Workshop Manual

Caddy 2004 ➤
Caddy 2011 ➤

Electrical system

Edition 10.2014

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27 - Starter, current supply, CCS

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

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27 – Starter, current supply, CCS

1 Battery

(VRL007279; Edition 10.2014)

⇒ “1.1 General description - battery”, page 1

⇒ “1.2 Assembly overview - battery”, page 1

⇒ “1.3 Disconnecting and reconnecting battery”, page 3

⇒ “1.4 Removing and installing battery”, page 6

⇒ “1.5 Checking battery”, page 11

⇒ “1.6 Charging battery”, page 11

1.1 General description - battery

General information for the batteries is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 27 ; Battery .

1.2 Assembly overview - battery

⇒ “1.2.1 Assembly overview - vehicles without battery monitor control unit J367 ”, page 1

⇒ “1.2.2 Assembly overview - vehicles with battery monitor control unit J367 ”, page 2

1.2.1 Assembly overview - vehicles without battery monitor control unit - J367-

Warning notices and safety regulations

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

Battery terminal connection

All the instructions and information regarding this manual are available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 27 ; Battery; Battery terminal connection .

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1 - Earth wire battery terminal clamp

- ❑ Comply with the instructions regarding threaded connections of the battery terminals ⇒ page 1 .

2 - Securing nut for earth wire battery terminal clamp

- ❑ M6
- ❑ 6 Nm

3 - Positive wire battery terminal clamp

- ❑ Comply with the instructions regarding threaded connections of the battery terminals ⇒ page 1 .

4 - Securing nut for positive wire battery terminal clamp

- ❑ M6
- ❑ 6 Nm

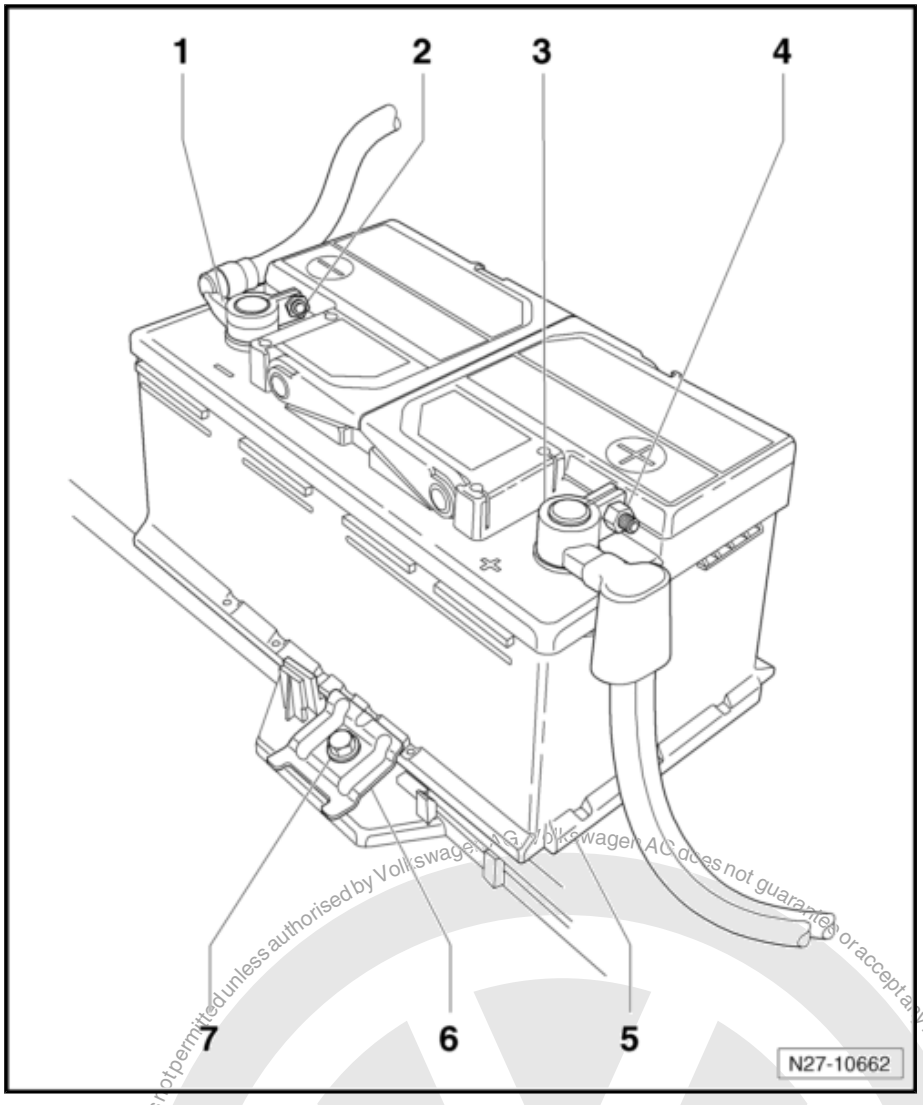
5 - Battery

- ❑ Removing and installing ⇒ page 6 .

6 - Clamping plate

7 - Clamping plate securing nut

- ❑ M8 x 35
- ❑ 20 Nm



1.2.2 Assembly overview - vehicles with battery monitor control unit - J367-

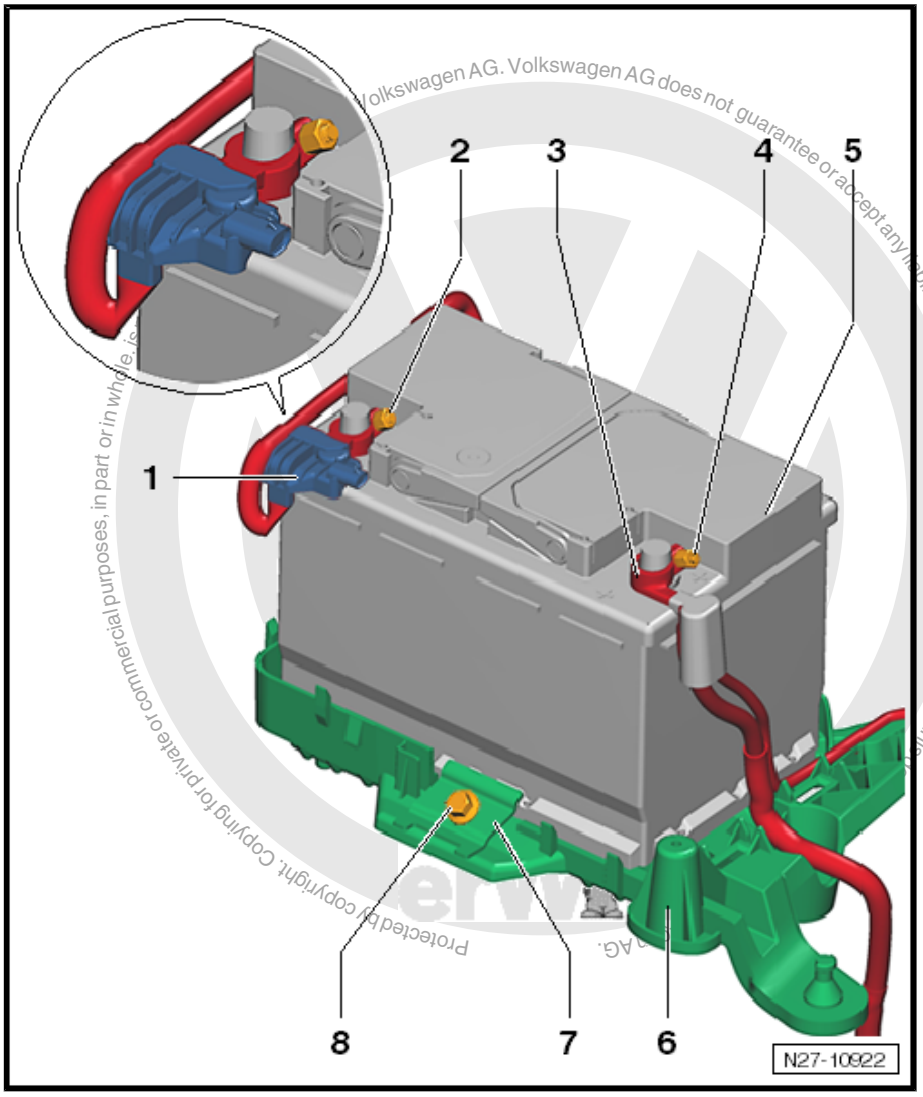
Warning notices and safety regulations

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

Battery terminal connection

All the instructions and information regarding this manual are available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 27 ; Battery; Battery terminal connection .

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

- ❑ Battery monitor control unit - J367- only in vehicles with Start/Stop system.
- ❑ Comply with the instructions regarding threaded connections of the battery terminals ⇒ page 2 .
- ❑ Comply with instructions regarding battery monitoring control unit - J367- (battery sensor) ⇒ page 95 .

2 - Securing nut for earth wire battery terminal clamp

- ❑ M6
- ❑ 6 Nm

3 - Positive wire battery terminal clamp

- ❑ Comply with the instructions regarding threaded connections of the battery terminals ⇒ page 2 .

4 - Securing nut for positive wire battery terminal clamp

- ❑ M6
- ❑ 6 Nm

5 - Battery

- ❑ Removing and installing ⇒ page 6 .
- ❑ Parametering battery after replacement ⇒ page 11

6 - Battery carrier

7 - Clamping plate

8 - Clamping plate securing nut

- ❑ M8 x 35
- ❑ 20 Nm

1.3 Disconnecting and reconnecting battery

WARNING

Danger of injury! Comply with the warning notices and safety regulations ⇒ page 1 !

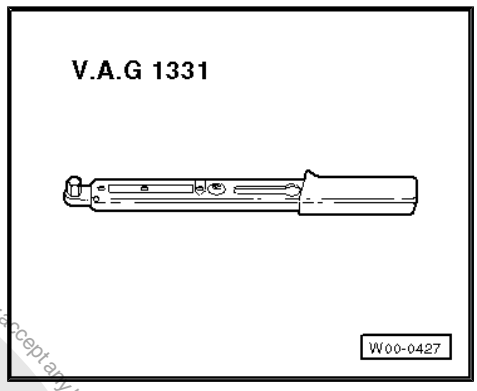
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Note

- *The order in which the work steps is carried out should be followed carefully.*
- *Disconnecting the battery earth strap (open circuit) provides a safe working environment for repairs to the electrical system.*
- *The battery positive wire need only be disconnected for removal of the battery.*

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-

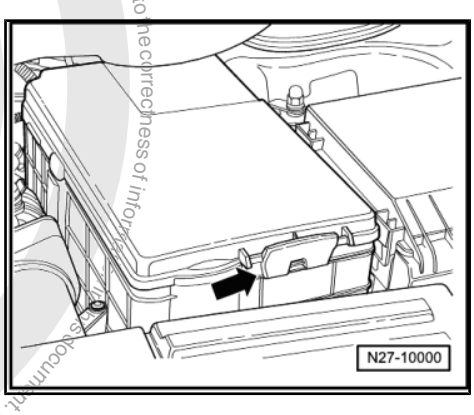


Disconnecting battery:

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

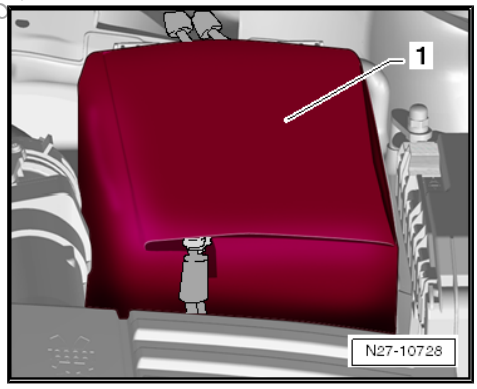
Only for vehicles with battery housing:

– Open locking device -arrow- and remove battery housing cover.



Only for vehicles with battery protective jacket:

– Open cover -1- of battery protective jacket.



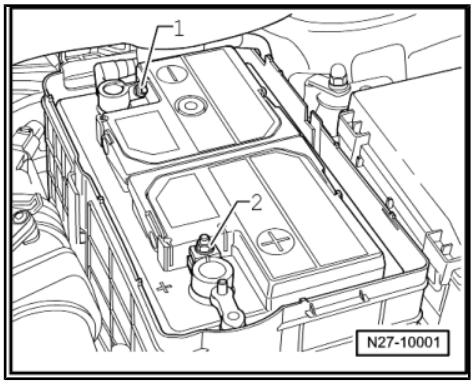
Note

In new vehicles, the battery box has been discontinued. Heat insulation has been fitted around the battery instead.

Continuation for all vehicles:

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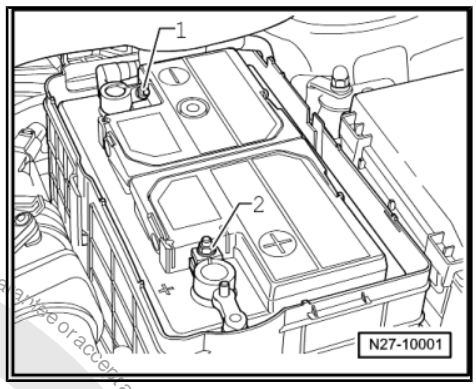
– Loosen securing nut -1- and disconnect battery earth cable from battery negative terminal.
– Then, loosen securing nut -2- and disconnect battery positive cable from battery positive terminal.



Connecting battery:

> **Caution**
>
> ***Battery terminal clamps must be fitted only by hand without force to prevent damage to battery housing.***
>
> ***Battery terminals must not be greased.***

– Fit positive cable clamp -2- onto battery positive terminal and tighten securing nut to 6 Nm.
– Fit earth cable clamp -1- onto battery negative terminal and tighten securing nut to 6 Nm.
– Fit cover for battery housing and lock it in position or close battery protective jacket.
– Work through steps listed in table.



Procedure	Performed
Using ignition key, switch ignition: on and then off again	
Read event memory: ⇒ Guided fault finding with vehicle diagnostic tester	
Steering angle sender - carry out zero compensation: ⇒ Guided fault finding with vehicle diagnostic tester	
Clock: Check clock setting, adjust if necessary.	
Electric window regulators: Fully open and then close all windows.	
Functional check: All electrical consumers	

Chart can be printed out as required.

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1.4 Removing and installing battery

⇒ “1.4.1 Removing and installing battery, vehicles with petrol engine”, page 6

⇒ “1.4.2 Removing and installing battery, vehicles with diesel engine”, page 8

⇒ “1.4.3 Parameterising battery after replacement, vehicles with Start/Stop system”, page 11

1.4.1 Removing and installing battery, vehicles with petrol engine

Replacing battery on vehicles with Start/Stop system:

Because of its higher deep-cycle resistance, only an absorbent glass mat battery is used as a starter battery instead of the normal lead battery in vehicles with Start/Stop system.

In case of repair, note correct part number designation in ETKA. The modified components for the Start/Stop system have no special markings. They do not differ externally, or hardly, from standard components.

Note

- *In vehicles with a battery sensor (start-stop system), the battery has to be parameterised after a new starter battery has been installed.*
- *The battery parameterisation sends the technical data of the new battery to the battery monitor.*
- *Performing battery parameterisation ⇒ page 11 .*

WARNING

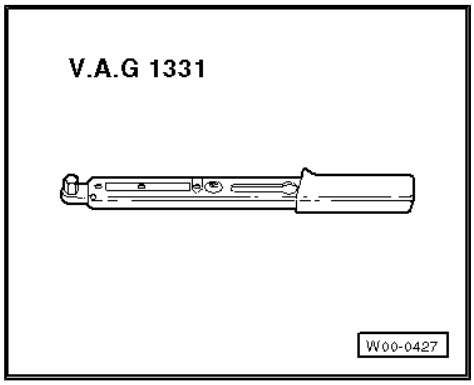
Danger of injury! Comply with the warning notices and safety regulations ⇒ page 1 !

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

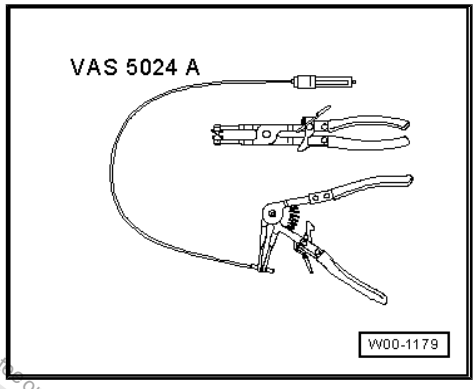
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



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♦ Spring-type clip pliers - VAS 5024A-



Removing battery:

On vehicles with rear wing doors only:

– Pull out dipstick.

– Remove engine cover panel.

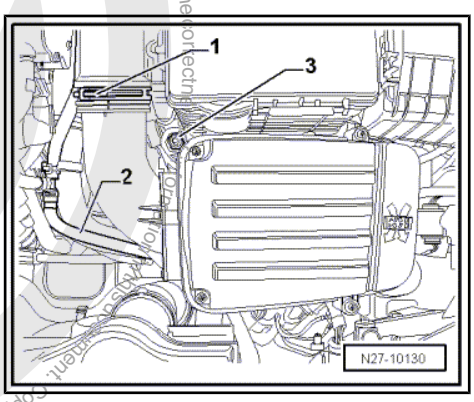
Continuation for all vehicles:

– Disconnect battery ⇒ page 3 .

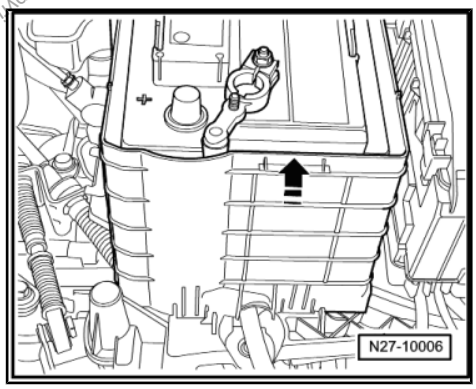
– Loosen spring-type clip -1-, pull off vacuum hose -2- and undo bolt -3- of air filter housing.

– Pull suction hose off air filter housing.

– Pull air filter housing upwards out of the brackets and remove.



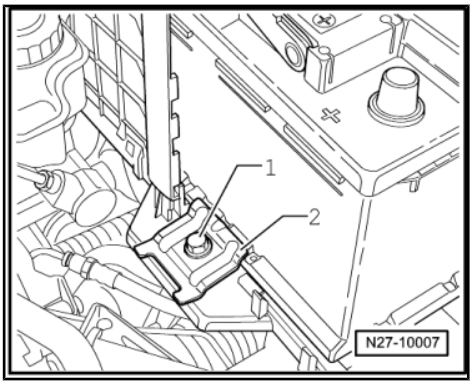
– Pull wall of battery box upwards in direction of arrow.



Note

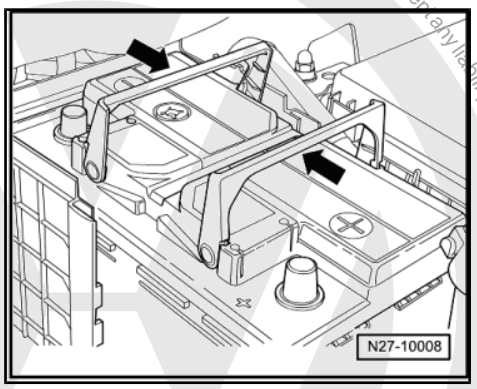
In new vehicles, the battery box has been discontinued. Heat insulation has been fitted around the battery instead.

– Unscrew securing bolt -1- and remove clamping plate -2-.



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– Fold grips -arrows- upwards and remove battery.



Installing battery

Install in the reverse order of removal. When doing this, note the following:

Caution

A loosely fitted battery creates the following dangers:

- ***Shortened service life due to damage from vibration (danger of explosion)***
- ***The cells in the battery will be damaged if the battery is not secured correctly.***
- ***Damage to battery housing by securing bracket (possibility of acid leaking, with high consequential costs)***
- ***Poor crash safety.***

– Tighten bolt for securing battery clamping plate to 20 Nm.

– After installing battery, check it is firmly seated.

– Connecting battery ⇒ page 3 .

On vehicles with start-stop system, the procedure “parameterising battery after replacement” has to be performed after the battery is replaced to ensure that the start-stop system subsequently works properly ⇒ page 11 .

1.4.2 Removing and installing battery, vehicles with diesel engine

Replacing battery on vehicles with Start/Stop system:

Because of its higher deep-cycle resistance, only an absorbent glass mat battery is used as a starter battery instead of the normal lead battery in vehicles with Start/Stop system.

In case of repair, note correct part number designation in ETKA. The modified components for the Start/Stop system have no special markings. They do not differ externally, or hardly, from standard components.

Note

- *In vehicles with a battery sensor (start-stop system), the battery has to be parameterised after a new starter battery has been installed.*
- *The battery parameterisation sends the technical data of the new battery to the battery monitor.*
- *Performing battery parameterisation ⇒ page 11 .*

WARNING

Danger of injury! Comply with the warning notices and safety regulations ⇒ page 1 !

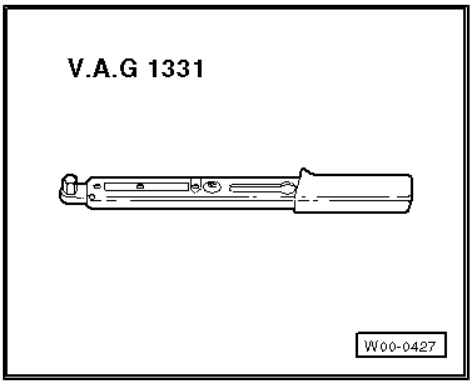
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Caution

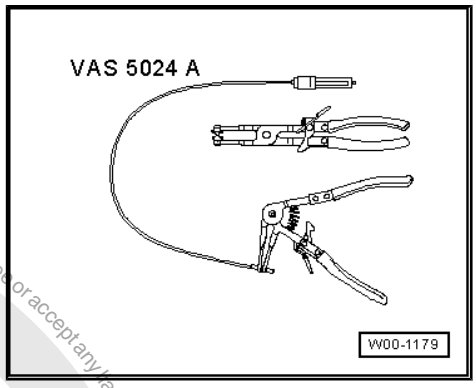
To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



- Spring-type clip pliers - VAS 5024A-

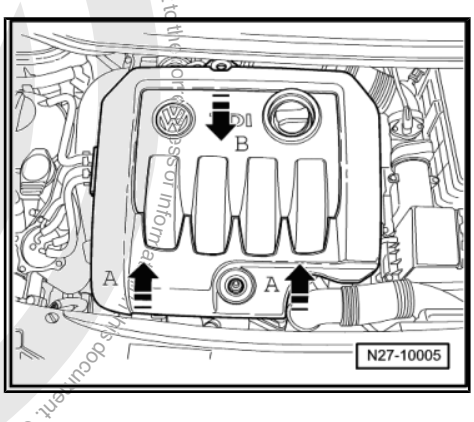


Removing battery:

On vehicles with rear wing doors only:

– Pull out dipstick.

– Pull engine cover panel upwards -arrows A- and forwards -arrow B-.



Continuation for all vehicles:

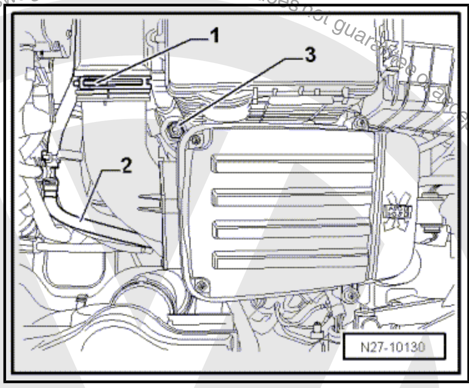
– Disconnect battery ⇒ page 3 .

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– Loosen spring-type clip -1-, pull off vacuum hose -2- and undo bolt -3- of air filter housing.

– Pull suction hose off air filter housing.

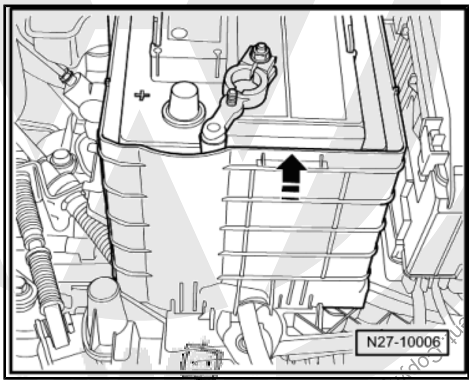
– Pull air filter housing upwards out of the brackets and remove.



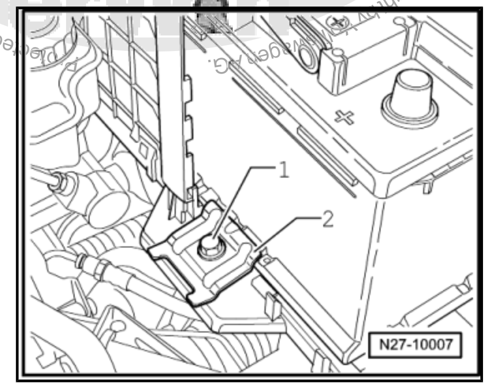
– Pull wall of battery box upwards in direction of arrow.

Note

In new vehicles, the battery box has been discontinued. Heat insulation has been fitted around the battery instead.

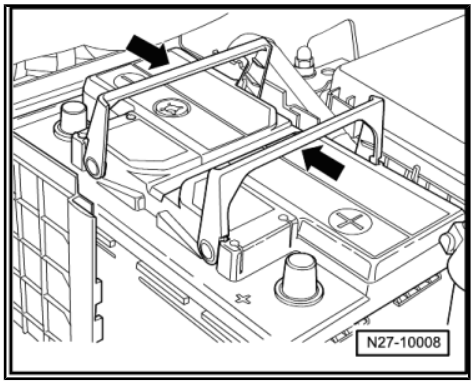


– Unscrew securing bolt -1- and remove clamping plate -2-.



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– Fold grips -arrows- upwards and remove battery.



Installing battery

Install in the reverse order of removal. When doing this, note the following:

> **Caution**
>
> *A loosely fitted battery creates the following dangers:*
>
> - *Shortened service life due to damage from vibration (danger of explosion)*
> - *The cells in the battery will be damaged if the battery is not secured correctly.*
> - *Damage to battery housing by securing bracket (possibility of acid leaking, with high consequential costs)*
> - *Poor crash safety.*

– Tighten bolt for securing battery clamping plate to 20 Nm.

– After installing battery, check it is firmly seated.

– Connecting battery ⇒ page 3 .

On vehicles with start-stop system, the procedure “parameterising battery after replacement” has to be performed after the battery is replaced to ensure that the start-stop system subsequently works properly ⇒ page 11 .

1.4.3 Parameterising battery after replacement, vehicles with Start/Stop system

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Battery monitoring
- Battery monitoring function
- Parametering battery after replacement

1.5 Checking battery

General information for checking batteries is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 27 ; Checking battery .

1.6 Charging battery

General information for checking batteries is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 27 ; Checking battery .

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2 Starter

⇒ “2.1 Assembly overview - starter”, page 12

⇒ “2.2 Removing and installing starter”, page 13

⇒ “2.3 Checking starter ”, page 42

2.1 Assembly overview - starter

1 - Starter

- ❑ Removing and installing ⇒ page 13 .
- ❑ Checking ⇒ page 42 .
- ❑ Earth cable to starter bolt: 20 Nm.
- ❑ Wiring retainer to starter securing bolt: 15 Nm.

2 - Battery positive wire connection to starter

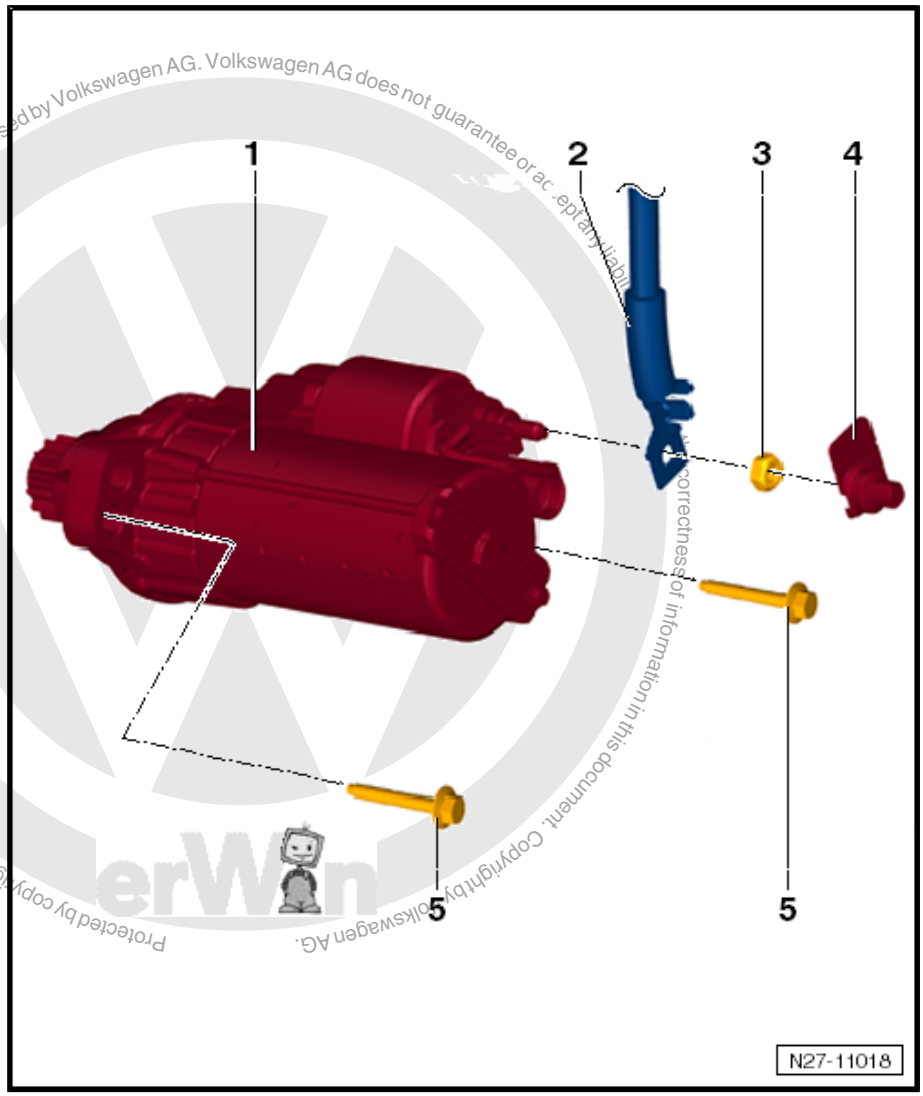
3 - Battery positive wire securing nut to starter

- ❑ M8
- ❑ 20 Nm

4 - Protective cap

5 - Starter securing bolts

- ❑ M10 = 60 Nm
- ❑ M12 = 75 Nm



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♦ Air filter housing to body: 10 Nm.

2.2 Removing and installing starter

⇒ “2.2.1 Removing and installing starter, 1.2 l injection engine, manual gearbox”, page 13

⇒ “2.2.2 Removing and installing starter, 1.4 l injection engine, manual gearbox”, page 15

⇒ “2.2.3 Removing and installing starter, 1.6 l injection engine, manual gearbox”, page 17

⇒ “2.2.4 Removing and installing starter, 2.0 l SDI engine, manual gearbox”, page 20

⇒ “2.2.5 Removing and installing starter, 1.6 l TDI engine, manual gearbox”, page 24

⇒ “2.2.6 Removing and installing starter, 1.9 l TDI engine, manual gearbox”, page 28

⇒ “2.2.7 Removing and installing starter, 2.0 l TDI engine, manual gearbox”, page 32

⇒ “2.2.8 Removing and installing starter, 2.0 l natural gas engine, manual gearbox”, page 36

⇒ “2.2.9 Removing and installing starter, 1.9 l TDI engine, dual clutch gearbox”, page 39

2.2.1 Removing and installing starter, 1.2 l injection engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

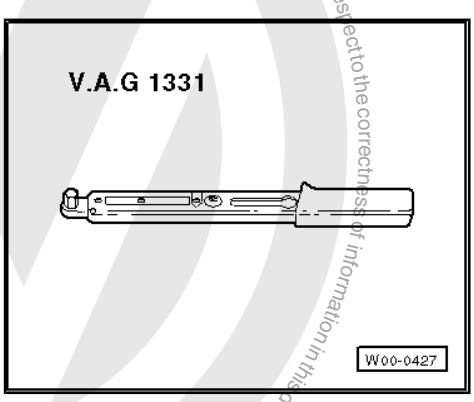
When renewing starter, make sure the new one with the correct part designation as shown in ⇒ ETKA (Electronic Parts Catalogue) is used. Components adapted to Start/Stop system are not identified separately and are not or barely different from normal components in their appearance.

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

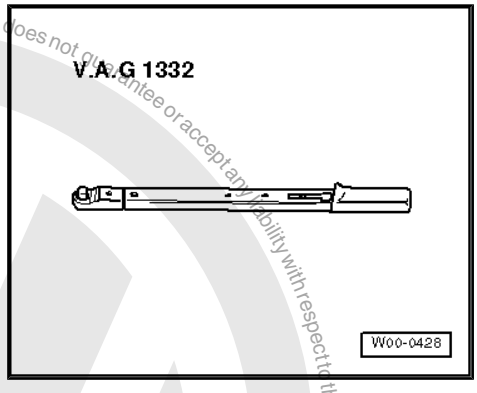
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



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♦ Torque wrench - V.A.G 1332-

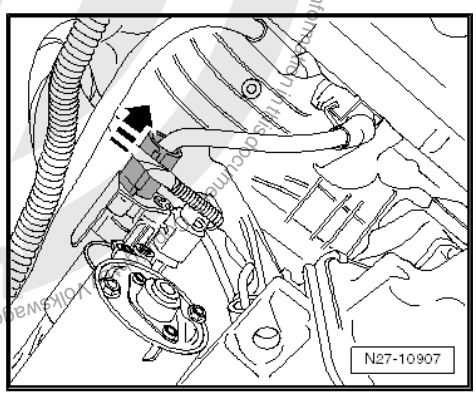


Removing:

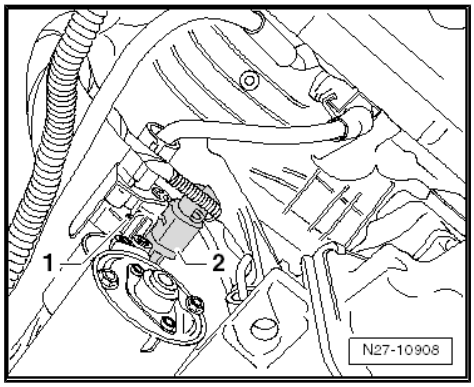
– Disconnect battery ⇒ page 3 .

– Remove air filter housing ⇒ Engine; Rep. gr. 24 ; Injection system; Assembly overview - air filter .

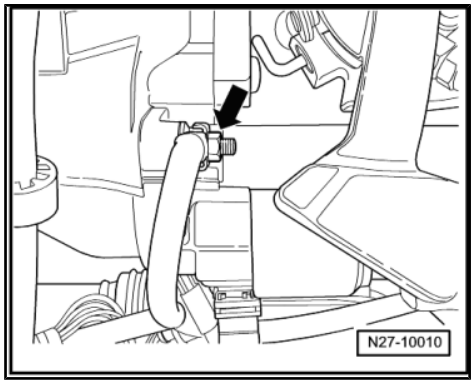
– Push protective caps off solenoid switch downwards in direction of -arrow-.



– Unbolt positive cable -1- and release and disconnect electrical connector of terminal 50 -2-.



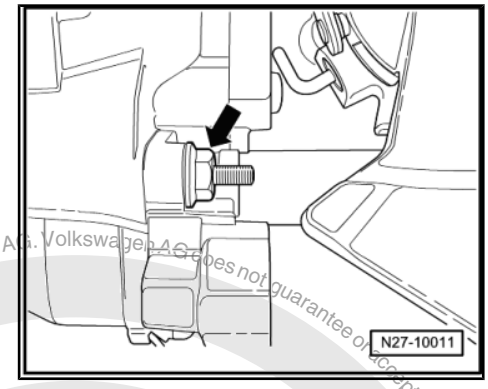
– Unscrew and remove earth wire from upper starter bolt -arrow-.



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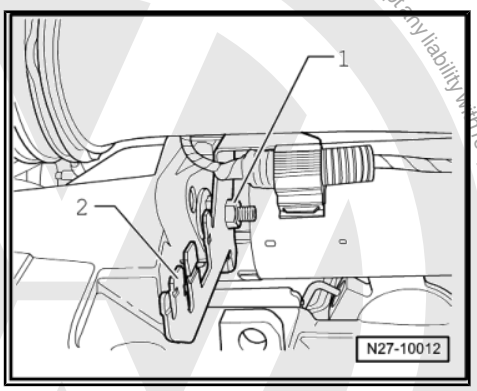
– Undo upper starter bolt -arrow-.

– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



– Undo nut -1- and remove it from lower securing bolt of starter.

– Remove wire holder -2-.



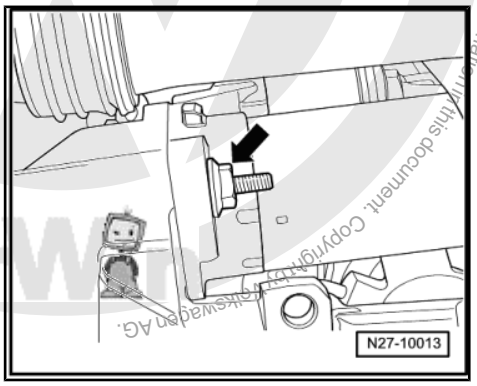
– Undo lower starter bolt -arrow-.

– Remove starter by taking it downwards out of the vehicle.

Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .



2.2.2 Removing and installing starter, 1.4 l injection engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

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

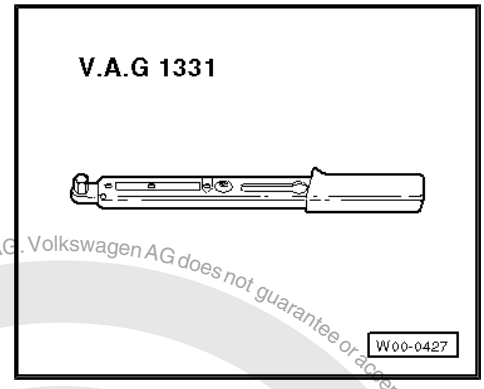
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

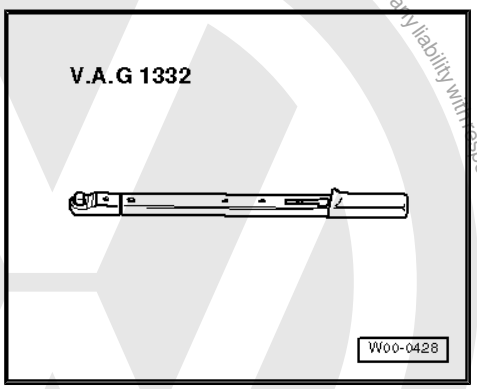
Special tools and workshop equipment required

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- Torque wrench (5 - 50 Nm) - V.A.G 1331-

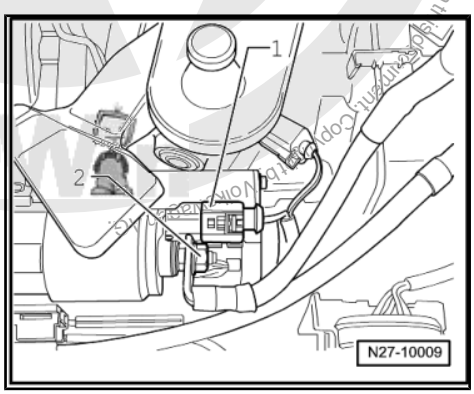


- Torque wrench (40 - 200 Nm) - V.A.G 1332-

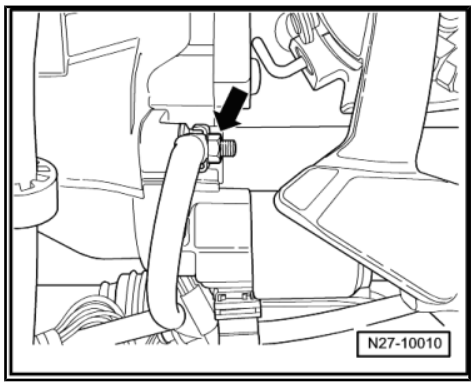


Removing:

– Disconnect battery ⇒ page 3 .
– Release and disconnect connector of terminal 50 -1-.
– Unbolt positive cable -2-.

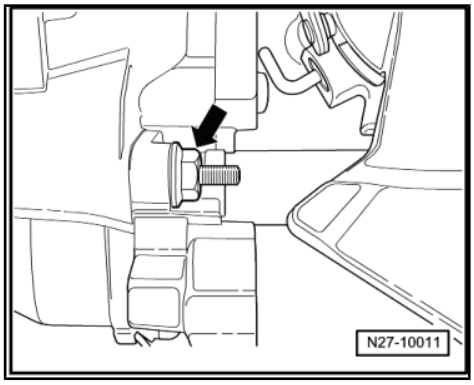


– Unscrew and remove earth wire from starter bolt -arrow-.

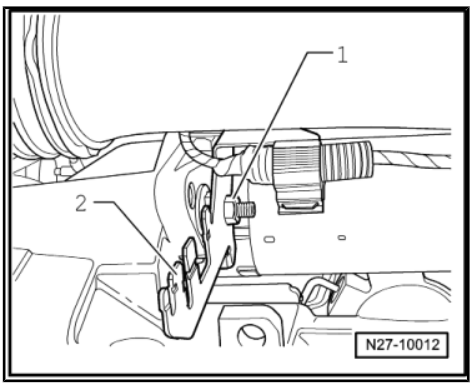


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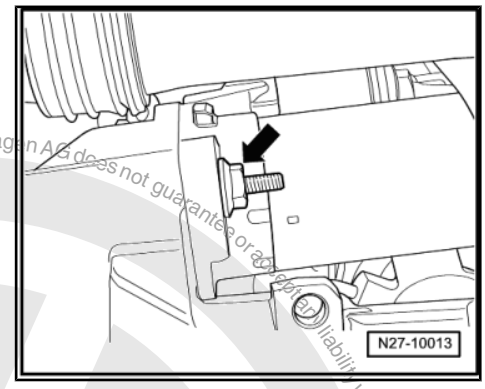
– Undo upper starter bolt -arrow-.
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



– Unscrew securing nut -1- from starter securing bolt and remove bracket -2-.



– Undo lower starter bolt -arrow-.
– Remove starter.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .

2.2.3 Removing and installing starter, 1.6 l injection engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

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

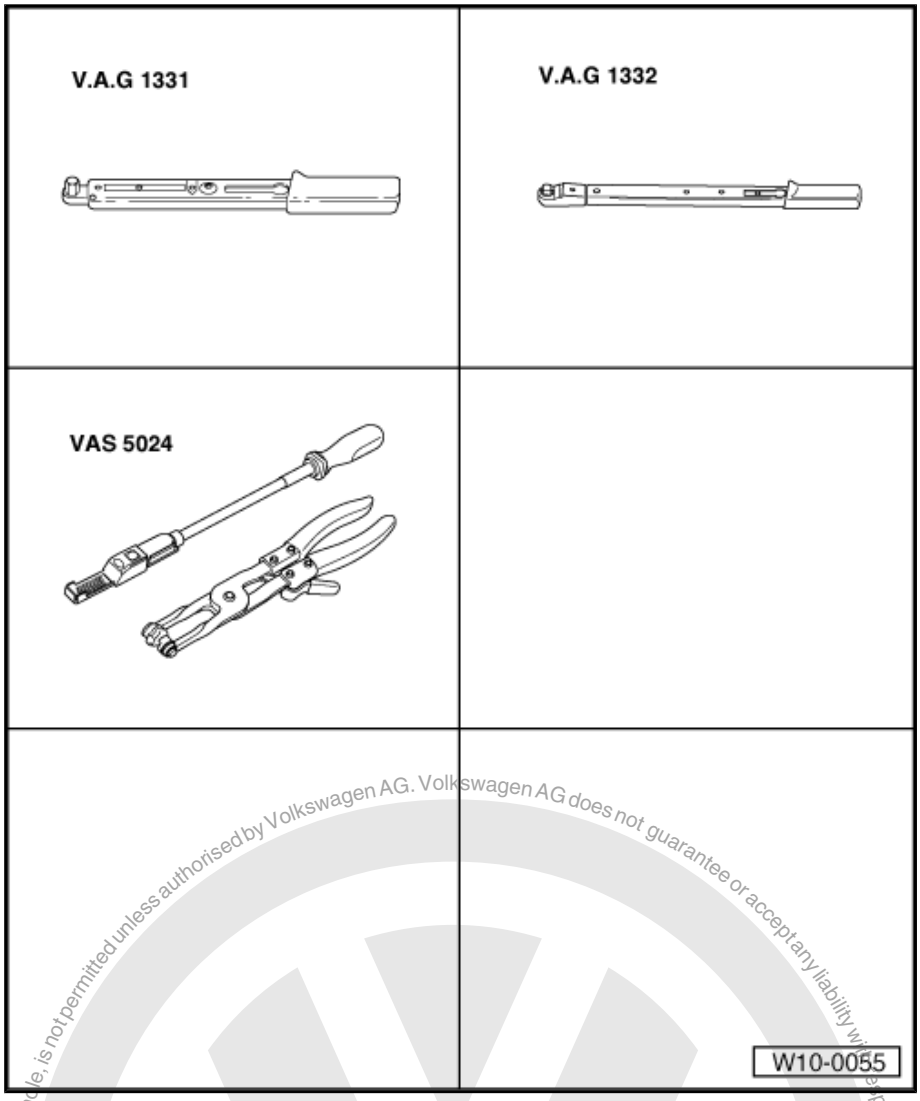
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

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Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Spring-type clip pliers - VAS 5024-

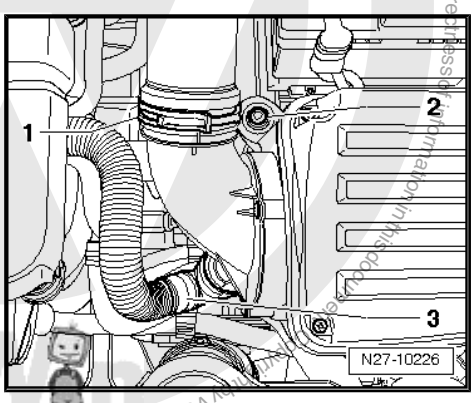


Removing:

– Disconnect battery ⇒ page 3

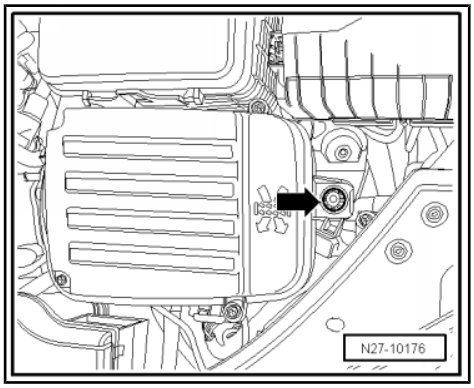
– Loosen spring-type clip -1- using spring-type clip pliers - VAS 5024- and undo and remove bolt -2-.

– Release hose -3- and pull off air filter housing.

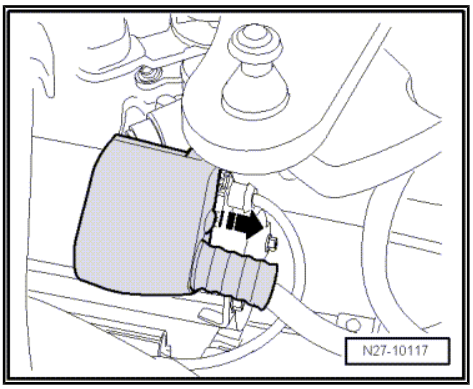


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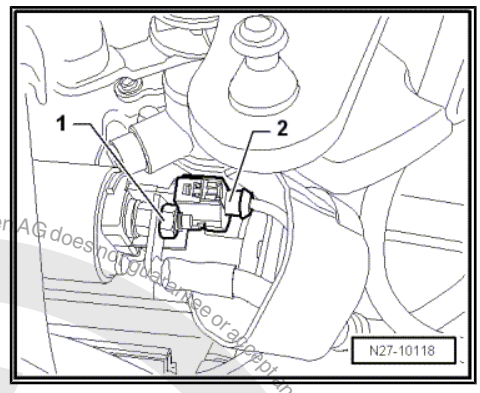
– Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
– Remove air filter housing from vehicle.



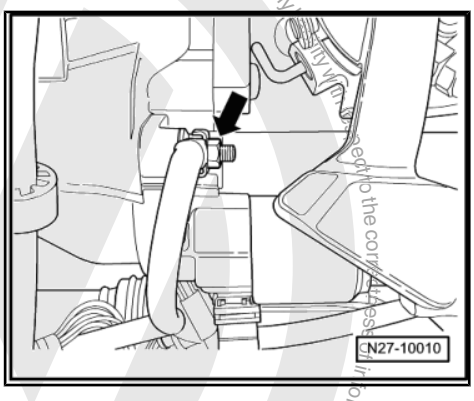
– Push protective cap off solenoid switch downwards in direction of -arrow-.



– Release and disconnect connector of terminal 50 -2-.
– Unbolt positive cable -1-.



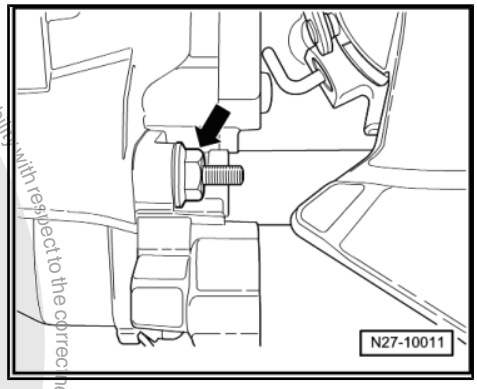
– Unscrew and remove earth wire from starter bolt -arrow-.



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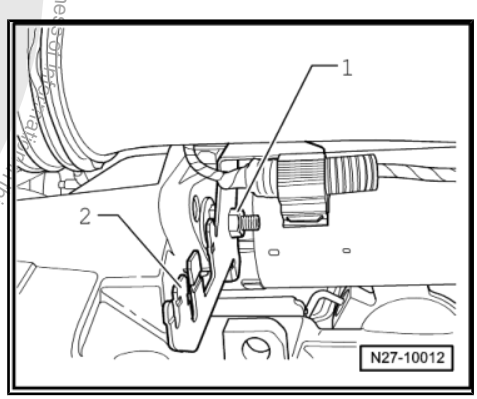
– Undo upper starter bolt -arrow-.

– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



– Undo nut -1- and remove it from lower securing bolt of starter.

– Remove wire holder -2-.



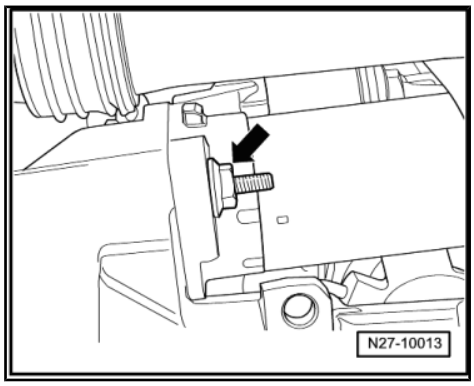
– Undo lower starter bolt -arrow-.

– Remove starter.

Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .



2.2.4 Removing and installing starter, 2.0 l SDI engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

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

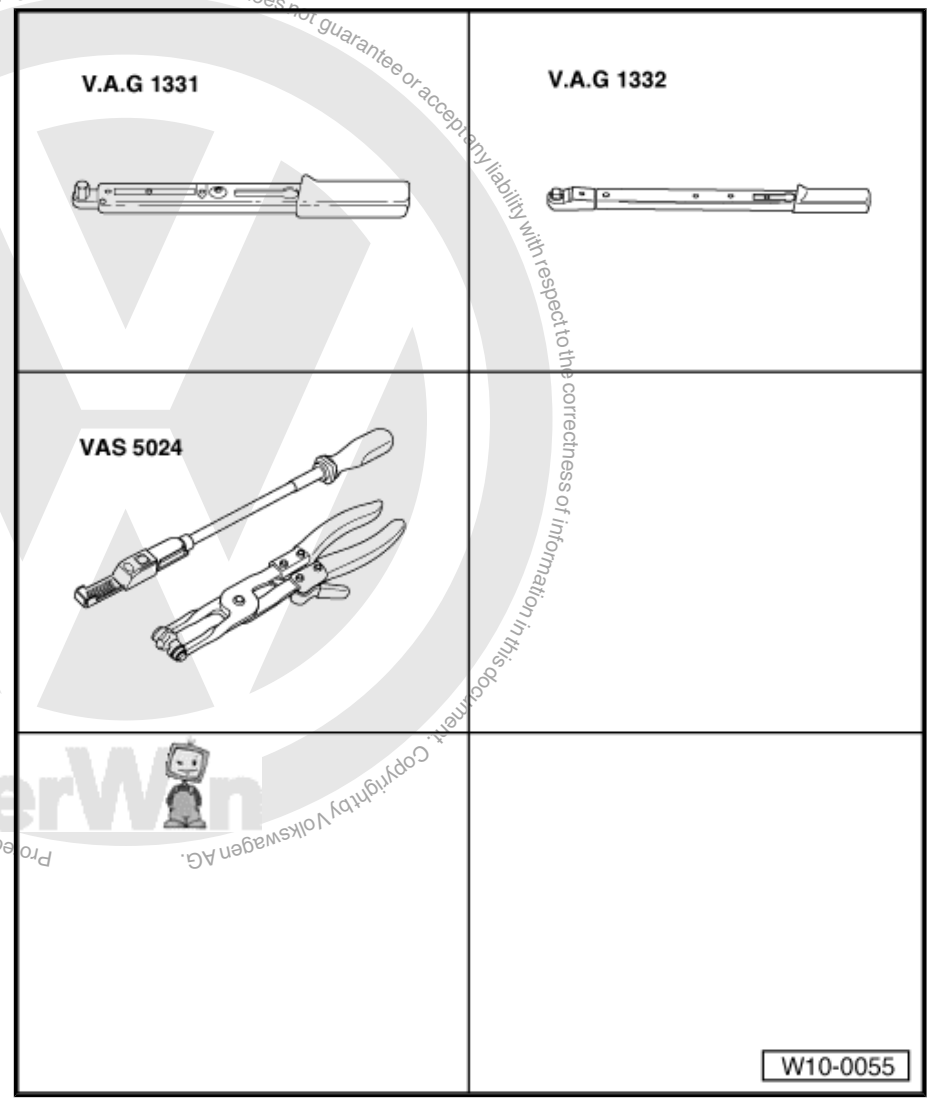
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

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Special tools and workshop equipment required

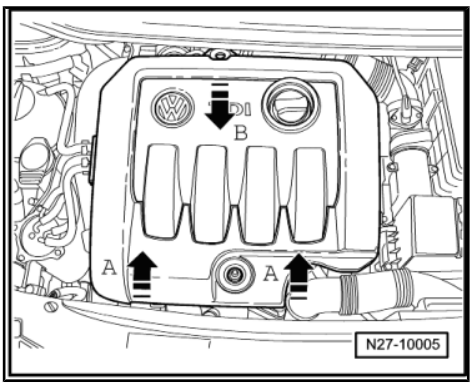
- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Spring-type clip pliers - VAS 5024-



Removing:

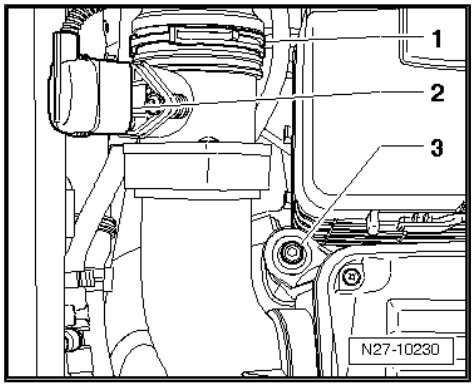
– Disconnect battery ⇒ page 3 .

– Pull engine cover panel upwards -arrows A- and forwards -arrow B-.

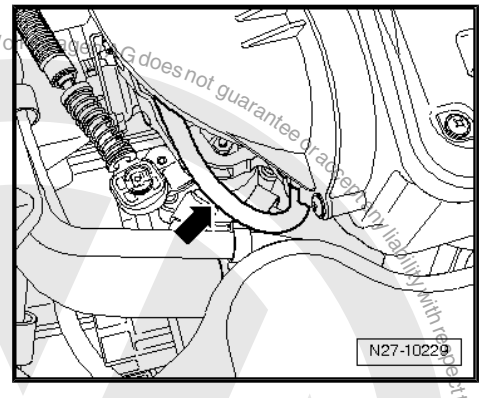


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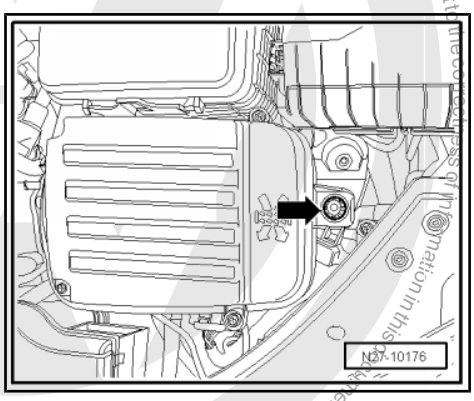
– Loosen spring-type clip -1- using spring-type clip pliers - VAS 5024- .
– Release and disconnect electrical connector -2-.
– Remove securing bolt -3-.



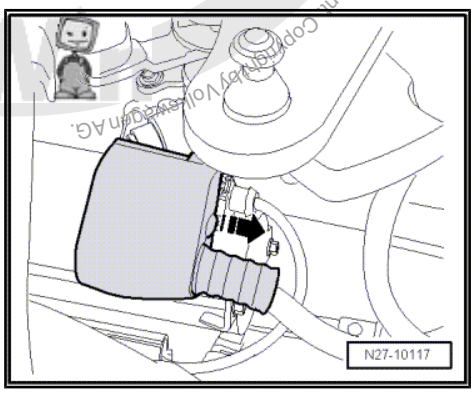
– Pull off vacuum hose -arrow-.



– Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
– Remove air filter housing from vehicle.

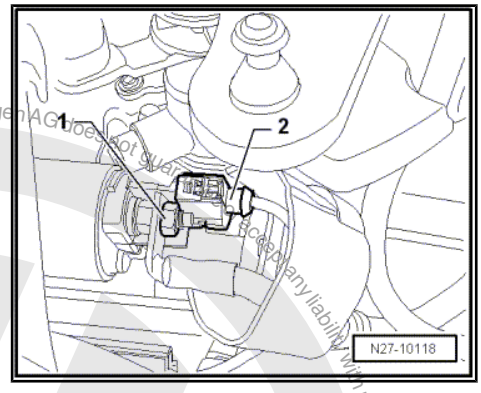


– Push protective cap off solenoid switch downwards in direction of -arrow-.

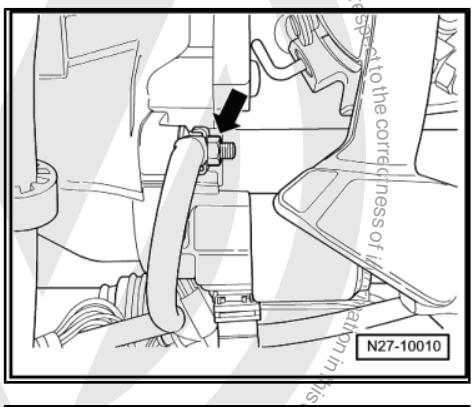


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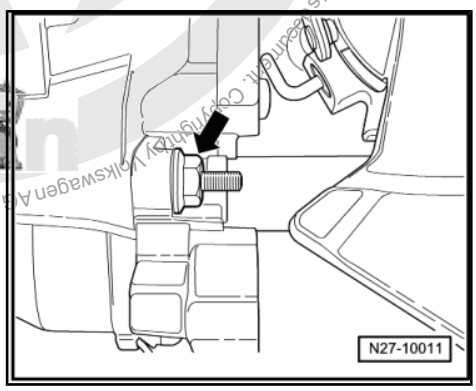
– Release and disconnect connector of terminal 50 -2-.
– Unbolt positive cable -1-.



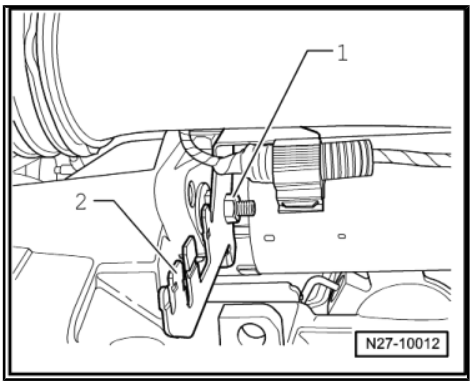
– Unscrew and remove earth wire from starter bolt -arrow-.



– Undo upper starter bolt -arrow-.
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation.



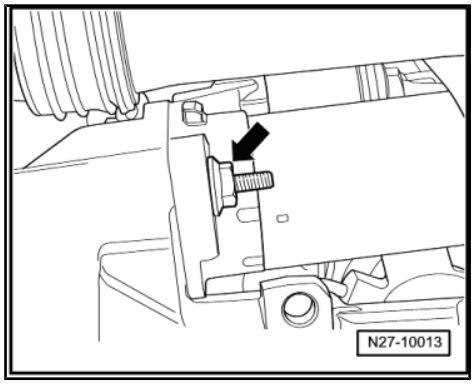
– Undo nut -1- and remove it from lower securing bolt of starter.
– Remove wire holder -2-.



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– Undo lower starter bolt -arrow-.

– Remove starter.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .

2.2.5 Removing and installing starter, 1.6 l TDI engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

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

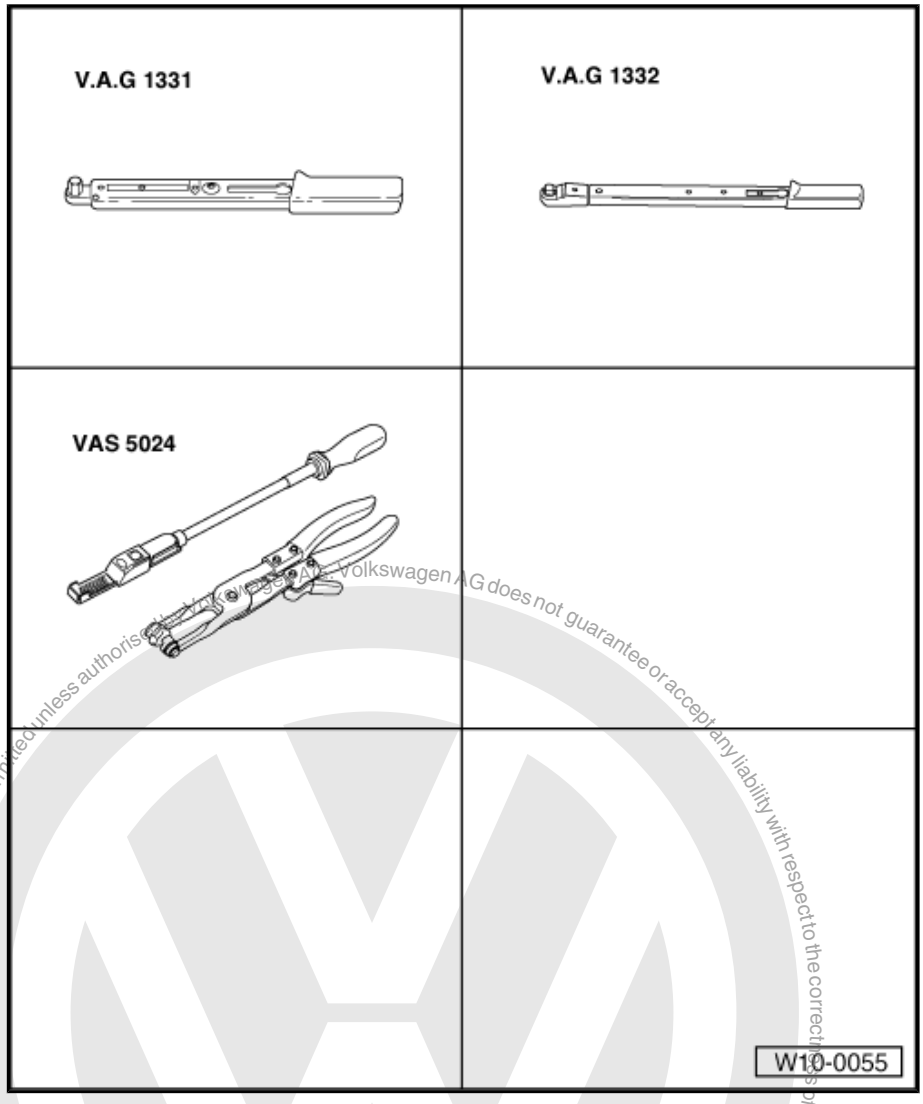
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ***⇒ page 3*** ***.***

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Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Spring-type clip pliers - VAS 5024-

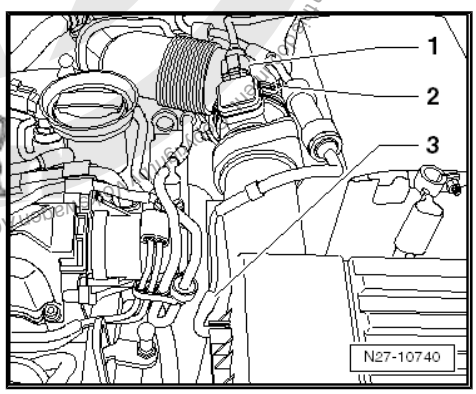


Removing:

– Disconnect battery ⇒ page 3 .

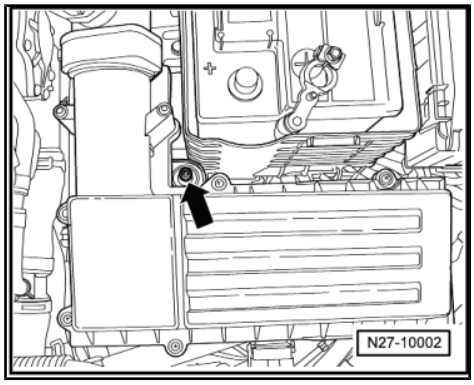
– Release and disconnect electrical connector -1-.

– Loosen spring-type clip -2- using spring-type clip pliers - VAS 5024- and pull vacuum hose -3- off.

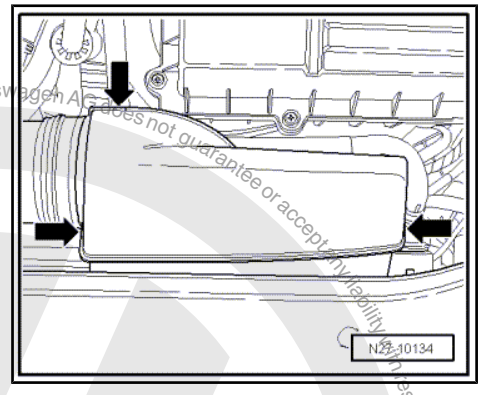


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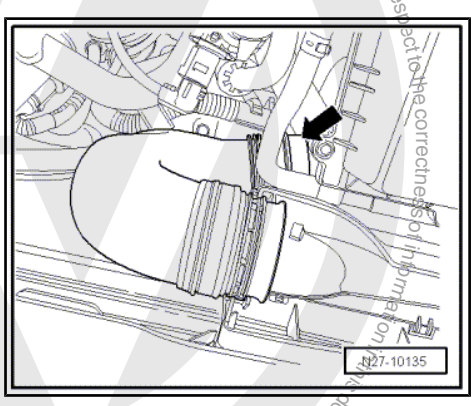
– Unscrew securing bolt -arrow- of air filter housing.



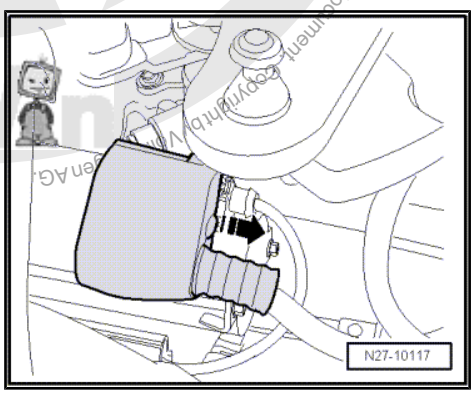
– Release locking lug -arrow- and remove cover.



– Pull hose -arrow- off air filter housing and remove.
– Pull air filter housing upwards out of its rubber mountings and remove from vehicle.

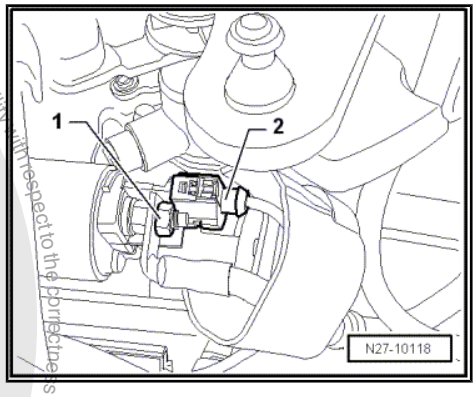


– Push protective cap off solenoid switch downwards in direction of -arrow-.

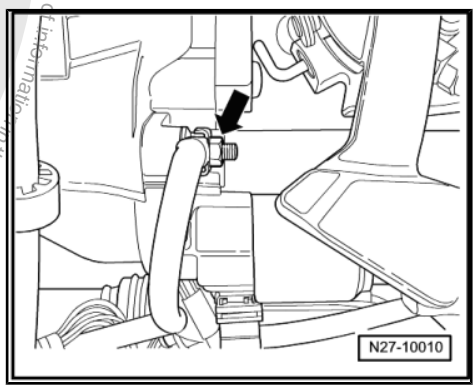


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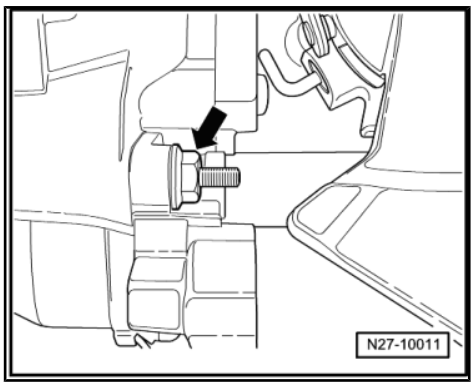
– Release and disconnect connector of terminal 50 -2-.
– Unbolt positive cable -1-.



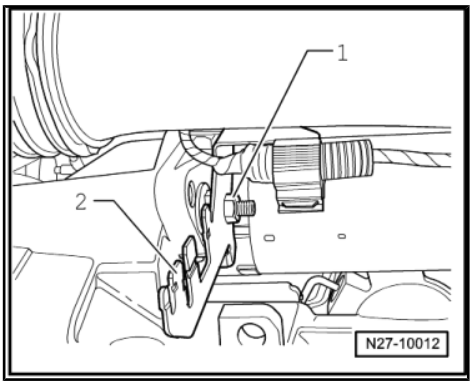
– Undo nut -arrow- of upper bolt securing the starter and remove earth wire.



– Undo upper starter bolt -arrow-.
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



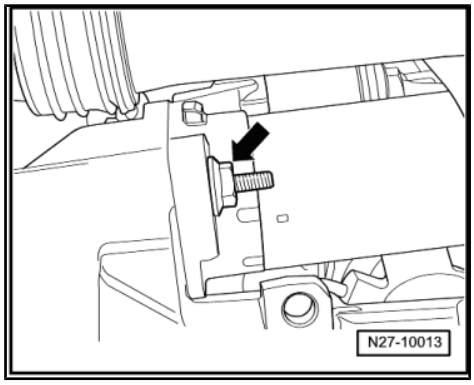
– Undo nut -1- and remove it from lower bolt securing the starter.
– Remove wire holder -2-.



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– Undo lower starter bolt -arrow-.

– Remove starter by taking it downwards out of the vehicle.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .

2.2.6 Removing and installing starter, 1.9 l TDI engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

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

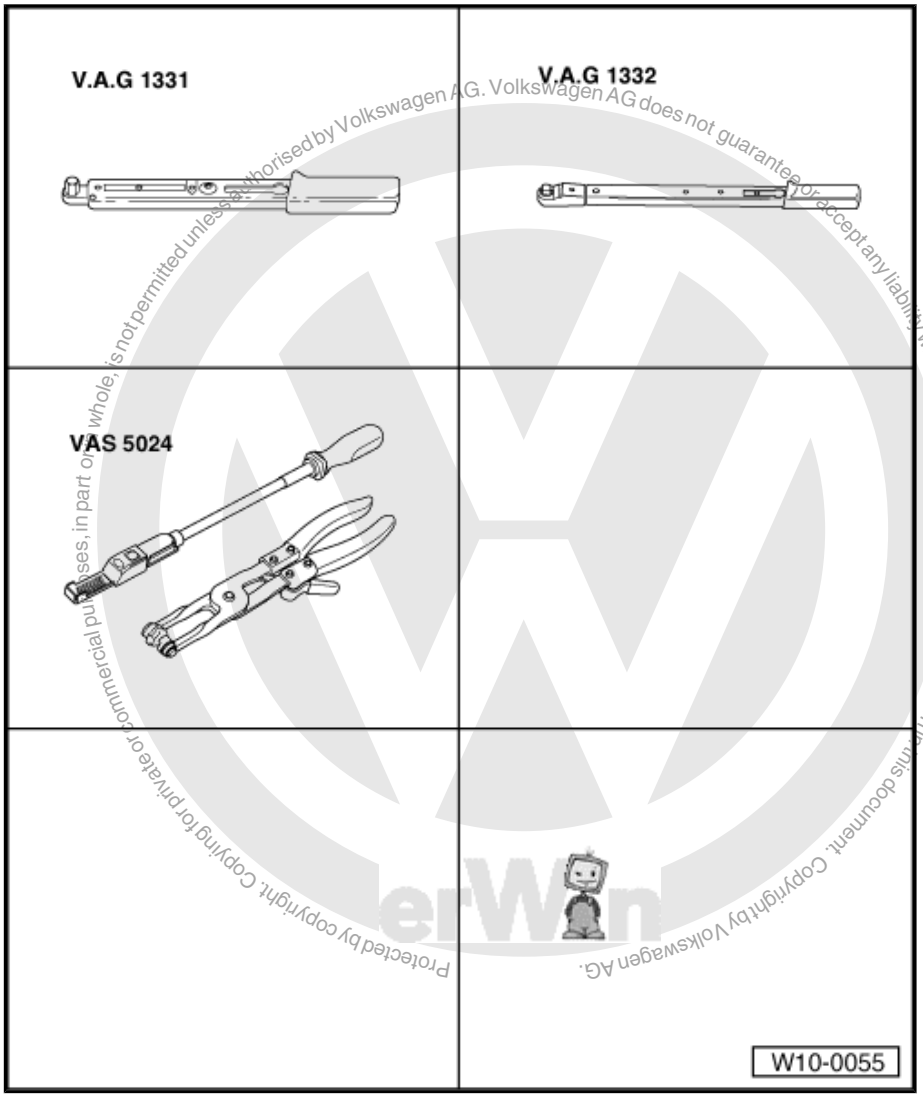
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

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Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Spring-type clip pliers - VAS 5024-

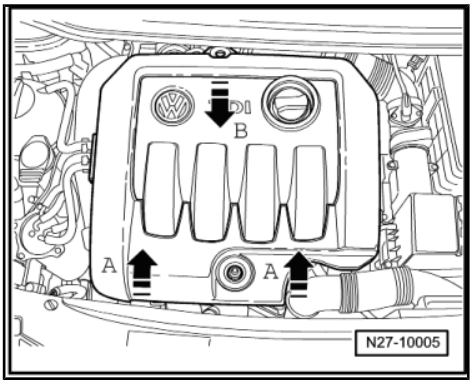


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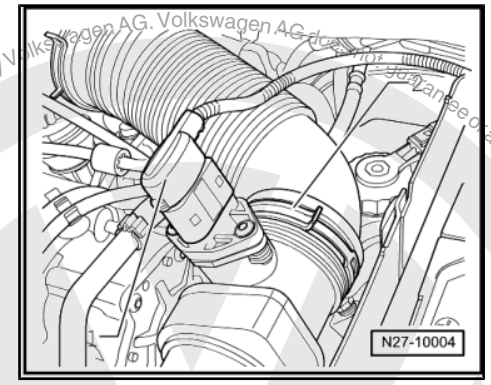
Removing:

– Disconnect battery ⇒ page 3 .

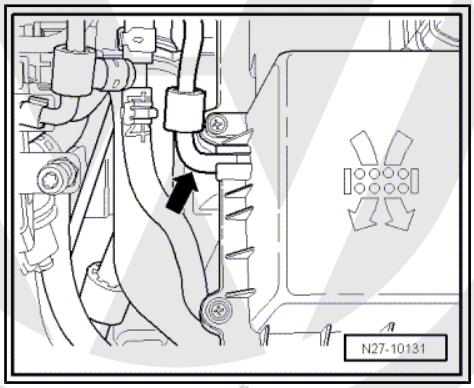
– Pull engine cover panel upwards -arrows A- and forwards -arrow B-.



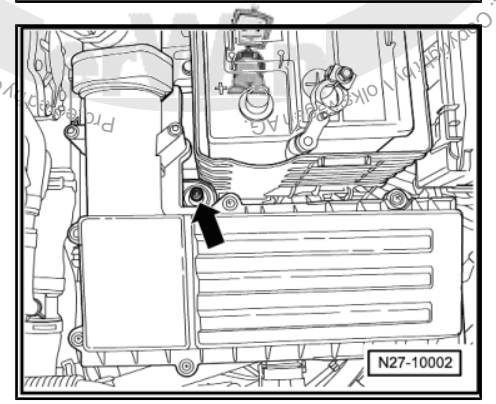
– Release and disconnect electrical connector -1-.
– Loosen spring-type clip -2- using spring-type clip pliers - VAS 5024- .



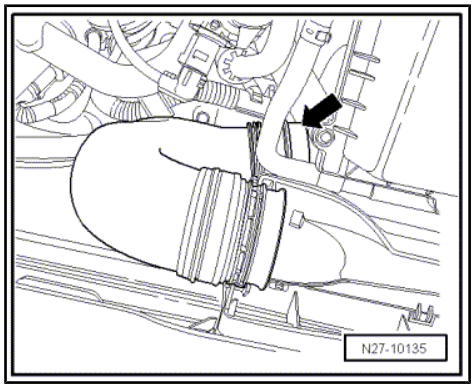
– Pull vacuum hose -arrow- off air filter housing.



– Unscrew securing bolt -arrow- of air filter housing.

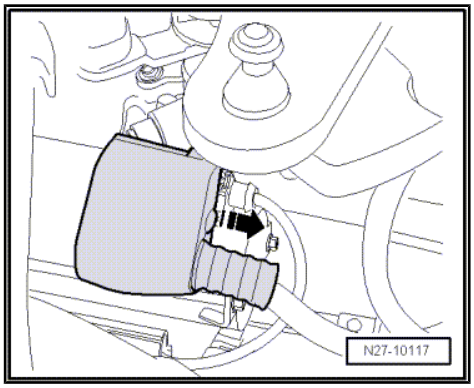


– Pull hose -arrow- off air filter housing and remove.
– Pull air filter housing upwards out of the brackets and remove.

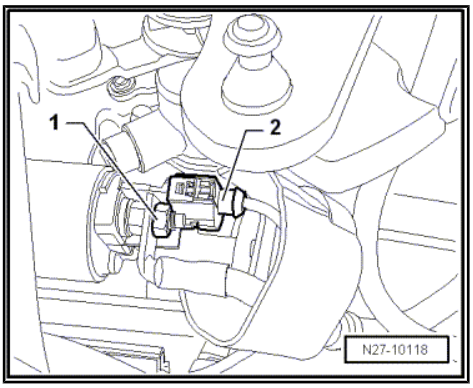


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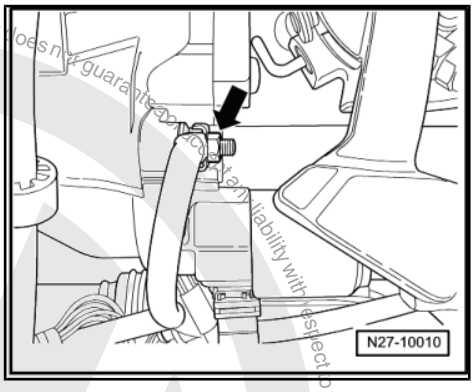
– Push protective cap off solenoid switch downwards in direction of -arrow-.



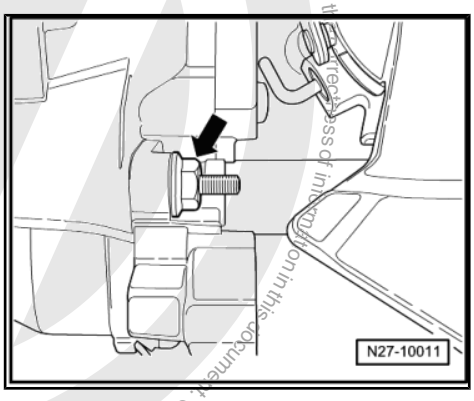
– Release and disconnect connector of terminal 50 -2-.
– Unbolt positive cable -1-.



– Unscrew and remove earth wire from starter bolt -arrow-.

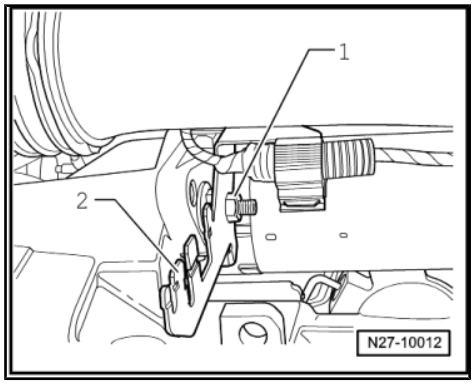


– Undo upper starter bolt -arrow-.
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

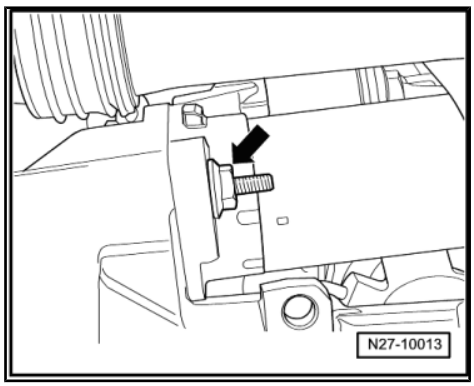


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– Undo nut -1- and remove it from lower securing bolt of starter.
– Remove wire holder -2-.



– Undo lower starter bolt -arrow-.
– Remove starter.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .

2.2.7 Removing and installing starter, 2.0 l TDI engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

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

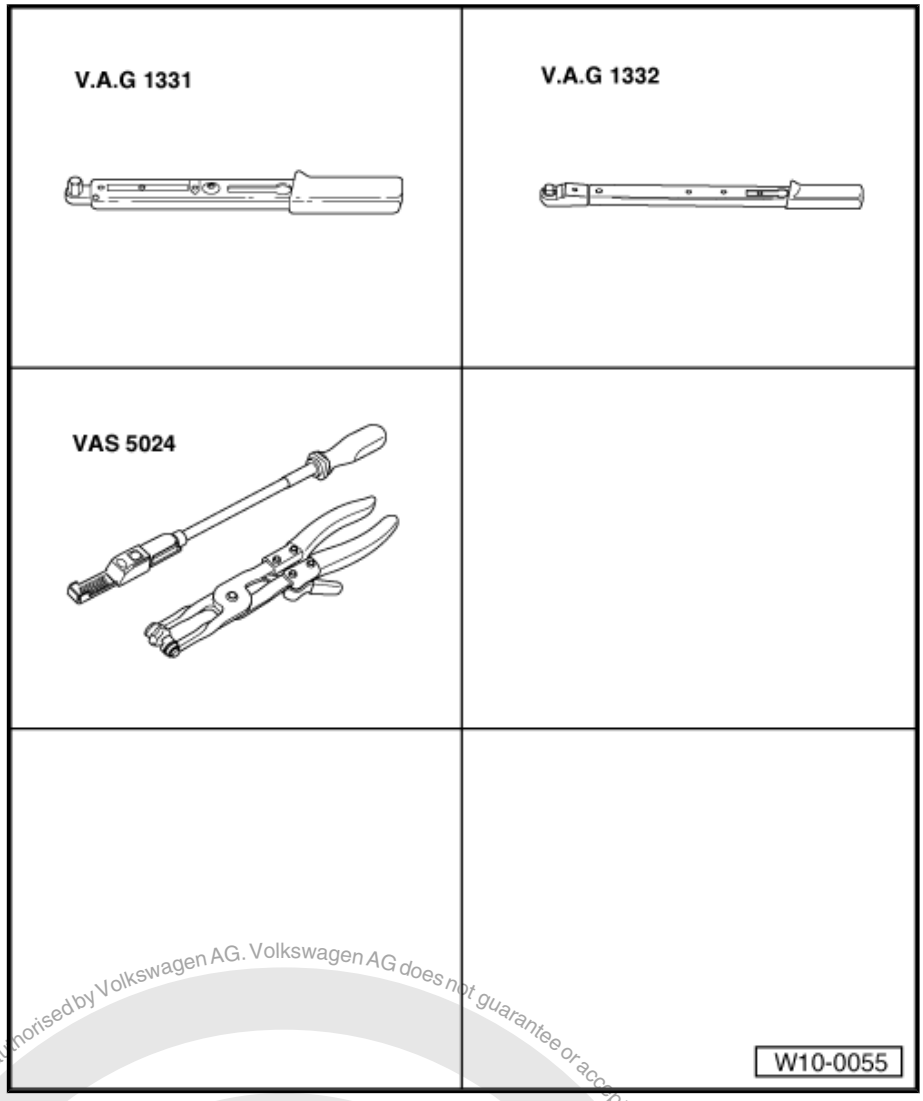
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

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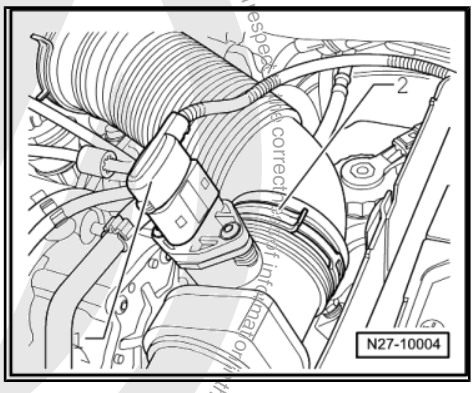
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Spring-type clip pliers - VAS 5024-



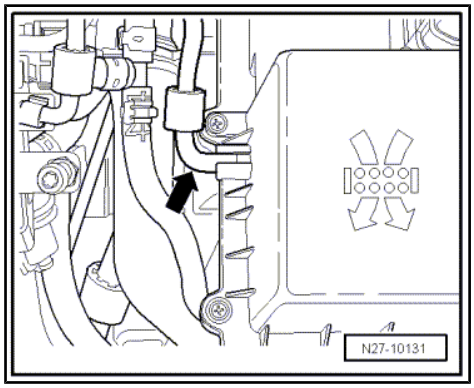
Removing:

– Disconnect battery ⇒ page 3 .
– Release and disconnect electrical connector -1-.
– Loosen spring-type clip -2- using spring-type clip pliers - VAS 5024- .

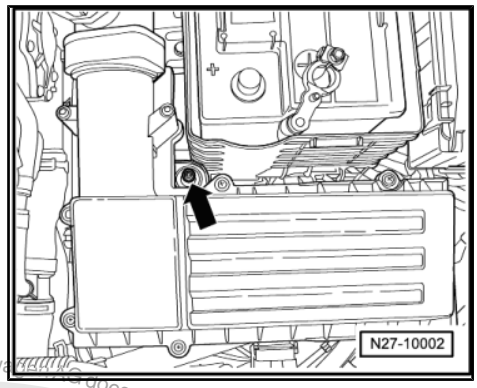


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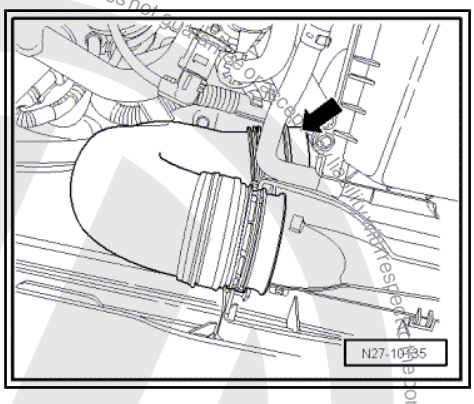
– Pull vacuum hose -arrow- off air filter housing.



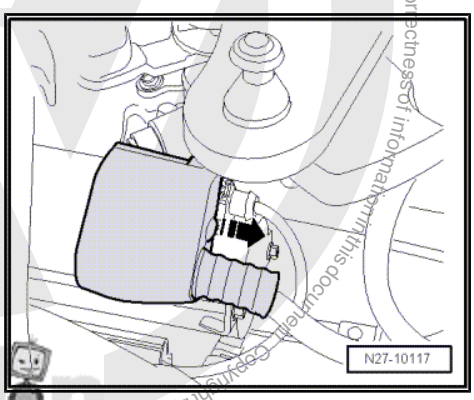
– Unscrew securing bolt -arrow- of air filter housing.



– Pull hose -arrow- off air filter housing and remove.
– Pull air filter housing upwards out of the brackets and remove.

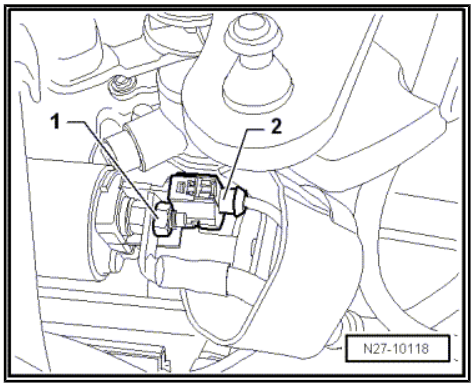


– Push protective cap off solenoid switch downwards in direction of -arrow-.

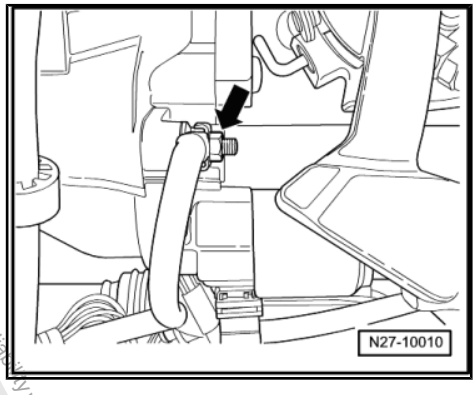


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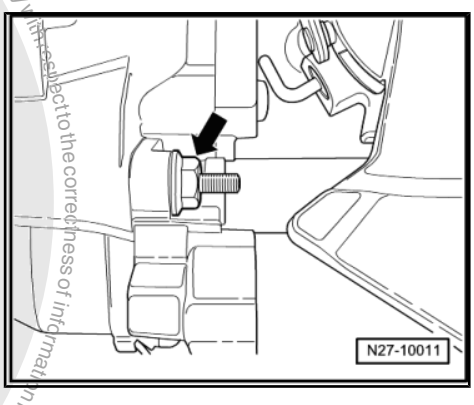
– Release and disconnect connector of terminal 50 -2-.
– Unbolt positive cable -1-.



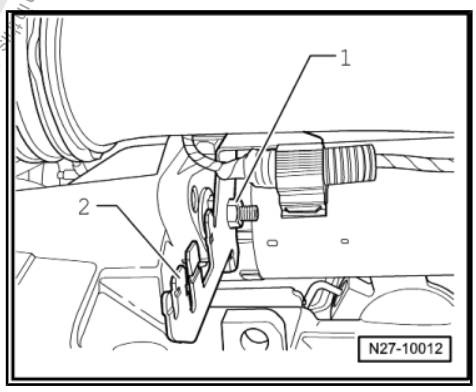
– Unscrew and remove earth wire from bolt securing the starter -arrow-.



– Undo upper starter bolt -arrow-.
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



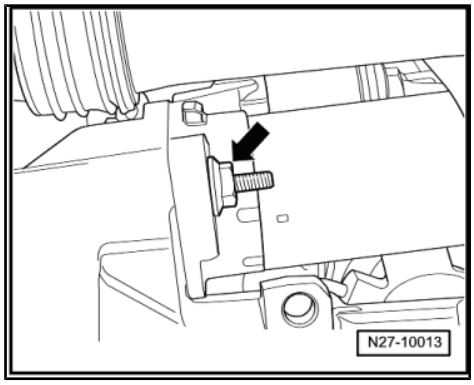
– Undo securing nuts -1- and remove cable bracket -2-.



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– Undo lower starter bolt -arrow-.

– Remove starter by taking it downwards out of the vehicle.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .

2.2.8 Removing and installing starter, 2.0 l natural gas engine, manual gearbox

Renewing starter on vehicles with Start/Stop system:

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

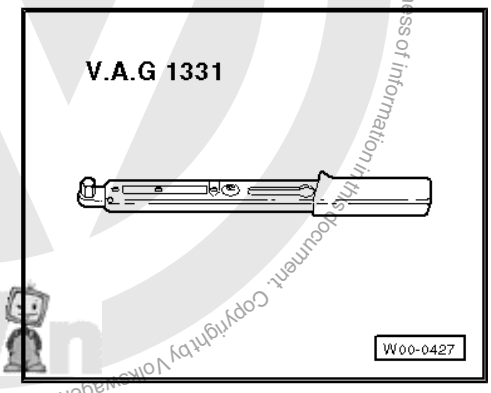
When renewing starter, make sure the new one with the correct part designation as shown in ⇒ ETKA (Electronic Parts Catalogue) is used. Components adapted to Start/Stop system are not identified separately and are not or barely different from normal components in their appearance.

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

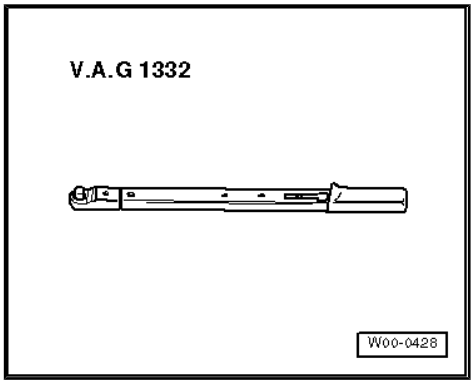
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



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♦ Torque wrench - V.A.G 1332-



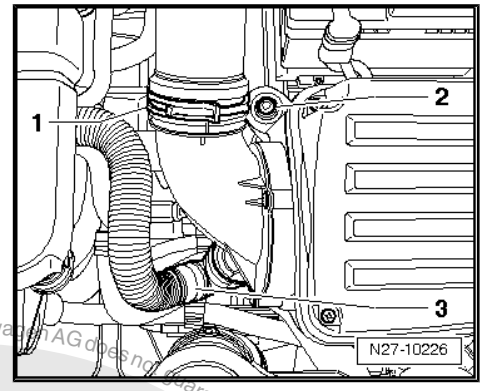
Removing:

– Disconnect battery ⇒ page 3 .

– Loosen spring-type clip -1- using spring-type clip pliers - VAS 5024- .

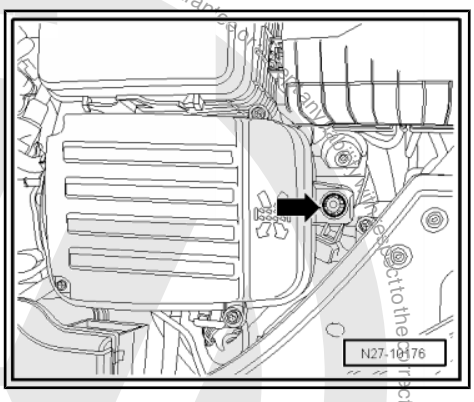
– Remove securing bolt -2-.

– Release hose -3- and pull off air filter housing.

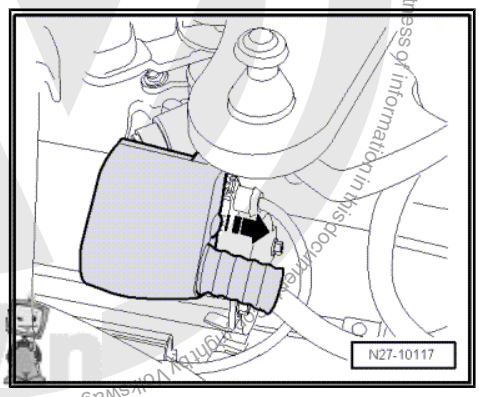


– Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.

– Remove air filter housing from vehicle.

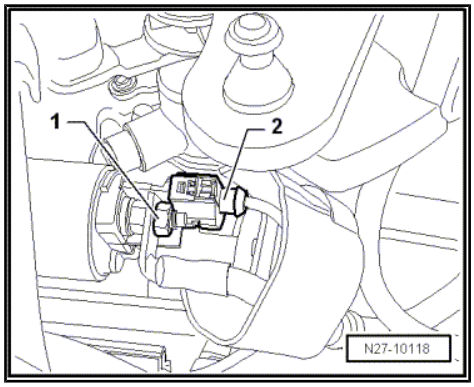


– Push protective cap off solenoid switch downwards in direction of -arrow-.

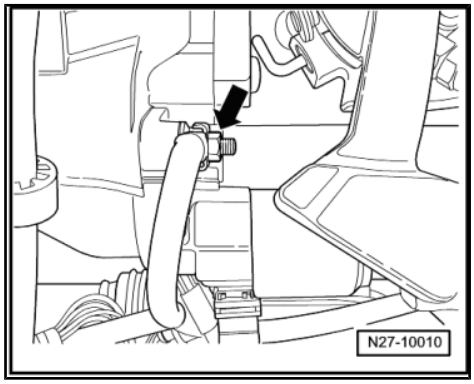


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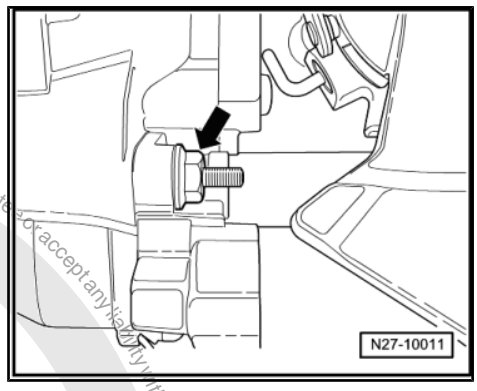
– Release and disconnect connector of terminal 50 -2-.
– Unbolt positive cable -1-.



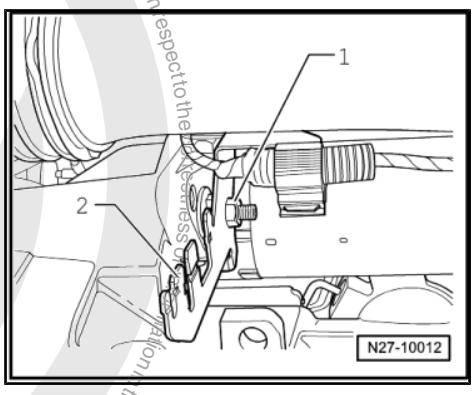
– Unscrew and remove earth wire from bolt securing the starter -arrow-.



– Undo upper starter bolt -arrow-.
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



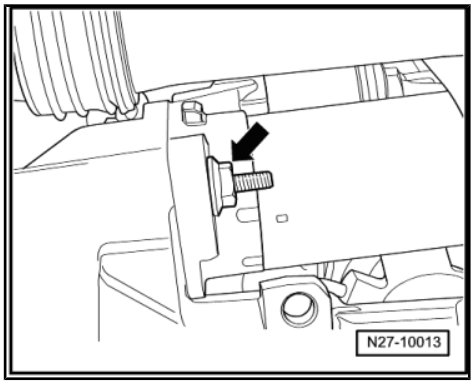
– Unscrew nut -1- of lower bolt securing starter and remove wiring retainer -2-.



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– Undo lower starter bolt -arrow-.

– Remove starter.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .

2.2.9 Removing and installing starter, 1.9 l TDI engine, dual clutch gearbox

Renewing starter on vehicles with Start/Stop system:

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

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

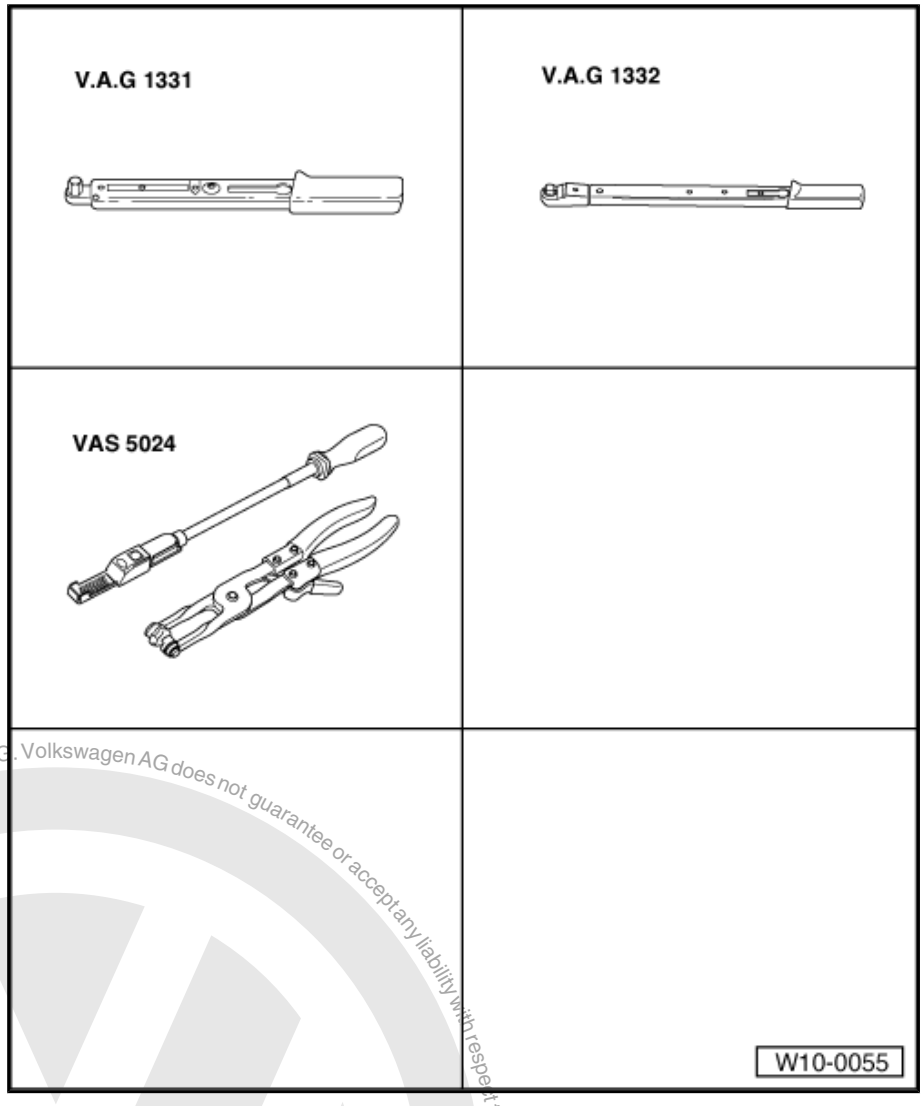
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

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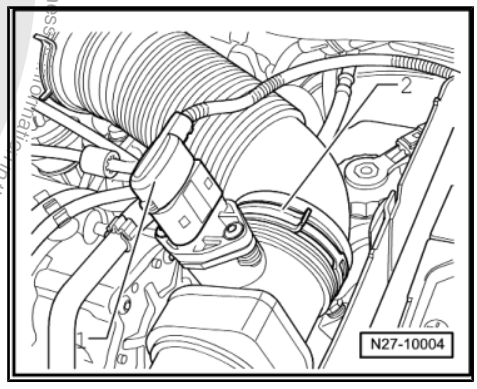
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Torque wrench - V.A.G 1332-
- Spring-type clip pliers - VAS 5024-



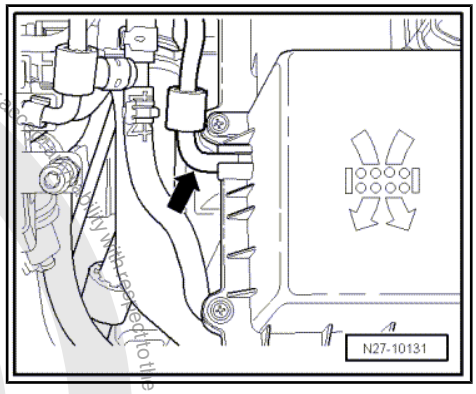
Removing:

– Disconnect battery ⇒ page 3 .
– Release and disconnect electrical connector -1-.
– Loosen spring-type clip -2- using spring-type clip pliers - VAS 5024- and pull hose off.

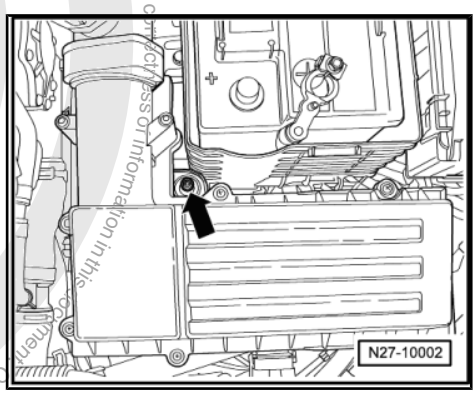


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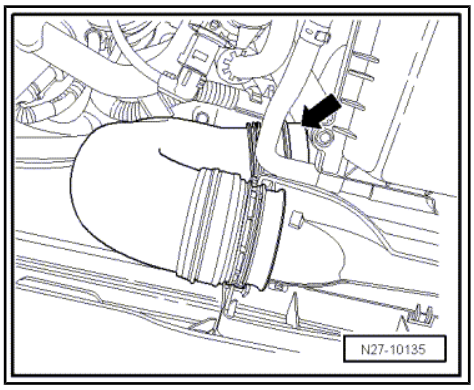
– Pull vacuum hose -arrow- off air filter housing.



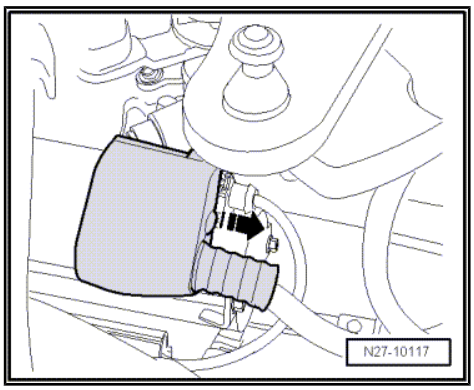
– Unscrew securing bolt -arrow- of air filter housing.



– Pull hose -arrow- off air filter housing and remove from vehicle.
– Pull air filter housing upwards out of the brackets and remove from vehicle.

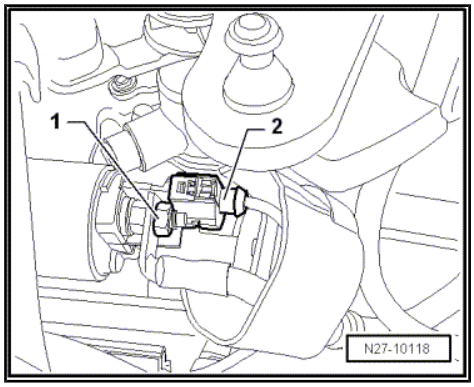


– Push protective cap off solenoid switch downwards in direction of -arrow-.

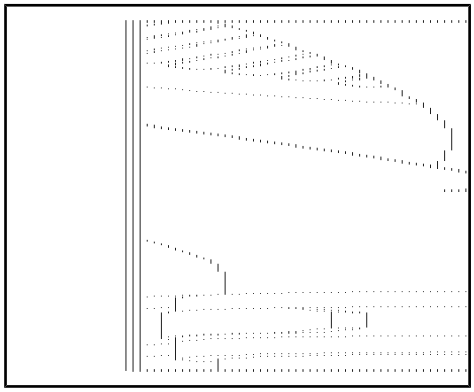


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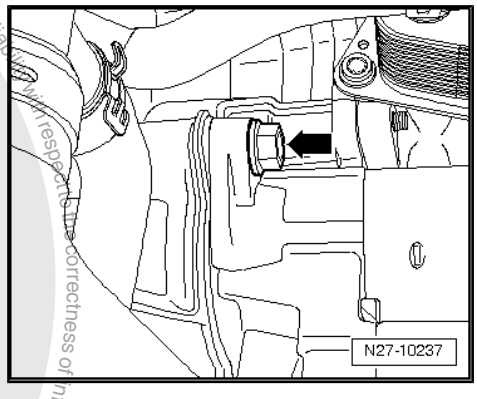
– Release and disconnect connector of terminal 50 -2-.
– Unbolt positive cable -1-.



– Unclip line -1- from bracket -2-.



– Undo upper starter bolt -arrow-.

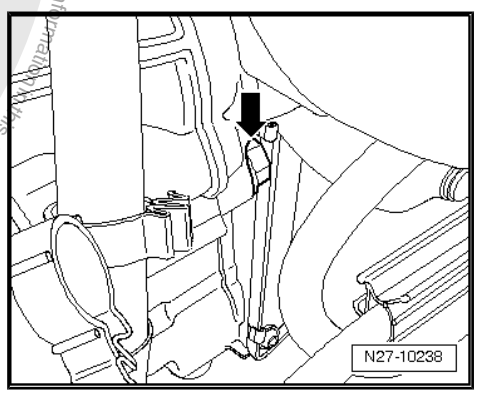


– Undo lower starter bolt -arrow-.
– Remove starter by taking it upwards out of the vehicle.

Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 12 .



2.3 Checking starter

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .
– Select “Guided fault finding” in vehicle diagnostic tester .
– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

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- Body
- Electrical system
- 27 - Starter, current supply
- Electrical components
- B - Starter

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3 Alternator

⇒ “3.1 Assembly overview - alternator”, page 44

⇒ “3.2 Removing and installing alternator”, page 58

⇒ “3.3 Checking alternator”, page 86

⇒ “3.4 Repairing alternator”, page 87

⇒ “3.5 Checking poly V-belt”, page 93

3.1 Assembly overview - alternator

⇒ “3.1.1 Assembly overview - alternator, 1.2 l injection engine with air conditioning system”, page 44

⇒ “3.1.2 Assembly overview - alternator, 1.4 l injection engine without air conditioning system”, page 46

⇒ “3.1.3 Assembly overview - alternator, 1.4 l injection engine with air conditioning system”, page 47

⇒ “3.1.4 Assembly overview - alternator, 1.6 l injection engine”, page 48

⇒ “3.1.5 Assembly overview - alternator, 1.6 l diesel engine, common rail (TDI)”, page 50

⇒ “3.1.6 Assembly overview - alternator, 1.9 l diesel engine, unit injector (TDI)”, page 51

⇒ “3.1.8 Assembly overview - alternator, 2.0 l diesel engine, common rail (TDI)”, page 53

⇒ “3.1.9 Assembly overview - alternator, 2.0 l diesel engine, unit injector (SDI)”, page 54

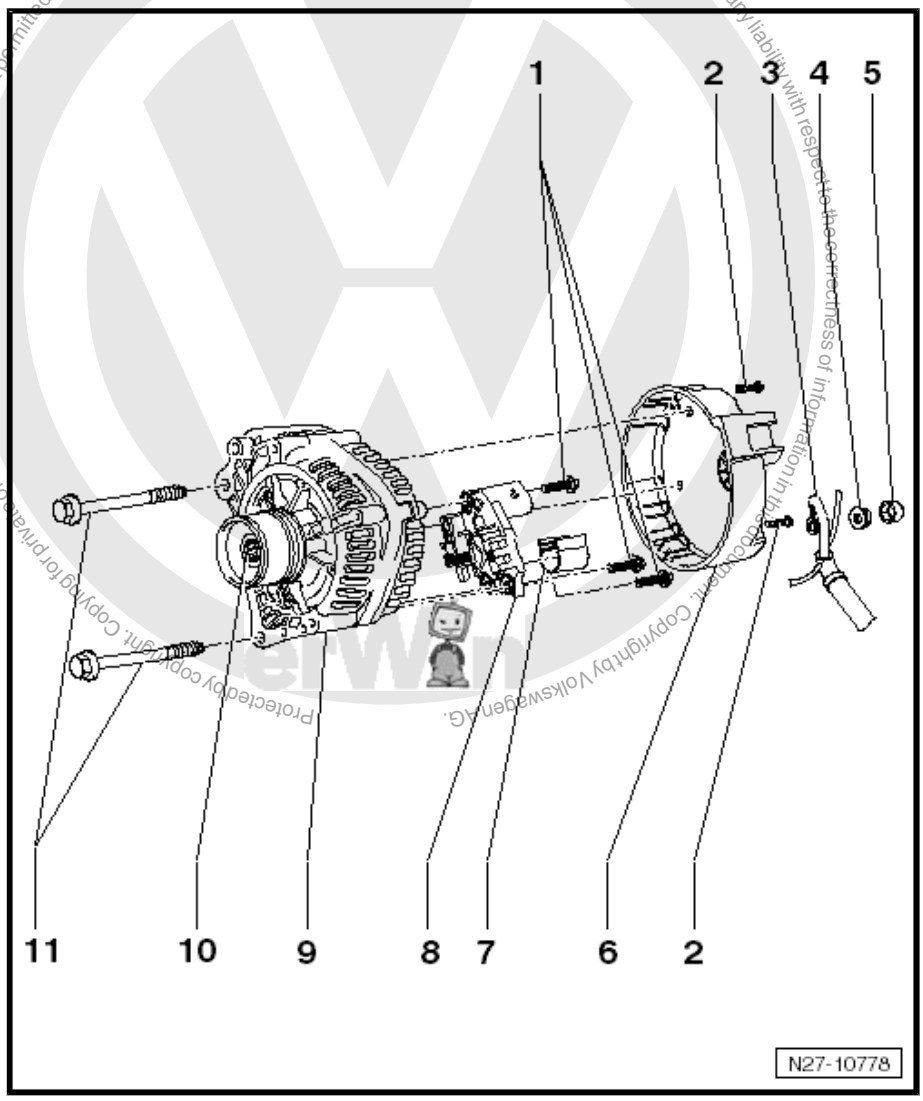
⇒ “3.1.10 Assembly overview - alternator, 2.0 l natural gas engine without air conditioning system”, page 55

⇒ “3.1.11 Assembly overview - alternator, 2.0 l natural gas engine with air conditioning system”, page 56

3.1.1 Assembly overview - alternator, 1.2 l injection engine with air conditioning system

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1 - Securing bolts of voltage regulator

- ❑ M4
- ❑ 2 Nm

2 - Hexagon head flange bolts

- ❑ For securing protective cap
- ❑ M5
- ❑ 4.5 Nm

3 - Battery positive wire

4 - Hexagon flange nut

- ❑ M8
- ❑ 15 Nm

5 - Protective cap

6 - Protective cap

7 - Protective cap

8 - Voltage regulator

- ❑ Removing and installing voltage regulator ⇒ page 87

9 - Alternator

- ❑ Removing and installing alternator ⇒ page 58 .
- ❑ Checking alternator ⇒ page 86 .

10 - Belt pulley

- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm
- ❑ Checking poly V-belt ⇒ page 93

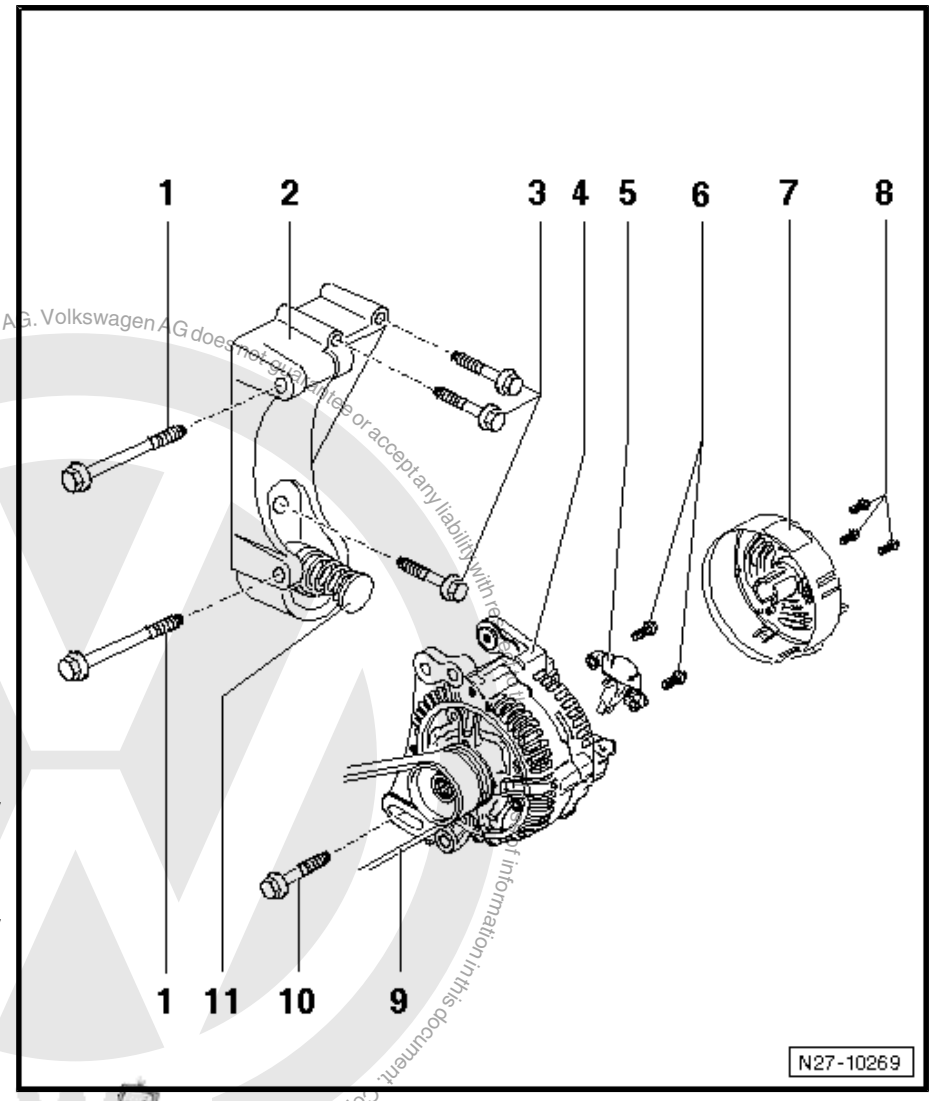
11 - Hexagon head flange bolts

- ❑ M8
- ❑ 20 Nm

Not illustrated

- ♦ Securing bolt for guide roller: M8, 40 Nm
- ♦ Securing bolt for air conditioner compressor: M8, 25 Nm

3.1.2 Assembly overview - alternator, 1.4 l injection engine without air conditioning system



1 - Hexagon head flange bolts
- ❑ M8 x 90
- ❑ 20 Nm

2 - Ancillary bracket
- ❑ For alternator

3 - Hexagon head flange bolts
- ❑ M10 x 55, Aluminium cylinder block
- ❑ M10 x 50, Cast iron cylinder block
- ❑ 40 Nm
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

4 - Alternator
- ❑ Removing and installing alternator ⇒ page 61 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

5 - Voltage regulator
- ❑ Removing and installing voltage regulator ⇒ page 87

6 - Cross-head screws
- ❑ M4 x 18
- ❑ 2 Nm

7 - Protective cap for alternator

8 - Hexagon bolts
- ❑ M4 x 20
- ❑ 2 Nm

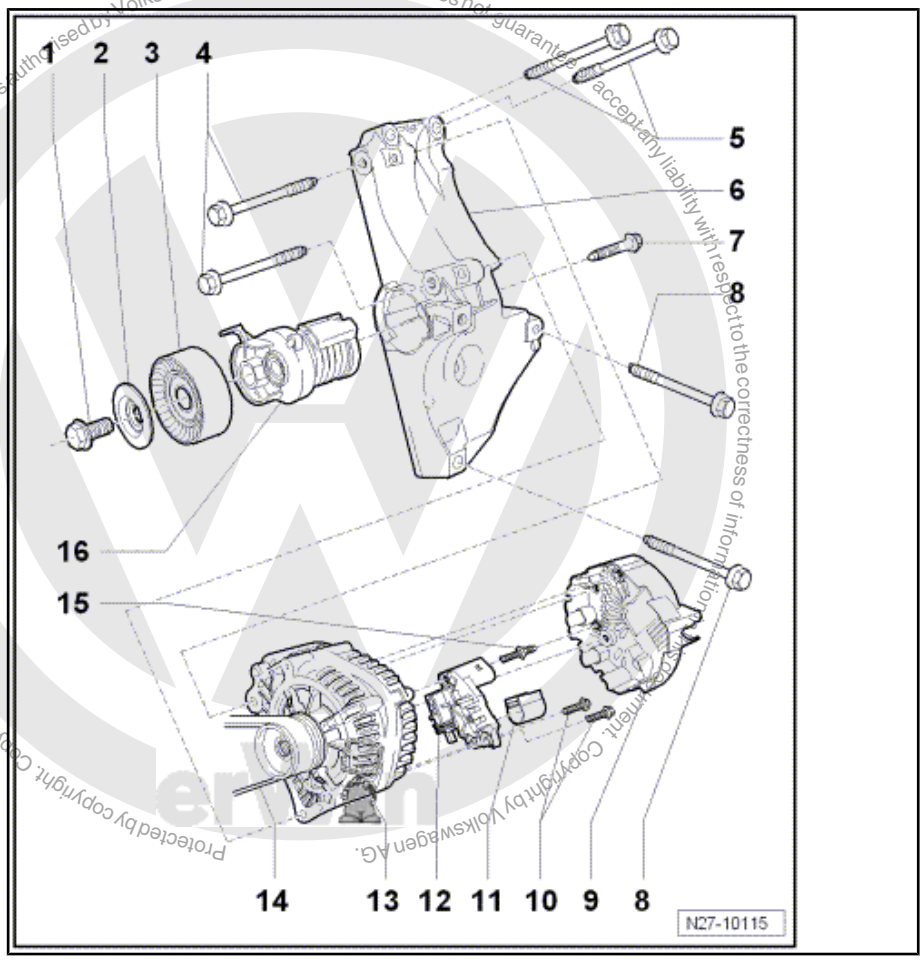
9 - Poly V-belt
- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

10 - Hexagon head flange bolt
- ❑ M8 x 39
- ❑ 25 Nm

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11 - Tensioning spring

3.1.3 Assembly overview - alternator, 1.4 l injection engine with air conditioning system



1 - Hexagon head flange bolt
- ❑ M10 x 22
- ❑ 60 Nm

2 - Washer

3 - Tensioning roller

4 - Hexagon head flange bolts
- ❑ M8 x 90
- ❑ 20 Nm

5 - Hexagon head flange bolts
- ❑ M10 x 55, Aluminium cylinder block
- ❑ M10 x 50, Cast iron cylinder block
- ❑ 40 Nm
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

6 - Ancillary bracket
- ❑ For alternator and air conditioner compressor.

7 - Hexagon head flange bolt
- ❑ M8 x 42
- ❑ 20 Nm

8 - Hexagon head flange bolts
- ❑ M10 x 45, Aluminium cylinder block
- ❑ M10 x 40, Cast iron cylinder block
- ❑ 40 Nm
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

9 - Protective cap for alternator

10 - Hexagon bolts with washer
- ❑ M4 x 20
- ❑ 2 Nm

11 - Protective cap for carbon brushes

12 - Voltage regulator
- ❑ Removing and installing voltage regulator ⇒ page 87

13 - Alternator
- ❑ Removing and installing alternator ⇒ page 63 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

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14 - Poly V-belt

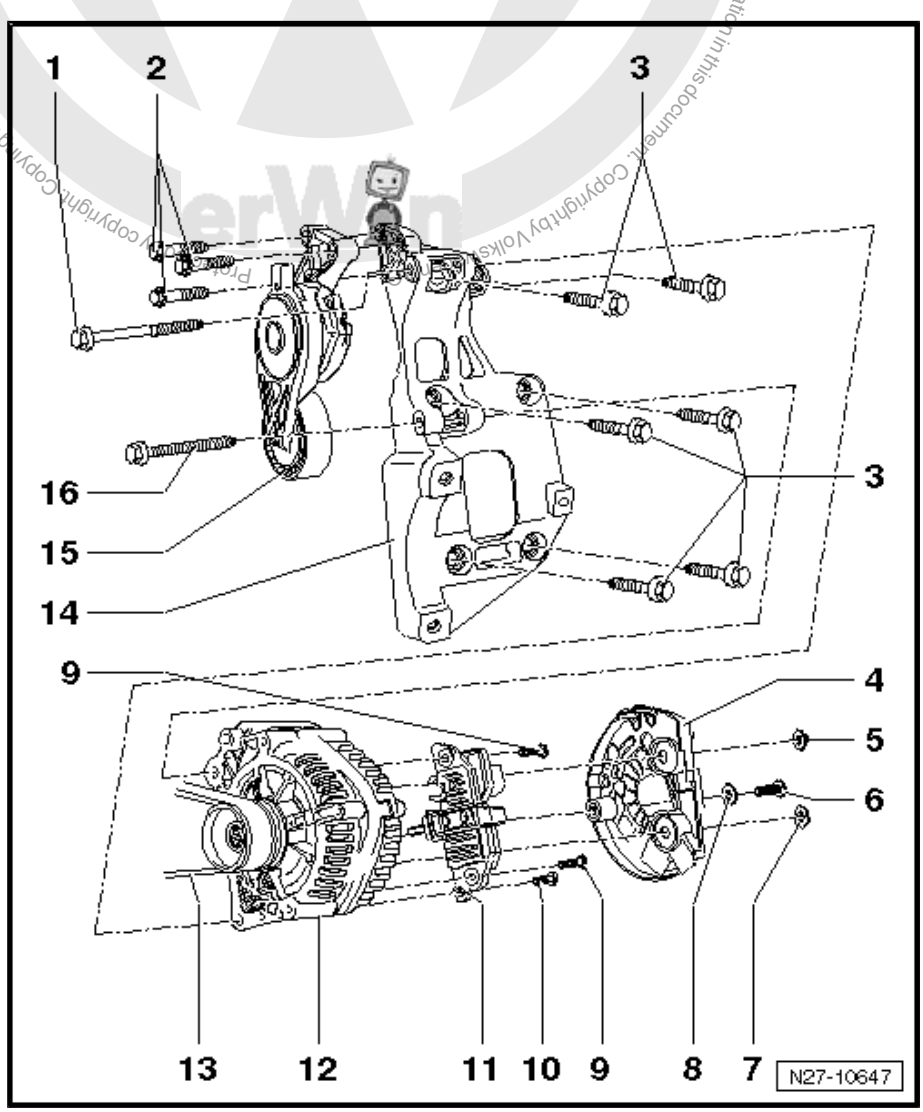
- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

15 - Hexagon bolt with washer and threaded element

- ❑ M4 x 20, M4 x 15
- ❑ 2 Nm

16 - Poly V-belt tensioning element

3.1.4 Assembly overview - alternator, 1.6 l injection engine



1 - Hexagon head flange bolt

- ❑ M8 x 108
- ❑ 23 Nm

2 - Hexagon head flange bolts

- ❑ M8 x 50
- ❑ 23 Nm

3 - Hexagon head flange bolts

- ❑ M8 x 45
- ❑ 52 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

4 - Protective cap

5 - Hexagon flange nut

- ❑ M8

6 - Cross-head screw

- ❑ M5 x 21
- ❑ 4.5 Nm

7 - Hexagon nut, flat

- ❑ M8

8 - Washer

- ❑ M5

9 - Cross-head screws

- ❑ M4 x 19
- ❑ 2 Nm

10 - Cross-head screw

- ❑ M4 x 13
- ❑ 2 Nm

11 - Voltage regulator

- ❑ Removing and installing voltage regulator ⇒ page 87

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12 - Alternator

- ❑ Removing and installing alternator ⇒ page 65 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

13 - Poly V-belt

- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

14 - Ancillary bracket

- ❑ For alternator and air conditioner compressor.
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .

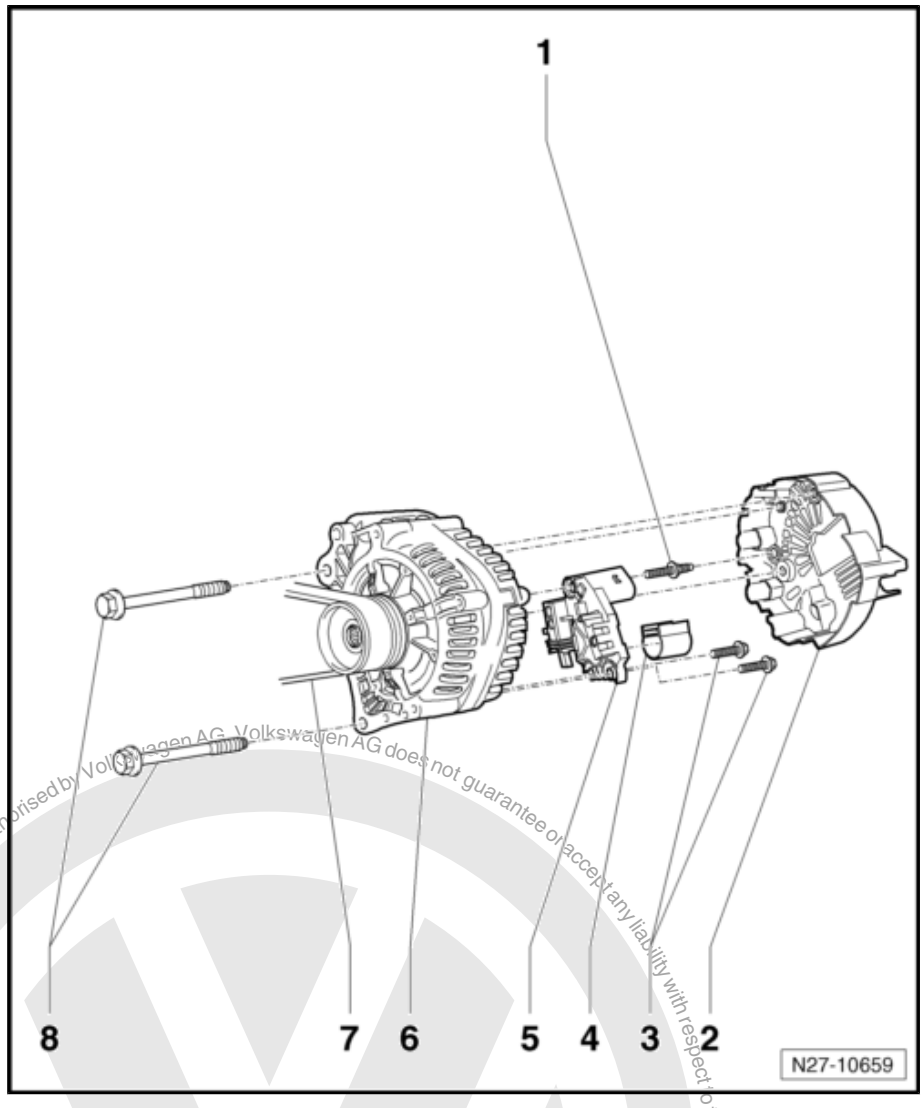
15 - Poly V-belt tensioning element

16 - Hexagon head flange bolt

- ❑ M8 x 90
- ❑ 23 Nm

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3.1.5 Assembly overview - alternator, 1.6 l diesel engine, common rail (TDI)



1 - Hexagon bolt with washer and threaded element

- ❑ M4 x 20, M4 x 15
- ❑ 2 Nm

2 - Protective cap for alternator

3 - Cross-head screws

- ❑ M4 x 20
- ❑ 2 Nm

4 - Protective cap for carbon brushes

5 - Voltage regulator

- ❑ Removing and installing voltage regulator ⇒ page 87

6 - Alternator

- ❑ Removing and installing alternator ⇒ page 68 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

7 - Poly V-belt

- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

8 - Hexagon head flange bolts

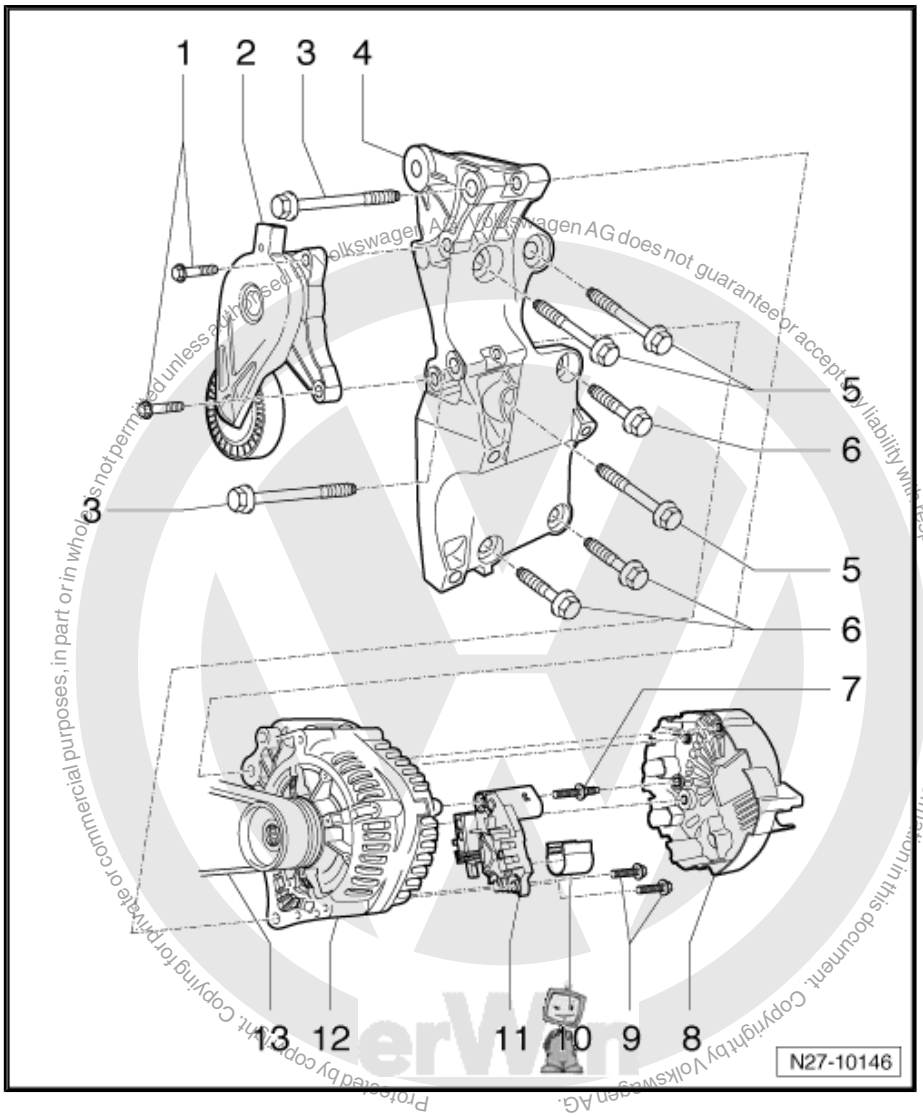
- ❑ M8 x 90
- ❑ 20 Nm

Not illustrated

- ♦ M5 securing nut on back of alternator for wiring clamp - 3.2 Nm
- ♦ M8 securing bolts of air conditioner compressor on ancillary bracket - 23 Nm

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3.1.6 Assembly overview - alternator, 1.9 l diesel engine, unit injector (TDI)



1 - Hexagon head flange bolts
- ❑ M8 x 45
- ❑ 20 Nm

2 - Poly V-belt tensioning element

3 - Hexagon head flange bolts
- ❑ M8 x 90
- ❑ 20 Nm

4 - Ancillary bracket
- ❑ For alternator and air conditioner compressor.

5 - Hexagon head flange bolts
- ❑ M10 x 65
- ❑ 45 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

6 - Hexagon head flange bolts
- ❑ M10 x 45
- ❑ 45 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

7 - Hexagon bolt with washer and threaded element
- ❑ M4 x 20, M4 x 15
- ❑ 2 Nm

8 - Protective cap for alternator

9 - Cross-head screws
- ❑ M4 x 20
- ❑ 2 Nm

10 - Protective cap for carbon brushes

11 - Voltage regulator
- ❑ Removing and installing voltage regulator ⇒ page 87

12 - Alternator
- ❑ Removing and installing alternator ⇒ page 71 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm

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- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

13 - Poly V-belt

- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

3.1.7 Assembly overview - alternator, 2.0 l diesel engine, unit injector (TDI)

1 - Hexagon bolt with washer and threaded element

- ❑ M4 x 20, M4 x 15
- ❑ 2 Nm

2 - Protective cap for alternator

3 - Cross-head screws

- ❑ M4 x 20
- ❑ 2 Nm

4 - Protective cap for carbon brushes

5 - Voltage regulator

- ❑ Removing and installing voltage regulator ⇒ page 87

6 - Alternator

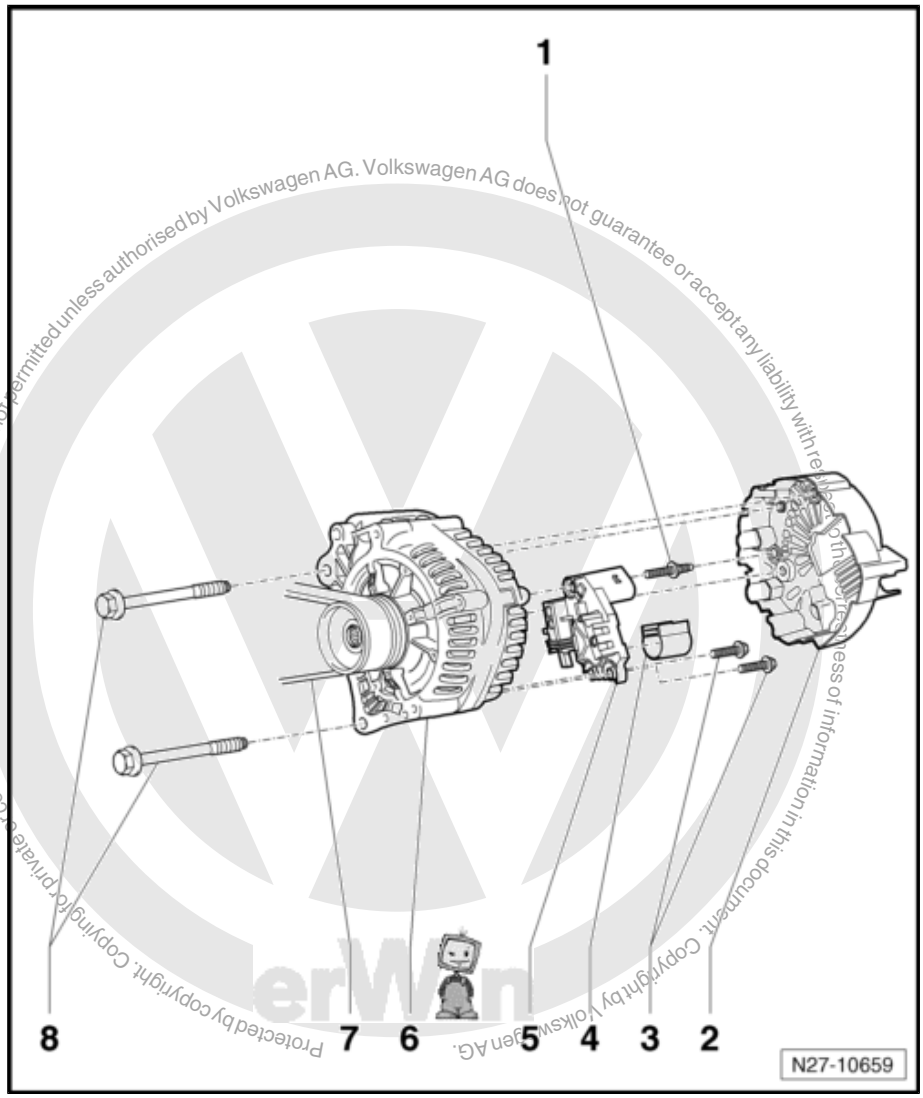
- ❑ Removing and installing alternator ⇒ page 75
- ❑ Checking alternator ⇒ page 86
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87

7 - Poly V-belt

- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .
- ❑ Checking poly V-belt ⇒ page 93

8 - Hexagon head flange bolts

- ❑ M8 x 90
- ❑ 20 Nm

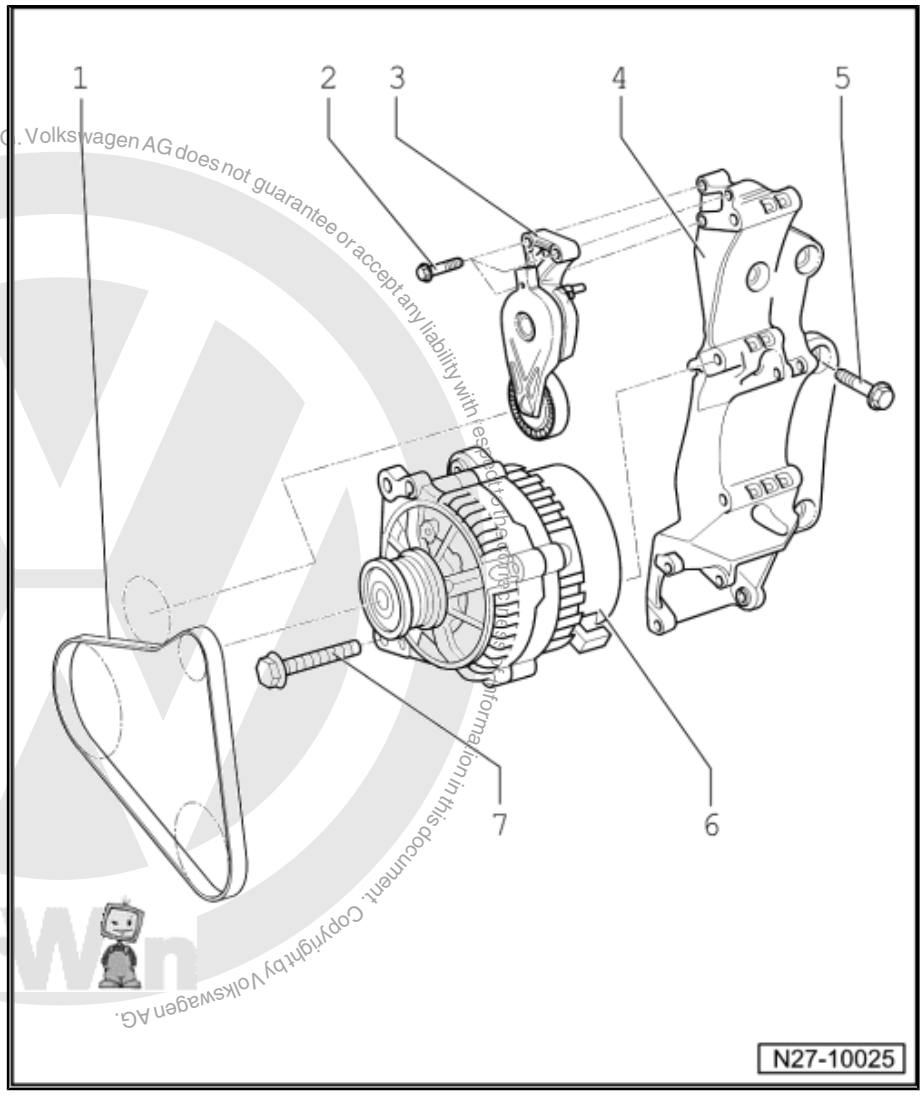


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Not illustrated

- ♦ M5 securing nut on back of alternator for wiring clamp - 3.2 Nm
- ♦ M8 securing bolts of air conditioner compressor on ancillary bracket - 23 Nm

3.1.8 Assembly overview - alternator, 2.0 l diesel engine, common rail (TDI)



1 - Poly V-belt

- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

2 - Hexagon bolts

- ❑ 20 Nm

3 - Poly V-belt tensioning element

4 - Ancillary bracket

- ❑ For alternator, power steering vane pump and air conditioner compressor.

5 - Hexagon bolt

- ❑ 45 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .

6 - Alternator

- ❑ Removing and installing alternator ⇒ page 78 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm
- ❑ Removing and installing voltage regulator ⇒ page 87

7 - Hexagon bolt

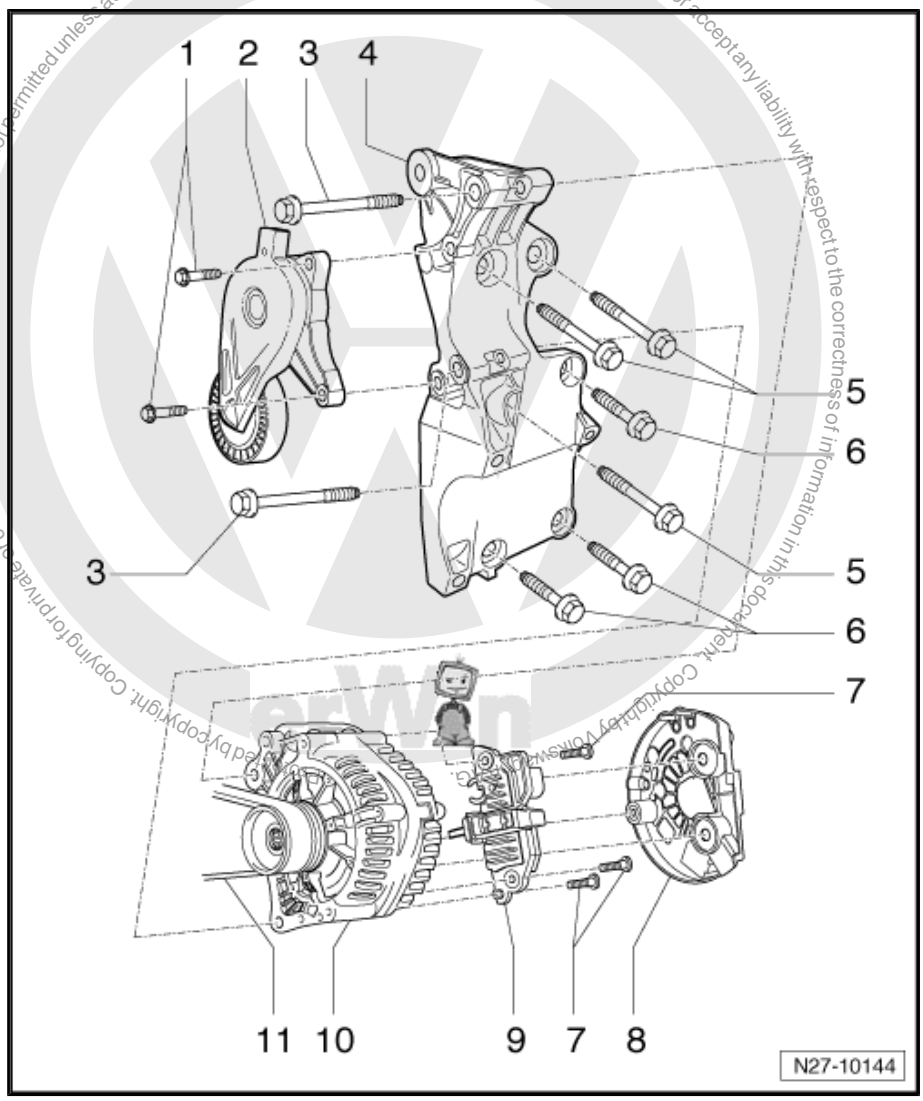
- ❑ 25 Nm

Not illustrated

- ♦ M8 securing nut B+ wire to alternator, 15 Nm
- ♦ M5 securing nut of wiring retainer on rear of alternator, 3.2 Nm

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3.1.9 Assembly overview - alternator, 2.0 l diesel engine, unit injector (SDI)



1 - Hexagon head flange bolts
- ❑ M8 x 45
- ❑ 20 Nm

2 - Poly V-belt tensioning element

3 - Hexagon head flange bolts
- ❑ M8 x 90
- ❑ 20 Nm

4 - Ancillary bracket
- ❑ For alternator and air conditioner compressor.

5 - Hexagon head flange bolts
- ❑ M10 x 65
- ❑ 45 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

6 - Hexagon head flange bolts
- ❑ M10 x 45
- ❑ 45 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

7 - Cross-head screws
- ❑ M4 x 20
- ❑ 2 Nm

8 - Protective cap

9 - Voltage regulator
- ❑ Removing and installing voltage regulator ⇒ page 87

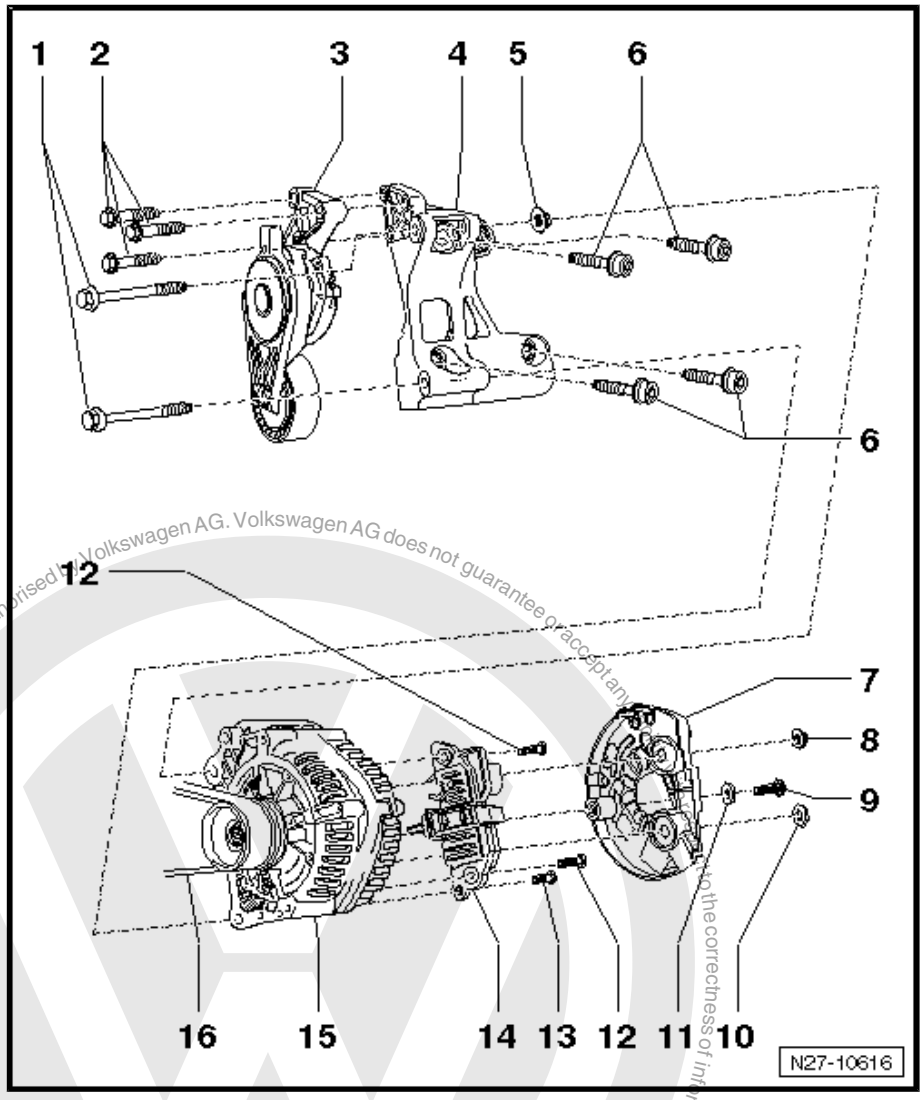
10 - Alternator
- ❑ Removing and installing alternator ⇒ page 81 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

11 - Poly V-belt
- ❑ Checking poly V-belt ⇒ page 93

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❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

3.1.10 Assembly overview - alternator, 2.0 l natural gas engine without air conditioning system



1 - Hexagon head flange bolts
- ❑ M8 x 90
- ❑ 20 Nm

2 - Hexagon head flange bolts
- ❑ M8 x 50
- ❑ 23 Nm

3 - Poly V-belt tensioning element

4 - Ancillary bracket
- ❑ For alternator

5 - Hexagon nut

6 - Hexagon socket head bolts
- ❑ M10 x 45
- ❑ 45 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

7 - Protective cap

8 - Hexagon flange nut
- ❑ Securing nut for B+ wire on rear of alternator
- ❑ M8
- ❑ 15 Nm

9 - Cross-head screw
- ❑ M5 x 21
- ❑ 4.5 Nm

10 - Hexagon nut, flat
- ❑ M8

11 - Washer
- ❑ M5

12 - Cross-head screws
- ❑ M4 x 19
- ❑ 2 Nm

13 - Cross-head screw
- ❑ M4 x 13
- ❑ 2 Nm

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14 - Voltage regulator

- ❑ Removing and installing voltage regulator ⇒ page 87

15 - Alternator

- ❑ Removing and installing alternator ⇒ page 83 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

16 - Poly V-belt

- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

Not illustrated

- ♦ M5 securing nut of wiring retainer on rear of alternator, 3.2 Nm

3.1.11 Assembly overview - alternator, 2.0 l natural gas engine with air conditioning system

1 - Hexagon head flange bolts

- ❑ M8 x 90
- ❑ 20 Nm

2 - Hexagon head flange bolts

- ❑ M8 x 50
- ❑ 23 Nm

3 - Poly V-belt tensioning element

4 - Ancillary bracket

- ❑ For alternator and air conditioner compressor.

5 - Hexagon nut

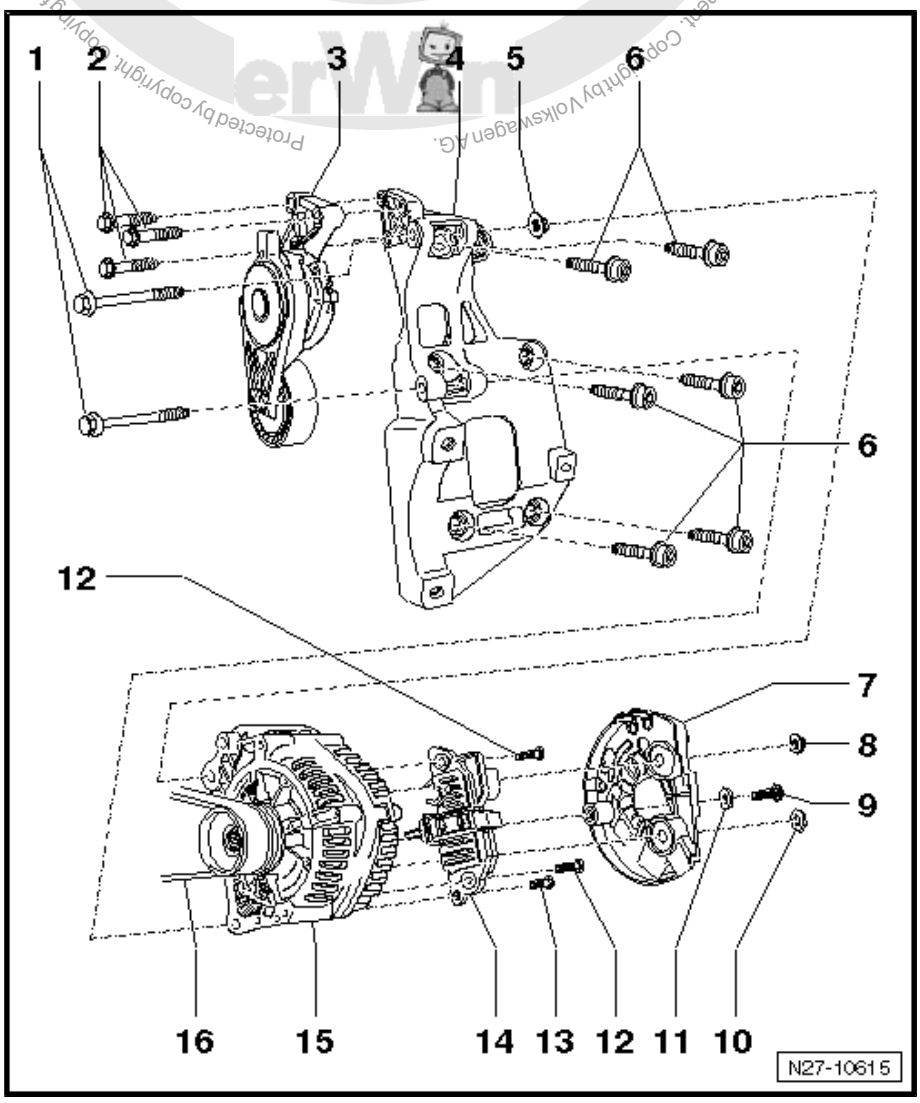
6 - Hexagon socket head bolts

- ❑ M10 x 45
- ❑ 45 Nm
- ❑ Observe tightening sequence ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing ancillary bracket .
- ❑ Dacromet bolts (entire bolt of greenish colour) must be renewed when carrying out repair work.

7 - Protective cap

8 - Hexagon flange nut

- ❑ Securing nut for B+ wire on rear of alternator
- ❑ M8
- ❑ 15 Nm



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9 - Cross-head screw

- ❑ M5 x 21
- ❑ 4.5 Nm

10 - Hexagon nut, flat

- ❑ M8

11 - Washer

- ❑ M5

12 - Cross-head screws

- ❑ M4 x 19
- ❑ 2 Nm

13 - Cross-head screw

- ❑ M4 x 13
- ❑ 2 Nm

14 - Voltage regulator

- ❑ Removing and installing voltage regulator ⇒ page 87

15 - Alternator

- ❑ Removing and installing alternator ⇒ page 83 .
- ❑ Checking alternator ⇒ page 86 .
- ❑ Removing and installing poly V-belt pulley on alternator ⇒ page 87 .
- ❑ Specified torque for poly V-belt pulley with freewheel to alternator: 80 Nm
- ❑ Specified torque for poly V-belt pulley without freewheel to alternator: 65 Nm

16 - Poly V-belt

- ❑ Checking poly V-belt ⇒ page 93
- ❑ Poly V-belt routing ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Assembly overview - poly V-belt .

Not illustrated

- ♦ M5 securing nut of wiring retainer on rear of alternator, 3.2 Nm

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3.2 Removing and installing alternator

⇒ “3.2.1 Removing and installing alternator, 1.2 l injection engine with air conditioning system”, page 58

⇒ “3.2.2 Removing and installing alternator, 1.4 l injection engine without air conditioning system”, page 61

⇒ “3.2.3 Removing and installing alternator, 1.4 l injection engine with air conditioning system”, page 63

⇒ “3.2.4 Removing and installing alternator, 1.6 l injection engine”, page 65

⇒ “3.2.5 Removing and installing alternator, 1.6 l diesel engine, common rail (TDI)”, page 68

⇒ “3.2.6 Removing and installing alternator, 1.9 l diesel engine, unit injector (TDI)”, page 71

⇒ “3.2.7 Removing and installing alternator, 2.0 l diesel engine, unit injector (TDI)”, page 75

⇒ “3.2.8 Removing and installing alternator, 2.0 l diesel engine, common rail (TDI)”, page 78

⇒ “3.2.9 Removing and installing alternator, 2.0 l diesel engine, unit injector (SDI)”, page 81

⇒ “3.2.10 Removing and installing alternator, 2.0 l natural gas engine”, page 83

Caution

Please note the following points during all assembly work, in particular in the engine compartment, due to the narrow installation conditions:

- *Route electrical wiring so that original wiring layout is restored.*
- *Make sure there is adequate clearance from all moving or hot components.*

Alternator on vehicles with Start/Stop system:

Until now the alternator and the voltage regulator were connected together via their own wires to the engine and onboard supply control unit. For vehicles with Start/Stop system, the information transmission occurs via a LIN data bus to the diagnostic interface for data bus. Via the CAN data bus, it supplies information to other control units such as the engine control unit.

3.2.1 Removing and installing alternator, 1.2 l injection engine with air conditioning system

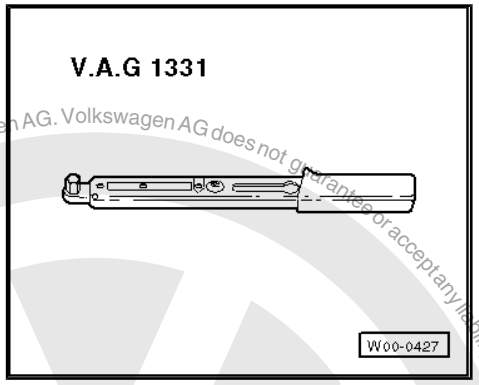
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Special tools and workshop equipment required

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♦ Torque wrench - V.A.G 1331-

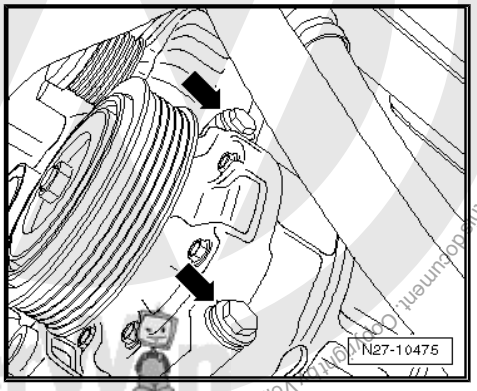


Removing:

– Disconnect battery ⇒ page 3 .

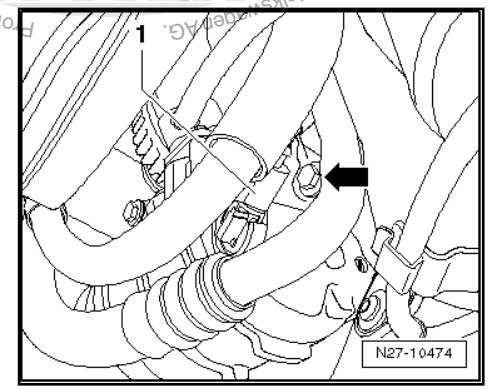
– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .

– Unscrew the two securing bolts of air conditioner compressor -arrows-.



– Release and disconnect electrical connector -1-.

– Undo the third bolt -arrow- and remove air conditioner compressor from bracket.

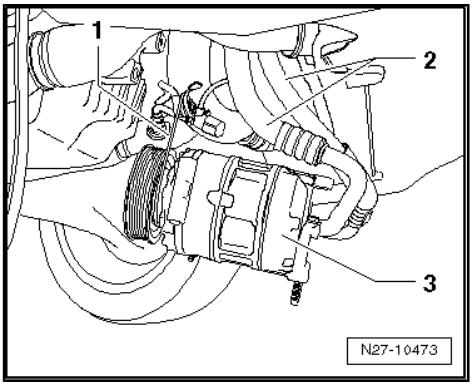


Note

♦ *The hoses of the air conditioner compressor can remain connected.*

♦ *Suspend the air conditioner compressor -3- using a piece of wire -1- at a suitable position under the vehicle until it is ready to be reinstalled.*

♦ *Ensure that the hoses -2- are not stretched or kinked.*

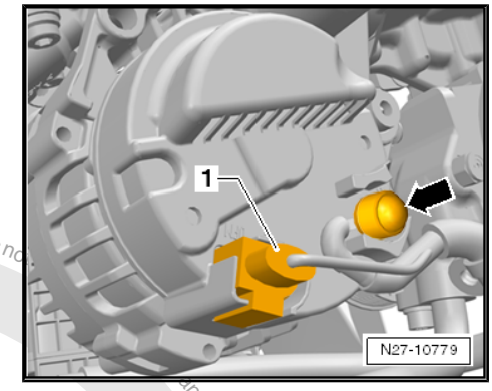


– Release and disconnect electrical connector -1-.

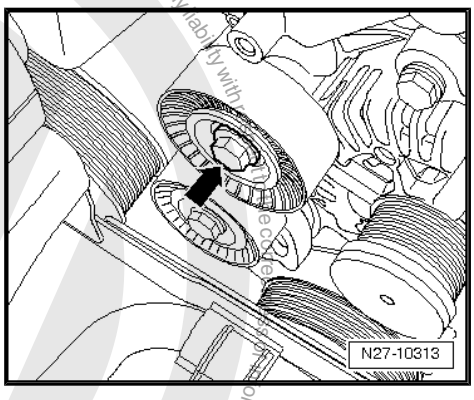
– Pull off protective cap -arrow-.

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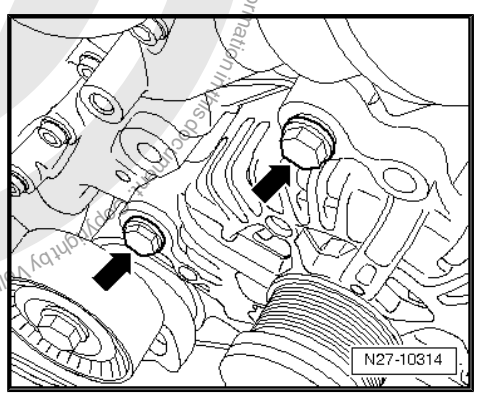
– Unscrew securing nut behind it and remove battery positive cable from alternator.



– Undo bolt securing the guide roller -arrow- and remove guide roller.



– Undo bolts securing alternator -arrows-.
– Remove alternator by taking it downwards out of the vehicle.



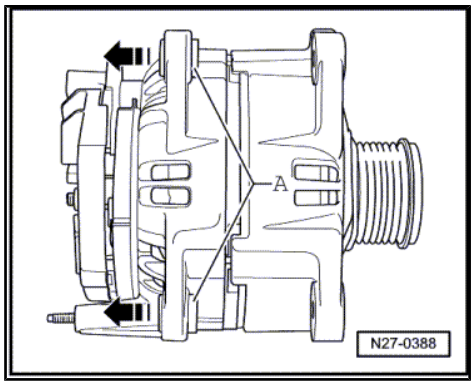
Installing:

Installation is carried out in reverse order of removal. Observe the following when doing this:

Caution

- ***When fitting used poly V-belts observe the direction of rotation marked on removal!***
- ***Before installing poly V-belt, make sure that all ancillaries (alternator, air conditioner compressor) are firmly secured in place.***
- ***When fitting belt, ensure that poly V-belt seats correctly in pulleys!***

– Drive threaded sleeve -A- about 4 mm in -direction of arrow- out of alternator housing.
– Tighten threaded connections to specified torque given in assembly overview ⇒ page 44 .
– Connecting battery ⇒ page 3 .
– Start engine and check belt running.



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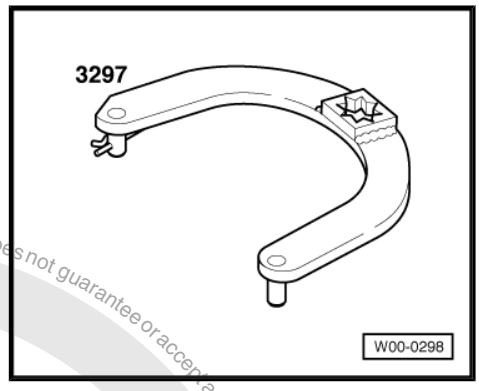
3.2.2 Removing and installing alternator, 1.4 l injection engine without air conditioning system

Caution

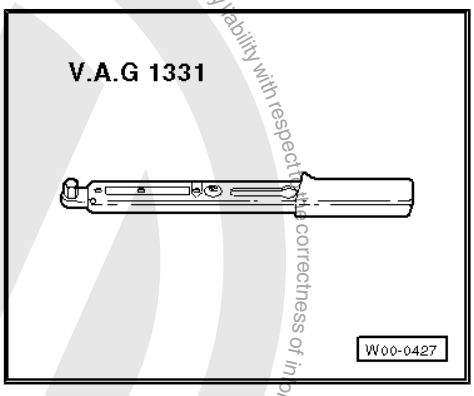
To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Special tools and workshop equipment required

- Tensioning lever - 3297-



- Torque wrench - V.A.G 1331-

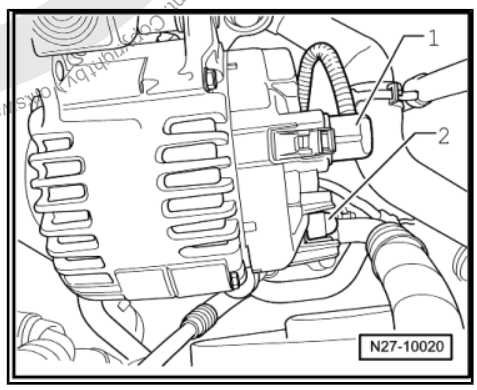


Removing:

– Disconnect battery ⇒ page 3 .

– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

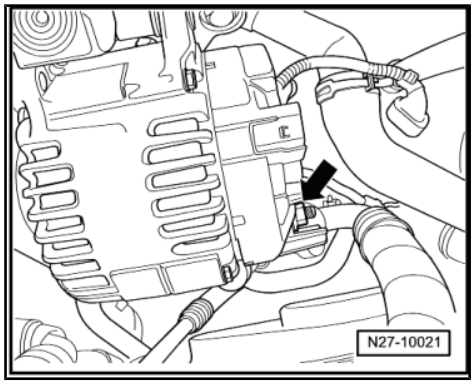
– Release and disconnect connector of DF cable -1- and pull off protective cap -2-.



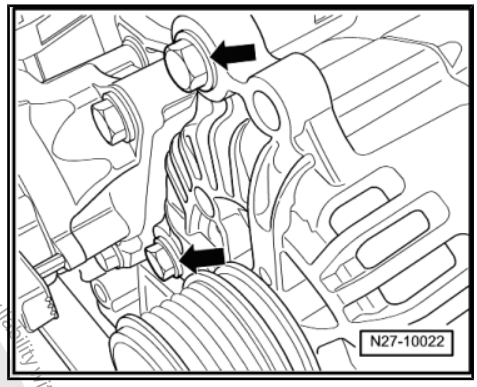
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– Unscrew B+ wire -arrow- from alternator.

– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .

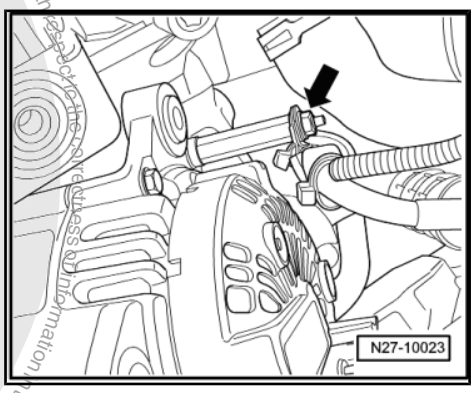


– Undo bolts securing alternator -arrows-.



– Unscrew wire holder -arrow- from alternator.

– Take out alternator.



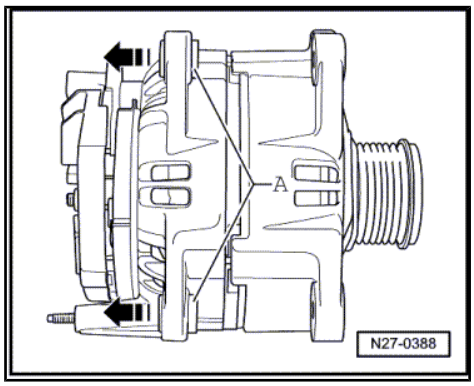
Installing:

Installation is carried out in reverse order of removal. Observe the following when doing this:

Caution

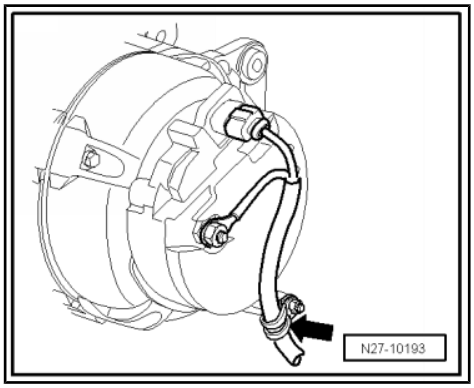
- *When installing used poly V-belts observe the direction of rotation marked on removal!*
- *Before installing poly V-belt, ensure that all ancillaries (alternator, air conditioning compressor) are securely fitted.*
- *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.



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– Secure wiring retainer -arrow- on back of alternator in 9 o'clock position.
– Tighten threaded connections to specified torque given in assembly overview ⇒ page 46 .
– Connecting battery ⇒ page 3 .
– Start engine and check belt running.



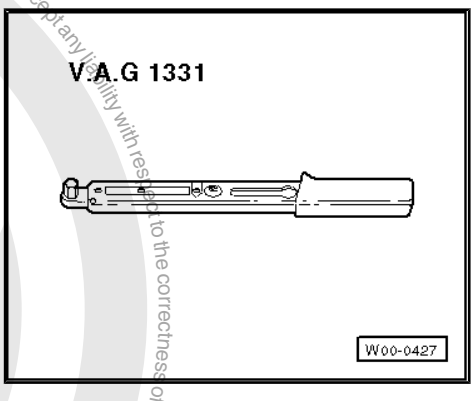
3.2.3 Removing and installing alternator, 1.4 l injection engine with air conditioning system

Caution

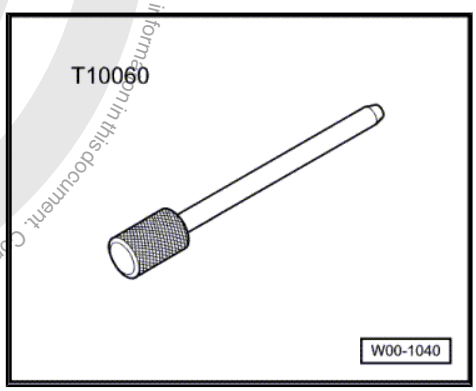
To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



♦ Locking pin - T10060-

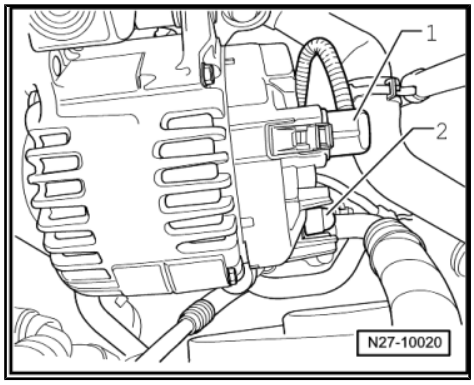


Removing:

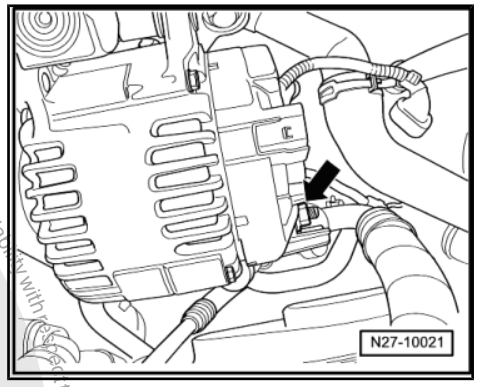
– Disconnect battery ⇒ page 3 .

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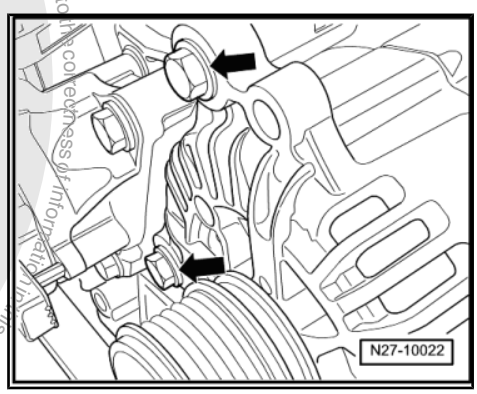
– Release and disconnect connector of DF cable -1- and pull off protective cap -2-.



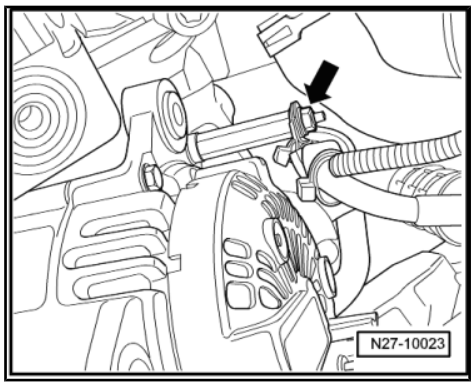
– Unscrew B+ wire -arrow- from alternator.
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body front; Noise insulation .
– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .



– Undo bolts securing alternator -arrows-.



– Unscrew wire holder -arrow- from alternator.
– Take out alternator.



Installing:

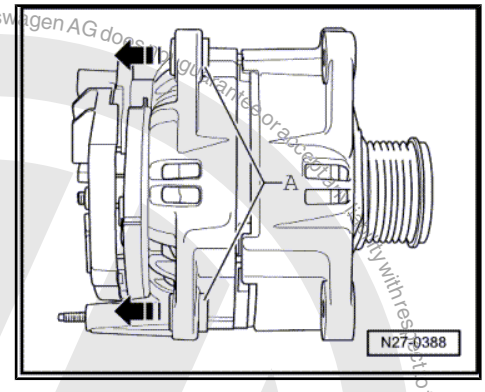
Install in the reverse order of removal. When doing this, note the following:

Caution

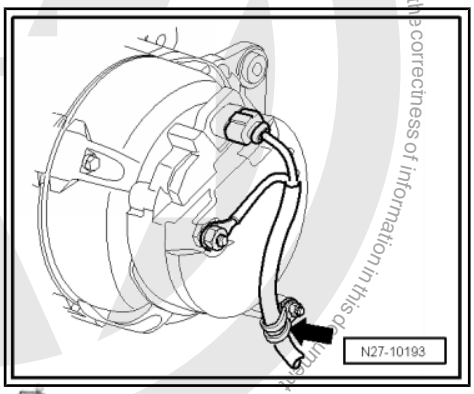
- *When fitting used poly V-belts, take note of the direction of rotation as marked during removal!*
- *Before installing poly V-belt, ensure that all ancillaries (alternator, air conditioner compressor) are secure.*
- *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

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– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.



– Secure wiring retainer -arrow- on back of alternator in 9 o'clock position.
– Tighten threaded connections to specified torque given in assembly overview ⇒ page 47 .
– Connecting battery ⇒ page 3 .
– Start engine and check belt running.



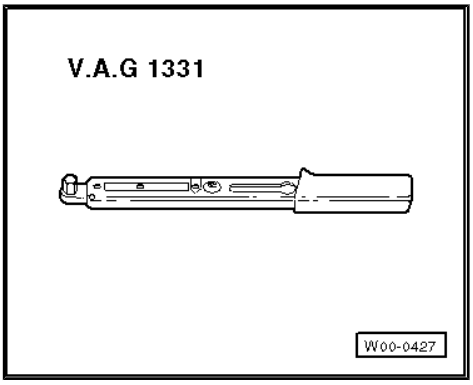
3.2.4 Removing and installing alternator, 1.6 l injection engine

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

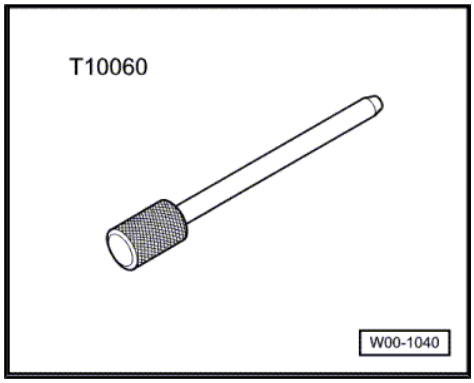
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



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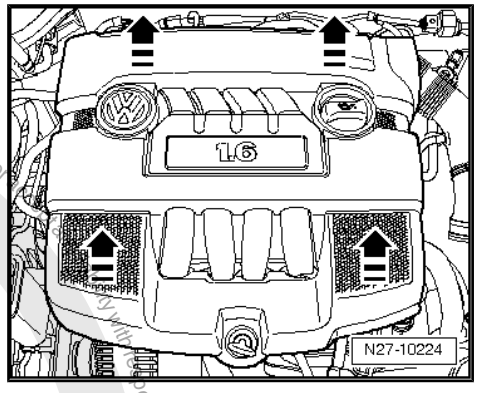
♦ Locking pin - T10060-



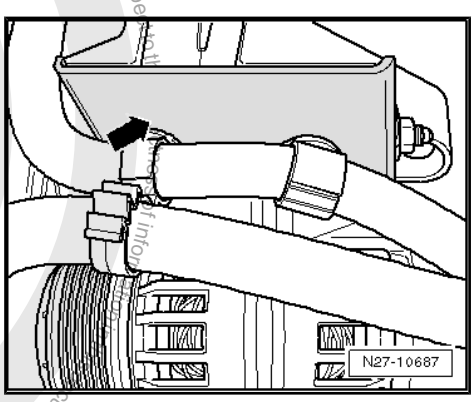
Removing:

– Disconnect battery ⇒ page 3 .

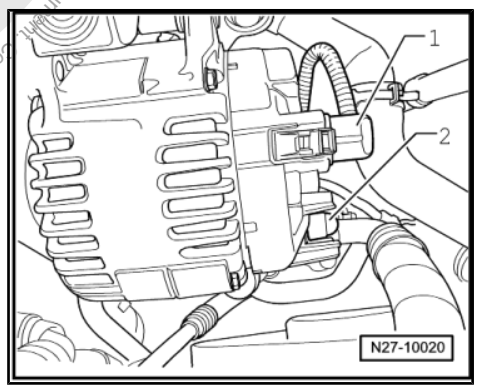
– Pull off engine cover panel upwards -arrows-.



– Remove bracket -arrow- upwards.



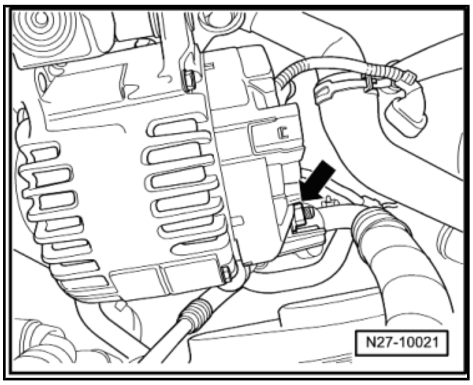
– Release and disconnect connector of DF cable -1- and pull off protective cap -2-.



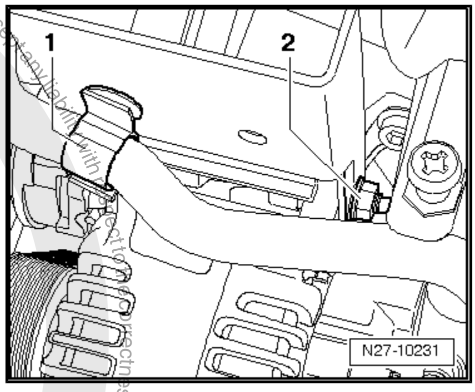
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– Unscrew B+ wire -arrow- from alternator.

– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .

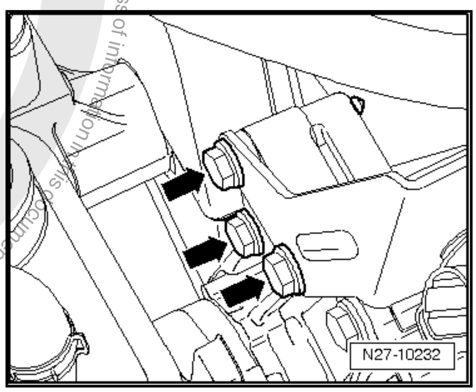


– Unclip coolant hose from hose retainer -1- and undo nut -2-.

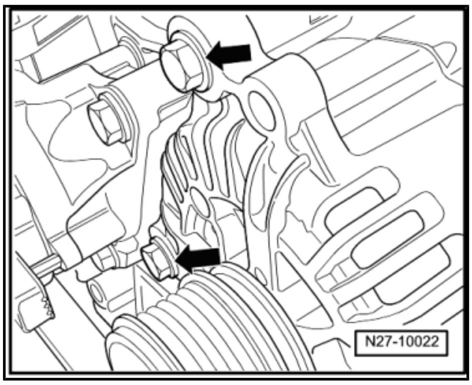


– Remove securing bolts -arrows-.

– Remove bracket together with tensioning device from the vehicle.



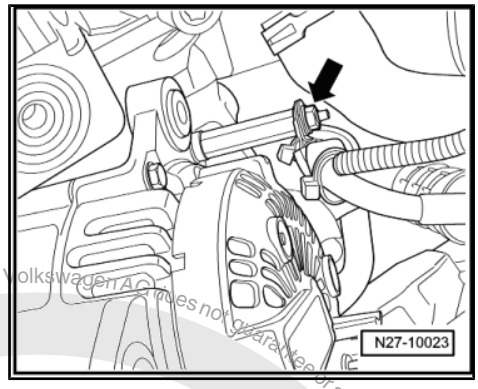
– Undo bolts securing alternator -arrows-.



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– Unscrew wire holder -arrow- from alternator.

– Remove alternator.



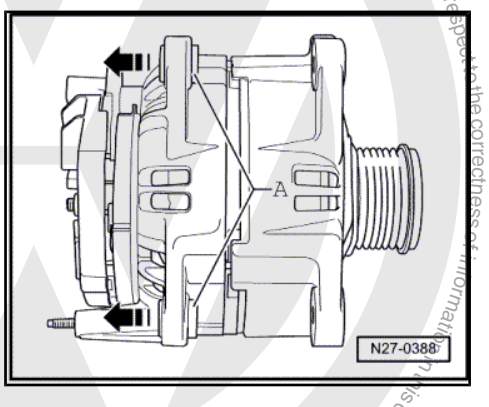
Installing:

Install in the reverse order of removal. When doing this, note the following:

Caution

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

– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.

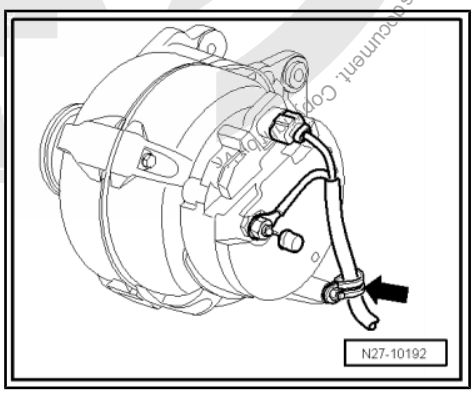


– Secure wiring retainer -arrow- on back of alternator in 3 o'clock position.

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 48 .

– Connecting battery ⇒ page 3 .

– Start engine and check belt running.



3.2.5 Removing and installing alternator, 1.6 l diesel engine, common rail (TDI)

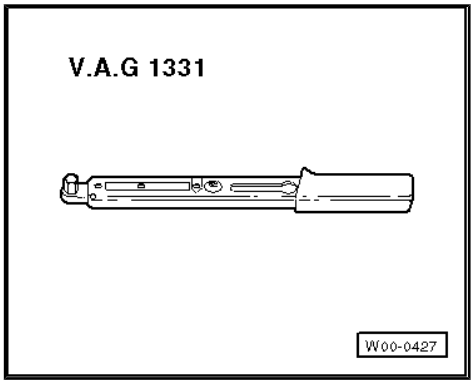
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Special tools and workshop equipment required

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- Torque wrench - V.A.G 1331-



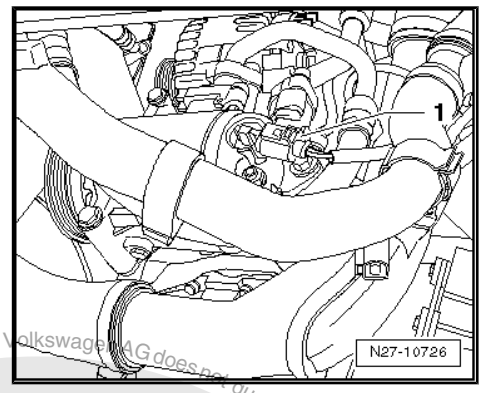
Removing:

– Disconnect battery ⇒ page 3 .

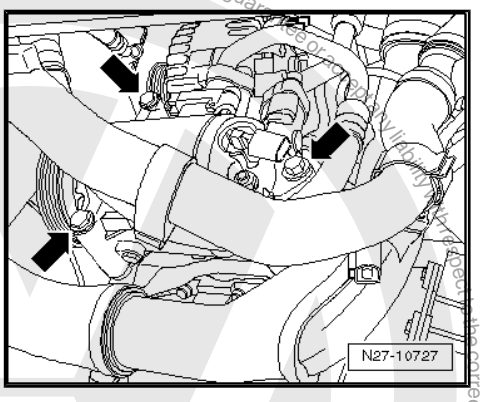
– Move lock carrier to service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier, up to 2011; Moving to and back from service position or ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier, as of 2011; Moving to and back from service position .

– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .

– Release and disconnect electrical connector -1-.



– Unscrew securing bolts of air conditioner compressor -arrows-.

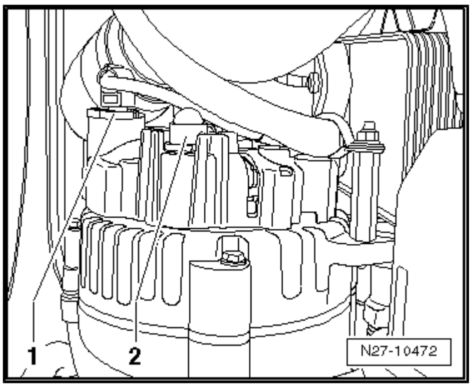


Note

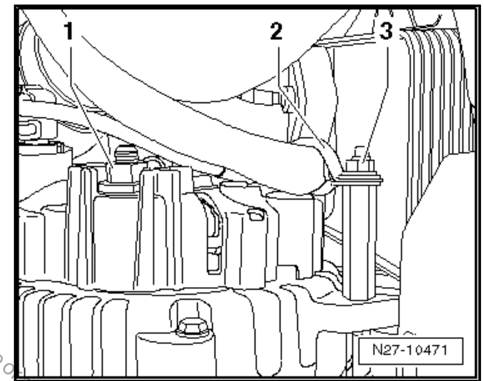
- *The hoses of the air conditioner compressor can remain connected.*
- *Hang up air conditioner compressor somewhere suitable with a wire until it is reinstalled.*
- *Ensure that the hoses are not stretched or kinked.*

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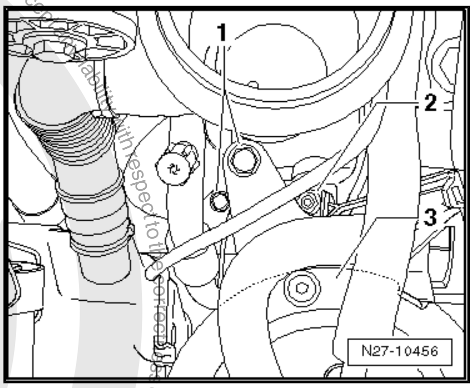
– Release and disconnect connector of DF cable -1-.
– Lever off deflector cap -2-.



– Undo nut -1- and detach the B+ wire under it from the connecting thread of the alternator.
– Undo nuts -3- and remove cable bracket -2- from alternator.



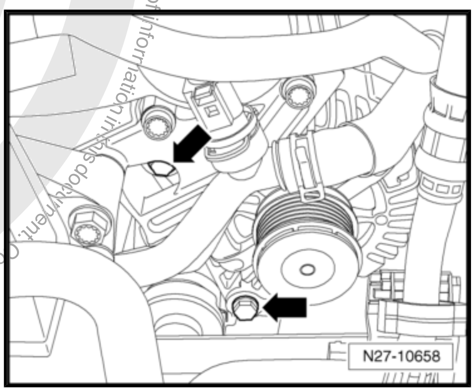
– Undo the two securing bolts -1- and the nuts -2- of the fuel filter -3- and place fuel filter to one side. The fuel hoses can then remain connected.



Note

Unscrew the lower of the two bolts -1- by approx. 1 cm; the bracket on fuel filter has a slit in it for installation and removal.

– Undo and remove the two bolts -arrows- securing the alternator.
– Remove alternator by taking it upwards out of the vehicle.



Installing:

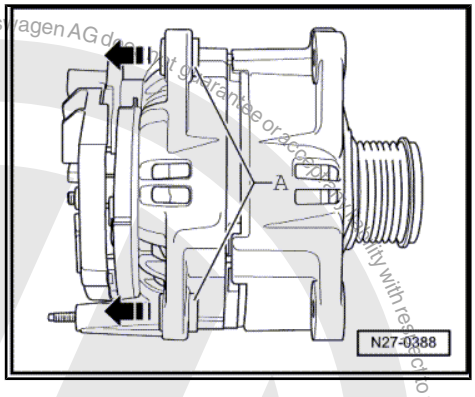
Install in the reverse order of removal. When doing this, note the following:

Caution

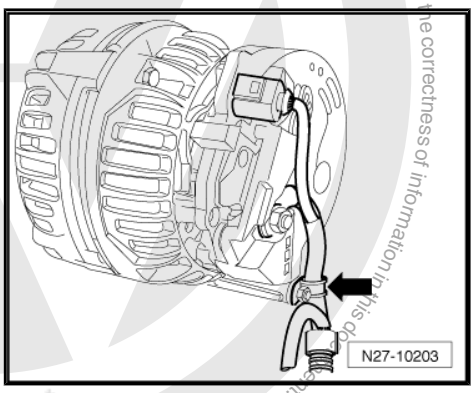
- *When fitting used poly V-belts observe the direction of rotation marked on removal!*
- *Before installing poly V-belt, make sure that all ancillaries (alternator, air conditioner compressor) are firmly secured in place.*
- *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

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– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.



– Secure wiring retainer -arrow- on back of alternator in 3 o'clock position.
– Tighten threaded connections to specified torque given in assembly overview ⇒ page 50 .
– Connecting battery ⇒ page 3 .
– Start engine and check belt running.



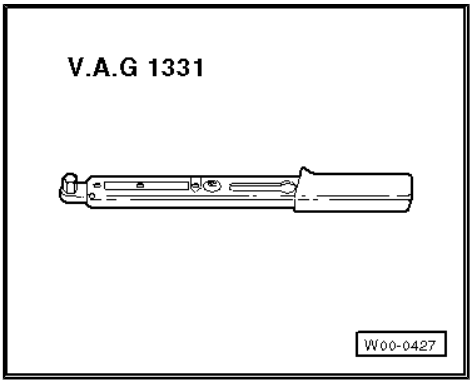
3.2.6 Removing and installing alternator, 1.9 l diesel engine, unit injector (TDI)

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

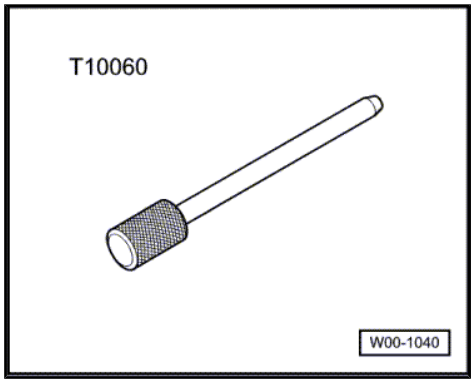
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



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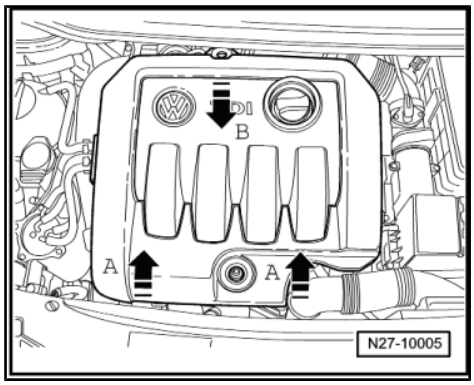
- Locking pin - T10060-



Removing:

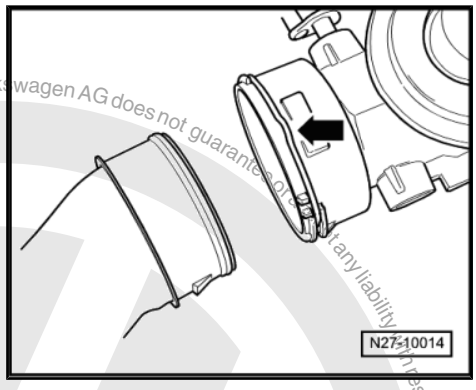
– Disconnect battery ⇒ page 3 .

– Pull off engine cover panel upwards -arrows A- and forwards -arrow B-.



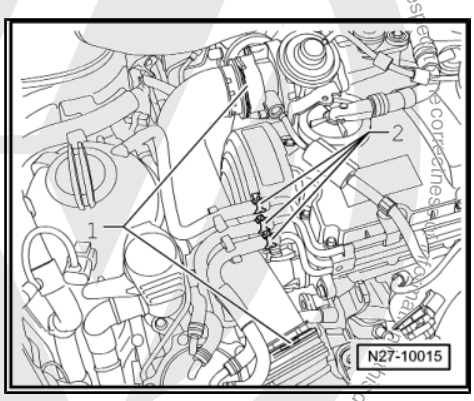
Note

- *All hose connections of charge air system are secured with spring-type clips or push-on couplings. The following instructions must be complied with for push-on couplings:*
- *Release push-on connection by pulling securing ring -arrow-.*
- *Pull off hose/pipe without tools.*



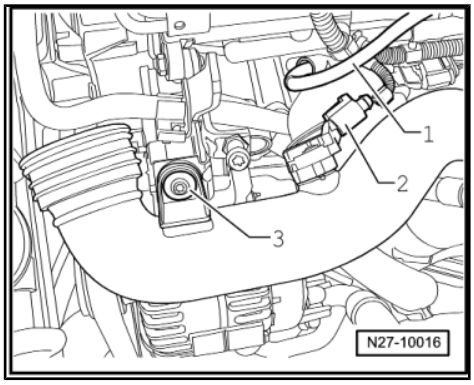
– Disconnect push-on couplings -1-.

– Unclip fuel hoses -2- and remove charge air hose.

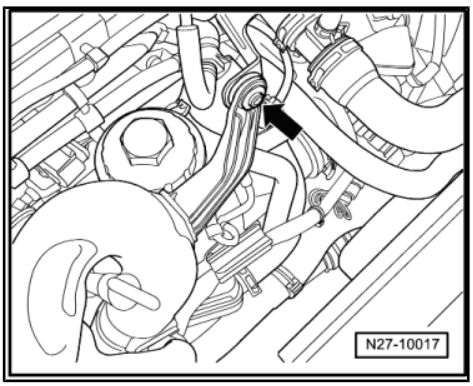


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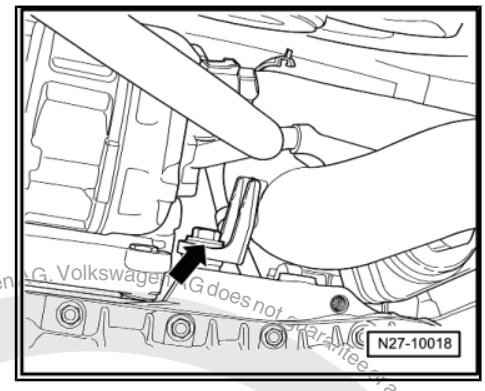
– Pull vacuum hose -1- off.
– Disconnect connector -2-.
– Remove securing bolt -3-.



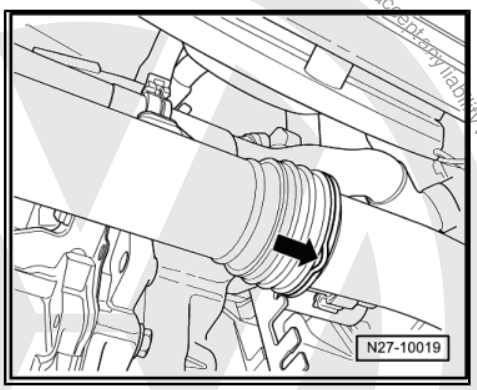
– Remove bolt -arrow-.
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .



– Undo bolt securing charge air pipe -arrow-.

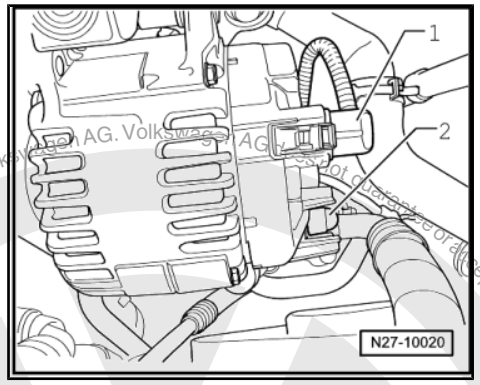


– Disconnect push-on coupling of charge air pipe -arrow-.
– Take charge air pipe out upwards.

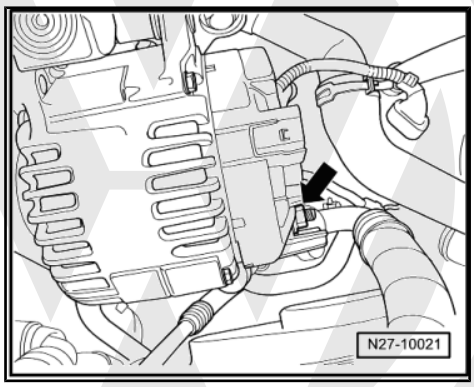


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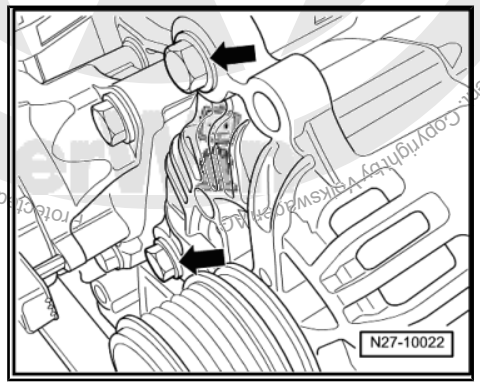
– Disconnect connector of DF cable -1- and pull off protective cap -2-.



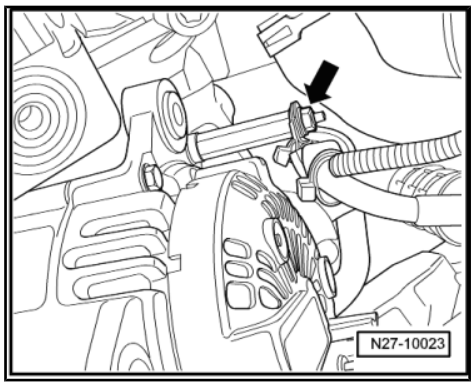
– Unscrew B+ wire -arrow- from alternator.
– Pull fuel filter out of holding bracket and place to one side. When doing this, the fuel hoses can remain connected.
– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .



– Undo bolts securing alternator -arrows-.



– Unscrew wire holder -arrow- from alternator.
– Take out alternator.



Installing:

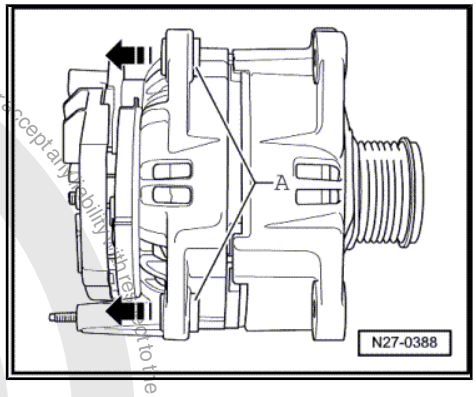
Install in the reverse order of removal. When doing this, note the following:

Caution

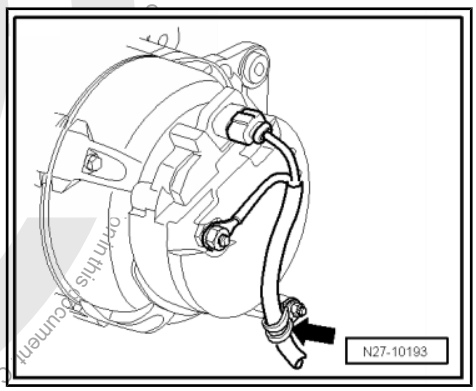
- *When fitting used poly V-belts, take note of the direction of rotation as marked during removal!*
- *Before installing poly V-belt, ensure that all ancillaries (alternator, air conditioner compressor) are secure.*
- *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

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– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.



– Secure wiring retainer -arrow- on back of alternator in 9 o'clock position.



Note

- *All hose connections of charge air system are secured with spring-type clips or push-on couplings. The following instructions must be complied with for push-on couplings:*
- *Push on hose or pipe without tools.*
- *Ensure that retaining lugs have securely engaged -arrow-.*

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 51 .

– Connecting battery ⇒ page 3 .

– Start engine and check belt running.

3.2.7 Removing and installing alternator, 2.0 l diesel engine, unit injector (TDI)

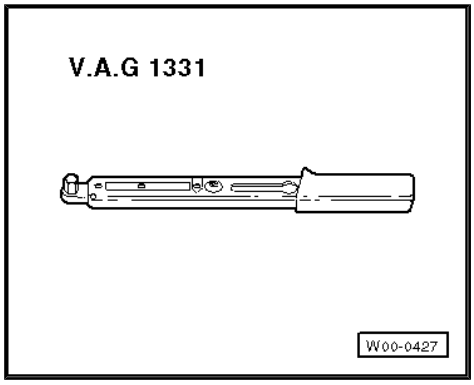
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

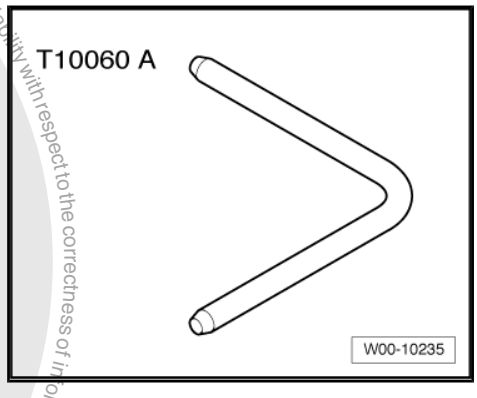
Special tools and workshop equipment required

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- Torque wrench - V.A.G 1331-



- Locking pin - T10060 A-

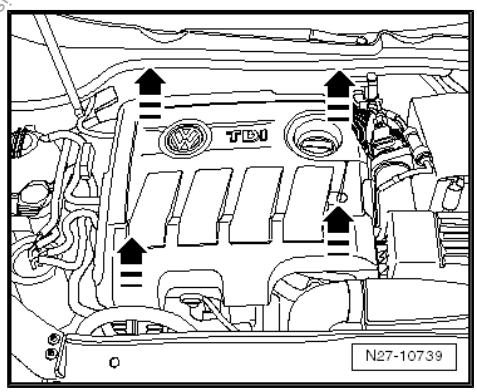


Removing:

– Disconnect battery ⇒ page 3 .

– Pull engine cover panel off upwards -arrows-.

– Move lock carrier to service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier, up to 2011; Moving to and back from service position or ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier, as of 2011; Moving to and back from service position .



Caution

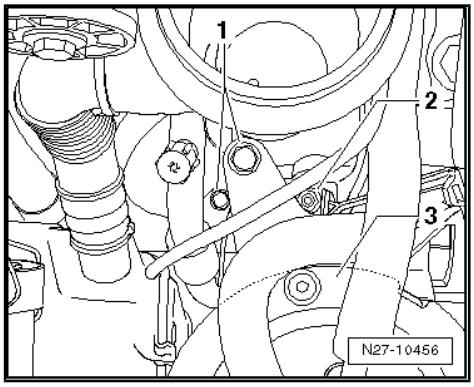
Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!

– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .

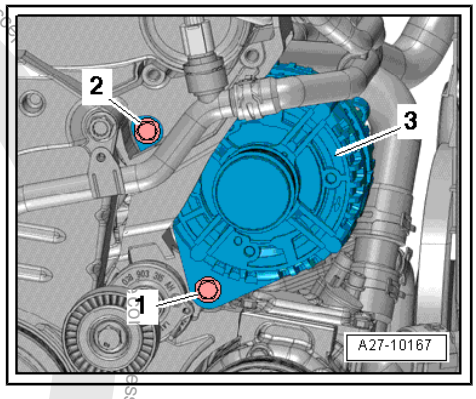
– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

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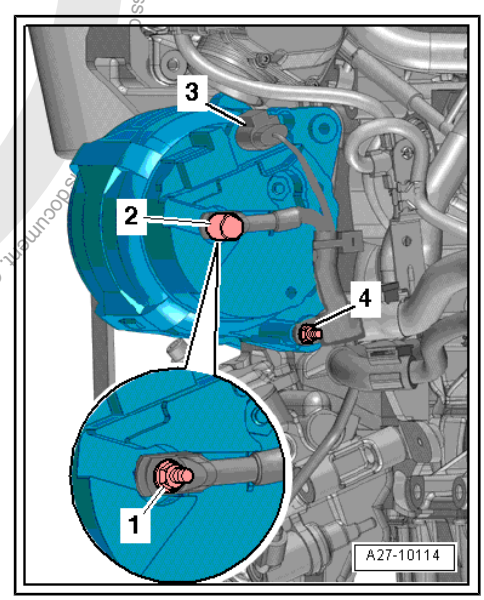
– Unscrew both securing bolts -1- and securing nut -2- and place fuel filter -3- to one side. The fuel hoses can then remain connected.
– Unscrew upper securing bolt -2- of alternator.
– Open lower spring-type clip -1-.



– Tilt alternator -3- forwards.
– Unlock and separate connector of DF cable -3-.
– Lever off deflector cap -2-.
– Undo nut -1- and detach the B+ wire under it from the connecting thread of the alternator.



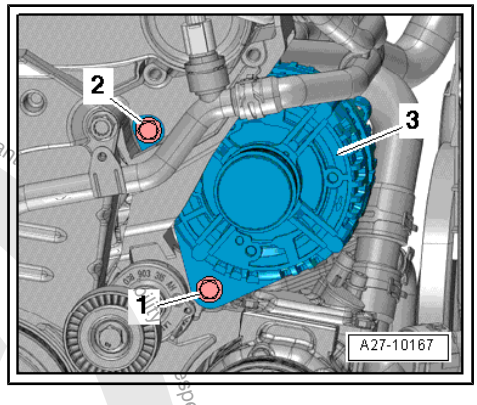
– Undo securing nuts -4- and remove cable bracket from alternator.



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– Unscrew lower securing bolt -1- of alternator.

– Remove alternator by taking it upwards out of the vehicle.



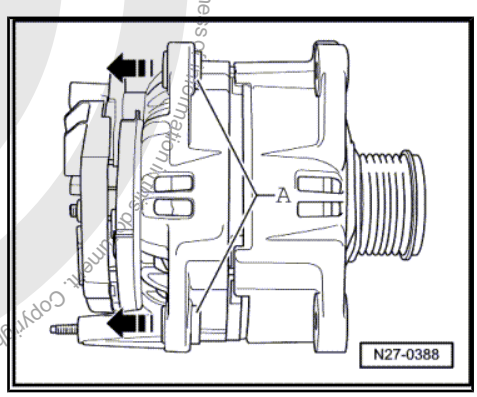
Installing:

Install in the reverse order of removal. When doing this, note the following:

Caution

- *When installing used poly V-belts observe the direction of rotation marked on removal!*
- *Before installing poly V-belt, ensure that all ancillaries (alternator, air conditioning compressor) are secure.*
- *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.

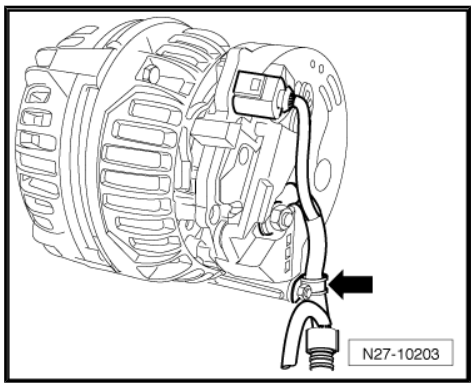


– Secure wiring retainer -arrow- on back of alternator in 3 o'clock position.

– Tighten threaded connections to specified torque given in assembly overview.

– Connecting battery ⇒ page 3 .

– Start engine and check belt running.



Specified torques

- ⇒ “3.1.7 Assembly overview - alternator, 2.0 l diesel engine, unit injector (TDI)”, page 52

3.2.8 Removing and installing alternator, 2.0 l diesel engine, common rail (TDI)

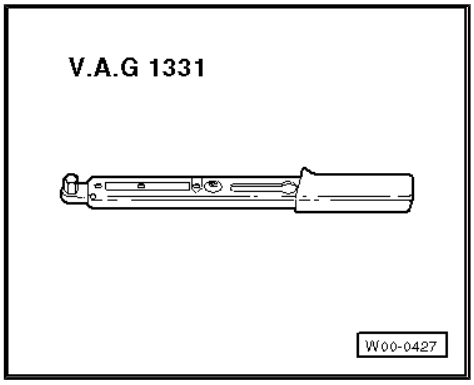
Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

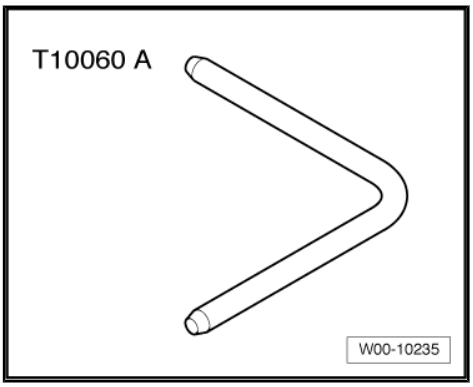
Special tools and workshop equipment required

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- Torque wrench - V.A.G 1331-



- Locking pin - T10060 A-



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Removing:

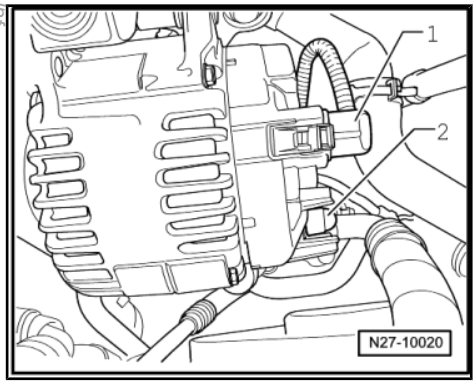
– Disconnect battery ⇒ page 3 .

– Move lock carrier to service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier, up to 2011; Moving to and back from service position or ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier, as of 2011; Moving to and back from service position .

– Remove charge air pipe above alternator.

– Release and disconnect connector of DF cable -1-.

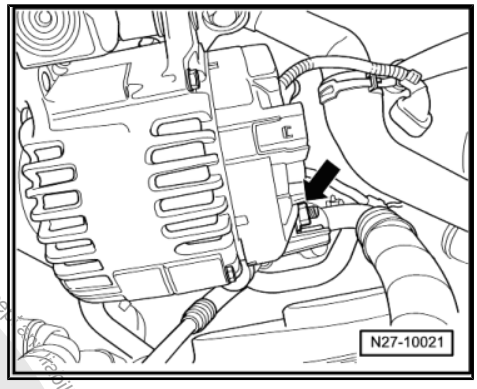
– Pull off protective cap -2-.



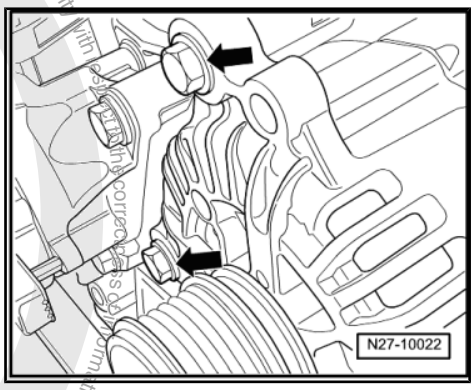
– Unscrew B+ wire -arrow- from alternator.

– Unbolt fuel filter, and lay it to one side. When doing this, the fuel hoses can remain connected.

– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .

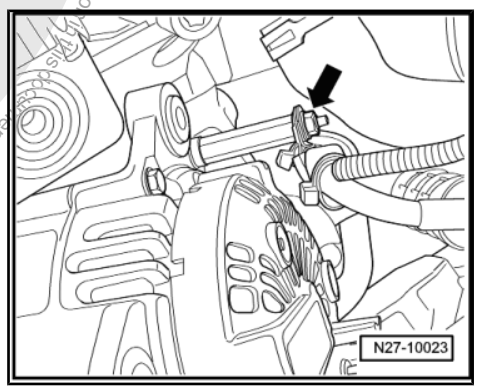


– Undo bolts securing alternator -arrows-.



– Unscrew wire holder -arrow- from alternator.

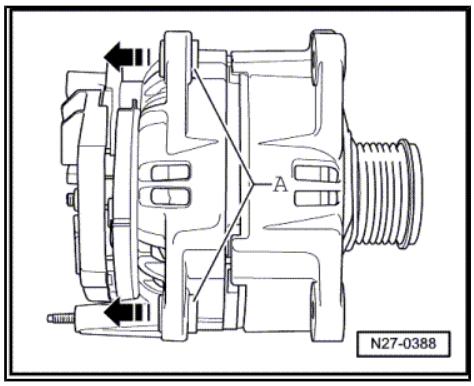
– Take out alternator.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.



Caution

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

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 53 .

– Start engine and check belt running.

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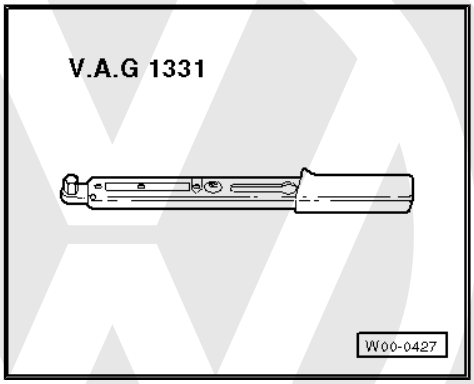
3.2.9 Removing and installing alternator, 2.0 l diesel engine, unit injector (SDI)

Caution

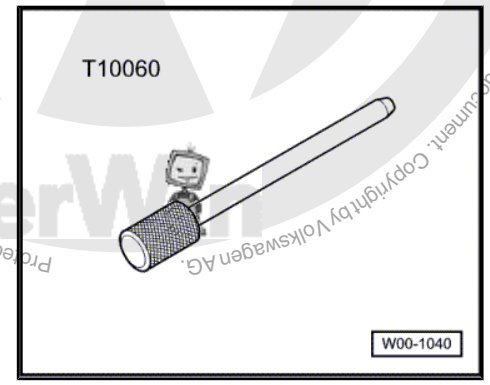
To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Special tools and workshop equipment required

- Torque wrench (5 - 50 Nm) - V.A.G 1331-



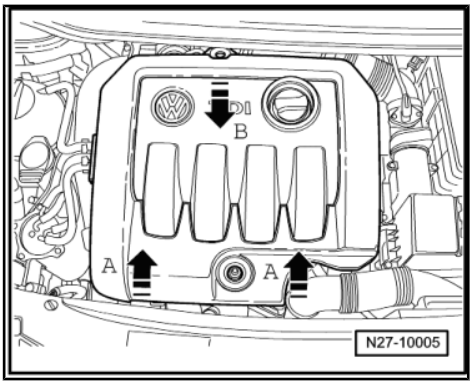
- Locking pin - T10060-



Removing:

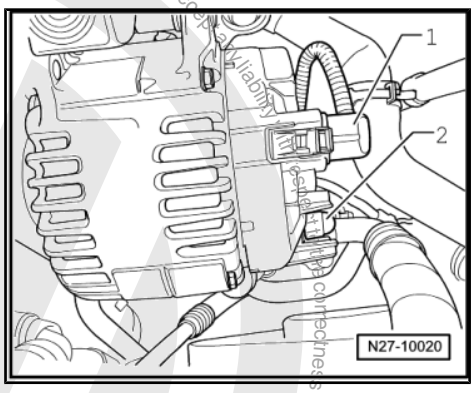
– Disconnect battery ⇒ page 3 .

– Pull engine cover panel upwards -arrows A- and forwards -arrow B-.

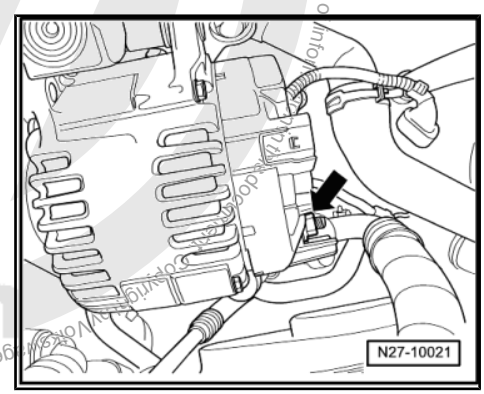


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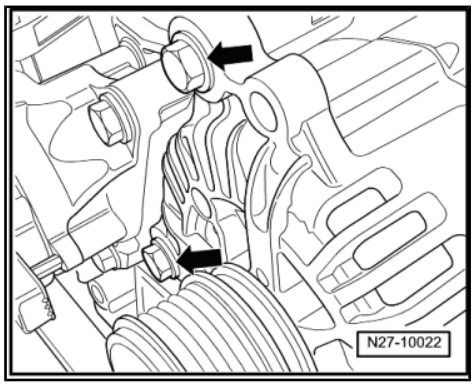
– Release and disconnect connector of DF cable -1-.
– Pull off protective cap -2-.



– Unscrew B+ wire -arrow- from alternator.
– Pull fuel filter out of holding bracket and place to one side. When doing this, the fuel hoses can remain connected.
– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .



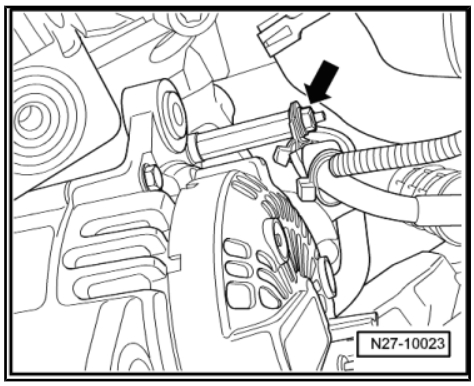
– Undo bolts securing alternator -arrows-.



– Unscrew wire holder -arrow- from alternator.
– Take out alternator.

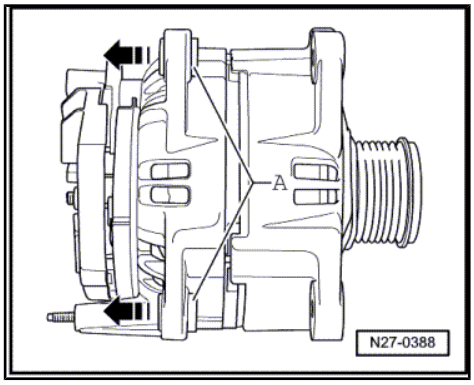
Installing:

Install in the reverse order of removal. When doing this, note the following:



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– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.



Caution

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

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 54 .

– Connecting battery ⇒ page 3 .

– Start engine and check belt running.

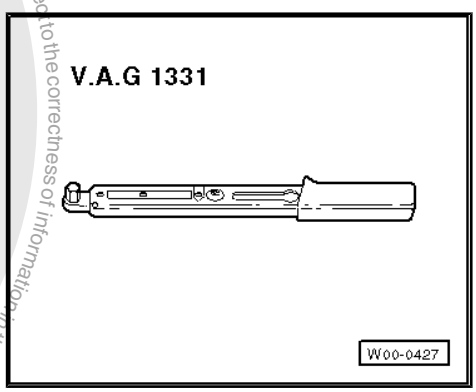
3.2.10 Removing and installing alternator, 2.0 l natural gas engine

Caution

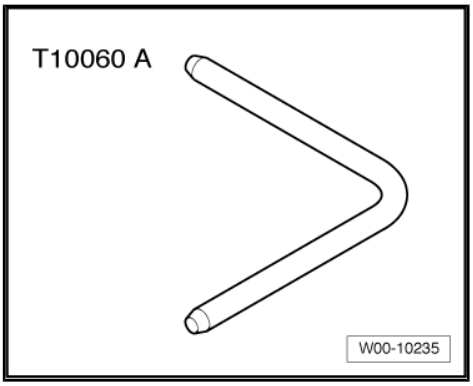
To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



- Locking pin - T10060 A-



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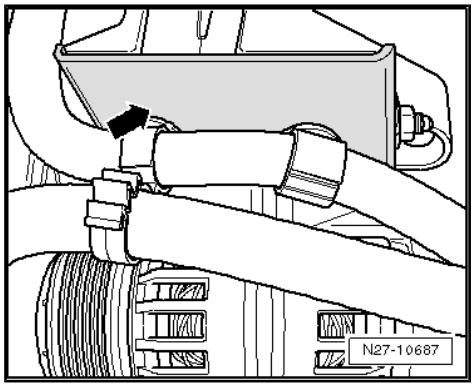
Removing:

WARNING

Any work to be done on the high-pressure lines of the natural gas system must be carried out by fully trained personnel.

– Disconnect battery ⇒ page 3 .

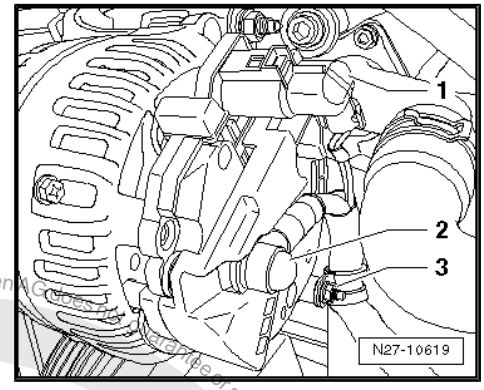
– Remove bracket -arrow- upwards.



– Release and disconnect connector of DF cable -1-.

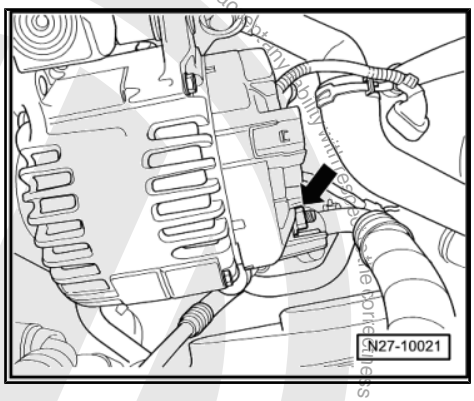
– Pull off protective cap -2-.

– Unscrew cable holder -3- from alternator.



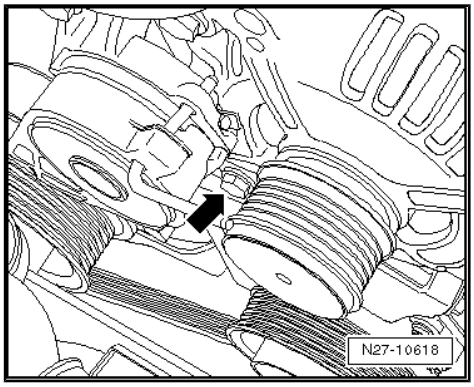
– Unscrew B+ wire -arrow- from alternator.

– Remove poly V-belt ⇒ Power unit; Rep. gr. 13 ; Cylinder block, belt pulley end; Removing and installing poly V-belt .

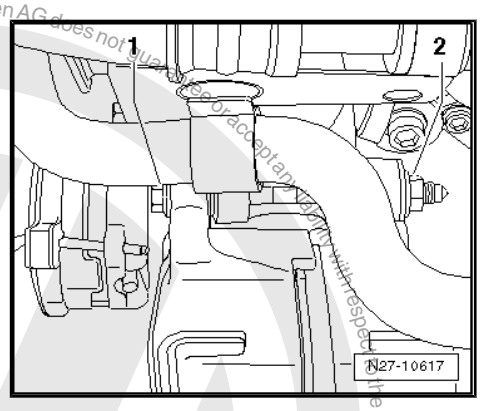


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– Undo lower bolt securing alternator -arrow-.



– Remove hexagon nut -2-.
– Undo upper bolt securing alternator -1-.
– Remove alternator by taking it upwards out of the vehicle.



Caution

The space between the low-pressure line and the lock carrier is just big enough to allow removal of the alternator.

The alternator must be removed from the vehicle very carefully in order to avoid damage to the low-pressure line leading to the gas rail.

The low-pressure line to the gas rail must not be opened to remove the alternator.

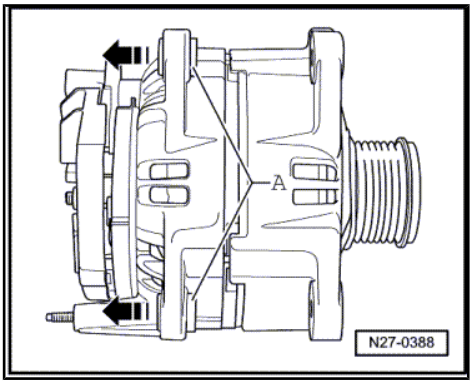
Installing:

Installation is carried out in reverse order of removal. Observe the following when doing this:

Caution

- *When fitting used poly V-belts, take note of the direction of rotation as marked during removal!*
- *Before installing poly V-belt, ensure that all ancillaries (alternator, air conditioner compressor, vane pump) are secured tightly.*
- *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*
- *The alternator must be installed carefully in order to avoid any damage to the low-pressure line to the gas rail.*

– Drive threaded sleeve -A- about 4 mm in direction of arrow out of alternator housing.



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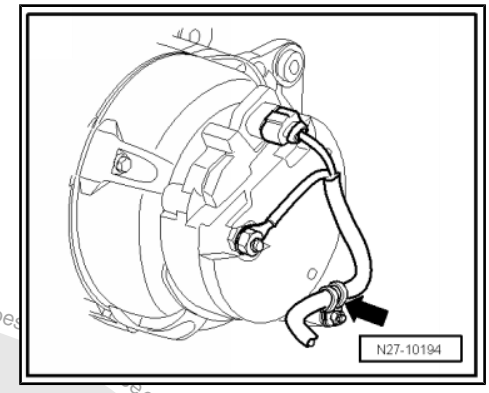
– Secure wiring retainer -arrow- on back of alternator in 12 o'clock position.

– Tighten threaded connections to specified torque given in assembly overview:

♦ Vehicles without air conditioner ⇒ page 55

♦ Vehicles with air conditioning system ⇒ page 56

– Start engine and check belt running.



3.3 Checking alternator

⇒ “3.3.1 Checking alternator”, page 86

⇒ “3.3.2 Functional check of poly V-belt pulley with freewheel on alternator”, page 86

3.3.1 Checking alternator

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

♦ Body

♦ Electrical system

♦ 27 - Starter, current supply

♦ Electrical components

♦ C - Alternator

3.3.2 Functional check of poly V-belt pulley with freewheel on alternator

The freewheel of the poly V-belt pulley on alternator is an important component of the belt drive and should always be checked if damage to the belt drive/alternator is suspected.

Functional check of poly V-belt pulley with freewheel on alternator ⇒ Electrical system, General information; Rep. gr. 27 ; Alternator; Functional check of poly V-belt pulley with freewheel on alternator .

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3.4 Repairing alternator

⇒ “3.4.1 Removing and installing voltage regulator, manufacturer Bosch”, page 87

⇒ “3.4.2 Removing and installing voltage regulator, manufacturer Valeo”, page 88

⇒ “3.4.3 Removing and installing poly V-belt pulley without free-wheel”, page 89

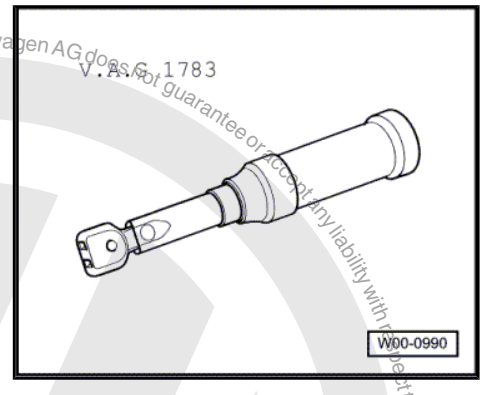
⇒ “3.4.4 Removing and installing poly V-belt pulley with free-wheel, manufacturer Bosch”, page 90

⇒ “3.4.5 Removing and installing poly V-belt pulley with free-wheel, manufacturer Valeo”, page 91

3.4.1 Removing and installing voltage regulator, manufacturer Bosch

Special tools and workshop equipment required

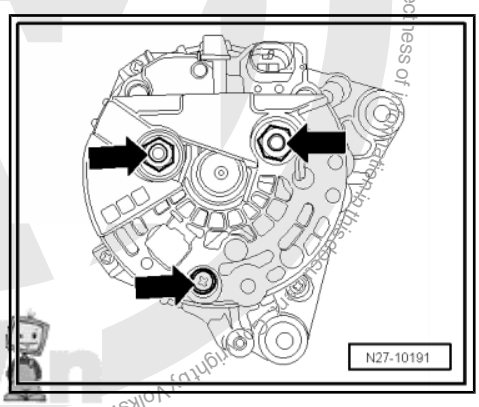
- Torque wrench - V.A.G 1783-



Removing:

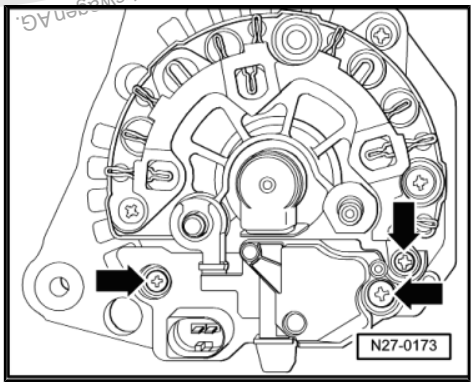
– Remove alternator ⇒ page 58 .

– Unscrew securing bolts and nuts -arrows- and remove protective cap from alternator.



– Undo bolts securing voltage regulator -arrows-.

– Carefully remove voltage regulator from alternator.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten threaded connections to specified torque ⇒ page 44 .

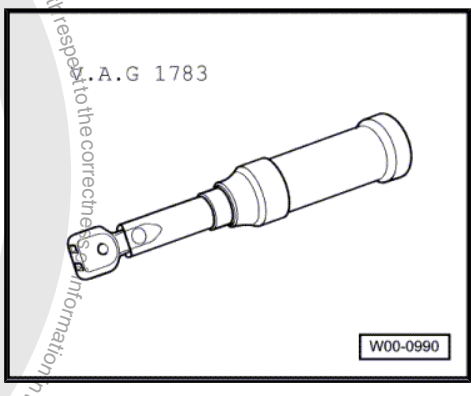
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3.4.2 Removing and installing voltage regulator, manufacturer Valeo

Special tools and workshop equipment required

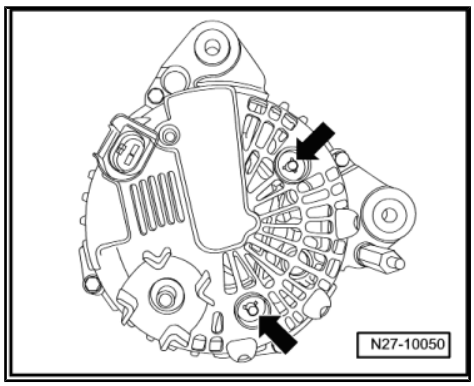
- Torque wrench - V.A.G 1783/-



Removing:

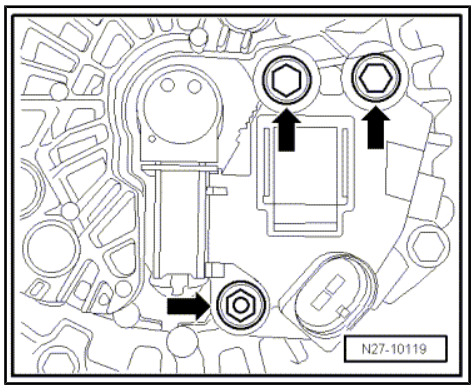
– Remove alternator ⇒ page 58 .

– Remove clamping rings -arrows- and remove protective cap from alternator.



– Unscrew securing bolts of voltage regulator -arrows-.

– Carefully remove voltage regulator from alternator.



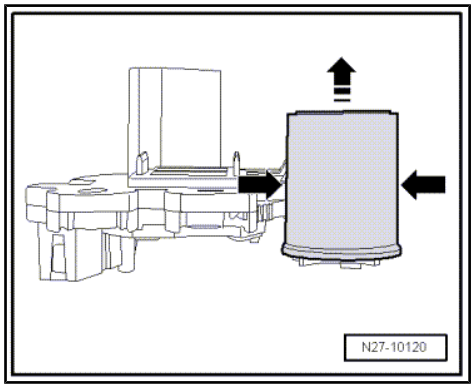
Installing:

Install in the reverse order of removal. When doing this, note the following:

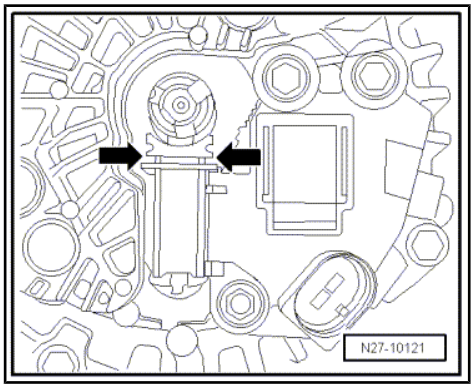
– Release locking lugs -arrows- and pull off protective cap from voltage regulator.

– Push carbon brushes into housing of voltage regulator and insert voltage regulator into alternator.

– Tighten threaded connections to specified torque ⇒ page 44 .



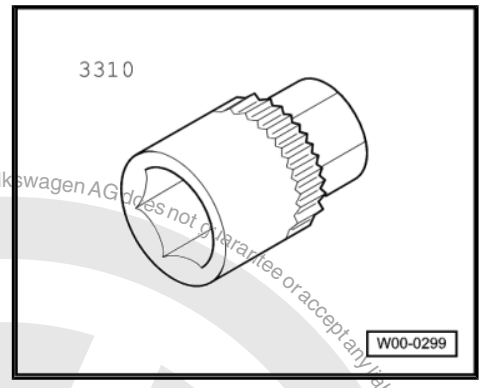
– Push protective cap into guides -arrows- until it can be heard to engage.



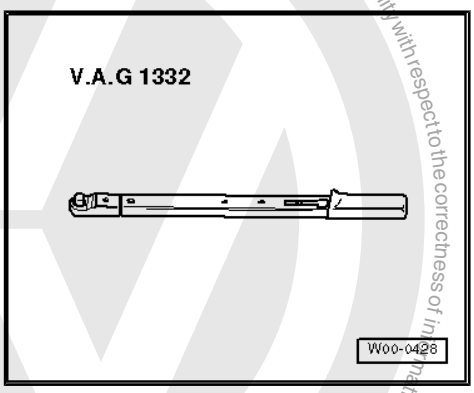
3.4.3 Removing and installing poly V-belt pulley without freewheel

Special tools and workshop equipment required

♦ Socket - VAS 3310-



♦ Torque wrench - V.A.G 1332-



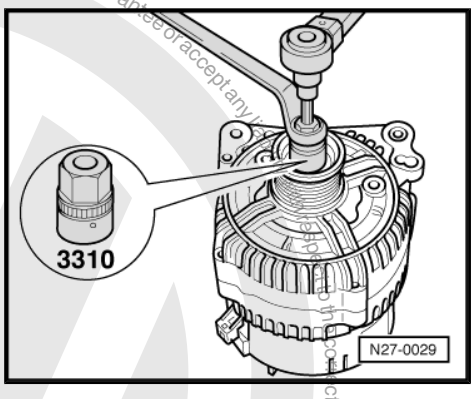
Removing:

– Remove alternator ⇒ page 58 .

– Clamp alternator in a vice at securing points.

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– Use socket - VAS 3310- to unscrew poly V-belt pulley securing nut from alternator shaft.



Installing:

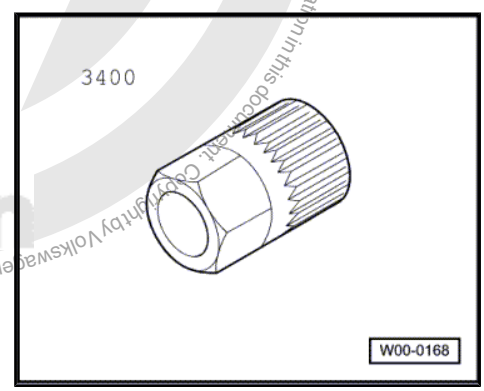
Installation is carried out in the reverse order. When installing observe the following:

– Tighten threaded connections to specified torque ⇒ page 44 .

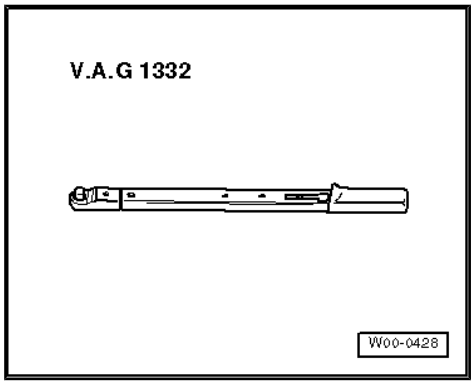
3.4.4 Removing and installing poly V-belt pulley with freewheel, manufacturer Bosch

Special tools and workshop equipment required

♦ Multipoint adapter - VAS 3400-



♦ Torque wrench - V.A.G 1332-



Removing:

– Remove alternator ⇒ page 58 .

– Clamp alternator in a vice at securing points.

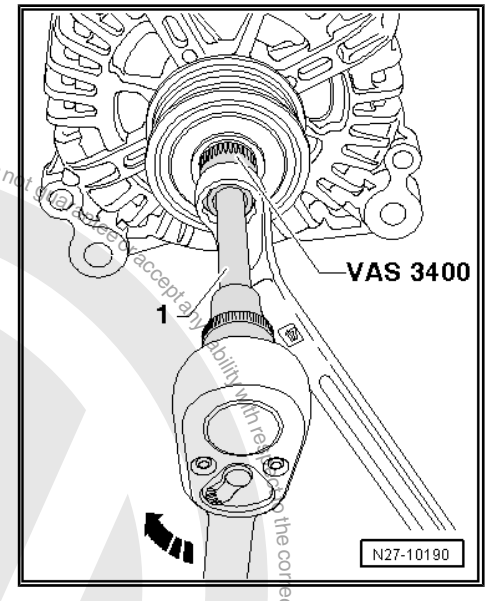
– Remove protective cap from poly V-belt pulley with freewheel.

Note

The thread on the alternator shaft is a right-handed thread. To undo the threaded connection, the shaft on the inside has to be twisted out of the fixed pulley. This means that the nut is not unscrewed from the fixed bolt but the bolt is unscrewed from the fixed nut, hence the changed direction of rotation.

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– Insert multi-point adapter - VAS 3400- with ring spanner 17 mm in poly V-belt pulley with freewheel of alternator.
– Insert M10 multi-point bit -1- into alternator shaft.
– Undo bolted connection by turning it clockwise and counter-holding with ring spanner.
– Hold poly V-belt pulley with freewheel stationary by hand and turn input shaft of alternator until poly V-belt pulley with freewheel can be removed.



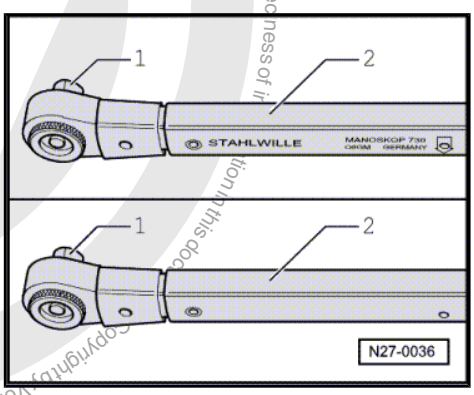
Installing:

Install in the reverse order of removal. When doing this, note the following:

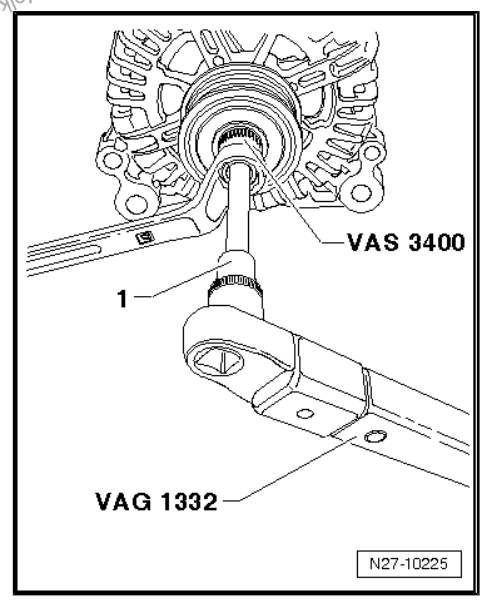
– First screw poly V-belt pulley with freewheel on drive shaft of alternator by hand as far as limit stop.

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

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



– Insert M10 multi-point bit -1- into alternator shaft.
– Counterhold adapter - VAS 3400- using 17 mm ring spanner.
– Tighten poly V-belt with freewheel by turning drive shaft of alternator anti-clockwise using torque wrench - V.A.G 1332- .
– Tighten threaded connections to specified torque ⇒ page 44 .

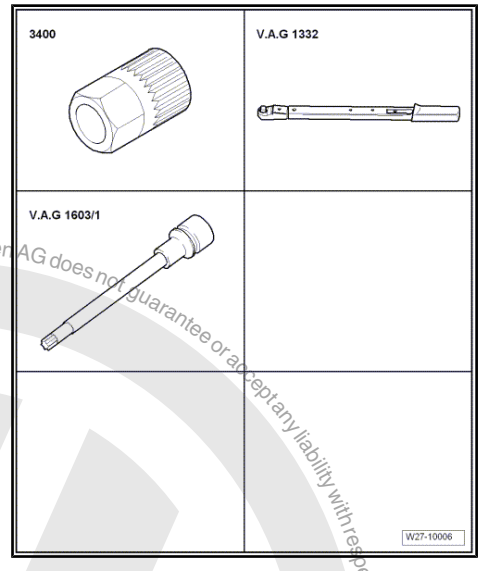


3.4.5 Removing and installing poly V-belt pulley with freewheel, manufacturer Valeo

Special tools and workshop equipment required

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- Multipoint adapter - VAS 3400-



- Torque wrench - V.A.G 1332-
- TORX driver bit - V.A.G 1603/1-

Removing:

– Remove alternator ⇒ page 58 .

– Clamp alternator in a vice at securing points.

– Remove protective cap from poly V-belt pulley with freewheel.

Note

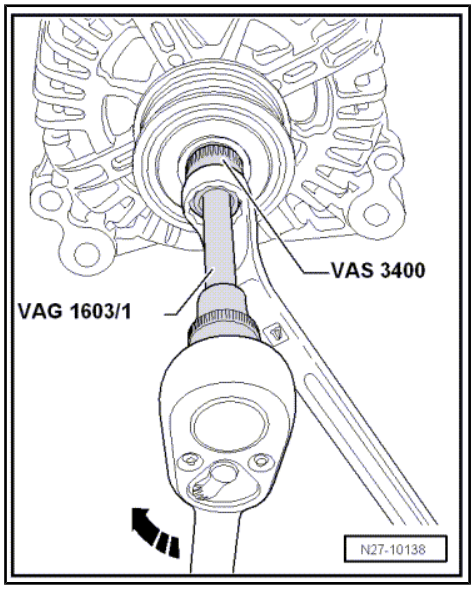
The thread on the alternator shaft is a right-handed thread. To undo the threaded connection, the shaft on the inside has to be twisted out of the fixed pulley. This means that the nut is not unscrewed from the fixed bolt but the bolt is unscrewed from the fixed nut, hence the changed direction of rotation.

– Insert multi-point adapter - VAS 3400- with ring spanner 17 mm in poly V-belt pulley with freewheel of alternator.

– Insert TORX driver bit - V.A.G 1603/1- into alternator shaft.

– Undo bolted connection by turning it clockwise and counter-holding with ring spanner.

– Hold poly V-belt pulley with freewheel stationary by hand and turn input shaft of alternator until poly V-belt pulley with freewheel can be removed.



Installing:

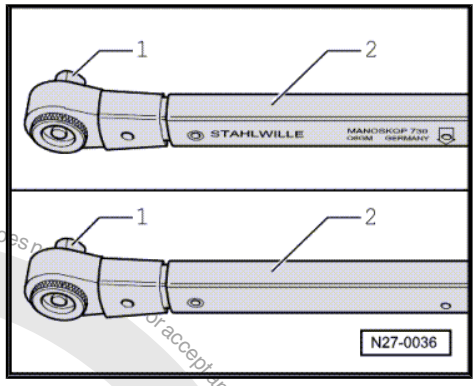
Install in the reverse order of removal. When doing this, note the following:

– First screw poly V-belt pulley with freewheel on drive shaft of alternator by hand as far as limit stop.

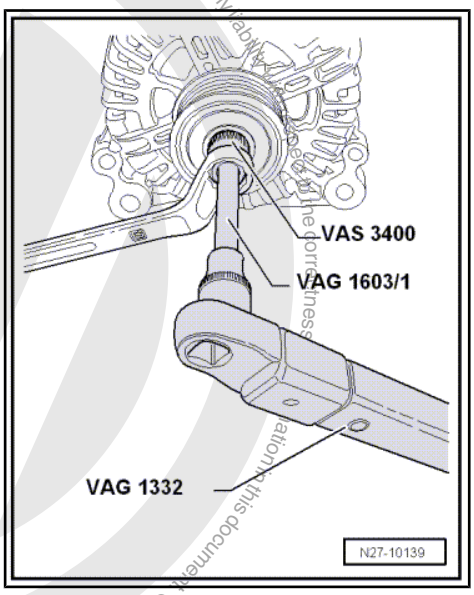
The torque wrench - V.A.G 1332- must be modified for assembly of poly V-belt with freewheel as follows:

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



– Insert TORX driver bit - V.A.G 1603/1- into alternator shaft.
– Counterhold adapter - VAS 3400- using 17 mm ring spanner.
– Tighten poly V-belt with freewheel by turning drive shaft of alternator anti-clockwise using torque wrench - V.A.G 1332- .
– Tighten threaded connections to specified torque ⇒ page 44 .



3.5 Checking poly V-belt

– Crank engine at vibration damper/belt pulley using a socket.
– Check poly V-belt for:

♦ Sub-surface cracks (cracks, core ruptures, cross sectional breaks)
♦ Layer separation (top layer, cord strands)
♦ Base break-up
♦ Fraying of cord strands
♦ Flank wear (material wear, frayed flanks, flank brittleness - glassy flanks-, surface cracks)
♦ Traces of oil and grease

Caution

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

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4 Cruise control system (CCS)

General information on cruise control system (CCS) is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 27 ; Cruise control system (CCS) .

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5 Start/Stop system

⇒ “5.1 General description - Start/Stop system”, page 95

⇒ “5.2 Removing and installing start-stop mode switch”, page 96

⇒ “5.3 Removing and installing voltage stabiliser”, page 96

⇒ “5.4 Removing and installing battery monitoring control unit”, page 100

5.1 General description - Start/Stop system

Note

Additional information:

⇒ Operating manual of vehicle

⇒ Self-study programme No. 426 ; Start/Stop system 2009

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

General description:

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

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 403 .

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 monitoring control unit 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.

Replacing battery on vehicles with Start/Stop system:

Because of its higher deep-cycle resistance, only an absorbent glass mat battery is used as a starter battery instead of the normal lead battery in vehicles with Start/Stop system.

In case of repair, note correct part number designation in ETKA. The modified components for the Start/Stop system have no special markings. They do not differ externally, or hardly, from standard components.

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On vehicles with start-stop system, the procedure “parameterising battery after replacement” has to be performed after the battery is replaced to ensure that the start-stop system subsequently works properly ⇒ page 11 .

Following components are involved in the Start/Stop system:

- Battery - A-
- Alternator - C- ⇒ page 44
- Voltage regulator - C1-
- Starter - B- ⇒ page 12
- Brake light switch - F-
- Clutch pedal switch - F36-
- Start/stop operation switch - E693- ⇒ page 96
- Coolant temperature sender - G62-
- Accelerator position sender - G79-
- Gearbox neutral position sender - G701-
- Control unit for ABS with EDL - J104-
- Climatronic control unit - J255-
- Control unit with display in dash panel insert - J285- ⇒ page 101
- Battery monitoring control unit - J367- ⇒ page 100
- Power steering control unit - J500-
- Onboard supply control unit - J519- ⇒ page 382
- Voltage stabiliser - J532- ⇒ page 96
- Data bus diagnostic interface - J533- ⇒ page 387
- Engine control unit - J623-

5.2 Removing and installing start-stop mode switch

The start/stop operation switch - E693- is located in the centre console switch unit in front of the gear lever. It serves to switch off manually the Start/Stop system.

Removal and installation of the start/stop operation button - E693- are carried out in the same way for all switches in the centre console switch unit
⇒ “4.1 Removing and installing buttons in centre console storage compartment”, page 332 .

5.3 Removing and installing voltage stabiliser

⇒ “5.3.1 General description - voltage stabiliser”, page 96

⇒ “5.3.2 Removing and installing voltage stabiliser J532 , left-hand drive vehicles”, page 97

⇒ “5.3.3 Removing and installing voltage stabiliser J532 , right-hand drive vehicles”, page 98

5.3.1 General description - voltage stabiliser

Role of voltage stabiliser:

Due to the high current draw of the starter, voltage dips occur in the onboard supply system each time the engine is started. To prevent any failure in the infotainment components and the dash

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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).

Voltage stabiliser - J532- is fitted on left in dash panel behind relay carrier on onboard supply control unit - J519- (LHD).

On RHD models, voltage stabiliser - J532- is fitted on right in dash panel behind relay carrier on onboard supply control unit - J519- .

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 concerning a malfunction of the voltage regulator, 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.

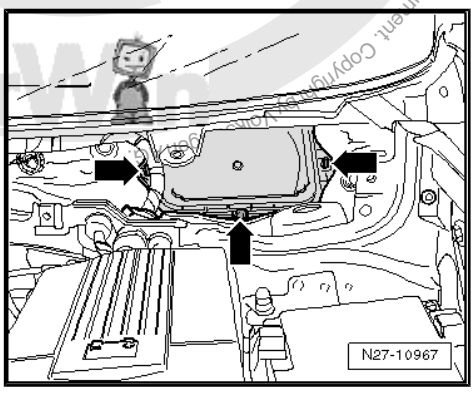
5.3.2 Removing and installing voltage stabiliser - J532- , left-hand drive vehicles

Removing:

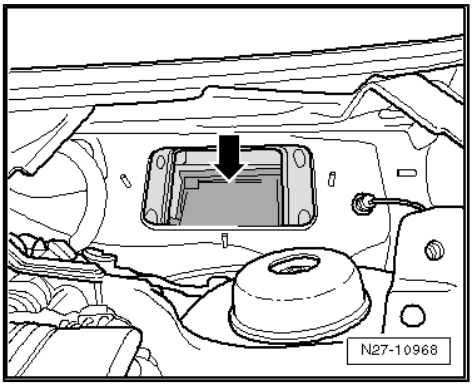
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove wiper frame with linkage and wiper motor ⇒ page 108 .

– Unscrew nuts -arrows- and remove cover.

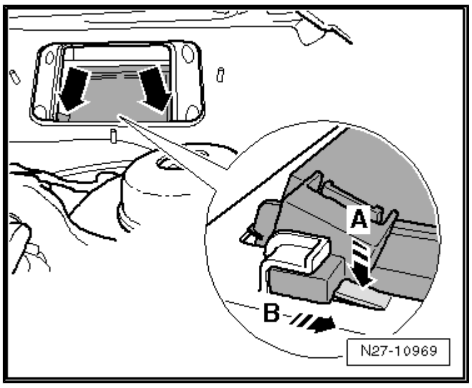


Installation position of voltage stabiliser - J532- -arrow-.

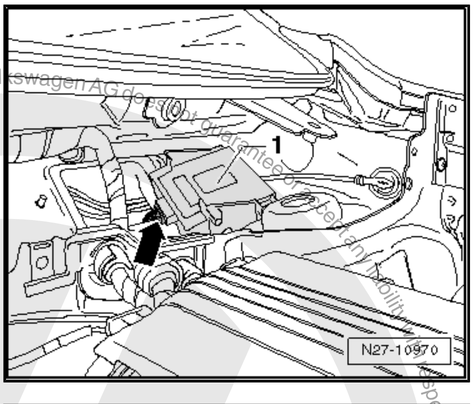


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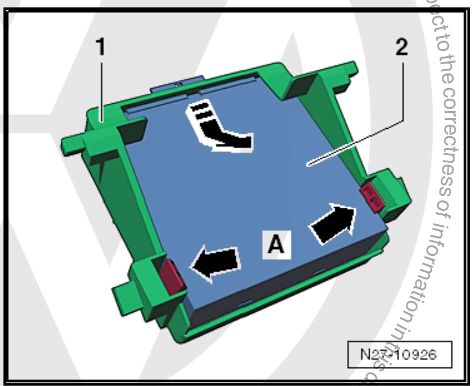
– Press locking mechanism -arrow A- next to voltage stabiliser on each side -arrows- and push voltage stabiliser in direction of -arrow B- towards inside of vehicle.



– Remove voltage stabiliser -1- and release and disconnect connector -arrow-.



– Press release buttons -arrows A- outwards and push voltage stabiliser -2- off bracket -1- in direction of arrow.



Installing:

Installation is carried out in reverse order of removal.

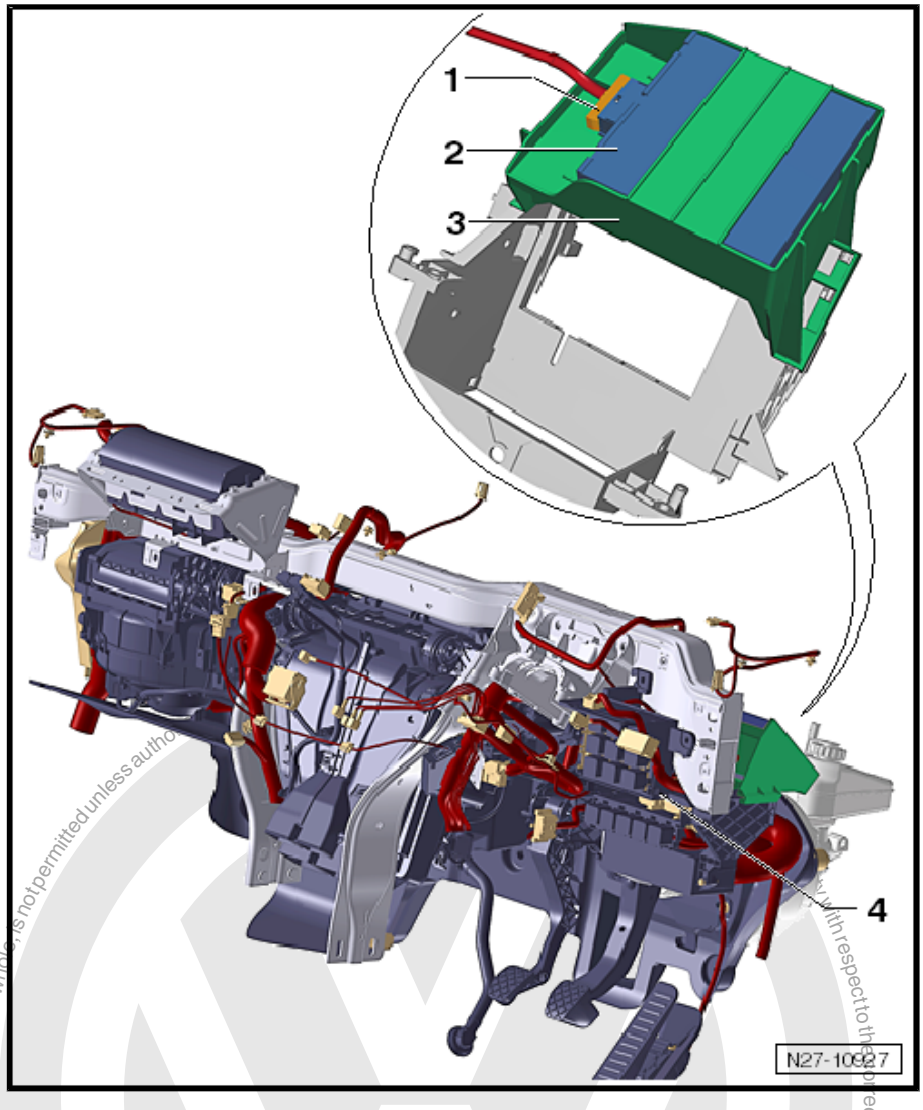
5.3.3 Removing and installing voltage stabiliser - J532- , right-hand drive vehicles

Note

For reasons of clarity, the components in the magnified section are shown from the perspective of looking down through the dash panel.

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1 - Electrical connector
2 - Voltage stabiliser - J532-
3 - DC/DC bracket
4 - Rack assembly



Removing:

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

– Remove assembly bracket (rack) complete with onboard supply control unit - J519- , relay carrier (9 slot) and relay carrier (5 slot).

– Remove onboard supply control unit - J519- , data bus diagnosis interface - J533- , relay carrier (9 slot) and relay carrier (5 slot) from assembly bracket (rack).

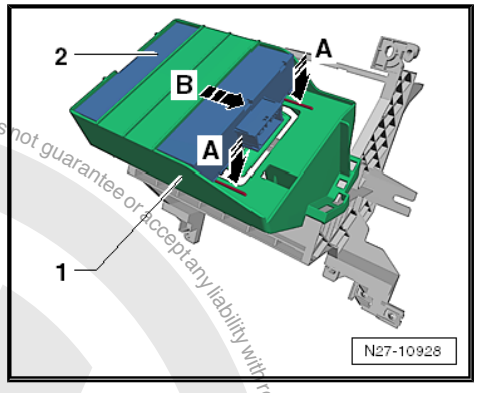
Note

When doing this, do not disconnect connectors of control units and relay carriers.

– Release and disconnect connector ⇒ Item 1 (page 99) on voltage stabiliser - J532- .

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– Press release buttons -arrows A- on DC/DC bracket (plastic frame) -1- and push voltage stabiliser -2- off bracket in direction of -arrow B-.



Installing:

Installation is carried out in reverse order of removal.

5.4 Removing and installing battery monitoring control unit

The battery monitoring control unit can only be replaced together with the negative cable of the battery.

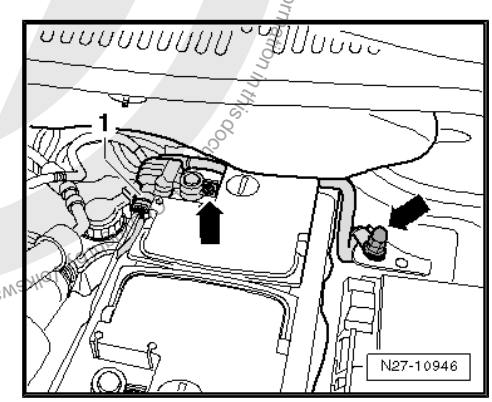
Removing:

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

– Release and disconnect connector -1- on battery monitor control unit - J367- .

– Loosen clamp bolt -arrow- at battery negative terminal and unscrew negative cable securing nut -arrow- on right next to battery.

– Remove negative cable.



Installing:

Installation is carried out in reverse order of removal.

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90 – Gauges, instruments

1 Dash panel insert

⇒ “1.1 General description - dash panel insert”, page 101

⇒ “1.2 Renewing dash panel insert”, page 102

⇒ “1.3 Removing and installing dash panel insert”, page 102

⇒ “1.4 Connector pin assignment - dash panel insert”, page 103

⇒ “1.5 Warning lamp symbols in dash panel insert”, page 103

⇒ “1.6 Coding dash panel insert”, page 104

1.1 General description - dash panel insert

Note

Additional information:

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

General description:

Integrated in the dash panel insert are the following components:

- Control unit with display in dash panel insert - J285-
- Immobiliser control unit - J362-
- Speedometer
- Rev. counter
- Fuel gauge
- Coolant temperature gauge
- Multifunction display
- Warning lamps ⇒ page 103

To provide acoustic support to some of the visual displays, the dash panel features a warning buzzer, which is actuated by the control unit.

All warning lamps are fitted with light-emitting diodes (LEDs). No provision is made for dash panel insert repair. If necessary, the dash panel insert is renewed as a unit ⇒ page 102 .

The data bus diagnostic interface - J533- (Gateway) is an individual control unit option and not part of the dash panel insert ⇒ page 387 , unlike on several other vehicles.

– On vehicles manufactured up to week 22.09, the gateway control unit and the onboard supply control unit are combined to form one control unit.

Fault detection and fault display:

The dash panel insert 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 ⇒ page 403 .

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1.2 Renewing dash panel insert

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Dash panel insert
- Functions of dash panel insert
- Adapting/renewing dash panel insert

1.3 Removing and installing dash panel insert

Note

Before removing the dash panel insert, the ⇒ “1.2 Renewing dash panel insert”, page 102 work procedure should always be carried out in order that the data stored in the control unit can be read.

Removing:

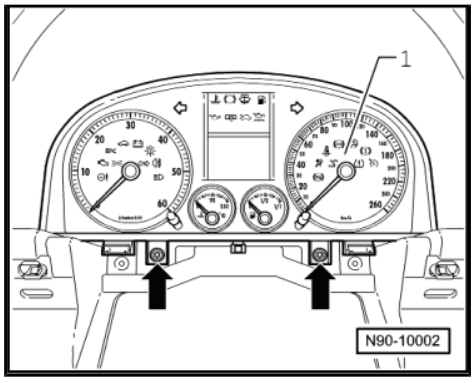
– Switch off ignition and all electrical loads, and pull out ignition key.

– Unclip steering column trim on dash panel insert.

– Undo and remove bolts -arrows- securing dash panel insert -1-.

For reasons of clarity, the steering wheel is not shown on the illustration.

– Pull dash panel insert -1- out of dash panel.



Note

- *Vehicles up to and including model year 2010: Connectors do not have to be disconnected before the dash panel insert is pulled out. The electrical connector is permanently fitted in the vehicle and is automatically disconnected when dash panel insert is pulled out.*
- *Vehicles as of model year 2011: After dash panel insert has been pulled out, the connector on the rear of the dash panel insert must be released and disconnected.*

Installing:

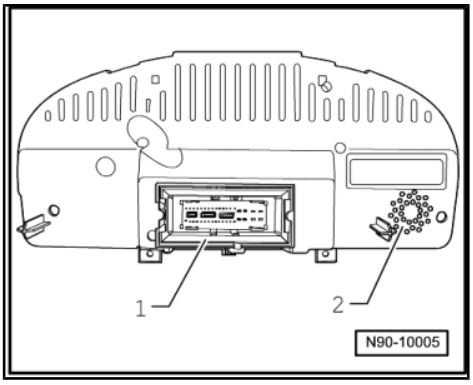
Installation is carried out in reverse order of removal.

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1.4 Connector pin assignment - dash panel insert

Note

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



1 - Connector, 36-pin

2 - Warning buzzer

Connector pin assignment for dash panel insert: ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

1.5 Warning lamp symbols in dash panel insert

1 - Electric On Board Diagnosis (EOBD)

2 - E-gas (electronic throttle)

3 - Immobiliser

4 - Charge control

5 - Bulb failure

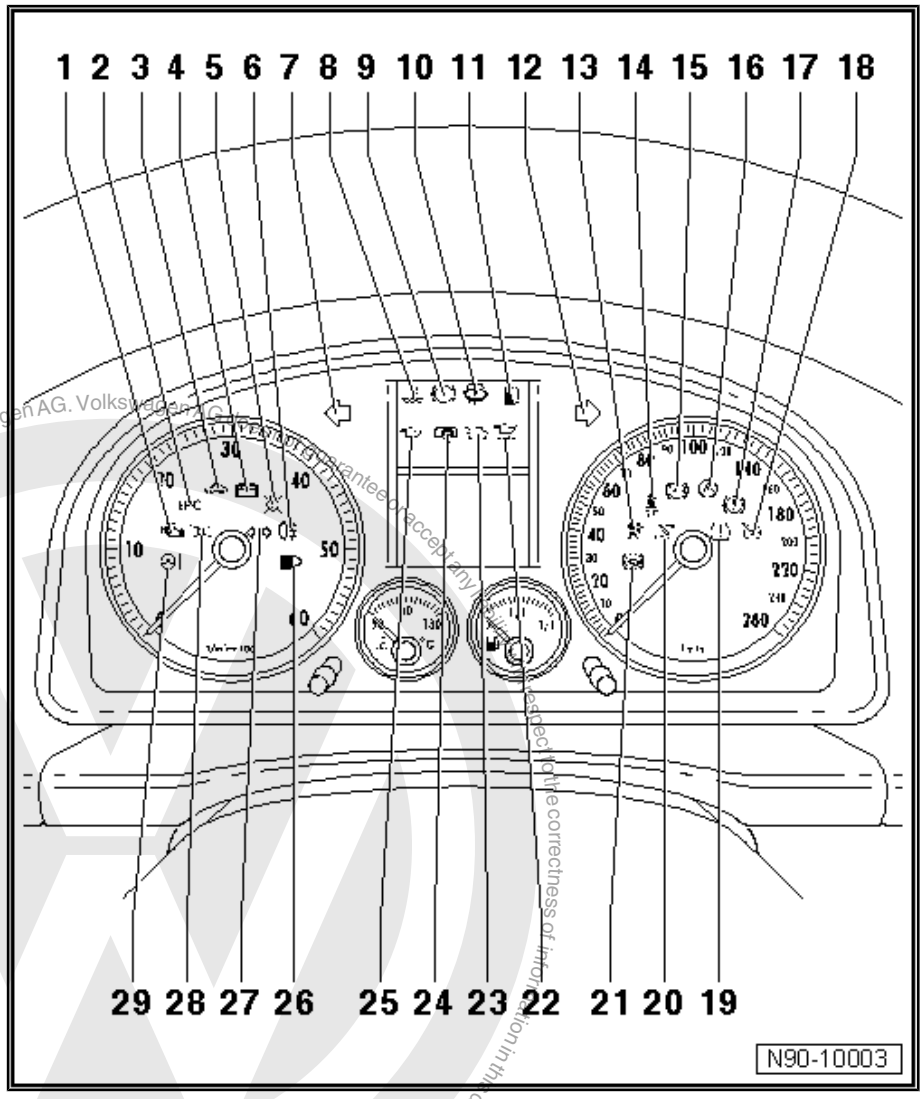
6 - Rear fog light

7 - Left turn signal switch

8 - Low coolant level/coolant overheating

9 - Brake pad wear

- The brake pad wear indicator is no more installed on Caddy base vehicles/light commercial vehicles with “Lowline” dash panel insert as of 06.2007.



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10 - Washer fluid level

11 - Fuel reserve

12 - Right turn signal switch

13 - Airbag display

14 - Driver seat belt

15 - Anti-lock brake system (ABS)

16 - Electronic stabilisation programme (ESP)/Traction control system (TCS)

17 - Brake fault/handbrake

18 - Cruise control system

19 - Tyre pressure monitoring (TPM)

20 - Rear seat backrest lock

21 - Shift lock

22 - Oil level

23 - Bonnet open

24 - Door open

25 - Oil pressure

26 - Main beam

27 - Turn signal switch for trailer

28 - Side lights

29 - Steering

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1.6 Coding dash panel insert

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Dash panel insert
- Functions of dash panel insert

2 Horn

⇒ “2.1 Removing and installing treble horn and bass horn ”, page 105

⇒ “2.2 Checking treble horn and bass horn ”, page 105

2.1 Removing and installing treble horn and bass horn

Note

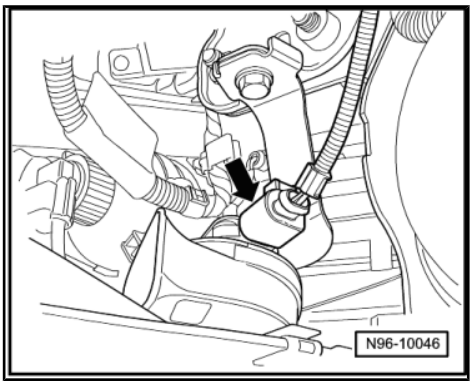
- *The treble horn - H2- and the bass horn - H7- are actuated in parallel by the onboard supply control unit - J519- .*
- *The procedure for removal and installation of the treble horn - H2- and the bass horn - H7- is the same and is therefore described for just one horn.*
- *The horns can be found on the left and right next to the longitudinal members.*

Removing:

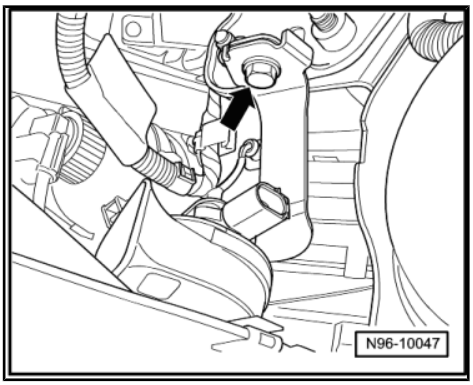
– Switch off ignition and all electrical loads, and pull out ignition key.

– If fitted, remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

– Release and disconnect electrical connector -arrow-.



– Unscrew securing bolt -arrow- and remove horn together with bracket.



Installing:

Installation is carried out in reverse order of removal.

2.2 Checking treble horn and bass horn

The horns (treble tone horn - H2- and bass tone horn - H7-) can be checked in final control diagnosis by the onboard supply control unit - J519- .

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92 – Windscreen wash/wipe system

1 Windscreen wiper system

⇒ “1.1 Moving wipers to service position”, page 106

⇒ “1.2 Deactivating APP function of wiper motor”, page 106

⇒ “1.3 Removing and installing wiper arms”, page 107

⇒ “1.4 Removing and installing wiper frame with linkage and wiper motor”, page 108

⇒ “1.5 Removing and installing wiper motor”, page 110

⇒ “1.6 Removing and installing wiper blades”, page 111

⇒ “1.7 Renewing windscreen wiper rubber”, page 112

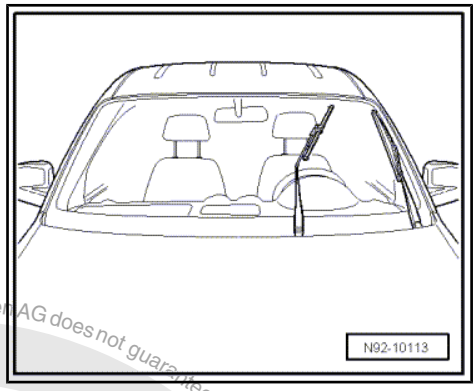
⇒ “1.8 Adjusting windscreen wiper park position”, page 113

⇒ “1.9 Removing and installing rain and light sensor”, page 114

⇒ “1.10 Coding rain and light sensor”, page 117

1.1 Moving wipers to service position

To remove wiper blades, wiper arms must be moved to “service/ winter position”. The “service/winter position” is activated within 10 seconds after ignition is switched off by pressing windscreen wiper lever in “flick wipe” position ⇒ Operating manual of vehicle .



1.2 Deactivating APP function of wiper motor

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

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

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

Note

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

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

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– Select “Guided fault finding” in vehicle diagnostic tester .
– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

♦ Body
♦ Electrical system
♦ 01 - On Board Diagnostic capable systems
♦ Onboard supply control unit
♦ Functions - onboard supply control unit
♦ Coding wiper electronics control unit / deactivating APP function

– Read out current code and make a note of the reading.
– Code control unit with noted reading.

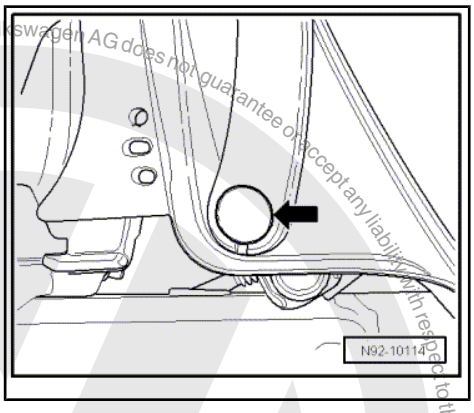
Note

The reading can vary in the number of figures from the number of spaces available for the new code. This has absolutely no bearing on the function of the windscreen wiper system. The new coding simply has the effect of resetting the wiper cycle counter to zero.

1.3 Removing and installing wiper arms

Removing:

– Deactivate APP function ⇒ page 106 .
– Move windscreen wipers to park position. Then, switch off ignition and all electrical loads, and pull out ignition key.
– Lever off cap -arrow- using screwdriver.

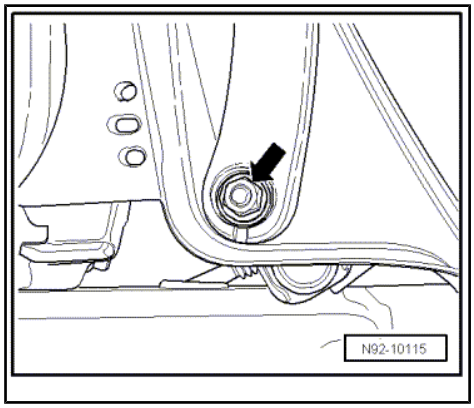


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– Loosen nut -arrow- without screwing it off completely.

– Fold up wiper arm and release it from taper by rocking arm back and forth sideways.

– Now, unscrew securing nut completely and remove wiper arm.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Fit wiper arms on driver and front passenger sides onto their shafts.

– Screw securing nut loosely onto wiper arm shaft.

Note

- *The securing nut of the wiper arm shaft should not be tightened until the wiper blade parking position has been adjusted.*
- *If wiper arms are secured with self-locking nuts, these must be renewed on reinstallation.*

– Adjust wiper blade park position ⇒ page 113 .

– After the wiper blade park position has been adjusted, tighten securing nuts of wiper arms to 20 Nm.

– Fit caps.

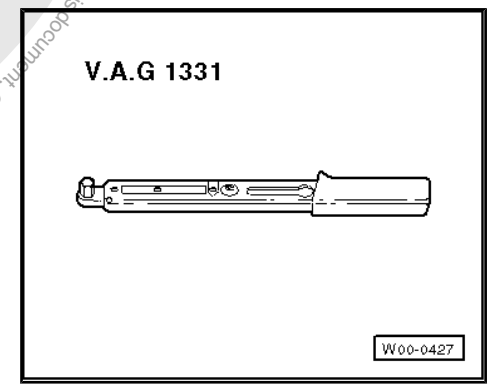
1.4 Removing and installing wiper frame with linkage and wiper motor

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

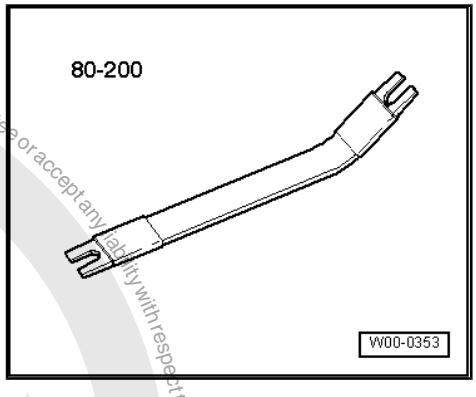
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



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♦ Release lever - 80-200-



Removing:

– Deactivate APP function ⇒ page 106 .

– Move windscreen wipers to park position. Then, switch off ignition and all electrical loads, and pull out ignition key.

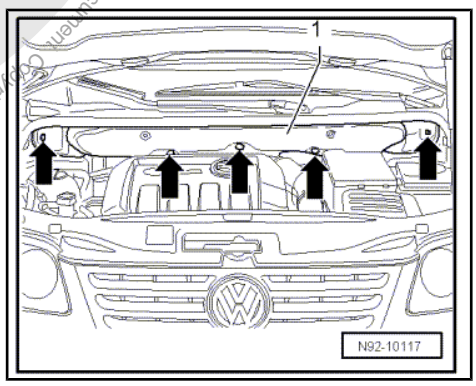
– Disconnect battery ⇒ page 3 .

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 66 ; Removing and installing plenum chamber cover .

– Removing wiper arm ⇒ page 107 .

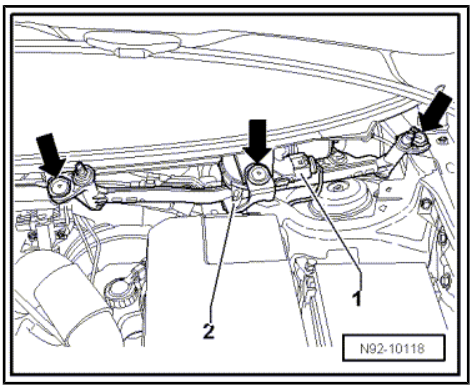
– Undo and remove bolts -arrows- securing trim -1-.

– Remove trim -1- from vehicle.



– Release and disconnect electrical connector -1-.

– Unscrew securing bolts -arrows- and remove wiper frame -2- towards front from vehicle.

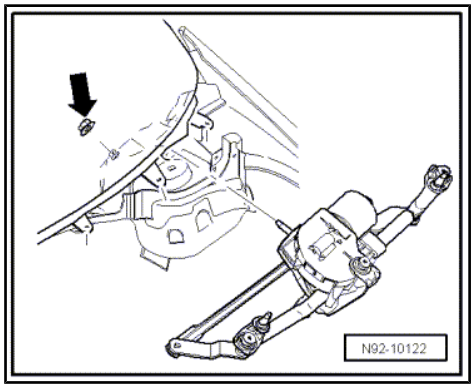


Installing:

Install in the reverse order of removal. When doing this, note the following:

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– When installing, fit guide pin located on back of wiper frame into grommet -arrow- on plenum chamber bulkhead.
– Tighten bolts securing wiper frame to body to 8 Nm.
– Push connector onto connection of wiper motor and engage it.
– Install air duct trim.
– Connect battery ⇒ page 3 .
– Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 66 ; Removing and installing plenum chamber cover .

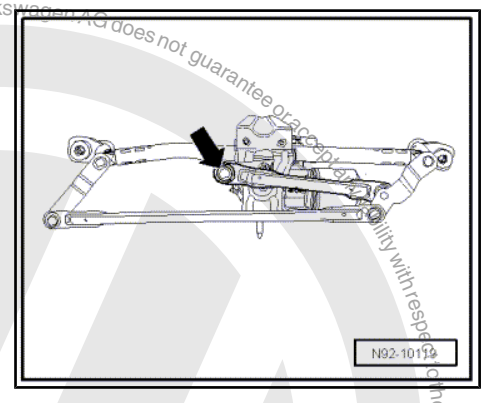


1.5 Removing and installing wiper motor

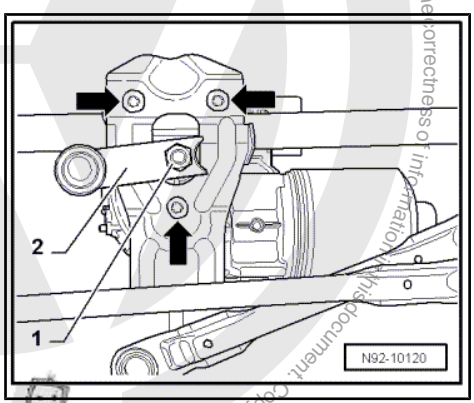
The wiper motor control unit - J400- and the wiper motor - V- are combined to form one unit.

Removing:

– Remove wiper frame with linkage and wiper motor ⇒ page 108 .
– Lever rods -arrow- off motor crank using removal lever -80-200- .



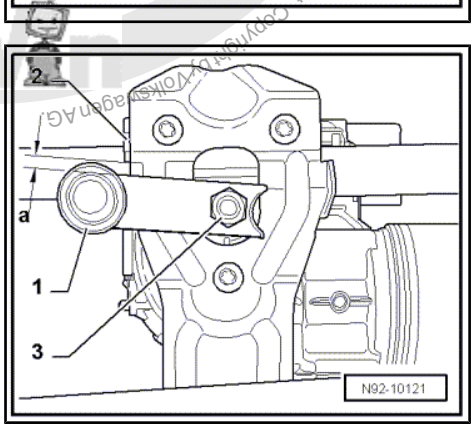
– Undo and remove nut -1-.
– Pull motor crank -2- off wiper motor shaft.
– Unscrew securing bolts -arrows- and remove wiper motor together with control unit from wiper frame.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Insert wiper motor into wiper frame and tighten bolts securing wiper motor to wiper frame to 8 Nm.
– Fit motor crank -1- onto shaft of wiper motor. Distance -a- to limit stop -2- should be 3 ± 1 mm.
– Screw on nut -3- securing motor crank to shaft of wiper motor and tighten it to 18 Nm.
– Install wiper frame with linkage and wiper motor ⇒ page 108 .



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1.6 Removing and installing wiper blades

⇒ “1.6.1 Removing and installing joint-free wiper blades without TOP-Lock catch”, page 111

⇒ “1.6.2 Removing and installing joint-free wiper blades with TOP-Lock catch”, page 111

1.6.1 Removing and installing joint-free wiper blades without TOP-Lock catch

Note

- *Driver and front passenger wiper blades must not be interchanged during installation.*
- *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 windscreen wipers.*
- *To remove wiper blades, wiper arms must be moved to “service/winter position”. The “service/winter position” is activated within 10 seconds after ignition is switched off by moving the windscreen wiper lever to “flick wipe” position ⇒ page 106 .*

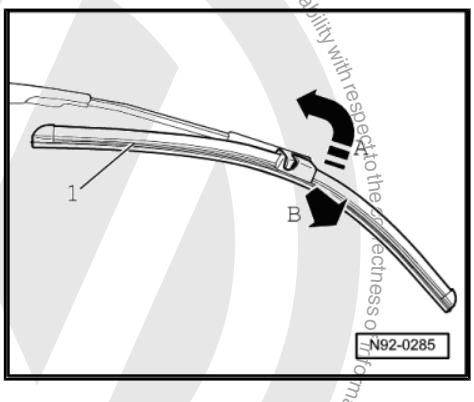
Removing:

– Move wiper arms to “service/winter position” ⇒ page 106 .

– Fold up wiper arm.

– Turn wiper blade -1- on wiper arm as far as stop -arrow A-.

– Pull wiper blade -1- off wiper arm axis -arrow B-.



Installing:

– Push wiper blade onto wiper arm axis.

– Turn wiper blade on wiper arm axis as far as stop.

– Carefully fold wiper arm back onto windscreen.

1.6.2 Removing and installing joint-free wiper blades with TOP-Lock catch

Note

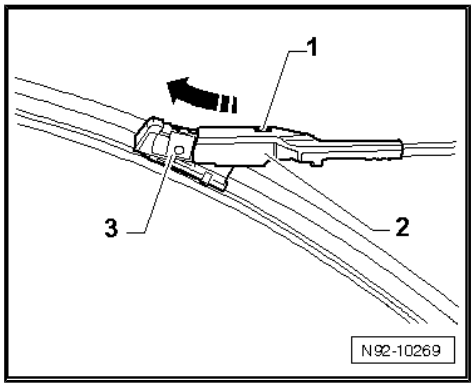
- *Driver and front passenger wiper blades must not be interchanged during installation.*
- *Joint-free wipers are very flexible. To lift the wiper blades off the windscreen, touch them only in the area in which the wiper blades are attached to the windscreen wipers.*
- *To remove wiper blades, wiper arms must be moved to “service/winter position”. The “service/winter position” is activated within 10 seconds after ignition is switched off by moving the windscreen wiper lever to “flick wipe” position ⇒ page 106 .*

Removing:

– Move wiper arms to “service/winter position” ⇒ page 106 .

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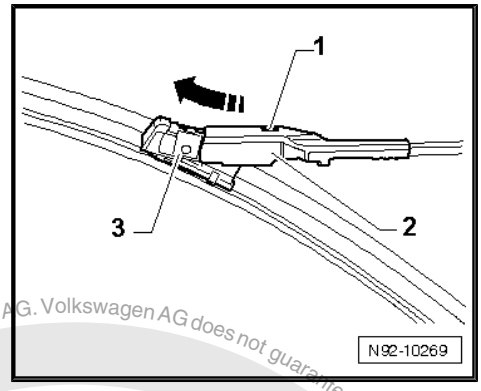
– Fold up wiper arm.
– Press button -1- and pull wiper blade mounting -3- in -direction of arrow- out of wiper arm -2-.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Push wiper blade mounting -3- onto wiper arm -2- as far as stop.
– Ensure proper engagement of button -1- in wiper arm -2-.
– Carefully fold wiper arm back onto windscreen.



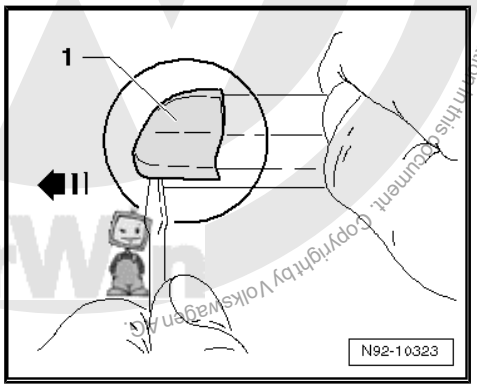
1.7 Renewing windscreen wiper rubber

⇒ “1.7.1 Renewing windscreen wiper rubber, joint-free windscreen wipers”, page 112

1.7.1 Renewing windscreen wiper rubber, joint-free windscreen wipers

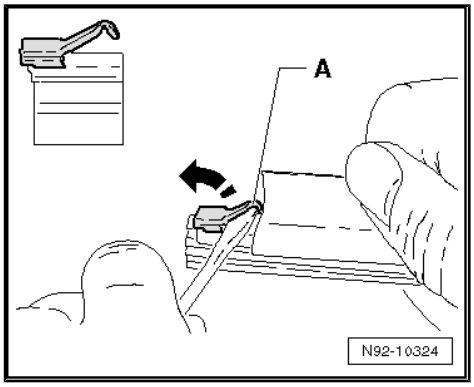
Removing:

– Switch off ignition and all electrical loads, and pull out ignition key.
– Remove wiper blade ⇒ page 111
– Check to see on which side windscreen wiper rubber cannot be moved in guide.
– On that side, carefully lever off cap -1-.



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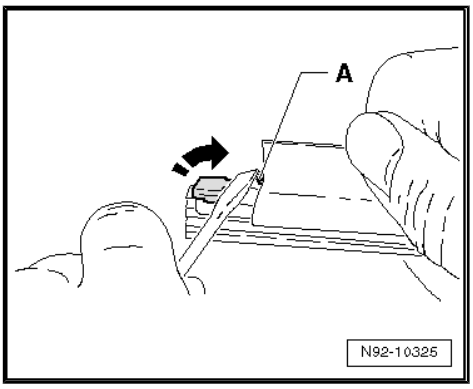
– Bend windscreen wiper rubber stop -A- open using a suitable screwdriver.
– Now, renew windscreen wiper rubber.



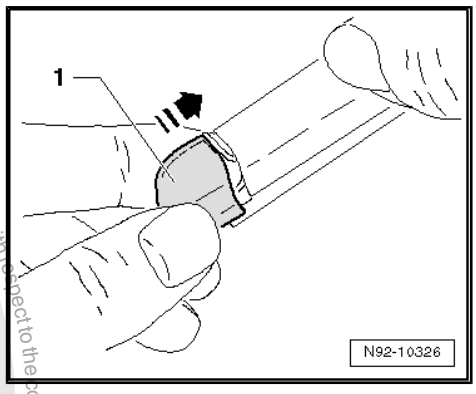
Note

Ensure that windscreen wiper rubber is seated correctly in wiper blade guides.

– Using a suitable screwdriver, push windscreen wiper rubber stop -A- back down until windscreen wiper rubber can no longer be moved within guide.



– Fit new cap -1- and check it is seated securely.



Installing:

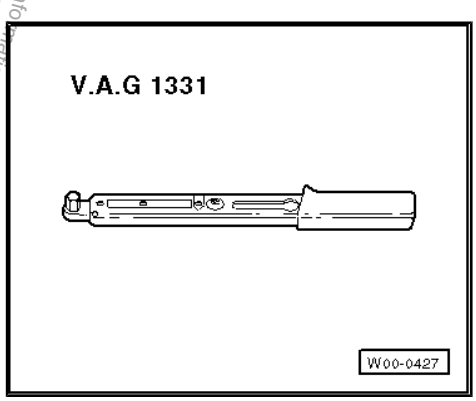
Install in the reverse order of removal. When doing this, note the following:

– Install wiper blade ⇒ page 111 .
– Ensure proper operation of wiper blade.

1.8 Adjusting windscreen wiper park position

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331/-



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Note

On right-hand drive vehicles, the wiper blades are a mirror-image of those on left-hand drive vehicles.

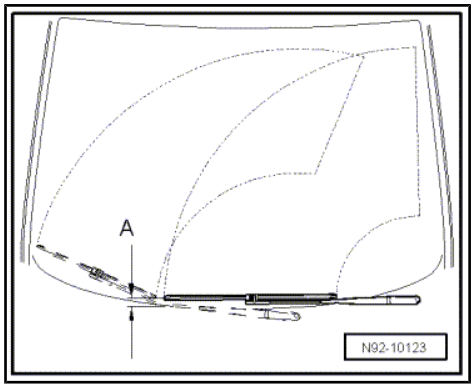
– Deactivate APP function ⇒ page 106 .

– Move windscreen wipers to park position. Then, switch off ignition and all electrical loads, and pull out ignition key.

– Adjust windscreen wiper park position.

Driver side:

Distance -A- between windscreen wiper rubber and upper edge of plenum chamber cover must be 30 mm.



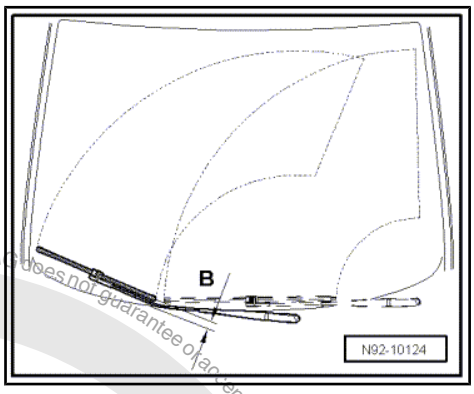
– Adjust windscreen wiper park position by moving wiper arm, if necessary.

Removing wiper arm ⇒ page 107 .

– Tighten bolt for securing wiper arm to shaft of wiper motor to 20 Nm.

Front passenger side:

Distance -B- between windscreen wiper rubber and upper edge of plenum chamber cover must be 30 mm.



– Adjust windscreen wiper park position by moving wiper arm, if necessary.

Removing wiper arm ⇒ page 107 .

– Tighten bolt for securing wiper arm to shaft of wiper motor to 20 Nm.

1.9 Removing and installing rain and light sensor

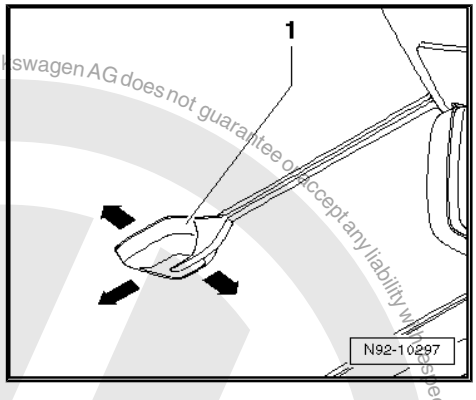
If an intact rain and light sensor - G397- is removed from its retaining plate on the windscreen (e.g. renewing a windscreen) it can be subsequently reinstalled. Store the removed rain and light sensor - G397- in a dust-free location until reinstallation and ensure the silicone contact pad is not soiled.

Removing:

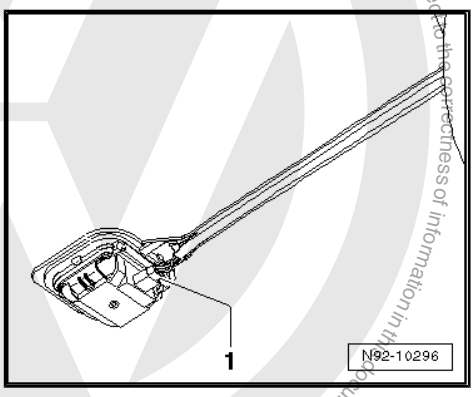
– Switch off ignition and all electrical loads, and pull out ignition key.

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– Unclip cover -1- of rain and light sensor - G397- together with lower wiring cover at the detents -arrows-.

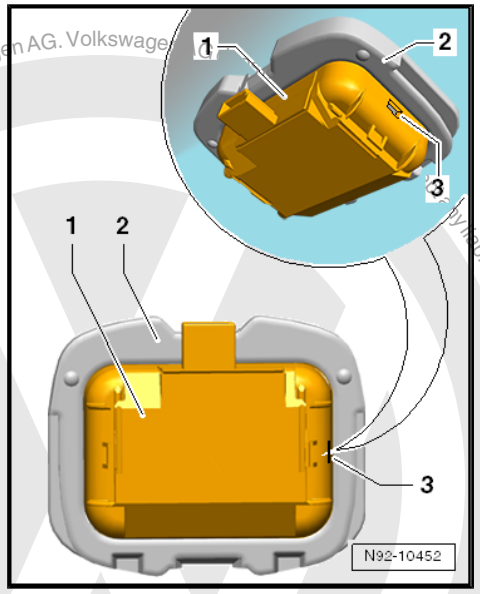


– Release and disconnect electrical connector -1-.



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– Using a suitable plain slot screwdriver, lever rain and light sensor - G397- -1- on recess -3- out of retaining plate -2-.



Note

On removal, take care to lever out the entire rain and light sensor - G397- and not just the upper shell of the sensor.

Installing:

Installation is carried out in the reverse order. When installing observe the following:

Caution

- ***Prior to installation, thoroughly clean the surface of the windscreen inside the bracket for rain and light sensor - G397- . Any remains of coupling pad adhering to the windscreen must be completely removed.***
- ***The surface (coupling pad) of the rain and light sensor - G397- must not be soiled on installation. A sensor with damaged coupling pad must be renewed.***

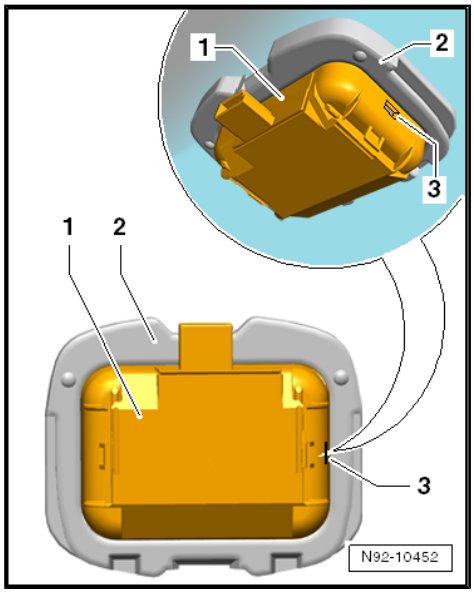
Note

If the surface (coupling pad) of 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.

– Clean windscreen within retaining plate thoroughly; cleansing agent ⇒ General body repairs, interior; Rep. gr. 68 ; Interior mirror; Bonding retaining plate for interior mirror with rain sensor .

– Remove protective cap of new rain and light sensor - G397- .

– Insert rain and light sensor - G397- -1- into the retaining plate on front windscreen -2- by pressing it in firmly.



Note

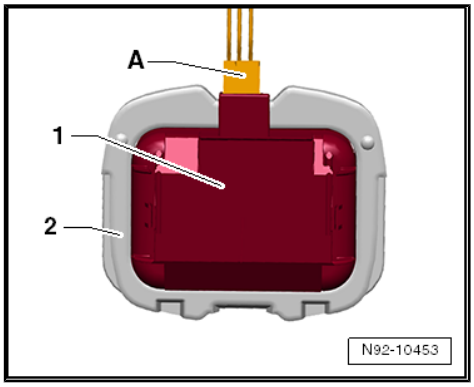
Even when sensor is installed correctly, small air bubbles may first appear between windscreen and coupling pad. After approx. 10 minutes, the contact surface must be free of bubbles.

– Engage clasps -3-.

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– Connect electrical connector -A-.

– Install cover of rain and light sensor - G397- .



Note

- *The cover of the rain and light sensor - G397- must first be pushed under the headliner at the top and then engaged on the retaining frame.*
- *The cover must engage with the upper wiring cover securely and over its complete length.*

– If necessary, code rain and light sensor - G397- ⇒ page 117 .

1.10 Coding rain and light sensor

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Onboard supply control unit
- Functions
- Coding rain and light sensor

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2 Windscreen washer system

⇒ “2.1 Assembly overview - windscreen washer system”, page 118

⇒ “2.2 Removing and installing washer fluid reservoir”, page 120

⇒ “2.3 Removing and installing filler pipe for washer fluid reservoir”, page 123

⇒ “2.4 Removing and installing windscreen and rear window washer pump V59 ”, page 123

⇒ “2.5 Removing and installing windscreen washer fluid level sender G33 ”, page 125

⇒ “2.6 Removing and installing windscreen spray jets”, page 127

⇒ “2.7 Adjusting windscreen washer system spray jets”, page 127

2.1 Assembly overview - windscreen washer system

Note

- *In vehicles with auxiliary heater a washer fluid reservoir with a different shape may be installed, depending on the vehicle equipment.*
- *The windscreen washer system function can be checked using the final control diagnosis of the onboard supply control unit - J519- .*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

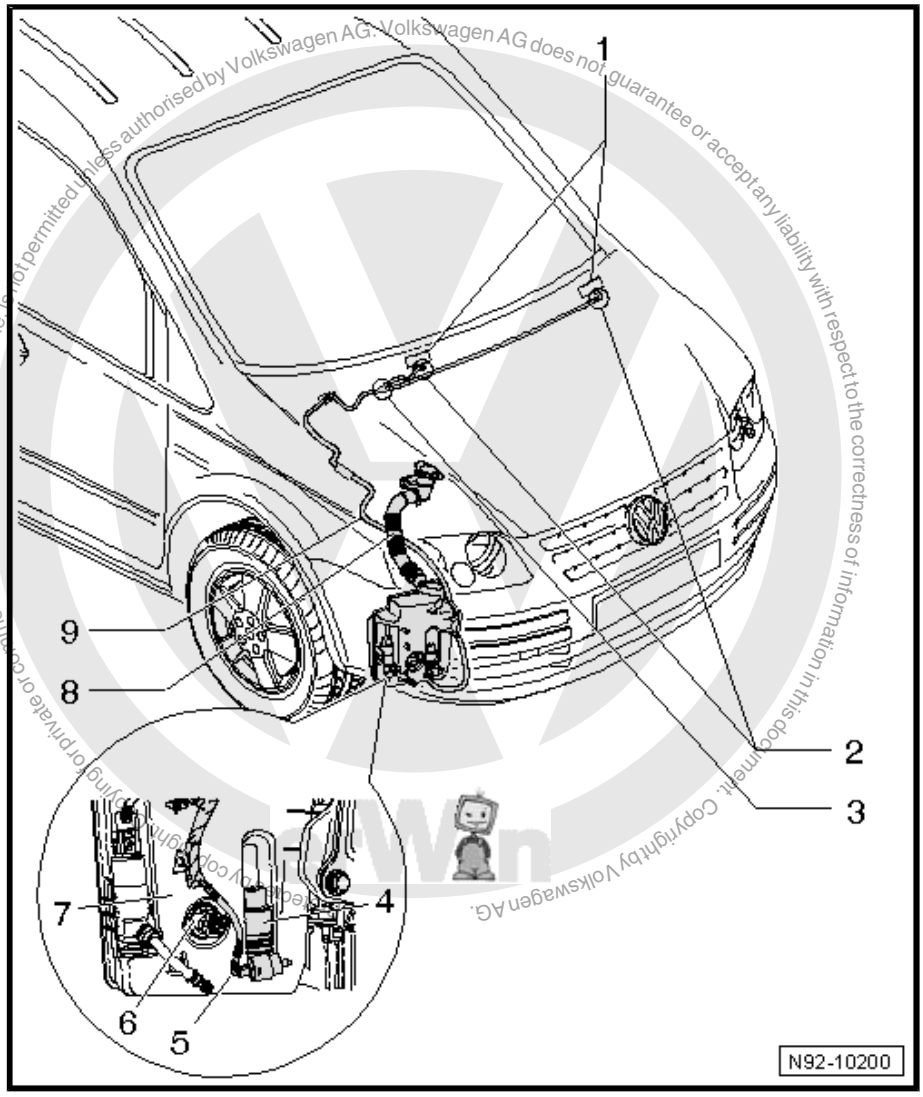
⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit - J519- features a self-diagnosis function that facilitates fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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1 - Spray jet for windscreen washer system

- ❑ Depending on equipment with heater element for left washer jet - Z20- or heater element for right washer jet - Z21- :
- ❑ Removing and installing ⇒ page 127
- ❑ Adjusting ⇒ page 127

2 - Angled piece

- ❑ Connection to spray jet for windscreen washer system
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

3 - Y-piece

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

4 - Windscreen and rear window washer pump - V59-

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 123
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 124

5 - Angled connection piece

- ❑ Connection to windscreen and rear window washer pump - V59-
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

6 - Windscreen washer fluid level sender - G33-

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 125
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 125

7 - Washer fluid reservoir

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 120
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 121

8 - Filler pipe for washer fluid reservoir

- ❑ Removing and installing ⇒ page 123 .

9 - Hose

- ❑ Hose repair ⇒ page 155

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2.2 Removing and installing washer fluid reservoir

⇒ “2.2.1 Removing and installing washer fluid reservoir, vehicles without auxiliary heater”, page 120

⇒ “2.2.2 Removing and installing washer fluid reservoir, vehicles with auxiliary heater”, page 121

2.2.1 Removing and installing washer fluid reservoir, vehicles without auxiliary heater

Removing:

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

– Remove filler pipe for washer fluid reservoir ⇒ page 123 .

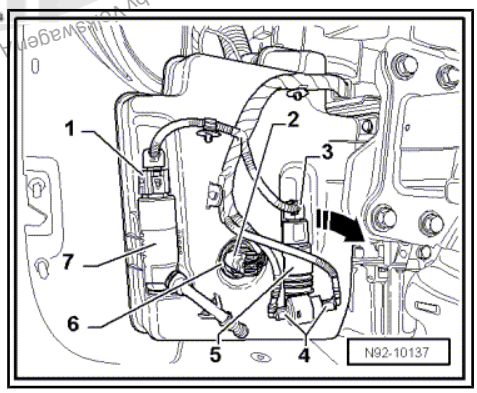
– Detach front bumper cover on right side until washer fluid reservoir is accessible ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, up to 2011 or ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, as of 2011 .

– Detach hose at connecting pipe of headlight washer system pump - V11- -7- and use a suitable container to collect the washing fluid that comes out.

– Disconnect connectors from washer fluid level sender -2- and headlight washer system pump -1-.

– To disconnect connector of windscreen and rear window washer pump - V59- -3-, swing windscreen and rear window washer pump -5- slightly towards front and out of washer fluid reservoir.

– Separate hose connections -4- on windscreen and rear window washer pump - V59- -3-.



Note

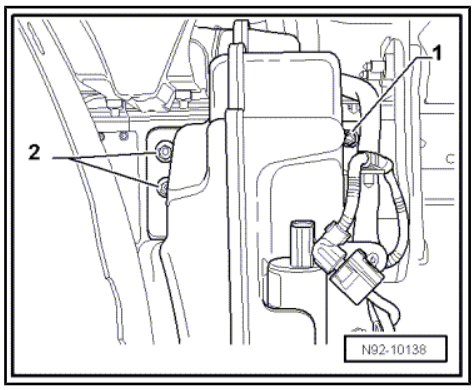
The connections to the pump and hose lines are colour-coded in order to prevent the washer fluid lines being incorrectly connected to the front and rear washer fluid pump - V59- . The hose fittings must be connected to the correct colour-coded pump connections during installation.

– Unclip pipe from retainers on washer fluid reservoir.

– Unscrew securing bolt -1- of washer fluid reservoir.

– Unscrew securing nuts -2- of washer fluid reservoir.

– Remove washer fluid reservoir by pulling it towards right out of vehicle.



Installing:

Installation is carried out in reverse order of removal. Observe the following when doing this:

– After completing the installation work, bleed the headlight washer system ⇒ page 153 .

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2.2.2 Removing and installing washer fluid reservoir, vehicles with auxiliary heater

Removing:

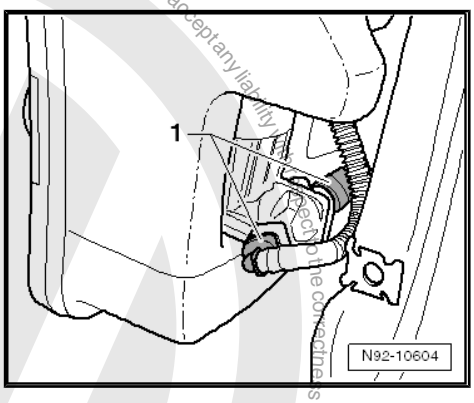
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove filler pipe for washer fluid reservoir ⇒ page 123 .

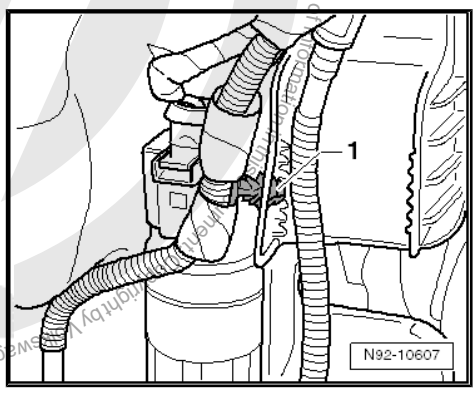
– Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, up to 2011 or ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, as of 2011 .

– Remove right headlight ⇒ page 166 .

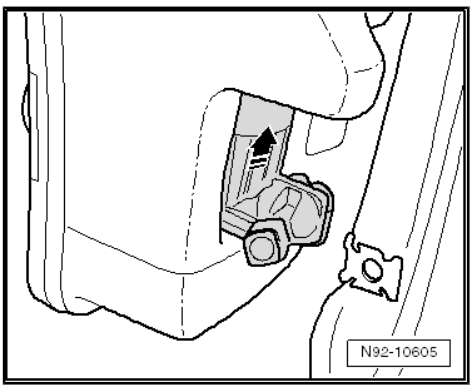
– Pull hose connections -1- off windscreen and rear window washer pump and use a suitable container to collect the washing fluid that comes out.



– Unclip fastener -1- from wiring harness.

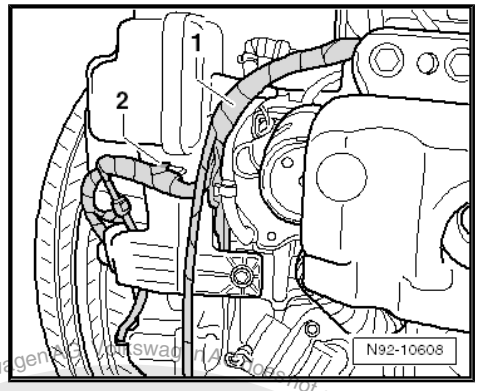


– Push window washer pump upwards in -direction of arrow- and remove.

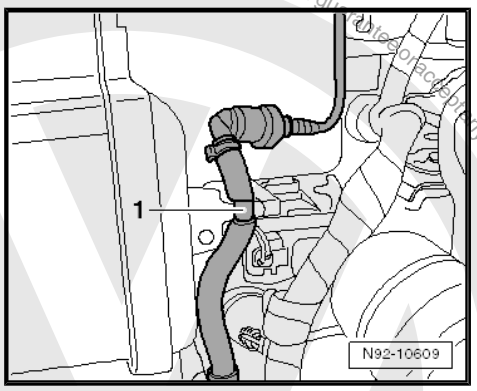


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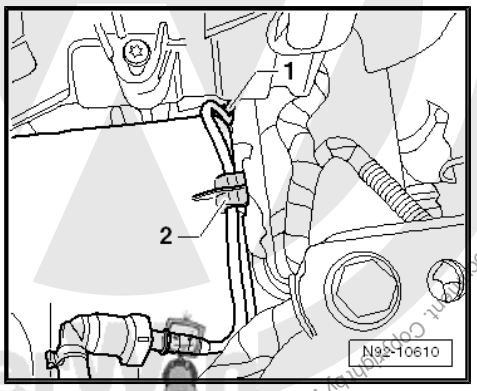
– Unclip fasteners -1- and -2- from wiring harness.



– Unclip fuel line of auxiliary heater from retainer -1-.

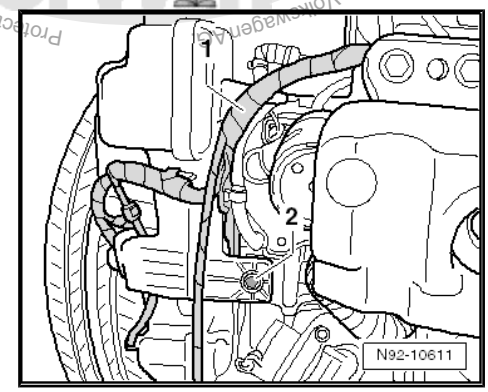


– Unclip fuel line from retainers -1- and -2-.



– Unscrew securing bolts -1- and -2-.

– Pull washer fluid reservoir towards front out of mountings.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– On completion of installation work, bleed headlight washer system ⇒ page 153 .

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2.3 Removing and installing filler pipe for washer fluid reservoir

Note

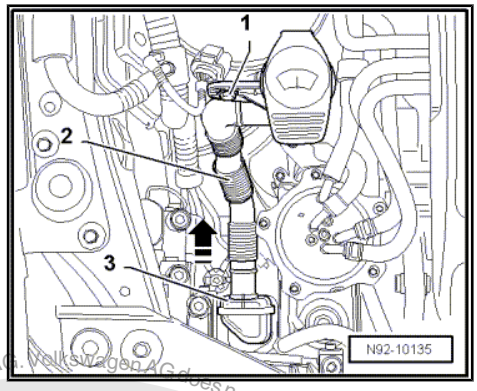
- *Depending on vehicle equipment, two different washer fluid reservoirs are used.*
- *Therefore, the illustrations may differ. The filler tube is removed and installed in the same way for both versions.*

Removing:

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

– Remove securing bolt -1-.

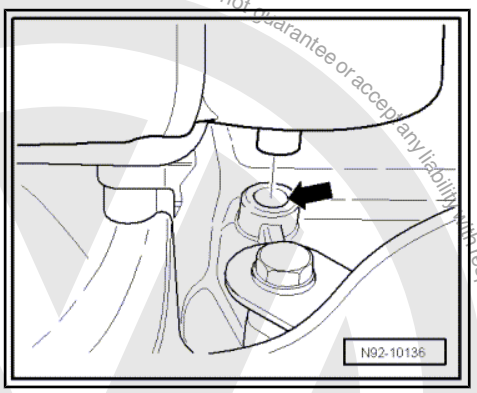
– Pull filler pipe -2- in -direction of arrow- off connection -3- on washer fluid reservoir.



Installing:

Install in the reverse order of removal. When doing this, note the following:

The protrusion on the underside of the filler pipe should be inserted in the hole -arrow-.



2.4 Removing and installing windscreen and rear window washer pump - V59-

⇒ “2.4.1 Removing and installing windscreen and rear window washer pump V59 , vehicles without auxiliary heater”, page 123

⇒ “2.4.2 Removing and installing windscreen and rear window washer pump V59 , vehicles with auxiliary heater”, page 124

2.4.1 Removing and installing windscreen and rear window washer pump - V59- , vehicles without auxiliary heater

Removing:

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

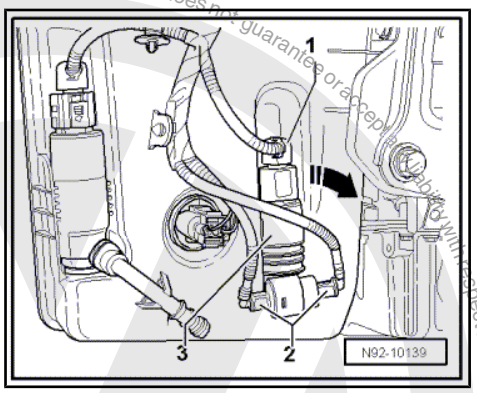
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– Unclip fog light trim, or remove right fog light ⇒ page 243 .

– Pull hose connections -2- off windscreen and rear window washer pump - V59- -3- and use a suitable container to collect the washing fluid that comes out.

– Disconnect connector -1- of windscreen and rear window washer pump - V59- -3-. To do this, swing windscreen and rear window washer pump -3- slightly towards front -arrow- and out of washer fluid reservoir.

– Pull windscreen and rear window washer pump - V59- -3- upwards out of washer fluid reservoir.



Installing:

Install in the reverse order of removal. When doing this, note 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 fittings must be connected to the correct colour-coded pump connections during installation.

– On completion of installation work, bleed headlight washer system ⇒ page 153 .

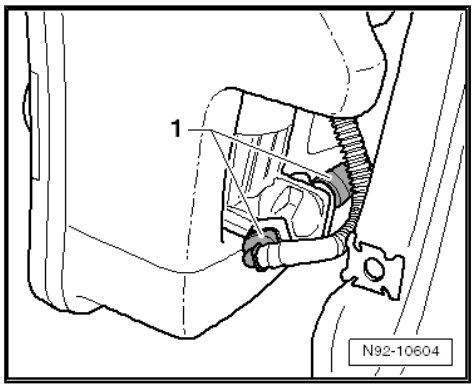
2.4.2 Removing and installing windscreen and rear window washer pump - V59-, vehicles with auxiliary heater

Removing:

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

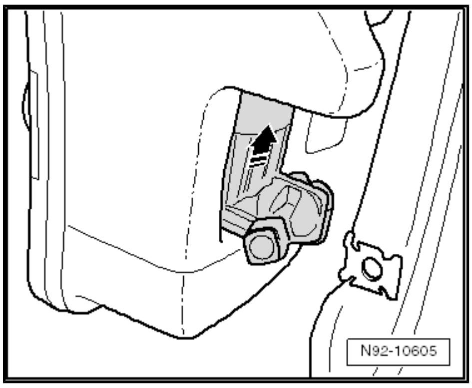
– Detach front right wheel housing liner in front area ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Removing and installing front wheel housing liner .

– Pull hose connections -1- off windscreen and rear window washer pump and use a suitable container to collect the washing fluid that comes out.

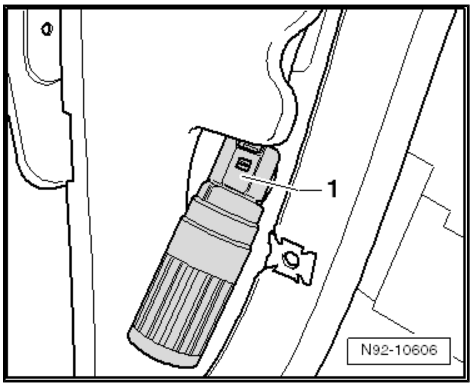


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– Push window washer pump upwards in -direction of arrow- and remove.



– Disconnect connector -1- at windscreen and rear window washer pump.



Installing:

Install in the reverse order of removal. When doing this, note 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 fittings must be connected to the correct colour-coded pump connections during installation.

– On completion of installation work, bleed headlight washer system ⇒ page 153 .

2.5 Removing and installing windscreen washer fluid level sender - G33-

⇒ “2.5.1 Removing and installing windscreen washer fluid level sender G33 , vehicles without auxiliary heater”, page 125

⇒ “2.5.2 Removing and installing windscreen washer fluid level sender G33 , vehicles with auxiliary heater”, page 126

2.5.1 Removing and installing windscreen washer fluid level sender - G33- , vehicles without auxiliary heater

The windscreen washer fluid level sender - G33- is installed in the washer fluid reservoir before the front right wheel housing.

Removing:

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

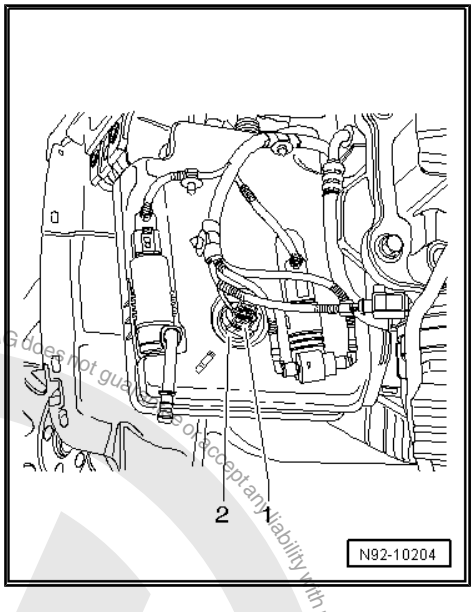
– Unclip cover of right fog light, or remove fog light ⇒ page 243 .

– Release and disconnect connector -1- on windscreen washer fluid level sender - G33- .
– Pull windscreen washer fluid level sender - G33- -2- out of its rubber seal.
– Collect escaping fluid in a suitable container.

Installing:

Install in the reverse order of removal. When doing this, note the following:

– After completing the installation work, bleed the headlight washer system ⇒ page 153 .



2.5.2 Removing and installing windscreen washer fluid level sender - G33- , vehicles with auxiliary heater

The windscreen washer fluid level sender - G33- is installed in the washer fluid reservoir before the front right wheel housing.

Removing:

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

Caution

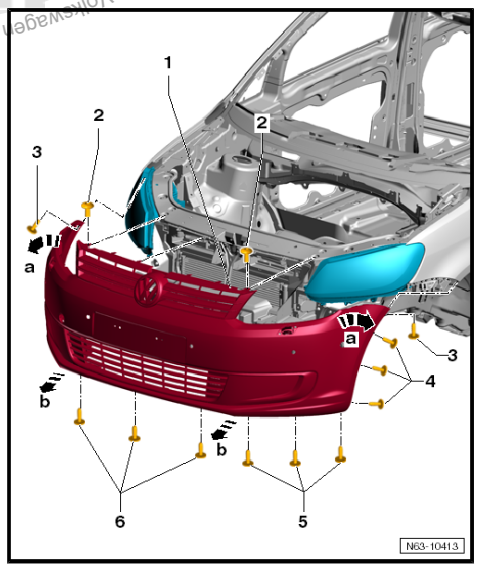
Risk of damage to component.

- ***Carefully pull off bumper. When doing this, ensure that the bumper is not being deformed or torn.***

– Unscrew bolts -2-.
– Unscrew bolts -3- of right wheel housing (facing upwards).
– Unscrew bolts -4- and -5- of right wheel housing.
– Unscrew bolts -6- from below.
– Release catches at top of radiator grille from lock carrier.

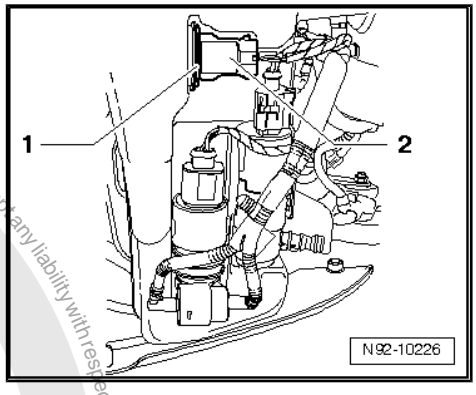
Further removal is only possible with a second mechanic.

– Pull front bumper cover -1- on the right side out of catches of guides on wing -arrows a- until the windscreen washer fluid level sender - G33- is accessible.



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– Release and disconnect connector -2- on windscreen washer fluid level sender - G33- .
– Pull windscreen washer fluid level sender - G33- -1- out of its rubber seal in washer fluid reservoir.



Installing:

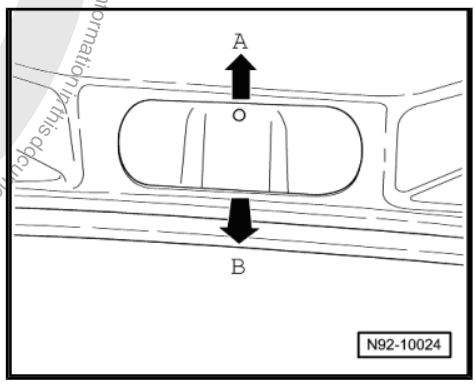
Install in the reverse order of removal. When doing this, note the following:

– On completion of installation work, bleed headlight washer system ⇒ page 153 .

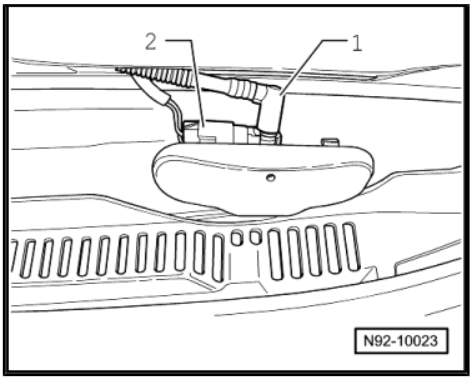
2.6 Removing and installing windscreen spray jets

Removing:

– Switch off ignition and all electrical loads, and pull out ignition key.
– Push spray jet upwards -arrow A- and pull it out of bonnet at rear -arrow B-.



– Pull hose -1- off spray jet, and release and disconnect connector -2-.



Installing:

– Fit connector -2- and hose -1- onto spray jet.
– Push spray jet into mounting hole until it locks in place audibly.
– Adjusting spray jets ⇒ page 127

2.7 Adjusting windscreen washer system spray jets

Note

- *In case of uneven spray field due to impurities in the spray jet: remove spray jet and rinse it through with water in both directions.*
- *Purging the spray jet with compressed air in both directions is then permitted.*
- *Do not use any objects for cleaning spray jets!*

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

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3 Rear window wiper system

⇒ “3.1 Assembly overview - rear window wiper system”, page 129

⇒ “3.2 Removing and installing rear window wiper arm”, page 131

⇒ “3.3 Removing and installing rear window wiper motor”, page 133

⇒ “3.4 Adjusting rear window wiper park position”, page 135

⇒ “3.5 Removing and installing rear window wiper blade”, page 136

⇒ “3.6 Renewing rear window wiper rubber”, page 137

3.1 Assembly overview - rear window wiper system

⇒ “3.1.1 Assembly overview - rear window washer system, vehicles with rear lid”, page 129

⇒ “3.1.2 Assembly overview - rear window wiper system, vehicles with rear wing doors”, page 130

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

Note

Additional information:

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

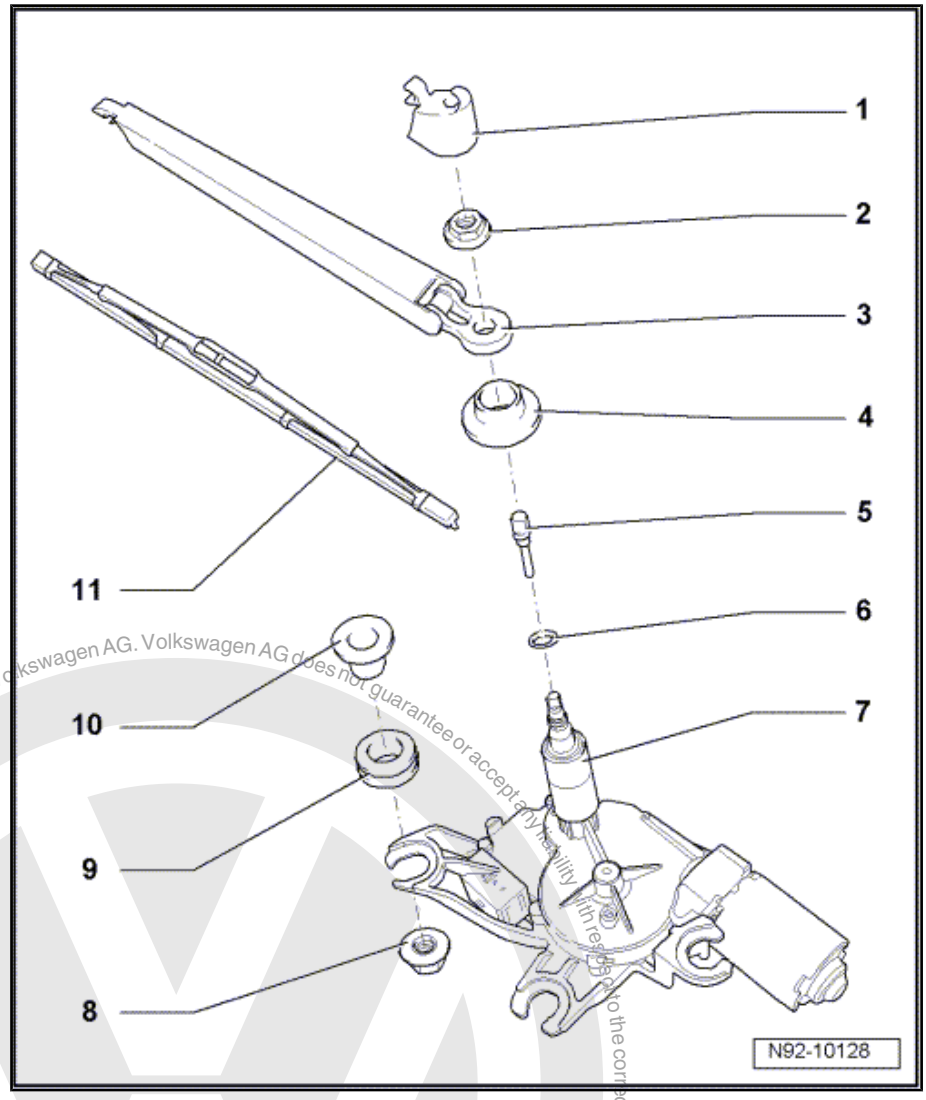
⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit - J519- features a self-diagnosis function that facilitates fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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1 - Cover cap

2 - Hexagon nut, AF 13 mm

- ❑ Rear window wiper arm to shaft of rear window wiper motor
- ❑ 12 Nm

3 - Rear window wiper arm

- ❑ Removing and installing ⇒ page 131 .
- ❑ Adjusting park position ⇒ page 135 .

4 - Seal

5 - Spray jet

- ❑ Removing and installing ⇒ page 144 .
- ❑ Adjusting ⇒ page 144

6 - Seal

7 - Rear window wiper motor - V12-

- ❑ Removing and installing ⇒ page 133 .

8 - M6 hexagon nut with washer

- ❑ Rear window wiper motor to rear lid
- ❑ 8 Nm

9 - Rubber ring

10 - Spacer

11 - Rear window wiper

- ❑ Removing and installing rear window wiper ⇒ page 136 .
- ❑ Renewing rear window wiper rubber ⇒ page 137 .

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

Note

Additional information:

⇒ Self-study programme No. 328 , The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit - J519- features a self-diagnosis function that facilitates fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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1 - Cover cap

2 - Hexagon nut, AF 13 mm

- ❑ Rear window wiper arm to shaft of rear window wiper motor
- ❑ 12 Nm

3 - Rear window wiper arm

- ❑ Removing and installing ⇒ page 131 .
- ❑ Adjusting park position ⇒ page 135 .

4 - Seal

5 - Spray jet

- ❑ Removing and installing ⇒ page 144 .
- ❑ Adjusting ⇒ page 144

6 - Rear window wiper motor - V12-

- ❑ Removing and installing ⇒ page 134 .

7 - M6 hexagon bolt with washer

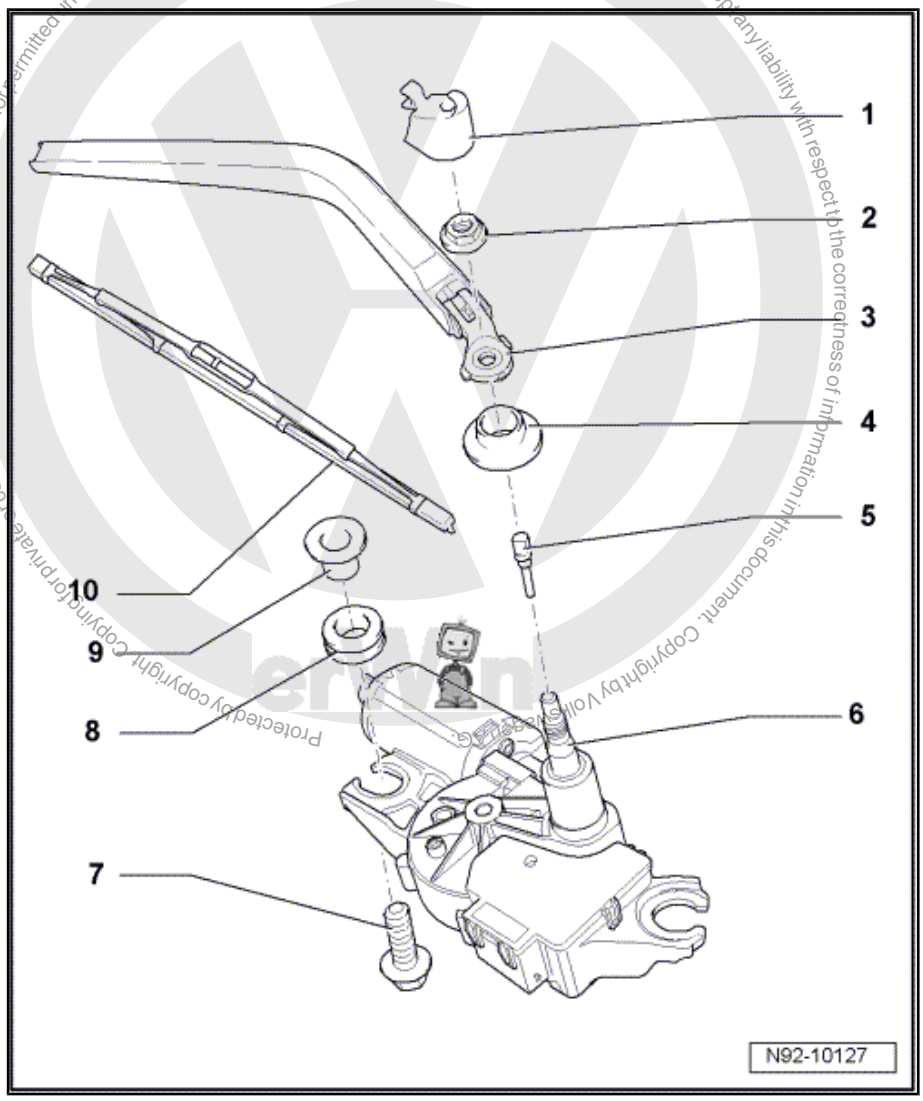
- ❑ Rear window wiper motor to rear wing door
- ❑ 8 Nm

8 - Rubber ring

9 - Spacer

10 - Rear window wiper

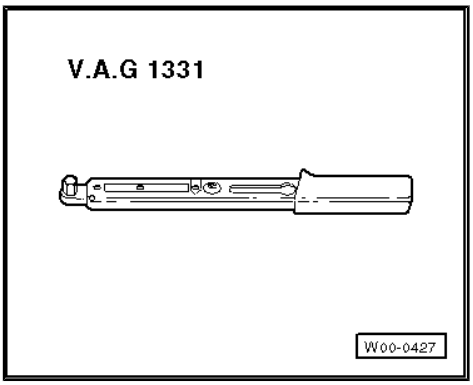
- ❑ Renewing rear window wiper rubber ⇒ page 138 .



3.2 Removing and installing rear window wiper arm

Special tools and workshop equipment required

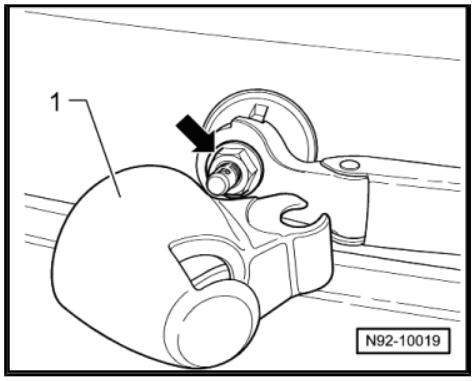
♦ Torque wrench - V.A.G 1331/-



Removing:

– Move wipers to park position.

– Switch off ignition and all electrical loads, and pull out ignition key.
– Fold cover cap -1- of rear window wiper up and unclip it.
– Loosen nut -arrow- without screwing it off completely.
– Fold wiper arm up and release from taper by rocking arm back and forth sideways.

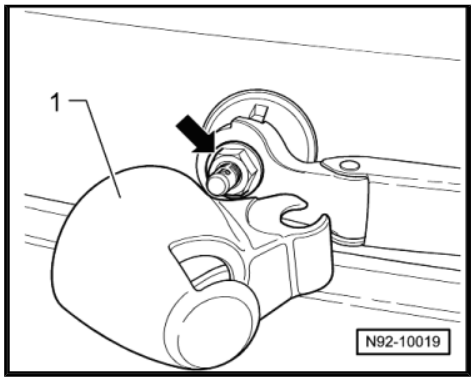


– Undo nuts -arrows- and remove wiper arm

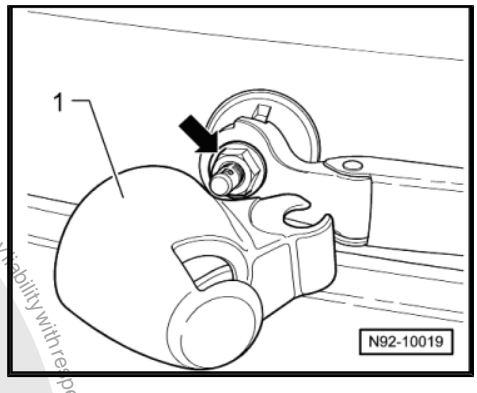
Installing:

Install in the reverse order of removal. When doing this, note the following:

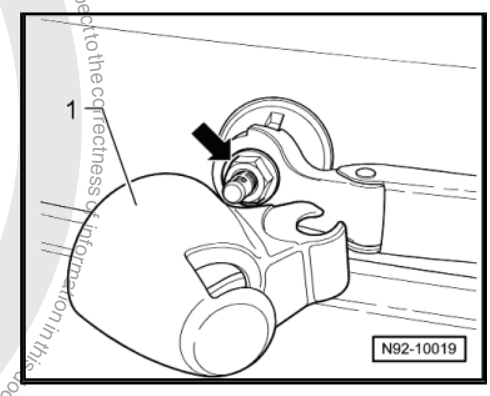
– To place wiper motor in its rest position, switch rear windscreen wiper on and off with ignition on.
– Switch off ignition and remove ignition key.



– Fit rear window wiper arm in approximate park position onto rear window wiper arm shaft and tighten securing nut -arrow- by hand.
– Adjust rear window wiper park position ⇒ page 135 .



– Clip cover -1- onto rear window wiper.



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3.3 Removing and installing rear window wiper motor

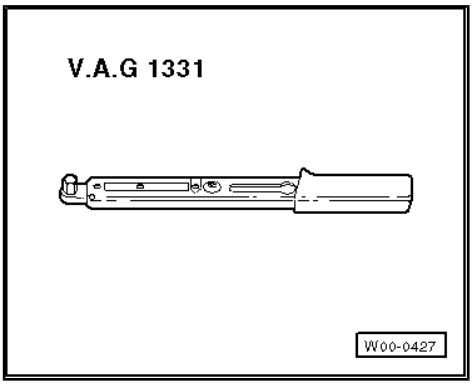
⇒ "3.3.1 Removing and installing rear window wiper motor, vehicles with rear lid", page 133

⇒ "3.3.2 Removing and installing rear window wiper motor, vehicles with rear wing doors", page 134

3.3.1 Removing and installing rear window wiper motor, vehicles with rear lid

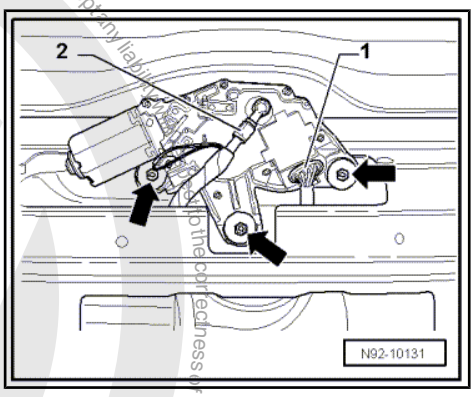
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331/-



Removing:

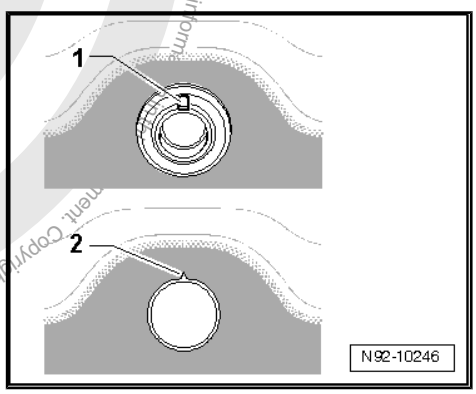
– Remove rear window wiper arm ⇒ page 131 .
– Unclip and remove cover on wiper motor.
– Release and disconnect electrical connector -1-.
– Remove hose -2- from window washer system.
– Remove securing nuts -arrows-.
– Carefully pull motor from rear lid.



Installing:

Installation is carried out in reverse order of removal. Observe the following when doing this:

– 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 , moisten rear window wiper arm shaft with lubricant polyethylene glycol.***

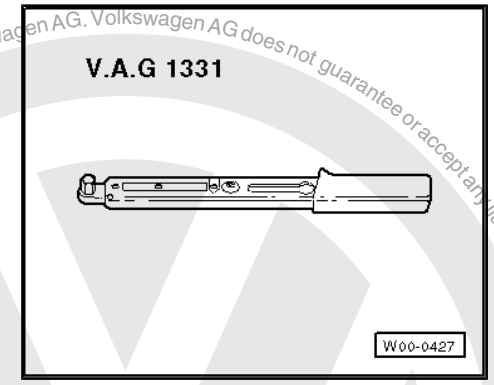
– Tighten threaded connections to specified torque given in assembly overview ⇒ page 129 .
– Install rear window wiper arm ⇒ page 131 .

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3.3.2 Removing and installing rear window wiper motor, vehicles with rear wing doors

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331/-



Removing:

– Remove rear window wiper arm ⇒ page 131 .

– Remove left rear wing door trim ⇒ General body repairs, interior; Rep. gr. 70 ; Rear lid/rear wing door trims .

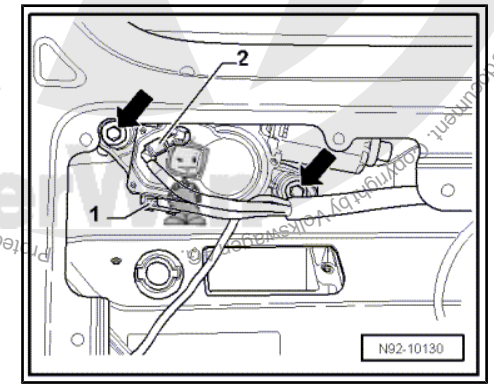
– Remove the lock cylinder carrier and the left rear wing door lock ⇒ General body repairs, exterior; Rep. gr. 55 .

– Release and disconnect electrical connector -1-.

– Remove hose -2- from rear window washer system.

– Remove securing bolts -arrows-.

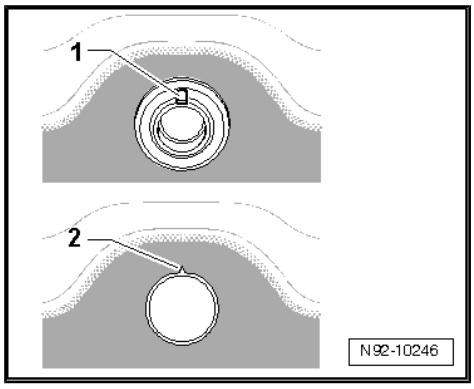
– Carefully remove motor from rear wing door.



Installing:

Install in the reverse order of removal. When doing this, note 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 , moisten rear window wiper arm shaft with lubricant polyethylene glycol.***

– Tighten threaded connections to specified torque given in assembly overview ⇒ page 130 .

– Install rear window wiper arm ⇒ page 131 .

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3.4 Adjusting rear window wiper park position

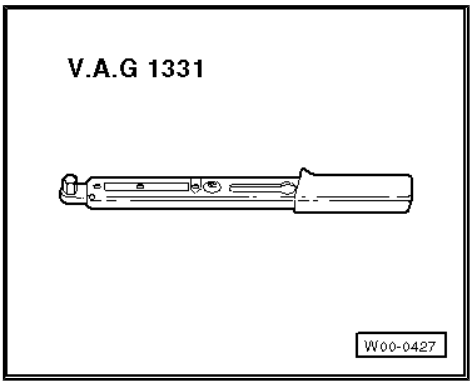
⇒ "3.4.1 Adjusting rear window wiper park position, vehicles with rear lid", page 135

⇒ "3.4.2 Adjusting rear window wiper park position, vehicles with rear wing doors", page 135

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/-



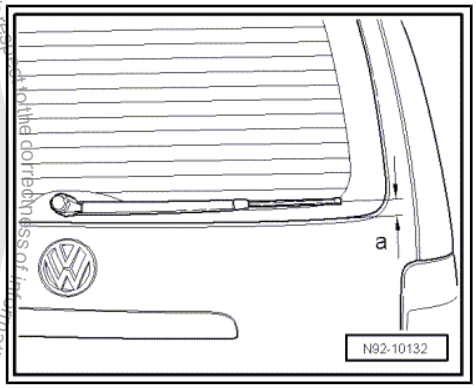
– Move rear window wiper to park position.

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

– Adjust rear window wiper park position by moving rear window wiper arm, if necessary.

Removing and installing rear window wiper arm ⇒ page 131 .

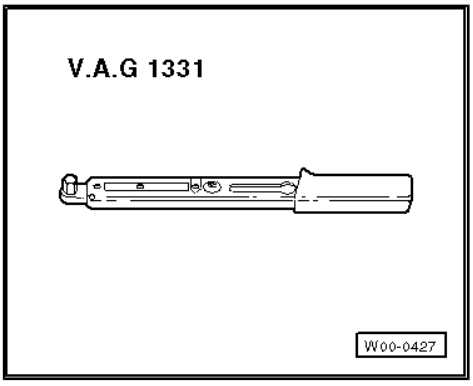
– Tighten threaded connection to specified torque ⇒ page 129 .



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

Special tools and workshop equipment required

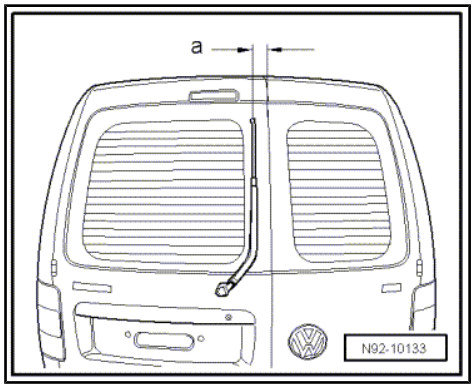
- Torque wrench - V.A.G 1331/-



– Move rear window wiper to park position.

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Distance -a- between rear window wiper rubber and edge of door must be 25 mm.



– Adjust rear window wiper park position by moving rear window wiper arm, if necessary.

Removing and installing rear window wiper arm ⇒ page 131 .

– Tighten threaded connection to specified torque ⇒ page 130 .

3.5 Removing and installing rear window wiper blade

⇒ “3.5.1 Removing and installing rear window wiper blade, vehicles with rear lid and joint-free rear window wiper”, page 136

3.5.1 Removing and installing rear window wiper blade, vehicles with rear lid and joint-free rear window wiper

Note

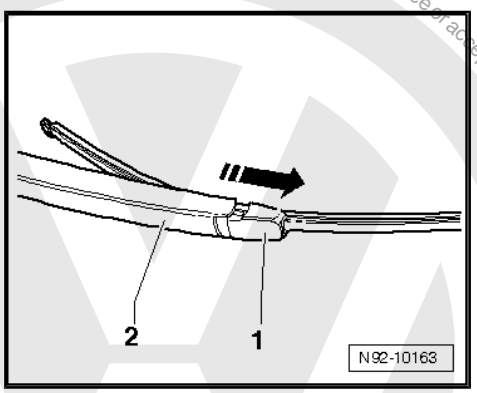
- *On vehicles with rear lid, the standard rear window wiper blade has been replaced by a joint-free rear window wiper blade.*
- *Rear window wiper blades of that kind are very flexible.*
- *To lift the rear window wiper blades off the rear window, touch them only in the area in which the rear window wiper blades are attached to the rear window wipers.*

Removing:

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

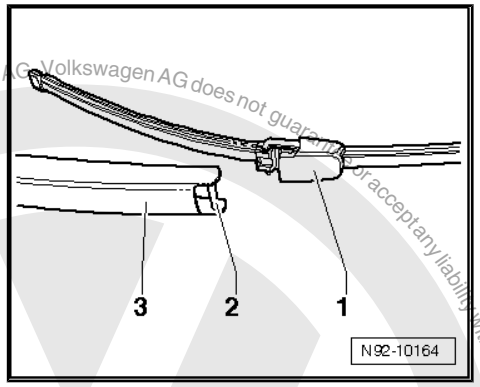
– Fold up rear window wiper arm -2-.

– Pull rear window wiper blade fastening element -1- out of rear window wiper arm -2- -arrow-.



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– Remove rear window wiper blade fastening element -1- from axis -2- of rear window wiper arm.

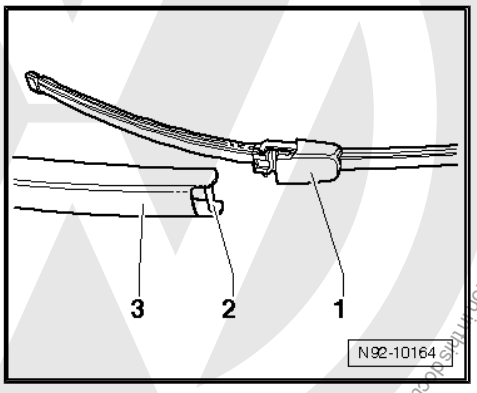


Installing:

– Push rear window wiper blade fastening element -1- onto axis -2- of rear window wiper arm -3-.

– Push rear window wiper blade fastening element into rear window wiper arm until it engages.

– Carefully fold rear window wiper arm back onto rear window.



3.6 Renewing rear window wiper rubber

⇒ “3.6.1 Removing and installing rear window wiper rubber, vehicles with rear lid and joint-free rear window wiper”, page 137

⇒ “3.6.2 Renewing rear window wiper rubber, vehicles with rear wing doors, without joint-free rear window wiper”, page 138

3.6.1 Removing and installing rear window wiper rubber, vehicles with rear lid and joint-free rear window wiper

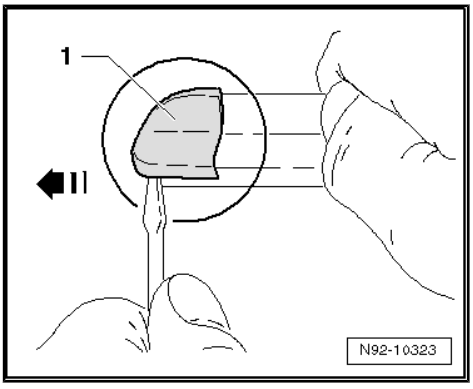
Note

On vehicles with rear lid, the standard wiper blade has been replaced by a joint-free wiper blade.

– Remove joint-free rear window wiper blade ⇒ page 136 .

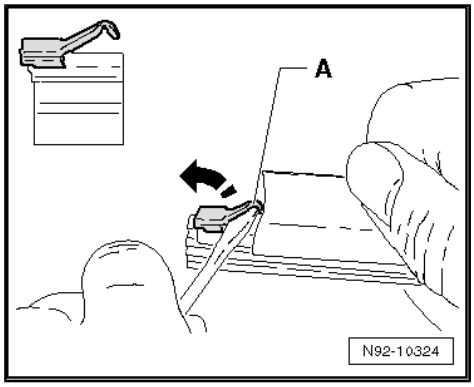
– Check to see on which side the wiper rubber cannot be pushed into the guide.

– On the side that cannot be pushed into the guide, carefully lever off the cap -1-.



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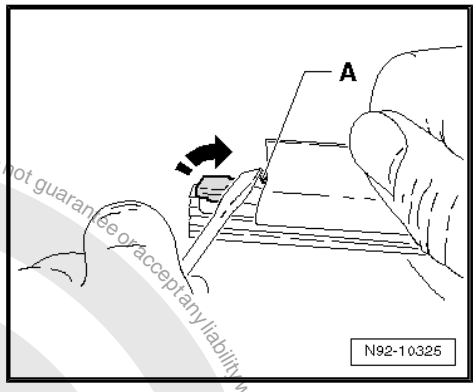
– Bend rear window wiper rubber stop -A- open using a suitable screwdriver.
– Replace wiper rubber.



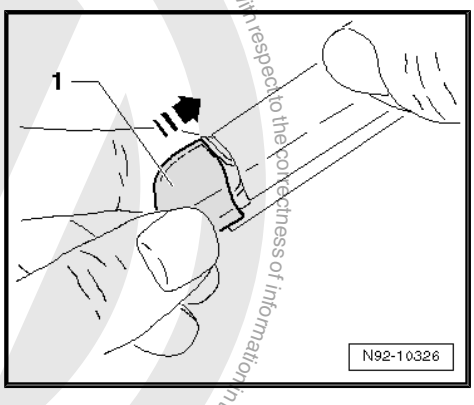
Note

Ensure that wiper rubber blade is seating correctly in wiper rubber blade guides.

– Push wiper blade stop -A- back down using a suitable screwdriver until wiper rubber blade can no longer be moved in the guide.



– Fit new cap -1- and check it is seated securely.
– Install rear window wiper blade ⇒ page 136 .
– Check wiper blade is working correctly.



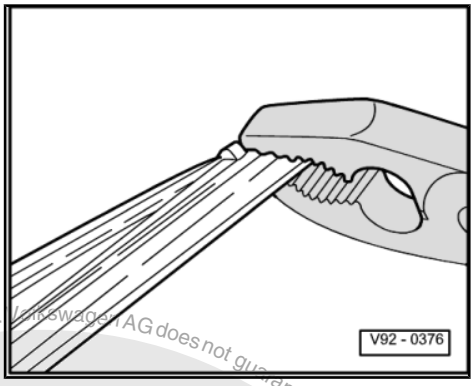
3.6.2 Renewing rear window wiper rubber, vehicles with rear wing doors, without joint-free rear window wiper

Removing:

– Remove rear window wiper blade.

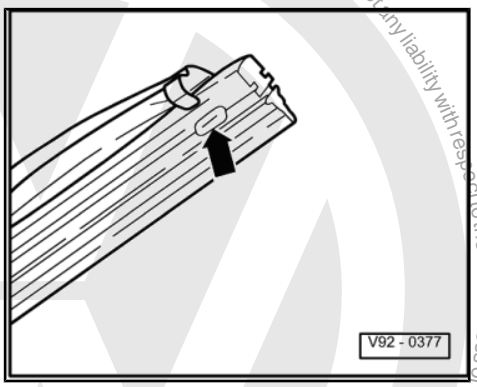
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– On enclosed side of wiper rubber, press steel strips and wiper rubber together using suitable pliers.
– Turn both steel strips and wiper rubber sideways out of upper clip.
– Pull both steel strips and wiper rubber out of wiper blade clips.



Installing:

– Thread new wiper rubber into lower clips of wiper blade.
– Guide both steel strips into the first groove of the wiper rubber so that the recesses in the strips face the rubber and engage in the rubber lugs of the groove.
– Press both steel strips and wiper rubber back together using suitable pliers.
– Place both steel strips and wiper rubber in upper clip so that lugs of clip engage on both sides in retaining grooves -arrow- of wiper rubber.



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4 Rear window washer system

⇒ “4.1 Assembly overview - rear window washer system”, page 140

⇒ “4.2 Removing and installing rear window spray jet”, page 144

⇒ “4.3 Adjusting spray jet for rear window washer system”, page 144

4.1 Assembly overview - rear window washer system

⇒ “4.1.1 Assembly overview - rear window washer system, vehicles with rear lid”, page 140

⇒ “4.1.2 Assembly overview - rear window washer system, vehicles with rear wing doors”, page 142

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

Note

- *In vehicles with auxiliary heater a washer fluid reservoir with a different shape may be installed, depending on the vehicle equipment.*
- *The rear window washer system function can be checked using the final control diagnosis of the onboard supply control unit - J519- .*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

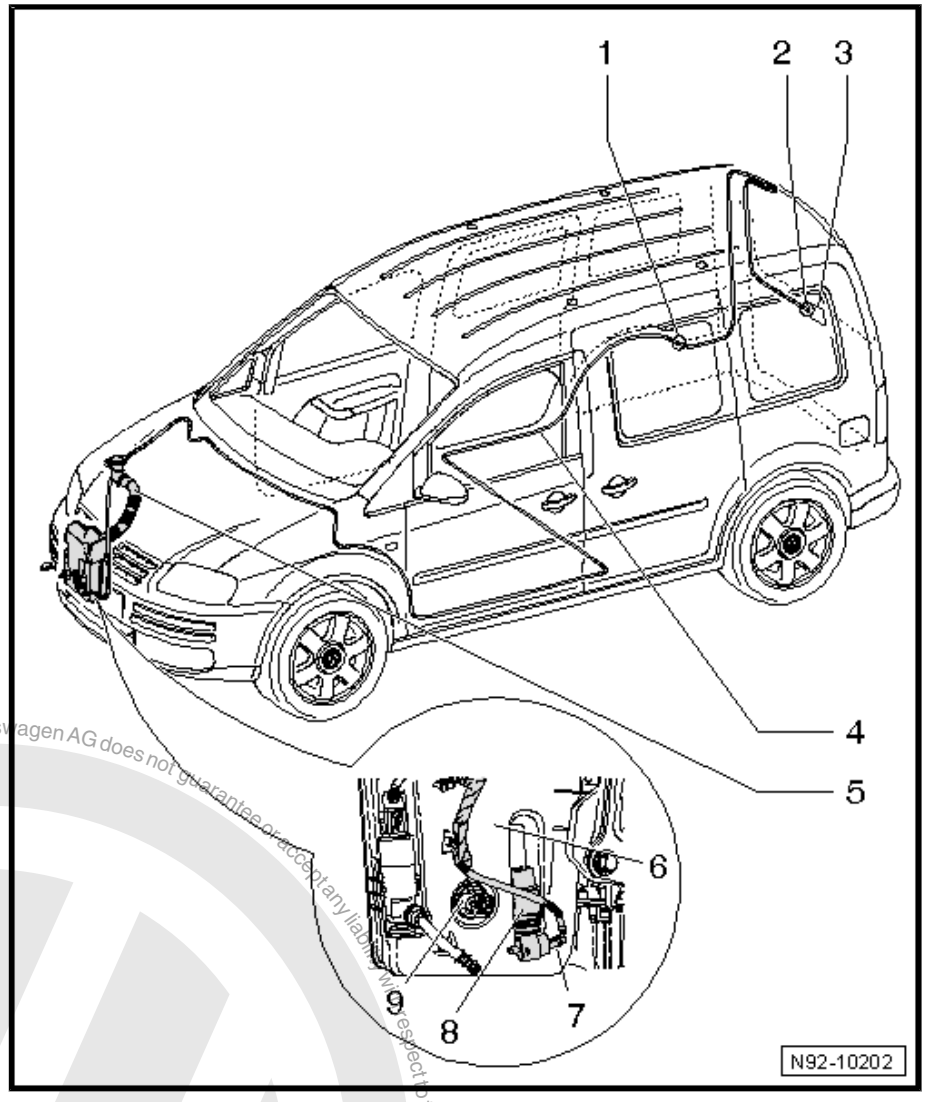
⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit - J519- features a self-diagnosis function that facilitates fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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1 - Connection piece

- ❑ Interior wiring harness point of separation to rear lid wiring harness.
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

2 - Connection piece

- ❑ Connection to spray jet for rear window washer system
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

3 - Spray jet for rear window washer system

- ❑ Removing and installing ⇒ page 144 .
- ❑ Adjusting ⇒ page 144 .

4 - Hose

- ❑ Hose repair ⇒ page 155

5 - Filler pipe for washer fluid reservoir

- ❑ Removing and installing ⇒ page 123 .

6 - Washer fluid reservoir

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 120
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 121

7 - Angled connection piece

- ❑ Connection to windscreen and rear window washer pump - V59-
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

8 - Windscreen and rear window washer pump - V59-

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 123
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 124

9 - Windscreen washer fluid level sender - G33-

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 125
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 126

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

Note

- *In vehicles with auxiliary heater a washer fluid reservoir with a different shape may be installed, depending on the vehicle equipment.*
- *The rear window washer system function can be checked using the final control diagnosis of the onboard supply control unit - J519- .*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

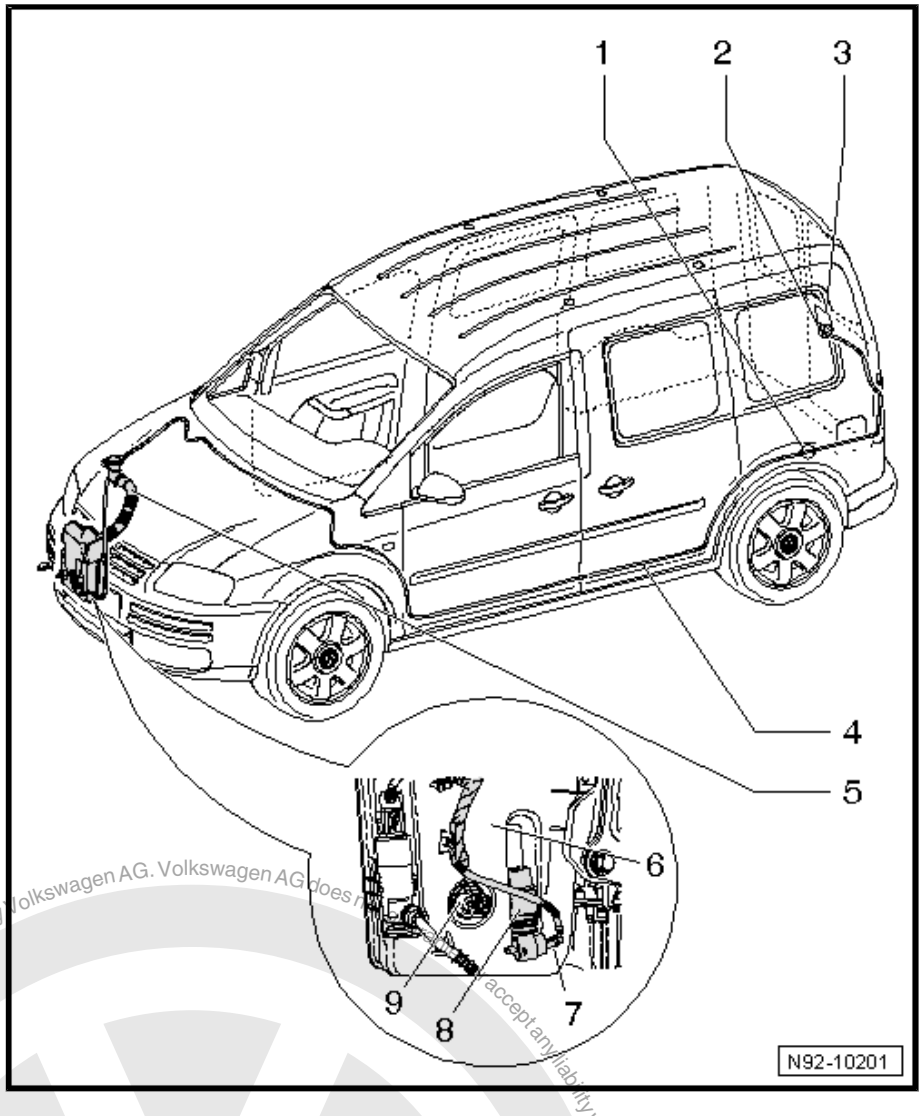
⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit - J519- features a self-diagnosis function that facilitates fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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1 - Connection piece

- ❑ Interior wiring harness point of separation to rear wing door wiring harness.
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

2 - Angled connection piece

- ❑ Connection to spray jet for rear window washer system
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

3 - Spray jet for rear window washer system

- ❑ Removing and installing ⇒ page 144 .
- ❑ Adjusting ⇒ page 144 .

4 - Hose

- ❑ Hose repair ⇒ page 155

5 - Filler pipe for washer fluid reservoir

- ❑ Removing and installing ⇒ page 123 .

6 - Washer fluid reservoir

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 120
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 121

7 - Angled connection piece

- ❑ Connection to windscreen and rear window washer pump - V59-
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

8 - Windscreen and rear window washer pump - V59-

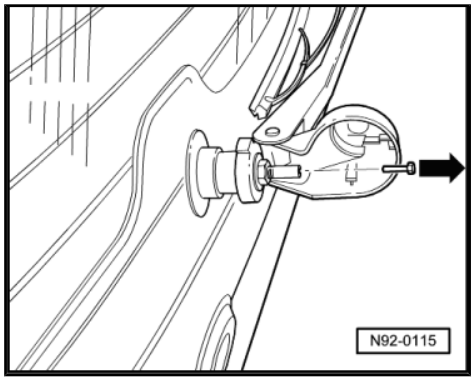
- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 123
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 124

9 - Windscreen washer fluid level sender - G33-

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 125
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 126

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4.2 Removing and installing rear window spray jet



Removing:

– Allow rear window wiper to adopt park position.

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

– Fold up cover of rear window wiper arm.

– Pull spray jet out of rear window wiper arm shaft using suitable pliers -arrow-.

Installing:

– Push spray jet as far as stop into rear window wiper arm shaft, ensuring that spray jet opening faces upwards.

– Adjusting spray jet ⇒ page 144

4.3 Adjusting spray jet for rear window washer system

Note

- *In case of uneven spray field due to impurities in the spray jet: remove spray jet and rinse it through with water in both directions.*
- *Purging the spray jet with compressed air in both directions is then permitted.*
- *Do not use any objects for cleaning spray jets!*

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

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5 Headlight washer system

⇒ “5.1 General description - headlight washer system”, page 145

⇒ “5.2 Assembly overview - headlight washer system”, page 146

⇒ “5.3 Removing and installing headlight washer system pump V11 ”, page 147

⇒ “5.4 Removing and installing spray jet pop-up cylinders”, page 148

⇒ “5.5 Removing and installing spray jet assembly”, page 151

⇒ “5.6 Adjusting headlight washer system spray jets”, page 152

⇒ “5.7 Bleeding headlight washer system”, page 153

5.1 General description - headlight washer system

Note

- *The function of the headlight washer system can be checked using the final control diagnosis of the onboard supply control unit - J519- .*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

General description:

Every fifth time the windscreen washer system stalk is activated the headlight washer system is also activated and headlights are washed. Provided either dipped beam or main beam are switched on and the windscreen washer system stalk is pulled for at least 1.5 seconds.

The “active time” of the headlight washer system can be variably adjusted to between 0 and 12.75 seconds ⇒ page 381 .

Following installation work or on initial start-up of the headlight washer system, the system must be bled to ensure proper operation of the pop-up cylinders and spray jets ⇒ page 153 .

Fault detection and fault display:

The onboard supply control unit - J519- features a self-diagnosis function that facilitates fault finding.

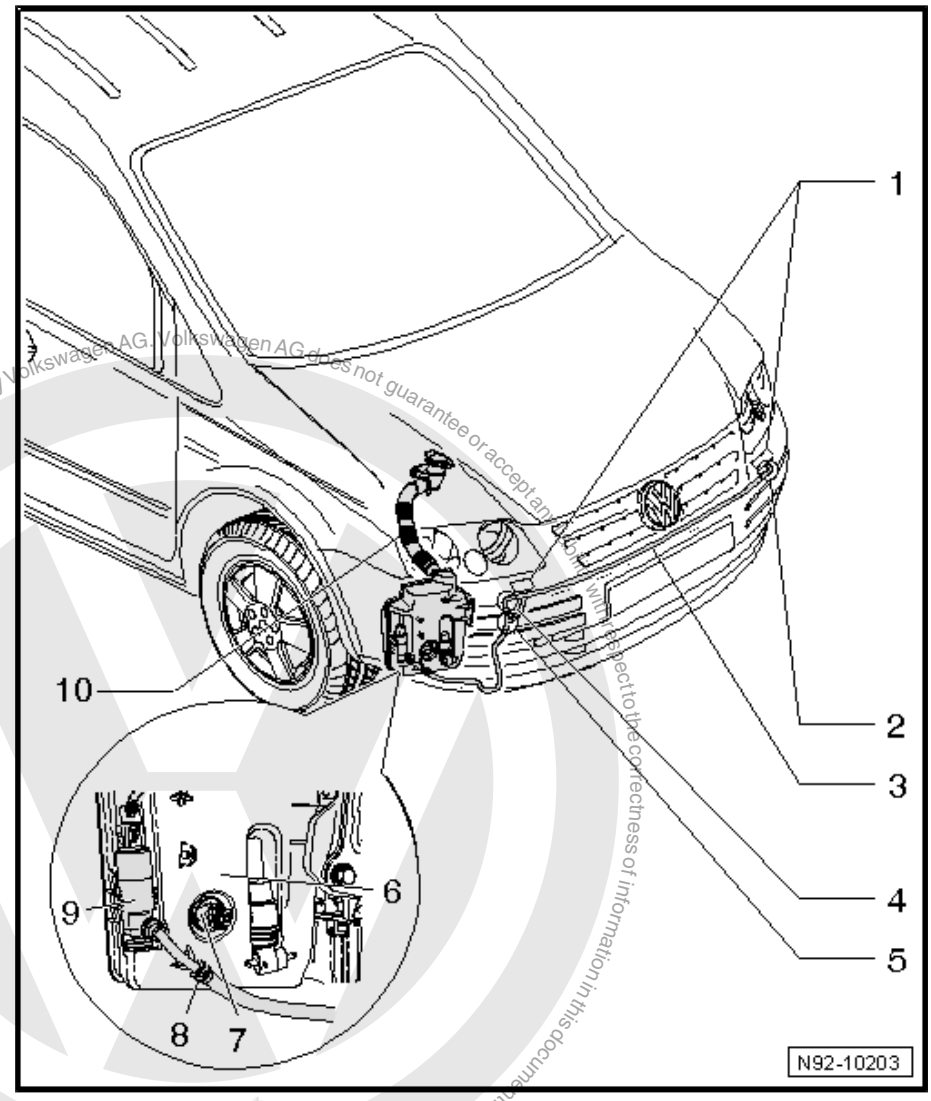
For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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5.2 Assembly overview - headlight washer system

Note

In vehicles with auxiliary heater a washer fluid reservoir with a different shape may be installed, depending on the vehicle equipment.



1 - Washer jet assembly with washer jets

- ❑ Removing and installing spray jet assembly ⇒ page 151
- ❑ Adjusting spray jets ⇒ page 152
- ❑ Removing and installing spray jet pop-up cylinder, vehicles up to 2011 ⇒ page 148
- ❑ Removing and installing spray jet pop-up cylinders, vehicles as of 2011 ⇒ page 150

2 - Angled connection piece

- ❑ Connection to left spray jet pop-up cylinder
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

3 - Hose

4 - Angled piece

5 - Y-piece

- ❑ Connection to right spray jet pop-up cylinder
- ❑ Distribution of wash water line to headlight washer system spray jets

6 - Washer fluid reservoir

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 120
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 121

7 - Windscreen washer fluid level sender - G33-

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 125
- ❑ Removing and installing, vehicles with auxiliary heater ⇒ page 126

8 - Connection piece

- ❑ Connection to headlight washer system pump - V11-
- ❑ Overview of hose couplings for washer fluid lines ⇒ page 154

9 - Headlight washer system pump - V11-

- ❑ Removing and installing, vehicles without auxiliary heater ⇒ page 147

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❑ Removing and installing, vehicles with auxiliary heater ⇒ page 147

10 - Filler pipe for washer fluid reservoir

❑ Removing and installing ⇒ page 123 .

5.3 Removing and installing headlight washer system pump - V11-

⇒ "5.3.1 Removing and installing headlight washer system pump V11 , vehicles without auxiliary heater", page 147

⇒ "5.3.2 Removing and installing headlight washer system pump V11 , vehicles with auxiliary heater", page 147

5.3.1 Removing and installing headlight washer system pump - V11- , vehicles without auxiliary heater

The headlight washer system pump - V11- is mounted on the washer fluid reservoir in the right-hand wheel housing.

Removing:

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

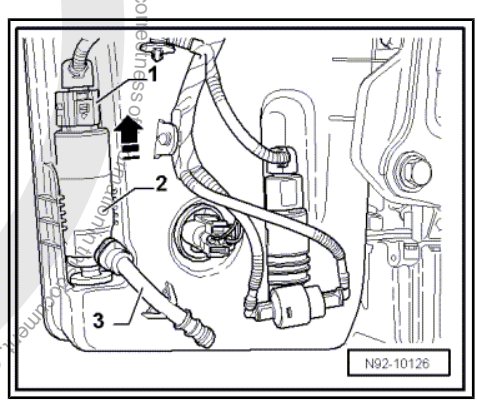
– Unclip fog light trim, or remove right fog light ⇒ page 243 .

– Detach hose from connection pipe -3- of headlight washer system pump -2-.

– Unclip connection pipe -3- of headlight washer system pump from washer fluid reservoir.

– Pull headlight washer system pump -2- upwards -arrow- out of washer fluid reservoir.

– Release and disconnect connector -1-.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– After completing the installation work, bleed the headlight washer system ⇒ page 153 .

5.3.2 Removing and installing headlight washer system pump - V11- , vehicles with auxiliary heater

The headlight washer system pump - V11- is mounted on the washer fluid reservoir in the right-hand wheel housing.

Removing:

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

Caution

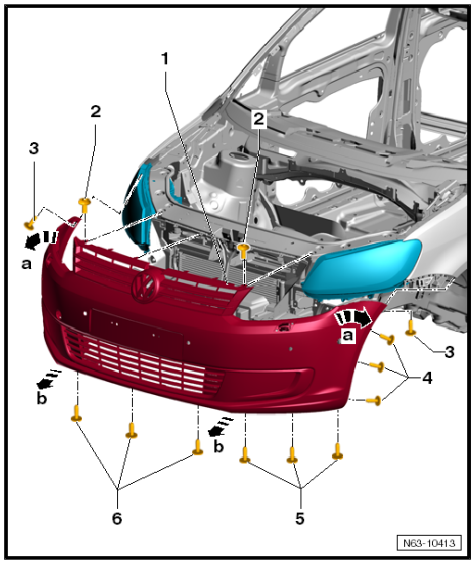
Risk of damage to component.

- *Carefully pull off bumper. When doing this, ensure that the bumper is not being deformed or torn.*

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– Unscrew bolts -2-.
– Unscrew bolts -3- of right wheel housing (facing upwards).
– Unscrew bolts -4- and -5- of right wheel housing.
– Unscrew bolts -6- from below.
– Release catches at top of radiator grille from lock carrier.

Further removal is only possible with a second mechanic.

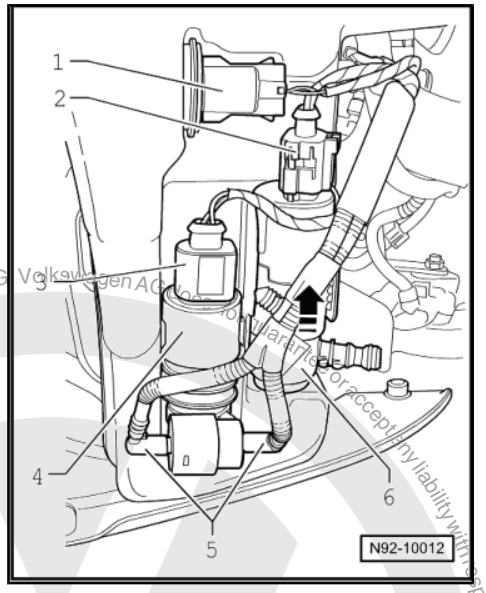


– Pull front bumper cover -1- on the right side out of catches of guides on wing -arrows a- until the headlight washer system pump is accessible.
– Release and disconnect electrical connector -2-.
– Pull headlight washer system pump -6- upwards -arrow- out of washer fluid reservoir.

Installing:

Install in the reverse order of removal. When doing this, note the following:

– On completion of installation work, bleed headlight washer system ⇒ page 153 .



5.4 Removing and installing spray jet pop-up cylinders

⇒ “5.4.1 Removing and installing spray jet pop-up cylinder, vehicles up to 2011”, page 148

⇒ “5.4.2 Removing and installing spray jet pop-up cylinders, vehicles as of 2011”, page 150

5.4.1 Removing and installing spray jet pop-up cylinder, vehicles up to 2011

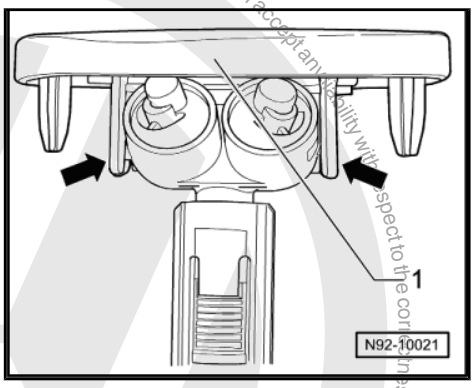
Removing:

– Switch off ignition and all electrical loads, and pull out ignition key.
– Pull spray jets together with cover cap -1- out of bumper cover to stop.

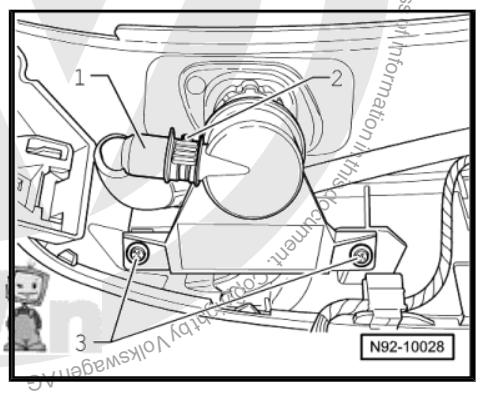
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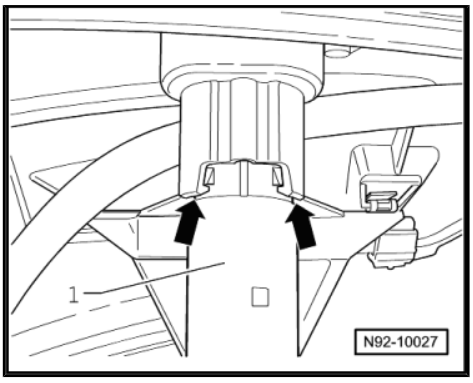
– Unclip cover cap -1- from mounting points -arrows- on spray jet retainer.
– Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, up to 2011 .



– Push and hold down circlip -2- of hose connection -1- and pull hose connection -1- off pop-up cylinder.
– Remove securing bolts -3-.



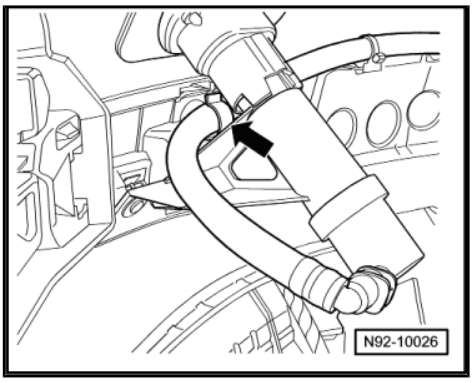
– Unclip and remove pop-up cylinder -1- from bumper cover -arrows-.



Installing:

Install in the reverse order of removal. When doing this, note the following:

The pop-up spray jet cylinder hose must be attached to the retaining clip on the bracket -arrow-.



– After completing the installation work, bleed the headlight washer system ⇒ page 153 .
– Check headlight washer system spray jets and adjust if necessary ⇒ page 152 .

5.4.2 Removing and installing spray jet pop-up cylinders, vehicles as of 2011

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.

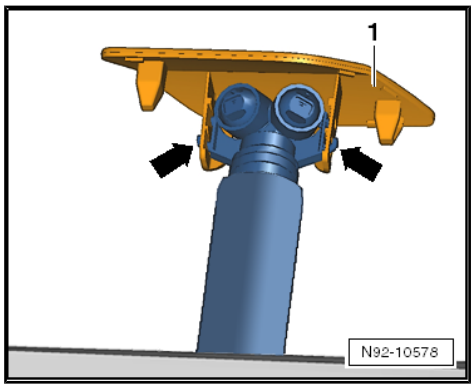
Eject pop-up cylinder using only water pressure or air pressure.

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

Removing:

– Eject pop-up cylinder by activating headlight washer system, and hold it in ejected position.

– Unclip cover cap -1- from mounting points -arrows- on spray jet retainer.



Note

- *On vehicles without auxiliary heater, the pop-up cylinders can be removed without having to remove the bumper cover.*
- *After the fog light on the relevant side has been removed, the pop-up cylinder can be accessed through the aperture of the fog light.*

Vehicles without auxiliary heater:

– Unclip fog light cover, or remove fog light on the respective side ⇒ page 243 .

Vehicles with auxiliary heater:

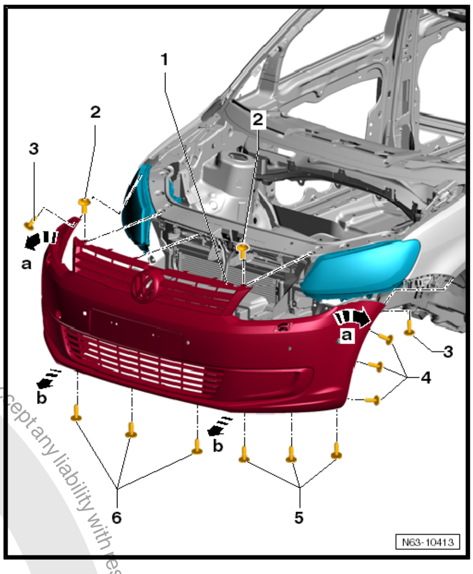
Caution

Risk of damage to component.

- *Carefully pull off bumper. When doing this, ensure that the bumper is not being deformed or torn.*

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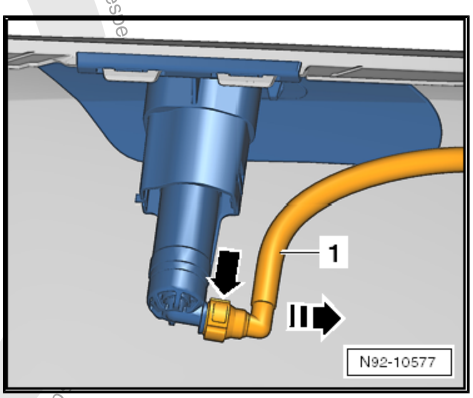
- Unscrew bolts -2-.
- Unscrew bolts -3- of wheel housing (facing upwards) on the respective side.
- Unscrew bolts -4- and -5- of wheel housing on the respective side.
- Unscrew bolts -6- from below.
- Release catches at top of radiator grille from lock carrier.



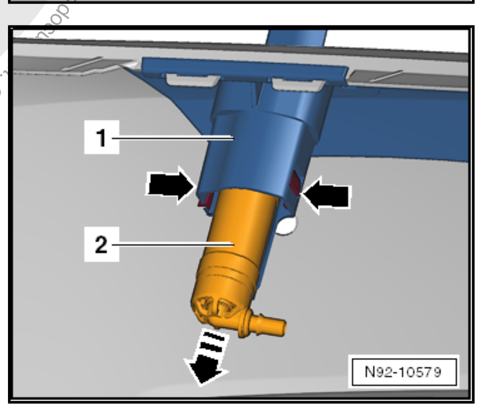
Further removal is only possible with a second mechanic.

- Pull front bumper cover -1- on the respective side out of catches of guides on wing -arrows a- until the pop-up cylinder is accessible.

Continuation for all vehicles:



- Press and hold securing clip -arrow-, and pull hose connection -1- off pop-up cylinder.
- Collect escaping fluid in a suitable container.



- Push together locking mechanisms -arrows- on both sides, and pull pop-up cylinder -2- in -direction of arrow- out of mounting in bumper cover.

Installing:

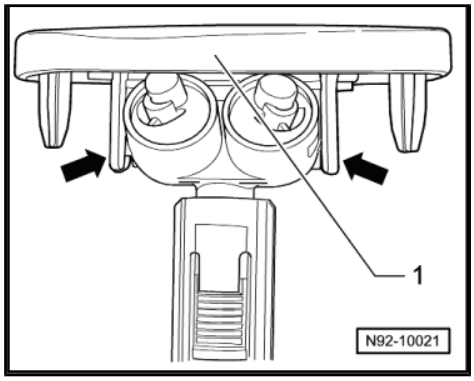
- Install in the reverse order of removal. When doing this, note the following:
- Check cover cap is seated correctly on bumper cover.
- On completion of installation work, bleed headlight washer system ⇒ page 153 .
- Check headlight washer system spray jets and adjust if necessary ⇒ page 152 .

5.5 Removing and installing spray jet assembly

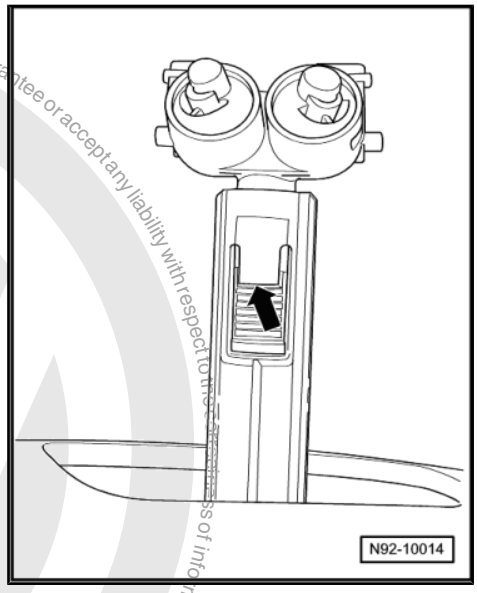
Removing:

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

– Pull spray jet together with cover cap -1- out of bumper cover to stop.
– Pull cover cap -1- off mountings -arrows- on spray jet assembly.



– Lift locking hooks -arrow- a little and pull out spray yet assembly.



Installing:

Note

- *The degree to which the cover cap of the spray jet is pulled down onto the bumper cover can be adjusted using the detents on the spray jet retainer.*
- *If the spray jet assembly is not pulled in far enough, the cover cap will not seat correctly.*
- *If the spray jet assembly is pulled in too far, the cover cap and the bumper cover could be pushed out of shape.*

– Push spray jet into pop-up cylinder until it locks in place.
– Clip cover cap onto spray jet retainer and allow it to engage in pop-up cylinder.
– Check that cover cap is correctly seated on bumper cover.
– If necessary, adjust seat of cover cap by pushing spray jet assembly in higher or lower position on pop-up cylinder.
– After completing the installation work, bleed the headlight washer system ⇒ page 153 .
– Check headlight washer system spray jets and adjust if necessary ⇒ page 152 .

5.6 Adjusting headlight washer system spray jets

Note

- *In case of uneven spray field due to impurities in the spray jet: remove spray jet and rinse it through with water in both directions.*
- *Purging the spray jet with compressed air in both directions is then permitted.*
- *Do not use any objects for cleaning spray jets!*

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

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5.7 Bleeding headlight washer system

To guarantee sound functioning of pop-up cylinders and spray jets, the headlight washer system must be bled following assembly work or when operated for the first time.

– Top up washer fluid reservoir.
– Start engine.
– Switch headlights “ON”.
– Operate headlight washer system several times (3-5 times, 3 seconds each time).
– Repeat this bleeding procedure, if necessary, until the pop-up cylinders and spray jets are functioning perfectly.

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6 Washer fluid line hose couplings

General information for hose couplings for washer fluid lines is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 92 ; Hose couplings for washer fluid lines .

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7 Hose repair

General information for hose repair is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 92 ; Hose repair .

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94 – Lights, bulbs, switches - exterior

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1 Headlight

⇒ “1.1 Assembly overview - headlight”, page 158

⇒ “1.2 Removing and installing headlight”, page 166

⇒ “1.3 Adjusting headlights”, page 174

⇒ “1.4 Adjusting headlight installation position”, page 175

⇒ “1.5 Removing and installing front turn signal bulb M5 / M7 ”, page 180

⇒ “1.6 Removing and installing bulb for daytime running light and side light”, page 185

⇒ “1.7 Removing and installing daytime running light and main beam bulb”, page 187

⇒ “1.8 Removing and installing side light bulb M1 / M3 ”, page 188

⇒ “1.9 Removing and installing main beam and dipped beam bulb”, page 191

⇒ “1.10 Removing and installing dipped beam bulb M29 / M31 ”, page 193

⇒ “1.11 Removing and installing main beam bulb M30 / M32 ”, page 196

⇒ “1.12 Removing and installing bulb for static cornering light M51/M52 ”, page 198

⇒ “1.13 Removing and installing gas discharge lamp L13 / L14 ”, page 200

⇒ “1.14 Removing and installing LED modules for daytime running light and side light L176 / L177 ”, page 202

⇒ “1.15 Removing and installing dynamic cornering light control motor V318 / V319 ”, page 202

⇒ “1.16 Removing and installing swivel module position sensor G475 / G474 ”, page 203

⇒ “1.17 Removing and installing dipped beam screen”, page 203

⇒ “1.18 Removing and installing gas discharge lamp control unit J343 / J344 ”, page 203

⇒ “1.19 Removing and installing output module for headlight J667 / J668 ”, page 205

⇒ “1.20 Removing and installing control unit for daytime running light and side light J860 / J861 ”, page 207

⇒ “1.21 Removing and installing cornering light and headlight range control unit J745 ”, page 208

⇒ “1.22 Coding cornering light and headlight range control unit J745 ”, page 209

⇒ “1.23 Headlight conversion for left-hand/right-hand traffic”, page 210

⇒ “1.24 Removing and installing headlight range control actuator V48 / V49 ”, page 225

⇒ “1.25 Removing and installing front left vehicle level sender G78 ”, page 228

⇒ “1.26 Removing and installing rear left vehicle level sender G76 :”, page 229

⇒ “1.27 Installing repair kit for headlight housing”, page 232

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1.1 Assembly overview - headlight

⇒ “1.1.1 Assembly overview - headlight with H7 bulb, vehicles up to model year 2010”, page 158

⇒ “1.1.2 Assembly overview - headlight with H4 bulb, vehicles as of model year 2011”, page 160

⇒ “1.1.3 Assembly overview - headlight with H7 bulb, vehicles as of model year 2011”, page 161

⇒ “1.1.4 Assembly overview - headlights with gas discharge lamps and cornering lights”, page 162

1.1.1 Assembly overview - headlight with H7 bulb, vehicles up to model year 2010

Note

- *Before working on headlights, always switch off the headlights and remove the ignition key.*
- *When dealing with complaints, it is absolutely essential that the function and operation of the lighting system are first understood.*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

Fault detection and fault display:

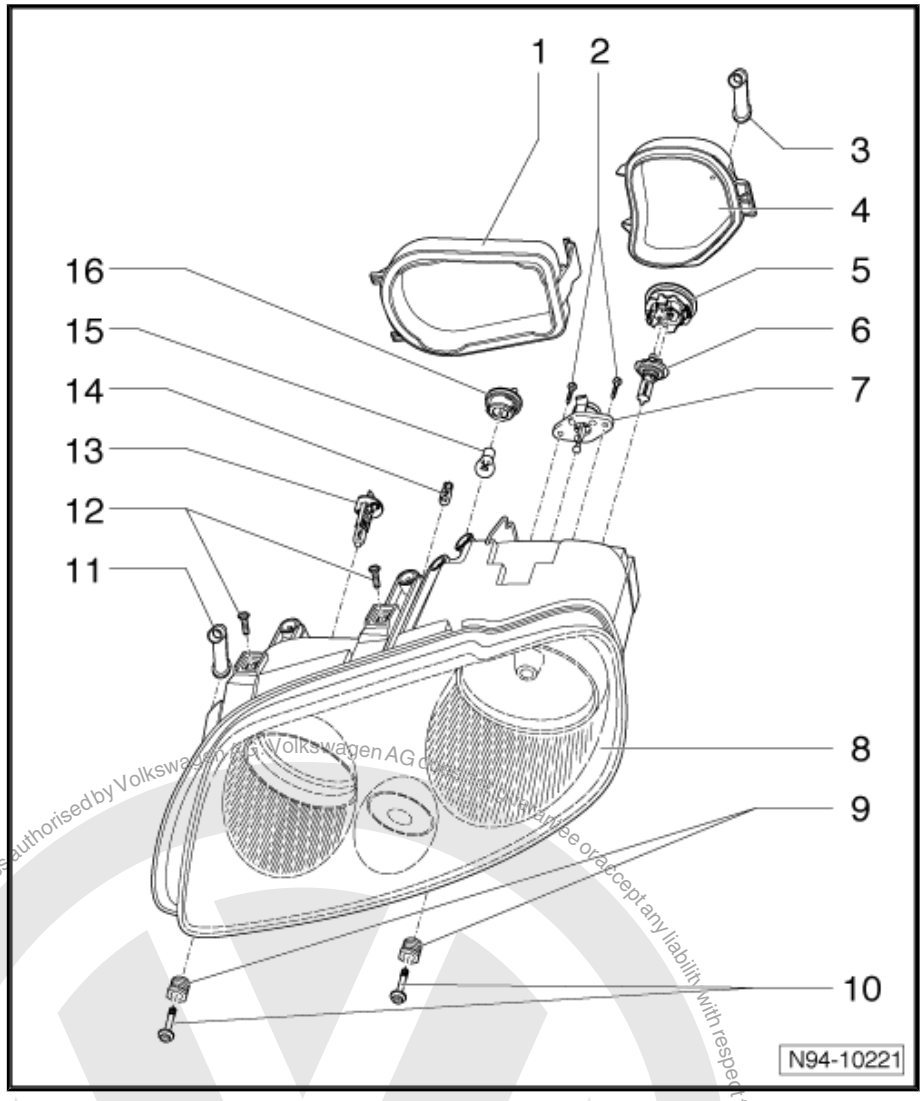
The onboard supply control unit has a self-diagnostic function, which makes fault finding on headlights easier.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

Note

After any measures which could affect the setting of the headlights, check the headlights and adjust if necessary ⇒ page 174

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1 - Cover cap

2 - Securing bolts

- ❑ For left headlight range control motor - V48- or right headlight range control motor - V49-

3 - Bleeder hose

- ❑ To cover cap ⇒ Item 4 (page 159)

4 - Cover cap

5 - Bulb holder with grip element

- ❑ For left headlight dipped beam bulb - M29- or right headlight dipped beam bulb - M31-

6 - Left headlight dipped beam bulb - M29- or right headlight dipped beam bulb - M31-

- ❑ Bulb H7U 12 V, 55 W
- ❑ Removing and installing ⇒ page 193 .

7 - Left headlight range control actuator - V48- or right headlight range control actuator - V49-

- ❑ Removing and installing ⇒ page 225 .

8 - Headlight

- ❑ Removing and installing ⇒ page 166 .
- ❑ Correcting installation position of headlight ⇒ page 175
- ❑ Adjusting headlights ⇒ page 174 .
- ❑ Installing repair kit for headlight housing ⇒ page 232
- ❑ Converting headlights to drive on the left or the right ⇒ page 210

9 - Adjustment bush

- ❑ Correcting installation position of headlight ⇒ page 175

10 - Securing bolts

- ❑ 5 Nm
- ❑ On base of headlight

11 - Bleeder hose

- ❑ On headlight

12 - Securing bolts

- ❑ 5 Nm
- ❑ On top of headlight

13 - Left headlight main beam bulb - M30- or right headlight main beam bulb - M32-

- ❑ Bulb: H1, 12 V, 55 W
- ❑ Removing and installing ⇒ page 196 .

14 - Left side light bulb - M1- or right side light bulb - M3-

- ❑ Bulb: 12 V, W5W

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- ❑ Removing and installing ⇒ page 188 .

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

- ❑ Bulb: 12 V, PY 21W
- ❑ Removing and installing ⇒ page 180 .

16 - Bulb holder with grip element

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

1.1.2 Assembly overview - headlight with H4 bulb, vehicles as of model year 2011

1 - Headlight

- ❑ Removing and installing ⇒ page 168 .
- ❑ Securing bolt specified torque (M8): 4 Nm
- ❑ Correcting installation position of headlight ⇒ page 176
- ❑ Adjusting headlights ⇒ page 174 .
- ❑ Installing repair kit for headlight housing ⇒ page 234
- ❑ Converting headlights to drive on the left or the right ⇒ page 212

2 - Left sidelight bulb - M1- and Right sidelight bulb - M3- , Left daytime running light bulb - L174- and Right daytime running light bulb - L175-

- ❑ Bulb 12V, 21/5W
- ❑ Removing and installing ⇒ page 185 .

3 - Bulb holder with grip element

- ❑ Left sidelight bulb - M1- and Right sidelight bulb - M3- , Left daytime running light bulb - L174- and Right daytime running light bulb - L175-

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

- ❑ Bulb: 12 V, PY 21W
- ❑ Removing and installing ⇒ page 181 .

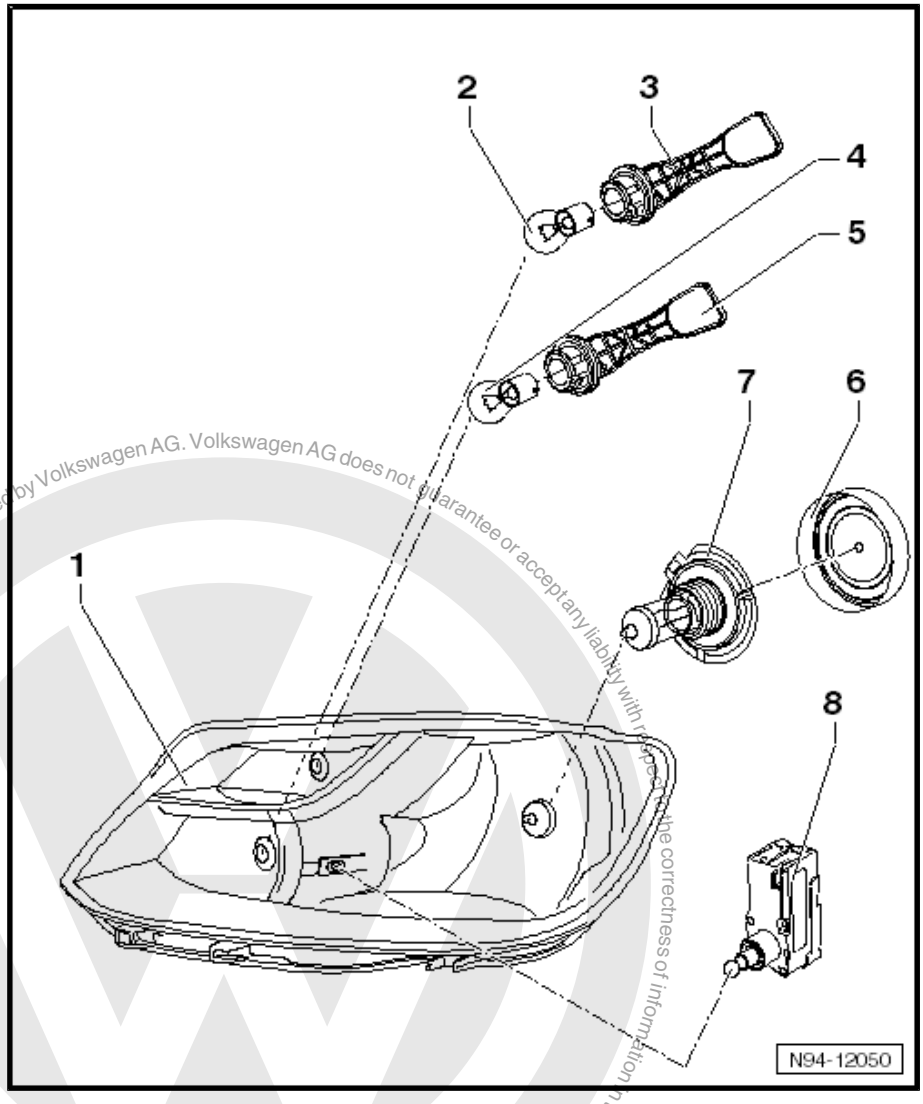
5 - Bulb holder with grip element

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

6 - Cover cap

7 - Left dipped beam bulb - M29- or right dipped beam bulb - M31- and left main beam bulb - M30- or right main beam bulb - M32-

- ❑ Bulb H4 12V, 60/55W
- ❑ Removing and installing ⇒ page 191 .

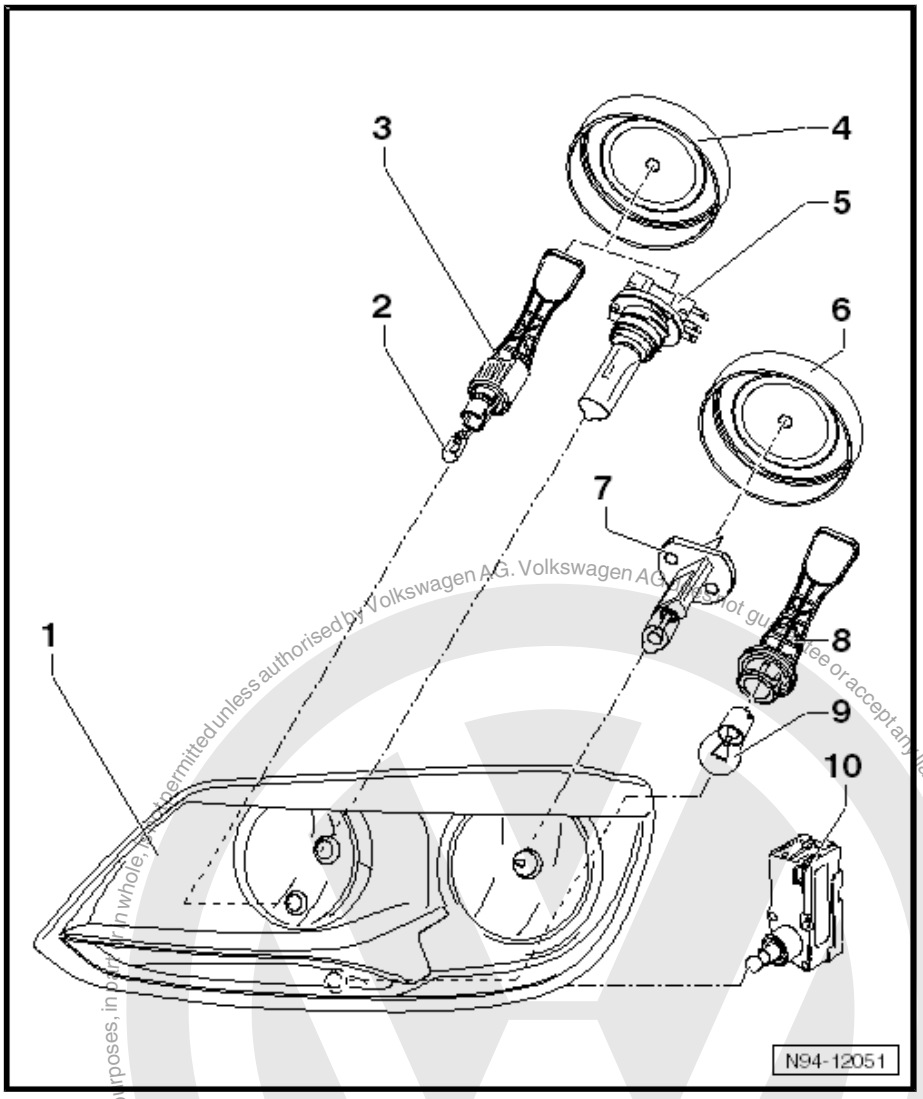


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8 - Left headlight range control actuator - V48- or right headlight range control actuator - V49-

- ❑ Removing actuator ⇒ page 227 .
- ❑ Checking actuator ⇒ page 227 .

1.1.3 Assembly overview - headlight with H7 bulb, vehicles as of model year 2011



1 - Headlight

- ❑ Removing and installing ⇒ page 170 .
- ❑ Correcting installation position of headlight ⇒ page 176
- ❑ Adjusting headlights ⇒ page 174 .
- ❑ Installing repair kit for headlight housing ⇒ page 238
- ❑ Headlight conversion for left-hand/right-hand traffic ⇒ page 219

2 - Left side light bulb - M1- or right side light bulb - M3-

- ❑ Bulb: 12 V, 5 W
- ❑ Removing and installing ⇒ page 190 .

3 - Bulb holder with grip element

- ❑ Left side light bulb - M1- or right side light bulb - M3-

4 - Cover cap

5 - Left daytime running light bulb - L174- or right daytime running light bulb - L175- and left main beam bulb - M30- or right main beam bulb - M32-

- ❑ H15 bulb.
- ❑ 12 V, 15/55 W
- ❑ Removing and installing ⇒ page 187 .

6 - Cover cap

7 - Left headlight dipped beam bulb - M29- or right headlight dipped beam bulb - M31-

- ❑ H7 bulb
- ❑ 12 V, 55 W
- ❑ Removing and installing ⇒ page 195 .

8 - Bulb holder with grip element

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

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

- ❑ Bulb, 12 V, PY21 W
- ❑ Removing and installing ⇒ page 183 .

10 - Left headlight range control actuator - V48- or right headlight range control actuator - V49-

- ❑ Removing actuator ⇒ page 227 .

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❑ Checking actuator ⇒ page 227 .

1.1.4 Assembly overview - headlights with gas discharge lamps and cornering lights

Note

- *Before working on headlights with gas discharge lamps and cornering lights, always switch off the headlights and remove the ignition key.*
- *The automatic headlight range control and cornering lights on headlights with gas discharge lamps is equipped with self-diagnosis.*
- *When dealing with complaints, it is absolutely essential that the function and operation of the lighting system are first understood.*
- *After measures that could influence the headlight setting, check the headlight setting and, if necessary, correct the setting ⇒ Maintenance ; Booklet ; Work descriptions .*
- *Additional information:*

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

General description:

The headlights with gas discharge lamps and cornering lights (AFS = Adaptive Front Lighting System) have a “bi-xenon” function.

With conventional “xenon” headlights, the gas discharge lamps only generate the dipped beam. The “bi-xenon” features makes it possible to generate both the dipped beam and the main beam with “one” gas discharge lamp. To achieve this, an electromechanical adjuster (left dip beam screen motor - V294- or right dip beam screen motor - V295-) uncovers the screened area of the dipped beam on actuation of the main beam function, thus producing main beam light distribution.

This means that with “bi-xenon” headlights the main beam is always automatically adjusted together with the dipped beam.

The headlights with gas discharge lamps and cornering lights do not have an “additional main beam”.

The cornering light system consists of the following functions:

- Swivelling main and dipped beams (dynamic cornering lights): at vehicle speeds in excess of 10 km/h and steering turned.
- Cornering light bulb (static cornering light): when turning into tight bends (bend radius < 500 m) or when turning a corner at vehicle speeds of less than 50 km/h

Fault detection and fault display:

The automatic headlight range control, the cornering lights and onboard supply control systems feature self-diagnosis to facilitate fault finding for headlights with gas discharge lamps.

For fault finding, use vehicle diagnosis, testing and information system in “Guided fault finding” mode.

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Depending on equipment, the following functions can be adapted or coded via the onboard supply control unit - J519- ⇒ page 382 .

- Adapting coming home time
- Adapting leaving home time
- Coding rain and light sensor
- Coding control unit for wiper electronics/deactivating APP

Note

The “bulb failure” warning lamp lights-up in the dash panel when the headlight range control or the AFS (adaptive front lighting system) malfunctions.

WARNING

Risk of death due to high voltage! Risk of injury and environmental pollution!

- ***Observe operation and safety notes for gas discharge lamps ⇒ Electrical System, General Information; Rep. gr. 94 ; Operation and safety notes for gas discharge lamps .***

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1 - Front end support part

2 - Securing bolts

- ❑ M6 x 22
- ❑ Specified torque: 4 Nm

3 - Headlight adapter

4 - Securing bolt

- ❑ AM6 x 40 - S1, (included with headlight).
- ❑ Specified torque: 4 Nm

5 - Cover cap

6 - Left gas discharge lamp - L13- or right gas discharge lamp - L14-

- ❑ “Bi-xenon” with gas discharge lamp starter unit - N195-
- ❑ Type D3S, 42V/35W
- ❑ Removing and installing ⇒ page 200 .

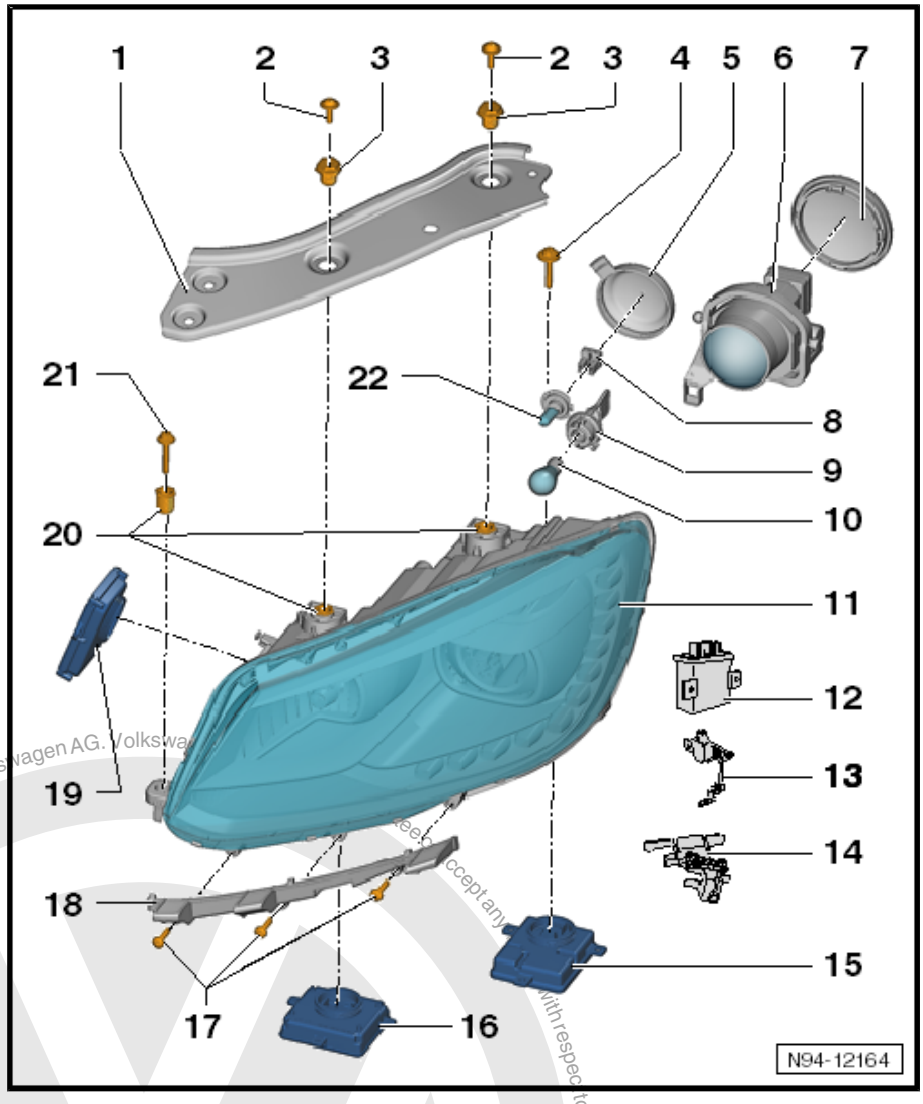
7 - Screw cap

8 - Bulb holder with grip element

- ❑ For left static cornering light - M51- or right static cornering light - M52-

9 - Bulb holder with grip element

- ❑ For front left turn signal bulb - M5- or front right



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turn signal bulb - M7-

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

- ❑ Bulb, 12 V, PY21 W
- ❑ Removing and installing ⇒ page 184 .

11 - Headlight with LED module for daytime running light and side light

- ❑ Removing and installing ⇒ page 172 .
- ❑ Correcting installation position of headlight ⇒ page 176
- ❑ Converting headlights to drive on the left or the right ⇒ page 210
- ❑ Installing repair kit for headlight housing ⇒ page 242
- ❑ Perform basic setting of headlights ⇒ Maintenance ; Booklet Arbeitsbeschreibungen .

12 - Cornering light and headlight range control unit - J745-

- ❑ Removing and installing ⇒ page 208 .
- ❑ Coding ⇒ page 209 .

13 - Front left vehicle level sender - G78-

- ❑ Removing and installing ⇒ page 228 .
- ❑ Securing bolt specified torque (M8): 9 Nm

14 - Rear left vehicle level sender - G76-

- ❑ Removing and installing ⇒ page 229 .
- ❑ Specified torque for securing nut: 5 Nm

15 - Control unit for left gas discharge lamp - J343- or control unit for right gas discharge lamp - J344-

- ❑ Removing and installing ⇒ page 203 .
- ❑ Securing bolt specified torque (M8): 1.3 Nm

16 - Control unit for left daytime running light and side light - J860- or control unit for right daytime running light and side light - J861-

- ❑ Removing and installing ⇒ page 207 .
- ❑ Securing bolt specified torque (M8): 1.3 Nm

17 - Securing bolts

- ❑ 4 x 16.
- ❑ Specified torque: 4 Nm

18 - Bumper mounting

19 - Output module for left headlight - J667- or output module for right headlight - J668-

- ❑ Removing and installing ⇒ page 205 .
- ❑ Securing bolt specified torque (M8): 1.3 Nm

Note

The cornering light and headlight range control unit - J745- must be recoded if a new output module for headlight is installed ⇒ page 209 . Then subsequently perform the basic setting of headlights ⇒ Maintenance ; Booklet ; Descriptions of work .

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20 - Adjustment sleeve (hollow-core bolt)

- ❑ Correcting installation position of headlight ⇒ page 176

21 - Securing bolt

- ❑ BM6 x 40 x 18 - S2.
- ❑ Specified torque: 4 Nm

22 - Checking left static cornering light - M51- or right static cornering light - M52-

- ❑ Bulb H7 12V, 55W
- ❑ Removing and installing ⇒ page 198 .

1.2 Removing and installing headlight

⇒ "1.2.1 Removing and installing headlights, headlights with H7 bulb, vehicles up to model year 2010 ", page 166

⇒ "1.2.2 Removing and installing headlights, headlights with H4 bulb, vehicles as of model year 2011", page 168

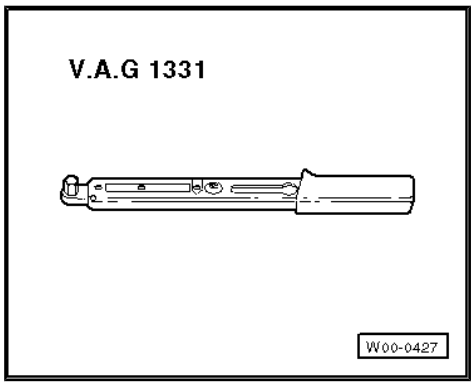
⇒ "1.2.3 Removing and installing headlights, headlights with H7 bulb, vehicles as of model year 2011", page 170

⇒ "1.2.4 Removing and installing headlights, headlights with gas discharge lamps and cornering light", page 172

1.2.1 Removing and installing headlights, headlights with H7 bulb, vehicles up to model year 2010

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



Note

- *There is no requirement to disconnect the battery earth strap.*
- *Illustrations show removal and installation of the left headlight. Removal and installation of the right headlight are carried out in the same way.*
- *If a headlight is removed, the alignment should always be checked following installation ⇒ page 174 .*

Removing:

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

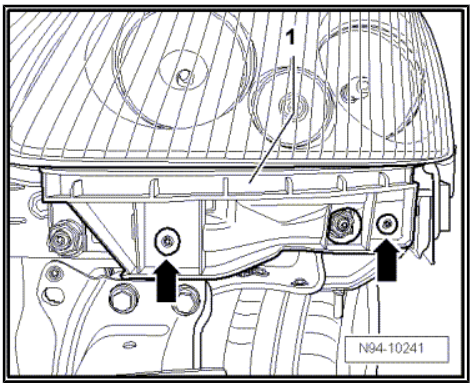
– Loosen and release the bolts and retaining hooks on the relevant side and pull bumper off bumper guide until all securing bolts are accessible and the headlight can be pulled out of its

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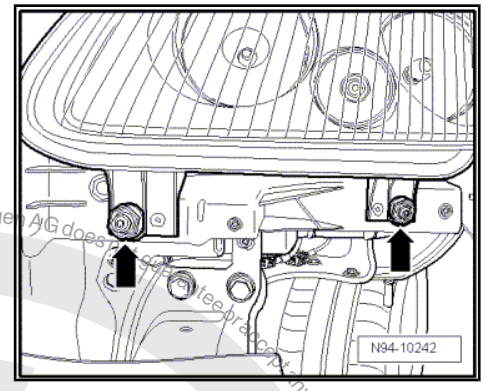
assembly aperture ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, up to 2011 .

– Using commercially available adhesive tape, mask off any potential contact areas between bumper cover and headlight to avoid any scratches when removing and installing the headlight.

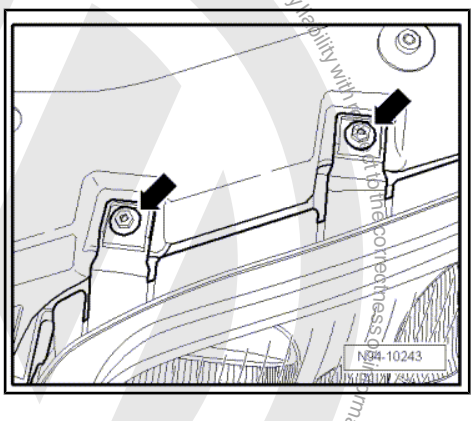
– Unscrew securing bolts -arrows- and remove guide -1-.



– Unscrew lower securing bolts -arrows- on headlight.



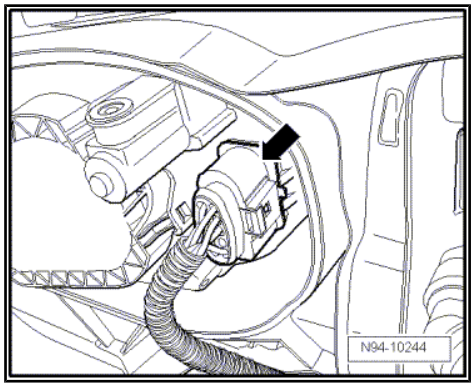
– Unscrew upper securing bolts -arrows- on headlight.



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– Release and disconnect electrical connector -arrow-.

– Remove headlight from vehicle.



Installing:

Installation is carried out in the reverse sequence. Observe the following when doing this:

– Tighten all securing bolts and nuts to specified torques given in assembly overview ⇒ page 158 .

– Check installation position so that shut lines/gaps around headlight are even.

If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted ⇒ page 175 .

– Check functions of headlight.

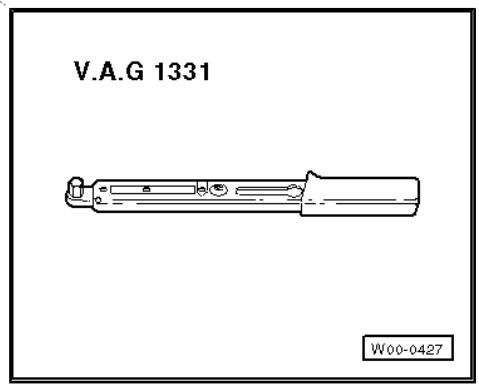
Note

If a headlight is removed or adjusted to fit more accurately to the vehicle body, it must be aligned following such measures ⇒ page 174 .

1.2.2 Removing and installing headlights, headlights with H4 bulb, vehicles as of model year 2011

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



Note

♦ *There is no requirement to disconnect the battery earth strap.*

♦ *Illustrations show removal and installation of the left headlight. Removal and installation of the right headlight are carried out in the same way.*

♦ *If a headlight is removed, the alignment should always be checked following installation ⇒ page 174 .*

Removing:

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

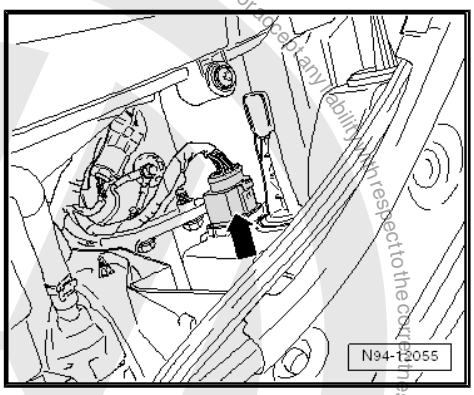
– Loosen and release the bolts and retaining hooks on the relevant side and pull bumper off bumper guide until all securing bolts are accessible and the headlight can be pulled out of its

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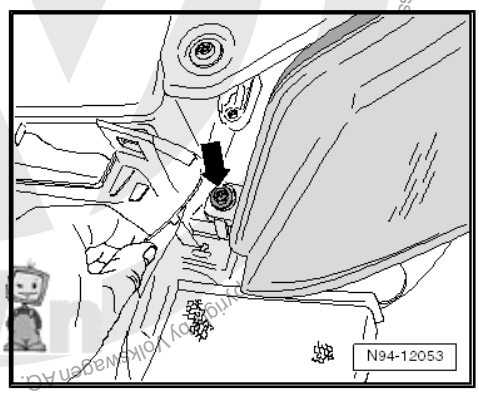
assembly aperture ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, as of 2011 .

– Using commercially available adhesive tape, mask off any potential contact areas between bumper cover and headlight to avoid any scratches when removing and installing the headlight.

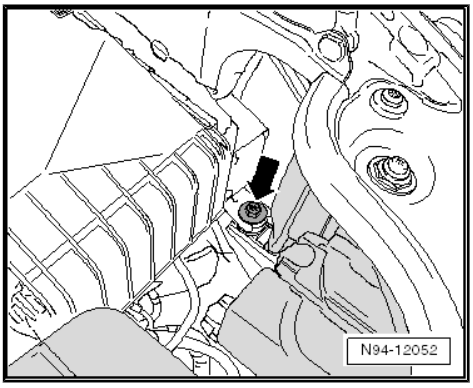
– Release and disconnect electrical connector -arrow-.



– Remove securing bolt -arrow-.



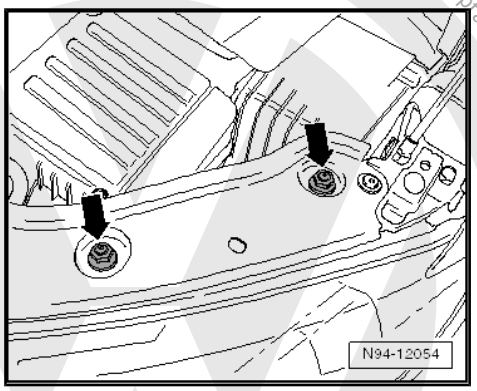
– Loosen securing bolt -arrow-, do not unscrew completely.



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– Remove securing bolts -arrows-.

– Pull headlight out of body opening in a straight line towards the front.



Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten all securing bolts and nuts to specified torques given in assembly overview ⇒ page 160 .

– Check installation position of headlight so that shut lines/gaps around headlight are even.

If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted ⇒ page 176.

– Check functions of headlight.

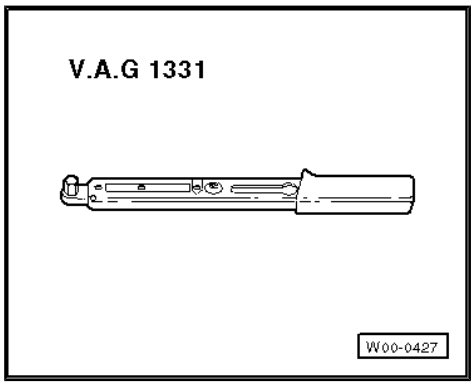
Note

If a headlight is removed or adjusted to fit more accurately to the vehicle body, it must be aligned following such measures ⇒ page 174 .

1.2.3 Removing and installing headlights, headlights with H7 bulb, vehicles as of model year 2011

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



Note

♦ *There is no requirement to disconnect the battery earth strap.*

♦ *Illustrations show removal and installation of the left headlight. Removal and installation of the right headlight are carried out in the same way.*

♦ *If a headlight is removed, the alignment should always be checked following installation ⇒ page 174 .*

Removing:

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

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Caution

Risk of damage to component.

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

– Using commercially available adhesive tape, mask off any potential contact areas between bumper cover, wing and headlight to avoid any scratches when removing and installing the headlight.

– Unscrew bolts -2-.

– Unscrew bolts -3- of wheel housing (facing upwards) on the respective side.

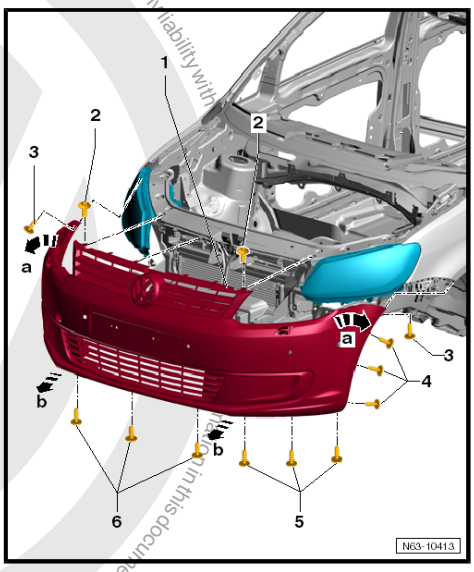
– Unscrew bolts -4- and -5- of wheel housing on the respective side.

– Unscrew bolts -6- from below.

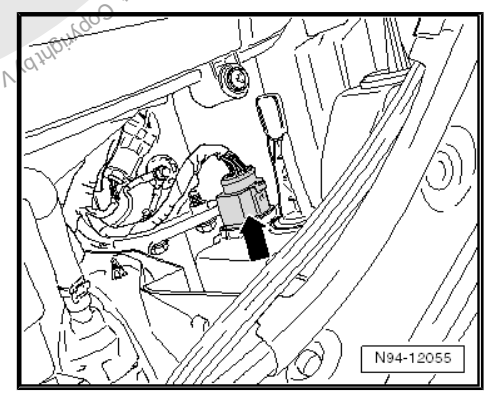
– Release catches at top of radiator grille from lock carrier.

Further removal is only possible with a second mechanic.

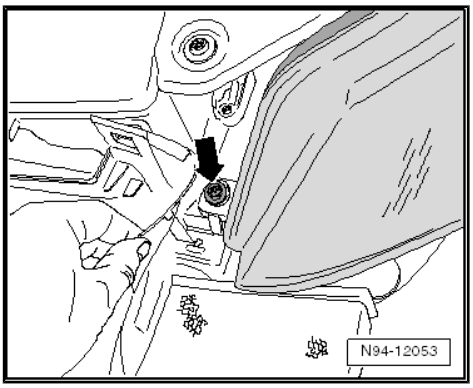
– Pull front bumper cover -1- on the respective side out of catches of guides on wing -arrows a- until all securing bolts for the headlight are accessible and the headlight can be pulled out of the assembly aperture.



– Release and disconnect electrical connector -arrow-.

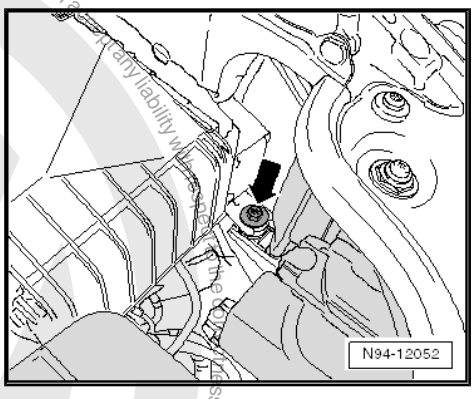


– Remove securing bolt -arrow-.

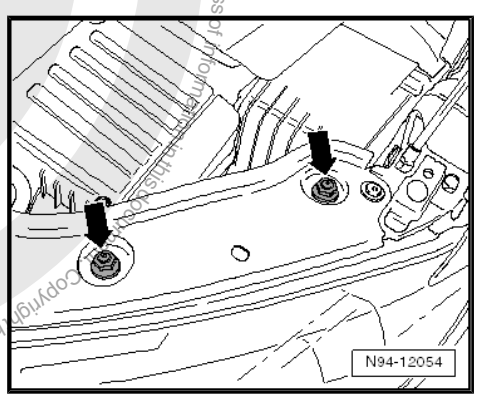


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– Loosen securing bolt -arrow-, do not unscrew completely.



– Remove securing bolts -arrows-.



– Pull headlight out of body opening in a straight line towards the front.

Installing:

Install in the reverse order of removal. When doing this, note the following:

– Tighten all securing bolts and nuts to specified torques given in assembly overview ⇒ page 161 .

– Check installation position of headlight so that shut lines/gaps around headlight are even.

If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted ⇒ page 176 .

– Check functions of headlight.

Note

If a headlight is removed or adjusted to fit more accurately to the vehicle body, it must be aligned following such measures ⇒ page 174 .

1.2.4 Removing and installing headlights, headlights with gas discharge lamps and cornering light

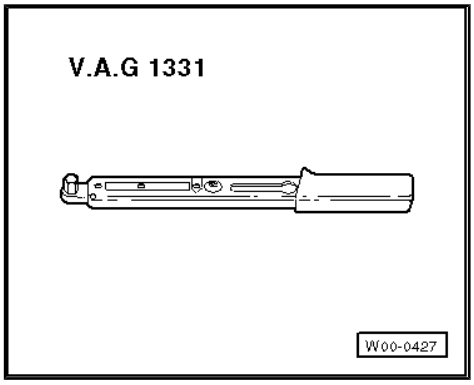
WARNING

Risk of death due to high voltage! Risk of injury and environmental pollution!

- ***High voltage is supplied to the gas discharge bulbs. If they are not handled properly they can cause serious or fatal injuries.***
- ***If work on high-voltage components is to be performed after a headlight has been removed (e.g change gas discharge bulb), the battery earth strap must be disconnected and the residual voltage in the headlight must be discharged before the headlight is removed.***
- ***Observe operation and safety notes for gas discharge bulbs ⇒ Electrical System, General Information; Rep. gr. 94 ; Operation and safety notes for gas discharge bulbs .***

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



Note

- *Illustrations show removal and installation of the left headlight. Removal and installation of the right headlight are carried out in the same way.*
- *If a headlight is removed, the alignment should always be checked following installation* ⇒ page 174 .

Removing:

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

Caution

Risk of damage to component.

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

– Using commercially available adhesive tape, mask off any potential contact areas between bumper cover, wing and headlight to avoid any scratches when removing and installing the headlight.

– Unscrew bolts -2-.

– Unscrew bolts -3- of wheel housing (facing upwards) on the respective side.

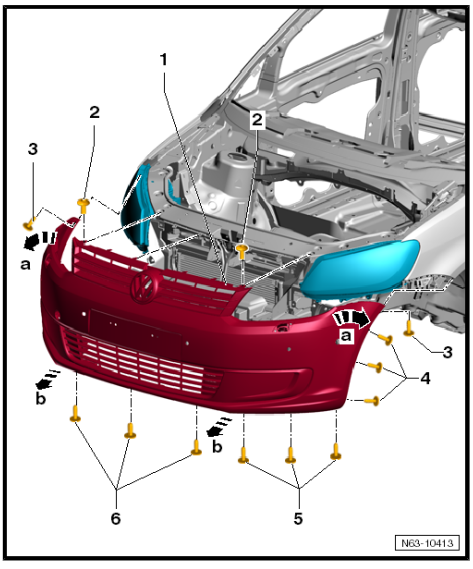
– Unscrew bolts -4- and -5- of wheel housing on the respective side.

– Unscrew bolts -6- from below.

– Release catches at top of radiator grille from lock carrier.

Further removal is only possible with a second mechanic.

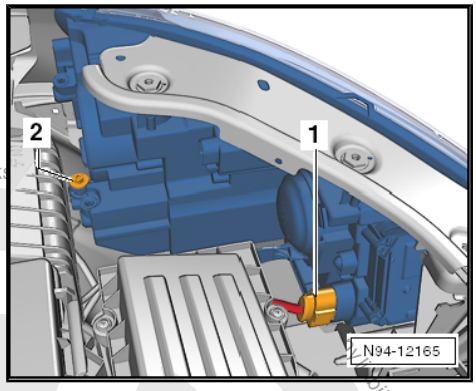
– Pull front bumper cover -1- on the respective side out of catches of guides on wing -arrows a- until all securing bolts for the headlight are accessible and the headlight can be pulled out of the assembly aperture.



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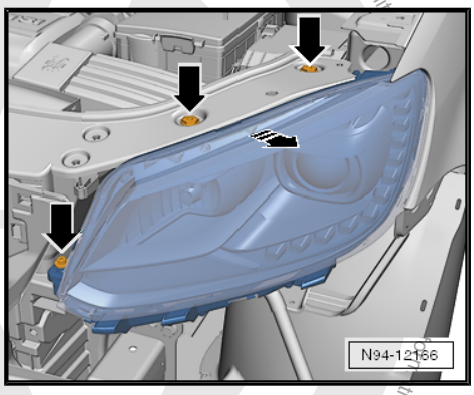
– Release and disconnect connector -1-.

– Loosen, but do not unscrew completely, securing bolt -2- at rear of headlight.



– Remove three securing bolts -arrows-.

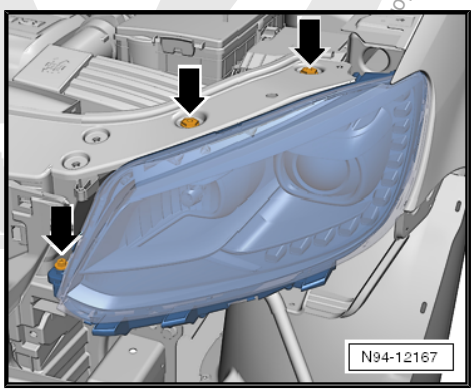
– Remove headlight forwards out of body aperture.



Installing:

Installation is carried out in the reverse order. When installing observe the following:

– First tighten bolts -arrows- to specified torque ⇒ page 162 .

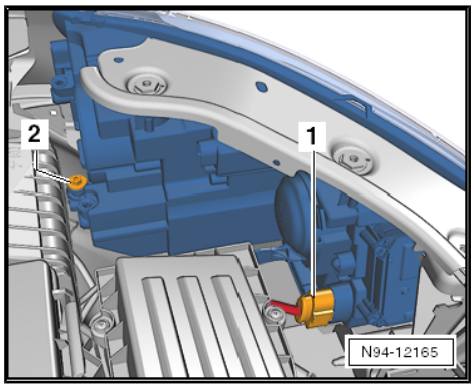


– Tighten bolt -2- at rear of headlight to specified torque ⇒ page 162 .

– Check installation position so that shut lines/gaps around headlight are even.

If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted ⇒ page 176 .

– Check functions of headlight.



Note

If a headlight is removed or adjusted to fit more accurately to the vehicle body, it must be aligned following such measures ⇒ page 174 .

1.3 Adjusting headlights

– Adjusting headlight in “Maintenance manual”: ⇒ Maintenance ; Booklet ; Descriptions of work .

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1.4 Adjusting headlight installation position

⇒ “1.4.1 Adjusting headlight installation position, headlight with H7 bulb, vehicles up to model year 2010”, page 175

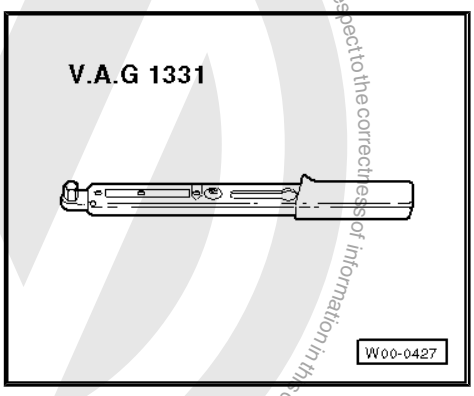
⇒ “1.4.2 Adjusting headlight installation position, headlight with bulbs H4 and H7, vehicles as of model year 2011”, page 176

⇒ “1.4.3 Adjusting installation position of headlights, headlights with gas discharge lamps and cornering lights”, page 178

1.4.1 Adjusting headlight installation position, headlight with H7 bulb, vehicles up to model year 2010

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



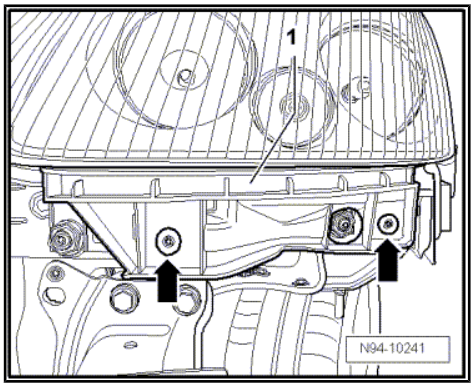
Note

If the shut lines/gaps around the headlight are uneven after installation, the installation position must be adjusted.

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

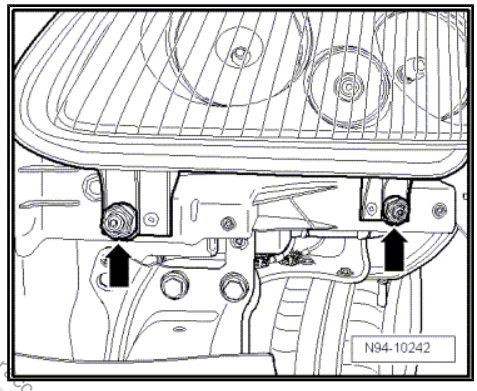
– Loosen and release the bolts and retaining hooks on the relevant side and pull bumper off bumper guide until all securing bolts are accessible ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, up to 2011 .

– Unscrew securing bolts -arrows- and remove guide -1-.

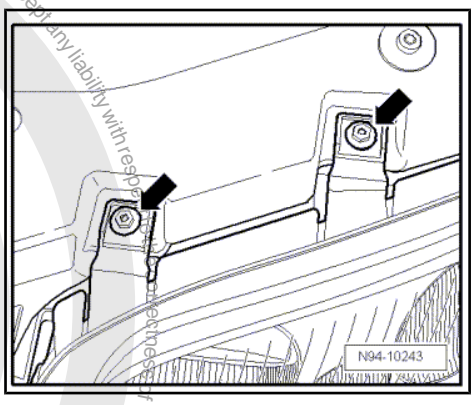


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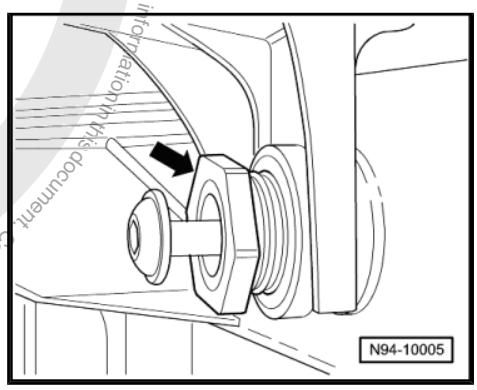
– Loosen -arrows- at bottom of headlight.



– Loosen bolts -arrows- at top of headlight.



– Adjust shut lines/flushness to body by pushing in or pulling out alignment bush -arrow-.
– Tighten all securing bolts and nuts to specified torques given in assembly overview ⇒ page 158 .
– Check headlight installation position to ensure gaps are even; correct if necessary.
– Fit bumper cover in reverse sequence.
– Check functions of headlight.



Note

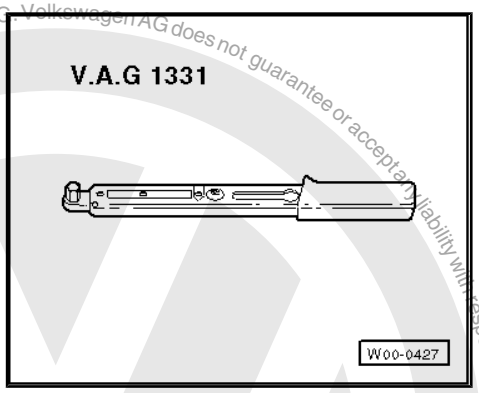
If a headlight is removed or adjusted to fit more accurately to the vehicle body, it must be aligned following such measures *⇒ page 174* .

1.4.2 Adjusting headlight installation position, headlight with bulbs H4 and H7, vehicles as of model year 2011

Special tools and workshop equipment required

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♦ Torque wrench - V.A.G 1331-

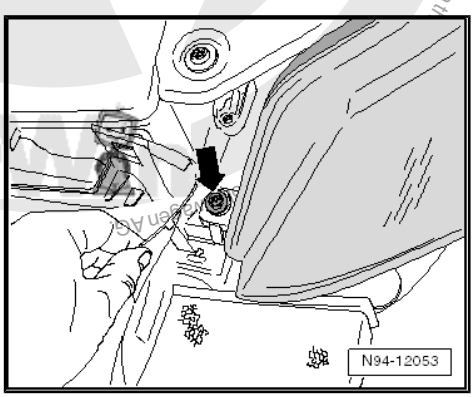


Note

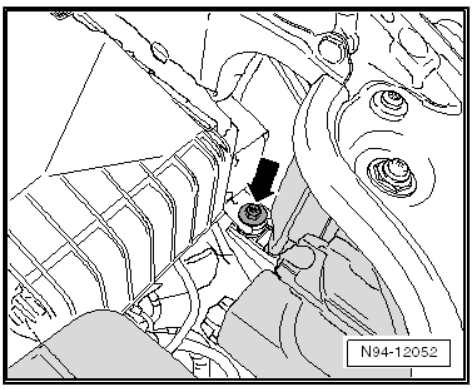
If the shut lines/gaps around the headlight are uneven after installation, the installation position must be adjusted.

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

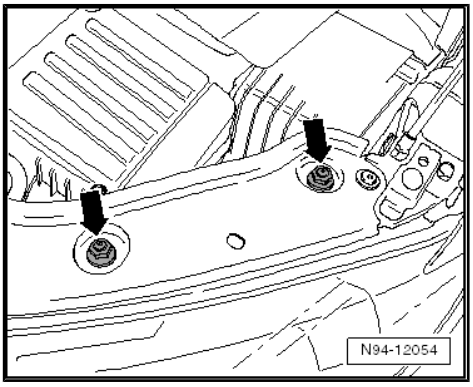
– Loosen securing bolt -arrow-.



– Loosen securing bolt -arrow-.

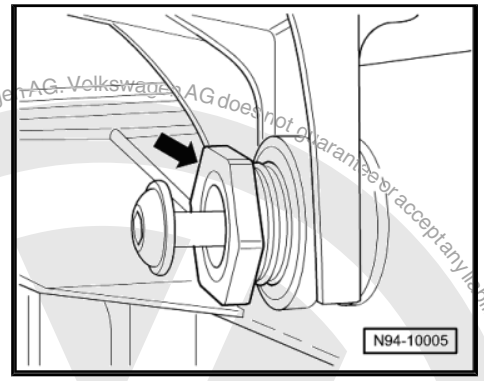


– Remove securing bolts -arrows-.



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– Adjust shut lines/flushness to body by pushing in or pulling out alignment bush -arrow- on headlight.
– Tighten threaded connections to specified torques given in assembly overviews ⇒ page 160 or ⇒ page 161 .
– Check headlight installation position to ensure gaps are even; correct if necessary.
– Check functions of headlight.



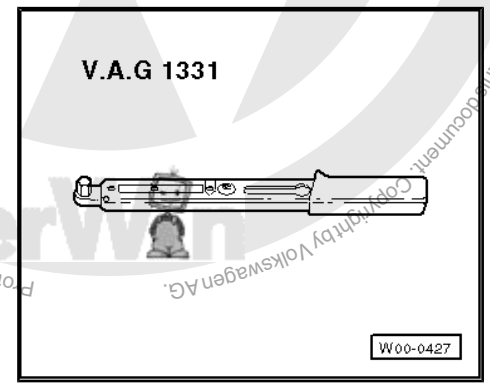
Note

If a headlight is removed or adjusted to fit more accurately to the vehicle body, it must be aligned following such measures ⇒ page 174 .

1.4.3 Adjusting installation position of headlights, headlights with gas discharge lamps and cornering lights

Special tools and workshop equipment required

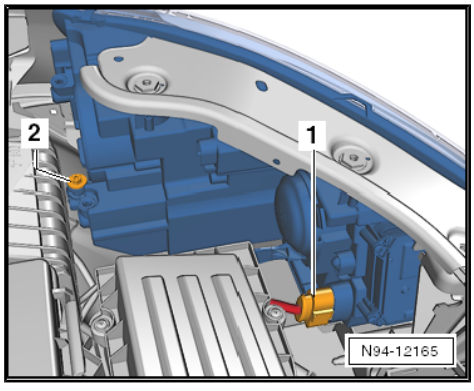
♦ Torque wrench - V.A.G 1331-



Note

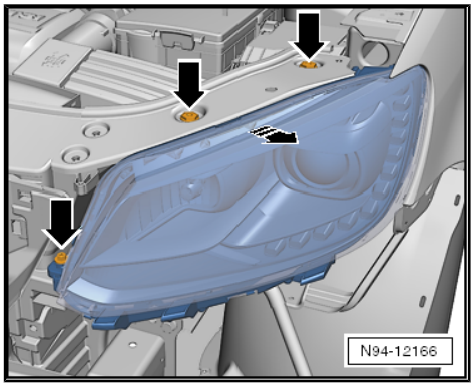
♦ *If the shut lines/gaps around the headlight are uneven after installation, the installation position must be adjusted.*
♦ *The diagrams show the adjustment of the installation position for the left headlight. The adjustment of the right headlight follows the same principle.*

– Switch off ignition and all electrical loads, and pull out ignition key.
– Loosen, but do not unscrew completely, securing bolt -2- at rear of headlight.

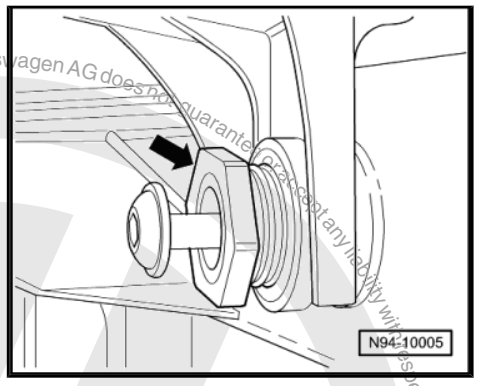


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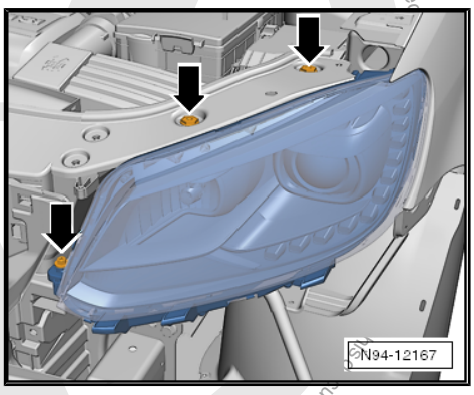
– Remove three securing bolts -arrows-.



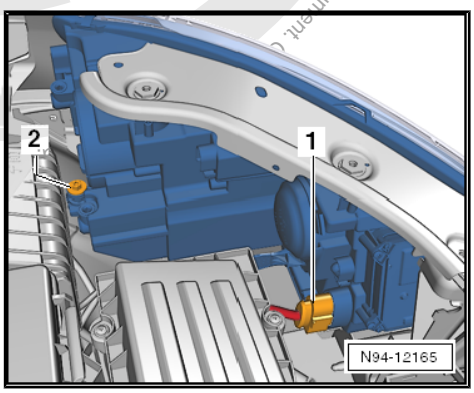
– Adjust shut lines/flushness to body by pushing in or pulling out alignment bush -arrow-.



– Tighten the three bolts -arrows- to specified torque ⇒ page 162 .



– Tighten bolt -2- at rear of headlight to specified torque ⇒ page 162 .
– Check headlight to ensure gaps are even all round and readjust again if necessary.
– Check functions of headlight.
– Check headlight setting and adjust headlight as necessary ⇒ page 174 .



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

⇒ “1.5.1 Removing and installing front turn signal bulb M5 / M7 , headlights with H7 bulb, vehicles up to model year 2010”, page 180

⇒ “1.5.2 Removing and installing front turn signal bulb M5 / M7 , headlights with H4 bulb, vehicles as of model year 2011”, page 181

⇒ “1.5.3 Removing and installing front turn signal bulb M5 / M7 , headlights with H7 bulb, vehicles as of model year 2011”, page 183

⇒ “1.5.4 Removing and installing front turn signal bulb M5 / M7 , headlights with gas discharge lamps and cornering lights”, page 184

1.5.1 Removing and installing front turn signal bulb -M5- / -M7- , headlights with H7 bulb, vehicles up to model year 2010

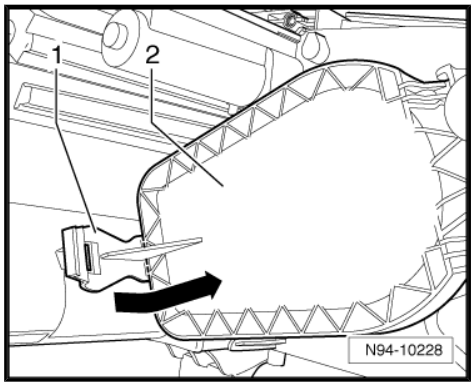
Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the front left turn signal bulb -M5- .*
- *The renewal of the front right turn signal bulb - M7- is carried out in the same way.*

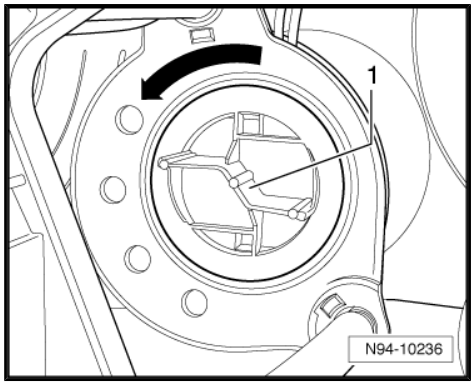
Removing:

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

– Release catch -1- in -direction of arrow- and remove cap -2-.

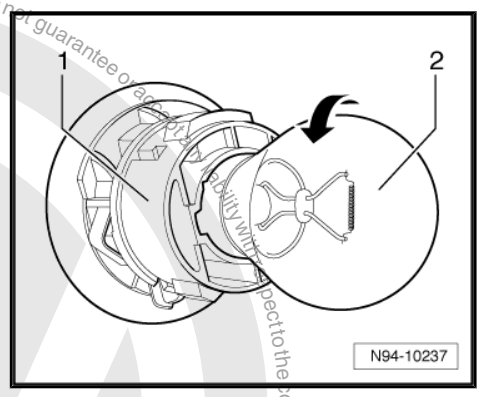


– Turn bulb holder of front turn signal bulb at grip -1- in -direction of arrow- and remove bulb holder from headlight.



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– Push front turn signal bulb -2- into bulb holder -1- and turn it in -direction of arrow-.
– Pull front turn signal bulb -2- out of bulb holder -1-.



Front turn signal bulb : 12V, PY 21W

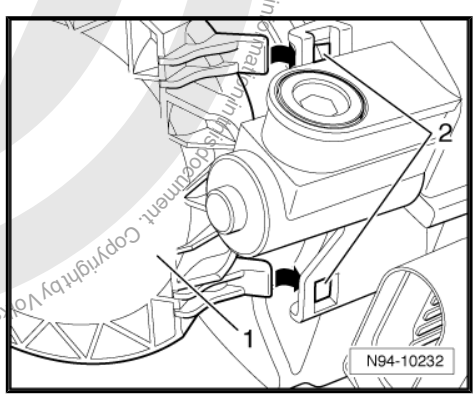
Installing:

Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

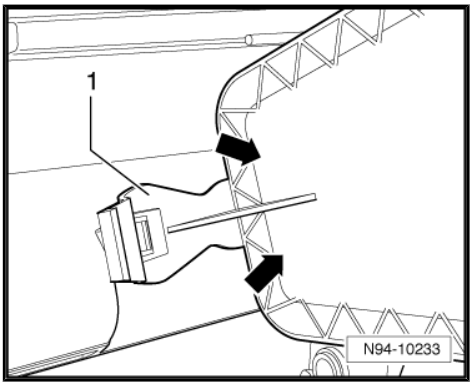
Do not touch bulb glass when installing a bulb. Fingers leave traces of grease on the glass, which evaporate when the bulb is switched on and cause the glass to cloud over.

– Insert cover cap -1- in -direction of arrow- in recesses -2- of headlight.



Note

When engaging cap, do not press against retaining lug -1- as this can break off.



– Apply pressure on cover cap -arrows- until it is heard to engage.
– Check function of headlight.
– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

1.5.2 Removing and installing front turn signal bulb -M5- / -M7- , headlights with H4 bulb, vehicles as of model year 2011

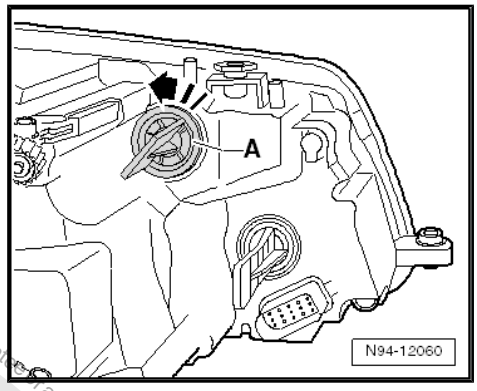
Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the front left turn signal bulb -M5- .*
- *The renewal of the front right turn signal bulb - M7- is carried out in the same way.*

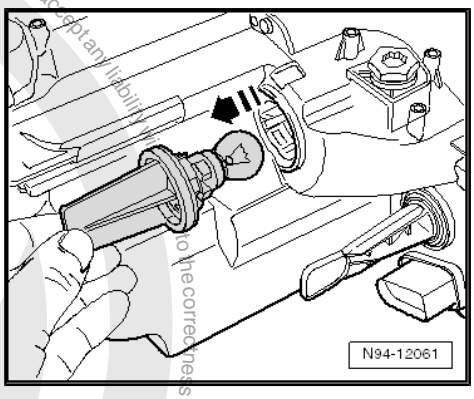
Removing:

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

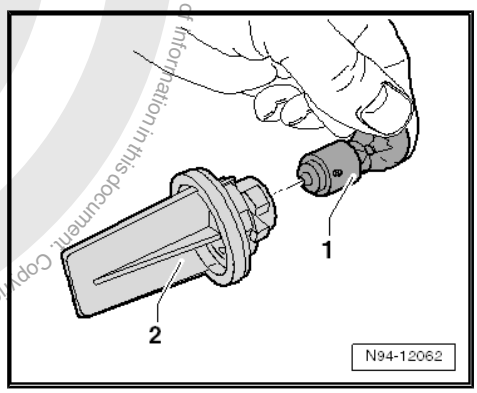
– Turn grip element -A- in -direction of arrow-.



– Remove grip together with bulb from headlight housing in -direction of arrow-.



– Press bulb -1- into grip -2-, turn it to left and pull it out in a straight line.



Front turn signal bulb : 12V, PY 21W

Installing:

Caution

Make sure seal is correctly seated when grip element is installed. The ingress of water will lead to permanent damage to the headlight.

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

– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

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1.5.3 Removing and installing front turn signal bulb -M5- / -M7- , headlights with H7 bulb, vehicles as of model year 2011

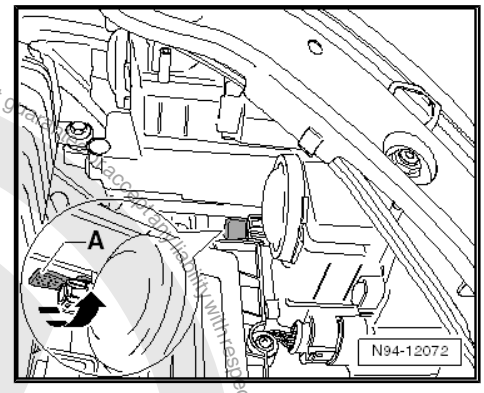
Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the front left turn signal bulb -M5- .*
- *The renewal of the front right turn signal bulb - M7- is carried out in the same way.*

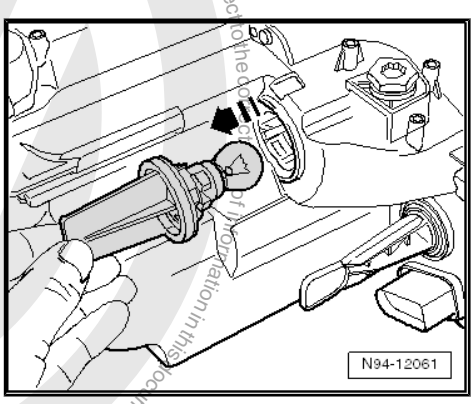
Removing:

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

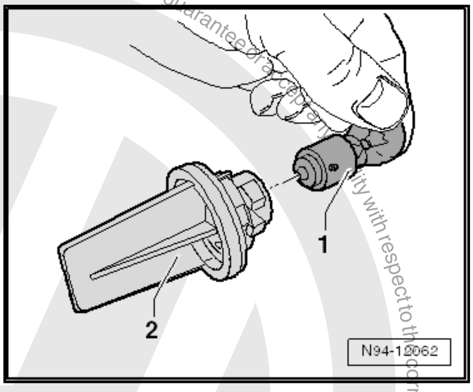
– Turn grip element -A- in -direction of arrow-.



– Remove grip together with bulb from headlight housing in -direction of arrow-.



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– Press bulb -1- into grip -2-, turn it to left and pull it out in a straight line.

Front turn signal bulb : 12V, PY 21W

Installing:

> **Caution**
>
> *Make sure seal is correctly seated when grip element is installed. The ingress of water will lead to permanent damage to the headlight.*
>
> *Do not touch bulb glass when installing a bulb. Fingers leave traces of grease on the glass, which evaporate when the bulb is switched on and cause the glass to cloud over.*

– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

1.5.4 Removing and installing front turn signal bulb -M5- / -M7- , headlights with gas discharge lamps and cornering lights

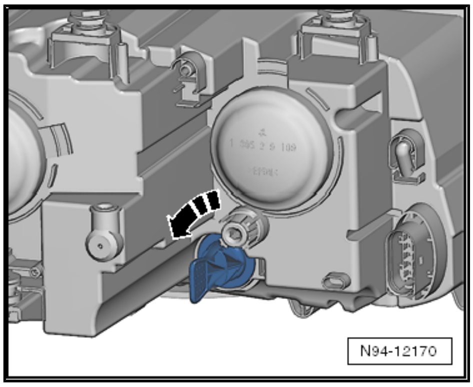
Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the front left turn signal bulb - M5- .*
- *The renewal of the front right turn signal bulb - M7- is carried out in the same way.*

Removing:

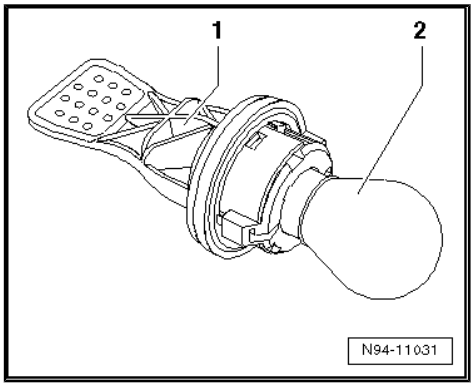
– Switch off ignition and all electrical consumers, and remove ignition key.

– Turn bulb holder together with front turn signal bulb in -direction of arrow- and remove from headlight.



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– Push front turn signal bulb -2- into grip -1-, turn it towards left and pull it out straight.



Front turn signal bulb : 12V, PY 21W

Installing:

Installation is carried out in the reverse order. When installing observe the following:

Caution

Make sure seal is correctly seated when grip element is installed. The ingress of water will lead to permanent damage to the headlight.

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

– Check functions of headlight.

1.6 Removing and installing bulb for daytime running light and side light

⇒ "1.6.1 Removing and installing bulb for daytime running light and side light, headlights with H4 bulb, vehicles as of model year 2011", page 185

1.6.1 Removing and installing bulb for daytime running light and side light, headlights with H4 bulb, vehicles as of model year 2011

Note

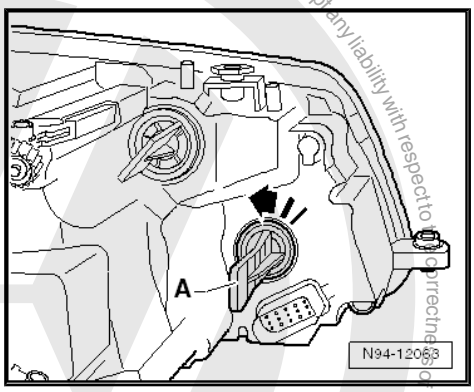
- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The side light bulb also functions as the daytime running light.*
- *The illustrations show the renewal of the left side light bulb - M1- / left daytime running light bulb - L174- .*
- *The renewal of the right side light bulb - M3- / right daytime running light bulb - L175- is carried out in the same way.*

Removing:

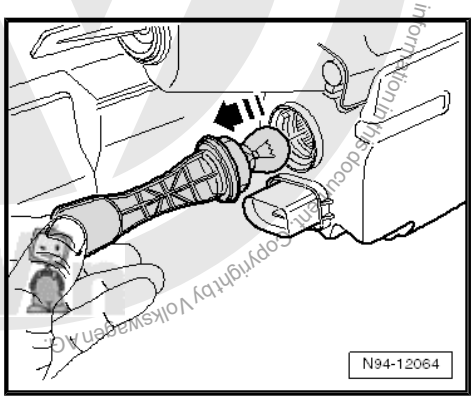
– Switch off ignition and all electrical loads, and pull out ignition key.

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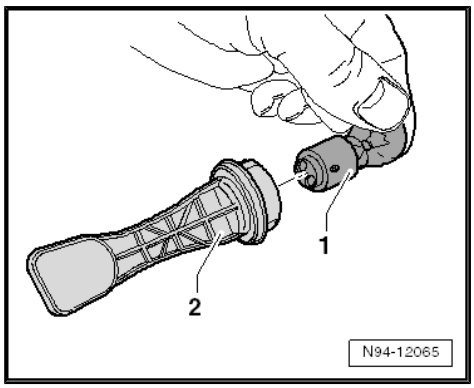
– Turn grip element -A- in -direction of arrow-.



– Remove grip together with bulb from headlight housing in -direction of arrow-.



– Press bulb -1- into grip -2-, turn it to left and pull it out in a straight line.



Side light bulb / daytime running light bulb : 12 V, 21/5 W

Installing:

Caution

Make sure seal is correctly seated when grip element is installed. The ingress of water will lead to permanent damage to the headlight.

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

– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

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1.7 Removing and installing daytime running light and main beam bulb

⇒ "1.7.1 Removing and installing daytime running light and main beam bulb, headlights with H7 bulb, vehicles as of model year 2011", page 187

1.7.1 Removing and installing daytime running light and main beam bulb, headlights with H7 bulb, vehicles as of model year 2011

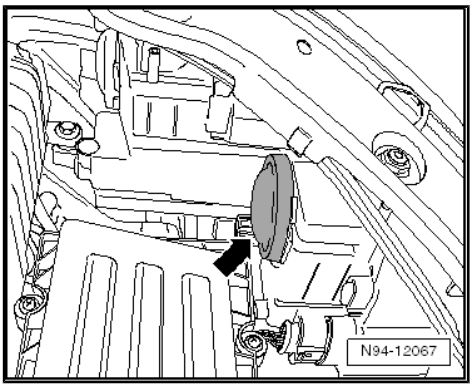
Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The main beam bulb also functions as the daytime running light.*
- *The illustrations show the renewal of the left headlight main beam bulb - M30- / left daytime running light bulb - L174-.*
- *The renewal of the right headlight main beam bulb - M32- / right daytime running light bulb - L175- is carried out in the same way.*

Removing:

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

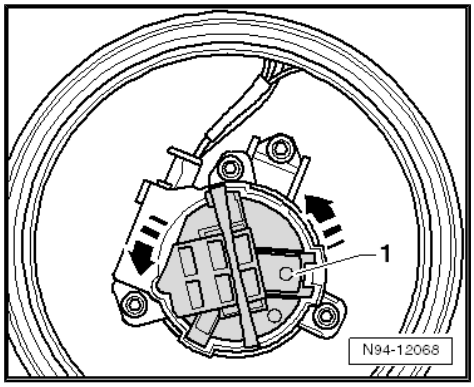
– Remove protective cap -arrow-.



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– Unscrew bulb holder -1- in -direction of arrow-.

– Remove bulb from reflector.



Headlight main beam bulb / daytime running light bulb : 12 V, 15/55 W

Installing:

– After inserting bulb into reflector, turn it clockwise as far as stop. This ensures proper engagement of the bulb as well as a proper electrical connection.

Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

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

– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

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

⇒ “1.8.1 Removing and installing side light bulb M1 / M3 , headlights with H7 bulb, vehicles up to model year 2010”, page 188

⇒ “1.8.2 Removing and installing side light bulb M1 / M3 , headlights with H7 bulb, vehicles as of model year 2011”, page 190

1.8.1 Removing and installing side light bulb - M1- / -M3- , headlights with H7 bulb, vehicles up to model year 2010

Note

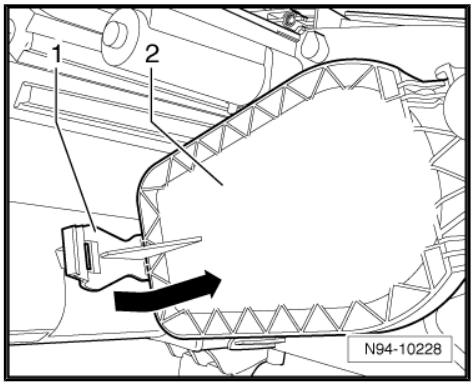
- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the left side light bulb - M1- .*
- *The renewal of the right side light bulb - M3- is carried out in the same way.*

Removing:

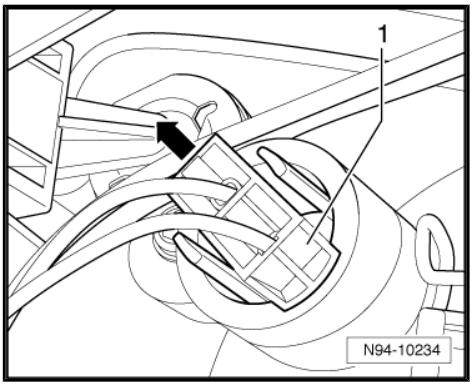
– Switch off ignition and all electrical loads, and pull out ignition key.

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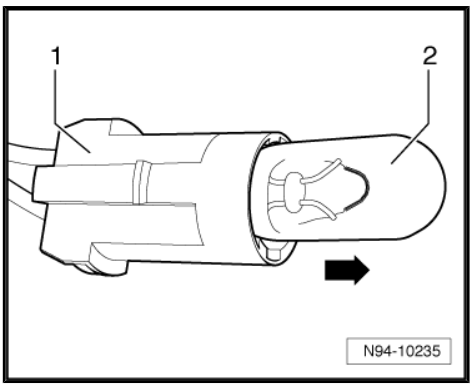
– Release catch -1- in -direction of arrow- and remove cap -2-.



– Pull bulb holder -1- with side light bulb in -direction of arrow- out of reflector.



– Pull side light bulb -2- in -direction of arrow- straight out of bulb holder -1-.



Side light bulb : 12 V, W 5 W

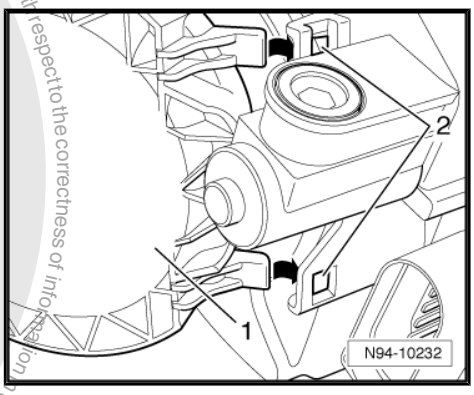
Installing:

Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

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

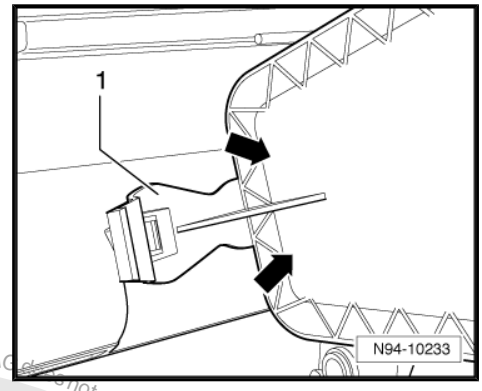
– Insert cover cap -1- in -direction of arrow- in recesses -2- of headlight.



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Note

When engaging cap, do not press against retaining lug -1- as this can break off.



- Apply pressure on cover cap -arrows- until it is heard to engage.
- Check function of headlight.
- Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

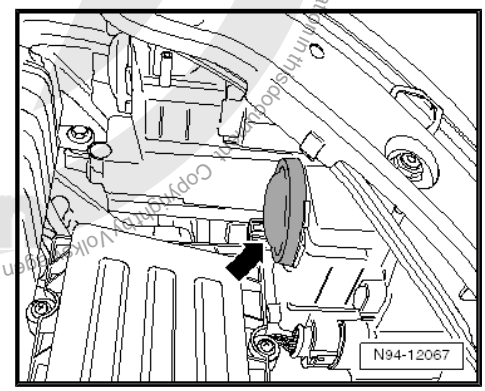
1.8.2 Removing and installing side light bulb - M1- / -M3- , headlights with H7 bulb, vehicles as of model year 2011

Note

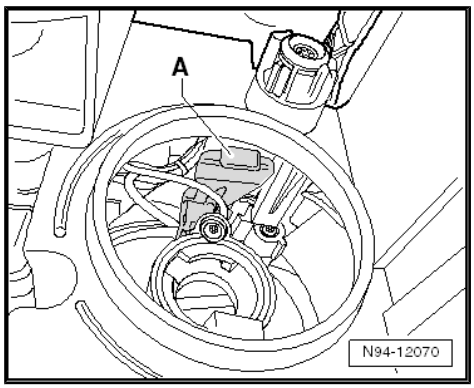
- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the left side light bulb - M1- .*
- *The renewal of the right side light bulb - M3- is carried out in the same way.*

Removing:

- Switch off ignition and all electrical loads, and pull out ignition key.
- Remove protective cap -arrow-.

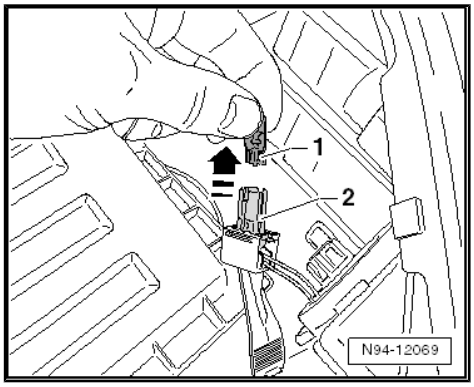


- Pull grip element -A- together with bulb holder out of reflector.



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– Pull -side light bulb- out of holder -2-.



Side light bulb : 12 V, W 5 W

Installing:

Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

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

– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

1.9 Removing and installing main beam and dipped beam bulb

⇒ "1.9.1 Removing and installing main beam and dipped beam bulb, headlights with H4 bulb, vehicles as of model year 2011", page 191

1.9.1 Removing and installing main beam and dipped beam bulb, headlights with H4 bulb, vehicles as of model year 2011

Note

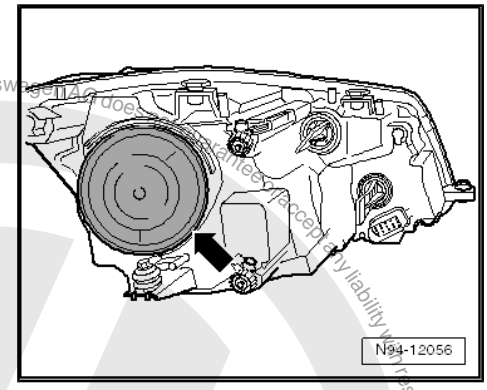
- *Removing and installing the bulbs is possible when the headlight is installed.*
- *For reasons of clarity, the headlight is shown removed in the following illustrations.*
- *The dipped beam bulb also functions as the main beam.*
- *The illustrations show the renewal of the left headlight dipped beam bulb - M29- / left headlight main beam bulb - M30- .*
- *The renewal of the right headlight dipped beam bulb - M31- / right headlight main beam bulb - M32- is carried out in the same way.*

Removing:

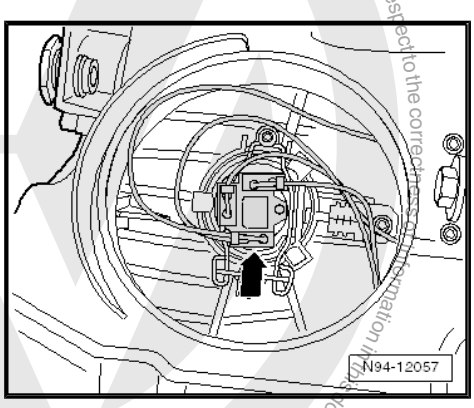
– Switch off ignition and all electrical loads, and pull out ignition key.

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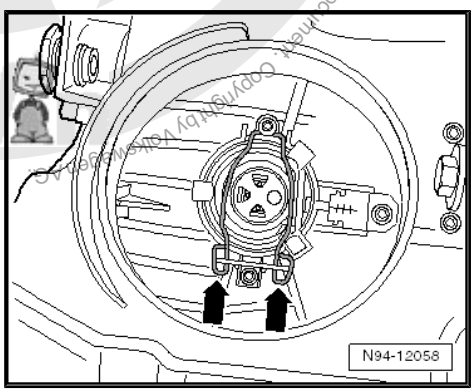
– Remove protective cap -arrow-.



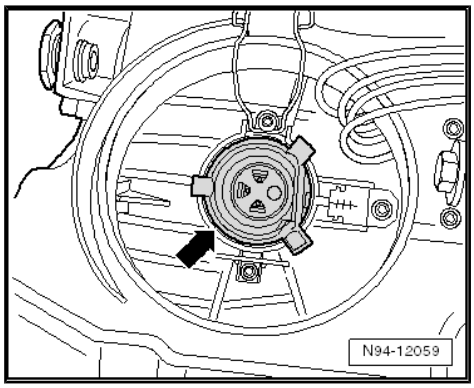
– Release and disconnect connector on bulb -arrow-.



– Remove securing bolts -arrows- and fold back.



– Remove bulb -arrow-.



Headlight dipped beam bulb / headlight dipped beam bulb : H4, 12 V, 60/55 W

Installing:

Caution

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

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

– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

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

⇒ "1.10.1 Removing and installing dipped beam bulb M29 / M31 , headlights with H7 bulb, vehicles up to model year 2010", page 193

⇒ "1.10.2 Removing and installing dipped beam bulb M29 / M31 , headlights with H7 bulb, vehicles as of model year 2011", page 195

1.10.1 Removing and installing dipped beam bulb -M29- / -M31- , headlights with H7 bulb, vehicles up to model year 2010

Note

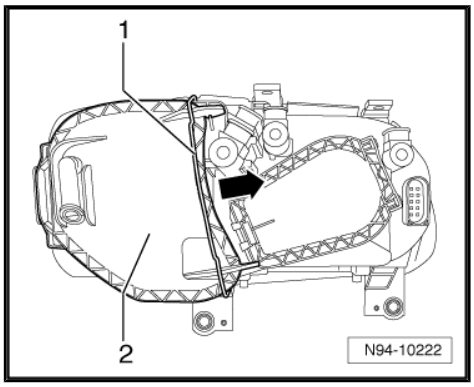
- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the left headlight dipped beam bulb - M29- .*
- *The renewal of the right headlight dipped beam bulb - M31- is carried out in the same way.*

Removing:

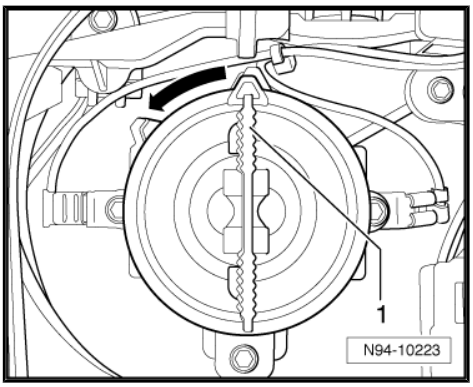
– Switch off ignition and all electrical loads, and pull out ignition key.

– Push wire shackle to one side -1- in -direction of arrow-.

– Take cover cap -2- out through recesses in side of headlight.

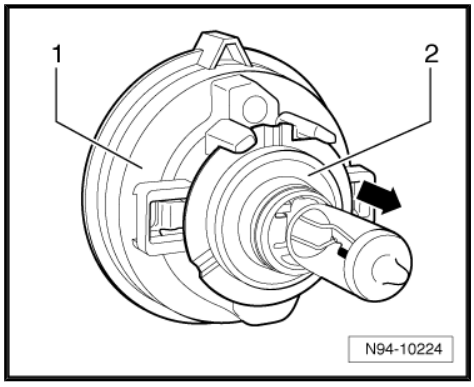


– Turn bulb holder by grip element -1- in -direction of arrow- and remove from headlight.



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– Pull dipped beam bulb -2- in -direction of arrow- straight out of bulb holder -1-.



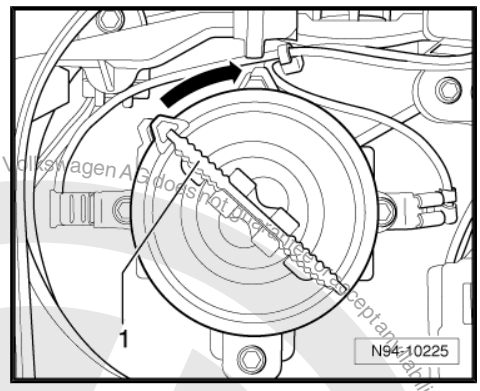
Headlight dipped beam bulb : H7U, 12V, 55W

Installing:

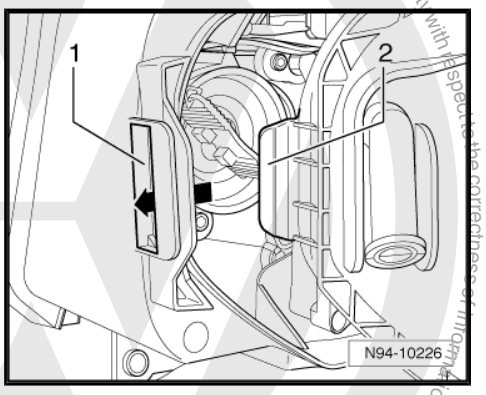
> **Caution**
>
> ***When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.***
>
> ***Do not touch bulb glass when installing a bulb. Fingers leave traces of grease on the glass, which evaporate when the bulb is switched on and cause the glass to cloud over.***

Fit dipped beam bulb into bulb holder.

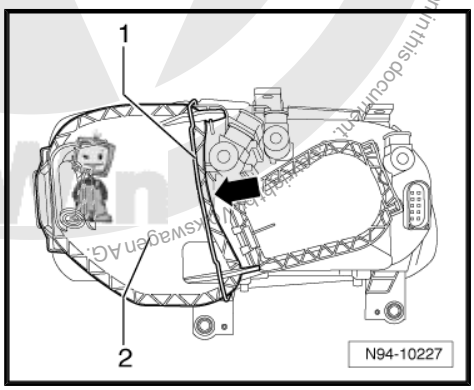
– Place bulb holder with dipped beam bulb in headlight and turn bulb holder by grip element -1- in -direction of arrow-.



– Put cap -2- into recess -1- of headlight and push fully into position.



– Lock cap -2- in place by closed the wire shackle -1- in -direction of arrow-.



– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

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1.10.2 Removing and installing dipped beam bulb -M29- / -M31- , headlights with H7 bulb, vehicles as of model year 2011

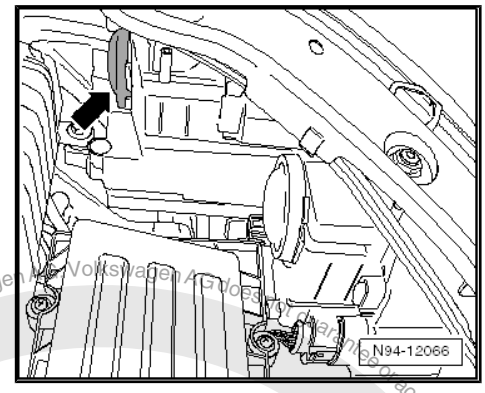
Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The diagrams show renewal of the left headlight dipped beam bulb - M29- .*
- *The renewal of the right headlight dipped beam bulb - M31- is carried out in the same way.*

Removing:

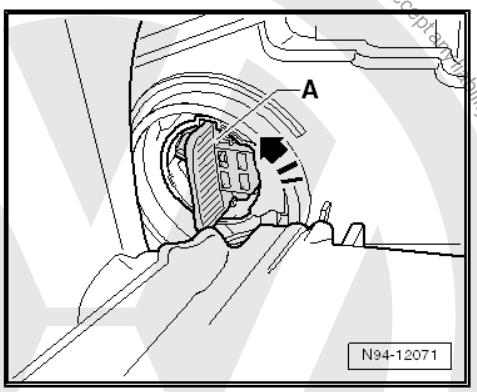
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove protective cap -arrow-.



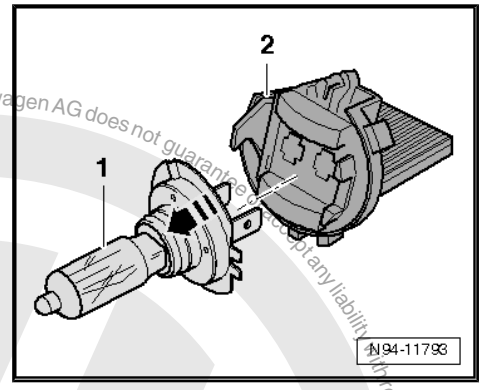
– Turn grip element -A- in -direction of arrow-.

– Remove holder together with dipped beam bulb from headlight.



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



Headlight dipped beam bulb : H7, 12 V, 55 W

Installing:

Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

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

– Check function of headlight.

– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

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

⇒ “1.11.1 Removing and installing main beam bulb M30 / M32 , headlights with H7 bulb, vehicles up to model year 2010”, page 196

1.11.1 Removing and installing main beam bulb -M30- / -M32-, headlights with H7 bulb, vehicles up to model year 2010

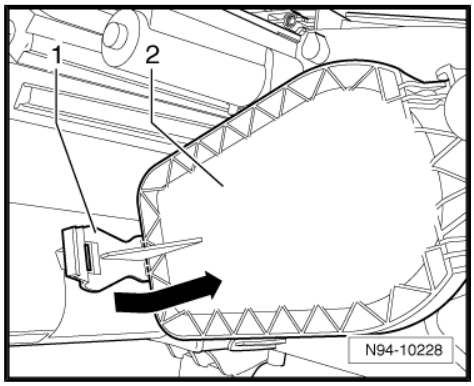
Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The illustrations show the renewal of the left headlight main beam bulb - M30- .*
- *The renewal of the right headlight main beam bulb - M32- is carried out in the same way.*

Removing:

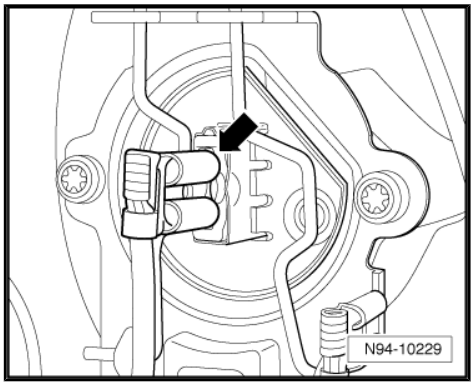
– Switch off ignition and all electrical loads, and pull out ignition key.

– Release catch -1- in -direction of arrow- and remove cap -2-.

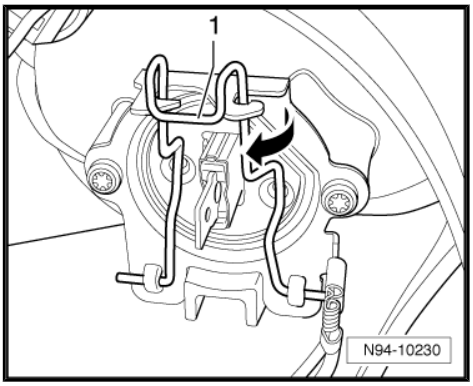


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– Pull off connector -arrow-.



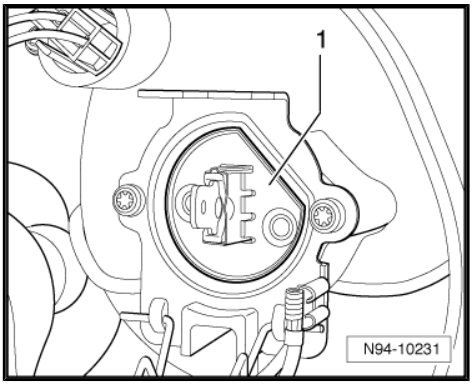
– Press spring-type wire shackle -1- and release spring-type wire shackle -direction of arrow-.



– Take main beam headlight bulb -1- out of bulb holder.

Headlight main beam bulb : H1, 12 V, 55 W

Installing:

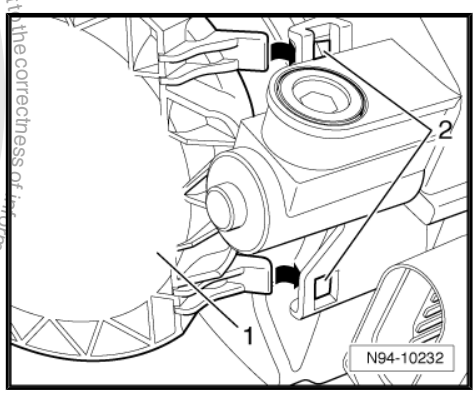


Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

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

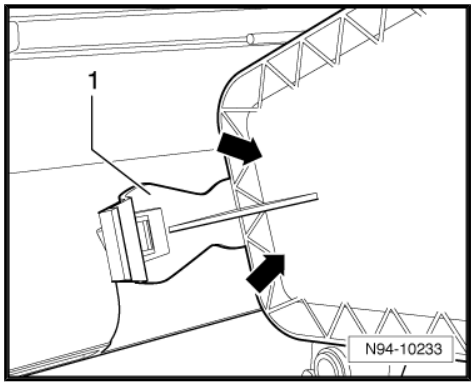
– Insert cover cap -1- in -direction of arrow- in recesses -2- of headlight.



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Note

When engaging cap, do not press against retaining lug -1- as this can break off.



- Apply pressure on cover cap -arrows- until it is heard to engage.
- Check function of headlight.
- Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

1.12 Removing and installing bulb for static cornering light - M51/M52-

⇒ "1.12.1 Removing and installing bulb for static cornering light M51/M52 , headlights with gas discharge lamps and cornering lights", page 198

1.12.1 Removing and installing bulb for static cornering light - M51/M52- , headlights with gas discharge lamps and cornering lights

The static cornering light integrated in the headlight is automatically switched on when the turn signal lever is operated and the vehicle turns and when turning into tight bends. The static cornering light only functions at speeds lower than 40 km/h when the dipped beam is switched on.

Note

- *Removing and installing the bulbs is possible when the headlight is installed.*
- *The illustrations show the bulb replacement for the left static cornering light - M51- .*
- *Bulb replacement for the right static cornering light - M52- is carried out in the same way.*
- *For reasons of clarity, the headlight is shown removed in the following illustrations. There is no requirement to remove the headlight to replace the cornering light bulb .*

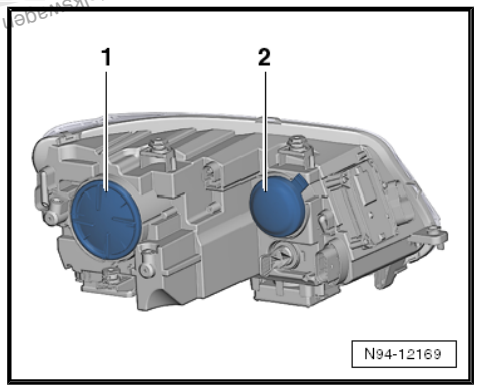
Removing:

- Switch off ignition and all electrical loads, and pull out ignition key.
- Pull cover -2- off.

Note

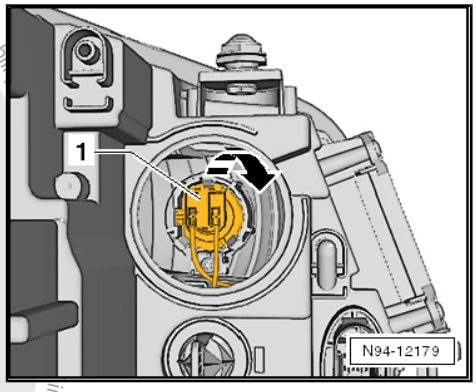
- *Cornering light bulb -1- is clipped into reflector.*
- *Initially, the connector is not disconnected when removing the cornering light bulb .*

- Push connector -1- with bulb holder in -direction of arrow- until bulb feels loose.

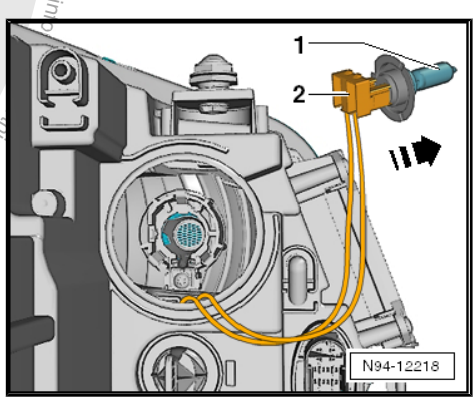


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– Grasp on connector and pull cornering light bulb out of reflector as far as wiring allows.



– Pull cornering light bulb -1- in -direction of arrow- straight off connector -2-.



Bulb for cornering light : H7 12 V, 55 W

Installing:

Installation is carried out in the reverse order. When installing observe the following:

Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

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

– Guide cornering light bulb into headlight housing.
– Push cornering light bulb into reflector.
– Cornering light bulb must engage audibly.
– Check functions of headlight.
– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .

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1.13 Removing and installing gas discharge lamp -L13- / -L14-

⇒ "1.13.1 Removing and installing gas discharge lamp L13 / L14 , headlights with gas discharge lamps and cornering lights", page 200

1.13.1 Removing and installing gas discharge lamp -L13- / -L14- , headlights with gas discharge lamps and cornering lights

WARNING

Risk of death due to high voltage! Risk of injury and environmental pollution!

- *High voltage is supplied to the gas discharge bulbs. If they are not handled properly they can cause serious or fatal injuries.*
- *If work on high-voltage components is to be performed after a headlight has been removed (e.g change gas discharge bulb), the battery earth strap must be disconnected and the residual voltage in the headlight must be discharged before the headlight is removed.*
- *Observe operation and safety notes for gas discharge lamps ⇒ Electrical System, General Information; Rep. gr. 94 ; Operation and safety notes for gas discharge lamps .*

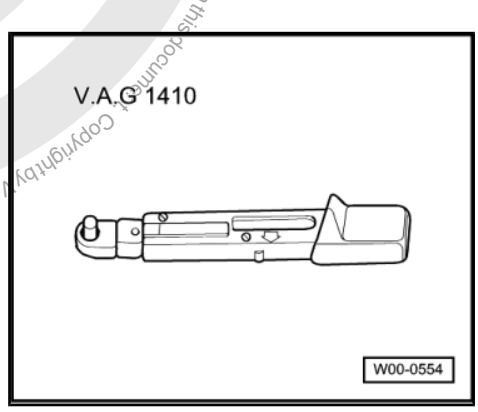
Note

- *The illustrations show the renewal of the left gas discharge lamp - L13-.*
- *Renewal of the right gas discharge lamp - L14- is analogous.*
- *Left gas discharge lamp - L13- and right gas discharge lamp - L14- can be checked by the final control diagnosis for the onboard supply control unit - J519- ⇒ page 386 .*

Removing:

Special tools and workshop equipment required

- Torque wrench - V.A.G 1410-

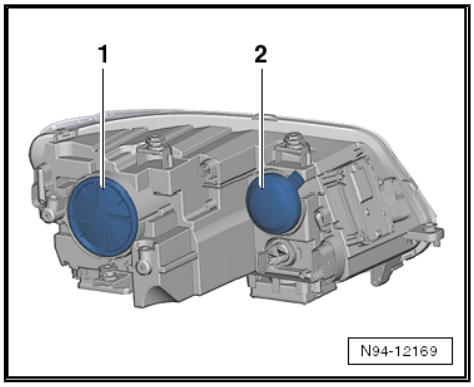


– Switch off ignition and all electrical loads, and pull out ignition key.

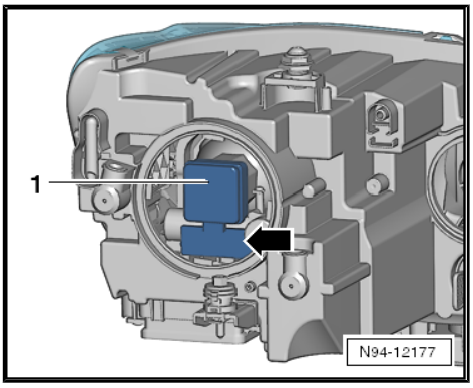
– Headlights with gas discharge lamps and cornering lights ⇒ page 172

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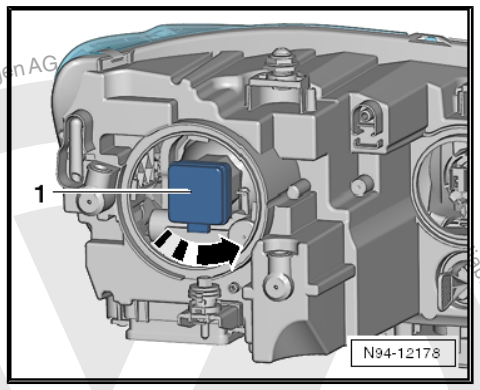
– Turn cover cap -1- anti-clockwise and remove it.



– Pull connector -arrow- downwards off gas discharge lamp starter unit - N195- -1-.



– Turn gas discharge lamp starter unit - N195- -1- in -direction of arrow- and carefully remove it from reflector together with gas discharge lamp .



Gas discharge lamp -L13- / -L14- : D3S, 42V/35W

Installing:

Installation is carried out in the reverse order. When installing observe the following:

Caution

Risk of damage to the headlight.

- ***Do not touch the glass part of the bulb 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 bulbs.***
- ***Make sure the housing cover is correctly seated when installing. The ingress of water will lead to permanent damage to the headlight.***

– Check functions of headlight.

– Check headlight setting and adjust headlight as necessary ⇒ page 174 .

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

⇒ “1.14.1 Removing and installing LED modules for daytime running light and side light L176 / L177 , headlights with gas discharge lamps and cornering lights”, page 202

1.14.1 Removing and installing LED modules for daytime running light and side light - L176- / -L177- , headlights with gas discharge lamps and cornering lights

The left LED module for daytime running light and side light - L176- and the right LED module for daytime running light and side light - L177- are located inside the respective headlight. The LED module cannot be renewed individually.

In the event of damage, the headlight must be renewed ⇒ page 172 .

1.15 Removing and installing dynamic cornering light control motor -V318- / -V319-

⇒ “1.15.1 Removing and installing dynamic cornering light control motor V318 / V319 , headlights with gas discharge lamps and cornering lights”, page 202

1.15.1 Removing and installing dynamic cornering light control motor -V318- / -V319- , headlights with gas discharge lamps and cornering lights

The dynamic cornering light only functions at a speed above approx. 10 km/h when the dipped beam is switched on.

The dynamic cornering light control motors are located inside the headlights. They cannot be replaced individually.

In the event of damage, the headlight must be renewed ⇒ page 172 .

Note

If faulty, check wiring of dynamic cornering light control motor for wiring defects and/or loose connections before renewing headlight.

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1.16 Removing and installing swivel module position sensor -G475- / -G474-

⇒ “1.16.1 Removing and installing swivel module position sensor G475 / G474 , headlights with gas discharge lamps and cornering lights”, page 203

1.16.1 Removing and installing swivel module position sensor -G475- / -G474- , headlights with gas discharge lamps and cornering lights

The swivel module position sensors are located inside the headlights. The swivel module position sensors cannot be renewed or adjusted individually.

In the event of damage, the headlight must be renewed ⇒ page 172 .

1.17 Removing and installing dipped beam screen

⇒ “1.17.1 Removing and installing dipped beam screen, headlights with gas discharge lamps and cornering lights”, page 203

1.17.1 Removing and installing dipped beam screen, headlights with gas discharge lamps and cornering lights

The dipped beam screens are located inside the headlights. They screens cannot be replaced individually or adjusted.

In the event of damage, the headlight must be renewed ⇒ page 172 .

1.18 Removing and installing gas discharge lamp control unit -J343- / -J344-

⇒ “1.18.1 Removing and installing gas discharge lamp control unit J343 / J344 , headlights with gas discharge lamps and cornering lights”, page 203

1.18.1 Removing and installing gas discharge lamp control unit -J343- / -J344- , headlights with gas discharge lamps and cornering lights

WARNING

Risk of death due to high voltage! Risk of injury and environmental pollution!

- *Observe operation and safety notes for gas discharge lamps ⇒ Electrical System, General Information; Rep. gr. 94 ; Operation and safety notes for gas discharge lamps .*
- *It is essential that the battery earth cable is disconnected before any work on the components of the gas discharge headlight is performed. The components of the gas discharge headlight are marked with a yellow high-voltage symbol.*

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Note

- *The gas discharge lamp control unit is installed on the underside of the respective headlight housing.*
- *The illustrations show how to remove and install the left gas discharge lamp control unit - J343- .*
- *Removal and installation of the right gas discharge lamp control unit - J344- are analogous.*

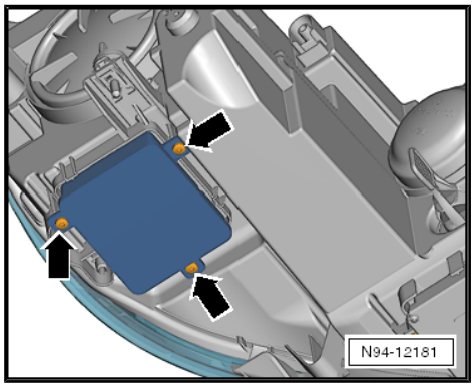
Removing:

– Switch off ignition and all electrical consumers, and remove ignition key.

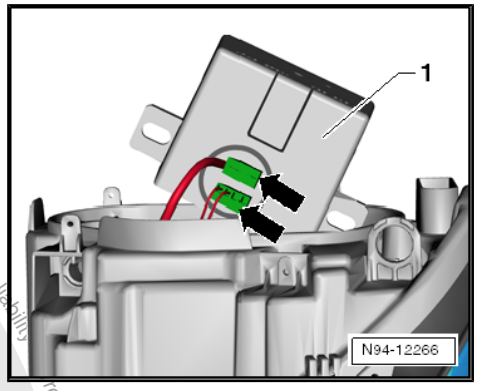
– Remove headlight ⇒ page 172 .

– Unscrew the three securing bolts -arrows-.

– Carefully pull gas discharge lamp control unit -1- straight out of headlight housing.



– Release and disconnect electrical connectors -arrows- and remove gas discharge lamp control unit -1-.



Installing:

Install in the reverse order of removal. When doing this, note the following:

Caution

Make sure seal is correctly seated when installing the gas discharge lamp control unit. The ingress of water will lead to permanent damage to the headlight.

Note

The cornering light and headlight range control unit - J745- must be recoded if a new gas discharge lamp control unit is installed ⇒ page 209 . Then subsequently perform the basic setting of headlights ⇒ Maintenance ; Booklet ; Descriptions of work .

– Tighten securing bolts to torque specified in assembly overview ⇒ page 162 .

– Check functions of headlight.

– Check headlight setting and adjust headlight if necessary ⇒ Maintenance ; Booklet ; Descriptions of work

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

⇒ "1.19.1 Removing and installing output module for headlight J667 / J668 , headlights with gas discharge lamps and cornering lights", page 205

1.19.1 Removing and installing output module for headlight -J667- / -J668- , headlights with gas discharge lamps and cornering lights

WARNING

Risk of death due to high voltage! Risk of injury and environmental pollution!

- *Observe operation and safety notes for gas discharge lamps ⇒ Electrical System, General Information; Rep. gr. 94 ; Operation and safety notes for gas discharge lamps .*
- *It is essential that the battery earth cable is disconnected before any work on the components of the gas discharge headlight is performed. The components of the gas discharge headlight are marked with a yellow high-voltage symbol.*

Note

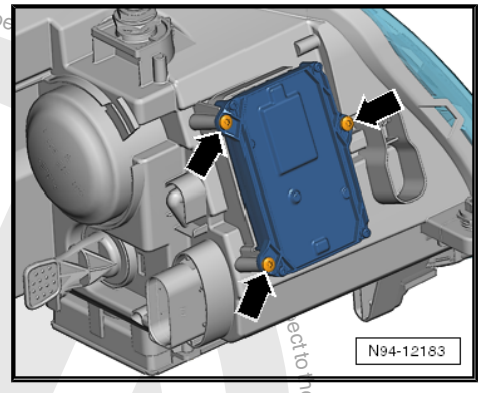
- *The output module for headlight is installed on the side of the respective headlight housing.*
- *The illustrations show how to remove and install the left output module for headlight - J667- .*
- *Removal and installation of the right output module for headlight - J668- are analogous.*

Removing:

– Remove headlight ⇒ page 172 .

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– Unscrew the three securing bolts -arrows-.



Note

When power output module for headlight is pulled off from headlight housing, electrical connectors are simultaneously disconnected.

– Pull output module for headlight straight off headlight housing.

Installing:

Installation is carried out in the reverse order. When installing observe the following:

– Check seal between output module and headlight for damage.

Caution

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

Note

The cornering light and headlight range control unit - J745- must be recoded if a new output module for headlight is installed ⇒ page 209 . Then subsequently perform the basic setting of headlights ⇒ Maintenance ; Booklet ; Descriptions of work .

– Tighten securing bolts to torque specified in assembly overview ⇒ page 162 .

– Check functions of headlight.

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

⇒ "1.20.1 Removing and installing control unit for daytime running light and side light J860 / J861 , headlights with gas discharge lamps and cornering lights", page 207

1.20.1 Removing and installing control unit for daytime running light and side light - J860- / -J861- , headlights with gas discharge lamps and cornering lights

WARNING

Risk of death due to high voltage! Risk of injury and environmental pollution!

- *Observe operation and safety notes for gas discharge lamps ⇒ Electrical System, General Information; Rep. gr. 94 ; Operation and safety notes for gas discharge lamps .*
- *It is essential that the battery earth cable is disconnected before any work on the components of the gas discharge headlight is performed. The components of the gas discharge headlight are marked with a yellow high-voltage symbol.*

Note

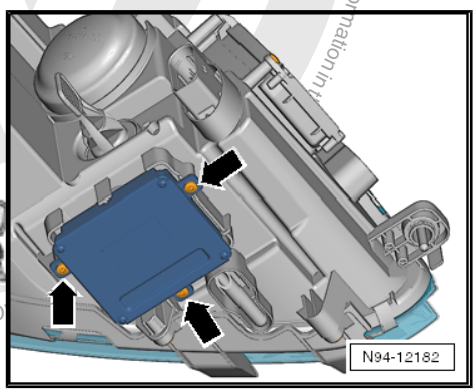
- *The control unit for daytime running light and side light is installed on the underside of the respective headlight housing.*
- *The illustrations show how to remove and install the left control unit for daytime running light and side light - J860- .*
- *Removal and installation of the right control unit for daytime running light and side light - J861- are analogous.*

Removing:

– Remove headlight ⇒ page 172 .

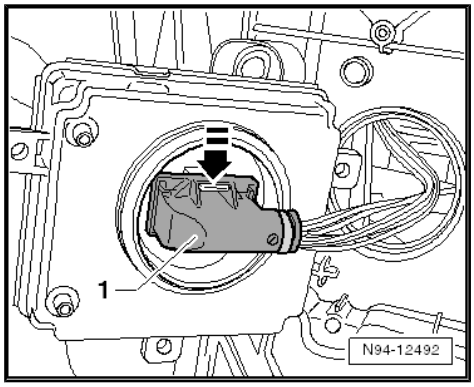
– Unscrew the three securing bolts -arrows-.

– Carefully pull control unit for daytime running light and side light straight off headlight housing.



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– Release -arrow- and disconnect connector -1-.



Installing:

Install in the reverse order of removal observing the following:

– Check seal between control unit and headlight for damage.

Caution

Make sure seal is correctly seated when installing the control unit for daytime running light and side light. The ingress of water will lead to permanent damage to the headlight.

Note

Headlight range control unit must be recoded if a new control unit for daytime running light and side light - J745- is installed ⇒ page 209 . Then perform the basic setting of headlights ⇒ Maintenance ; Booklet ; Descriptions of work .

– Tighten securing bolts to torque specified in assembly overview ⇒ page 162 .

– Check functions of headlight.

1.21 Removing and installing cornering light and headlight range control unit - J745-

⇒ "1.21.1 Removing and installing cornering light and headlight range control unit J745 , headlights with gas discharge lamps and cornering lights", page 208

1.21.1 Removing and installing cornering light and headlight range control unit - J745-, headlights with gas discharge lamps and cornering lights

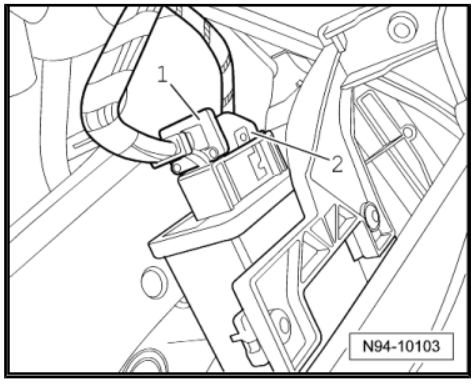
The cornering light and headlight range control unit - J745- is installed underneath the dash panel near the centre console on driver side.

Removing:

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

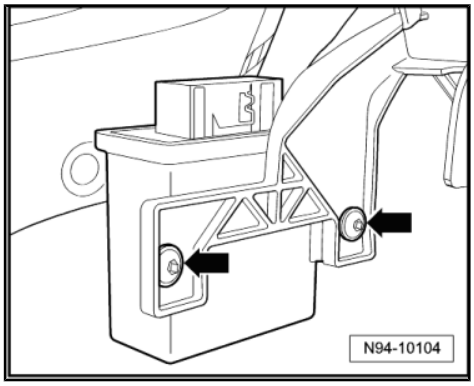
– Remove footwell trim on driver side ⇒ General body repairs, interior; Rep. gr. 69 ; Driver side footwell covers; Removing and installing footwell trim .

– Release locking bar -1- and pull connector -2- off cornering light and headlight range control unit - J745- .



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– Unscrew securing bolts -arrows- and remove cornering light and headlight range control unit - J745- from bracket.



Installing:

Installation is carried out in the reverse order. When installing observe the following:

Note

After installing a new cornering light and headlight range control unit - J745- , the control unit must be coded ⇒ page 209 .

1.22 Coding cornering light and headlight range control unit - J745-

⇒ “1.22.1 Coding cornering light and headlight range control unit J745 , headlights with gas discharge lamps and cornering lights”, page 209

1.22.1 Coding cornering light and headlight range control unit - J745- , headlights with gas discharge lamps and cornering lights

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Headlight range control -J745-
- Headlight range control functions
- Coding control unit

Note

If the cornering light and headlight range control unit - J745- has to be coded, basic setting of the headlights must be performed after coding ⇒ Maintenance ; Booklet ; Descriptions of work .

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1.23 Headlight conversion for left-hand/right-hand traffic

⇒ “1.23.1 Headlight conversion for left-hand/right-hand traffic, headlights with H7 bulb, vehicles up to model year 2010 ”, page 210

⇒ “1.23.2 Headlight conversion for left-hand/right-hand traffic, headlights with H4 bulb, vehicles as of model year 2011 ”, page 212

⇒ “1.23.3 Headlight conversion for left-hand/right-hand traffic, headlights with H7 bulb, vehicles as of model year 2011 ”, page 219

⇒ “1.23.4 Headlight conversion for left-hand/right-hand traffic, headlights with gas discharge lamps and cornering lights”, page 224

1.23.1 Headlight conversion for left-hand/right-hand traffic, headlights with H7 bulb, vehicles up to model year 2010

Note

- *To avoid dazzling oncoming traffic with asymmetrical lights, both headlights should be converted to the direction of traffic (driving on the left or right) relevant to the country in which the vehicle is being driven.*
- *Conversion of the headlights is not designed as a permanent conversion for other countries. It is only suitable as a “tourist solution” for a short stay abroad.*
- *The corresponding headlight conversion set consists of two sections of film.*
- *Please note the different part numbers for the headlight conversion sets from right to left-hand traffic and from left to right-hand traffic.*
- *The details “right” and “left” on the masking film always refer to the direction of travel when looking forwards from inside the vehicle.*
- *Conversion of the headlights from right-hand to left-hand traffic and from left-hand to right-hand traffic is carried out in the same way.*
- *Turn light switch to “0” position.*

Conversion from driving on right to driving on left:

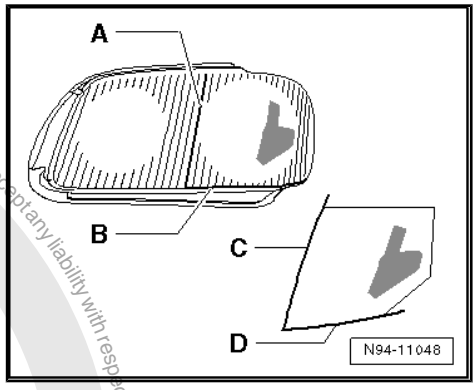
»Left headlight:«

– Clean headlight lens.

– Remove release paper from masking film.

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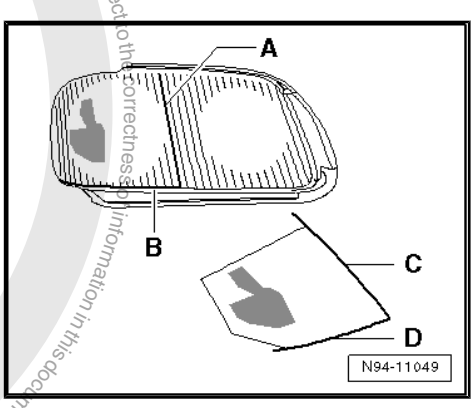
– Position contact edge -C- of application film at first continuous line -A- on headlight lens.
– Position lower edge -D- of application film at lower edge -B- of headlight lens.
– Pull application film off headlight. Masking film cut-out remains on headlight lens.



»Right headlight:«

– Clean headlight lens.
– Remove release paper from masking film.

– Position contact edge -C- of application film at first continuous line -A- on headlight lens.
– Position lower edge -D- of application film at lower edge -B- of headlight lens.
– Pull application film off headlight. Masking film cut-out remains on headlight lens.



Note

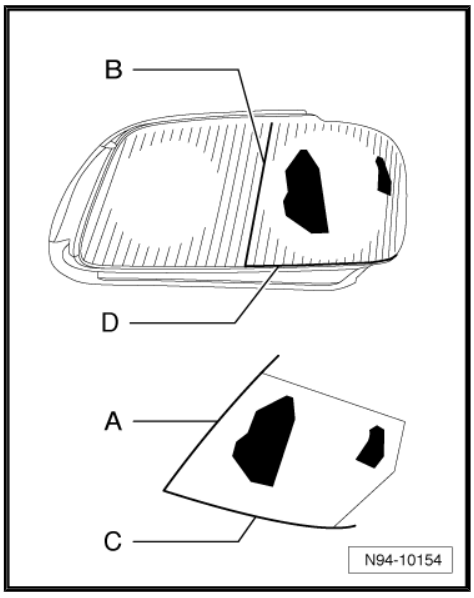
- *Remove any remaining adhesive using alcohol-based or alcohol and water-based cleaning fluid. For example a cloth soaked with isopropyl alcohol.*
- *Customers should be informed of how to remove residual adhesive after pulling off the masking section.*

Conversion from driving on left to driving on right:

»Left headlight:«

– Clean headlight lens.
– Remove release paper from masking film.

– Position contact edge -A- of application film at first continuous line -B- on headlight lens.
– Position lower edge -C- of application film at lower edge -D- of headlight lens.
– Pull application film off headlight. Masking film cut-out remains on headlight lens.



Note

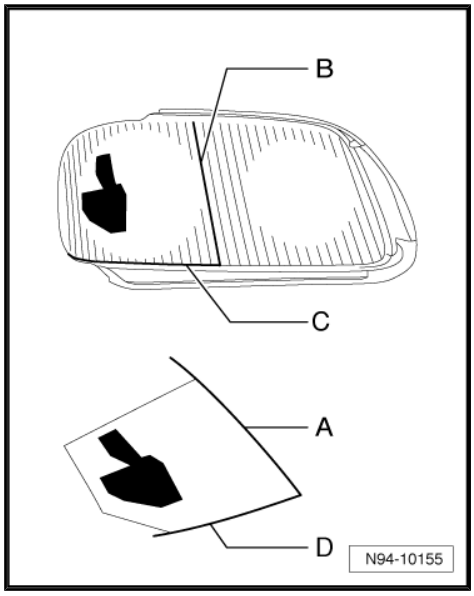
- *Remove any remaining adhesive using alcohol-based or alcohol and water-based cleaning fluid. For example a cloth soaked with isopropyl alcohol.*
- *Customers should be informed of how to remove residual adhesive after pulling off the masking section.*

»Right headlight:«

– Clean headlight lens.
– Remove release paper from masking film.
– Align masking film as follows:

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– Position contact edge -A- of application film at first continuous line -B- on headlight lens.
– Position lower edge -D- of application film at lower edge -C- of headlight lens.
– Pull application film off headlight. Masking film cut-out remains on headlight lens.



Note

- *Remove any remaining adhesive using alcohol-based or alcohol and water-based cleaning fluid. For example a cloth soaked with isopropyl alcohol.*
- *Customers should be informed of how to remove residual adhesive after pulling off the masking section.*

1.23.2 Headlight conversion for left-hand/right-hand traffic, headlights with H4 bulb, vehicles as of model year 2011

Note

- *To avoid dazzling oncoming traffic with asymmetrical lights, both headlights should be converted to the direction of traffic (driving on the left or right) relevant to the country in which the vehicle is being driven.*
- *Conversion of the headlights is not designed as a permanent conversion for other countries. It is only suitable as a "tourist solution" for a short stay abroad.*
- *The corresponding headlight conversion set consists of two sections of film.*
- *Please note the different part numbers for the headlight conversion sets from right to left-hand traffic and from left to right-hand traffic.*
- *The details "right" and "left" on the masking film always refer to the direction of travel when looking forwards from inside the vehicle.*
- *Conversion of the headlights from right-hand to left-hand traffic and from left-hand to right-hand traffic is carried out in the same way.*
- *Turn light switch to "0" position.*

Overview of application films for headlight conversion

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1 - Application film for headlight conversion

- ❑ Conversion from driving on left to driving on right
- ❑ For right headlight
- ❑ Conversion from driving on left to driving on right for right headlight
  ⇒ page 217

2 - Application film for headlight conversion

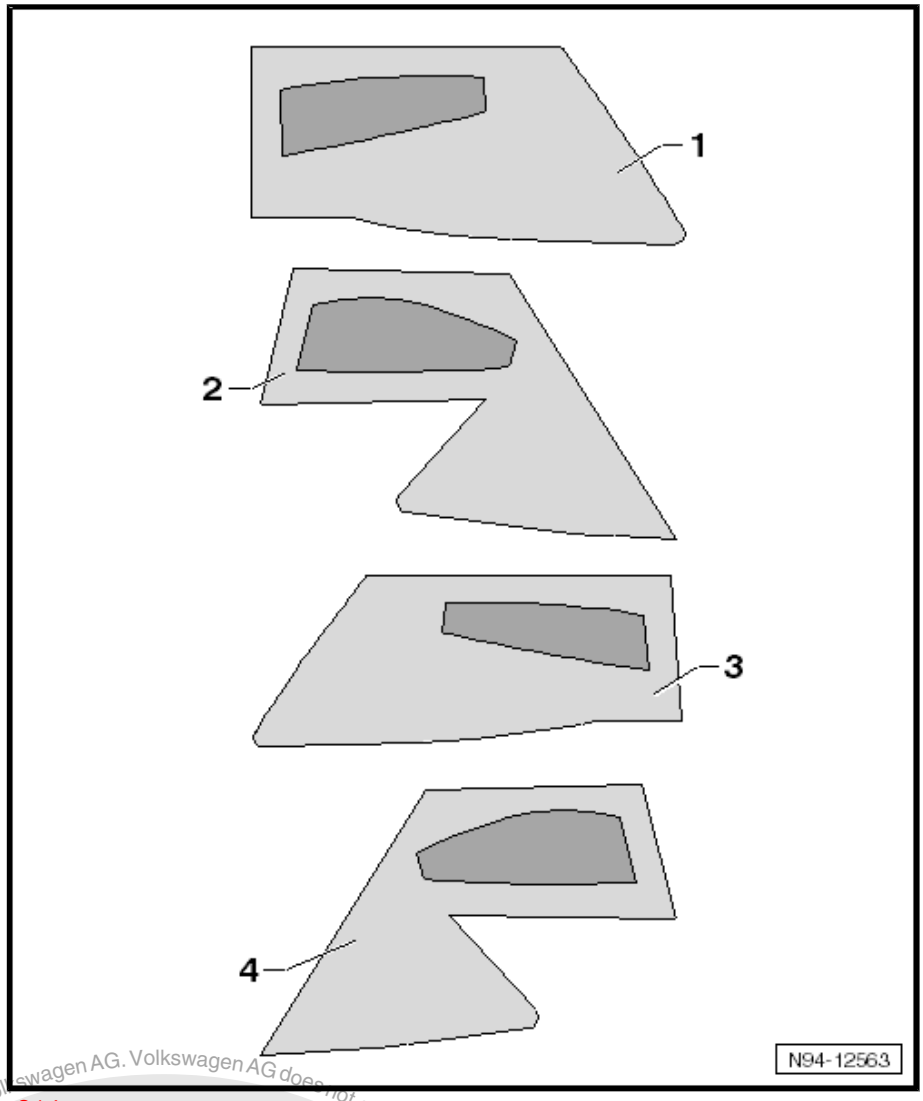
- ❑ Conversion from driving on left to driving on right
- ❑ For left headlight
- ❑ Conversion from driving on left to driving on right for left headlight
  ⇒ page 216

3 - Application film for headlight conversion

- ❑ Conversion from driving on right to driving on left
- ❑ For left headlight
- ❑ Conversion from driving on right to driving on left for left headlight
  ⇒ page 213

4 - Application film for headlight conversion

- ❑ Conversion from driving on right to driving on left
- ❑ For right headlight
- ❑ Conversion from driving on right to driving on left for right headlight ⇒ page 214



Conversion from driving on right to driving on left:

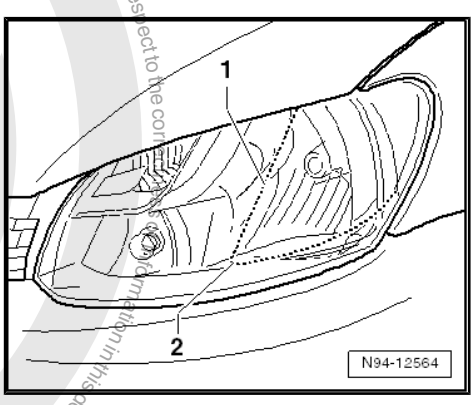
»Left headlight:«

– Clean plastic lens of headlight.

– Remove release paper from masking film.

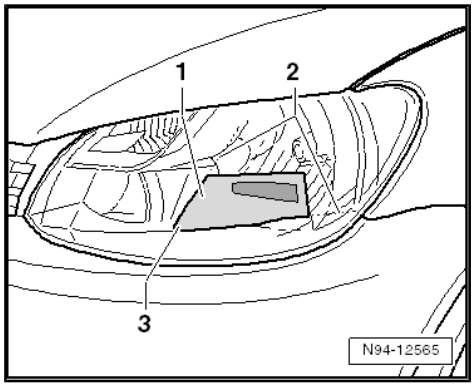
Note

Take note of marking line on plastic lens of headlight. The application film must be applied along the marking line -1-.

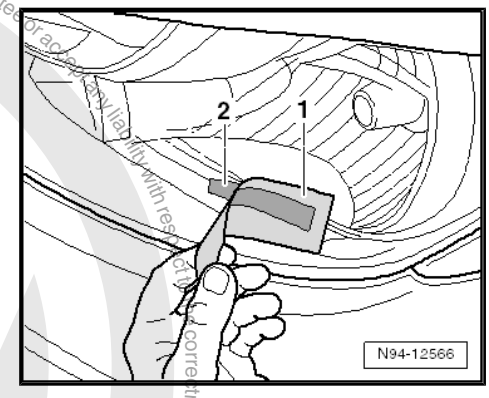


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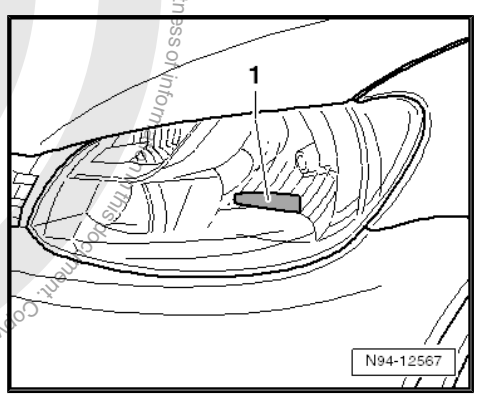
– Bond application film -1- along the dotted line -2- and over corner point -3- onto plastic lens of headlight as shown in illustration.



– Pull application film -1- off plastic lens of headlight; masking film -2- remains on plastic lens.



The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

»Right headlight:«

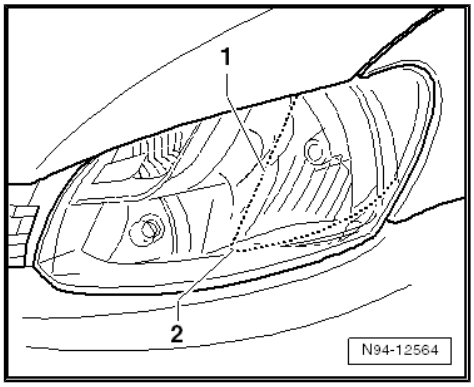
– Clean plastic lens of headlight.

– Remove release paper from masking film.

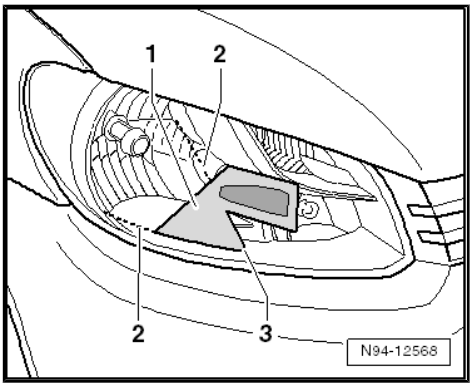
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Note

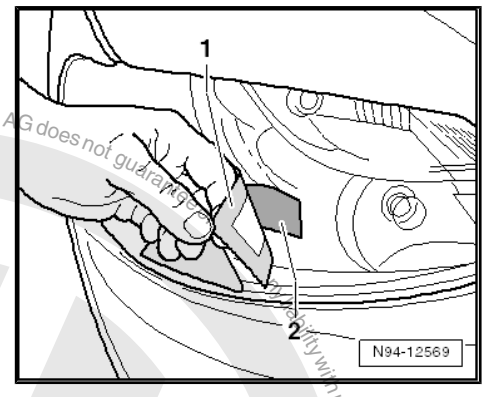
Take note of marking line on plastic lens of headlight. The application film must be applied along the marking line -1-.



– Bond application film -1- along the dotted line -2- and over corner point -3- onto plastic lens of headlight as shown in illustration.

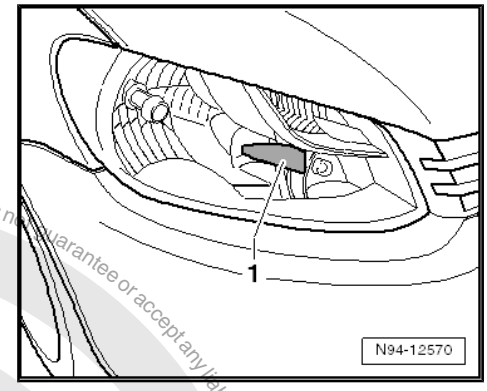


– Pull application film -1- off plastic lens of headlight; masking film -2- remains on plastic lens.



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The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

Conversion from driving on left to driving on right:

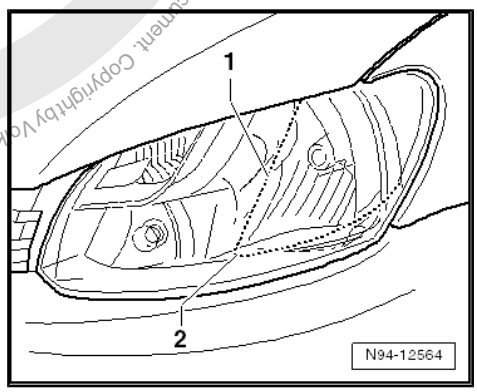
»Left headlight:«

– Clean plastic lens of headlight.

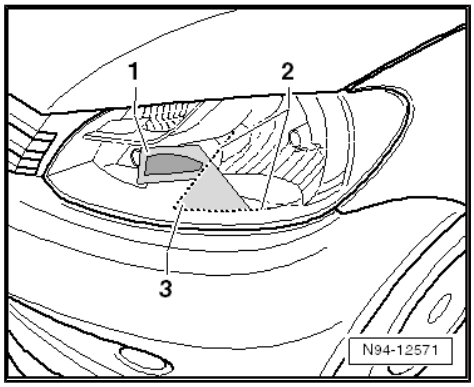
– Remove release paper from masking film.

Note

Take note of marking line on plastic lens of headlight. The application film must be applied along the marking line -1-.

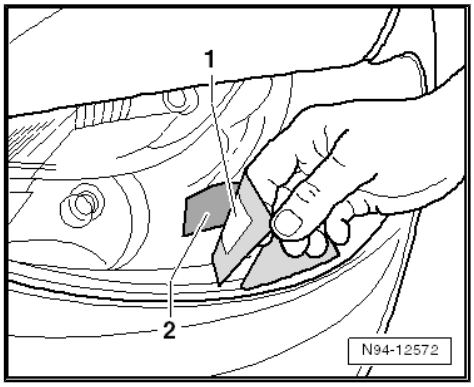


– Bond application film -1- along the dotted line -2- and over corner point -3- onto plastic lens of headlight as shown in illustration.

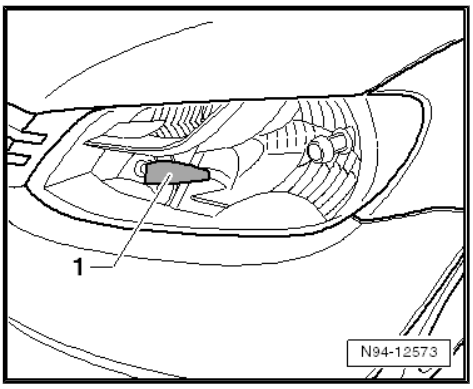


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– Pull application film -1- off plastic lens of headlight; masking film -2- remains on plastic lens.



The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

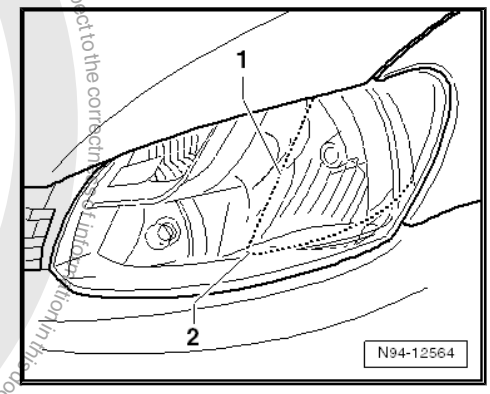
»Right headlight:«

– Clean plastic lens of headlight.

– Remove release paper from masking film.

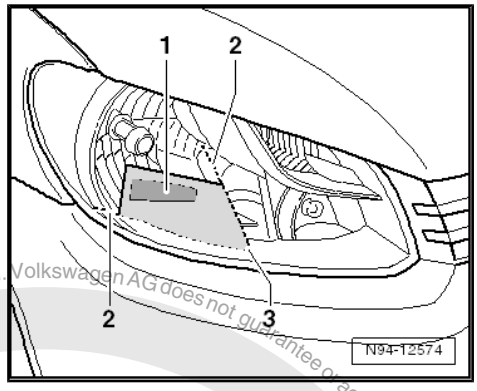
Note

Take note of marking line on plastic lens of headlight. The application film must be applied along the marking line -1-.

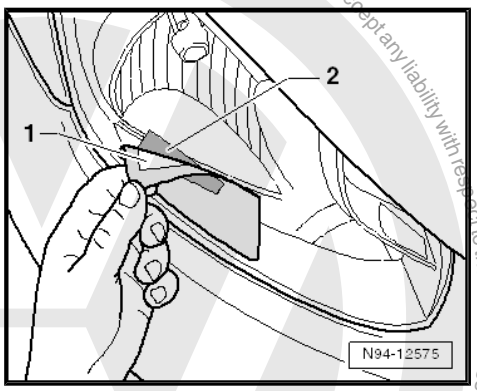


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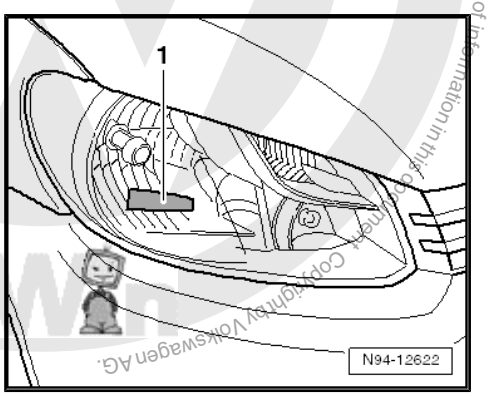
– Bond application film -1- along the dotted line -2- and over corner point -3- onto plastic lens of headlight as shown in illustration.



– Pull application film -1- off plastic lens of headlight; masking film -2- remains on plastic lens.



The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

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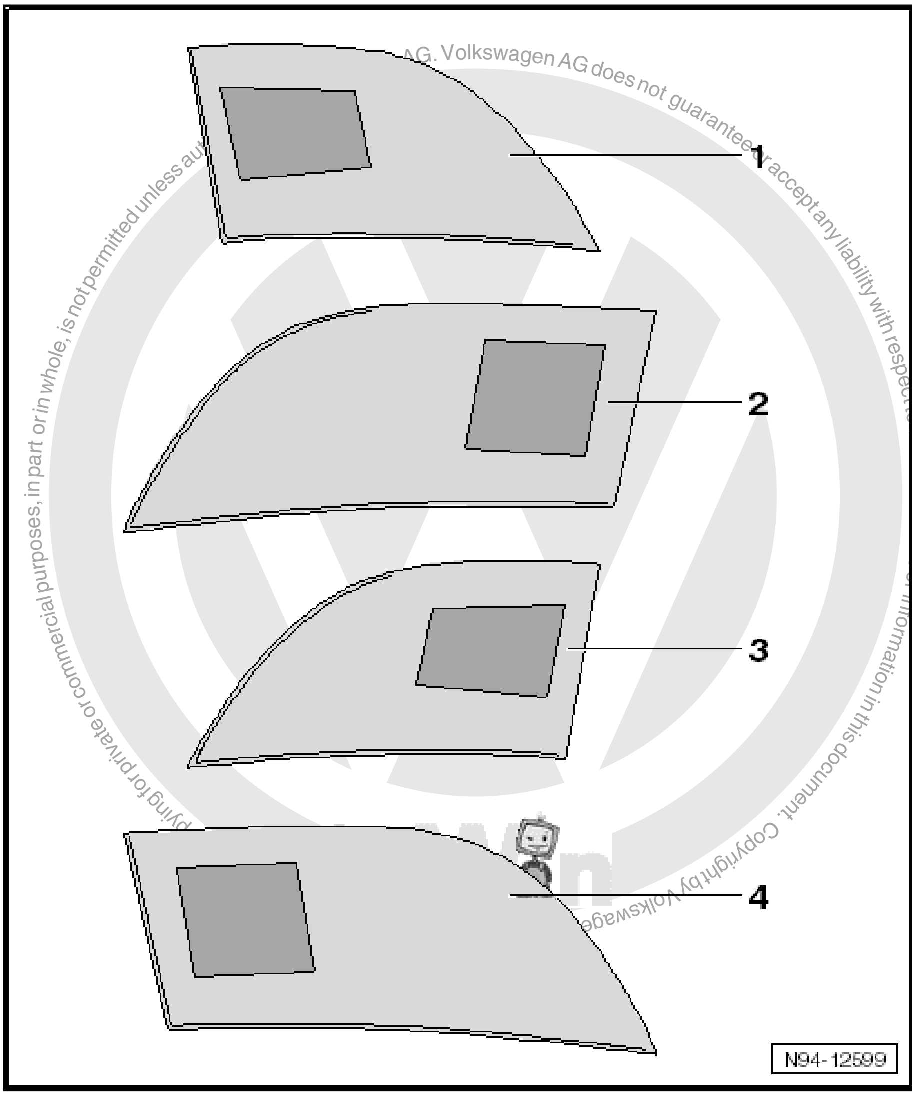
1.23.3 Headlight conversion for left-hand/right-hand traffic, headlights with H7 bulb, vehicles as of model year 2011

Note

- *To avoid dazzling oncoming traffic with asymmetrical lights, both headlights should be converted to the direction of traffic (driving on the left or right) relevant to the country in which the vehicle is being driven.*
- *Conversion of the headlights is not designed as a permanent conversion for other countries. It is only suitable as a "tourist solution" for a short stay abroad.*
- *The corresponding headlight conversion set consists of two sections of film.*
- *Please note the different part numbers for the headlight conversion sets from right to left-hand traffic and from left to right-hand traffic.*
- *The details "right" and "left" on the masking film always refer to the direction of travel when looking forwards from inside the vehicle.*
- *Conversion of the headlights from right-hand to left-hand traffic and from left-hand to right-hand traffic is carried out in the same way.*
- *Turn light switch to "0" position.*

Overview of application films for headlight conversion

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1 - Application film for headlight conversion

- ❑ Conversion from driving on right to driving on left
- ❑ For right headlight
- ❑ Conversion from driving on right to driving on left for right headlight ⇒ page 221

2 - Application film for headlight conversion

- ❑ Conversion from driving on right to driving on left
- ❑ For left headlight
- ❑ Conversion from driving on right to driving on left for left headlight ⇒ page 220

3 - Application film for headlight conversion

- ❑ Conversion from driving on left to driving on right
- ❑ For left headlight
- ❑ Conversion from driving on left to driving on right for left headlight ⇒ page 222

4 - Application film for headlight conversion

- ❑ Conversion from driving on left to driving on right
- ❑ For right headlight
- ❑ Conversion from driving on left to driving on right for right headlight ⇒ page 223

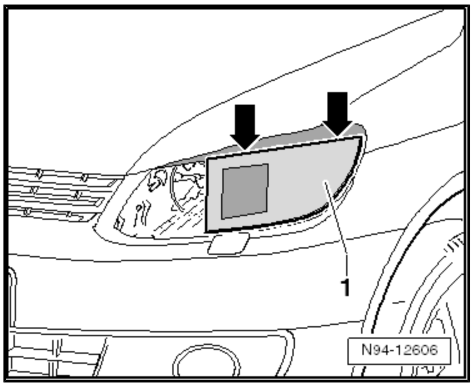
Conversion from driving on right to driving on left:

»Left headlight:«

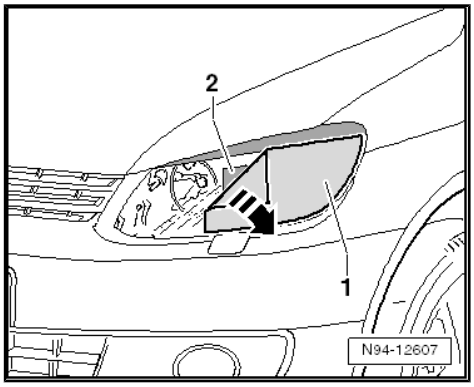
– Clean plastic lens of headlight.

– Remove release paper from masking film.

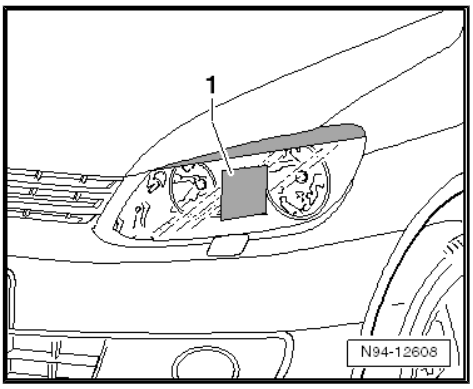
– Position application film -1- at lower edge of grey surface on headlight -arrows- and bond it on. At the same time, make sure that application film is aligned against edge of plastic lens of headlight next to body.



– Pull application film -1- off plastic lens of headlight in -direction of arrow-, ensuring that masking film -2- remains on plastic lens of headlight.



The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

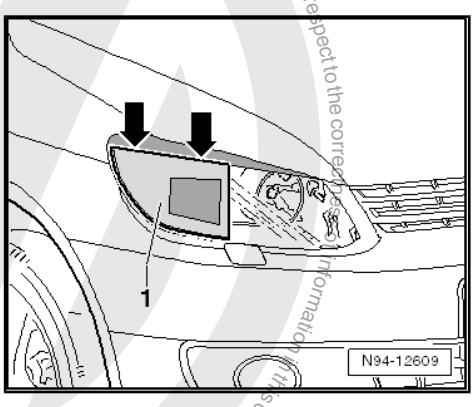
- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

»Right headlight:«

– Clean plastic lens of headlight.

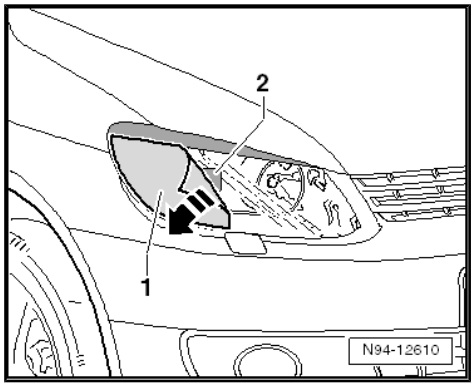
– Remove release paper from masking film.

– Position application film -1- at lower edge of grey surface on headlight -arrows- and bond it on. At the same time, make sure that application film is aligned against edge of plastic lens of headlight next to body.

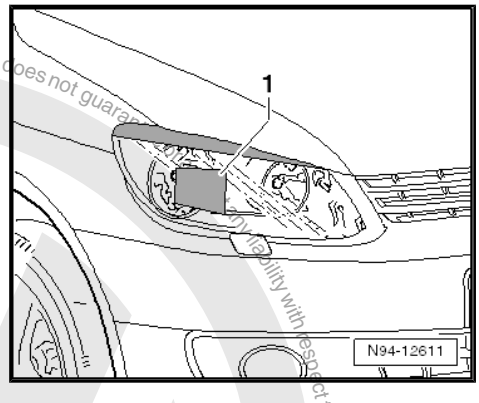


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– Pull application film -1- off plastic lens of headlight in -direction of arrow-, ensuring that masking film -2- remains on plastic lens of headlight.



The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

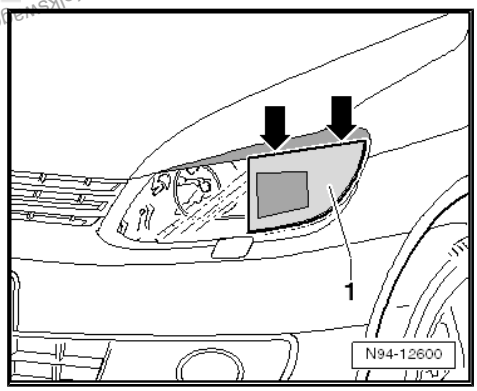
Conversion from driving on left to driving on right:

»Left headlight:«

– Clean plastic lens of headlight.

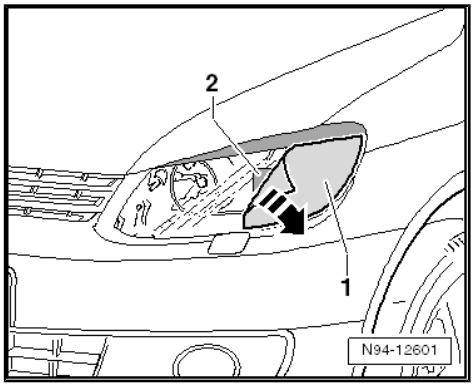
– Remove release paper from masking film.

– Position application film -1- at lower edge of grey surface on headlight -arrows- and bond it on. At the same time, make sure that application film is aligned against edge of plastic lens of headlight next to body.

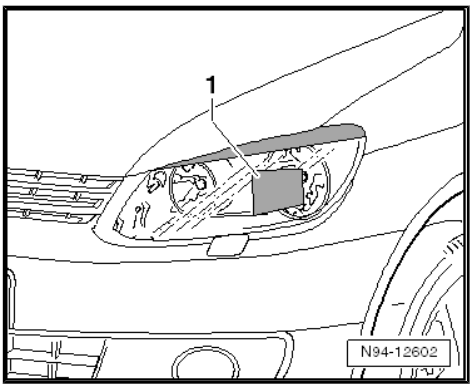


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– Pull application film -1- off plastic lens of headlight in -direction of arrow-, ensuring that masking film -1- remains on plastic lens of headlight.



The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

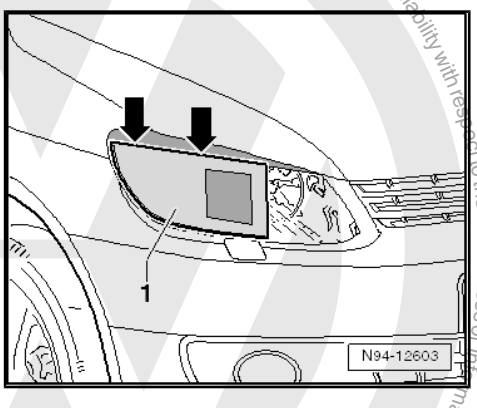
- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

»Right headlight:«

– Clean plastic lens of headlight.

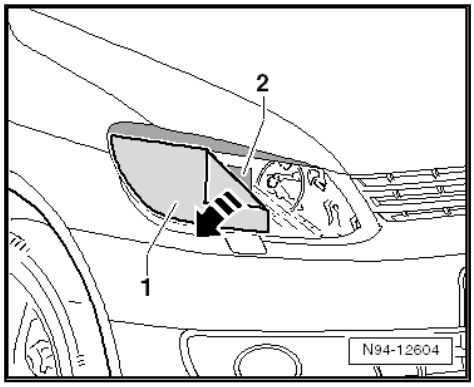
– Remove release paper from masking film.

– Position application film -1- at lower edge of grey surface on headlight -arrows- and bond it on. At the same time, make sure that application film is aligned against edge of plastic lens of headlight next to body.

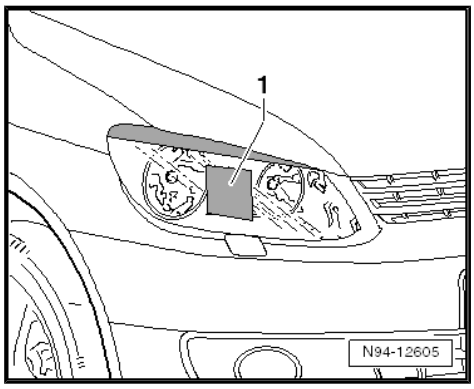


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– Pull application film -1- off plastic lens of headlight in -direction of arrow-, ensuring that masking film -2- remains on plastic lens of headlight.



The illustration shows the headlight with masking film -1- after conversion.



Caution

Risk of plastic erosion!

If solvent-based cleaners are used, the plastic lens of the headlight could become damaged.

To remove any adhesive residue on the plastic headlight lenses, use only alcohol-based cleaning agents or those with a diluted alcohol mix (isopropanol).

Note

- *Remove any adhesive residue using alcohol-based or diluted alcohol-based cleaning fluids, for example with a cloth soaked in isopropanol.*
- *Customers should be informed of how to remove residual adhesive after the masking film is pulled off.*

1.23.4 Headlight conversion for left-hand/right-hand traffic, headlights with gas discharge lamps and cornering lights

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

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.

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .
– Select “Guided fault finding” in vehicle diagnostic tester.
– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

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- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Headlight range control -J745-
- Headlight range control functions
- Travel mode

1.24 Removing and installing headlight range control actuator -V48- / -V49-

⇒ “1.24.1 Removing and installing headlight range control motor V48 / V49 , headlights with H7 bulb, vehicles up to model year 2010”, page 225

⇒ “1.24.2 Removing and installing headlight range control motor V48 / V49 , headlights with H4 bulb, vehicles as of model year 2011”, page 227

⇒ “1.24.3 Removing and installing headlight range control motor V48 / V49 , headlights with H7 bulb, vehicles as of model year 2011”, page 227

⇒ “1.24.4 Removing and installing headlight range control motor V48 / V49 , headlights with gas discharge lamps and cornering lights”, page 227

⇒ “1.24.5 Checking headlight range control motor”, page 227

1.24.1 Removing and installing headlight range control motor -V48- / -V49- , headlights with H7 bulb, vehicles up to model year 2010

Note

If control motor is renewed or if it is removed and then reinstalled, the headlight adjustment must be checked and adjusted if necessary ⇒ page 174 .

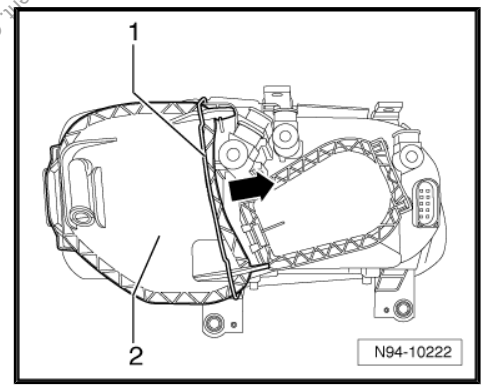
Removing:

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

– Remove headlight ⇒ page 166 .

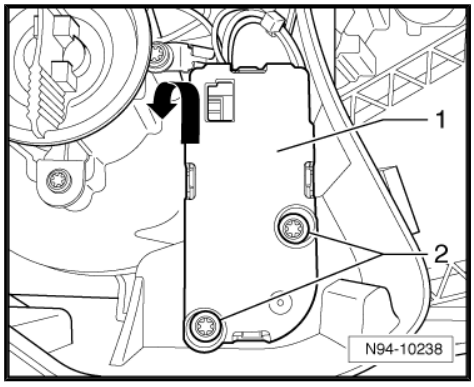
– Push wire shackle to one side -1- in -direction of arrow-.

– Take cover cap -2- out through recesses in side of headlight.

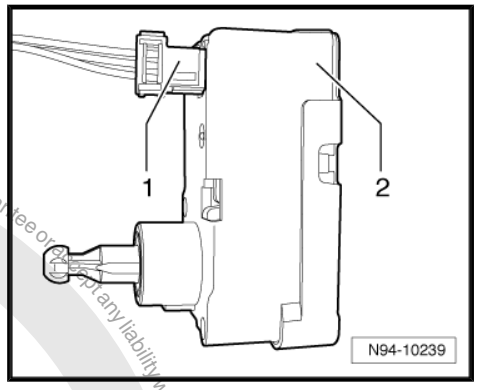


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– Unscrew securing bolts -2- for headlight range control motor -1-.
– Push headlight range control motor -1- in -direction of arrow- so that ball head of headlight range control motor can be pulled downwards out of ball head cup in reflector.



– Pull connector -1- off headlight range control motor -2-.
– Remove headlight range control motor from headlight housing.



Installing:

Install in the reverse order of removal. When doing this, note the following:

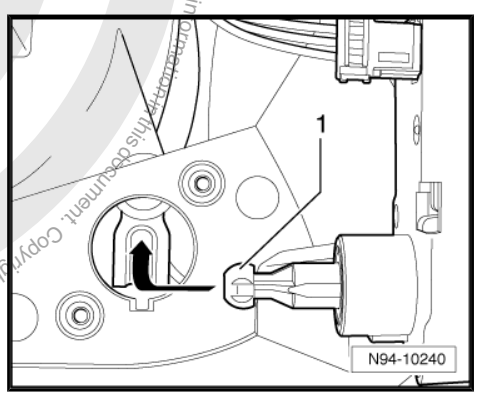
Caution

When installing, make sure cover is correctly seated. The ingress of water will lead to permanent damage to the headlight.

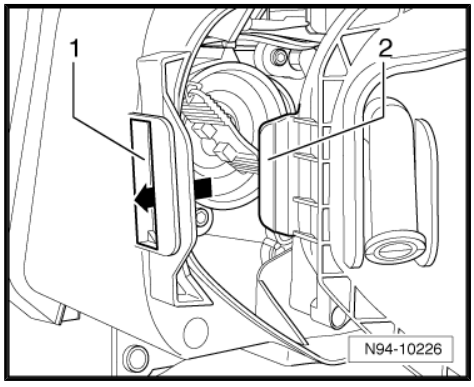
Note

The electrical connector of the headlight range control motor must be connected prior to installation.

– Connect electrical connector of headlight range control motor .
– Carefully insert ball head of headlight range control motor -1- in ball head cup -arrow-.

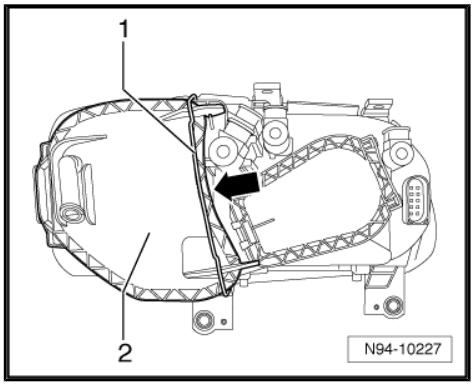


– Fit cap -2- into recess -1- on headlight and push it fully into position.



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– Lock cap -2- in place by closed the wire shackle -1- in -direction of arrow-.
– Check functions of headlight.
– Checking and, if necessary, adjusting headlight setting ⇒ page 174 .



1.24.2 Removing and installing headlight range control motor -V48- / -V49- , headlights with H4 bulb, vehicles as of model year 2011

The headlight range control motor cannot be removed.

The headlight must be renewed if the headlight range control motor is defective.

Checking headlight range control motor ⇒ page 227 .

1.24.3 Removing and installing headlight range control motor -V48- / -V49- , headlights with H7 bulb, vehicles as of model year 2011

The headlight range control motor cannot be removed.

The headlight must be renewed if the headlight range control motor is defective.

Checking headlight range control motor ⇒ page 227 .

1.24.4 Removing and installing headlight range control motor -V48- / -V49- , headlights with gas discharge lamps and cornering lights

The headlight range control motors -V48- / -V49- are located inside the headlights. They cannot be replaced individually.

In the event of damage, the headlight must be renewed ⇒ page 172 .

Note

If faulty, check wiring of headlight range control motor for wiring defects and/or loose connections before renewing headlight.

1.24.5 Checking headlight range control motor

The following procedure enables you to check left headlight range control actuator - V48- or right headlight range control actuator - V49- .

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

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– Select “Guided fault finding” in vehicle diagnostic tester .
– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Automatic headlight range control
- Electrical components, automatic headlight range control
- Headlight range control motor

1.25 Removing and installing front left vehicle level sender - G78-

⇒ “1.25.1 Removing and installing front left vehicle level sender G78 , headlights with gas discharge lamps and cornering lights”, page 228

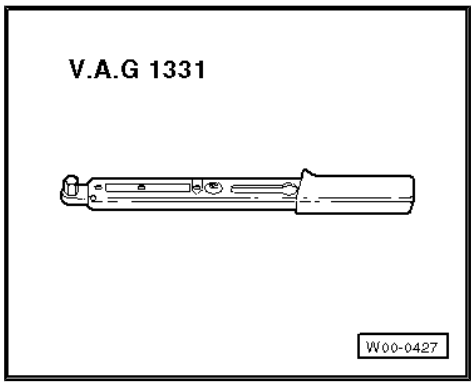
1.25.1 Removing and installing front left vehicle level sender - G78- , headlights with gas discharge lamps and cornering lights

Note

- *The front left vehicle level sender - G78- is installed on the front axle.*
- *If the vehicle level senders are renewed, basic setting of the headlights must be performed afterwards ⇒ Maintenance ; Booklet ; Descriptions of work .*

Special tools and workshop equipment required

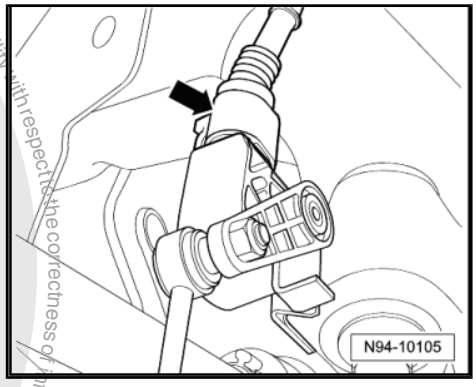
- Torque wrench - V.A.G 1331-



Removing:

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

– Release and disconnect electrical connector -arrow-.



– Remove nut -5-.

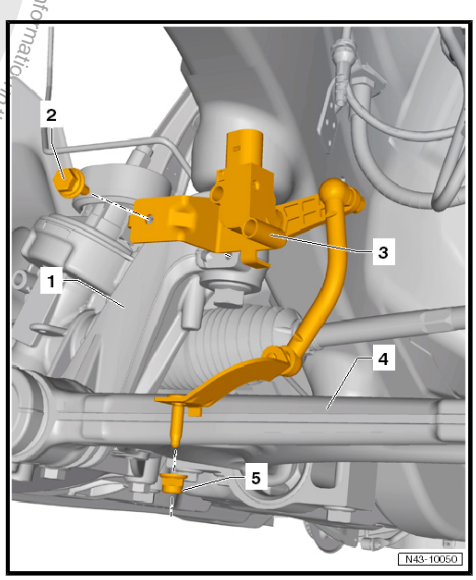
– Unscrew securing bolt -2-, and remove front left vehicle level sender - G78- -3- with bracket.

Installing:

Install in the reverse order of removal. When doing this, note the following:

Note

- *The lever of the vehicle level sender must face towards outer side of vehicle.*
- *The thread of the vehicle level sender must be screwed into the front hole of suspension link -4-. The retaining lug of the vehicle level sender must engage in the rear hole in order to ensure the correct installation position.*



– Tighten upper securing bolt to 9 Nm.

– Tighten new self-locking securing nut at bottom to 9 Nm.

– Carry out basic setting of headlights ⇒ Maintenance ; Booklet ; Descriptions of work .

1.26 Removing and installing rear left vehicle level sender - G76- :

⇒ "1.26.1 Removing and installing rear left vehicle level sender G76 , headlights with gas discharge lamps and cornering lights", page 229

1.26.1 Removing and installing rear left vehicle level sender - G76- , headlights with gas discharge lamps and cornering lights

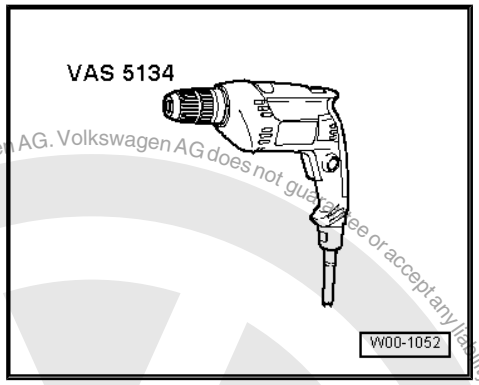
Note

- *The rear left vehicle level sender - G76- is installed near the left rear wheel.*
- *2 new pop rivets are required for the installation of the rear left vehicle level sender - G76- ⇒ Electronic Parts Catalogue (ET-KA) .*
- *If the vehicle level senders are removed and installed, basic setting of the headlights must be performed afterwards ⇒ Maintenance ; Booklet ; Descriptions of work .*

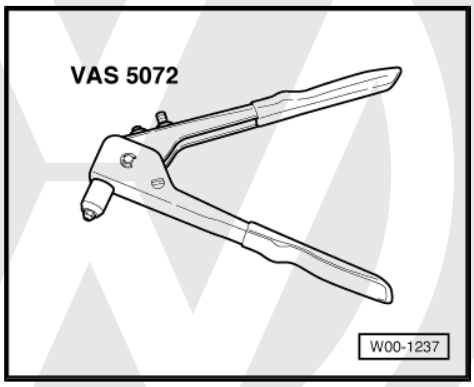
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Special tools and workshop equipment required

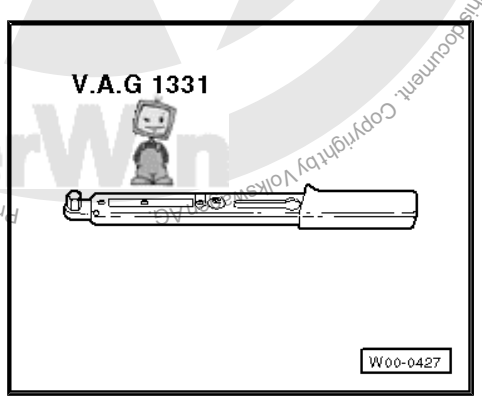
- Drill - VAS 5134-



- Pop rivet pliers - VAS 5072-



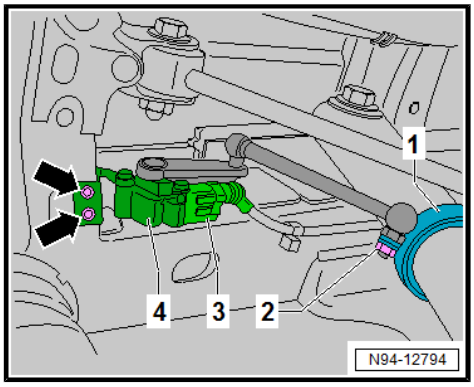
- Torque wrench - V.A.G 1331-



Removing:

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

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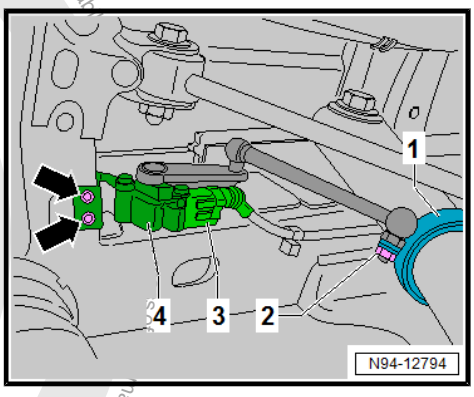
– Release and disconnect electrical connector -3-.
– Unscrew securing nut -2- and pull lower ball head out of securing clamp -1-.
– Drill out heads of the 2 pop rivets -arrows-, and remove rear left vehicle level sender - G76- -4-.
– Remove remaining parts of pop rivets and all metal shavings caused by drilling out the pop rivets.
– If necessary, carry out corrosion protection measures on securing holes in body ⇒ General information on paintwork; Rep. gr. 00 ; Genuine products; Conservation .

Installing:

Install in the reverse order of removal. When doing this, note the following:

Note

When installing rear left vehicle level sender - G76- , ensure that lever and jointed rod are in position as illustrated. Otherwise the rear left vehicle level sender - G76- will supply incorrect data which causes the headlight range control to malfunction.



– Fit rear left vehicle level sender - G76- -4-, and rivet it to vehicle body using 2 new pop rivets -arrows-.
– Connect and engage connector -3-.
– Align securing clamp -1- with lower edge of outer shock absorber tube, insert ball head mounting and tighten securing nut to 5 Nm.
– Carry out basic setting of headlights ⇒ Maintenance ; Booklet ; Descriptions of work .

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1.27 Installing repair kit for headlight housing

⇒ “1.27.1 Installing repair kit for headlight housing, headlights with H7 bulb, vehicles up to model year 2010 ”, page 232

⇒ “1.27.2 Installing repair kit for headlight housing, headlights with H4 bulb, vehicles as of model year 2011”, page 234

⇒ “1.27.3 Installing repair kit for headlight housing, headlights with H7 bulb, vehicles as of model year 2011”, page 238

⇒ “1.27.4 Installing repair kit for headlight housing, headlights with gas discharge lamps and cornering lights”, page 242

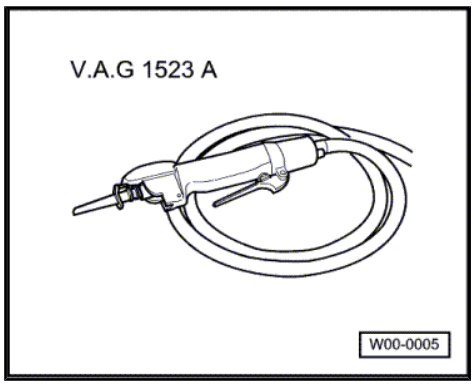
1.27.1 Installing repair kit for headlight housing, headlights with H7 bulb, vehicles up to model year 2010

Note

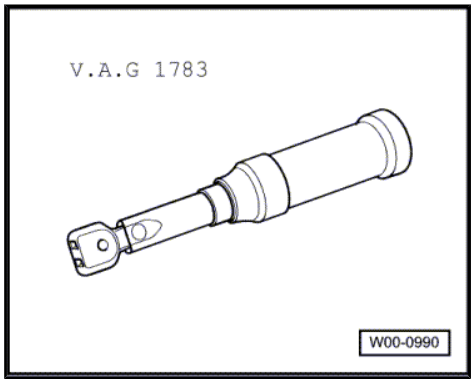
- *If retaining tabs broke off the headlights, they can be renewed using the repair kit for headlight housing. There is therefore no need to renew the entire headlight.*
- *There are different repair kits for the left and right headlight housing available ⇒ Electronic Parts Catalogue .*
- *Removal and installation are described for the left side. Removal and installation on the right side are carried out analogously.*

Special tools and workshop equipment required

- Pneumatic sabre saw - VAS 1523 A-



- Torque wrench - V.A.G 1783-



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

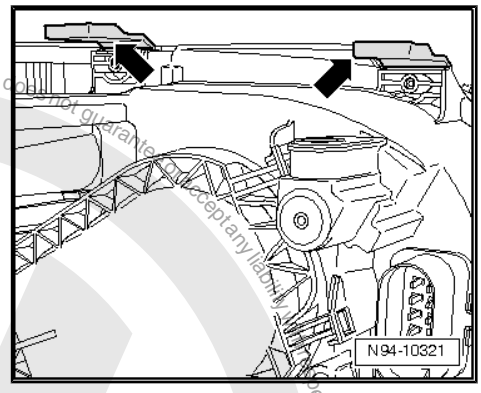
– Remove headlight whose retaining tab is broken ⇒ page 168 .

Installing upper retaining tabs:

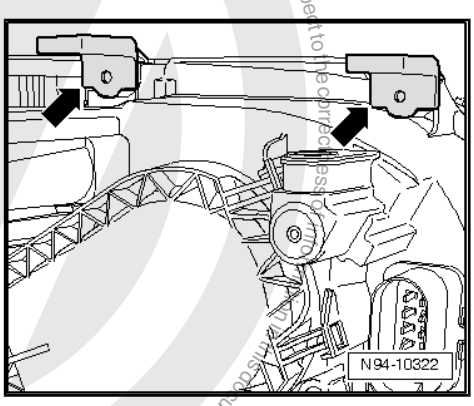
Note

- *The repair kit comprises 3 identical retaining tabs, each with one securing bolt.*
- *It is not necessary to install both retaining tabs if only one is damaged.*

– Completely remove the area of the damaged retaining tab shown in the diagram -arrows-.



– Insert the new retaining tab into the headlight housing until it engages -arrows-.



– Secure each of the retaining tabs with a bolt from the repair kit.

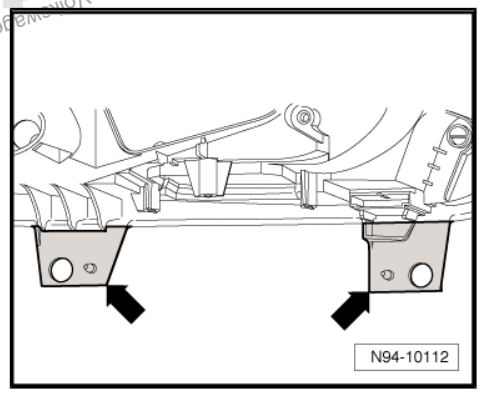
– Tighten securing bolts to specified torque of 3.5 Nm.

Installing lower retaining tabs:

Note

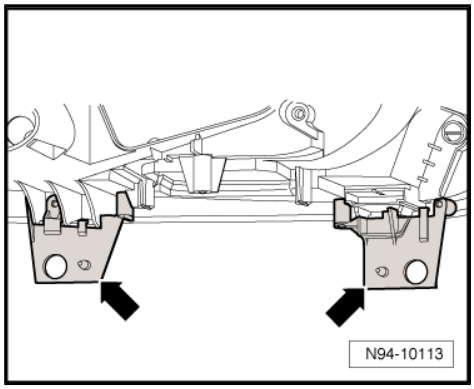
- *The repair kit comprises 2 retaining tabs, each with two securing bolts.*
- *It is not necessary to install both retaining tabs if only one is damaged.*

– Completely remove the area of the damaged retaining tab shown in the diagram -arrows-.



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– Insert the new retaining tab into the headlight housing until it engages -arrows-.
– Secure each of the retaining tabs with 2 bolts from the repair kit.
– Tighten securing bolts to specified torque of 3.5 Nm.
– Install headlight and align it flush to body contour.
– Check headlight setting and adjust headlight as necessary ⇒ page 174 .



1.27.2 Installing repair kit for headlight housing, headlights with H4 bulb, vehicles as of model year 2011

Note

- *If retaining tabs broke off the headlights, they can be renewed using the repair kit for headlight housing. There is therefore no need to renew the entire headlight.*
- *There are different repair kits for the left and right headlight housing available ⇒ Electronic Parts Catalogue .*
- *Removal and installation are described for the left side. Removal and installation on the right side are carried out in the same way.*

Overview over headlight retaining tabs:

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1 - Headlight retaining tabs -1-

- ❑ Renewing ⇒ page 236 .
- ❑ Specified torque for securing bolts: 3.5 Nm

2 - Headlight retaining tabs -2-

- ❑ Renewing ⇒ page 236 .
- ❑ Specified torque for securing bolts: 3.5 Nm

3 - Headlight housing -3-

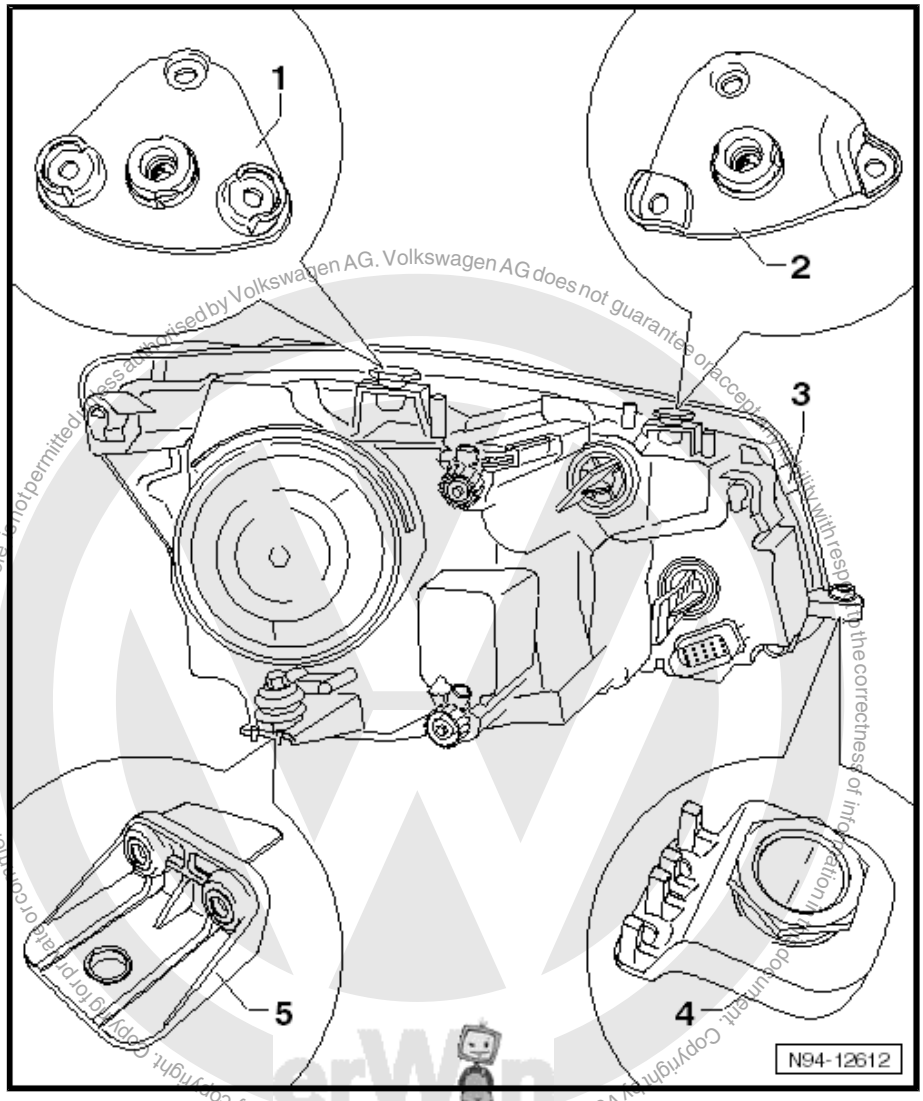
- ❑ Removing ⇒ page 168

4 - Headlight retaining tabs -4-

- ❑ Renewing ⇒ page 237 .
- ❑ Specified torque for securing bolts: 3.5 Nm

5 - Headlight retaining tabs -5-

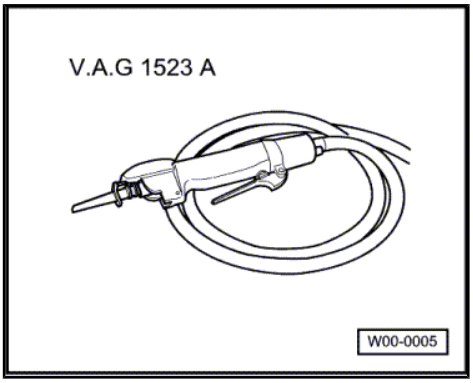
- ❑ Renewing ⇒ page 237 .
- ❑ Specified torque for securing bolts: 3.5 Nm



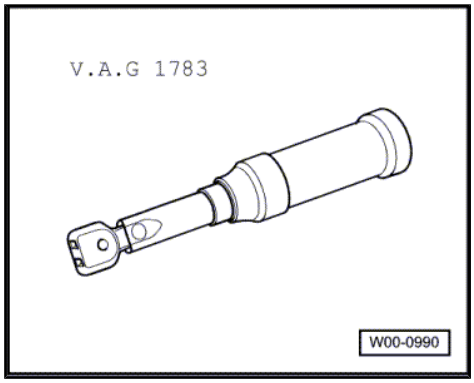
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Special tools and workshop equipment required

♦ Pneumatic sabre saw - VAS 1523 A-



♦ Torque wrench - V.A.G 1783-

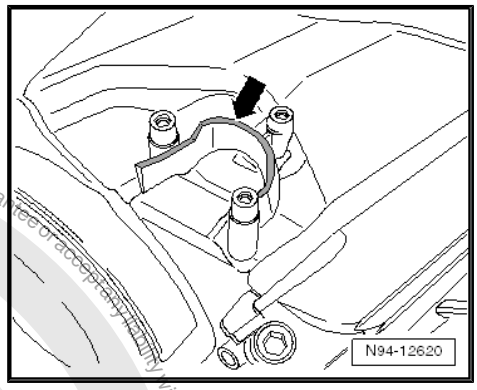


– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove headlight whose retaining tab is broken ⇒ page 168 .

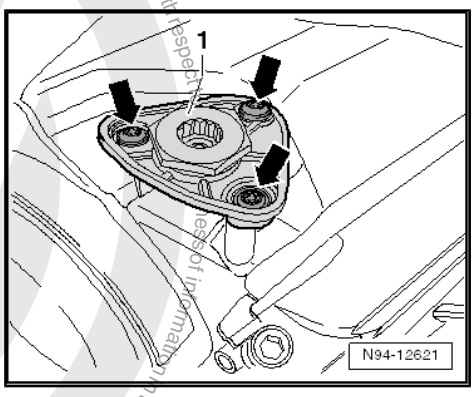
Renewing headlight retaining tab -1-:

– Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.



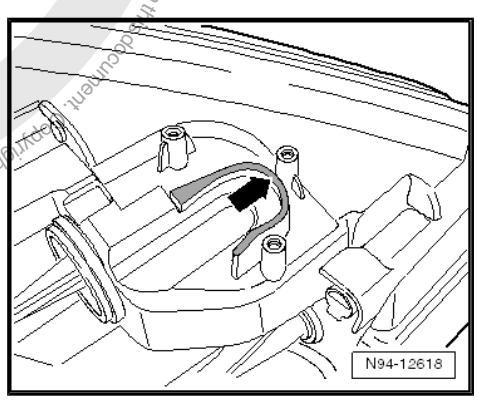
– Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).

Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.



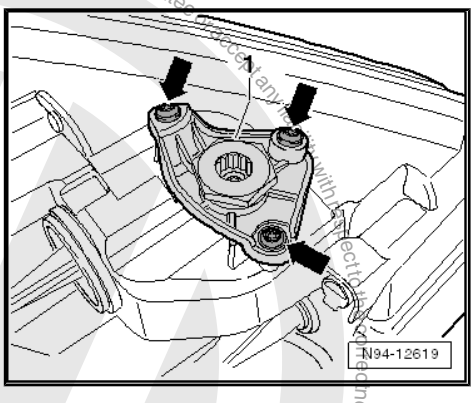
Renewing headlight retaining tab -2-:

– Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.



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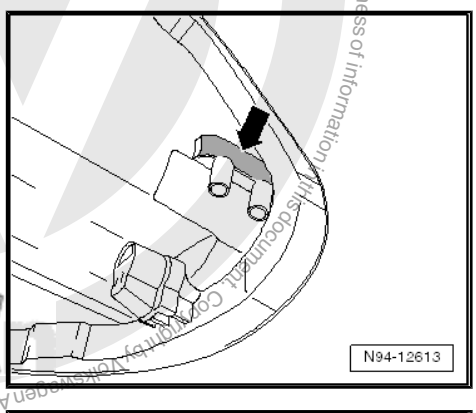
– Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).



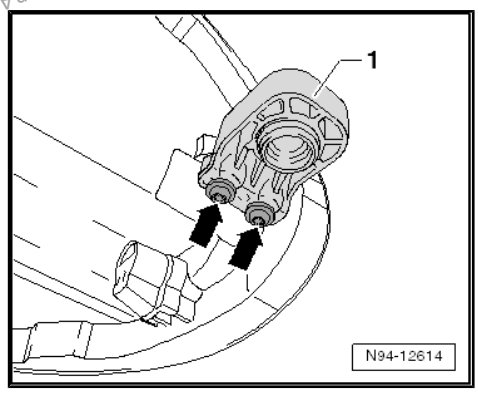
Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.

Renewing headlight retaining tab -4-:

– Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.



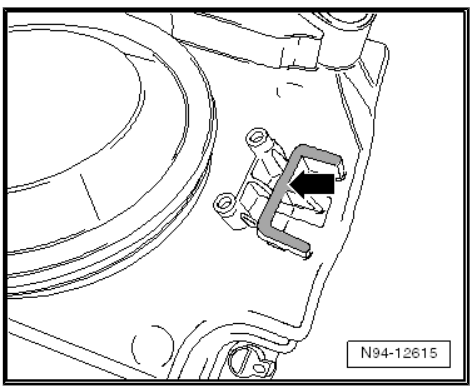
– Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).



Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.

Renewing headlight retaining tab -5-:

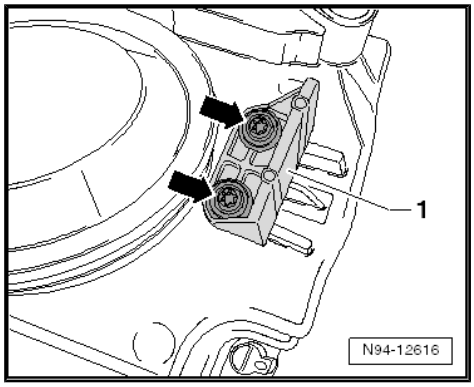
– Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.



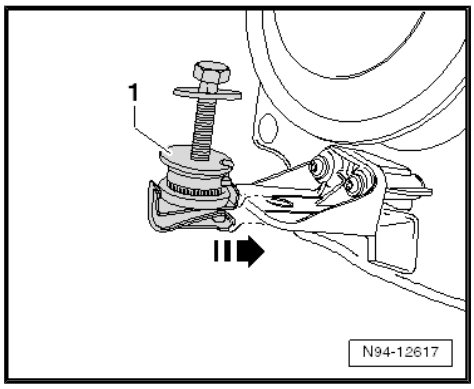
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– Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).

Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.



– Push adjusting device of headlight housing -1- in -direction of arrow- onto new headlight retaining tab.
– Install headlight and align it flush to body contour.
– Check headlight setting and adjust headlight as necessary ⇒ page 174 .



1.27.3 Installing repair kit for headlight housing, headlights with H7 bulb, vehicles as of model year 2011

Note

- *If retaining tabs broke off the headlights, they can be renewed using the repair kit for headlight housing. There is therefore no need to renew the entire headlight.*
- *There are different repair kits for the left and right headlight housing available⇒ Electronic Parts Catalogue .*
- *Removal and installation are described for the left side. Removal and installation on the right side are carried out in the same way.*

Overview over headlight retaining tabs:

Note

The overview shows the headlight retaining tabs of the H4 headlight. The headlight retaining tabs of the H7 headlight are only slightly different to those of the H4 headlight.

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1 - Headlight retaining tabs -1-

- ❑ Renewing ⇒ page 240 .
- ❑ Specified torque for securing bolts: 3.5 Nm

2 - Headlight retaining tabs -2-

- ❑ Renewing ⇒ page 240 .
- ❑ Specified torque for securing bolts: 3.5 Nm

3 - Headlight housing -3-

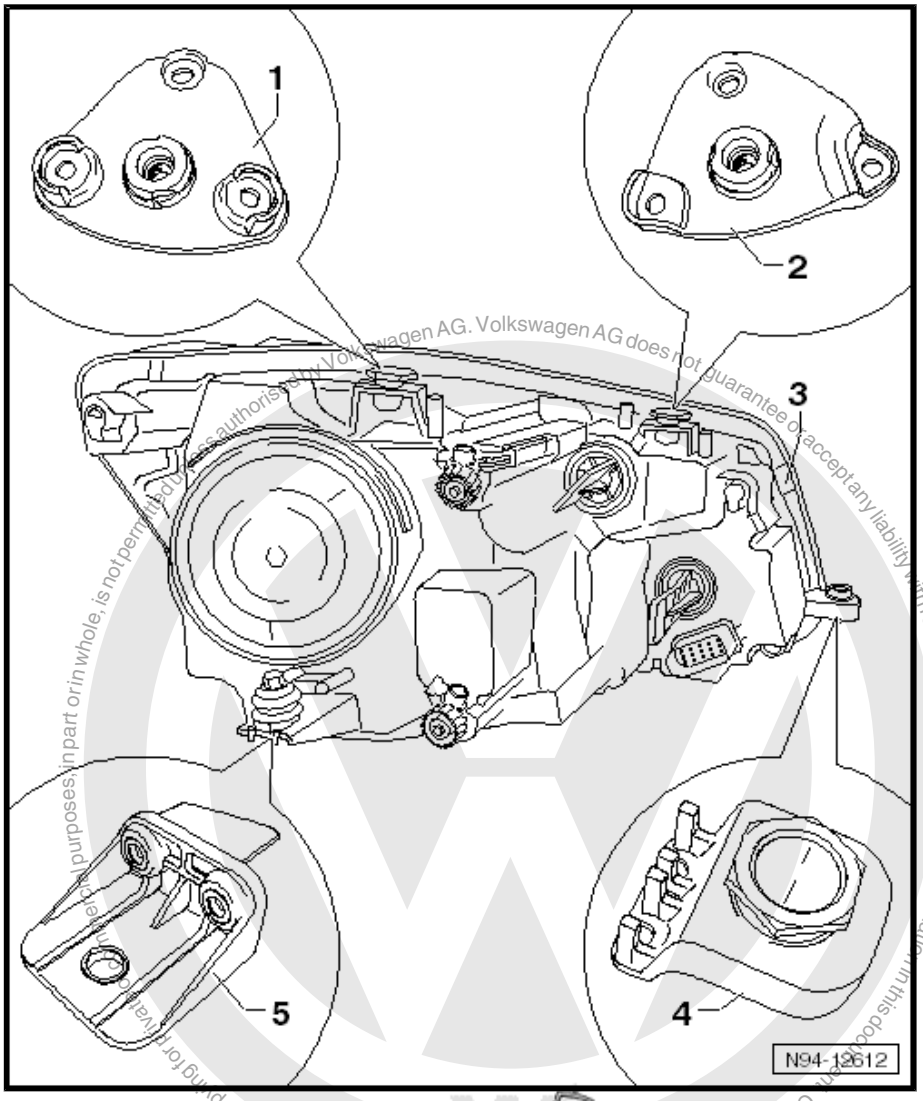
- ❑ Removing ⇒ page 170

4 - Headlight retaining tabs -4-

- ❑ Renewing ⇒ page 241 .
- ❑ Specified torque for securing bolts: 3.5 Nm

5 - Headlight retaining tabs -5-

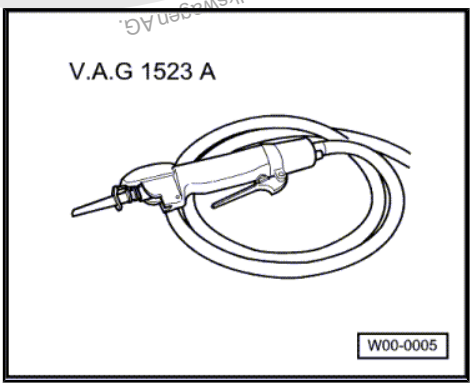
- ❑ Renewing ⇒ page 241 .
- ❑ Specified torque for securing bolts: 3.5 Nm



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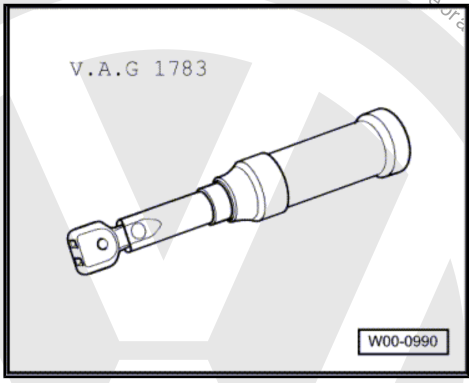
Special tools and workshop equipment required

♦ Pneumatic sabre saw - VAS 1523 A-



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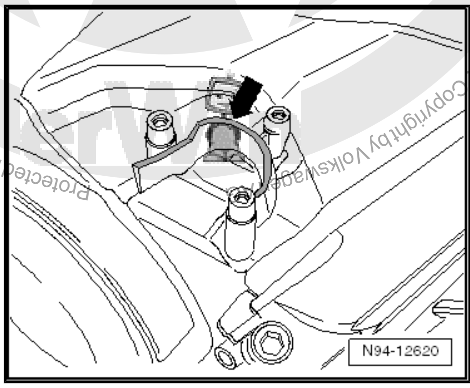
- ♦ Torque wrench - V.A.G 1783-



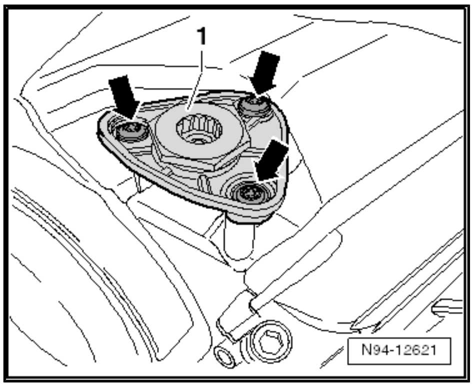
- – Switch off ignition and all electrical loads, and pull out ignition key.
- – Remove headlight whose retaining tab is broken ⇒ page 168 .

Renewing headlight retaining tab -1-:

- – Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.



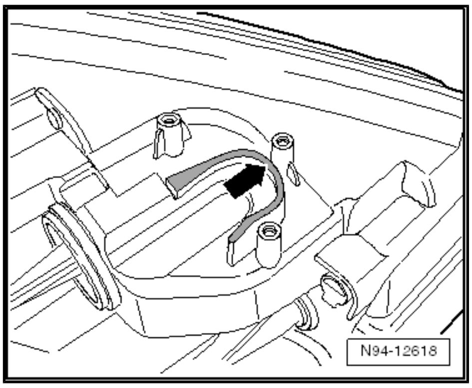
- – Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).



Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.

Renewing headlight retaining tab -2-:

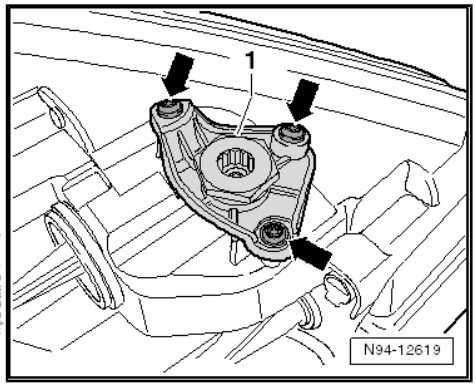
- – Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.



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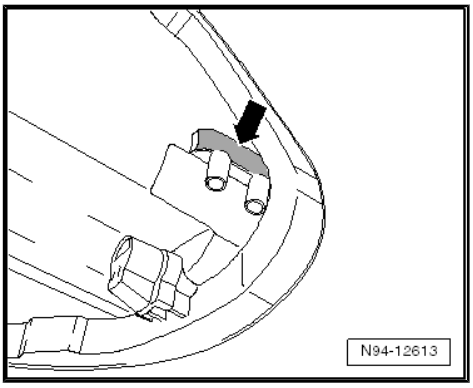
– Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).

Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.



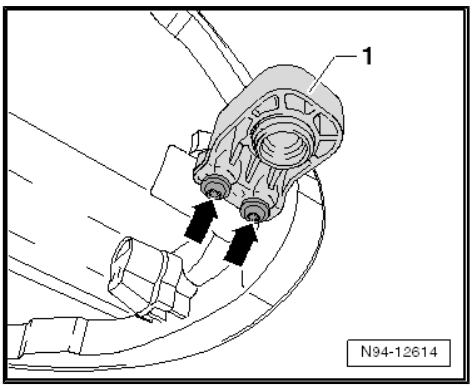
Renewing headlight retaining tab -4-:

– Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.



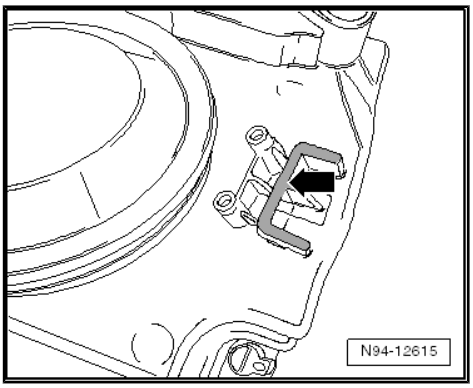
– Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).

Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.



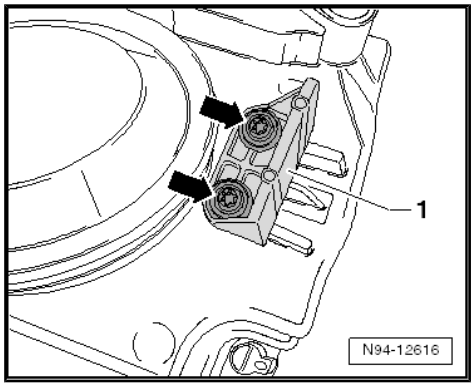
Renewing headlight retaining tab -5-:

– Cut off defect headlight retaining tab using a suitable tool, e.g. pneumatic sabre saw - VAS 1523 A- . When doing this, always wear protective goggles to protect the eyes. Grind down the surface where tab was removed -arrow- with emery paper if necessary and remove any burrs.

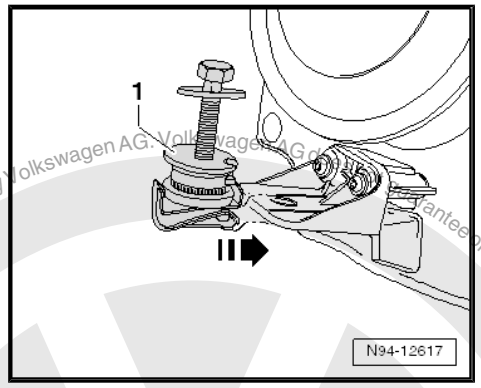


– Place new headlight retaining tab -1- over dedicated fastening holes and secure it with supplied bolts -arrows- (specified torque: 3.5 Nm).

Make sure that new headlight retaining tab is seated flush on securing points. Otherwise, a little more material must be removed from the surface where the old headlight retaining tab was cut off.

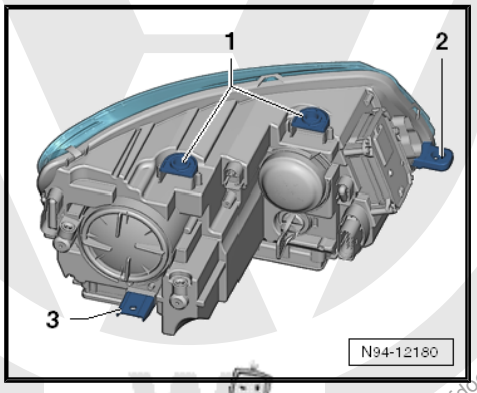


– Push adjusting device of headlight housing -1- in -direction of arrow- onto new headlight retaining tab.
– Install headlight and align it flush to body contour.
– Check headlight setting and adjust headlight as necessary ⇒ page 174 .



1.27.4 Installing repair kit for headlight housing, headlights with gas discharge lamps and cornering lights

If both upper headlight retaining tabs -1-, the side retaining tab -2- or the rearmost retaining tab -3- are damaged or have broken off, they can be repaired by installing a repair kit. There is no need to renew the entire headlight.



Note

- *Check that there is no further damage to the headlight that would make installation of the repair kit unnecessary.*
- *A repair kit is available for the headlight housing which can be used for the left or right headlight ⇒ ETKA (Electronic Parts Catalogue) .*

Installing the repair kit for the headlight housing on headlights with gas discharge lamps and cornering lights is carried out in the same way as on headlights with halogen bulbs as of 2011 ⇒ page 234 or ⇒ page 238 .

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2 Fog lights

⇒ “2.1 Removing and installing fog light”, page 243

⇒ “2.2 Removing and installing fog light bulb”, page 245

⇒ “2.3 Adjusting fog lights”, page 245

2.1 Removing and installing fog light

⇒ “2.1.1 Removing and installing fog light, vehicles up to model year 2010”, page 243

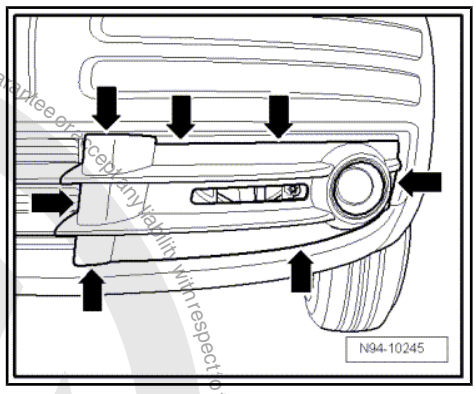
⇒ “2.1.2 Removing and installing fog light, vehicles as of model year 2011”, page 244

2.1.1 Removing and installing fog light, vehicles up to model year 2010

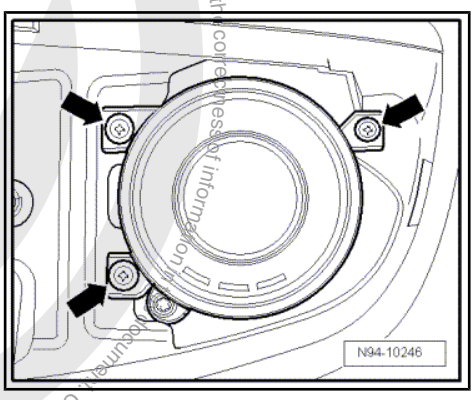
Removing:

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

– Unclip cover from catches -arrow-.

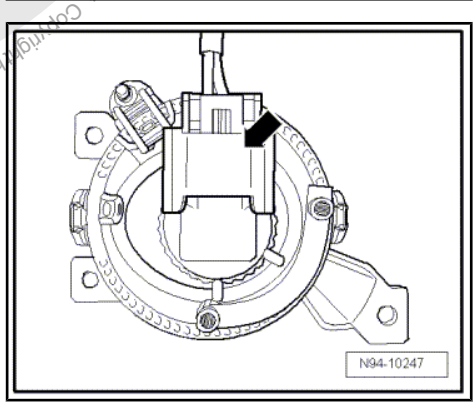


– Remove securing bolts -arrows-.



– Pull fog light housing out of bumper.

– Release and disconnect electrical connector -arrow-.



Installing:

Installation is carried out in the reverse order. When installing observe the following:

– Tighten bolt for securing fog light to bumper cover to 1.5 Nm.

– Check functioning of fog light.

– Check fog light setting and adjust if necessary ⇒ page 245 .

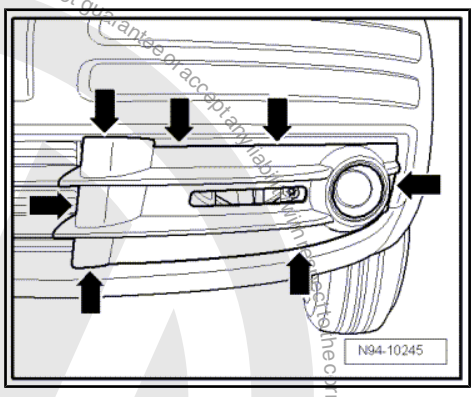
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2.1.2 Removing and installing fog light, vehicles as of model year 2011

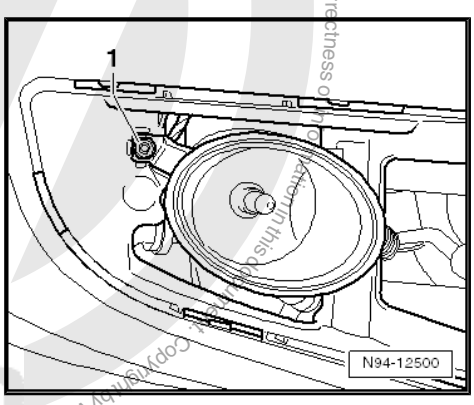
Removing:

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

– Unclip cover from catches -arrow-.

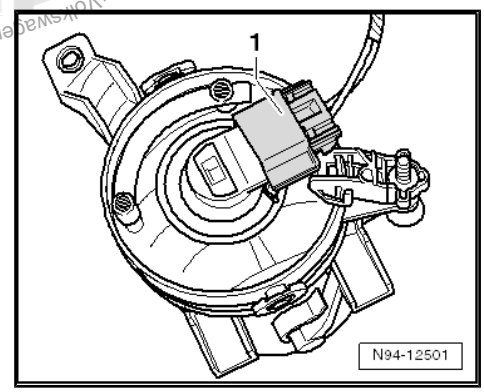


– Remove securing bolt -1-.



– Pull fog light housing out of bumper.

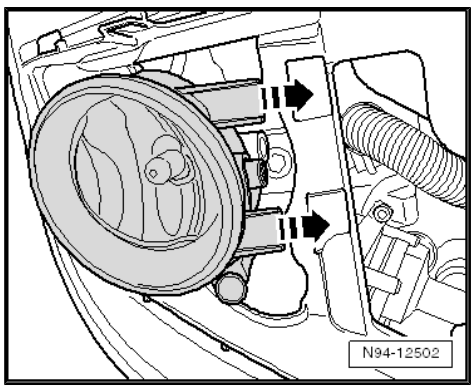
– Release and disconnect electrical connector -1-.



Installing:

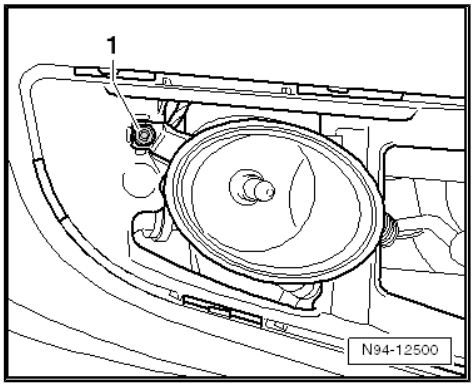
Install in the reverse order of removal. When doing this, note the following:

– Press fog light with tabs in -direction of arrow- into mountings in bumper.



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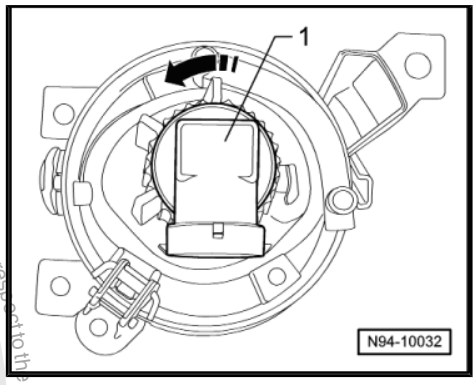
– Screw in securing bolt -1- and tighten it to 1.5 Nm.
– Check functioning of fog light.
– Check fog light setting and adjust if necessary ⇒ page 245 .



2.2 Removing and installing fog light bulb

Removing:

– Removing fog light ⇒ page 243
– Turn bulb holder -1- in -direction of arrow- and remove it from fog light.



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

The bulb for the fog light of type “H11” (12 V, 55 W) was installed in vehicles up to vehicle identification number “2K5 060 000”.

All Caddy vehicles built after this have the “HB4” bulb for the fog light.

Installing:

Installation is carried out in the reverse order. When installing observe the following:

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

– Check functions of fog light.
– Check fog light setting and adjust if necessary ⇒ page 245

2.3 Adjusting fog lights

– Adjusting spray jet in “Maintenance manual” ⇒ Maintenance ; Booklet ; Description of work

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3 Side turn signals

⇒ “3.1 Removing and installing side turn signals”, page 246

⇒ “3.2 Removing and installing turn signal light bulb”, page 247

3.1 Removing and installing side turn signals

Note

- *The illustrations show removal and installation of the left turn signal light*
- *Removal and installation of the right turn signal light are analogous.*

Caution

Risk of damage when turn signal repeater is being removed!

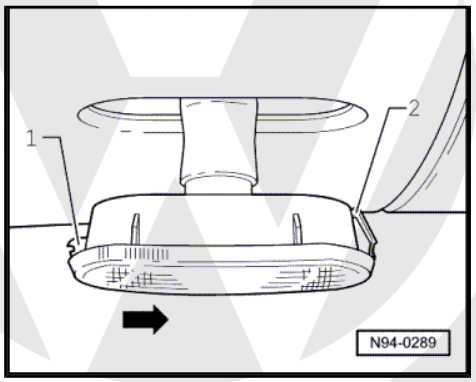
- ***It is only possible to remove turn signal repeater in one direction, therefore great care must be taken during removal.***
- ***Attempting to lever out the light on the spring clip side by force runs the risk of damaging the turn signal repeater or the vehicle paintwork.***
- ***When seen from outside in installed condition, it is not possible to tell on which side of the turn signal repeater the bearing point is located and on which side the spring clip is located.***
- ***Locate spring clip by carefully pushing turn signal repeater sideways.***

Removing:

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

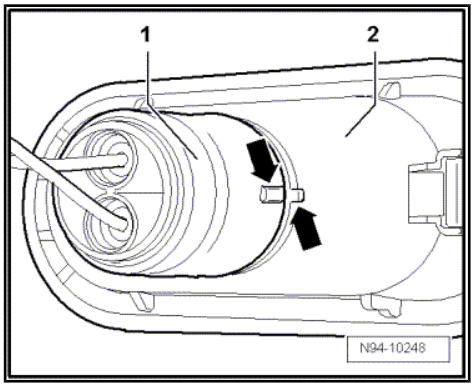
– Mask off the painted area on both sides of the turn signal.

– Carefully press the turn signal light in the direction of the spring clip -arrow- and, starting with the fixed anchor point, pull it out of the body.



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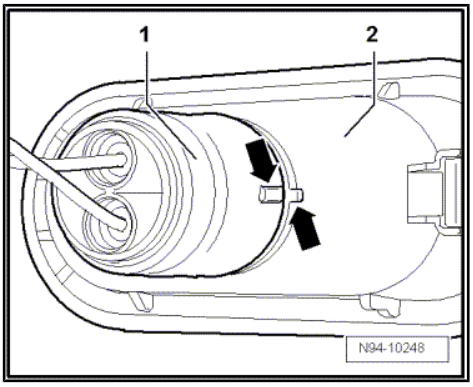
– Pull holder together with glass base bulb -1- off bulb housing -2- and remove bulb housing.



Installing:

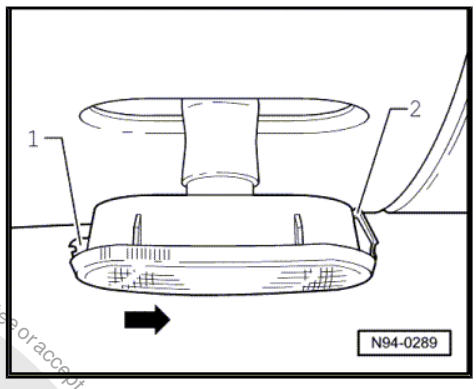
Install in the reverse order of removal. When doing this, note the following:

– Fit holder together with glass base bulb -1- onto bulb housing -2- so that retaining lugs -arrows- are opposite one another.



– Insert bulb housing into body, starting with the spring clip -2-, press in direction of spring clip -arrow- and secure it in body with fixed anchor point -1-.

– Following installation, check whether turn signal light is functioning correctly.



3.2 Removing and installing turn signal light bulb

Note

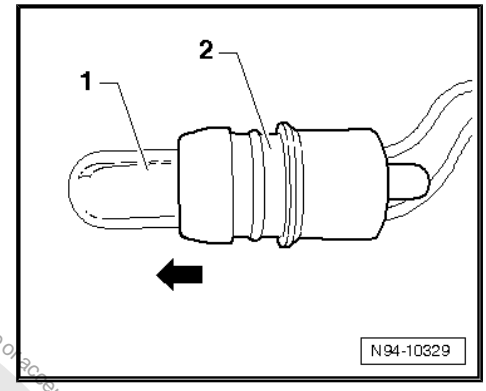
- *The illustrations show removal and installation of the bulb for left turn signal - M18- .*
- *Removal and installation of bulb for right turn signal - M19- are analogous.*

Removing:

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

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– Remove turn signal light ⇒ page 246 .
– Pull glass-base bulb -1- in a straight line out of bulb holder -2-.



Bulb for turn signal repeater : 12 V, WY5W

Installing:

Install in the reverse order of removal. When doing this, note the following:

– Following installation, check whether turn signal light is functioning correctly.

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4 Tail lights

⇒ “4.1 Assembly overview - tail light”, page 249

⇒ “4.2 Removing and installing tail light”, page 250

⇒ “4.3 Removing and installing tail light bulb carrier”, page 253

4.1 Assembly overview - tail light

Note

Additional information:

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

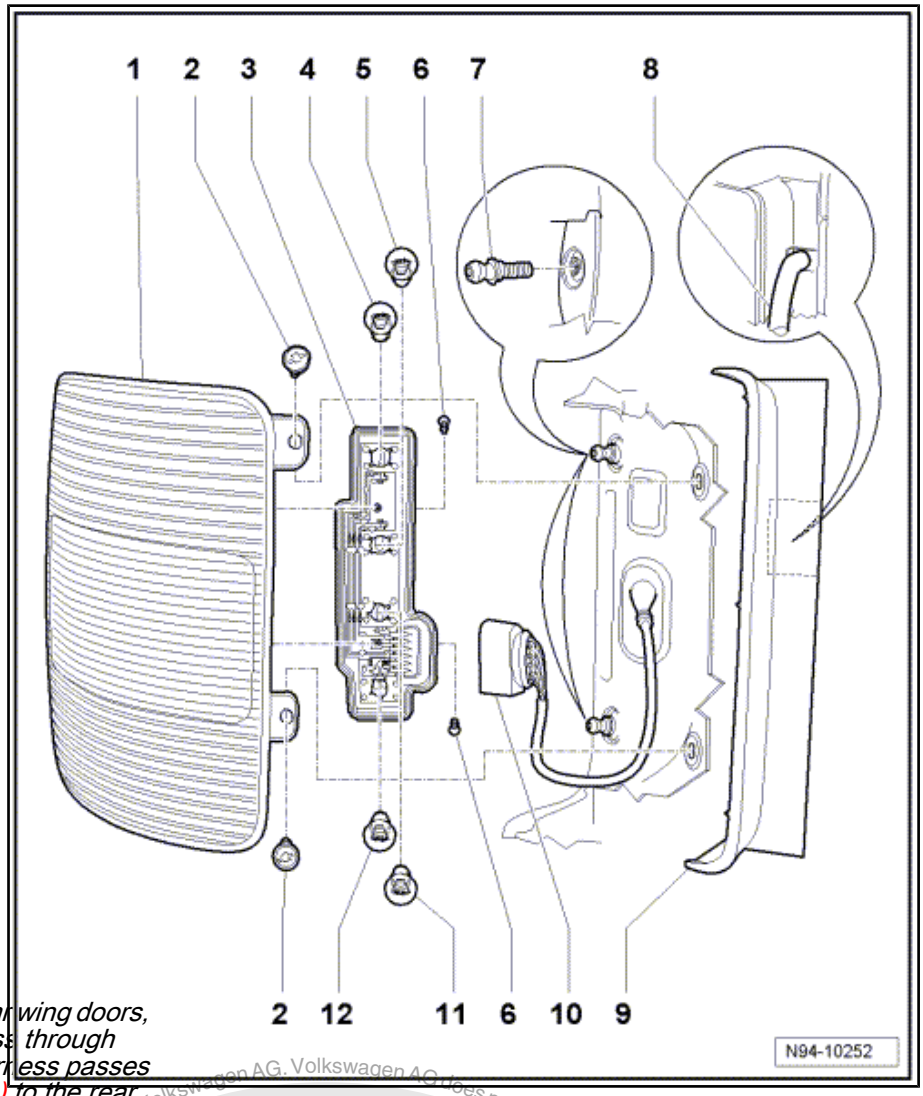
⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit has a self-diagnosis function, which makes fault finding on the tail lights easier.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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1 - Tail light housing

- ❑ Removing and installing ⇒ page 250

2 - Securing bolts

- ❑ For tail light housing ⇒ Item 1 (page 250)
- ❑ 3.5 Nm

3 - Bulb carrier

- ❑ Removing and installing ⇒ page 253

4 - Left brake light bulb - M9- or right brake light bulb - M10-

- ❑ 12 V, P21 W

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

- ❑ 12 V, P21 W

6 - Securing bolts

- ❑ For bulb holder ⇒ Item 3 (page 250)

7 - Ball head stud

8 - Wiring harness

- ❑ Only vehicles with rear wing doors

9 - Trim

Note

- *On vehicles with rear wing doors, the trim has a recess through which the wiring harness passes ⇒ Item 8 (page 250) to the rear wing door.*
- *Removal and installation on vehicles with rear lid is the same as on vehicles with rear wing doors.*

10 - Connector

- ❑ For tail light

11 - Left tail light and rear fog lamp bulb - M41- or right tail light and rear fog lamp bulb - M42-

- ❑ 12 V, P21 W, 4 W

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

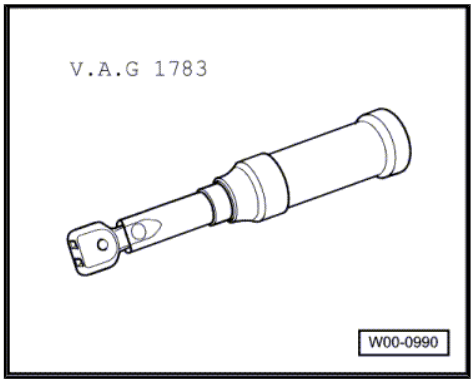
- ❑ 12 V, PY21 W

4.2 Removing and installing tail light

Special tools and workshop equipment required

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♦ Torque wrench - V.A.G 1783-



Removing:

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

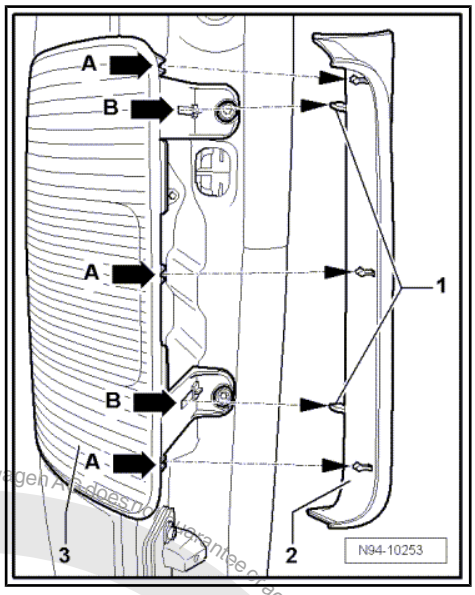
– Open rear lid or rear wing door.

Note

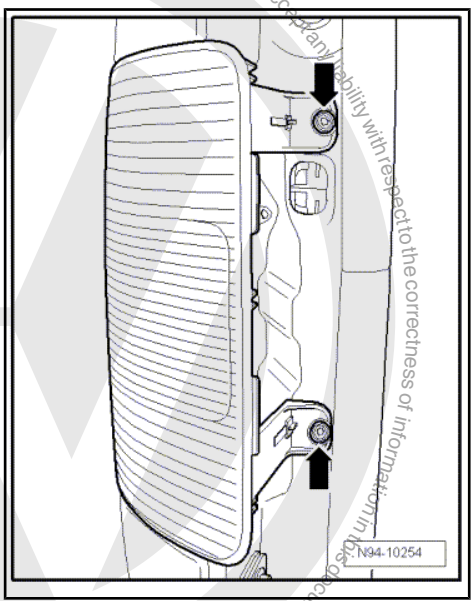
On vehicles with rear wing doors, the trim -2- has an opening through which the wiring harness passes into the rear wing door. Removal and installation on vehicles with rear lid is the same as on vehicles with rear wing doors.

– Unclip trim -2- from catches -arrows A- in tail light -3-.

– Pull guide lugs -1- of trim out of slits -arrows B- of the tail light and remove trim.

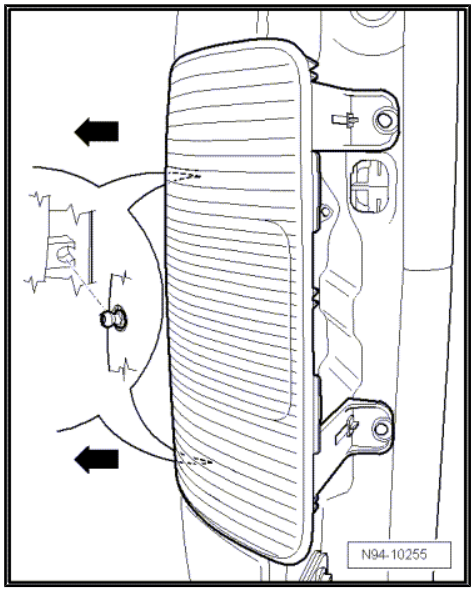


– Remove securing bolts -arrows-.

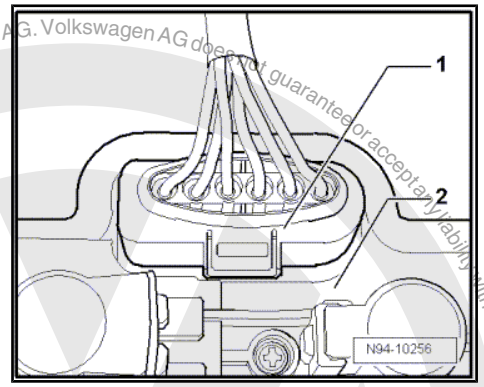


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– Pull mountings of tail light out of ball head studs in -direction of arrow-.



– Release and disconnect connector -1- and remove tail light -2- from vehicle.



Installing:

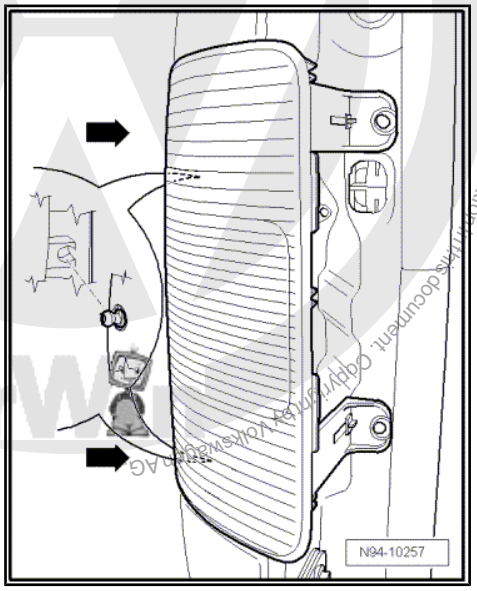
Note

- *If ball head stud has been removed (e.g. to facilitate body repairs), it must be screwed into body as far as it will go.*
- *On vehicles with a rear lid, the rear lid remains open during installation.*

– Close doors of vehicles with rear wing doors.

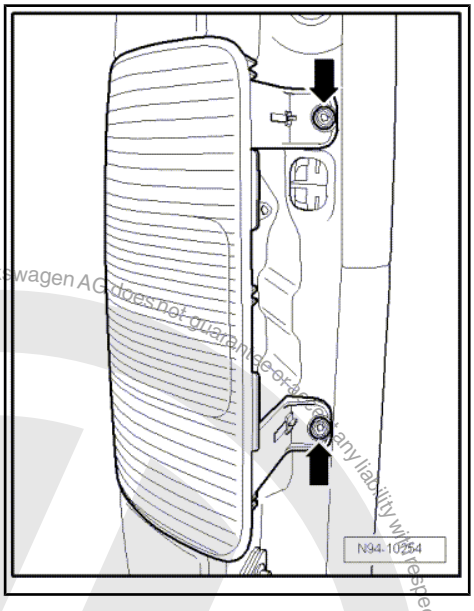
– Push tail light together with mountings onto ball head studs in -direction of arrow-.

– Open doors of vehicles with rear wing doors.



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– Tighten securing bolts -arrows- to 3.5 Nm.

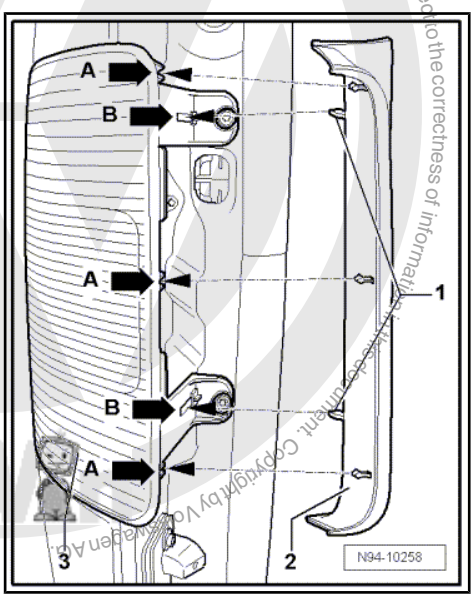


– Insert guide lugs -1- of trim -2- into slots -arrows B- of tail light -3-.

Note

On vehicles with rear wing doors, the wiring harness must be fed through the recess in the trim -2-.

– Press trims -2- into catches -arrows A- of tail light -3- until they audibly engage.



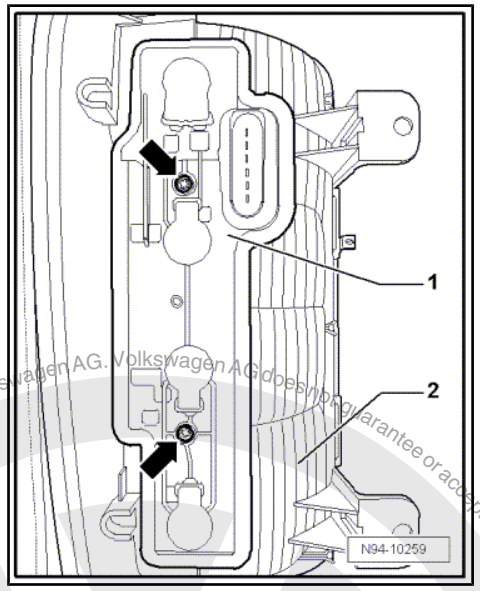
4.3 Removing and installing tail light bulb carrier

Removing:

– Remove tail light ⇒ page 250 .

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– Undo screws -arrows- and pull lamp carrier -1- out of tail light -2-.



Installing:

Installation is carried out in reverse order of removal.

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5 Additional brake light

⇒ “5.1 Removing and installing additional brake light”, page 255

⇒ “5.2 Removing and installing additional brake light bulb/LEDs”, page 256

5.1 Removing and installing additional brake light

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Note

- *Depending on the type of vehicle, the additional brake light is installed in either the rear lid or left rear wing door.*
- *Removal and installation of the additional brake light is the same for both versions.*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit has a self-diagnostic function, which facilitates fault finding in respect of the additional brake light.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

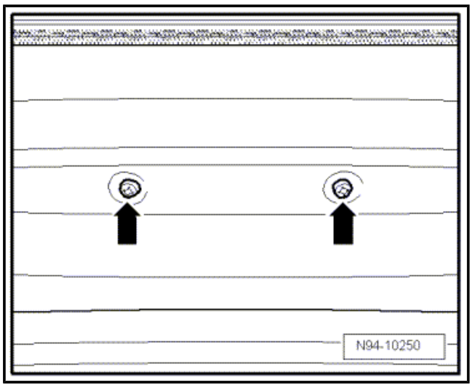
Removing:

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

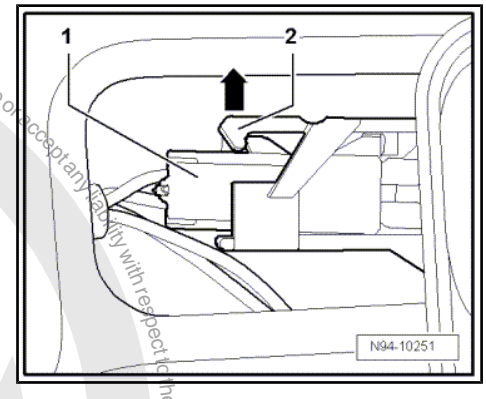
– Open rear lid or left rear wing door.

– Remove securing bolts -arrows-.

– Close rear lid or left rear wing door.



– Pull additional brake light out of rear lid/left rear wing door until connector is accessible.
– Press retaining lug -2- in -direction of arrow- and disconnect connector -1-.
– Take additional brake light out of rear lid/left rear wing door.



Installing:

Installation is carried out in the reverse sequence. Observe the following when doing this:

Note

When installing additional brake light, make sure seal is correctly seated.

5.2 Removing and installing additional brake light bulb/LEDs

Note

- *Failure of LEDs in additional brake lights*
- *The individual LEDs (light-emitting diodes) in the additional 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 additional brake must be renewed.*

The LEDs in the additional brake light cannot be renewed individually. In the event of repairs, the additional brake light bulb -M25- must be renewed as a complete unit ⇒ page 255 .

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6 Number plate light

⇒ “6.1 Removing and installing number plate light ”, page 257

⇒ “6.2 Removing and installing bulb for number plate light”, page 258

6.1 Removing and installing number plate light

Note

- *Depending on the type of vehicle, the number plate light is installed in either the rear lid or left rear wing door.*
- *Removal and installation of the number plate light is the same for both versions.*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

Fault detection and fault display:

The onboard supply control unit has a self-diagnosis function, which makes fault finding on the number plate lights easier.

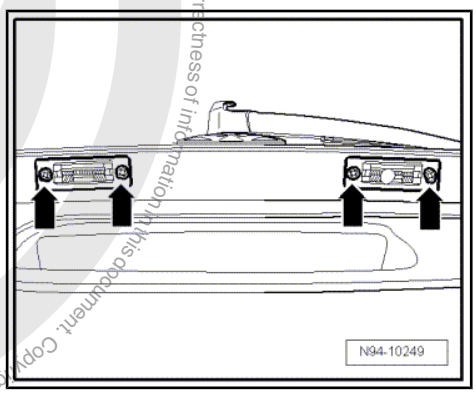
For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒page 403 .

Removing:

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

– Unscrew securing bolts -arrows- for number plate light - X- .

– Remove number plate light - X- .



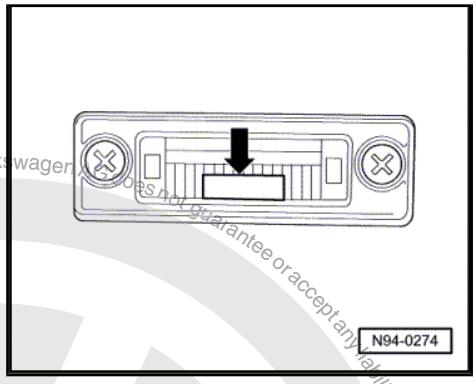
Installing:

Install in the reverse order of removal. When doing this, note the following:

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Note

A small silver coloured anti-dazzle strip -arrow- is fitted on scatter lens of number plate light - X- . When installing the lens, always make sure that the anti-dazzle strip faces the bumper.



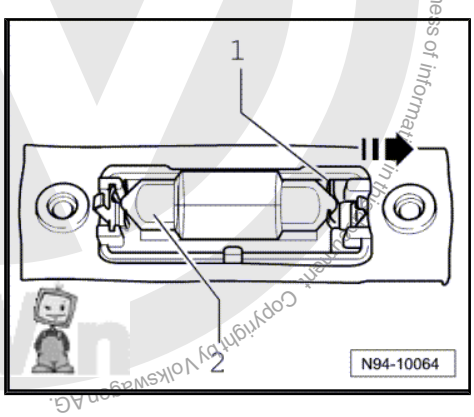
6.2 Removing and installing bulb for number plate light

Removing:

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

– Remove number plate light ⇒ page 257 .

– Press contact plate -1- in -direction of arrow- and remove bulb -2- from bulb holder.



Bulb for number plate light - X- : festoon bulb, 12 V, C5W.

Installing:

Installation is carried out in reverse order of removal.

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7 Steering column switch module, vehicles up to model year 2010

⇒ “7.1 General description - steering column switch module, vehicles up to model year 2010”, page 259

⇒ “7.2 Assembly overview - steering column switch module, vehicles up to model year 2010”, page 260

⇒ “7.3 Components of steering column switch module - removal and installation sequence”, page 261

⇒ “7.4 Removing and installing steering column electronics control unit J527 ”, page 262

⇒ “7.5 Removing and installing coil connector F350 ”, page 263

⇒ “7.6 Removing and installing steering angle sender G85 ”, page 265

⇒ “7.7 Removing and installing turn signal switch E2 ”, page 266

⇒ “7.8 Removing and installing windscreen wiper switch E ”, page 267

⇒ “7.9 Removing and installing steering column switch module base”, page 269

⇒ “7.10 Coding steering column electronics control unit ”, page 270

⇒ “7.11 Steering column electronics control unit - final control diagnosis”, page 271

⇒ “7.12 Basic setting of steering angle sensor ”, page 271

7.1 General description - steering column switch module, vehicles up to model year 2010

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 261 .

Note

- *If a new steering column electronics control unit - J527- is installed, it must be coded ⇒ page 270 .*
- *In the event of faults in the steering column switch module, the coding of the steering column electronics control unit - J527- must be checked ⇒ page 270 .*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

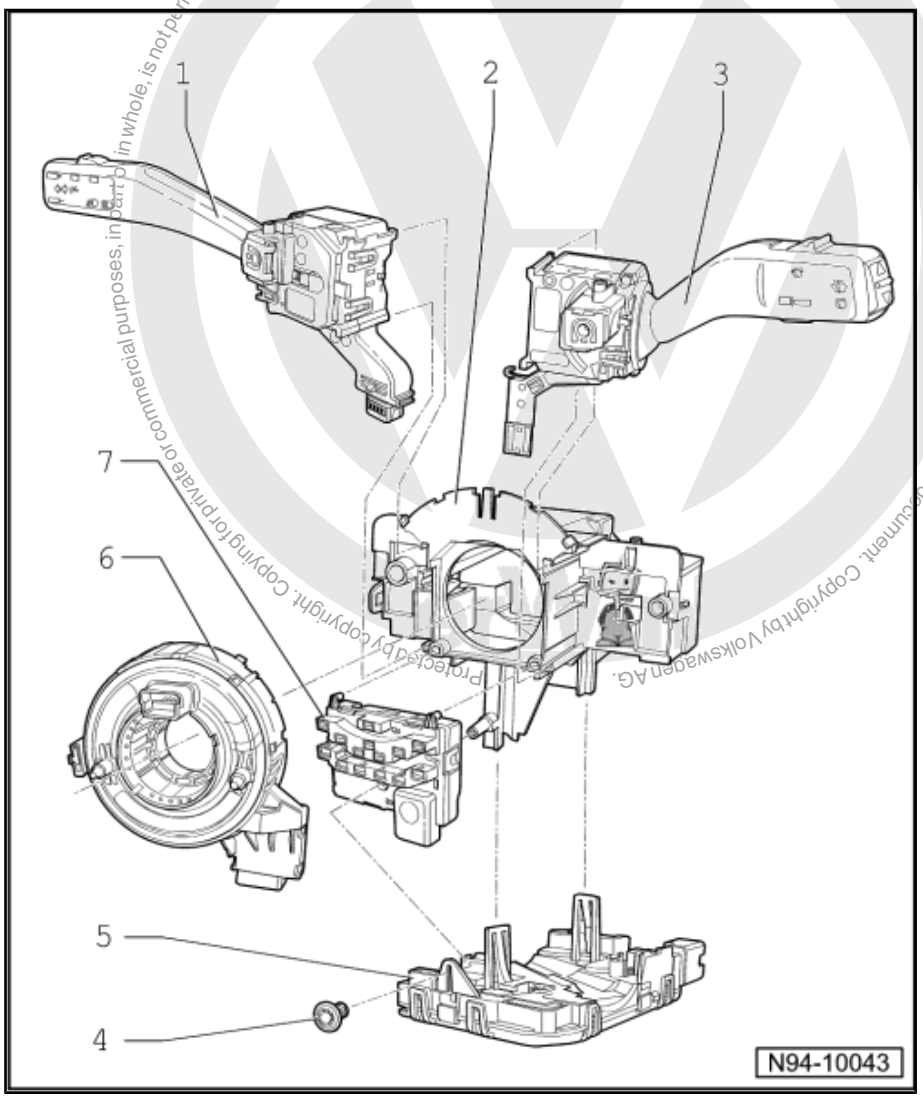
Fault detection and fault display:

The steering column electronics control unit - J527- is equipped with self-diagnosis, which makes fault finding easier.

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For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

7.2 Assembly overview - steering column switch module, vehicles up to model year 2010



1 - Turn signal switch

- ❑ Observe removal and installation sequence! ⇒ page 261
- ❑ Removing and installing ⇒ page 266 .
- ❑ The “turn signal switch” comprises of the following components: turn signal switch - E2- , headlight dipper and flasher switch - E4- and, if fitted with cruise control system, cruise control system switch - E45-
- ❑ The illustration shows the “turn signal switch” with no cruise control system switch - E45-

2 - Steering column switch module base

- ❑ Observe removal and installation sequence! ⇒ page 261
- ❑ Removing and installing ⇒ page 269 .

3 - Windscreen wiper switch - E-

- ❑ Observe removal and installation sequence! ⇒ page 261
- ❑ Removing and installing ⇒ page 267 .

4 - Securing bolt

5 - Steering column electronics control unit - J527-

- ❑ Observe removal and installation sequence! ⇒ page 261
- ❑ Removing and installing ⇒ page 262 .
- ❑ Coding ⇒ page 270
- ❑ Final control diagnosis ⇒ page 271 .

6 - Coil connector - F350-

- ❑ Observe removal and installation sequence! ⇒ page 261
- ❑ Removing and installing ⇒ page 263 .

7 - Steering angle sender - G85-

- ❑ Observe removal and installation sequence! ⇒ page 261
- ❑ Removing and installing ⇒ page 265 .
- ❑ Basic setting ⇒ page 271

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7.3 Components of steering column switch module - removal and installation sequence

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Removing:

For removal of the complete steering column switch module, including base, the switch module is dismantled and the steering lock housing is also removed. For assembly of the steering lock housing, new shear bolts are required. Even if only one component of the steering column switch module is removed or renewed, the sequence described as follows must always be adhered to.

– Disconnect battery ⇒ page 3 .

WARNING

- *Danger of the triggering of the airbag!*
- *Improper action on airbag unit may result in the triggering of the airbag!*
- *Observe safety precautions when working on airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag; Safety precautions when working on airbag .*

– Remove driver airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag; Removing and installing driver airbag; Removing .

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

Remove components of steering column switch module in following sequence:

- Steering column electronics control unit - J527- ⇒ page 262
- Coil connector - F350- ⇒ page 263
- Steering angle sensor - G85- ⇒ page 265
- Turn signal switch - E2- ⇒ page 266
- Windscreen wiper switch - E- ⇒ page 267
- Steering column switch module base ⇒ page 269

Installing:

Installation is carried out in reverse order of removal.

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

Note

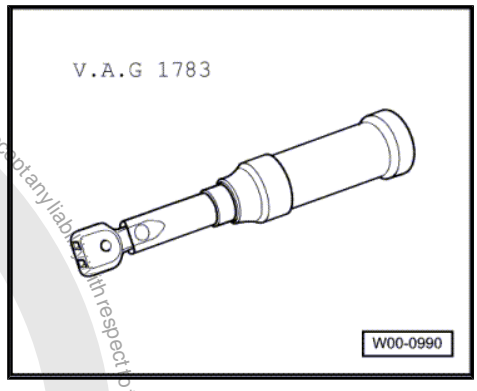
- *After new control unit has been installed, it must be coded ⇒ page 270 .*
- *In the event of faults in the steering column switch module, the coding of the control unit must be checked ⇒ page 270 .*

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 261 .

Special tools and workshop equipment required

- Torque wrench - V.A.G 1783-



Removing:

– Disconnect battery ⇒ page 3 .

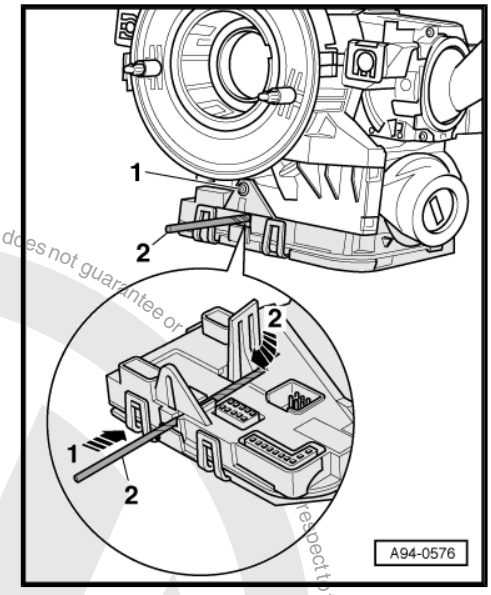
Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

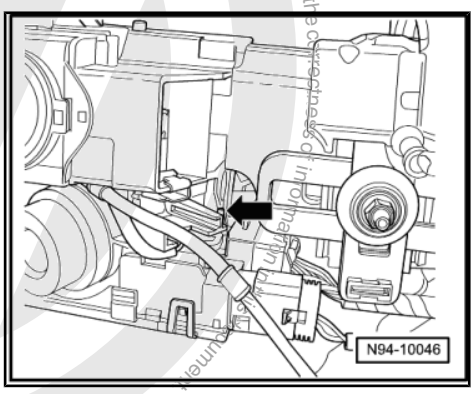
– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

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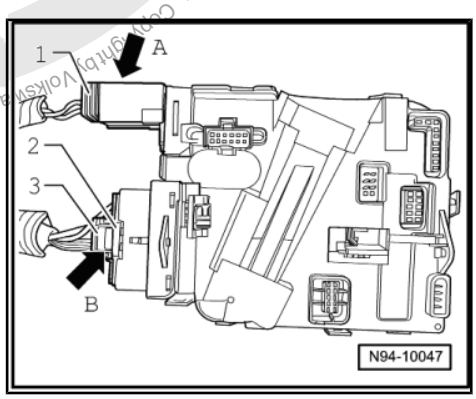
– Remove securing bolt -1-.
– Insert e.g. a piece of wire or a 2.5 mm drill bit -2- approx. 45 mm into hole -arrow 1- in steering column electronics control unit - J527- to release locking tab -arrow 2-.



– Using a screwdriver, push against rear retaining clip -arrow- of control unit for steering column electronics - J527- .
– Carefully pull steering column electronics control unit - J527- downwards off steering column switch module.



– Release -arrow A- connector -1- and pull it off steering column electronics control unit - J527- .
– Pull locking bar -3- out of connector.
– Release -arrow B- connector -2- and pull it off steering column electronics control unit - J527- .



Installing:

Install in the reverse order of removal. When doing this, note the following:

Note

When connecting connectors, ensure that none of the pins become bent and that the connectors audibly engage.

7.5 Removing and installing coil connector - F350-

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 261 .

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Removing:

– Disconnect battery ⇒ page 3 .

Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

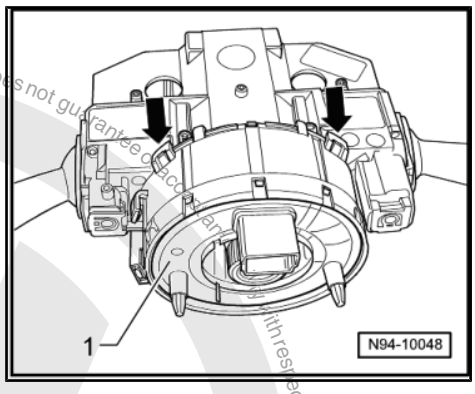
– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Remove steering column electronics control unit - J527- ⇒ page 262 .

Note

Coil connector should not be moved out of central position during removal and road wheels should be in “straight-ahead” position.

– Slightly raise tabs -arrows- on coil connector -1-, and pull coil connector towards rear and off steering column/steering column switch module.



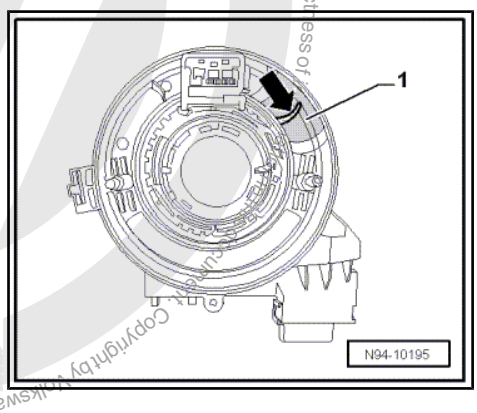
Installing:

Install in the reverse order of removal. When doing this, note the following:

Note

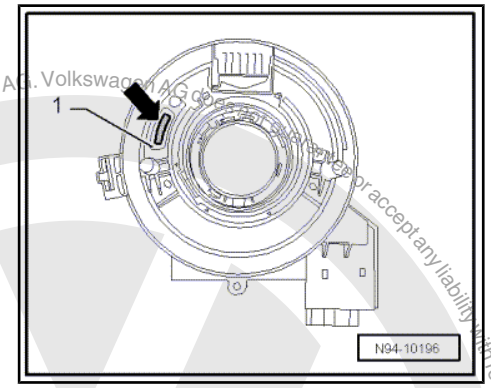
During installation of coil connector, coil connector must be in central position and road wheels must be in “straight-ahead” position.

The central position (depending on manufacturer) of the coil connector is shown in the following diagram:



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- The coloured strip (black rectangles) -arrow- must be located in sight window -1-.
- The coloured strip (yellow) -arrow- must be in sight window -1-.



Note

If a new steering angle sensor - G85- in installed, this procedure must be followed by a "basic setting" ⇒ page 271 .

7.6 Removing and installing steering angle sender - G85-

Assignment of fitting locations of steering angle sender:

	Vehicles with electronic steering without ESP	Vehicles with electronic steering with ESP	Vehicles with hydraulic steering without ESP	Vehicles with hydraulic steering with ESP
Steering angle sender on steering column	x[1)]	x[1)]	No steering angle sender installed	x
Steering angle sender in steering rack	x[2)]	x[2)]	No steering angle sender installed	

1) Vehicles up to model year 2009

2) Vehicles as of model year 2010

Note

- *On vehicles with hydraulic steering and without ESP, the steering angle sender is no more installed as of 06.2007.*
- *On vehicles with electronic steering as of model year 2010, the steering angle sender is only installed in the steering rack.*

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 261 .

Removing:

– Disconnect battery ⇒ page 3 .

Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

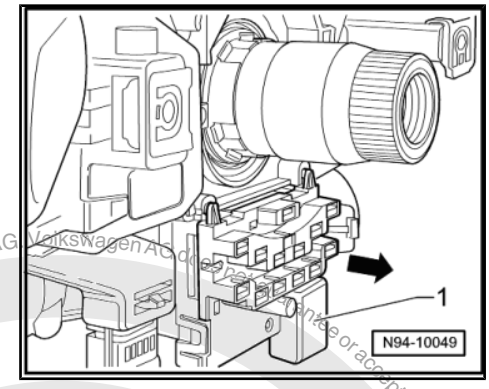
– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Remove steering column electronics control unit - J527- ⇒ page 262 .

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– Remove airbag coil connector and return ring with slip ring - F138- ⇒ page 263 .

– Pull steering angle sender - G85- -1- towards rear -arrow- off steering column switch module.



Installing:

Installation is carried out in reverse order of removal.

7.7 Removing and installing turn signal switch - E2-

Note

- *The "turn signal switch" comprises of the following components: turn signal switch - E2- , headlight dipper and flasher switch - E4- and, if fitted with cruise control system, cruise control system switch - E45- .*
- *For reasons of clarity, the steering column switch module is shown in the removed state with cruise control system switch - E45- in the illustration.*

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 261 .

Removing:

– Disconnect battery ⇒ page 3 .

Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

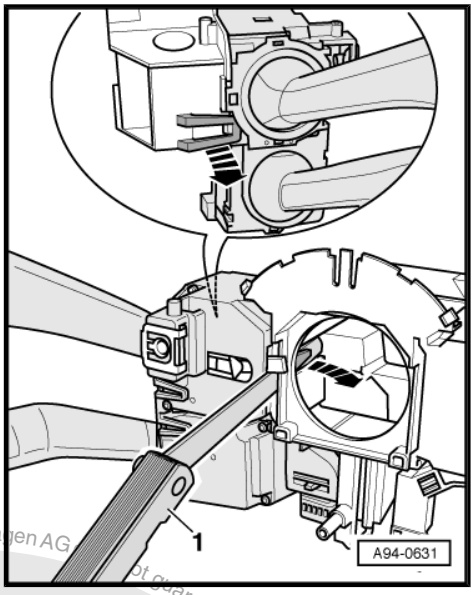
– Remove steering column electronics control unit - J527- ⇒ page 262 .

– Remove airbag coil connector and return ring with slip ring - F138- ⇒ page 263 .

– Remove steering angle sensor - G85- ⇒ page 265

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– Release retaining clips -arrows- with a feeler gauge 1.0 mm -1- and remove “turn signal switch” towards the rear.



Installing:

Install in the reverse order of removal. When doing this, note the following:

Note

The “turn signal switch” should be heard to engage.

7.8 Removing and installing windscreen wiper switch - E-

Note

For reasons of clarity, the illustration shows the steering column switch module in the removed state.

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 261

Removing:

– Disconnect battery ⇒ page 3

Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Remove steering column electronics control unit - J527- ⇒ page 262 .

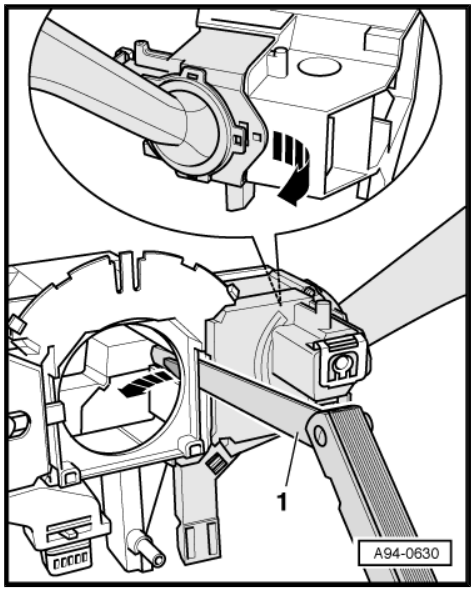
– Remove airbag coil connector and return ring with slip ring - F138- ⇒ page 263 .

– Remove steering angle sensor - G85- ⇒ page 265

– Remove turn signal switch - E2- ⇒ page 266

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– Release retaining clips -arrows- with a feeler gauge 1.0 mm -1- and remove windscreen/window washer switch - E- towards the rear.



Installing:

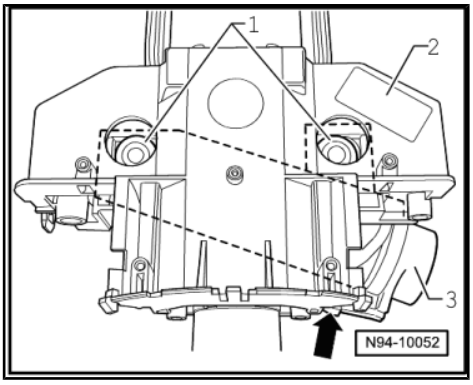
Install in the reverse order of removal. When doing this, note the following:

Note

The windscreen wiper switch - E- should be heard to engage.

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7.9 Removing and installing steering column switch module base



Note

To remove steering column switch module base -2-, shear bolts of the steering lock housing must be drilled out. To reinstall, new shear-head bolts -1- are required ⇒ Parts catalogue (ETKA) .

Caution

- *Ensure that the components mounted on the carrier have been removed before drilling out the shear-head bolts.*
- *The drilling operation can cause swarf to penetrate the adjacent components resulting in damage and/or malfunction!*
- *Always observe the prescribed sequence when removing components ⇒ page 261 .*
- *To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .*

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 261 .

Removing:

– Disconnect battery ⇒ page 3 .

Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Remove steering column electronics control unit - J527- ⇒ page 262 .

– Remove airbag coil connector and return ring with slip ring - F138- ⇒ page 263 .

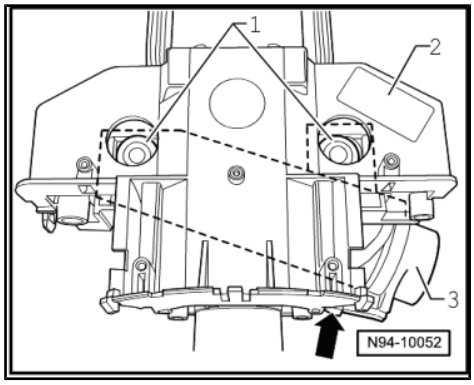
– Remove steering angle sensor - G85- ⇒ page 265

– Remove turn signal switch - E2- ⇒ page 266

– Remove windscreen wiper switch - E- ⇒ page 267

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– Pull connector -arrow- off reader coil -3-.



The base can be removed once all the components secured to it have been removed:

– Drill out bolts -1- of steering lock housing -3-.

Note

Bolts M8 -1-, core diameter 6.8 mm

– Pull steering lock housing and steering column switch module base -2- towards rear off steering column.

– Remove steering lock housing from steering column switch module base.

Installing:

Install in the reverse order of removal. When doing this, note the following:

Caution

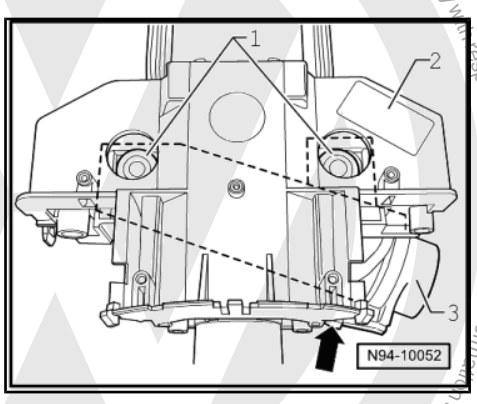
Steering lock will be damaged if improperly fitted!

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.

– Insert steering lock housing into steering column switch module base.

– Push steering column switch module base -2- as far as possible onto steering column.



– Connect electrical connector -arrow- to reader coil -3-.

– Bolt steering lock housing onto steering column using new shear-head bolts -1-.

– Tighten shear-head bolts -1- until bolt heads shear off.

– Fit all components analogously in reverse order of removal.

7.10 Coding steering column electronics control unit

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select "Guided fault finding" in vehicle diagnostic tester .

– Using "GoTo" button, select "Functions/component" and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems

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- Steering wheel electronics
- Steering wheel electronics functions
- Coding steering wheel electronics control unit

7.11 Steering column electronics control unit - final control diagnosis

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Steering wheel electronics
- Steering wheel electronics functions
- Steering wheel electronics final control diagnosis

7.12 Basic setting of steering angle sensor

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Running gear
- Brake system
- 01 - On Board Diagnostic capable systems Mark 60 / Mark 70
- Anti-lock brake system ABS/EDL/TCS/ESP Mark 60
- Functions
- Basic setting of steering angle sensor - G85-

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8 Steering column switch module, vehicles as of model year 2011

⇒ “8.1 General description - steering column switch module, vehicles as of model year 2011”, page 272

⇒ “8.2 Assembly overview - steering column switch module, vehicles as of model year 2011”, page 273

⇒ “8.3 Components of steering column switch module - removal and installation sequence”, page 274

⇒ “8.4 Removing and installing steering column electronics control unit J527 ”, page 275

⇒ “8.5 Steering column combination switch E595 ”, page 278

⇒ “8.6 Steering column switch module base”, page 280

⇒ “8.7 Coding steering column electronics control unit J527 ”, page 283

8.1 General description - steering column switch module, vehicles as of model year 2011

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 274 .

The components of the steering column combination switch, steering column electronics control unit and steering column switch module base are installed as 2 different versions depending on respective manufacturer (Valeo or Kostal). The visible fastening of the steering column electronics control unit to the steering column combination switch can be used to identify which version is installed.

- Manufacturer Valeo: 3 bolts.
- Manufacturer Kostal: 1 bolt at bottom and 2 fasteners at top.

Note

- *If a new steering column electronics control unit - J527- is installed, it must be coded ⇒ page 283 .*
- *Additional information:*

⇒ Operating manual

Fault detection and fault display:

The steering column electronics control unit - J527- is equipped with self-diagnosis, which is designed to simplify fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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8.2 Assembly overview - steering column switch module, vehicles as of model year 2011

Note

The components steering column electronics control unit - J527- , steering column combination switch - E595- and the steering column switch module base are available as different versions depending on manufacturer (Valeo or Kostal). Illustration of assembly overview shows Valeo version.

1 - Steering column electronics control unit - J527-

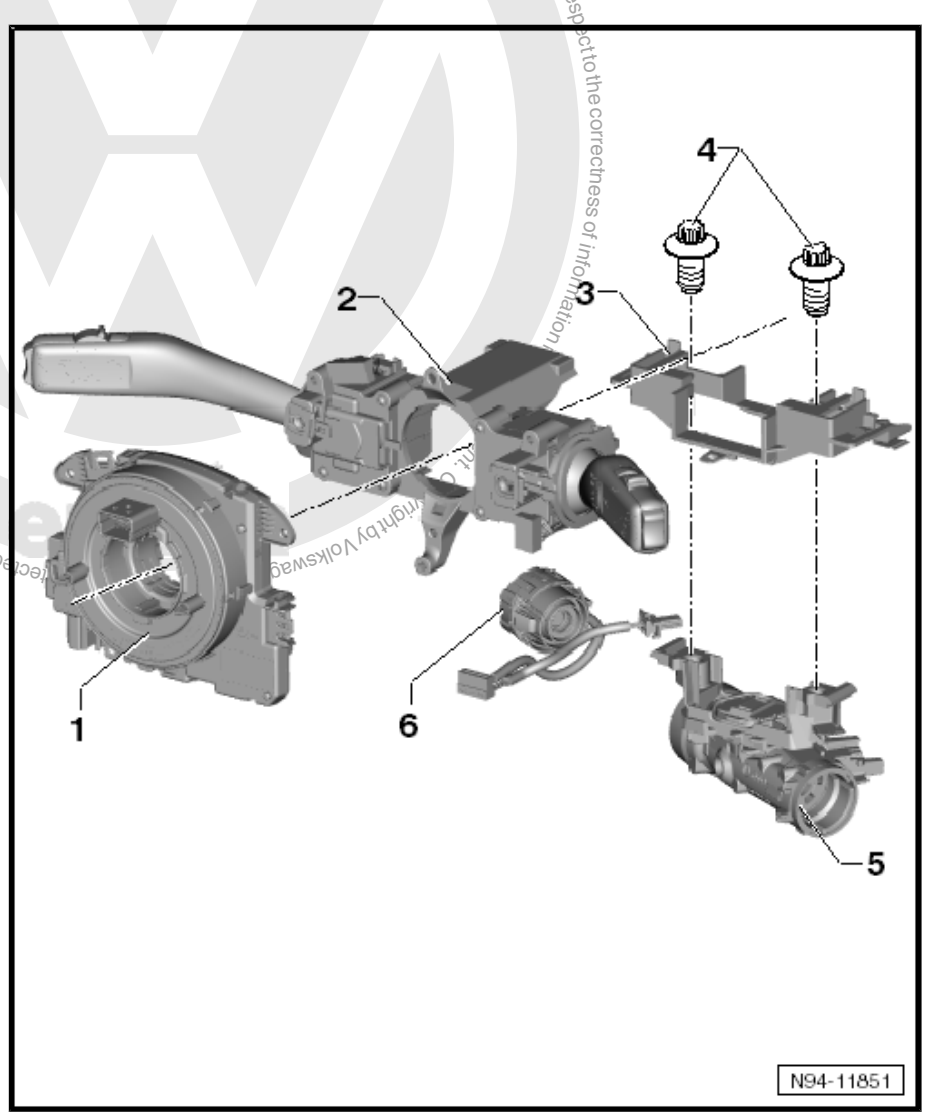
- ❑ Note removal and installation sequence ⇒ page 274
- ❑ Removing and installing (manufacturer Valeo) ⇒ page 275 .
- ❑ Removing and installing (manufacturer Kostal) ⇒ page 276 .
- ❑ Coding ⇒ page 283 .
- ❑ Specified torque of securing bolts: 1.5 Nm

2 - Steering column combination switch - E595-

- ❑ Note removal and installation sequence ⇒ page 274
- ❑ Removing and installing (manufacturer Valeo) ⇒ page 278 .
- ❑ Removing and installing (manufacturer Kostal) ⇒ page 279 .

3 - Steering column switch module base

- ❑ Note removal and installation sequence ⇒ page 274
- ❑ Removing and installing (manufacturer Valeo) ⇒ page 280 .
- ❑ Removing and installing (manufacturer Kostal)



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⇒ page 282 .

4 - Shear-head bolts

- ❑ M8x20
- ❑ Shear moment approx. 15 Nm

5 - Steering lock housing

Steering lock housing is removed and installed together with steering column switch module base.

- ❑ Note removal and installation sequence ⇒ page 274
- ❑ Removing and installing (manufacturer Valeo) ⇒ page 280 .
- ❑ Removing and installing (manufacturer Kostal) ⇒ page 282 .

6 - Ignition/starter switch and lock cylinder

- ❑ Removing and installing ⇒ page 359 .

8.3 Components of steering column switch module - removal and installation sequence

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

For removal of the complete steering column switch module, including base, the switch module is dismantled and the steering lock housing is also removed. For assembly of the steering lock housing, new shear bolts are required.

Even if only one component of the steering column switch module is removed or renewed, the sequence described as follows must always be adhered to.

Removing:

– Disconnect battery ⇒ page 3 .

WARNING

- ♦ ***Danger of the triggering of the airbag!***
- ♦ ***Improper action on airbag unit may result in the triggering of the airbag!***
- ♦ ***Observe safety precautions when working on airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag; Safety precautions when working on airbag .***

– Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

The components of the steering column module must be removed in the following sequence:

- ♦ Steering column electronics control unit - J527- ⇒ page 275
- ♦ Steering column combination switch - E595- ⇒ page 278

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- Steering column switch module base ⇒ page 280 .

Installing:

Installation is carried out in reverse order of removal.

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

⇒ "8.4.1 Removing and installing steering column electronics control unit J527 , manufacturer Valeo", page 275

⇒ "8.4.2 Removing and installing steering column electronics control unit J527 , manufacturer Kostal", page 276

8.4.1 Removing and installing steering column electronics control unit - J527- , manufacturer Valeo

The steering column electronics control unit - J527- comprises the following components and cannot be dismantled:

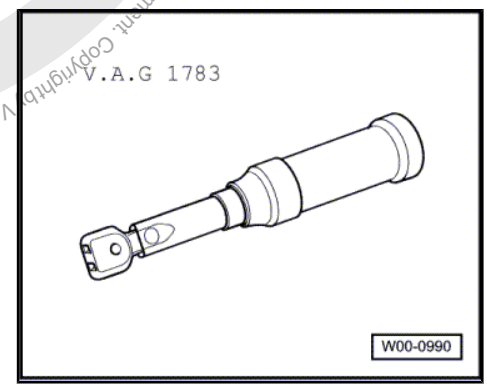
- Airbag coil connector and return ring with slip ring - F138-
- Steering angle sender - G85-

Note

- *If a new steering column electronics control unit - J527- is installed, the inserted transport protection must be removed before installation.*
- *If a new steering column electronics control unit - J527- is installed, it must be coded ⇒ page 283 .*
- *In the event of faults in the steering column switch module, the coding of the steering column electronics control unit - J527- must be checked ⇒ page 283 .*

Special tools and workshop equipment required

- Torque wrench - V.A.G 1783-



Removing:

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 274 .

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WARNING

- *Danger of the triggering of the airbag!*
- *Improper action on airbag unit may result in the triggering of the airbag!*
- *Observe safety precautions when working on airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag; Safety precautions when working on airbag .*

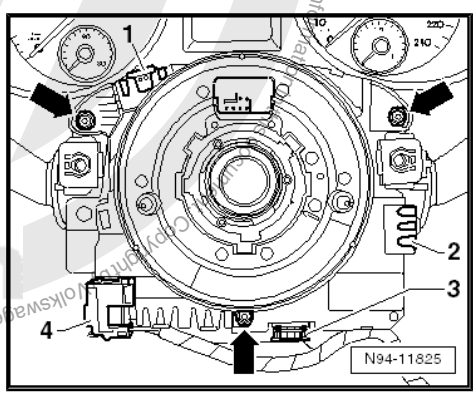
– Disconnect battery ⇒ page 3 .

Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Depending on equipment level, release and disconnect connectors -1-, -2-, -3- and -4-.



Note

Coil connector on steering column electronics control unit - J527- must not be twisted from its centre position. The front wheels must be in “straight-ahead” position.

– Unscrew the three securing bolts -arrows- and pull steering column electronics control unit - J527- towards rear off steering column switch module.

Installing:

Installation is carried out in the reverse order. When installing observe the following:

Caution

Turn signal switch reset lever can break when control unit is being installed.

Turn signal lever must be in 0 position when control unit is installed so that reset lever is not extended.

– Push steering column electronics control unit - J527- in a straight line onto steering column switch module.

– Screw in the three bolts for securing steering column electronics control unit - J527- to steering column switch module and tighten them to 1.5 Nm.

– Fit all components analogously in reverse order of removal.

8.4.2 Removing and installing steering column electronics control unit - J527- , manufacturer Kostal

The steering column electronics control unit - J527- comprises the following components and cannot be dismantled:

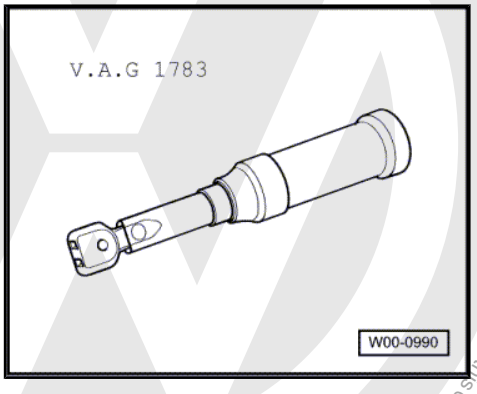
- Airbag coil connector and return ring with slip ring - F138-
- Steering angle sender - G85-

Note

- *If a new steering column electronics control unit - J527- is installed, the inserted transport protection must be removed before installation.*
- *If a new steering column electronics control unit - J527- is installed, it must be coded ⇒ page 283 .*
- *In the event of faults in the steering column switch module, the coding of the steering column electronics control unit - J527- must be checked ⇒ page 283 .*

Special tools and workshop equipment required

- Torque wrench - V.A.G 1783-



Removing:

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 274 .

WARNING

- *Danger of the triggering of the airbag!*
- *Improper action on airbag unit may result in the triggering of the airbag!*
- *Observe safety precautions when working on airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag; Safety precautions when working on airbag .*

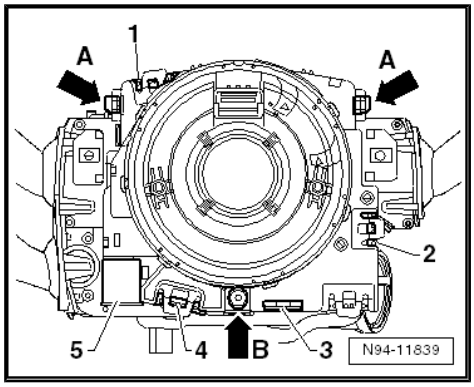
– Disconnect battery ⇒ page 3 .

Remove the following components in sequence (one after the other):

– Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag .

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– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .
– Depending on equipment level, release and disconnect connectors -1-, -2-, -3-, -4- and -5-.
– Unscrew securing bolt -arrow B-.



Note

Coil connector for steering column electronics on steering column electronics control unit - J527- must not be twisted from its centre position. The front wheels must be in "straight-ahead" position.

– Release both catches -arrows A- and pull steering column electronics control unit - J527- towards rear and off steering column switch module.

Installing:

Installation is carried out in the reverse order. When installing observe the following:

Caution

Turn signal switch reset lever can break when control unit is being installed.

Turn signal lever must be in 0 position when control unit is installed so that reset lever is not extended.

– Push steering column electronics control unit - J527- in a straight line onto steering column switch module until it securely engages.
– Screw in bolt for securing steering column electronics control unit - J527- to steering column switch module and tighten it to 1.5 Nm.
– Fit all components analogously in reverse order of removal.

8.5 Steering column combination switch - E595-

⇒ "8.5.1 Removing and installing steering column combination switch E595 , manufacturer Valeo", page 278

⇒ "8.5.2 Removing and installing steering column combination switch E595 , manufacturer Kostal", page 279

8.5.1 Removing and installing steering column combination switch - E595- , manufacturer Valeo

Depending on equipment, the steering column combination switch - E595- comprises the following components and cannot be dismantled:

- Turn signal switch - E2-
- Windscreen wiper switch - E-
- CCS switch - E45-

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Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 274 .

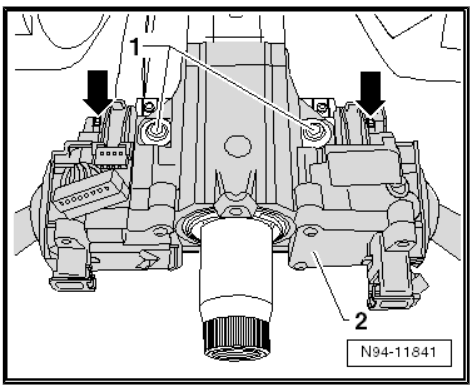
Removing:

– Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Remove steering column electronics control unit - J527- ⇒ page 275 .

– Release both catches -arrows- and pull complete steering column combination switch - E595- in a straight line and towards rear off steering column switch module base.



Installing:

– Push steering column combination switch - E595- in a straight line onto guides on steering column switch module base until it securely engages.

– Fit all components analogously in reverse order of removal.

8.5.2 Removing and installing steering column combination switch - E595- , manufacturer Kostal

Depending on equipment, the steering column combination switch - E595- comprises the following components and cannot be dismantled:

- Turn signal switch - E2-
- Windscreen wiper switch - E-
- CCS switch - E45-

Caution

The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 274 .

Removing:

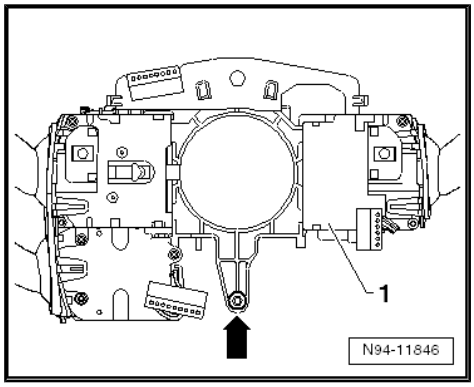
– Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

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– Remove steering column electronics control unit - J527- ⇒ page 275 .

– Unscrew securing bolt -arrow- and pull complete steering column combination switch - E595- -1- in a straight line and towards rear off steering column switch module base.



Installing:

– Push steering column combination switch - E595- in a straight line onto guides on steering column switch module base.

– Screw in securing bolt -arrow-.

– Fit all components analogously in reverse order of removal.

8.6 Steering column switch module base

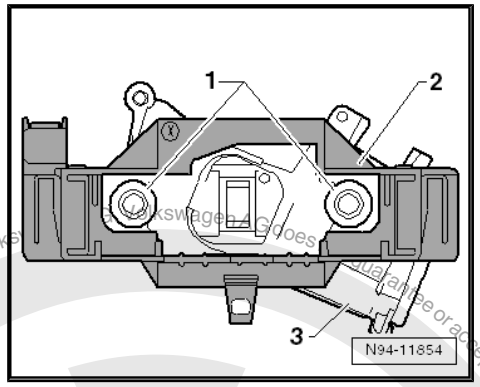
⇒ “8.6.1 Removing and installing steering column switch module base, manufacturer Valeo”, page 280

⇒ “8.6.2 Removing and installing steering column switch module base, manufacturer Kostal”, page 282

8.6.1 Removing and installing steering column switch module base, manufacturer Valeo

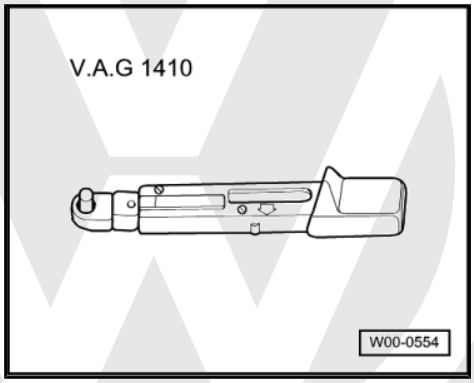
Note

To remove steering column switch module base -2-, shear bolts -1- of the steering lock housing must be drilled out. New shear-head bolts are required for subsequent installation ⇒ Electronics parts catalogue (ETKA) .



Special tools and workshop equipment required

- Angle hand drill
- Torque wrench - V.A.G 1410-



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Caution

- *Ensure that all the components mounted on the base have been removed before drilling out the shear-head bolts.*
- *The drilling operation can cause swarf to penetrate the adjacent components resulting in damage and/or malfunction!*
- *The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 274 .*
- *To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .*

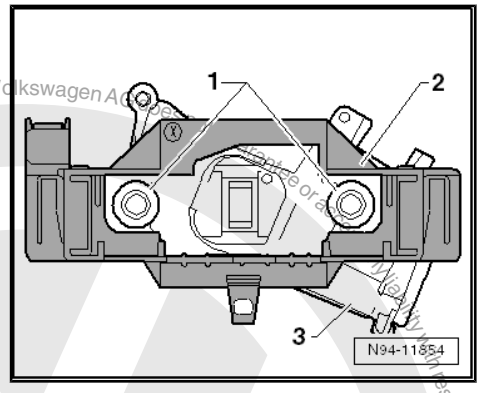
Removing:

– Disconnect battery ⇒ page 3 .

– Remove all components attached to base in prescribed sequence ⇒ page 274 .

The carrier can be removed once all the components mounted to it have been removed:

– Drill out shear-head bolts -1- of steering lock housing -3-.



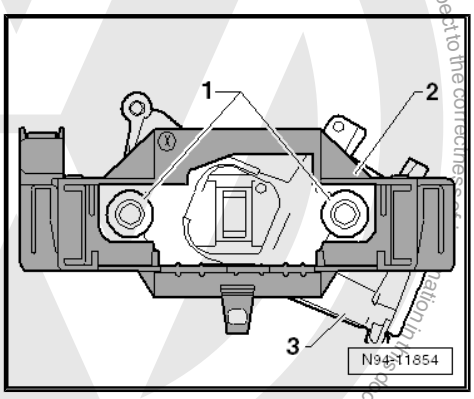
Note

Bolts M8 -1-, core diameter 6.8 mm

– Pull steering lock housing -3- and steering column switch module base -2- towards rear off steering column.

– Remove steering lock housing from steering column switch module base.

Installing:



– Insert steering lock housing -3- into steering column switch module base -2-.

– Push steering column combination switch - E595- in a straight line onto steering column switch module base until it securely engages.

– Push pre-assembled unit consisting of steering lock housing, steering column switch module base and steering column combination switch - E595- as far as stop onto steering column and align it with threaded holes.

– Secure steering lock housing -3- to steering column using new shear-head bolts -1-.

– Tighten new shear-head bolts -1- until bolt heads shear off.

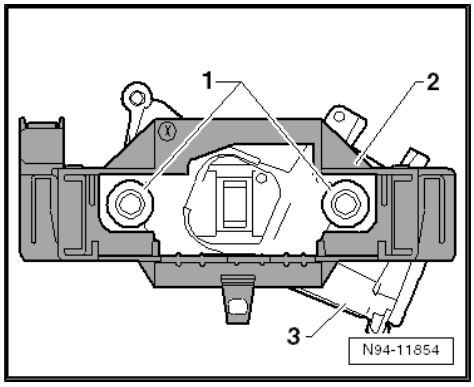
– Fit all components analogously in reverse order of removal.

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8.6.2 Removing and installing steering column switch module base, manufacturer Kostal

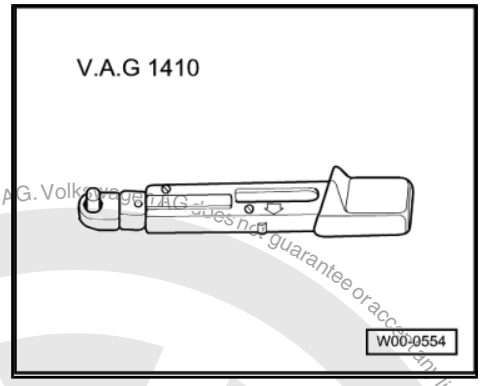
Note

To remove steering column switch module base -2-, shear bolts -1- of the steering lock housing must be drilled out. New shear-head bolts are required for subsequent installation ⇒ Electronics parts catalogue (ETKA) .



Special tools and workshop equipment required

- Angle hand drill
- Torque wrench - V.A.G 1410-



Caution

- *Ensure that all the components mounted on the base have been removed before drilling out the shear-head bolts.*
- *The drilling operation can cause swarf to penetrate the adjacent components resulting in damage and/or malfunction!*
- *The removal and installation of individual components of the steering column switch module must be performed in a specified sequence ⇒ page 274 .*
- *To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .*

Removing:

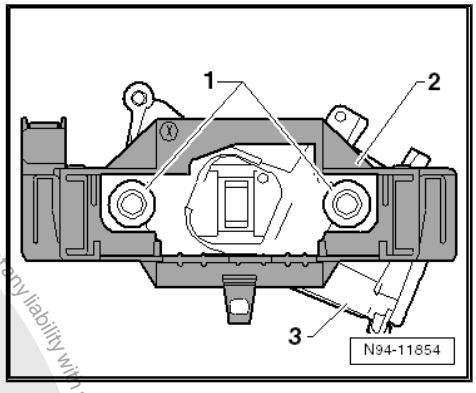
– Disconnect battery ⇒ page 3 .

– Remove all components attached to base in prescribed sequence ⇒ page 274 .

The carrier can be removed once all the components mounted to it have been removed:

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– Drill out shear-head bolts -1- of steering lock housing -3-.



Note

Bolts M8 -1-, core diameter 6.8 mm

– Pull steering lock housing -3- and steering column switch module base -2- towards rear off steering column.

– Remove steering lock housing from steering column switch module base.

Installing:

– Insert steering lock housing -3- into steering column switch module base -2-.

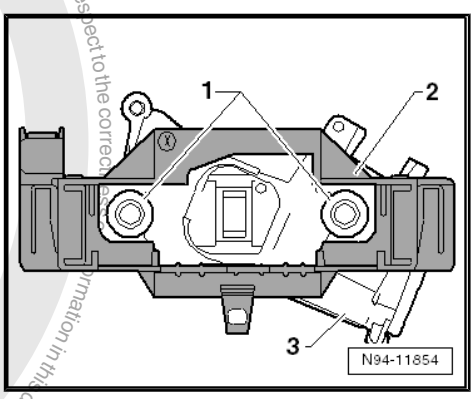
– Push steering column combination switch - E595- onto steering column switch module base and screw in lower securing bolt.

– Push pre-assembled unit consisting of steering lock housing, steering column switch module base and steering column combination switch - E595- as far as stop onto steering column and align it with threaded holes.

– Secure steering lock housing -3- to steering column using new shear-head bolts -1-.

– Tighten new shear-head bolts -1- until bolt heads shear off.

– Fit all components analogously in reverse order of removal.



8.7 Coding steering column electronics control unit - J527-

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Steering wheel electronics
- Steering wheel electronics functions
- Coding steering wheel electronics control unit

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9 Rear parking aid system

⇒ “9.1 General description - rear parking aid system”, page 284

⇒ “9.2 Assembly overview - rear parking aid system”, page 285

⇒ “9.3 Removing and installing rear parking aid control unit”, page 286

⇒ “9.4 Adapting rear parking aid control unit ”, page 287

⇒ “9.5 Removing and installing rear parking aid senders”, page 287

⇒ “9.6 Removing and installing parking aid system warning buzzer”, page 288

9.1 General description - rear parking aid system

Note

- *The description below applies to vehicles up to 05.2012 equipped with a parking aid system located in the rear bumper cover.*
- *The parking aid system for vehicles up to 05.2012 can be easily identified by the protruding parking aid sensors in the bumper cover.*
- *On vehicles as of 06.2012, the sensors are flush with the surface of the bumper cover.*
- *The rear parking aid system for vehicles as of 06.2012 is described in the park assist steering chapter ⇒ page 289 .*

Note

- *When faced with complaints, it is absolutely necessary to understand the function and operation of the parking aid system.*
- *Additional information ⇒ Owner's Manual*

When reversing the parking aid system supports the driver by indicating the distance from the rear of the vehicle to the obstacle by way of acoustic signals.

The rear parking aid system consists of:

- Rear parking aid control unit - J446-
- Rear parking aid warning buzzer - H15-
- Rear left parking aid sender - G203-
- Rear centre left parking aid sender - G204-
- Rear centre right parking aid sender - G205-
- Rear right parking aid sender - G206-

Fault detection and fault display:

The parking aid system is equipped with self-diagnosis, which is designed to simplify fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

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To check the parking aid system as a whole, perform final control diagnosis.

Note

- *On the first software version of parking aid control unit - J446- , the sender designations may differ slightly on the display due to different software versions. In this case allocation is as follows:*
- *Rear centre left parking aid sender - G204- is rear left parking aid sender - G203-*
- *Rear left inner parking aid sender - G334- is rear centre left parking aid sender - G204-*
- *Rear right inner parking aid sender - G335- is rear centre right parking aid sender - G205-*
- *Rear centre right parking aid sender - G205- is rear right parking aid sender - G206-*

9.2 Assembly overview - rear parking aid system

1 - Rear parking aid warning buzzer - H15-

- ❑ Removing and installing ⇒ page 288 .
- ❑ Adjusting volume of rear parking aid warning buzzer - H15- ⇒ page 287

2 - Rear parking aid control unit

- ❑ Behind right side panel trim, near tail light
- ❑ Removing and installing ⇒ page 286
- ❑ Adaption ⇒ page 287

3 - Rear right parking aid sender - G206-

- ❑ In rear bumper cover
- ❑ Removing and installing ⇒ page 287

4 - Rear centre right parking aid sender - G205-

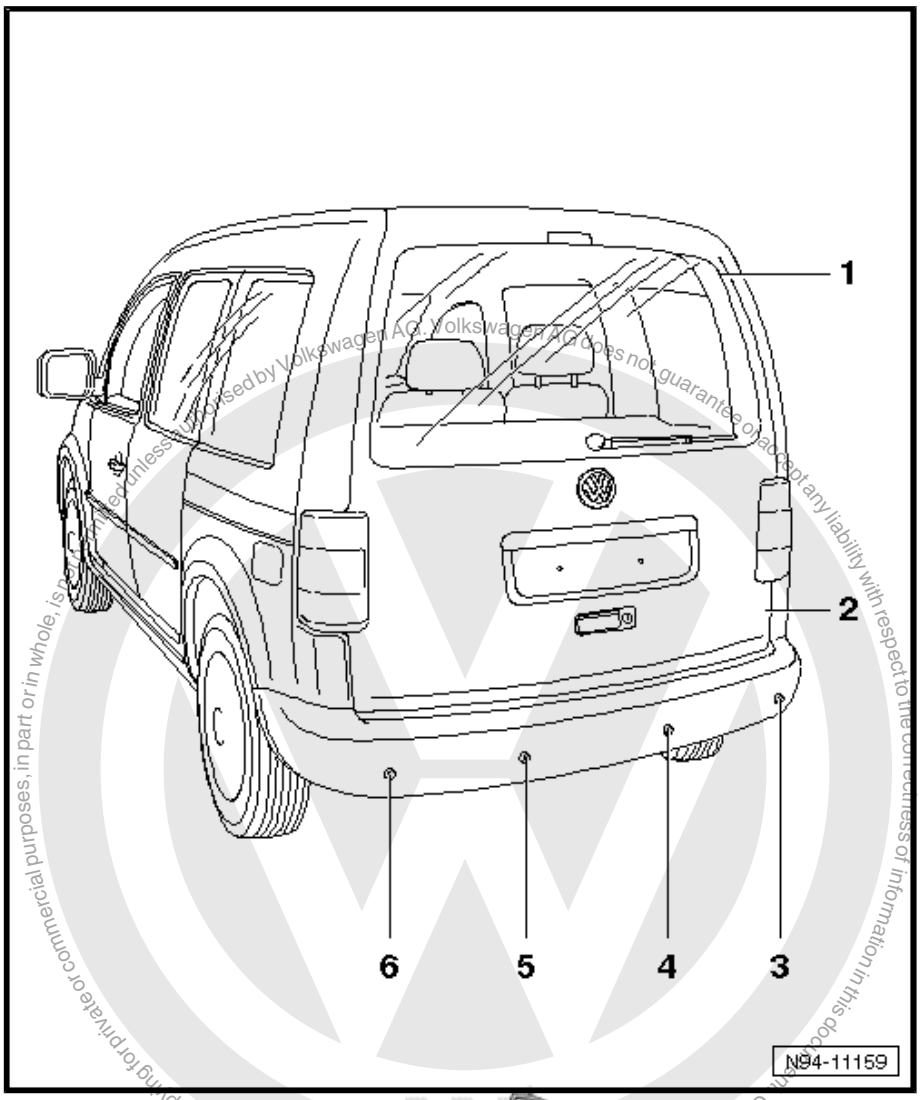
- ❑ In rear bumper cover
- ❑ Removing and installing ⇒ page 287

5 - Rear centre left parking aid sender - G204-

- ❑ In rear bumper cover
- ❑ Removing and installing ⇒ page 287

6 - Rear left parking aid sender - G203-

- ❑ In rear bumper cover
- ❑ Removing and installing ⇒ page 287



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9.3 Removing and installing rear parking aid control unit

Note

- *In vehicles with parking aid in the rear bumper cover only, the "parking aid" functions are controlled by the parking aid control unit - J446- .*
- *Depending on the equipment level and manufacturing date of the vehicle, the parking aid control unit - J446- can be installed at different locations:*

Vehicle equipment and manufacturing date:	Fitting location of parking aid control unit:
All vehicles manufactured up to week 22/12	Behind right side panel trim, near tail light ⇒ page 286
Vehicles with unpainted bumper covers manufactured from week 22/12 up to week 45/12	Behind right side panel trim, near tail light ⇒ page 286
Vehicles with painted bumper covers manufactured from week 22/12 up to week 45/12	In footwell on driver side, behind relay carrier under dash panel ⇒ page 293
All vehicles manufactured as of week 45/12	In footwell on driver side, behind relay carrier under dash panel ⇒ page 293

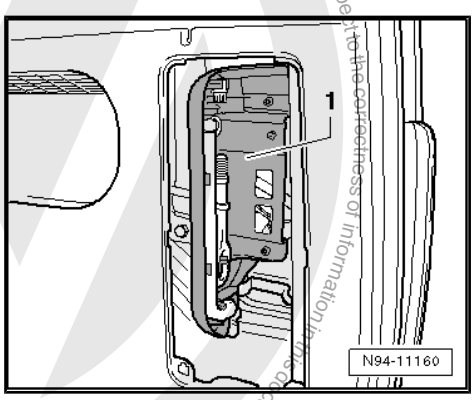
Removing:

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

– Remove flap in right side wall trim in luggage compartment.

– Remove bracket -1-.

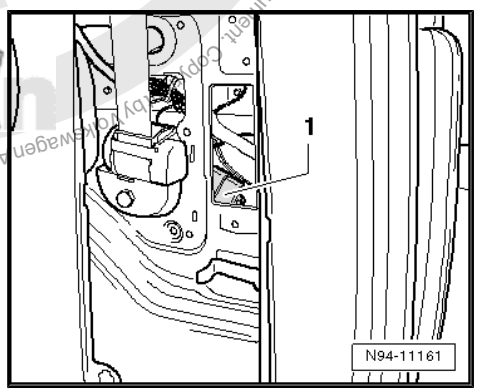
The control unit is bonded to the body.



– Remove parking aid control unit -1- from bracket, as far as the wiring allows.

– Release and disconnect electrical connectors.

– Remove parking aid control unit - J446- from vehicle.



Installing:

Installation is carried out in reverse order of removal.

Use a new adhesive pad for securing.

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9.4 Adapting rear parking aid control unit

This adaptation adapts the volume of the rear parking aid warning buzzer - H15- .

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- General body repairs
- 01 - On Board Diagnostic capable systems
- Parking aid
- Functions
- Adaptation

9.5 Removing and installing rear parking aid senders

Following 4 senders are located in the rear bumper cover:

- Rear left parking aid sender - G203-
- Rear centre left parking aid sender - G204-
- Rear centre right parking aid sender - G205-
- Rear right parking aid sender - G206-

Note

Removal and installation of the rear parking aid senders are carried out in the same way for all senders and are described as follows for just one sender.

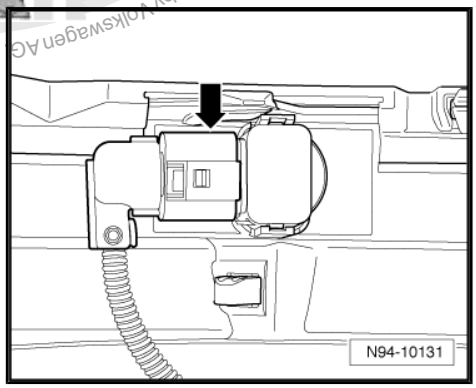
Removing:

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

Note

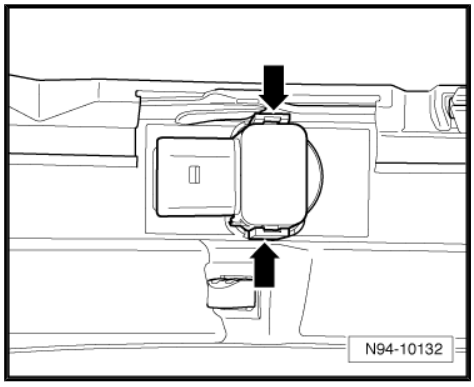
The rear parking aid senders are accessible without removing the bumper.

– Release and disconnect electrical connector -arrow-.



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– Release locking lugs -arrows- and remove sender from bumper cover.



Installing:

Installation is carried out in reverse order of removal.

9.6 Removing and installing parking aid system warning buzzer

Note

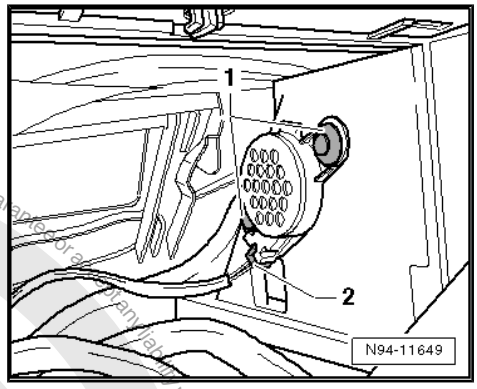
- *The volume and frequency of the parking aid warning buzzer can be adjusted by means of the parking aid control unit ⇒ page 287 .*
- *The parking aid warning buzzer is secured to the rack of the relay carrier above the onboard supply control unit.*

Removing:

– Release relay carrier and fold downwards ⇒ page 370 .

– Pull out pins of both spreader rivets -1- and remove warning buzzer.

– Release and disconnect connector -2- and remove warning buzzer.



Installing:

Installation is carried out in reverse order of removal.

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10 Park assist steering

⇒ “10.1 General description - park assist steering”, page 289

⇒ “10.2 Assembly overview - park assist steering”, page 291

⇒ “10.3 Removing and installing parking aid control unit J446 ”, page 293

⇒ “10.4 Coding parking aid control unit J446 ”, page 294

⇒ “10.5 Adapting parking aid control unit J446 ”, page 294

⇒ “10.6 Removing and installing front parking aid senders”, page 295

⇒ “10.7 Removing and installing rear parking aid senders”, page 297

⇒ “10.8 Removing and installing front park assist steering sender”, page 300

⇒ “10.9 Removing and installing rear park assist steering sender”, page 303

⇒ “10.10 Renewing parking aid sender or park assist steering sender ”, page 305

⇒ “10.11 Renewing retainers for parking aid senders and park assist steering senders ”, page 306

⇒ “10.12 Removing and installing park assist steering button E581 ”, page 310

⇒ “10.13 Removing and installing parking aid button E266 ”, page 311

⇒ “10.14 Removing and installing front parking aid warning buzzer ”, page 311

⇒ “10.15 Removing and installing rear parking aid warning buzzer ”, page 312

⇒ “10.16 Adapting parking aid warning buzzer”, page 312

10.1 General description - park assist steering

Note

- *When faced with complaints, it is absolutely necessary to understand the function and operation of the park assist and parking aid system.*
- *Additional information ⇒ Operating manual*

Vehicles with park assist steering are always equipped with the front and rear parking aid systems. The front parking aid system is only installed in conjunction with the park assist steering system.

The park assist steering supports the driver when reversing into a parallel parking space on the driver or passenger side. When the park assist steering is activated and the vehicle drives by at a speed of less than 35 km/h, the side of the road is measured by ultrasonic sensors searching for a suitable parking space. Once a parking space has been reliably detected, the park assist steering requests the driver to continue passing by the parking space until the vehicle is in a position from which rapid parking is possible. When the reverse gear is engaged, the park assist steering system undertakes lateral guidance of the vehicle by actuating the EPS (electronic power steering = electromechanical steering).

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The system steers the vehicle into the parking space in one movement according to a calculate nominal path. The driver maintains operation of the pedal cluster (accelerator, clutch, brake) and longitudinal vehicle guidance, and therefore determines the parking speed. During the parking process, the park assist steering sensors are used together with the parking aid senders to monitor proximity.

The Caddy features a second-generation park steering assist system. This enables parking in an even shorter parking space. Apart from the new function of transverse parking, longitudinal parking also has new functions, such as; the partial or complete parking on a kerb, parking between other obstacles (trees, bushes or motorcycles) as well as parking on bends. Furthermore it enables driving out of parallel parking spaces.

The following conditions lead to abortion of the parking process with the park assist steering:

- The park assist steering is switched off via the park assist steering button - E581- .
- Ignition is switched off
- Parking speed too high (>7 km/h)
- Steering intervention by driver during parking process
- Disengaging reverse gear
- Vehicle standstill time limit exceeded (approx. 30 s)
- ESP switched off or ESP intervention
- TCS intervention
- Trailer attached to vehicle coupling
- Front parking aid system is switched on.
- Sensors detect a status which endangers secure determination of the vehicle position.
- System malfunction

WARNING

- *Responsibility during parking is borne by the driver.*
- *The park assist steering cannot replace the driver's attentiveness.*
- *The sensors have blind spots, in which persons and objects can not be registered.*
- *Pay particular attention to small children and animals, as these are not always detected by the sensors.*

The park assist steering consists of:

- Rear left parking aid sender - G203-
- Rear centre left parking aid sender - G204-
- Rear centre right parking aid sender - G205-
- Rear right parking aid sender - G206-
- 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-

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- Front left sender for park assist steering on left side of vehicle - G568-
- Front right sender for park assist steering on right side of vehicle - G569-
- Rear left park assist steering sender - G716-
- Rear right park assist steering sender - G717-
- Rear parking aid warning buzzer - H15-
- Front parking aid warning buzzer - H22-
- Parking aid button - E266-
- Park assist steering button - E581-
- Button illumination bulb - L76-
- Warning light for park assist steering - K241-
- Parking aid control unit - J446-
- Park assist steering control unit - J791-

Fault detection and fault display:

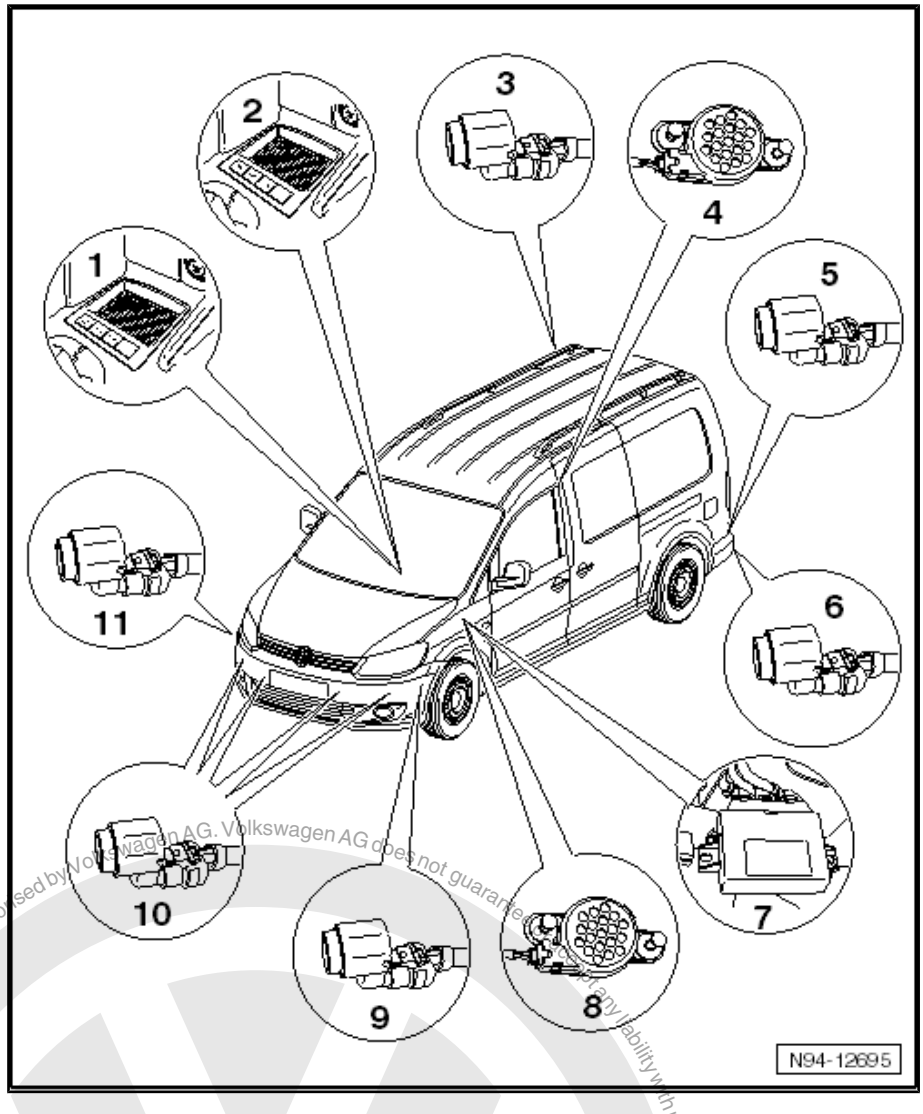
The park assist steering features self-diagnosis to facilitate fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

To check the park assist steering as a whole, perform final control diagnosis.

10.2 Assembly overview - park assist steering

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1 - Park assist steering button - E581-

- Installed in centre console storage compartment in front of gearbox selector lever.
- Removing and installing ⇒ page 310 .

2 - Parking aid button - E266-

- Installed in centre console storage compartment in front of gearbox selector lever.
- Removing and installing ⇒ page 311 .

3 - Park assist steering sender on right in rear bumper cover - G717 -

- Rear left park assist steering sender - G716-
- Removing and installing ⇒ page 303 .
- Renewing sender ⇒ page 305 .
- Renewing sender retainer ⇒ page 306

4 - Rear parking aid warning buzzer - H15-

- Installed behind side panel trim of left B-pillar.
- Removing and installing ⇒ page 312 .
- Can be checked via final control diagnosis
- Adaption ⇒ page 312

5 - Rear parking aid senders

- Rear left parking aid sender - G203-
- Rear centre left parking aid sender - G204-
- Rear centre right parking aid sender - G205-
- Rear right parking aid sender - G206-
- Removing and installing ⇒ page 297 .
- Renewing sender ⇒ page 305 .
- Renewing sender retainer ⇒ page 306

6 - Park assist steering senders on left in rear bumper cover - G716-

- Removing and installing ⇒ page 303 .
- Renewing sender ⇒ page 305 .
- Renewing sender retainer ⇒ page 306

7 - Parking aid control unit - J446-

- With integrated park assist steering control unit - J791-
- Located in driver side footwell, on left side of dash panel behind relay carrier
- Removing and installing ⇒ page 293 .
- Coding ⇒ page 294 .
- Adaption ⇒ page 294
- Securing bolt specified torque: 5 Nm

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8 - Front parking aid warning buzzer - H22-

- ❑ In driver side footwell, on left side of dash panel behind relay carrier
- ❑ Removing and installing ⇒ page 311 .
- ❑ Can be checked via final control diagnosis
- ❑ Adaption ⇒ page 312

9 - Front left sender for park assist steering on left side of vehicle - G568-

- ❑ Removing and installing ⇒ page 300 .
- ❑ Renewing sender ⇒ page 305 .
- ❑ Renewing sender retainer ⇒ page 306

10 - Front parking aid senders

- ❑ Front left parking aid sender - G255-
- ❑ Front centre left parking aid sender - G254-
- ❑ Front centre right parking aid sender - G253-
- ❑ Front right parking aid sender - G252-
- ❑ Removing and installing ⇒ page 295 .
- ❑ Renewing sender ⇒ page 305 .
- ❑ Renewing sender retainer ⇒ page 306

11 - Front right park assist steering sender in front bumper cover - G569-

- ❑ Removing and installing ⇒ page 300 .
- ❑ Renewing sender ⇒ page 305 .
- ❑ Renewing sender retainer ⇒ page 306

10.3 Removing and installing parking aid control unit - J446-

Note

- ♦ *The parking aid control unit - J446- with integrated park assist steering control unit - J791- can be found in the driver's foot-well behind the relay carrier of the dash panel.*
- ♦ *The parking aid control unit - J446- also simultaneously controls the park assist steering functions on vehicles with park assist steering.*

Removing:

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

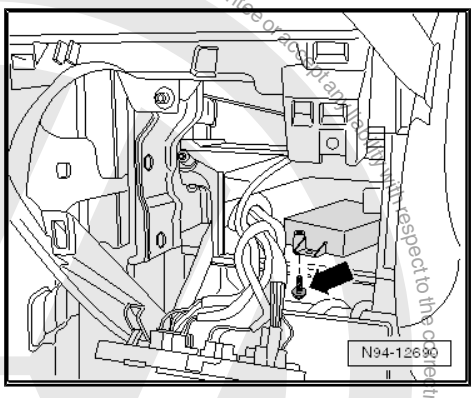
– Remove relay carrier, above onboard supply control unit, on left of dash panel ⇒ page 370 .

– Remove data bus diagnostic interface and lay it aside with wiring harness connected ⇒ page 388.

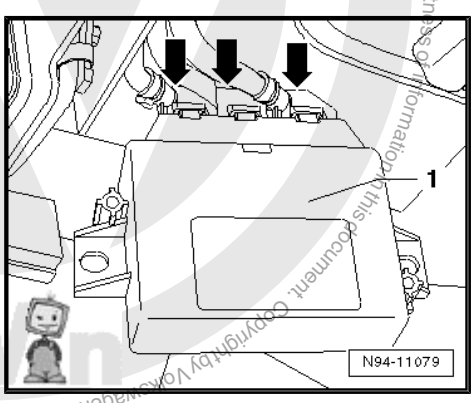
– Pull out onboard supply control unit and move it aside with wiring harness connected ⇒ page 382 ,

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– Remove bolt from below -arrow- and remove control unit from its installation position as far as the connected wiring allows.



– Release and disconnect the three electrical connectors -arrows-. Remove control unit -1- from vehicle.



Installing:

Install in the reverse order of removal observing the following:

– When installing, insert corner of control unit into opening in relay carrier again.

– Tighten bolt to torque specified in assembly overview ⇒ page 291 .

10.4 Coding parking aid control unit - J446-

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

♦ Body

♦ General body repairs

♦ 01 - On Board Diagnostic capable systems

♦ Parking aid II -J446-

♦ Parking aid II functions

♦ Coding

10.5 Adapting parking aid control unit - J446-

With this function, the following adaptions can be set in the parking aid control unit - J446- :

♦ Volume reduction in conjunction with parking aid

♦ Activation sound when parking aid is switched on

♦ Optical display for assisted parking

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

♦ Body

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- General body repairs
- 01 - On Board Diagnostic capable systems
- Parking aid II -J446-
- Parking aid II functions
- Adaption

10.6 Removing and installing front parking aid senders

Note

- *The front parking aid senders - G255, G254, G253, G252- are installed in the front bumper cover.*
- *Removal of the four front parking aid senders is carried out in the same way and is only described as follows for one sender.*
- *When installing a new park assist steering sender or parking aid sender, the sender head must be first painted in the colour of the bumper cover* *⇒ page 305* *.*

Removing:

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

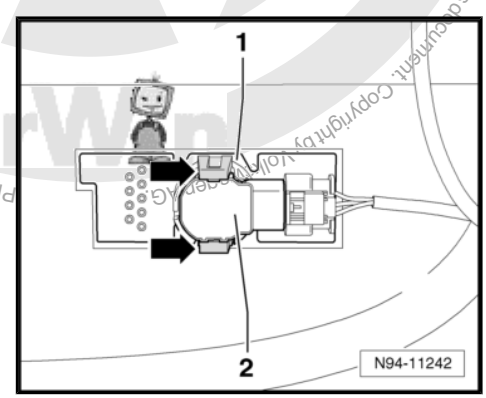
– Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, up to 2011 or ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, as of 2011 .

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.***

– Push fasteners -arrows- on sender bracket -1- outwards.

– Pull out sender -2- with wiring connected backwards from sender holder -1-.

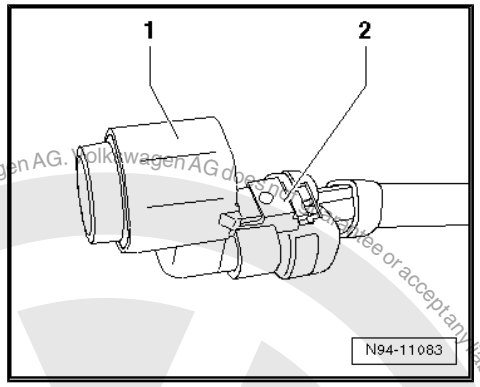


Note

- *When removing the sender, ensure the isolation ring (black silicone ring) remains on the sender head and does not remain stuck in the bracket or become lost.*
- *Expanding the isolation ring must be avoided under all circumstances.*

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– Release and disconnect connector -2- and remove sender -1-.



Installing:

Install in the reverse order of removal. When doing this, note the following:

Caution

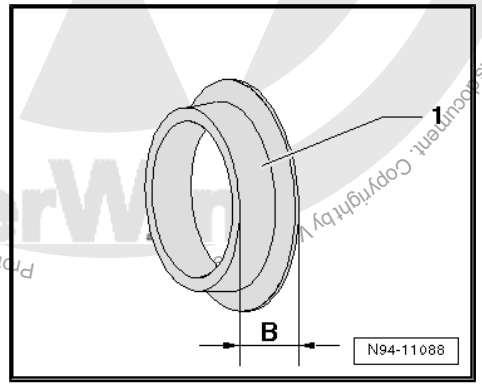
- ***Expanding the isolation ring must be avoided under all circumstances.***
- ***Function problems could occur if an incorrect or damaged isolation ring is used.***
- ***Replace any damaged isolation rings and make sure that the right isolation ring is fitted in each case.***

Note

As the front parking aid sender and the park assist steering senders have sender heads of different lengths, isolation rings of different heights are also installed.

– Check whether the correct isolation ring is installed on the respective sender head.

Type of sender	Isolation ring height dimension -B-
Front parking aid senders	5.7 mm
Park assist steering senders	9.05 mm



– Renew isolation ring -1- of sender if necessary.

– Assign sender to correct installation position in bumper cover.

Note

- *Senders are available in different forms and must be assigned to respective fitting location in bumper cover.*
- *When installing senders, note position of electrical connections of senders.*

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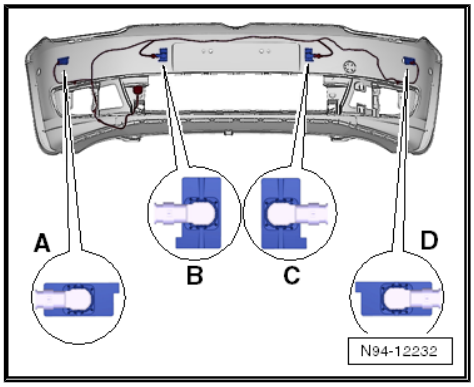
Assignment of parking aid sender on inside of rear bumper cover:

A - Left outer

B - left centre

C - right centre

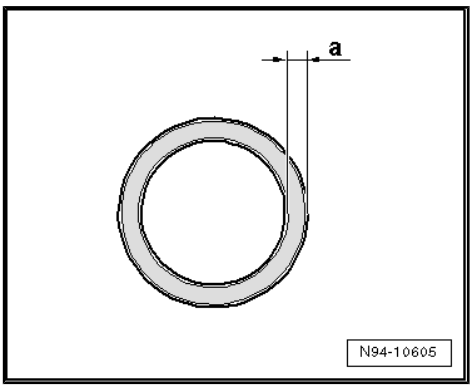
D - Right outer



Note

- *When installing the sender, ensure that the isolation ring is correctly mounted on the sender head and does not ride or roll up on insertion into the sender bracket.*
- *Both locking lugs of sender retainer must audibly engage when installing the sender.*

– After installing the sender, check that the sender is correctly seated in the bracket. Visible on the outer side of the bumper, dimension -a- of the ring gap between the sender head and bumper cover must be even all around.



10.7 Removing and installing rear parking aid senders

Note

- *The rear parking aid senders - G203, G204, G205, G206- are installed in the rear bumper cover.*
- *The removal of the four rear parking aid senders is carried out in the same way and is only described for one sender in the following.*
- *When installing a new park assist steering sender or parking aid sender, the sender head must be first painted in the colour of the bumper cover* ⇒ page 305 .

Removing:

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

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

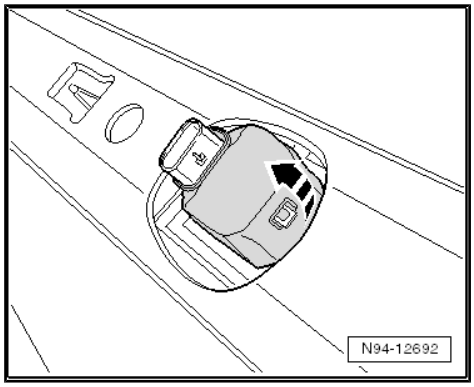
When removing rear bumper completely:

– Unclip wiring harness retainers in bumper, use a second person to hold removed bumper when unclipping retainers.

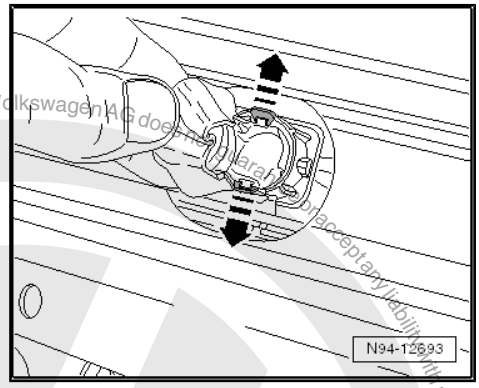
If only one parking aid sender or park assist steering sender is to be renewed, wiring harness can remain installed on bumper. However, the removed bumper must be held by a second person while replacing respective item.

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– Pull covers upwards off parking aid senders in -direction of arrow-.



– Press catches on parking aid senders in -direction of arrow- and pull sender, on rubber cap, out of bumper.

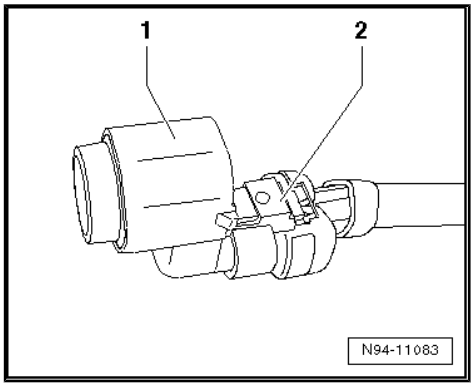


Note

- *When removing the sender, ensure the isolation ring (black silicone ring) remains on the sender head and does not remain stuck in the bracket or become lost.*
- *Expanding the isolation ring must be avoided under all circumstances.*

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– Release and disconnect connector -2- and remove sender -1-.



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.*

Installing:

Install in the reverse order of removal. When doing this, note the following:

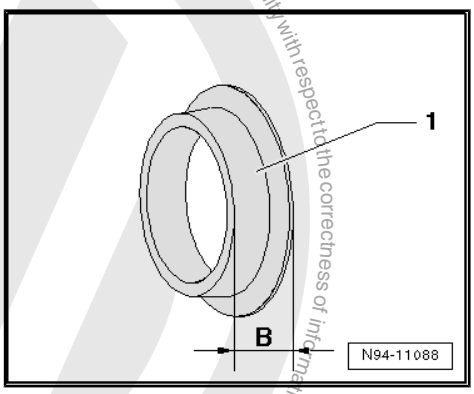
Caution

- *Expanding the isolation ring must be avoided under all circumstances.*
- *Function problems could occur if an incorrect or damaged isolation ring is used.*
- *Replace any damaged isolation rings and make sure that the right isolation ring is fitted in each case.*

Note

As the rear parking aid senders and the park assist steering senders have sender heads of different lengths, the isolation rings installed are of different heights accordingly.

– Check whether the correct isolation ring is installed on the respective sender head.



Type of sender	Isolation ring height dimension -B-
Rear parking aid senders	5.7 mm
Park assist steering senders	9.05 mm

– Renew isolation ring -1- of sender if necessary.

– Assign sender to correct installation position in bumper cover.

Note

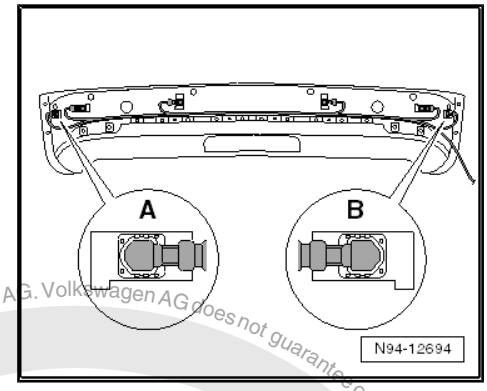
- *Senders are available in different forms and must be assigned to respective fitting location in bumper cover.*
- *When installing senders, note position of electrical connections of senders.*

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Assignment of senders on inside of rear bumper cover:

A - Bracket for rear right park assist steering sender - G717-

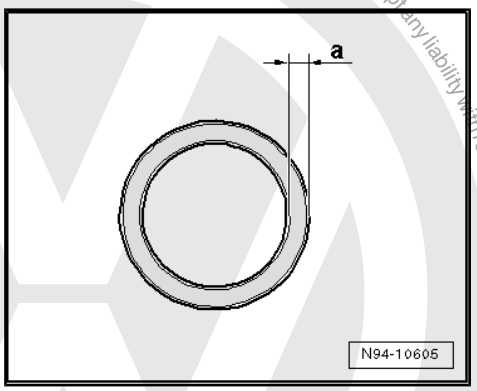
B - Bracket for rear left park assist steering sender - G716-



Note

- *When installing the sender, ensure that the isolation ring is correctly mounted on the sender head and does not ride or roll up on insertion into the sender bracket.*
- *Both locking lugs of sender retainer must audibly engage when installing the sender.*

– After installing the sender, check that the sender is correctly seated in the bracket. Visible on the outer side of the bumper, dimension -a- of the ring gap between the sender head and bumper cover must be even all around.



10.8 Removing and installing front park assist steering sender

Note

- *The front left sender for park assist steering on left side of vehicle - G568- and front right sender for park assist steering on right side of vehicle - G569- are installed in the front bumper cover.*
- *The two park assist steering senders are mounted at the outermost, lateral positions of the bumper cover, and are used to measure proximity during the parking process, together with the parking aid senders.*
- *When installing a new park assist steering sender or parking aid sender, the sender head must be first painted in the colour of the bumper cover* *⇒ page 305* *.*

Removing:

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

– Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, up to 2011 or ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper, as of 2011 .

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Caution

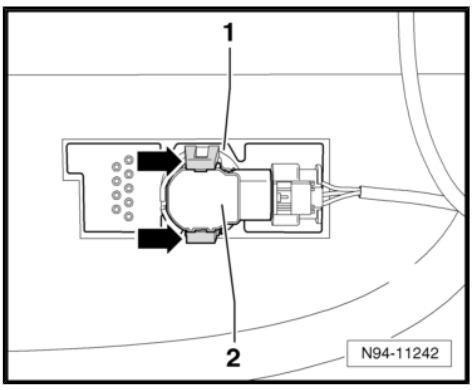
The order for removing the senders must be adhered to under all circumstances.

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 senders from the retainers and then release and disconnect the sender's connector.

– Push fasteners -arrows- on sender bracket -1- outwards.

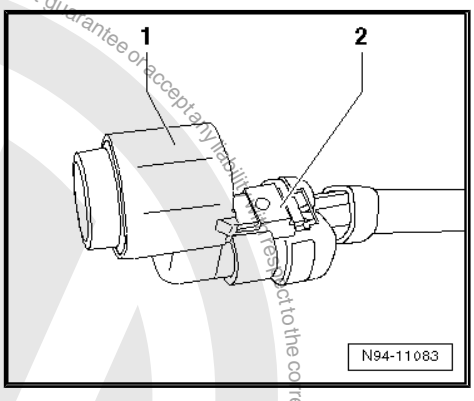
– Pull out sender -2- with wiring connected backwards from sender holder.



Note

- *When removing the sender, make sure that the isolation ring (black silicone ring) on the sender head does not remain in the bracket or become lost.*
- *Stretching the isolation ring must be avoided under all circumstances.*

– Release and disconnect connector -2- and remove sender -1-.



Installing:

Install in the reverse order of removal. When doing this, note the following:

Caution

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

Stretching the isolation ring must be avoided under all circumstances.

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

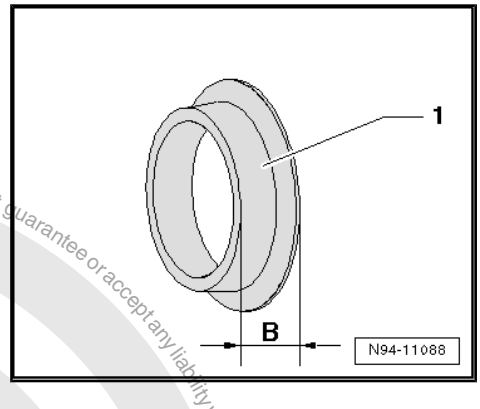
Note

As the front parking aid sender and the park assist steering senders have sender heads of different lengths, isolation rings of different heights are also installed.

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– Check whether the correct isolation ring is installed on the sender head.

Type of sender	Isolation ring height dimension -B-
Front parking aid senders	5.7 mm
Park assist steering senders	9.05 mm



– If necessary, renew isolation ring -1- of sender.

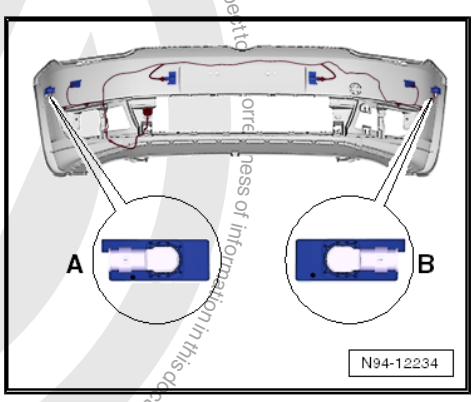
Note

When installing senders, note position of electrical connections of senders.

Assignment of senders on inside of front bumper cover:

A - Bracket for front left sender for Park Assist on left side of vehicle - G568-

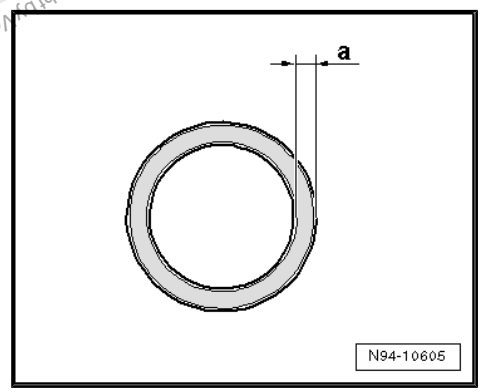
B - Bracket for front right sender for Park Assist on right side of vehicle - G569-



Note

- *When installing the sender, ensure that the isolation ring is correctly mounted on the sender head and does not ride or roll up on insertion into the sender bracket.*
- *Both locking lugs of sender retainer must audibly engage when installing the sender.*

– After installing the sender, check that the sender is correctly seated in the bracket. Visible on the outer side of the bumper, dimension -a- of the ring gap between the sender head and bumper cover must be even all around.



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10.9 Removing and installing rear park assist steering sender

Note

- *The rear left park assist steering sender - G716- and rear right park assist steering sender - G717 - are installed in the rear bumper cover.*
- *The two park assist steering senders are mounted at the outermost, lateral positions of the bumper cover, and are used to measure proximity during the parking process, together with the parking aid senders.*
- *When installing a new park assist steering sender or parking aid sender, the sender head must be first painted in the colour of the bumper cover* ⇒ page 305 .

Removing:

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

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

When removing rear bumper completely:

– Unclip wiring harness retainers in bumper, use a second person to hold removed bumper when unclipping retainers.

If only one parking aid sender or park assist steering sender is to be renewed, wiring harness can remain installed on bumper. However, the removed bumper must be held by a second person while replacing respective item.

Caution

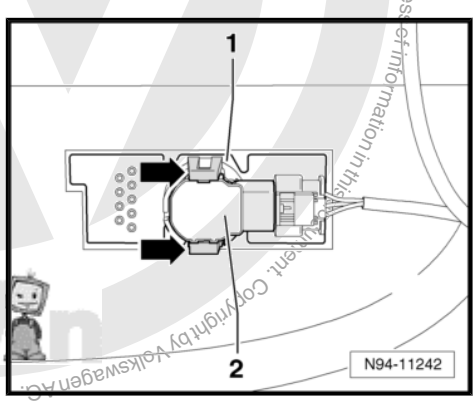
The order for removing the senders must be adhered to under all circumstances.

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 senders from the retainers and then release and disconnect the sender's connector.

– Push fasteners -arrows- on sender bracket -1- outwards.

– Pull out sender -2- with wiring connected backwards from sender holder.

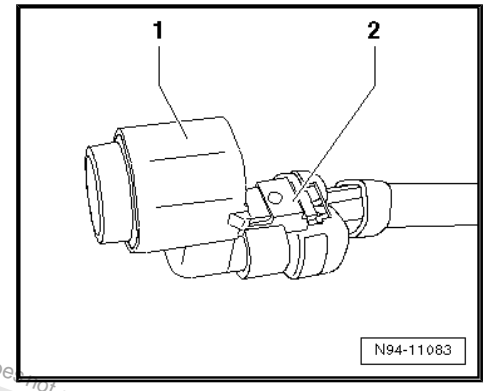


Note

- *When removing the sender, make sure that the isolation ring (black silicone ring) on the sender head does not remain in the bracket or become lost.*
- *Expanding the isolation ring must be avoided under all circumstances.*

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– Release and disconnect connector -2- and remove sender -1-.



Installing:

Install in the reverse order of removal. When doing this, note the following:

Caution

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

Stretching the isolation ring must be avoided under all circumstances.

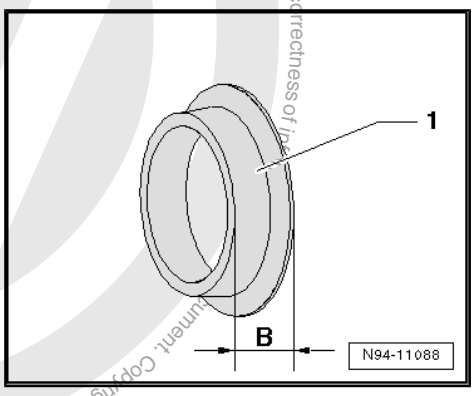
Replace any damaged isolation rings and make sure that the right isolation ring is fitted in each case.

Note

As the parking aid senders and the park assist steering senders have sender heads of different lengths, isolation rings of different heights are also installed.

– Check whether the correct isolation ring is installed on the sender head.

Type of sender	Isolation ring height dimension -B-
Rear parking aid senders	5.7 mm
Park assist steering senders	9.05 mm



– Renew isolation ring -1- of sender if necessary.

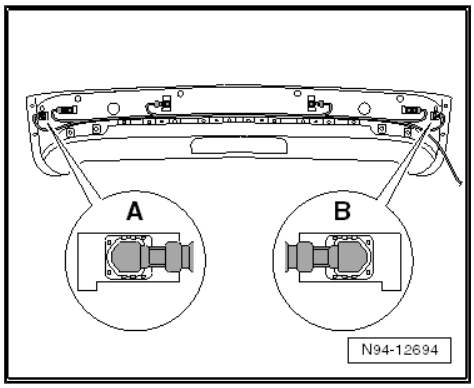
Note

When installing senders, note position of electrical connections of senders.

Assignment of senders on inside of rear bumper cover:

A - Bracket for rear right park assist steering sender - G717-

B - Bracket for rear left park assist steering sender - G716-

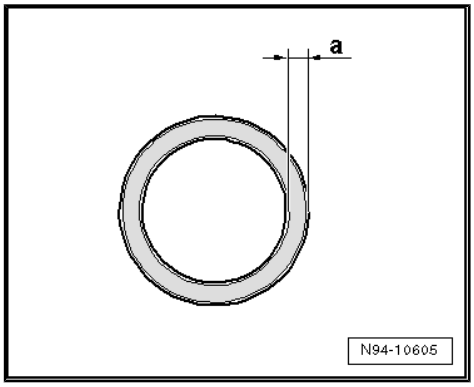


Note

- *When installing the sender, ensure that the isolation ring is correctly mounted on the sender head and does not ride or roll up on insertion into the sender bracket.*
- *Both locking lugs of sender retainer must audibly engage when installing the sender.*

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– After installing the sender, check that the sender is correctly seated in the bracket. Visible on the outer side of the bumper, dimension -a- of the ring gap between the sender head and bumper cover must be even all around.



10.10 Renewing parking aid sender or park assist steering sender

Note

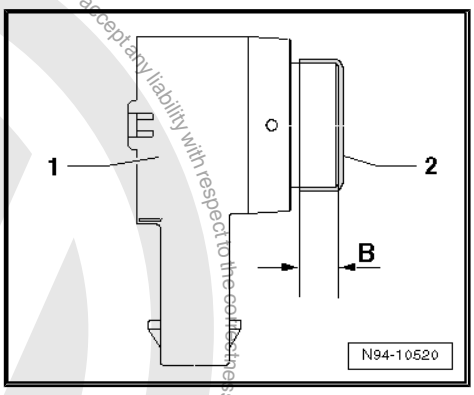
- *If a new park assist steering sender or parking aid sender is installed, the sender head must be first painted in the colour of the bumper cover.*
- *The following prerequisites must be adhered to when painting the senders to ensure the function of the system is not affected.*

Painting senders:

– Take insulation ring (black silicone ring) off sender head

– Remove grease from sender head -1- in area to be painted -2- with isopropanol.

– Paint sender in area to be painted -2- in colour of bumper cover.



Note

Dimension -B- for the painted area must not exceed 3 mm (+ maximum 2 mm).

– Fit isolation ring (black silicone ring) on sender head again once paint has dried.

Caution

- ***Expanding the isolation ring must be avoided under all circumstances.***
- ***Function problems may occur if a damaged isolation ring is used.***
- ***Renew damaged isolation rings.***

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10.11 Renewing retainers for parking aid senders and park assist steering senders

⇒ “10.11.1 Assembly overview - retainers for front centre parking aid senders ”, page 306

⇒ “10.11.2 Assembly overview - retainers for front parking aid senders and front park assist steering senders ”, page 307

⇒ “10.11.3 Assembly overview - retainers for rear parking aid senders and rear park assist steering senders ”, page 309

⇒ “10.11.4 Painting holders”, page 310

10.11.1 Assembly overview - retainers for front centre parking aid senders

Note

Following illustration shows the assembly overview of the retainer with a recess for the connector on the right-hand side. The assembly overview for the retainer with the recess for the connector on the left-hand side is similar (mirror image of right-hand side).

1 - Outline of sender holder

- ❑ Outline > 1 mm to holder
- ❑ Line < 2° to horizontal

2 - Adhesive pad

- ❑ Adhesive pad is already stuck on holder during production
- ❑ Foam adhesive tape TL 52018-E, s=1
- ❑ Qty. 2, 30 x 20, A = 12 cm^2

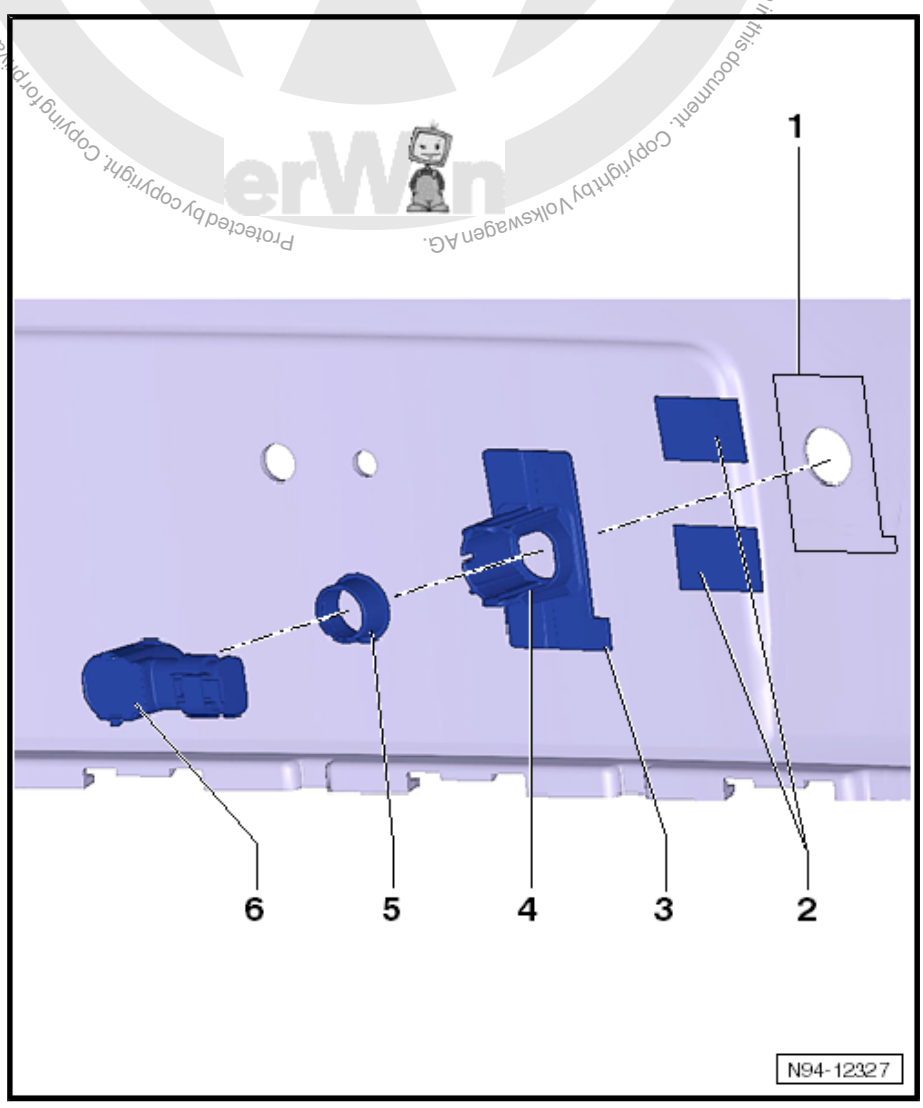
3 - Marking of installation position

- ❑ VRM - Front centre right parking aid sender - G253-
- ❑ VLM - Front centre left parking aid sender - G254-

4 - Sender holder

5 - Decoupling ring

6 - Sender



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Assembly:

– Place holder in installation position of inner bumper cover and outline installation area.

Note

When marking the outline, ensure that it is 1 mm greater than the holder. The deviation of the line to the horizontal should be less than 2°.

– Clean area within outline and, if necessary, remove any residual glue from old holder. Degrease area with isopropanol.
– Remove backing from adhesive tape and bond holder in installation position of inner bumper cover.

10.11.2 Assembly overview - retainers for front parking aid senders and front park assist steering senders

Note

Following illustration shows the assembly overview of the retainer with a recess for the connector on the right-hand side. The assembly overview for the retainer with the recess for the connector on the left-hand side is similar (mirror image of right-hand side).



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1 - Outline of sender holder

- ❑ Outline > 1 mm to holder
- ❑ Line < 2° to horizontal

2 - Adhesive pad

- ❑ Adhesive pad is already stuck on holder during production
- ❑ Foam adhesive tape TL 52018-E, s=1
- ❑ Qty. 2, 30 x 20, A = 12 cm^2

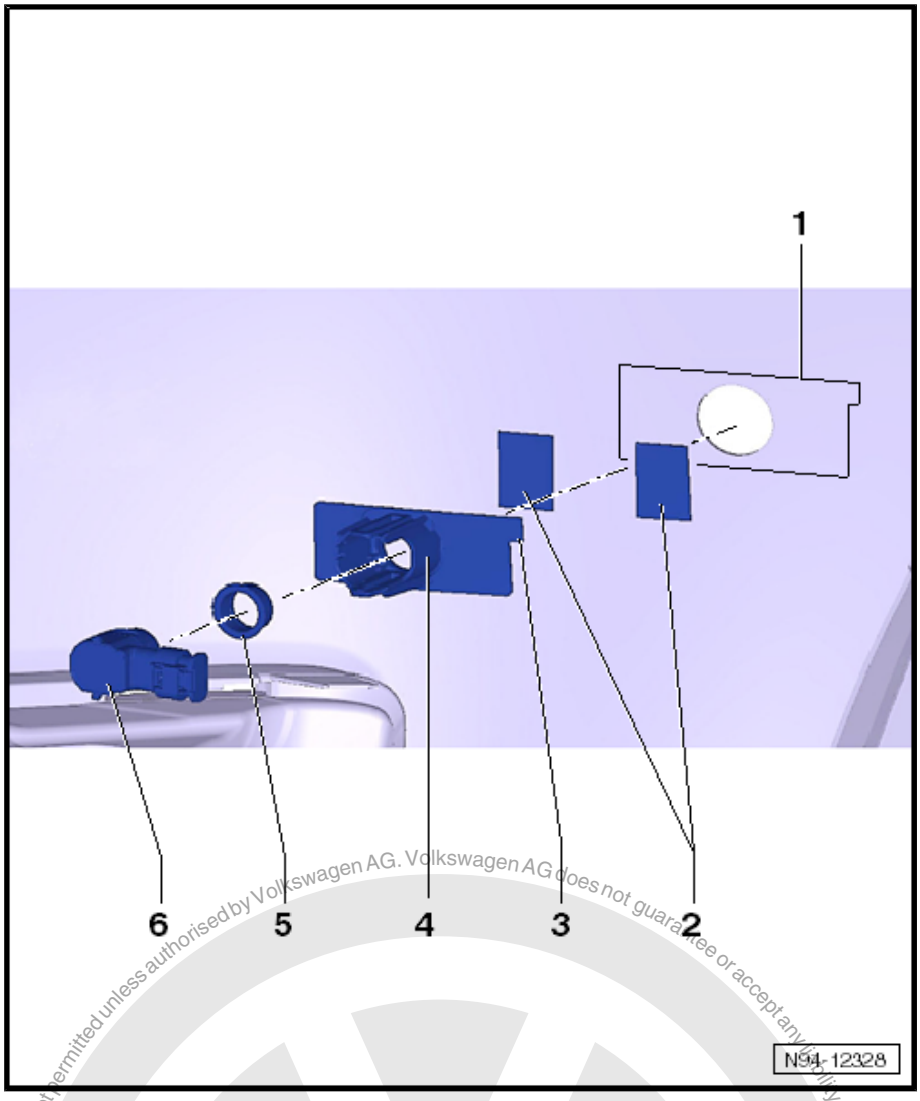
3 - Marking of installation position

- ❑ VR - Front right parking aid sender - G252-
- ❑ VL - Front left parking aid sender - G255-
- ❑ VLS - Front left sender for park assist steering on left side of vehicle - G568-
- ❑ VRS - Front right sender for park assist steering on right side of vehicle - G569-

4 - Sender holder

5 - Decoupling ring

6 - Sender



– Place holder in installation position of inner bumper cover and outline installation area.

Note

When marking the outline, ensure that it is 1 mm greater than the holder. The deviation of the line to the horizontal should be less than 2°.

– Clean area within outline and, if necessary, remove any residual glue from old holder. Degrease area with isopropanol.

– Remove backing from adhesive tape and bond holder in installation position of inner bumper cover.

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10.11.3 Assembly overview - retainers for rear parking aid senders and rear park assist steering senders

Note

Following illustration shows the assembly overview of the retainer with a recess for the connector on the right-hand side. The assembly overview for the retainer with the recess for the connector on the left-hand side is similar (mirror image of right-hand side).

1 - Adhesive pad

- ❑ Adhesive pad is already stuck on holder during production
- ❑ Foam adhesive tape TL 52018-E, s=1
- ❑ Qty. 2, 30 x 20, A = 12 cm^2

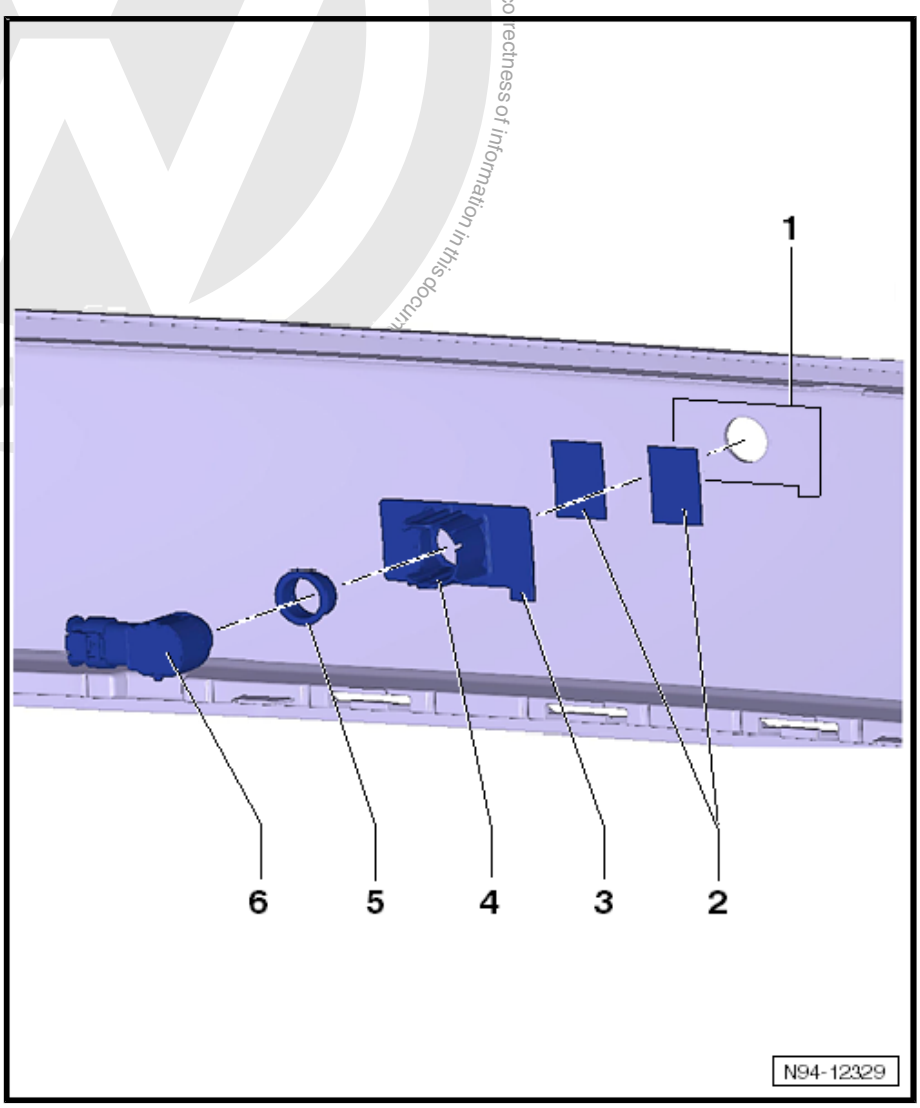
2 - Marking of installation position

- ❑ HL - Rear left parking aid sender - G203-
- ❑ HLM - Rear centre left parking aid sender - G204-
- ❑ HMR - Rear centre right parking aid sender - G205-
- ❑ HR - Rear right parking aid sender - G206-
- ❑ HLS - Rear left park assist steering sender - G716-
- ❑ HRS - Rear right park assist steering sender - G717-

3 - Sender holder

4 - Decoupling ring

5 - Sender



– Place holder in installation position of inner bumper cover and outline installation area.

Note

When marking the outline, ensure that it is 1 mm greater than the holder. The deviation of the line to the horizontal should be less than 2°.

– Clean area within outline and, if necessary, remove any residual glue from old holder. Degrease area with isopropanol.

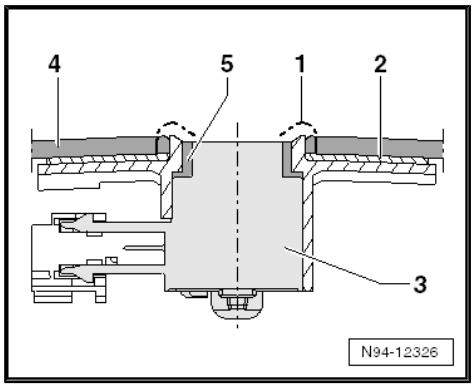
– Remove backing from adhesive tape and bond holder in installation position of inner bumper cover.

10.11.4 Painting holders

If a new retainer for a park assist steering sender is installed, the retainer must first be painted in the required area in the colour of the bumper cover.

Paint area for:

- holder of front left sender for park assist steering on left side of vehicle - G568-
- holder of front right sender for park assist steering on right side of vehicle - G569-
- holder of rear left park assist steering sender - G716-
- holder of rear right park assist steering sender - G717-



Paint area on holder:

1 - Paint area

2 - Adhesive tape s=1

3 - Sender

4 - Bumper cover

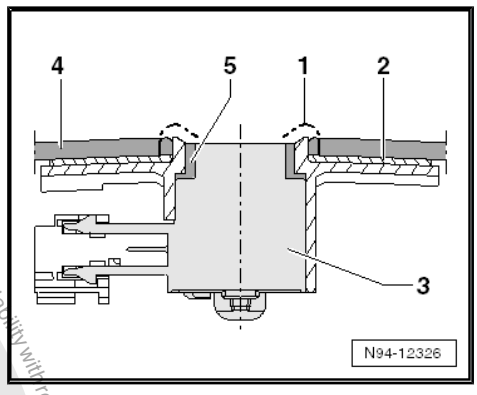
5 - Decoupling ring

Paint:

– Degrease holder in area to be painted -1- with isopropanol.

– Paint holder in area to be painted -1- in colour of bumper cover.

– Once the paint has dried, bond holder in bumper cover.



10.12 Removing and installing park assist steering button - E581-

The park assist steering button is located in the centre console storage compartment in front of the gearbox selector lever. It contains the warning light for park assist steering - K241- and cannot be disassembled any further.

Removal and installation of the park assist steering button - E581- are carried out in the same way for all buttons in the centre console storage compartment and are described in chapter ⇒ “4.1 Removing and installing buttons in centre console storage compartment”, page 332 .

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10.13 Removing and installing parking aid button - E266-

The parking aid button is located in the centre console storage compartment in front of the gearbox selector lever. It cannot be disassembled.

Removal and installation of the parking aid button - E266- are carried out in the same way for all buttons in the centre console storage compartment and is described in chapter
⇒ “4.1 Removing and installing buttons in centre console storage compartment”, page 332 .

10.14 Removing and installing front parking aid warning buzzer

Note

- *The acoustic warning messages of the park assist steering system are given via the parking aid warning buzzer (rear parking aid warning buzzer - H15- and front parking aid warning buzzer - H22-).*
- *The front parking aid warning buzzer - H22- is located under the dash panel in the driver footwell. It is attached above the onboard supply control unit on the rack of the relay carrier.*

Removing:

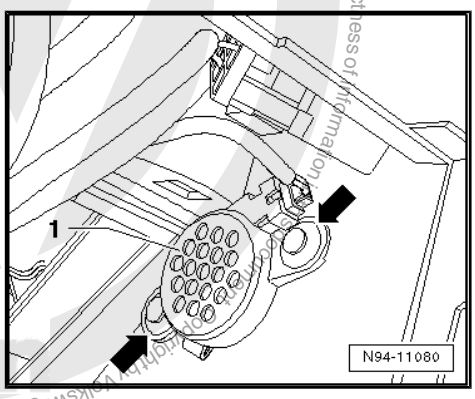
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove relay carrier, above onboard supply control unit, on left of dash panel ⇒ page 370 .

– Remove data bus diagnostic interface and lay it aside with wiring harness connected ⇒ page 388 .

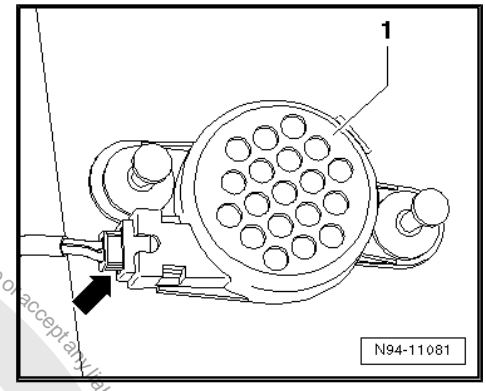
– Pull out onboard supply control unit and move it aside with wiring harness connected ⇒ page 382 ,

– Pull out pins of both expansion rivets -arrows- and remove front parking aid warning buzzer - H22- -1- under consideration of connected line lengths.



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– Release and disconnect connector -arrow- and remove front parking aid warning buzzer - H22- -1- from vehicle.



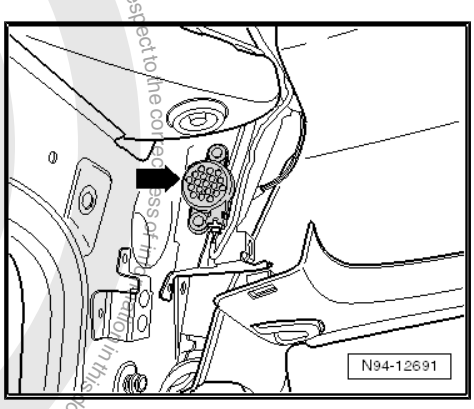
Installing:

Installation is carried out in reverse order of removal.

10.15 Removing and installing rear parking aid warning buzzer

Note

The rear parking aid warning buzzer - H15- -arrow- is located behind upper trim of left B-pillar.

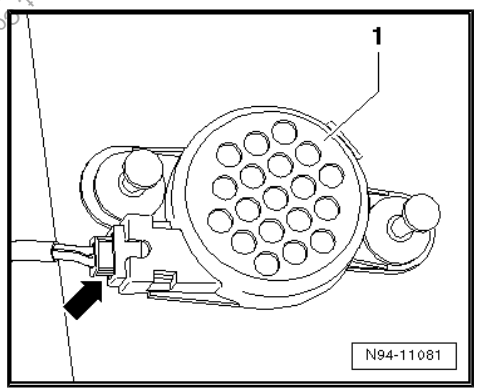


Removing:

– Remove upper trim of left B-pillar ⇒ General body repairs, interior; Rep. gr. 70 ; Removing and installing upper trim of B-pillar (Kombi) .

– Pull out pins of both expansion rivets and remove rear parking aid warning buzzer - H15- , as far as the connected cables will allow.

– Release and disconnect connector -arrow- and remove rear parking aid warning buzzer - H15- -1- from vehicle.



Installing:

Installation is carried out in reverse order of removal.

10.16 Adapting parking aid warning buzzer

With this function, the following functions of the parking aid warning buzzer can be adapted:

- Frequency of parking aid speaker
- Volume of parking aid loudspeaker

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- General body repairs

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- 01 - On Board Diagnostic capable systems
- Parking aid II -J446-
- Parking aid II functions
- Adaption

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11 Towing bracket

⇒ “11.1 General description - towing bracket”, page 314

⇒ “11.2 Removing and installing trailer socket U10 ”, page 314

⇒ “11.3 Pin assignment of trailer socket U10 ”, page 317

⇒ “11.4 Removing and installing trailer detector control unit ”, page 318

11.1 General description - towing bracket

For vehicles manufactured from calendar week 22/2013 onwards, a preparation for towing bracket can be ordered as an option. This applies for all vehicles for which a “towing bracket” can be ordered.

During production, the same modules are fed to the vehicle as is the case for the version with “towing bracket”. These modules include e.g.:

- Cooler module
- Battery
- Alternator

The following components or preparations are installed:

- Wiring harness up to coupling point on right D-pillar
- Trailer detector control unit - J345- including bracket and all add-on parts

The following control units and the module family for convenience electronics must be coded for towing mode:

- Onboard supply control unit - J519-
- Data bus diagnostic interface - J533-
- Control unit for ABS with EDL - J104-
- Parking aid control unit - J446-
- Reversing camera system via reversing camera system control unit - J772-
- Anti-theft alarm system via convenience system central control unit - J393-

11.2 Removing and installing trailer socket - U10-

⇒ “11.2.1 Removing and installing trailer socket U10 ”, page 314

11.2.1 Removing and installing trailer socket - U10-

Note

- *If the trailer socket is to be repaired due to, e.g. corrosion, check 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.*

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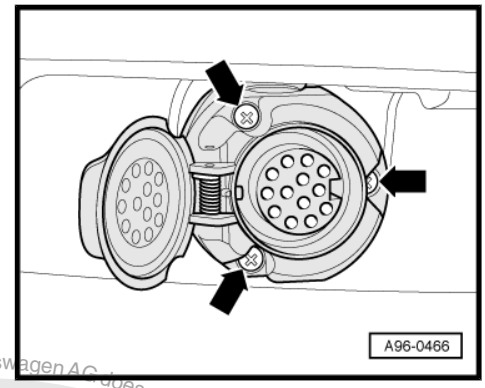
Removing

– Switch off ignition and all electrical consumers, and remove ignition key.

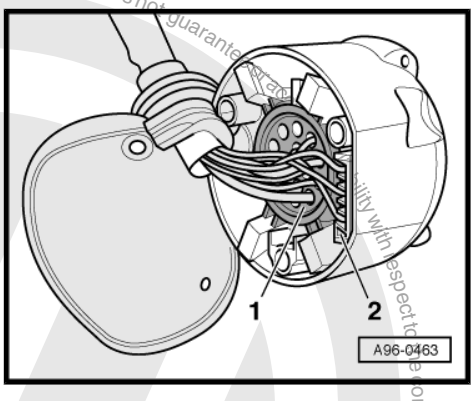
– Remove securing bolts -arrows-.

– Remove trailer socket - U10- from retaining plate.

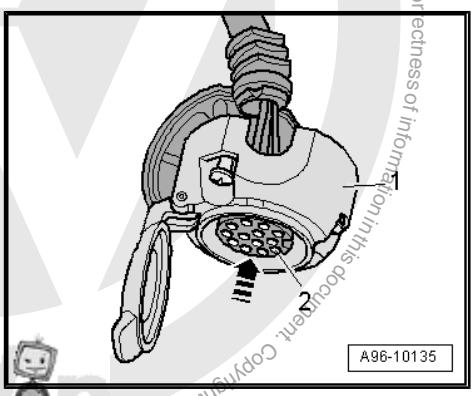
– Pull rubber cover off trailer socket.



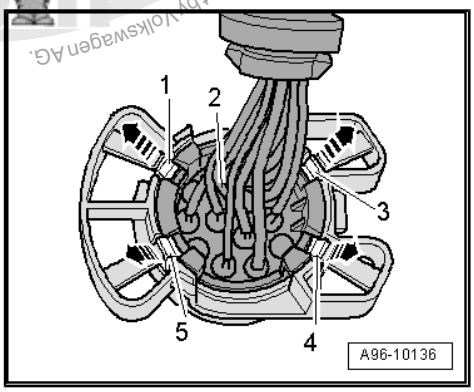
– Depending on equipment level, disconnect connector -2- for rear fog light cut-out contact switch - F216- .



– Push multi-pin connector -2- in direction of -arrow- out of socket housing -1-.

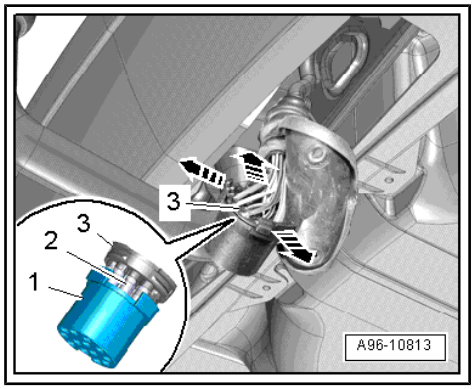


– Release fasteners -arrows-, and remove multi-pin connector frame -2-.



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– Release retaining clips -arrows-, and remove retaining cage -1- from multi-pin connector -3-.

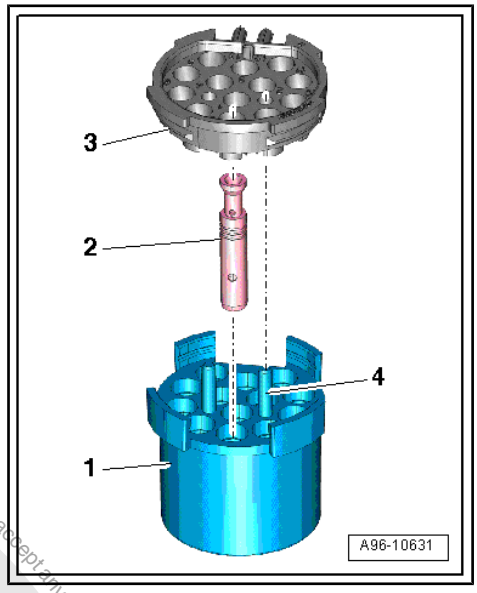


Note

Proceed with care when pulling off retaining cage -1- in order to prevent the contacts -2- from being disconnected from the wiring harness.

Installing

Install in the reverse order of removal. When doing this, note the following:

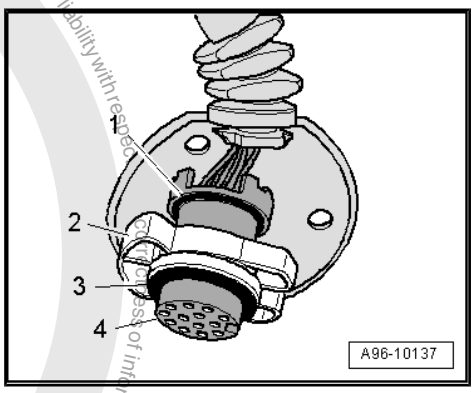


Note

- *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.

– Push multi-pin connector -4- into retaining cage -2- until it engages audibly.



Note

Be especially careful that seals -1- and -3- are not damaged.

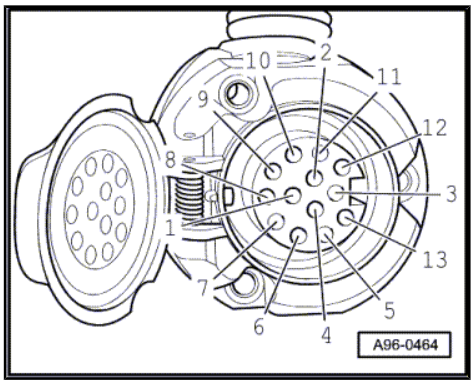
– Slide multi-pin connector in correct installation position from behind into socket housing.
– Fit rubber cover onto socket housing and fit trailer socket to retaining plate.
– Screw in 3 securing bolts, and tighten them to 2 Nm.

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11.3 Pin assignment of trailer socket - U10-

⇒ “11.3.1 Pin assignment of trailer socket U10 ”, page 317

11.3.1 Pin assignment of trailer socket - U10-



Pin assignment of trailer socket - U10- with rear fog light cut-out contact switch - F216-

1 - Terminal BLL (left turn signal)

2 - Terminal NSL (rear fog lamp)

3 - Terminal 31 (earth)

4 - Terminal BRR (right turn signal)

5 - Terminal 58 R (right tail light)

6 - Terminal 54 (brake light)

7 - Terminal 58 L (left tail light)

8 - Terminal RFL (back-up lamp)

9 - Terminal 30 (Battery “+”), permanent positive, low permissible current range, approx. 7.5 to 10 A

10 - Reserved for terminal 30

11 - Reserved for terminal 31

12 - Not assigned

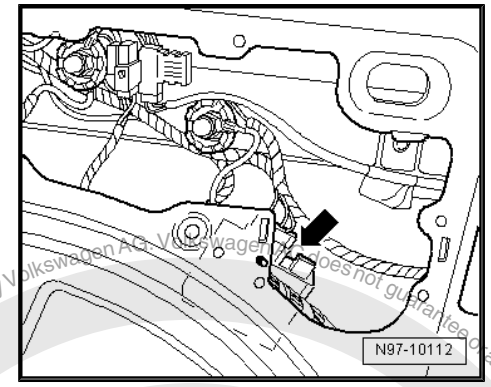
13 - Terminal 31 (earth)

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11.4 Removing and installing trailer detector control unit

Note

The trailer detector control unit - J345- -arrow- is located behind the rear right side panel trim.



Note

Additional information:

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

The trailer detector control unit - J345- detects from a power draw of minimum 5 W[3)] the “trailer operation” and transmits this information to various control units via the CAN data bus.

The trailer detector control unit - J345- is supplied with information (light control) from the onboard supply control unit - J519- and convenience system central control unit - J393- via the CAN data bus.

3) Left turn signal light or brake light as a minimum must be switched on, in order to detect “trailer operation”.

Fault detection and fault display:

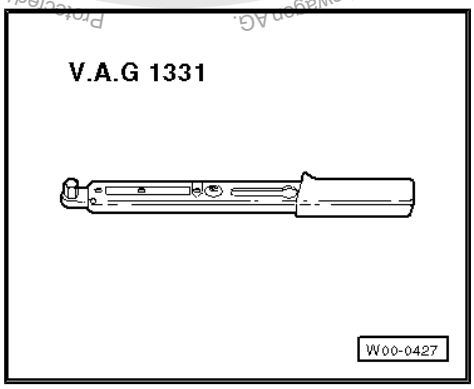
The trailer detector control unit - J345- manufactured by Hella is not self-diagnosis capable.

Currently, only control units not capable of self-diagnosis (manufacturer Hella) are installed on Caddy vehicles.

The trailer detector control unit - J345- detects “trailer operation” from a power draw of minimum 5 W on brake light or left turn signal switch.

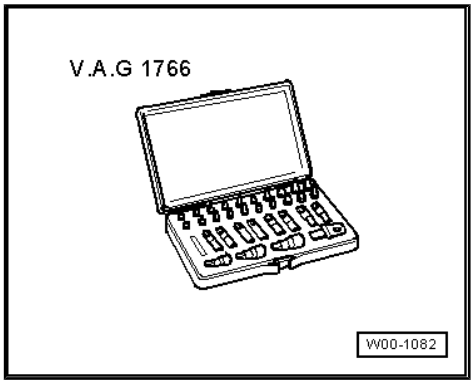
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



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♦ TORX bit range - V.A.G 1766-



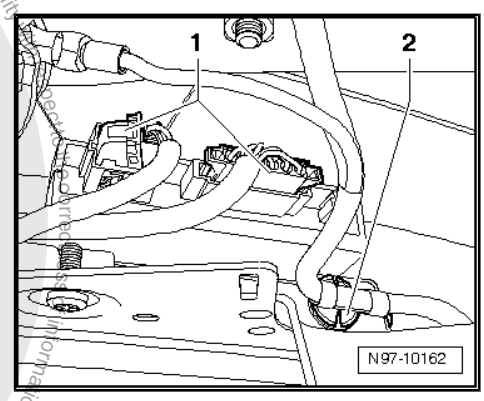
Removing:

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

– Remove right-hand luggage compartment side trim panel ⇒ General body repairs, interior; Rep. gr. 70 ; Load, luggage compartment trim .

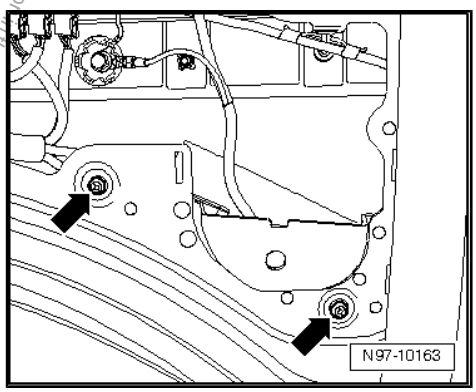
– Release connector -1- and disconnect it from trailer detector control unit - J345- .

– Pull guide clip -2- out of bracket and place cable as far to one side as the cable length allows.



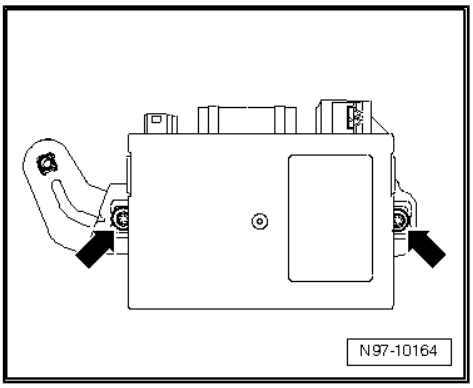
– Remove securing bolts -arrows-.

– Remove the bracket together with trailer detector control unit - J345- from the vehicle.



– Remove securing bolts -arrows-.

– Remove trailer detector control unit - J345- from bracket.



Installing:

Installation is carried out in the reverse order. When installing observe the following:

– Tighten bolt for securing control unit to bracket to 9 Nm.

– Tighten bolt securing bracket to body to 9 Nm.

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96 – Lights, bulbs, switches - interior

1 Lights and controls in the dash panel

⇒ “1.1 Removing and installing light switch ”, page 320

⇒ “1.2 Removing and installing headlight range control regulator and switch and instrument illumination regulator ”, page 321

⇒ “1.3 Removing and installing front passenger side airbag de-activated warning lamp ”, page 322

⇒ “1.4 Removing and installing hazard warning light switch E229 ”, page 323

⇒ “1.5 Removing and installing key operated switch to deactivate front passenger front airbag ”, page 324

1.1 Removing and installing light switch

The following components are integrated into the light switch -E1- :

Note

- *Fog light switch - E7-*
- *Rear fog light switch - E18-*
- *Bulb for illumination of light switch - L9-*

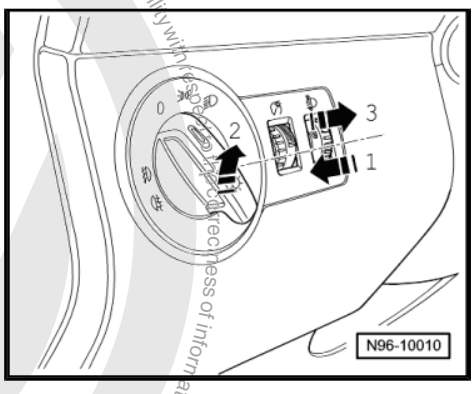
Removing:

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

– Turn rotary knob part of light switch to “0”.

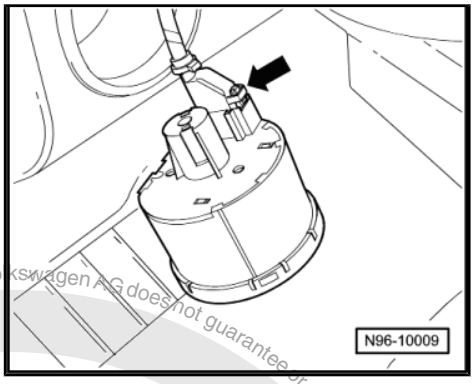
– Press rotary position indicator of light switch firmly inwards -1- and turn slightly to right -2-.

– Hold rotary grip in this position and pull light switch out of dash panel using rotary grip -3-.



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– Release and disconnect electrical connector -arrow-.



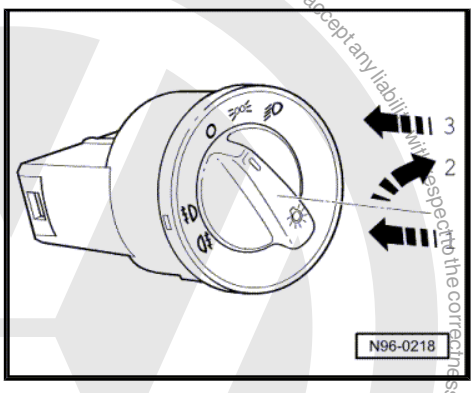
Installing:

– Connect connector to light switch.

– Holding light switch, press rotary position indicator of light switch firmly inwards -1- and turn slightly to right -2-.

– Hold rotary grip in this position and insert light switch in dash panel -3-.

– Turn rotary grip to “0” position, release and engage switch.



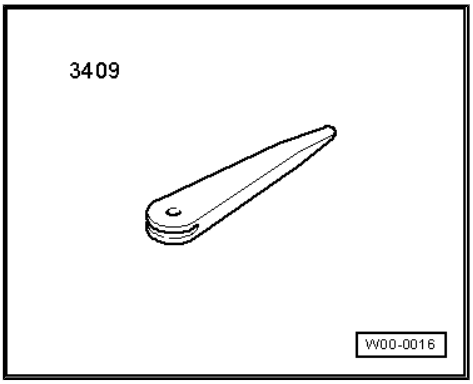
1.2 Removing and installing headlight range control regulator and switch and instrument illumination regulator

Note

- *The headlight range control regulator - E102- and the switch and instrument illumination regulator - E20- form one component.*
- *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 - VAS 3409-

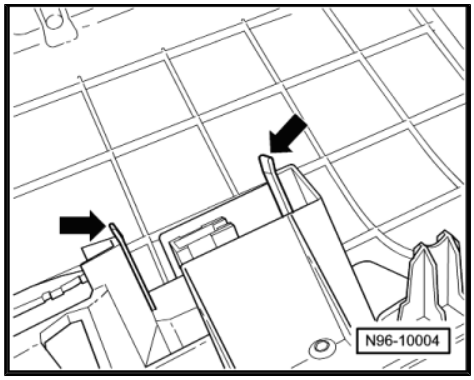


Removing:

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

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– Remove storage compartment on driver side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers; Removing and installing storage compartment on driver side .
– Release locking lugs -arrows- and take out adjuster and regulator.



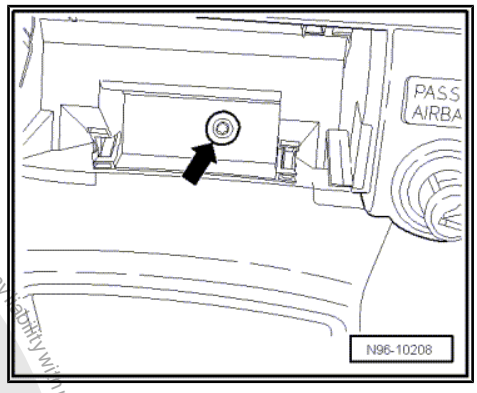
Installing:

Installation is carried out in reverse order of removal.

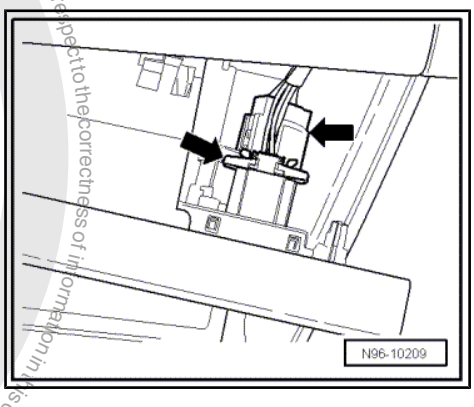
1.3 Removing and installing front passenger side airbag deactivated warning lamp

Removing:

– Switch off ignition and all electrical loads, and pull out ignition key.
– Pull ashtray out of centre console.
– Remove securing bolt -arrow-.
– Pull trim out of centre console a little.

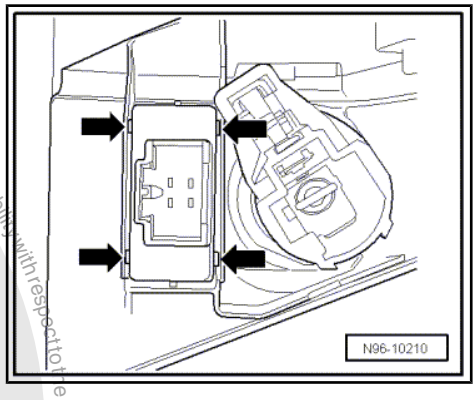


– Release and disconnect electrical connectors -arrows-.



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– Release locking lugs -arrows- and remove warning lamp from trim.



Installing:

Installation is carried out in reverse order of removal.

1.4 Removing and installing hazard warning light switch - E229-

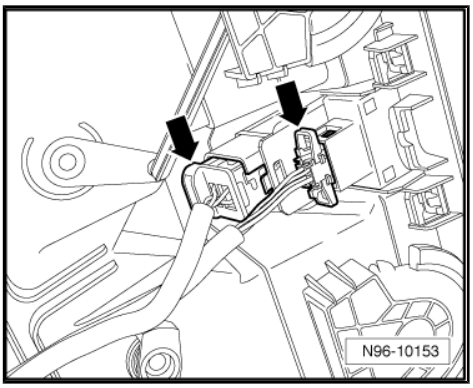
Removing:

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

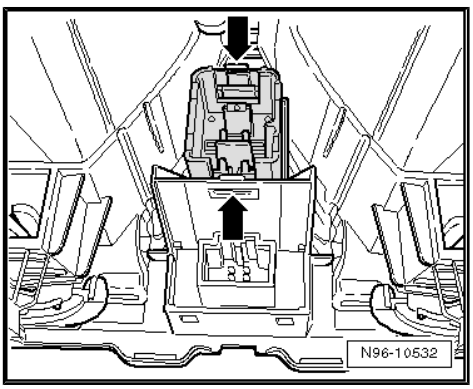
– Remove trim from centre of dash panel ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trim; Removing and installing trim in centre of dash panel .

– Operating and display unit for heating, or removing the air conditioning ⇒ Heating, air conditioning; Rep. gr. 80 ; Operating and display unit or⇒ heating, air conditioning; Rep. gr. 87 ; operating and display unit .

– Release and disconnect electrical connectors -arrows-.



– Release locking lugs -arrows- and take out hazard warning light switch - E229- .



Installing:

Installation is carried out in reverse order of removal.

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1.5 Removing and installing key operated switch to deactivate front passenger front airbag

WARNING

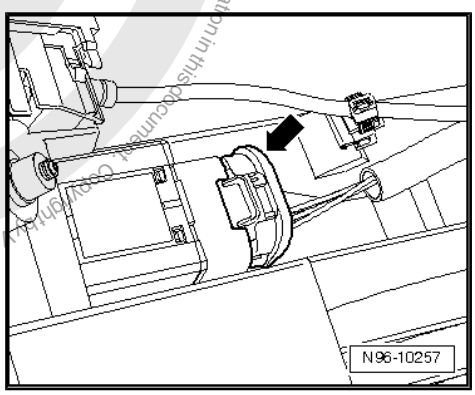
- *Danger of the triggering of the airbag!*
- *Improper action on airbag unit may result in the triggering of the airbag!*
- *Observe safety precautions when working on airbag.*

Removing:

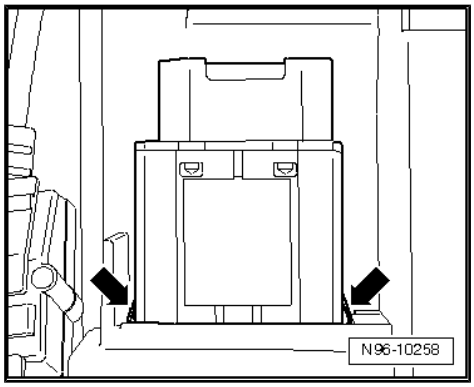
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove passenger side lower compartment ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trim; Removing and installing passenger side lower compartment .

– Release and disconnect electrical connector -arrow-.



– Release locking lugs -arrows- and remove key operated switch.



Installing:

Installation is carried out in reverse order of removal.

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2 Lights and controls in front doors

⇒ “2.1 Removing and installing front left window regulator switch”, page 325

⇒ “2.2 Removing and installing front right window regulator switch”, page 326

⇒ “2.3 Removing and installing switch for exterior mirror adjustment and button for central locking, driver side”, page 327

⇒ “2.4 Removing and installing door contact switch”, page 327

2.1 Removing and installing front left window regulator switch

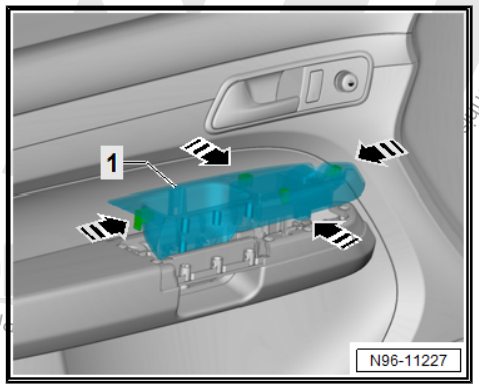
Note

- *Depending on vehicle equipment, the front left window regulator switch may have 2 or 4 buttons.*
- *The removal and installation of the front left window regulator switch is carried out in the same way for both versions.*

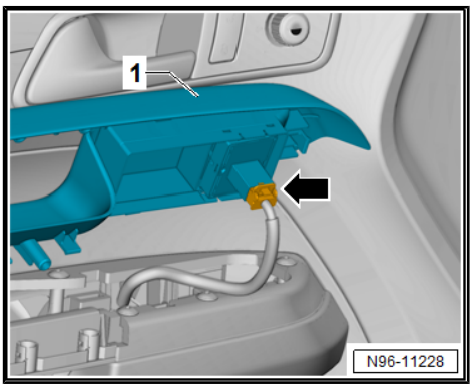
Removing:

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

– Using removal wedge - 3409- , carefully lever handle trim at catches -arrows- out of door trim.

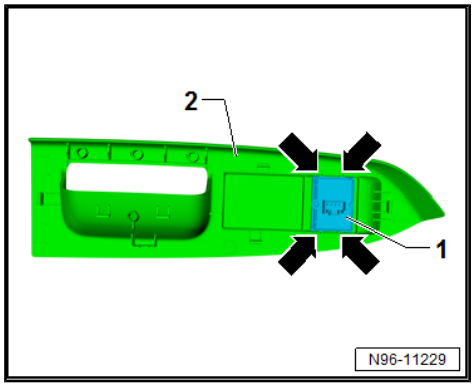


– Release and disconnect connector -arrow-, and remove handle trim -1-.



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– Release locking lugs -arrows-, and remove switch module -1- from handle trim -2-.



Installing:

Installation is carried out in reverse order of removal.

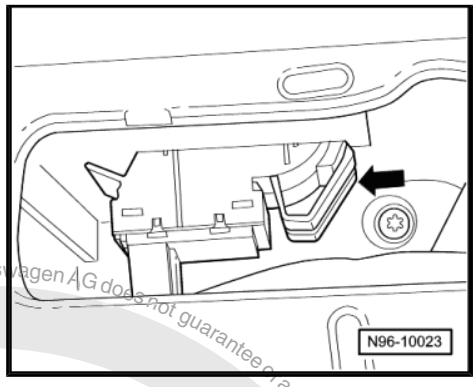
2.2 Removing and installing front right window regulator switch

Removing:

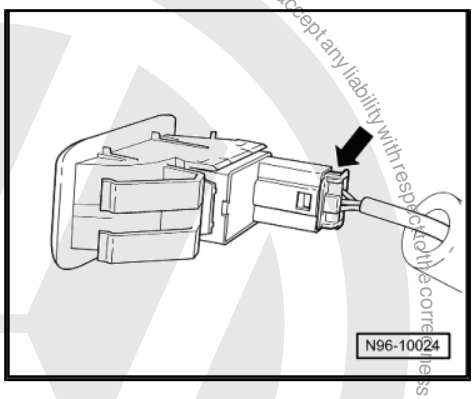
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove door trim ⇒ General body repairs, interior; Rep. gr. 70 ; Door trims; Front door trim; Removing and installing .

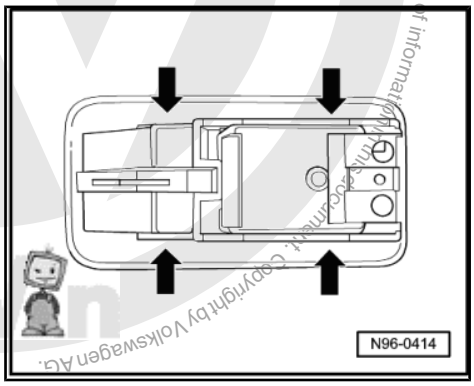
– Release locking lug -arrow- and remove switch together with mounting frame from door trim.



– Release and disconnect electrical connector -arrow-.



– Release locking lugs -arrows- and remove switch from mounting frame.



Installing:

Installation is carried out in reverse order of removal.

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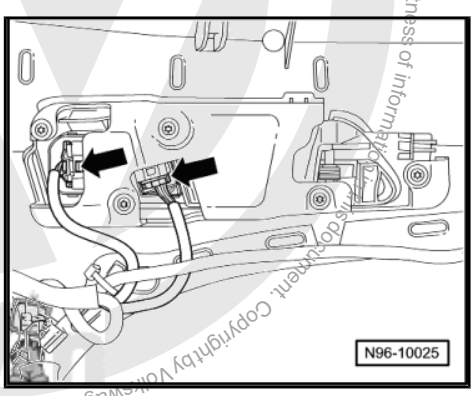
2.3 Removing and installing switch for exterior mirror adjustment and button for central locking, driver side

Removing:

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

– Remove door trim ⇒ General body repairs, interior; Rep. gr. 70 ; Door trims; Front door trim; Removing and installing .

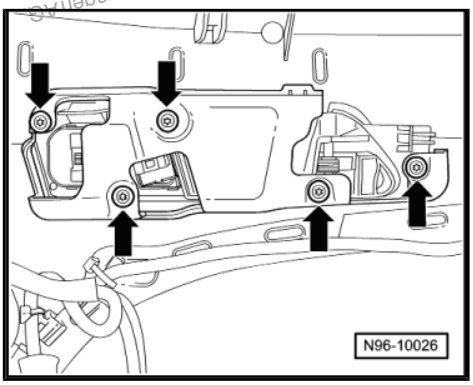
– Release and disconnect electrical connectors -arrows-.



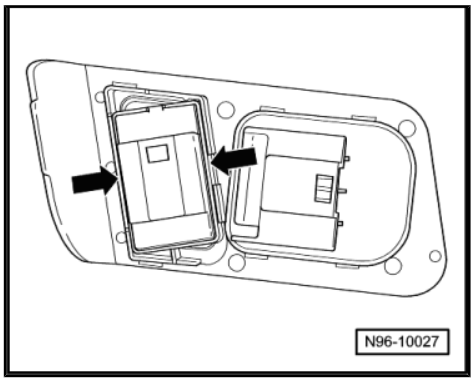
– Undo bolts -arrows- and remove cover.

– Remove trim of door opener together with switches from the door trim.

– Unclip mounting frame of switches from trim.



– Release locking lugs -arrows- and remove central locking switch from mounting frame.



Note

The adjustment switch for mirror with fold-in feature - E43- is joined permanently to the mounting frame. In the event of repair, the complete component must be renewed.

Installing:

Installation is carried out in reverse order of removal.

2.4 Removing and installing door contact switch

The door contact switch is integrated into door lock and cannot be replaced separately.

The complete door lock must always be renewed if the door contact switch is defective.

– Replace the corresponding door lock ⇒ General body repairs, exterior; Rep. gr. 57 or ⇒ General body repairs, exterior; Rep. gr. 58 .

3 Lights and controls in sliding doors

⇒ “3.1 Removing and installing contact strip in left sliding door ”, page 328

⇒ “3.2 Removing and installing contact strip in right sliding door ”, page 330

⇒ “3.3 Removing and installing rear door contact switches for sliding door or side door ”, page 330

3.1 Removing and installing contact strip in left sliding door

⇒ “3.1.1 Removing and installing contact strip in left sliding door , B-pillar”, page 328

⇒ “3.1.2 Removing and installing contact strip in left sliding door , sliding door”, page 329

3.1.1 Removing and installing contact strip in left sliding door , B-pillar

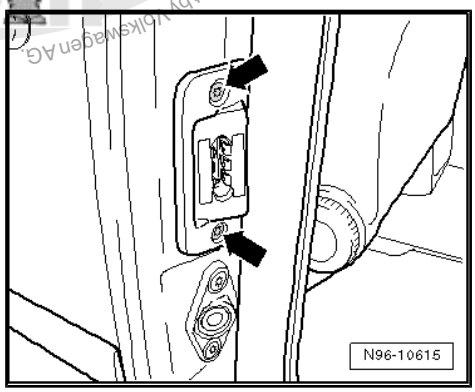
Note

- *In the Caddy, the contact strip in left sliding door - F353- is used only in vehicles with central locking.*
- *The contact strip in left sliding door - F353- comprises a contact carrier (wedge) in the sliding door and a contact strip (bush) in the B-pillar.*

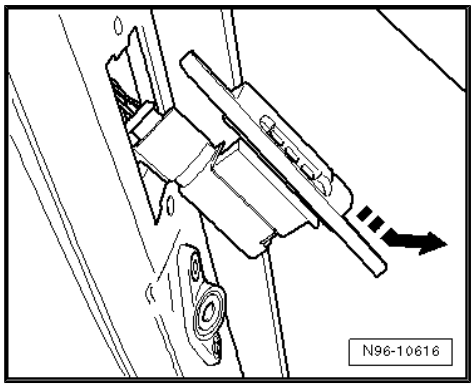
Removing:

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

– Remove securing bolts -arrows-.



– Remove contact strip in -direction of arrow-.



Installing:

Installation is carried out in reverse order of removal.

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3.1.2 Removing and installing contact strip in left sliding door , sliding door

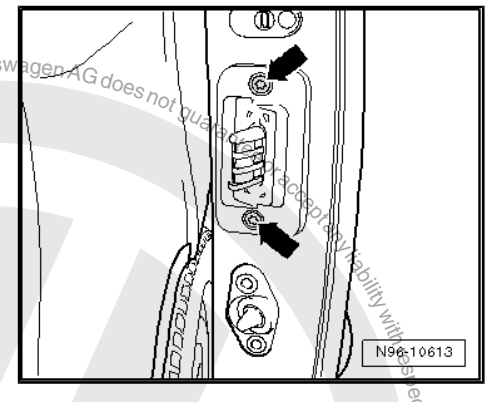
Note

- *In the Caddy, the contact strip in left sliding door - F353- is used only in vehicles with central locking.*
- *The contact strip in left sliding door - F353- comprises a contact carrier (wedge) in the sliding door and a contact strip (bush) in the B-pillar.*

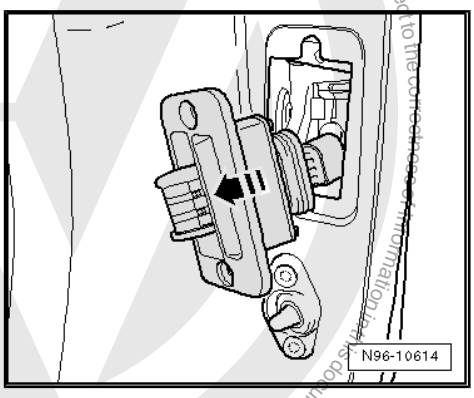
Removing:

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

– Remove securing bolts -arrows-.



– Remove contact strip in -direction of arrow-.



Installing:

Installation is carried out in reverse order of removal.

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3.2 Removing and installing contact strip in right sliding door

⇒ “3.2.1 Removing and installing contact strip in right sliding door , B-pillar”, page 330

⇒ “3.2.2 Removing and installing contact strip in right sliding door , sliding door”, page 330

3.2.1 Removing and installing contact strip in right sliding door , B-pillar

Note

- *In the Caddy, the contact strip in right sliding door - F352- is used only in vehicles with central locking.*
- *The contact strip in right sliding door - F352- comprises a contact carrier (wedge) in the sliding door and a contract strip (bush) in the B-pillar.*

– Removal and installation of the contact strip in the right B-pillar are carried out in the same way as the removal and installation of the contact strip in the left B-pillar ⇒ page 328 .

3.2.2 Removing and installing contact strip in right sliding door , sliding door

Note

- *In the Caddy, the contact strip in right sliding door - F352- is used only in vehicles with central locking.*
- *The contact strip in right sliding door - F352- comprises a contact carrier (wedge) in the sliding door and a contract strip (bush) in the B-pillar.*

– Removal and installation of the contact strip in the right sliding door are carried out in the same way as the removal and installation of the contact strip in the left sliding door ⇒ page 329 .

3.3 Removing and installing rear door contact switches for sliding door or side door

⇒ “3.3.1 Removing and installing rear left door contact switch for sliding door or side door ”, page 330

⇒ “3.3.2 Removing and installing rear right door contact switch for sliding door or side door ”, page 331

3.3.1 Removing and installing rear left door contact switch for sliding door or side door

Note

The rear left door contact switch for sliding door or side door - F176- is located in the bush (B-pillar), which is activated and deactivated by a wedge in the sliding door.

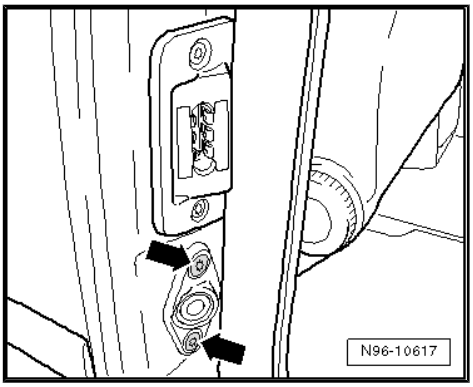
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Removing:

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

– Remove securing bolts -arrows-.

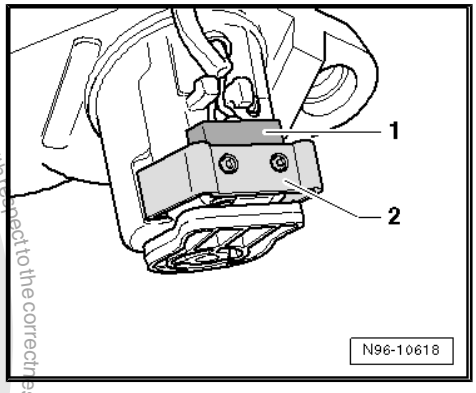
– Remove door contact switch from B-pillar.



– Remove spring clip -2- and remove microswitch -1-.

– Remove lower trim from B-pillar ⇒ General body repairs, interior; Rep. gr. 70 ; Trim, insulation; Pillar trims; Removing and installing lower B-pillar trim .

– Release and disconnect connector from door contact switch inside B-pillar.



Installing:

Installation is carried out in reverse order of removal.

3.3.2 Removing and installing rear right door contact switch for sliding door or side door

Note

The rear right door contact switch for sliding door or side door -F7- is located in the bush (B-pillar), which is activated and deactivated by a wedge in the sliding door.

– Removal and installation of the rear right door contact switch for sliding door or side door are carried out in the same way as the removal and installation of the rear left door contact switch for sliding door or side door ⇒ page 330 .

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4 Lights and controls in the centre console

⇒ “4.1 Removing and installing buttons in centre console storage compartment”, page 332

4.1 Removing and installing buttons in centre console storage compartment

Depending on equipment, the following buttons are installed in the centre console storage compartment:

- TCS and ESP button - E256-
- Fuel selection switch (petrol, gas) - E395-
- Tyre pressure monitor display button - E492-
- Parking aid button - E266-
- Park assist steering button - E581-
- Start/stop operation switch - E693-

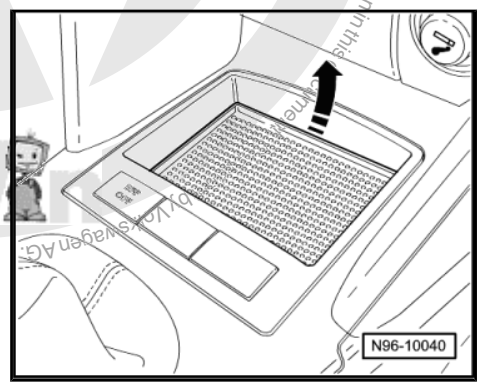
Note

The procedure for removal and installation is the same for all buttons in the centre console storage compartment and is therefore described for just one button.

Removing:

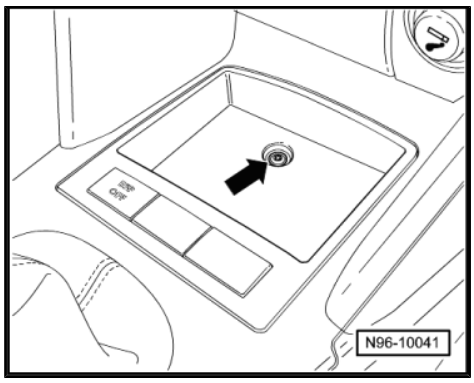
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove rubber mat from storage compartment.



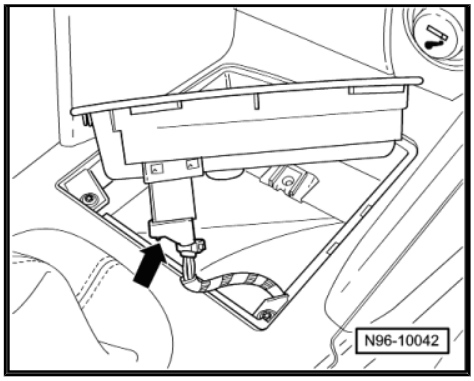
– Remove securing bolt -arrow-.

– Pull storage compartment out of centre console.

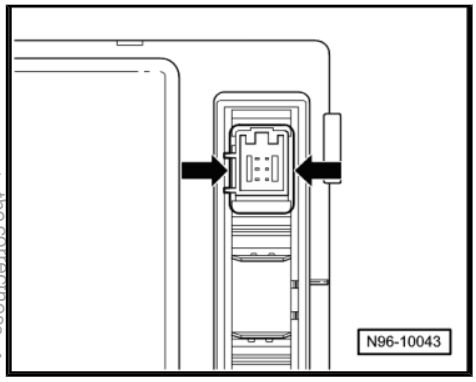


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– Release and disconnect connectors -arrow- from all built-in buttons.



– Unlock locking lugs -arrows- and remove button from mounting frame.



Installing:

Installation is carried out in reverse order of removal.

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5 Lights and controls in luggage compartment

⇒ “5.1 Removing and installing luggage compartment light ”, page 334

⇒ “5.2 Removing and installing bulb for luggage compartment light”, page 335

⇒ “5.3 Removing and installing luggage compartment light switch F5 ”, page 336

⇒ “5.4 Removing and installing central locking switch in left wing door F213 ”, page 336

⇒ “5.5 Removing and installing rear door contact switches ”, page 336

⇒ “5.6 Removing and installing rear lid release switch E165 ”, page 336

5.1 Removing and installing luggage compartment light

⇒ “5.1.1 Removing and installing luggage compartment light , vehicles with rear lid”, page 334

⇒ “5.1.2 Removing and installing luggage compartment light , vehicles with rear wing doors”, page 335

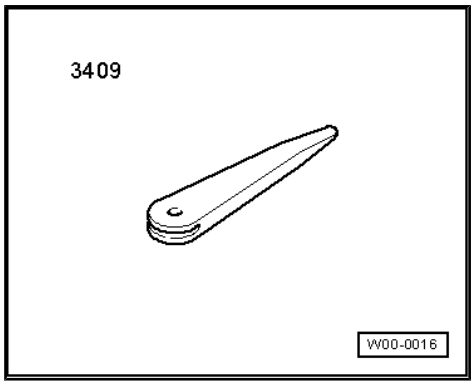
5.1.1 Removing and installing luggage compartment light , vehicles with rear lid

Note

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

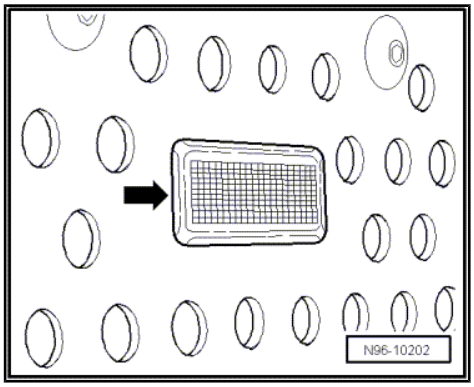
- Removal wedge - VAS 3409-



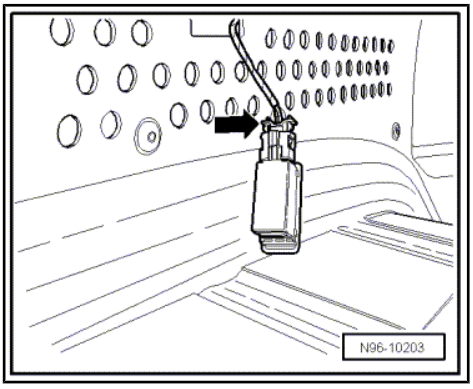
Removing:

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

– Lever out luggage compartment light -arrow- from luggage compartment trim using removal wedge - VAS 3409- .



– Release and disconnect electrical connector -arrow-.



Installing:

Installation is carried out in reverse order of removal.

5.1.2 Removing and installing luggage compartment light , vehicles with rear wing doors

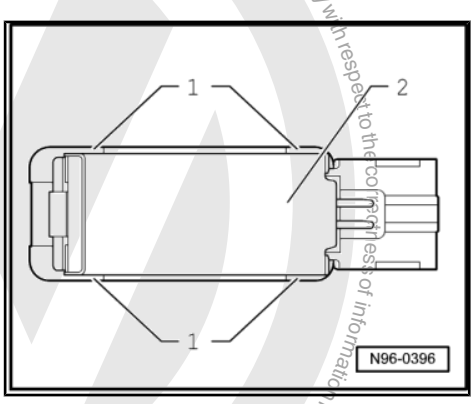
– The procedure for removing and installing the luggage compartment light - W3- on vehicles with rear wing doors is the same as that on vehicles with rear lid ⇒ page 334 .

5.2 Removing and installing bulb for luggage compartment light

Removing:

– Remove luggage compartment light ⇒ page 334 .

– Release locking lugs -1- and remove heat shield -2- from lens of light.



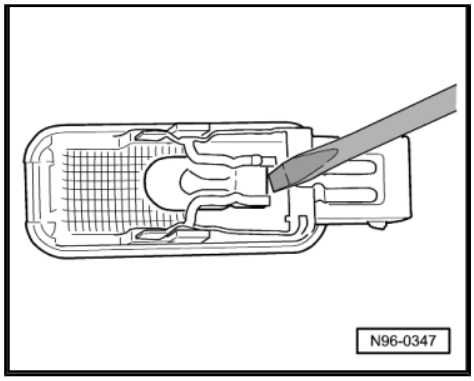
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– Carefully lever bulb out of socket.

Bulb for luggage compartment light : glass base bulb 12 V, 6 W

Installing:

Installation is carried out in reverse order of removal.



5.3 Removing and installing luggage compartment light switch - F5-

Luggage compartment light switch - F5- (vehicles with rear lid) and left luggage compartment light switch - F357- / right luggage compartment light switch - F358- (vehicles with rear wing doors) are integral parts of corresponding rear lid/door locks and can therefore not be renewed individually.

– Replace rear lid lock cylinder ⇒ General body repairs, exterior; Rep. gr. 55 ; Rear lid; Removing and installing lock cylinder .

– Renewing rear wing door lock ⇒ General body repairs, exterior; Rep. gr. 55 ; Rear wing doors; Removing and installing lower left lock .

5.4 Removing and installing central locking switch in left wing door - F213-

The central locking switch in left wing door - F213- is integral part of the rear wing door lock and cannot be renewed individually.

– Renewing rear wing door lock ⇒ General body repairs, exterior; Rep. gr. 55 ; Rear wing doors; Removing and installing lower left lock .

5.5 Removing and installing rear door contact switches

The rear left door contact switch - F227- as well as the rear right door contact switch - F226- is integral part of the rear wing door lock and cannot be renewed individually.

– Renewing rear wing door lock ⇒ General body repairs, exterior; Rep. gr. 55 ; Rear wing doors; Removing and installing lower left lock .

5.6 Removing and installing rear lid release switch - E165-

The rear lid release switch - E165- is integral part of the rear wing door lock and cannot be renewed individually.

– Replace rear lid lock cylinder ⇒ General body repairs, exterior; Rep. gr. 55 ; Rear lid; Removing and installing lock cylinder .

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6 Lights and controls in the roof trim

⇒ “6.1 Removing and installing front interior light , vehicles as of 06.07”, page 337

⇒ “6.2 Removing and installing bulb for front interior light , vehicles as of 06.07”, page 338

⇒ “6.3 Removing and installing front interior light , driver side reading light and front passenger reading light ”, page 338

⇒ “6.4 Removing and installing bulb for front interior light”, page 340

⇒ “6.5 Removing and installing bulb for front reading light”, page 341

⇒ “6.6 Removing and installing left centre reading lamp and right centre reading lamp ”, page 342

⇒ “6.7 Removing and installing rear left interior light and rear right interior light ”, page 342

⇒ “6.8 Removing and installing bulbs for centre reading lights and rear interior lights ”, page 343

⇒ “6.9 Removing and installing vanity mirror light ”, page 344

⇒ “6.10 Removing and installing light for vanity mirror”, page 345

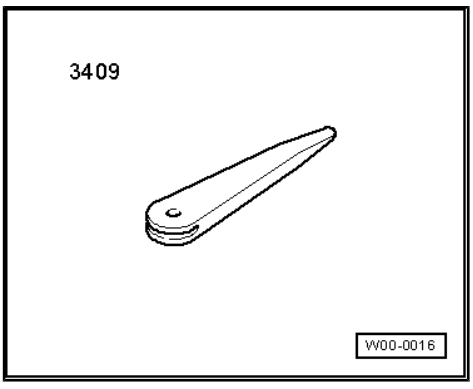
6.1 Removing and installing front interior light , vehicles as of 06.07

Note

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 - VAS 3409-



Removing:

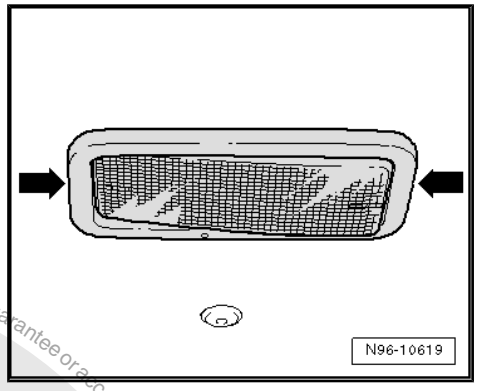
– Switch off ignition and all electrical loads, and pull out ignition key.

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– Carefully lever interior/reading light out of installation frame using removal wedge - VAS 3409- or suitable screwdriver.
– Release and disconnect electrical connector.

Installing:

Installation is carried out in reverse order of removal.



6.2 Removing and installing bulb for front interior light , vehicles as of 06.07

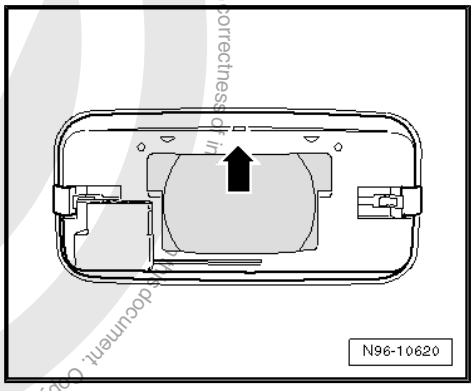
Removing:

– Switch off ignition and all electrical loads, and pull out ignition key.
– Remove front interior light ⇒ page 337 .
– Remove cover on rear of interior light in -direction of arrow-.

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

Installing:

Installation is carried out in reverse order of removal.



6.3 Removing and installing front interior light , driver side reading light and front passenger reading light

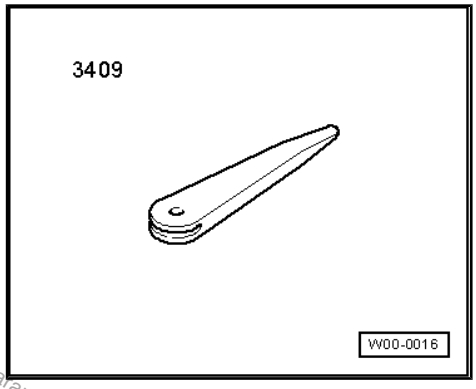
Note

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

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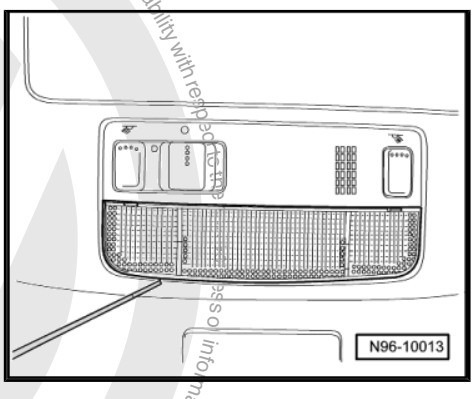
♦ Removal wedge - VAS 3409-



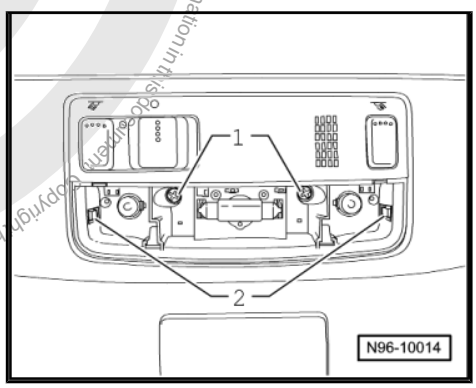
Removing:

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

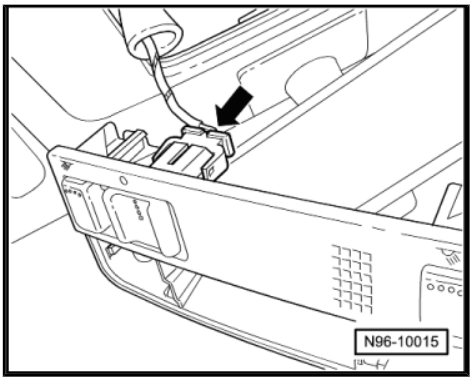
– Carefully lever lens for interior/reading light out of installation frame using removal wedge - VAS 3409- or suitable screwdriver.



– Undo screws -1- and release locking lugs -2-.



– Release and disconnect electrical connector -arrow-.



Installing:

Installation is carried out in reverse order of removal.

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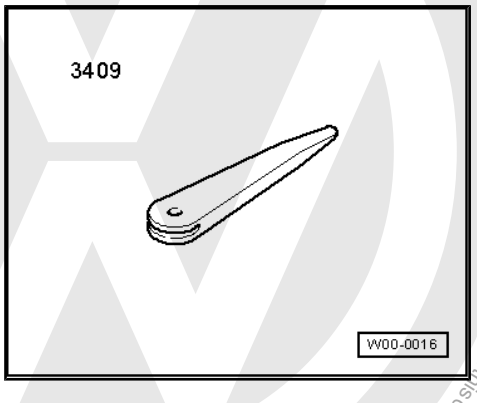
6.4 Removing and installing bulb for front interior light

Note

- *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.*
- *There is no need to remove the interior light and reading lamp to gain access to the bulbs.*

Special tools and workshop equipment required

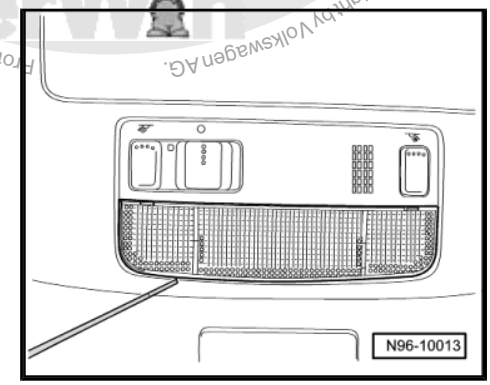
- Removal wedge - VAS 3409-



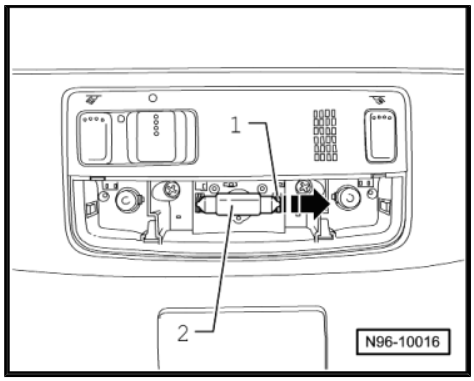
Removing:

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

– Carefully lever lens for interior/reading light out of installation frame using removal wedge - VAS 3409- or suitable screwdriver.



– Press contact plate -1- of light in direction of arrow and remove festoon bulb -2- from bulb holder.



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

Installing:

Installation is carried out in reverse order of removal.

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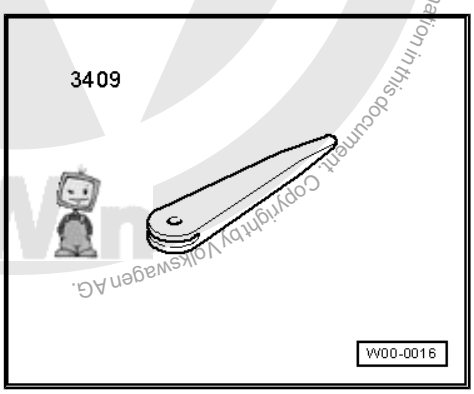
6.5 Removing and installing bulb for front reading light

Note

- *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.*
- *There is no need to remove the interior light and reading lamp to gain access to the bulbs.*
- *The procedure for removal and installation of bulbs for the driver side reading light and the front passenger reading light is the same and is therefore described for one bulb only.*

Special tools and workshop equipment required

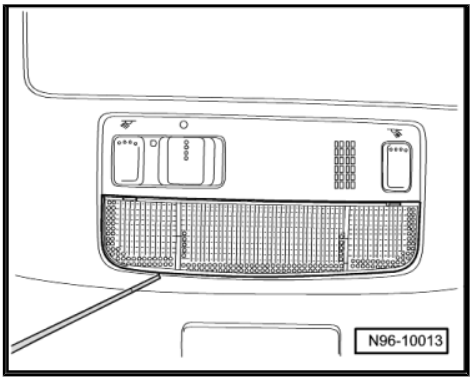
- Removal wedge - VAS 3409-



Removing:

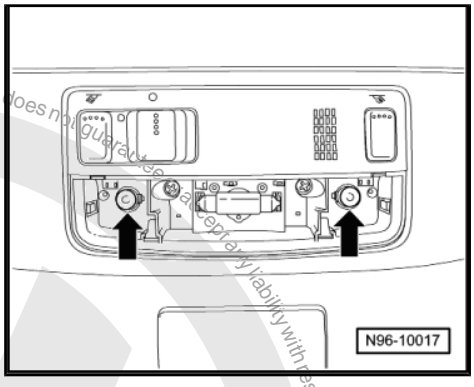
– Switch off ignition and all electrical loads, and pull out ignition key.

– Carefully lever lens for interior/reading light out of installation frame using removal wedge - VAS 3409- or suitable screwdriver.



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– Carefully pull defective capless glass bulb -arrows- of the corresponding reading light out of holder.



Bulb for front reading light : glass base bulb 12 V, 5 W

Installing:

Installation is carried out in reverse order of removal.

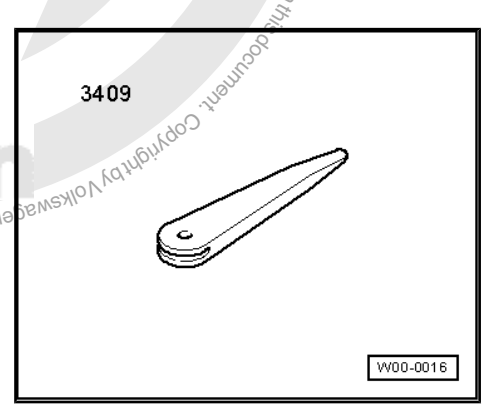
6.6 Removing and installing left centre reading lamp and right centre reading lamp

Removal and installation of the left centre reading light and the right centre reading light are carried out in the same way as those of the rear left interior light - W47- and the rear right interior light - W48- ⇒ page 342 .

6.7 Removing and installing rear left interior light and rear right interior light

Special tools and workshop equipment required

- Removal wedge - VAS 3409-



Note

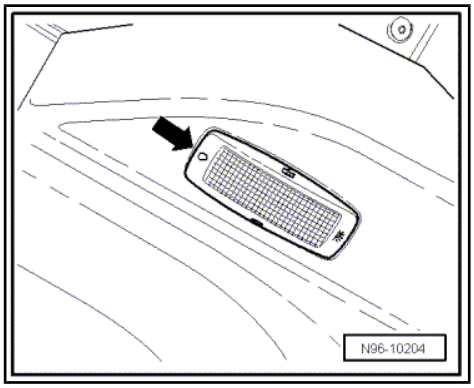
- *When removing and installing components that are in view (switches, covers, trim and so on), mask off areas in which tools (removal wedge - VAS 3409- , screwdriver) are used to lever out those components using commercially available masking tape.*
- *The procedure for removal and installation is the same for all the rear interior lights and is therefore described for one light only.*

Removing:

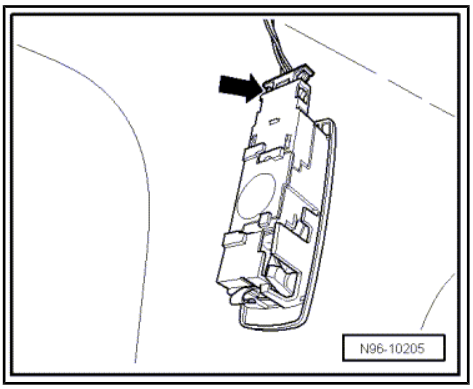
– Switch off ignition and all electrical loads, and pull out ignition key.

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– Lever interior light out of the roof trim -arrow-.



– Release and disconnect electrical connector -arrow-.



Installing:

Installation is carried out in reverse order of removal.

6.8 Removing and installing bulbs for centre reading lights and rear interior lights

Note

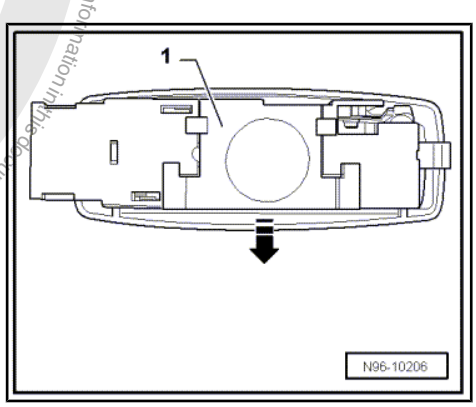
The procedure for removal and installation of these bulbs is the same and is therefore described for one light only.

Removing:

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

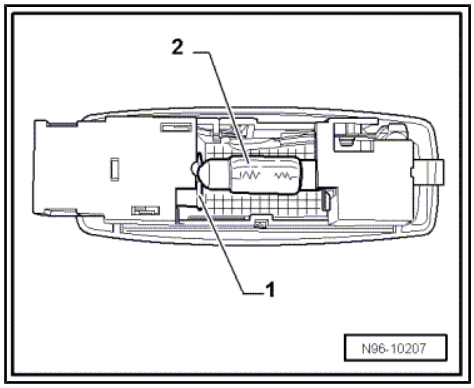
– Remove centre reading light ⇒ page 342 or rear interior light ⇒ page 342 .

– Pull cover -1- off light.



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– Press contact plate -1- to one side and remove festoon bulb -2- from bulb holder.



Bulb for centre reading lights and rear interior lights : festoon bulb 12 V, 5 W

Installing:

Installation is carried out in reverse order of removal.

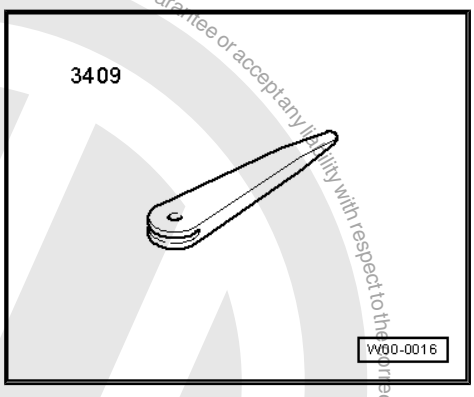
6.9 Removing and installing vanity mirror light

Note

- *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.*
- *The procedure for removal and installation of the vanity mirror lights on driver and front passenger sides is the same and is therefore described for one light only.*

Special tools and workshop equipment required

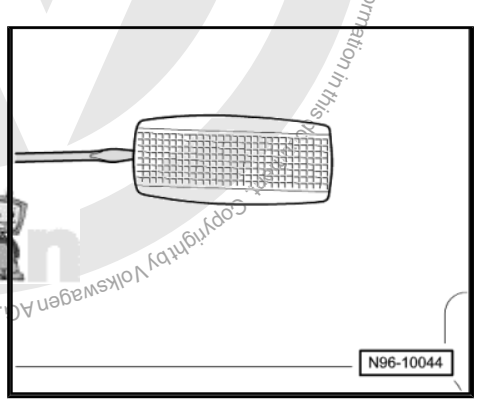
- Removal wedge - VAS 3409-



Removing:

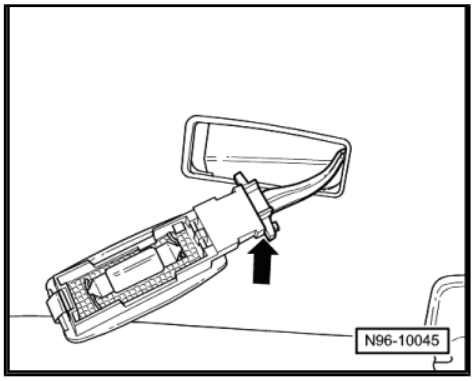
– Switch off ignition and all electrical loads, and pull out ignition key.

– Carefully lever light out of roof trim using removal wedge - VAS 3409- or a screwdriver.



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– Release and disconnect electrical connector -arrow-.



Installing:

Installation is carried out in reverse order of removal.

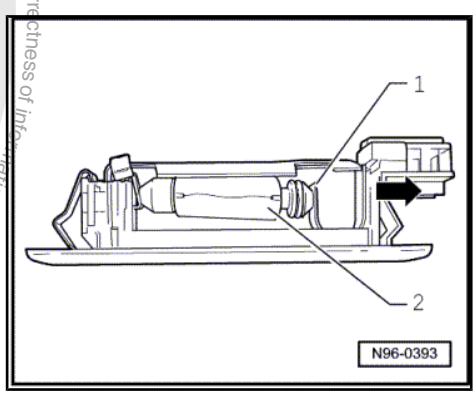
6.10 Removing and installing light for vanity mirror

Removing:

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

– Remove illuminated vanity mirror light ⇒ page 344 .

– Press contact plate -1- of light in direction of arrow and remove festoon bulb -2- from bulb holder.



Bulb for vanity mirror light : festoon bulb 12 V, 5 W

Installing:

Installation is carried out in reverse order of removal.

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7 Lights and controls in engine compartment

⇒ “7.1 Removing and installing bonnet contact switch ”, page 346

7.1 Removing and installing bonnet contact switch

Note

- *The bonnet contact switch - F266- is integrated in the bonnet lock and cannot be replaced as a single item.*
- *If the bonnet contact switch - F266- is found to be defective, the entire bonnet lock must always be replaced.*

– Remove bonnet lock ⇒ General body repairs, exterior; Rep. gr. 55 ; Bonnet; Removing and installing bonnet lock; Removing .

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8 Other interior lights and controls

⇒ “8.1 Removing and installing interior monitoring deactivation switch and deactivation button for vehicle inclination sender ”, page 347

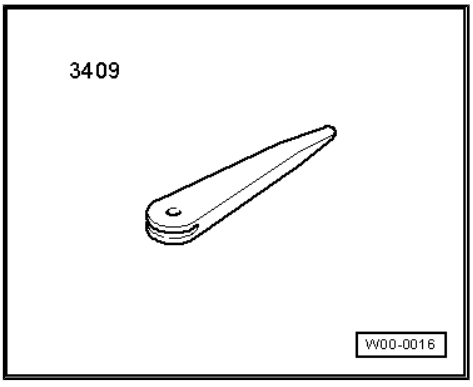
8.1 Removing and installing interior monitoring deactivation switch and deactivation button for vehicle inclination sender

Note

- *The interior monitoring deactivation switch - E267- and the deactivation button for vehicle inclination sender - E360- are located in the B-pillar trim on the driver side.*
- *When removing and installing components that are in areas on view (switches, covers, trims etc.), mask off areas in which leverage tools (removal wedge - VAS 3409- , screwdriver) are used to lever out those components using commercially available adhesive tape.*
- *On vehicles as of 06.2007, the design of the interior monitoring deactivation switch/vehicle inclination sender deactivation button has been modified and the function of the switch/button has been changed from that of a rocker switch to that of a single button switch.*

Special tools and workshop equipment required

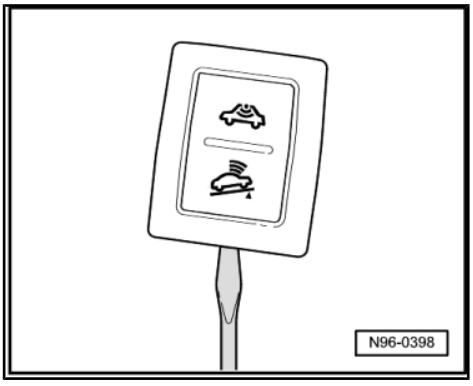
- Removal wedge - VAS 3409-



Removing:

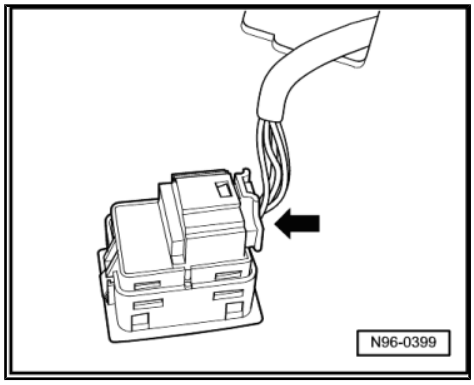
– Switch off ignition and all electrical loads, and pull out ignition key.

– Carefully prise out the interior monitoring deactivation switch - E267- and the deactivation button for vehicle inclination sender - E360- using the wedge - VAS 3409- or a suitable screwdriver.



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– Release and disconnect electrical connector -arrow-.



Installing:

Installation is carried out in reverse order of removal.

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9 Cigarette lighter and 12 V socket

⇒ “9.1 Removing and installing cigarette lighter U1 ”, page 349

⇒ “9.2 Removing and installing 12 V socket”, page 349

9.1 Removing and installing cigarette lighter - U1-

All information regarding removal and installation of cigarette lighters is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 96 ; Cigarette lighters - U1- .

9.2 Removing and installing 12 V socket

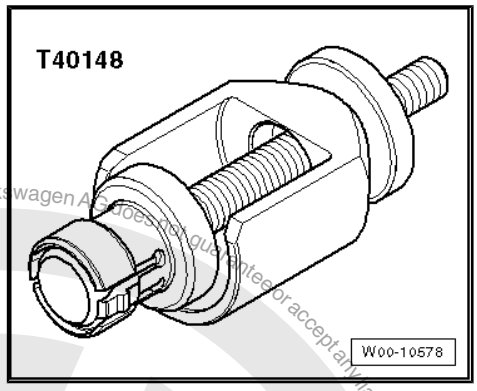
⇒ “9.2.1 Removing and installing 12 V socket”, page 349

⇒ “9.2.2 Removing and installing 12 V-socket (for accessories) in centre of dash panel”, page 349

9.2.1 Removing and installing 12 V socket

Special tools and workshop equipment required

- Puller - T40148-



The 12 volt sockets installed in the vehicle can be removed with the help of the puller - T40148- without removal of the interior equipment components. Sockets that are secured with a threaded connection as well as sockets of a type that the puller does not fit on to are exceptions.

All necessary information on cigarette lighters and 12 V sockets can be found in the workshop manual “Electrical system, General information”:

- Removing and installing 12 V socket ⇒ Electrical system, General information; Rep. gr. 96 ; 12 V socket .
- Removing and installing cigarette lighter ⇒ Electrical system, General information; Rep. gr. 96 ; Cigarette lighter - U1- .

9.2.2 Removing and installing 12 V-socket (for accessories) in centre of dash panel

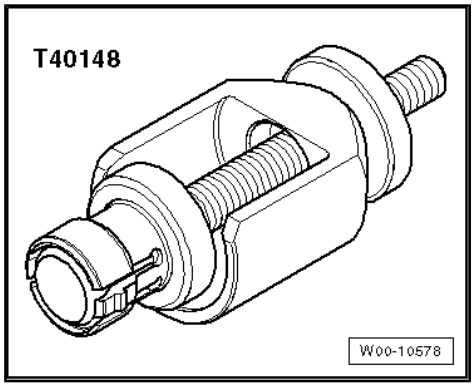
Note

The 12 V-socket (for accessories) is installed in the upper centre storage compartment of the dash panel.

Special tools and workshop equipment required

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♦ Puller - T40148-



Removing:

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

– Remove upper storage compartment in centre of dash panel ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments/ covers; Removing and installing upper storage compartment in centre of dash panel .

Further removal of the socket is carried out, as for all other sockets, using puller - T40148- ⇒ Electrical System, General Information; Rep. gr. 96 ; 12 V-socket .

Installing:

Installation is carried out in reverse order of removal.

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10 Immobiliser

⇒ “10.1 General description - immobiliser”, page 351

⇒ “10.2 Removing and installing immobiliser control unit ”, page 351

⇒ “10.3 Removing and installing immobiliser reader coil ”, page 351

⇒ “10.4 Removing and installing ignition key variable code transponder”, page 352

⇒ “10.5 Adapting ignition keys to the immobiliser”, page 352

⇒ “10.6 Adapting ignition keys to the convenience system”, page 352

10.1 General description - immobiliser

Note

Additional information:

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

General description:

The Caddy features a fourth-generation immobiliser.

New features of the forth-generation immobiliser:

- It is no longer possible to adapt components of other corporate brands for use in Volkswagen vehicles.
- The ignition keys are preprogrammed with a base code on the premises of the manufacturer. This base code contains a specific manufacturer's code. The keys can be taught into a vehicle only if programmed with the correct manufacturer's mode.

Fault detection and fault display:

The immobiliser 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 ⇒ page 403 .

10.2 Removing and installing immobiliser control unit

The immobiliser control unit - J362- is integrated in the dash panel insert. In the event of control unit failure, the complete dash panel insert must be renewed.

– Renewing dash panel insert ⇒ page 102 .

10.3 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 362 .

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10.4 Removing and installing ignition key variable code transponder

– Removing and installing the ignition key battery with remote control ⇒ General body repairs, exterior; Rep. gr. 57 ; Central locking; Removing and installing battery for key with remote control (folding) .

– Removing and installing the radio container (transmission unit for remote control central locking) for the ignition key ⇒ General body repairs, exterior; Rep. gr. 57 ; Central locking; Removing and installing battery for key with remote control (folding) .

Ignition key - variable code transponder:

The variable code transponder in the ignition key cannot be replaced.

The ignition key must always be replaced if the variable code transponder is defective.

Note

- *If an ignition key is replaced or a further ignition key is required, the new ignition key must always be adapted to the immobiliser ⇒ page 352 .*
- *If the radio container (transmission unit for remote controlled central locking) of the ignition key is also replaced, it must be adapted to the convenience system ⇒ page 352 .*

10.5 Adapting ignition keys to the immobiliser

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Immobiliser
- Immobiliser functions
- Adapting ignition keys

10.6 Adapting ignition keys to the convenience system

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- General body repairs
- 01 - On Board Diagnostic capable systems

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- Convenience system
- Functions of convenience system central control unit
- Adapting/checking convenience system central control unit - J393-

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11 Anti-theft alarm (ATA)

⇒ “11.1 General description - anti-theft alarm system (ATA)”, page 354

⇒ “11.2 Removing and installing interior monitoring deactivation switch and deactivation button for vehicle inclination sender ”, page 355

⇒ “11.3 Removing and installing interior monitoring sensor ”, page 355

⇒ “11.4 Removing and installing vehicle inclination sender ”, page 356

⇒ “11.5 Removing and installing central locking and anti-theft alarm system aerial ”, page 356

⇒ “11.6 Removing and installing alarm horn ”, page 357

⇒ “11.7 Reading alarm sources of anti-theft alarm”, page 357

11.1 General description - anti-theft alarm system (ATA)

Note

Additional information:

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

The functions of the ATA are integrated into the convenience system central control unit - J393- .

Fault detection and fault display:

The anti-theft alarm system 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 ⇒ page 403 .

Note

If the anti-theft alarm has been triggered, the alarm source stored in the convenience system central control unit - J393- can be read ⇒ page 357 .

Activating anti-theft alarm:

The anti-theft alarm system is switched on automatically when the vehicle is locked. The anti-theft alarm is then immediately primed.

Note

To prevent the anti-theft alarm system from triggering alarms unnecessarily, make sure to close all windows and doors completely before locking the vehicle.

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Deactivating anti-theft alarm:

- The anti-theft alarm is deactivated on unlocking the vehicle with the remote control unlocking button or
- when the ignition is switched on.

Unlock the vehicle mechanically (emergency open):

– Open driver's door.

The anti-theft alarm system remains active, although no alarm is triggered.

– Switch ignition on within 15 seconds.

Note

If ignition is not switched on, alarm will trigger after 15 seconds.

When the ignition is switched on, the electronic immobiliser detects a valid ignition key and deactivates the anti-theft alarm.

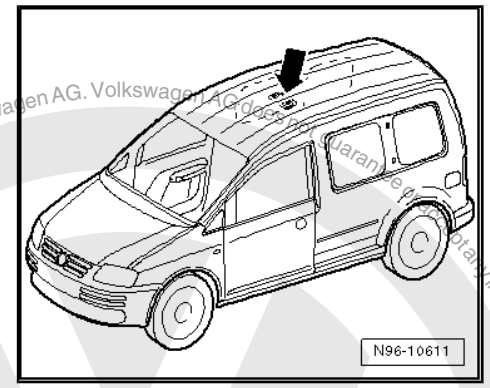
11.2 Removing and installing interior monitoring deactivation switch and deactivation button for vehicle inclination sender

– Removing and installing interior monitoring deactivation switch - E267- and deactivation button for vehicle inclination sender - E360- ⇒ page 347

11.3 Removing and installing interior monitoring sensor

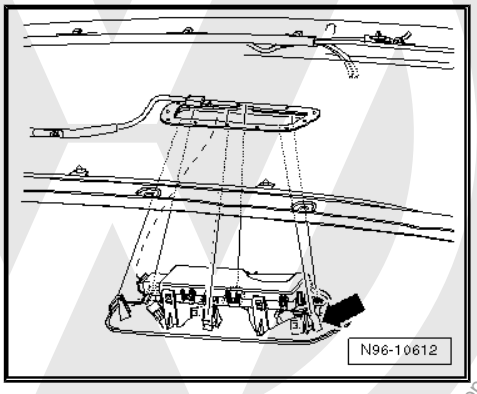
Note

The interior monitoring sensor is installed in the moulded headliner -arrow-.



Removing:

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



– Using a small screwdriver on the right-hand side of the interior monitoring sensor, open the spring clips -arrow- and unclip the interior monitoring sensor from the headliner.

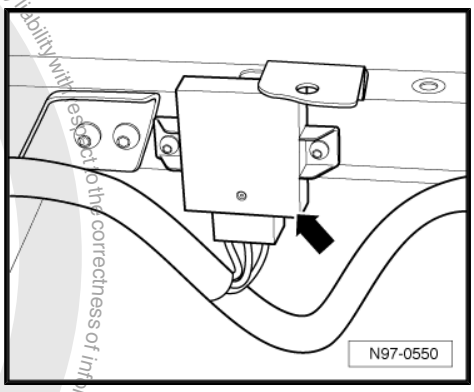
– Release and disconnect electrical connector on interior monitoring sensor.

Installing:

Installation is carried out in reverse order of removal.

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11.4 Removing and installing vehicle inclination sender



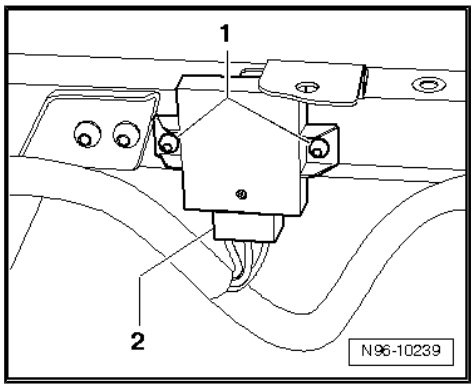
Note

- *On vehicles as of model year 2011, the vehicle inclination sender described below is no longer being used. The vehicle inclination sender on vehicles as of model year 2011 is integrated into the anti-theft alarm sensor - G578- .*
- *The vehicle inclination sender - G384- -arrow- is located on the right beneath the dash panel, behind the front passenger's airbag.*
- *The anti-theft alarm system must be deactivated before vehicle inclination sender - G384- is removed ⇒ page 354 .*

Removing:

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

– Remove passenger side lower compartment ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trim; Removing and installing passenger side lower compartment .



– Unscrew securing bolts -1- and remove vehicle inclination sender - G384- from support.

– Release connector -2- and disconnect it from vehicle inclination sender - G384- .

Installing:

Installation is carried out in reverse order of removal.

11.5 Removing and installing central locking and anti-theft alarm system aerial

Note

Additional information:

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

The central locking and anti-theft alarm system aerial - R47- is routed from the convenience system central control unit - J393- to the A-pillar (driver side) in the main wiring harness.

Note

- *The aerial cannot be repaired as this would adversely affect the reception quality.*
- *In the event of damage, it is necessary to replace the central locking and anti-theft alarm system aerial - R47- .*

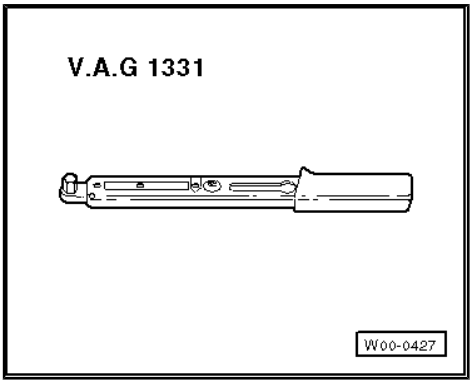
11.6 Removing and installing alarm horn

Note

- *The alarm horn - H12- is installed on the left below the plenum chamber cover.*
- *On right-hand drive vehicles, the alarm horn - H12- is installed in the mirror-image position on the right-hand side.*
- *The alarm horn - H12- can be checked using final control diagnosis for convenience system central control unit - J393- .*

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-

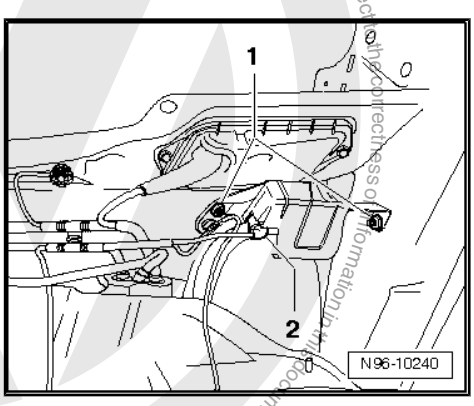


Note

If the alarm horn - H12- is removed, the anti-theft alarm system must be deactivated ⇒ page 354 .

Removing:

- Switch off ignition and all electrical loads, and pull out ignition key.
- Remove wiper frame with linkage and wiper motor ⇒ page 108 .
- Release connector -2- and disconnect it from alarm horn - H12- .
- Unscrew securing nuts -1-.
- Remove alarm horn - H12- from vehicle.



Installing:

Installation is carried out in the reverse order. When installing observe the following:

- Tighten securing nuts for alarm horn to 9 Nm.

11.7 Reading alarm sources of anti-theft alarm

- Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .
- Select “Guided fault finding” in vehicle diagnostic tester .

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– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- General body repairs
- 01 - On Board Diagnostic capable systems
- Convenience system
- Functions of convenience system central control unit
- Reading J393 alarm sources of anti-theft alarm

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12 Ignition/starter switch and lock cylinder

⇒ “12.1 Removing and installing ignition/starter switch”, page 359

⇒ “12.2 Checking ignition/starter switch”, page 361

⇒ “12.3 Removing and installing lock cylinder”, page 362

⇒ “12.4 Removing and installing steering lock housing”, page 366

⇒ “12.5 Removing and installing ignition key withdrawal lock solenoid”, page 367

12.1 Removing and installing ignition/starter switch

⇒ “12.1.1 Removing and installing ignition/starter switch, vehicles up to model year 2010”, page 359

⇒ “12.1.2 Removing and installing ignition/starter switch, vehicles as of model year 2011”, page 360

12.1.1 Removing and installing ignition/starter switch, vehicles up to model year 2010

> **Caution**
>
> *To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .*

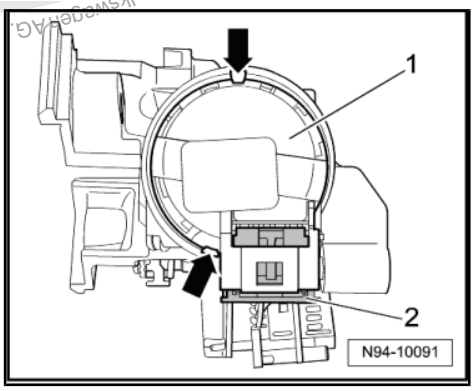
Removing:

– Disconnect battery ⇒ page 3 .

– Release and disconnect connector -2- at ignition/starter switch -1-.

– Release ignition/starter switch with a small screwdriver -arrows-.

– Remove ignition/starter switch -1- from steering lock housing.



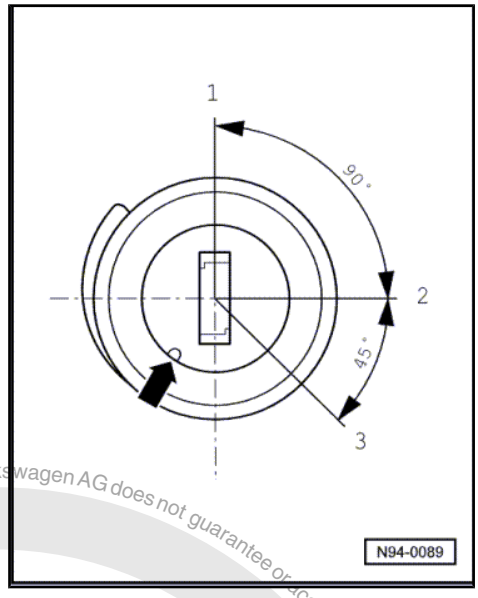
Installing:

> **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”.*

– Push ignition/starter switch into steering lock housing until it engages audibly.

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– Insert ignition key in lock cylinder and turn to “Drive” position.



Note

The key must be in the “Drive” position.

Positions for key in lock cylinder:

1 - Position “Stop”

2 - Position “Drive”

3 - Position “Start”

– Install components in reverse order of removal.

12.1.2 Removing and installing ignition/starter switch, vehicles as of model year 2011

Removing:

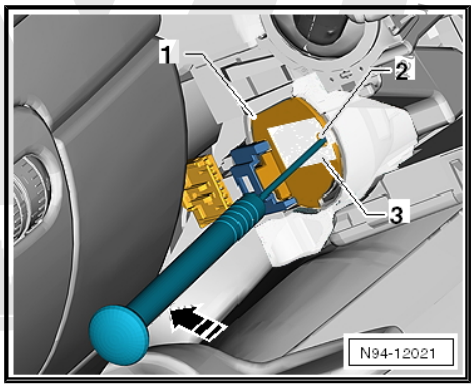
– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Release and disconnect electrical connector -2- at ignition/ starter switch -1-.

Manufacturer Kostal:

– Expose hole -2- under seal -3-.

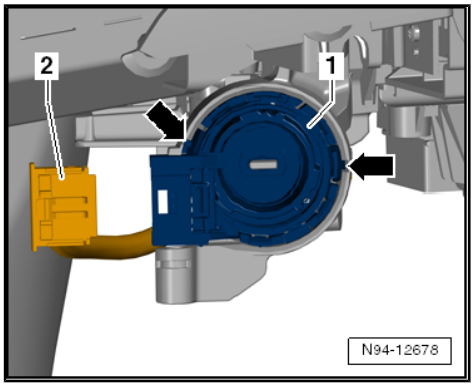
– Using a small screwdriver, release cover -1- in direction of -arrow- and remove.



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– Release ignition/starter switch using 2 small screwdrivers -arrows-.

– Pull ignition/starter switch -1- out of steering lock housing.



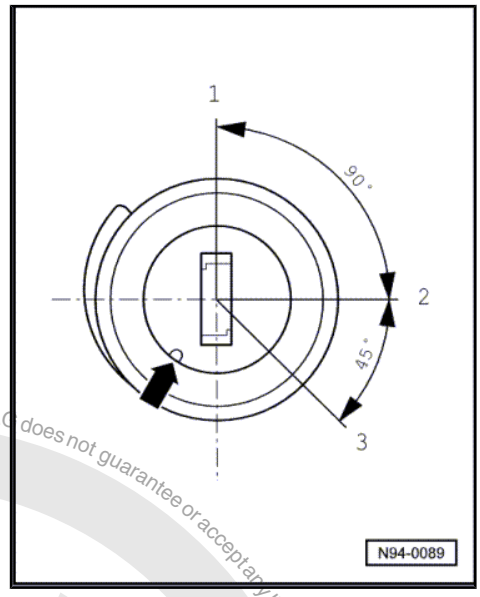
Installing:

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".

– Push ignition/starter switch into steering lock housing until it engages audibly.

– Insert ignition key in lock cylinder and turn to position "Drive".



Note

The key must be in the "Drive" position.

Positions for key in lock cylinder:

1 - Position "Stop"

2 - Position "Drive"

3 - Position "Start"

– Install all components in reverse order of removal.

12.2 Checking ignition/starter switch

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems, Connecting vehicle diagnostic tester .

– Select "Guided fault finding" in vehicle diagnostic tester .

– Using "GoTo" button, select "Functions/component" and then the following menu options in succession:

- Body
- Electrical system
- Diagnostic capable systems
- Onboard supply control unit
- Switch button
- Ignition/starter switch

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12.3 Removing and installing lock cylinder

⇒ "12.3.1 Removing and installing lock cylinder, vehicles up to model year 2010", page 362

⇒ "12.3.2 Removing and installing lock cylinder, vehicles as of model year 2011", page 364

12.3.1 Removing and installing lock cylinder, vehicles up to model year 2010

Caution

- *To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .*
- *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 3 .

– Remove driver airbag ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag; Removing and installing driver airbag; Removing .

– Remove steering wheel ⇒ Running gear, axles, steering; Rep. gr. 48 ; Assembly overview - steering wheel; Removing and installing steering wheel: Removing .

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

Note

The immobiliser reading coil is secured to the lock cylinder and cannot be renewed individually.

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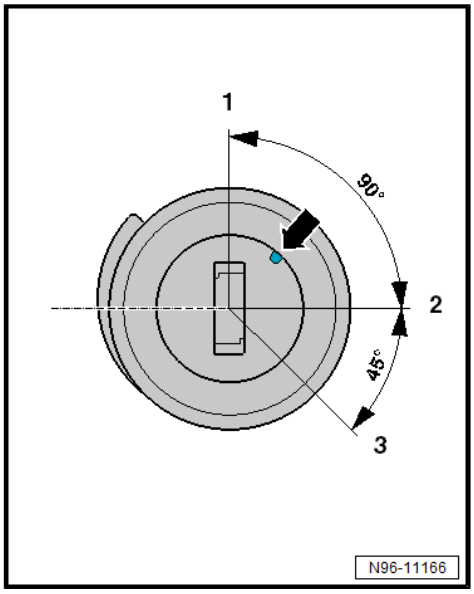
– Insert ignition key in lock cylinder and turn to “Drive” position.

Positions for key in lock cylinder:

1 - Position “Stop”

2 - Position “Drive”

3 - Position “Start”

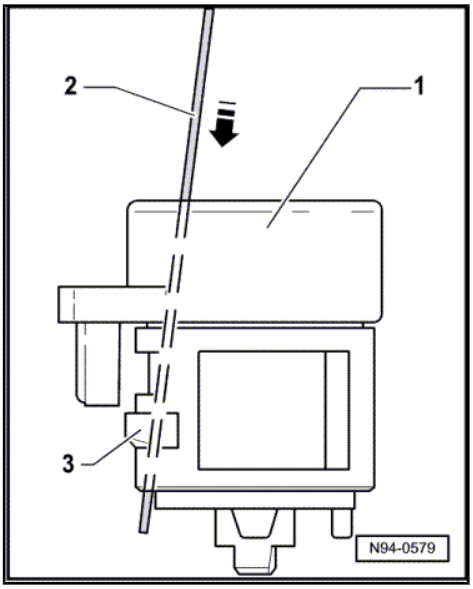


Note

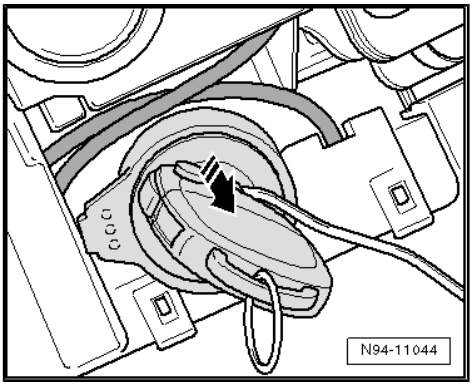
For reasons of clarity, the lock cylinder is shown in the following illustration without ignition key.

– Insert a piece of steel wire (approx. 1.2 mm in diameter) into hole -arrow- next to ignition key.

– Using steel wire -2- release locking lever -3- of lock cylinder -1- -arrow-.

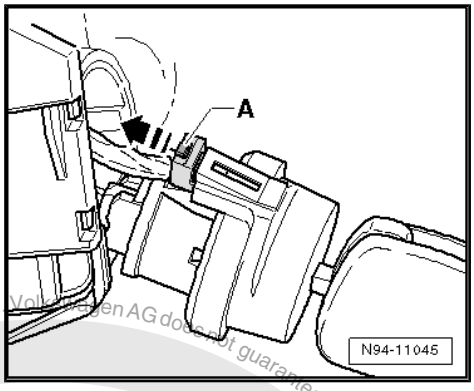


– Pull lock cylinder together with inserted steel wire out of steering lock housing in direction of arrow.



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– Release and disconnect connector of reader coil -A- in -direction of arrow-.

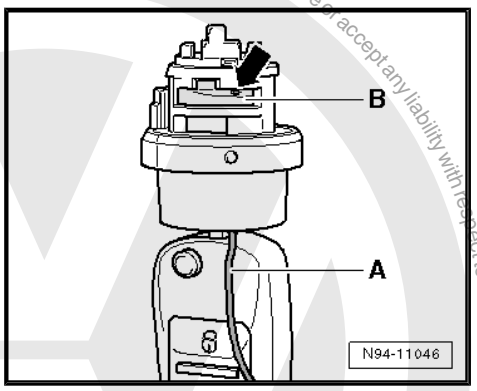


Installing:

– Insert ignition key in lock cylinder and turn to “Drive” position.

– Insert steel wire -A- through hole in lock cylinder until it appears in securing lever hole -B- -arrow-. This is the release position of the securing lever.

– Insert lock cylinder -1- into steering lock housing.



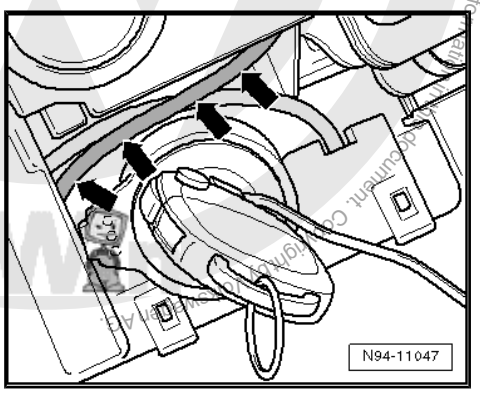
Note

The connection for the reader coil of the immobiliser must be inserted in the steering lock housing guide.

– Pull steel wire -2- out of lock cylinder -1- and check lock cylinder is seated correctly in the steering lock housing.

– Fit connector onto immobiliser reader coil and engage it.

– Ensure that wiring harness of reader coil is properly routed over lock cylinder -arrows-.



12.3.2 Removing and installing lock cylinder, vehicles as of model year 2011

Caution

- *To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .*
- *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 3 .

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– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

Note

- *For reasons of clarity, the steering column switch module, coil connector and steering wheel are not shown in the illustration. There is no need to remove the components in order to remove the lock cylinder.*
- *The immobilizer reading coil is secured to the lock cylinder and cannot be renewed individually.*
- *For reasons of clarity, the ignition key is not shown in the following illustrations.*
- *The hole may be 180° further than shown in the illustration. This does however not affect the procedure for removing and installing.*

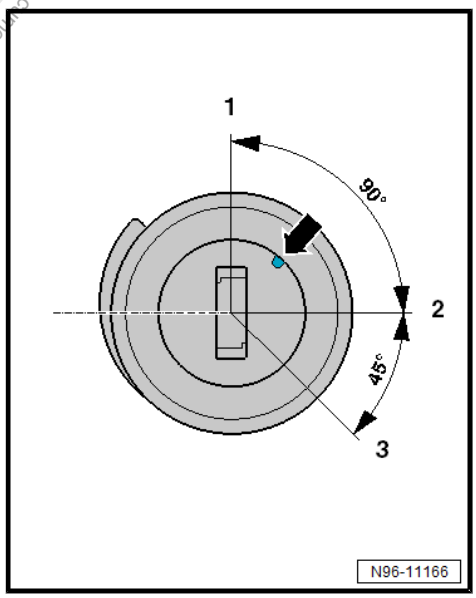
– Insert ignition key in lock cylinder and turn to position “Drive”.

Positions for key in lock cylinder:

1 - Position “Stop”

2 - Position “Drive”

3 - Position “Start”



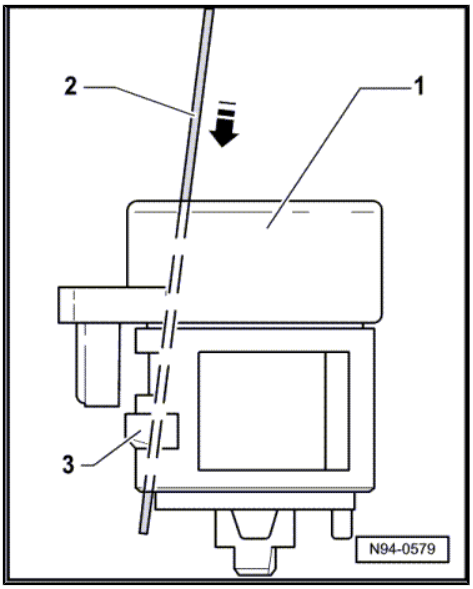
Note

For reasons of clarity, the lock cylinder is shown in the following illustration without ignition key.

– Insert a piece of steel wire (approx. 1.2 mm in diameter) in hole -arrow- next to ignition key.

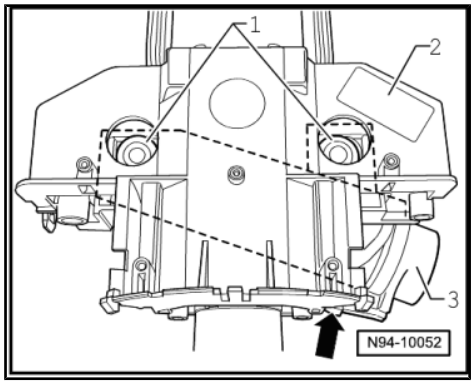
– Using steel wire -2- release locking lever -3- of lock cylinder -1- -arrow-.

– Pull lock cylinder -1- out of steering lock housing.



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– Release and disconnect connector -arrow- on immobiliser reader coil.

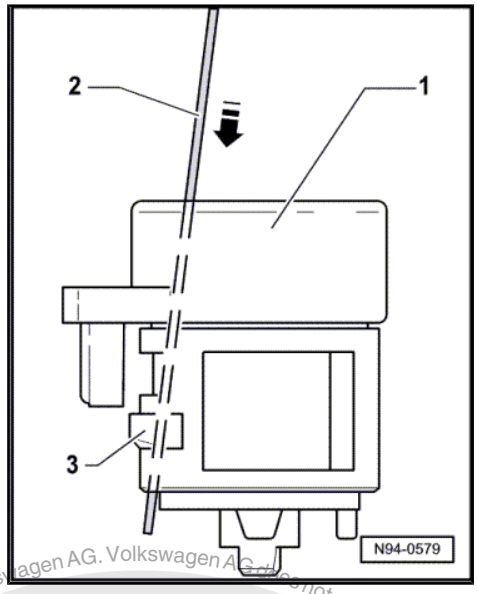


Installing:

Note

For reasons of clarity, the ignition key is not shown in the following illustration.

– Insert ignition key in lock cylinder -1- and turn to position “Drive”.
– Using steel wire -2- release locking lever -3- of lock cylinder -1- -arrow-.
– Connect connector to immobiliser reader coil and engage it.
– Insert lock cylinder -1- into steering lock housing.



Note

The connection for the reader coil of the immobilizer must be inserted in the steering lock housing guide.

– Pull steel wire -2- out of lock cylinder -1- and check lock cylinder is seated correctly in the steering lock housing.
– Install all components in reverse order of removal.

12.4 Removing and installing steering lock housing

Note

Steering lock housing is removed together with steering column switch module base.

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> **Caution**
>
> - *To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .*
> - *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 3 .

– Remove steering column switch module base ⇒ page 269 .

12.5 Removing and installing ignition key withdrawal lock solenoid

⇒ “12.5.1 Removing and installing ignition key withdrawal lock solenoid, vehicles up to model year 2010”, page 367

⇒ “12.5.2 Removing and installing ignition key withdrawal lock solenoid, vehicles as of model year 2011”, page 368

12.5.1 Removing and installing ignition key withdrawal lock solenoid, vehicles up to model year 2010

Note

- *The ignition key withdrawal lock solenoid - N376- is located very close to the ignition starter key.*
- *To remove ignition key on vehicles with an automatic gearbox, always move selector lever to position “P” first then switch off ignition. Otherwise the ignition key withdrawal lock solenoid - N376- will inhibit the removal of the ignition key.*

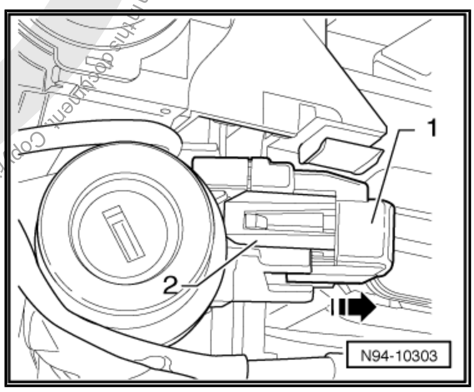
Removing:

– Remove steering column electronics control unit - J527- ⇒ page 262 .

– Release catch -2- with a suitable screwdriver.

– Pull ignition key withdrawal lock solenoid - N376- -1- in direction of arrow out of its mounting.

– The connector will be disconnected automatically.



Installing:

– Installation is carried out in the reverse sequence. Observe the following when doing this:

Note

After connecting the battery, carry out final control diagnosis to activate the ignition key withdrawal lock solenoid ⇒ page 271 .

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12.5.2 Removing and installing ignition key withdrawal lock solenoid, vehicles as of model year 2011

Note

- *The ignition key withdrawal lock solenoid - N376- is located very close to the ignition starter key.*
- *To remove ignition key on vehicles with dual clutch gearbox (DSG), always move selector lever to position "P" first, then switch off ignition. Otherwise the ignition key withdrawal lock solenoid - N376- will inhibit the removal of the ignition key.*

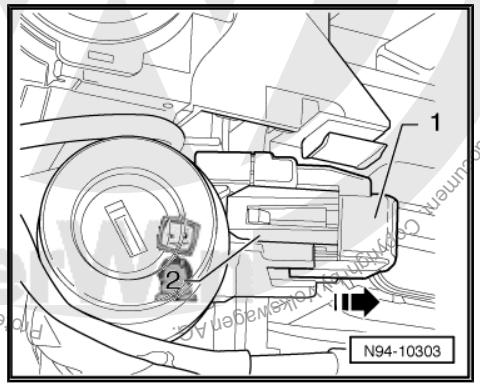
Removing:

– Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing steering column trim .

– Release catch -2- using a suitable screwdriver.

– Pull ignition key withdrawal lock solenoid - N376- -1- in direction of arrow out of its mounting.

– The connector will be disconnected automatically.



Installing:

– Installation is carried out in the reverse order. When installing observe the following:

Note

After connecting the battery, carry out final control diagnosis to activate the ignition key withdrawal lock solenoid *⇒ page 283* *.*

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97 – Wiring

1 Relay carriers, fuse holders, E-boxes

⇒ “1.1 Overview of fitting locations - relay carriers, fuse holders, E-boxes”, page 369

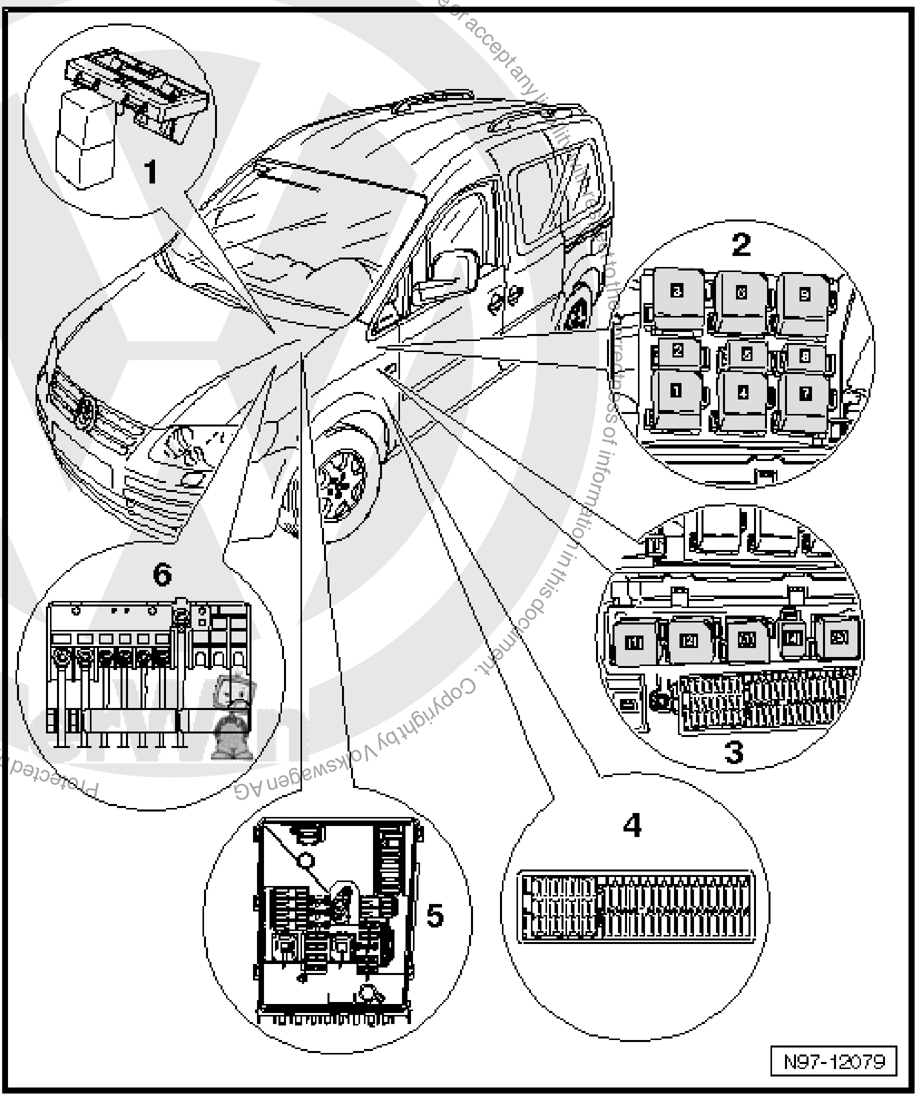
⇒ “1.2 Removing and installing fuse holder on left beneath dash panel”, page 370

⇒ “1.3 Removing and installing relay carrier on left of dash panel”, page 370

⇒ “1.4 Removing and installing relay carrier on onboard supply control unit”, page 371

⇒ “1.5 Removing and installing E-box on left side of engine compartment”, page 374

1.1 Overview of fitting locations - relay carriers, fuse holders, E-boxes



1 - Auxiliary relay carrier in engine compartment

- ❑ Installed under E-box.

2 - Relay carrier

- ❑ Installed on bracket on driver side under dash panel.
- ❑ Removing and installing relay carrier ⇒ page 370

3 - Relay carrier on onboard supply control unit

- ❑ Installed on bracket on onboard supply control unit.
- ❑ Removing and installing relay carrier, vehicles up to and including model year 2010 ⇒ page 371
- ❑ Removing and installing relay carrier, vehicles from model year 2011 ⇒ page 373

4 - Fuse holder C - SC-

- ❑ Installed on bracket on driver side under dash panel.
- ❑ Removing and installing fuse holder ⇒ page 370

5 - Fuse holder B - SB-

- ❑ Installed on left of E-box in engine compartment.
- ❑ Removing and installing ⇒ page 374 .

6 - Fuse holder A - SA-

- ❑ Installed on left-hand side of E-box in engine compartment.

❑ Removing and installing ⇒ page 374 .

1.2 Removing and installing fuse holder on left beneath dash panel

Caution

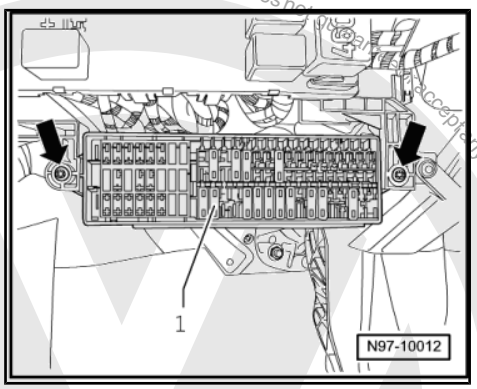
To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Removing:

– Disconnect battery ⇒ page 3 .
– Remove storage compartment on driver's side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trim
– Undo and remove bolts -arrows- and pull off fuse holder -1- downwards from bracket.

Installing:

Installation is carried out in reverse order of removal.



1.3 Removing and installing relay carrier on left of dash panel

Caution

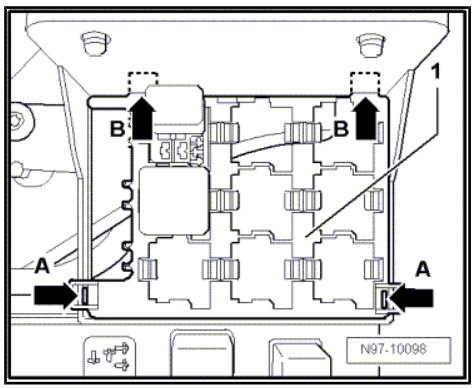
To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

Removing:

– Disconnect battery ⇒ page 3 .
– Remove storage compartment on driver's side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trim
– Release catches -arrows A-.
– Twist out relay carrier -1- under locking lugs -arrows B-.
– Pull built-in relays out of relay carrier.
– Release and disconnect connectors on rear of relay carrier -1-.
– Remove relay carrier -1- from vehicle.

Installing:

Installation is carried out in reverse order of removal.



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1.4 Removing and installing relay carrier on onboard supply control unit

⇒ “1.4.1 Removing and installing relay carrier on onboard supply control unit, vehicles up to model year 2010”, page 371

⇒ “1.4.2 Removing and installing relay carrier on onboard supply control unit, vehicles from model year 2011”, page 373

1.4.1 Removing and installing relay carrier on onboard supply control unit, vehicles up to model year 2010

Note

- *The onboard supply control unit - J519- and the relay carrier attached to it in left side of dash panel form one unit and cannot be separated.*
- *If the relay unit on the onboard supply control unit on the left is to be replaced, the procedure for reading out the codes stored in the onboard supply control unit - J519- must always be carried out*
  ⇒ “2.1.3 Coding onboard supply control unit ”, page 380 .

Removing:

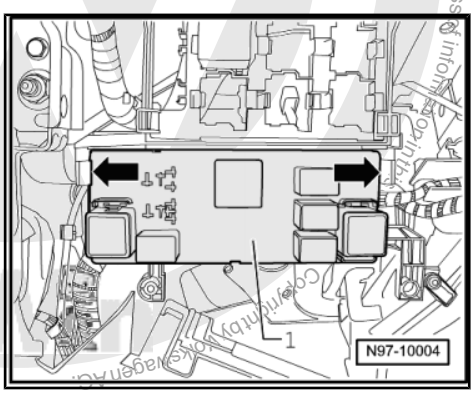
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove fuse holder on the left in dash panel ⇒ page 370

Note

The fuse holder does not have to be removed completely. You only have to loosen it and, if necessary, place it to one side.

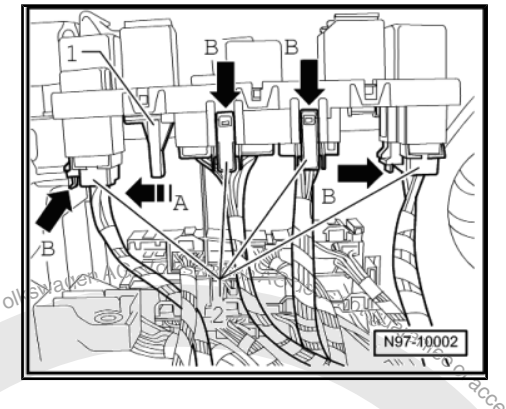
– Press lugs on bracket apart -arrows- and pull relay carrier -1- out of holder as far as the wire lengths allow.



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– Push locking bar -1- into “OPEN” position -arrow A-.

– Release locking lugs -arrows B- of connectors -2- and pull connectors off relay carrier on onboard supply control unit on left of dash panel.

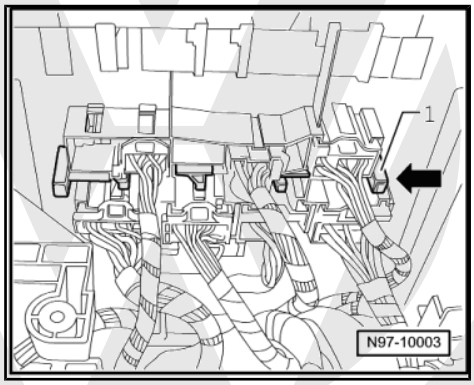


Note

- *The number of connectors can deviate from that shown in the illustration depending on the vehicle equipment level.*
- *The connectors for the control unit and relay carrier attached to the onboard supply control unit, on left of dash panel cannot be pulled off until the locking bars have been placed in the “OPEN” position.*

– To gain access to rear connectors, pull relay carrier secured to onboard supply control unit, on left of dash panel, out of retainer as far as wiring allows.

– Push locking bar -1- into “OPEN” position -arrow-.



Note

- *The number of connectors can deviate from that shown in the illustration depending on the vehicle equipment level.*
- *The connectors for the control unit and relay carrier attached to the onboard supply control unit, on left of dash panel cannot be pulled off until the locking bars have been placed in the “OPEN” position.*

– Release all connectors and disconnect them from onboard supply control unit - J519- .

– Pull onboard supply control unit - J519- and relay carrier on onboard supply control unit on the left in the dash panel out of the holder.

Installing:

Installation is carried out in the reverse order. When installing observe the following:

Note

- *The locking catches cannot be placed in the “CLOSED” position until all connectors are “fitted” correctly.*
- *After new control unit has been installed, it must be coded* *⇒ page 380* .

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1.4.2 Removing and installing relay carrier on onboard supply control unit, vehicles from model year 2011

Note

- *The relay carrier on the onboard supply control unit is clipped under the onboard supply control unit and can be removed.*
- *The following illustrations show removal on a LHD vehicle. Removal and installation in an RHD vehicle are performed using the corresponding mirror-image procedure.*

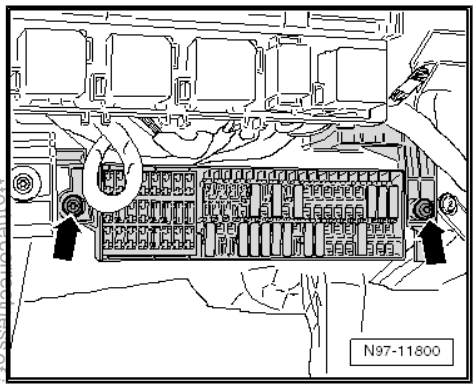
Removing:

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

– Remove storage compartment on drive's side ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartment on driver's side; Removing and installing .

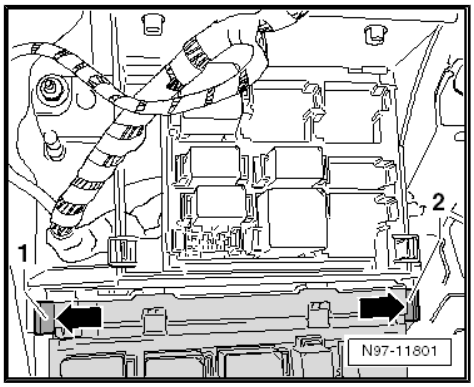
– Undo screws -arrows- holding fuse carrier in place.

– Remove fuse carrier from holder and allow to hang.



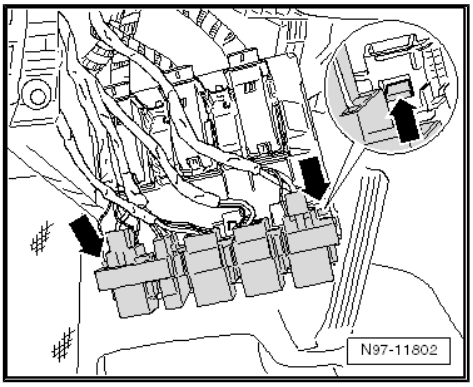
– Press the two catches of the onboard supply control unit -1- and -2- in -direction of arrow-.

– Remove onboard supply control unit together with relay carrier from holder.



– Press the two catches -arrows- and pull relay carrier off onboard supply control unit.

– Release and disconnect all connectors from relay carrier.



Installing:

Installation is carried out in the reverse sequence.

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1.5 Removing and installing E-box on left side of engine compartment

Note

One of two different E-boxes are fitted depending on the level of equipment (high or low versions). The following illustration show the "High" version. Removing and installing the "Low" version is performed in the same manner.

Caution

To disconnect and reconnect the battery, the procedure described in the workshop manual should be strictly adhered to ⇒ page 3 .

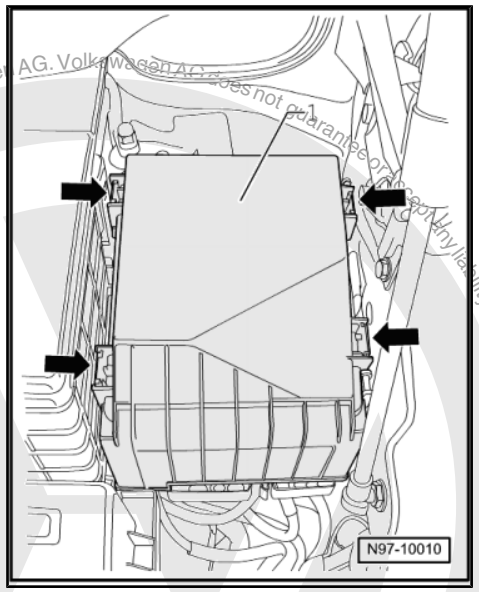
Removing:

– Disconnect battery ⇒ page 3 .

Only for vehicles up to 05.2004

– Release catches in -arrows- and remove lid of E-box -1- upwards.

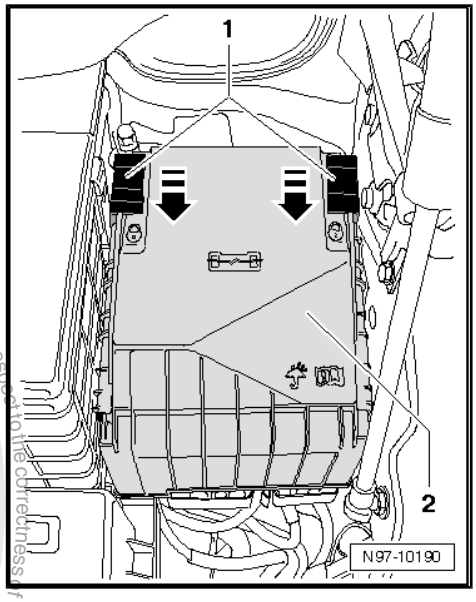
Only for vehicles as of 05.2004



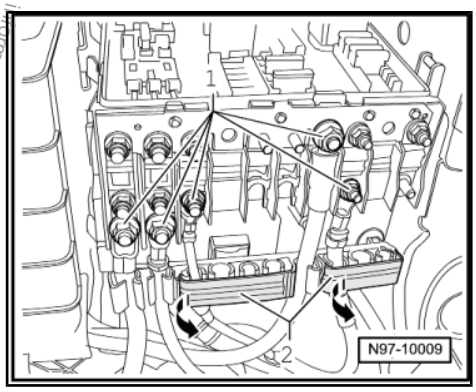
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– Push locking bar -1- in -direction of arrow- and remove E-box cover -2- upwards.

Continued for all vehicles



– Remove hexagon nuts -1-.
– Open -arrows- covers -2- of cable guides on E-box.
– Remove wires from connecting bolts.
– Remove wiring from wiring guides.

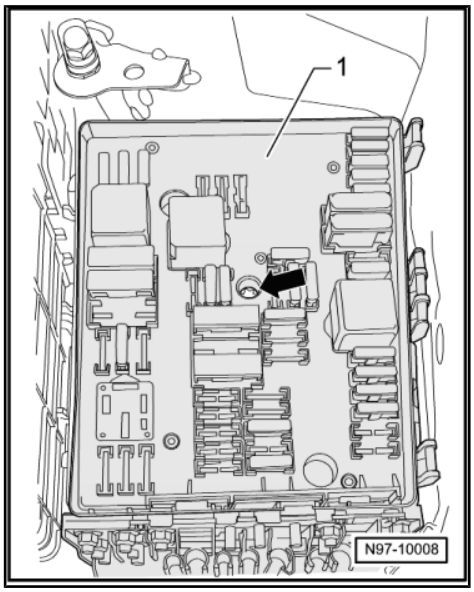


– Remove central securing bolt -arrow- from E-box -1-.

Note

When central securing bolt -arrow- is unscrewed, E-box -1- is pushed upwards off bracket of E-box.

– Pull E-box -1- upwards away from bracket of E-box.

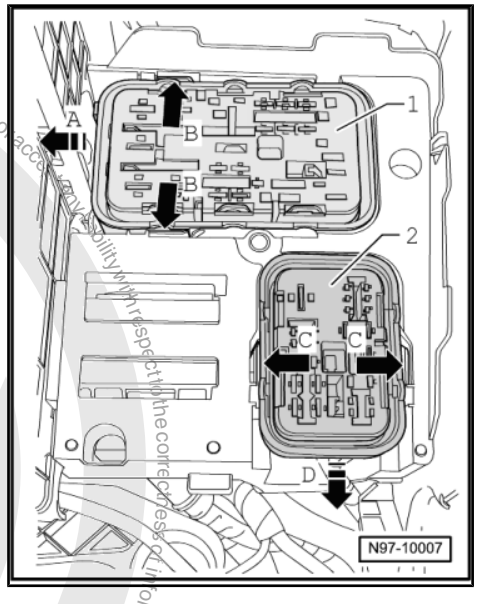


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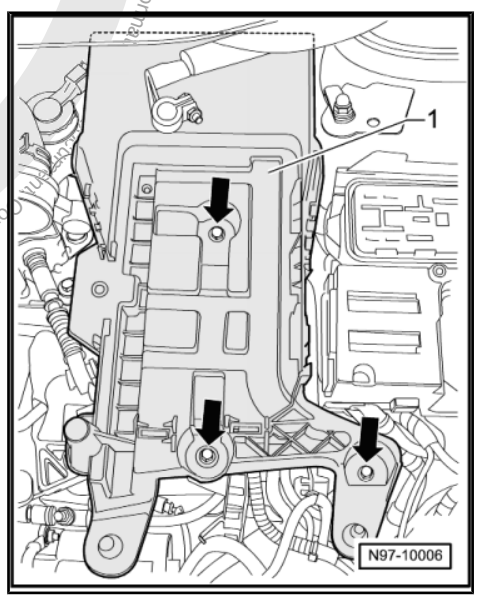
Note

In order to remove the flat contact housing -1- on vehicles with diesel engine, the air filter housing, the battery and the battery tray must be removed first.

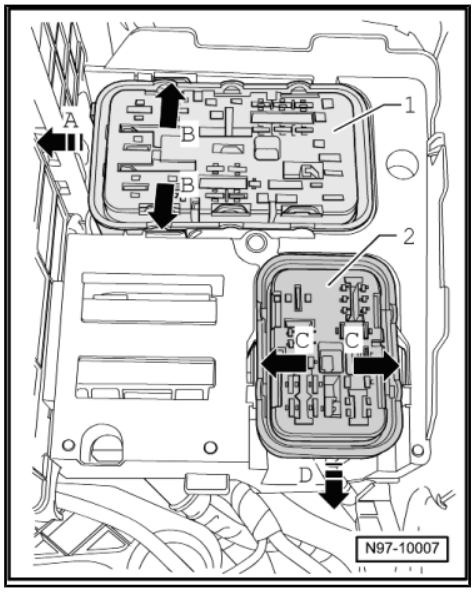
– Remove air filter housing if necessary (only in the case of vehicles with diesel engine).
– Remove battery ⇒ page 6 .



– Undo and remove bolts -arrows- of battery tray -1-.
– Remove battery tray -1- from vehicle.

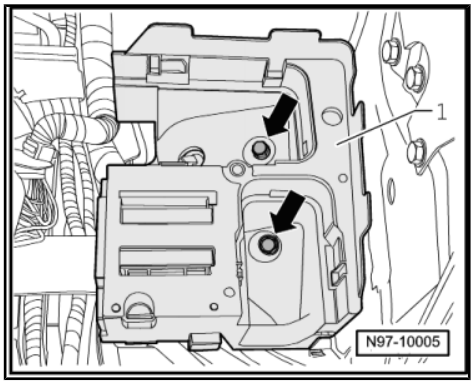


– Press tabs apart on bracket of E-box -arrows B- and slide flat contact housing -1- sideways -arrow A- out of bracket of E-box.
– Press tabs apart on bracket of E-box -arrows C- and slide flat contact housing -2- forwards -arrow D- out of bracket of E-box.



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– Undo nuts -arrows- from bracket of E-box -1-.

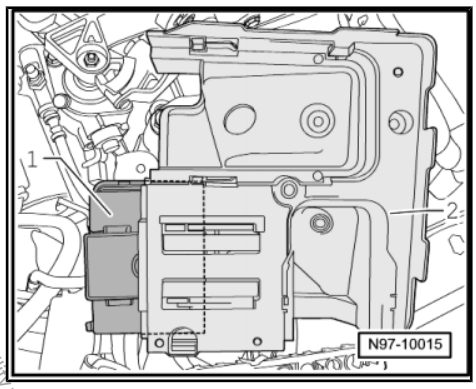


Note

The installation of an additional relay carrier depends entirely on the vehicle equipment.

– Pull bracket of E-box -1- upwards off stud bolts as far as length of relay carrier cables allows.

– Unclip relay carrier -1- sideways out of bracket of E-box -2-.



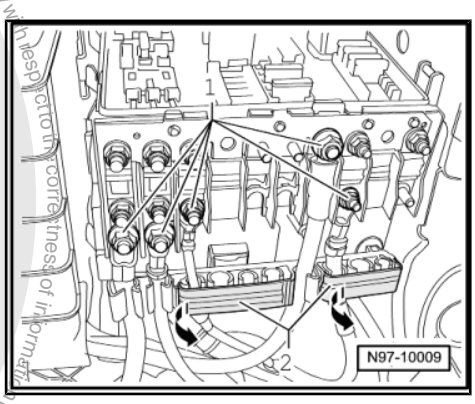
– Remove bracket of E-box -2- from vehicle.

Installing:

Installation is carried out in the reverse order. When installing observe the following:

– Tighten M5 securing nuts -1- to 4 Nm.

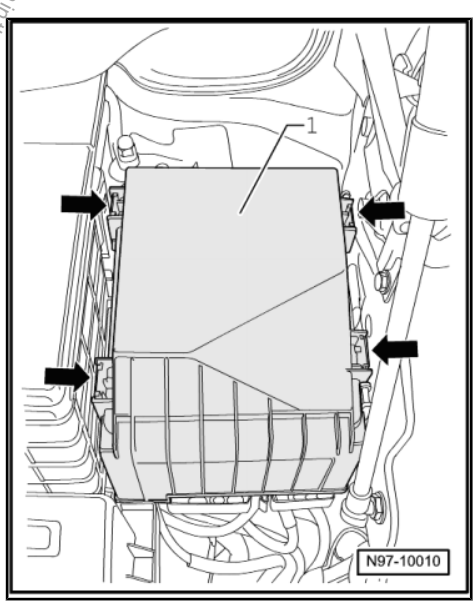
– Tighten M6 securing nuts -1- to 6 Nm.



Vehicles up to 05.2004

Note

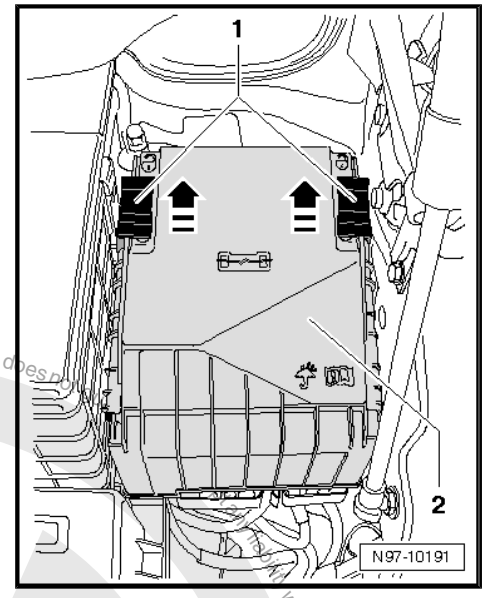
Finally, ensure that the E-box cover is engaged correctly -arrows-.



Vehicles as of 05.2004

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– Fit cover -2- onto E-box and push locking bar -1- in -direction of arrow- until cover -2- engages.



Note

Finally, ensure that the E-box cover -2- is engaged correctly.

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2 Control units

⇒ “2.1 Removing and installing onboard supply control unit , vehicles up to model year 2010”, page 379

⇒ “2.2 Removing and installing onboard supply control unit , vehicles as of model year 2011”, page 382

⇒ “2.3 Removing and installing data bus diagnostic interface ”, page 387

⇒ “2.4 Removing and installing convenience system central control unit ”, page 389

⇒ “2.5 Removing and installing special vehicle control unit ”, page 392

2.1 Removing and installing onboard supply control unit , vehicles up to model year 2010

⇒ “2.1.1 General description - onboard supply control unit ”, page 379

⇒ “2.1.2 Removing and installing onboard supply control unit ”, page 380

⇒ “2.1.3 Coding onboard supply control unit ”, page 380

⇒ “2.1.4 Adapting headlight washer system”, page 381

2.1.1 General description - onboard supply control unit

Note

- *The onboard supply control unit - J519- and the relay carrier attached to it in left side of dash panel form one unit and cannot be separated.*
- *If the onboard supply control unit - J519- is to be renewed, the procedure ⇒ “2.1.3 Coding onboard supply control unit ”, page 380 for reading the codes stored in the unit must always be carried out.*
- *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

General description:

The onboard supply control unit - J519- has the following equipment-specific functions in the vehicle:

- Electrical load management
- Exterior light control
- Turn signal control
- Rear window wiper
- Heated rear window
- Interior light control
- Ambient lighting

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- Terminal control
- Dimmers, instrument lighting
- Fuel pump presupply
- Alternator stand-by
- Horn

Some of the above mentioned functions can be adapted:

- Adapt heating function switch-off time for exterior mirrors
- Adapt heating function switch-off time for rear window
- Adapt lane change flashes
- Adapting coming home time
- Adapting footwell light dimmer value
- Adapt footwell dimmer value and lighting
- Adapting leaving home time
- Adapt headlight washer system ⇒ page 381

Note

- *It depends on the fitted optional equipment whether or not the above-mentioned adaptations can be carried out.*
- *“Lane-change signalling”, “comfort signalling”, or “tap signalling” means, one touch of the turn signal lever will activate the turn signals (1 to 5 times) (turn signal cycles).*

Fault detection and fault display:

The onboard supply control unit - J519- features a self-diagnosis function that facilitates fault finding.

For fault finding, use the systems described in chapter “Vehicle diagnosis, testing and information system” in “Guided Fault Finding” mode ⇒ page 403 .

2.1.2 Removing and installing onboard supply control unit

Note

If the onboard supply control unit - J519- is to be renewed, the procedure
⇒ “2.1.3 Coding onboard supply control unit ”, page 380 for reading the codes stored in the unit must always be carried out.

The removal and installation procedure of the onboard supply control unit - J519- is the same as that of the relay carrier on onboard supply control unit, on left of dash panel ⇒ page 371 .

2.1.3 Coding onboard supply control unit

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Onboard supply control unit
- Functions - onboard supply control unit
- Coding control unit

2.1.4 Adapting headlight washer system

The “active time” of the headlight washer system can be variably adjusted to between 0 and 12.75 seconds.

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Onboard supply control unit
- Functions - onboard supply control unit
- Adapting headlight washer system

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2.2 Removing and installing onboard supply control unit , vehicles as of model year 2011

⇒ “2.2.1 General description - onboard supply control unit”, page 382

⇒ “2.2.2 Removing and installing onboard supply control unit”, page 384

⇒ “2.2.3 Coding onboard supply control unit J519 ”, page 385

⇒ “2.2.4 Adapting onboard supply control unit ”, page 385

⇒ “2.2.5 Onboard supply control unit J519 final control diagnosis”, page 386

2.2.1 General description - onboard supply control unit

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Note

- *The relay carrier on the onboard supply control unit is clipped under the onboard supply control unit and can be removed.*
- *If the onboard supply control unit - J519- is to be renewed, the procedure ⇒ “2.2.3 Coding onboard supply control unit J519 ”, page 385 for reading the codes stored in the unit must be carried out first.*
- *After renewing onboard supply control unit - J519- , the remaining functions of the onboard supply control unit, such as “immobilizer”, “anti-theft alarm”, “entry and start authorisation”, “tyre pressure monitor” and the central locking system keys must also be adapted (depending on equipment).*
- *Start by adapting the immobiliser and continue, in any sequence, with the further functions (dependent on equipment level of vehicle) of the onboard supply control unit - J519- .*
- *Additional information:*

⇒ Self-study programme No. 423 ; The Golf 2009

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

The onboard supply control unit - J519- controls the following functions in the vehicle:

- Electrical load management
- Exterior light control
- Turn signal control
- Automatic wipe/wash, windscreen and rear window
- Headlight washer system
- Rain/light sensor
- Heated windscreen and rear window
- Interior light control
- Terminal control
- Dimmers, instrument lighting

- Fuel pump presupply
- Alternator stand-by
- Horn
- Hazard warning light
- Release control
- Control of the central locking system
- Actuation of the front and rear door control units
- Activation of the rear lid unlocking function
- Activation of the fuel filler flap unlocking function
- Activation of the anti-theft alarm (ATA)
- Activation of the immobiliser
- Activation of the entry and start authorisation

The following functions can be adapted ⇒ page 385 :

- Adapting turn signal cycles for lane change flash
- Adapting automatic unlocking on removing ignition key
- Adapting automatic locking at 15 km/h
- Adapting confirmation of convenience closing
- Adapting coming home time
- Adapting leaving home time
- Deactivating factory mode
- Adapting convenience operation via remote control
- Adapting visual feedback when locking
- Adapting remote control key

Note

It depends on the fitted optional equipment whether or not the above-mentioned adaptations can be carried out.

Fault detection and fault display:

The onboard supply control unit - J519- 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 403 .

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2.2.2 Removing and installing onboard supply control unit

Note

- *The relay carrier on the onboard supply control unit is clipped under the onboard supply control unit and can be removed.*
- *If the onboard supply control unit - J519- is to be renewed, the procedure ⇒ "2.2.3 Coding onboard supply control unit J519 ", page 385 for reading the codes stored in the unit must be carried out first.*
- *The following illustrations show removal on a LHD vehicle. Removal and installation of onboard supply control unit on an RHD vehicle are performed using the corresponding mirror-image procedure.*

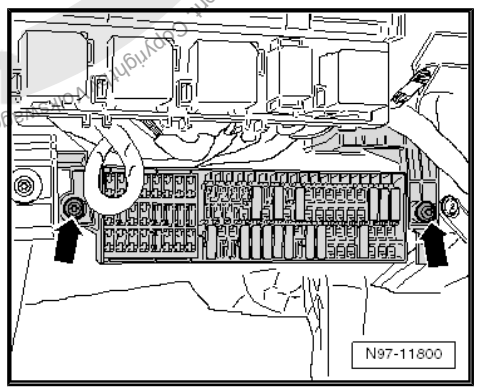
Removing:

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

– Remove storage compartment on drive's side ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartment on driver's side; Removing and installing .

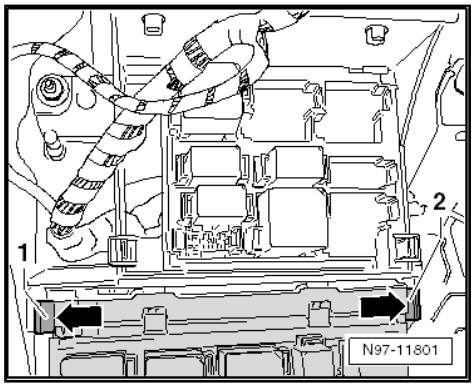
– Unscrew securing bolts -arrows- from fuse carrier.

– Remove fuse carrier from holder and allow to hang.



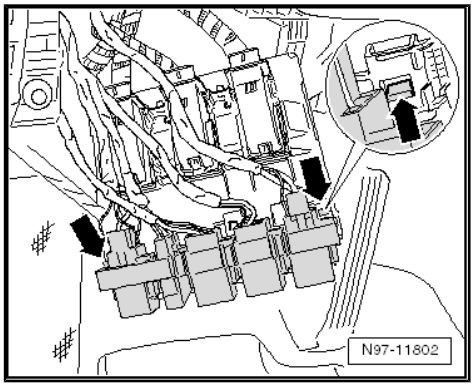
– Press the two catches of the onboard supply control unit -1- and -2- in -direction of arrow-.

– Remove onboard supply control unit together with relay carrier from holder.



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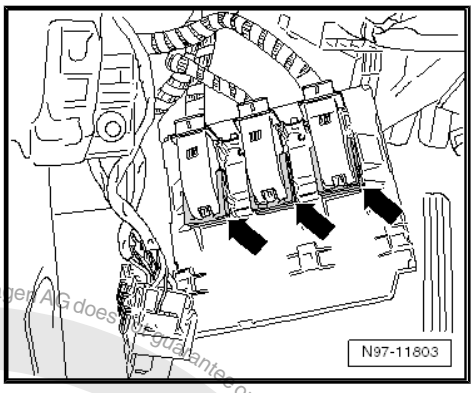
– Press the two catches -arrows- and pull relay carrier off onboard supply control unit.



– Release and fold up locking bar -arrows- and disconnect all connectors from onboard supply control unit.

Installing:

Installation is carried out in the reverse sequence.



2.2.3 Coding onboard supply control unit - J519-

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Onboard supply control unit
- Functions
- Coding onboard supply control unit online

2.2.4 Adapting onboard supply control unit

The following functions can be adapted:

- Adapting turn signal cycles for lane change flash
- Adapting automatic unlocking on removing ignition key
- Adapting automatic locking at 15 km/h
- Adapting confirmation of convenience closing
- Adapting coming home time
- Adapting leaving home time
- Deactivating factory mode
- Adapting convenience operation via remote control

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- ♦ Adapting visual feedback when locking
- ♦ Adapting remote control key

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- ♦ Body
- ♦ Electrical system
- ♦ 01 - On Board Diagnostic capable systems
- ♦ Onboard supply control unit
- ♦ Functions

2.2.5 Onboard supply control unit - J519- final control diagnosis

Note

Whether the components named below can be checked depends on the fitted equipment options.

The following components and/or functions can be checked by the final control diagnosis for the onboard control unit:

- ♦ Left sidelight bulb - M1- , Right sidelight bulb - M3- , Left tail light bulb - M4- and Right tail light bulb - M2-
- ♦ Left headlight dipped beam bulb - M29- and right headlight dipped beam bulb - M31-
- ♦ Left daytime running light bulb - L174- and right daytime running light bulb - L175-
- ♦ Left headlight main beam bulb - M30- and right headlight main beam bulb - M32-
- ♦ Left fog light bulb - L22- and right fog light bulb - L23-
- ♦ Right reverse light bulb - M17- or left reverse light bulb - M16-
- ♦ Left brake light bulb - M9- or right brake light bulb - M10- and additional brake light bulb - M25-
- ♦ Rear left fog light bulb - L46- and rear right fog light bulb - L47-
- ♦ Front left turn signal bulb - M5- and rear left turn signal bulb - M6-
- ♦ Front right turn signal bulb - M7- and rear right turn signal bulb - M8-
- ♦ Number plate light - X-
- ♦ Dimmed interior light
- ♦ Instrument lighting of all keys and switches and the dash panel insert
- ♦ Terminal 30 voltage supply relay - J317-
- ♦ LED heated rear window / heated rear window
- ♦ LED heated exterior mirrors / heated exterior mirrors
- ♦ Release of sliding/tilting sunroof

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- ♦ Release of seat heating
- ♦ Fuel pump relay - J17-
- ♦ Headlight washer system relay - J39- and headlight washer system pump - V11-
- ♦ Windscreen wipers
- ♦ Wiper module change direction point
- ♦ Washer pump - V5-
- ♦ Dual tone horn relay - J4- , treble horn - H2- and bass horn - H7-
- ♦ Bulb for left static cornering light - M51- and right static cornering light - M52-
- ♦ Luggage compartment lock

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester.

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- ♦ Body
- ♦ Electrical system
- ♦ 01 - On Board Diagnostic capable systems
- ♦ Onboard supply control unit
- ♦ Functions
- ♦ Onboard supply control unit final control diagnosis

2.3 Removing and installing data bus diagnostic interface

⇒ “2.3.1 General description - data bus diagnostic interface ”, page 387

⇒ “2.3.2 Removing and installing data bus diagnostic interface ”, page 388

⇒ “2.3.3 Renewing data bus diagnostic interface ”, page 389

2.3.1 General description - data bus diagnostic interface

Note

- ♦ *If the data bus diagnostic interface - J533- is to be renewed, the procedure ⇒ “2.3.3 Renewing data bus diagnostic interface ”, page 389 for reading the codes stored in the unit must be carried out first.*
- ♦ *Additional information:*
- ♦ *⇒ Self-study programme No. 328 ; The Caddy 2004*
- ♦ *⇒ Current flow diagrams, Electrical fault finding and Fitting locations*

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The data bus diagnostic interface - J533- (Gateway) is designed as a separate control unit. It is responsible for the following in the vehicle:

- Data exchange between “powertrain CAN data bus”, “convenience CAN data bus” and “infotainment CAN data bus”.
- Transfer of diagnostic data from the CAN bus to the “diagnosis CAN data bus” and vice versa, so that data can be used by the vehicle diagnostic tester .

Fault detection and fault display:

The data bus diagnostic interface - J533- 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 ⇒ page 403 .

2.3.2 Removing and installing data bus diagnostic interface

Note

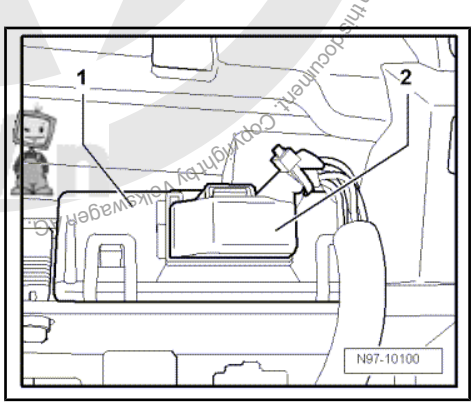
If the diagnosis interface for data bus - J533- is to be replaced, the ⇒ “2.3.3 Renewing data bus diagnostic interface ”, page 389 procedure must always be carried out for reading the codes stored in the unit.

Removing:

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

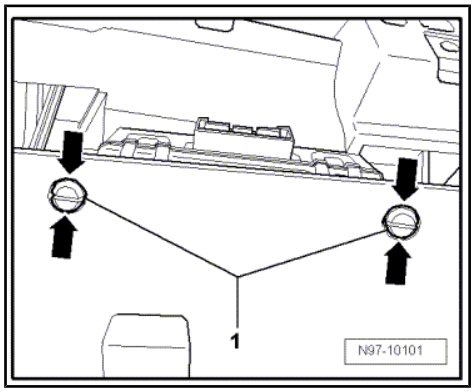
– Remove cover, footwell, driver's side ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trim

– Release connector -2- and pull it off data bus diagnostic interface - J533- -1-.



– Press together -arrows- securing pins -1- and push them upwards out of holes.

– Remove data bus diagnostic interface - J533- from bracket.



Installing:

Installation is carried out in reverse order of removal.

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2.3.3 Renewing data bus diagnostic interface

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

♦ Body

♦ Electrical system

♦ 01 - On Board Diagnostic capable systems

♦ Data bus diagnostic interface

♦ Data bus diagnostic interface functions

♦ Renewing data bus diagnostic interface

2.4 Removing and installing convenience system central control unit

⇒ “2.4.1 General description - convenience system central control unit ”, page 389

⇒ “2.4.2 Removing and installing convenience system central control unit ”, page 390

⇒ “2.4.3 Renewing convenience system central control unit ”, page 391

⇒ “2.4.4 Adapting convenience system central control unit ”, page 391

2.4.1 General description - convenience system central control unit

Note

♦ *If the convenience system central control unit - J393- is to be renewed, the procedure ⇒ “2.4.3 Renewing convenience system central control unit ”, page 391 for reading the codes stored in the unit must be carried out first.*

♦ *Additional information:*

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

General description:

The convenience system control unit - J393- is responsible for the following in the vehicle:

♦ Sliding/tilting sunroof control (release instruction)

♦ Power window control (release instruction)

♦ Central locking control

♦ Anti-theft alarm control

♦ Radio-wave receiver

♦ Rear lid lock

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♦ Convenience operation

Some of the above mentioned functions can be adapted
⇒ page 391 .

Fault detection and fault display:

The convenience system central control unit - J393- 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 ⇒ page 403 .

2.4.2 Removing and installing convenience system central control unit

Note

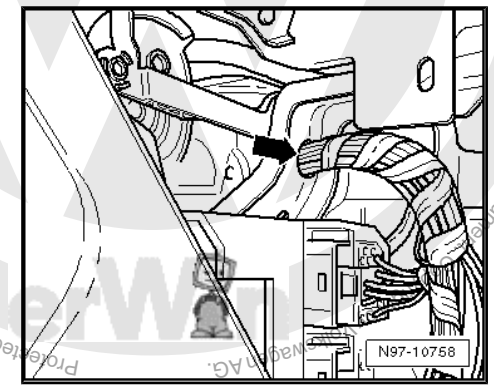
If the convenience system central control unit - J393- is to be renewed, the procedure
⇒ “2.4.3 Renewing convenience system central control unit ”, page 391 for reading the codes stored in the unit must be carried out first.

Removing:

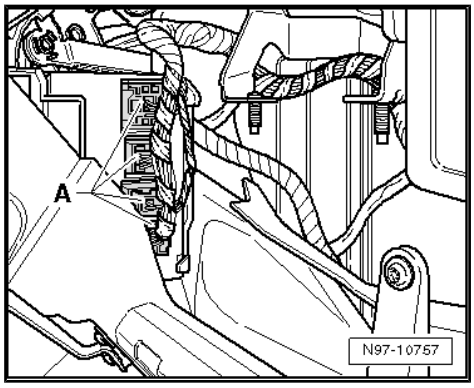
– Switch off ignition and all electrical loads, and pull out ignition key.

– Remove passenger side lower compartment ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trim; Removing and installing passenger side lower compartment .

– Release wiring harness -arrow- from retainer.

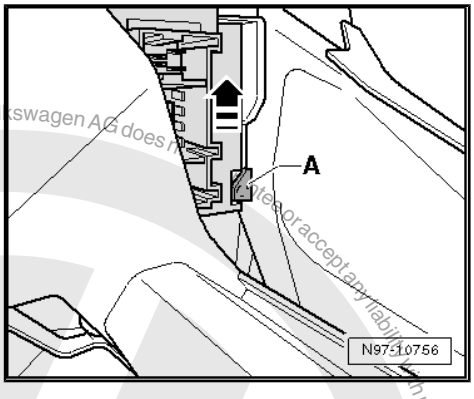


– Release connectors -A- and pull them off convenience system central control unit - J393- .

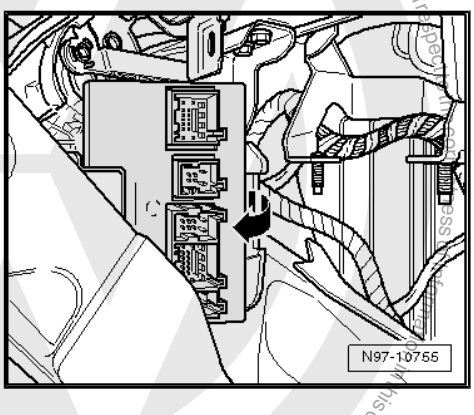


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– Release clip -A- and push control unit upwards in -direction of arrow-.



– Using a screwdriver, carefully unclip central convenience system control unit - J393- from bracket in -direction of arrow-.



Installing:

Installation is carried out in reverse order of removal.

2.4.3 Renewing convenience system central control unit

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- General body repairs
- 01 - On Board Diagnostic capable systems
- Convenience system
- Functions of convenience system central control unit
- J393 - Renewing convenience system central control unit

2.4.4 Adapting convenience system central control unit

The following functions can be adapted:

- Activating and deactivating “single door opening”
- Activating and deactivating “automatic locking at >15 km/h”
- Activating and deactivating “automatic unlocking when ignition key is removed”
- Activating and deactivating “country settings for intelligent alarm horn”
- Activating and deactivating “battery monitoring system (sounder)”

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- Activating and deactivating “convenience actuation via radio remote control unit”
- Activating and deactivating “anti-theft alarm system - alarm delay when driver's door is opened”
- “Sensitivity of tilt angle sensor”
- “Sensitivity of interior monitoring system”

Note

It depends on the fitted optional equipment whether or not the above-mentioned adaptations can be carried out.

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .
– Select “Guided fault finding” in vehicle diagnostic tester .
– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- General body repairs
- 01 - On Board Diagnostic capable systems
- Convenience system
- Functions of convenience system central control unit
- J393 - Adapting convenience system central control unit

2.5 Removing and installing special vehicle control unit

⇒ “2.5.1 General description - special vehicle control unit ”, page 392

⇒ “2.5.2 Removing and installing special vehicle control unit ”, page 393

⇒ “2.5.3 Coding special vehicle control unit ”, page 394

⇒ “2.5.4 Connector pin assignment - Special vehicle control unit (MFG 1)”, page 394

⇒ “2.5.5 Connector pin assignment - Special vehicle control unit (MFG 2)”, page 398

2.5.1 General description - special vehicle control unit

Note

Additional information:

⇒ Self-study programme No. 328 ; The Caddy 2004

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

General description:

The special vehicle control unit - J608- is used by the following special-purpose vehicles, their special equipment and functions:

- Taxis
- Driving schools
- Disabled
- Driving schools for the disabled
- Special signal vehicles
- Special protection vehicles

Fault detection and fault display:

The special-purpose 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 ⇒ page 403 .

2.5.2 Removing and installing special vehicle control unit

Note

The special vehicle control unit is located on the airbag control unit, in the area of the centre tunnel, under the dash panel.

Removing:

– Disconnect battery ⇒ page 3 .

– Remove footwell cover on driver side -1- ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments, covers and trims; Removing and installing footwell trims .

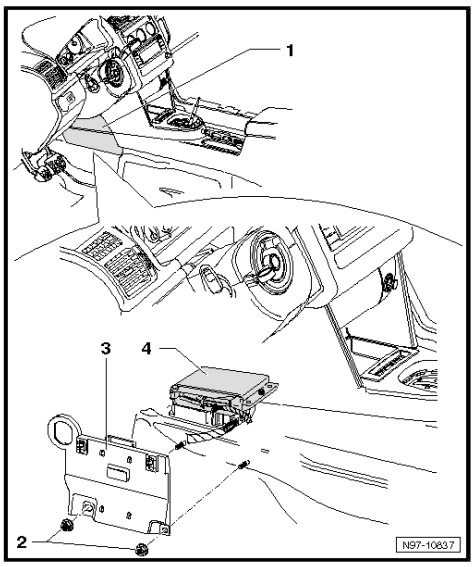
– Undo and remove the 2 nuts -2-.

Note

Two sorts of nuts are used: plastic nuts (1.5 Nm) and metal nuts (3.5 Nm).

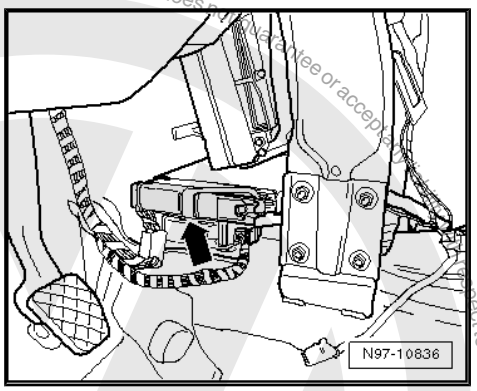
– Pull retaining bracket -3- downwards off threaded bolts.

4 - Special vehicle control unit



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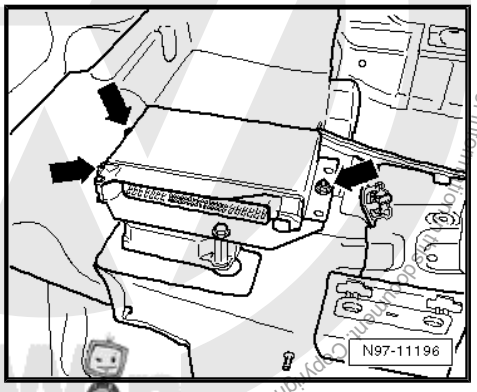
– Release and disconnect connector -arrow- from control unit.



– Unscrew securing bolts on control unit -arrows-.

For reasons of clarity, the dash panel is not shown in the illustration.

– Take special vehicle control unit downwards and out of airbag control unit.



Installing:

Installation is carried out in reverse order of removal.

2.5.3 Coding special vehicle control unit

– Connect vehicle diagnostic tester ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems; Connecting vehicle diagnostic tester .

– Select “Guided fault finding” in vehicle diagnostic tester .

– Using “GoTo” button, select “Functions/component” and then the following menu options in succession:

- Body
- Electrical system
- 01 - On Board Diagnostic capable systems
- Multifunction control unit
- Multifunction control unit functions
- Coding the multifunction control unit

2.5.4 Connector pin assignment - Special vehicle control unit (MFG 1)

Contact	Designation	Output/input	Functioning	Taxis	Authorities	Driving schools	Driving aid
1	Terminal 31, earth	Input	Earth connection	X	X	X	X
2	Terminal 31, earth	Input	Earth connection	X	X	X	X
3	Terminal 31, earth	Input	Earth connection	X	X	X	X
4	A01	Output	High side: 6 A	Supply for radiotelephony	Supply for radio telephone 1	Not assigned	Not assigned

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Contact	Designation	Output/input	Functioning	Taxis	Authorities	Driving schools	Driving aid
5	A02	Output	High side: 6 A	Supply for radio frequency data transmission	Supply for radio telephone 2	Not assigned	Not assigned
6	A03	Output	High side: 5 A	Terminal 15	Terminal 15	Terminal 15	Terminal 15
7	A08_1	Output	Pot. fr. relay contact 0.5 A	Hand-free function of two-way radio	Not assigned	Not assigned	Not assigned
8	A08_2	Output	Pot. fr. relay contact 0.5 A	Hand-free function of two-way radio	Not assigned	Not assigned	Not assigned
9	A09_1	Output	Pot. fr. relay contact 0.5 A	Radio distress signal	Isolation relay for 2nd battery	Not assigned	Not assigned
10	A09_2	Output	Pot. fr. relay contact 0.5 A	Radio distress signal	Isolation relay for 2nd battery	Not assigned	Not assigned
11	A10	Output	High side: 0.4 A	X	X	X	X
12	A11	Output	High side: 0.4 A	Not assigned	Activation via button for engine run-on, terminal 15	Not assigned	Activation via button for engine start, terminal 50
13	A12	Output	High side: 0.4 A	Not assigned	Special signal siren activated	Not assigned	Not assigned
14	A13	Output	Low side 0.2 A	Warning light for roof symbol button	Warning light for engine run-on button	Not assigned	Door contact switch status on driver side
15	A14	Output	High side: 0.4 A	Not assigned	Not assigned	Supply for warning buzzer	Not assigned
16	A15	Output	Low side 0.2 A	Not assigned	Urban/ country changeover of signal installation	Warning light for warning buzzer button	Not assigned
17	A16	Output	Low side 0.2 A	Warning light for interior lighting button	Warning light for radio telephone button	Warning light for footwell light button	Warning light for remote control button
18	A17	Output	Low side 0.2 A	Speed signal	Speed signal	Speed signal	Speed signal
19							
20							
21							

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Contact	Designation	Output/input	Functioning	Taxis	Authorities	Driving schools	Driving aid
22	A04	Output	High / low side 3 A	Supply 1 for roof symbol	Rear flashing lights	Not assigned	Supply for steering wheel remote control
23	A05	Output	High / low side 3 A	Supply 2 for roof symbol	Left additional turn signal	Not assigned	Not assigned
24	A06	Output	High / low side 3 A	Not assigned	Right additional turn signal	Not assigned	Not assigned
25	A07	Output	High side, 1 A permanent current, 6 A pulsed current	Not assigned	Weapon box activation	Not assigned	Not assigned
26	Terminal 30, positive	Input	Supply connection	X	X	X	X
27	Terminal 30, positive	Input	Supply connection	X	X	X	X
28	Terminal 30, positive	Input	Supply connection	X	X	X	X
29	Terminal 31, negative	Input	Earth connection	X	X	X	X
30	Terminal 31, negative	Input	Earth connection	X	X	X	X
31	Terminal 31, negative	Input	Earth connection	X	X	X	X
32							
33							
34							
35							
36							
37							
38							
39							
40							
41	LIN_0		LIN bus	X	X	X	X
42	Earth		Earth output	X	X	X	X
43							
44	LIN_1		LIN bus	X	X	X	X
45	Earth		Earth output	X	X	X	X
46	Earth		Earth output	X	X	X	X
47	CAN bus, high		CAN bus, convenience, high	X	X	X	X
48	CAN bus, low		CAN bus, convenience, low	X	X	X	X
49							
50							
51							
52							

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Contact	Designation	Output/input	Functioning	Taxis	Authorities	Driving schools	Driving aid
53	Terminal 30, positive	Input	Supply connection	X	X	X	X
54	Terminal 30, positive	Input	Supply connection	X	X	X	X
55	Terminal 30, positive	Input	Supply connection	X	X	X	X
56							
57							
58							
59							
60							
61	A08-norm. closed	Output	Relay 0.5 A	Not assigned	Not assigned	Not assigned	Not assigned
62							
63	E01	Input	Low active	Passive taxi alarm button	Engine run-on button	Switch operation, front passenger	Not assigned
64	E02	Input	Low active	Passive taxi alarm button	Not assigned	Footwell light button	Not assigned
65	E03	Input	Low active	Off button for taxi alarm	X	Warning buzzer button	Not assigned
66	E04	Input	Low active	Button for interior lighting	Button for two-way radio supply	Not assigned	Button for front left window opening
67	E05	Input	Low active	Button for taxi roof sign	Not assigned	Not assigned	Button for front left window closing
68	E06	Input	Low active	Button for hand-free function of two-way radio	Starter inhibitor	Not assigned	Button for front right window opening
69	E07	Input	Low active	Not assigned	Button for suppression of interior lighting	Not assigned	Button for front right window closing
70	E08	Input	Low active	Not assigned	Button for urban/ country change-over	Not assigned	Engine start button
71	E09	Input	Low active	Not assigned	Not assigned	Not assigned	Remote control button
72	E10	Input	Low active	Not assigned	Not assigned	Not assigned	Not assigned

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Contact	Designation	Output/input	Functioning	Taxis	Authorities	Driving schools	Driving aid
73	E11	Input	Low active	Not assigned	Not assigned	Not assigned	Not assigned
74	E12	Input	High active	Radio receiver for taxi alarm	Not assigned	Not assigned	Not assigned
75	E13	Input	High active	Off status input of taximeter	Off status input, special signal	Not assigned	Not assigned
76	E14	Input	High active	Not assigned	Not assigned	Not assigned	Not assigned
77							
78	SDI BKGD	Output	SDI BKGD	X	X	X	X
79	SDI VCC	Output	SDI VCC	X	X	X	X
80	SDI GND	Output	SDI GND	X	X	X	X
81	SDI reset	Output	SDI reset	X	X	X	X
82							
83							
84							
85			Pull-up				
86							
87	Earth		Earth	X	X	X	X
88	Watchdog-disable	Output	Watchdog-disable	X	X	X	X

2.5.5 Connector pin assignment - Special vehicle control unit (MFG 2)

Inputs:

Contact no.	Type	Taxi	Special vehicle	Driving aid	Driving school and extra
E 01	Low active	Passive taxi alarm button	Engine run-on button	Not assigned	Switch for operation of pedals by front passenger
E 02	Low active	Active taxi alarm button	Button for two-way radio supply	Not assigned	Footwell light button
E 03	Low active	Off button for taxi alarm	Starter inhibitor	Not assigned	Warning buzzer button
E 04	Low active	Button for interior lighting	Button for interior lighting	Button for front left window regulator, low	Button for front left window regulator, low
E 05	Low active	Roof symbol button	Changeover between urban and countryside	Button for front left window regulator, high	Button for front left window regulator, high
E 06	Low active	Button for unlocking rear doors	Button for switching daylight running lights off	Button for front right window regulator, low	Button for front right window regulator, low

Contact no.	Type	Taxi	Special vehicle	Driving aid	Driving school and extra
E 07	Low active	Not assigned	Button for blue light	Button for front right window regulator, high	Button for front right window regulator, high
E08	Low active	Not assigned	Button for tonal sequence standby	Engine start button	Engine start button
E 09	Low active	Not assigned	Button for special signal	Remote control button	Remote control button
E 10	Low active	Not assigned	Button for Stop Police, front	Not assigned	Button for left turn signal
E 11	Low active	Not assigned	Button for Stop Police, rear	Not assigned	Button for right turn signal
E 12	Low active	Not assigned	Button for Please Follow, rear	Not assigned	Button for main beam
E 13	Low active	Not assigned	Microphone button	Not assigned	Button for dipped beam
E 14	Low active	Not assigned	Test button	Not assigned	Horn plate
E 15	High active	Radio receiver for taxi alarm	Not assigned	Not assigned	Not assigned
E 16	High active	Off status input of taximeter	Status input from special signalling system	Not assigned	Not assigned
E 17	High active	Not assigned	Not assigned	Not assigned	Not assigned
E 18	High active	Not assigned	Not assigned	Not assigned	Not assigned

Outputs:

Contact no.	Type	Taxi	Special vehicle	Driving aid	Driving school and extra
A 01	High / low side	Supply 1 for roof symbol	Supply for radio telephone 1	Not assigned	Not assigned
A 02	High / low side	Supply 2 for roof symbol	Supply for radio telephone 2	Not assigned	Not assigned
A 03	High side	Terminal 15	Terminal 15	Terminal 15	Terminal 15
A 04	High side	Not assigned	Rear flashing lights	Supply for remote control	Supply for remote control
A 05	High side	Not assigned	Left additional turn signal	Not assigned	Supply for footwell lights
A 06	High side	Not assigned	Right additional turn signal	Not assigned	Supply for warning buzzer
A 07	High side	Not assigned	Luggage compartment light	Not assigned	Not assigned
A 08	High side	Supply output with protection against total discharge	Supply output with protection against total discharge	Supply output with protection against total discharge	Supply output with protection against total discharge
A 09_C	Relay	Radio distress signal	Terminal 15 from ignition/starter switch	Not assigned	Not assigned
A 09_NO	Relay	Radio distress signal	Not assigned	Not assigned	Not assigned
A 09_NC	Relay	Not assigned	Terminal 15 to on-board supply control unit	Not assigned	Not assigned

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Contact no.	Type	Taxi	Special vehicle	Driving aid	Driving school and extra
A 10_C	Relay	Not assigned	Not assigned	Not assigned	Not assigned
A 10_NO	Relay	Not assigned	Not assigned	Not assigned	Not assigned
A 10_NC	Relay	Not assigned	Not assigned	Not assigned	Not assigned
A 11	High side	Not assigned	Engine run-on, terminal 15	Terminal 50 for engine start	Terminal 50 for engine start
A 12	High side	Not assigned	Activating sequence of sounds for signalling system	Not assigned	Not assigned
A 13	High side	Isolation relay for 2nd battery	Isolation relay for 2nd battery	Not assigned	Not assigned
A 14	High side	Not assigned	Indicator light for blue light	Not assigned	Indicator lamp for dipped beam
A 15	High side	Not assigned	Error indication, special signalling system	Not assigned	Indicator light for left turn signal
A 16	High side	Not assigned	Indicator light for status of special signal	Not assigned	Indicator light for right turn signal
A 17	High side	Door status	Door status	Not assigned	Main beam warning lamp
A 18	Low side	Warning light for roof symbol button	Warning light for engine run-on button	Warning light for remote control button	Warning light for remote control button
A 19	Low side	Indicator light for interior lighting button	Indicator light for interior lighting button	Not assigned	Indicator light for warning buzzer button
A 20	Low side	Not assigned	Urban/countryside changeover for signalling system	Not assigned	Warning light for footwell light button
A 21	Low side	Not assigned	Warning light for radio telephone button	Not assigned	Not assigned
A 22	Low side	Speed signal	Speed signal	Speed signal	Speed signal
A 23	Low side	Not assigned	Indicator light for daylight driving lights button	Door status	Door status

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3 Connectors

⇒ “3.1 Repairing electrical wiring harnesses and plug-in connections”, page 401

3.1 Repairing electrical wiring harnesses and plug-in connections

⇒ “3.1.1 Wiring harness and connector repairs”, page 401

⇒ “3.1.2 Contact surface cleaning set VAS 6410 ”, page 401

3.1.1 Wiring harness and connector repairs

General information for wiring harness and connector repair is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 97 ; Wiring harness and connector repair .

3.1.2 Contact surface cleaning set - VAS 6410-

General information for the contact surface cleaning set - VAS 6410- is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 97 ; Contact surface cleaning set VAS 6410 .

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4 Renewing Lambda probe

General information for renewing the lambda probes is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 97 ; Renewing lambda probe .

5 Vehicle diagnosis, testing and information systems

General information for vehicle diagnosis, testing and information systems is available in the workshop manual “Electrical system, General information” ⇒ Electrical system, General information; Rep. gr. 97 ; Vehicle diagnosis, testing and information systems .

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