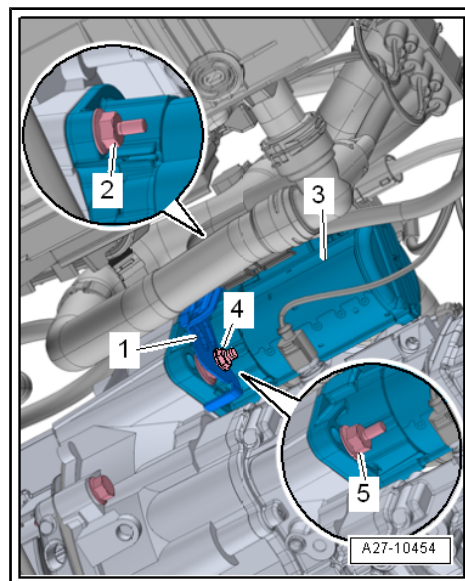
Install in reverse order of removal, observing the following:

- Connect batteries ⇒ [page 8](#) .

Torque settings

- ♦ ⇒ ["3.1.2 Assembly overview - starter, vehicles with dual clutch gearbox DQ500"](#), page 34

Component	Torque setting
Bolts for coolant expansion tank	3.5 Nm





4 Cruise control system (CCS)



Note

All instructions and information about this chapter: ➔ Electrical system; General information; Rep. gr. 27; Cruise control system (CCS).





5 Start/stop system

⇒ [“5.1 General description - start/stop system”, page 44](#)

⇒ [“5.2 Overview of fitting locations - start/stop system”, page 44](#)

⇒ [“5.3 Removing and installing voltage stabiliser”, page 45](#)

5.1 General description - start/stop system

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 moving on, the vehicle is driven for about 4 seconds at a minimum speed of 3 km/h.

Battery recharging 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 monitor control unit - J367- is not bridged. Charging the battery directly on the negative terminal causes the battery monitoring control unit to be bridged. The battery data is not collected by the battery monitoring control unit during the charging process. 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.

Renewing battery on vehicles with start/stop system



Note

- ◆ *Due to higher demands on the deep-cycle resistance, a special battery is used in vehicles equipped with a start/stop system.*
- ◆ *When renewing the battery, note the correct part designation ⇒ ETKA .*
- ◆ *Batteries intended for use in vehicles with a start/stop system are marked “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.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ [page 303](#) .

5.2 Overview of fitting locations - start/stop system

Observe safety precautions ⇒ [page 1](#) .

The illustration shows fitting locations for left-hand drive vehicles. Fitting locations for right-hand drive vehicles are similar.

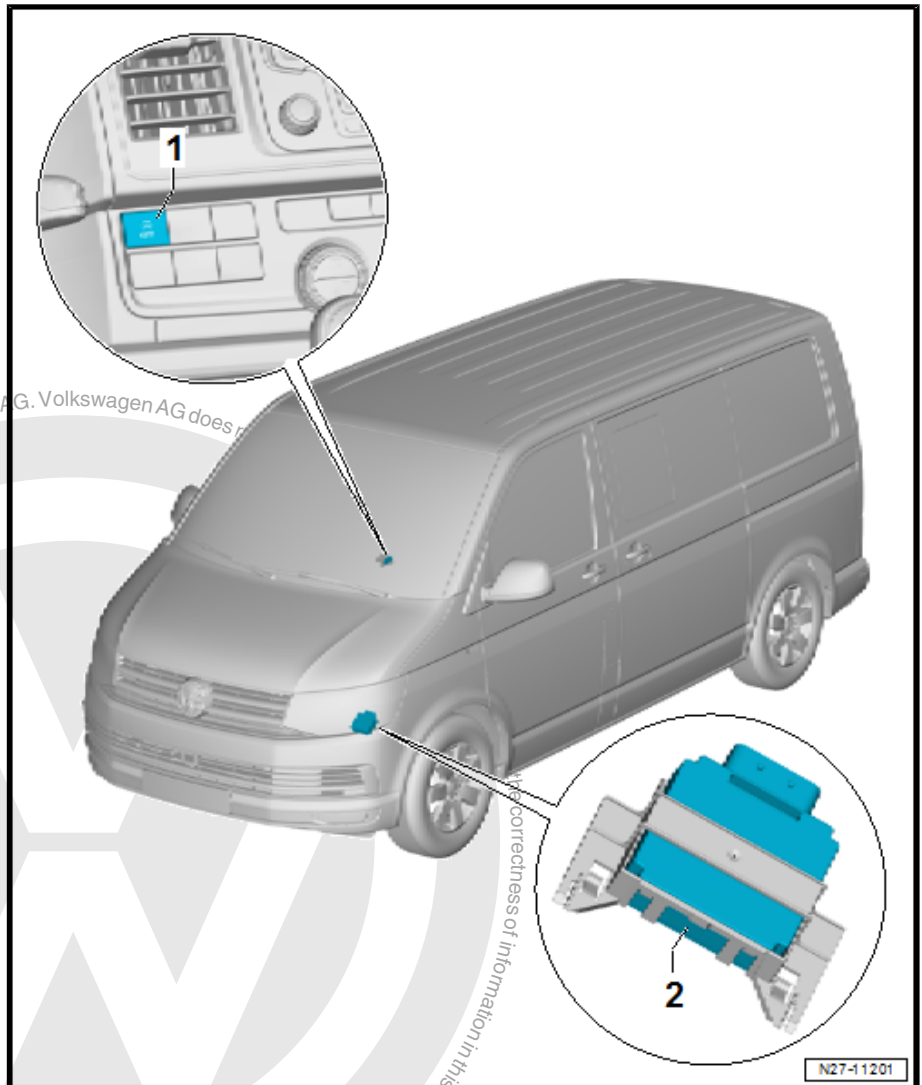


1 - Start/stop operation switch - E693-

- ☐ Installed in centre of dash panel.
- ☐ Removing and installing
⇒ [page 246](#)

2 - Engine (motor) control unit - J623-

- ☐ Installed in electronics box on left in engine compartment
- ☐ Removing and installing
⇒ Power unit; Rep. gr. 24 ; Engine control unit; Removing and installing engine control unit J623



5.3 Removing and installing voltage stabiliser

Role of voltage stabiliser:

Voltage dips occur in the onboard supply system each time the engine is started due to the high current draw of the starter. To prevent any failure in the infotainment components and the dash panel insert when the engine is restarted, the voltage supply to the infotainment system and the dash panel insert is protected by means of voltage stabilisation. To do this, terminal 30 is fed through a DC/DC converter during the starting process and the voltage is stabilised at 12V. The DC/DC converter is only active during the actual starting process (terminal 50). For other times, the converter is bridged with the aid of an internal relay and supply comes directly from the onboard supply system (terminal 30).



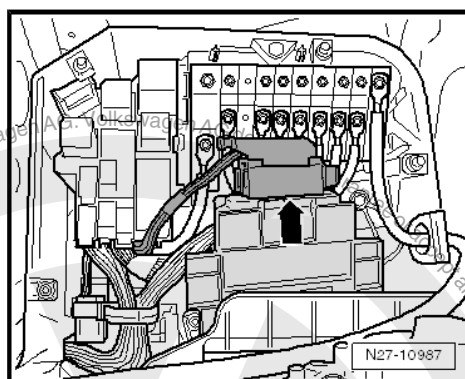
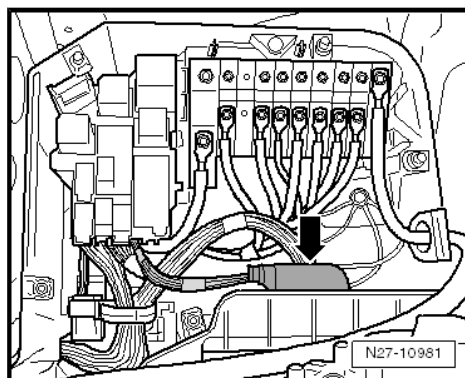
Effects in case of voltage stabiliser failure:

When the starter is operated and the voltage supply is insufficient for devices like radio, radio navigation or telephone they will perform a reset. 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. A direct entry regarding a voltage regulator malfunction, e.g. in the event memory of the diagnostic interface or the onboard supply control unit, does not occur at present. If radio, radio navigation and telephone units fail together, first check fuse of voltage regulator.

Location of the voltage stabiliser -arrow- in electronics box on the left in the engine compartment

Removing

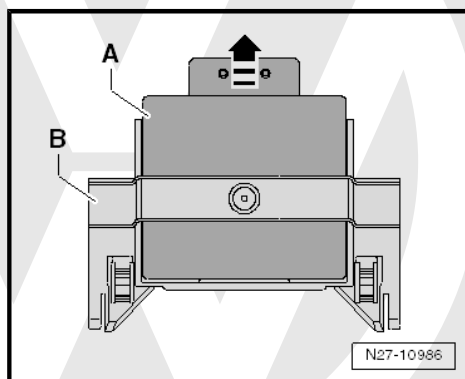
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Open electronics box on left side of engine compartment
⇒ [page 287](#) .
- Pull out voltage stabiliser together with holder in -direction of arrow-.
- Release connector on voltage stabiliser and pull connector off.



- Pull voltage stabiliser -A- out of holder -B- in -direction of arrow-.

Installing

Install in reverse order of removal.



6 Adaptive cruise control

⇒ ["6.1 Overview of fitting locations - adaptive cruise control", page 47](#)

⇒ ["6.2 Removing and installing automatic distance control unit", page 47](#)

⇒ ["6.3 Removing and installing trim for radar sensor", page 48](#)

⇒ ["6.4 Calibrating adaptive cruise control", page 49](#)

6.1 Overview of fitting locations - adaptive cruise control

1 - Dash panel insert - KX2-

- ☐ With control unit in dash panel insert - J285- .

2 - Holder

- ☐ ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Assembly overview - lock carrier

3 - Securing nuts

- ☐ Qty. 2
- ☐ 8 Nm.

4 - Retaining plate with adapter frame

- ☐ Serves as mounting bracket for adaptive cruise control unit - J428-
- ☐ With adjuster screws for adaptive cruise control unit - J428-

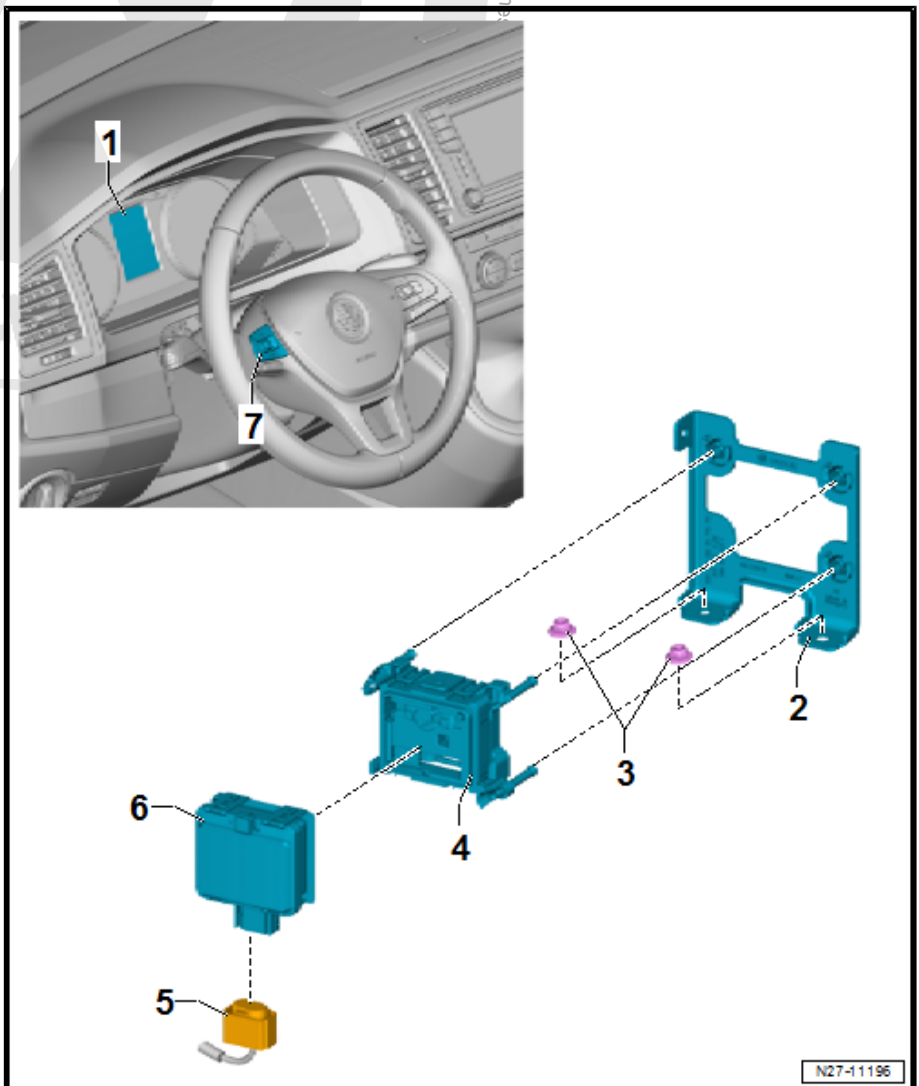
5 - Connector

6 - Adaptive cruise control unit - J428-

- ☐ Removing and installing ⇒ [page 47](#)
- ☐ Calibrating ⇒ [page 49](#)

7 - Adaptive cruise control button - E357-

- ☐ Integrated in multifunction steering wheel
- ☐ Removing and installing ⇒ Communication; Rep. gr. 91 ; Multifunction steering wheel; Removing and installing multifunction buttons in steering wheel -E441- / -E440- .

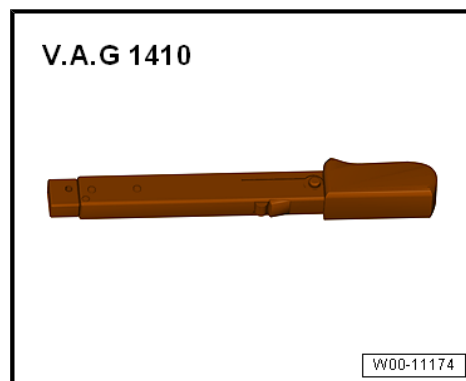


6.2 Removing and installing automatic distance control unit

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1410-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Removing trim for radar sensor ⇒ [page 48](#) .



Note

- ◆ *For reasons of clarity, the diagram shows removal without the bumper cover.*
- ◆ *The control unit can be removed without taking off the bumper cover.*
- Release and disconnect connector -3-.
- Unscrew securing nuts -2-.
- Remove adaptive cruise control unit - J428- -1- together with bracket forwards out of installation opening in radiator grille.

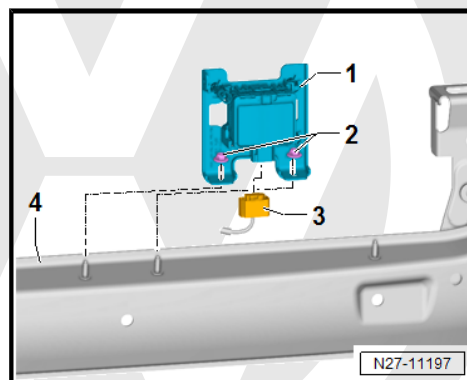
Installing

Install in reverse order of removal, observing the following:

- After installing, calibrate adaptive cruise control system ⇒ [page 49](#) .

Torque settings

- ◆ ⇒ ["6.1 Overview of fitting locations - adaptive cruise control", page 47](#)



6.3 Removing and installing trim for radar sensor



Note

- ◆ *The shape of the radar sensor trim depends on the type of bumper cover.*
- ◆ *Version -A- for unpainted commercial vehicle bumper covers.*
- ◆ *Version -B- for painted bumper covers.*

Removing

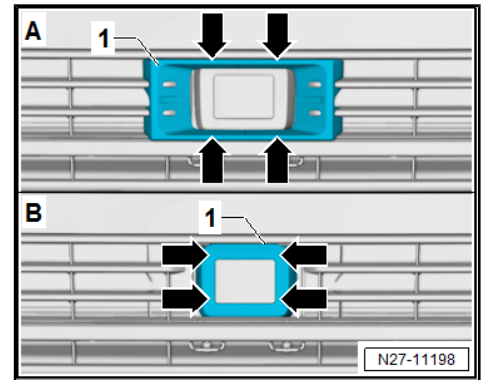
- Switch off ignition and all electrical equipment and then remove ignition key.



- Detach radar sensor trim -1- at fasteners -arrows- and remove.

Installing

Install in reverse order of removal.



6.4 Calibrating adaptive cruise control

Conditions

- The adaptive cruise control unit - J428- needs to be calibrated if the following conditions apply:
 - ◆ The rear axle toe setting has been adjusted.
 - ◆ The adaptive cruise control unit - J428- has been removed and reinstalled.
 - ◆ The front bumper support has been removed and installed.
 - ◆ The front bumper support has been loosened or moved.
 - ◆ The misalignment angle is greater than -0.8° to $+0.8^\circ$.
 - ◆ Dorothee85!
 - ◆ The vehicle has been brought into the service position.



Note

- ◆ *Excessive horizontal adjustment of the adaptive cruise control unit - J428- results in permanent deactivation of the functions ACC/front scan system. In this case, the following message appears in the dash panel insert - KX2- : ACC/front scan system not available.*
- ◆ *Limited sensor functionality due to soiling or weather conditions, e.g. heavy rain, snowfall, sensor icing etc., results in temporary loss of the ACC/front scan system functions. In this case, the following message appears in the dash panel insert - KX2- : ACC/front scan system: no sensor data.*
- Calibrate adaptive cruise control ⇒ Running gear, axles steering; Rep. gr. 44 ; Adaptive cruise control; Calibrating adaptive cruise control .

90 – Gauges, instruments

1 Dash panel insert

⇒ [“1.1 Assembly overview - dash panel insert”, page 50](#)

⇒ [“1.2 Removing and installing dash panel insert KX2”, page 51](#)

⇒ [“1.3 Removing and installing ambient temperature sensor”, page 52](#)

1.1 Assembly overview - dash panel insert



Note

The illustration shows fitting locations for left-hand drive vehicles. Fitting locations for right-hand drive vehicles are similar.

1 - Connector

- ☐ For dash panel insert

2 - Dash panel insert - KX2-

- ☐ With control unit in dash panel insert - J285-
- ☐ With immobiliser control unit - J362-
- ☐ Dash panel insert must be renewed if warning lamp LED or illumination for dash panel insert is defective
- ☐ Removing and installing
⇒ [page 51](#)
- ☐ Observe information about renewing

3 - Securing bolt

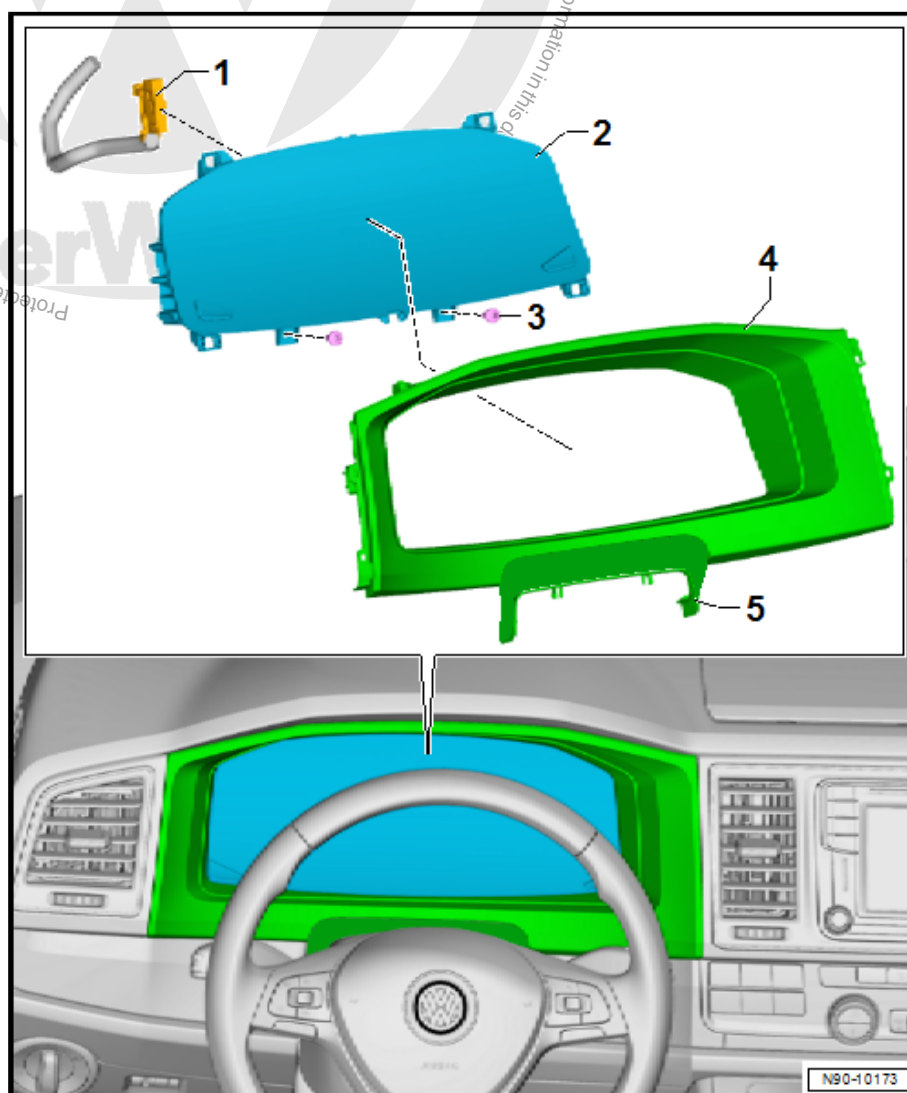
- ☐ Qty. 2
- ☐ 1.5 Nm

4 - Dash panel insert trim

- ☐ Removing and installing
⇒ General body repairs, interior; Rep. gr. 70 ; Compartments/covers; Removing and installing dash panel insert trim .

5 - Gap cover

- ☐ Part of dash panel insert trim; clipped into steering column trim at top

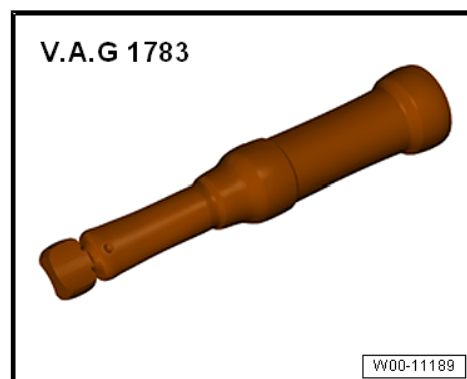




1.2 Removing and installing dash panel insert - KX2-

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



Note

- ◆ *All indicator lamps in the dash panel insert - KX2- are equipped with light-emitting diodes. Light-emitting diodes cannot be renewed separately if defective. The dash panel insert must be renewed.*
- ◆ *The dash panel insert - KX2- must not be dismantled.*
- ◆ *It is not necessary to remove the steering wheel prior to removal of the dash panel insert - KX2- .*
- ◆ *The control unit in dash panel insert - J285- and immobiliser control unit - J362- are integrated in the dash panel insert and cannot be renewed individually.*

Renewing dash panel insert



Note

- ◆ *If a new dash panel insert is installed in the vehicle, the control unit of the dash panel insert must be adjusted to the different combination possibilities depending on the associated country settings, number of cylinders and engine type.*
- ◆ *To adapt the integrated immobiliser to the engine control unit, the data from the engine control unit has to be stored in the replacement dash panel insert.*
- ◆ *Select "Renew" function for the respective control unit in "Guided Fault Finding" or "Guided Functions" mode ⇒ Vehicle diagnostic tester.*
- ◆ *After installing a new dash panel insert, all ignition keys must be adapted.*

Following components are integrated in the dash panel insert - KX2- :

- ◆ Control unit in dash panel insert - J285-
- ◆ Fuel gauge - G1-
- ◆ Speedometer - G21-
- ◆ Coolant temperature gauge - G3-
- ◆ Rev. counter - G5-



◆ Warning lamps

Removing

- Move steering wheel to rearmost and lowest position. Use the full range of the steering column adjustment for this purpose.
- Switch off ignition.
- Store the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.
- Remove dash panel insert trim ➔ General body repairs, interior; Rep. gr. 70 ; Compartments/covers; Removing and installing dash panel insert trim .
- Unscrew securing bolts -1-.



Note

The dash panel insert - KX2- is engaged in the dash panel. Therefore, a greater force is necessary to remove it.

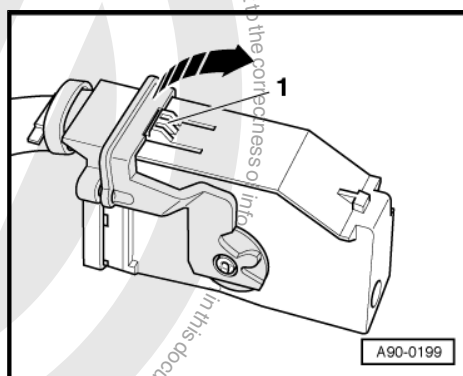
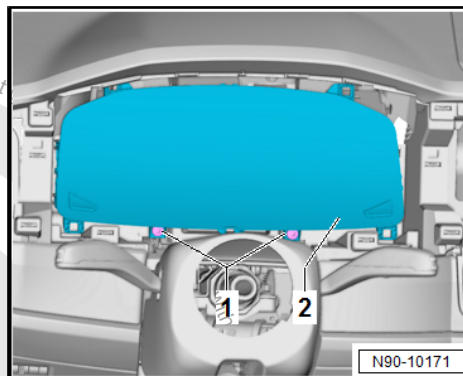
- Pull out dash panel insert - KX2- -2- until it makes contact with steering wheel.
- To separate electrical connector on back of dash panel insert, press locking detent -1- and swing retaining clip in direction of -arrow-.
- Remove dash panel insert - KX2- from between steering wheel and dash panel.

Installing

Install in reverse order of removal.

Torque settings

- ◆ ➔ [“1.1 Assembly overview - dash panel insert”, page 50](#)



1.3 Removing and installing ambient temperature sensor

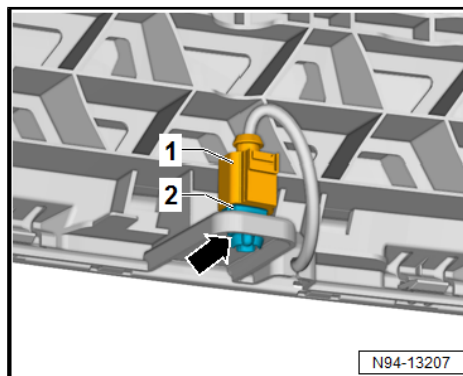
Removing

- Remove front bumper cover ➔ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover .
- Carefully press together retaining clips -arrow- and pull out ambient temperature sensor - G17- -2- from retainer.
- Release and disconnect connector -1-.

Installing

Install in reverse order of removal, observing the following:

On completion of repair work, interrogate event memory and erase any entries “Guided Fault Finding” ➔ Vehicle diagnostic tester.





2 Clock

⇒ ["2.1 Removing and installing clock", page 53](#)

2.1 Removing and installing clock

The clock is integrated in the dash panel insert and cannot be removed or renewed individually. In the event of damage, the dash panel insert must be renewed ⇒ [page 51](#) .





3 Horn

⇒ ["3.1 Assembly overview - horn", page 54](#)

⇒ ["3.2 Removing and installing treble horn H2 and bass horn H7", page 54](#)

3.1 Assembly overview - horn

1 - Nut securing bass horn

□ 9 Nm.

2 - Electrical connector of bass horn

3 - Bass tone horn

□ Removing and installing
⇒ [page 54](#)

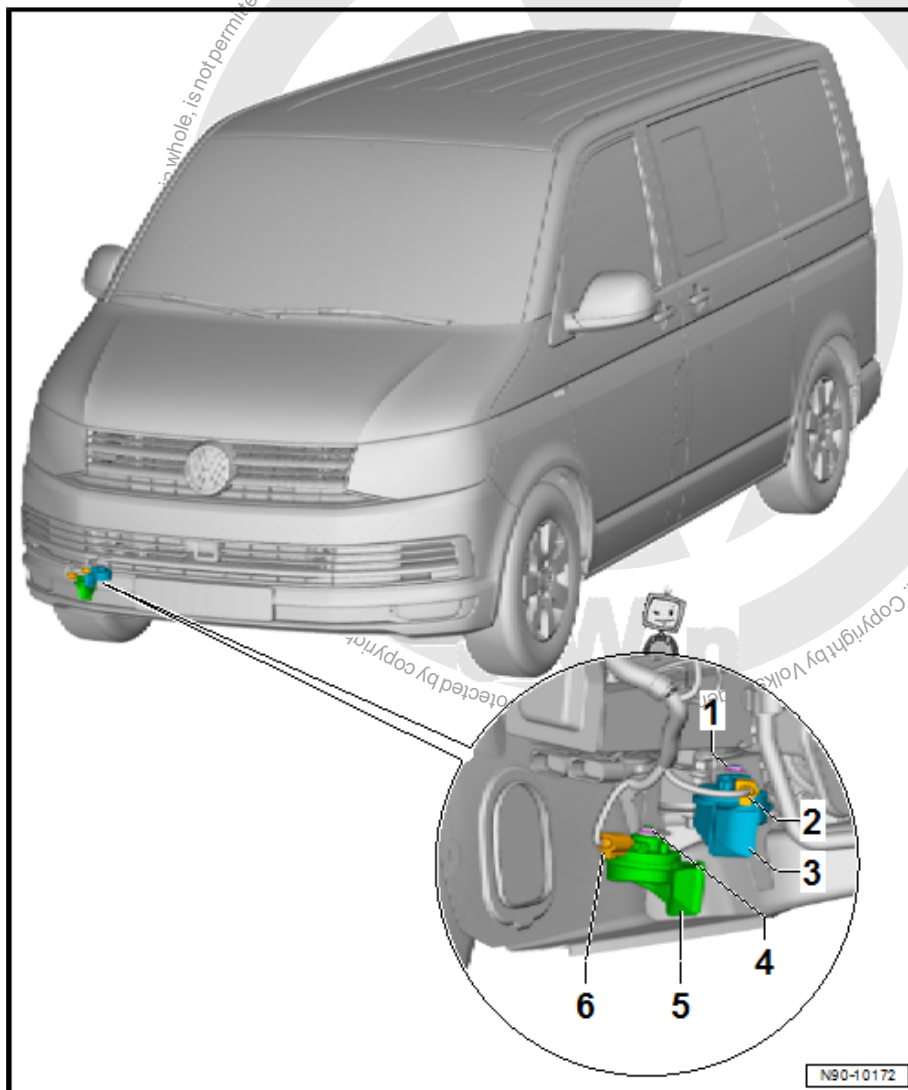
4 - Nut securing treble horn

□ 9 Nm.

5 - Treble tone horn

□ Removing and installing
⇒ [page 54](#)

6 - Electrical connector of treble horn



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

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-

V.A.G 1331



W00-11166

Removing



Note

The procedure for removal and installation of the bass horn - H7- (top) and the treble horn - H2- (bottom) is the same.

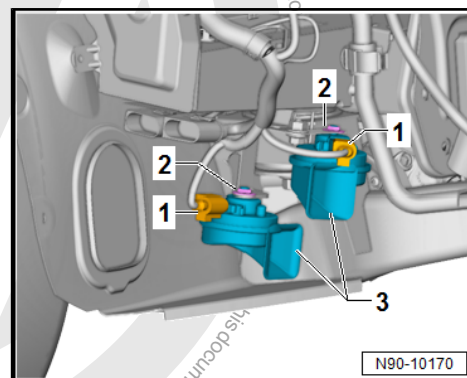
- Remove noise insulation under engine ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
- Release and disconnect connector -1-.
- Undo nuts -2-.
- Detach horn -3- from bracket.

Installing

Install in reverse order of removal, observing the following:

Torque settings

- ◆ ⇒ [“3.1 Assembly overview - horn”, page 54](#)



N90-10170



4 Tachograph "DTCO 1381"

⇒ ["4.1 General description - tachograph DTCO 1381", page 56](#)

⇒ ["4.2 Overview of fitting locations - tachograph DTCO 1381", page 57](#)

⇒ ["4.3 Removing and installing tachograph DTCO 1381", page 58](#)

⇒ ["4.4 Messages displayed on tachograph DTCO 1381", page 60](#)

⇒ ["4.5 Connector pin assignment - tachograph DTCO 1381", page 62](#)

⇒ ["4.6 Removing and installing tachograph sender G75", page 63](#)

4.1 General description tachograph "DTCO 1381"

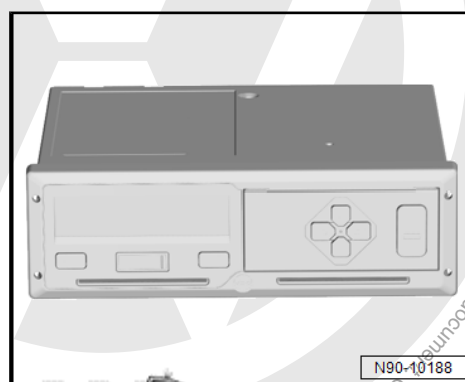
Tachograph "DTCO 1381"

The tachograph is installed and sealed by authorised personal. Do not modify the unit or any wires.



Note

- ◆ *Sealing and activating the tachograph - G24- may only be carried out by authorised specialist workshops in accordance with § 57b StVZO (German vehicle licensing regulations).*
- ◆ *Additional information and diagnosis instructions for the tachograph - G24- can be found in the ⇒ operating manual of the vehicle and in the ⇒ operating manual of the tachograph.*
- ◆ *When retrofitting, repairing or fault finding, observe: ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*



Do not insert other types of cards in the card slot, for example credit cards, cards with embossed lettering or metal cards. They will damage the card slot of the tachograph.

Access rights to the data stored in the memory of the tachograph are regulated by legislation and are only released with the corresponding tachograph card.

Changing roll of paper ⇒ Operating Instructions

If the tachograph has not been activated as a monitoring unit, the display will show two rectangles, one above the other, next to the time display. Apart from the workshop card the tachograph will accept no other tachograph card. Ensure that the tachograph is immediately and properly brought into operation by an authorised workshop.

The tachograph cards prescribed by the legislator can be obtained through the authorities of the EU member states. Colour marked tachograph cards are available for the following users according to access rights and use:

Colour of card	Application
White	Driver card used to share driver identity with tachograph. The driver card is intended for normal vehicle operation.
yellow	Company card used to share identity of company with tachograph and to access company data. The company card is designed for owners and operators of vehicles.



Colour of card	Application
blue	The control card used by authorities (police etc.) to identify themselves to the tachograph and to access the mass storage of the tachograph.
red	The workshop card used by personal of an authorised workshop. This card allows a workshop to perform authorised programming, calibration, activation and checks on a tachograph.

Locking of tachograph card: a mechanical lock prevents the tachograph card from being removed after it has been inserted and accepted by the tachograph. Removal of the tachograph card is only possible when:

- ◆ Ignition is switched »ON« and vehicle is stationary.
- ◆ On request by the user.
- ◆ After saving the data defined by the regulation on the tachograph card.

Checking and repairing tachograph

The tachograph must be checked when the following occurs:

- ◆ Always when changing to different tyres; this is because the effective diameter of the tyres may change.
- ◆ Always whenever the tachograph is repaired.
- ◆ When the official registration number of the vehicle is changed.
- ◆ When the UTC time (universal time coordinated) of the tachograph deviates by more than 20 minutes.
- ◆ After a period of 2 years (at least every 2 years) the tachograph must be checked by the tachograph manufacturer or a specialist workshop authorised by the manufacturer.



Note

- ◆ *Checks and repairs on the tachograph - G24- can only be carried out by the tachograph manufacturer or by a specialist workshop authorised by this manufacturer.*
- ◆ *Sealing and activating the tachograph - G24- may only be carried out by authorised specialist workshops in accordance with § 57b StVZO (German vehicle licensing regulations).*
- ◆ *Manipulating the tachograph or its signal functions is an offence and can be prosecuted.*

Fault detection and fault display:

The tachograph "DTCO 1381" is equipped with self-diagnosis.

For fault finding, use the systems described in chapter "Vehicle diagnosis, testing and information system" in "Guided Fault Finding" mode ⇒ Vehicle diagnostic tester.

Fault messages are displayed on the tachograph display
⇒ ["4.4 Messages displayed on tachograph DTCO 1381"](#),
[page 60](#) .

4.2 Overview of fitting locations - tachograph "DTCO 1381"



1 - Dash panel insert - KX2-

- ❑ Removing and installing
⇒ [page 51](#)

2 - Tachograph - G24- "DTCO 1381"

- ❑ Installed in centre of dash panel.
- ❑ Removing and installing
⇒ [page 58](#)
- ❑ Connector pin assignment
⇒ [page 62](#)
- ❑ New version (release 2.2)

3 - Printout from tachograph

- ❑ Changing roll of paper
⇒ Operating Instructions

4 - Tachograph sender - G75-

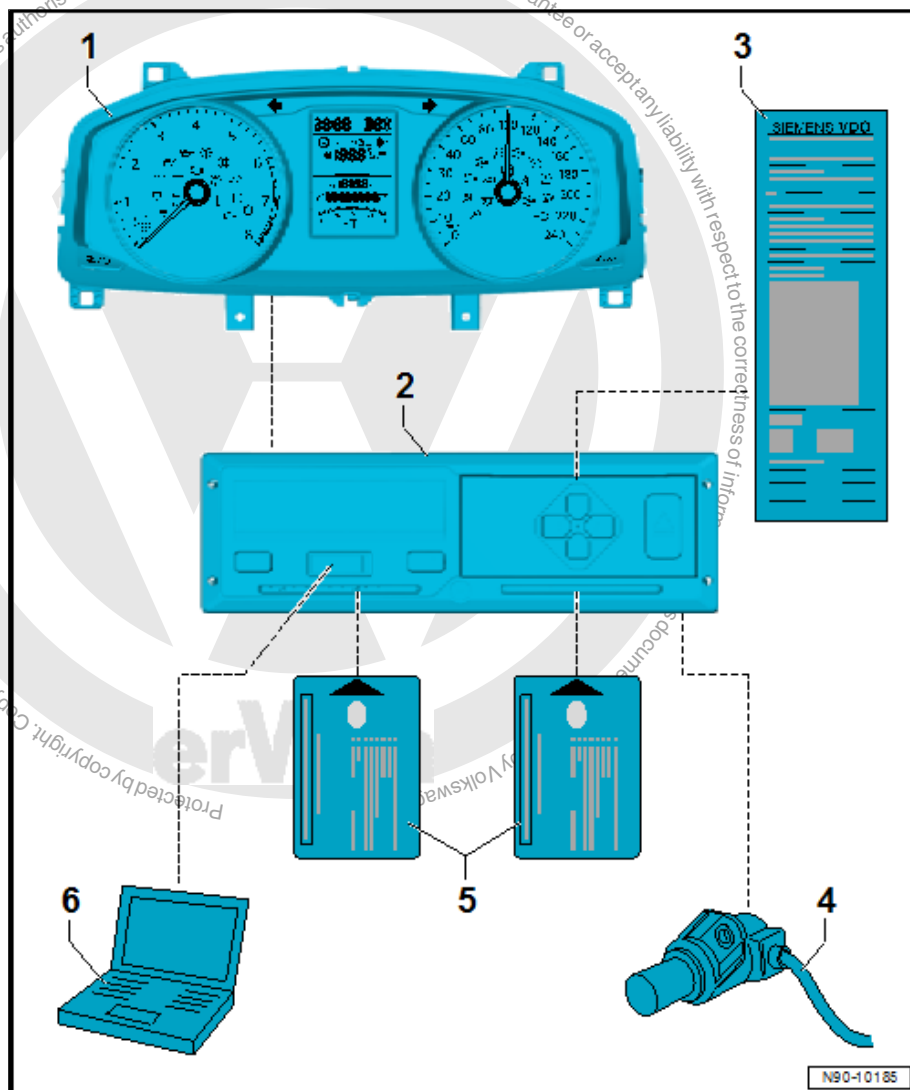
- ❑ Installed on gearbox.
- ❑ Removing and installing
⇒ [page 63](#)
- ❑ Provides real-time signals and encrypted data for capturing distance and velocity.
- ❑ The tachograph can detect external tampering and influences through data communication and comparison with the real-time signal.
- ❑ Specified torque, vehicles with 5-speed manual gearbox: 6 Nm
- ❑ Specified torque, vehicles with 6-speed manual gearbox: 45 Nm
- ❑ Specified torque, vehicles with automatic gearbox/dual clutch gearbox: 45 Nm

5 - Tachograph card

- ❑ Assignment of the different card colours ⇒ [page 56](#)

6 - Retrieval software with data exchange connection

- ❑ Reads data on tachograph
- ❑ Pin assignment for data exchange connection ⇒ [page 62](#)



4.3 Removing and installing tachograph "DTCO 1381"



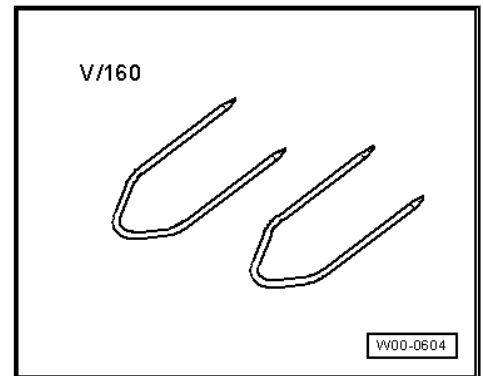
Note

- ◆ Depending on the model, the factory-fitted tachograph - G24- can be installed between the central vents in the dash panel or in an additional console on the dash panel. The procedure for removing and installing is the same.
- ◆ If necessary, remove additional dash panel console ⇒ Rep. gr. 68.



Special tools and workshop equipment required

- ◆ Release tool - V /160-



- Download tachograph data if tachograph is to be repaired or renewed.

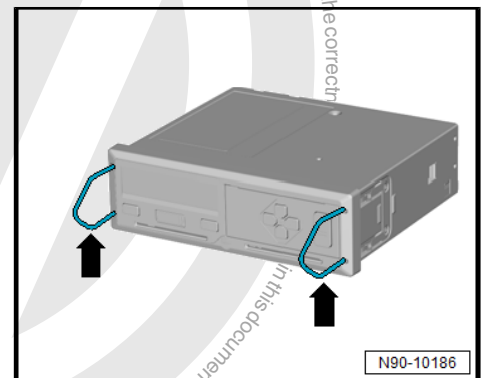


Note

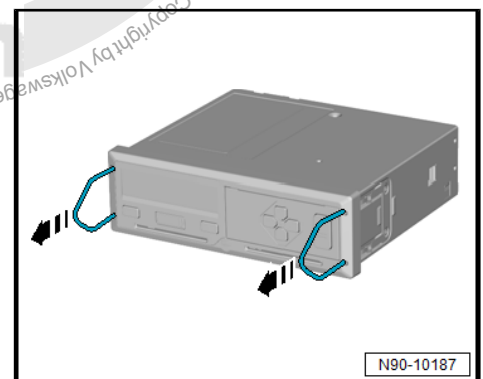
Repairing or exchanging: the authorised workshop can download the tachograph data and hand them over to the respective company/business. If the data cannot be downloaded because of a defect, the workshop must provide the customer with a certificate stating this.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Insert both release tools into the intended openings in the tachograph -arrows- and engage them.



- Pull tachograph in -direction of arrows- out of dash panel using release tools.

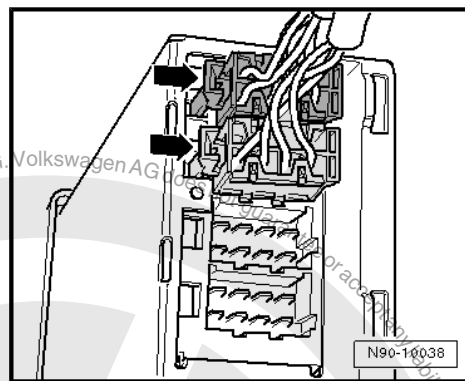




- Release and disconnect the two connectors -arrows-.

Installing:

Install in reverse order of removal.



4.4 Messages displayed on tachograph “DTCO 1381”

This chapter describes the most important messages displayed on the tachograph and their causes. It is not a replacement for the self-diagnosis using the → Vehicle diagnostic tester.

Fault table

Indicated on display:	Meaning	Measures
Power interruption	The power was disconnected or the power supply to the tachograph or distance sender was too low. Under certain circumstances, this message may also be displayed when the engine is started.	Continue fault finding via vehicle self-diagnosis.
Internal fault	Serious fault in tachograph. The following are possible causes: <ul style="list-style-type: none"> ◆ Unexpected programme or processing time fault. ◆ Switching elements blocked or pressed simultaneously for some time. ◆ Communication fault with external devices. ◆ Communication fault with dash panel insert ◆ Fault with pulse output. ◆ Fault in the card mechanics. 	<ul style="list-style-type: none"> ◆ Check function of switching elements ◆ Check connecting wires to external units. ◆ Check dash panel insert using self-diagnosis. ◆ Check tachograph using self-diagnosis. ◆ Remove tachograph card and reinsert
Printer fault	The printer supply voltage has failed or the temperature sensor for the printing head is defective.	<ul style="list-style-type: none"> ◆ Acknowledge message ◆ Repeat process and, if necessary, switch ignition off and on again.
Download fault	Fault while downloading the data to an external device	<ul style="list-style-type: none"> ◆ Acknowledge message ◆ Repeat data download once again. ◆ Check connecting wires to external device or external device itself.



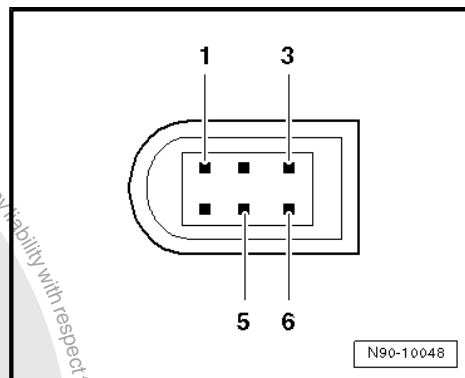
Indicated on display:	Meaning	Measures
Card fault	A communication fault has occurred during reading or writing of a tachograph card, e.g. due to dirty contacts. As a result, it is possible that the data will not be recorded completely on the tachograph card.	Clean contacts of tachograph card and insert it again.
Printout delayed	An ongoing printout is interrupted or delayed because the temperature of the thermal printing head is too high.	Wait until cool. The printout will continue automatically as soon as the permissible condition is reached.
Printout not possible	A printout is not possible at the moment because: ◆ the ignition is switched off ◆ the temperature of the thermal printing head is too high ◆ or because the supply voltage is too low.	Request printout again when fault has been rectified.
Card error	An error has occurred when processing the tachograph card. The tachograph card is not accepted and is rejected.	◆ Clean contacts of tachograph card and insert it again. ◆ If this message is displayed again, check whether the tachograph card can be read correctly.
Wrong card	The inserted card is not a tachograph card. The card is not accepted and is ejected again.	Insert a valid tachograph card.
No data	The menu function cannot be called up because: ◆ no driver card is inserted, ◆ or a company card / control card is inserted in the card slot.	This message will disappear after 3 seconds. No measures required.
Entry stored	Acknowledgement that the tachograph has saved the entry.	This message will disappear after 3 seconds. No measures required.
Display impossible	No data can be displayed as long as the printing is in process.	This message will disappear after 3 seconds. No measures required.
Please wait!	The tachograph card has not yet been read completely. Menu functions cannot be called up.	This message will disappear after 3 seconds. No measures required.



4.5 Connector pin assignment - tachograph "DTCO 1381"

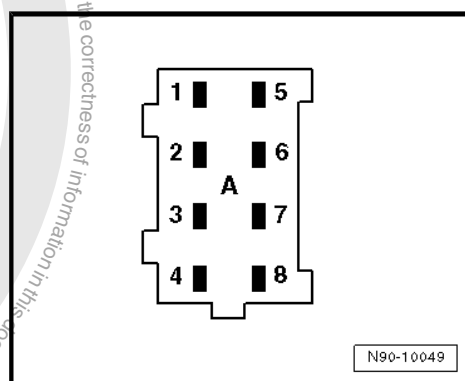
Connector for data exchange on front of unit

- 1 - 0 volt reference potential
- 2 - Not assigned
- 3 - RXD data interface, receive
- 4 - Not assigned
- 5 - 24 or 12 volt vehicle voltage
- 6 - TXD data interface, send



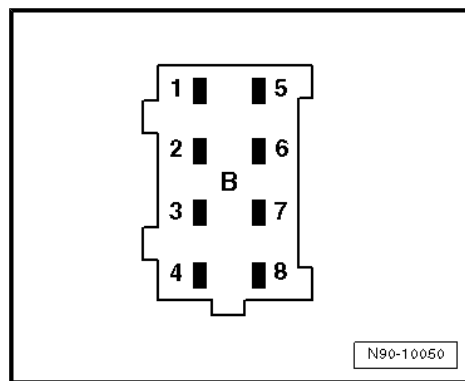
Connector "A"

- 1 - Terminal 30 voltage supply, positive
- 2 - Illumination, terminal 58d
- 3 - Voltage supply, positive, terminal 15
- 4 - CAN bus, high
- 5 - Voltage supply, negative, terminal 31a
- 6 - Terminal 31 voltage supply, negative
- 7 - CAN bus, negative
- 8 - CAN bus, Low



Connector "B"

- 1 - Voltage supply to tachograph sender, positive
- 2 - Voltage supply to tachograph sender, negative
- 3 - Speed signal for tachograph (real time)
- 4 - Data signal for tachograph
- 5 - Not assigned
- 6 - Sender pulse output
- 7 - Speed signal output (PWM)
- 8 - Signal for distance travelled (4 pulses per meter)



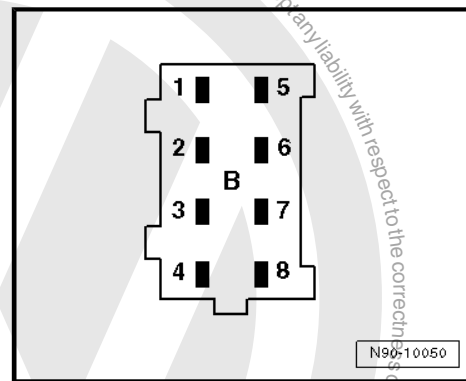
Connector "C"

This connector is not used.



Connector "D"

- 1 - Input for supplementary tachograph, flashing blue light (Hi level 12 volts: 9-15 V; 24 V: 9-30 V)
- 2 - Input for supplementary tachograph, siren (Hi level 12 volts: 9-15 V; 24 V: 9-30 V)
- 3 - Not assigned
- 4 - Output for TCO warning light (1.5 V, max. 20 mA)
- 5 - Not assigned
- 6 - Not assigned
- 7 - Not assigned
- 8 - Not assigned



4.6 Removing and installing tachograph sender - G75-

⇒ ["4.6.1 Removing and installing tachograph sender G75 , 5-speed manual gearbox", page 63](#)

⇒ ["4.6.2 Removing and installing tachograph sender G75 , 6-speed manual gearbox", page 65](#)

⇒ ["4.6.3 Removing and installing tachograph sender G75 , automatic gearbox/dual clutch gearbox", page 67](#)

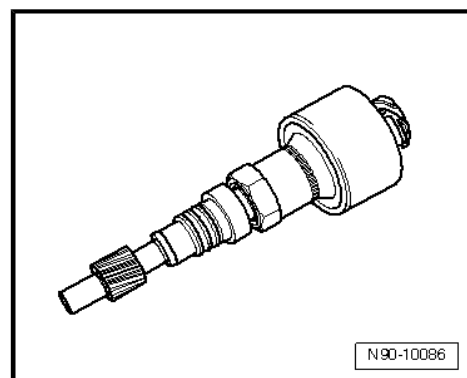
4.6.1 Removing and installing tachograph sender - G75- , 5-speed manual gearbox

Tachograph sender for 5-speed manual gearboxes.



Note

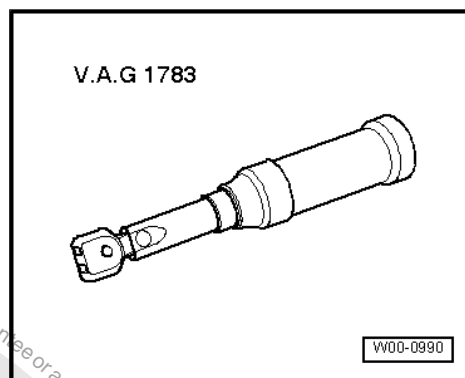
- ◆ *Checks and repairs on the tachograph - G24- can only be carried out by the tachograph manufacturer or by a specialist workshop authorised by this manufacturer.*
- ◆ *Sealing and activating the tachograph - G24- may only be carried out by authorised specialist workshops in accordance with § 57b StVZO (German vehicle licensing regulations).*
- ◆ *Additional information and diagnosis instructions for the tachograph - G24- can be found in the ⇒ operating manual of the vehicle and in the ⇒ operating manual of the tachograph.*
- ◆ *When retrofitting, repairing or fault finding, observe: ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *Manipulating the tachograph or its signal functions is an offence and can be prosecuted.*



Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing



Note

For reasons of clarity, the tachograph sender in the graphic is shown with the gearbox removed.

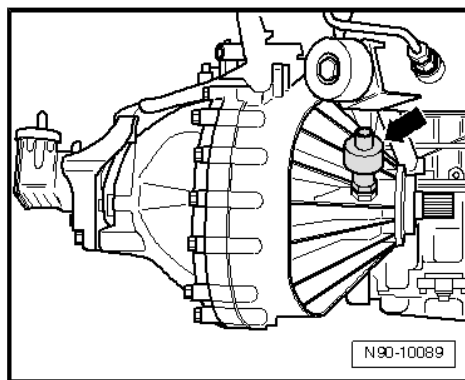
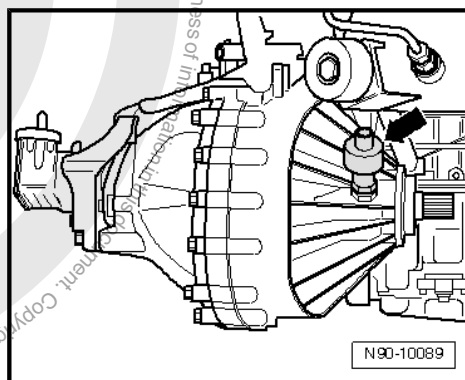
- Remove anti-tamper seal from tachograph sender.
- Disconnect connector on tachograph sender.
- Remove tachograph sender -arrow-.

Installing

- Install tachograph sender -arrow-, and tighten it to specified torque.
- Connect connector to tachograph sender.
- Fit anti-tamper seal with wire and aluminium seal on tachograph sender.

Torque settings

- ◆ ➔ ["4.2 Overview of fitting locations - tachograph DTCO 1381", page 57](#)





4.6.2 Removing and installing tachograph sender - G75- , 6-speed manual gear-box

Tachograph sender for 6-speed manual gearboxes

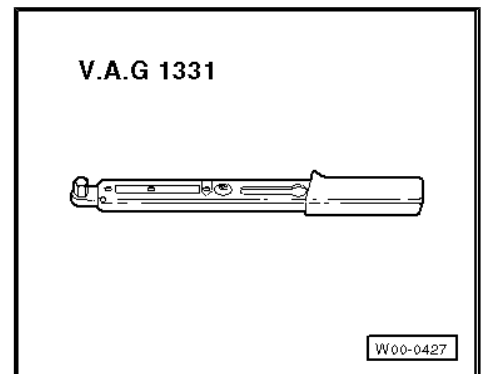
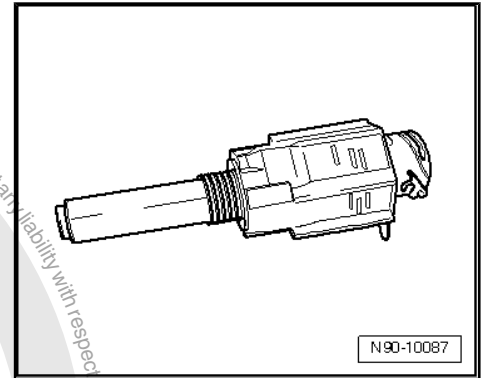


Note

- ◆ Checks and repairs on the tachograph - G24- can only be carried out by the tachograph manufacturer or by a specialist workshop authorised by this manufacturer.
- ◆ Sealing and activating the tachograph - G24- may only be carried out by authorised specialist workshops in accordance with § 57b StVZO (German vehicle licensing regulations).
- ◆ Additional information and diagnosis instructions for the tachograph - G24- can be found in the ⇒ operating manual of the vehicle and in the ⇒ operating manual of the tachograph.
- ◆ When retrofitting, repairing or fault finding, observe: ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Manipulating the tachograph or its signal functions is an offence and can be prosecuted.

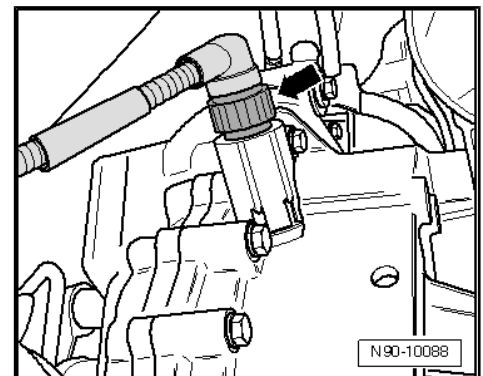
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



Removing

- Remove anti-tamper seal from tachograph sender.
- Disconnect connector -arrow- on tachograph sender.
- Destroy the plastic cap enclosing the tachograph sender.

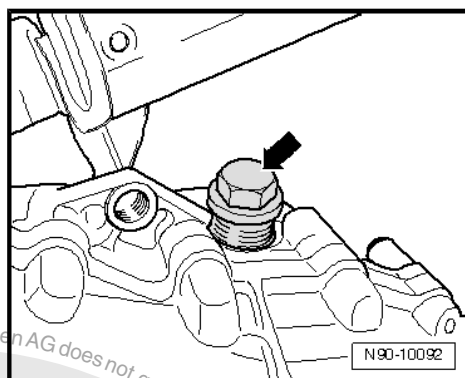
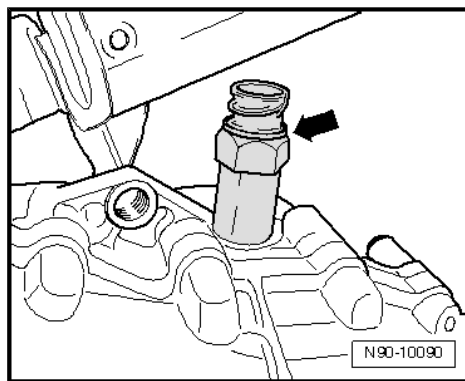




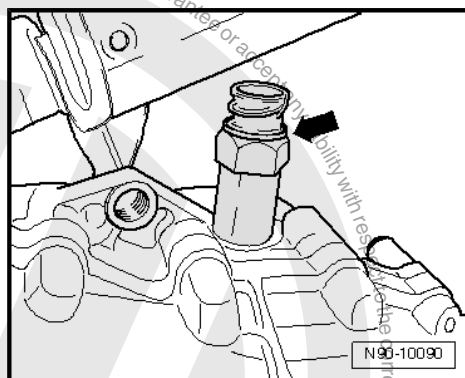
- Remove tachograph sender -arrow-.

Installing

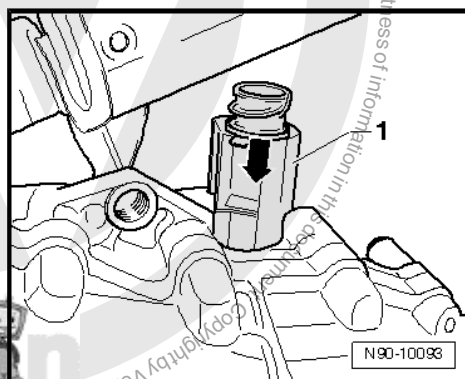
- If the tachograph sender is to be removed and fitted to another gearbox (replacement gearbox or new gearbox), first remove the M18 bolt with washer -arrow- from the new gearbox.



- Install tachograph sender -arrow-, and tighten it to specified torque.



- Fit a new cap -1- in -direction of arrow- onto tachograph sender until it audibly engages.

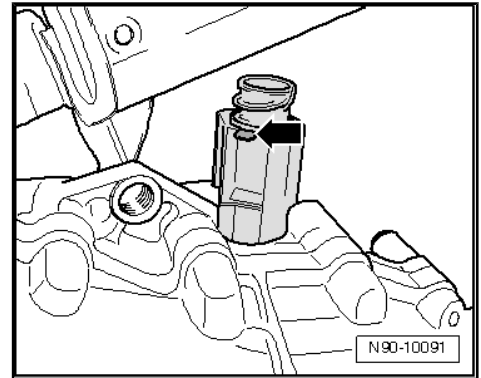




- When fitting the cap, align it so that the sealing tab -arrow- on the cap is pointing in the opposite direction to the diesel particulate filter.
- Attach anti-tamper seal on tachograph sender.

Torque settings

- ◆ ➔ [“4.2 Overview of fitting locations - tachograph DTCO 1381”](#), page 57



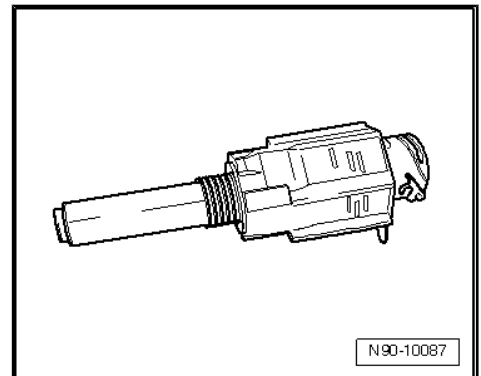
4.6.3 Removing and installing tachograph sender - G75- , automatic gearbox/dual clutch gearbox

Tachograph sender for automatic gearbox/dual clutch gearbox



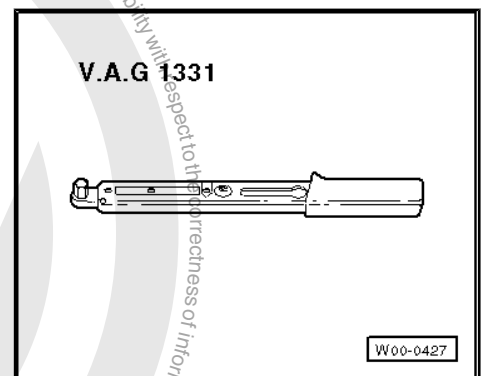
Note

- ◆ Checks and repairs on the tachograph - G24- can only be carried out by the tachograph manufacturer or by a specialist workshop authorised by this manufacturer.
- ◆ Sealing and activating the tachograph - G24- may only be carried out by authorised specialist workshops in accordance with § 57b StVZO (German vehicle licensing regulations).
- ◆ Additional information and diagnosis instructions for the tachograph - G24- can be found in the ➔ operating manual of the vehicle and in the ➔ operating manual of the tachograph.
- ◆ When retrofitting, repairing or fault finding, observe: ➔ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Manipulating the tachograph or its signal functions is an offence and can be prosecuted.



Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

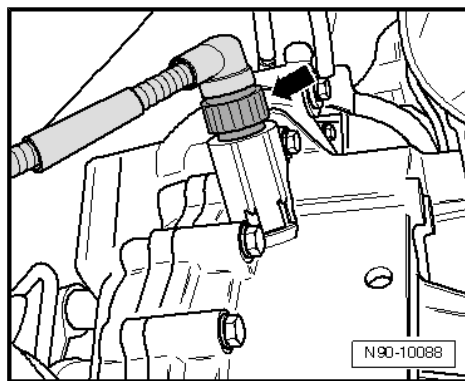


Removing

- Remove anti-tamper seal from tachograph sender.

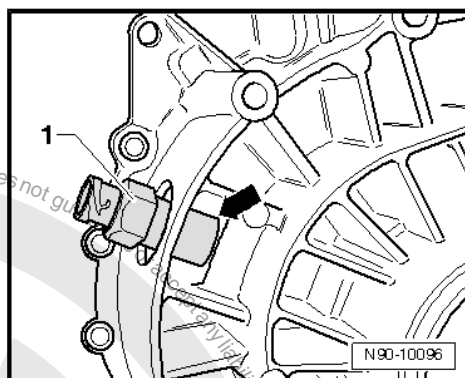


- Disconnect connector -arrow- on tachograph sender.
- Destroy the plastic cap enclosing the tachograph sender.

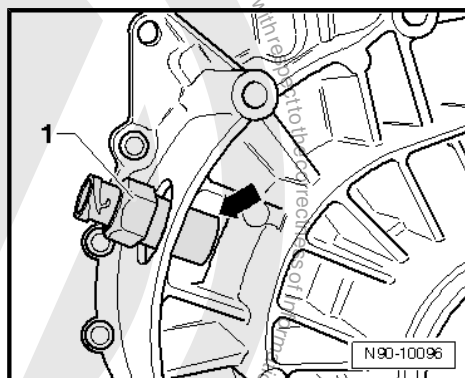


- Remove tachograph sender -1-.

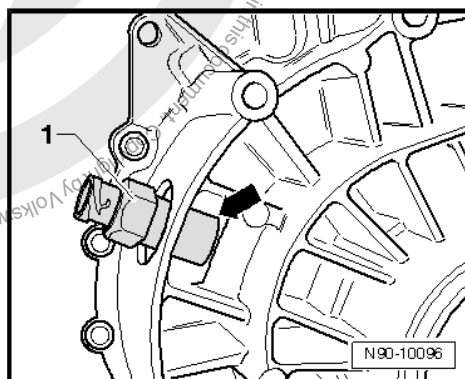
Installing



- If the tachograph sender is to be removed and fitted to another gearbox (replacement gearbox or new gearbox), first remove the M18 bolt with washer -arrow- from the new gearbox.

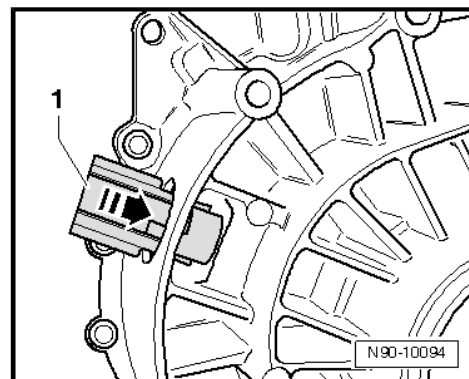


- Install tachograph sender -1-, and tighten it to specified torque.





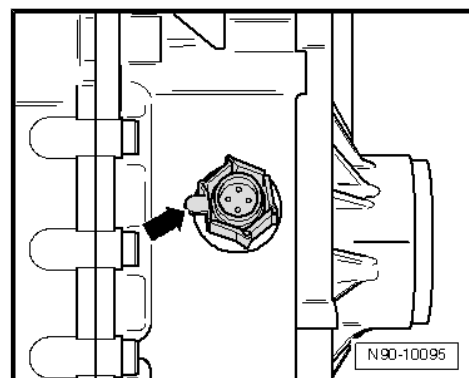
- Fit a new cap -1- in -direction of arrow- onto tachograph sender until it audibly engages.



- When fitting the cap, align it so that the sealing tab -arrow- on the cap is pointing in the opposite direction to the diesel particulate filter.
- Attach anti-tamper seal on tachograph sender.

Torque settings

- ◆ ⇒ ["4.2 Overview of fitting locations - tachograph DTCO 1381" - page 57](#)





92 – Windscreen wash/wipe system

1 windscreen wiper system.

⇒ [“1.1 Assembly overview - windscreen wiper system”, page 70](#)

⇒ [“1.2 Moving wipers to service position”, page 71](#)

⇒ [“1.3 Removing and installing wiper blade”, page 72](#)

⇒ [“1.4 Removing and installing wiper arms”, page 73](#)

⇒ [“1.5 Adjusting wiper arms”, page 74](#)

⇒ [“1.6 Removing and installing wiper frame with linkage and wiper motor V”, page 76](#)

⇒ [“1.7 Renewing wiper motor”, page 77](#)

⇒ [“1.8 Removing and installing rain and light sensor”, page 81](#)

1.1 Assembly overview - windscreen wiper system



Note

The illustration shows fitting locations for left-hand drive vehicles. Fitting locations for right-hand drive vehicles are similar.





1 - Wiper blade on front passenger side

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

2 - Wiper blade on driver side

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

3 - Wiper arm on driver side

- ☐ Removing and installing
⇒ [page 73](#)
- ☐ Adjusting ⇒ [page 74](#)

4 - Cover

5 - Nut

- ☐ 20 Nm.

6 - Securing bolt

- ☐ 5 Nm.

7 - Wiper frame with linkage

- ☐ Removing and installing
⇒ [page 76](#)

8 - Wiper motor - V-

- ☐ With wiper motor control unit - J400- .
- ☐ Replacing ⇒ [page 77](#)

9 - Support plate

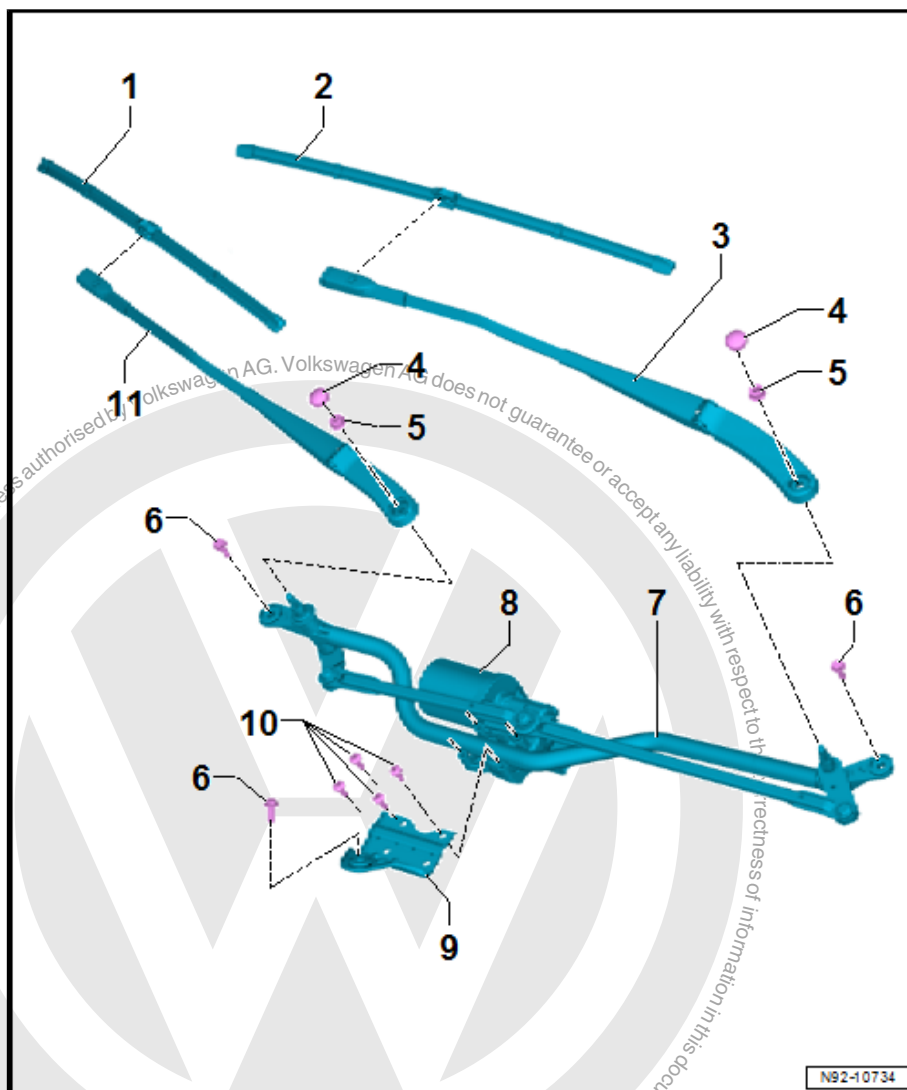
- ☐ Means of securing wiper motor - V- on wiper frame

10 - Securing bolts

- ☐ Means of securing wiper motor and retaining plate on wiper frame
- ☐ 8 Nm.

11 - Wiper arm on front passenger side

- ☐ Removing and installing ⇒ [page 73](#)
- ☐ Adjusting ⇒ [page 74](#)



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.

To remove wiper blades, wiper arms must be moved to “service position”.

- Switch on ignition briefly, then switch it off again.
- Actuate windscreen wiper lever in “flick wipe” position within 10 seconds.
- The wipers are moving to “service position”.
- For additional information, refer to ⇒ Vehicle operating manual .

1.3 Removing and installing wiper blade

Removing

- Move wipers to service position ⇒ [page 71](#) .



Caution

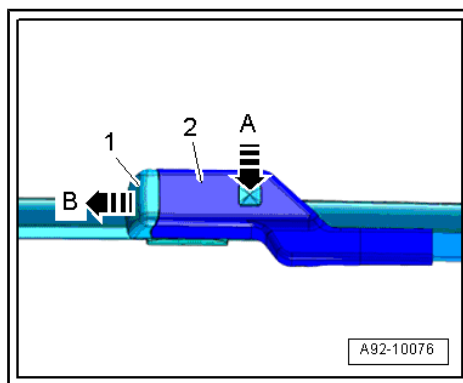
Risk of damage to the wiper blade.

- ◆ **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

Install in reverse order of removal, observing the following:

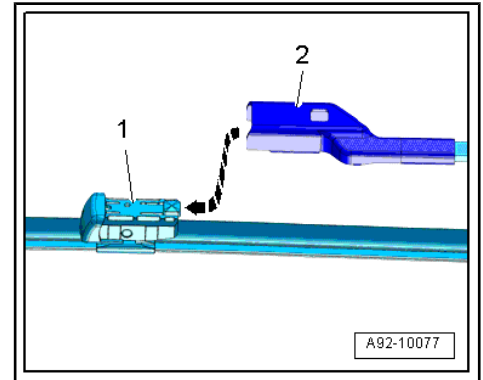




- Insert wiper blade -1- in parallel movement into wiper arm -2- -arrow-. Ensure that wiper blade -1- is pushed into wiper arm -2- until retaining clip is heard to engage.

To leave the “service position”:

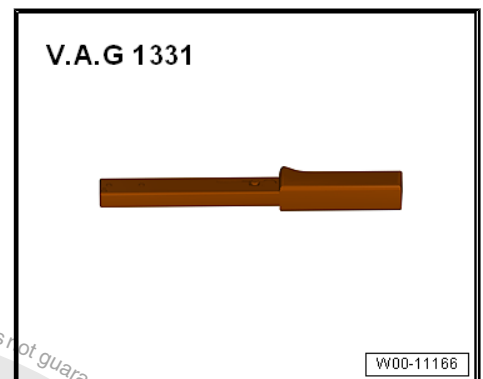
- Operate windscreen wiper switch. OR
- Drive vehicle faster than 6 km/h.



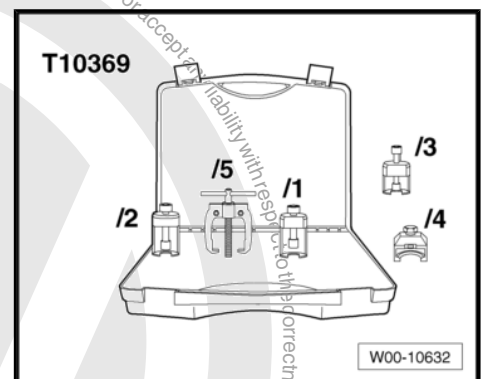
1.4 Removing and installing wiper arms

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Tapered roller bearing 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- .**





Note

- ♦ If it is necessary for the wiper motor to run during the working procedure, the bonnet must be closed as otherwise the power supply to the wiper motor will be interrupted.
- ♦ The removal and installation procedure is described for left-hand drive vehicles. Removal and installation for right-hand drive vehicles is similar.

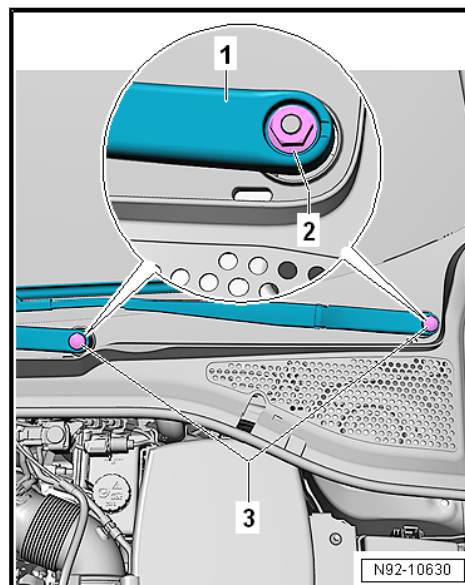
- Move wipers to service position ➔ [page 71](#) .
- Using a screwdriver, lever caps -3- off wiper arms -1-.
- Loosen nuts -2- a few turns.



Caution

The wiper shaft may be damaged.

Always use thrust piece -3- to loosen wiper arm.

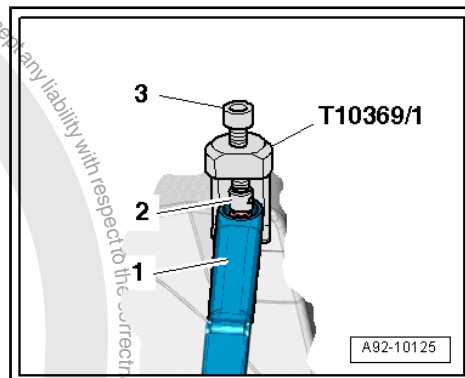


- Fit puller - T10369/1- to wiper arm -1- as shown in illustration.
- Fit thrust piece -2- on wiper shaft.
- Turn bolt -3- clockwise until wiper arm -1- is pulled off wiper shaft.
- Unscrew nut completely and remove wiper arm -1-.

Installing

Install in reverse order of removal, observing the following:

- Adjust wiper arms ➔ [page 74](#) .



1.5 Adjusting wiper arms

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1331-

V.A.G 1331



WV00-11166

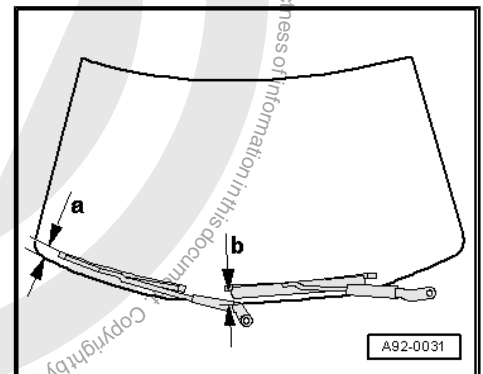
i Note

- ◆ *If it is necessary for the wiper motor to run during the working procedure, the bonnet must be closed as otherwise the power supply to the wiper motor will be interrupted.*
- ◆ *The removal and installation procedure is described for left-hand drive vehicles. Removal and installation for right-hand drive vehicles is similar.*
- Removing wiper arm ⇒ [page 73](#) .
- Switch on ignition.
- Actuate “flick wipe” function and allow wiper motor to move to its end position.
- Switch off ignition.
- Fit wiper arm together with attached wiper blade onto wiper shaft.
- Align wiper blade as follows against the windscreen:

i Note

The dimensions given here indicate the distance between the tip of the wiper blades to the upper edge of the plenum chamber cover.

- ◆ Dimension -a- = 25 mm ± 10 mm.
- ◆ Dimension -b- = 25 mm ± 10 mm.



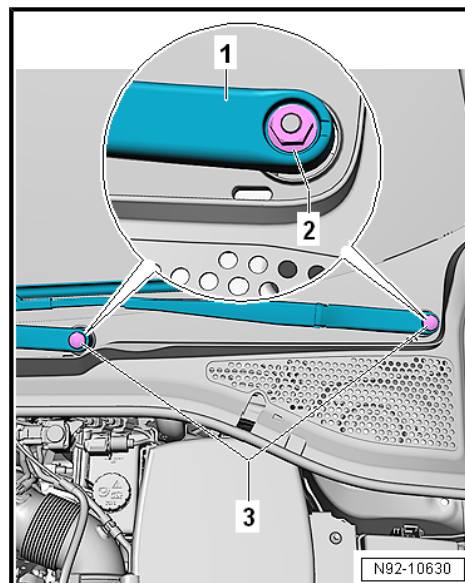
A92-0031



- Tighten nuts -2- for wiper arms -1-.
- Switch on ignition.
- Actuate "flick wipe" function and allow wiper arms move to their end position.
- Switch off ignition.
- Check wiper arm adjustment again and correct, if necessary.
- Press caps -3- onto wiper arms.

Torque settings

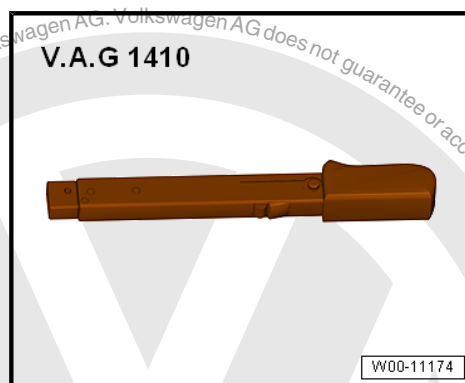
- ♦ ➔ ["1.1 Assembly overview - windscreen wiper system", page 70](#)



1.6 Removing and installing wiper frame with linkage and wiper motor - V-

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1410-



- ♦ Torque wrench - V.A.G 1331-



Removing

The removal and installation procedure is described for left-hand drive vehicles. Removal and installation for right-hand drive vehicles is similar.

- Move windscreen wipers to park position.
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Removing wiper arm ➔ [page 73](#) .



- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Plenum chamber cover; Removing and installing plenum chamber cover .
- Remove securing bolts -arrows-.
- Release and disconnect connector on wiper motor.
- Remove wiper frame with linkage and wiper motor - V- upwards from plenum chamber.

Installing

Install in reverse order of removal, observing the following:

- Install plenum chamber cover and wiper arms ⇒ [page 73](#) .
- Adjust wiper arms ⇒ [page 74](#) .

Torque settings

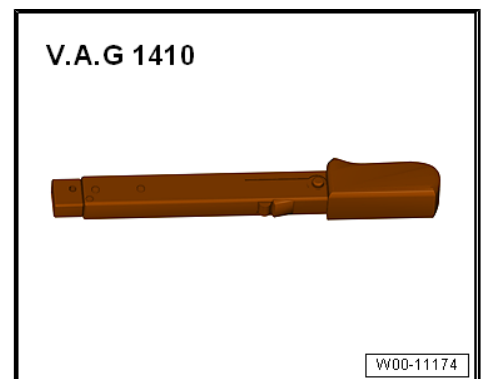
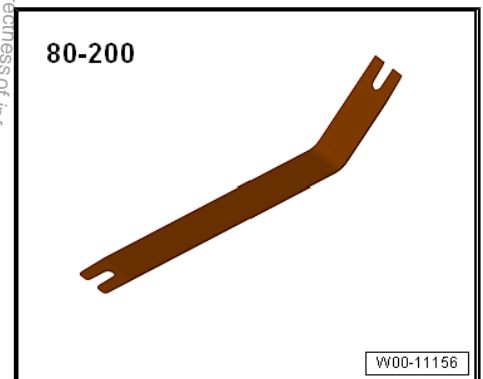
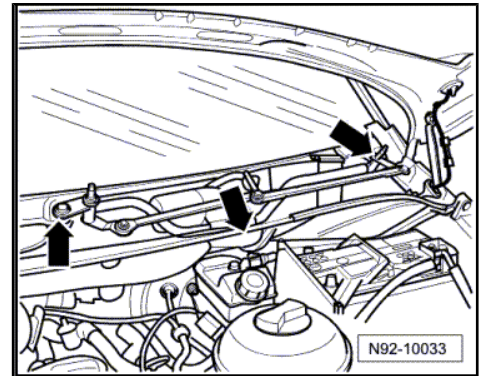
- ◆ ⇒ [“1.1 Assembly overview - windscreen wiper system”, page 70](#)

1.7 Renewing wiper motor

Special tools and workshop equipment required

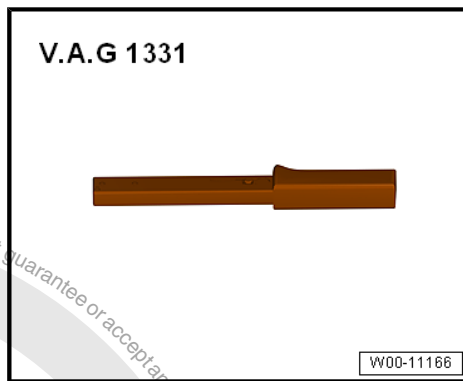
- ◆ Release lever - 80-200-

- ◆ Torque wrench - V.A.G 1410-





- ◆ Torque wrench - V.A.G 1331-



WARNING

Danger of injury!

- ◆ ***Risk of crushing injuries when performing work on uncovered windscreen wiper system.***
- ◆ ***The windscreen wiper system may only be operated after its proper installation.***



Caution

There is a risk of damage to the bonnet and the wiper arms.

- ◆ ***Before operating the windscreen wiper system with open bonnet, ensure that there is sufficient space for the components to move.***



Note

In order to be able to operate the windscreen wiper system with open bonnet, the bonnet lock must be engaged in position »closed«.

The removal and installation procedure is described for left-hand drive vehicles. Removal and installation for right-hand drive vehicles is similar.

Removing

- Removing wiper arm ⇒ [page 73](#) .
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Plenum chamber cover; Removing and installing plenum chamber cover .



Note

- ◆ ***To remove the wiper motor - V- from the wiper frame, none of the four bolts securing the wiper motor may be concealed by the motor crank.***
- ◆ ***Before removing the wiper motor, switch on the windscreen wipers and have a second fitter watch the motor crank on the wiper motor - V- . Switch off the ignition when the motor crank reaches the "12 o'clock" position and none of the four bolts securing the wiper motor are concealed.***



- Release and disconnect connector on wiper motor.
- Lever drive rods for wiper arms off wiper motor crank using removal lever - 80-200- or a suitable levering tool.
- Unscrew four securing bolts -arrows- and remove wiper motor from wiper frame.

i Note

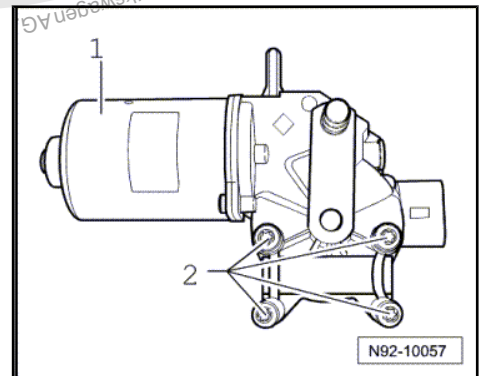
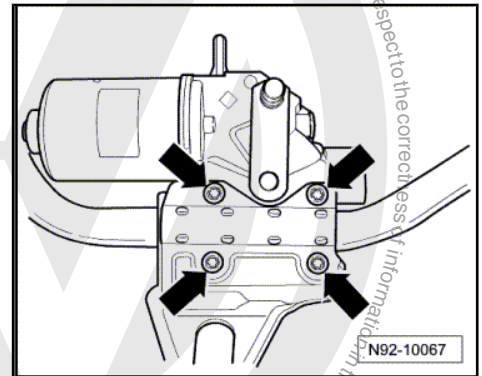
On vehicles with an anti-theft alarm, the horn of the anti-theft alarm system may have to be detached in order to remove the wiper motor.

Installing

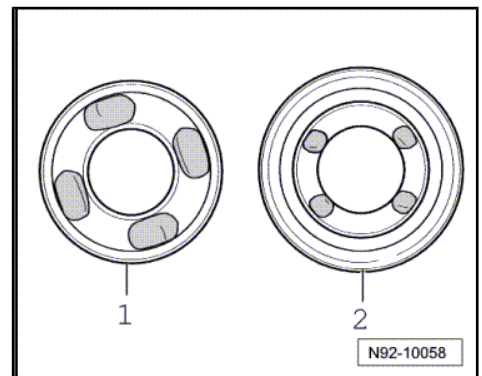
i Note

On new wiper motors, the motor crank is set to the correct installation position. Do not operate the wiper motor electrically until the entire windscreen wiper unit has been installed.

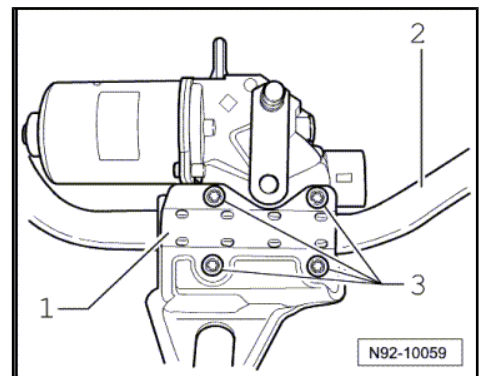
- On new wiper motor -1- unscrew securing bolts -2- from pre-tapped holes in bracket.



- Lubricate seals -1- (small outer diameter) and -2- (larger outer diameter) using grease from repair kit.



- Insert wiper motor into bracket of wiper frame -2- and align to fasteners accordingly.
- Fit upper part of bracket -1- and start self-tapping securing bolts -3-. When installing, ensure that bolts are not canted in pre-tapped holes, and ensure that upper part of bracket engages correctly in wiper frame.
- Tighten securing bolts.



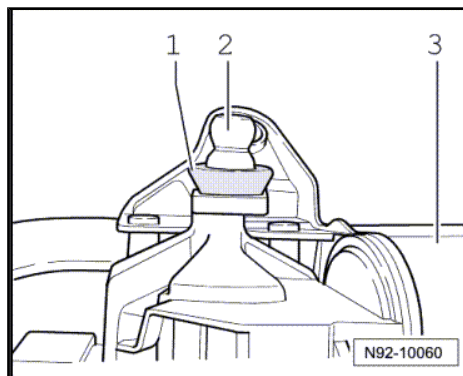


- Press lubricated seal -1- (small outer diameter) over ball head of motor crank -2- for wiper motor -3-.

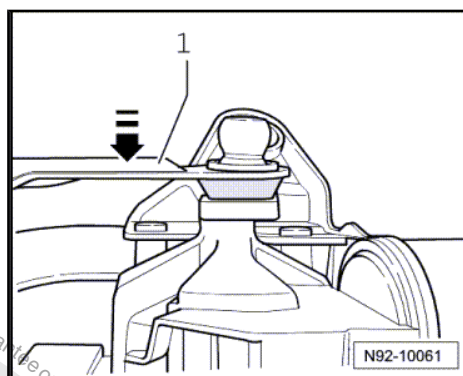


Note

Make sure seal is in correct installation position when installing.



- Press drive rod -arrow- of right windscreen wiper -1- over ball head of motor crank.

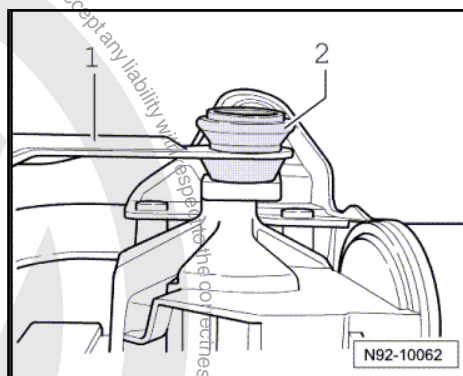


- Press lubricated seal -2- (larger outer diameter) onto drive rod -1-.

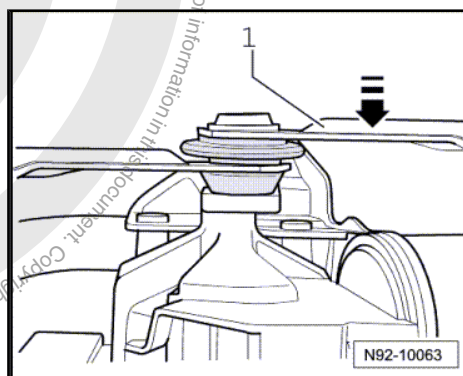


Note

Make sure seal is in correct installation position when installing.



- Press drive rod -arrow- of left windscreen wiper -1- onto ball head of motor crank.
- Connect connector to wiper motor and engage it.
- To maintain end position of wiper motor, switch on wiper to stage 1 for approx. 3 seconds.
- Switch off ignition and install plenum chamber cover and wiper arms ⇒ [page 73](#).



Torque settings

- ♦ ⇒ [“1.1 Assembly overview - windscreen wiper system”](#), [page 70](#)



1.8 Removing and installing rain and light sensor

⇒ **"1.8.1 Removing and installing rain and light sensor G397 , vehicles without front camera for driver assist systems", page 81**

1.8.1 Removing and installing rain and light sensor - G397- , vehicles without front camera for driver assist systems



Note

- ◆ *The rain and light sensor has a silicon layer (coupling pad) which forms the contact surface to the windscreen.*
- ◆ *The rain and light sensor has been designed so that it can be used again. A prerequisite for re-use is that the coupling pad is not damaged or dirty (check!).*
- ◆ *If a rain sensor is renewed and has to be replaced by a rain sensor with another part number, the rain sensor must be coded ⇒ [page 83](#) .*
- ◆ *The rain sensors cannot be installed optionally. Determine which rain sensor is the right one by referring to ⇒ Electronic parts catalogue (ETKA) .*

Removing

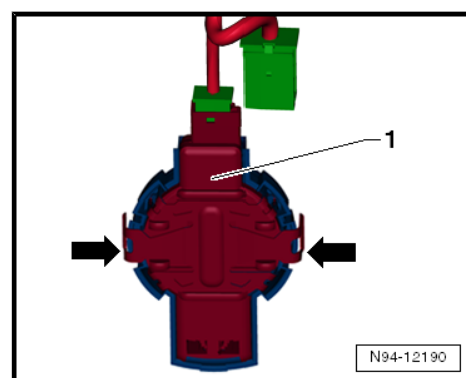
- Switch off ignition and all electrical consumers.
- Store the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.
- Remove interior mirror ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Removing and installing interior mirror .



Note

Wait for at least 1 minute after releasing the retaining clip. This is necessary to ensure that the silicone coating is relieved of tension and will not be damaged during removal.

- Release retaining clip on left and right -arrows-.
- Starting from top, carefully lever rain and light sensor - G397-1- out of retaining frame on windscreen.





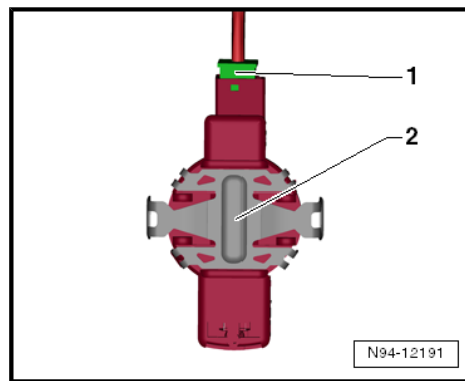
- Disconnect connector -1- from rain and light sensor - G397- .
- Remove rain and light sensor - G397- -2-.



Caution

The rain and light sensor - G397- may be soiled.

- ◆ *Store the removed rain and light sensor - G397- so that the coupling pad cannot be damaged or soiled from dust etc. until it is refitted.*



Installing

Install in reverse order of removal, observing the following:



Caution

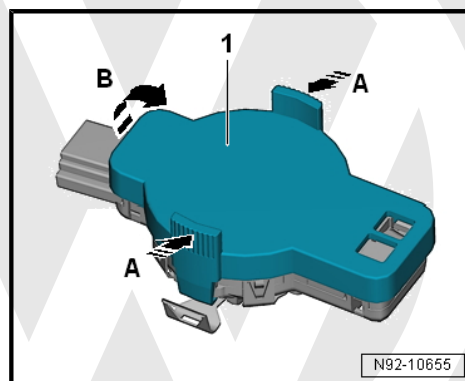
- ◆ *Prior to installation, thoroughly clean the surface of the windscreen within the retaining frame for rain and light sensor - G397- . Make sure to completely remove any remains of the coupling pad adhering to the windscreen.*
- ◆ *When installing, the surface of the coupling pad of the rain and light sensor - G397- must not be soiled or damaged. A sensor with a damaged coupling pad must be renewed.*



Note

If the surface of the coupling pad on the rain and light sensor - G397- is soiled, it may be possible to clean it by "bonding on" and then "pulling off" one or more adhesive strips.

- Thoroughly clean windscreen in area of retaining plate.
- If fitted, remove protective cap -1- from new rain and light sensor - G397- .
- Push grip in direction of arrow -A-.
- Remove protective cap -1- in direction of arrow -B-.



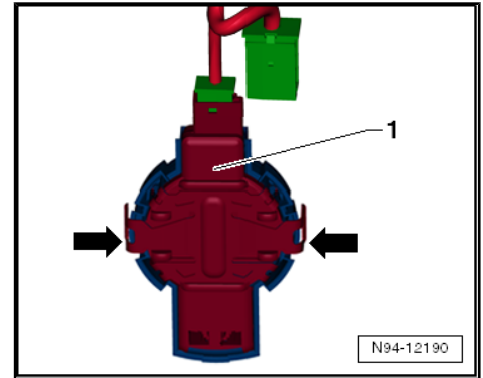


- Insert rain and light sensor - G397- -1- into retaining frame on windscreen.
- Push in retaining clip on both sides -arrows- until it engages audibly.
- Connect connector and engage it.



Note

- ◆ *Even when rain and light sensor - G397- is installed correctly, small air bubbles may initially appear between windscreen and coupling pad. After approx. 10 minutes, the contact surface must be free of bubbles.*
- ◆ *If the contact surface is not free of bubbles after 10 minutes, the rain and light sensor - G397- must be removed and installed anew.*
- ◆ *Air bubbles between the windscreen and the coupling pad will cause the rain and light sensor - G397- to malfunction.*
- Read event memory and delete sporadic faults of the rain sensor ⇒ Vehicle diagnostic tester.



Note

With the rain sensor disconnected, it is possible to wake the CAN bus e.g. by opening the door. The sporadic event entries in the onboard supply control unit must be deleted following repair work.

- If the rain and light sensor - G397- was renewed, perform coding ⇒ [page 83](#) .

Coding rain and light sensor - G397-

- Connect vehicle diagnostic tester ⇒ [page 303](#) .
- Code rain and light sensor - G397- ⇒ Vehicle diagnostic tester.



2 Windscreen washer system

⇒ [“2.1 Assembly overview - windscreen washer system”, page 84](#)

⇒ [“2.2 Removing and installing filler pipe for washer fluid reservoir”, page 85](#)

⇒ [“2.3 Removing and installing washer fluid reservoir”, page 86](#)

⇒ [“2.4 Removing and installing windscreen washer fluid level sender”, page 89](#)

⇒ [“2.5 Removing and installing windscreen washer pump”, page 89](#)

⇒ [“2.6 Removing and installing washer jets”, page 90](#)

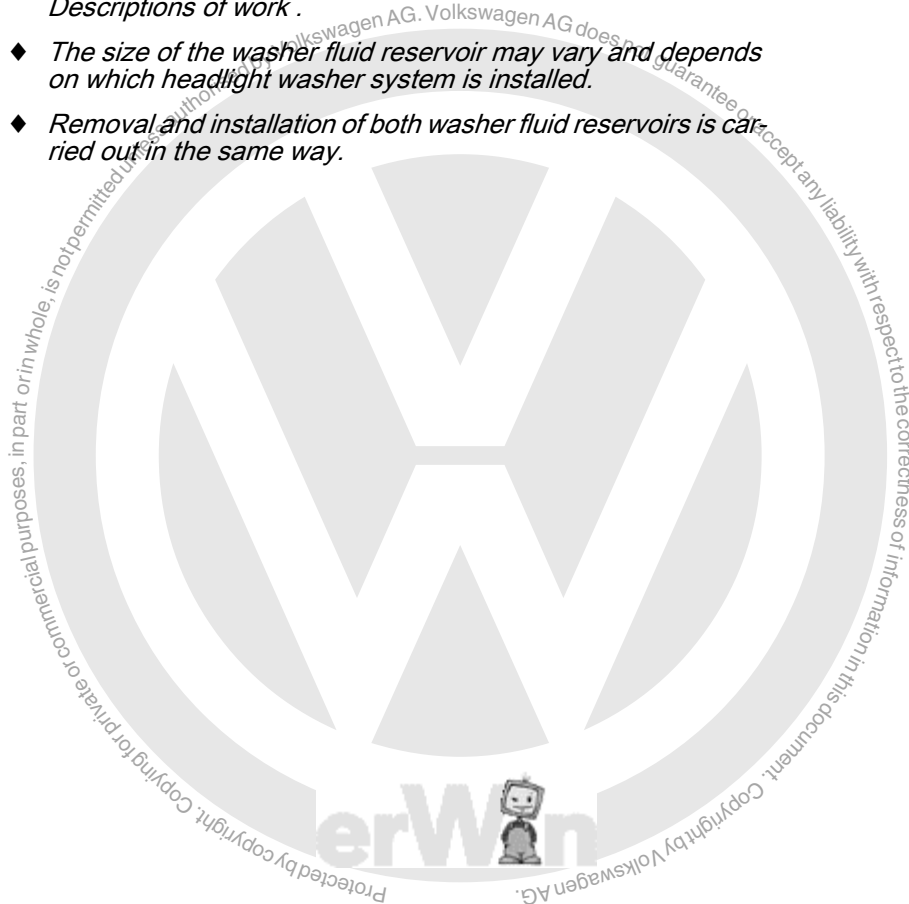
⇒ [“2.7 Adjusting spray jets”, page 90](#)

2.1 Assembly overview - windscreen washer system



Note

- ◆ For additional information refer to ⇒ Maintenance ; Booklet ; Descriptions of work .
- ◆ The size of the washer fluid reservoir may vary and depends on which headlight washer system is installed.
- ◆ Removal and installation of both washer fluid reservoirs is carried out in the same way.





1 - Spray jets for windscreen washer system

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

2 - Connection piece

- ☐ Connection to spray jet for windscreen washer system
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

3 - Y-piece

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

4 - Hose

- ☐ Hose repair
⇒ [page 113](#)

5 - Washer fluid reservoir

- ☐ The size of the reservoir depends on which headlight washer system is installed.
- ☐ Removing and installing
⇒ [page 86](#)
- ☐ Securing bolts for washer fluid reservoir: 4.5 Nm

6 - Windscreen and rear window washer pump - V59-

- ☐ On vehicles without rear window washer system windscreen washer pump - V589-
- ☐ Removing and installing ⇒ [page 89](#)
- ☐ In event of damage, renew sealing grommet at transition to washer fluid reservoir

7 - Connection piece

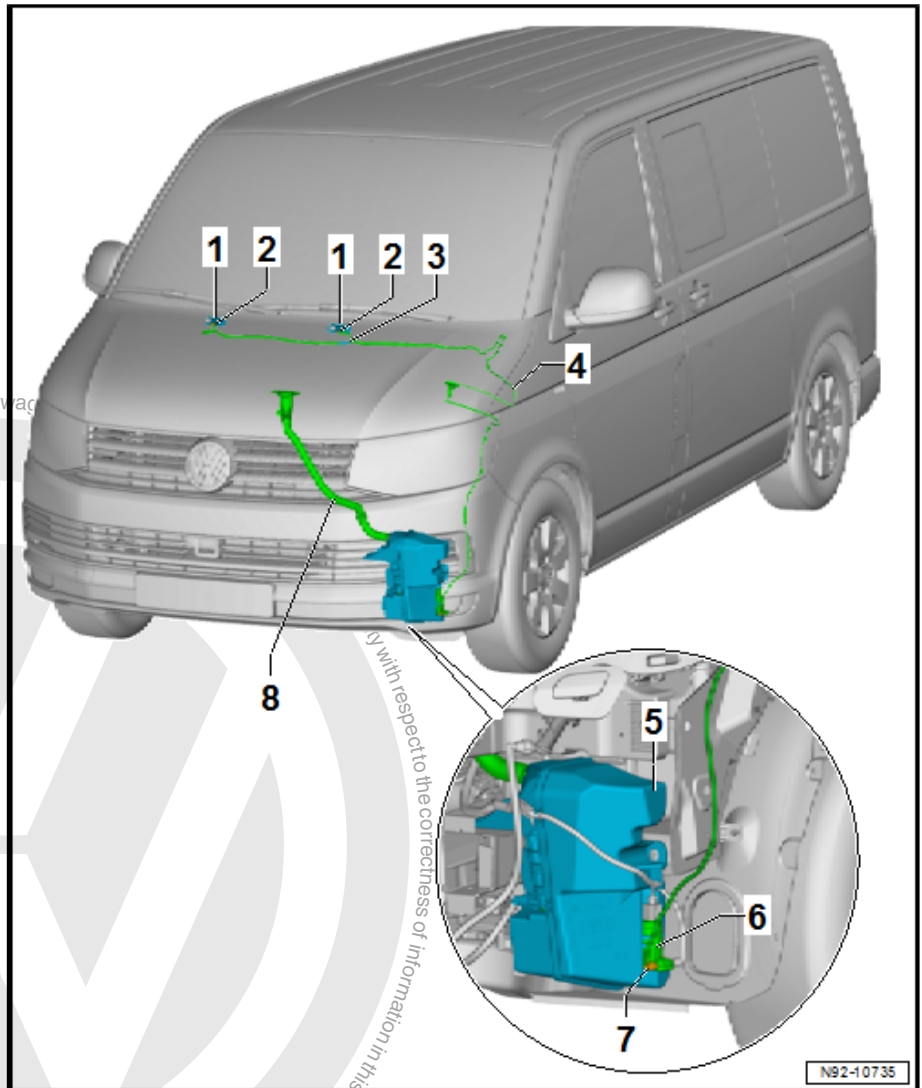
- ☐ Connection to windscreen and rear window washer pump
- ☐ Colour coding »black«, washer fluid line to windscreen
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

8 - Filler pipe for washer fluid reservoir

- ☐ Removing and installing filler pipe ⇒ [page 85](#)
- ☐ Check seal at base of filler pipe for signs of damage, renew if necessary.
- ☐ Securing bolt for filler pipe: 2 Nm
- ☐ Securing bolts for coolant expansion tank: 2 Nm

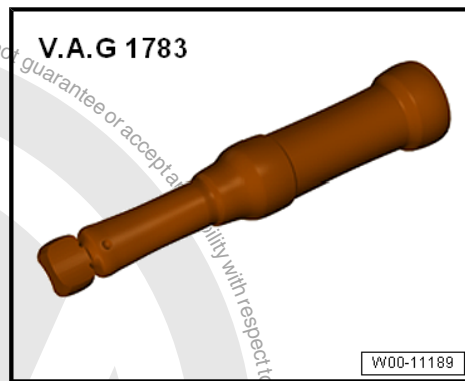
2.2 Removing and installing filler pipe for washer fluid reservoir

Special tools and workshop equipment required





- ◆ Torque wrench - V.A.G 1783-



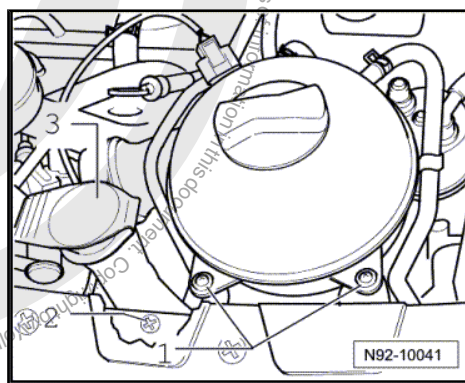
Removing

- Drain washer fluid reservoir until water level has dropped below opening for filler pipe.
- Unscrew securing bolts -1- of coolant expansion tank and push coolant expansion tank to one side.
- Unscrew securing bolt -2- of filler pipe -3-.
- Pull filler pipe downwards out of washer fluid reservoir and remove it upwards.

Installing

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

- Check seal at base of filler pipe for signs of damage, renew if necessary.
- Insert filler pipe in washer fluid reservoir onto stop (use lubrication if necessary). Note position of anti-rotation tab when doing this.
- Screw in and tighten securing bolt -2- for filler pipe -3- and securing bolts -1- for coolant expansion tank.



Torque settings

- ◆ ➔ ["2.1 Assembly overview - windscreen washer system", page 84](#)

2.3 Removing and installing washer fluid reservoir



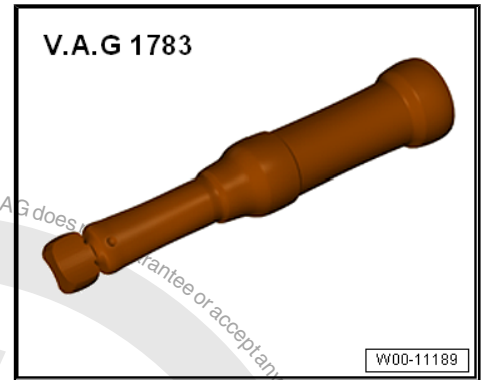
Note

- ◆ *On vehicles with a headlight washer system, a reservoir with approx. 5 litre capacity is installed. On vehicles without a headlight washer system, the reservoir capacity is approx. 4 litres.*
- ◆ *Removal and installation for both versions is basically the same.*

Special tools and workshop equipment required

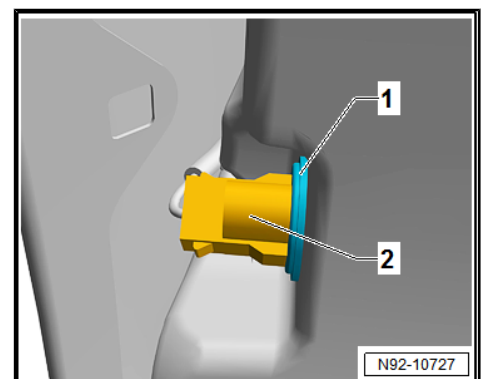
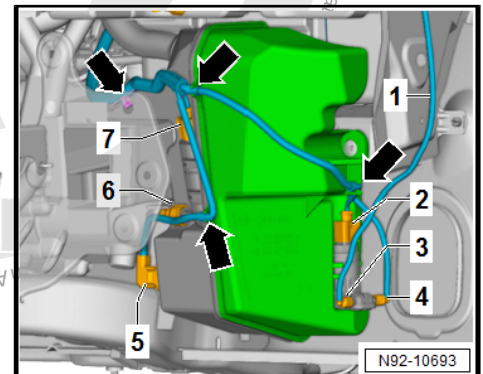


- ◆ Torque wrench - V.A.G 1783-



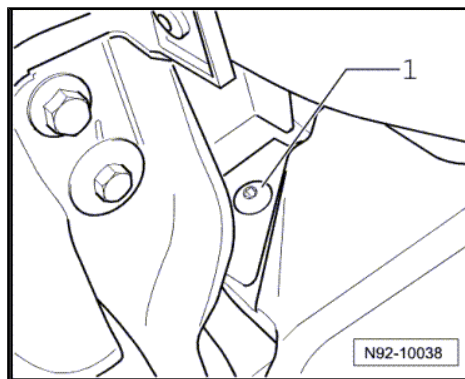
Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Removing and installing filler pipe for washer fluid reservoir ➔ [page 85](#) .
- Remove front bumper cover ➔ General body repairs, exterior; Rep. gr. 63 ; Removing and installing bumper cover .
- Starting at front, detach front left wheel housing liner until washer fluid reservoir is accessible ➔ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing front wheel housing liner .
- Release and pull off electrical connectors -2-, -5- and -7- from pumps.
- Release and pull off hose connection pieces -3-, -4- and -6- on windscreen and rear window washer pump - V59- and headlight washer system pump - V11- .
- Collect leaking fluid in accordance with regulations.
- Detach lines from fasteners on reservoir -arrows-.
- Release and separate electrical connector -2- on windscreen washer fluid level sender - G33- .

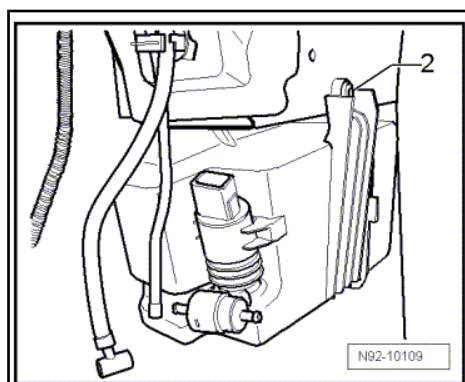




- Unscrew upper right securing bolt -1- on reservoir on longitudinal member.



- Unscrew securing bolt -2- of reservoir in wheel housing.



- Unscrew front securing bolt -3- on reservoir.
- Pull off washer fluid reservoir downwards.

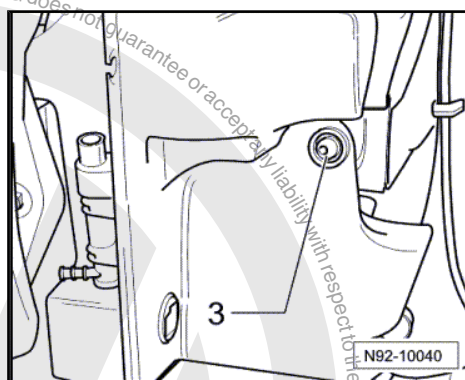
Installing

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



Note

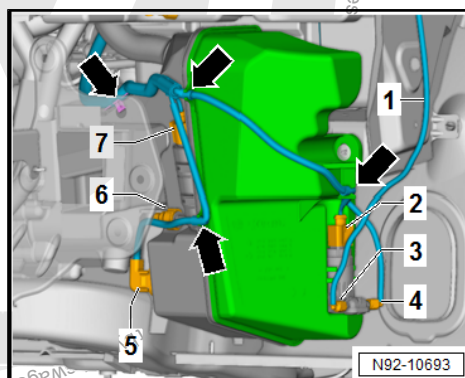
The connections to the pump and hose lines are colour-coded in order to prevent the washer fluid lines being incorrectly connected to the front and rear washer fluid pump - V59-. The hose unions must be connected to the correct colour-coded pump connections during installation.



- Secure lines as per installation markings on lines -arrows- on reservoir.
- Check seal between washer fluid reservoir and filler pipe for signs of damage; renew if necessary.
- Insert filler pipe in washer fluid reservoir onto stop (use lubrication if necessary). When doing this, note position of anti-rotation tab.

Torque settings

- ♦ ⇒ ["2.1 Assembly overview - windscreen washer system", page 84](#)





2.4 Removing and installing windscreen washer fluid level sender



Note

- ◆ The windscreen washer fluid level sender - G33- is permanently integrated in the washer fluid reservoir on the engine side and cannot be replaced individually.
- ◆ In the event of damage, the washer fluid reservoir must be renewed ⇒ [page 86](#).

2.5 Removing and installing windscreen washer pump



Note

- ◆ The windscreen and rear window washer pump - V59- is mounted on the washer fluid reservoir on the front left in front of the wheel housing.
- ◆ On vehicles without a rear window washer system, the windscreen washer pump - V589- is fitted with just one hose connection.

Removing

- Open service flap in front left wheel housing liner.
- Release and disconnect connector -2- on windscreen and rear window washer pump - V59- .
- Release black hose connecting piece -4- (windscreen) and pull off white hose connecting piece -3- (rear window) from windscreen and rear window washer pump - V59- -5-.
- Collect leaking fluid in accordance with regulations.
- Pull pump -5- upwards out of reservoir.
- Check sealing grommet for damage and renew if necessary.

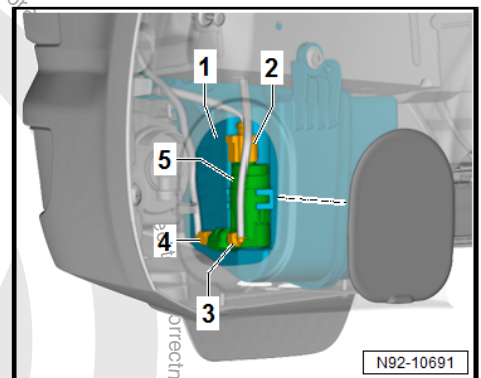
Installing

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



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 unions must be connected to the correct colour-coded pump connections during installation.





2.6 Removing and installing washer jets

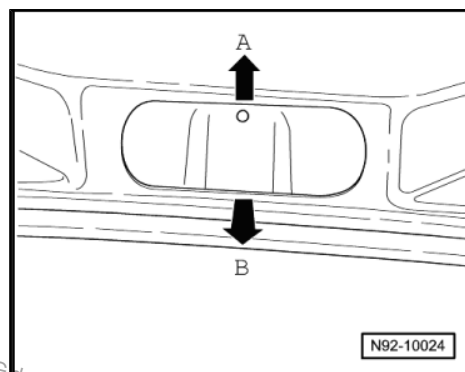
Removing



Note

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

- Open bonnet.
- Push spray jet upwards -arrow A- and pull out of flap at the rear -arrow B-.



- Release hose clip -1- in direction of -arrow-, and pull hose connection -2- off spray jet -4-.
- Release and detach connector -3- and remove spray jet -4-.

Installing

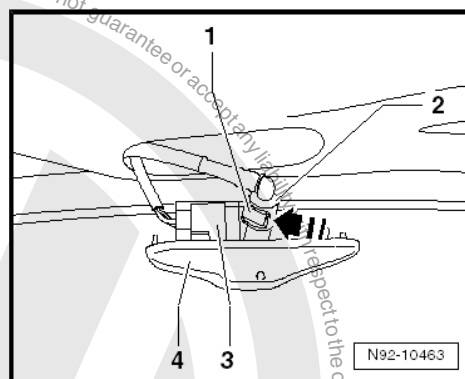
Install in reverse order of removal, observing the following:



Note

When connecting the washer fluid line, ensure that the securing clip engages audibly in the connection.

- Starting at the top, push spray jet into mounting hole until it locks in place audibly.
- Adjusting spray jets ➔ [page 90](#).



2.7 Adjusting spray jets



Caution

Risk of damage.

- ◆ **Never use items to clean the washer jets!**



Note

In case of uneven spray field due to impurities in 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!

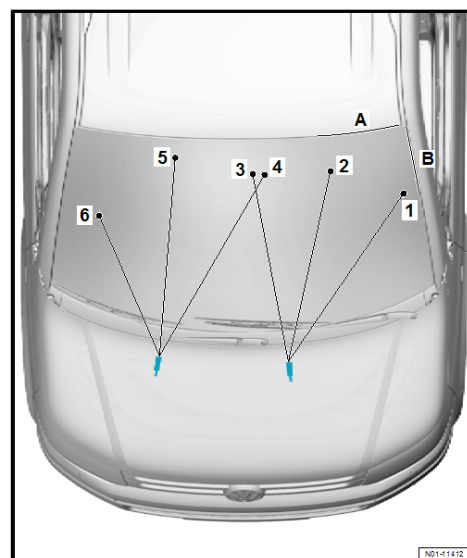


3-jet nozzle

– Adjust 3-jet nozzle according to the following table:

Item	Dimension -A- in cm measured from upper edge of windscreen	Dimension -B- in cm measured from driver side edge of windscreen
1	40	16
2	19	42
3	27	76
4	27	73
5	20	109
6	50	139

Adjusting windscreen washer system spray jets ⇒ Maintenance ;
Booklet 20.1 ; Descriptions of work





3 Rear window wiper system

⇒ ["3.1 Assembly overview - rear window wiper system", page 92](#)

⇒ ["3.2 Removing and installing wiper blade", page 94](#)

⇒ ["3.3 Removing and installing wiper arm", page 95](#)

⇒ ["3.4 Adjusting wiper arm", page 97](#)

⇒ ["3.5 Removing and installing rear window wiper motor V12", page 99](#)

3.1 Assembly overview - rear window wiper system

⇒ ["3.1.1 Assembly overview - rear window wiper system, vehicles with rear lid", page 92](#)

⇒ ["3.1.2 Assembly overview - rear window wiper system, vehicles with rear wing doors", page 93](#)

3.1.1 Assembly overview - rear window wiper system, vehicles with rear lid

1 - Rubber seal

- ❑ Install with marking facing upwards (tolerance $-a- = \pm 10^\circ$).

2 - Tailgate

3 - Securing nuts

- ❑ 8 Nm.

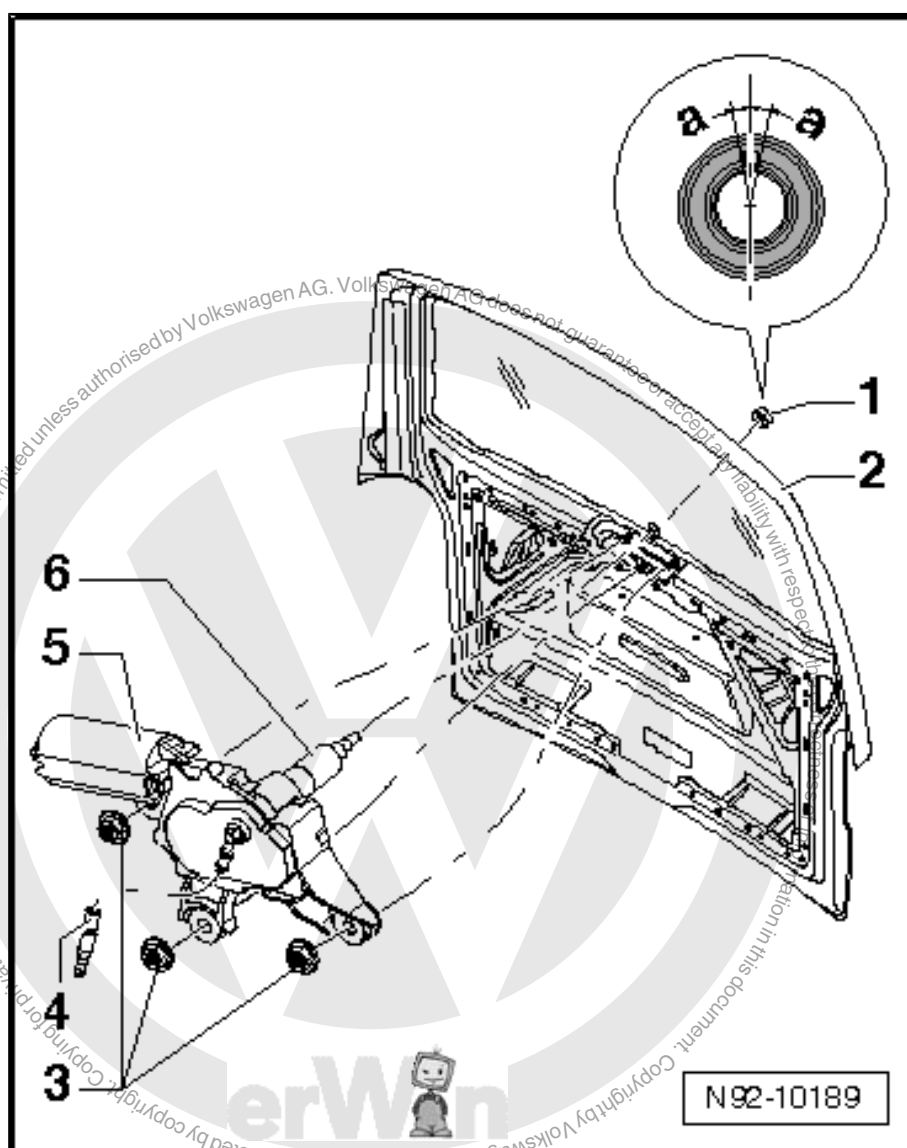
4 - Hose connection for rear window washer system

5 - Rear window wiper motor - V12-

- ❑ Removing and installing
⇒ [page 99](#)

6 - Wiper arm shaft

- ❑ Moisten with lubricant polyethylene glycol when installing.
- ❑ Wiper arm securing nut: 12 Nm





3.1.2 Assembly overview - rear window wiper system, vehicles with rear wing doors

1 - Rubber seal

- ☐ Install with marking facing upwards (tolerance -a- = $\pm 10^\circ$).

2 - Left rear wing door

3 - Rear window wiper motor, left rear wing door - V92-

- ☐ Removing and installing
⇒ [page 101](#)

4 - Securing bolts

- ☐ 8 Nm.

5 - Hose connection for rear window washer system

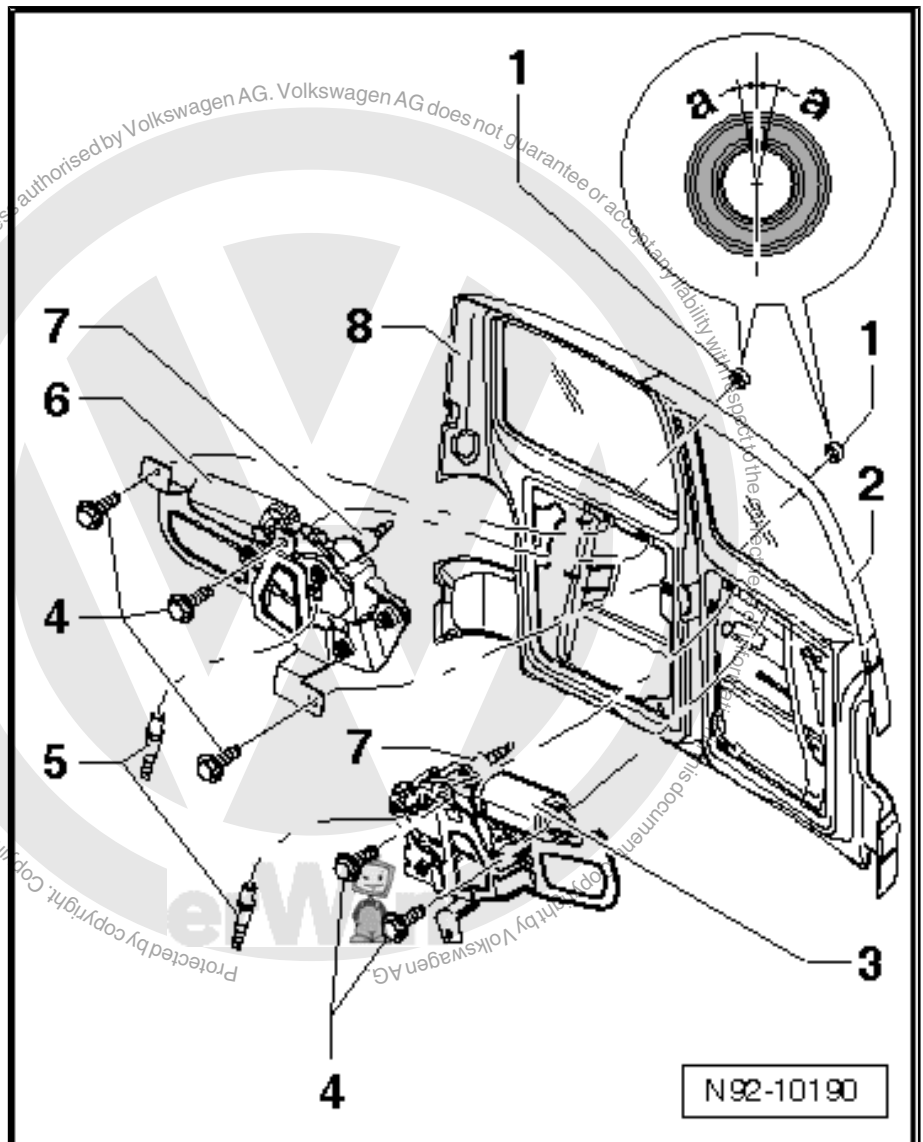
6 - Rear window wiper motor, right rear wing door - V93-

- ☐ Removing and installing
⇒ [page 100](#)

7 - Rear window wiper arm shafts

- ☐ Moisten with lubricant polyethylene glycol when installing.
- ☐ Wiper arm securing nut: 12 Nm

8 - Right rear wing door





3.2 Removing and installing wiper blade

⇒ **"3.2.1 Removing and installing wiper blade, vehicles with rear lid", page 94**

⇒ **"3.2.2 Removing and installing wiper blade, vehicles with rear wing doors", page 94**

3.2.1 Removing and installing wiper blade, vehicles with rear lid



WARNING

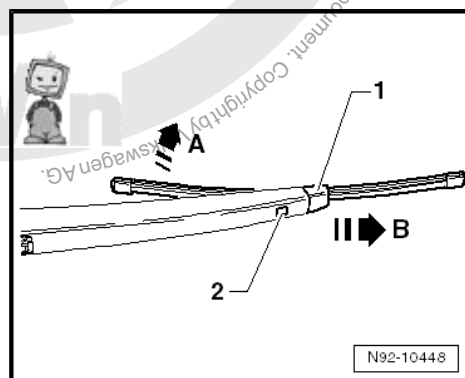
- ◆ *Joint-free wipers are very flexible. To lift the rear window wiper blades off the rear window, touch them only in the area in which the rear window wiper blades are attached to the rear window wipers.*
- ◆ *Avoid bending rear window wiper arm and blade.*
- ◆ *Prevent rear window wiper arm from springing back unintentionally and damaging the glass.*

Removing

- Allow rear window wiper to adopt park position.
- Switch off ignition and all electrical equipment and then remove ignition key.
- Fold rear window wiper arm -1- away from rear window.
- Swivel rear window wiper blade in -direction of arrow A-.
- Press release button -2- and pull rear window wiper blade on rear window wiper blade fastener -1- in -direction of arrow B- out of rear window wiper arm.

Installing

- Installation is basically carried out in the reverse sequence; note the following when doing this:
- Fold back rear window wiper arm.
- Check rear window wiper blade parking position and adjust if necessary ⇒ [page 97](#) .



3.2.2 Removing and installing wiper blade, vehicles with rear wing doors



Caution

- ◆ *Joint-free wipers are very flexible. To lift the rear window wiper blades off the rear window, touch them only in the area in which the rear window wiper blades are attached to the rear window wipers.*
- ◆ *Avoid bending rear window wiper arm and blade.*
- ◆ *Prevent rear window wiper arm from springing back unintentionally and damaging the glass.*

Removing

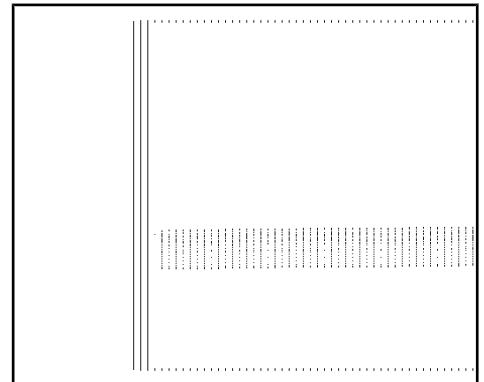
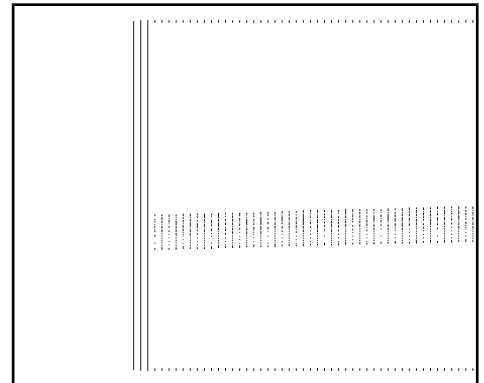
- Allow rear window wiper to adopt park position.



- Switch off ignition and all electrical equipment and then remove ignition key.
- Fold rear window wiper arm -1- away from rear window.
- Fold rear window wiper blade -2- 90° towards rear window wiper arm -1- and back again.
- Pull plastic cap off rear window wiper arm -arrow 1-.
- Remove rear window wiper blade -2- in -direction of arrow 2- from rear window wiper arm axis -1-.

Installing

- Installation is basically carried out in the reverse sequence; note the following when doing this:
- Push rear window wiper blade -2- in -direction of arrow 1- onto rear window wiper arm axis -1-.
- Fit plastic cap and engage it -arrow 2- to secure rear window wiper blade in position.
- Fold back rear window wiper arm.
- Check rear window wiper blade parking position and adjust if necessary. ➤ [page 97](#) .



3.3 Removing and installing wiper arm

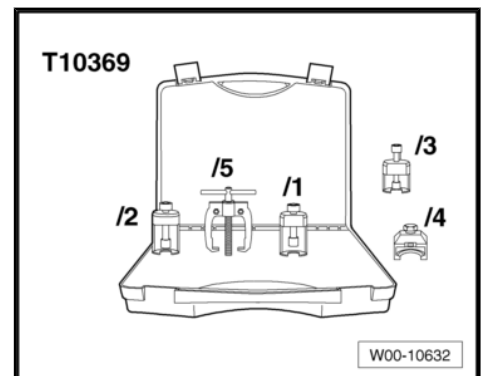
⇒ [“3.3.1 Removing and installing wiper arm, vehicles with rear lid”, page 95](#)

⇒ [“3.3.2 Removing and installing wiper arm, vehicles with rear wing doors”, page 96](#)

3.3.1 Removing and installing wiper arm, vehicles with rear lid

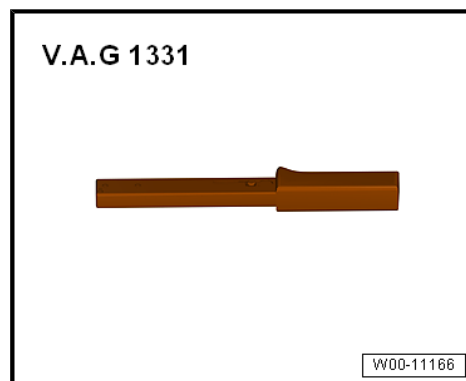
Special tools and workshop equipment required

- ◆ Puller - T10369-



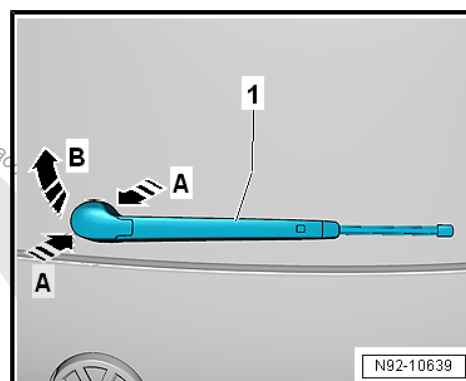


- ◆ Torque wrench - V.A.G 1331-

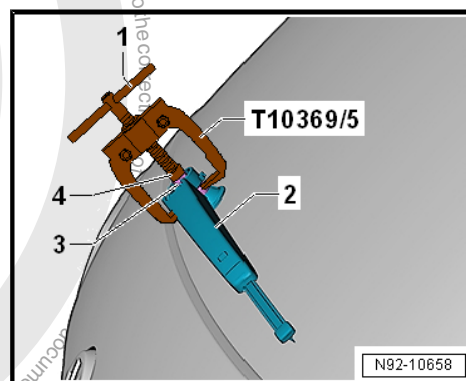


Removing

- Switch on ignition.
- Actuate "rear window wipe" function and allow wiper arm to move to its end position.
- Switch off ignition and remove ignition key.
- Press together cap of rear window wiper -1- in direction of arrow -A-.
- Fold up cover cap in direction of arrow -B- to unclip.
- Remove spray jet ⇒ [page 105](#) .
- Loosen securing nut of wiper arm by one turn.
- Fit an M6 nut on top of securing nut.



- Fit puller - T10369/5- to wiper arm -2-.
- Fit thrust piece -3- to wiper shaft.
- Screw in bolt -1- until wiper arm has been pulled off the wiper shaft.
- Unscrew nut -4- completely and remove wiper arm.



Installing

- Fit rear window wiper arm, and screw securing nut loosely onto wiper arm shaft.
- Adjust rear window wiper park position ⇒ [page 97](#) .

3.3.2 Removing and installing wiper arm, vehicles with rear wing doors



Note

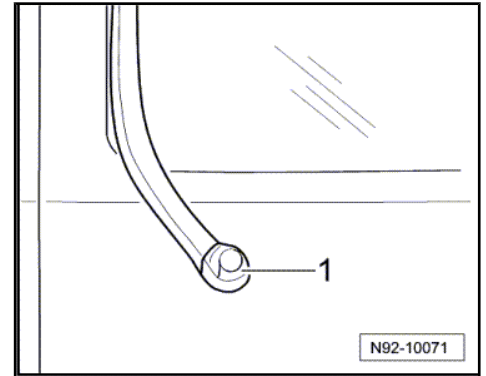
- ◆ The following section is a description of how to remove and install the rear window wiper arm on the right rear wing door.
- ◆ Removal and installation of the rear window wiper arm on the left rear wing door are carried out in the same way.

Removing

- Move rear window wiper to park position.



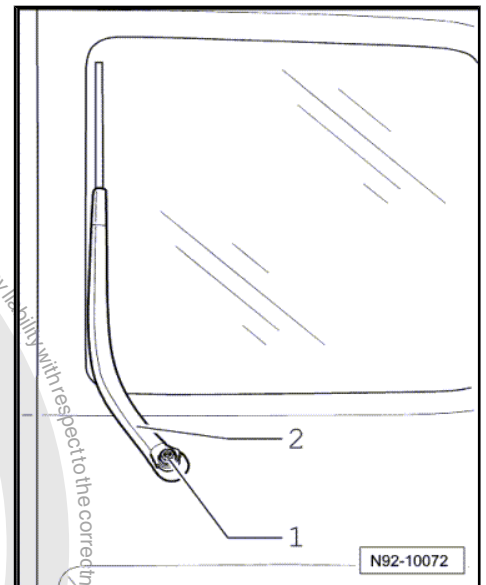
- Unclip cover cap -1- of rear window wiper arm outwards.



- Unscrew hexagon nut -1-.
- Fold rear window wiper arm away from rear window.
- Release rear window wiper arm -2- from rear window wiper motor shaft by rocking arm back and forth sideways.

Installing

- Fit rear window wiper arm and screw hexagon nut loosely onto rear window wiper arm shaft.
- Adjust rear window wiper park position ⇒ [page 98](#).



3.4 Adjusting wiper arm

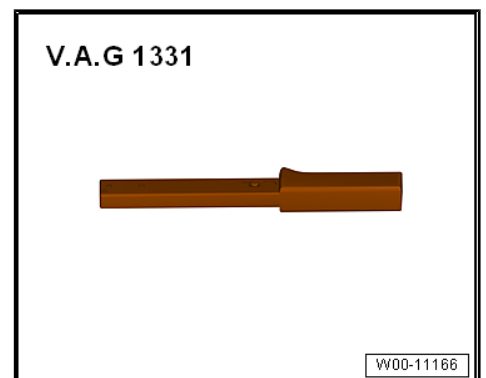
⇒ [“3.4.1 Adjusting rear window wiper park position, vehicles with rear lid”, page 97](#)

⇒ [“3.4.2 Adjusting rear window wiper park position, vehicles with rear wing doors”, page 98](#)

3.4.1 Adjusting rear window wiper park position, vehicles with rear lid

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331 -



- Move rear window wiper to park position.

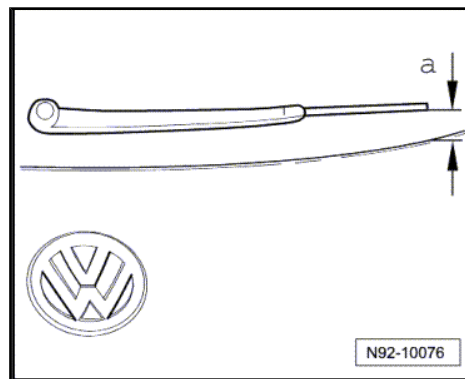


Distance -a- between wiper rubber and lower edge of window must be 25 ± 5 mm.

- Adjust park position by moving rear window wiper arm if necessary.
- Tighten securing nut for rear window wiper arm.

Torque settings

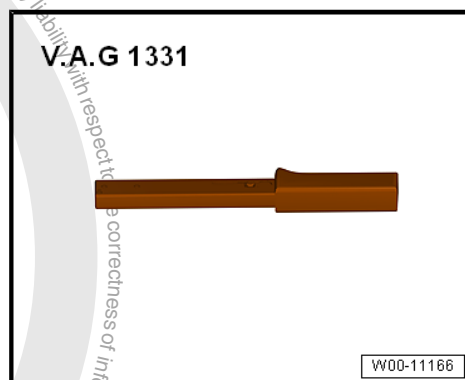
- ♦ ⇒ ["3.1.1 Assembly overview - rear window wiper system, vehicles with rear lid", page 92](#)



3.4.2 Adjusting rear window wiper park position, vehicles with rear wing doors

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



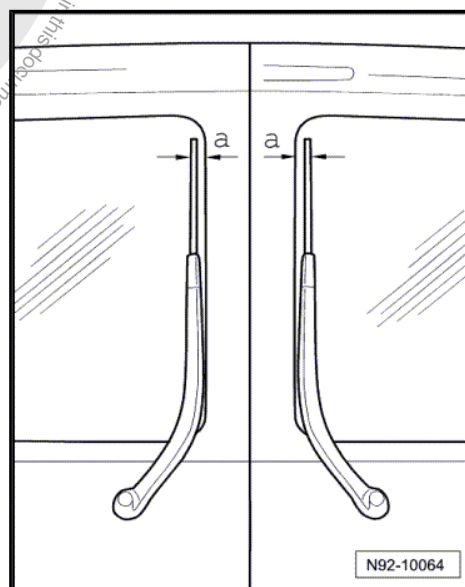
- Move rear window wiper to park position.

Distance -a- between wiper rubber and side edge of window must be 25 ± 5 mm.

- Adjust park position by moving rear window wiper arm if necessary.
- Tighten securing nut for rear window wiper arm.

Torque settings

- ♦ ⇒ ["3.1.2 Assembly overview - rear window wiper system, vehicles with rear wing doors", page 93](#)





3.5 Removing and installing rear window wiper motor - V12-

⇒ [“3.5.1 Removing and installing rear window wiper motor V12 , vehicles with rear lid”, page 99](#)

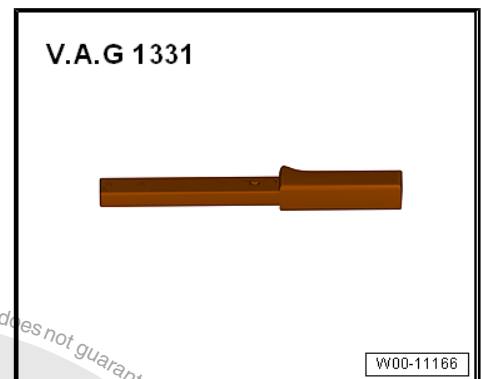
⇒ [“3.5.2 Removing and installing right rear wing door window wiper motor V93 , vehicles with rear wing doors”, page 100](#)

⇒ [“3.5.3 Removing and installing left rear wing door window wiper motor V92 , vehicles with rear wing doors”, page 101](#)

3.5.1 Removing and installing rear window wiper motor - V12- , vehicles with rear lid

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

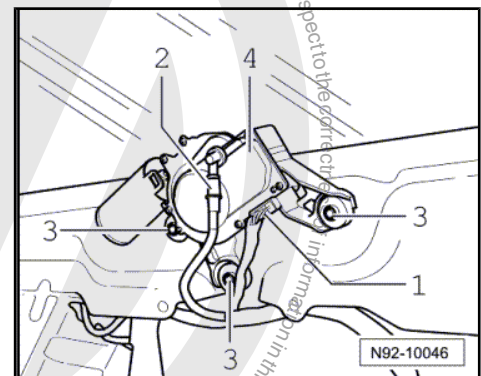


Removing

- Remove rear window wiper arm ⇒ [page 95](#) .
- Remove lower rear lid trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Overview of fitting locations – luggage compartment trim .
- Release and disconnect connector -1- on rear window wiper motor.
- Pull off hose connecting piece -2- for rear window washer system.
- Remove hexagon nuts -3-.
- Carefully pull rear window wiper motor -4- inwards off rear lid.

Installing

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





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



Caution

Before inserting rear window wiper motor - V12- , moisten rear window wiper arm shaft with lubricant polyethylene glycol.

- Install lower rear lid trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Overview of fitting locations – luggage compartment trim .
- Install rear window wiper arm ⇒ [page 95](#) .

Torque settings

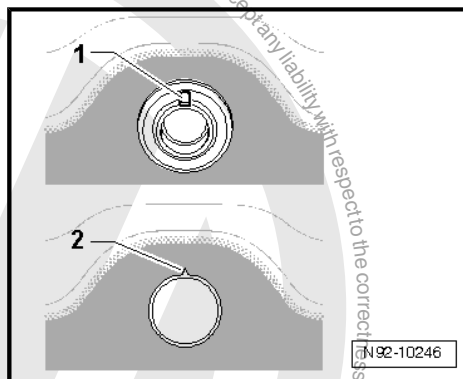
- ♦ ⇒ [“3.1.1 Assembly overview - rear window wiper system, vehicles with rear lid”](#), [page 92](#)

3.5.2 Removing and installing right rear wing door window wiper motor - V93- , vehicles with rear wing doors

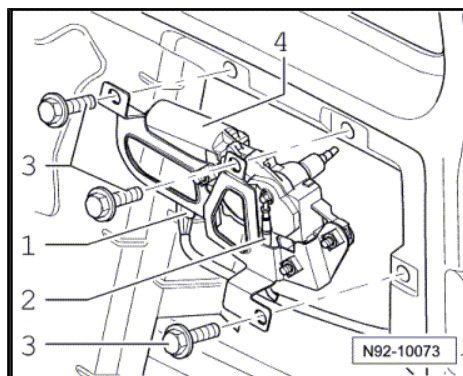
Removing

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-



- Remove rear window wiper arm ⇒ [page 96](#) .
- Remove lower trim of rear wing door ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Overview of fitting locations – luggage compartment trim .
- Release and disconnect connector -1- on rear window wiper motor.
- Pull off hose connecting piece -2- for rear window washer system.
- Remove securing bolts -3-.
- Remove rear window wiper motor -4-.

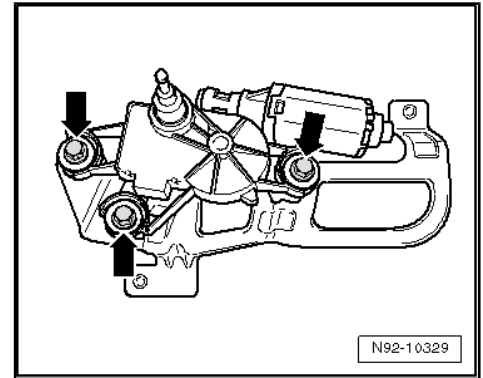




- If necessary, unbolt rear window wiper motor from bracket -arrows-.

Installing

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

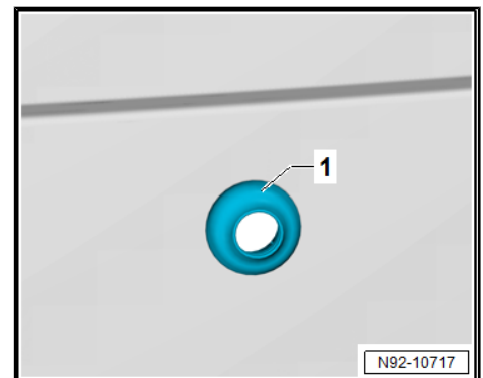


- Make sure that seal -1- is properly seated in installation aperture of wing door.



Caution

Before inserting rear right wing door window wiper motor - V93- , moisten rear window wiper arm shaft with lubricant polyethylene glycol.



- Install lower trim of rear wing door ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Overview of fitting locations – luggage compartment trim .
- Install rear window wiper arm ⇒ [page 96](#) .

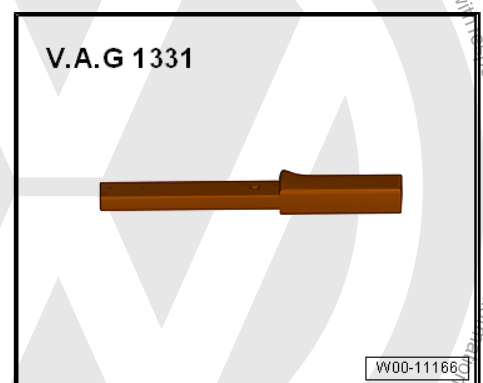
Torque settings

- ♦ ⇒ [“3.1.2 Assembly overview - rear window wiper system, vehicles with rear wing doors”](#), [page 93](#)

3.5.3 Removing and installing left rear wing door window wiper motor - V92- , vehicles with rear wing doors

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-

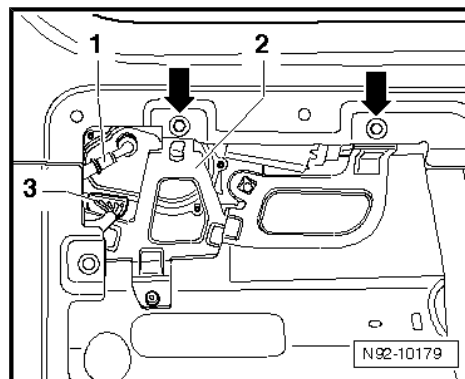


Removing

- Remove rear window wiper arms ⇒ [page 96](#) .
- Remove lower trim of rear wing door ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Overview of fitting locations – luggage compartment trim .
- Remove assembly carrier ⇒ General body repairs, exterior; Rep. gr. 58 ; Door components; Removing and installing assembly carrier .



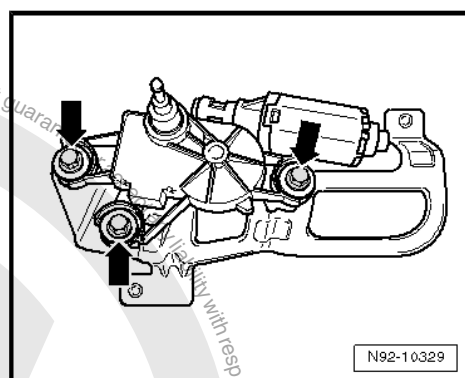
- Remove hose -1- from window washer system.
- Release and disconnect connector -3-.
- Unscrew securing bolts -arrows-.
- Remove rear window wiper motor -2-.



- If necessary, unbolt rear window wiper motor from bracket -arrows-.

Installing

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

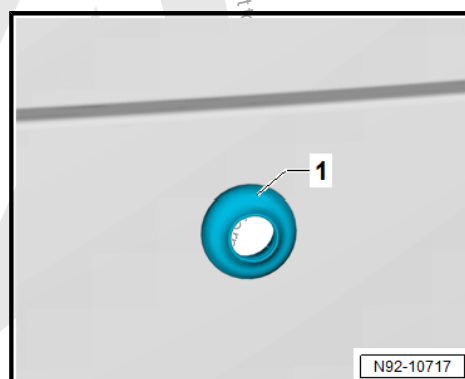


- Make sure that seal -1- is properly seated in installation aperture of wing door.



Caution

Before inserting the rear left wing door window wiper motor - V92- , moisten the wiper arm shaft with polyethylene glycol lubricant.



- Install assembly carrier ⇒ General body repairs, exterior; Rep. gr. 58 ; Door components; Removing and installing assembly carrier .
- Install lower trim of rear wing door ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Overview of fitting locations – luggage compartment trim .
- Install rear window wiper arms ⇒ [page 96](#).

Torque settings

- ♦ ⇒ [“3.1.2 Assembly overview - rear window wiper system, vehicles with rear wing doors”, page 93](#)



4 Rear window washer system

⇒ ["4.1 Assembly overview - rear window washer system", page 103](#)

⇒ ["4.2 Removing and installing washer fluid reservoir", page 105](#)

⇒ ["4.3 Removing and installing rear window washer pump", page 105](#)

⇒ ["4.4 Removing and installing washer jet", page 105](#)

⇒ ["4.5 Adjusting spray jet", page 107](#)

4.1 Assembly overview - rear window washer system

⇒ ["4.1.1 Assembly overview - rear window washer system, vehicles with rear lid", page 103](#)

⇒ ["4.1.2 Assembly overview - rear window washer system, vehicles with rear wing doors", page 104](#)

4.1.1 Assembly overview - rear window washer system, vehicles with rear lid

1 - Spray jet for rear window washer system

- ☐ Integrated in drive shaft of rear wiper motor
- ☐ Removing and installing
⇒ [page 105](#)
- ☐ Adjusting ⇒ [page 107](#)

2 - Connection piece

- ☐ Connection to rear window spray jet
- ☐ Overview of hose couplings for washer fluid lines
⇒ [page 113](#)

3 - Connection piece

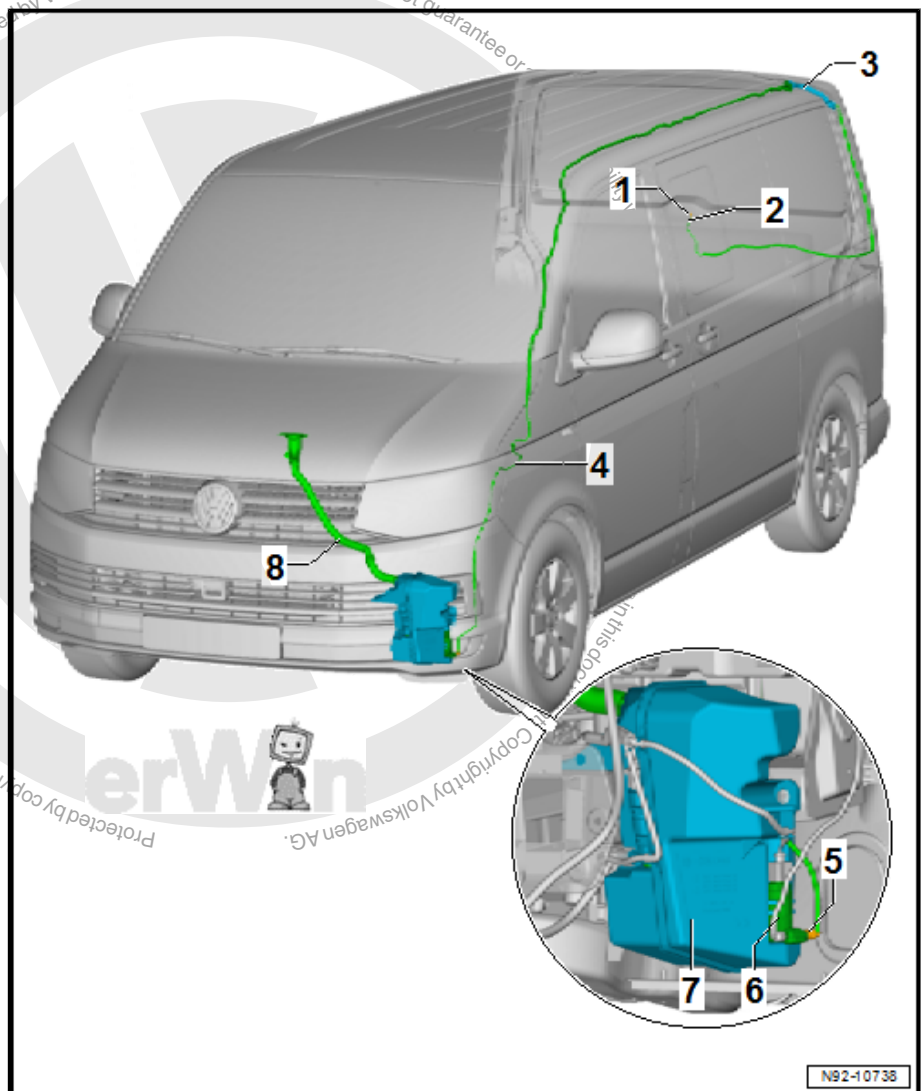
- ☐ Coupling point between roof wiring harness and rear lid wiring harness
- ☐ Overview of hose couplings for washer fluid lines
⇒ [page 113](#)

4 - Hose

- ☐ Hose repair
⇒ [page 113](#)

5 - Angled piece

- ☐ Connection to windscreen and rear window washer pump
- ☐ Colour of connection to windscreen washer system spray jets is black
- ☐ Colour of connection to rear window spray jet - white
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)





6 - Windscreen and rear window washer pump - V59-

- ❑ Removing and installing ⇒ [page 89](#)

7 - Washer fluid reservoir

- ❑ The size of the reservoir depends on which headlight washer system is installed.
- ❑ Removing and installing ⇒ [page 86](#)

8 - Filler pipe for washer fluid reservoir

- ❑ Removing and installing filler pipe ⇒ [page 85](#)

4.1.2 Assembly overview - rear window washer system, vehicles with rear wing doors

1 - Spray jet for rear window washer system

- ❑ Right rear wing door
- ❑ Removing and installing ⇒ [page 105](#)
- ❑ Adjusting ⇒ [page 107](#)

2 - Spray jet for rear window washer system

- ❑ Left rear wing door
- ❑ Removing and installing ⇒ [page 105](#)
- ❑ Adjusting ⇒ [page 107](#)

3 - T-piece

- ❑ In roof cross member wiring harness
- ❑ Distribution of washer fluid line to rear window spray jets

4 - Connection piece

- ❑ Coupling point between body wiring harness and left door wiring harness.
- ❑ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

5 - Kink protection

- ❑ For wiring harness in area between body and door

6 - Connection piece

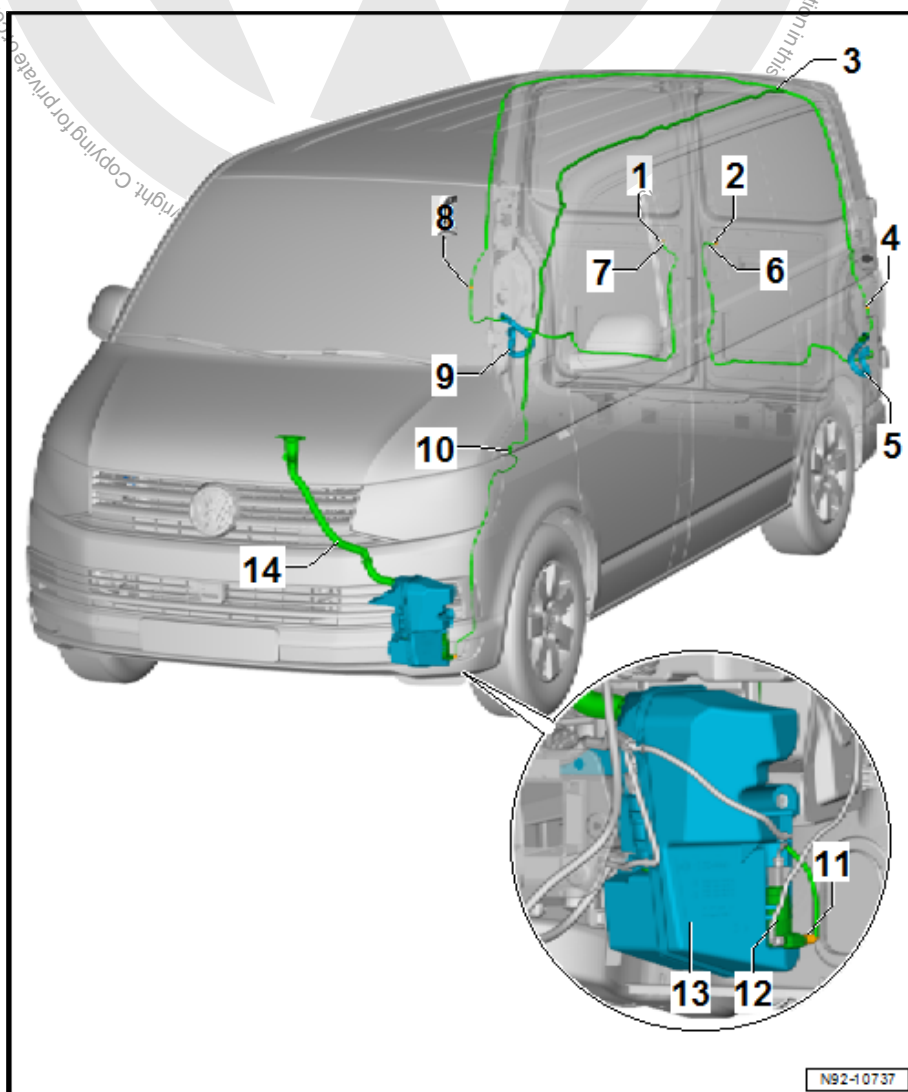
- ❑ Connection to left-hand rear window spray jet
- ❑ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

7 - Connection piece

- ❑ Connection to right-hand rear window spray jet
- ❑ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

8 - Connection piece

- ❑ Coupling point between body wiring harness and right door wiring harness.
- ❑ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)





9 - Kink protection

- ☐ For wiring harness in area between body and door

10 - Hose

- ☐ Hose repair ⇒ [page 113](#)

11 - Angled piece

- ☐ Connection to windscreen and rear window washer pump
- ☐ Colour of connection to windscreen washer system spray jets is black
- ☐ Colour of connection to rear window spray jets - white
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

12 - Windscreen and rear window washer pump - V59-

- ☐ Removing and installing ⇒ [page 89](#)

13 - Washer fluid reservoir

- ☐ The size of the reservoir depends on which headlight washer system is installed.
- ☐ Removing and installing ⇒ [page 86](#)

14 - Filler pipe for washer fluid reservoir

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

4.2 Removing and installing washer fluid reservoir



Note

The washer fluid reservoir (which is the same for the windscreen and the rear window washer systems) is located in front of the front left wheel housing.

- Removing and installing washer fluid reservoir ⇒ [page 86](#) .

4.3 Removing and installing rear window washer pump



Note

The rear window washer pump supplies both the windscreen and the rear window washer systems. It is located in the washer fluid reservoir in front of the front left wheel housing.

- Removing and installing windscreen and rear window washer pump - V59- ⇒ [page 89](#) .

4.4 Removing and installing washer jet

⇒ ["4.4.1 Removing and installing rear window spray jet, vehicles with rear lid", page 105](#)

⇒ ["4.4.2 Removing and installing rear window spray jet, vehicles with rear wing doors", page 106](#)

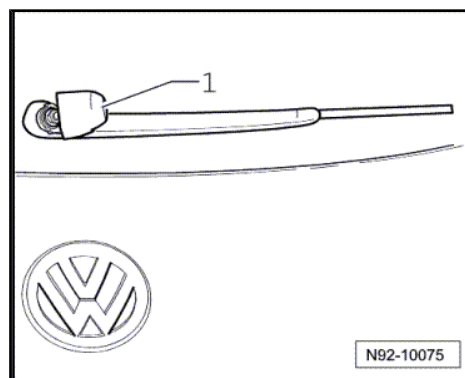
4.4.1 Removing and installing rear window spray jet, vehicles with rear lid

Removing

- Allow rear window wiper to adopt park position.



- Switch off ignition and all electrical equipment and then remove ignition key.
- Unclip cover cap -1- of rear window wiper outwards.

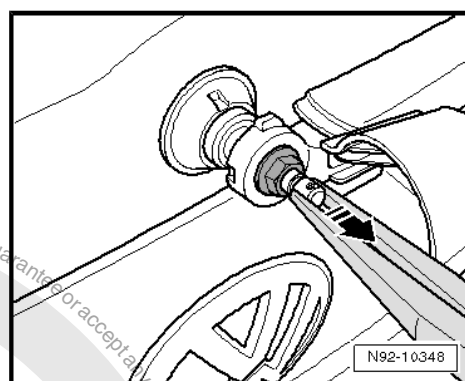


- Using suitable long-nose pliers, carefully pull out washer spray jet in -direction of arrow-.

Installing

Install in reverse order of removal, observing the following:

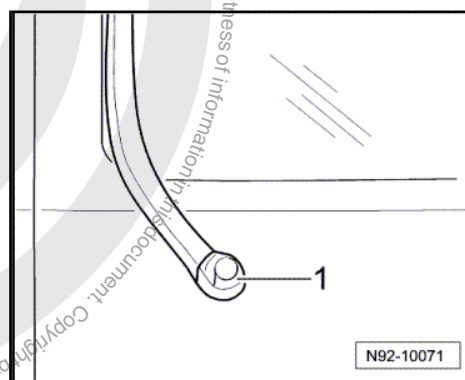
- On completion of work, adjust washer jet ➤ [page 107](#).



4.4.2 Removing and installing rear window spray jet, vehicles with rear wing doors

Removing

- Allow rear window wiper to adopt park position.
- Switch off ignition and all electrical equipment and then remove ignition key.
- Unclip cover cap -1- of rear window wiper outwards.



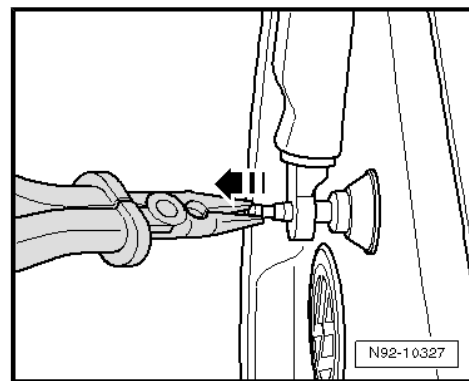


- Using suitable long-nose pliers, carefully pull out washer spray jet.

Installing

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

- On completion of work, adjust washer jet ⇒ [page 107](#) .



4.5 Adjusting spray jet

- Adjusting rear window washer system spray jets ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



5 Headlight washer system

⇒ ["5.1 Assembly overview - headlight washer system", page 108](#)

⇒ ["5.2 Removing and installing washer fluid reservoir", page 109](#)

⇒ ["5.3 Removing and installing headlight washer system pump V11", page 109](#)

⇒ ["5.4 Removing and installing pop-up cylinder", page 109](#)

⇒ ["5.5 Removing and installing washer jets", page 111](#)

⇒ ["5.6 Adjusting spray jets", page 111](#)

5.1 Assembly overview - headlight washer system

1 - Washer fluid reservoir

- ☐ Removing and installing
⇒ [page 86](#)

2 - Connection piece

- ☐ Connection to headlight cleaning system pump
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

3 - Headlight washer system pump - V11-

- ☐ Removing and installing
⇒ [page 109](#)

4 - Connection piece

- ☐ Connection to left spray jet pop-up cylinder
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)

5 - Pop-up cylinder for left spray jet

- ☐ Removing and installing pop-up cylinder
⇒ [page 109](#)
- ☐ Removing and installing spray jets ⇒ [page 111](#)
- ☐ Checking and adjusting spray jet setting
⇒ [page 111](#)

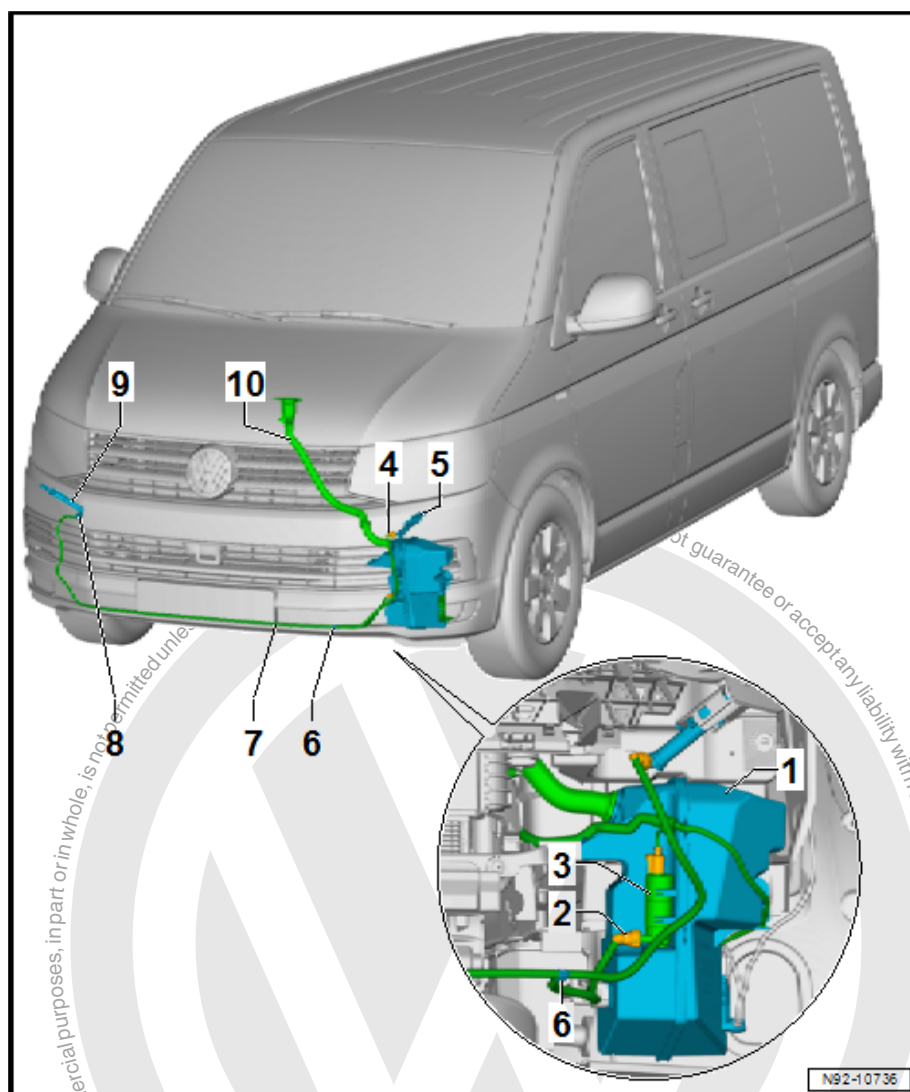
6 - Y-piece

- ☐ Distribution of washer fluid to spray jets on headlight washer system.

7 - Hose

8 - Connection piece

- ☐ Connection to right spray jet pop-up cylinder
- ☐ Overview of hose couplings for washer fluid lines ⇒ [page 113](#)





9 - Pop-up cylinder for right spray jet

- ❑ Removing and installing pop-up cylinder ⇒ [page 109](#)
- ❑ Removing and installing spray jets ⇒ [page 111](#)
- ❑ Checking and adjusting spray jet setting ⇒ [page 111](#)

10 - Filler pipe for washer fluid reservoir

- ❑ Removing and installing filler pipe ⇒ [page 85](#)

5.2 Removing and installing washer fluid reservoir



Note

The washer fluid reservoir (which is the same for the window and the headlight washer systems) is located in front of the front left wheel housing.

- Removing and installing washer fluid reservoir ⇒ [page 86](#) .

5.3 Removing and installing headlight washer system pump - V11-



Note

The headlight washer system pump - V11- is installed in the washer fluid reservoir in front of the front left wheel housing.

Special tools and workshop equipment required

- ◆ Drip tray

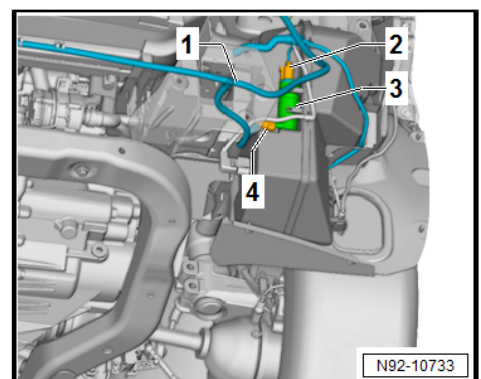
Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Switch off ignition and all electrical equipment and then remove ignition key.
- Release and disconnect hose connection -4- on headlight washer system pump.
- Collect leaking fluid in accordance with regulations.
- Release and disconnect connector -2- on headlight washer system pump.
- Pull pump -3- upwards out of reservoir.

Installing

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

- On completion of installation work, bleed headlight washer system ⇒ [page 111](#) .



5.4 Removing and installing pop-up cylinder

Removal and installation are described for the left side. Removal and installation for the right side are similar.

Special tools and workshop equipment required



◆ Drip tray

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 .
- Press release button -1- in direction of arrow -A-.
- Pull water hose -2- off pop-up cylinder -3- in direction of arrow -B-.



Note

The removal of the cap should be carried out with aid of a second person.



Caution

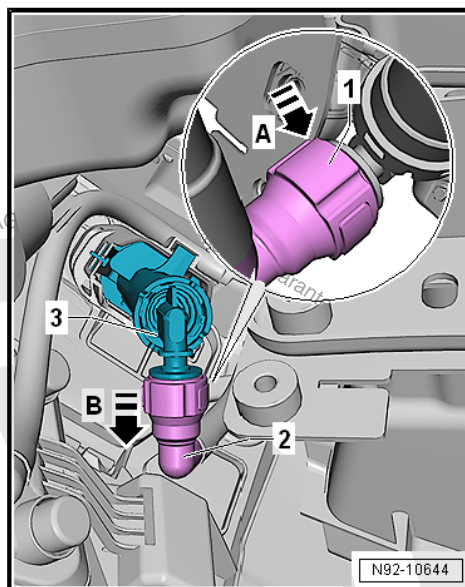
Spray jet pop-up cylinders must not be extracted by hand.

Depending on type, a hand-extracted pop-up cylinder can get stuck during return stroke.

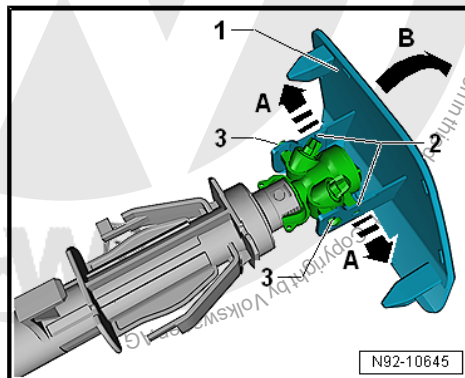
Pushing back pop-up jet piston by hand is not permissible and can damage pop-up cylinder.

Eject pop-up cylinder using only water pressure or air pressure.

A sticking pop-up cylinder can be brought back to full functionality by ejecting it with water pressure or air pressure.



- Working with compressed air, drive pop-up cylinder together with cap -1- out of bumper cover and hold it in place.
- Press cap -1- on both sides out of upper mountings -2- in direction of arrow -A-.
- Swing cap -1- in direction of arrow -B- and unclip it from lower mountings -3-.





- Press release buttons -1- in direction of arrow -A-.
- Pull pop-up cylinder -2- downwards out of mounting -3-.

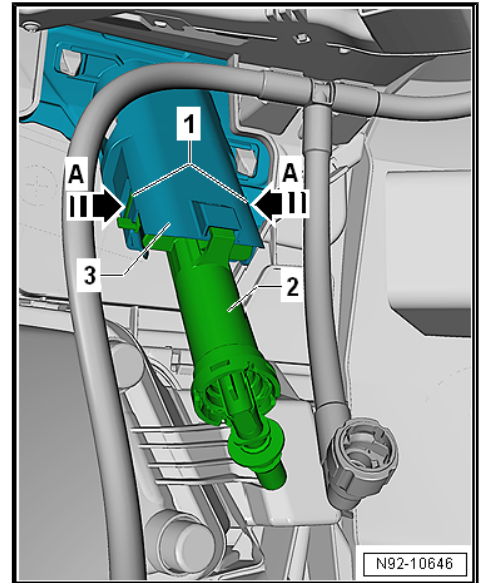
Installing

Install in reverse order of removal, observing the following:

- Observe the markings distinguishing the pop-up cylinders for left and right.

Ensure that the pop-up cylinder engages audibly when being pushed into the mounting.

- When connecting the washer fluid line, ensure that the securing clip engages audibly in the connection.
- Check cover cap is seated correctly on bumper cover.
- On completion of installation work, bleed headlight washer system ⇒ [page 111](#).
- Check headlight washer system spray jets and adjust if necessary ⇒ [page 111](#).



5.5 Removing and installing washer jets

Removing

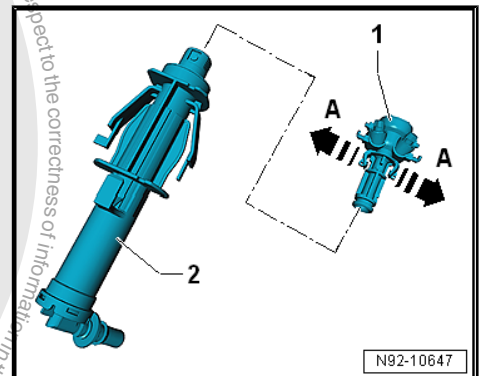
- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove pop-up cylinder ⇒ [page 109](#).
- Pull fasteners in direction of arrow -A-.
- Pull spray jet -1- out of pop-up cylinder -2-.

Installing

Install in reverse order of removal, observing the following:

Ensure that spray jet engages audibly on both sides when pushing it into pop-up cylinder.

On completion of installation work, bleed headlight washer system ⇒ [page 111](#).



5.6 Adjusting spray jets



Note

The delivered spray jets are preset by the manufacturer so that there is no need to adjust them following installation.

- Checking adjustment of spray jets ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

5.7 Bleeding headlight washer system

To guarantee sound functioning, the headlight washer system must be bled following assembly work or when operated for the first time.

- Top up washer fluid reservoir.
- Start the engine.
- Switch headlights “ON”.



- Operate headlight washer system several times (3-5 times, 3 seconds each time).
- If necessary, repeat this bleeding procedure until the pop-up cylinders and spray jets are functioning correctly.





6 Washer fluid lines

⇒ ["6.1 Washer fluid line hose couplings", page 113](#)

⇒ ["6.2 Repairing washer fluid lines", page 113](#)

6.1 Washer fluid line hose couplings



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 92 ; Hose couplings of washer fluid lines .

6.2 Repairing washer fluid lines



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 92 ; Hose repair .



94 – Lights, bulbs, switches - exterior

1 Headlights

- ⇒ [“1.1 Assembly overview - headlight”, page 114](#)
- ⇒ [“1.2 Removing and installing headlight”, page 118](#)
- ⇒ [“1.3 Adjusting headlights”, page 120](#)
- ⇒ [“1.4 Adjusting headlight installation position”, page 120](#)
- ⇒ [“1.5 Removing and installing front turn signal bulb M5 / M7 ”, page 122](#)
- ⇒ [“1.6 Installing repair kit for headlight housing”, page 125](#)
- ⇒ [“1.7 Converting headlights from driving on right to driving on left”, page 125](#)
- ⇒ [“1.8 Converting headlights from driving on left to driving on right”, page 126](#)
- ⇒ [“1.9 Removing and installing headlight range control motor V48 / V49 ”, page 127](#)
- ⇒ [“1.10 Removing and installing headlight dipped beam bulb M29 / M31 ”, page 132](#)
- ⇒ [“1.11 Removing and installing headlight main beam bulb M30 / M32 ”, page 136](#)
- ⇒ [“1.12 Removing and installing side light bulb M1 / M3 ”, page 139](#)
- ⇒ [“1.13 Removing and installing daytime running light bulb L174 / L175 ”, page 142](#)
- ⇒ [“1.14 Removing and installing output module for headlight J667 / J668 ”, page 144](#)
- ⇒ [“1.15 Removing and installing output module 1 for left LED headlight A27 / A31 ”, page 146](#)
- ⇒ [“1.16 Removing and installing LED headlight fan”, page 148](#)
- ⇒ [“1.17 Fine adjustment of LED modules - LED headlights”, page 149](#)

1.1 Assembly overview - headlight

- ⇒ [“1.1.1 Assembly overview - H4 headlight”, page 114](#)
- ⇒ [“1.1.2 Assembly overview - H7 headlight”, page 116](#)
- ⇒ [“1.1.3 Assembly overview - LED headlights”, page 117](#)

1.1.1 Assembly overview - H4 headlight



1 - Headlights

- ☐ Removing and installing
⇒ [page 118](#)

2 - Bolts

- ☐ Qty. 2
- ☐ Means of securing headlight on lock carrier
- ☐ 4.5 Nm.

3 - Daytime running light bulb

- ☐ Daytime running light bulb -L174- / -L175-
- ☐ Removing and installing
⇒ [page 142](#)
- ☐ 12V, BA15s

4 - Housing cover

5 - Headlight range control motor

- ☐ Headlight range control motors -V48- / -V49-
- ☐ Removing and installing
⇒ [page 127](#)

6 - Housing cover

7 - Housing cover

8 - Front turn signal bulb

- ☐ Front turn signal bulb - M5- / -M7-
- ☐ Removing and installing
⇒ [page 122](#)
- ☐ 12V, PY21W

9 - Housing cover

10 - Headlight dipped beam/main beam bulb

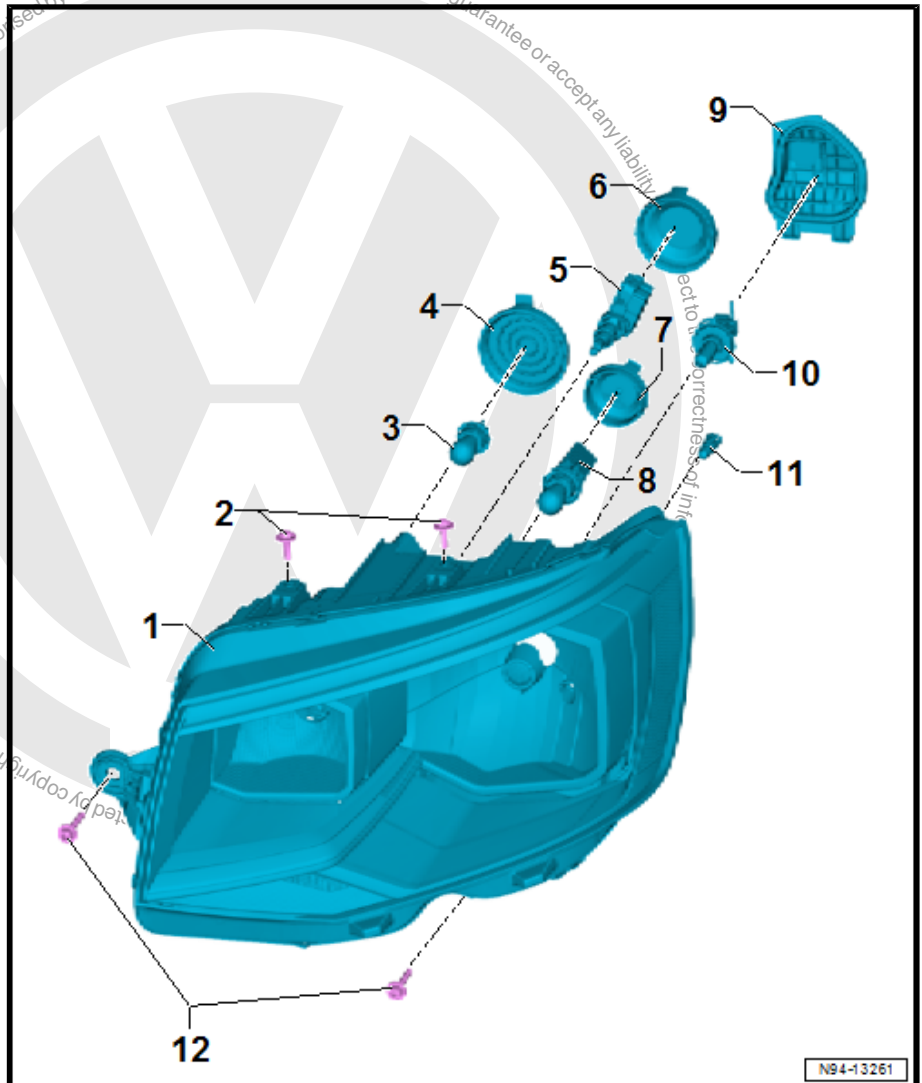
- ☐ Headlight dipped beam bulb -M29- / -M31-
- ☐ Headlight main beam bulb -M30- / -M32-
- ☐ Removing and installing ⇒ [page 132](#)
- ☐ 12V, H4 60/55W

11 - Side light bulb

- ☐ Side light bulb -M1- / -M3-
- ☐ Removing and installing ⇒ [page 139](#)
- ☐ 12V, W5W

12 - Bolts

- ☐ Qty. 2
- ☐ Means of securing headlight on bumper guide profile
- ☐ Inner bolt: 2.2 Nm
- ☐ Lower bolt: 4.5 Nm



1.1.2 Assembly overview - H7 headlight

1 - Headlights

- ☐ Removing and installing
⇒ [page 118](#)

2 - Bolts

- ☐ Qty. 2
- ☐ Means of securing headlight on lock carrier
- ☐ 4.5 Nm.

3 - Headlight main beam bulb

- ☐ Headlight main beam bulb -M30- / -M32-
- ☐ Removing and installing
⇒ [page 136](#)
- ☐ 12V, H7 55W

4 - Housing cover

5 - Headlight range control motor

- ☐ Headlight range control motors -V48- / -V49-
- ☐ Removing and installing
⇒ [page 129](#)

6 - Housing cover

7 - Housing cover

8 - Front turn signal bulb

- ☐ Front turn signal bulb - M5- / -M7-
- ☐ Removing and installing
⇒ [page 123](#)
- ☐ 12V, PWY24W

9 - Headlight dipped beam bulb

- ☐ Headlight dipped beam bulb -M29- / -M31-
- ☐ Removing and installing ⇒ [page 133](#)
- ☐ 12V, H7 55W

10 - Housing cover

11 - Side light bulb

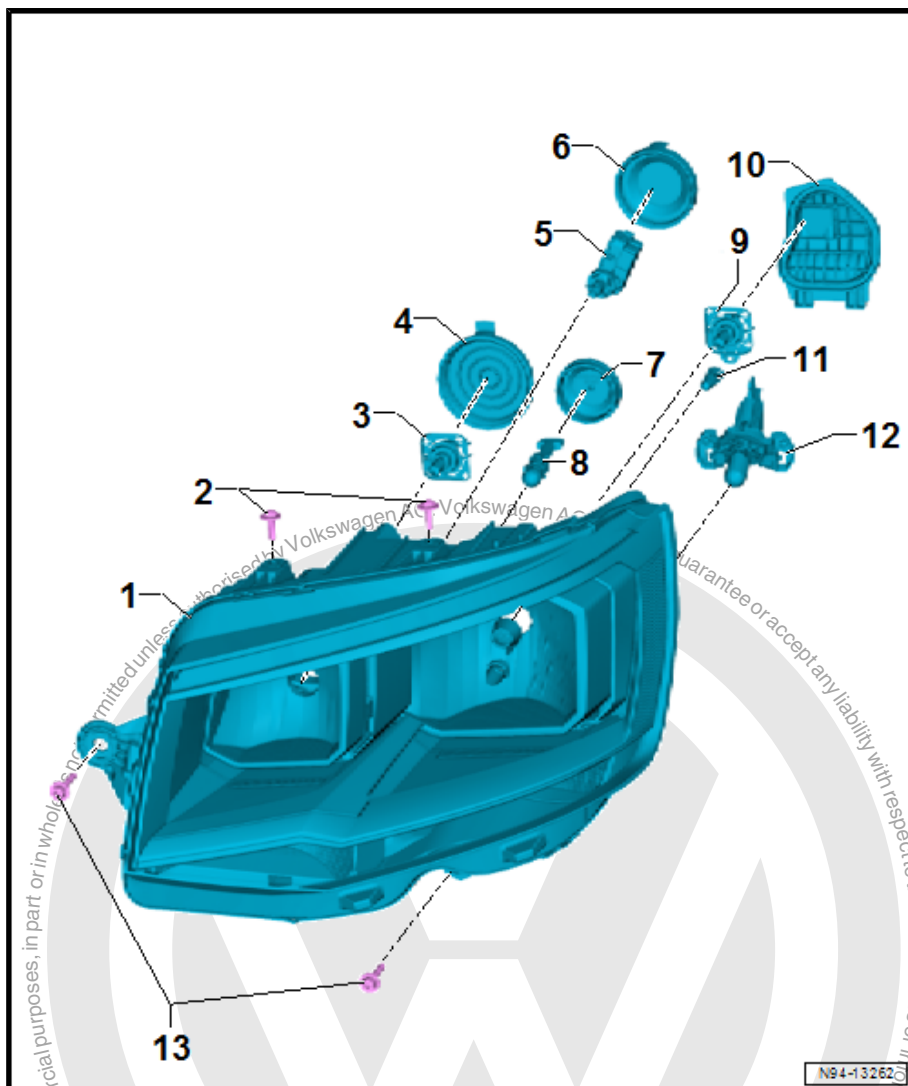
- ☐ Side light bulb -M1- / -M3-
- ☐ Removing and installing ⇒ [page 140](#)
- ☐ 12V, W5W

12 - Daytime running light bulb

- ☐ Daytime running light bulb -L174- / -L175-
- ☐ Removing and installing ⇒ [page 143](#)
- ☐ 12V, W21W

13 - Bolts

- ☐ Qty. 2
- ☐ Means of securing headlight on bumper guide profile
- ☐ Inner bolt: 2.2 Nm





- ☐ Lower bolt: 4.5 Nm

1.1.3 Assembly overview - LED headlights

1 - Headlights

- ☐ Removing and installing
⇒ [page 118](#)
- ☐ Removing and installing
headlight range control
unit ⇒ [page 209](#)

2 - Bolts

- ☐ Qty. 2
- ☐ Means of securing
headlight on lock carrier
- ☐ 4.5 Nm.

3 - Main beam LED module

- ☐ Headlight main beam
bulb -M30- / -M32-
- ☐ With reflector
- ☐ Removing and installing
⇒ [page 137](#)
- ☐ Fine adjustment of LED
modules ⇒ [page 149](#)

4 - Bolts

- ☐ Qty. 3
- ☐ Means of securing main
beam LED module in
headlight
- ☐ 1 Nm.

5 - Housing cover

- ☐ Securing bolts for repair
cover 1.6 Nm

6 - Headlight range control motor

- ☐ Headlight range control
motors -V48- / -V49-
- ☐ Removing and installing ⇒ [page 129](#)

7 - Housing cover

8 - Housing cover

- ☐ Securing bolts for repair cover 1.6 Nm

9 - Bolts

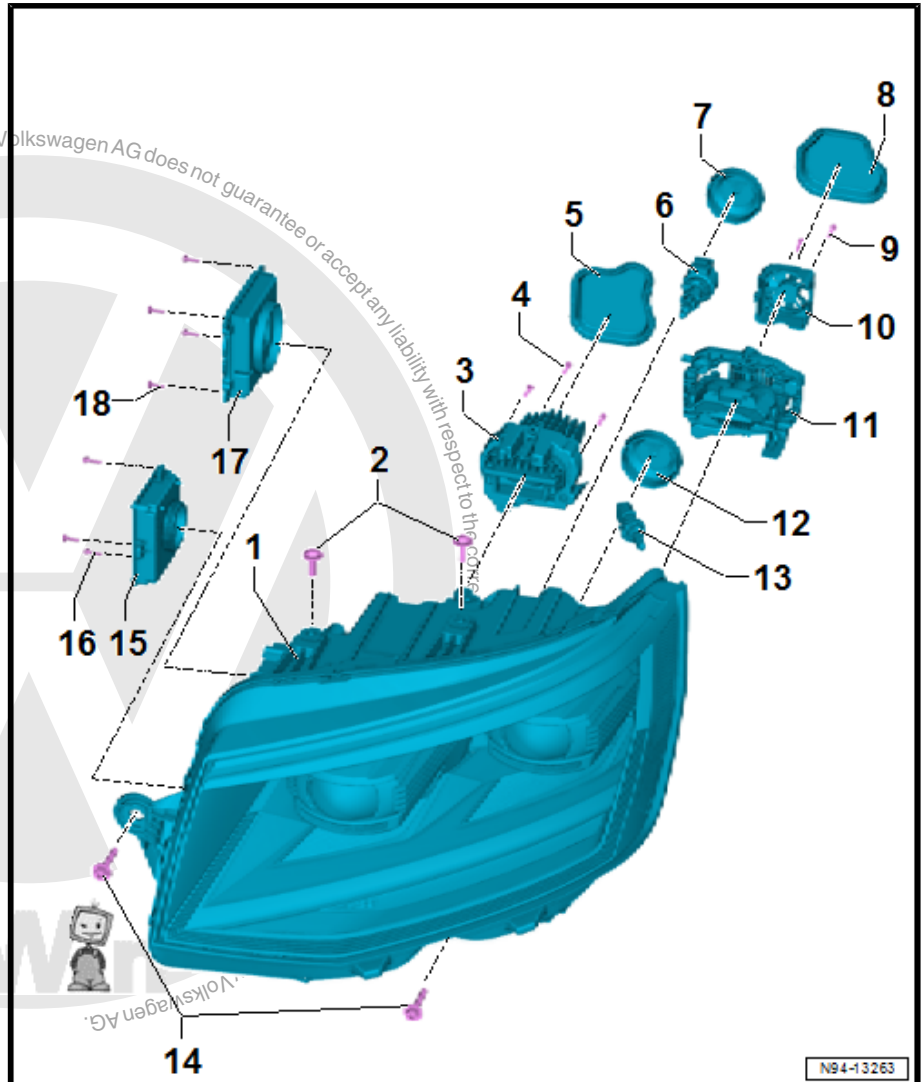
- ☐ Qty. 2
- ☐ Means of securing fan for LED headlight on dipped beam LED module
- ☐ 2.5 Nm.

10 - LED headlight fan

- ☐ Behind dipped beam LED module
- ☐ Removing and installing ⇒ [page 148](#)

11 - Dipped beam LED module

- ☐ Headlight dipped beam bulb -M29- / -M31-
- ☐ Removing and installing ⇒ [page 134](#)



N94-13263



- ☐ Fine adjustment of LED modules ⇒ [page 149](#)

12 - Housing cover

13 - Front turn signal bulb

- ☐ Front turn signal bulb -M5- / -M7-
- ☐ Removing and installing ⇒ [page 124](#)
- ☐ 12V, H21W

14 - Bolts

- ☐ Qty. 2
- ☐ Means of securing headlight on bumper guide profile
- ☐ Inner bolt: 2.2 Nm
- ☐ Lower bolt: 4.5 Nm

15 - Output module 1 for left LED headlight

- ☐ Output module 1 for LED headlight -A27- / -A31-
- ☐ Removing and installing ⇒ [page 146](#)

16 - Bolts

- ☐ Qty. 3
- ☐ Means of securing headlight output module to headlight housing
- ☐ 1 Nm.

17 - Power output module for headlight

- ☐ Output module for headlight -J667- / -J668-
- ☐ Removing and installing ⇒ [page 144](#)

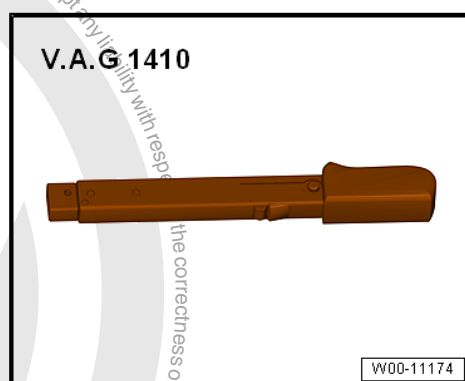
18 - Bolts

- ☐ Qty. 4
- ☐ Means of securing output module 1 for LED headlight to headlight housing
- ☐ 1 Nm.

1.2 Removing and installing headlight

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1410-



Note

- ♦ *The procedure for removal and installation is described as an example for the H4 headlight on the left-hand side.*
- ♦ *Removal and installation is basically the same on the right-hand side and for H7 and LED headlights.*



Removing

- Detach front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover .



Note

The bumper cover does not have to be removed completely. For the headlight in question, it is sufficient to remove the fastenings at the front and at the sides of the bumper cover. The bumper cover can then be press downwards carefully until the lower bolt securing the headlight can be reached.

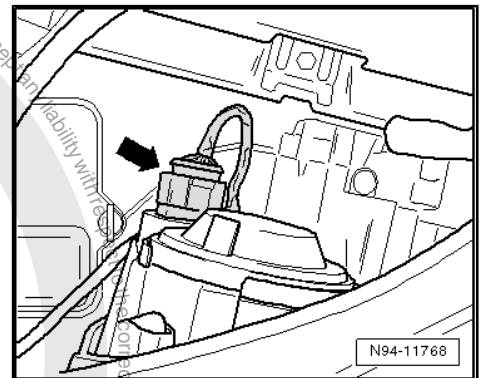


Caution

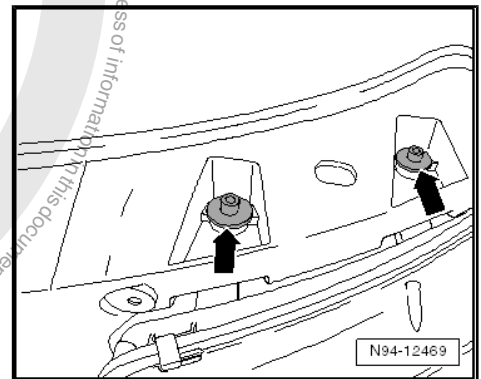
Risk of damage to component.

- ◆ **Carefully pull off bumper cover. When doing this, make sure that the bumper cover is not being deformed or torn.**
- ◆ **In order to avoid scratches on the surfaces when removing the headlight, mask off the surrounding areas.**

- Separate electrical connector -arrow-.

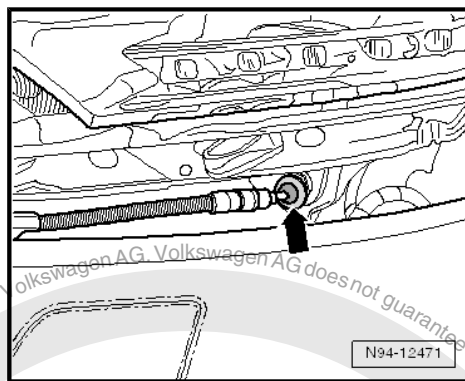


- Unscrew upper bolts -arrows-.





- Unscrews lower bolt -arrow-, while lightly pressing bumper cover downwards.
- If necessary, unclip radiator fan air guide to gain access to inner headlight securing bolt ⇒ Power unit; Rep. gr. 19 ; Radiator/radiator fan; Assembly overview - radiator/radiator fan .

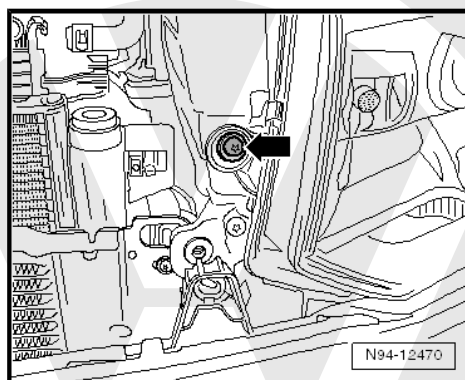


- Unscrew inner bolt on headlight -arrow-.
- Carefully remove headlight from body aperture, taking care not to damage paintwork on bumper cover when doing so. If necessary, cover bumper cover in area of headlight for protection.

Installing

Install in reverse order of removal, observing the following:

- Insert headlight into holder. When doing this, ensure that guide at the side is seated correctly on the wing.
- Check and, if necessary, adjust installation position of headlight to body ⇒ [page 120](#) .
- Tighten all bolts in sequence: top, bottom, inner.
- Perform functional check.
- Check headlight setting and adjust headlight if necessary ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work



Torque settings

- ♦ ⇒ [“1.1.1 Assembly overview - H4 headlight”, page 114](#)
- ♦ ⇒ [“1.1.2 Assembly overview - H7 headlight”, page 116](#)
- ♦ ⇒ [“1.1.3 Assembly overview - LED headlights”, page 117](#)

1.3 Adjusting headlights



Note

Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

1.4 Adjusting headlight installation position



Note

- ♦ The procedure for adjusting the installation position is described as an example for the H4 headlight on the left-hand side.
- ♦ Adjustment of the installation position is basically the same on the right-hand side and for H7 and LED headlights.

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1410-

V.A.G 1410



W00-11174

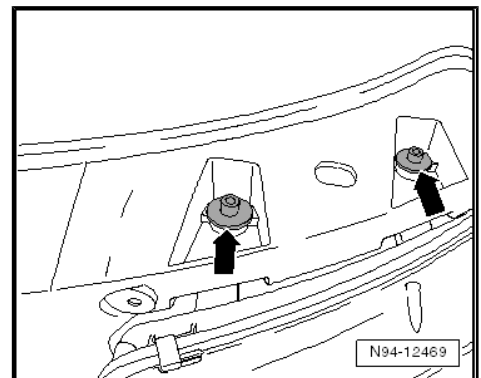
Sequence of operations

Detach front bumper cover ⇒ General body repairs, exterior;
Rep. gr. 63 ; Front bumper; Removing and installing bumper
cover .

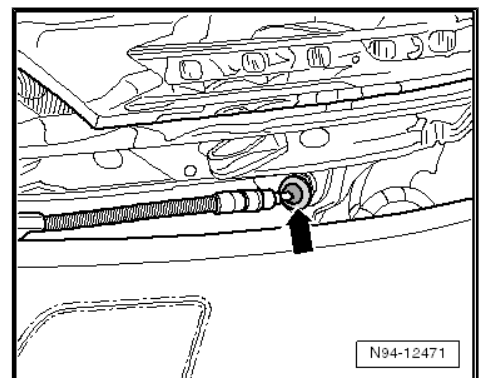


Note

- ◆ *The bumper cover does not have to be removed completely. For the headlight in question, it is sufficient to remove the fastenings at the front and at the sides of the bumper cover. The bumper cover can then be press downwards carefully until the lower bolt securing the headlight can be reached.*
- ◆ *In the area of the two bolts securing the bumper at the sides, it must be ensured that the bolts exposed when the bumper cover is removed do not scratch the wing. Protect this area with foam padding during assembly work.*
- Loosen upper bolts -arrows-.

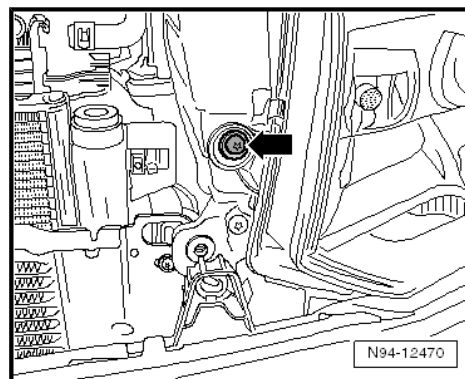


- Loosen lower bolt -arrow-, while lightly pressing bumper cover downwards.

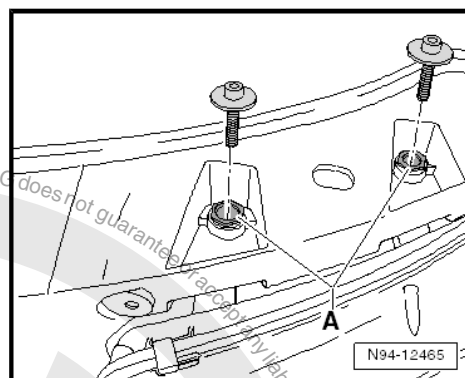




- Loosen inner bolt on headlight -arrow-.
- Place all screws in holes but do not tighten firmly yet.



- Using upper adjustment bushes -A- and lower bolt, adjust position of headlight in relation to body, while ensuring that gaps are even.
- Tighten all bolts in sequence: top, bottom, inner.
- Close bonnet.
- Check position of headlight in relation to body and, if necessary, adjust again with aid of adjustment bushes.
- Perform functional check.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work



Torque settings

- ♦ ⇒ ["1.1.1 Assembly overview - H4 headlight", page 114](#)
- ♦ ⇒ ["1.1.2 Assembly overview - H7 headlight", page 116](#)
- ♦ ⇒ ["1.1.3 Assembly overview - LED headlights", page 117](#)

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

⇒ ["1.5.1 Removing and installing front turn signal bulb M5 / M7 , H4 headlight", page 122](#)

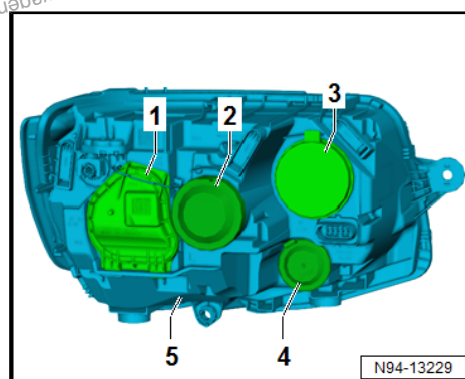
⇒ ["1.5.2 Removing and installing front turn signal bulb M5 / M7 , H7 headlight", page 123](#)

⇒ ["1.5.3 Removing and installing front turn signal bulb M5 / M7 , LED headlights", page 124](#)

1.5.1 Removing and installing front turn signal bulb -M5- / -M7- , H4 headlight

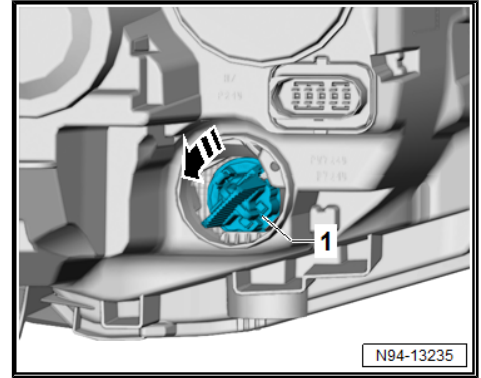
Removing

- Pull housing cover -4- off headlight.





- Turn grip piece -1- in direction of -arrow- and pull out bulb from reflector.



- Push bulb -1- into holder and, at same time, turn it anti-clockwise and pull it out from bulb holder -2-.

Front turn signal bulb -M5- / -M7- : 12V, PY21W

Installing

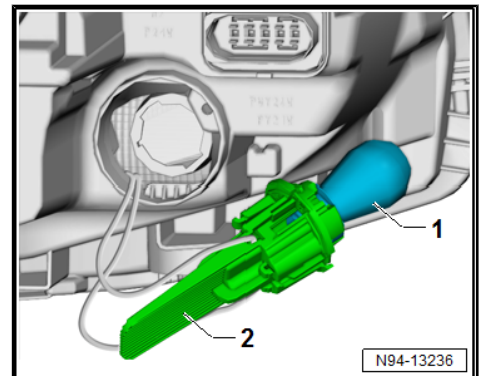
Install in reverse order of removal, observing the following:



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

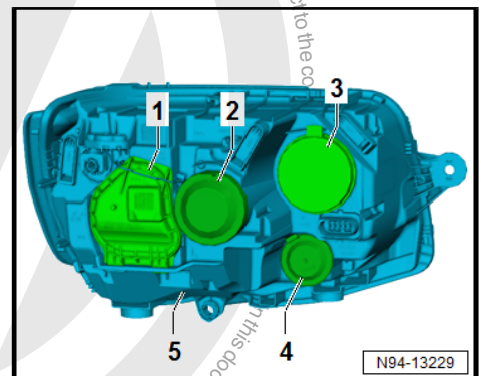


- Perform functional check.

1.5.2 Removing and installing front turn signal bulb -M5- / -M7- , H7 headlight

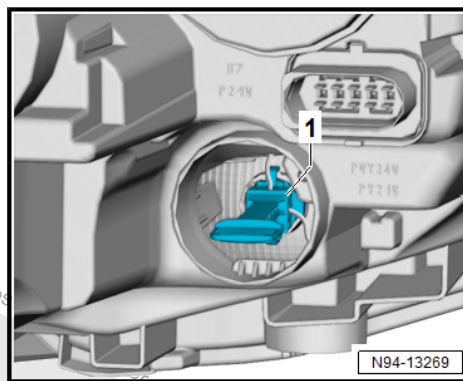
Removing

- Pull housing cover -4- off headlight.





- Pull out grip piece -1- from reflector together with bulb.



- Pull out bulb -1- in straight line from bulb holder -2-.

Front turn signal bulb -M5- / -M7- : 12V, PWY24W

Installing

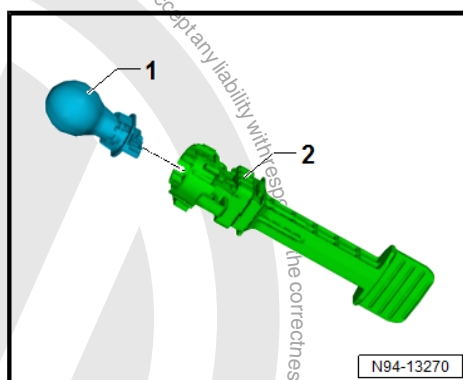
Install in reverse order of removal, observing the following:



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

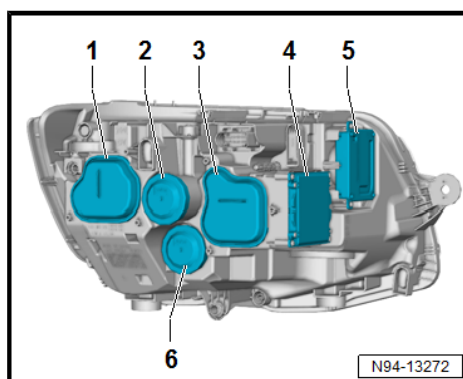


- Perform functional check.

1.5.3 Removing and installing front turn signal bulb -M5- / -M7- , LED headlights

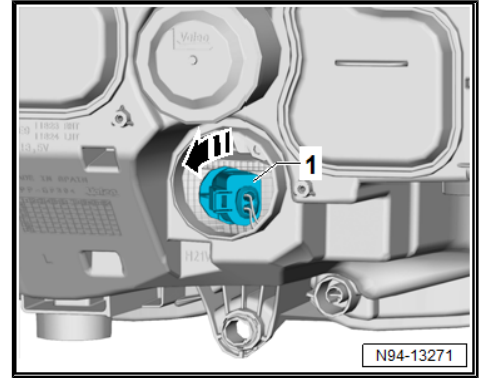
Removing

- Remove headlight ➔ [page 118](#) .
- Pull housing cover -6- off headlight.





- Turn grip piece -1- in direction of -arrow- and pull out bulb from reflector.



- Separate electrical connector -1- on front left turn signal bulb and its holder -2-.
- Remove front turn signal bulb -M5- / -M7- : 12V, H21W from holder -2-.

Installing

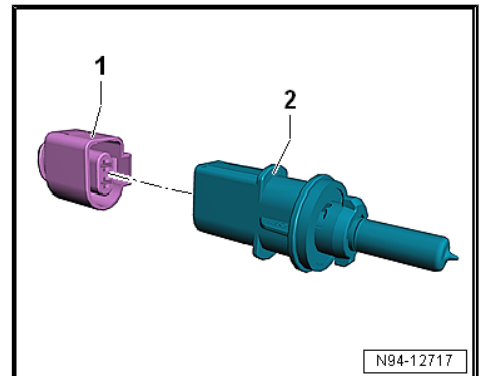
Install in reverse order of removal, observing the following:



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



- Perform functional check.

Torque settings

- ◆ ⇒ [“1.1.3 Assembly overview - LED headlights”, page 117](#)

1.6 Installing repair kit for headlight housing

No information on this subject was available for this chapter at the time of publication.

1.7 Converting headlights from driving on right to driving on left

⇒ [“1.7.1 Converting headlights from driving on right to driving on left, H4 headlights”, page 125](#)

⇒ [“1.7.2 Converting headlights from driving on right to driving on left, H7 headlights”, page 126](#)

⇒ [“1.7.3 Converting headlights from driving on right to driving on left, LED headlights”, page 126](#)

1.7.1 Converting headlights from driving on right to driving on left, H4 headlights

If an RHD vehicle is driven in a left-traffic country, or vice versa, the headlights do not need to be adapted in any way.



1.7.2 Converting headlights from driving on right to driving on left, H7 headlights

If an RHD vehicle is driven in a left-traffic country, or vice versa, the headlights do not need to be adapted in any way.

1.7.3 Converting headlights from driving on right to driving on left, LED headlights

If a right-hand drive vehicle is driven in a left-hand drive country, or vice versa, the headlights must be converted. This is necessary in order to avoid dazzling oncoming traffic with the asymmetric low beam headlights.



Note

- ◆ *The adjustment for driving on the left to driving on the right or vice versa (travel mode) is carried out in the dash panel insert using the menu.*
- ◆ *It is only permissible to make use of the headlight converter for a short period of time. When permanently driving in the respective country during a longer period of time, suitable headlights need to be installed according to valid specifications.*
- Call up main menu in dash panel insert ⇒ Operating instructions .
- Call up “Settings” menu.
- Call up “Light & visibility” sub-menu option.
- Activate or deactivate “Travel mode” menu item to switch travel mode on or off.

1.8 Converting headlights from driving on left to driving on right

⇒ [“1.8.1 Converting headlights from driving on left to driving on right, H4 headlights”, page 126](#)

⇒ [“1.8.2 Converting headlights from driving on left to driving on right, H7 headlights”, page 126](#)

⇒ [“1.8.3 Converting headlights from driving on left to driving on right, LED headlights”, page 126](#)

1.8.1 Converting headlights from driving on left to driving on right, H4 headlights

If an RHD vehicle is driven in a left-traffic country, or vice versa, the headlights do not need to be adapted in any way.

1.8.2 Converting headlights from driving on left to driving on right, H7 headlights

If an RHD vehicle is driven in a left-traffic country, or vice versa, the headlights do not need to be adapted in any way.

1.8.3 Converting headlights from driving on left to driving on right, LED headlights

If a right-hand drive vehicle is driven in a left-hand drive country, or vice versa, the headlights must be converted. This is necessary in order to avoid dazzling oncoming traffic with the asymmetric low beam headlights.



Note

- ◆ *The adjustment for driving on the left to driving on the right or vice versa (travel mode) is carried out in the dash panel insert using the menu.*
- ◆ *It is only permissible to make use of the headlight converter for a short period of time. When permanently driving in the respective country during a longer period of time, suitable headlights need to be installed according to valid specifications.*
- Call up main menu in dash panel insert ⇒ Operating instructions .
- Call up “Settings” menu.
- Call up “Light & visibility” sub-menu option.
- Activate or deactivate “Travel mode” menu item to switch travel mode on or off.

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

⇒ [“1.9.1 Removing and installing headlight range control motor V48 / V49 , H4 headlights”, page 127](#)

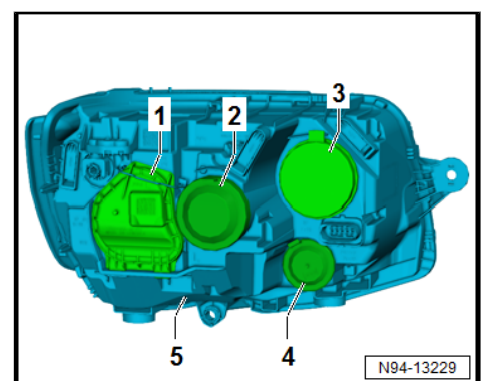
⇒ [“1.9.2 Removing and installing headlight range control motor V48 / V49 , H7 headlights”, page 129](#)

⇒ [“1.9.3 Removing and installing headlight range control motor V48 / V49 , LED headlights”, page 129](#)

1.9.1 Removing and installing headlight range control motor -V48- / -V49- , H4 headlights

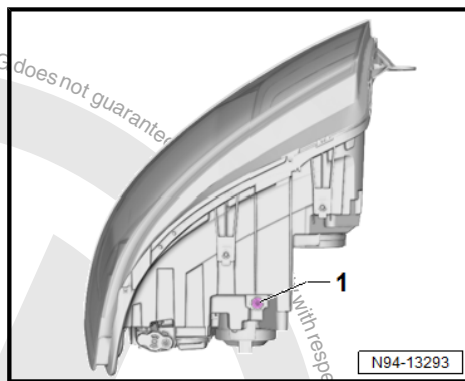
Removing

- Remove headlight ⇒ [page 118](#) .
- Pull off housing cover -2- from headlight.

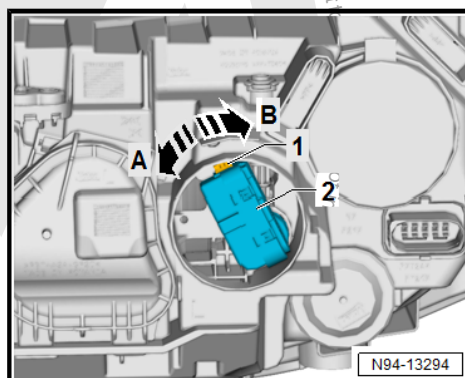




- Pull vertical adjuster -1- upwards out of headlight.



- Turn headlight range control motor -2- to stop in direction of arrow -A- to release it.
- Pull headlight range control motor -2- towards rear out of headlight until connector is accessible.
- Disconnect connector -1-.
- Pull out ball head on headlight range control motor -1- from mounting on reflector.



Installing

Install in reverse order of removal, observing the following:

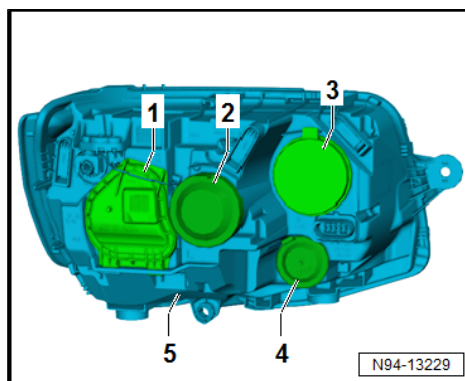


Caution

Risk of damage to the headlight.

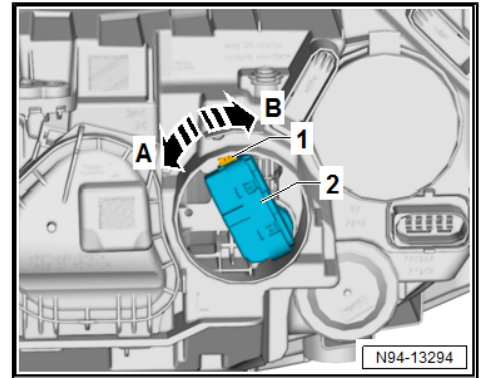
- ◆ ***Make sure the housing cover is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.***

- While pressing in headlight range control motor , fit electrical connector.
- Release wire clasp and remove housing cover -1- from headlight.
- Reach through opening behind housing cover -1- then pull back and hold reflector.
- Press headlight range control motor into mounting on reflector until it can be heard to engage.

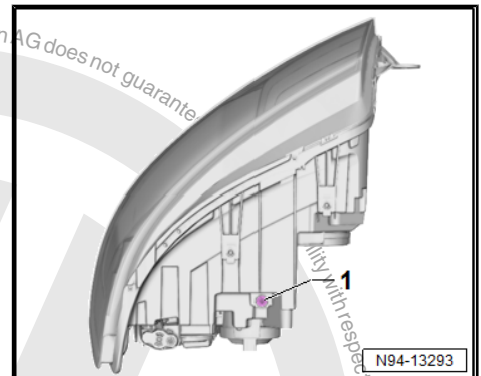




- Turn headlight range control motor -2- to stop in direction of arrow -B- to engage it.



- Install vertical adjuster -1-.
- Perform functional check.
- Check headlight settings, and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



1.9.2 Removing and installing headlight range control motor -V48- / -V49- , H7 head-lights

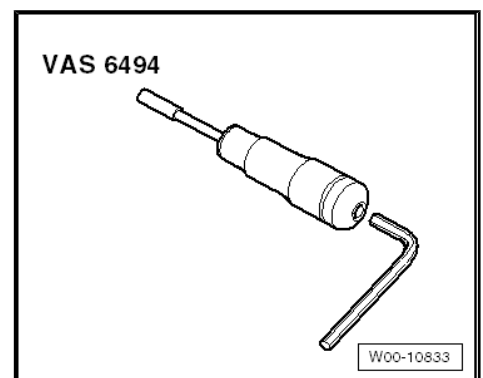
Note

- ♦ The procedure for removal and installation of the headlight range control motor -V48- / -V49- in the H7 headlight is the same as that for the H4 headlight.
- ♦ Removing and installing headlight range control motor -V48- / -V49- , H4 headlights ➔ [page 127](#).

1.9.3 Removing and installing headlight range control motor -V48- / -V49- , LED head-lights

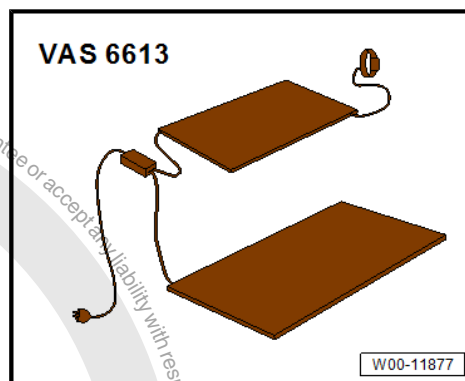
Special tools and workshop equipment required

- ♦ Torque screwdriver - VAS 6494-





◆ ESD (electrostatic discharge) workplace - VAS 6613-



Note

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

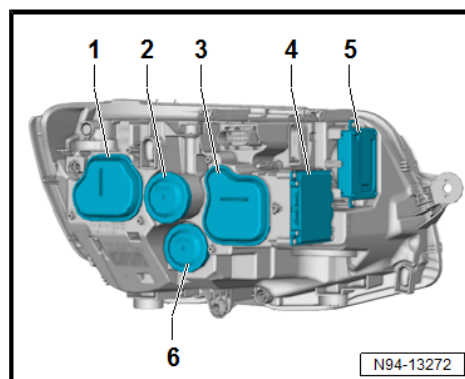


Caution

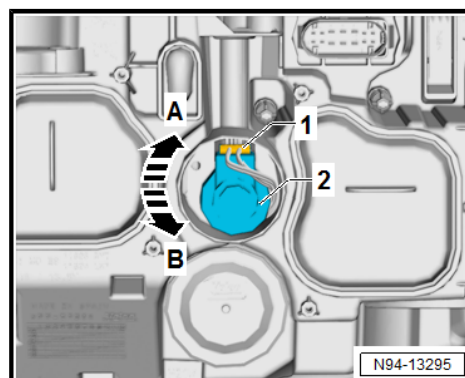
Work on the LED control motor may only be performed in an ESD workplace.

Removing

- Remove headlight ➔ [page 118](#).
- Pull off cap -2- from headlight housing.
- Remove housing cover from main beam LED module to gain access to control motor ball head ➔ [page 137](#).

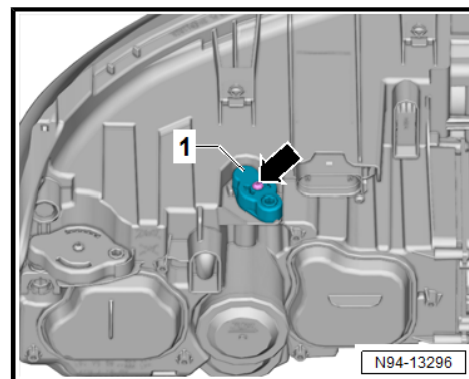


- Separate electrical connector -1- from control motor -2-.
- To release, turn control motor -2- in direction of arrow -A- as far as it will go.





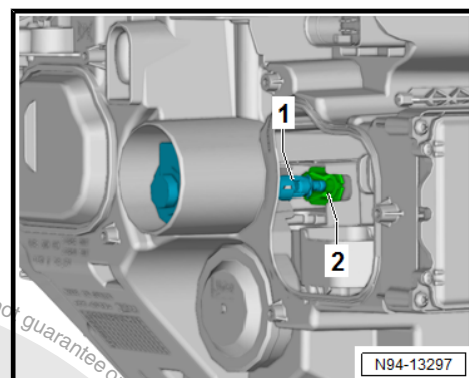
- Unscrew bolt -arrow- and remove adjuster -1- with shaft.



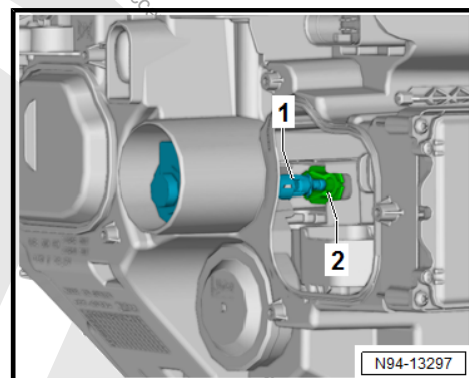
- Push ball head on control motor -1- upwards as far as it will go.
- Tilt control motor and pull out sideways from guide -2-.

Installing

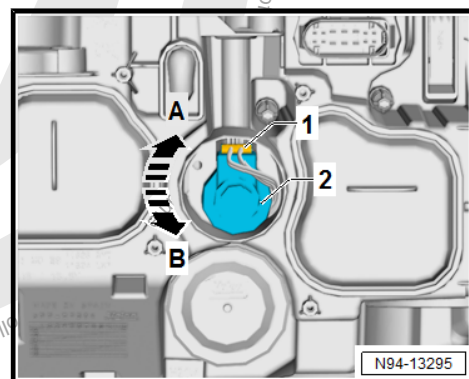
Install in reverse order of removal, observing the following:



- Push control motor -1- into guide -2-.
- Push ball head on control motor -1- downwards as far as it will go and install adjuster.



- To engage, turn control motor -2- in direction of arrow -B- as far as it will go.
- Fit electrical connector -1- on control motor -2-.





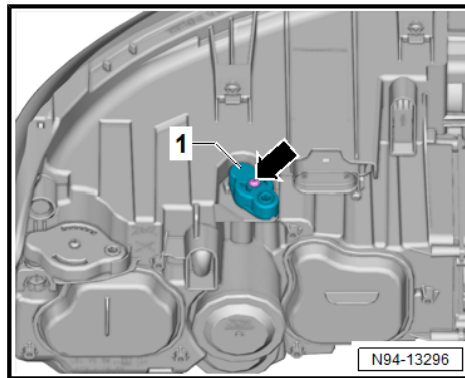
- Install adjuster -1- with shaft.



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.**



- Perform functional check.
- Install new housing cover on main beam LED module
⇒ [page 137](#) .
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work

Torque settings

- ◆ ⇒ [“1.1.3 Assembly overview - LED headlights”, page 117](#)

1.10 Removing and installing headlight dipped beam bulb -M29- / -M31-

⇒ [“1.10.1 Removing and installing headlight dipped beam bulb M29 / M31 , H4 headlight”, page 132](#)

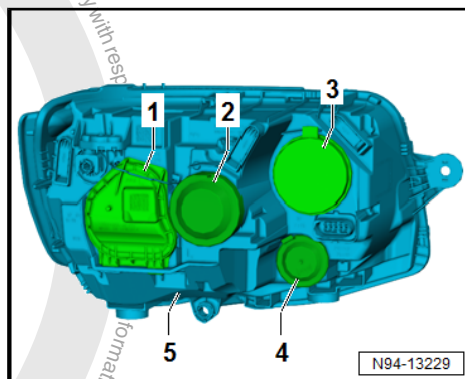
⇒ [“1.10.2 Removing and installing headlight dipped beam bulb M29 / M31 , H7 headlight”, page 133](#)

⇒ [“1.10.3 Removing and installing headlight dipped beam bulb M29 / M31 , LED headlight”, page 134](#)

1.10.1 Removing and installing headlight dipped beam bulb -M29- / -M31- , H4 headlight

Removing

- Release wire clasp and remove housing cover -1- from headlight.





- Disconnect connector -3-.
- Release wire clasp -1- and fold down.
- Remove bulb -2- from reflector.

Headlight dipped beam bulb -M29- / -M31- : 12V, H4 60/55W

Installing

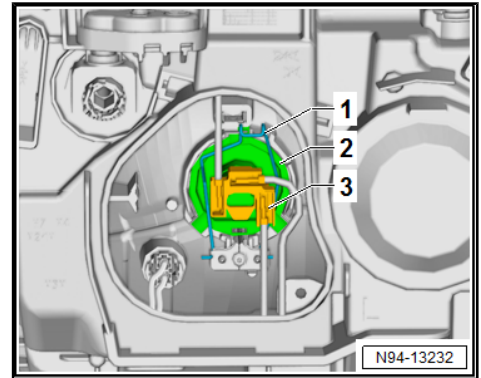
Install in reverse order of removal, observing the following:



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

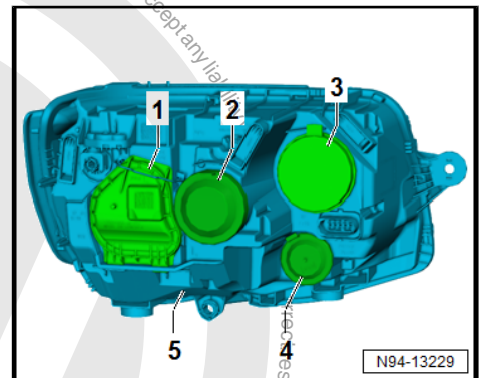


- Perform functional check.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work

1.10.2 Removing and installing headlight dipped beam bulb -M29- / -M31- , H7 headlight

Removing

- Release wire clasp and remove housing cover -1- from headlight.





- Tilt bulb -1- sideways to release it, and pull it out of reflector.
- Pull bulb -1- off connector.

Headlight dipped beam bulb -M29- / -M31- : 12V, H7 55W

Installing

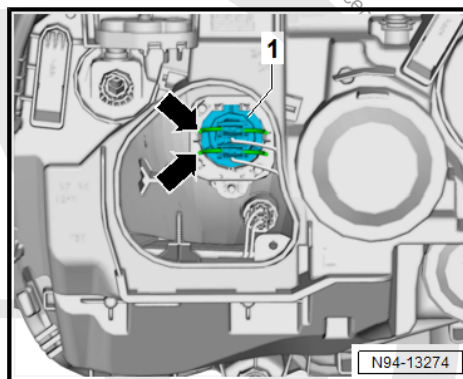
Install in reverse order of removal, observing the following:



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

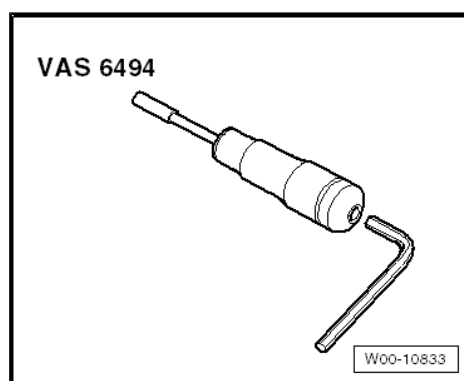


- Perform functional check.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work

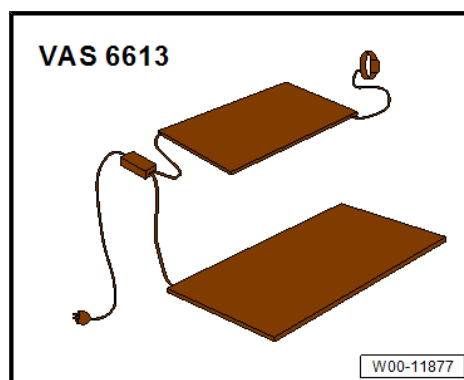
1.10.3 Removing and installing headlight dipped beam bulb -M29- / -M31- , LED headlight

Special tools and workshop equipment required

- ◆ Torque screwdriver - VAS 6494-



- ◆ ESD (electrostatic discharge) workplace - VAS 6613-





Note

- ◆ The dipped beam function in the LED headlight is not performed by a conventional bulb but an LED module instead.
- ◆ The removal and installation procedure is described for the left-hand side. The removal and installation procedure for the right-hand side is basically the same.

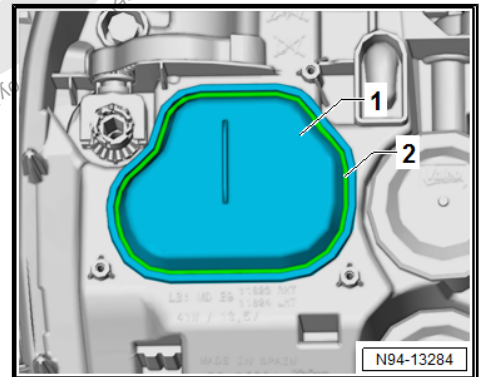


Caution

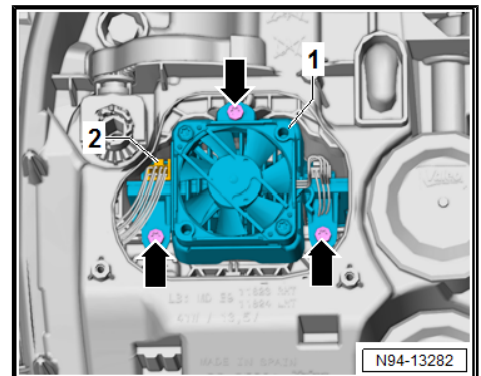
Work on the LED module must be performed only at an ESD workplace.

Removing

- Remove headlight ➤ [page 118](#) .
- Using a hammer, carefully detach housing cover -1- around engineered break line -2-. Preferably, strike on the corners of the cover when doing this to prevent it from breaking.
- Remove housing cover -1- from headlight.



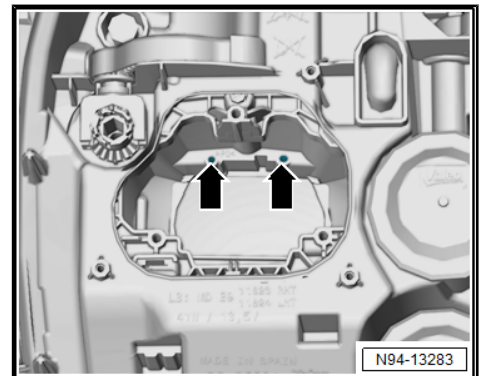
- Disconnect connector -2-.
- Unscrew bolts -arrows- of LED module.
- Guide main beam LED module -1- backwards out of headlight.



Installing

Install in reverse order of removal, observing the following:

- Insert LED module and, when doing this, ensure that centring pins on LED module are correctly positioned in mountings -arrows-.
- Connect electrical connector.



Caution

Risk of damage to the headlight.

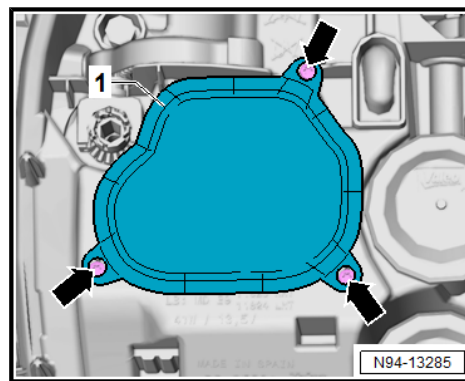
- ◆ Make sure the housing cover is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.



- Position new housing cover -1- onto headlight.
- Screw in and tighten bolts -arrows-.
- Calibrate LED modules ➔ [page 149](#) .
- Perform functional check.
- Check headlight setting and adjust headlight if necessary
➔ Maintenance ; Booklet 20.1 ; Descriptions of work

Torque settings

- ♦ ➔ [“1.1.3 Assembly overview - LED headlights”, page 117](#)



1.11 Removing and installing headlight main beam bulb -M30- / -M32-

➔ [“1.11.1 Removing and installing headlight main beam bulb M30 / M32 , H4 headlight”, page 136](#)

➔ [“1.11.2 Removing and installing headlight main beam bulb M30 / M32 , H7 headlight”, page 136](#)

➔ [“1.11.3 Removing and installing headlight main beam bulb M30 / M32 \(LED\)”, page 137](#)

1.11.1 Removing and installing headlight main beam bulb -M30- / -M32- , H4 headlight



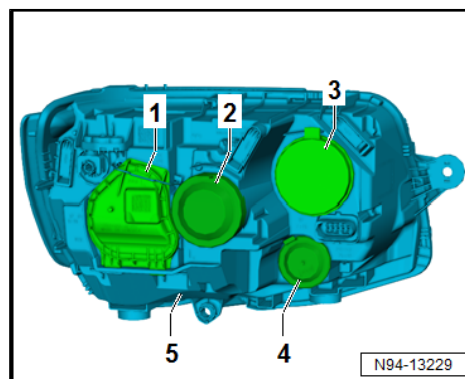
Note

- ♦ *In H4 headlights, the main beam is generated by the dipped beam bulb -M29- / -M31- .*
- ♦ *Removing and installing headlight dipped beam bulb -M29- / -M31- ➔ [page 132](#) .*

1.11.2 Removing and installing headlight main beam bulb -M30- / -M32- , H7 headlight

Removing

- Pull off housing cover -3- from headlight.





- Tilt bulb -1- sideways to release it, and pull it out of reflector.
- Pull bulb -1- off connector.

Headlight main beam bulb -M30- / -M32- : 12V, H7 55W

Installing

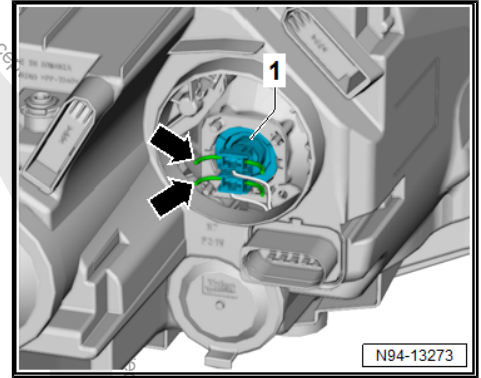
Install in reverse order of removal, observing the following:



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

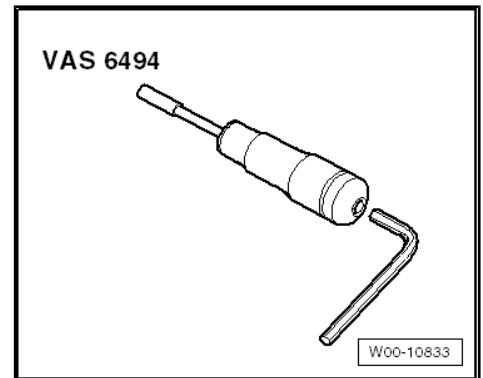


- Perform functional check.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work

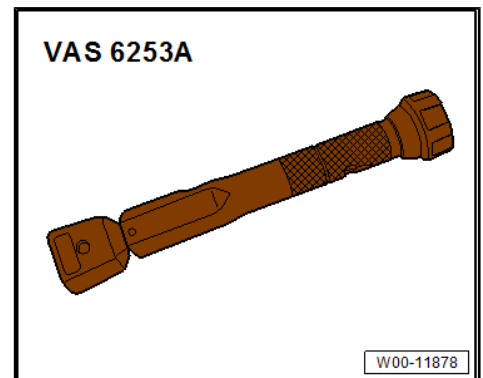
1.11.3 Removing and installing headlight main beam bulb -M30- / -M32- (LED)

Special tools and workshop equipment required

- ◆ Torque screwdriver - VAS 6494-

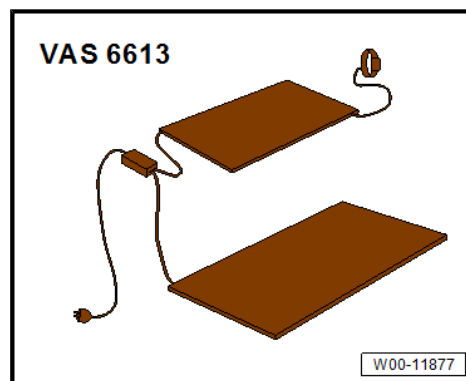


- ◆ Torque wrench 50-100Ncm - VAS 6253A-





- ◆ ESD (electrostatic discharge) workplace - VAS 6613-



Note

- ◆ The main beam in the LED headlight is not generated by a conventional bulb but an LED module instead.
- ◆ The removal and installation procedure is described for the left-hand side. The removal and installation procedure for the right-hand side is basically the same.



Caution

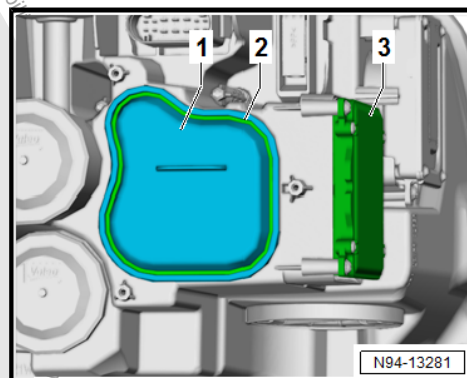
Work on the LED module must be performed only at an ESD workplace.

Removing

- Remove headlight ⇒ [page 118](#) .
- Using a hammer, carefully detach housing cover -1- around engineered break line -2-. Preferably, strike on the corners of the cover when doing this to prevent it from breaking.

Remove housing cover -1- from headlight.

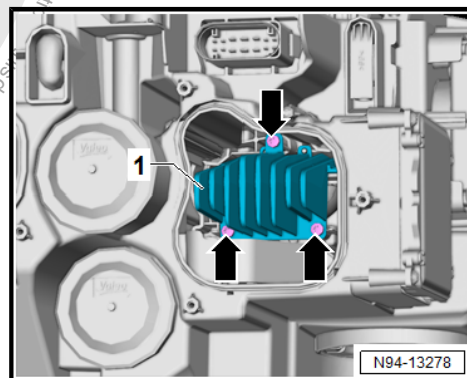
Remove output module for headlight -J667- / -J668--3- to gain access to electrical connector ⇒ [page 144](#) .



- Unscrew three bolts -arrows- of LED module -1-.
- Guide main beam LED module -1- backwards out of headlight and separate electrical connector.

Installing

Install in reverse order of removal, observing the following:





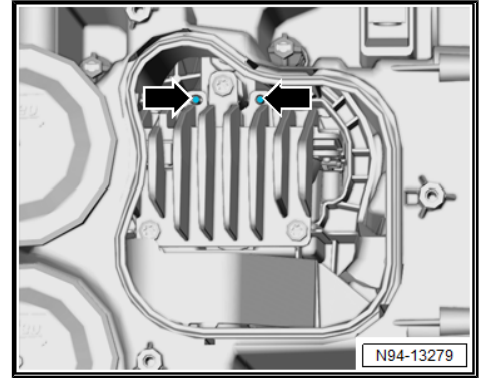
- Insert LED module and, when doing this, ensure that LED module is correctly positioned on centring pins -arrows-.
- Join electrical connector when inserting.
- Install output module for headlight -J667- / -J668-
⇒ [page 144](#) .



Caution

Risk of damage to the headlight.

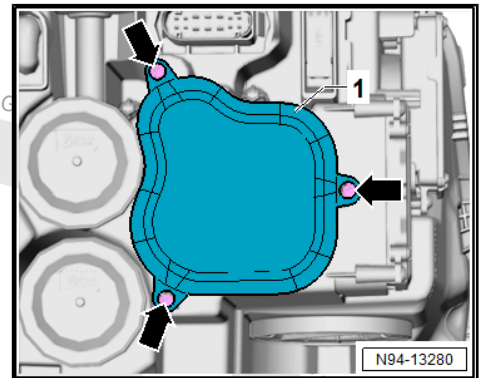
- ◆ **Make sure the housing cover is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.**



- Position new housing cover -1- onto headlight.
- Screw in and tighten bolts -arrows-.
- Calibrate LED modules ⇒ [page 149](#) .
- Perform functional check.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work

Torque settings

- ◆ ⇒ [“1.1.3 Assembly overview - LED headlights”, page 117](#)



1.12 Removing and installing side light bulb - M1- / -M3-

⇒ [“1.12.1 Removing and installing side light bulb M1 / M3 , H4 headlight”, page 139](#)

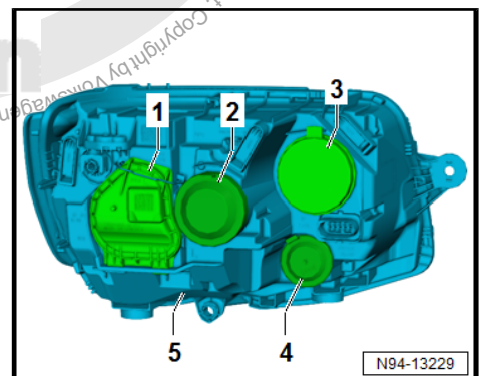
⇒ [“1.12.2 Removing and installing side light bulb M1 / M3 , H7 headlight”, page 140](#)

⇒ [“1.12.3 Removing and installing side light bulb M1 / M3 , LED headlight”, page 141](#)

1.12.1 Removing and installing side light bulb - M1- / -M3- , H4 headlight

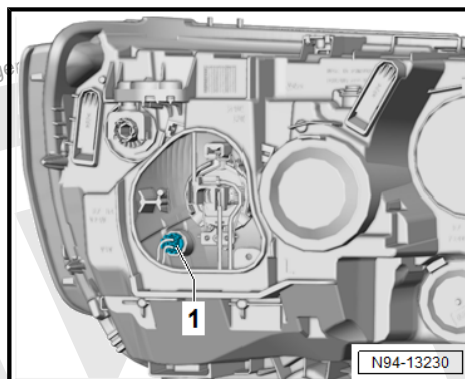
Removing

- Release wire clasp and remove housing cover -1- from headlight.





- Push button on connector -1- and pull out side light bulb with holder from reflector.



- Pull out side light bulb -1- from holder -2-.

Side light bulb -M1- / -M3- : 12V, W5W

Installing

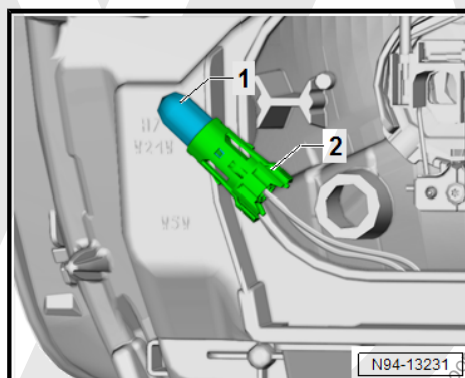
Install in reverse order of removal, observing the following:



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

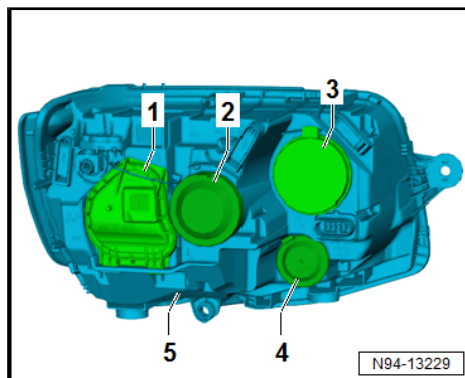


- Perform functional check.

1.12.2 Removing and installing side light bulb - M1- / -M3- , H7 headlight

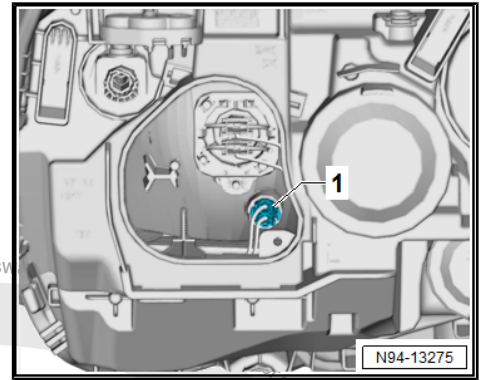
Removing

- Release wire clasp and remove housing cover -1- from headlight.





- Pull out side light bulb with holder -1- from reflector.



- Pull out side light bulb -1- in straight line from holder -2-.

Side light bulb -M1- / -M3- : 12V, W5W

Installing

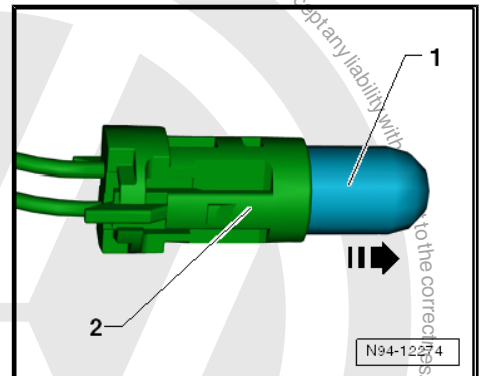
Install in reverse order of removal, observing the following:



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



- Perform functional check.

1.12.3 Removing and installing side light bulb - M1- / -M3- , LED headlight



Note

- ◆ *The side light function on LED headlights is performed by the LED module for daytime running lights.*
- ◆ *The LED module for daytime running lights cannot be replaced individually. In the event of damage, the headlight must be renewed => [page 118](#).*



1.13 Removing and installing daytime running light bulb -L174- / -L175-

⇒ ["1.13.1 Removing and installing daytime running light bulb L174 / L175 , H4 headlight", page 142](#)

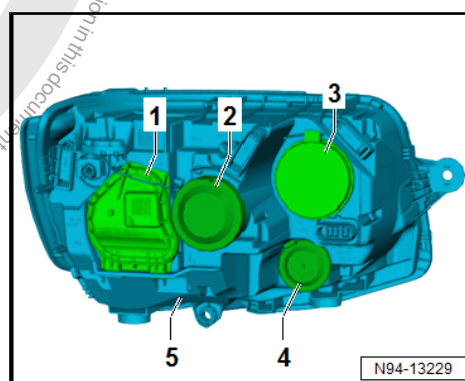
⇒ ["1.13.2 Removing and installing daytime running light bulb L174 / L175 , H7 headlight", page 143](#)

⇒ ["1.13.3 Removing and installing daytime running light bulb L174 / L175 , LED headlight", page 144](#)

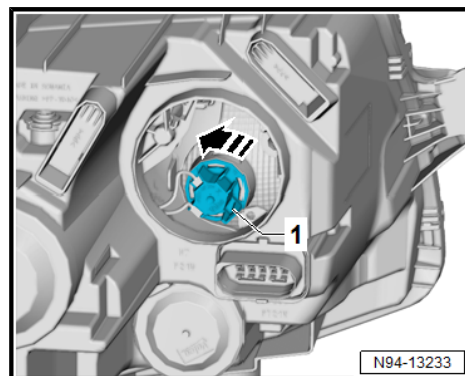
1.13.1 Removing and installing daytime running light bulb -L174- / -L175- , H4 headlight

Removing

- Pull off housing cover -3- from headlight.



- Release connector -1- in direction of -arrow- and pull out from reflector.





- Push daytime running light bulb -1- into holder and, at same time, turn it anti-clockwise and pull it out from bulb holder -2-.

Daytime running light bulb -L174- / -L175- : 12V, BA15s

Installing

Install in 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 housing cover is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.*

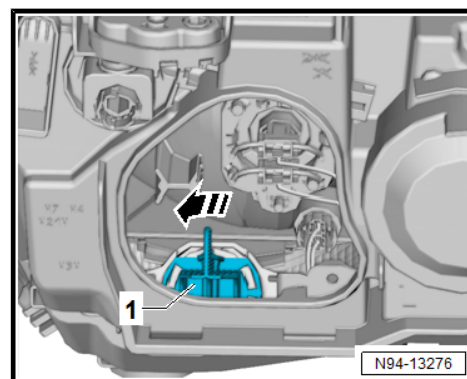
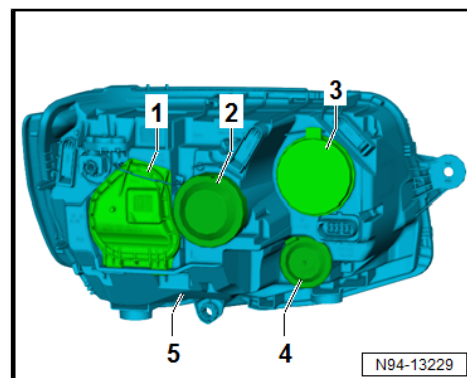
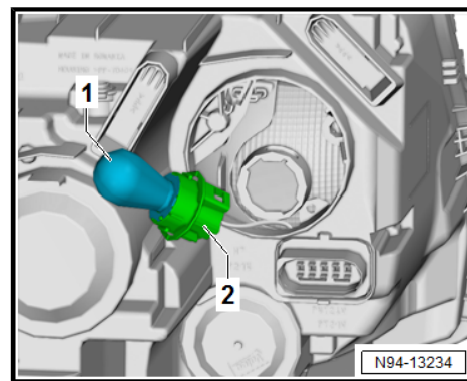
- Perform functional check.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work

1.13.2 Removing and installing daytime running light bulb -L174- / -L175- , H7 headlight

Removing

- Release wire clasp and remove housing cover -1- from headlight.

- Release grip piece with holder -1- in direction of -arrow- and pull out from reflector.





- Pull out daytime running light bulb -1- in straight line from holder -2-.

Daytime running light bulb -L174- / -L175- : 12V, W21W

Installing

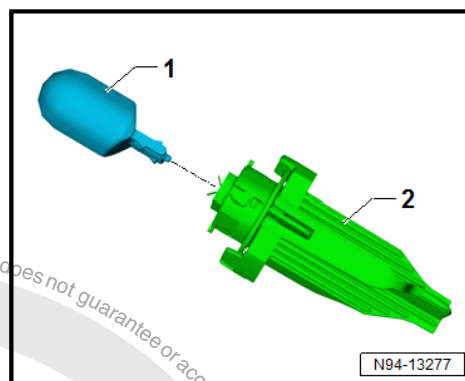
Install in reverse order of removal, observing the following:



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



- Perform functional check.
- Check headlight setting and adjust headlight if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work

1.13.3 Removing and installing daytime running light bulb -L174- / -L175- , LED headlight



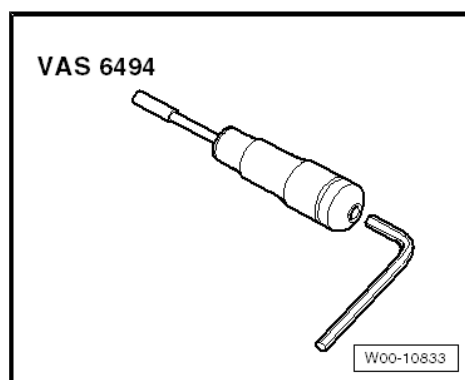
Note

- ◆ ***The function of the daytime running light bulb -L174- / -L175- on LED headlights is performed by the LED module for daytime running lights.***
- ◆ ***The LED module for daytime running lights cannot be replaced individually. In the event of damage, the headlight must be renewed ⇒ [page 118](#).***

1.14 Removing and installing output module for headlight -J667- / -J668-

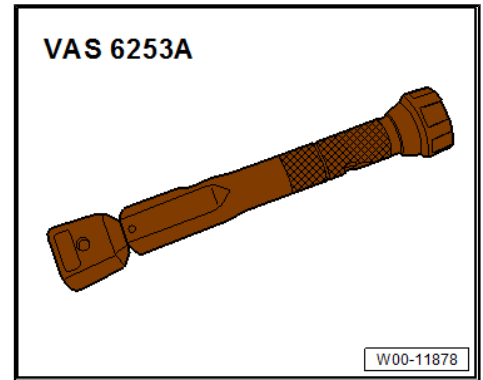
Special tools and workshop equipment required

- ◆ Torque screwdriver - VAS 6494-

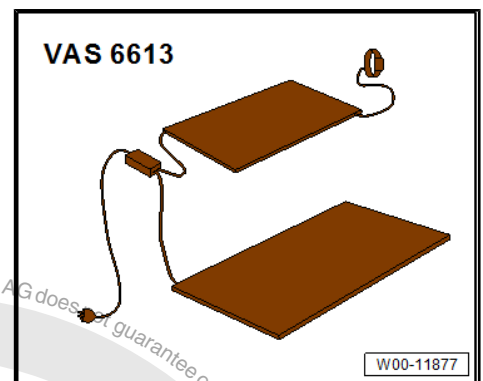




- ◆ Torque wrench 50-100Ncm - VAS 6253A-



- ◆ ESD (electrostatic discharge) workplace - VAS 6613-



Note

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



Caution

Work on the output module may only be performed in an ESD workplace.

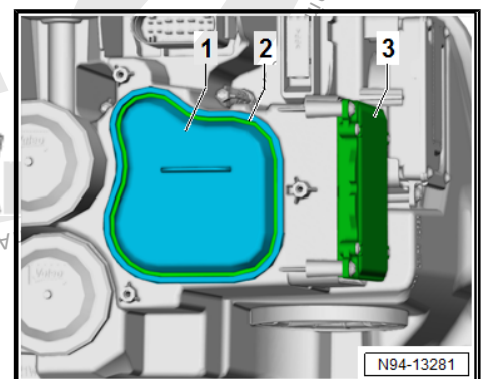
Removing

- Remove headlight ➔ [page 118](#) .
- Using a hammer, carefully detach housing cover on back of main beam LED module -1-, around engineered break line -2-. Preferably, strike on the corners of the cover when doing this to prevent it from breaking
- Remove housing cover -1- from headlight.



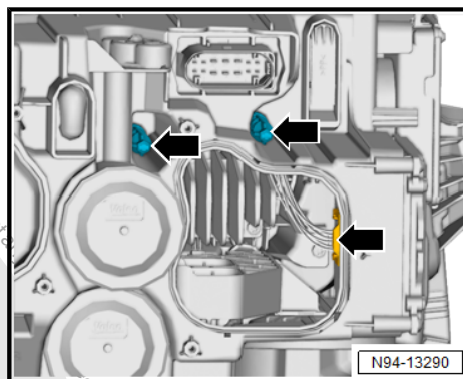
Note

The adjuster screws -top arrows- serve as a means of orientation.





- Separate electrical connector on headlight output module -bottom arrow-.



- Unscrew bolts -arrows-.
- Remove output module for headlight -1-.

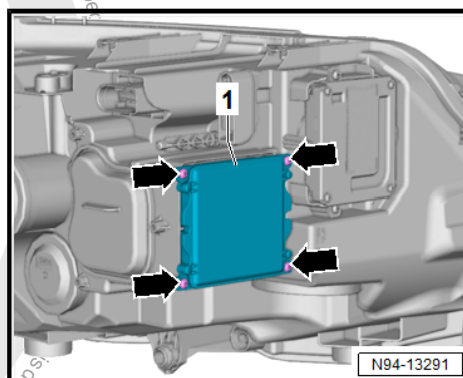
Installing

Install in reverse order of removal, observing the following:



Caution

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



- Check seal between headlight output module and headlight for damage.



Caution

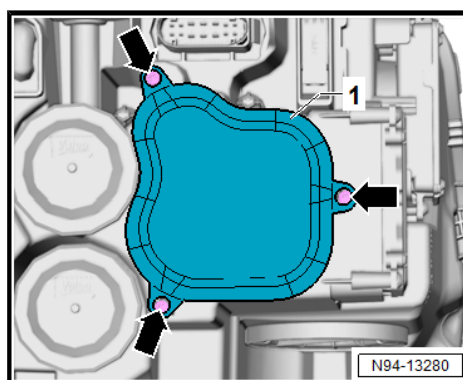
Risk of damage to the headlight.

- ◆ ***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-.

Torque settings

- ◆ ➔ ["1.1.3 Assembly overview - LED headlights", page 117](#)

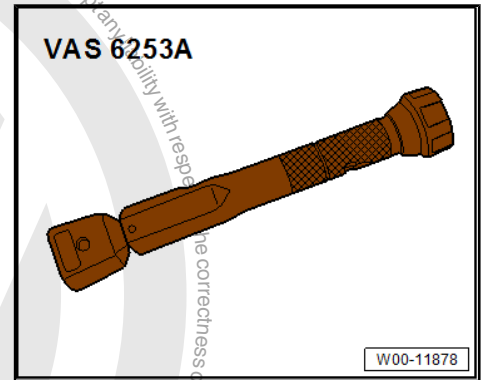


1.15 Removing and installing output module 1 for left LED headlight -A27- / -A31-

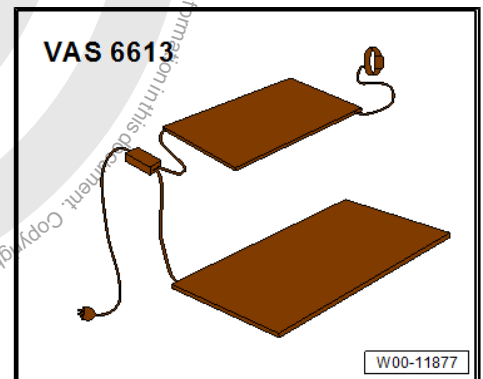
Special tools and workshop equipment required



- ◆ Torque wrench 50-100Ncm - VAS 6253A-



- ◆ ESD (electrostatic discharge) workplace - VAS 6613-



Note

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

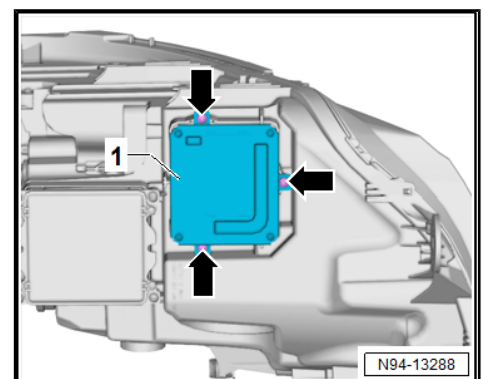


Caution

Work on the output module may only be performed in an ESD workplace.

Removing

- Remove headlight ➔ [page 118](#) .
- Unscrew three bolts -arrows- and remove LED headlight output module 1 -1-.





- Separate electrical connector -arrow- and remove LED headlight output module 1 -1-.

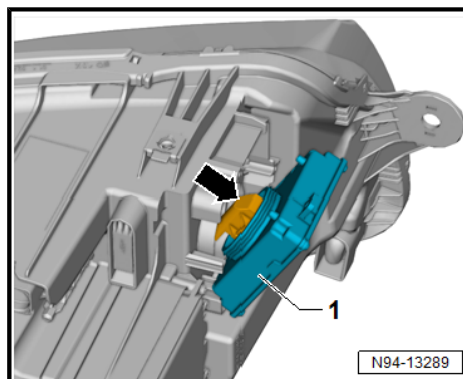
Installing

Install in reverse order of removal, observing the following:



Caution

Ensure that the seal is correctly seated when installing the LED headlight output module 1. The ingress of water will cause permanent damage to the headlight.



- Check seal between LED headlight output module 1 and headlight for damage.

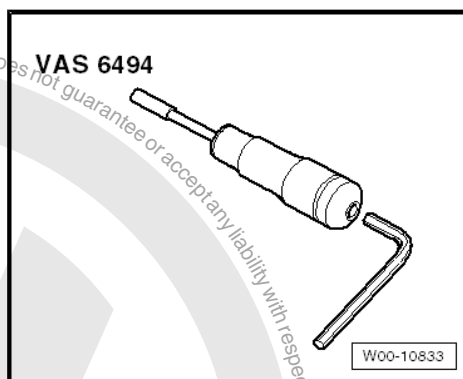
Torque settings

- ♦ ⇒ [“1.1.3 Assembly overview - LED headlights”, page 117](#)

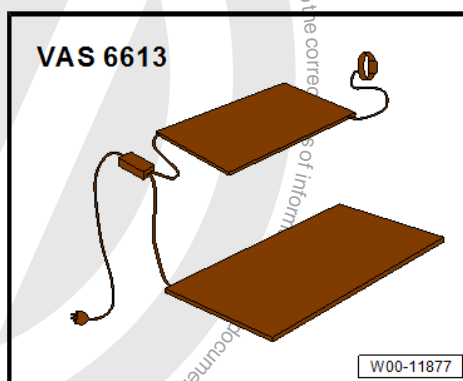
1.16 Removing and installing LED headlight fan

Special tools and workshop equipment required

- ♦ Torque screwdriver - VAS 6494-



- ♦ ESD (electrostatic discharge) workplace - VAS 6613-



Note

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



Caution

Work on the LED headlight fan may only be performed in an ESD workplace.

Removing

- Remove headlight ➤ [page 118](#) .
- Remove dipped beam LED module to gain access to electrical connector ➤ [page 134](#) .
- Unscrew bolts -arrows-.
- Separate electrical connector -1- and remove fan -2-.

Installing

Install in reverse order of removal, observing the following:



Caution

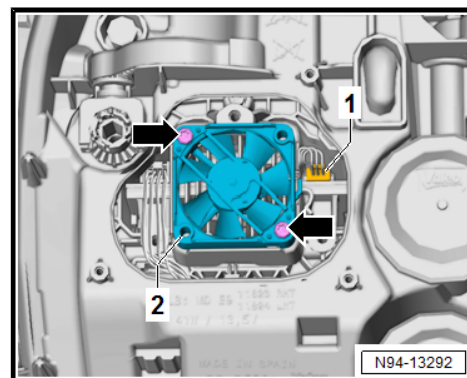
Risk of damage to the headlight.

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

- Before installing headlight, carry out fine adjustment of dipped beam LED module ➤ [page 149](#) .
- Perform functional check.
- Check headlight setting and adjust headlight if necessary ➤ Maintenance ; Booklet 20.1: Descriptions of work

Torque settings

- ◆ ➤ ["1.1.3 Assembly overview - LED headlights", page 117](#)



1.17 Fine adjustment of LED modules - LED headlights



Note

- ◆ *Following removal and installation or renewal of an LED module in the LED headlight, the main beam LED modules and dipped beam LED modules must be calibrated.*
- ◆ *The LED modules can be calibrated with the headlight removed using the headlight extension cable (test cable - VAS 621 003-) or with the headlight installed.*
- ◆ *When positioning the headlight in front of a wall, the distance must be 10 metres since the light pattern is far more distinct.*
- ◆ *The objective of the calibration is to align the light pattern of the main beam module with the light pattern of the dipped beam module.*

Preliminary work for calibration with headlight removed

- Join electrical connector for headlight in vehicle and electrical connector on headlight removed from vehicle to headlight extension cable test cable - VAS 621 003- .



- Position removed headlights horizontally at a distance of either 5 or 10 metres in front of a wall.

Preliminary work for calibration with headlight installed

- Position installed headlight horizontally at a distance of either 5 or 10 metres in front of a wall.

Continued for both calibration set-ups



Note

- ♦ *Adjust the main beam module in vertical direction by turning the two adjuster screws -1- and -2- on the back of the headlight.*
- ♦ *Adjust the main beam module in horizontal direction by turning the outer adjuster screw (as seen in direction of travel) -1- on the back of the headlight.*

- Switch on main beam.

1. Vertical adjustment

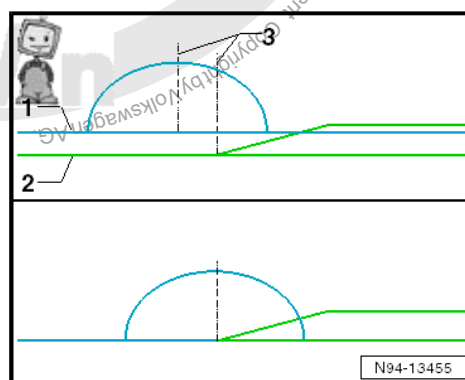
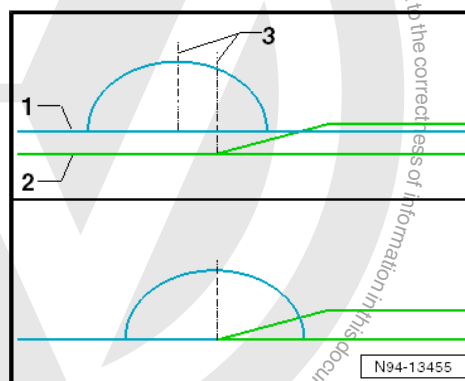
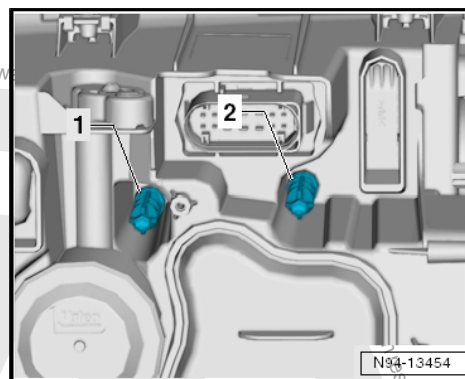
- Turn the »two adjuster screws« to set the bottom edge of the light pattern of the main beam module -1- to the same height as the bottom edge of the light pattern of the dipped beam module -2-.

2. Horizontal adjustment

- Turn the »outer adjuster screw (as seen in direction of travel)« until the two imaginary centre lines -3- of both light patterns are on top of each other.

The bottom section of the illustration shows the light pattern for properly calibrated LED modules.

- Install headlight as necessary ⇒ [page 118](#) .
- Adjust headlights ⇒ [page 120](#) .





2 Fog lights

⇒ [“2.1 Assembly overview - fog lights”, page 151](#)

⇒ [“2.2 Removing and installing fog light”, page 151](#)

⇒ [“2.3 Removing and installing fog light bulb L22 / L23 ”, page 152](#)

⇒ [“2.4 Removing and installing static cornering light bulb”, page 153](#)

⇒ [“2.5 Fog lights: Adjust”, page 153](#)

2.1 Assembly overview - fog lights

1 - Fog lights

- ❑ Removing and installing
⇒ [page 151](#)

2 - Bolt

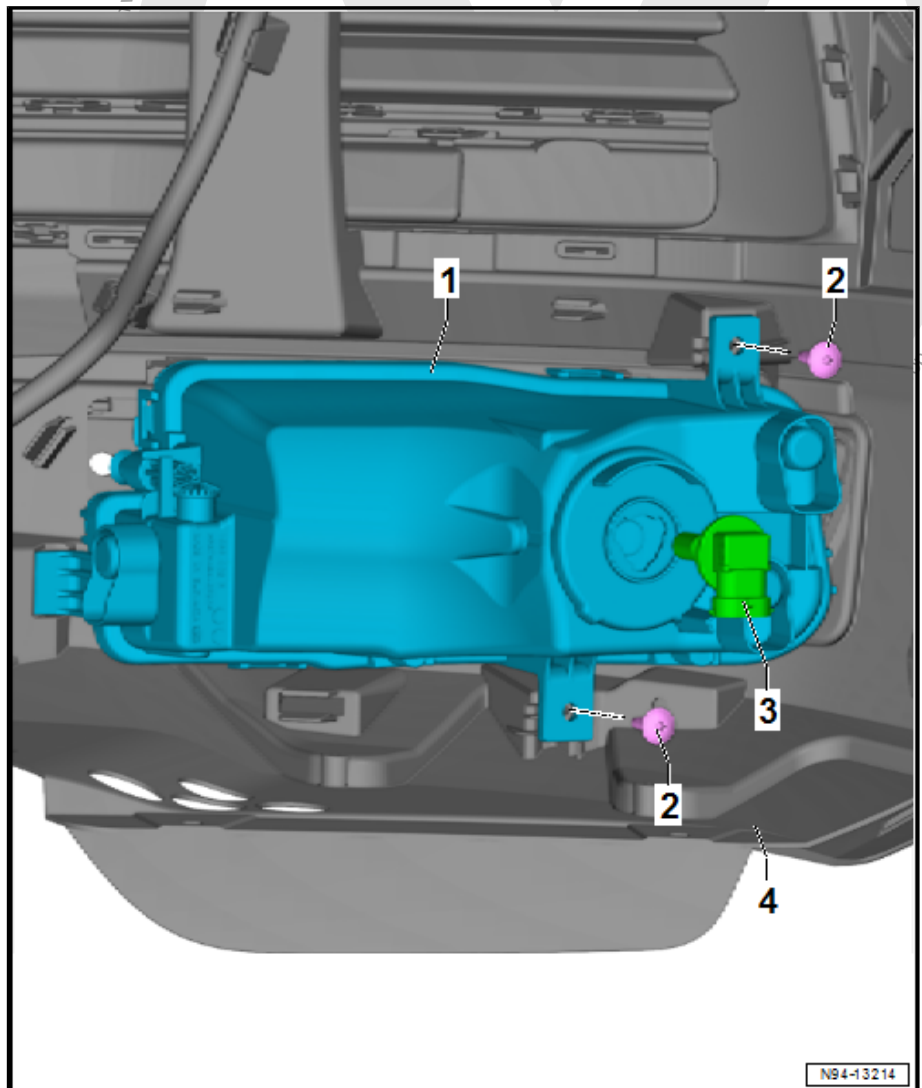
- ❑ Qty. 2
- ❑ 2.2 Nm.

3 - Bulb holder with fog light bulb

- ❑ Left fog light bulb - L22-
- ❑ Right fog light bulb - L23-
- ❑ Removing and installing
⇒ [page 152](#)
- ❑ Also fulfils function of static cornering light - L148- / -L149- depending on equipment

4 - Front bumper cover

- ❑ ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Assembly overview - bumper cover

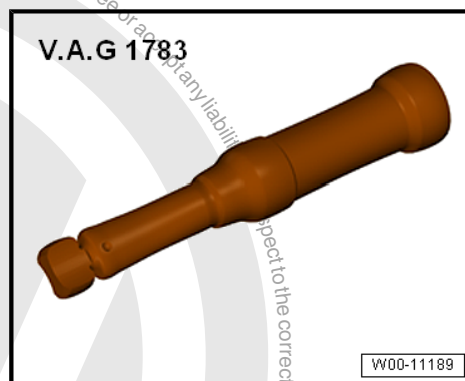


2.2 Removing and installing fog light

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing

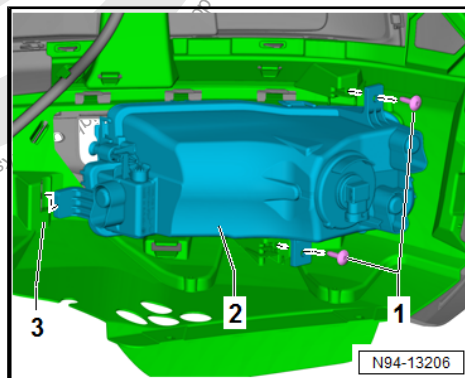
- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Removing and installing bumper cover .
- Remove screws -1-.
- Pull out fog light housing -2- sideways from mounting -3- in bumper cover.

Installing

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

Torque settings

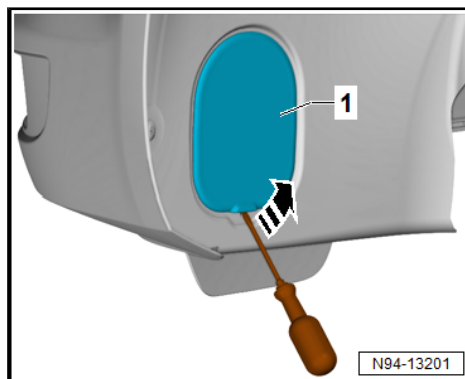
- ◆ ⇒ ["2.1 Assembly overview - fog lights", page 151](#)



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

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Open service flap -1- in front left wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - front wheel housing liner .





- Release and disconnect connector -1-.
- Turn bulb holder -2- in direction of -arrow- and remove it from fog light -3-.

Front fog light bulb -L22- / -L23- : H11, 12V 55 W



Note

The left fog light bulb -L22- or right fog light bulb -L23- is permanently fixed in the bulb holder and cannot be renewed individually.

Installing

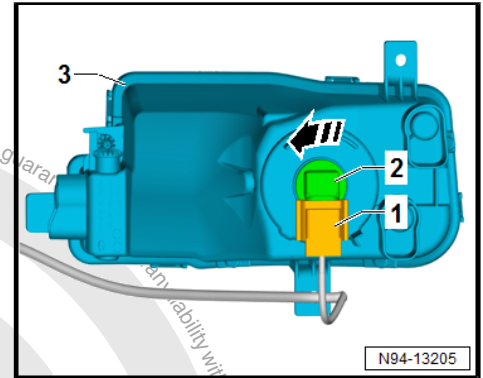
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.**
- ◆ **Make sure cover cap is correctly seated when installing. The ingress of water will cause permanent damage to the headlight.**



- Check functioning of fog light.
- Checking fog light settings and, if necessary, adjusting
⇒ [page 153](#) .

2.4 Removing and installing static cornering light bulb



Note

- ◆ *Depending on the vehicle equipment, the fog light bulbs -L22- / -L23- are also used as the static cornering light bulbs -L148- / -L149- .*
- ◆ *Removing and installing fog light bulbs -L22- / -L23-
⇒ [page 152](#) .*

2.5 Fog lights: Adjust

Adjusting fog light ⇒ Maintenance ; Booklet 20.1 ; Work descriptions .



3 Turn signal repeater

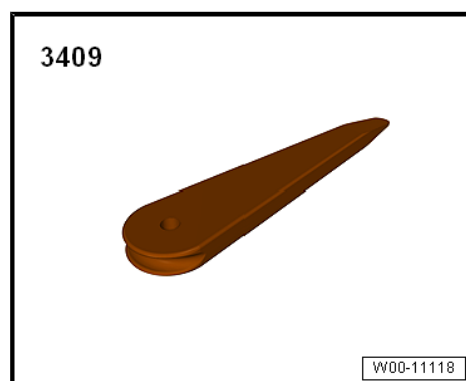
⇒ "3.1 Removing and installing turn signal repeater", page 154

⇒ "3.2 Removing and installing turn signal repeater bulb M18/M19", page 155

3.1 Removing and installing turn signal repeater

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-



Note

- ◆ The illustrations show removal and installation of the left turn signal light
- ◆ Removal and installation of the right turn signal light are analogous.

Removing

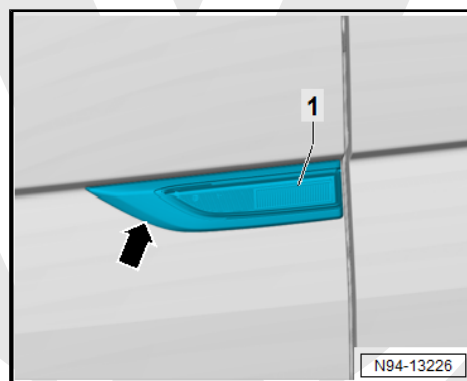
- Switch off ignition and all electrical equipment and then remove ignition key.



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

- Carefully lever out front turn signal repeater 1- from installation opening at position shown -arrow- using removal wedge.





- Pull out primary locking element -1- -arrow A- and then press -arrow B- to release.
- Pull off electrical connector -2- from bulb holder -3-.

Installing

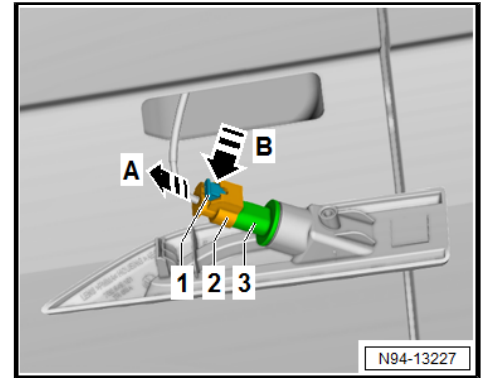
Installation is basically carried out in the reverse sequence; note the following when doing this:



Caution

The metallic spring clip in the turn signal repeater can cause damage to the paintwork in the installation opening during removal and installation.

Check the installation opening for paint damage and, if necessary, undertake corrosion protection measures (wax).



- Fit electrical connector and engage securely; push in primary locking element.
- Insert turn signal repeater in installation opening at front first with spring clip, and then push it in at rear and engage.

3.2 Removing and installing turn signal repeater bulb - M18/M19-

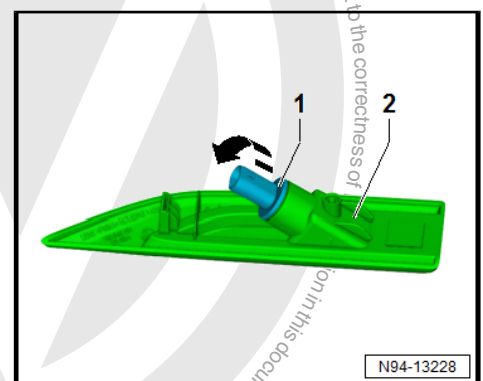


Note

- ♦ *The illustrations show removal and installation of the bulb for left turn signal - M18- .*
- ♦ *Removal and installation of bulb for right turn signal - M19- are analogous.*

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove turn signal light ➔ [page 154](#) .
- Turn bulb holder -1- anti-clockwise to release -arrow- and pull out in straight line backwards out of turn signal repeater -2-.





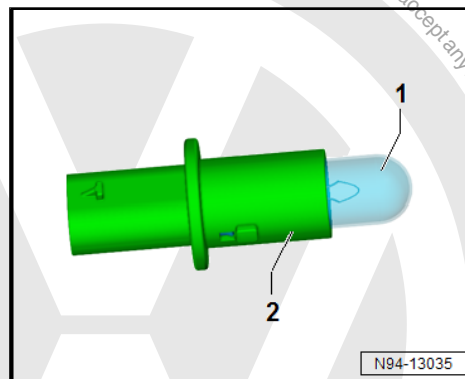
- Pull out turn signal repeater -1- in a straight line from bulb holder -2-.

Turn signal repeater bulb - M18/M19- : glass-base bulb
12V, WY5W.

Installing

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

- Following installation, check whether turn signal light is functioning correctly.





4 Lights in sill panel moulding

⇒ [“4.1 Removing and installing entry light”, page 157](#)

⇒ [“4.2 Removing and installing bulb for entry light”, page 158](#)

4.1 Removing and installing entry light

⇒ [“4.1.1 Removing and installing entry light, Transporter”, page 157](#)

⇒ [“4.1.2 Removing and installing entry light, Multivan”, page 157](#)

4.1.1 Removing and installing entry light, Transporter

Removal and installation of all entry lights are performed in the same manner and are described only for one light.



Caution

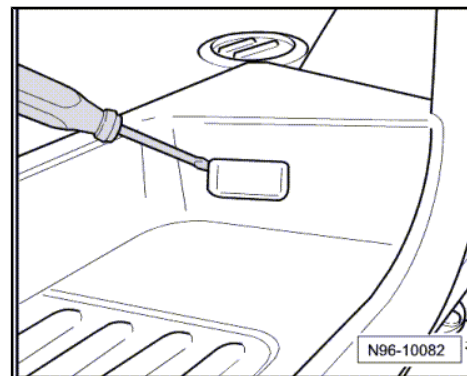
When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Fit screwdriver (screwdriver handle must face towards inside of vehicle) and carefully lever out light.
- Release and separate electrical connector.

Installing

Install in reverse order of removal.



4.1.2 Removing and installing entry light, Multivan

Removal and installation of all entry lights are performed in the same manner and are described only for one light.



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.

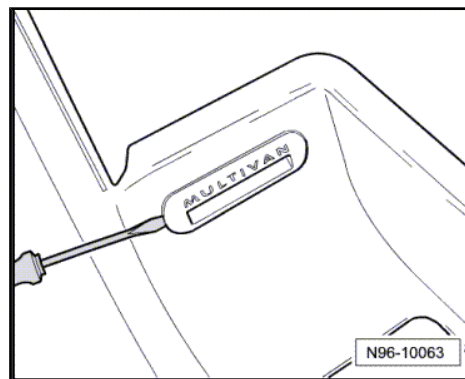


- Fit screwdriver from left side and carefully lever out light.
- Release and separate electrical connector.

Installing

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

Fit light first on left side and then engage spring.



4.2 Removing and installing bulb for entry light

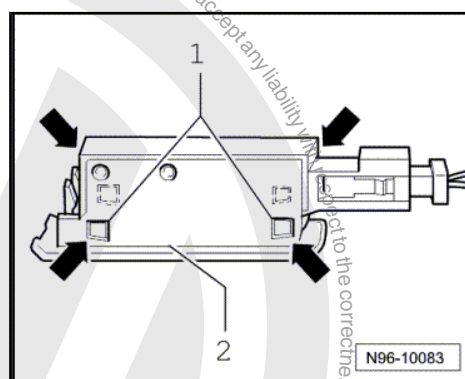
⇒ ["4.2.1 Removing and installing bulb for entry light, Transporter", page 158](#)

⇒ ["4.2.2 Removing and installing bulb for entry light, Multivan", page 159](#)

4.2.1 Removing and installing bulb for entry light, Transporter

Removing

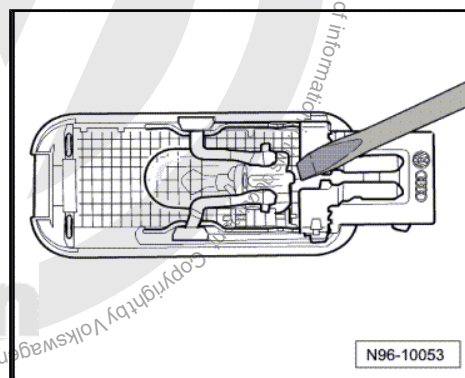
- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove entry light ⇒ [page 157](#)
- Release locking lugs -1- and remove cover from bulb carrier -2-.



- Carefully lever defective bulb out of bulb holder.
- Entry light bulb : glass-base bulb 12V, 5 W

Installing

Install in reverse order of removal.

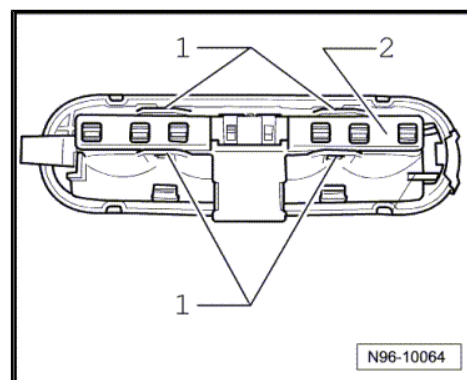




4.2.2 Removing and installing bulb for entry light, Multivan

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove entry light ➔ [page 157](#) .
- Release locking lugs -1-, and detach bulb carrier -2- from housing of light.

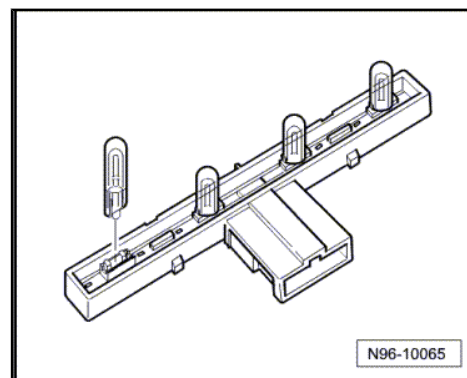


- Carefully pull defective bulb out of bulb holder.
- Entry light bulb : glass-base bulb 12V, 1.2 W



Note

To check which bulb is defective, the connector can be fitted to the lamp carrier.



Installing

Install in reverse order of removal.





5 Tail lights

- ⇒ ["5.1 Assembly overview - tail lights", page 160](#)
- ⇒ ["5.2 Removing and installing bulb carrier", page 164](#)
- ⇒ ["5.3 Removing and installing tail light", page 166](#)
- ⇒ ["5.4 Removing and installing tail light bulb M2 / M4 ", page 168](#)
- ⇒ ["5.5 Removing and installing rear fog light bulb L46 / L47 ", page 171](#)
- ⇒ ["5.6 Removing and installing brake light bulb M9 / M10 ", page 174](#)
- ⇒ ["5.7 Removing and installing reversing light bulb M16 / M17 ", page 177](#)
- ⇒ ["5.8 Removing and installing turn signal bulb M6 / M8 ", page 181](#)

5.1 Assembly overview - tail lights

- ⇒ ["5.1.1 Assembly overview - tail lights, rear wing doors", page 160](#)
- ⇒ ["5.1.2 Assembly overview - tail lights, rear lid", page 162](#)
- ⇒ ["5.1.3 Assembly overview - tail lights, rear lid \(LED\)", page 163](#)
- ⇒ ["5.1.4 Assembly overview - tail lights, dropside vehicles", page 164](#)

5.1.1 Assembly overview - tail lights, rear wing doors



1 - Ball heads to body

- ☐ Qty. 2
- ☐ For securing tail light cluster
- ☐ 1.5 Nm.

2 - Connector

3 - Brake light bulb -M9- / -M10-

- ☐ 12 V, W16W
- ☐ Removing and installing
⇒ [page 174](#)

4 - Turn signal bulb -M6- / -M8-

- ☐ 12V, WY16W
- ☐ Removing and installing
⇒ [page 181](#)

5 - Tail light

- ☐ Removing and installing
⇒ [page 166](#)

6 - Bolts securing tail light cluster

- ☐ Qty. 2
- ☐ 4 Nm.

7 - Reversing light bulb -M16- / -M17-

- ☐ 12V, W16W
- ☐ Removing and installing
⇒ [page 177](#)

8 - Rear fog light bulb -L46- / -L47-

- ☐ Driver side only
- ☐ 12V, P 21/4W
- ☐ Removing and installing ⇒ [page 171](#)

9 - Bulb carrier

- ☐ Removing and installing ⇒ [page 164](#)
- ☐ 4 bolts securing bulb carrier to tail light housing
- ☐ 1 Nm.

10 - Tail light bulb -M4-

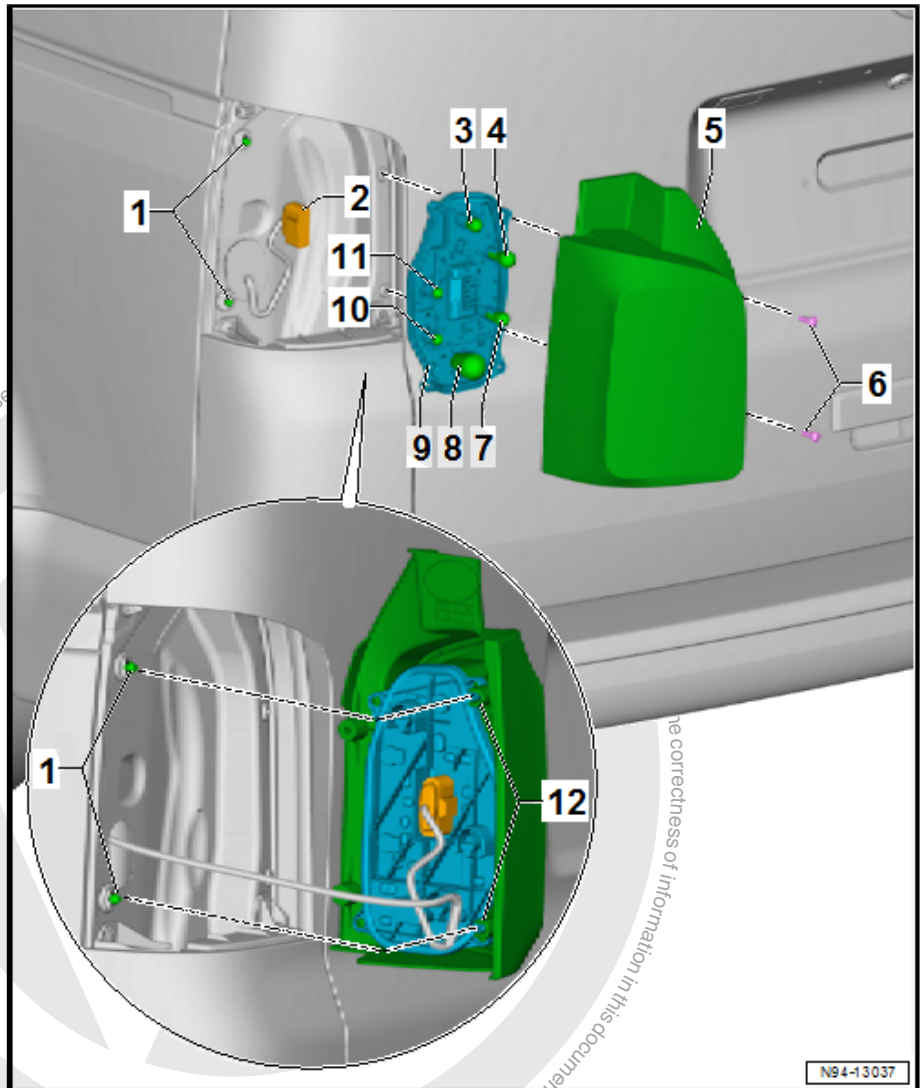
- ☐ 12 V W5W
- ☐ Removing and installing ⇒ [page 168](#)

11 - Tail light bulb -M4-

- ☐ 12 V W5W
- ☐ Removing and installing ⇒ [page 168](#)

12 - Ball head mountings to tail light cluster

- ☐ Qty. 2





5.1.2 Assembly overview - tail lights, rear lid

1 - Ball heads to body

- Qty. 2
- For securing tail light cluster
- 1.5 Nm.

2 - Connector

3 - Brake and tail light bulb - M21- / -M22-

- 12 V, P21/5W
- Removing and installing
⇒ [page 175](#)

4 - Turn signal bulb -M6- / -M8-

- 12V, WY16W
- Removing and installing
⇒ [page 182](#)

5 - Tail light

- Removing and installing
⇒ [page 166](#)

6 - Bolts securing tail light cluster

- Qty. 2
- 4 Nm.

7 - Reversing light bulb -M16- / -M17-

- 12V, P21W
- Removing and installing
⇒ [page 178](#)

8 - Rear fog light bulb -L46- / -L47-

- Driver side only
- 12V, H21W
- Removing and installing ⇒ [page 172](#)

9 - Bulb carrier

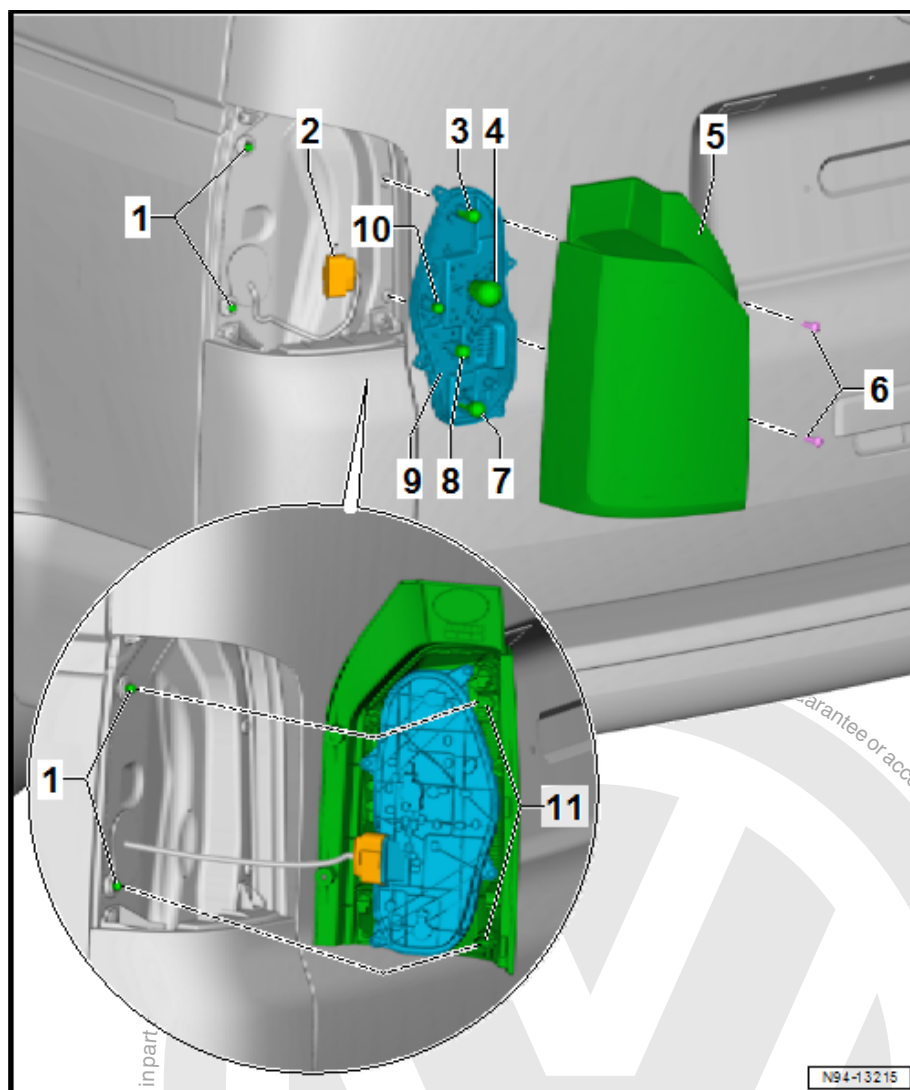
- Removing and installing ⇒ [page 165](#)
- 4 bolts securing bulb carrier to tail light housing
- 1 Nm.

10 - Tail light bulb -M4-

- 12 V W5W
- Removing and installing ⇒ [page 169](#)

11 - Ball head mountings to tail light cluster

- Qty. 2





5.1.3 Assembly overview - tail lights, rear lid (LED)

1 - Ball heads to body

- ☐ Qty. 2
- ☐ 1.5 Nm.

2 - Connector

3 - Reversing light bulb -M16- / -M17-

- ☐ 12V, W16W
- ☐ Removing and installing
⇒ [page 179](#)

4 - Tail light

- ☐ Following functions are performed by light-emitting diodes. Lighting elements cannot be replaced individually.
- ☐ Tail light bulb -M4- / -M4- ⇒ [page 170](#)
- ☐ Rear fog light bulb - L46- / -L47- ⇒ [page 173](#)
- ☐ Brake light bulb -M9- / -M10- ⇒ [page 176](#)
- ☐ Removing and installing tail light ⇒ [page 166](#)

5 - Bolts securing tail light cluster

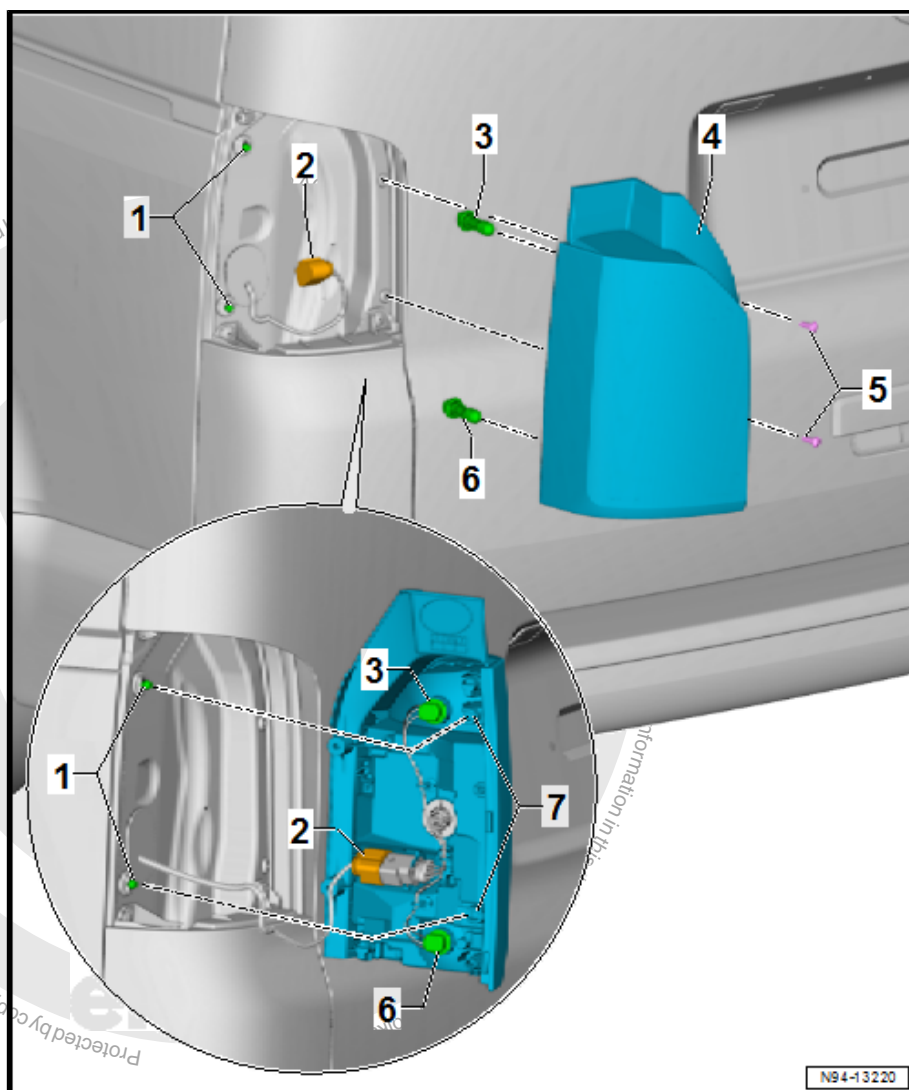
- ☐ Qty. 2
- ☐ 4 Nm.

6 - Turn signal bulb -M6- / -M8-

- ☐ 12V, WY16W
- ☐ Removing and installing
⇒ [page 183](#)

7 - Ball head mountings to tail light cluster

- ☐ Qty. 2





5.1.4 Assembly overview - tail lights, dropside vehicles

1 - Securing bolts for lens

- ☐ Securing bolts for lens:
0.75 Nm
- ☐ Securing nuts of cap:
6 Nm
- ☐ Securing nuts of tail
light: 6 Nm

2 - Lens

3 - Bulb carrier

- ☐ Removing and installing
⇒ [page 166](#)

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

- ☐ 12V, P 21 W
- ☐ Removing and installing
⇒ [page 184](#)

5 - Left brake light bulb - M9- or right brake light bulb - M10-

- ☐ 12V, P 21W
- ☐ Removing and installing
⇒ [page 176](#)

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

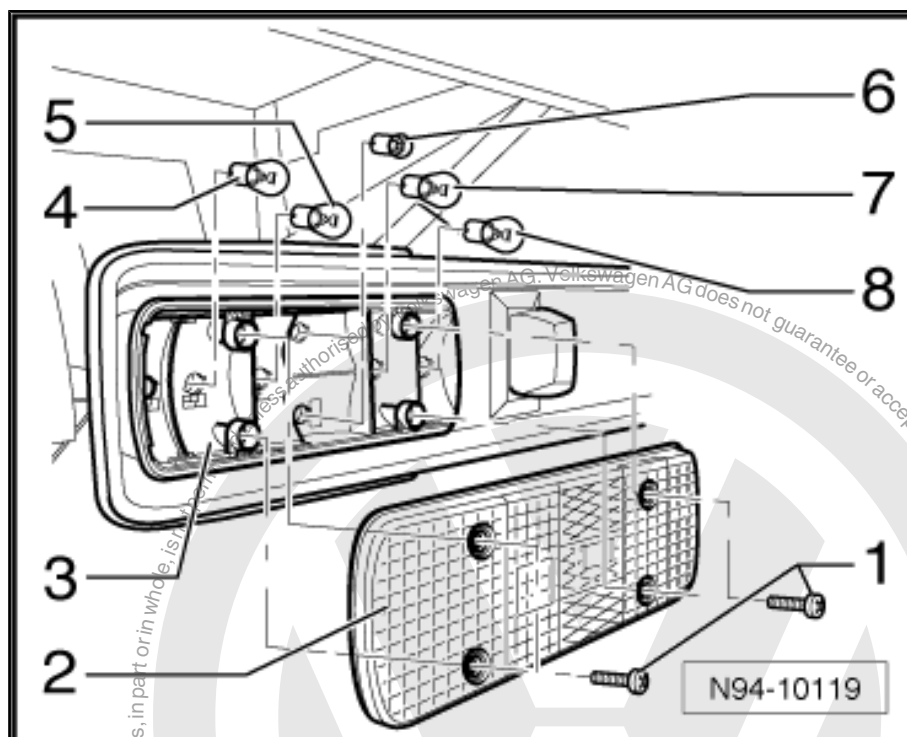
- ☐ Qty. 2 12V, P 5 W each
- ☐ Removing and installing ⇒ [page 170](#)

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

- ☐ 12V, P 21 W
- ☐ Removing and installing ⇒ [page 180](#)

8 - Left rear fog light bulb - L46-

- ☐ Only driver side, 12V, P 21W
- ☐ Removing and installing ⇒ [page 173](#)



5.2 Removing and installing bulb carrier

⇒ [“5.2.1 Removing and installing bulb carrier, rear wing doors”, page 164](#)

⇒ [“5.2.2 Removing and installing bulb carrier, rear lid”, page 165](#)

⇒ [“5.2.3 Removing and installing bulb carrier, rear lid \(LED\)”, page 166](#)

⇒ [“5.2.4 Removing and installing bulb carrier, dropside vehicle”, page 166](#)

5.2.1 Removing and installing bulb carrier, rear wing doors

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove tail light ⇒ [page 166](#) .

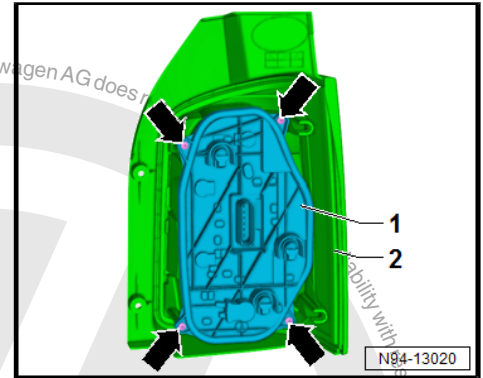


- Unscrew the four securing bolts -arrows-.
- Remove bulb carrier -1- from tail light -2-.

Installing

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

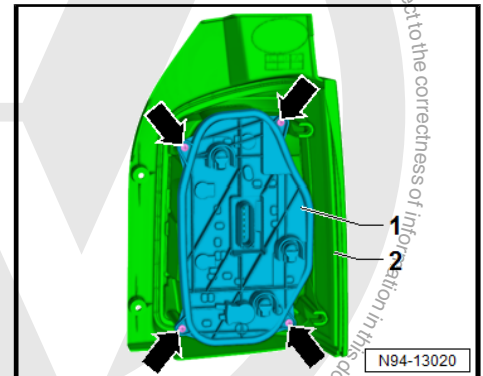
- Check that seal around bulb carrier is seated correctly and not damaged.



- Insert bulb carrier -1- in tail light cluster -2- and tighten securing bolts -arrows-.

Torque settings

- ◆ ⇒ [“5.1.1 Assembly overview - tail lights, rear wing doors”, page 160](#).



5.2.2 Removing and installing bulb carrier, rear lid

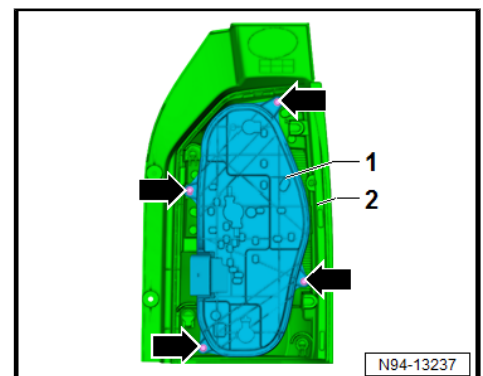
Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove tail light ⇒ [page 166](#).
- Unscrew the four securing bolts -arrows-.
- Remove bulb carrier -1- from tail light -2-.

Installing

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

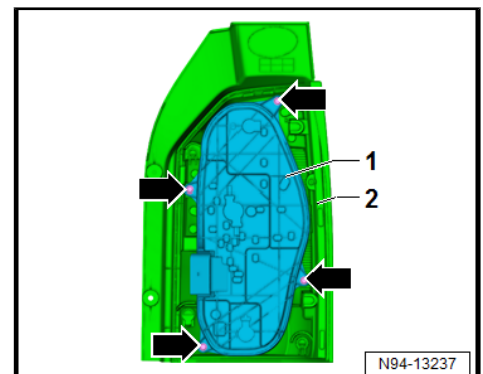
- Check that seal around bulb carrier is seated correctly and not damaged.



- Insert bulb carrier -1- in tail light cluster -2- and tighten securing bolts -arrows-.

Torque settings

- ◆ ⇒ [“5.1.2 Assembly overview - tail lights, rear lid”, page 162](#).





5.2.3 Removing and installing bulb carrier, rear lid (LED)



Note

- ♦ LED tail lights do not have any replaceable lighting elements.
- ♦ The tail light bulbs are light-emitting diodes and are integrated in the tail lights. These light-emitting diodes cannot be renewed in the course of repair. The entire tail light cluster must be renewed.
- ♦ The turn signal bulb and reversing light bulb can be replaced directly in the tail light housing.

5.2.4 Removing and installing bulb carrier, dropside vehicle



Note

The procedure for removal and installation of the bulb carrier on vehicles with a dropside body is as per removal and installation of the tail light cluster ➔ [page 167](#).

5.3 Removing and installing tail light

➔ ["5.3.1 Removing and installing tail light, rear wings doors and rear lid", page 166](#)

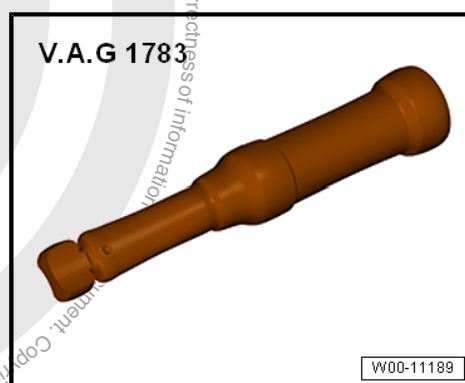
➔ ["5.3.2 Removing and installing tail light, dropside vehicles", page 167](#)

5.3.1 Removing and installing tail light, rear wings doors and rear lid

The removal and installation procedure is carried out in the same way on both sides and is described for just one light.

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1783-

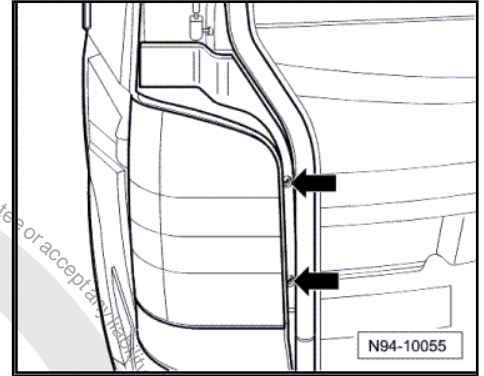


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- On vehicles with rear wing doors, fully open the door in question so that the tail light does not strike against the apex of the door aperture.



- Unscrew two securing bolts -arrows- and remove tail light cluster outwards from ball studs.

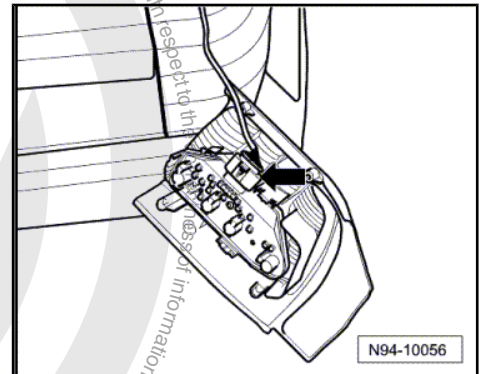


- Release and disconnect connector -arrow-.

Installing

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

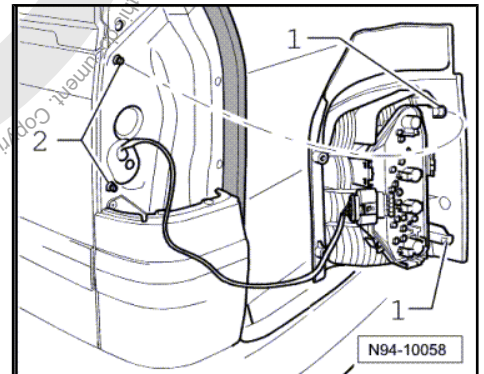
- Connect connector and engage it.



- Insert tail light cluster in body aperture and insert mountings -1- from the side onto the ball heads -2-.
- Swing tail light cluster towards body, align and tighten with securing bolts.

Torque settings

- ◆ ⇒ ["5.1.1 Assembly overview - tail lights, rear wing doors", page 160](#).

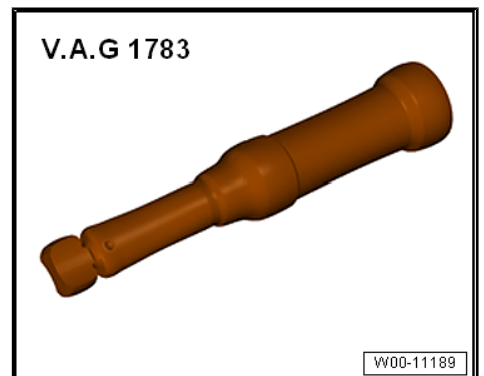


5.3.2 Removing and installing tail light, drop-side vehicles

The removal and installation procedure is carried out in the same way on both sides and is described for just one light.

Special tools and workshop equipment required

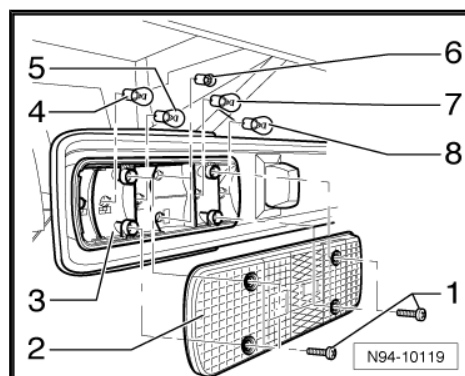
- ◆ Torque wrench - V.A.G 1783-





Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Unscrew securing bolts -1- of lens -2-.
- Remove bulb carrier -3-.

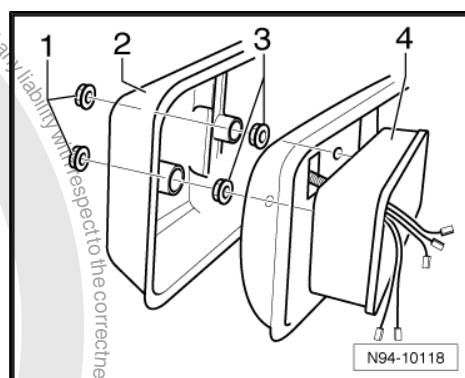


- Pull off connectors.
- Unscrew securing nuts -1- and remove cover cap -2-.
- Unscrew securing nuts -3- and remove tail light cluster -4-.

Installing

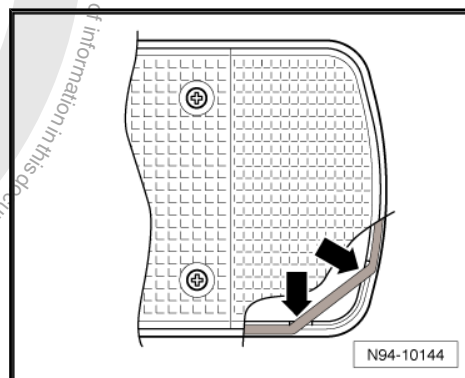
Installation is basically carried out in the reverse sequence; note the following when doing this:

- On assembly, rubber seal of scatter lens must be installed inwards in lower corners of light -arrows- to act as water drain aperture.



Torque settings

- ◆ ⇒ ["5.4.1 Assembly overview - tail lights, dropside vehicles", page 164](#).



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

⇒ ["5.4.1 Removing and installing tail light bulb M2 / M4 , rear wing doors", page 168](#)

⇒ ["5.4.2 Removing and installing tail light bulb M2 / M4 , rear lid", page 169](#)

⇒ ["5.4.3 Removing and installing tail light bulb M2 / M4 , LED tail lights", page 170](#)

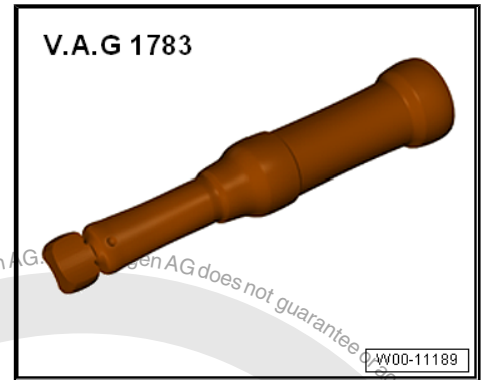
⇒ ["5.4.4 Removing and installing tail light bulb M2 / M4 , dropside", page 170](#)

5.4.1 Removing and installing tail light bulb - M2- / -M4- , rear wing doors

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing

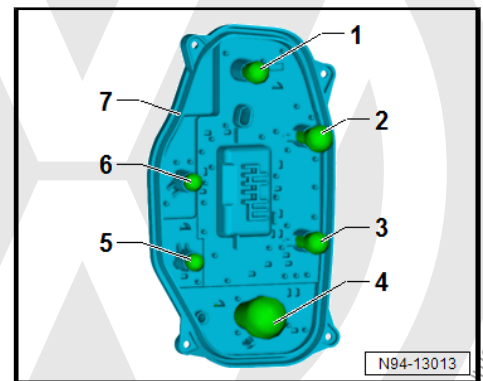
- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ➔ [page 164](#) .
- Pull tail light bulb -5- and -6- in straight line out of bulb carrier -7-.

Tail light bulb -M2- / -M4- : glass-base bulb 12V, W5W



Note

- ◆ The rear fog light bulb -L46- / -L47- -4- also fulfils a tail light function.
- ◆ Removing and installing rear fog light bulb -L46- / -L47- ➔ [page 171](#) .



Installing

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



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 clean fabric gloves when inserting bulbs.

Torque settings

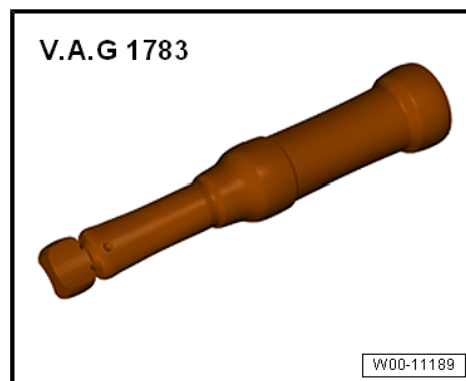
- ◆ ➔ ["5.1.1 Assembly overview - tail lights, rear wing doors", page 160](#) .

5.4.2 Removing and installing tail light bulb - M2- / -M4- , rear lid

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ⇒ [page 165](#) .
- Pull out tail light bulbs -4- in a straight line from bulb carrier -5-.

Tail light bulb -M2- / -M4- : glass-base bulb 12V, W5W

Installing

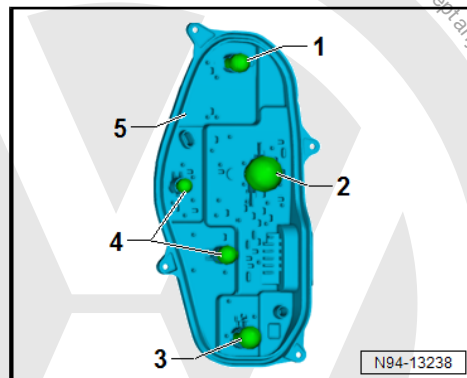
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



Torque settings

- ◆ ⇒ ["5.1.2 Assembly overview - tail lights, rear lid", page 162](#) .

5.4.3 Removing and installing tail light bulb - M2- / -M4- , LED tail lights



Note

- ◆ *The tail light bulb uses light-emitting diodes and is integrated in the tail lights.*
- ◆ *Exchange of the light-emitting diodes in the course of repair is not possible. The tail light must be renewed completely*
⇒ [page 166](#) .

5.4.4 Removing and installing tail light bulb - M2- / -M4- , dropside

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



- Unscrew securing bolts -1- of lens -2-.
- Push tail light bulb -6- into holder, turn anti-clockwise and pull out of bulb carrier -3-.

Left tail light bulb - M4- or right tail light bulb - M2- : 2 bulbs 12 V, P 5 W each

Installing

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



Caution

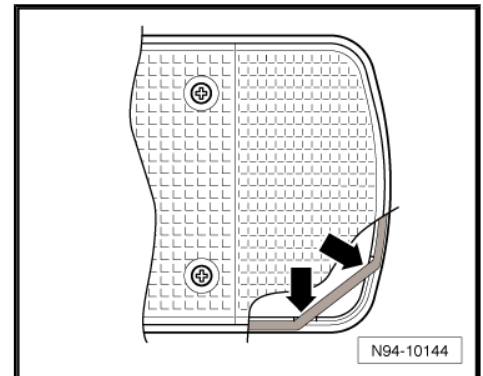
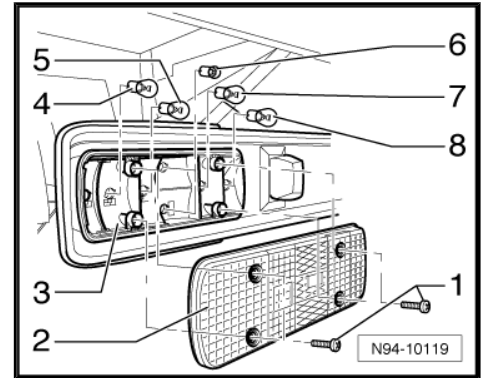
Risk of damage to the bulb.

- ◆ **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 clean fabric gloves when inserting bulbs.**

- On assembly, rubber seal of scatter lens must be installed inwards in lower corners of light -arrows- to act as water drain aperture.

Torque settings

- ◆ ⇒ ["5.1.4 Assembly overview - tail lights, dropside vehicles", page 164](#) .



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

⇒ ["5.5.1 Removing and installing rear fog light bulb L46 / L47 , rear wing doors", page 171](#)

⇒ ["5.5.2 Removing and installing rear fog light bulb L46 / L47 , rear lid", page 172](#)

⇒ ["5.5.3 Removing and installing rear fog light bulb L46 / L47 , rear lid \(LED\)", page 173](#)

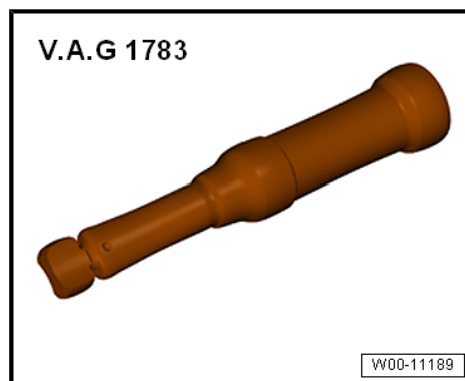
⇒ ["5.5.4 Removing and installing rear fog light bulb L46 / L47 , dropside", page 173](#)

5.5.1 Removing and installing rear fog light bulb -L46- / -L47- , rear wing doors

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing

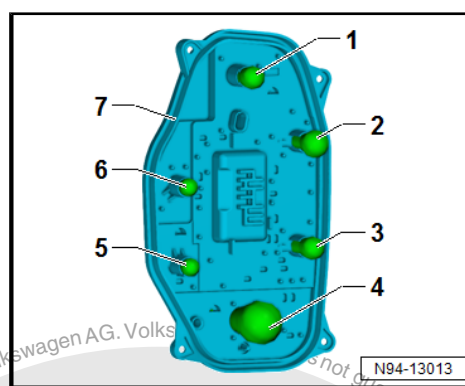
- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ⇒ [page 164](#) .
- Push rear fog light bulb -L46- / -L47- -4- into holder, turn anti-clockwise and pull out of bulb carrier -7-.

Rear fog light bulb -L46- / -L47- : 12V, P 21/4W



Note

- ◆ The rear fog light bulb -L46- / -L47- -4- also fulfils a tail light function.
- ◆ Removing and installing tail light bulbs -M2- / -M4- ⇒ [page 168](#) .



Installing

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



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 clean fabric gloves when inserting bulbs.

Torque settings

- ◆ ⇒ [“5.1.1 Assembly overview - tail lights, rear wing doors”, page 160](#) .

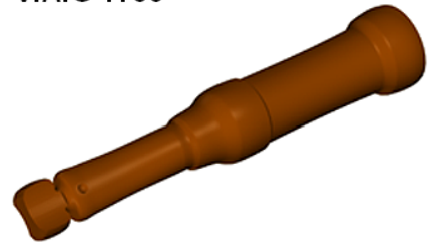
5.5.2 Removing and installing rear fog light bulb -L46- / -L47- , rear lid

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-

V.A.G 1783



WV00-11189

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove left bulb holder ➔ [page 165](#) .
- Push rear fog light bulb -3- into holder, turn anti-clockwise and pull out of bulb carrier -5-.

Rear fog light bulb -L46- / -L47- : 12V, H21W

Installing

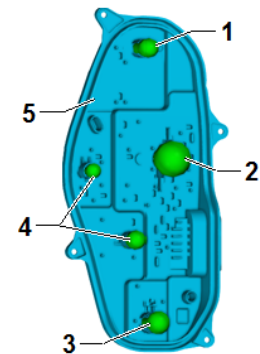
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



N94-13238

Torque settings

- ◆ ➔ ["5.1.2 Assembly overview - tail lights, rear lid", page 162](#) .

5.5.3 Removing and installing rear fog light bulb -L46- / -L47- , rear lid (LED)



Note

- ◆ *The rear fog light bulb uses light-emitting diodes and is integrated in the tail lights.*
- ◆ *Exchange of the light-emitting diodes in the course of repair is not possible. The tail light must be renewed completely ➔ [page 166](#) .*

5.5.4 Removing and installing rear fog light bulb -L46- / -L47- , dropside

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



- Unscrew securing bolts -1- of lens -2-.
- Push rear fog light bulb -8- into holder, turn anti-clockwise and pull out of bulb carrier -3-.

Rear left fog light bulb - L46- : only driver side 12 V, P 21 W

Installing

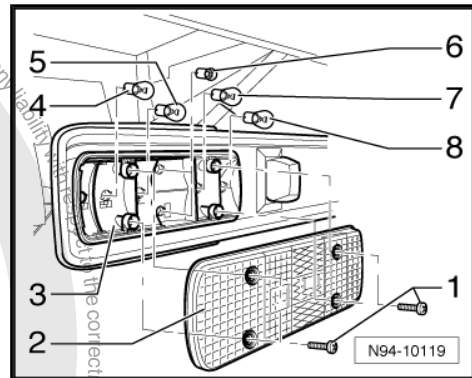
Installation is basically carried out in the reverse sequence; note the following when doing this:



Caution

Risk of damage to the bulb.

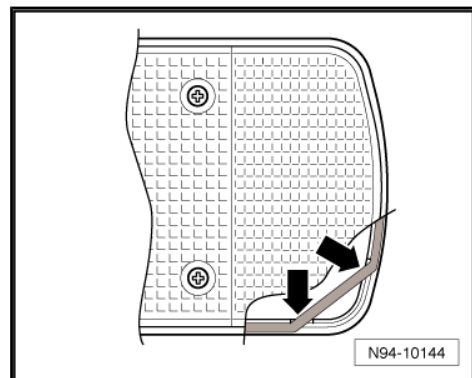
- ◆ *Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.*
- ◆ *Wear clean fabric gloves when inserting bulbs.*



- On assembly, rubber seal of scatter lens must be installed inwards in lower corners of light -arrows- to act as water drain aperture.

Torque settings

- ◆ ⇒ ["5.1.4 Assembly overview - tail lights, dropside vehicles", page 164](#).



5.6 Removing and installing brake light bulb -M9- / -M10-

⇒ ["5.6.1 Removing and installing brake light bulb M9 / M10 , rear wing doors", page 174](#)

⇒ ["5.6.2 Removing and installing brake and tail light bulb M21 / M22 , rear lid", page 175](#)

⇒ ["5.6.3 Removing and installing brake light bulb M9 / M10 , rear lid \(LED\)", page 176](#)

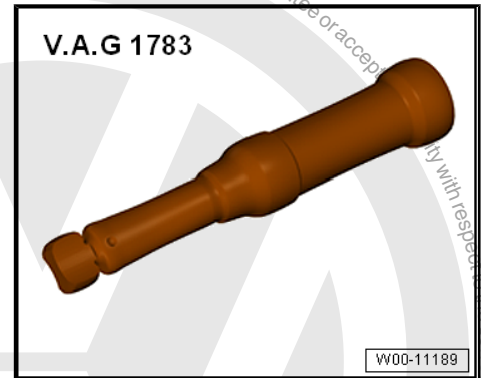
⇒ ["5.6.4 Removing and installing brake light bulb M9 / M10 , drop-side", page 176](#)

5.6.1 Removing and installing brake light bulb -M9- / -M10- , rear wing doors

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ➔ [page 164](#).
- Pull out brake light bulb -M9- / -M10- 1- in a straight line from bulb carrier -7-.

Brake light bulb -M9- / -M10- : 12V, W16W

Installing

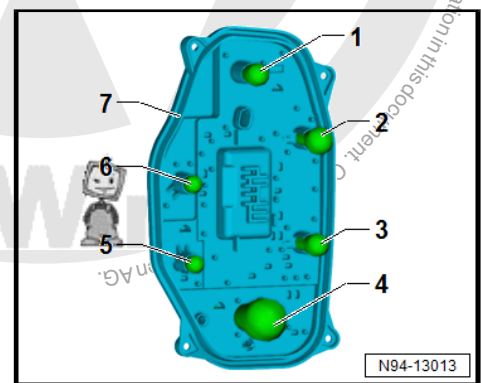
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



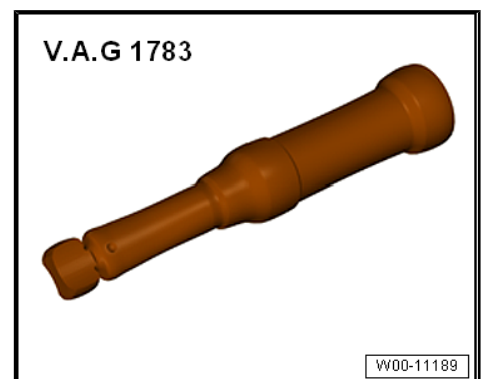
Torque settings

- ◆ ➔ [“5.1.1 Assembly overview - tail lights, rear wing doors”, page 160](#).

5.6.2 Removing and installing brake and tail light bulb -M21- / -M22-, rear lid

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-





Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ⇒ [page 165](#) .
- Push brake and tail light bulbs -2- into holder, turn anti-clockwise and pull out of bulb carrier -5-.

Brake and tail light bulb -M21- / -M22- : 12V, P21/5W

Installing

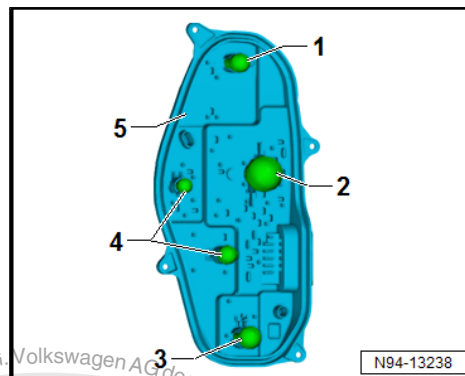
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



Torque settings

- ◆ ⇒ [“5.1.2 Assembly overview - tail lights, rear lid”, page 162](#) .

5.6.3 Removing and installing brake light bulb -M9- / -M10- , rear lid (LED)



Note

- ◆ *The brake light bulb uses light-emitting diodes and is integrated in the tail lights.*
- ◆ *Exchange of the light-emitting diodes in the course of repair is not possible. The tail light must be renewed completely*
⇒ [page 166](#) .

5.6.4 Removing and installing brake light bulb -M9- / -M10- , dropside

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



- Unscrew securing bolts -1- of lens -2-.
- Push brake light bulb -5- into holder, turn anti-clockwise and pull out of bulb carrier -3-.

Left brake light bulb - M9- or right brake light bulb - M10- 12V, P 21W

Installing

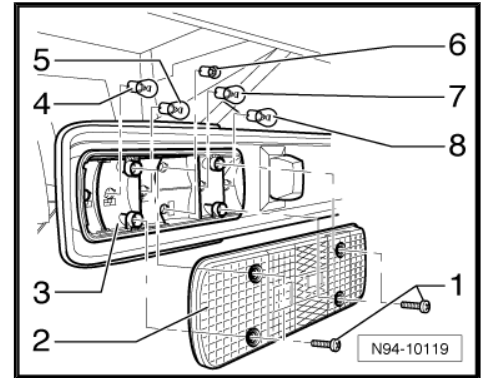
Installation is basically carried out in the reverse sequence; note the following when doing this:



Caution

Risk of damage to the bulb.

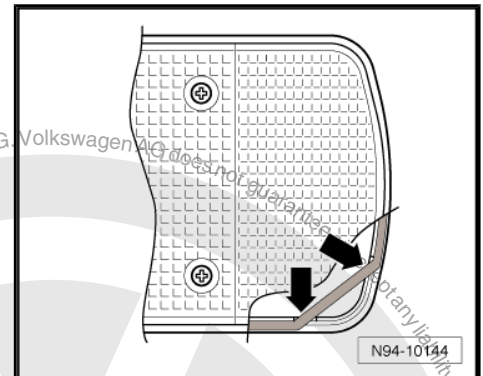
- ◆ **Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.**
- ◆ **Wear clean fabric gloves when inserting bulbs.**



- On assembly, rubber seal of scatter lens must be installed inwards in lower corners of light -arrows- to act as water drain aperture.

Torque settings

- ◆ ⇒ [“5.1.4 Assembly overview - tail lights, dropside vehicles”, page 164](#).



5.7 Removing and installing reversing light bulb -M16- / -M17-

⇒ [“5.7.1 Removing and installing reversing light bulb M16 / M17 , rear wing doors”, page 177](#)

⇒ [“5.7.2 Removing and installing reversing light bulb M16 / M17 , rear lid”, page 178](#)

⇒ [“5.7.3 Removing and installing reversing light bulb M16 / M17 , rear lid \(LED\)”, page 179](#)

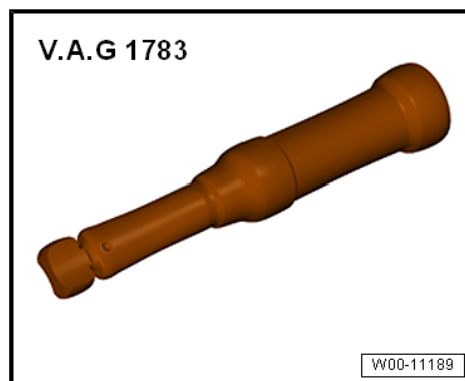
⇒ [“5.7.4 Removing and installing reversing light bulb M16 / M17 , dropside”, page 180](#)

5.7.1 Removing and installing reversing light bulb -M16- / -M17- , rear wing doors

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ⇒ [page 164](#) .
- Pull out reversing light bulb -M16- / -M17- -3- in a straight line from bulb carrier -7-.

Reversing light bulb -M16- / -M17- : 12V, W16W

Installing

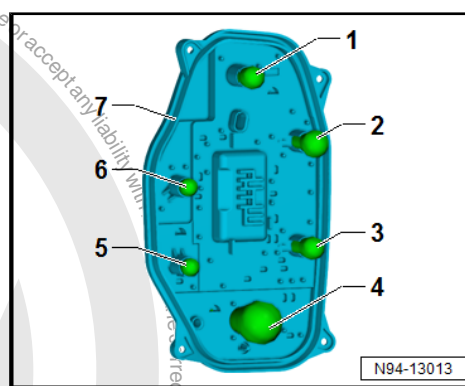
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.**



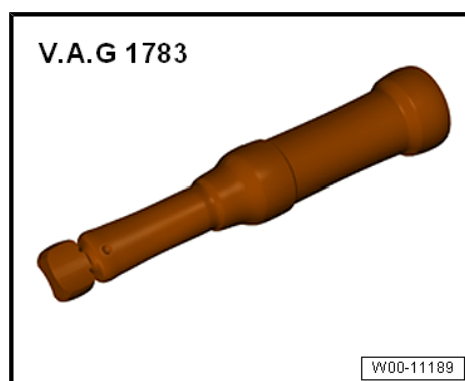
Torque settings

- ◆ ⇒ [“5.1.1 Assembly overview - tail lights, rear wing doors”, page 160](#) .

5.7.2 Removing and installing reversing light bulb -M16- / -M17- , rear lid

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-





Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove right-hand bulb carrier ➔ [page 165](#) .
- Push reversing light bulbs -3- into holder, turn anti-clockwise and pull out of bulb carrier -5-.

Reversing light bulb -M16- / -M17- : 12V, P21W

Installing

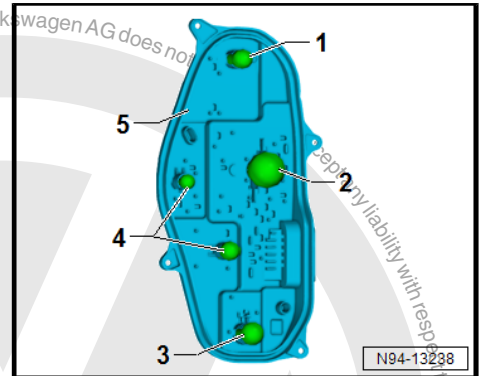
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



Torque settings

- ◆ ➔ ["5.1.2 Assembly overview - tail lights, rear lid", page 162](#) .

5.7.3 Removing and installing reversing light bulb -M16- / -M17- , rear lid (LED)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-

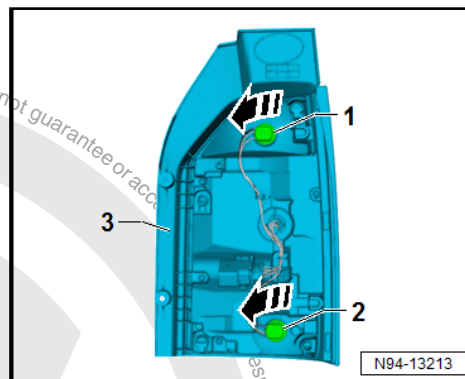


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove tail light ➔ [page 166](#) .



- Turn bulb holder anti-clockwise in direction of -arrow- and pull out reversing light bulb -2- from tail light housing -3-.



- Pull out reversing light bulb -2- in a straight line from bulb holder -1-.

Reversing light bulb -M16- / -M17- : 12V, W16 W

Installing

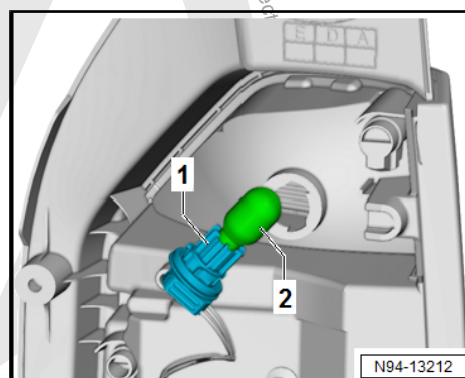
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



Torque settings

- ◆ ⇒ ["5.1.3 Assembly overview - tail lights, rear lid \(LED\)", page 163](#) .

5.7.4 Removing and installing reversing light bulb -M16- / -M17- , dropside

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



- Unscrew securing bolts -1- of lens -2-.
- Push reversing light bulb -7- into holder, turn anti-clockwise and pull out of bulb carrier -3-.

Left reversing light bulb - M16- or right reversing light bulb - M17- :
12V, P21 W

Installing

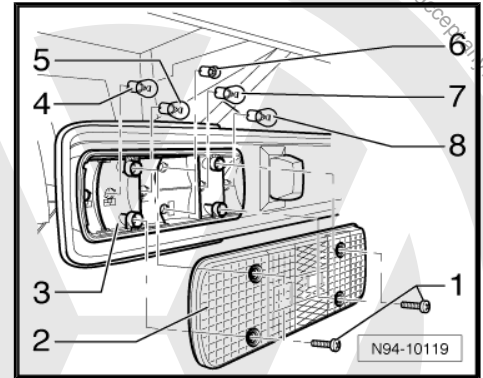
Installation is basically carried out in the reverse sequence; note the following when doing this:



Caution

Risk of damage to the bulb.

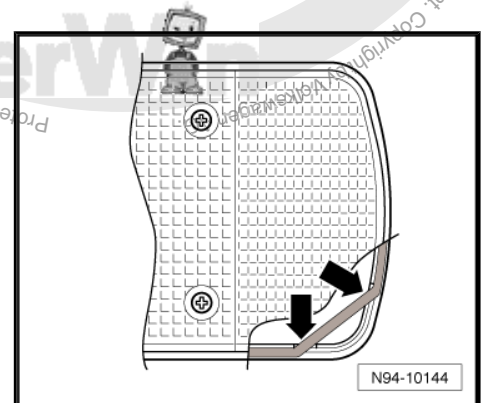
- ◆ *Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.*
- ◆ *Wear clean fabric gloves when inserting bulbs.*



- On assembly, rubber seal of scatter lens must be installed inwards in lower corners of light -arrows- to act as water drain aperture.

Torque settings

- ◆ ⇒ [“5.1.4 Assembly overview - tail lights, dropside vehicles”, page 164](#) .



5.8 Removing and installing turn signal bulb -M6- / -M8-

⇒ [“5.8.1 Removing and installing turn signal bulb M6 / M8 , rear wing doors”, page 181](#)

⇒ [“5.8.2 Removing and installing turn signal bulb M6 / M8 , rear lid”, page 182](#)

⇒ [“5.8.3 Removing and installing turn signal bulb M6 / M8 , rear lid \(LED\)”, page 183](#)

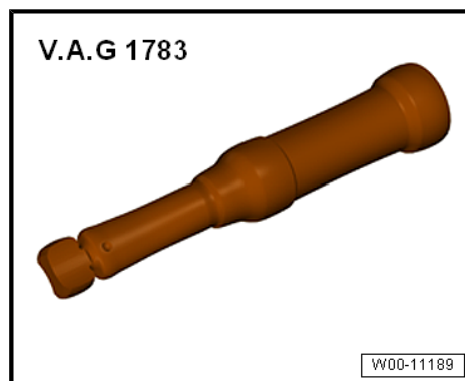
⇒ [“5.8.4 Removing and installing turn signal bulb M6 / M8 , drop-side”, page 184](#)

5.8.1 Removing and installing turn signal bulb -M6- / -M8- , rear wing doors

Special tools and workshop equipment required



- ◆ Torque wrench - V.A.G 1783-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ⇒ [page 164](#) .
- Pull out turn signal bulb -M6- / -M8- -2- in a straight line from bulb carrier -7-.

Turn signal bulb -M6- / -M8- : 12V, W16W

Installing

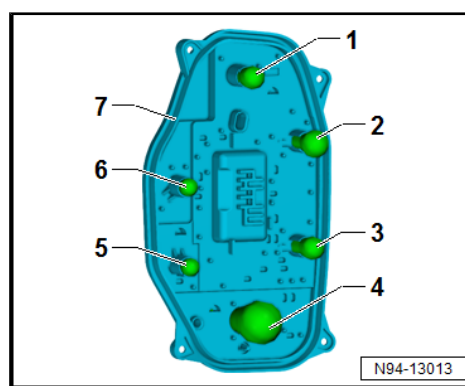
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



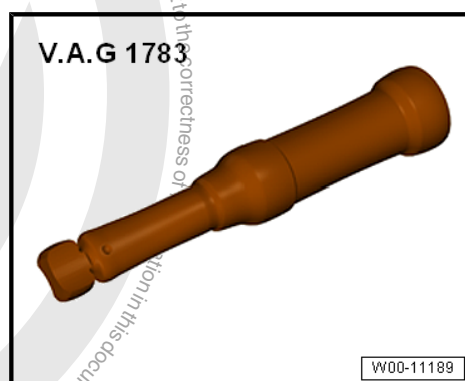
Torque settings

- ◆ ⇒ ["5.1.1 Assembly overview - tail lights, rear wing doors", page 160](#) .

5.8.2 Removing and installing turn signal bulb -M6- / -M8- , rear lid

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-





Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove bulb holder ➔ [page 165](#) .
- Pull out turn signal bulbs -1- in a straight line from bulb carrier -5-.

Turn signal bulb -M6- / -M8- : 12V, WY16W

Installing

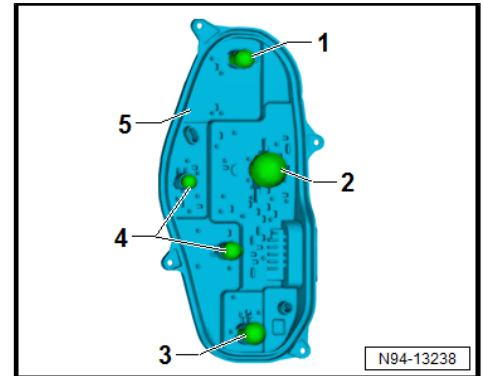
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.**



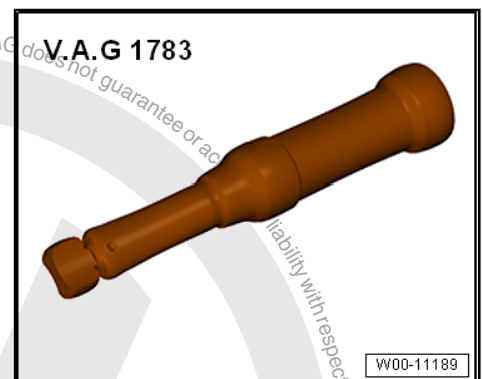
Torque settings

- ◆ ➔ ["5.1.2 Assembly overview - tail lights, rear lid", page 162](#) .

5.8.3 Removing and installing turn signal bulb -M6- / -M8- , rear lid (LED)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-

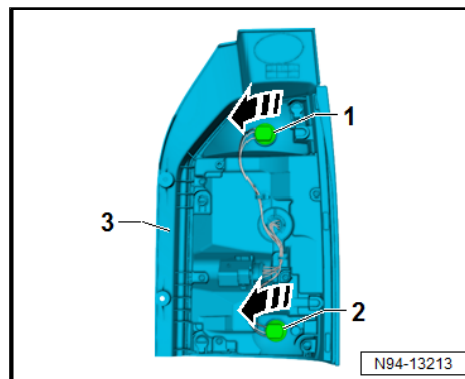


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove tail light ➔ [page 166](#) .



- Turn bulb holder anti-clockwise in direction of -arrow- and pull out turn signal bulb -2- from tail light housing -3-.



- Pull out turn signal bulb -2- in a straight line from bulb holder -1-.

Turn signal bulb -M6- / -M8- : 12V, WY16 W

Installing

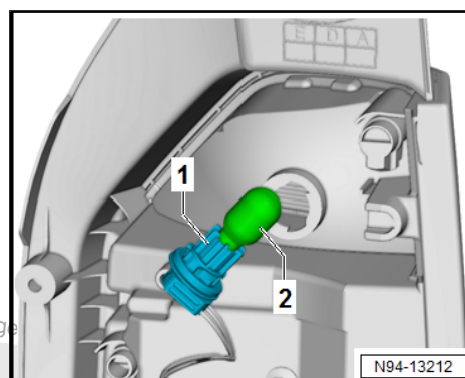
Installation is basically carried out in the reverse sequence; note the following when doing this:



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 clean fabric gloves when inserting bulbs.*



Torque settings

- ◆ ⇒ ["5.1.3 Assembly overview - tail lights, rear lid \(LED\)", page 163](#).

5.8.4 Removing and installing turn signal bulb -M6- / -M8-, dropside

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



- Unscrew securing bolts -1- of lens -2-.
- Push turn signal bulb -4- into holder, turn anti-clockwise and pull out of bulb carrier -3-.

Rear left turn signal bulb - M6- or rear right turn signal bulb - M8- : 12V, P21 W

Installing

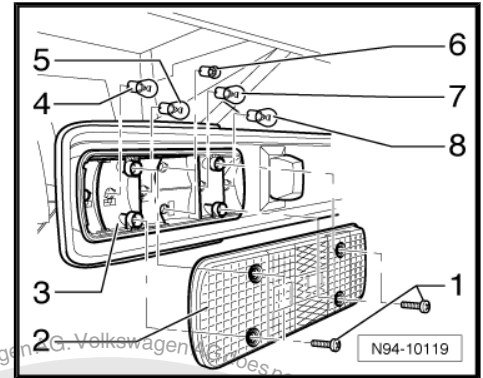
Installation is basically carried out in the reverse sequence; note the following when doing this:



Caution

Risk of damage to the bulb.

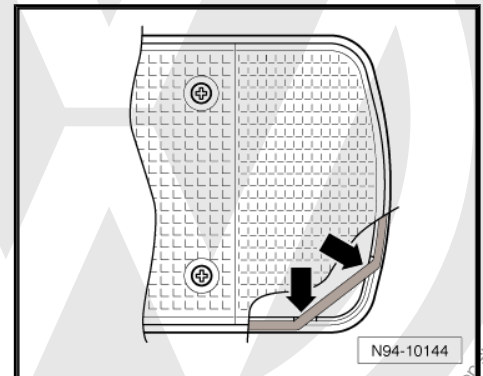
- ◆ **Do not touch the glass part of the bulb with bare fingers. Fingers leave traces of grease on the glass bulb, which evaporate when the bulb is switched on and cause the glass bulb to cloud over.**
- ◆ **Wear clean fabric gloves when inserting bulbs.**



- On assembly, rubber seal of scatter lens must be installed inwards in lower corners of light -arrows- to act as water drain aperture.

Torque settings

- ◆ ⇒ ["5.1.4 Assembly overview - tail lights, dropside vehicles", page 164](#) .





6 High-level brake light

⇒ "6.1 Removing and installing additional brake light",
page 186

⇒ "6.2 Removing and installing high-level brake light",
page 188

6.1 Removing and installing additional brake light

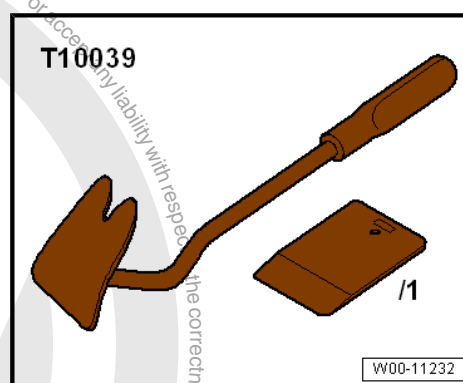
⇒ "6.1.1 Removing and installing high-level brake light, vehicles
with rear lid", page 186

⇒ "6.1.2 Removing and installing high-level brake light, vehicles
with rear wing doors", page 187

6.1.1 Removing and installing high-level brake light, vehicles with rear lid

Special tools and workshop equipment required

- ◆ Plastic wedge - T10039/1-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



Caution

Danger of damage to component surfaces.

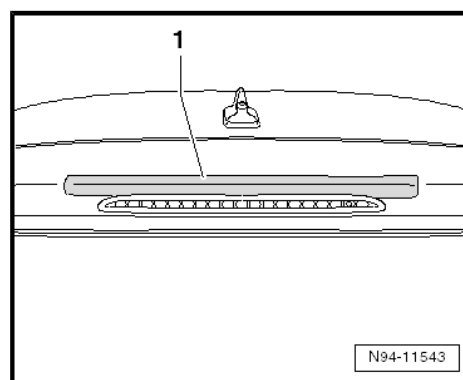
- ◆ ***When working with leverage tools, always mask off the components installed in visible areas using commercially available adhesive tape.***

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



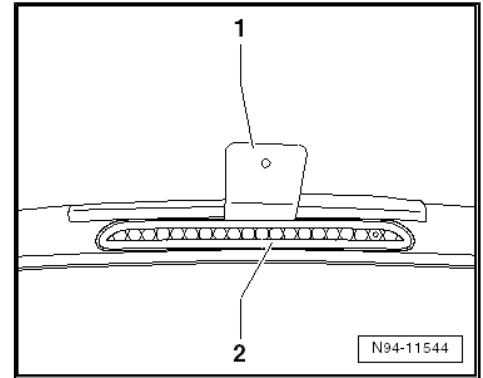
Note

The high-level brake light cannot be removed without permanently damaging it and must be renewed following removal ⇒ Electronic parts catalogue (ETKA) .





- Insert wedge - T10039/1- -1- at top between high-level brake light -2- and rear lid.
- Using plastic wedge - T10039/1- -1-, press high-level brake light -2- downwards.

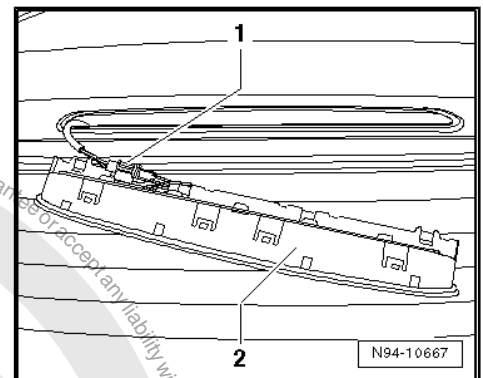


- Swing high-level brake light -2- out of rear lid.
- Release and disconnect connector -1-.
- Remove high-level brake light.

Installing

When installing high-level brake light, make sure seal is correctly seated. The seal must not form loops or be damaged.

- Connect connector and engage it.
- Press high-level brake light into rear lid.
- Engage locking devices at top.
- Engage retaining springs at bottom.
- Check proper operation of high-level brake light bulb - M25- .



6.1.2 Removing and installing high-level brake light, vehicles with rear wing doors

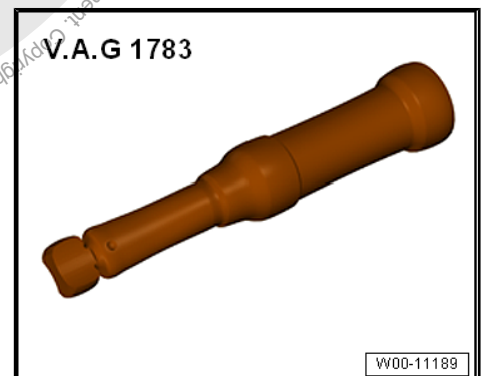


Note

The high-level brake light bulb - M25- is divided for vehicles with rear wing doors. When ordering spare parts, note the respective vehicle side.

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-

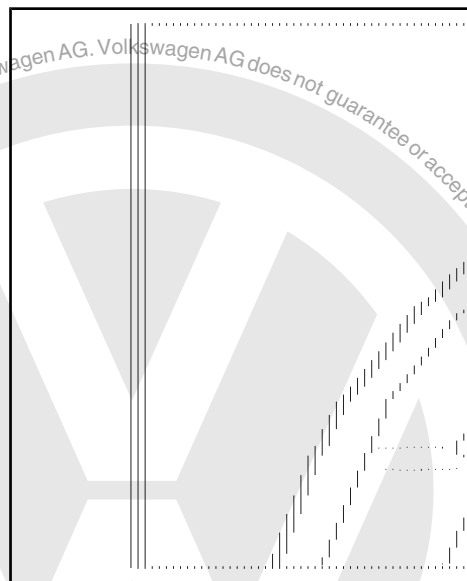


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



- Unscrew both securing bolts -2- of high-level brake light -1-.
- Remove high-level brake light.



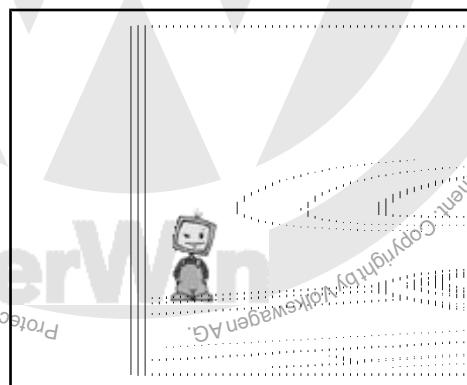
- Release connector and pull it off in -direction of arrow-.
- Remove high-level brake light - M25- .

Installing

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

Torque settings

Component	Torque setting
High-level brake light bulb - M25- to body	1.5 Nm.



6.2 Removing and installing high-level brake light



Note

- ◆ *Failure of light-emitting diodes in high-level brake lights*
- ◆ *The individual light-emitting diodes (LEDs) in the high-level brake lights are comprised in groups of 3 LEDs and are supplied with current in groups.*
- ◆ *Due to the failure of individual LEDs, the intact LEDs of the group in question are placed under increased strain and it must therefore be anticipated that further LED will soon fail as well.*
- ◆ *If an LED group (3 individual light-emitting diodes) fails, the legal light values of the ECE ruling (ECE = Economic Commission for Europe) are still complied with.*
- ◆ *If more than 3 individual LEDs fail, the legal light values of the ECE ruling are no longer complied with and the light for the high-level brake must be renewed.*

The LEDs in the high-level brake light cannot be renewed individually. In the event of repairs, the high-level brake light bulb - M25- must be renewed as a complete unit.

- ⇒ [“6.1.1 Removing and installing high-level brake light, vehicles with rear lid”, page 186](#) .



- ⇒ "6.1.2 Removing and installing high-level brake light, vehicles with rear wing doors", page 187 .





7 Number plate light

⇒ "7.1 Removing and installing number plate light X4 / X5", page 190

⇒ "7.2 Removing and installing bulb for number plate light X4 / X5", page 192

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

⇒ "7.1.1 Removing and installing number plate light, rear lid or rear wing door", page 190

⇒ "7.1.2 Removing and installing number plate light, rear lid or rear wing door (LED)", page 191

⇒ "7.1.3 Removing and installing number plate light, dropside vehicles", page 191

7.1.1 Removing and installing number plate light, rear lid or rear wing door

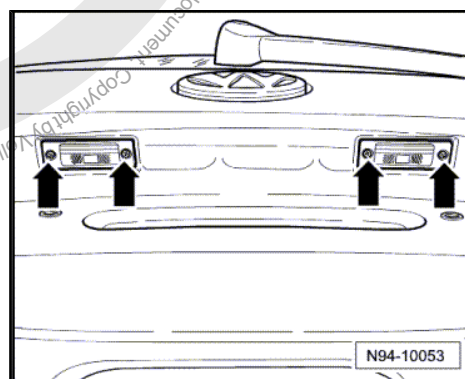
The removal and installation procedure for both number plate lights is carried out in the same way and is only described for one light.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Unscrew securing bolts -arrows- for number plate light - X- .
- Remove number plate light - X- .

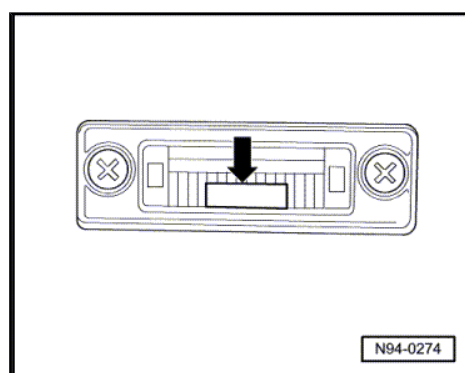
Installing

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



Note

On the scatter lens of the number plate light - X- is a small silver coloured anti-dazzle strip -arrow-. When installing the lens, always make sure that the anti-dazzle strip faces the bumper.





7.1.2 Removing and installing number plate light light, rear lid or rear wing door (LED)

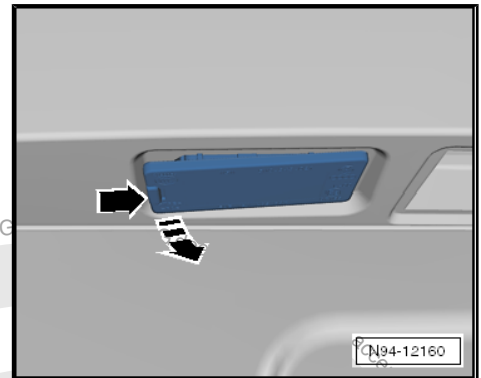


Note

The lighting element of the number plate light - X- has light-emitting diodes and cannot be renewed individually. If damaged, entire number plate light must be renewed.

Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Turn light switch to “0” position.
- Push number plate light in direction of -arrow- using a suitable screwdriver and remove from installation opening.

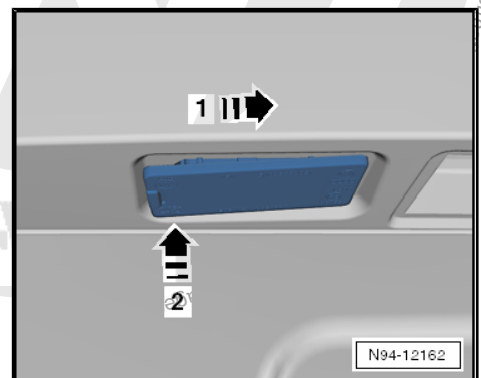
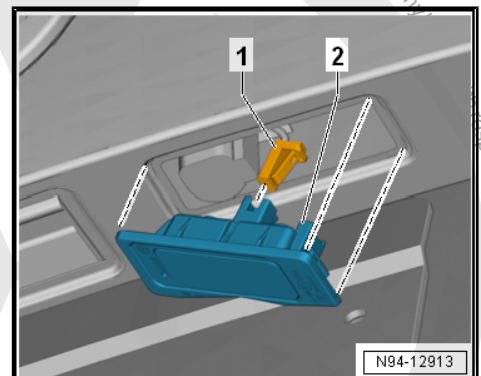


- Release and separate electrical connector -1- on number plate light - X- -2-.

Installing

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

- Reconnect connector, must engage audibly.
- First insert number plate light with spring clip in installation opening in direction of -arrow 1- and then engage securely in direction of -arrow 2-.
- Perform functional check.



7.1.3 Removing and installing number plate light, dropside vehicles

The removal and installation procedure for both number plate lights - X- is carried out in the same way and is only described for one light.

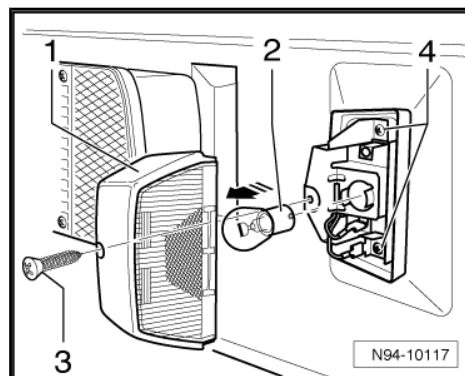


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Unscrew securing bolt -3- for cover cap with lens.
- Remove protective cap with lens -1-.
- Pull off connectors.
- Unscrew securing bolts -4- and remove lower part of housing.

Installing

Install in reverse order of removal.



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

⇒ [“7.2.1 Removing and installing bulb for number plate light, rear lid or rear wing door”, page 192](#)

⇒ [“7.2.2 Removing and installing bulb for number plate light, rear lid or rear wing door \(LED\)”, page 193](#)

⇒ [“7.2.3 Removing and installing bulb for number plate light, dropside vehicles”, page 193](#)

7.2.1 Removing and installing bulb for number plate light, rear lid or rear wing door

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove number plate light ⇒ [page 190](#) .
- Press contact plate -1- in -direction of arrow- and remove bulb -2- from bulb holder.

Bulb for number plate light - X- : festoon bulb, 12V, 5 W

Installing

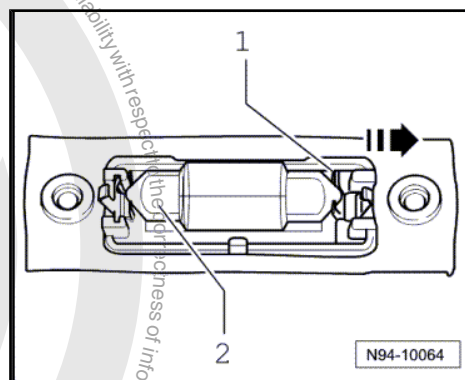
Installation is basically carried out in the reverse sequence; note the following when doing this:



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.**

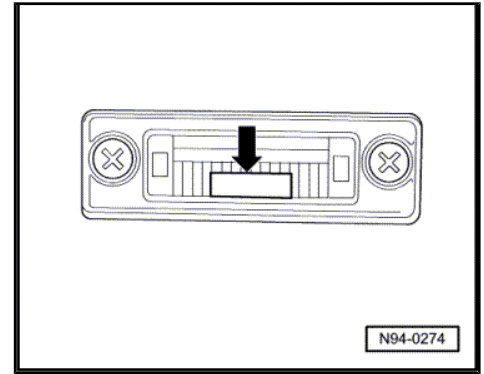




Note

On the scatter lens of the number plate light - X- is a small silver coloured anti-dazzle strip -arrow-. When installing the lens, always make sure that the anti-dazzle strip faces the bumper.

- Perform functional check.



7.2.2 Removing and installing bulb for number plate light, rear lid or rear wing door (LED)



Note

*The lighting element of the number plate light - X- has light-emitting diodes and cannot be renewed individually. In the event of damage, the entire number plate light must be renewed
⇒ [page 191](#).*

7.2.3 Removing and installing bulb for number plate light, dropside vehicles

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Unscrew securing bolt -3- for cover cap with lens.
- Push bulb -2- into holder, turn it anti-clockwise and pull it out of bulb holder.

Bulb for number plate light - X- : festoon bulb, 12V, P 5 W

Installing

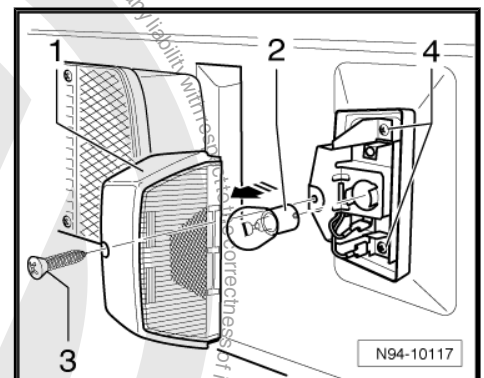
Installation is basically carried out in the reverse sequence; note the following when doing this:



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.

8 Steering column switch module

⇒ ["8.1 Assembly overview - steering column switch module", page 194](#)

⇒ ["8.2 Removing and installing return spring with slip ring \(coil connector\)", page 195](#)

⇒ ["8.3 Removing and installing steering column switch module", page 195](#)

⇒ ["8.4 Removing and installing ignition/starter switch", page 196](#)

⇒ ["8.5 Removing and installing closing cylinder", page 197](#)

⇒ ["8.6 Removing and installing steering lock housing", page 199](#)

8.1 Assembly overview - steering column switch module

1 - Steering column

2 - Bolt

- ☐ Qty. 2
- ☐ For securing steering lock housing to steering column
- ☐ Shear bolts

3 - Clamping piece

- ☐ Means of securing switch module to steering column

4 - Steering column switch module

- ☐ Removing and installing ⇒ [page 195](#)

5 - Clamping screw

- ☐ For securing switch module to steering column
- ☐ 3 Nm.

6 - Return ring with slip ring (coil connector)

- ☐ Removing and installing ⇒ [page 195](#)

7 - Steering lock housing

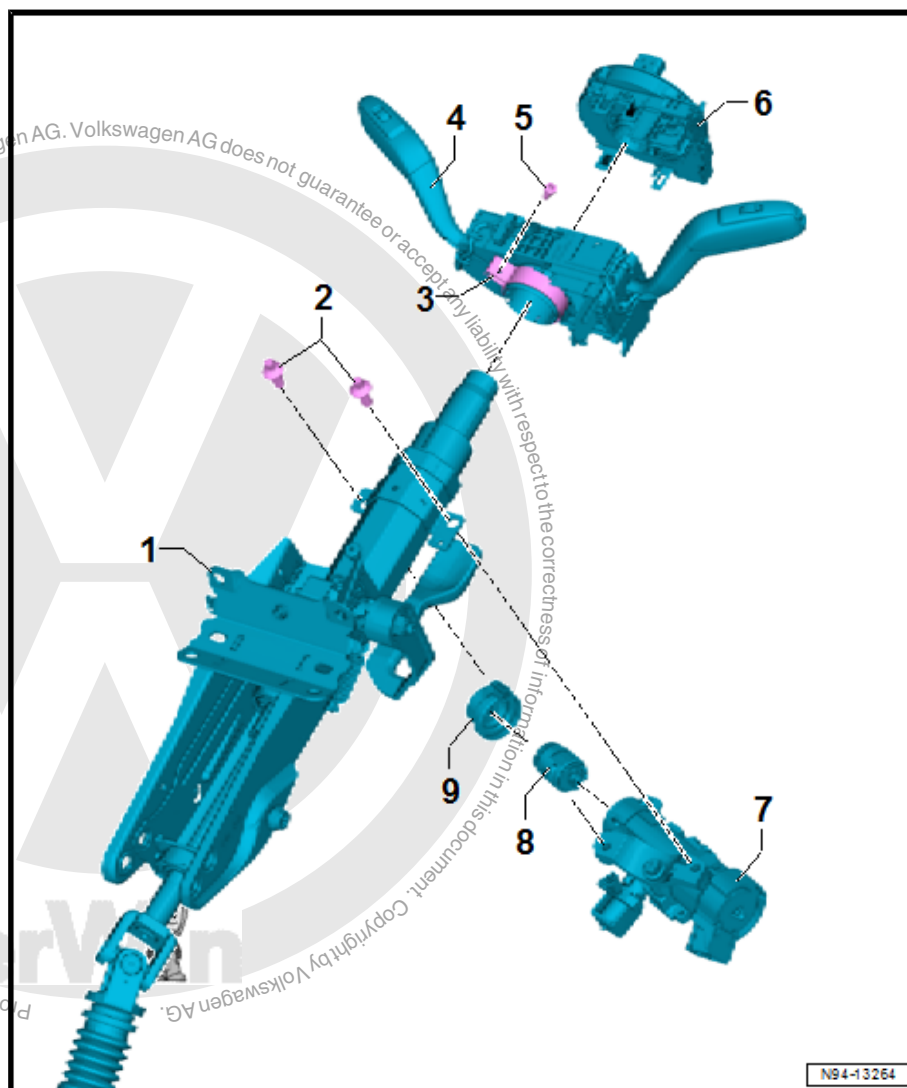
- ☐ Removing and installing steering lock housing ⇒ [page 199](#)
- ☐ Removing and installing ignition switch ⇒ [page 196](#)

8 - Lock cylinder

- ☐ Removing and installing ⇒ [page 197](#)

9 - Immobiliser reader coil

- ☐ Part of lock cylinder and can only be removed together with lock cylinder





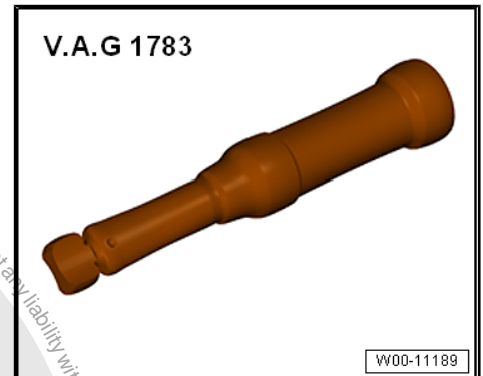
8.2 Removing and installing return spring with slip ring (coil connector)

Removing and installing return ring with slip ring (coil connector)
⇒ General body repairs, interior; Rep. gr. 69 ; Driver side airbag;
Removing and installing return ring with slip ring (coil connector) .

8.3 Removing and installing steering column switch module

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



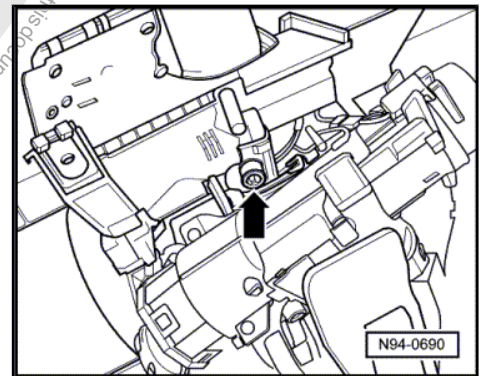
Removing

- Disconnect battery ⇒ [page 8](#) .
- Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering wheel; Removing and installing steering wheel .
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - steering column trim .
- Remove return ring with slip ring (coil connector) ⇒ [page 195](#) .
- Unscrew clamp bolt -arrow- on steering column switch module.



Note

The connector catch on the steering column switch module runs in a quadrant in the housing. When pulling out the steering column switch module, there may be a requirement to pull the locking lever up again to enable the connector to slide easily out of the quadrant.



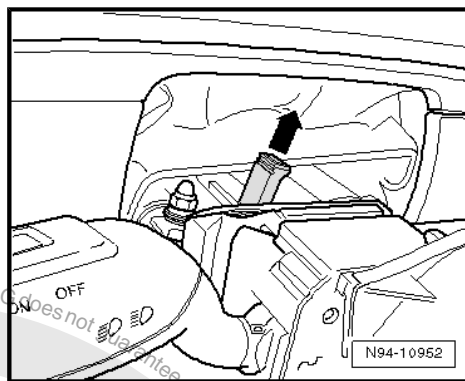


- To release the catch, pull up locking lever on connector on steering column switch module in -direction of arrow-.
- Pull steering column switch module out of contact connector housings and remove it.

Installing

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

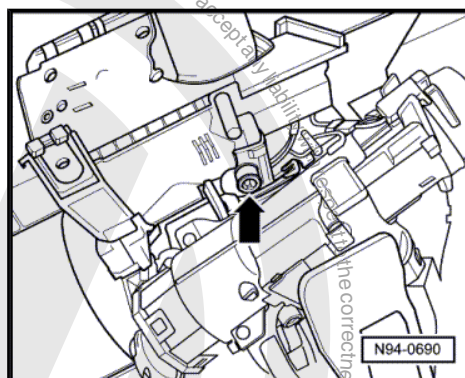
- Push steering column switch module onto steering column as far as it will go and align straight.



- Tighten clamping bolt -arrow- on steering column switch module.

Torque settings

- ♦ ⇒ ["8.1 Assembly overview - steering column switch module", page 194](#)



8.4 Removing and installing ignition/starter switch

Removing

- Disconnect battery ⇒ [page 8](#) .
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - steering column trim .

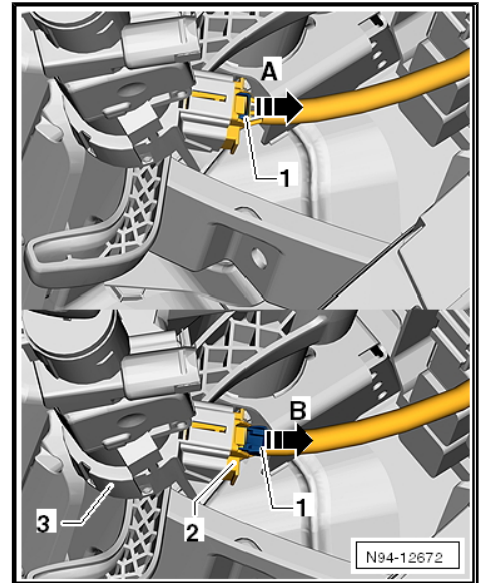


Note

- ♦ *The illustrations below are only schematic illustrations and specific details may vary.*
- ♦ *For reasons of clarity, the ignition/starter switch is shown without steering wheel and steering column switch module in the illustrations below.*



- Pull out primary locking element -1- of connector in -direction of arrow A-.
- Press primary locking element -1- and pull connector -2- in -direction of arrow B- off ignition/starter switch - D- -3-.



- Remove anti-tamper paint from both clamping bolts -A-.
- Loosen clamping bolts -A- slightly and pull ignition/starter switch - D- -1- in -direction of arrow- out of steering lock housing.

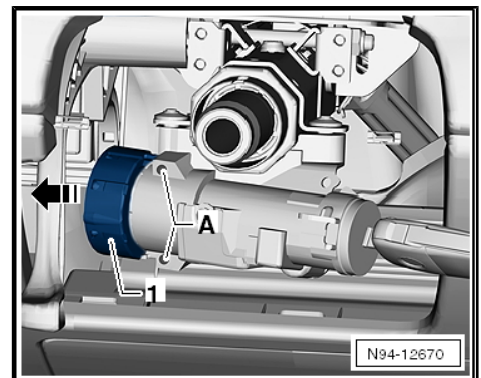
Installing

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



Caution

When installing the ignition/starter switch, ensure that the ignition/starter switch and the lock cylinder are in the same position, e.g. "Ignition on".



- Turn ignition key in lock cylinder to "Ignition ON" position.
- Push ignition/starter switch into steering lock housing to stop.
- Tighten clamping bolts and seal with anti-tamper paint.
- Push connector onto ignition/starter switch and push in primary locking element.
- Install steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - steering column trim .

8.5 Removing and installing closing cylinder



Caution

- ◆ **The steering lock could be destroyed.**
- ◆ **If the steering lock is actuated without lock cylinder, it will block and must be renewed.**
- ◆ **The steering lock must not be actuated without lock cylinder.**



Removing

- Disconnect battery ⇒ [page 8](#) .
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - steering column trim .
- Release connector -arrow- of immobiliser reader coil on lock cylinder and carefully pull it off.



Note

The immobiliser reading coil is secured to the lock cylinder and cannot be renewed individually.

- Insert ignition key in lock cylinder and turn to position “Drive”.

Positions for key in lock cylinder:

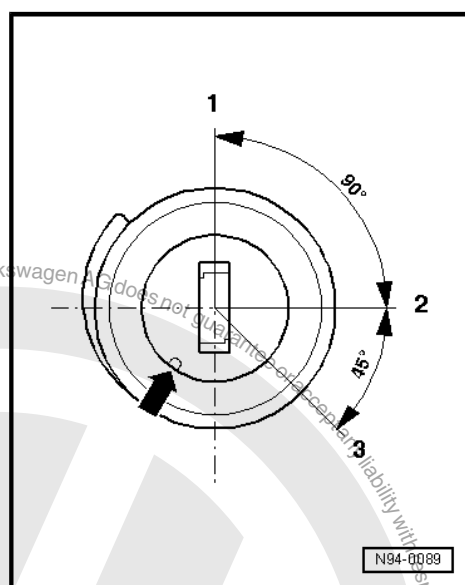
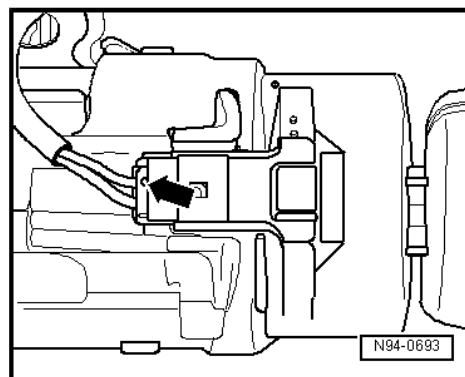
- 1 - Position “Stop”
- 2 - Position “Drive”
- 3 - Position “Start”

- Insert a piece of steel wire (approx. 1.2 mm in diameter) in drilling next to ignition key -arrow-.



Note

- ◆ *In order to ensure that the steel wire is inserted straight into the hole, it may be necessary to dismantle the ignition key and insert key into lock cylinder without key head ⇒ General body repairs, exterior; Rep. gr. 57 ; Central locking; Overview of fitting locations - central locking .*
- ◆ *If possible, use the so-called “workshop key”. This has a smaller head and there is no requirement for it to be dismantled.*





- Release lock cylinder securing lever using steel wire -arrow- and remove lock cylinder from steering lock housing.

- 1 - Lock cylinder
- 2 - Steel wire (approx. 1.2 mm diameter)
- 3 - Securing lever

Installing

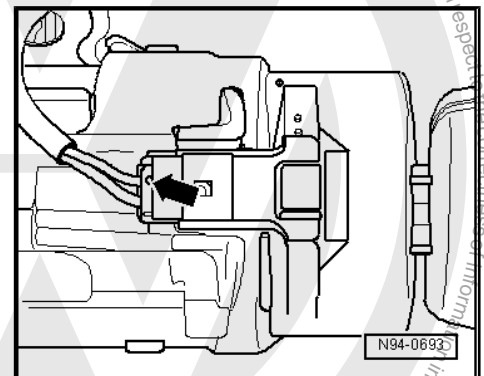
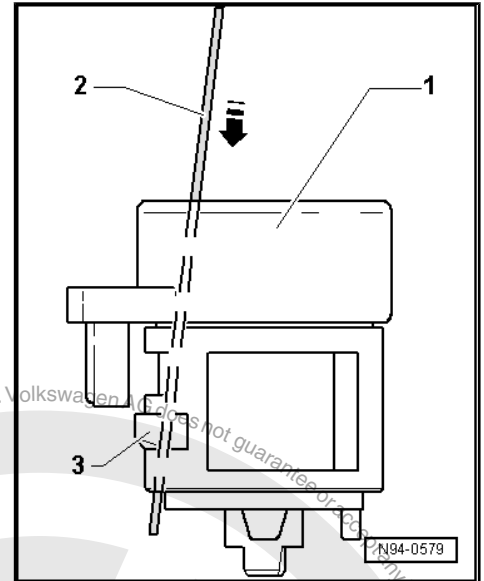
- Insert ignition key in lock cylinder and turn to position "Drive".
- Release securing lever using a piece of steel wire (approx. 1.2 mm diameter) and insert lock cylinder in steering lock housing.



Note

When installing lock cylinder, ensure that connection for immobiliser reader coil is in guide of steering lock housing.

- Pull piece of steel wire out of lock cylinder and check that lock cylinder is seated properly in steering lock housing.
- Connect immobiliser reader coil connector -arrow- to lock cylinder and engage it.
- Install steering column trim ➔ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Assembly overview - steering column trim .



8.6 Removing and installing steering lock housing



Note

To remove the steering lock housing, the shear bolts of the steering column switch must be drilled out. New shear bolts are required for subsequent installation ➔ ETKA (electronic parts catalogue) .

Removing

- Disconnect battery ➔ [page 8](#) .
- Remove steering column switch module ➔ [page 195](#) .



WARNING

Danger of eye injury from drilling swarf.

When drilling out, swarf may fly off and cause eye injury.

Wear safety goggles.



- Drill out shear-head bolts -arrows-.
- Remove steering lock housing.

If steering lock housing is to be renewed, further steps may be necessary:

- Remove lock cylinder ⇒ [page 197](#) .
- Remove ignition/starter switch - D- ⇒ [page 196](#) .

Installing



Caution

Steering lock will be damaged if improperly fitted!

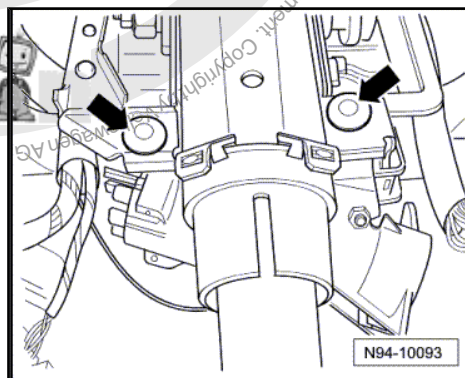
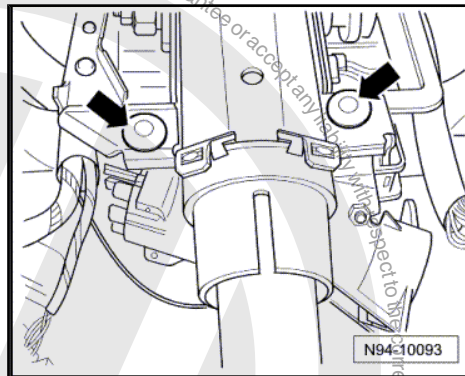
Failure to follow instructions will result in damage to the steering lock when the shear-head bolts are tightened.

Before fitting the steering lock housing to the steering column, the ignition key must be turned in the lock cylinder to the "Ignition ON" position.

- Fit steering lock housing with new shear-head bolts -arrows- to steering column.
- Tighten shear-head bolts until the heads shear off.
- Install steering column switch module ⇒ [page 195](#) .

If the steering lock housing has been renewed:

- Install lock cylinder ⇒ [page 197](#) .
- Install ignition/starter switch - D- ⇒ [page 196](#) .



9 Parking aid

⇒ ["9.1 Assembly overview – parking aid", page 201](#)

⇒ ["9.2 Removing and installing parking aid control unit J446 ", page 202](#)

⇒ ["9.3 Removing and installing front parking aid warning buzzer H22 ", page 203](#)

⇒ ["9.4 Removing and installing rear parking aid warning buzzer H15 ", page 204](#)

⇒ ["9.5 Adapting volume and frequency of rear parking aid warning buzzer", page 206](#)

⇒ ["9.6 Removing and installing front parking aid senders", page 206](#)

⇒ ["9.7 Removing and installing rear parking aid senders", page 207](#)

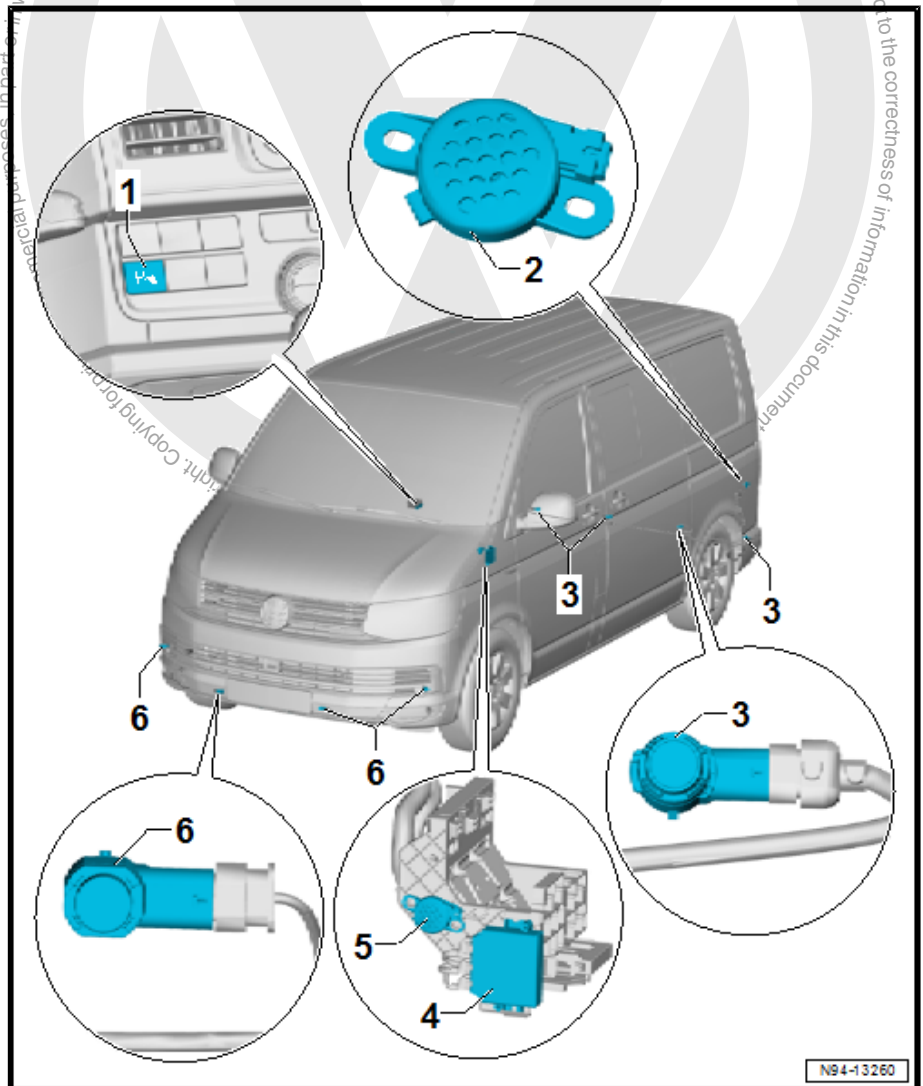
9.1 Assembly overview – parking aid

1 - Parking aid button - E266-

- ☐ With parking aid switch illumination bulb - L117-
- ☐ With parking aid warning lamp - K136-
- ☐ Installed in switch unit in middle section of dash panel
- ☐ Removing and installing ⇒ [page 247](#)

2 - Rear parking aid warning buzzer - H15-

- ☐ Only on vehicles with a parking aid in the rear and front bumper cover (8-channel)
- ☐ Installed behind B-pillar trim in Camper vans and vehicles with partition wall (right B-pillar for left-hand drive vehicles, left B-pillar for right-hand drive vehicles).
- ☐ Removing and installing ⇒ [page 205](#) .
- ☐ Securing nuts for warning buzzer on B-pillar: 2 Nm
- ☐ Installed behind rear left loudspeaker in Multivan vehicles with loudspeaker system.
- ☐ Removing and installing ⇒ [page 204](#)
- ☐ Installed on rear left D-pillar in Multivan vehicles without loudspeaker system.
- ☐ Removing and installing ⇒ [page 204](#)
- ☐ Adjusting volume of rear parking aid warning buzzer - H15- ⇒ [page 206](#)





3 - Rear parking aid senders

- ☐ Rear left parking aid sender - G203-
- ☐ Rear left centre parking aid sender - G204-
- ☐ Rear right centre parking aid sender - G205-
- ☐ Rear right parking aid sender - G206-
- ☐ Installed in rear bumper.
- ☐ Removing and installing ⇒ [page 207](#)

4 - Parking aid control unit - J446-

- ☐ Fitting location in driver footwell, on side of retainer of onboard supply control unit
- ☐ Removing and installing ⇒ [page 202](#)

5 - Front parking aid warning buzzer - H22-

- ☐ Fitting location in driver footwell, on side of retainer of onboard supply control unit
- ☐ Removing and installing ⇒ [page 203](#) .
- ☐ Securing bolts for warning buzzer on retainer of onboard supply control unit: 4 Nm

6 - Front parking aid senders

- ☐ Front right parking aid sender - G252-
- ☐ Front centre right parking aid sender - G253-
- ☐ Front centre left parking aid sender - G254-
- ☐ Front left parking aid sender - G255-
- ☐ Installed in front bumper.
- ☐ Removing and installing ⇒ [page 206](#)

9.2 Removing and installing parking aid control unit - J446-

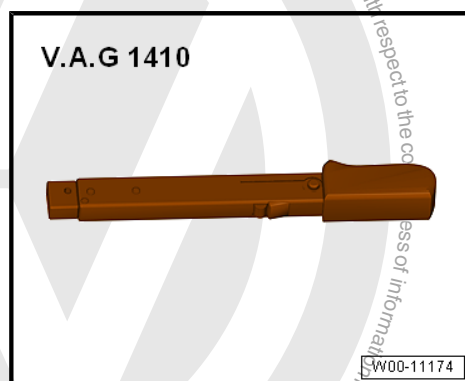


Note

Parking aid control unit - J446- is secured in driver footwell to side of onboard supply control unit retainer.

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove driver footwell cover ⇒ Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .
- Remove side left dash panel cover ⇒ Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .

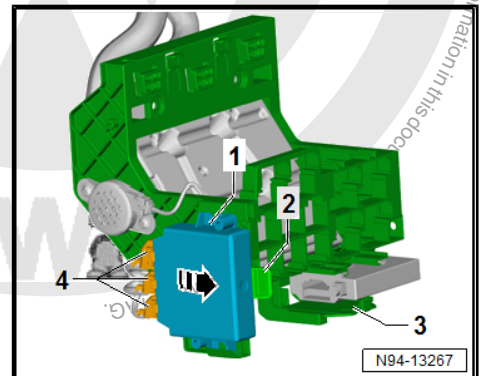
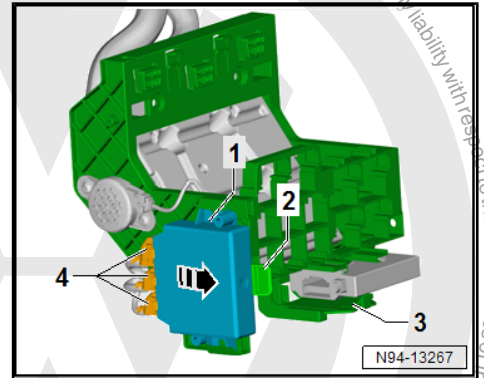


- Press release button -2- and remove parking aid control unit -1- from onboard supply control unit bracket -3-.
- Release and disconnect connectors -4-.

Installing

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

- Connect and engage connectors -4-.
- Push parking aid control unit -1- into onboard supply control unit bracket -3- and engage.



9.3 Removing and installing front parking aid warning buzzer - H22-

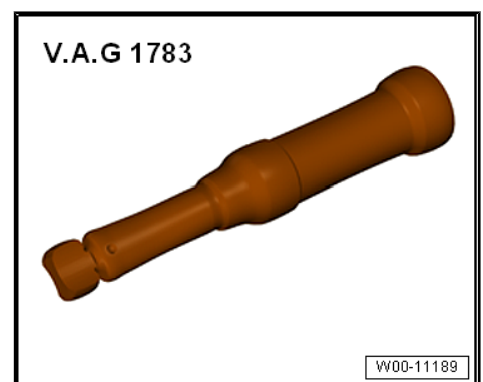


Note

The front parking aid warning buzzer - H22- is secured in the driver footwell to the side of the onboard supply control unit bracket.

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1783-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove driver footwell cover ⇒ Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .
- Remove side left dash panel cover ⇒ Rep. gr. 70 ; Dash panel; Assembly overview - dash panel .
- Remove parking aid control unit - J446- ⇒ [page 202](#) .



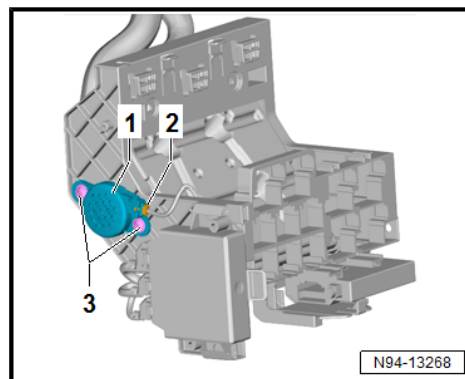
- Unscrew securing bolts -3- and remove front parking aid warning buzzer - H22- -1-.
- Release and disconnect connector on front parking aid warning buzzer - H22- -2-.

Installing

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

Torque settings

- ♦ ➔ [“9.1 Assembly overview – parking aid”, page 201](#)



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

➔ [“9.4.1 Removing and installing rear parking aid warning buzzer, Multivan”, page 204](#)

➔ [“9.4.2 Removing and installing rear parking aid warning buzzer, Camper vans and vehicles with partition wall”, page 205](#)

9.4.1 Removing and installing rear parking aid warning buzzer, Multivan

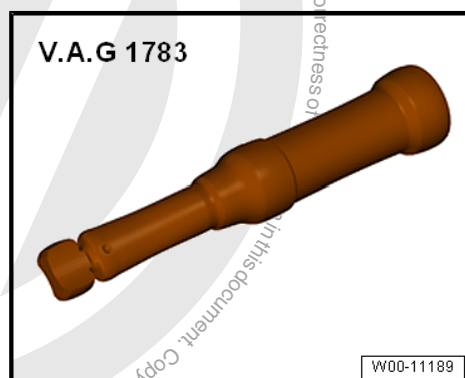


Note

- ♦ *Installed behind B-pillar trim in Camper vans and vehicles with partition wall (right B-pillar for left-hand drive vehicles, left B-pillar for right-hand drive vehicles) ➔ [page 205](#) .*
- ♦ *Installed behind rear left loudspeaker in Multivan vehicles with loudspeaker system.*
- ♦ *Installed on rear left D-pillar in Multivan vehicles without loudspeaker system.*
- ♦ *The rear warning buzzer has been discontinued in vehicles with a parking aid only in the rear bumper cover (4-channel).*

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1783-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.

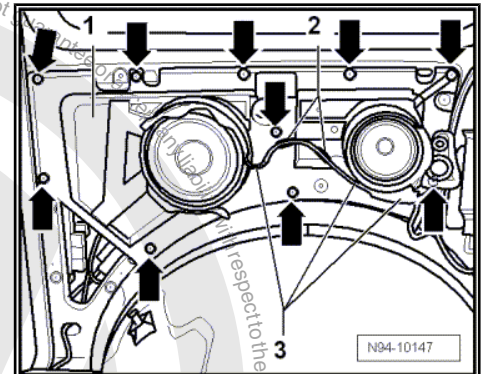
“California” model only

- Remove rear left cupboard ➔ General body repairs - California; Rep. gr. 77 ; Interior fittings .



Continuation all vehicles

- Remove rear left side panel trim ⇒ General body repairs, interior; Rep. gr. 70 ; Trims, interior; Overview of fitting locations - interior trims .
- Release and disconnect connectors -3- on each loudspeaker.
- Pull out cable retaining clips -2-.
- Unscrew plastic bolts from spreader rivets -arrows- and pull out spreader rivets.
- Remove loudspeaker retaining plate -1- on rear left.



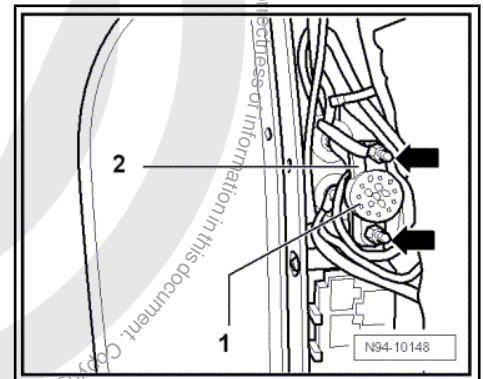
- Release and disconnect connector -2- on rear parking aid warning buzzer - H15- .
- Unscrew securing nuts -arrows- and remove rear parking aid warning buzzer - H15- -1-.

Installing

Install in reverse order of removal.

Torque settings

- ♦ ⇒ ["9.1 Assembly overview – parking aid", page 201](#)



9.4.2 Removing and installing rear parking aid warning buzzer, Camper vans and vehicles with partition wall



Note

- ♦ Installed behind B-pillar trim in Camper vans and vehicles with partition wall (right B-pillar for left-hand drive vehicles, left B-pillar for right-hand drive vehicles).
- ♦ Installed behind rear left loudspeaker in Multivan vehicles with loudspeaker system ⇒ [page 204](#) .
- ♦ Installed on rear left D-pillar in Multivan vehicles without loudspeaker system ⇒ [page 204](#) .
- ♦ The rear warning buzzer has been discontinued in vehicles with a parking aid only in the rear bumper cover (4-channel).

Removing

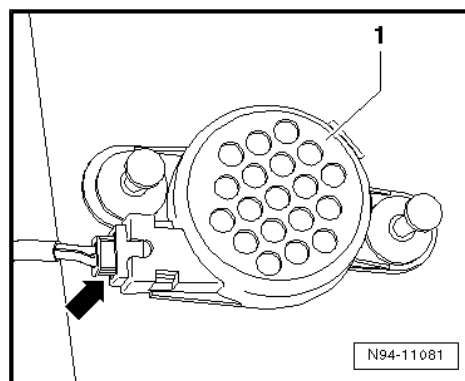
- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove upper B-pillar trim ⇒ General body repairs, interior; Rep. gr. 70 ; Trims, interior; Overview of fitting locations - interior trims .



- Release and disconnect connector -arrow-.
- Loosen spreader rivets and remove rear parking aid warning buzzer - H15- -1-.

Installing

Install in reverse order of removal.



9.5 Adapting volume and frequency of rear parking aid warning buzzer



Note

To adapt the volume and frequency of the rear parking aid warning buzzer - H15- , use ⇒ Vehicle diagnostic tester in Guided Fault Finding to select the Adaption function.

9.6 Removing and installing front parking aid senders

Removing

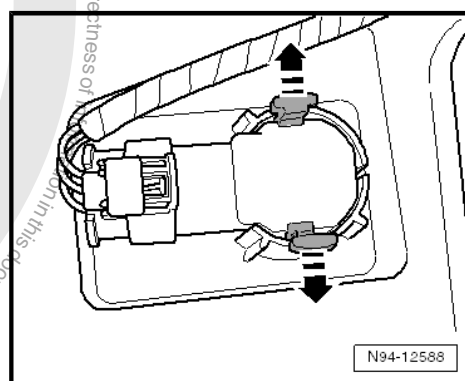


Caution

- ◆ **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 the sender from the retainer and then release and disconnect the sender's connector.**

Outer senders

- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover .
- Press both locking lugs in direction of -arrow- while, at the same time, pressing in sender onto stop from outside.



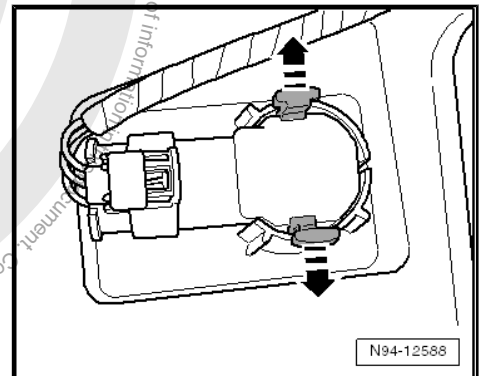
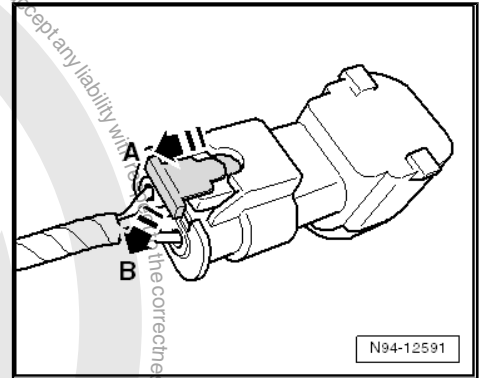


- Slide locking element in -direction of arrow A-, then push it in -direction of arrow B- and pull off connector.

Inner senders

The two interior parking aid senders can be removed and installed without having to remove the front bumper cover.

- Remove noise insulation under engine ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
- Press both locking lugs in direction of -arrow- while, at the same time, pressing in sender onto stop from outside.



- Slide locking element in -direction of arrow A-, then push it in -direction of arrow B- and pull off connector.

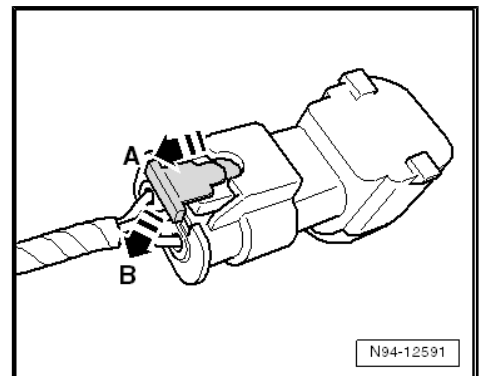
Installing

Install in reverse order of removal, observing the following:



Note

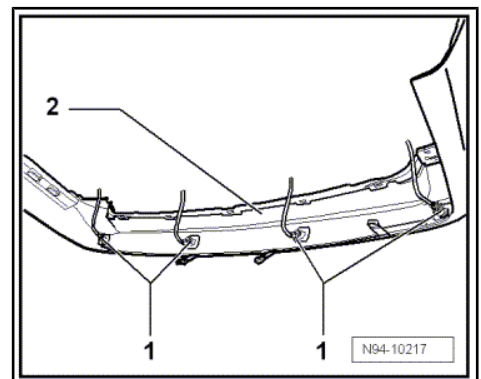
- ◆ When inserting the sender in the sender retainer, make sure that the isolation ring (black silicone ring) is seated correctly on the sender head.
- ◆ Both locking lugs of sender retainer must audibly engage when installing the sender.



9.7 Removing and installing rear parking aid senders

Removing

- Remove rear bumper cover -2- ⇒ General body repairs, exterior; Rep. gr. 63 ; Rear bumper; Removing and installing rear bumper cover .
- Release and disconnect connectors -1- on all parking aid senders .





- Push both locking lugs on bracket -2- outwards -arrows- and at the same time press parking aid sender -1- from outside inwards out of bracket.

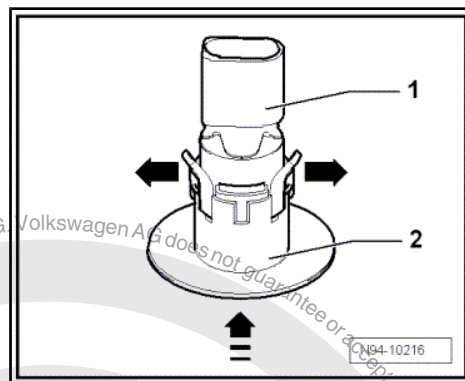
Installing

Install in reverse order of removal, observing the following:



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.*





10 Automatic headlight range control

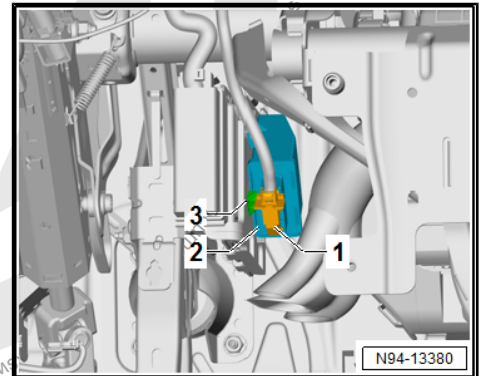
⇒ "10.1 Removing and installing headlight range control unit",
page 209

10.1 Removing and installing headlight range control unit

If the control unit is replaced, select the **Replace** function of the respective control unit in **Guided fault finding** ⇒ Vehicle diagnostic tester.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing glove compartment .
- Push fastener -3- and pull out headlight range control unit -2- from bracket.

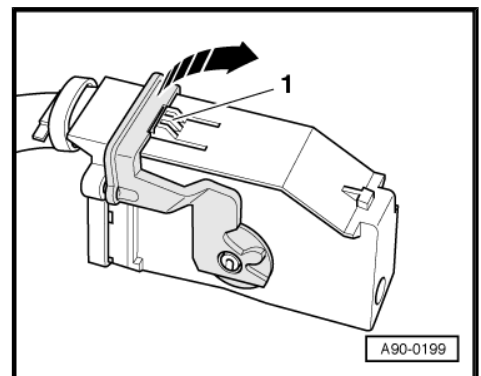


- Press fastener -1- and swing bar in direction of -arrow-.
- Separate electrical connector -1- on headlight range control unit.

Installing

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

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





11 Towing bracket

⇒ "11.1 Assembly overview - towing bracket socket", page 210

⇒ "11.2 Trailer socket U10 ", page 210

⇒ "11.3 Removing and installing trailer socket U10 ", page 211

⇒ "11.4 Removing and installing trailer detector control unit J345", page 213

11.1 Assembly overview - towing bracket socket

1 - Trailer detector control unit - J345-

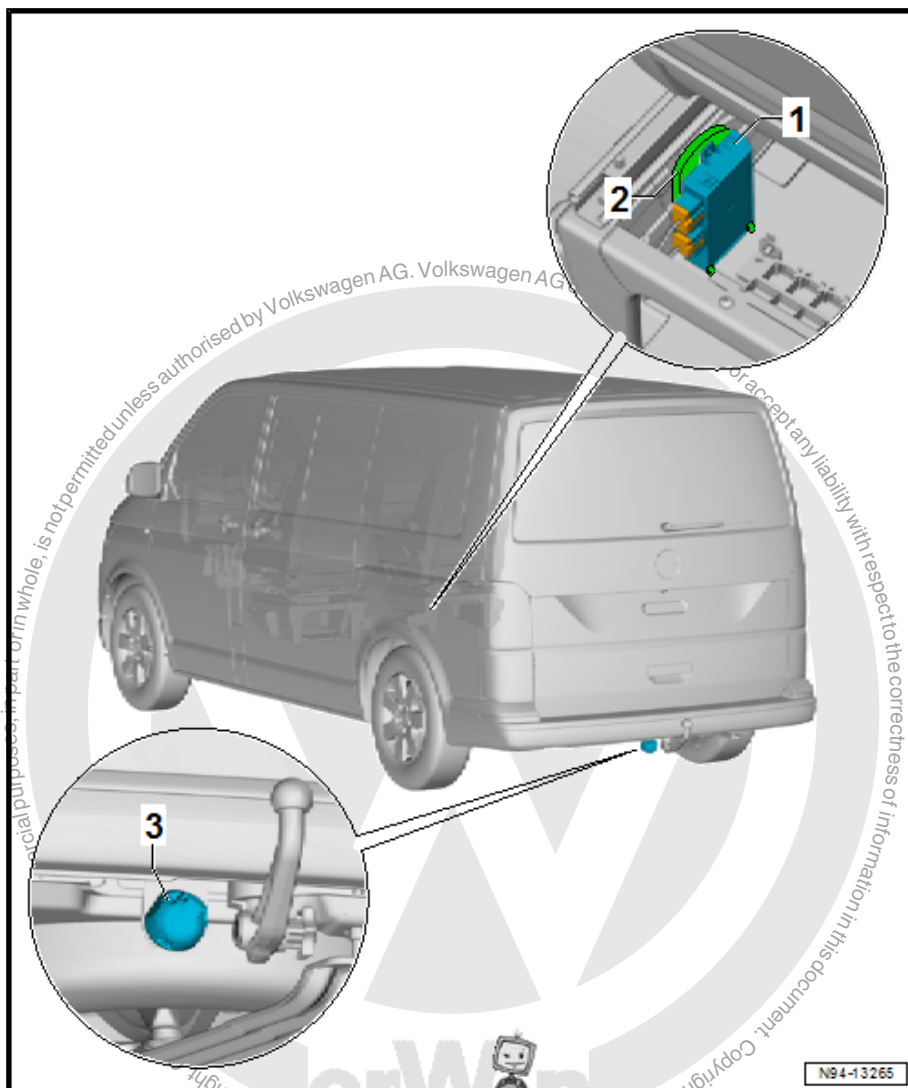
- ❑ Removing and installing
⇒ [page 213](#)

2 - Retaining frame

- ❑ For trailer detector control unit - J345-

3 - Trailer socket - U10-

- ❑ Pin assignment
⇒ [page 210](#)
- ❑ Removing and installing
⇒ [page 211](#)



11.2 Trailer socket - U10-

Properties of pin 9

- ◆ Pin 9, permanent plus, continuous supply of positive voltage from battery - A- .
- ◆ Permanent plus is always directly connected to battery - A- .
- ◆ Only low current ranges permissible, approx. 7.5 to 10 A



Properties of pin 10

- ◆ Pin 10, charging wire, controlled supply of battery positive voltage from vehicle to trailer.
- ◆ Charging current is only supplied with engine running and if the condition of the onboard power supply is OK.
- ◆ Higher current ranges permissible, approx. 15 to 20 A (e.g. for supplying fan heater or charging trailer battery).

Pin assignment of trailer socket - U10-

The exact assignment can be found in the latest current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

11.3 Removing and installing trailer socket - U10-

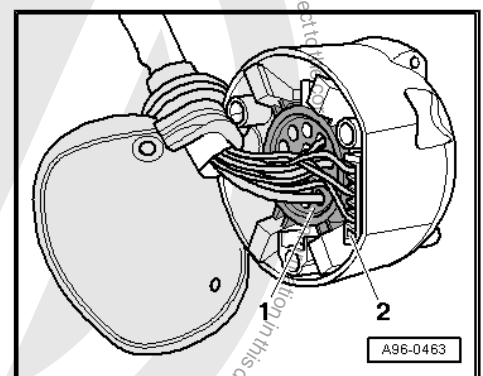
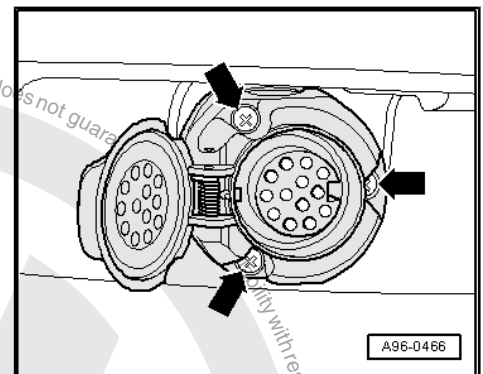


Note

- ◆ *If the trailer socket is to be repaired due to e.g. corrosion, check in each case whether it is sufficient to renew individual contacts or seals, or if the entire wiring harness with trailer socket must be renewed.*
- ◆ *Because part numbers may vary, check if the installed trailer socket is original equipment or a retrofitted accessory before ordering the replacement part.*

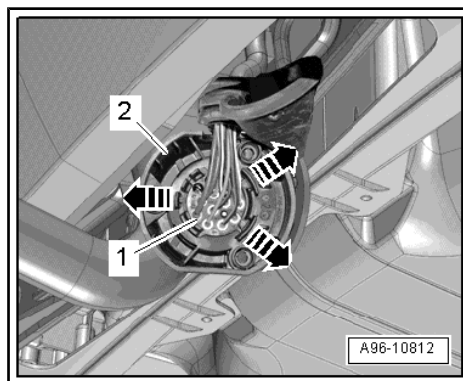
Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Unscrew securing bolts -arrows-.
- Remove trailer socket - U10- from retaining plate.
- Pull rubber cover off trailer socket.
- Disconnect connector -2- for rear fog light cut-out contact switch - F216- .





- Release retaining clips -arrows- and push multi-pin connector -1- towards rear out of socket housing -2-.

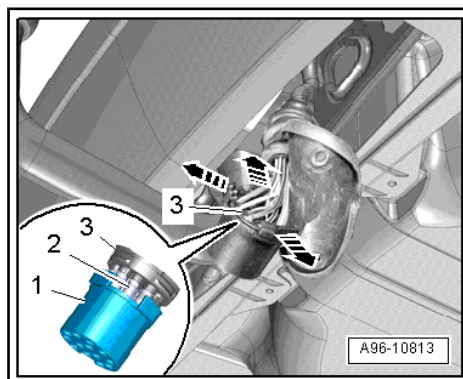


- Release retaining clips -arrows- and remove retaining cage -1- from multi-pin connector -3-.



Note

Proceed with care when pulling off retaining cage -1- in order to prevent the contacts -2- from being disconnected from the wiring harness.



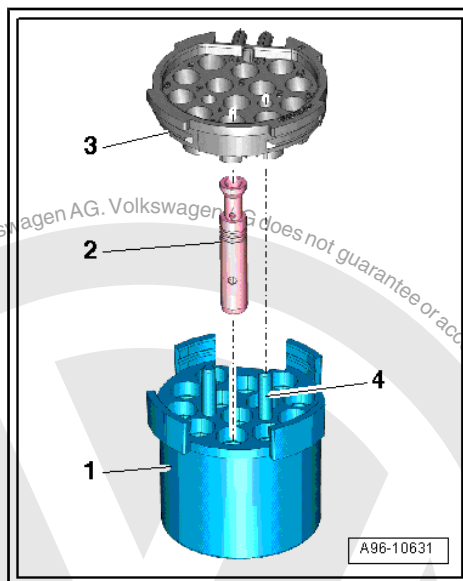
Installing

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



Note

- ♦ *The retaining cage -1- can only be pushed onto the multi-pin connector -3- and engaged in one specific position.*
- ♦ *The guide pins -4- on retaining cage -1- only fit into the multi-pin connector -3- in one specific position.*
- ♦ *To insert the guide pins into the multi-pin connector all contacts -2- must be properly inserted in the retaining cage at the correct positions.*
- Insert contacts -2- in retaining cage -1- and push retaining cage into multi-pin connector -3- until it engages audibly.
- Slide multi-pin connector in correct installation position from behind into socket housing and engage it.
- Fit rubber cover onto socket housing and fit trailer socket to retaining plate.
- Screw in and tighten three securing bolts.



Torque settings

Component	Torque setting
Bolts securing socket to retaining plate (qty. 3)	2 Nm.



11.4 Removing and installing trailer detector control unit - J345-



Note

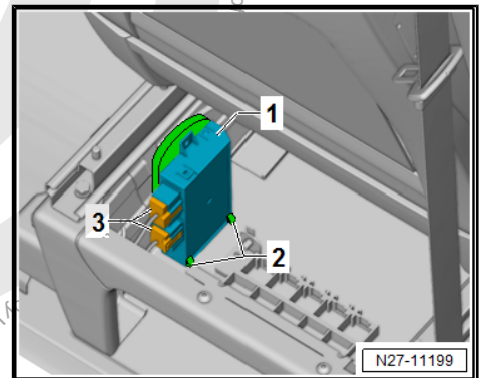
The trailer detector control unit - J345- is installed in the seat box beneath the front passenger seat.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Move front passenger seat to the foremost position.
- Remove rear trim from seat supporting frame.
- Press fasteners -2- and swing out control unit -1- from beneath bracket.
- Guide control unit -1- out of bracket.
- Release and separate electrical connectors -3- on control unit.

Installing

Install in reverse order of removal.





96 – Lights, bulbs, switches - interior

1 Lights

- ⇒ "1.1 Overview of fitting locations - lights in dash panel", page 214
- ⇒ "1.2 Overview of fitting locations - lights in luggage compartment", page 216
- ⇒ "1.3 Overview of fitting locations - lights in roof trim", page 217
- ⇒ "1.4 Removing and installing glove compartment light W6 ", page 217
- ⇒ "1.5 Replacing bulb for glove compartment light W6 ", page 218
- ⇒ "1.6 Removing and installing front entry light W31 / W32 ", page 219
- ⇒ "1.7 Removing and installing bulb for front entry light W31 / W32 ", page 220
- ⇒ "1.8 Removing and installing rear entry light W33 / W34 ", page 222
- ⇒ "1.9 Removing and installing bulb for rear entry light W33 / W34 ", page 222
- ⇒ "1.10 Removing and installing luggage compartment light W3 ", page 223
- ⇒ "1.11 Removing and installing bulb for luggage compartment light W3 ", page 224
- ⇒ "1.12 Removing and installing vanity mirror light W20 / W14 ", page 224
- ⇒ "1.13 Removing and installing bulb for illuminated vanity mirror W20 / W14 ", page 225
- ⇒ "1.14 Removing and installing front interior light/reading light", page 225
- ⇒ "1.15 Removing and installing bulb for front interior light/reading light", page 228
- ⇒ "1.16 Removing and installing rear interior light/reading light", page 231
- ⇒ "1.17 Removing and installing bulb for rear interior light/reading light", page 235

1.1 Overview of fitting locations - lights in dash panel

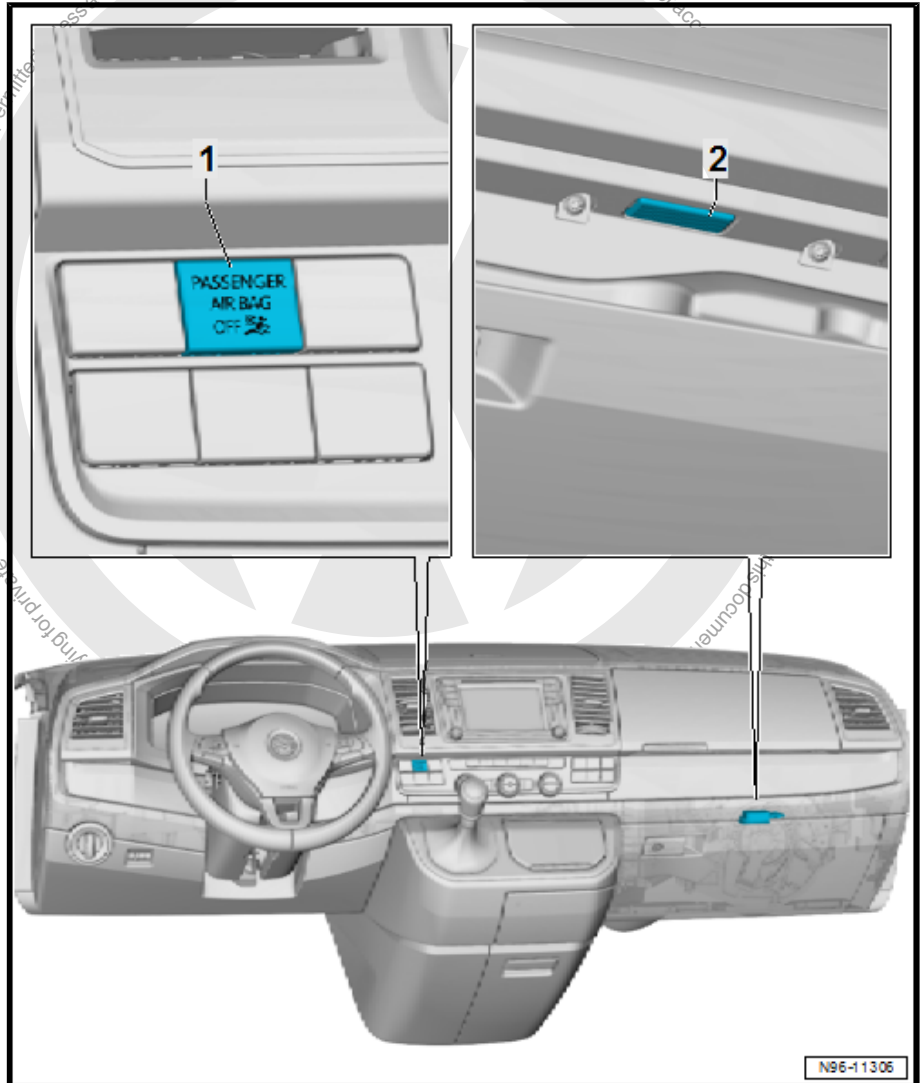


**1 - Front passenger side airbag
deactivated warning lamp -
K145-**

- ❑ Removing and installing
⇒ [page 247](#)

**2 - Glove compartment light -
W6-**

- ❑ Removing and installing
⇒ [page 217](#)

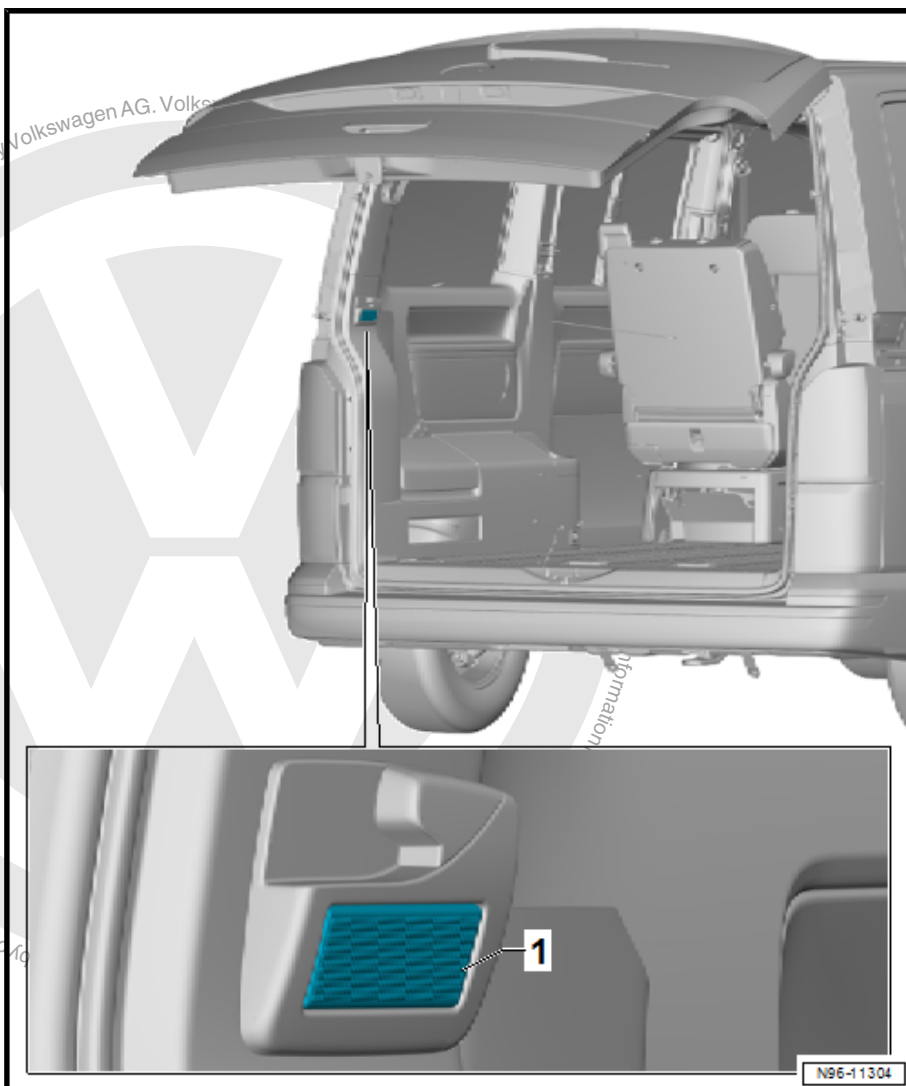




1.2 Overview of fitting locations - lights in luggage compartment

1 - Luggage compartment light - W3-

- ❑ Removing and installing
⇒ [page 223](#)





1.3 Overview of fitting locations - lights in roof trim

1 - Rear interior light/reading light

- ☐ Removing and installing
⇒ [page 261](#)
- ☐ Removing and installing
bulb for rear interior
light/reading light
⇒ [page 235](#)

2 - Rear interior light

- ☐ Rear interior light – light
with toggle switch
- ☐ Removing and installing
⇒ [page 261](#)
- ☐ Removing and installing
bulb for rear interior light
- light with toggle switch
⇒ [page 237](#)
- ☐ Rear interior light – light
with rocker switch
- ☐ Removing and installing
⇒ [page 261](#)
- ☐ Removing and installing
bulb for rear interior light
- light with toggle switch
⇒ [page 236](#)

3 - Front courtesy light/reading light

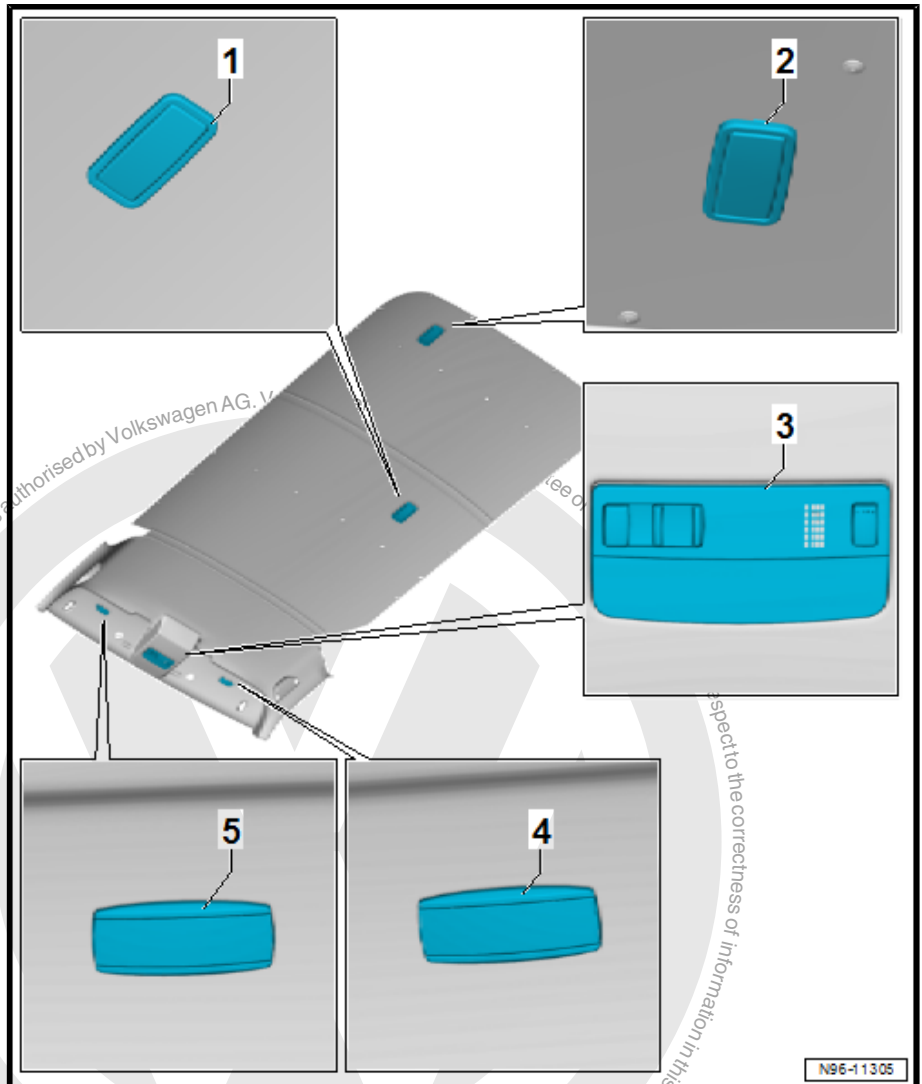
- ☐ Removing and installing
⇒ [page 261](#)
- ☐ Removing and installing
bulb for front interior
light/reading light
⇒ [page 228](#)

4 - Front passenger side illuminated vanity mirror

- ☐ Removing and installing ⇒ [page 224](#)

5 - Driver side illuminated vanity mirror

- ☐ Removing and installing ⇒ [page 224](#)

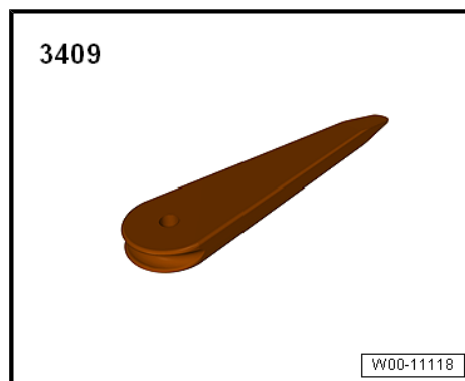


1.4 Removing and installing glove compartment light - W6-

Special tools and workshop equipment required

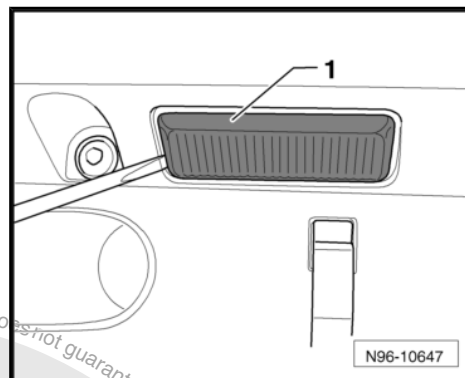


◆ Removal wedge - VAS 3409-



Removing

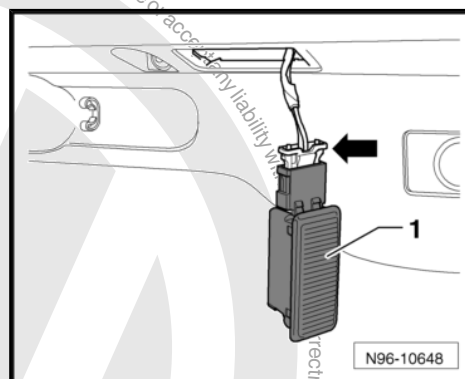
- Turn light switch to “0” position.
- Switch off ignition and all electrical equipment and then remove ignition key.
- Carefully lever out glove compartment light -1- with removal wedge - VAS 3409- or suitable screwdriver.



- Release and separate electrical connector -arrow- and remove glove compartment light -1-.

Installing

Install in reverse order of removal.

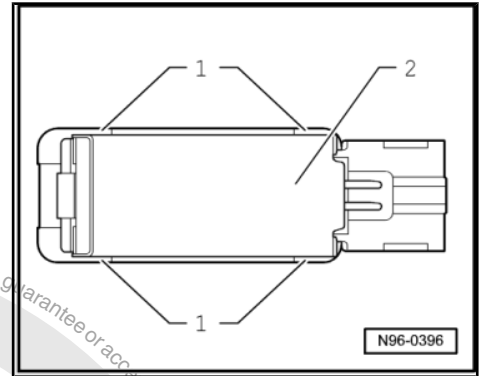


1.5 Replacing bulb for glove compartment light - W6-

- Remove glove compartment light ➔ [page 217](#) .



- Release locking lugs -1- and remove heat shield cover -2- from lens of light.



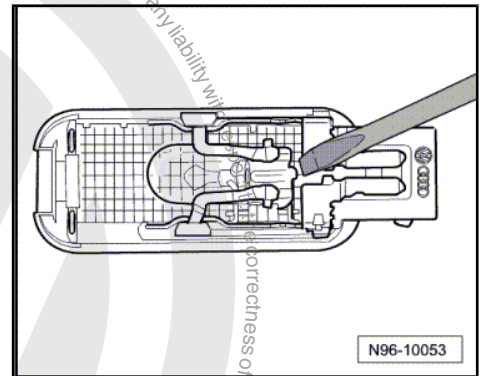
- Carefully lever out bulb from socket.

Glove compartment light bulb: glass base bulb 12V, 5W.

Installing

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

- Check function of glove compartment switch. When the lid is closed, the glove compartment light should not be on.



1.6 Removing and installing front entry light -W31- / -W32-

⇒ [“1.6.1 Removing and installing front entry light W31 / W32 ,
Transporter”, page 219](#)

⇒ [“1.6.2 Removing and installing front entry light W31 / W32 ,
Multivan”, page 220](#)

1.6.1 Removing and installing front entry light -W31- / -W32- , Transporter

Removal and installation of all entry lights are performed in the same manner and are described only for one light.



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

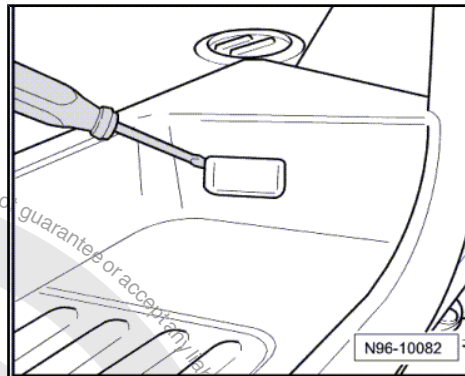
- Switch off ignition and all electrical equipment and then remove ignition key.



- Fit screwdriver (screwdriver handle must face towards inside of vehicle) and carefully lever out light.
- Release and separate electrical connector.

Installing

Install in reverse order of removal.



1.6.2 Removing and installing front entry light -W31- / -W32- , Multivan

Removal and installation of all entry lights are performed in the same manner and are described only for one light.



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

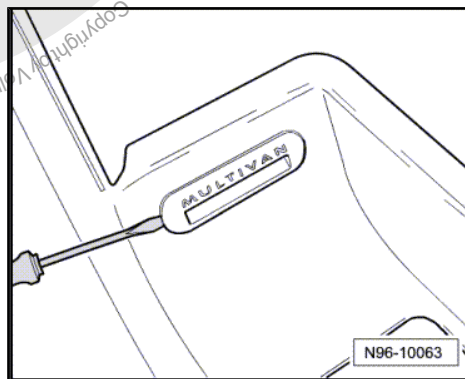
Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Fit screwdriver from left side and carefully lever out light.
- Release and separate electrical connector.

Installing

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

Fit light first on left side and then engage spring.



1.7 Removing and installing bulb for front entry light -W31- / -W32-

⇒ ["1.7.1 Removing and installing bulb for front entry light W31 / W32 , Transporter", page 220](#)

⇒ ["1.7.2 Removing and installing bulb for front entry light W31 / W32 , Multivan", page 221](#)

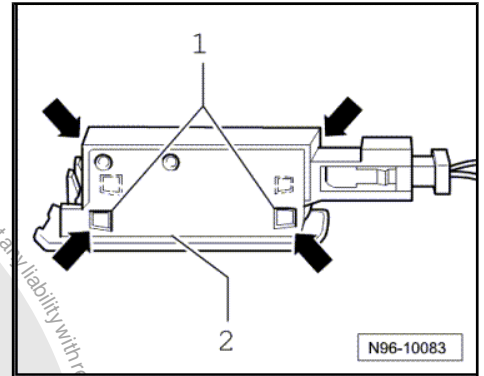
1.7.1 Removing and installing bulb for front entry light -W31- / -W32- , Transporter

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove entry light ⇒ [page 219](#) .



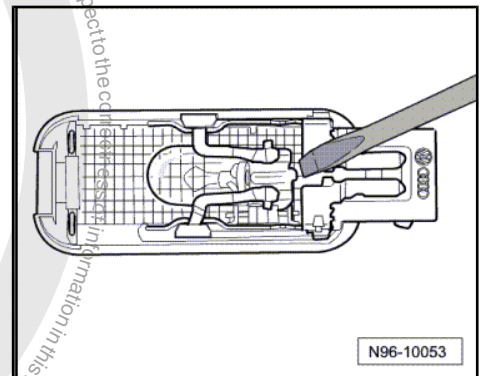
- Release locking lugs -1- and remove cover from bulb carrier -2-.



- Carefully lever defective bulb out of bulb holder.
- Entry light bulb : glass-base bulb 12V, 5W

Installing

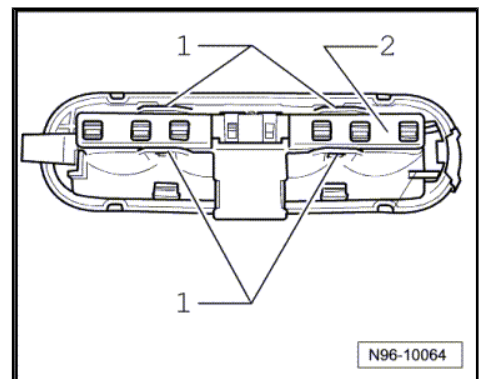
Install in reverse order of removal.



1.7.2 Removing and installing bulb for front entry light -W31- / -W32-, Multivan

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove entry light ⇒ [page 220](#) .
- Release locking lugs -1-, and detach bulb carrier -2- from housing of light.



- Carefully pull defective bulb out of bulb holder.
- Entry light bulb : glass-base bulb 12 V, 1.2 W

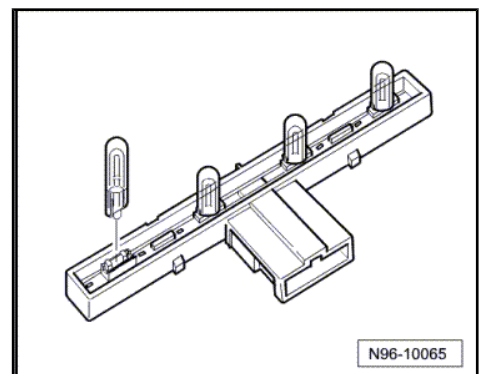


Note

To check which bulb is defective, the connector can be fitted to the lamp carrier.

Installing

Install in reverse order of removal.





1.8 Removing and installing rear entry light -W33- / -W34-

⇒ ["1.8.1 Removing and installing rear entry light W33 / W34 ,
Transporter", page 222](#)

⇒ ["1.8.2 Removing and installing rear entry light W33 / W34 ,
Multivan", page 222](#)

1.8.1 Removing and installing rear entry light -W33- / -W34- , Transporter



Note

- ◆ Removal and installation of the rear entry light -W33- / -W34- in the Transporter is carried out in the same way as for the front entry light -W31- / -W32- in the Transporter.
- ◆ Removing and installing front entry light -W31- / -W32- in Transporter ⇒ [page 219](#) .

1.8.2 Removing and installing rear entry light -W33- / -W34- , Multivan



Note

- ◆ Removal and installation of the rear entry light -W33- / -W34- in the Multivan is carried out in the same way as for the front entry light -W31- / -W32- in the Multivan.
- ◆ Removing and installing front entry light -W31- / -W32- in Multivan ⇒ [page 220](#) .

1.9 Removing and installing bulb for rear entry light -W33- / -W34-

⇒ ["1.9.1 Removing and installing bulb for rear entry light W33 /
W34 , Transporter", page 222](#)

⇒ ["1.9.2 Removing and installing bulb for rear entry light W33 /
W34 , Multivan", page 223](#)

1.9.1 Removing and installing bulb for rear entry light -W33- / -W34- , Transporter



Note

- ◆ Removal and installation of the bulb for the rear entry light -W33- / -W34- in the Transporter is carried out in the same way as for the front entry light -W31- / -W32- in the Transporter.
- ◆ Removing and installing bulb for front entry light -W31- / -W32- in Transporter ⇒ [page 220](#) .



1.9.2 Removing and installing bulb for rear entry light -W33- / -W34- , Multivan



Note

- ◆ Removal and installation of the bulb for rear entry light -W33- / -W34- in the Multivan is carried out in the same way as for the front entry light -W31- / -W32- in the Multivan.
- ◆ Removing and installing bulb for front entry light -W31- / -W32- in Multivan ⇒ [page 221](#) .

1.10 Removing and installing luggage compartment light - W3-



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

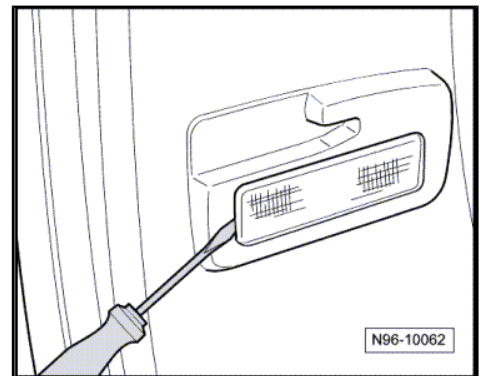


Note

Removal and installation of luggage compartment lights are performed in the same manner for both lights and are described only for one light.

Removing

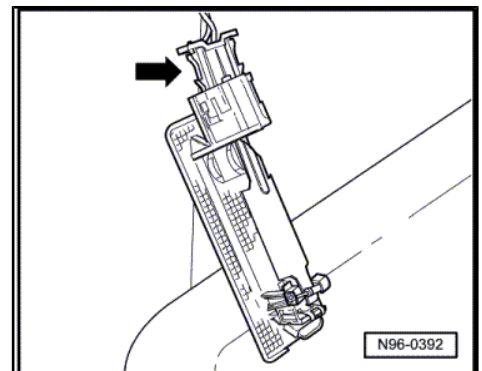
- Switch off ignition and all electrical equipment and then remove ignition key.
- Carefully lever out luggage compartment light - W3- using a screwdriver.



- Release and disconnect connector -arrow-.

Installing

Install in reverse order of removal.





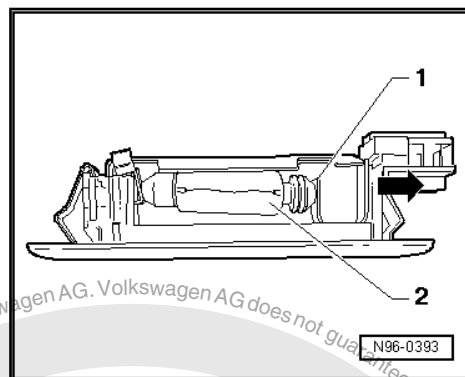
1.11 Removing and installing bulb for luggage compartment light - W3-

Removing

- Remove luggage compartment light ⇒ [page 223](#) .
- Press contact plate -1- in -direction of arrow- and remove bulb -2- from bulb holder.
- Bulb for luggage compartment light : festoon bulb 12V, 10W

Installing

Install in reverse order of removal.



1.12 Removing and installing vanity mirror light -W20- / -W14-



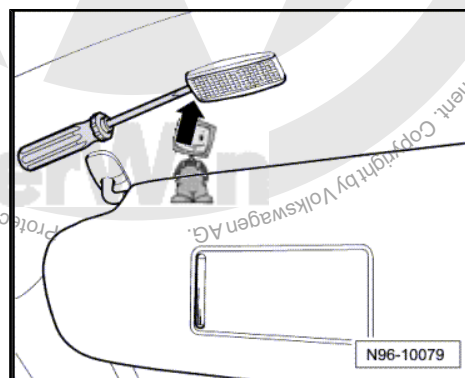
Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

The removal and installation procedure for both vanity mirror lights is carried out in the same way and is described just for one light.

Removing

- Close vanity mirror in sun visor.
- Carefully lever out light using a screwdriver. Fit screwdriver on recess -arrow-.

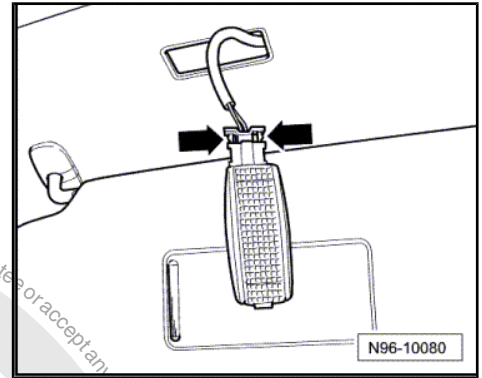




- Release and disconnect connector -arrows-.

Installing

Install in reverse order of removal.



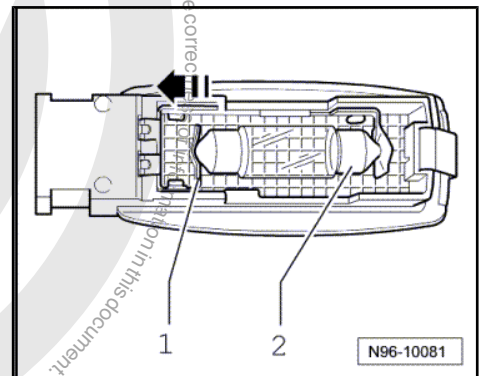
1.13 Removing and installing bulb for illuminated vanity mirror -W20- / -W14-

Removing

- Remove illuminated vanity mirror light ⇒ [page 224](#) .
- Press contact plate -1- in -direction of arrow- and remove bulb -2- from bulb holder.
- Bulb for illuminated vanity mirror : festoon bulb 12V, 5W

Installing

Install in reverse order of removal.



1.14 Removing and installing front interior light/reading light

⇒ ["1.14.1 Removing and installing front interior light, Multivan"](#), [page 225](#)

⇒ ["1.14.2 Removing and installing front interior light, Transporter"](#), [page 226](#)

⇒ ["1.14.3 Removing and installing front reading light"](#), [page 227](#)

1.14.1 Removing and installing front interior light, Multivan



Caution

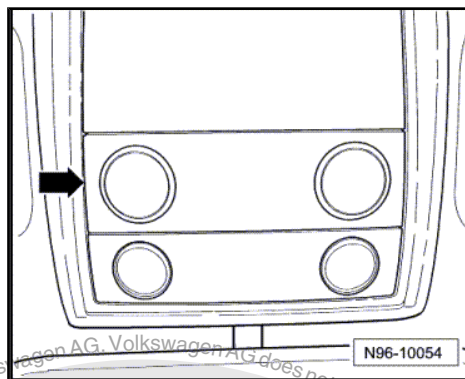
When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

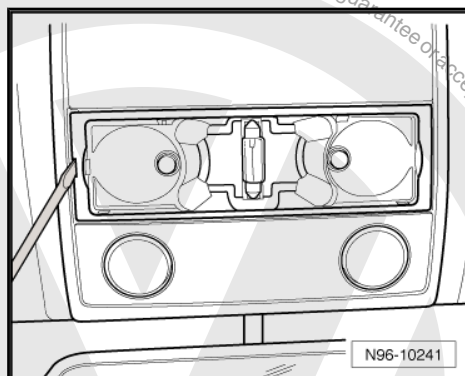
- Switch off ignition and all electrical equipment and then remove ignition key.



- Carefully lever out lens of front interior light - W1- -arrow-.



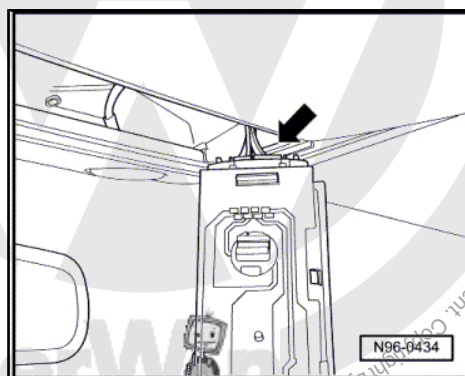
- Carefully lever interior and reading light out of mounting frame using a -screwdriver-.



- Release and disconnect connector -arrow-.

Installing

Install in reverse order of removal.



1.14.2 Removing and installing front interior light, Transporter



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

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



Version 1:

- Carefully lever interior light out of mounting frame -arrow-.
- Release and separate electrical connector.

Version 2:

- Unclip lens.

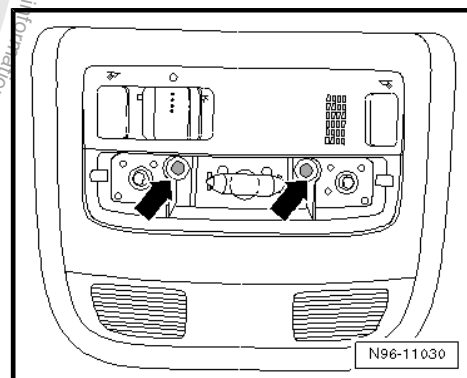
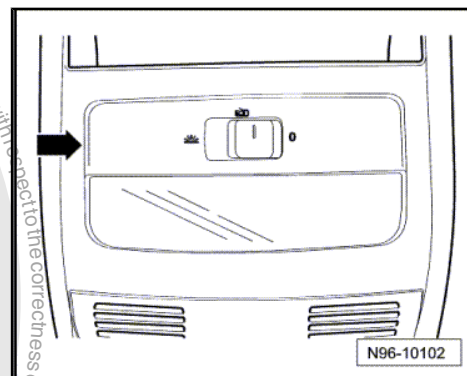
- Unscrew screws -arrows- in interior light.

- Detach side fasteners and carefully remove interior light from mounting frame.

- Release and separate electrical connector.

Installing

Install in reverse order of removal.



1.14.3 Removing and installing front reading light

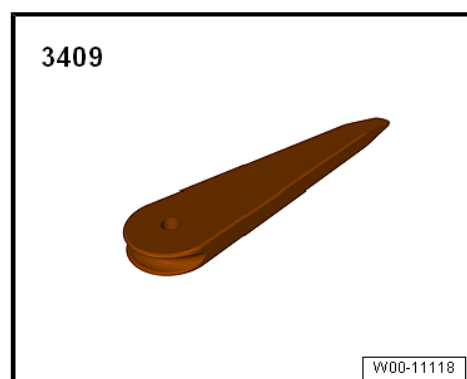


Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-

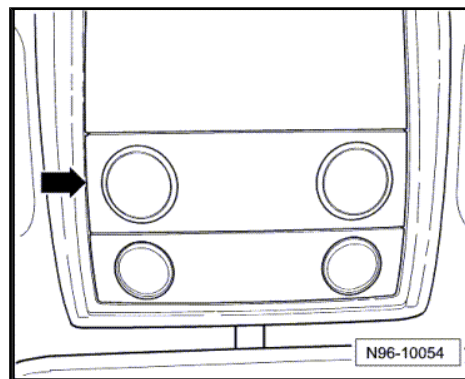


Removing

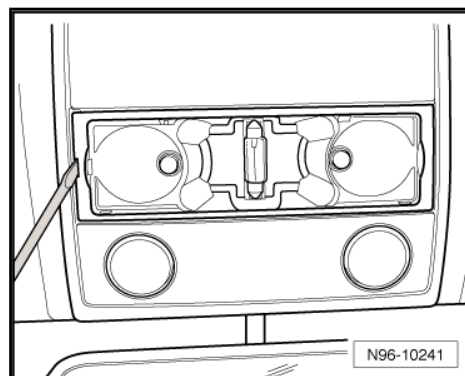
- Switch off ignition and all electrical equipment and then remove ignition key.



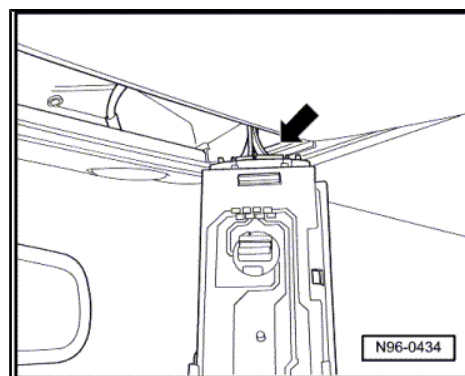
- Carefully lever lens of front passenger reading light - W13- and driver side reading light - W19- out of mounting frame -arrow-.



- Carefully lever reading light out of mounting frame using a -screwdriver-.



- Release and disconnect connector -arrow-.



Installing

Install in reverse order of removal.

1.15 Removing and installing bulb for front interior light/reading light

⇒ ["1.15.1 Removing and installing bulb for front interior light, Multivan", page 228](#)

⇒ ["1.15.2 Removing and installing bulb for front interior light, Transporter", page 229](#)

⇒ ["1.15.3 Removing and installing bulb for front reading light", page 230](#)

1.15.1 Removing and installing bulb for front interior light, Multivan



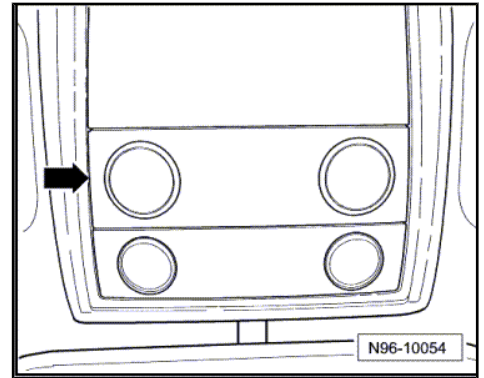
Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.



Removing

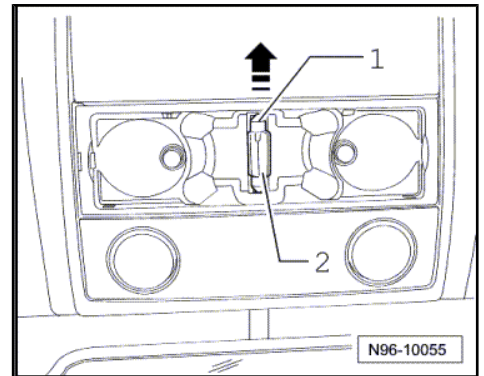
- Carefully lever out lens of front interior light - W1- -arrow-.



- Press contact plate -1- in -direction of arrow- and remove bulb -2- from bulb holder.
- Bulb for front interior light : festoon bulb 12V, 10W

Installing

Install in reverse order of removal.



1.15.2 Removing and installing bulb for front interior light, Transporter



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

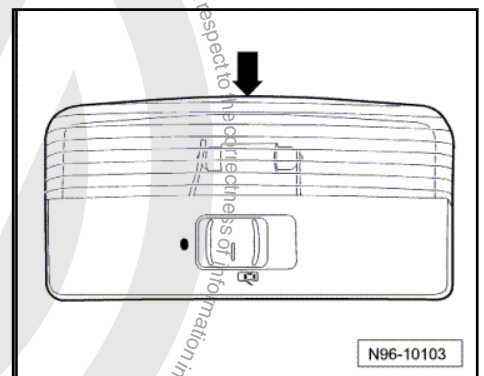
Removing

- Pull lens -arrow- off reflector.



Note

Depending on version, the interior light may look different from interior light in illustration.

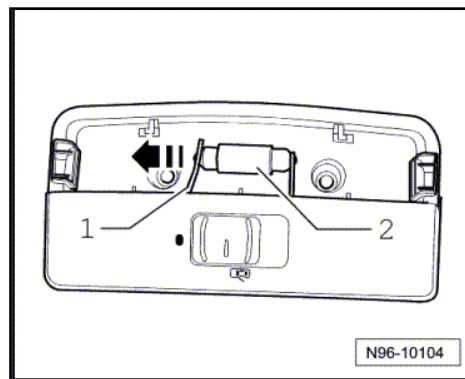




- Press contact plate -1- in -direction of arrow- and remove bulb -2- from bulb holder.
- Bulb for front interior light : festoon bulb 12V, 10W

Installing

Install in reverse order of removal.



1.15.3 Removing and installing bulb for front reading light

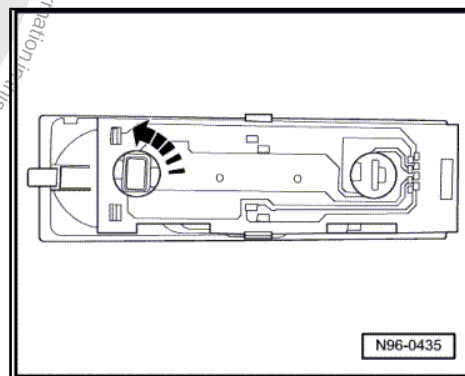


Note

Removal and installation of the bulbs are carried out in the same way for both reading lights and are described only for one light.

Removing

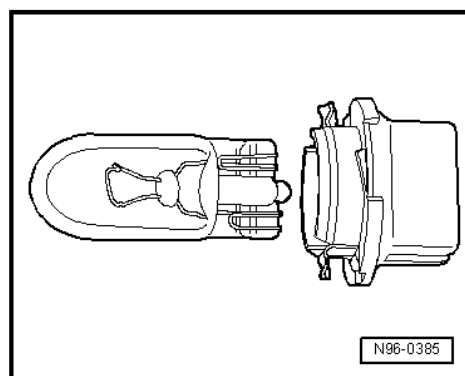
- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove front reading light ➔ [page 225](#) .
- Turn bulb holder in direction of -arrow- and pull out.



- Carefully pull bulb straight out of bulb holder.
- Bulb for front reading light : glass-base bulb 12V, 5W

Installing

Install in reverse order of removal.





1.16 Removing and installing rear interior light/reading light

⇒ ["1.16.1 Removing and installing rear interior and reading light, Multivan", page 231](#)

⇒ ["1.16.2 Removing and installing centre interior light and front interior light in high roof", page 232](#)

⇒ ["1.16.3 Removing and installing rear interior light with rotary pushbutton", page 233](#)

⇒ ["1.16.4 Removing and installing rear interior light with rocker switch", page 233](#)

⇒ ["1.16.5 Removing and installing rear interior light with toggle switch", page 234](#)

1.16.1 Removing and installing rear interior and reading light, Multivan



Note

- ◆ Depending on the equipment level, the interior lights and reading lamps of the 1st row of seats include the left interior light - W16- , the centre left reading lamp - W39- , the right interior light - W17- and the centre right reading lamp - W40- .
- ◆ Depending on the equipment level, the interior lights and reading lamps of the 2nd row of seats include the rear left interior light - W47- , the rear left reading lamp - W11- , the rear right interior light - W48- and the rear right reading lamp - W12- .
- ◆ Removal and installation of interior lights in 1st and 2nd row of seats are performed in the same manner and are described only for one light.



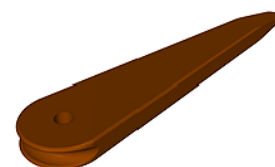
Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-

3409



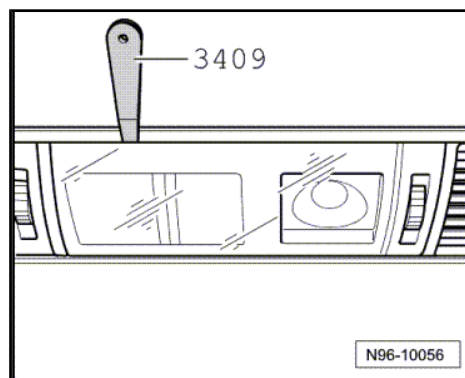
W00-11118

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



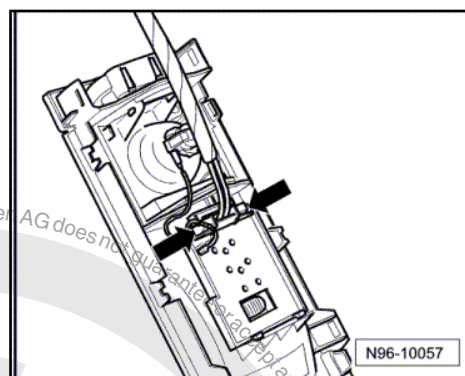
- Carefully lever out light using a removal wedge - 3409- .



- Release and disconnect connector -arrows-.

Installing

Install in reverse order of removal.



1.16.2 Removing and installing centre interior light and front interior light in high roof



Note

- ◆ Depending on level of equipment, the centre interior light - W7- , the front interior light in high roof - W28- and the rear interior light - W43- are installed in Multivan with long wheel base, Transporter with flat roof, medium-high roof and high roof or shuttle.
- ◆ The removal and installation procedure for both interior lights is carried out in the same way and is described only for one light.



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

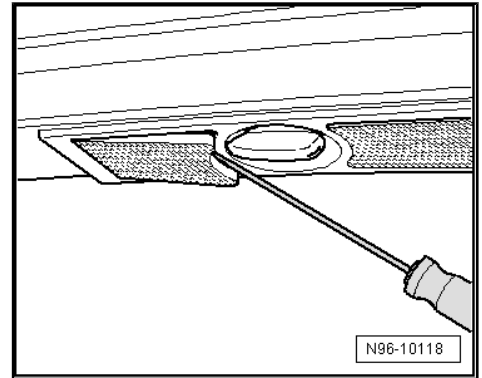


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



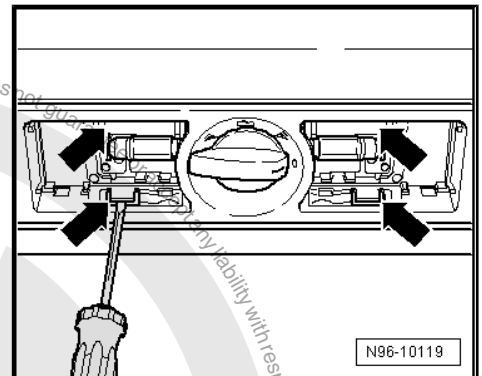
- Carefully lever out light using a screwdriver.



- Release all four locking lugs -arrows- and carefully pull out light downwards.
- Release and separate electrical connector.

Installing

Install in reverse order of removal.



1.16.3 Removing and installing rear interior light with rotary pushbutton

Removal and installation of the rear interior light with rotary pushbutton are carried out in the same way as the removal and installation of the centre interior light and the front interior light in high roof ➔ [page 232](#) .

1.16.4 Removing and installing rear interior light with rocker switch



Note

- ◆ Depending on the equipment level, the centre interior light - W7- , the front interior light in high roof - W28- and the rear interior light - W43- are installed in Multivan with long wheel base, Transporter with flat roof, medium-high roof and high roof or shuttle.
- ◆ The removal and installation procedure for both interior lights is carried out in the same way and is described only for one light.



Caution

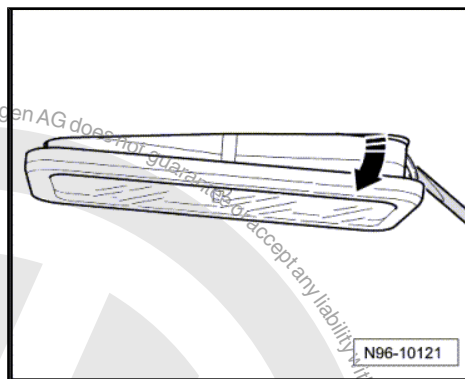
When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



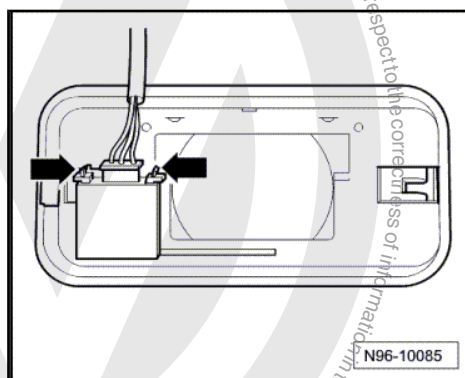
- Carefully lever out light in -direction of arrow- using a screw-driver.



- Release and disconnect connector -arrows-.

Installing

Install in reverse order of removal.



1.16.5 Removing and installing rear interior light with toggle switch



Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

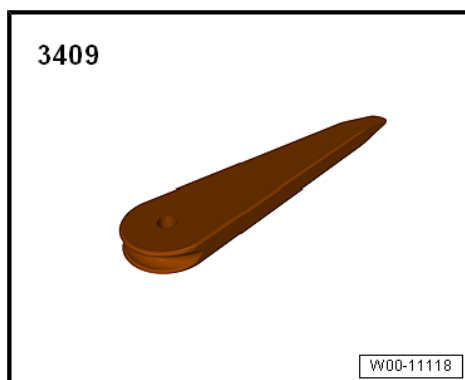


Note

The procedure for removal and installation of the interior lights above the right-hand sliding door is performed in the same way and is only described for one light.

Special tools and workshop equipment required

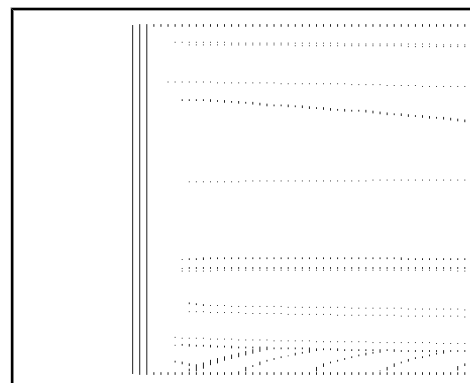
- ◆ Removal wedge - 3409-





Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Using removal wedge - 3409- , lever light out of mountings on left and right -arrow-.



- Release -arrows- and disconnect -A- connector.

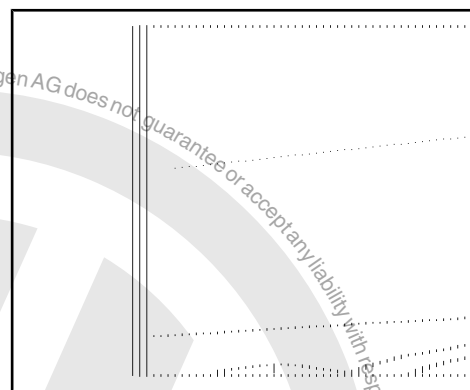


Note

The lighting elements for the interior light above the right-hand sliding door have light-emitting diodes and cannot be repaired. If repair is required, the entire light must be replaced.

Installing

Install in reverse order of removal.



1.17 Removing and installing bulb for rear interior light/reading light

⇒ ["1.17.1 Removing and installing centre interior light, interior light in high roof and rear interior light \(rotary pushbutton\)", page 235](#)

⇒ ["1.17.2 Removing and installing bulb for rear interior light with rocker switch", page 236](#)

⇒ ["1.17.3 Removing and installing bulb for rear interior light with toggle switch", page 237](#)

⇒ ["1.17.4 Removing and installing bulb for rear reading light", page 237](#)

1.17.1 Removing and installing centre interior light, interior light in high roof and rear interior light (rotary pushbutton)



Caution

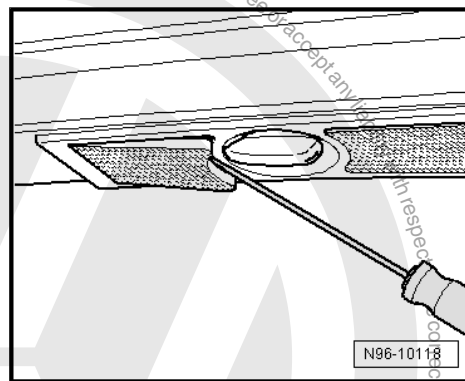
When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



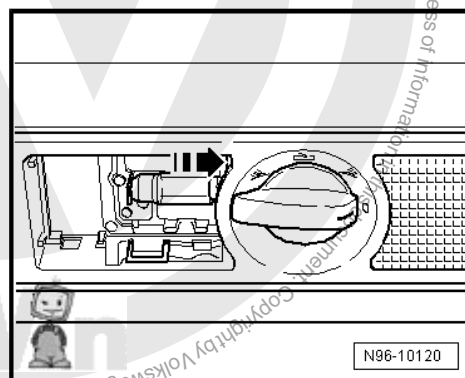
- Carefully lever out respective lens using a screwdriver.



- Push bulb in -direction of arrow- and remove it from bulb holder.
- Bulb for interior light or bulb for rear reading light : festoon bulb 12V, 10W

Installing

Install in reverse order of removal.



1.17.2 Removing and installing bulb for rear interior light with rocker switch

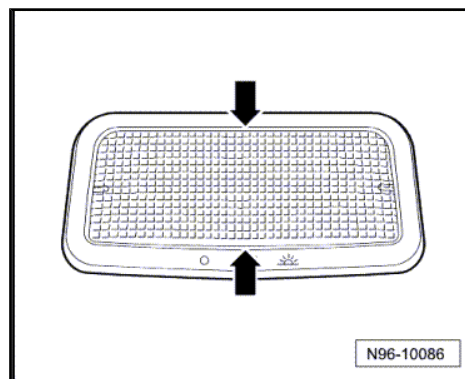


Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove rear interior light ➔ [page 232](#) .
- Release locking lugs -arrows- and remove lens from bulb carrier.

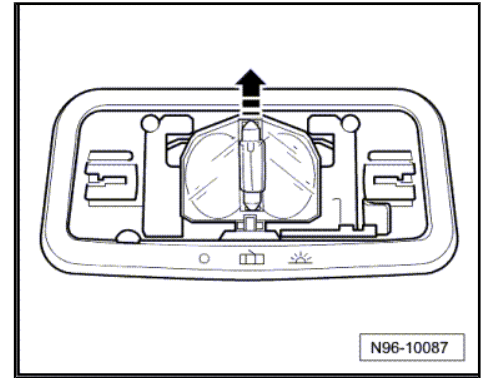




- Push bulb in -direction of arrow- and remove it from bulb holder.
- Bulb for rear interior light : 12V, 10W

Installing

Install in reverse order of removal.



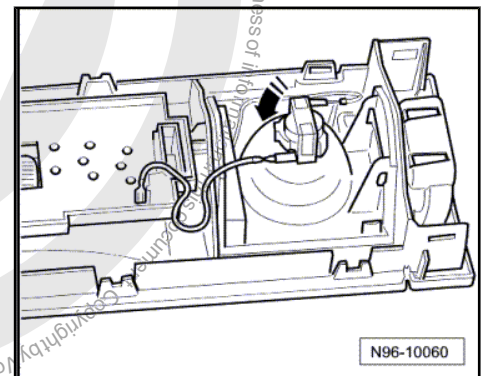
1.17.3 Removing and installing bulb for rear interior light with toggle switch

The lighting elements for the rear interior light bulb have light-emitting diodes and cannot be repaired. In the event of repair, the entire light must be replaced ⇒ [page 231](#) .

1.17.4 Removing and installing bulb for rear reading light

Removing

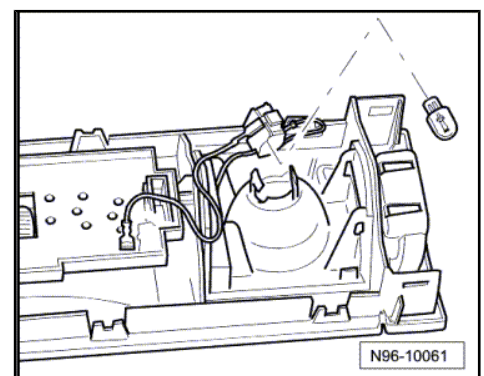
- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove rear interior and reading light ⇒ [page 231](#) .
- Turn bulb holder in -direction of arrow- and pull it out.



- Pull bulb straight out of bulb holder.
- Bulb for rear reading light : glass-base bulb 12V, 5W

Installing

Install in reverse order of removal.







2 Controls

⇒ ["2.1 Overview of fitting locations - controls in dash panel", page 240](#)

⇒ ["2.2 Overview of fitting locations - controls in front doors", page 242](#)

⇒ ["2.3 Overview of fitting locations - controls in luggage compartment", page 243](#)

⇒ ["2.4 Overview of fitting locations - controls in roof trim", page 244](#)

⇒ ["2.5 Removing and installing rotary light switch EX1 ", page 244](#)

⇒ ["2.6 Removing and installing regulator for switch and instrument illumination E20 ", page 245](#)

⇒ ["2.7 Removing and installing headlight range control regulator E102 ", page 246](#)

⇒ ["2.8 Removing and installing Start/Stop operation button E693 ", page 246](#)

⇒ ["2.9 Removing and installing TCS and ESP button E256 ", page 246](#)

⇒ ["2.10 Removing and installing parking aid button E266 ", page 247](#)

⇒ ["2.11 Removing and installing front passenger side airbag deactivated warning lamp K145 ", page 247](#)

⇒ ["2.12 Removing and installing heated rear window switch E15 ", page 247](#)

⇒ ["2.13 Removing and installing tyre pressure monitor display button E492 ", page 247](#)

⇒ ["2.14 Removing and installing heated windscreen button E627 ", page 248](#)

⇒ ["2.15 Removing and installing rear differential lock switch E121 ", page 248](#)

⇒ ["2.16 Removing and installing hill descent control button E618 ", page 249](#)

⇒ ["2.17 Removing and installing sliding door button E442 ", page 249](#)

⇒ ["2.18 Removing and installing button to deactivate sliding door E443 ", page 249](#)

⇒ ["2.19 Removing and installing buttons in centre of dash panel", page 250](#)

⇒ ["2.20 Removing and installing hazard warning light switch EX3 ", page 251](#)

⇒ ["2.21 Removing and installing buttons for seat heating E653 / E654 ", page 251](#)

⇒ ["2.22 Removing and installing glove compartment light switch E26 ", page 251](#)

⇒ ["2.23 Removing and installing mirror adjustment switch E43 / E168 ", page 252](#)

⇒ ["2.24 Removing and installing operating unit for window regulator in driver door E512 ", page 253](#)

⇒ ["2.25 Removing and installing window regulator switch in front passenger door E107 ", page 254](#)



⇒ "2.26 Removing and installing driver side interior locking button for central locking system E308 ", page 254

⇒ "2.28 Removing and installing door contact switch F2 / F3 ", page 256

⇒ "2.29 Removing and installing rear door contact switches F10 / F11 ", page 256

⇒ "2.30 Removing and installing release button for rear lid lock cylinder F248 ", page 258

⇒ "2.33 Removing and installing rear lid contact switch", page 259

⇒ "2.34 Removing and installing vanity mirror contact switch F147 / F148 ", page 259

⇒ "2.35 Removing and installing sliding sunroof adjustment regulator E139 ", page 259

⇒ "2.36 Removing and installing front interior light/reading light", page 261

⇒ "2.37 Removing and installing rear interior light/reading light", page 261

⇒ "2.38 Removing and installing front reading light button E633 / E634 and button for central deactivation of interior light", page 261

2.1 Overview of fitting locations - controls in dash panel



Note

The illustration shows fitting locations for left-hand drive vehicles. Fitting locations for right-hand drive vehicles are similar.



1 - Rotary light switch - EX1-

- ☐ Removing and installing
⇒ [page 244](#)

2 - Headlight range control regulator - E102-

- ☐ Removing and installing
⇒ [page 246](#)

3 - Key operated switch to deactivate front passenger side airbag - E224-

- ☐ Assembly overview ⇒
General body repairs;
interior; Rep. gr. 69;
Airbag (front passenger
side); Assembly over-
view - airbag (front pas-
senger side)

4 - Button for left seat heating - E653-

- ☐ Integrated in operating
and display unit:
- ◆ Heater control unit - J65-
OR
- ◆ air conditioning system
control unit - J301- OR
- ◆ Climatronic control unit -
J255-
- ☐ Cannot be renewed
separately if defective.
- ☐ Removing and installing
-J65- / -J301- / -J255-
Heating, air condition-
ing; Rep. gr. 87 ; Over-
view of fitting locations -
operating and display
unit .

5 - Button for right seat heating - E654-

- ☐ Integrated in operating and display unit:
- ◆ Heater control unit - J65- OR
- ◆ air conditioning system control unit - J301- OR
- ◆ Climatronic control unit - J255-
- ☐ Cannot be renewed separately if defective.
- ☐ Removing and installing -J65- / -J301- / -J255- ⇒ Heating, air conditioning; Rep. gr. 87 ; Overview of fitting locations - operating and display unit .

6 - Tyre pressure monitor display button - E492-

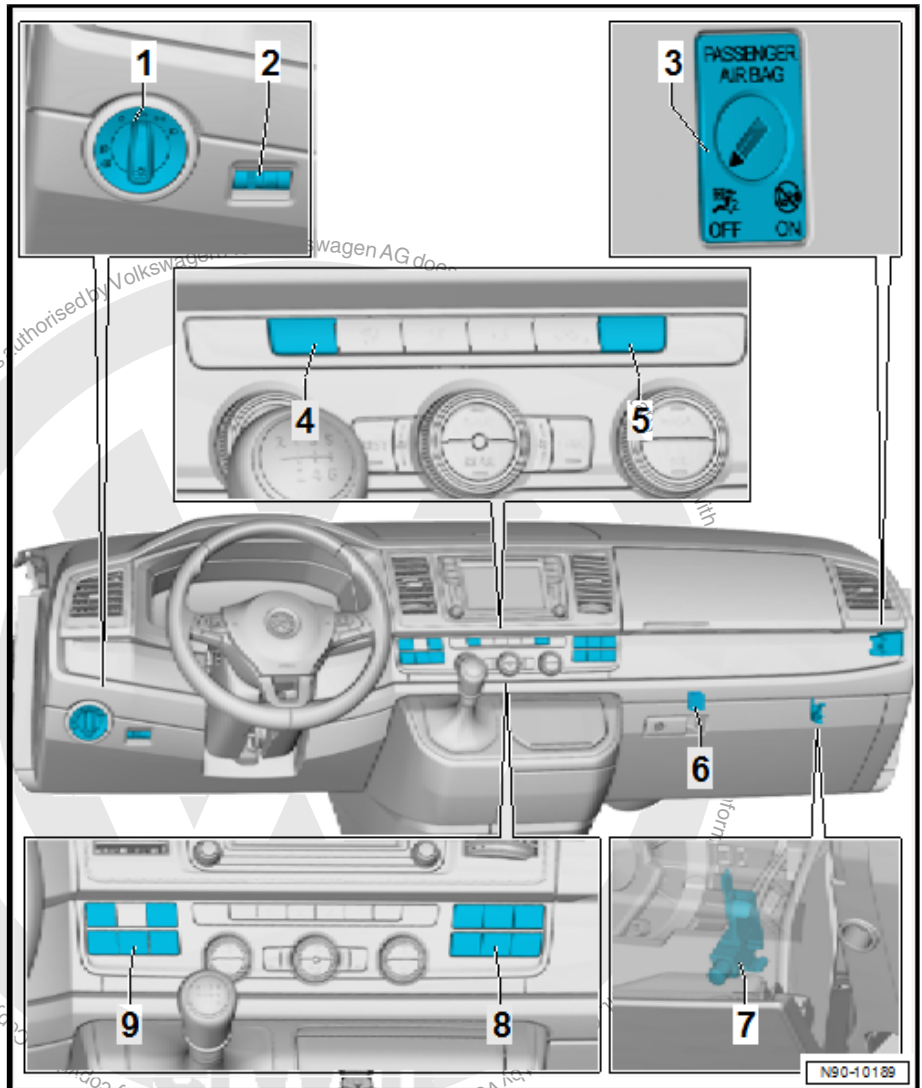
- ☐ Only in vehicles with »Low Line« dash panel insert
- ☐ Removing and installing ⇒ [page 247](#)

7 - Glove compartment light switch - E26-

- ☐ Removing and installing ⇒ [page 251](#)

8 - Buttons in centre of dash panel on right

- ◆ TCS and ESP button - E256-
- ◆ Rear differential lock switch - E121-
- ◆ Hill descent control button - E618-





- ◆ Left sliding door button - E442-
- ◆ Deactivation of sliding door button - E443-
- ◆ Right sliding door button - E442-
 - ❑ Removing and installing ⇒ [page 250](#)

9 - Buttons in centre of dash panel on left

- ❑ Start/stop operation switch - E693-
- ❑ Front passenger side airbag deactivated warning lamp - K145-
- ❑ Hazard warning light switch - EX3-
- ❑ Parking aid button - E266-
- ❑ Heated rear window switch - E15-
- ❑ Heated windscreen button - E627-
- ❑ Removing and installing ⇒ [page 250](#)

2.2 Overview of fitting locations - controls in front doors

1 - Rear lid remote release button - E233-

- ❑ Removing and installing ⇒ [page 256](#)

2 - Operating unit for window regulator in driver door - E512-

- ❑ With:

- ◆ Front driver side window regulator button - E710-
- ◆ Front passenger side window regulator button - E716-

- ❑ Removing and installing ⇒ [page 253](#)

3 - Mirror adjustment switch - E43-

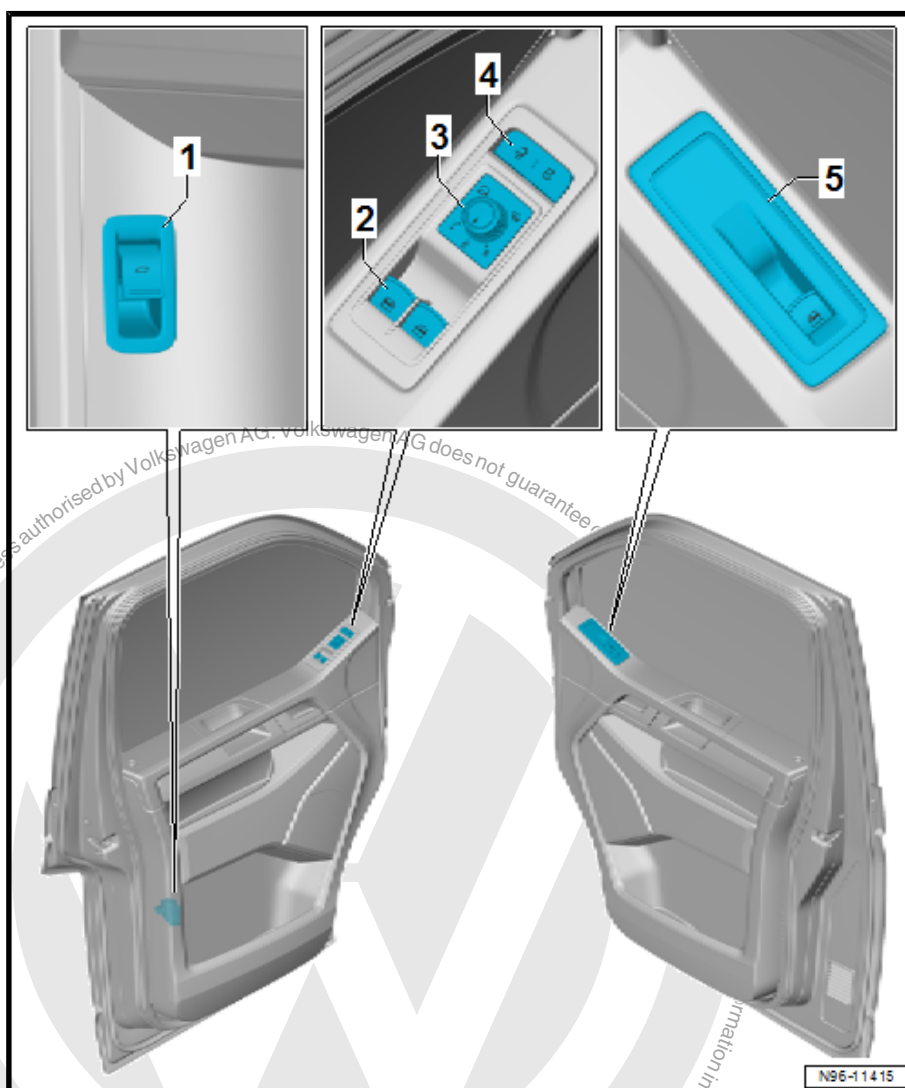
- ❑ Removing and installing ⇒ [page 252](#)

4 - Driver side interior locking button for central locking system - E308-

- ❑ Removing and installing ⇒ [page 254](#)

5 - Front passenger side window regulator button - E716-

- ❑ Removing and installing ⇒ [page 254](#)





2.3 Overview of fitting locations - controls in luggage compartment

1 - Rear lid warning buzzer - H32-

- ☐ Removing and installing
⇒ [page 258](#)

2 - Release button for rear lid lock cylinder - F248-

- ☐ Removing and installing
⇒ [page 258](#)

3 - Rear door contact switch - F10- / -F11-

- ☐ Removing and installing
⇒ [page 256](#)

4 - Door lock

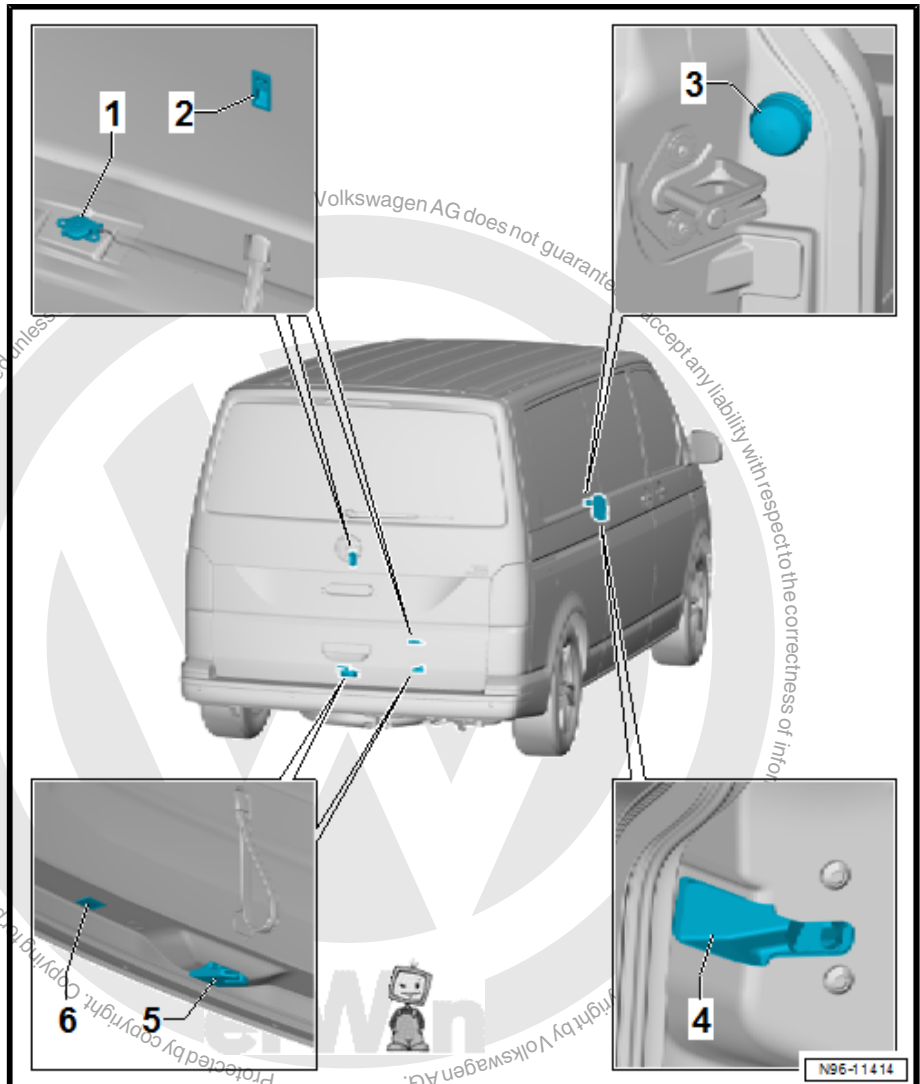
- ☐ Removing and installing
⇒ General body repairs, exterior; Rep. gr. 58 ; Door components; Removing and installing door lock .

5 - Rear lid contact switch

- ☐ With:
- ◆ Rear lid contact switch - F111-
- ◆ Luggage compartment light switch - F5-
- ☐ Removing and installing
⇒ [page 259](#)

6 - Button for closing rear lid - E574-

- ☐ Removing and installing
⇒ [page 258](#)





2.4 Overview of fitting locations - controls in roof trim



Note

The illustration shows fitting locations for left-hand drive vehicles. Fitting locations for right-hand drive vehicles are similar.

1 - Front reading light button - E633- / -E634- and button for central deactivation of interior light

❑ With:

- ◆ Front interior light button - W1-
- ◆ Front left reading light button - E633-
- ◆ Front right reading light button - E634-

❑ Removing and installing
⇒ [page 261](#)

2 - Sliding sunroof adjustment regulator - E139-

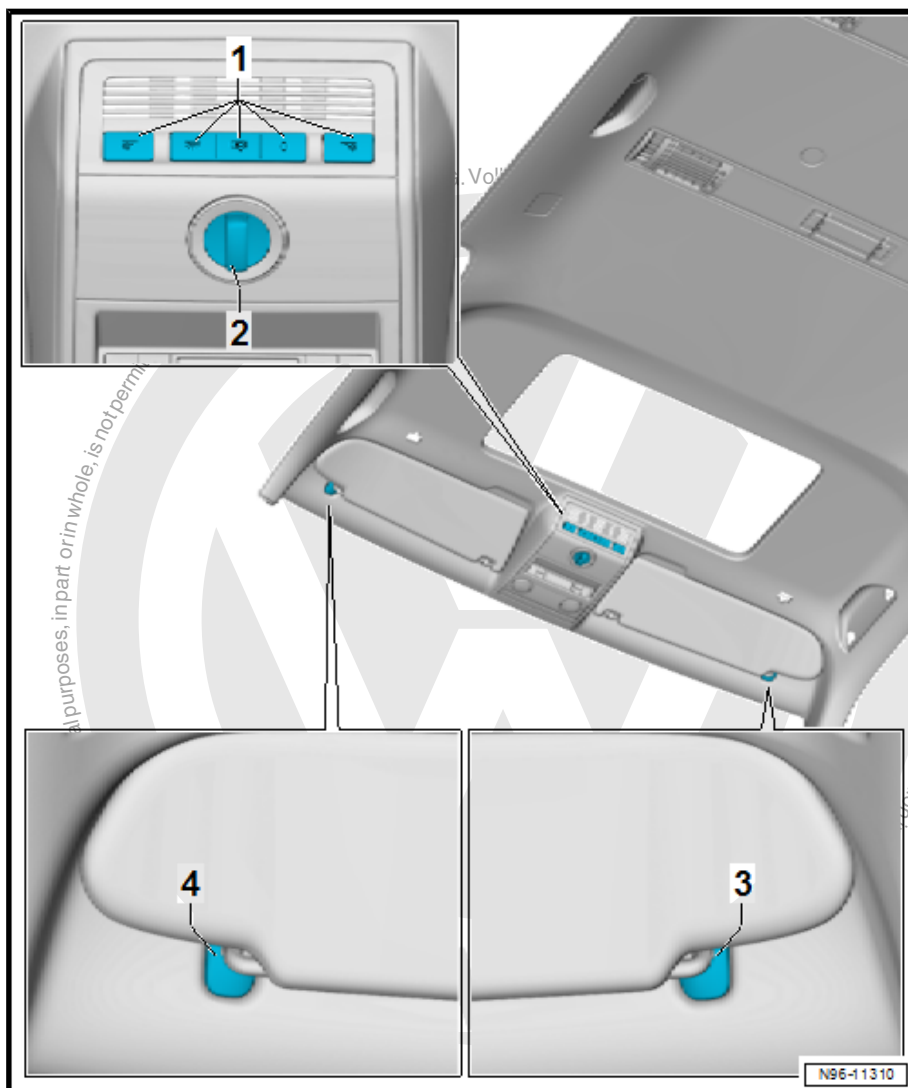
❑ Removing and installing
⇒ [page 259](#)

3 - Front passenger vanity mirror contact switch - F148-

❑ Removing and installing
⇒ [page 259](#)

4 - Driver vanity mirror contact switch - F147-

❑ Removing and installing
⇒ [page 259](#)



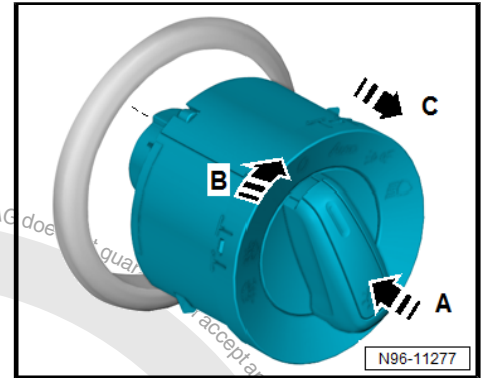
2.5 Removing and installing rotary light switch - EX1-

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Turn knob of rotary light switch - EX1- to position 0.



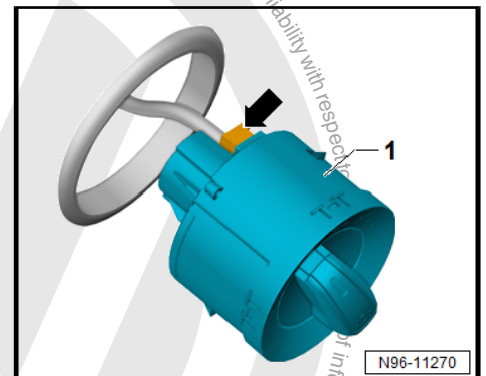
- Press in knob of rotary light switch - EX1- -arrow A- and turn clockwise onto stop -arrow B-.
- Hold knob in this position and pull rotary knob to remove rotary light switch - EX1- from dash panel -arrow C-.




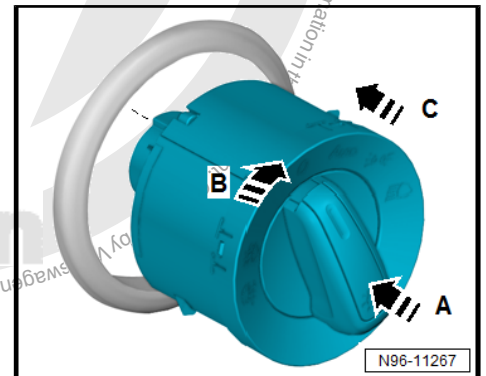
- Release and separate electrical connector -arrow- on headlight - EX1- -1-.

Installing

- Connect connector and engage it.



- Press in knob of rotary light switch - EX1- -arrow A- and turn clockwise onto stop -arrow B-.
- Hold grip in this position, and insert rotary light switch - EX1- into dash panel -arrow C-.
- Turn grip to position , release and engage rotary light switch - EX1- in installation position.



2.6 Removing and installing regulator for switch and instrument illumination - E20-



Note

- ◆ The switch and instrument illumination regulator - E20- is part of the headlight range control regulator - E102- .
- ◆ Removing and installing headlight range control regulator - E102- ➔ [page 246](#) .



2.7 Removing and installing headlight range control regulator - E102-



Note

The switch and instrument illumination regulator - E20- is part of the headlight range control regulator - E102-.

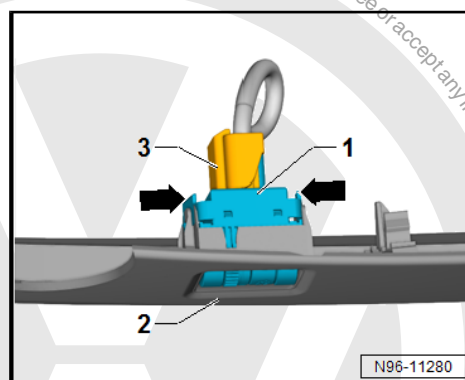
Removing

- Switch off ignition and all electrical consumers, and withdraw ignition key.
- Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Assembly overview – dash panel .
- Press side locking lugs -arrows- together and pull out headlight range control regulator - E102- -1- backwards out of trim -2-.
- Release and disconnect connector -3-.

Installing

Install in reverse order of removal, observing the following:

- Engage headlight range control regulator - E102- securely in trim.



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



Note

- ♦ *The Start/Stop operation button - E693- is installed in the switch unit in the centre of the dash panel.*
- ♦ *It is removed and installed in the same way as all other buttons in the centre of the dash panel ⇒ [page 250](#) .*

2.9 Removing and installing TCS and ESP button - E256-



Note

- ♦ *The button for TCS and electronic stabilisation program - E256- is installed in the switch unit in the centre of the dash panel.*
- ♦ *It is removed and installed in the same way as all other buttons in the centre of the dash panel ⇒ [page 250](#) .*



2.10 Removing and installing parking aid button - E266-



Note

- ◆ The parking aid button - E266- is installed in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ⇒ [page 250](#).

2.11 Removing and installing front passenger side airbag deactivated warning lamp - K145-



Note

- ◆ The front passenger side airbag deactivated warning lamp - K145- is located in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ⇒ [page 250](#).

2.12 Removing and installing heated rear window switch - E15-



Note

- ◆ The heated rear window switch - E15- is installed in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ⇒ [page 250](#).

2.13 Removing and installing tyre pressure monitor display button - E492-



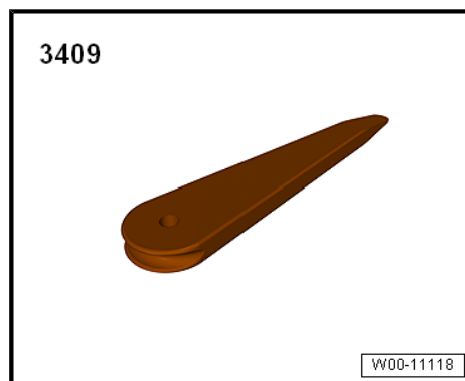
Note

- ◆ The Tyre Pressure Loss Indicator button - E492- is used for storing the current tyre pressures to enable monitoring by the Tyre Pressure Monitoring System.
- ◆ The Tyre Pressure Loss Indicator button - E492- is installed only in vehicles equipped with a tyre monitoring system in conjunction with a »Low Line« dash panel insert.
- ◆ In vehicles equipped with a tyre monitoring system in conjunction with a »High Line« dash panel insert, the current tyre pressures are stored via a menu option in the dash panel insert.
- ◆ The Tyre Pressure Loss Indicator button - E492- is then located in the glove compartment.

Special tools and workshop equipment required



◆ Removal wedge - 3409-

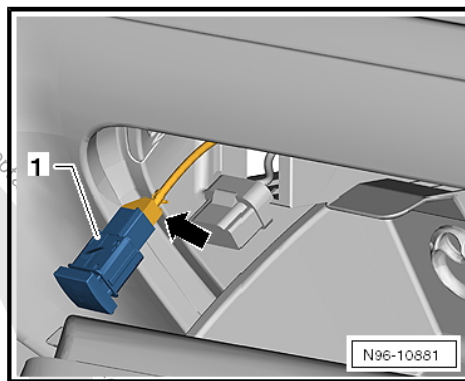


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove glove compartment far enough to gain access to rear of Tyre Pressure Loss Indicator button - E492- ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing glove compartment .
- Press fasteners on Tyre Pressure Loss Indicator button - E492- -1-, and push button from rear out of mounting hole in glove compartment.
- Release and disconnect connector -arrow-.

Installing

Install in reverse order of removal.



2.14 Removing and installing heated windscreen button - E627-



Note

- ◆ The heated windscreen button - E627- is installed in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ⇒ [page 250](#) .

2.15 Removing and installing rear differential lock switch - E121-



Note

- ◆ The rear differential lock switch - E121- is installed in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ⇒ [page 250](#) .



2.16 Removing and installing hill descent control button - E618-



Note

- ◆ The hill descent control button - E618- is installed in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ➔ [page 250](#).

2.17 Removing and installing sliding door button - E442-



Note

- ◆ The left sliding door button - E442- or right sliding door button - E442- is installed in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ➔ [page 250](#).

2.18 Removing and installing button to deactivate sliding door - E443-



Note

- ◆ The button to deactivate sliding door - E443- is installed in the switch unit in the centre of the dash panel.
- ◆ It is removed and installed in the same way as all other buttons in the centre of the dash panel ➔ [page 250](#).



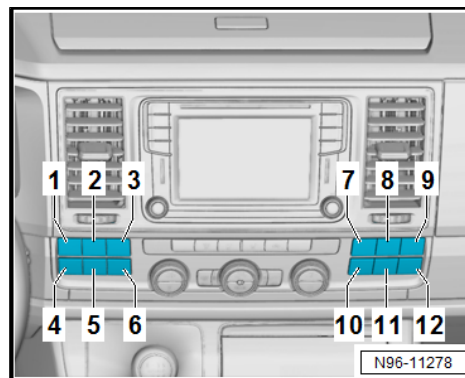
2.19 Removing and installing buttons in centre of dash panel



Note

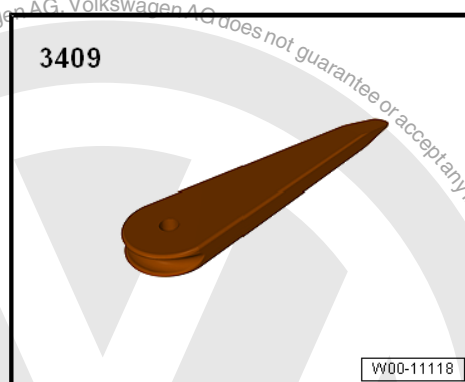
- ♦ The procedure for removal and installation is the same for all buttons and is therefore described for just one button.
- ♦ The button layout in the centre of the dash panel may vary depending on the vehicle equipment or type of heating or air conditioning system.

- 1 - Start/stop operation switch - E693- ➔ [page 246](#)
- 2 - Front passenger side airbag deactivated warning lamp - K145- ➔ [page 247](#)
- 3 - Hazard warning light switch - EX3- ➔ [page 251](#)
- 4 - Parking aid button - E266- ➔ [page 247](#)
- 5 - Heated windscreen button - E627- ➔ [page 248](#)
- 6 - Heated rear window switch - E15- ➔ [page 247](#) or engine run-on
- 7 - TCS and ESP button - E256- ➔ [page 246](#)
- 8 - Rear differential lock switch - E121- ➔ [page 248](#)
- 9 - Hill descent control button - E618- ➔ [page 249](#)
- 10 - Left sliding door button - E442- ➔ [page 249](#) or ventilation
- 11 - Button to deactivate sliding door - E443- ➔ [page 249](#) or ventilation
- 12 - Right sliding door button - E442- ➔ [page 249](#)



Special tools and workshop equipment required

- ♦ Removal wedge - VAS 3409-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove radio trim ➔ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing trim for operating and display unit .

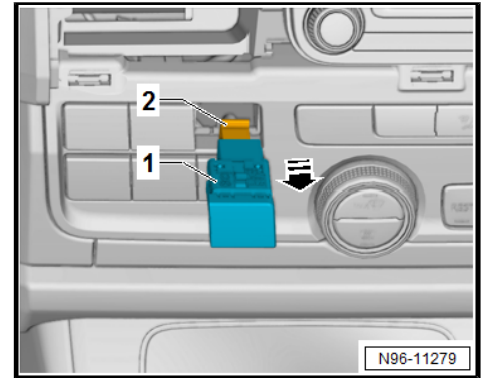


- Reach through opening next to radio/navigation system and press out required button -1- from mounting frame in direction of -arrow-. Move button lightly up and down to enable the spring clips of the button to release from the fastener.
- Release and disconnect electrical connector -2-.

Installing

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

Following installation, check whether all involved switches are functioning correctly.



2.20 Removing and installing hazard warning light switch - EX3-



Note

- ♦ The hazard warning light switch - EX3- is installed in the switch unit in the centre of the dash panel.
- ♦ It is removed and installed in the same way as all other buttons in the centre of the dash panel ➔ [page 250](#).

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

The buttons for seat heating -E653- / -E654- are part of the operating and display unit for the air conditioning or Climatronic system ➔ Heating, ventilation, air conditioning; Rep. gr. 87 ; Operating and display unit; Overview of fitting locations - operating and display unit .

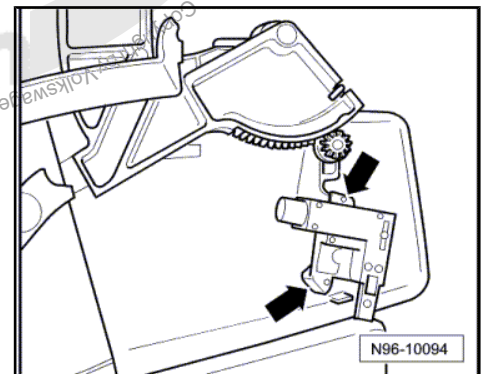
2.22 Removing and installing glove compartment light switch - E26-

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove glove compartment ➔ General body repairs, interior; Rep. gr. 68 ; Compartments/covers; Removing and installing glove compartment .
- Release locking lugs -arrows- and remove switch from glove compartment.

Installing

Install in reverse order of removal.





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



Caution

When removing and installing components that are in view (switches, covers, trim and so on), mask off areas in which tools (removal wedge - VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.

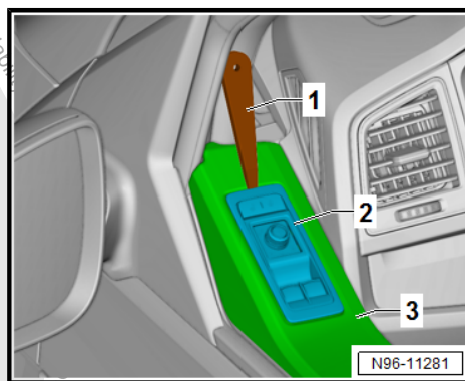
Special tools and workshop equipment required

- ◆ Removal wedge - 3409-

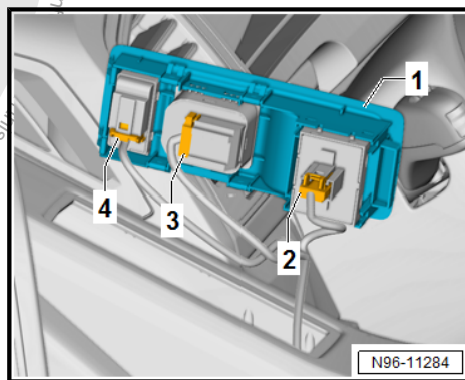


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Carefully lever out mounting frame -2- using removal wedge - 3409- .



Release and separate electrical connectors -2 to 4- and remove from mounting frame -1-.

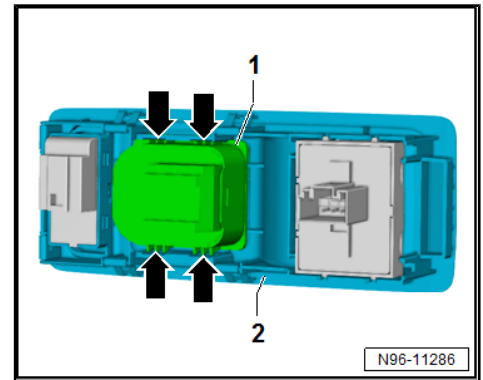




- Release locking lugs -arrows- and remove mirror adjustment switch - E43- -1- from mounting frame -2-.

Installing

Install in reverse order of removal.



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

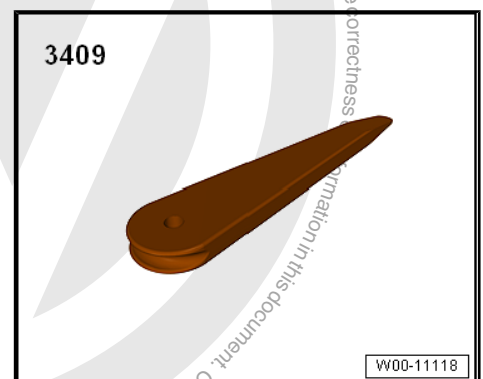


Caution

When removing and installing components that are in view (switches, covers, trim and so on), mask off areas in which tools (removal wedge - VAS 3409- , screwdriver) are used to lever out those components using commercially available masking tape.

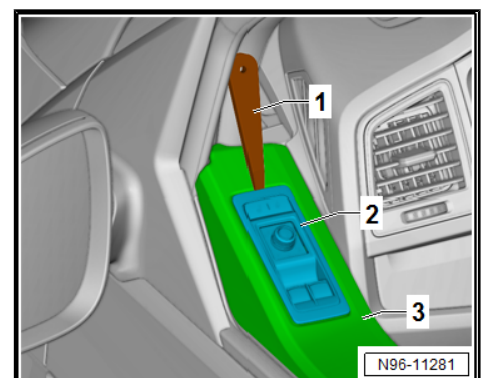
Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



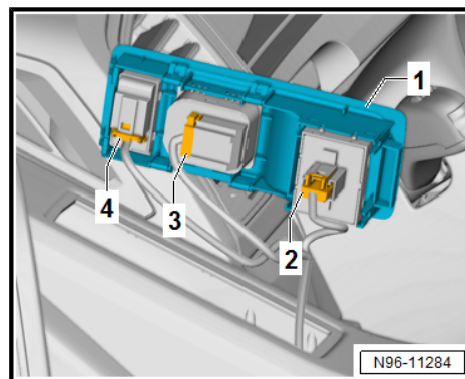
Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Carefully lever out mounting frame -2- using removal wedge - 3409- .





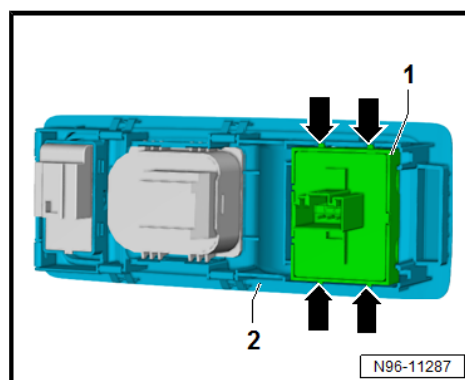
- Release and separate electrical connectors -2- 4- and remove from mounting frame -1-.



- Release locking lugs -arrows- and remove operating unit for window regulator in driver door - E512- / -E168- -1- from mounting frame -2-.

Installing

Install in reverse order of removal.



2.25 Removing and installing window regulator switch in front passenger door - E107-



Note

- ♦ The procedure for removal and installation of the window regulator switch in front passenger door - E107- is basically the same for the window regulator switch in driver door - E512- .
- ♦ Removing and installing operating unit for window regulator in driver door - E512- ➔ [page 253](#) .

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



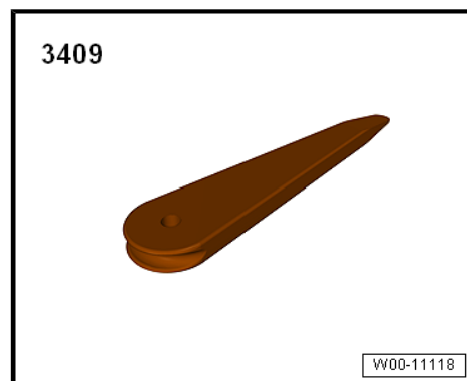
Caution

When removing and installing components that are in view (switches, covers, trim and so on), mask off areas in which tools (removal wedge - VAS 3409- , screwdriver) are used to lever out those components using commercially available masking tape.

Special tools and workshop equipment required

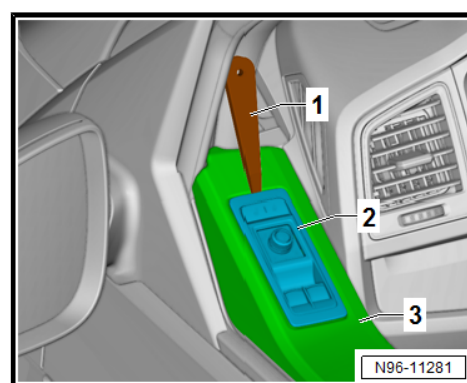


◆ Removal wedge - 3409-

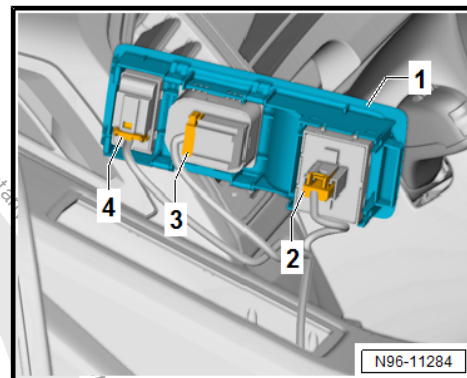


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Carefully lever out mounting frame -2- using removal wedge - 3409- .



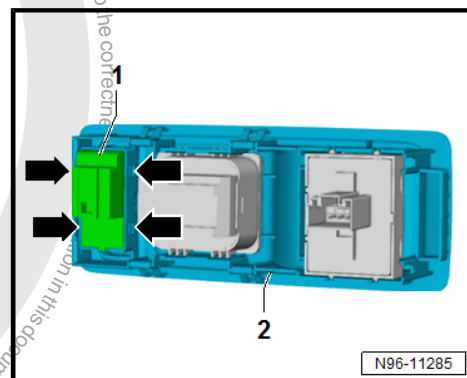
- Release and separate electrical connectors -2 - 4- and remove from mounting frame -1-



- Release locking lugs -arrows- and remove driver side interior locking button for central locking system - E308- / -E168- -1- from mounting frame -2-.

Installing

Install in reverse order of removal.





2.27 Removing and installing rear lid remote release button - E233-



Note

The removal and installation procedure is described for left-hand drive vehicles. Removal and installation for right-hand drive vehicles is similar.

Removing

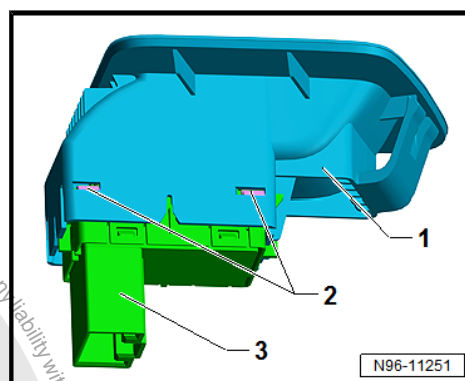
- Remove front door trim panel ⇒ General body repairs, interior; Rep. gr. 70 ; Front door trim panels; Removing and installing front door trim panel .



Note

For greater clarity, the door trim is not shown.

- Using a small screwdriver, release fasteners -2- on both sides.
- Pull rear lid remote release button - E233- -3- out of trim -1-.
- Release and separate electrical connector on rear lid remote release button - E233- -3-.



Installing

Install in reverse order of removal, observing the following:

- Perform functional check.

2.28 Removing and installing door contact switch -F2- / -F3-



Note

- ♦ *The door contact switches for the front doors are integrated in each of the door locks and cannot be renewed individually.*
- ♦ *If the door contact switch is defective, the entire door lock must be renewed ⇒ General body repairs, exterior; Rep. gr. 57 ; Door components; Removing and installing door lock .*

2.29 Removing and installing rear door contact switches -F10- / -F11-



Note

- ♦ *On vehicles with electric sliding door, the door contact switch is integrated in the door lock and cannot be renewed individually.*
- ♦ *The complete door lock must always be renewed if the door contact switch is defective.*
- ♦ *Renew door lock ⇒ General body repairs, exterior; Rep. gr. 58 ; Sliding door; Assembly overview - sliding door .*



A conventionally designed door contact switch is fitted on vehicles with no electric sliding doors, no electric sliding door closing aid and no anti-theft alarm.

Fitting location of door contact switch -arrow- in C-pillar.



Note

Due to double panels in the area of the C-Pillar, the door contact switch can only be removed from the outside. During disassembly, the retaining clips of the door contact switch retaining ring are usually destroyed, so that the retaining ring must be renewed.

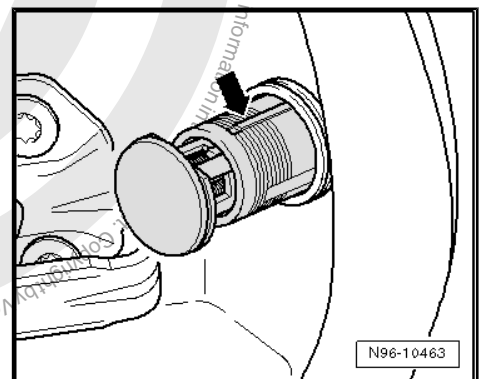
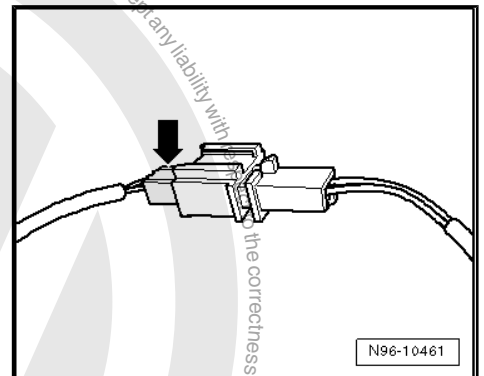
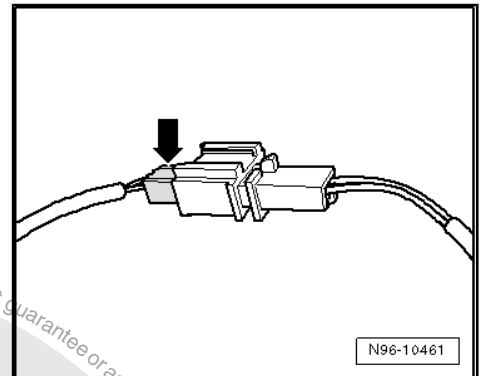
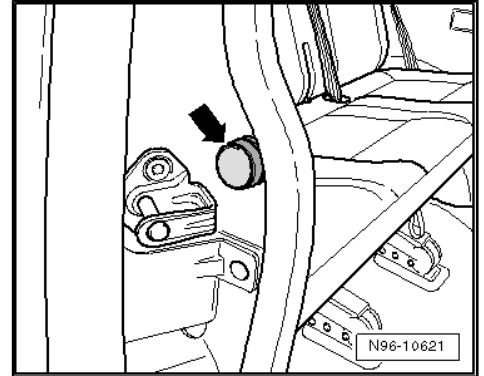
Removing

- Remove side panel trim on side of vehicle where door contact switch to be removed is located ⇒ General body repairs, interior; Rep. gr. 70 ; Interior trim; Overview of fitting locations - interior trim .
- Release and disconnect connector -arrow- from door contact switch.
- Pull door contact switch completely out of body aperture.

Installing

In a new door contact switch, the retaining ring and the boot are already fitted to the switch.

- Guide wire of door contact switch through body aperture to electrical connector.
- Connect and engage connector -arrow-.
- Insert door contact switch into body aperture and attach retaining ring. The retaining ring fits into the body aperture only in a particular position.
- The switch is adjusted using the fine locking ribs on its surface -arrow- (illustrated here without boot). Adjust door contact switch using detent setting so that contact switch opens circuit properly when sliding door is closed.
- Install side panel trim ⇒ General body repairs, interior; Rep. gr. 70 ; Trims, interior; Overview of fitting locations - interior trim .





2.30 Removing and installing release button for rear lid lock cylinder - F248-



Note

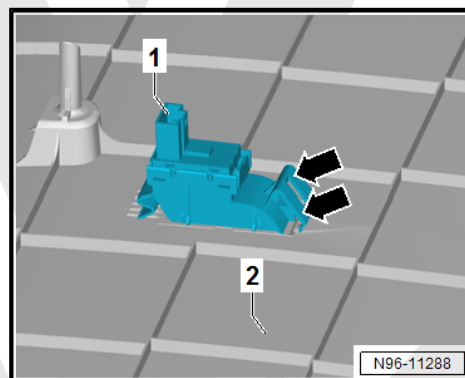
- ♦ The release button for rear lid lock cylinder is used to open the rear lid electrically from the inside.
- ♦ The button is installed in the lower rear lid trim on vehicles with central locking system and electrically operated rear lid.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove rear lid lower trim ⇒ General body repairs, exterior; Rep. gr. 70 ; Luggage compartment trim; Removing and installing rear lid lower trim .
- Press fasteners -arrows- and remove release button for rear lid lock cylinder - F248- -1- from trim -2-

Installing

Install in reverse order of removal.



2.31 Removing and installing rear lid closure button - E574-

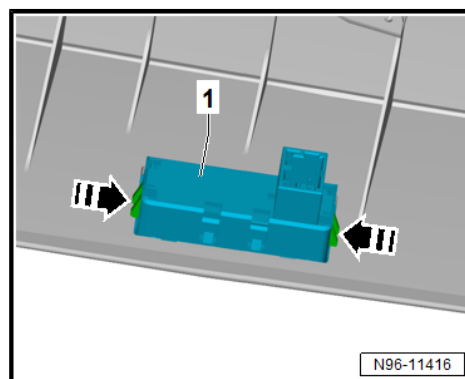
Removing

- Remove lower rear lid trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Removing and installing lower rear lid trim .
- Press catches -arrows-.
- Remove rear lid remote release button - E574- -1- from trim.

Installing

Install in reverse order of removal, observing the following:

- Perform functional check.



2.32 Removing and installing rear lid warning buzzer - H32-

Removing

- Remove lower rear lid trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trims; Removing and installing lower rear lid trim .

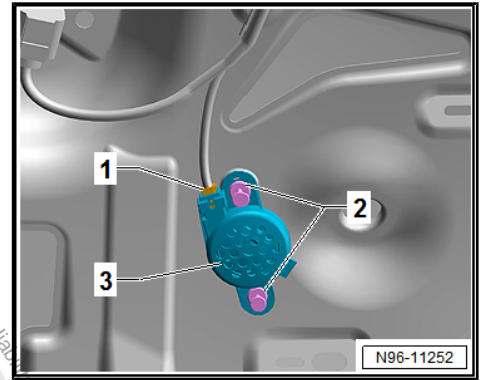


- Disconnect connector -1-.
- Lever off spreader rivets -2-.
- Remove rear lid warning buzzer - H32- -3-.

Installing

Install in reverse order of removal, observing the following:

- Perform functional check.



2.33 Removing and installing rear lid contact switch

Rear lid contact switch - F111- and luggage compartment light switch - F5- are integrated in rear lid lock and cannot be renewed individually.

If the light switch for luggage compartment - F5- or contact switch in rear lid - F111- are found to be defective, the complete rear lid lock must always be renewed.

Removing and installing rear lid lock ⇒ General body repairs, exterior; Rep. gr. 55 ; Rear lid; Removing and installing rear lid lock .

2.34 Removing and installing vanity mirror contact switch -F147- / -F148-



Note

- ◆ The vanity mirror contact switches are integrated in the sun visor and cannot be renewed individually.
- ◆ If the vanity mirror contact switch is defective, the entire sun visor has to be renewed ⇒ General body repairs, interior; Rep. gr. 68 ; Equipment; Removing and installing sun visor .

2.35 Removing and installing sliding sunroof adjustment regulator - E139-



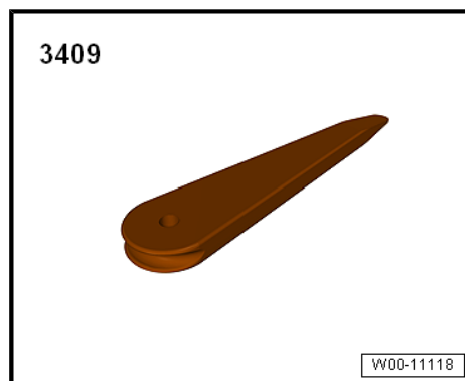
Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Special tools and workshop equipment required

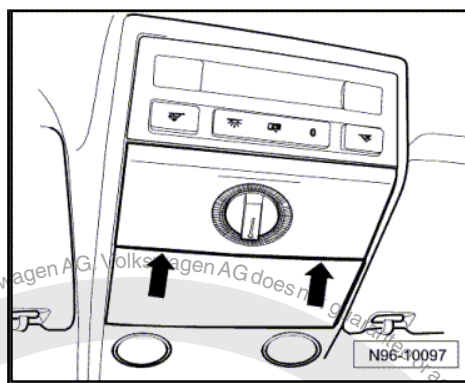


◆ Removal wedge - VAS 3409-

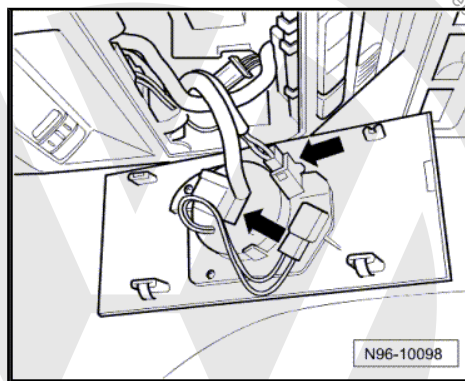


Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Carefully lever trim of sliding sunroof adjustment regulator - E139- out of mounting frame.



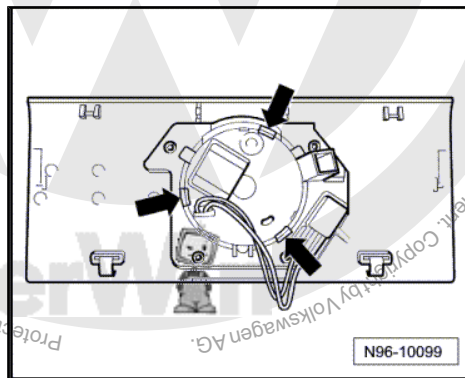
- Release and disconnect connectors -arrows-.



- Release locking lugs -arrows- and remove sliding sunroof adjustment regulator - E139- from mounting frame.

Installing

Install in reverse order of removal.





2.36 Removing and installing front interior light/reading light

Removing and installing front interior light/reading light
⇒ [page 225](#)

2.37 Removing and installing rear interior light/reading light

Removing and installing rear interior light/reading light
⇒ [page 231](#)

2.38 Removing and installing front reading light button -E633- / -E634- and button for central deactivation of interior light



Note

The front reading light button -E633- / -E634- and the button for central deactivation of the interior light form one component and cannot be renewed individually.



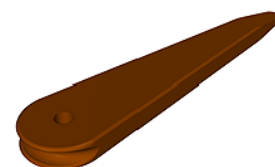
Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Special tools and workshop equipment required

- ◆ Removal wedge - VAS 3409-

3409



W00-11118

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.

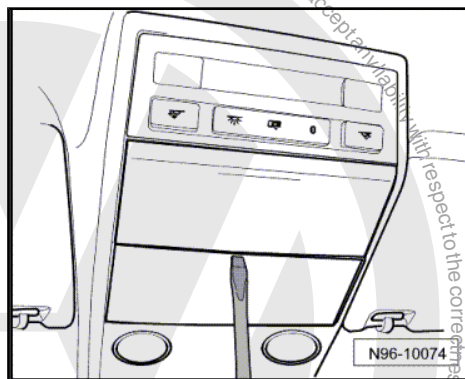


- Carefully lever cover next to switch element for interior and reading light out of mounting frame.

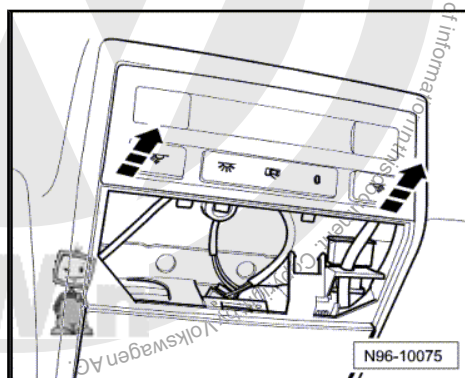
Only vehicles with electric sunroof

- Remove cover with sliding sunroof adjustment regulator - E139- ⇒ [page 259](#) .

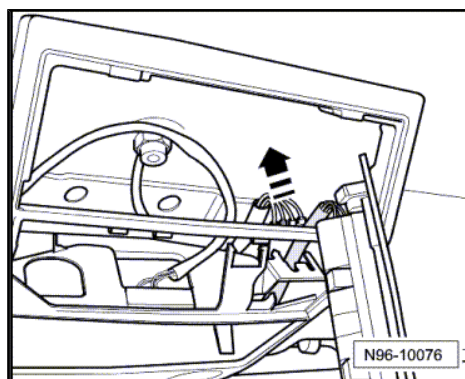
Continued for all vehicles:



- Carefully push switch element for interior and reading light out of mounting frame from behind.



- Push connector and wire upwards out of retainer -arrow-.



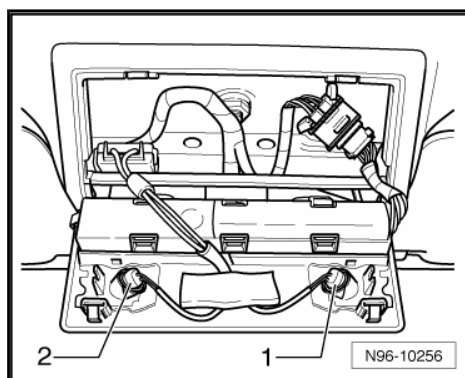
Only vehicles with interior monitoring

- Remove right ultrasonic sensor for anti-theft alarm system - G171- -1- and left ultrasonic sensor for anti-theft alarm system - G170- -2- from their retainer.



Note

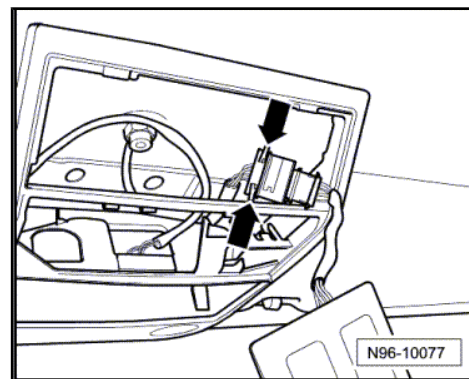
When installing the right ultrasonic sensor for anti-theft alarm system - G171- and the left ultrasonic sensor for anti-theft alarm system - G170- it is permissible to inter-change them.



Continued for all vehicles:



- Release and disconnect connector -arrows-.

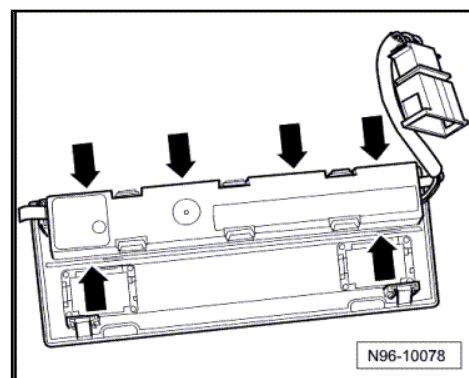


- Release locking lugs -arrows- and pull switch element out of frame.

These switches cannot be renewed individually. In the event of repair, always renew complete switch element.

Installing

Install in reverse order of removal.



3 Anti-theft alarm

⇒ ["3.1 Assembly overview - interior monitor", page 264](#)

⇒ ["3.2 Removing and installing alarm horn H12 ", page 265](#)

⇒ ["3.3 Removing and installing anti-theft and tilt system control unit ", page 266](#)

⇒ ["3.4 Removing and installing interior monitor send and receive module 2 G305 with three ultrasonic sensors", page 269](#)

⇒ ["3.5 Removing and installing deactivation button for vehicle inclination sender", page 270](#)

3.1 Assembly overview - interior monitor

Fault detection and fault display

Anti-theft and tilt system control unit - J529- is equipped with self-diagnosis to facilitate fault finding ⇒ Vehicle diagnostic tester.

Depending on vehicle equipment, the following components are installed:

1 - Alarm horn - H12-

- ☐ Installed in plenum chamber.
- ☐ Removing and installing ⇒ [page 265](#)
- ☐ Securing bolt: 6 Nm

2 - Front passenger door contact switch - F3-

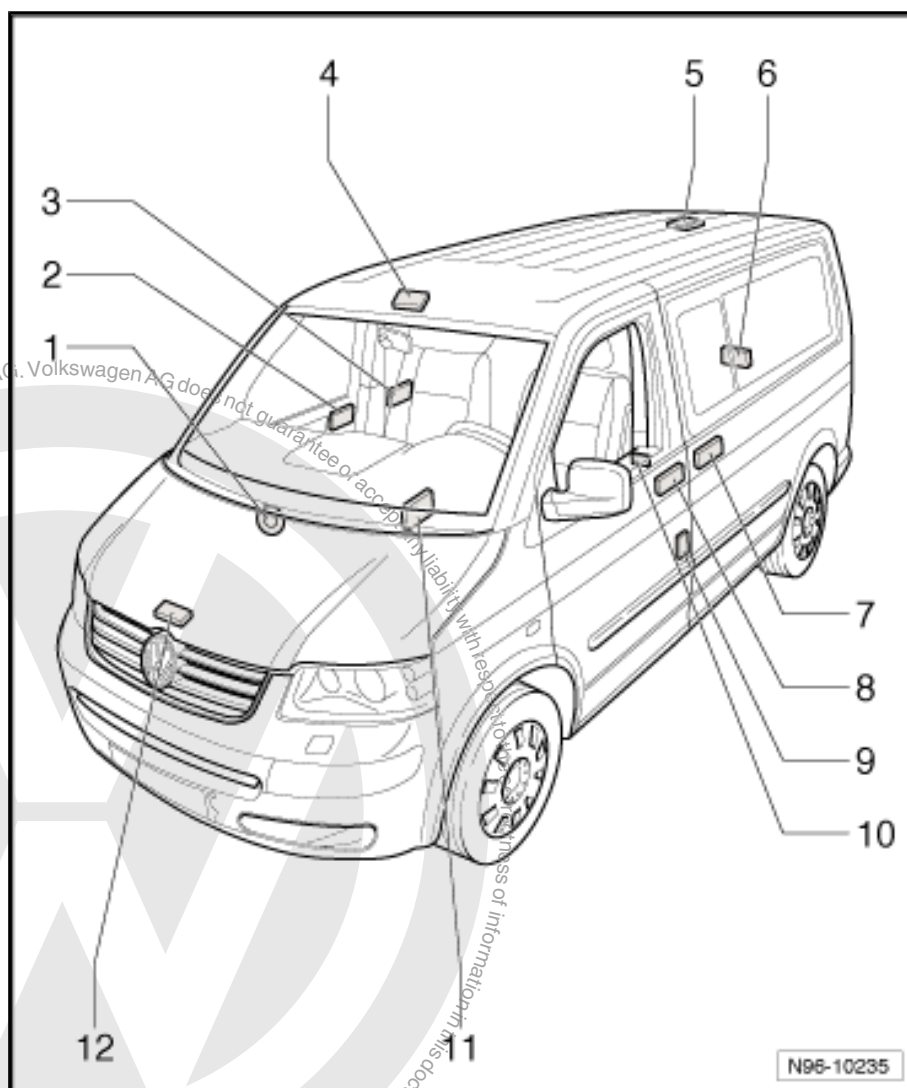
- ☐ In front passenger side central locking lock unit - F221- .
- ☐ Removing and installing door lock ⇒ General body repairs, exterior; Rep. gr. 57 ; Door components; Removing and installing door lock

3 - Rear right door contact switch - F11-

- ☐ In rear right central locking lock unit - F223- .
- ☐ Removing and installing door lock ⇒ General body repairs, exterior; Rep. gr. 58 ; Door components; Removing and installing door lock

4 - Anti-theft and tilt system control unit - J529- with vehicle inclination sender - G384- and interior monitor send and receive module 1 - G303- with left ultrasonic anti-theft alarm sensor - G170- and right ultrasonic anti-theft alarm sensor - G171-

- ☐ Installed behind front roof console.
- ☐ Removing and installing ⇒ [page 266](#)





- ☐ Coding ⇒ Vehicle diagnostic tester

5 - Interior monitor send and receive module 2 - G305- with 3 ultrasonic sensors

- ☐ Installed at rear in roof headliner.
- ☐ Removing and installing ⇒ [page 269](#)
- ☐ Adapting sensitivity ⇒ Vehicle diagnostic tester

6 - Rear lid contact switch - F111-

- ☐ Installed in bonnet lock
- ☐ Removing and installing ⇒ [page 259](#)

7 - Rear left door contact switch - F10-

- ☐ In rear left central locking lock unit - F222- .
- ☐ Removing and installing door lock ⇒ General body repairs, exterior; Rep. gr. 58 ; Door components; Removing and installing door lock

8 - Door contact switch, driver side - F2-

- ☐ In driver side central locking lock unit - F220- .
- ☐ Removing and installing door lock ⇒ General body repairs, exterior; Rep. gr. 57 ; Door components; Removing and installing door lock

9 - Interior monitoring switch - E183- with warning lamp for interior monitoring switch-off - K162- and deactivation button for vehicle inclination sender - E360- with vehicle inclination sender warning lamp - K188- each with button illumination bulb - L76-

- ☐ Installed in B-pillar trim on driver side
- ☐ Form one component, can only be replaced together
- ☐ Removing and installing deactivation button for vehicle inclination sender - E360- with vehicle inclination sender warning lamp - K188- ⇒ [page 270](#)

10 - Locking SAFELOCK function warning lamp - K133-

- ☐ Installed in front door trim next to locking bar
- ☐ Install front door trim panel ⇒ General body repairs, interior; Rep. gr. 70 ; Front door trim panels; Removing and installing front door trim panel

11 - Convenience system central control unit - J393-

- ☐ Installed in seat box on front right.
- ☐ Removing and installing ⇒ [page 294](#)

12 - Bonnet contact switch - F266-

- ☐ Installed in bonnet lock
- ☐ Removing and installing ⇒ General body repairs, interior; Rep. gr. 57 ; Central locking; Overview of fitting locations - central locking

3.2 Removing and installing alarm horn - H12-

Torque wrench - V.A.G 1331-

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Plenum chamber cover; Removing and installing plenum chamber cover .

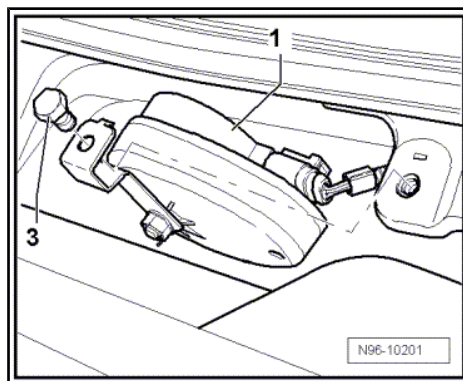
V.A.G 1331



W00-11166



- Unscrew securing bolt -3- on alarm horn - H12- -1-.



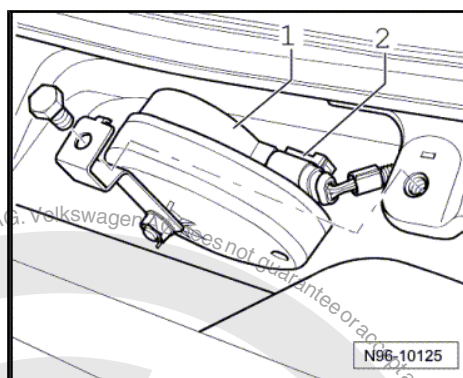
- Release and disconnect connector -2-.
- Remove alarm horn - H12- -1- with bracket.

Installing

Install in reverse order of removal, observing the following:

Torque settings

- ♦ ⇒ ["3.1 Assembly overview - interior monitor", page 264](#)



3.3 Removing and installing anti-theft and tilt system control unit



Note

The anti-theft and tilt system control unit - J529- , the vehicle inclination sender - G384- and interior monitor send and receive module 1 - G303- with left ultrasonic sensor for ATA - G170- and right ultrasonic sensor for ATA - G171- are one component and can only be renewed together.

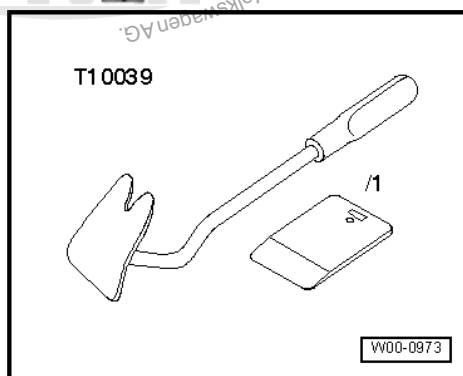


Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Special tools and workshop equipment required

- ♦ Release lever - T10039-





Note

- ◆ The anti-theft and tilt system control unit - J529- , the vehicle inclination sender - G384- and interior monitor send and receive module 1 - G303- with left ultrasonic sensor for ATA - G170- and right ultrasonic sensor for ATA - G171- are one component and can only be removed and installed together.
- ◆ As the vehicle inclination sender - G384- is integrated in the anti-theft and tilt system control unit - J529- , the anti-theft and tilt system control unit - J529- must be coded upon renewal according to whether it is installed lengthways (Multivan) or crossways (Transporter) to the direction of travel.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Turn or tilt interior mirror -6- downwards.
- Open spectacles compartment -3-.

Vehicles with auxiliary air heater (then without glasses compartment)

- Remove auxiliary heater operating and display unit - E407-1- ⇒ Parking heater, auxiliary heater; Rep. gr. 82 ; Parking heater/auxiliary heater; Overview of fitting locations - parking/auxiliary heater .

Continued for all vehicles:

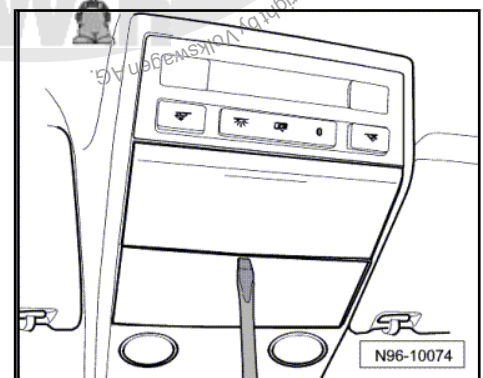
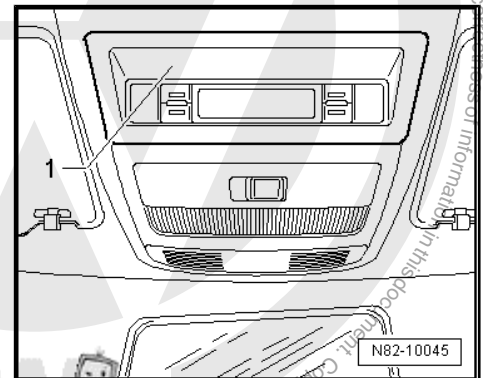
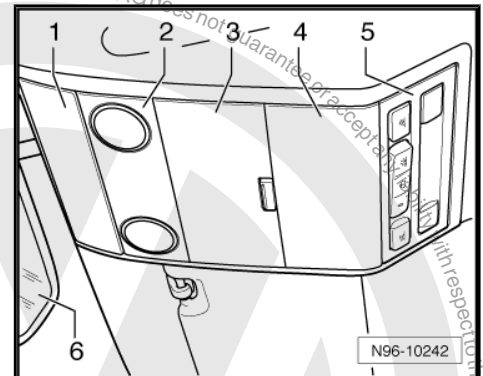
- Open cover.

Vehicles with electric sliding roof

- Remove cover with sliding sunroof adjustment regulator - E139- ⇒ [page 259](#) .

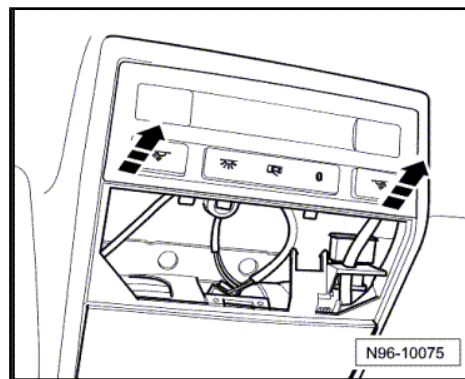
Continued for all vehicles:

- Remove front interior light - W1- and front passenger reading light - W13- or driver side reading light - W19- ⇒ [page 261](#) .

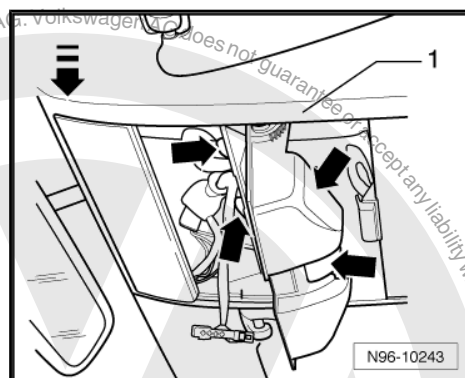




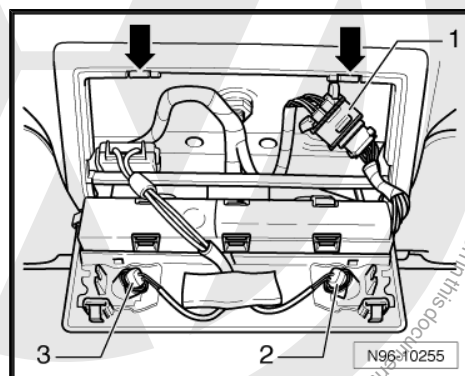
- Open cover with the operating buttons, right ultrasonic sensor for anti-theft alarm system - G170- and left ultrasonic sensor for anti-theft alarm system - G171- -arrows-.



- Remove securing bolts -arrows-.
- Unclip front of roof console -1- on windscreen from roof trim -arrow-.



- Push connector and wire upwards out of retainer -1-.
- Then unclip rear of roof console from roof trim -arrows-.
- Push cover with the operating buttons, left ultrasonic sensor for anti-theft alarm system - G170- -3- and right ultrasonic sensor for anti-theft alarm system - G171- -2- into the roof console.



Caution

The roof console -1- now hangs on the wiring harness. Proceed with caution to prevent damaging the attachments and cables.



- Release and disconnect connector -5- on anti-theft and tilt system control unit - J529- -4-.
- Remove right ultrasonic sensor for anti-theft alarm system - G171- -2- and left ultrasonic sensor for anti-theft alarm system - G170- -3- from their retainers.



Note

When installing the right ultrasonic sensor for anti-theft alarm system - G171- and the left ultrasonic sensor for anti-theft alarm system - G170- it is permissible to interchange them.

- Unclip anti-theft and tilt system control unit - J529- -4- from its bracket -arrows- on roof console -1-.

Installing

Install in reverse order of removal.

If the anti-theft and tilt system control unit - J529- has been renewed, the interior monitoring must be coded ⇒ Vehicle diagnostic tester.

3.4 Removing and installing interior monitor send and receive module 2 - G305- with three ultrasonic sensors

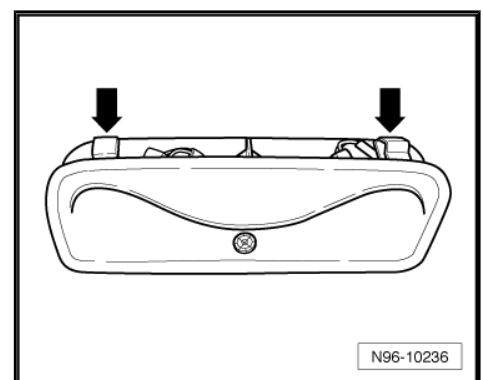
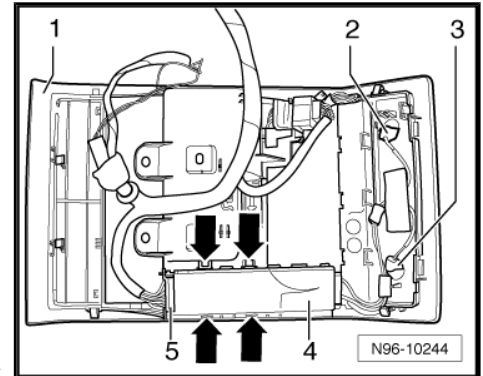


Caution

When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

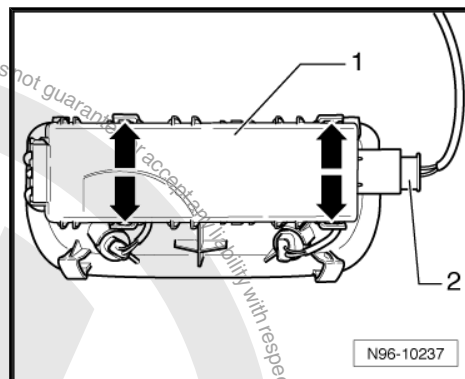
Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Carefully release catches in moulded headliner -arrows- using a screwdriver.
- Take bracket for interior monitor send and receive module 2 - G305- with the three ultrasonic sensors out of moulded headliner.





- Release and disconnect connector -2- on interior monitor send and receive module 2 - G305- -1-.
- Unclip interior monitor send and receive module 2 - G305- from the 4 retainers -arrows-.

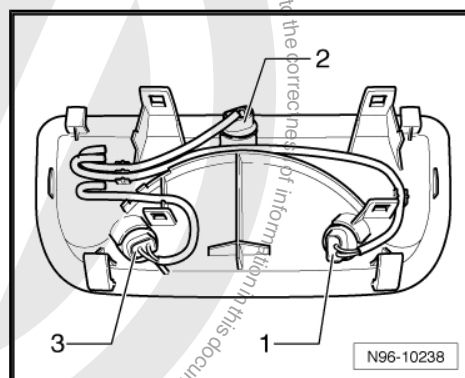


- Unclip sensor cables from cable guides and pull out sensors -1 to 3-.

Installing

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

- Install sensors -1 to 3- in sequence shown in illustration and clip cables into cable guides.



Note

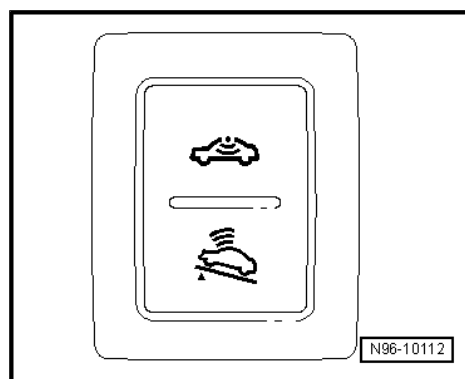
Adjust sensitivity of ultrasound sensors on interior monitor send and receive module 2 - G305- ➔ Vehicle diagnostic tester.

3.5 Removing and installing deactivation button for vehicle inclination sender



Note

- ♦ Different components may be installed depending on the vehicle equipment level.
- ♦ The interior monitoring switch - E183- with warning lamp for interior monitoring switch-off - K162- and button illumination bulb - L76- -upper symbol- and the deactivation button for vehicle inclination sender - E360- with vehicle inclination sender warning lamp - K188- and button illumination bulb - L76- -lower symbol- are installed as one component in the B-pillar trim on the driver side and can only be renewed together.



Caution

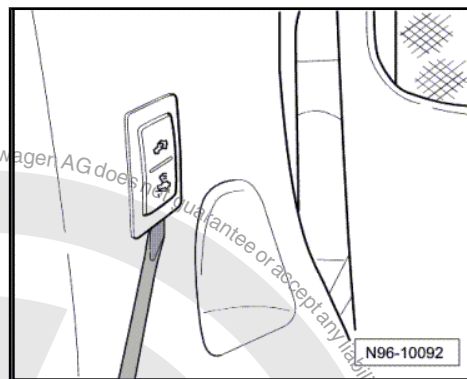
When removing and installing components that are in view (switches, covers, trims etc.), mask off areas in which tools (plastic wedge, screwdriver) are used to lever out those components using masking tape.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.



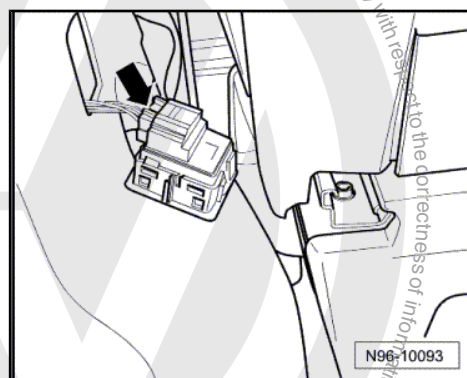
- Carefully lever out switch using a screwdriver.



- Release and disconnect connector -arrow-.

Installing

Install in reverse order of removal.





4 Immobiliser

⇒ [“4.1 General description - immobiliser”, page 272](#)

⇒ [“4.2 Removing and installing immobiliser control unit”, page 272](#)

⇒ [“4.3 Adapting immobiliser control unit”, page 272](#)

⇒ [“4.4 Removing and installing immobiliser reader coil”, page 272](#)

4.1 General description - immobiliser

The 4th generation immobiliser provides online and download capabilities. The main component of the fourth generation immobiliser is a central database, in which all of the theft-relevant data from the participating control units is stored. Adapting the control units associated with the immobiliser is not possible without an online link to this database.



Note

For additional information on the procedure for renewing components of the immobiliser and on the required adaptations, refer to the relevant chapters in »Electrical system; General information« ⇒ Electrical system; General information; Rep. gr. 96; Immobiliser.

Fault detection and fault display:

The immobiliser is equipped with self-diagnosis, which makes fault finding easier.

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

4.2 Removing and installing immobiliser control unit

The immobiliser control unit - J362- is integrated in the dash panel insert. If the control unit is defective, the dash panel insert must be renewed.

- Removing and installing dash panel insert ⇒ [page 51](#) .

4.3 Adapting immobiliser control unit

- Adapt immobiliser control unit - J362- ⇒ Vehicle diagnostic tester.

4.4 Removing and installing immobiliser reader coil

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

- Removing and installing lock cylinder ⇒ [page 197](#) .

5 Lane change assist

⇒ ["5.1 Assembly overview - lane change assist", page 273](#)

⇒ ["5.2 Removing and installing lane change assist warning lamp in exterior mirror K233 / K234", page 274](#)

⇒ ["5.3 Removing and installing lane change assist control unit J769 / J770", page 274](#)

⇒ ["5.4 Calibrating lane change assist", page 275](#)

5.1 Assembly overview - lane change assist

1 - Warning lamp for lane change assist in exterior mirror on front passenger side - K234-

- ☐ Installed in right exterior mirror housing.
- ☐ Removing and installing
⇒ [page 274](#)

2 - Lane change assist control unit 2 - J770-

- ☐ Slave control unit - right
- ☐ Removing and installing
⇒ [page 274](#)
- ☐ Calibrating ⇒ [page 280](#)
- ☐ Securing bolt: 3.5 Nm

3 - Lane change assist control unit - J769-

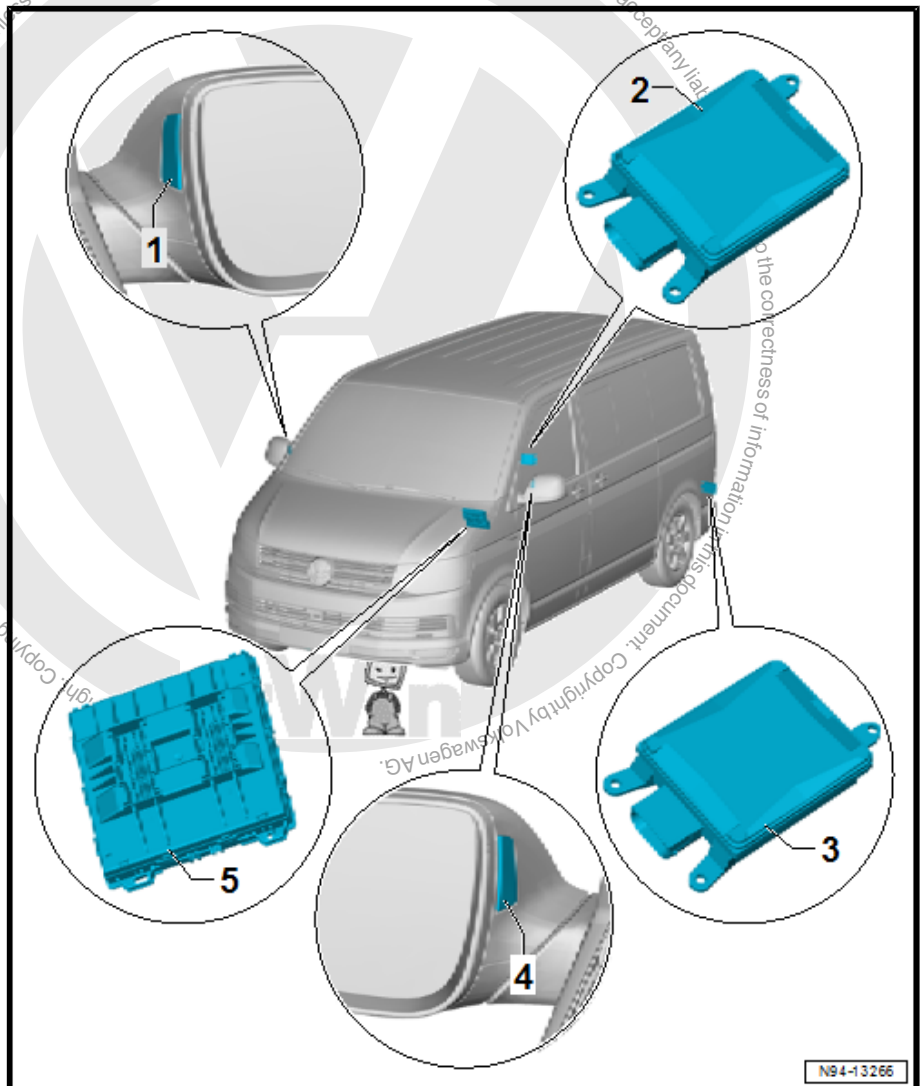
- ☐ Master control unit - left
- ☐ Removing and installing
⇒ [page 274](#)
- ☐ Calibrating ⇒ [page 280](#)
- ☐ Securing bolt: 3.5 Nm

4 - Warning lamp for lane change assist in exterior mirror on driver side - K233-

- ☐ Installed in left exterior mirror housing.
- ☐ Removing and installing
⇒ [page 274](#)

5 - Onboard supply control unit - J519-

- ☐ Function control of rain/light sensor for brightness regulation of warning lamps in exterior mirror
- ☐ Removing and installing ⇒ [page 295](#)



N94-13266



5.2 Removing and installing lane change assist warning lamp in exterior mirror - K233- / -K234-

Removal and installation of the lane change assist warning lamps in exterior mirror driver side - K233- and lane change assist warning lamps in exterior mirror front passenger side - K234- is carried out in the same manner and is described in the following illustrations for just one side.

Fitting location of warning lamp for lane change assist in exterior mirror -arrow-

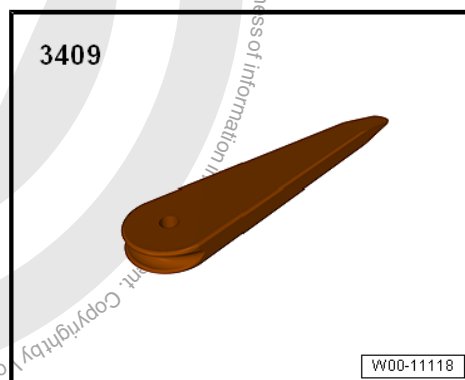
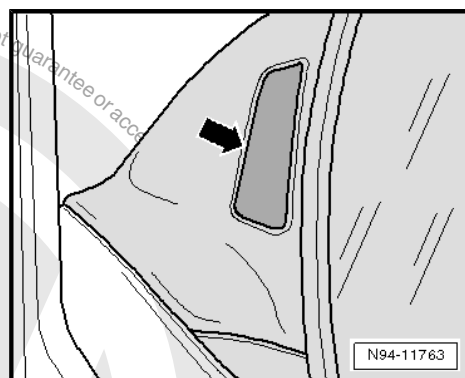


Note

The brightness of the warning lamps depends on the ambient brightness and is controlled by the rain and light sensor.

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Using removal wedge - 3409- , carefully remove warning lamp from mirror housing at position marked with -arrow-.
- Release and separate electrical connector on warning lamp.

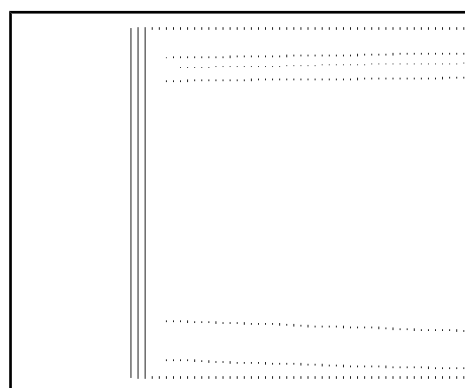
Installing

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



Note

In the event of one of more defective LEDs, the lane change assist warning lamp in exterior mirror must be replaced completely.



5.3 Removing and installing lane change assist control unit -J769- / -J770-

The lane change assist control unit - J769- left and lane change assist control unit 2 - J770- right is joined to the relevant radar sensor to form one unit for each side respectively. The lane change assist control units can be found at the rear of vehicle on the left and right behind the tail light cluster cover.



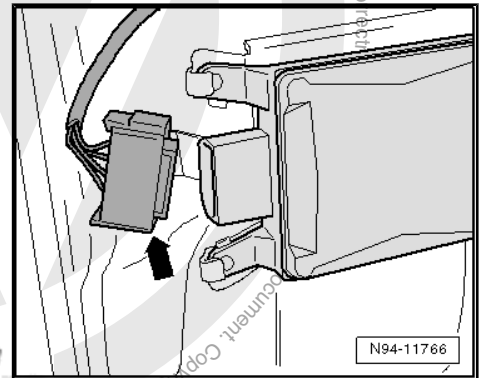
Removing



Note

Removal and installation of left lane change assist control unit - J769- are described in the following; removal and installation of right lane change assist control unit 2 - J770- are carried out in the same manner.

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove end piece beneath tail light cluster ⇒ General body repairs, exterior; Rep. gr. 63 ; Rear bumper; Assembly overview - bumper cover
- Release and disconnect connector -arrow- on control unit.

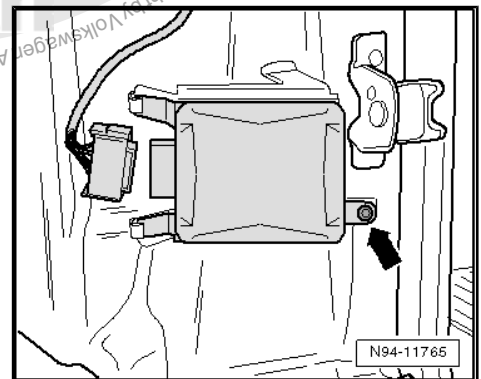


- Unscrew securing bolt -arrow- and remove lane change assist control unit from bracket.

Installing

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

- On completion of assembly work, the lane change assist system (Side Assist) must be calibrated ⇒ [page 275](#) .



Note

- ◆ *If both lane change assist control units or just lane change assist control unit - J769- left (master) require changing, the lane change assist system must first be coded on completion of the assembly work and parametrised ⇒ Vehicle diagnostic tester. The system is then calibrated ⇒ [page 275](#) .*
- ◆ *If just lane change assist control unit 2 - J770- right (slave) requires changing, the lane change assist system only has to be calibrated on completion of assembly work ⇒ [page 275](#) .*

Torque settings

- ◆ ⇒ [“5.1 Assembly overview - lane change assist”, page 273](#)

5.4 Calibrating lane change assist

⇒ [“5.4.1 Measurement location”, page 275](#)

⇒ [“5.4.2 Preparatory measures for calibration”, page 276](#)

⇒ [“5.4.3 Calibrating lane change assist control unit J769 / J770”, page 280](#)

5.4.1 Measurement location



1 - Volkswagen badge

- ☐ Laser pointer aimed at centre of Volkswagen badge

2 - Wheel centre mounting - VAS 6350/1-

- ☐ With wheel bolt adapter AF 19 mm and measuring paddle

3 - Stop bracket

- ☐ To support spacing laser -VAS 6350/2- for distance measurement
- ☐ Distance from wheel centre mountings -VAS 6350/1- on rear wheels: Dimension -a - = 1700 ± 2 mm.

4 - Spirit level

- ☐ On calibration unit - VAS 6350-
- ☐ To check horizontal position of calibration unit - VAS 6350-

5 - Calibration unit - VAS 6350-

6 - Plastic foot

- ☐ Qty. 3
- ☐ Adjustable to change horizontal position of calibration unit - VAS 6350-

7 - Spacing laser - VAS 6350/2-

- ☐ For distance measurement
- ☐ Handling ⇒ Operating instructions

8 - Linear laser - VAS 6350/3-

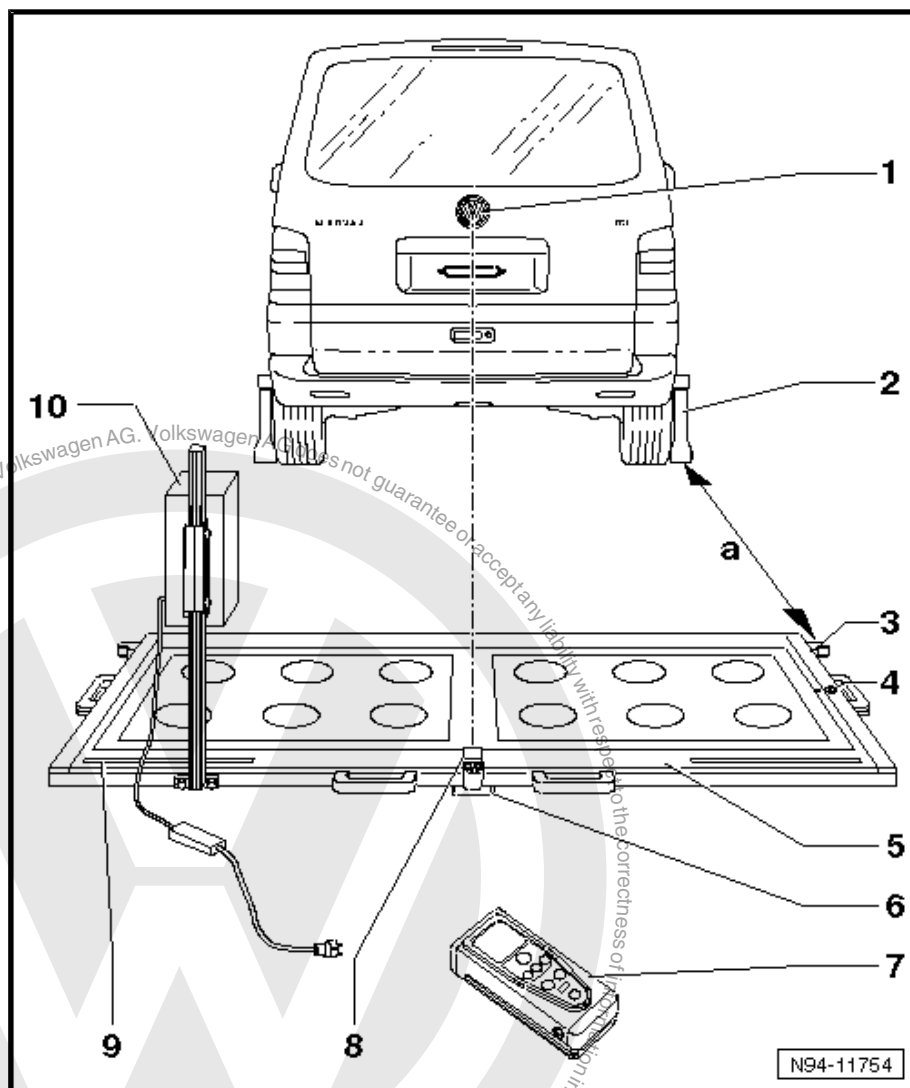
- ☐ With "laser goggles"
- ☐ On calibration unit - VAS 6350-
- ☐ Switching on and off ⇒ Operating instructions

9 - Measuring scale

- ☐ To position calibration unit for lane change assist -VAS 6350/4-
- ☐ Dimension to be set, measuring point on steel rule = 660 mm

10 - Calibration unit for lane change assist -VAS 6350/4-

- ☐ is changed over from the left to the right-hand side of the measuring field during calibration
- ☐ If assembled correctly, the mains power lead should be fitted to the bottom left of the calibration unit (as seen facing direction of normal travel)



5.4.2 Preparatory measures for calibration

The lane change assist control unit - J769- left (master) and lane change assist control unit 2 - J770- right (slave) is joined to the relevant radar sensor to form one unit for each side respectively.



They are located behind the end pieces beneath the tail lights and must be calibrated following:

- ◆ Removal and installation of one or both lane change assist control units
- ◆ Any change in the installation position of a lane change assist control unit
- ◆ After removal or installation of one of the covers above the lane change assist control unit

Extensive preliminary work is required before actual calibration can be carried out using vehicle diagnostic tester .

Prerequisites:

- Position vehicle on a firm and level surface.
- Apply parking brake. Vehicle must not be moved during measurement.
- Align front wheels to straight-ahead position – steering wheel in straight-ahead position.
- If necessary, remove sticker with metal foil from bumper cover.
- Nobody must be inside vehicle during measurement.
- Opening and closing the vehicle doors during calibration must be avoided.

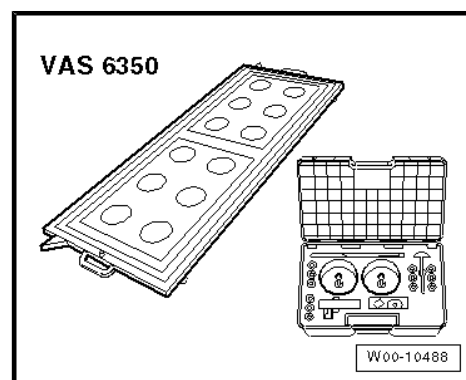


Note

If a fault message appears in the display ⇒ operating instructions of vehicle diagnostic tester .

Special tools and workshop equipment required

- ◆ Calibration unit - VAS 6350-



- ◆ Vehicle diagnostic tester
 - Connect vehicle diagnostic tester ⇒ [page 303](#) .
 - Switch on ignition.

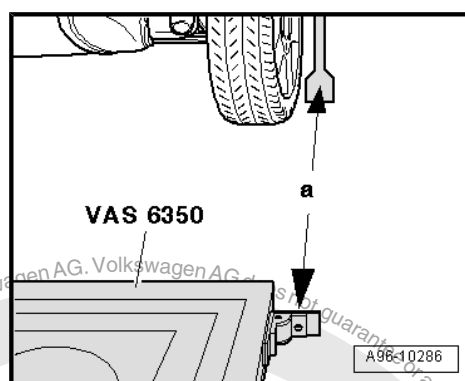
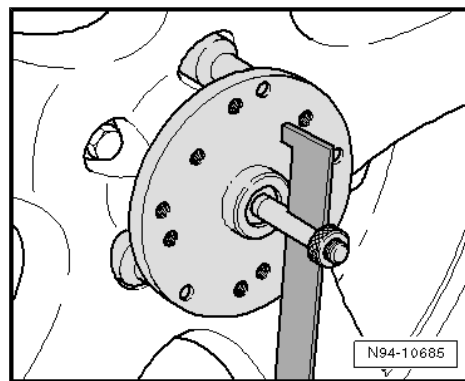


- Attach 3 wheel bolt adapters (19 mm) for wheel securing bolts to each wheel centre mounting - VAS 6350/1- .
- Insert the measuring paddles in the two wheel centre mountings -VAS 6350/1- and secure them with the clamping nut.
- Fit the wheel centre mountings - VAS 6350/1- onto the wheel bolts on both rear wheels.



Note

- ◆ *The turning centre of the wheel centre mounting must be in the turning centre of the wheel.*
- ◆ *Place wheel centre mountings - VAS 6350/1- on wheels so that "anti-theft wheel bolts" are not connected to the wheel centre mountings.*
- Set measuring paddles with the help of the clamping nuts in such a way that they can move freely just above the floor.
- The measuring paddles must not be restricted in movement.
- The measuring paddles must be vertical.
- Position the calibration unit - VAS 6350- at a distance of -a- to the rear wheels.
- Dimension -a- = 1700 ± 2 mm.



- Switch on spacing laser -VAS 6350/2- using  button.

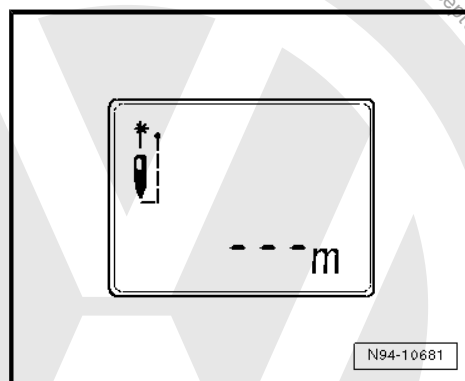
Display on -VAS 6350/2- :

- " - - - m"



Note

The laser is switched on at the same time.



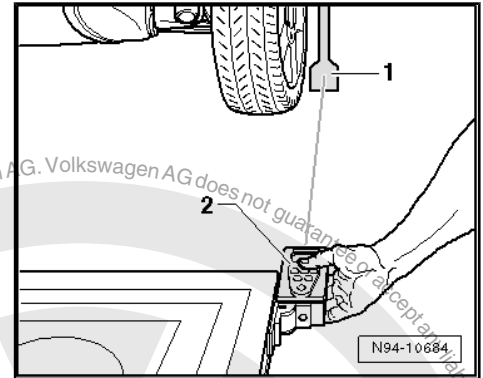


- Hold spacing laser -VAS 6350/2- -2- for distance measurement flush with stop bracket as shown in illustration.

The spacing laser -VAS 6350/2- must be firmly in contact with the stop bracket when doing this.

- Ensure that the “laser beam” for distance measurement is at the bottom enlarged part on the measuring paddle -1-.

If this is not the case, the height of the measuring paddles has to be corrected with the aid of the clamping nuts on the wheel centre mounting - VAS 6350/1- .

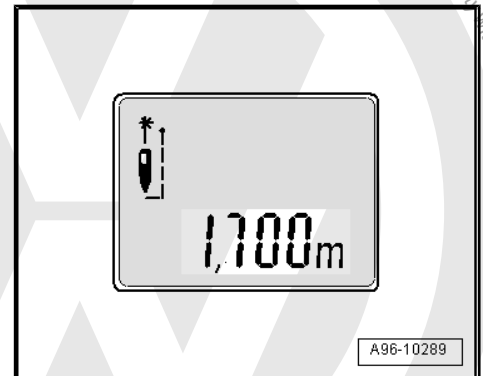


- Now, briefly press **ON** button to measure distance.

Display on -VAS 6350/2- :

- “1,700 m” (specification: 1700 ± 2 mm).
- Repeat the measuring process from the left stop bracket to the measuring paddle on the rear left wheel.
- Measured distance value must be identical on both sides.

If both measured values are not identical, adjust calibration unit - VAS 6350- accordingly.



- Attach the calibration unit for lane change assist -VAS 6350/4- on the rear left on the mounting of the calibration unit - VAS 6350- .



Note

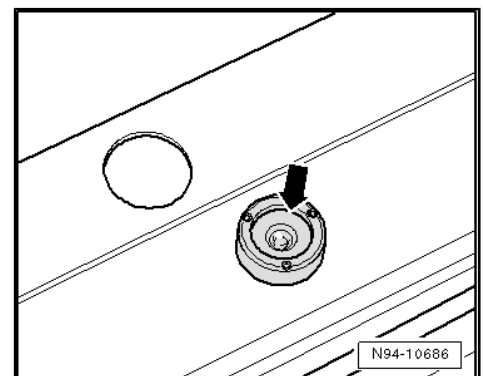
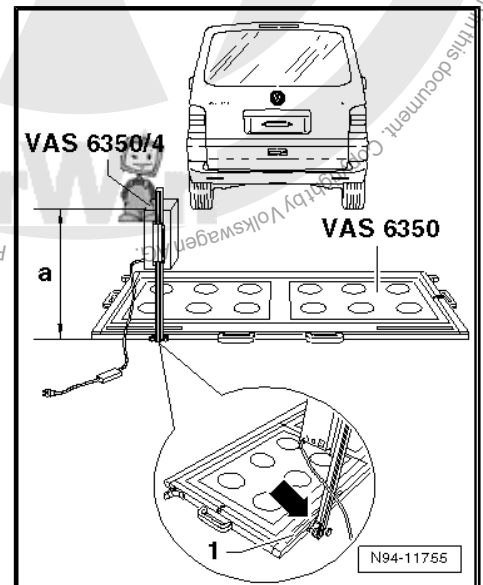
If assembled correctly, the mains power lead should be fitted to the bottom left of the calibration unit as seen facing direction of normal travel.

Dimension -a- = 840 mm measured from upper edge of calibration unit to workshop floor.

- The dimension is set with the measuring point -arrow- at the base of the calibration unit on the scale of the steel rule -1-.

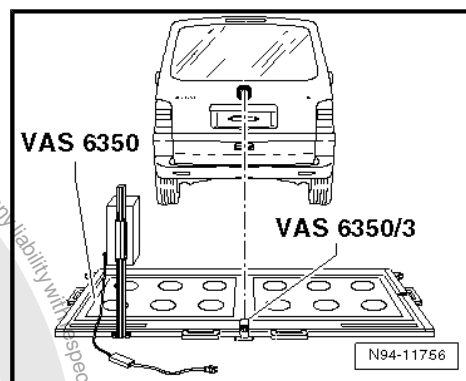
Setting dimension on left read off on measuring scale -1- = 697 mm.

- Connect the calibration unit for lane change assist -VAS 6350/4- to mains voltage.
- Align calibration unit - VAS 6350- to horizontal position with the aid of the vial (sight glass) -arrow- by turning the plastic feet.





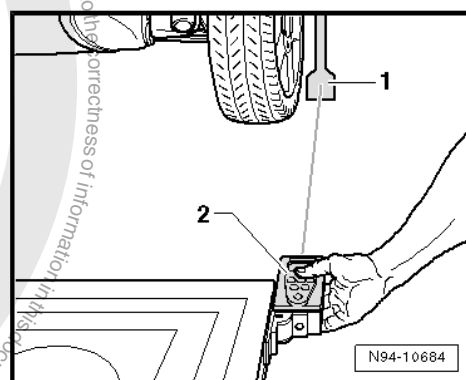
- Put on "laser protection glasses"
- Switch on linear laser - VAS 6350/3- on calibration unit - VAS 6350- .
- Align the whole calibration unit - VAS 6350- so that the laser beam is focused on the rear of the vehicle in the centre above the VW badge.



- Check the spacing on the left and right again between the stop brackets of the calibration unit - VAS 6350- and the measuring paddles -1- on the wheel mountings.

• Specification: 1700 ± 2 mm

Calibrating lane change assist control unit ⇒ [page 280](#) .



5.4.3 Calibrating lane change assist control unit -J769- / -J770-



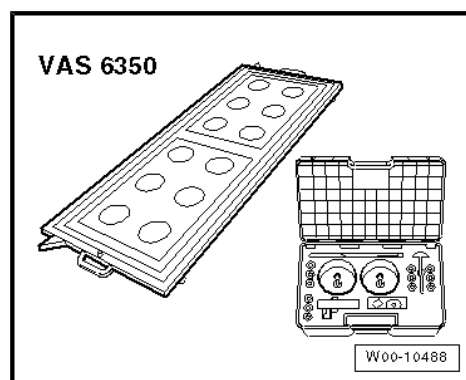
Note

Before the actual calibration process of the lane change assist control units, the calibration unit - VAS 6350- has to be set up as described in chapter

⇒ *["5.4.2 Preparatory measures for calibration", page 276](#) .*

Special tools and workshop equipment required

- ◆ Calibration unit - VAS 6350-



- ◆ Vehicle diagnostic tester

During the calibration procedure the following conditions must be met:

- Vehicle doors must not be opened or closed.
- There should be no-one in the vehicle.
- No-one should pass through the space between the vehicle and the calibration unit for lane change assist -VAS 6350/4- .



Sequence of operations

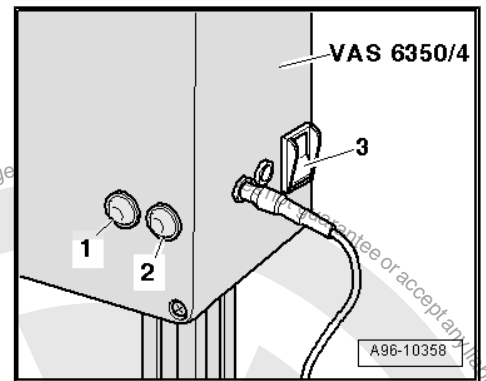
- Switch on the calibration unit for lane change assist -VAS 6350/4- using the mains switch -3-.
- The green LED -1- must light up.



Note

If the red LED -2- lights up: Check the calibration unit for lane change assist -VAS 6350/4-.

- Connect vehicle diagnostic tester ➔ [page 303](#).
- Select option for calibration in “Guided Fault Finding” mode ➔ Vehicle diagnostic tester.
- Using “GoTo” button, select “Functions/component” and then the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ 01 - Self-diagnosis compatible systems
 - ◆ Lane change assist
 - ◆ Function
 - ◆ Calibration - lane change assist
- Proceed by following the instructions on the display of vehicle diagnostic tester.



During the program sequence you will be requested to change the calibration unit for lane change assist -VAS 6350/4- from the left to the right-hand side of the calibration unit - VAS 6350-.

- Switch off the calibration unit for lane change assist -VAS 6350/4- and change to the other side.



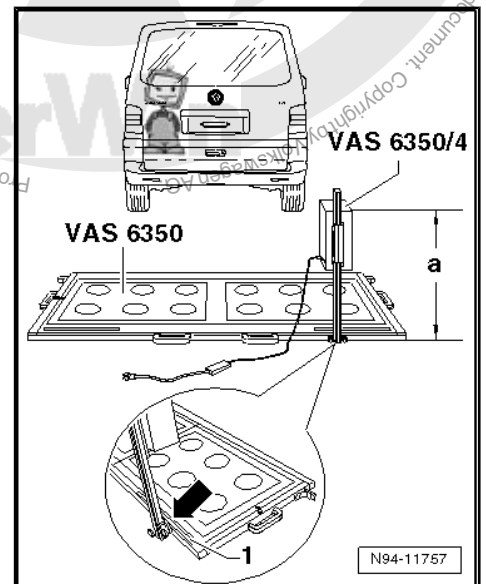
Note

If assembled correctly, the mains power lead should be fitted to the bottom left of the calibration unit as seen facing direction of normal travel.

Dimension -a- = 840 mm measured from upper edge of calibration unit to workshop floor.

- The dimension is set with the measuring point -arrow- at the base of the calibration unit on the scale of the steel rule -1-.

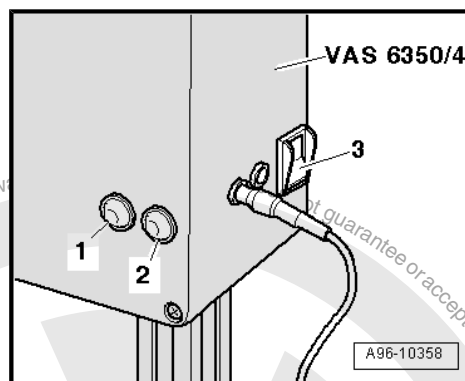
Setting dimension on right read off on measuring scale -1- = 697 mm.





- Switch on the calibration unit for lane change assist -VAS 6350/4- using the mains switch -3-.
- The green LED -1- must light up.
- Proceed by following the instructions on the display of vehicle diagnostic tester .

Upon completion of lane change assist system calibration switch off ignition and disconnect diagnosis connector.





6 Front camera for assist systems

⇒ ["6.1 Removing and installing front camera for driver assist systems", page 283](#)

⇒ ["6.2 Replacing front camera for driver assist systems R242 ", page 283](#)

⇒ ["6.3 Coding front camera for driver assist systems R242 ", page 283](#)

6.1 Removing and installing front camera for driver assist systems

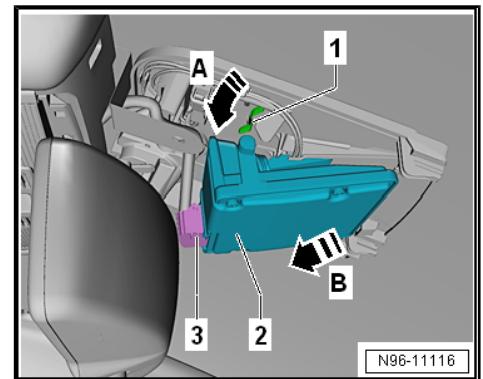
The front camera for driver assist systems - R242- acquires optical information for several assist systems, depending on the vehicle's equipment level.

Removing

- Switch off ignition.
- Store the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.
- Remove cover for mirror base ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Assembly overview - interior mirror
- Unclip front camera for driver assist systems - R242- -2- from retaining clips -1- in direction of arrow -A-.
- Pull front camera for driver assist systems - R242- -2- in direction of arrow -B- out of mounting.
- Release and disconnect connector -3-.

Installing

Install in reverse order of removal.



6.2 Replacing front camera for driver assist systems - R242-

- Connect vehicle diagnostic tester ⇒ [page 303](#) .
- Renew front camera for driver assist systems - R242- ⇒ Vehicle diagnostic tester.

6.3 Coding front camera for driver assist systems - R242-

- Connect vehicle diagnostic tester ⇒ [page 303](#) .
- Renew front camera for driver assist systems - R242- ⇒ Vehicle diagnostic tester.



7 Cigarette lighter, socket

⇒ ["7.1 Assembly overview - cigarette lighter, 12 V socket", page 284](#)

⇒ ["7.2 Removing and installing cigarette lighter U1 ", page 285](#)

⇒ ["7.3 Removing and installing socket illumination bulb L42 ", page 285](#)

⇒ ["7.4 Removing and installing rear cigarette lighter illumination bulb L32 ", page 285](#)

⇒ ["7.5 Removing and installing electric socket U ", page 285](#)

7.1 Assembly overview - cigarette lighter, 12 V socket

1 - Cigarette lighter socket with wiring harness

2 - Cigarette lighter

3 - Socket

Fitting location (depending on equipment):

- ◆ In centre console
- ◆ In stowage compartment of C-pillar
- ◆ In roof trim of pop-up roof
- ◆ On side of kitchen cabinet
- ◆ In centre console of two-seater bench in rear
- ◆ In luggage compartment

4 - Cigarette lighter socket

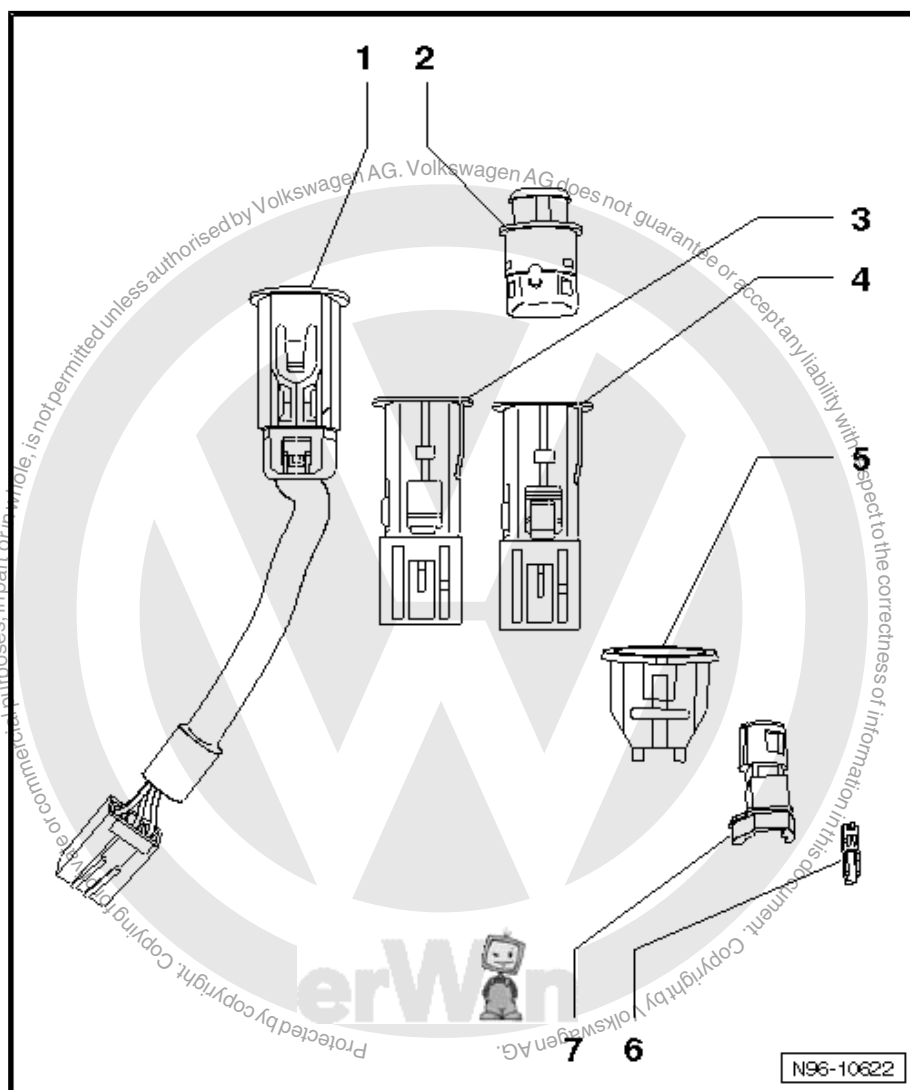
Fitting location (depending on equipment):

- ◆ In ashtray of centre console
- ◆ In centre console of two-seater bench in rear

5 - Retaining sleeve

6 - Light bulb W 5 12V, 1.2 watts

7 - Bulb carrier





7.2 Removing and installing cigarette lighter - U1-



Note

All instructions and information about this chapter: ➔ Electrical system; General information; Rep. gr. 96; Cigarette lighter - U1-.

7.3 Removing and installing socket illumination bulb - L42-



Note

All instructions and information about this chapter: ➔ Electrical system; General information; Rep. gr. 96; 12V socket.

7.4 Removing and installing rear cigarette lighter illumination bulb - L32-



Note

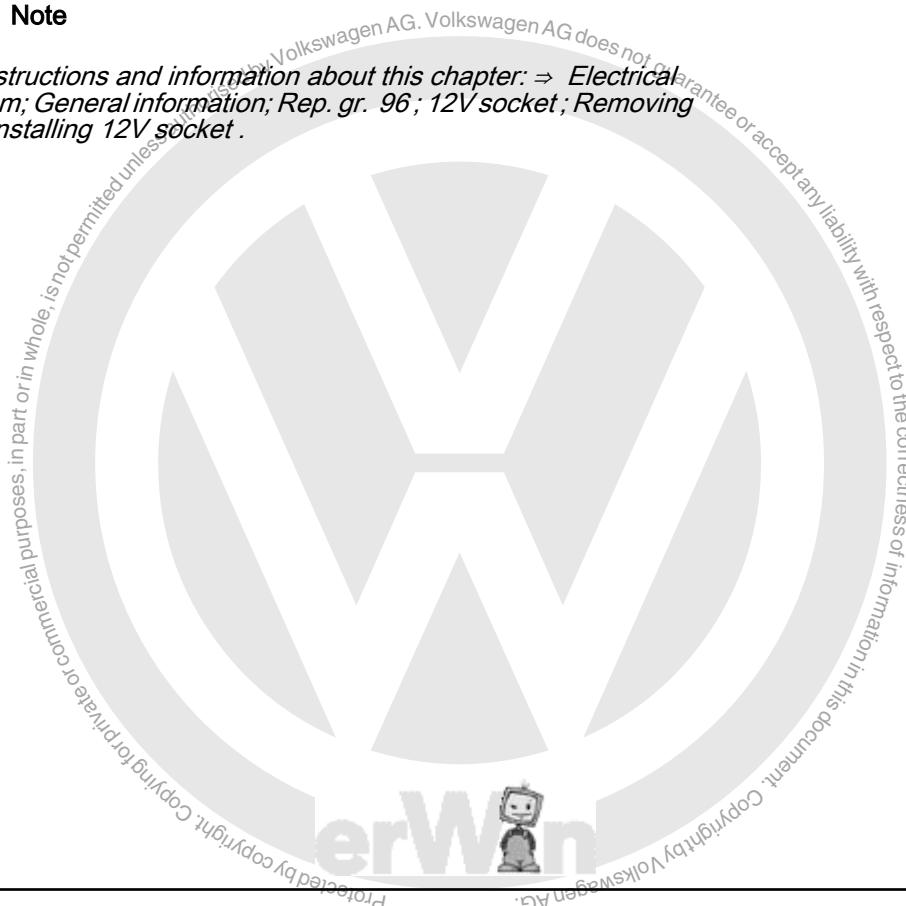
All instructions and information about this chapter: ➔ Electrical system; General information; Rep. gr. 96; Cigarette lighter - U1-.

7.5 Removing and installing electric socket - U-



Note

All instructions and information about this chapter: ➔ Electrical system; General information; Rep. gr. 96; 12V socket; Removing and installing 12V socket.





97 – Wiring

1 Relay carriers, fuse holders, electronics boxes

⇒ [“1.1 Overview of fitting locations - relay carriers, fuse holders, E-boxes”, page 286](#)

⇒ [“1.2 Removing and installing electronics box on left side of engine compartment”, page 287](#)

⇒ [“1.3 Removing and installing coupling station in seat box at front on left”, page 291](#)

⇒ [“1.4 Removing and installing relay carrier and fuse holder in front seat boxes”, page 292](#)

⇒ [“1.5 Removing and installing relay carrier and fuse holder in centre console”, page 293](#)

⇒ [“1.6 Removing and installing coupling station electronics box”, page 293](#)

⇒ [“1.7 Removing and installing relay carrier and fuse holder in electronics box”, page 293](#)

1.1 Overview of fitting locations - relay carriers, fuse holders, E-boxes



1 - Relay carrier and fuse holder in centre console

- ☐ Installed behind cover in the centre under the dash panel.
- ☐ Relay carrier and fuse holder are removed together ⇒ [page 293](#)

2 - Relay carrier in dash panel on driver side

- ☐ Installed on driver side under dash panel
- ☐ Dash panel relay carrier on driver side is part of onboard supply control unit bracket and cannot be removed individually

3 - Relay carrier and fuse holder in front seat box

- ☐ Installed on left and/or right
- ☐ Removing and installing ⇒ [page 292](#)

4 - Coupling station in front left seat box

- ☐ With fastening strip "interface for external use" UF1
- ☐ Removing and installing ⇒ [page 291](#)

5 - Fuse holder A - SA-

- ☐ Installed in electronics box on left in engine compartment
- ☐ Access to fuse holder gained by opening electronics box ⇒ [page 287](#)

6 - Relay carriers

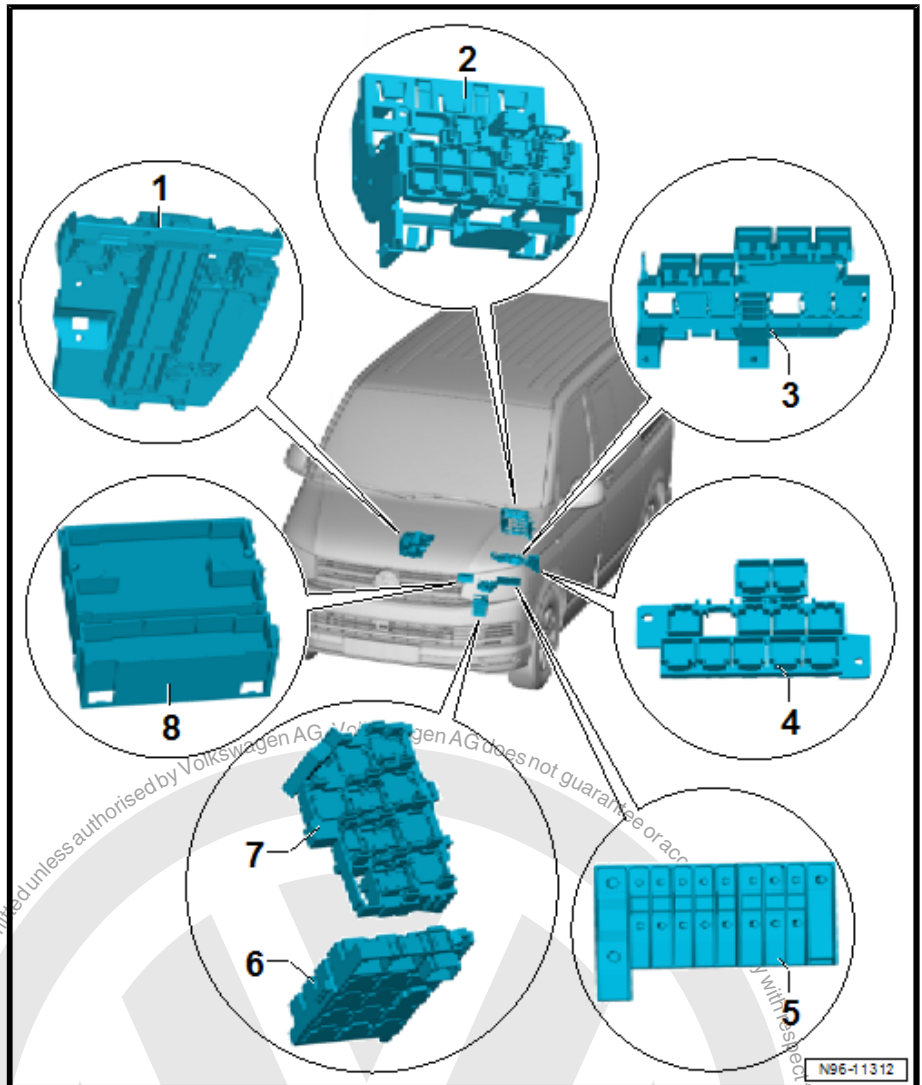
- ☐ Installed in electronics box on left in engine compartment
- ☐ Access to relay carrier by opening electronics box ⇒ [page 287](#)

7 - Relay carriers

- ☐ Installed in electronics box on left in engine compartment
- ☐ Access to relay carrier by opening electronics box ⇒ [page 287](#)

8 - Fuse holder D - SD-

- ☐ Installed in electronics box on left in engine compartment
- ☐ Access to fuse holder possible via separate cover without opening electronics box.



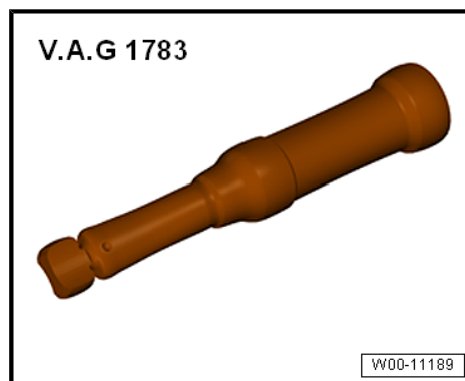
1.2 Removing and installing electronics box on left side of engine compartment

Removing

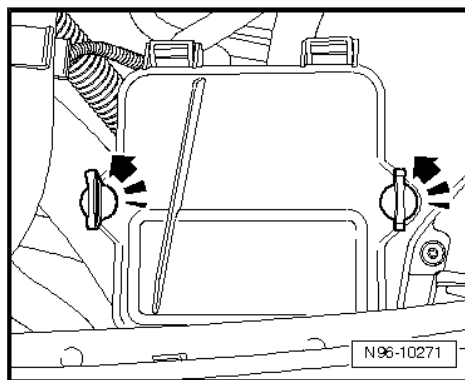
Special tools and workshop equipment required

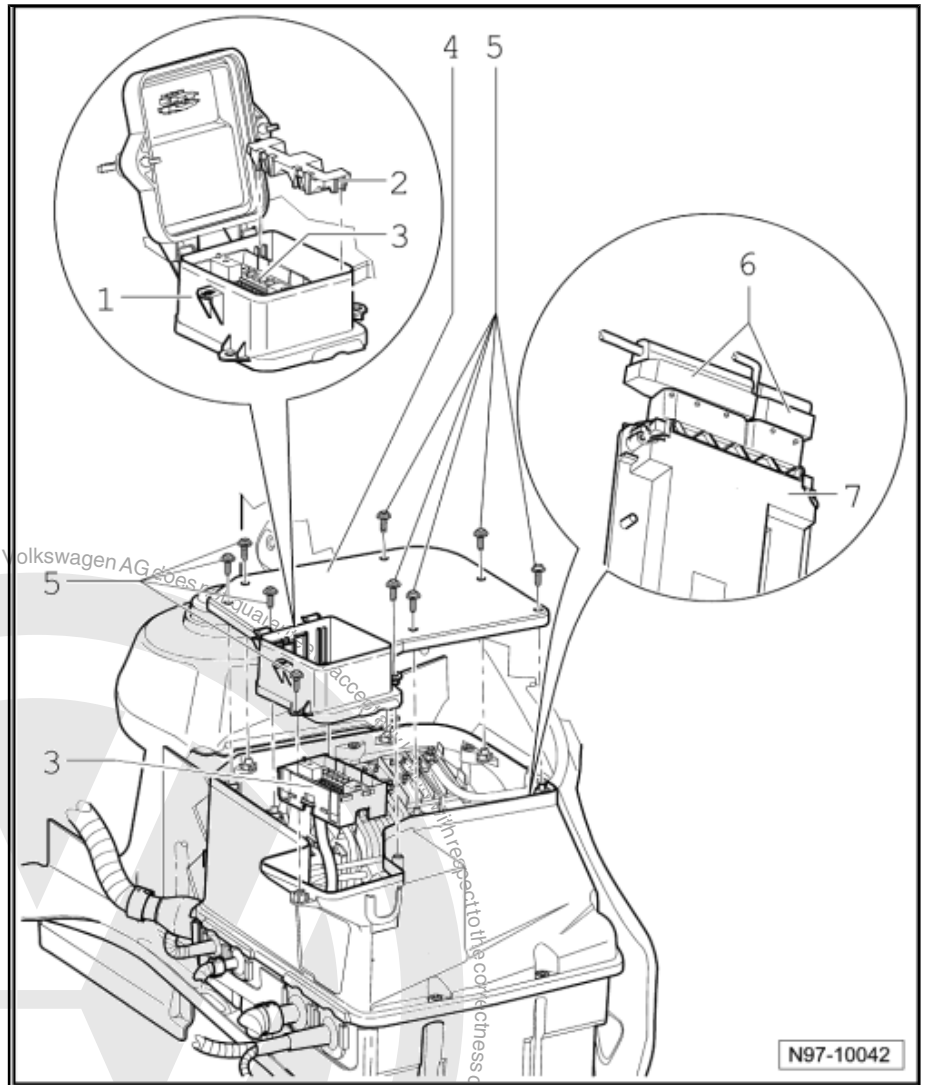


◆ Torque wrench - V.A.G 1783-



- Remove battery - A- in engine compartment ➔ [page 11](#) .
- Remove left headlight ➔ [page 118](#) .
- Remove battery partition ➔ [page 14](#) .
- Remove battery tray ➔ [page 15](#) .
- Turn catches -arrows- and open fuse cover.

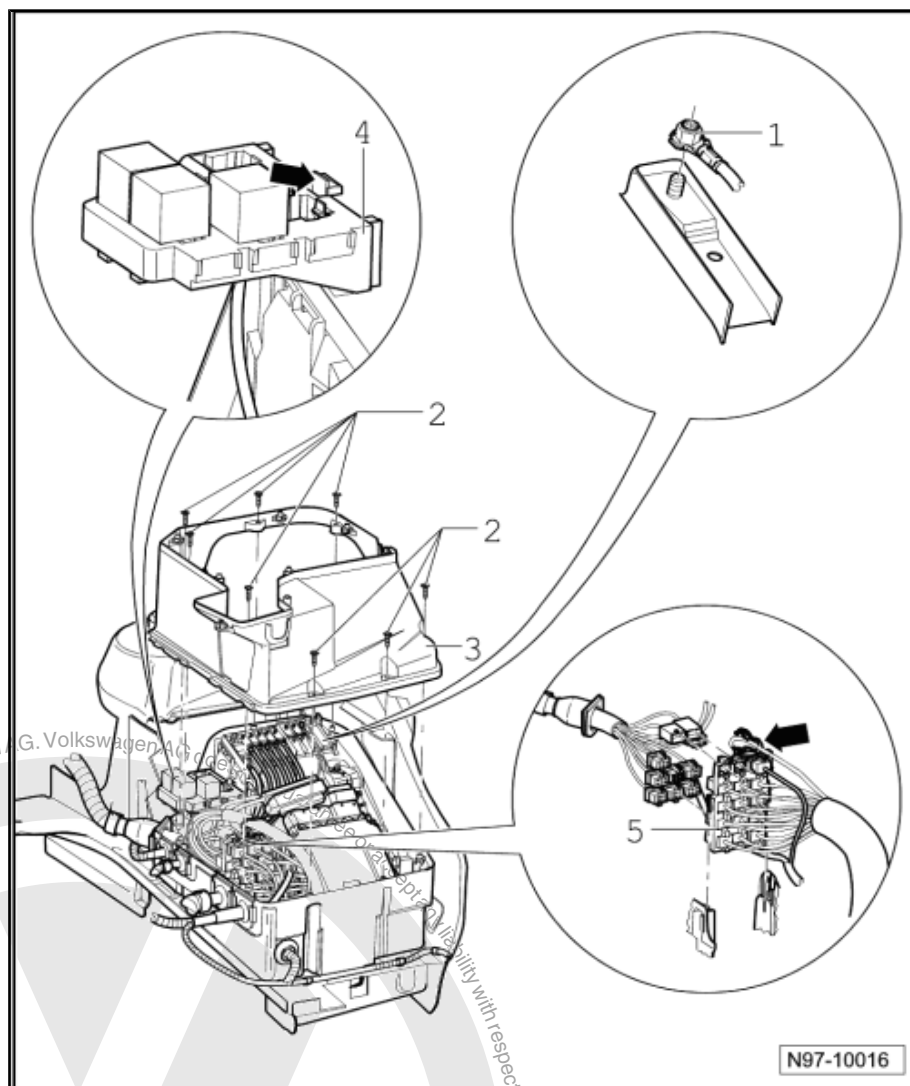




Note

For reasons of clarity, the area around the electronics box is not shown in the illustration.

- Push locking element on fuse insert -2- in direction of housing and pull fuse insert upwards out of fuse box -1-.
- Slide fuse carrier -3- sideways out of its position and push downwards.
- Unscrew the 8 securing bolts -5-.
- Remove upper part of electronics box -4-.
- Release and disconnect connector -6- on engine control unit -7-.



Note

For reasons of clarity, the area around the electronics box is not shown in the illustration.

- Unbolt cable (PIN 10) -1- and place aside.
- Unscrew eight securing bolts -2- and remove centre part of electronics box -3-.
- Press locking element -arrow- of relay carrier -4- and pull carrier upwards.
- Press locking element -arrow- of coupling station -5- and pull it upwards.
- Release and separate all electrical connectors.



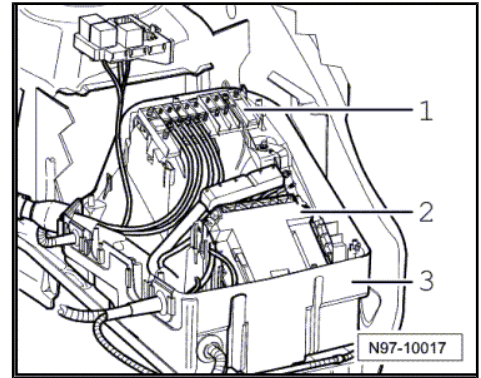
- Unbolt wiring from wiring carrier -1- and place to one side.



Note

The numbering on the line carrier is identical to the numbers shown on the lines.

- Pull engine control unit -2- out of runners.
- Remove all wiring with wiring guides out of lower part of electronics box -3- and place to one side.



- Unscrew securing nuts -1- and remove lower part of electronics box -2-.

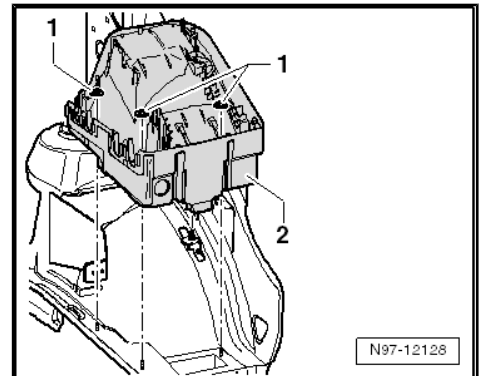
Installing

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



Note

- ♦ *The sealing collars of the lines must be inserted into the guides of the electronics box.*
- ♦ *The wires must not be pinched between the upper and lower parts of the electronics box when they are put together.*



Torque settings

Component	Torque setting
Bolts securing upper part of electronics box (qty. 8)	6 Nm
Nut securing cable PIN 10 (B+)	9 Nm.
Nut securing cable PIN 1 (alternator)	20 Nm.
Bolts securing centre part of electronics box (qty. 8)	4 Nm.
Nuts securing cables PIN 2-9 to cable holder	4 Nm.
Nuts securing upper part of electronics box (qty. 3)	6 Nm

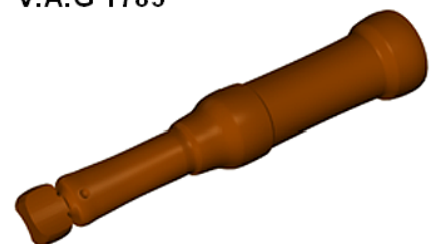
1.3 Removing and installing coupling station in seat box at front on left

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1783-



V.A.G 1783



W00-11189



Removing

- Disconnect batteries ➤ [page 8](#) .
- Remove the front seat ➤ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .
- Unscrew securing bolt -top arrow- and pull out coupling station -1- from under bracket with cables attached -bottom arrow-.

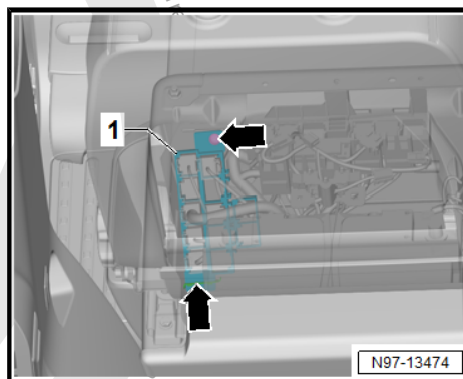
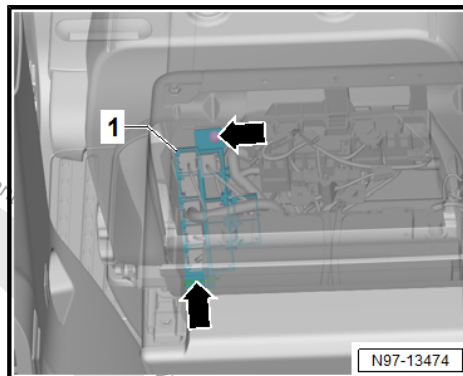
Installing

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

- First insert coupling station -1- underneath -bottom arrow- and then secure with securing bolt -top arrow-.

Torque settings

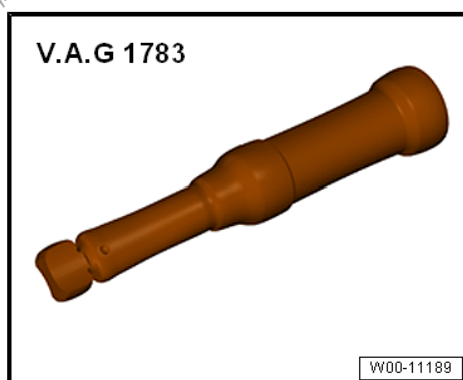
Component	Torque setting
Bolt securing coupling station	2 Nm.



1.4 Removing and installing relay carrier and fuse holder in front seat boxes

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1783



Removing

- Disconnect batteries ➤ [page 8](#) .
- Remove the front seat ➤ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .



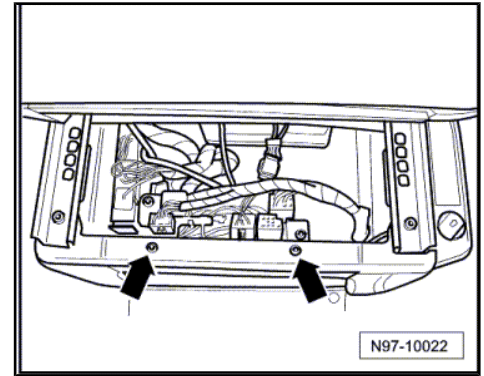
- Unscrew securing bolts -arrows- and remove relay carrier and fuse holder with wiring connected.

Installing

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

Torque settings

Component	Torque setting
Bolts securing relay carrier	6 Nm



1.5 Removing and installing relay carrier and fuse holder in centre console

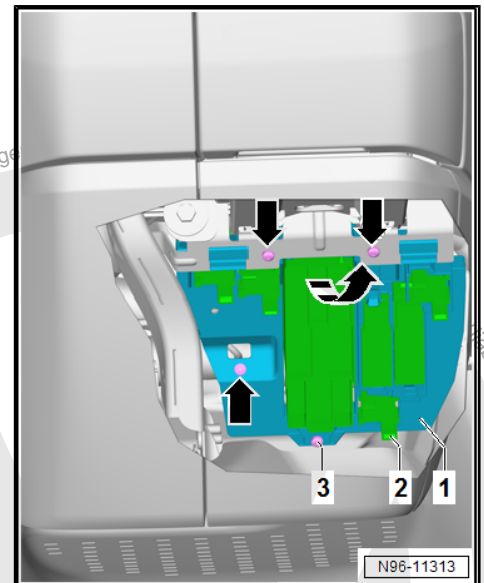
The fuse box can be found in the centre beneath the dash panel.

Removing

- Disconnect batteries ⇒ [page 8](#) .
- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Assembly overview - centre console .
- Unscrew securing bolts -arrows- for relay carrier and fuse holder in centre console.
- Swing out relay carrier -1- together with fuse holder -2- with wires attached.
- To separate relay carrier -1- and fuse holder -2-, unscrew securing bolt -3- and remove fuse holder -2-.

Installing

Install in reverse order of removal.



1.6 Removing and installing coupling station electronics box

The coupling station electronics box is removed in the course of electronics box removal ⇒ [page 287](#) .

1.7 Removing and installing relay carrier and fuse holder in electronics box

The relay carrier and fuse holder in the electronics box are removed in the course of electronics box removal ⇒ [page 287](#) .

2 Select Control units

⇒ "2.1 Overview of fitting locations - control units", page 294

⇒ "2.2 Removing and installing onboard supply control unit J519", page 295

⇒ "2.3 Removing and installing data bus diagnostic interface J533", page 296

⇒ "2.4 Removing and installing special vehicle control unit J608", page 296

⇒ "2.5 Coding special vehicle control unit", page 298

⇒ "2.6 Removing and installing rear lid power opening control unit J938", page 298

2.1 Overview of fitting locations - control units

1 - Rear lid power opening control unit - J938-

- ☐ Removing and installing
⇒ page 298

2 - Trailer detector control unit - J345-

- ☐ Installed in seat box on right
- ☐ Removing and installing
⇒ page 213

3 - Special vehicle control unit - J608-

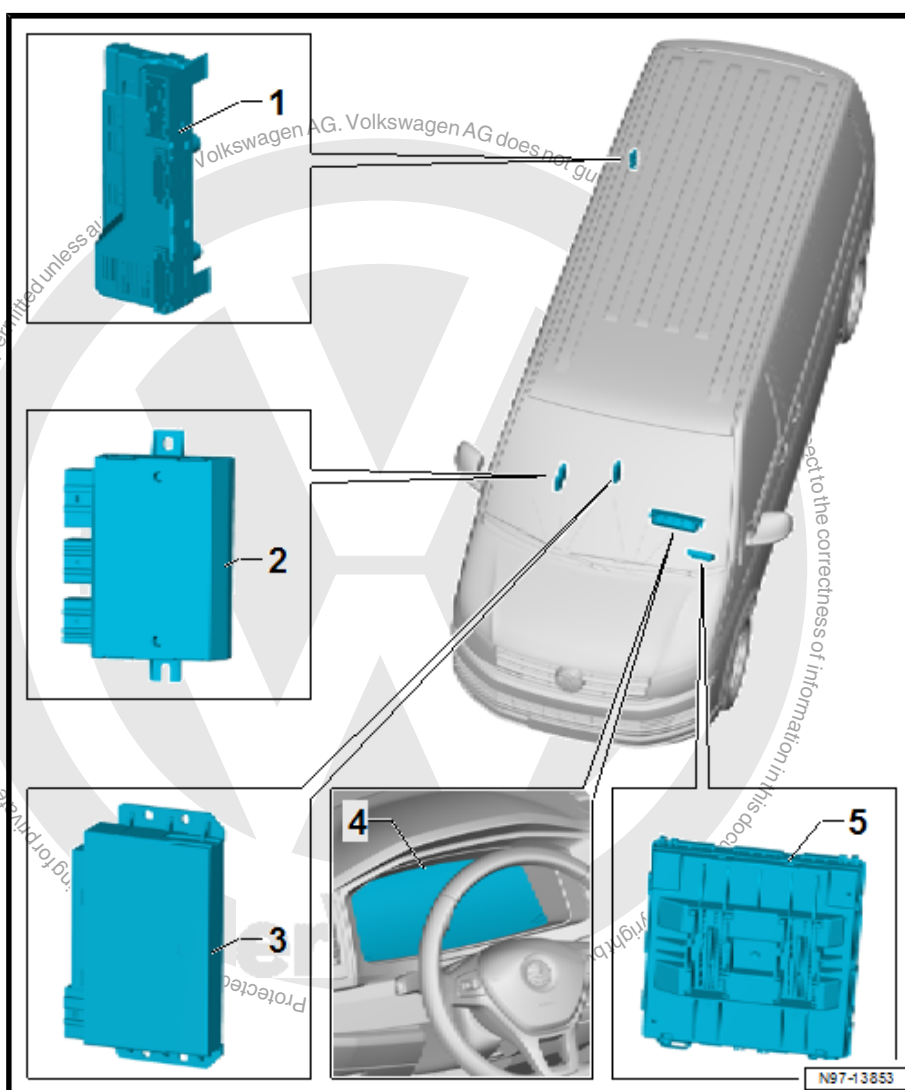
- ☐ Installed in seat box on right
- ☐ Removing and installing
⇒ page 296

4 - Dash panel insert - KX2-

- ☐ With control unit in dash panel insert - J285-
- ☐ With immobiliser control unit - J362-
- ☐ Removing and installing dash panel insert
⇒ page 51 .

5 - Onboard supply control unit - J519-

- ☐ With integrated data bus diagnostic interface - J533-
- ☐ Installed in driver footwell behind relay carrier
- ☐ Removing and installing
⇒ page 295





2.2 Removing and installing onboard supply control unit - J519-

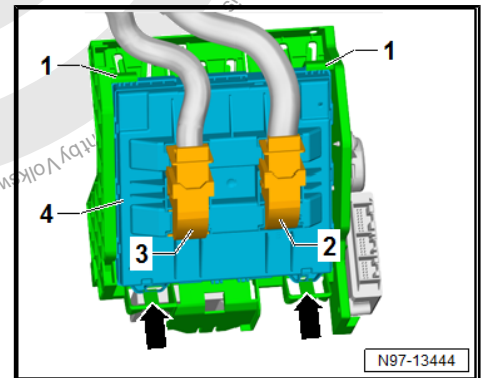


Note

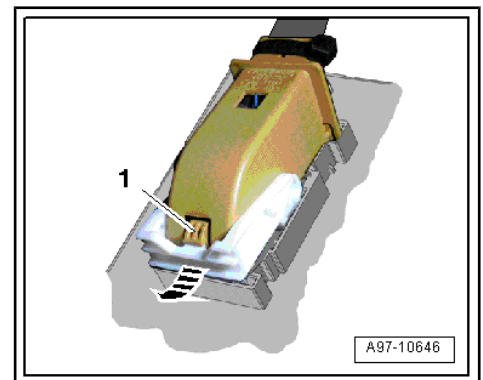
- ◆ The onboard supply control unit - J519- is secured in the driver footwell behind the relay carrier.
- ◆ If the control unit is replaced, select the **Replace** function of the respective control unit in **Guided fault finding** ⇒ Vehicle diagnostic tester.

Removing

- Switch off ignition and all electrical equipment and then remove ignition key.
- Remove driver footwell cover ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console trim in front footwell .
- Remove dash panel end cover on left side ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel end cover .
- Release and disconnect connectors -3- and -4-.



- To separate electrical connectors -3- and -4-, push locking detent -1-, swing retaining clip -arrow- and pull off connector.



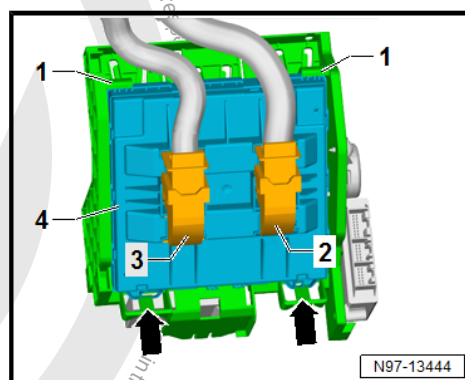
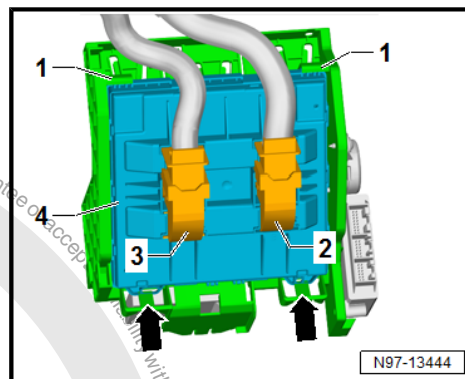


- Release bottom fasteners -arrows- and remove onboard supply control unit - J519- -4- downwards out of relay carrier -1-.

Installing

Install in reverse order of removal, observing the following:

- First insert onboard supply control unit - J519- -4- in mountings -1- and then engage securely underneath -arrows-.



2.3 Removing and installing data bus diagnostic interface - J533-

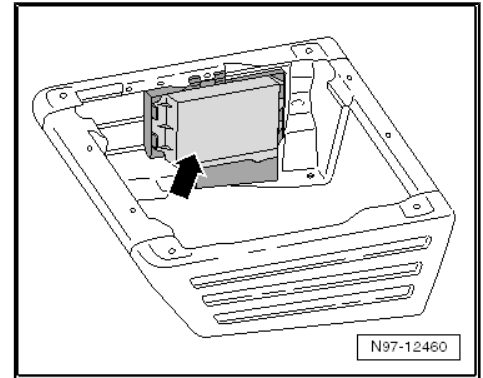
The data bus diagnostic interface - J533- is integrated into the onboard supply control unit - J519-. If control unit is defective, onboard supply control unit must be renewed.

- Removing and installing onboard supply control unit
⇒ [page 295](#) .

2.4 Removing and installing special vehicle control unit - J608-

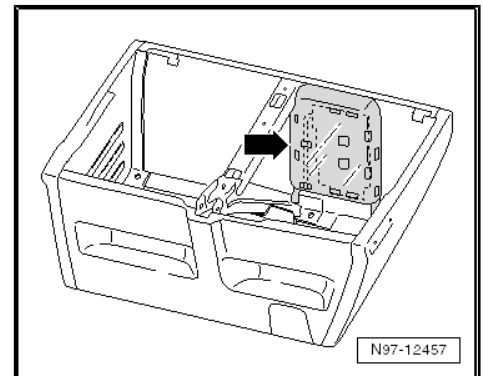
The special vehicle control unit - J608- controls special equipment and functions for the following special vehicles:

- ◆ Taxis
- ◆ Driving schools
- ◆ Disabled
- ◆ Driving schools for the disabled
- ◆ Special signal vehicles
- ◆ Special protection vehicles



Note

- ◆ The special vehicle control unit - J608- is installed in the seat box of the right seat. There are 2 versions:
- ◆ Special vehicle control unit - J608- -arrow- in vehicles with individual seat on right.
- ◆ Special vehicle control unit - J608- -arrow- in vehicles with double bench seat on right.



Fault detection and fault display

The special vehicle control unit - J608- is equipped with self-diagnosis, which makes fault finding easier.

For fault finding, use the systems described in chapter "Vehicle diagnosis, testing and information system" in "Guided Fault Finding" mode → Vehicle diagnostic tester.

Removing

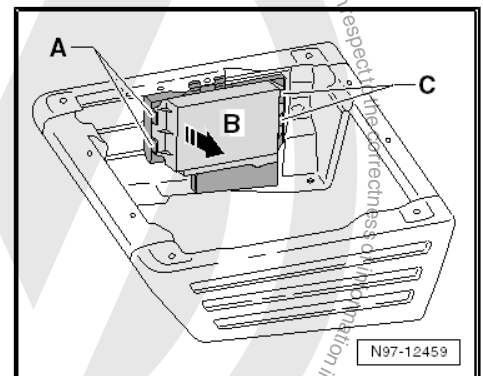
- Switch off ignition and all electrical equipment and then remove ignition key.

Only vehicles with individual seat

- Disconnect vehicle battery ⇒ [page 8](#) .
- Move right seat to foremost position.
- Press retaining clips -A- , move special vehicle control unit - J608- in direction of arrow -B- and remove it from retainers -C- .
- Release and disconnect connector on special vehicle control unit - J608- .

Only vehicles with double bench seat

- Disconnect vehicle battery ⇒ [page 8](#) .
- Fold up seat cushions of double bench seat.

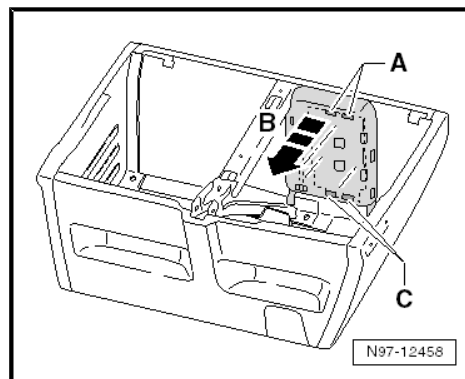




- Press retaining clips -A-, move special vehicle control unit - J608- in direction of arrow -B- and remove special vehicle control unit - J608- from retainers -C-.
- Separate electrical connector from special vehicle control unit - J608- .

Installing

Install in reverse order of removal.



2.5 Coding special vehicle control unit

For coding, use systems described in chapter "Vehicle diagnosis, testing and information system" in "Guided Fault Finding" mode
⇒ Vehicle diagnostic tester.

2.6 Removing and installing rear lid power opening control unit - J938-



Note

If rear lid power opening control unit - J938- is renewed, perform adaptation routines using ⇒ Vehicle diagnostic tester.

Removing

Vehicles with heater and air conditioning unit at rear

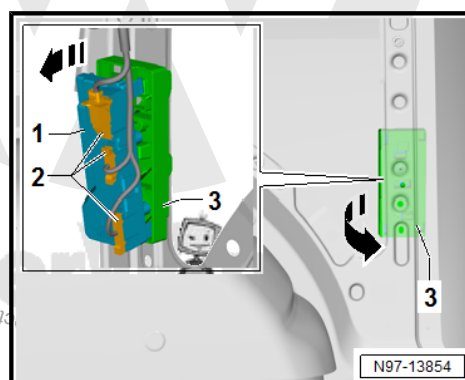
- Remove rear heater and air conditioning unit ⇒ Heating, air conditioning; Rep. gr. 87 ; Rear heater and air conditioning unit; Removing and installing heater and air conditioning unit .

Continued for all vehicles:

- Remove right side panel trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim; Removing and installing luggage compartment side trim .
- Remove rear lid power opening control unit - J938- -1- from bracket -3-.
- Unplug electrical connectors -2-.

Installing

Install in reverse order of removal.





3 Connectors

⇒ ["3.1 Repairing electrical wiring harnesses and plug-in connections", page 299](#)

3.1 Repairing electrical wiring harnesses and plug-in connections

⇒ ["3.1.1 Repairs to electrical wiring harnesses", page 299](#)

⇒ ["3.1.2 Repairing connector housings and connectors", page 299](#)

3.1.1 Repairs to electrical wiring harnesses



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 97 ; Wiring harness and connector repair; Repair of wiring harnesses .

3.1.2 Repairing connector housings and connectors



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 97 ; Wiring harness and connector repair; Repair of connector housings .



4 Releasing and dismantling connector housings



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 97 ; Wiring harness and connector repair; Releasing and dismantling connector housings .



5 Repairing aerial cables



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 97 ; Wiring harness and connector repair; Repair of aerial wires .





6 Fibre optic cables



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 97; Wiring harness and connector repair; Repair of fibre optic cables.



7 Vehicle diagnosis, testing and information systems



Note

All instructions and information about this chapter: ⇒ Electrical system; General information; Rep. gr. 97 ; Vehicle diagnostic, testing and information systems .

