



Workshop Manual Transporter 2020 ➤

Auxiliary heater

Edition 04.2020



List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

82 - Supplementary heating

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



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00 – Technical data

1 Safety information

(VRL014130; Edition 04.2020)

WARNING

If the vehicle has been the subject of an ABT e-Line conversion, the repair instructions below may have lost their validity.

- In this case, the workshop manual in ELSA Pro under the tab "Superstructures and modifications" provided by ABT e-Line must be observed and applied.

⇒ ["1.1 Safety precautions during work on fuel system", page 1](#)

⇒ ["1.2 Safety precautions when working on vehicles with start/stop system", page 1](#)

⇒ ["1.3 Safety precautions when using testing and measuring instruments during a road test", page 2](#)

⇒ ["1.4 Safety precautions when working on the cooling system", page 2](#)

⇒ ["1.5 Safety precautions for working on vehicles with auxiliary heater", page 2](#)

1.1 Safety precautions during work on fuel system

Risk of fire due to escaping fuel

When the battery is connected and the driver door opens, the door contact switch activates the fuel pump. Escaping fuel can ignite and cause a fire.

- Disconnect voltage supply to fuel pump before opening the fuel system.

Risk of injury from highly pressurised fuel

The fuel system is pressurised. Risk of injury from fuel spray.

Before opening the fuel system:

- Wear safety goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.

1.2 Safety precautions when working on vehicles with start/stop system

Risk of injury from engine starting unexpectedly

If the vehicle's start/stop system is activated, the engine can start unexpectedly. A message in the dash panel insert indicates whether the start/stop system is activated.

- To deactivate start/stop system: switch off ignition.



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

Risk of injury caused by unsecured testing and measuring instruments

When the front passenger airbag is deployed in an accident, insufficiently secured testing and measuring instruments become dangerous projectiles.

- Secure testing and measuring instruments on the rear seat.

Or

- Have a second person operate the testing and measuring instruments on the rear seat.

1.4 Safety precautions when working on the cooling system

Risk of scalding from hot coolant

On a warm engine, the cooling system is under high pressure. Risk of scalding from steam or hot coolant.

- Wear protective gloves.
- Wear safety goggles.
- To relieve pressure, cover the cap of the coolant expansion tank with a cloth, and open it carefully.

1.5 Safety precautions for working on vehicles with auxiliary heater

Danger of fire and explosion from auxiliary heater

In fire and explosion-endangered areas, a spark or the high temperature of the auxiliary heater can cause a fire or an explosion. Risk of burns.

- Switch the auxiliary heater off in fire and explosion-endangered areas.

Danger of poisoning from exhaust fumes

Auxiliary heaters produce poisonous exhaust fumes. Risk of poisoning and injuries to respiratory system.

- In closed areas, switch on the auxiliary heater only when it is connected to an exhaust extractor system.
- In closed areas without an exhaust extractor system, switch the auxiliary heater off.



Risk of damage when starting the engine

If components of the fuel system or coolant circuit of the auxiliary heater are removed or opened, there is a possibility of causing damage to the auxiliary heater.

- Never attempt to start the engine when components are removed or opened.

Malfunction caused by air in the fuel supply system

After work has been performed on the fuel tank or the fuel delivery unit, the metering pump will draw air and supply it to the auxiliary heater. The air in the fuel system may cause the auxiliary heater to malfunction.

- Fill fuel take-off pipe with fuel.

Risk of accidents and risk of injury due to activated timer of auxiliary heater

If the vehicle's timer for the auxiliary heater is active, the heater may switch on unexpectedly. This poses a risk of poisoning from exhaust gases, a risk of burns caused by hot auxiliary heater components as well as a risk of fire and explosions caused by high temperatures.

- Deactivate timer for auxiliary heater.



2 General information



WARNING

If the vehicle has been converted by ABT e-Line, it is possible that the repair instructions provided below are no longer valid.

- In this case, the workshop manual in ELSA Pro under the tab "Superstructures and modifications" provided by ABT e-Line must be observed and applied.

⇒ "2.1 Type plates", page 4

⇒ "2.2 Starting conditions for auxiliary/supplementary heater", page 4

⇒ "2.3 Rules for cleanliness when working on auxiliary/supplementary heater and fuel system", page 5

⇒ "2.4 Notes for vehicles with a start/stop system", page 5

2.1 Type plates

There are different types of type plates.

When the auxiliary heater is renewed, check the type plate and the duplicate plate and replace as necessary.

Type plate on auxiliary/supplementary heaters

- ◆ The date of first use is entered on the lower part of manufacturer's plate.
- ◆ The year the unit was first put into use must be entered on the Genuine part manufacturer's plate.

Webasto Thermo Top SE		E1	
Made in Germany	CE		
Model Type	Thermo Top Evo		
Operating Voltage			
Rated Output			
Fuel Type			
Working Pressure			
Part No.	Serial-No.		
Year of Manufacture			
			N00-11041

Duplicate type plate for auxiliary/supplementary heaters

- ◆ In the engine compartment of the vehicle, there is a second (duplicate) type plate attached to the right of the lock carrier (when looking in direction of travel). If there is any doubt concerning the type of the auxiliary/supplementary heater, always observe the type plate attached directly to the auxiliary/supplementary heater.

Factory label duplicate valid only with the original			
Webasto Thermo Top SE		E1	
Made in Germany	CE		
Model Type	Thermo Top Evo		
Operating Voltage / Rated Output			
Fuel Type			
Working Pressure			
Part No.			
			N00-11040

2.2 Starting conditions for auxiliary/supplementary heater

- ◆ Engine type OK (diesel/petrol)
- ◆ Terminal 15 (ignition) on
- ◆ Engine speed >600 rpm
- ◆ Coolant temperature <69°C
- ◆ Ambient temperature <5 C
- ◆ Reserve fuel level not reached



- ◆ Line filling carried out
- ◆ On-board network manager not active
- ◆ No crash shut-off
- ◆ No event memory entries blocking start procedure
- ◆ Has been put into service

2.3 Rules for cleanliness when working on auxiliary/supplementary heater and fuel system

- ◆ Thoroughly clean all connections and adjacent areas before disconnecting.
- ◆ Place removed parts on a clean surface, and cover them over. Use only lint-free cloths.
- ◆ Carefully cover opened components or seal them if repairs cannot be carried out immediately.
- ◆ Install only clean parts; do not remove new parts from packaging until immediately before installing. Do not use parts that have been kept unpackaged (for example in toolboxes).

If the fuel system is open:

- Do not work with compressed air.
- Do not move the vehicle.
- Do not start the engine.
- Do not switch on auxiliary/supplementary heater.

2.4 Notes for vehicles with a start/stop system

Additional information:

- ◆ Refer to ⇒ Self-study programme No. 426 ; Start/Stop System 2009 for description of features.



3 Repair notes



WARNING

If the vehicle has been converted by ABT e-Line, it is possible that the repair instructions provided below are no longer valid.

- In this case, the workshop manual in ELSA Pro under the tab "Superstructures and modifications" provided by ABT e-Line must be observed and applied.

⇒ ["3.1 Rules for cleanliness", page 6](#)

⇒ ["3.2 General information", page 6](#)

⇒ ["3.3 General repair instructions", page 6](#)

⇒ ["3.4 Contact corrosion", page 7](#)

⇒ ["3.5 Nuts and bolts", page 7](#)

⇒ ["3.6 Routing and attachment of lines", page 7](#)

3.1 Rules for cleanliness

Even small amounts of contamination/soiling can lead to defects. Therefore, observe the following rules for cleanliness when working on the air conditioning system:

- ◆ Seal open lines and connections immediately with clean plugs, e.g. from engine bung set - VAS 6122- .
- ◆ Place removed parts on a clean surface, and cover them over. Use only lint-free cloths.
- ◆ Carefully cover opened components or seal them if repairs cannot be carried out immediately.
- ◆ Install only clean parts; do not remove new parts from packaging until immediately before installing. Do not use parts that have been stored outside their packaging (e.g. in tool boxes).
- ◆ If system is open, do not work with compressed air.
- ◆ Protect disconnected electrical connectors from dirt and water, and reconnect them only when dry.

3.2 General information

- ◆ The engine control unit has a self-diagnosis capability. Before carrying out repairs and for fault finding, first read event memory.
- ◆ For trouble-free operation of electrical components, a voltage of at least 11.5 volts is necessary.
- ◆ Do not use sealants containing silicone. Particles of silicone drawn into the engine will not be burnt in the engine and damage the lambda probe.
- ◆ Vehicles are equipped with a crash fuel shut-off circuit. It reduces the danger of a fire in a crash as the fuel pump is switched off via the fuel pump relay.
- ◆ The system also improves the starting characteristics of the engine. When the driver door is opened, the fuel pump is activated for 2 seconds to build up pressure in the fuel system.

3.3 General repair instructions

Never attempt to repair any components of the auxiliary/supplementary heater. Defective components must be replaced with Genuine parts.



- Read self-diagnosis of auxiliary/supplementary heater using
⇒ Vehicle diagnostic tester.
- When parts of the fuel system are removed or renewed, ensure that all components for fuel delivery to the auxiliary/supplementary heater are properly installed.
- Mark coolant hoses before removing to avoid any confusion when reconnecting.

Following repair work in the vicinity of the auxiliary/supplementary heater fuel line, check the following points:

- ◆ that the fuel lines are routed flush with the vehicle underbody and are protected against mechanical damage.
- ◆ that the auxiliary/supplementary heater fuel line is protected from heating which might disturb operation.
- ◆ The fuel line does not come in contact with parts that become hot.

3.4 Contact corrosion

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

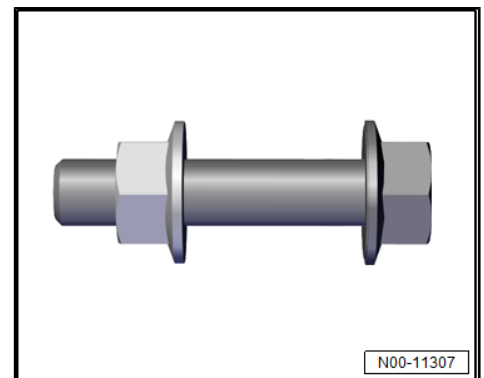
For this reason, only fasteners with a special surface coating are used.

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

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

3.5 Nuts and bolts

- ◆ Specified torques given are for uncoiled nuts, bolts and screws.
- ◆ Always renew self-locking nuts and bolts.
- ◆ Always renew nuts and bolts with turning further angle.



3.6 Routing and attachment of lines

Risk of damage to lines

Lines may become damaged by moving or hot components.

- Route lines in their original positions.
- Ensure there is sufficient clearance to moving or hot components.



4 Hazard classification of high-voltage system

DANGER

The vehicle's high-voltage system and the high-voltage battery are dangerous and can cause burns or other injuries and even lead to a fatal electric shock.

- Any work on the high-voltage system, or on systems which could be indirectly affected by it, must only be carried out by properly trained and qualified expert personnel.
- In the event of queries or uncertainties regarding the terms "high-voltage technician" or "high-voltage expert", or those concerning the high-voltage system, the responsible importer must be contacted before any work is undertaken.
- Any repair work must be performed in accordance with applicable laws and regulations, the state-of-the-art technology, any relevant accident prevention regulations (in Germany, including but not limited to the Information of the German Social Accident Insurance (DGUV) 200-005 – Qualification training for work on vehicles with high-voltage systems), as well as this workshop manual.

Procedure for vehicles electrified by ABT e-Line

Please observe the Workshop Manuals available in ElsaPro, tab "Superstructures and modifications".

If you have no access to ElsaPro, you can also obtain the relevant manuals from ABT e-Line.



82 – Supplementary heating

1 Overview of fitting locations - auxiliary/supplementary heater

⇒ [“1.1 Overview of fitting locations - components not located in passenger compartment”, page 9](#)

1.1 Overview of fitting locations - components not located in passenger compartment

1 - Fuel tank

- ☐ Removing and installing
⇒ Fuel supply - diesel engines; Rep. gr. 20 ; Fuel tank; Removing and installing fuel tank .

2 - Fuel line

3 - Fuel gauge sender - G-

- ☐ Removing and installing
⇒ Rep. gr. 20 ; Fuel delivery unit/fuel gauge sender; Removing and installing fuel delivery unit/fuel gauge sender

4 - Air intake silencer

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

5 - Exhaust system

- ☐ Removing and installing
⇒ [page 18](#)

6 - Auxiliary heater

- ☐ Removing and installing
⇒ [page 10](#)

7 - Metering pump - V54-

- ☐ Removing and installing
⇒ [page 29](#)
- ☐ Testing quantity of fuel delivered ⇒ [page 28](#)

8 - Circulation pump - V55-

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

9 - Remote control receiver for auxiliary coolant heater -

R149- or remote control receiver for auxiliary heating - R64-

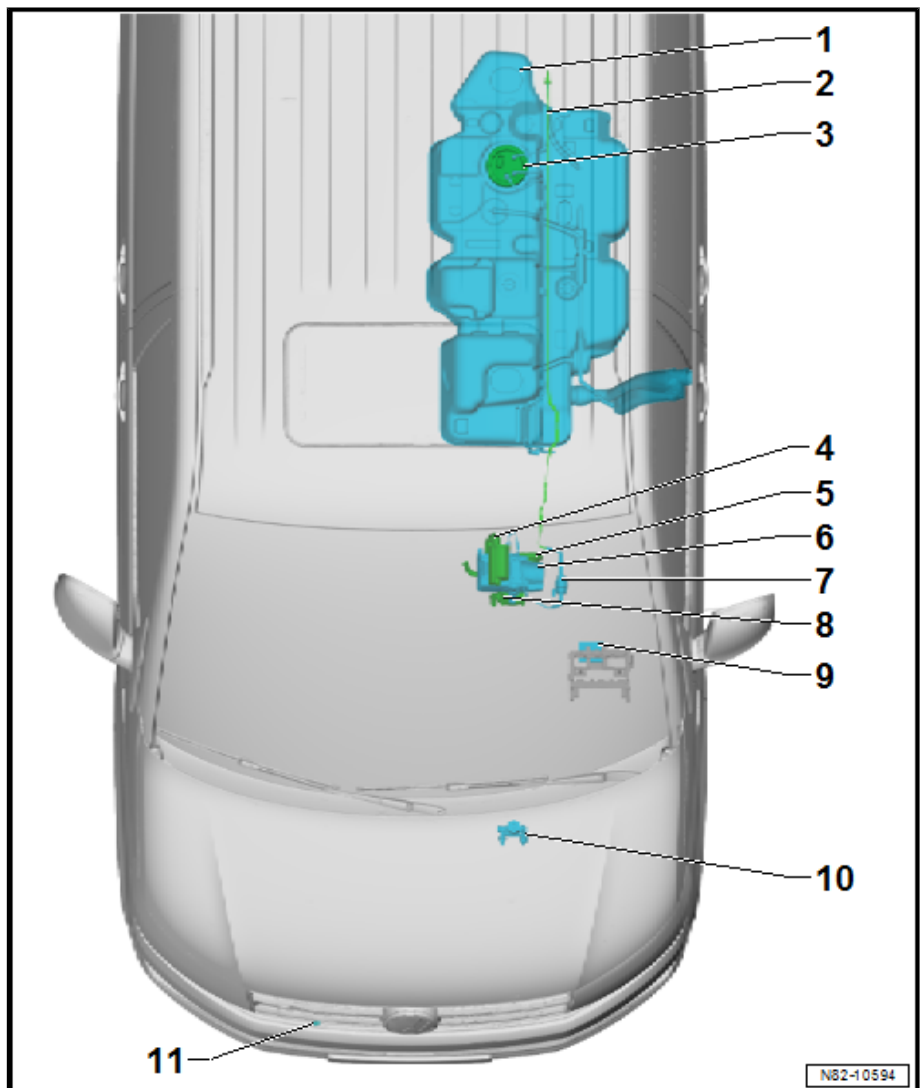
- ☐ Removing and installing ⇒ [page 32](#)

10 - Shut-off valve for heater coolant - N279-

- ☐ Removing and installing ⇒ [page 25](#)

11 - Ambient temperature sensor - G17-

- ☐ Removing and installing ⇒ Heating, air conditioning system; Rep. gr. 87 ; Other control components; Removing and installing ambient temperature sensor G17





2 Auxiliary/supplementary heater

⇒ ["2.1 Overview of fitting locations - auxiliary/supplementary heater", page 10](#)

⇒ ["2.2 Assembly overview - auxiliary/supplementary heater, internal", page 12](#)

⇒ ["2.3 Assembly overview - auxiliary/supplementary heater attachments", page 13](#)

⇒ ["2.4 Removing and installing auxiliary/supplementary heater", page 14](#)

⇒ ["2.5 Removing and installing air intake silencer", page 16](#)

⇒ ["2.6 Removing and installing circulation pump V55 ", page 16](#)

⇒ ["2.7 Removing and installing exhaust system", page 18](#)

⇒ ["2.8 Removing and installing cover", page 19](#)

⇒ ["2.9 Dismantling and assembling heater unit", page 20](#)

⇒ ["2.10 Removing and installing glow plug with flame monitor Q8 ", page 21](#)

⇒ ["2.11 Removing and installing temperature sensor G18 and overheating sensor G189 ", page 22](#)

⇒ ["2.12 Removing and installing auxiliary heater control unit J364 ", page 23](#)

⇒ ["2.14 Connector pin assignment for auxiliary/supplementary heater", page 23](#)

2.1 Overview of fitting locations - auxiliary/supplementary heater



1 - Auxiliary/supplementary heater

- ☐ Removing and installing
⇒ [page 14](#)
- ☐ Dismantling and assembling
⇒ [page 20](#)

2 - Bracket for auxiliary/supplementary heater

3 - Bracket

4 - Rubber mounting

5 - Electrical connector

6 - Coolant hose

7 - Circulation pump - V55-

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

8 - Bracket

- ☐ For circulation pump - V55-

9 - Exhaust system

- ☐ Removing and installing
⇒ [page 18](#)

10 - Bracket

- ☐ For circulation pump - V55-

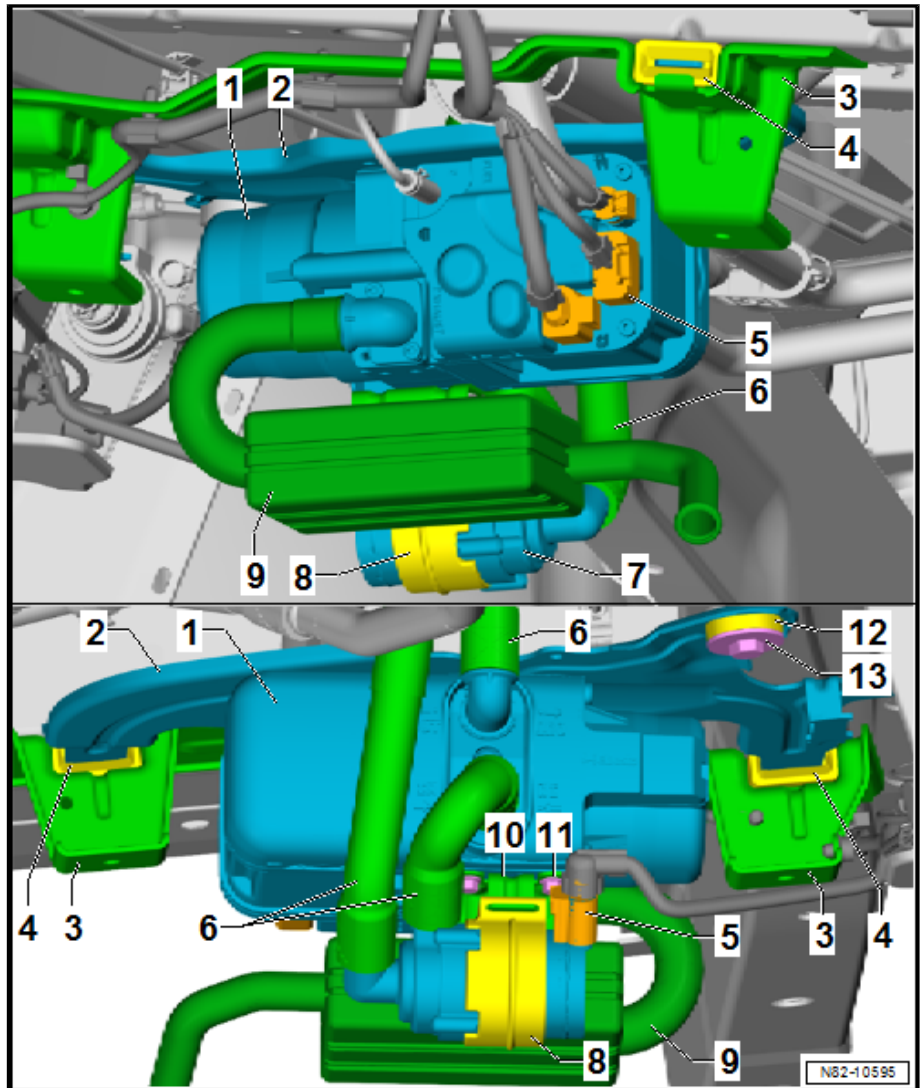
11 - Bolt

- ☐ 6 Nm

12 - Rubber mounting

13 - Bolt

- ☐ 20 Nm





2.2 Assembly overview - auxiliary/supplementary heater, internal

1 - Bolts

- ❑ Qty. 3
- ❑ 7 Nm

2 - Heat exchanger

- ❑ Removing and installing
⇒ [page 20](#)

3 - Seal

- ❑ Must be renewed each time after opening
- ❑ Observe installation position

4 - Combustion chamber insert

- ❑ Removing and installing
⇒ [page 20](#)

5 - Glow plug with flame monitor - Q8-

- ❑ Must be properly seated
- ❑ Removing and installing
⇒ [page 21](#)

6 - Cover

- ❑ For auxiliary heater control unit - J364-
- ❑ Removing and installing
⇒ [page 19](#)

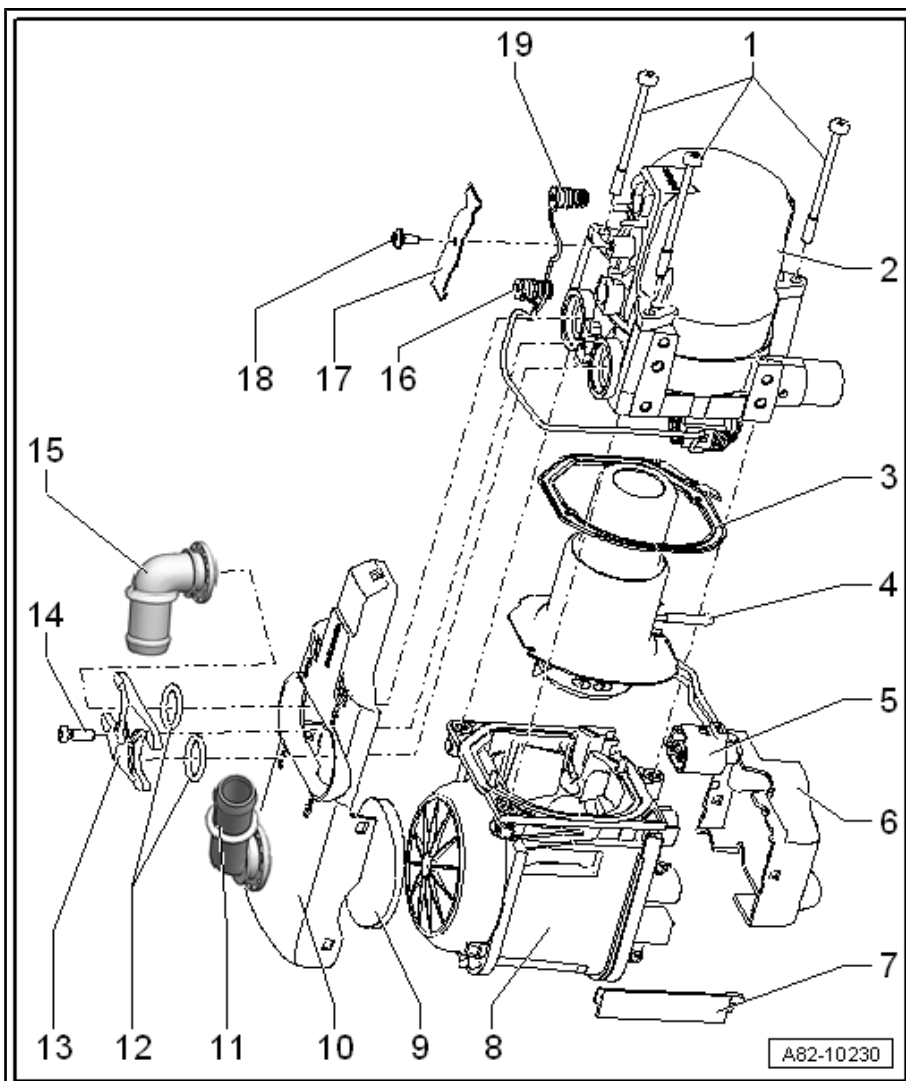
7 - Cover

8 - Auxiliary heater control unit - J364- with combustion air blower - V6-



Note

The auxiliary heater control unit - J364- and the combustion air blower - V6- with housing form one component and cannot be dismantled. The reason is the seal between the auxiliary heater control unit - J364- and the housing.



9 - Noise insulation

10 - Cover

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

11 - Union

- ❑ Mark installation position before removing

12 - Oil seals

- ❑ Renew after removal

13 - Support plate

14 - Bolt

- ❑ 4 Nm



15 - Union

- ☐ Mark installation position before removing

16 - Temperature sensor - G18-

- ☐ Removing and installing ⇒ [page 22](#)

17 - Retaining spring

18 - Bolt

- ☐ 4 Nm

19 - Overheating sensor - G189-

- ☐ Removing and installing ⇒ [page 22](#)

2.3 Assembly overview - auxiliary/supplementary heater attachments

1 - Bracket

- ☐ For auxiliary heater

2 - Bolts

- ☐ Qty. 3
- ☐ 6 Nm

3 - Rubber mounting

4 - Air intake silencer

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

5 - Exhaust system

- ☐ Removing and installing
⇒ [page 18](#)

6 - Auxiliary/supplementary heater

7 - Bracket

- ☐ For circulation pump -
V55- and air intake si-
lencer

8 - Bolts

- ☐ Qty. 2
- ☐ For bracket of circula-
tion pump - V55- and air
intake silencer
- ☐ 6 Nm

9 - Bracket

- ☐ For circulation pump -
V55-

10 - Circulation pump - V55-

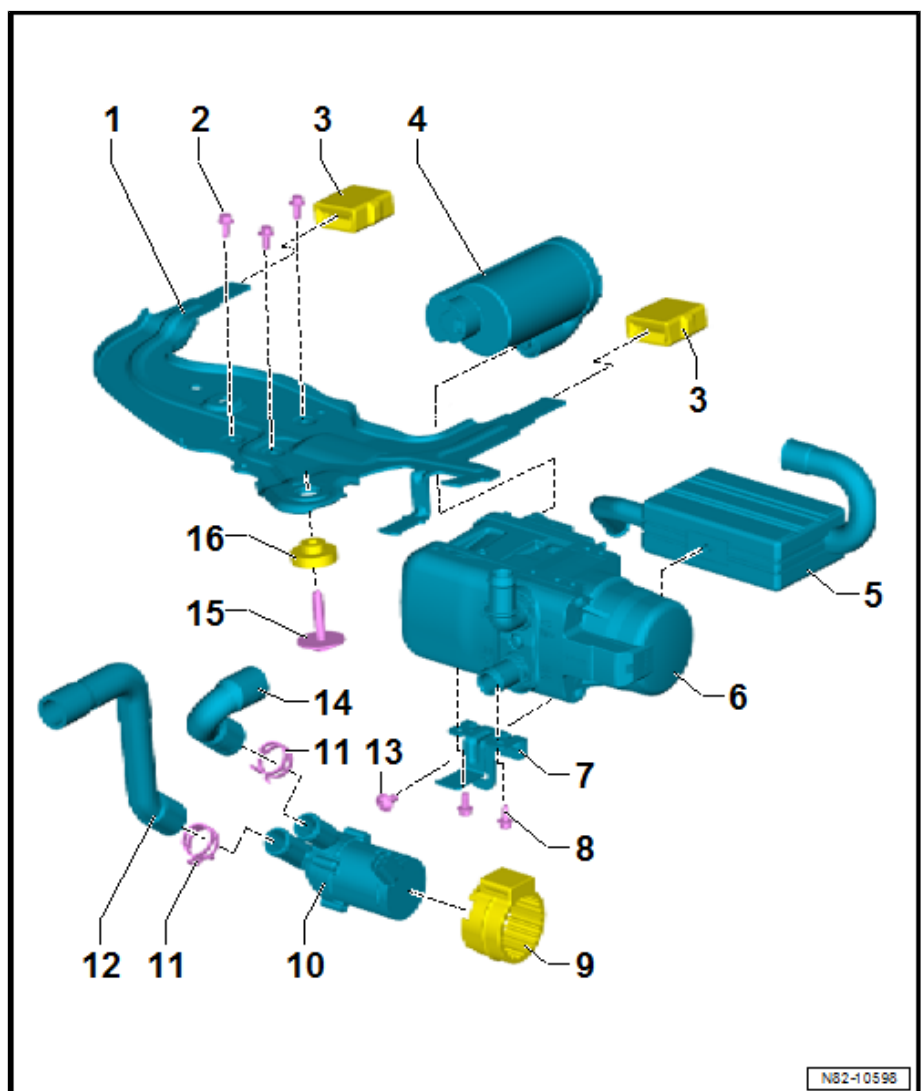
- ☐ Removing and installing
⇒ [page 16](#)

11 - Clamp

12 - Coolant hose

13 - Bolt

- ☐ 8 Nm





14 - Coolant hose

15 - Bolt

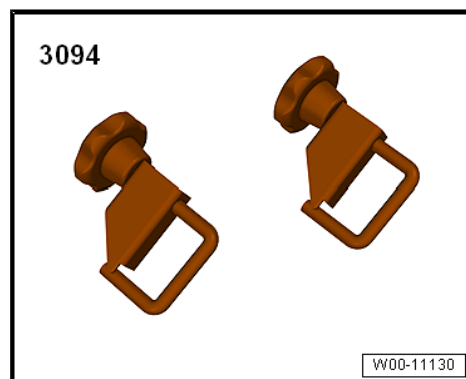
- 20 Nm

16 - Rubber mounting

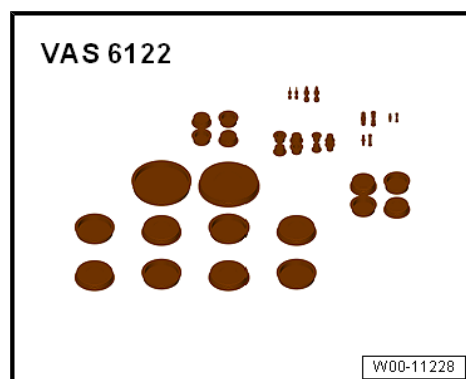
2.4 Removing and installing auxiliary/supplementary heater

Special tools and workshop equipment required

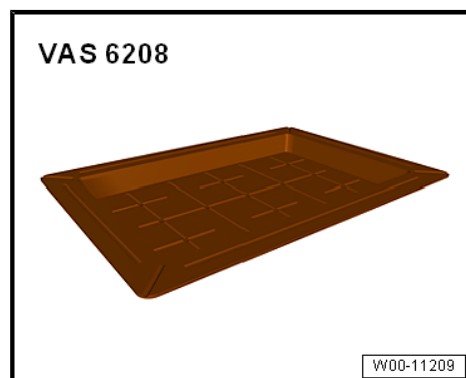
- ◆ Hose clamps to 25 mm - 3094-



- ◆ Engine bung set - VAS 6122-



- ◆ Drip tray for workshop hoist - VAS 6208-



- ◆ Vehicle diagnostic tester

Removing

- Connect ⇒ Vehicle diagnostic tester and start function "Renew heater" under "Guided Fault Finding" or "Guided Functions".
- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



- Remove left underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .
- Clamp off coolant hoses of auxiliary heater using hose clamps up to 25 mm - 3094- .
- Open hose clips of coolant hoses.
- Place drip tray for workshop hoist - VAS 6208- underneath.

⚠ CAUTION

On a warm engine, the cooling system is under high pressure.
Risk of scalding from steam or hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear safety goggles.
- To relieve pressure, cover the cap of the coolant expansion tank with a cloth, and open it carefully.

- Pull off coolant hoses from auxiliary heater.

⚠ CAUTION

The fuel system is pressurised.

Risk of injury caused by fuel spray.

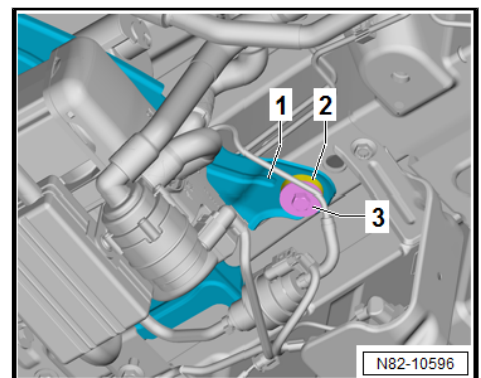
- Wear safety goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.

- Pull off fuel line from auxiliary heater to metering pump - V54- and seal with engine bung set - VAS 6122- .
- Secure auxiliary heater with welding wire to prevent it from falling down.
- Disconnect electrical connectors.
- Unscrew bolt -3- from bracket -1-.



Note

Observe the installation position of the rubber disc -2-.





- Lower auxiliary heater -1- with bracket -2- in direction of -arrow-.
- Pull out auxiliary heater -1- with bracket -2- from rubber mountings -3-.

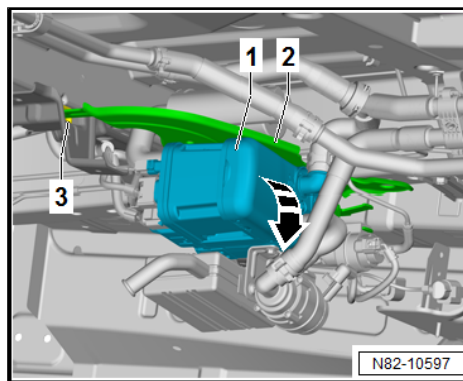
Installing

Install in reverse order of removal, observing the following:

- Bleed coolant circuit ⇒ Rep. gr. 19 ; Cooling system, coolant; Draining and filling coolant .

Torque settings

- ♦ ⇒ ["2.3 Assembly overview - auxiliary/supplementary heater attachments", page 13](#)



2.5 Removing and installing air intake silencer

Removing

- Remove left underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .
- Unscrew bolts -3-.
- Lower auxiliary heater -2- in direction of -arrow A-.



Note

The lines and coolant hoses remain connected.

- Release spreader clip of air intake silencer -1- in direction of -arrow B-.
- Pull off air intake silencer from auxiliary heater -2-.

Installing

Install in reverse order of removal, observing the following:

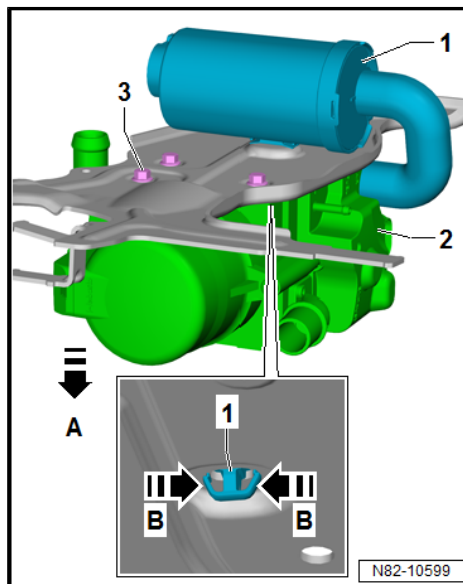


Note

- ♦ *The air intake silencer must not touch the auxiliary/supplementary heater housing.*
- ♦ *Do not kink or crush aluminium pipe.*

Torque settings

- ♦ ⇒ ["2.3 Assembly overview - auxiliary/supplementary heater attachments", page 13](#)

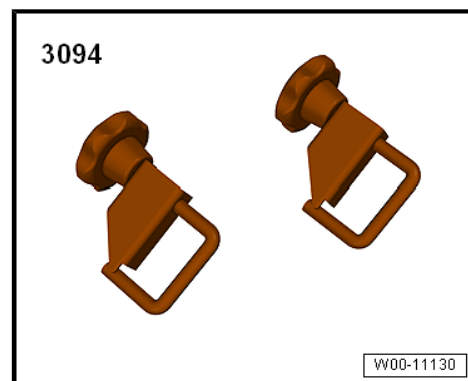


2.6 Removing and installing circulation pump - V55-

Special tools and workshop equipment required



- ◆ Hose clamps to 25 mm - 3094-



- ◆ Drip tray for workshop hoist - VAS 6208-



Removing

- Remove left underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .



CAUTION

On a warm engine, the cooling system is under high pressure.
Risk of scalding from steam or hot coolant.

Skin and other parts of the body may be scalded.

- Wear protective gloves.
- Wear safety goggles.
- To relieve pressure, cover the cap of the coolant expansion tank with a cloth, and open it carefully.

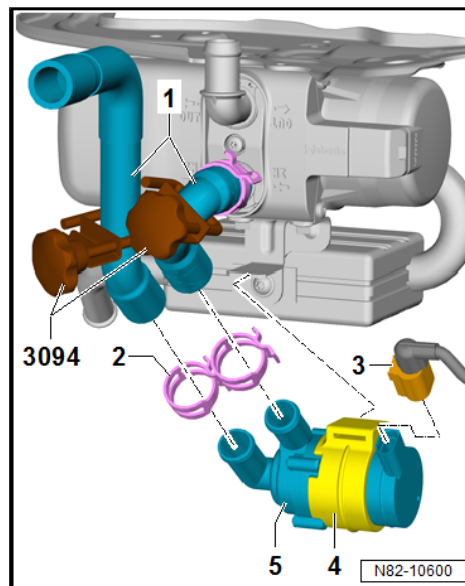


- Clamp off coolant hoses -1- on circulation pump - V55- -5- using hose clamps, up to 25 mm - 3094- .
- Disconnect electrical connector -3-.
- Loosen hose clips -2- and pull off coolant hoses.
- Pull coolant hoses -1- off circulation pump - V55- -5-.
- Pull off rubber mounting -4- with circulation pump - V55- -5- from bracket.

Installing

Install in reverse order of removal, observing the following:

- Bleed cooling system ⇒ Rep. gr. 19 ; Cooling system, coolant; Draining and filling with coolant .



2.7 Removing and installing exhaust system

Removing

- Remove left underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .

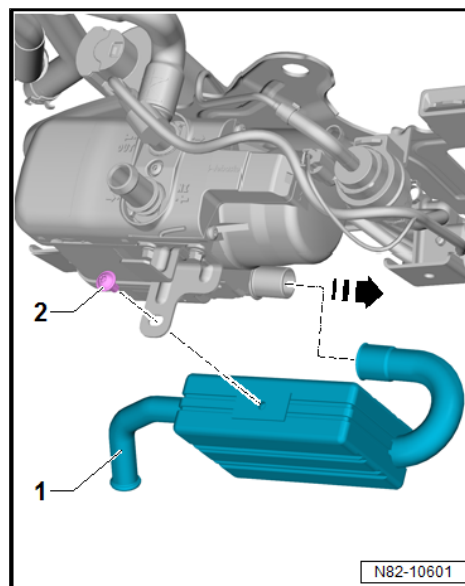
⚠ CAUTION

Danger of severe burns from hot exhaust system.
Risk of burns to hands and other parts of body.
- Allow exhaust system to cool down.

- Unscrew bolt -2-.
- Pull off exhaust system -1- from heat exchanger in direction of -arrow-.

Installing

Install in reverse order of removal, observing the following:



Risk of damage to lines

Lines may become damaged by moving or hot components.

- Route lines in their original positions.
- Ensure there is sufficient clearance to moving or hot components.



Torque settings

- ◆ ⇒ [“2.3 Assembly overview - auxiliary/supplementary heater attachments”, page 13](#)

2.8 Removing and installing cover

⇒ [“2.8.1 Removing and installing cover, auxiliary heater control unit J364”, page 19](#)

⇒ [“2.8.2 Removing and installing cover, burner unit”, page 19](#)

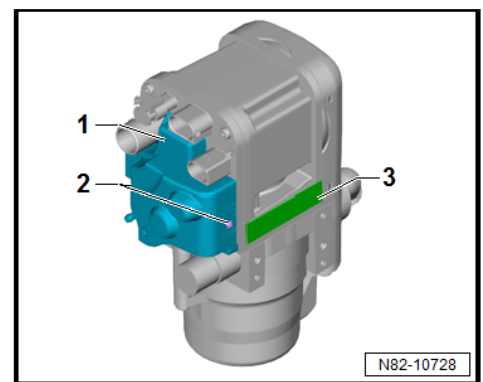
2.8.1 Removing and installing cover, auxiliary heater control unit - J364-

Removing

- Remove auxiliary heater ⇒ [page 14](#) .
- Unclip cover -1- in area -2-.
- Detach cover -1-.
- Detach cover -3-.

Installing

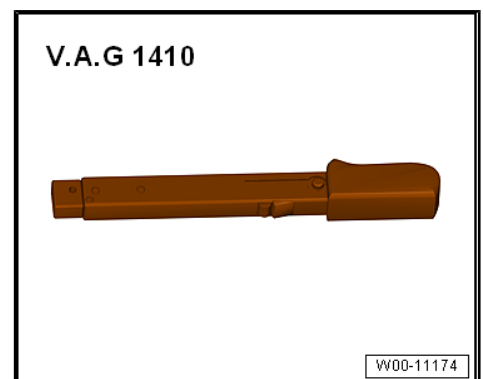
Install in reverse order of removal.



2.8.2 Removing and installing cover, burner unit

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-





Removing

- Remove auxiliary heater ⇒ [page 14](#) .
- Unscrew bolt -3-.
- Detach coolant connections together with bracket -4-.
- Unclip cover -1- in area -2-.
- Detach cover -1-.

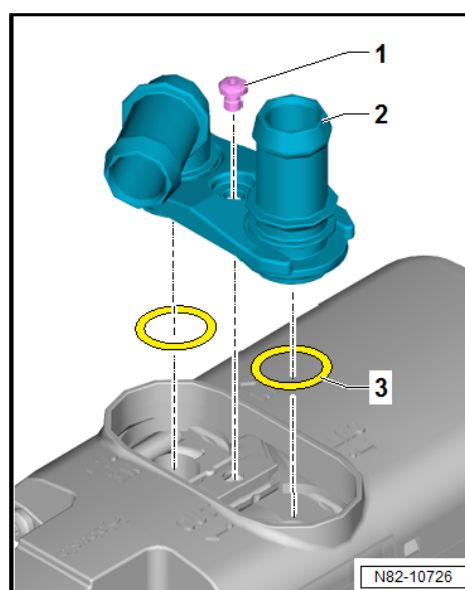
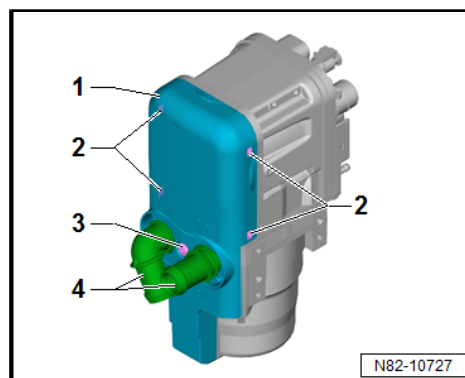
Installing

Install in reverse order of removal, observing the following:

- Check sealing surfaces for soiling and damage.
- Moisten oil seals with coolant before installing coolant connections.
- Renew oil seals -3-.
- Insert coolant connections together with bracket -2-.
- Tighten bolt -1-.

Torque settings

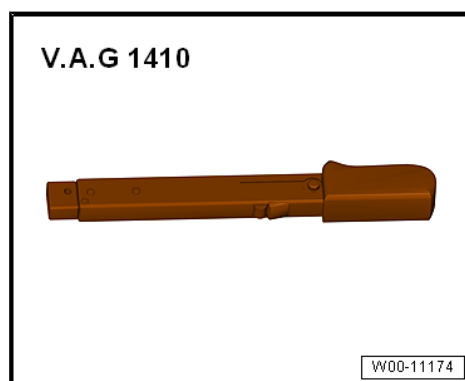
⇒ [“2.2 Assembly overview - auxiliary/supplementary heater, internal”, page 12](#)



2.9 Dismantling and assembling heater unit

Special tools and workshop equipment required

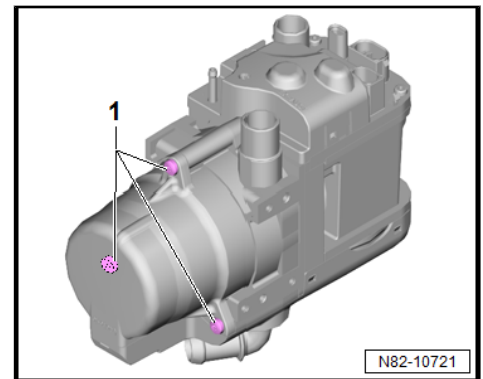
- ◆ Torque wrench - V.A.G 1410-





Dismantling

- Remove cover ⇒ [page 19](#) .
- Unscrew bolts -1-.
- Separate electrical connectors from temperature sensor - G18- and overheating sensor - G189- .
- Pull heat exchanger off blower housing.



- Remove seal -1-.
- Disconnect electrical connector -3-.
- Remove battery unit.

Installing

Assemble in the reverse order of dismantling, observing the following:



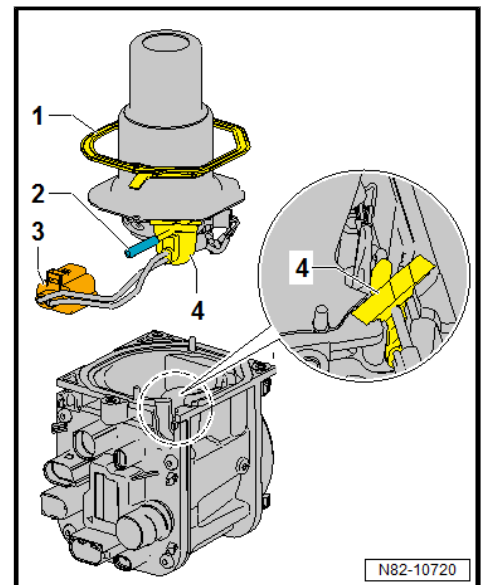
Note

Make sure that the gasket -1-, the grommet -4- and the fuel connection -2- are positioned correctly.

- Clean sealing surfaces.
- Renew seal -1-.

Torque settings

- ◆ ⇒ [“2.2 Assembly overview - auxiliary/supplementary heater, internal”, page 12](#)



2.10 Removing and installing glow plug with flame monitor - Q8-

Removing

- Dismantle heater unit ⇒ [page 20](#) .
- Pull out retaining spring -1- in direction of -arrow-.
- Remove retaining plate -2- in direction of -arrow-.
- Pull out glow plug with flame monitor - Q8- -3-.

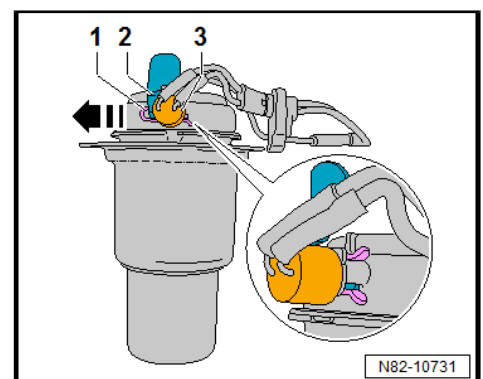
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Observe installation position of retaining spring -1- and retaining plate -2-.*
- ◆ *Curvature of retaining spring -1- faces up.*

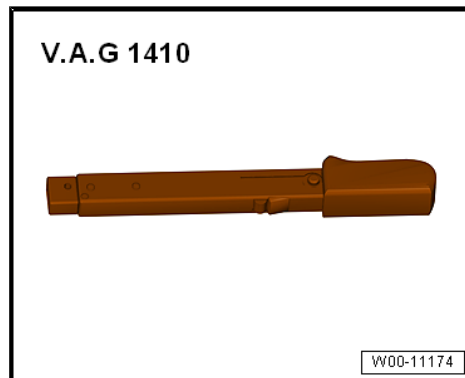




2.11 Removing and installing temperature sensor - G18- and overheating sensor - G189-

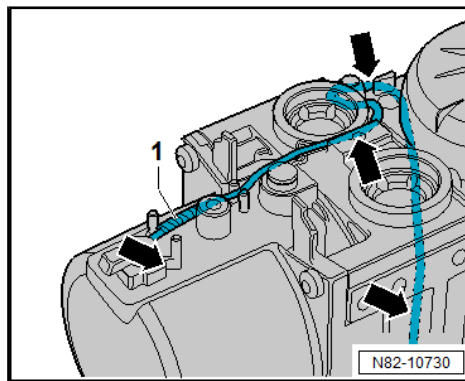
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



Removing

- Remove cover ➔ [page 19](#) .
- Unclip wiring harness -1- from retainers -arrows-.

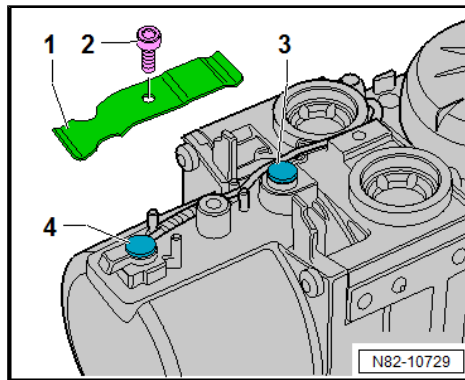


- Unscrew bolt -2-.
- Remove retaining spring -1-.
- Pull out temperature sensor - G18- -4- and overheating sensor - G189- -3- using long-nose pliers.

Installing

Install in reverse order of removal, observing the following:

- Coat seals from temperature sensor - G18- and overheating sensor - G189- with coolant for installation.



Note

- ◆ *When assembling, ensure proper position of retaining spring -1-.*
- ◆ *Sensors cannot be renewed individually.*

Torque settings

- ◆ ➔ [“2.2 Assembly overview - auxiliary/supplementary heater, internal”, page 12](#)



2.12 Removing and installing auxiliary heater control unit - J364-

The auxiliary heater control unit - J364- is an integral part of the combustion air blower - V6- and cannot be renewed individually
⇒ Electronic parts catalogue (ETKA) .

2.13 Removing and installing combustion air blower - V6-

Removing

Dismantling and assembling heater unit ⇒ [page 20](#) .

Installing

Install in reverse order of removal.

2.14 Connector pin assignment for auxiliary/supplementary heater

1 - 6-pin connector

- ❑ Information on pin assignment can be found in the latest current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

2 - 2-pin connector

- ❑ Information on pin assignment can be found in the latest current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

3 - 2-pin connector

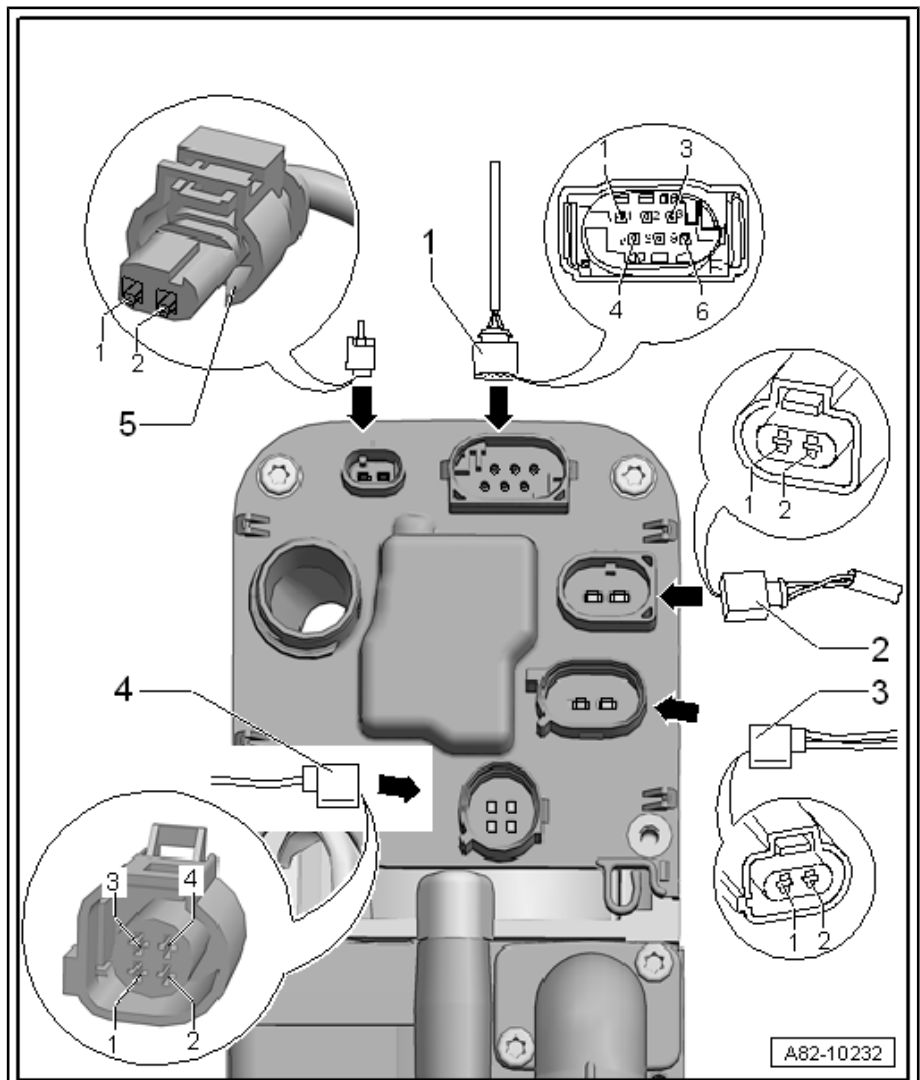
- ❑ Information on pin assignment can be found in the latest current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

4 - 4-pin connector

- ❑ Information on pin assignment can be found in the latest current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

5 - 2-pin connector

- ❑ Information on pin assignment can be found in the latest current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.





3 Coolant circuit with auxiliary/supplementary heater

⇒ "3.1 Connection diagram – coolant hoses", page 24

⇒ "3.2 Removing and installing heater coolant shut-off valve N279", page 25

3.1 Connection diagram – coolant hoses



Note

The -arrows- indicate the direction of coolant flow.

1 - Heat exchanger for heater in heater and air conditioning unit

- ❑ Incorporation in coolant circuit ⇒ Rep. gr. 19 ; Cooling system, coolant; Schematic diagram - coolant hoses

2 - Auxiliary/supplementary heater

- ❑ Removing and installing ⇒ page 14

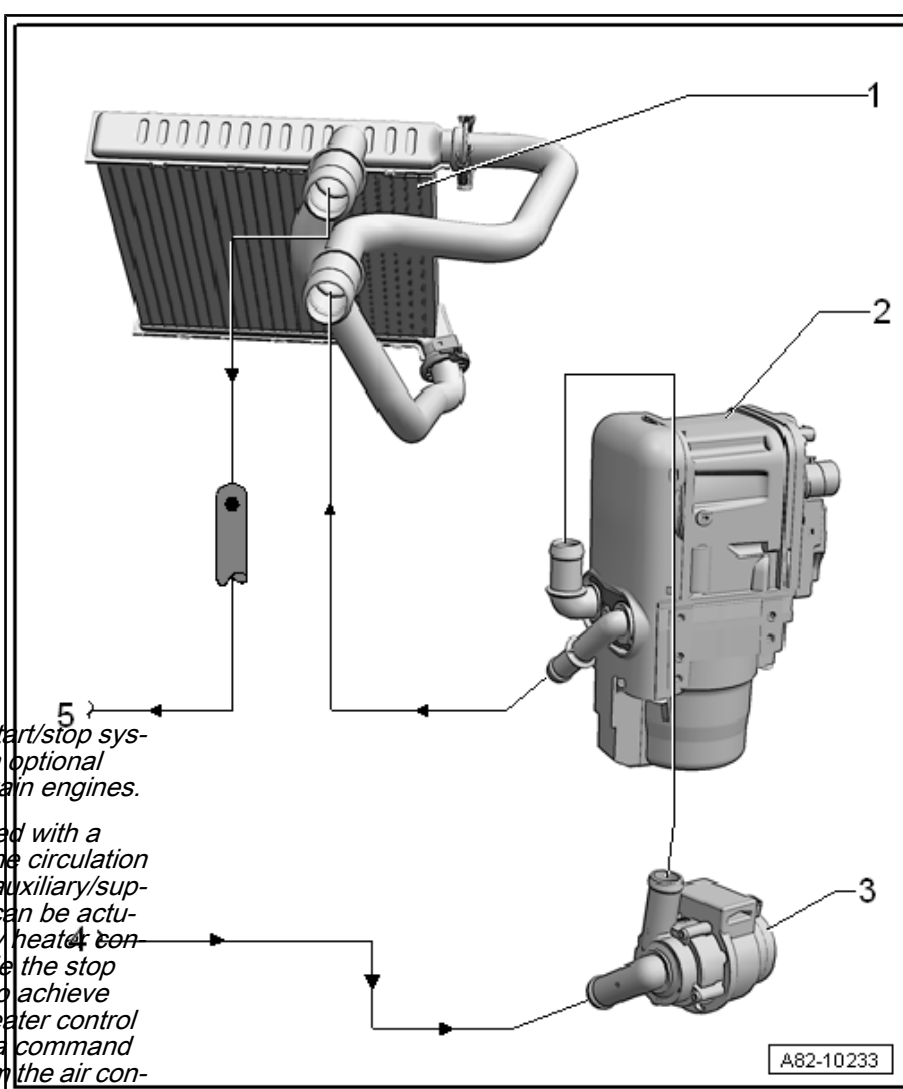
3 - Circulation pump - V55-

- ❑ The circulation pump - V55- is integrated in the hose assembly of the auxiliary/supplementary heater.
- ❑ Removing and installing ⇒ page 16



Note

- ◆ For this vehicle, a start/stop system is offered as an optional equipment with certain engines.
- ◆ On vehicles equipped with a start/stop system, the circulation pump - V55- of the auxiliary/supplementary heater can be actuated by the auxiliary heater control unit - J364- while the stop function is active. To achieve this, the auxiliary heater control unit - J364- is sent a command via the data bus from the air conditioning system operating unit, the Climatronic control unit - J255- and the air conditioning system control unit - J301- to switch on the circulation pump - V55- (⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode).





4 - Coolant supply from engine

- ❑ Connection of auxiliary heater to engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system, coolant; Connection diagram - coolant hoses .

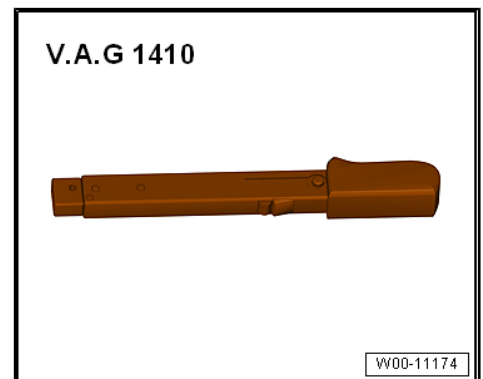
5 - Coolant return to the engine

- ❑ Connection of auxiliary heater to engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system, coolant; Connection diagram - coolant hoses .

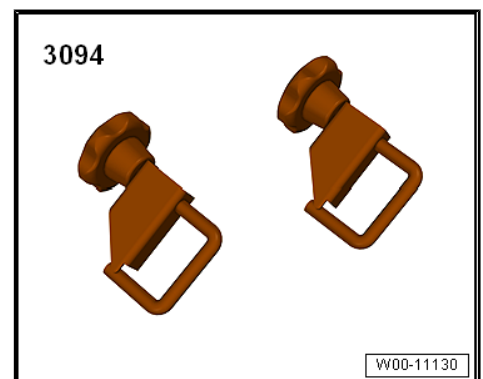
3.2 Removing and installing heater coolant shut-off valve - N279-

Special tools and workshop equipment required

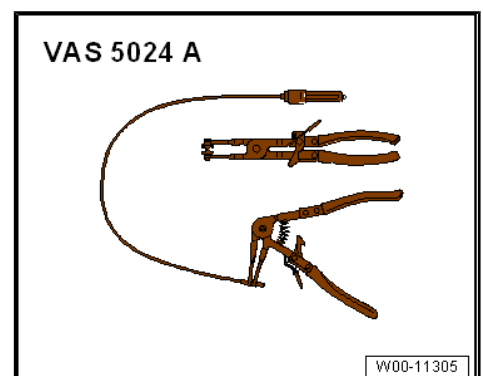
- ◆ Torque wrench - V.A.G 1410-



- ◆ Hose clamps to 25 mm - 3094-

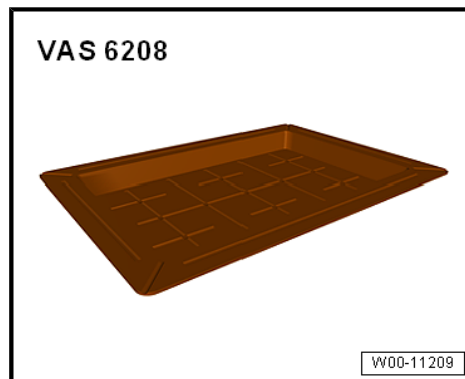


- ◆ Spring-type clip pliers - VAS 5024A- or hose clip pliers - VAS 6340-





- ◆ Drip tray for workshop hoist - VAS 6208-



Removing



Note

If the vehicle is fitted with an emission control module, the heater coolant shut-off valve - N279- can be actuated by two different relays. See the current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Vehicles with 4-cyl. common rail, 150 kW and 146 kW

- Release solenoid valve holder ⇒ Rep. gr. 21 ; charge air system , and lay it aside.

All vehicles

- Clamp off coolant hoses -3- using hose clamps, up to 25 mm - 3094- .
- Release spring-type clips -4- with spring-type clip pliers - VAS 5024A- or hose clip pliers - VAS 6340- .

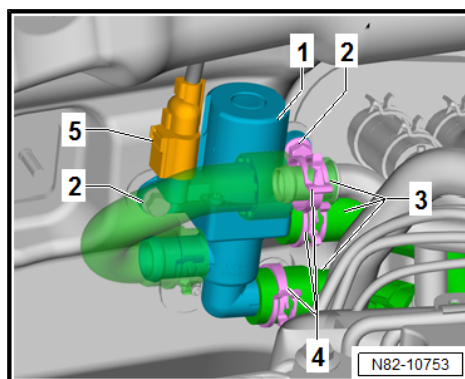


CAUTION

Risk of scalding from steam or hot coolant.

Skin and other parts of the body may be scalded.

- Release pressure by pressing pressure relief valve on cooling system tester until the gauge shows a pressure of 0.



- Place drip tray for workshop hoist - VAS 6208- underneath.
- Mark coolant hoses -3-.
- Pull off coolant hoses -3- from heater coolant shut-off valve - N279- -1-.
- Disconnect electrical connector -5-.
- Unscrew bolts -2-.
- Remove heater coolant shut-off valve - N279- -1-.

Installing

Install in reverse order of removal, observing the following:



Note

Ensure proper seating of cooling system hoses.

Torque settings



Component	Specified torque
Bolt of heater coolant shut-off valve - N279-	9 Nm



4 Fuel supply

⇒ ["4.1 Checking fuel delivery rate", page 28](#)

⇒ ["4.2 Removing and installing metering pump V54 ", page 29](#)

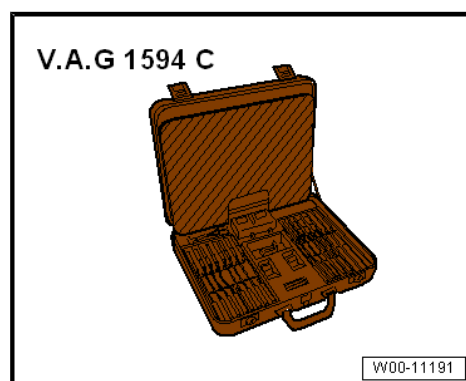
4.1 Checking fuel delivery rate

Special tools and workshop equipment required

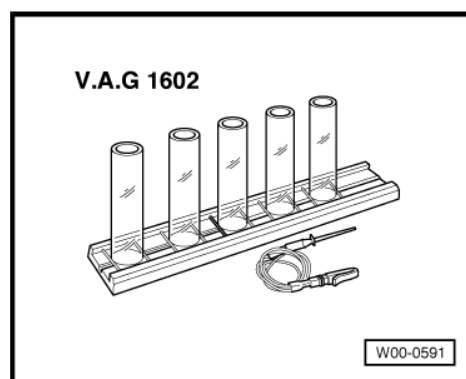
- ◆ Hand-held multimeter - V.A.G 1526E-



- ◆ Auxiliary measuring set - V.A.G 1594D-



- ◆ Measuring beaker - V.A.G 1602/1- from injection rate tester - V.A.G 1602-



- ◆ Vehicle diagnostic tester

Test requirements

- Resistance of metering pump - V54- = approx. 5 Ω – 5.4 Ω
- Battery voltage: at least 12.5 V
- No fault stored in event memory
- Fuel lines are not damaged or leaking
- Ambient temperature approx. 20°C



- Fuel tank sufficiently filled (fuel gauge on dash panel insert not in red area).

Check

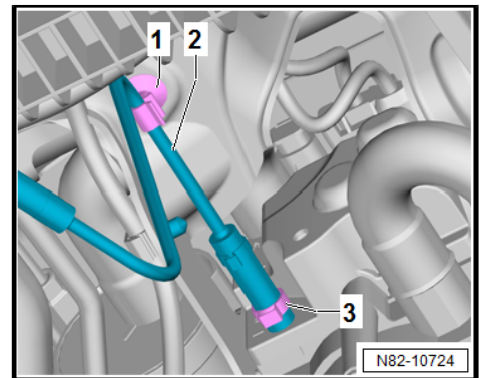
! CAUTION

The fuel system is pressurised.

Risk of injury caused by fuel spray.

- Wear safety goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.

- Unclip fuel line -2- from retainer -1-.
- Unclip fuel line -2- from retainer -1-.
- Remove clamp -3-.
- Pull off fuel line -2-.
- Guide fuel line -1- into measuring beaker - V.A.G 1602/1- .
- Hold measuring beaker - V.A.G 1602/1- at same height as auxiliary heater.
- Using ⇒ Vehicle diagnostic tester, check fuel delivery rate of metering pump - V54- .
- Read quantity of diesel in measuring beaker - V.A.G 1602/1- .



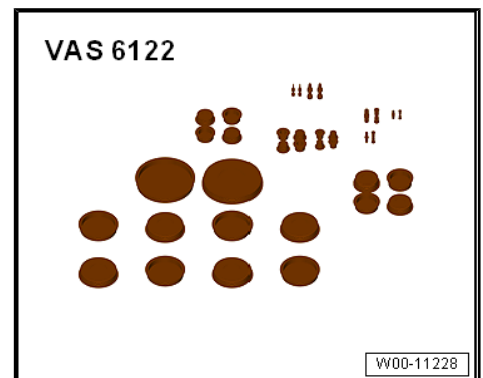
Min. quantity of fuel after 120 seconds, ml	Max. quantity of fuel after 120 seconds, ml
22	28

- If fuel delivery rates are not within specifications, renew metering pump - V54- ⇒ [page 29](#) .

4.2 Removing and installing metering pump - V54-

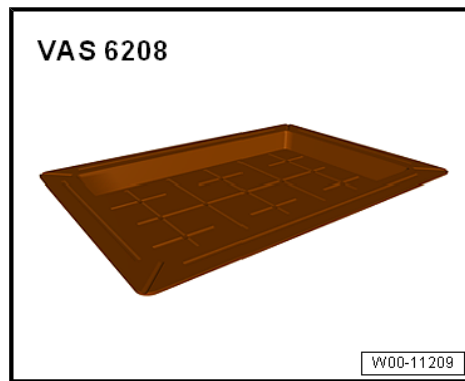
Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-





- ◆ Drip tray for workshop hoist - VAS 6208-



Removing

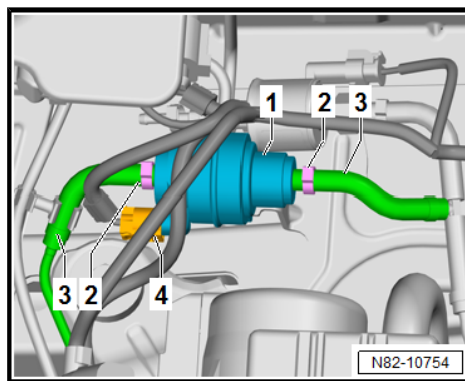
- Remove left underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .
- Disconnect electrical connector -4-.
- Loosen clamps -2-.

⚠ CAUTION

The fuel system is pressurised.

Risk of injury caused by fuel spray.

- Wear safety goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.



- Place drip tray - VAS 6208- beneath vehicle.
- Pull off fuel hoses -3-.
- Seal fuel hoses -3- with a bung from engine bung set - VAS 6122- .
- Remove metering pump - V54- -1- from bracket.

Installing

Install in reverse order of removal, observing the following:

- Replace O-type clips with screw-type clips.



5 Regulation of auxiliary/supplementary heater

Additional information:

- ◆ For a function description, see ⇒ Self-study programme No. 502 ; Supplementary heating systems Thermo Top V and Thermo Top Fleece - Design and function .



6 Other controlling and regulating components

⇒ ["6.1 Removing and installing ambient temperature sensor G17", page 32](#)

⇒ ["6.2 Removing and installing remote control receiver for auxiliary coolant heater R149", page 32](#)

6.1 Removing and installing ambient temperature sensor - G17-



Note

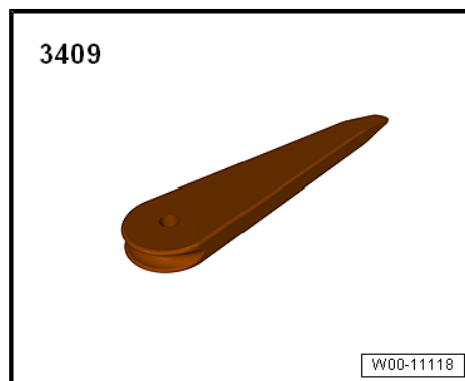
The ambient temperature sensor - G17- is used for determining the outside temperature and as a switch-on condition of the auxiliary/supplementary heater.

- Removing and installing ambient temperature sensor - G17-
⇒ Heating, air conditioning; Rep. gr. 87 ; Other control components .
- Check ambient temperature sensor - G17- ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode.

6.2 Removing and installing remote control receiver for auxiliary coolant heater - R149-

Special tools and workshop equipment required

- ♦ Removal wedge - 3409-



Note

If the remote control receiver for auxiliary coolant heater - R149- is renewed, the remote control receiver for auxiliary coolant heater - R149- must be adapted to the auxiliary heater using ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode.

Removing

- Remove cover in left footwell ⇒ General body repairs, interior; Rep. gr. 68 ; Interior equipment; Removing and installing footwell cover .

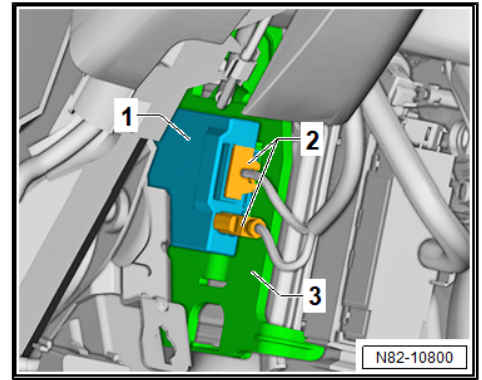


- Disconnect electrical connectors -2-.
- Release locking tab of bracket -3-.
- Remove remote control receiver for auxiliary coolant heater - R149- -1- from bracket.

Installing

- Connect connectors to remote control receiver for auxiliary coolant heater - R149- .
- Push remote control receiver for auxiliary coolant heater - R149- onto bracket, and engage it.

Continue installation in reverse order of removal.



Note

If the remote control receiver for auxiliary coolant heater - R149- is renewed, the remote control receiver for auxiliary coolant heater - R149- must be adapted to the auxiliary heater using ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode.

Specified torque

- ◆ Install cover in left footwell ⇒ General body repairs, interior; Rep. gr. 68 ; Interior equipment; Removing and installing footwell cover .



7 Auxiliary air heater

- ⇒ ["7.1 Assembly overview – auxiliary air heater", page 34](#)
- ⇒ ["7.2 Removing and installing auxiliary air heater", page 36](#)
- ⇒ ["7.3 Removing and installing air intake silencer", page 39](#)
- ⇒ ["7.4 Assembly overview - exhaust system", page 40](#)
- ⇒ ["7.5 Removing and installing exhaust system", page 40](#)
- ⇒ ["7.6 Removing and dismantling auxiliary air heater bracket", page 41](#)
- ⇒ ["7.7 Removing and installing auxiliary air heater control unit J604 ", page 42](#)
- ⇒ ["7.8 Removing and installing heater in housing", page 44](#)
- ⇒ ["7.9 Removing and installing burner unit", page 45](#)
- ⇒ ["7.10 Removing and installing glow plug for heater Q9 ", page 45](#)
- ⇒ ["7.11 Removing and installing flame monitor G64 and combination sensor", page 46](#)
- ⇒ ["7.12 Removing and installing combustion air blower 2 V385 ", page 47](#)
- ⇒ ["7.13 Removing and installing heat exchanger", page 48](#)
- ⇒ ["7.14 Removing and installing temperature sensor G18 ", page 50](#)

7.1 Assembly overview – auxiliary air heater



1 - Upper part of outer casing

- ☐ Made of plastic
- ☐ Removing and installing
⇒ [page 44](#)

2 - Flame monitor - G64- and overheating sensor - G189- (combination sensor)

- ☐ Overheating and flame monitor
- ☐ Supplied with installation tool
- ☐ Removing and installing
⇒ [page 46](#)

3 - Glow plug for heater - Q9-

- ☐ Supplied with special tool
- ☐ Removing and installing
⇒ [page 45](#)
- ☐ 6 Nm

4 - Front cover

- ☐ Made of plastic
- ☐ Removing and installing
⇒ [page 44](#)

5 - Glow pin lining

- ☐ Supplied with installation tool
- ☐ Vehicle-specific

6 - Heat exchanger

- ☐ Removing and installing
⇒ [page 48](#)

7 - Combustion chamber

- ☐ Removing and installing
⇒ [page 45](#)

8 - Lower part of outer casing

- ☐ Made of plastic
- ☐ Removing and installing ⇒ [page 44](#)

9 - Flange seal

- ☐ Renew if damaged

10 - Combustion air blower - V6- (combination blower)

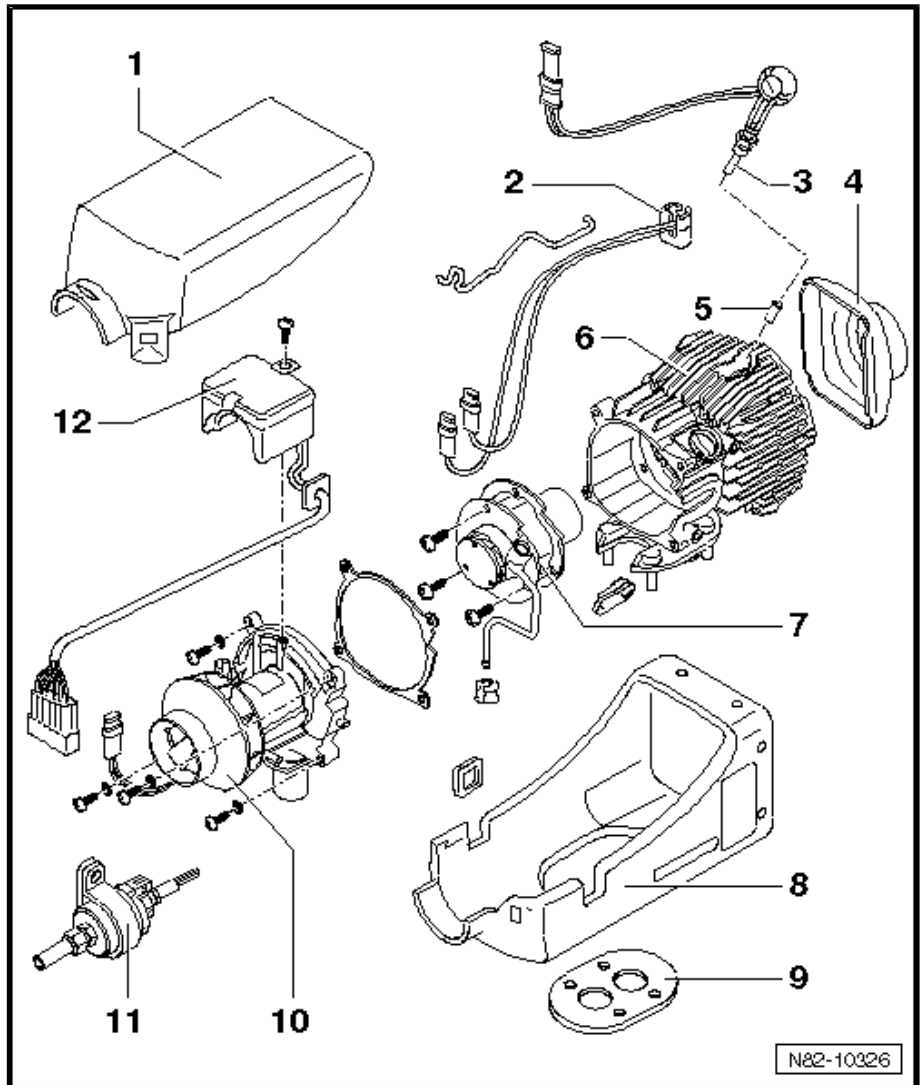
- ☐ Combustion and heating air blower in one
- ☐ Removing and installing ⇒ [page 47](#)

11 - Metering pump 2 - V386-

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

12 - Auxiliary air heater control unit - J604-

- ☐ Removing and installing ⇒ [page 42](#)





7.2 Removing and installing auxiliary air heater



Note

A type plate is fitted on the auxiliary air heater unit. This plate provides information about the type of auxiliary air heater installed in the vehicle ⇒ [page 38](#).



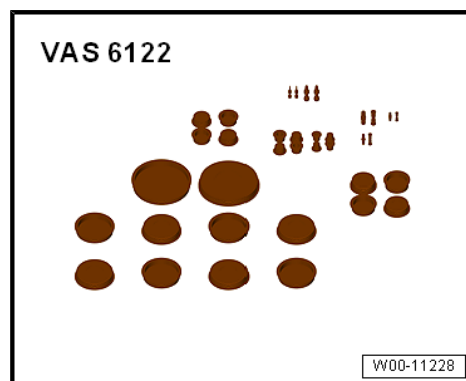
Note

The auxiliary air heater with bracket should only be removed if the bracket is damaged.

Removing without bracket ⇒ [page 38](#)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410A-
- ◆ Engine bung set - VAS 6122-



Removing

- Separate electrical 10-pin connector - T10ba- -1- from auxiliary air heater beneath front right seat.
- Remove right underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .
- If fitted, unbolt stone deflector strip.
- Guide wiring harnesses through opening in floor.

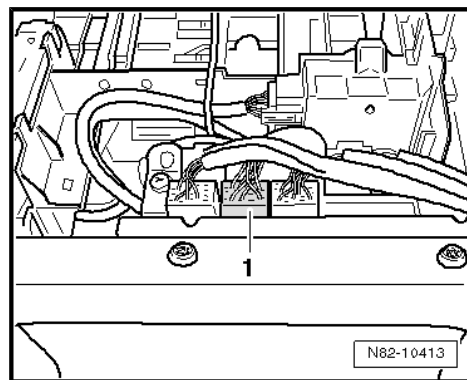


CAUTION

The fuel system is pressurised.

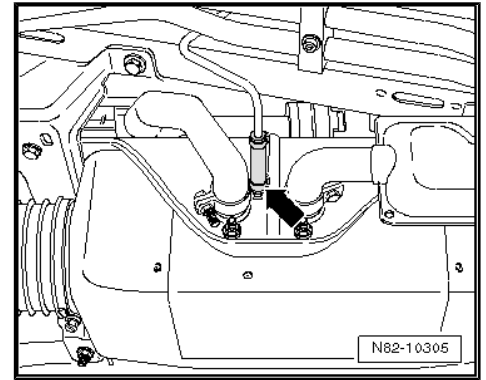
Risk of injury caused by fuel spray.

- Wear safety goggles.
 - Wear protective gloves.
 - To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.
-
- Separate fuel line -arrow- from auxiliary air heater.

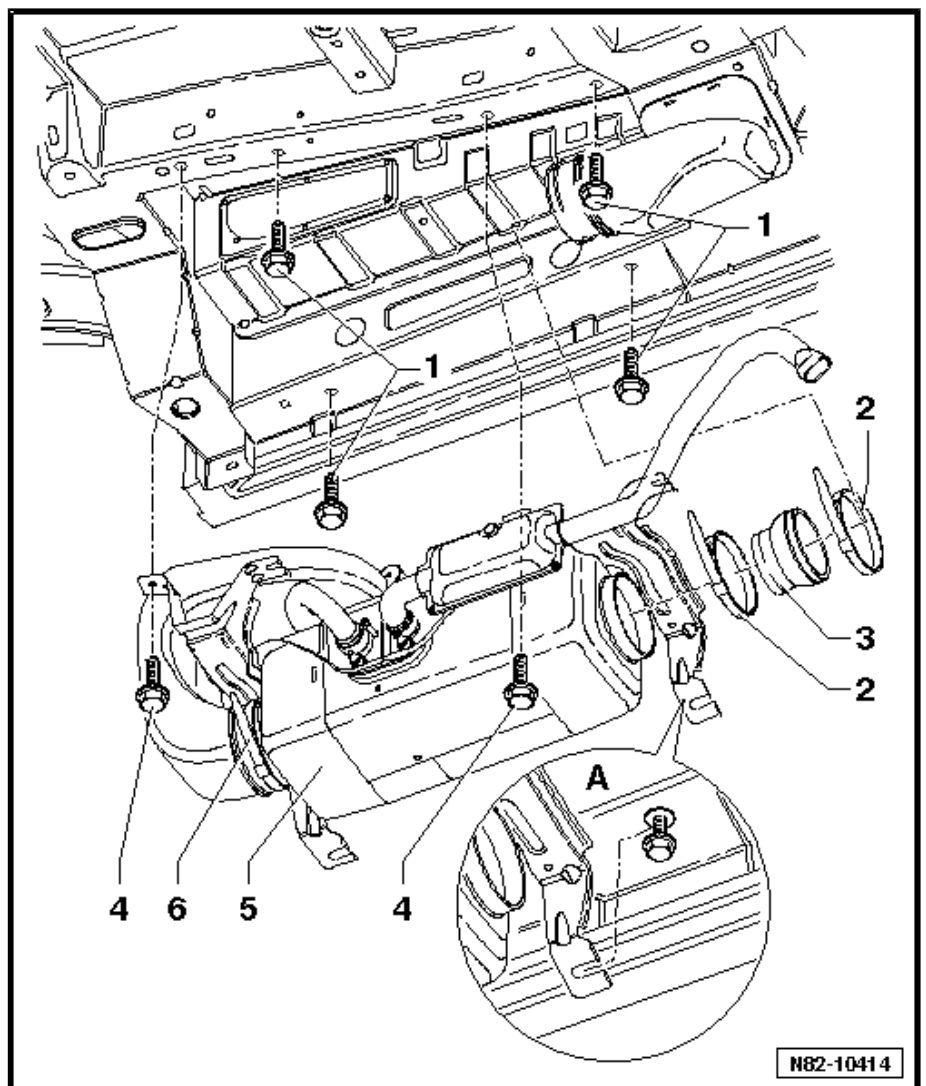




- Seal fuel line.



- Detach cable ties on connecting elements -2- and -6-.
- Loosen bolts -1-.



i Note

Do not remove bolts -1- completely.

- Unscrew bolts -4-.



- Remove auxiliary air heater -3- from guide -A-.

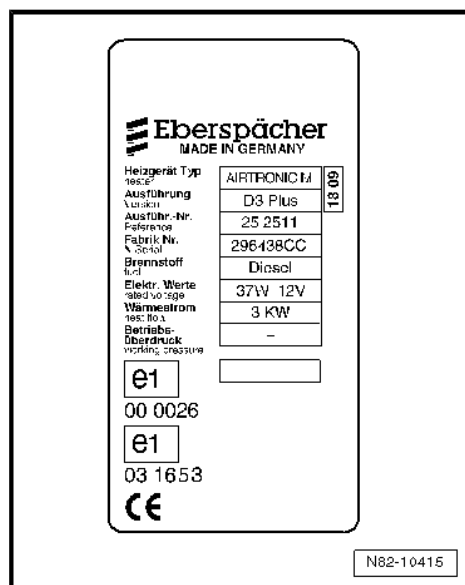
Type plate



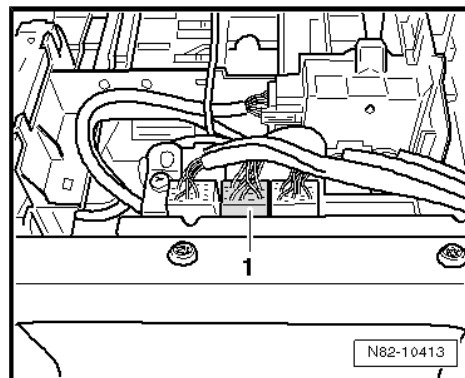
Note

- ♦ *Date of first use is entered on lower part of type plate.*
- ♦ *The heat exchanger can be used for 10 years but must be replaced once this date has elapsed.*

Removing without bracket



- Separate electrical 10-pin connector - T10ba- -1- from auxiliary air heater beneath front right seat.
- Remove right underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .
- Guide wiring harnesses through opening in floor.



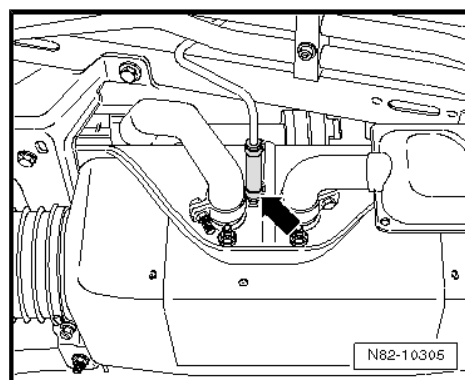
CAUTION

The fuel system is pressurised.

Risk of injury caused by fuel spray.

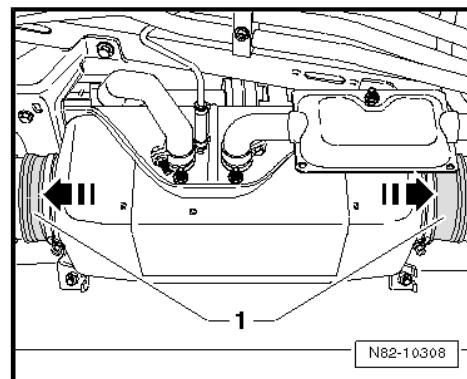
- Wear safety goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.

- Separate fuel line -arrow- from auxiliary air heater.
- Seal fuel line.
- Remove exhaust system ⇒ [page 40](#) .
- Loosen clamp for air intake silencer at auxiliary air heater.
- Detach cable ties at connecting elements -1- of air ducts.





- Push connecting elements in direction of -arrow-.



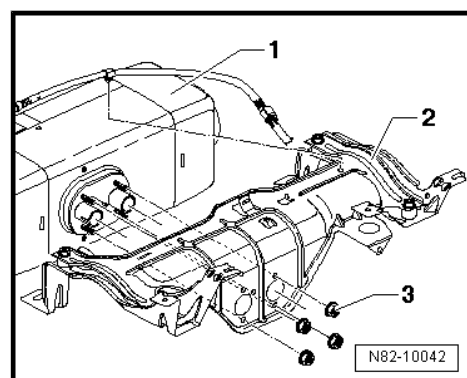
- Unscrew nuts -3-.
- Remove auxiliary air heater -1- from bracket -2-.

Installing

Install in reverse order of removal, observing the following:

Torque settings

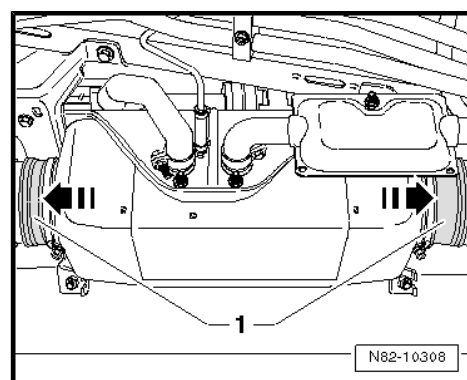
Component	Specified torque
Bolts for securing auxiliary heater to underbody	8 Nm
Collar nuts on auxiliary heater	8 Nm



7.3 Removing and installing air intake silencer

Removing

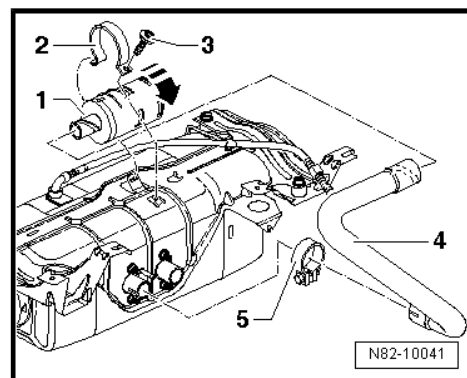
- If fitted, unbolt stone deflector strip.
- Detach clamps or cable ties at connecting elements of air ducts -1-.
- Push air ducts in direction of -arrow- off auxiliary air heater.
- Unscrew bolts from bracket of auxiliary air heater.
- Lower auxiliary air heater.
- Secure auxiliary air heater to body, e.g. with a welding wire.
- Unscrew bolt -3-.



- Remove clamp -2-.
- Unscrew air intake silencer -1- in direction of arrow.
- Loosen clamp -5-.
- Remove air intake silencer -4- from auxiliary air heater.

Installing

Install in reverse order of removal.





7.4 Assembly overview - exhaust system

1 - Bracket

- ❑ Removing ⇒ [page 41](#)

2 - Collar nut

- ❑ 8 Nm

3 - Exhaust system

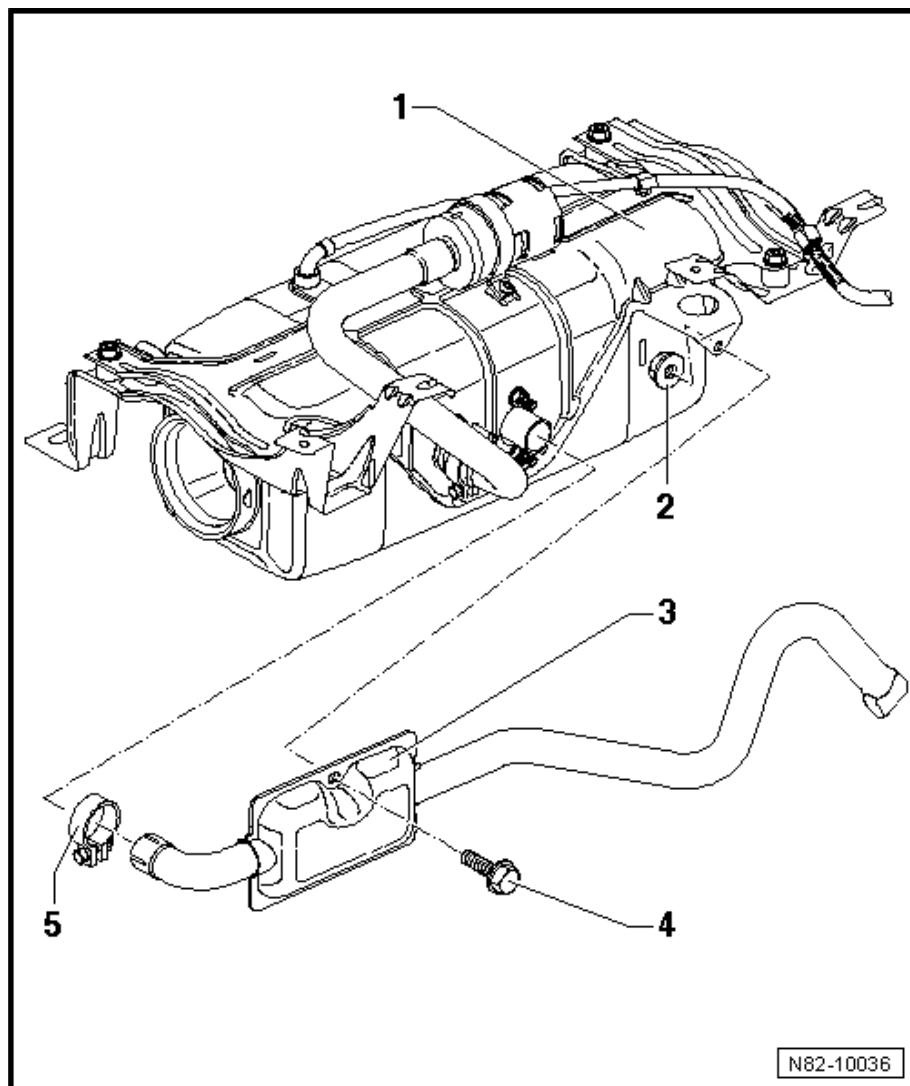
- ❑ Removing and installing
⇒ [page 40](#)

4 - Flange bolt

- ❑ 8 Nm

5 - Clip

- ❑ 6 Nm



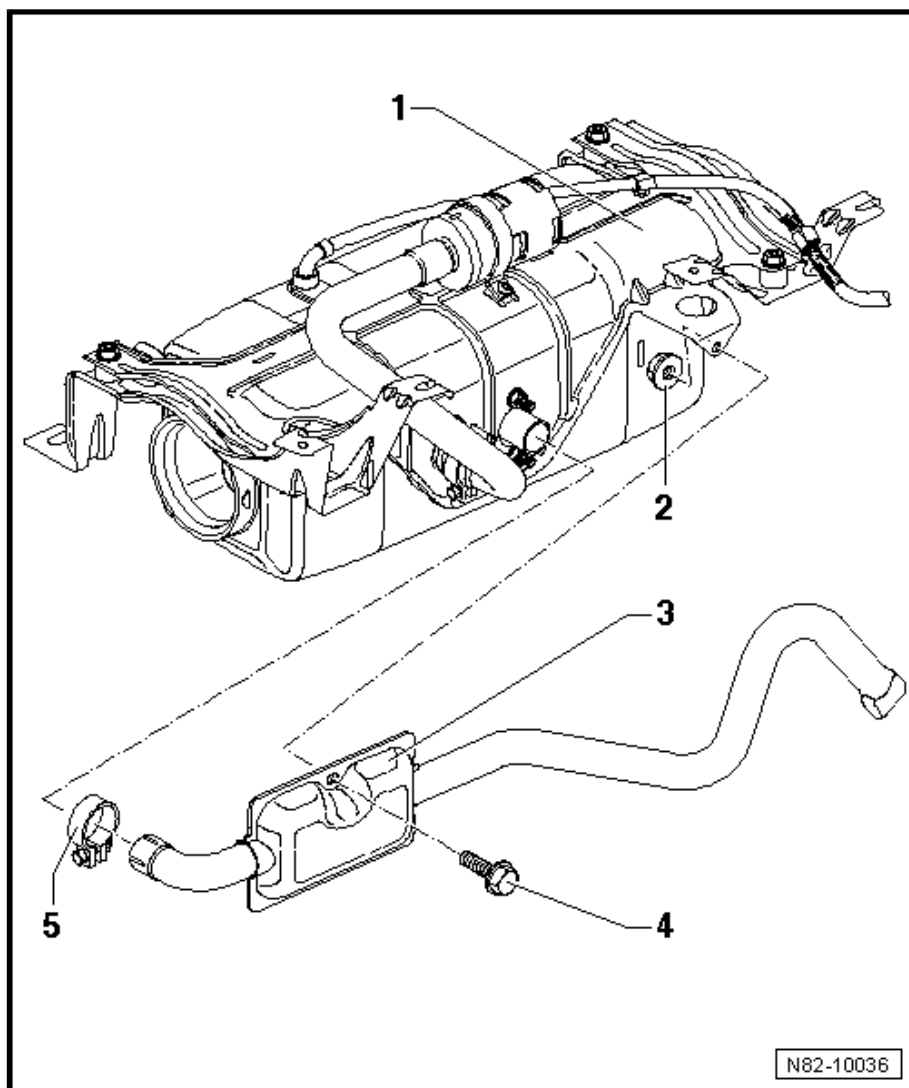
7.5 Removing and installing exhaust system

Removing

- Remove right underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .
- If fitted, unbolt stone deflector strip.

⚠ CAUTION

- Danger of severe burns from hot exhaust system.**
Risk of burns to hands and other parts of body.
- Allow exhaust system to cool down.



- Loosen clamp -5-.
- Unscrew bolt -4-.
- Detach exhaust system -3-.

Installing

Install in reverse order of removal, observing the following:

Torque settings

- ◆ ⇒ ["7.4 Assembly overview - exhaust system", page 40](#)

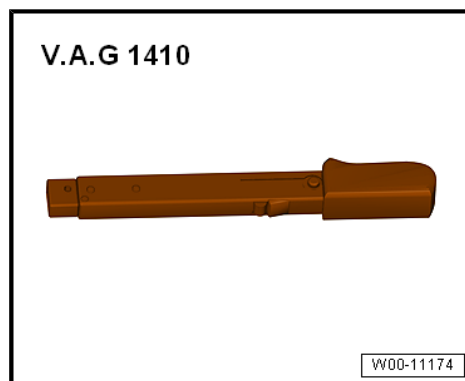
7.6 Removing and dismantling auxiliary air heater bracket

Remove for renewal only

Special tools and workshop equipment required



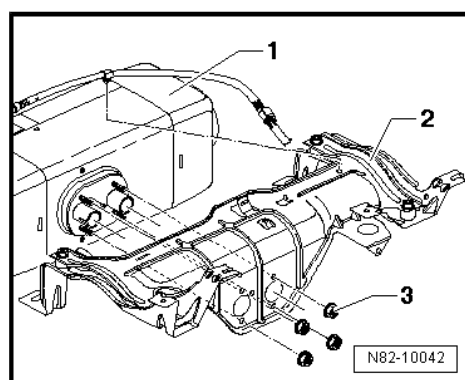
- ◆ Torque wrench - V.A.G 1410-



- Removing auxiliary air heater without bracket ⇒ [page 42](#) .
- If fitted, unbolt stone deflector strip.
- Unscrew nuts -3-.
- Remove bracket -2- from auxiliary air heater -1-.

Dismantling bracket

- Remove bracket from auxiliary air heater ⇒ [page 41](#) .



The complete bracket consists of 3 parts, each connected to a rubber buffer.

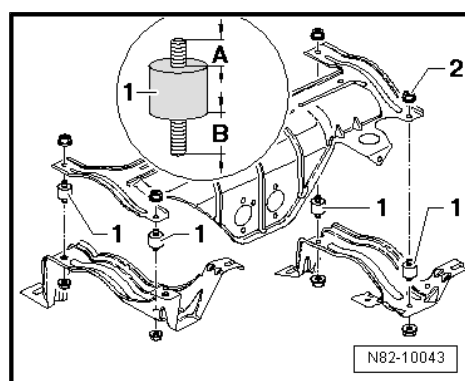
Rubber buffers -1- are secured by means of hexagon nuts -2-.

- ◆ Dimension -A- = 10 mm
- ◆ Dimension -B- = 16 mm



Note

During installation, dimension -A- must face upwards.



Torque settings

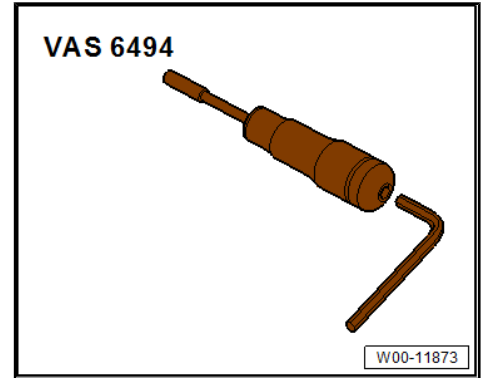
Component	Specified torque
Nuts securing rubber buffers	8 Nm
Nuts securing auxiliary heater	8 Nm

7.7 Removing and installing auxiliary air heater control unit - J604-

Special tools and workshop equipment required

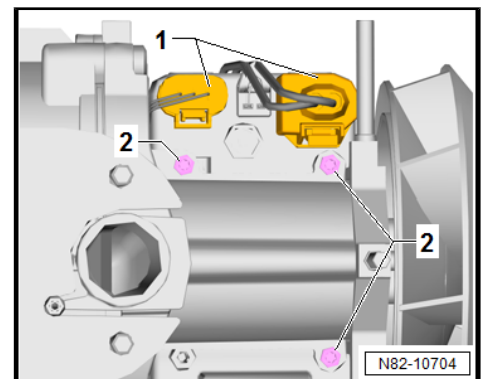


- ◆ Torque screwdriver - VAS 6494-



Removing

- If fitted, unbolt stone deflector strip.
- Remove heater unit from housing → [page 44](#) .
- Disconnect electrical connectors -1-.
- Move wiring harnesses aside.
- Unscrew bolts -2-.



- Detach auxiliary air heater control unit - J604- -1- upwards from heater unit -2-.

Installing

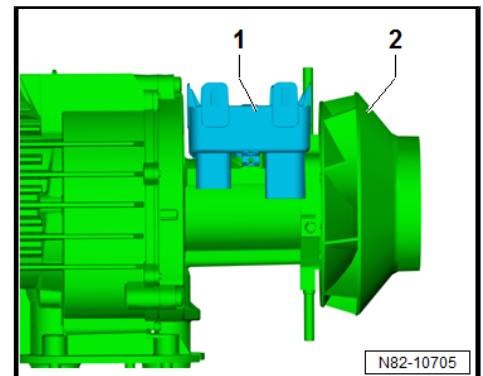
Install in reverse order of removal, observing the following:



Note

When installing, make sure that the 10-pin connection is located on the glow plug end.

- Screw in bolts -2- loosely.
- Tighten bolts -2- alternately in diagonal sequence to specified torque.



Specified torques

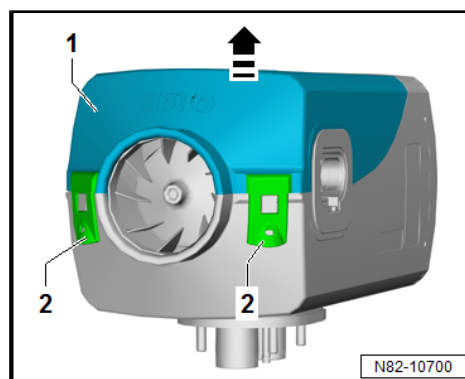
Component	Specified torque
Bolts -2-	1.5 Nm



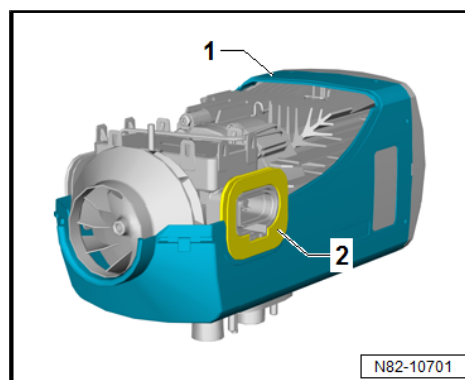
7.8 Removing and installing heater in housing

Removing

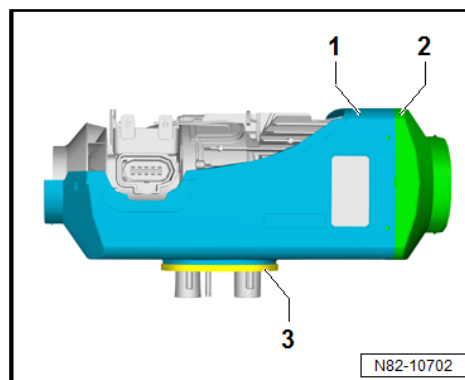
- Release locking tabs -2-.
- Swing cover -1- in direction of -arrow-, and detach it.



- Remove connector grommet -2- from lower casing -1-.



- Pull air outlet cowling -2- off lower casing -1-.
- Pull off flange seal -3-.



- Swing heater unit -2- in direction of -arrow- out of lower casing -1-, and remove it.

Installing

Install in reverse order of removal, observing the following:



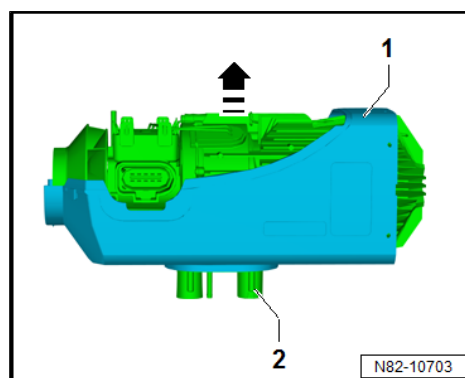
Note

If the lower casing is to be renewed, attach a new type plate, and transfer the data from the old type plate to the new one.

Installing

Install in reverse order of removal, observing the following:

- Before installing, check flange seal of heater unit for damage. Renew if necessary.





7.9 Removing and installing burner unit

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410A-

Removing

- Remove combustion air blower 2 - V385- ⇒ [page 47](#) .
- Unscrew bolts -2-.



Note

Combustion chamber -1- is removed along with glow plug for heater - Q9- and fuel pipe.

- Pull out combustion chamber -1-.

Installing

Install in reverse order of removal, observing the following:

- Renew seal between combustion chamber -1- and heat exchanger.



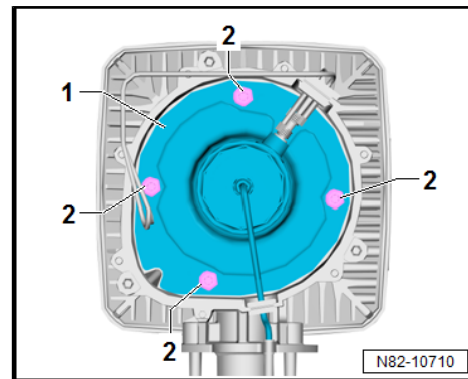
Note

When reassembling, use the rubber grommets for the wiring harness of the glow plug for heater - Q9- and fuel pipe as a guide.

- Insert combustion chamber -1-.
- Screw in bolts -2- loosely.
- Tighten bolts -2- alternately in diagonal sequence to specified torque.

Specified torques

Component	Specified torque
Bolts -2-	6.5 Nm



7.10 Removing and installing glow plug for heater - Q9-



Note

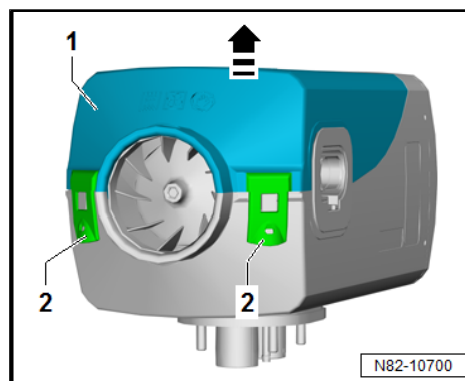
- ◆ *Glow plug with flame monitor - Q9- is activated immediately after activation and switched off again about 1 minute after a flame has been detected.*
- ◆ *The maximum glow period for the auxiliary air heater is 150 seconds.*
- ◆ *When heater unit is switched off, glow plug with flame monitor - Q9- is switched back on again during the 4 minute run-on time to burn off all fuel.*
- ◆ *It is essential to check the mantle for carbonised deposits and damage if glow plug with flame monitor - Q9- is renewed.*

Removing

- Remove auxiliary air heater ⇒ [page 36](#) .



- Release locking tabs -1-.
- Swing cover -2- in direction of -arrow-, and detach it.



- Pull grommet -3- out of lower casing -1-.
- Disconnect electrical connector -2-.
- Lever out grommet -4- with a screwdriver.
- Remove glow plug for heater - Q9- .

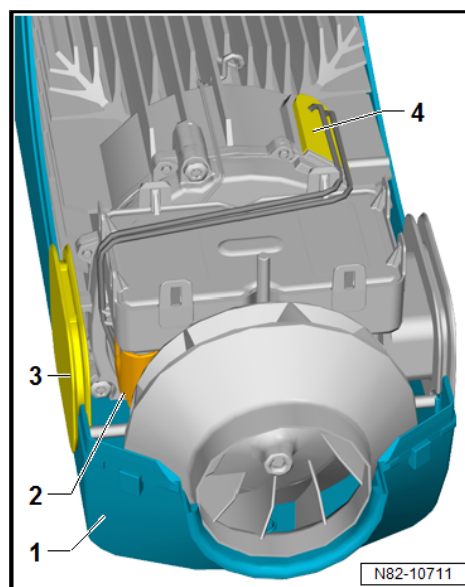
Installing

Install in reverse order of removal, observing the following:



Note

Make sure that the locking element of the electrical connector for the glow plug for heater - Q9- points towards the combustion air blower 2 - V385- .



7.11 Removing and installing flame monitor - G64- and combination sensor

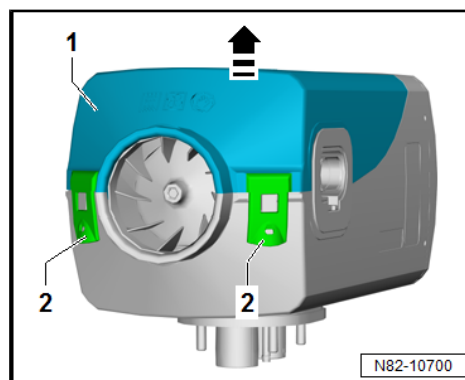


Note

The combination sensor comprises the flame monitor - G64- and overheating sensor - G189- in one component.

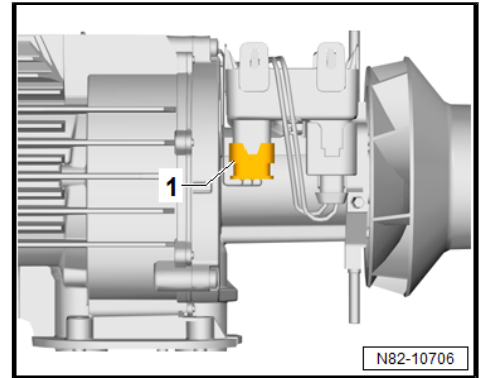
Removing

- Remove auxiliary air heater ➔ [page 36](#) .
- Release locking tabs -2-.
- Swing cover -1- in direction of -arrow-, and detach it.





- Disconnect electrical connector -1-.

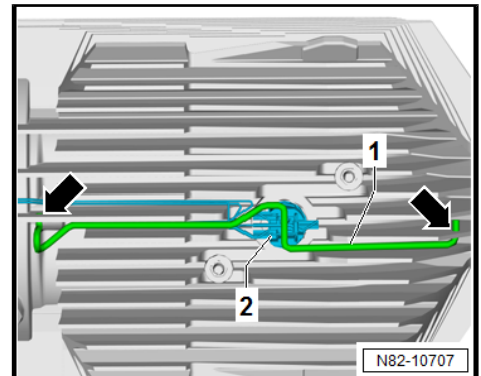


- Release retaining clip -1- in area marked by -arrows-, and remove it.
- Pull combination sensor -2- out of heater unit.

Installing

Install in reverse order of removal, observing the following:

- Rout wiring harness through nearest cooling fin.



Note

Make sure not to damage the wiring harness when inserting the retaining clip.

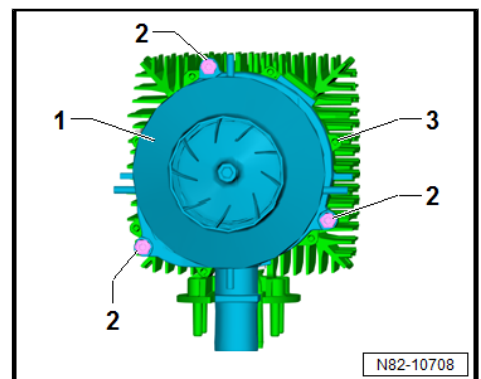
7.12 Removing and installing combustion air blower 2 - V385-

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410A-

Removing

- Remove auxiliary air heater control unit - J604- → [page 42](#) .
- Unscrew bolts -2-.
- Detach combustion air blower 2 - V385- -1- from heat exchanger -3-.





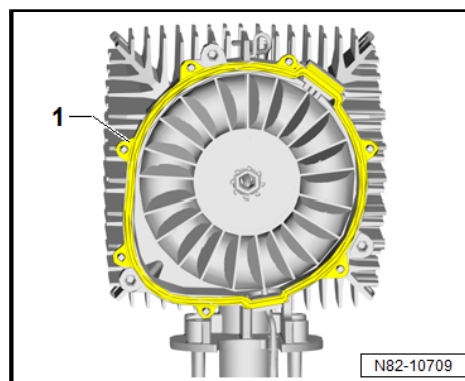
Installing

Install in reverse order of removal, observing the following:

- Renew seal -1-.

Specified torques

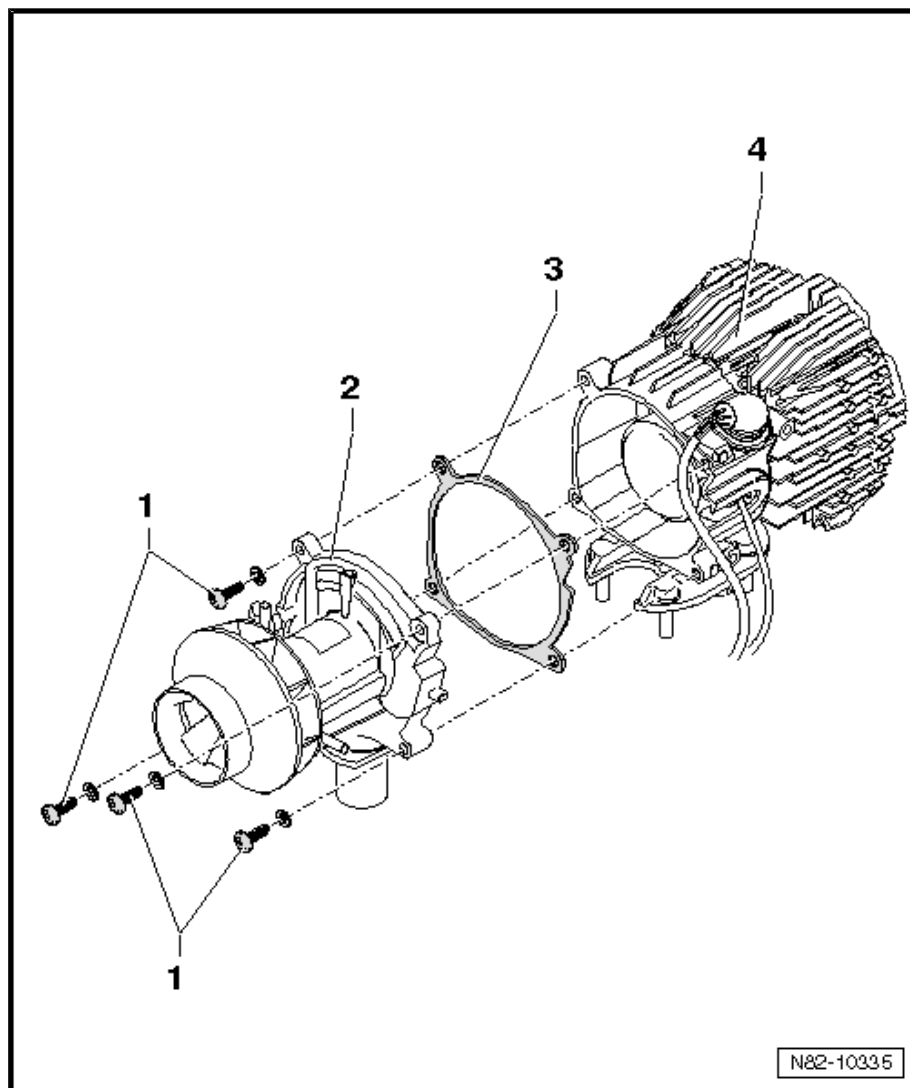
Component	Specified torque
Bolts -2-	6.5 Nm



7.13 Removing and installing heat exchanger

Removing

- Removing auxiliary air heater without bracket ⇒ [page 36](#) .
- Remove auxiliary air heater from plastic housing ⇒ [page 44](#) .
- Remove auxiliary air heater control unit - J604- ⇒ [page 42](#) .



- Unscrew bolts -1- from combustion air blower - V6- -2-.



- Remove heat exchanger -4- with seal -3- from combustion air blower - V6- -2-.

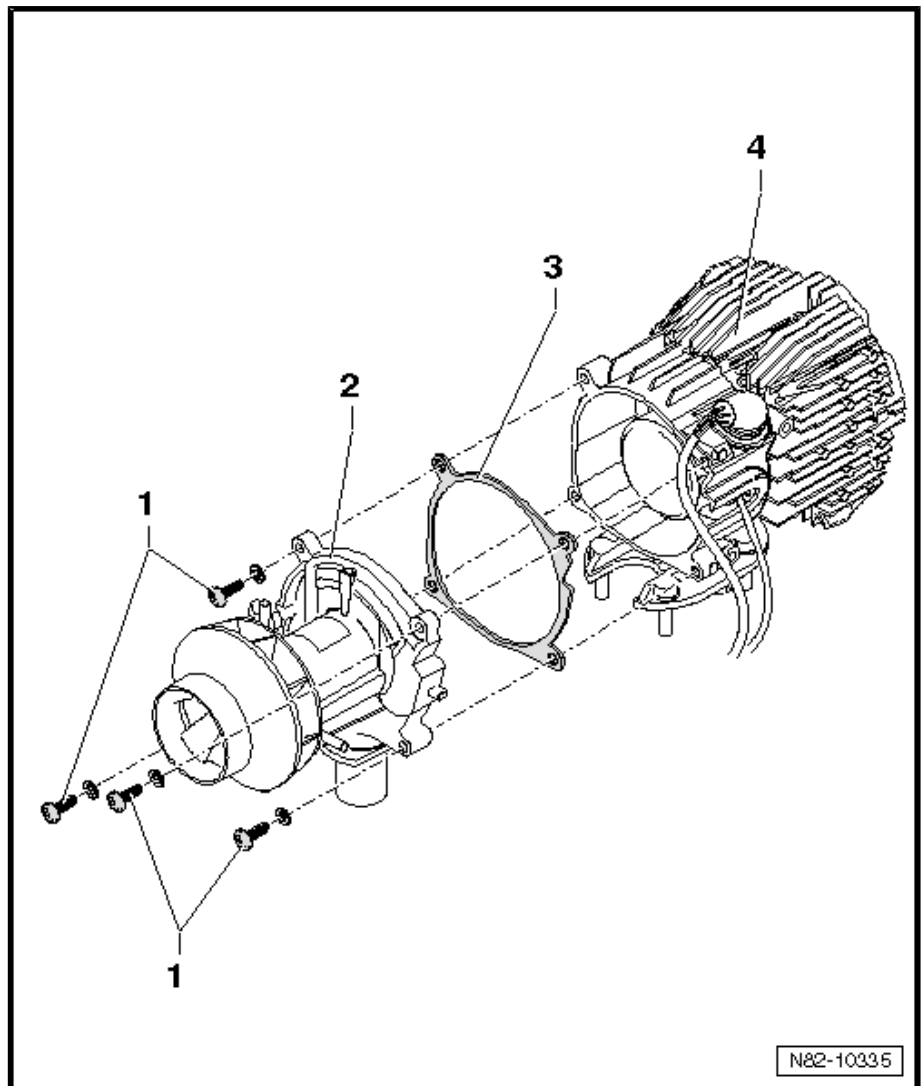
Installing

Install in reverse order of removal, observing the following:



Note

- ◆ *Note that seal -3- must be renewed when heat exchanger -4- is installed.*
- ◆ *If heat exchanger is renewed, flame monitor - G64- and overheating sensor - G189- (combination sensor) must be transferred.*



- Fit heat exchanger -4- with new seal -3- on combustion air blower - V6- -2-.
- Tighten bolts -1- in diagonal sequence
- Perform a functional check after completing all work on the heater unit.



Torque settings

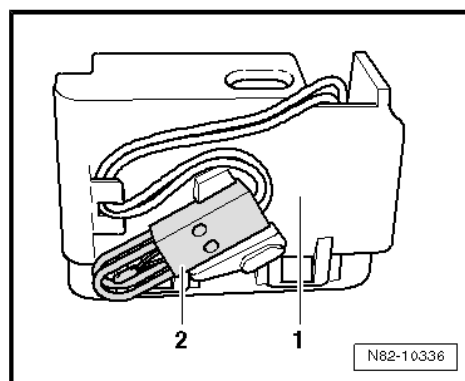
Component	Specified torque
Bolts -1- on combustion chamber	4 Nm

7.14 Removing and installing temperature sensor - G18-



Note

Temperature sender - G18- is permanently installed on auxiliary air heater control unit - J604- -1- and cannot be renewed individually.





8 Fuel supply to auxiliary air heater

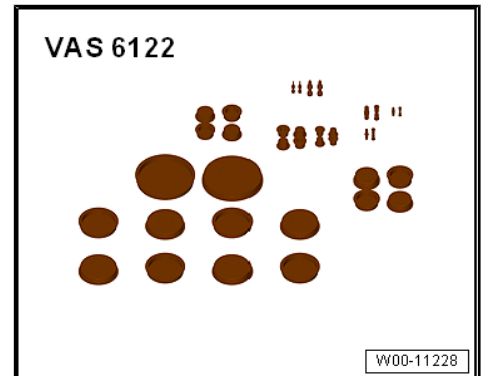
⇒ ["8.1 Removing and installing metering pump 2 V386", page 51](#)

⇒ ["8.2 Checking fuel delivery rate", page 52](#)

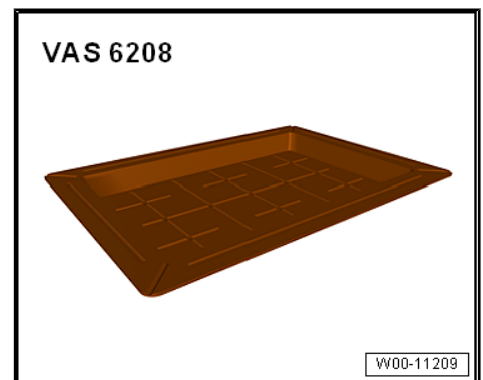
8.1 Removing and installing metering pump 2 - V386-

Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-



- ◆ Drip tray for workshop hoist - VAS 6208-





Removing

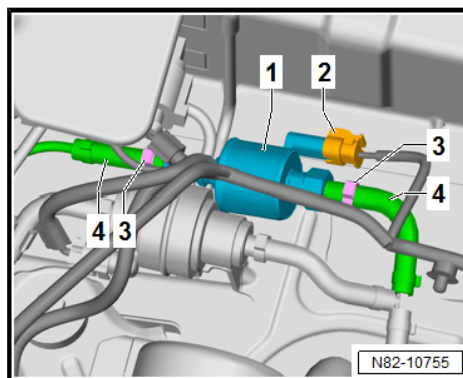
- Remove left underbody cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview - underbody cladding .
- Disconnect electrical connector -2-.
- Loosen clamps -3-.

CAUTION

The fuel system is pressurised.

Risk of injury caused by fuel spray.

- Wear safety goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.



- Place drip tray - VAS 6208- beneath vehicle.
- Pull off fuel hoses -4-.
- Seal fuel hoses -4- with a bung from engine bung set - VAS 6122- .
- Remove metering pump 2 - V386- -1- from bracket.

Installing

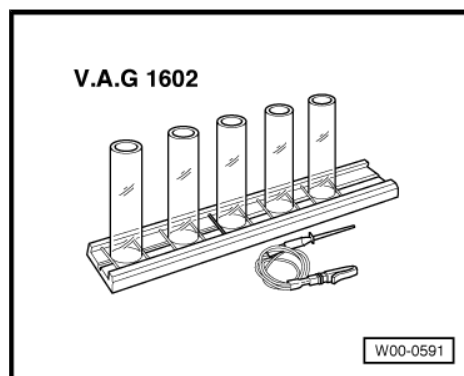
Install in reverse order of removal, observing the following:

- Replace O-type clips with screw-type clips.

8.2 Checking fuel delivery rate

Special tools and workshop equipment required

- ♦ Fuel hose, length approx. 200 mm
- ♦ Measuring beaker - V.A.G 1602/1- from injection rate tester - V.A.G 1602-



- ♦ Vehicle diagnostic tester

Test requirements

- Resistance of metering pump 2 - V386- = approx. 10 Ω - 10.5 Ω
- Battery voltage: at least 12.5 V
- No fault stored in event memory
- Fuel lines are not damaged or leaking
- Ambient temperature approx. 20°C
- Fuel tank sufficiently filled (fuel gauge on dash panel insert not in red area)



Sequence of operations

CAUTION

The fuel system is pressurised.

Risk of injury caused by fuel spray.

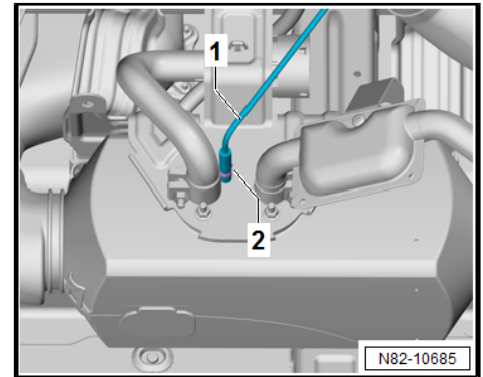
- Wear safety goggles.
- Wear protective gloves.
- To release pressure, wrap a clean cloth around the connection, and carefully loosen the connection.

- Remove clamp -2-.
- Pull off fuel line -1-.
- Guide fuel line -1- into measuring beaker - V.A.G 1602/1- .
- Hold measuring beaker - V.A.G 1602/1- at same height as auxiliary air heater.
- Using ⇒ Vehicle diagnostic tester, check fuel delivery rate of metering pump 2 - V386- .

Note

If the fuel is delivered evenly (beginning approx. 60 seconds after engine has been started), the fuel line is properly filled and vented.

- Empty fuel from measuring beaker - V.A.G 1602/1- .
- Guide fuel line -1- into measuring beaker - V.A.G 1602/1- .
- Hold measuring beaker - V.A.G 1602/1- at height of glow plug for heater - Q9- .
- Using ⇒ Vehicle diagnostic tester, check fuel delivery rate of metering pump 2 - V386- .
- Read quantity of fuel in measuring beaker - V.A.G 1602/1- .



Min. quantity of fuel after 90 seconds, ml	Max. quantity of fuel after 90 seconds, ml
18	22

- If fuel delivery rates are not within specifications, renew metering pump 2 - V386- ⇒ [page 51](#) .



9 Regulation of auxiliary air heater

⇒ "9.1 Principle of auxiliary air heater operation", page 54

⇒ "9.2 Function of auxiliary air heater operating and display unit E407 or roof display unit J702", page 56

⇒ "9.3 Removing and installing auxiliary air heater operating and display unit E407 or roof display unit J702", page 57

9.1 Principle of auxiliary air heater operation



Note

- ◆ Make sure that the auxiliary air heaters are operated only with diesel fuel. Operation with biodiesel can lead to malfunctions and damage.
- ◆ The heaters only have one electric motor. The motor pumps the heating and combustion air.

1 - Electrical connection

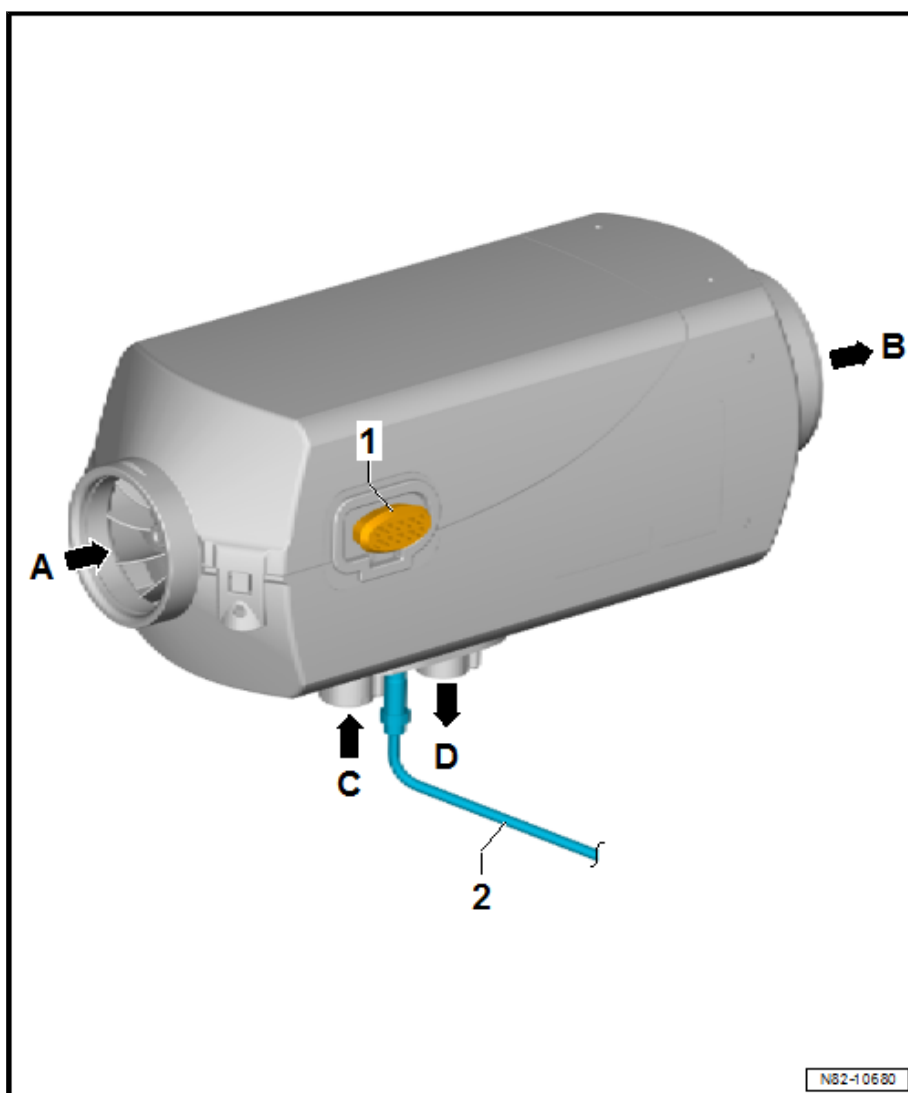
2 - Fuel supply

Pfeil A - Cold air in

Pfeil B - Hot air out

Pfeil C - Combustion air in

Pfeil D - Exhaust out



Switching on

The warning lamp in the control element lights up when the unit is switched on. The glow plug is switched on and the combustion air blower runs at slow speed.



Note

- ◆ *If there is still too much residual heat in the heat exchanger from a previous heating operation, only the combustion air blower starts up at first (cold blowing).*
- ◆ *The »start« takes place once the existing residual heat has been dissipated.*

Start of auxiliary air heater

Fuel delivery starts after about 60 seconds and the fuel/air mixture in the combustion chamber ignites. The glow plug is switched off 60 seconds after the combination sensor (flame monitor and overheating sensor) has detected the flame.

The heater is now in control mode and reaches the "Power" governor state after a short duration.

Temperature selection with control element

The desired interior temperature is preselected using the control dial. The value to be set can be chosen from a range of between +10°C and +30°C, depending on the version of the heater unit installed as well as the volume of the space to be heated and the prevailing ambient temperature.

The setting to be selected on the control knob in this case is based on experience.

Heater regulation

The room temperature or temperature of the drawn heated air is continuously measured during heating. Regulation starts if the temperature is higher than the temperature selected on the control element.

There are 4 control levels provided in order that the heat flow delivered by the heater can be finely adjusted to the heat demand. The blower speed and fuel volume correspond to the particular control level in this case.

If the set temperature is still exceeded even at the lowest control level, then the heater unit enters control level "Off", and the blower continues to operate for about 4 minutes to cool down.

Then, until the restart, the combustion air blower continues to run at minimum speed (recirculated air mode) or is switched off (fresh air mode).

Switching off

When the heater unit is switched off, the warning lamp goes out and the fuel delivery is switched off. The blower continues operating for about 4 minutes to provide cooling.

For cleaning, the glow plug is switched on for 40 seconds during the blower run-on.



Note

The heater unit is switched off without any run-on time if no fuel was pumped before the switch-off or if the heater unit is in the control level "OFF".

Control and regulating units for auxiliary air heater

- ◆ The start is repeated if the heater unit does not ignite within 90 seconds after fuel delivery starts. A malfunction shut-off occurs if the heater does not ignite after another 90 seconds. That means that fuel delivery will be ended and blower run-on



will continue for about 4 minutes. The control unit is locked out after the permitted number of unsuccessful start attempts has been exceeded.

- ◆ If the flame goes out by itself during heating operation, a new start is performed initially. If the heating unit does not ignite within 90 seconds after fuel delivery restarts or if it ignites but goes out within 15 minutes, a malfunction shut-off occurs. That means that fuel delivery will be ended and blower run-on will continue for about 4 minutes.



Note

- ◆ *The malfunction shut-down can be revoked by briefly switching off and back on again.*
- ◆ *Do not repeat the switch on/off procedure more than twice.*
- ◆ Overheating causes the combination sensor (flame monitor/overheating sensor) to be tripped, the fuel supply is interrupted and a malfunction shut-down is performed. Once the cause of overheating has been eliminated, the heater unit can be restarted by switching off and back on again. The control unit is locked out after the permitted number of unsuccessful start attempts has been exceeded.
- ◆ A malfunction shut-down will occur 20 seconds after the lower or upper voltage limit has been reached.
- ◆ The heater unit will not start if the glow plug or the blower motor is defective, or if there is a discontinuity in the electrical cable to the metering pump.
- ◆ If the combination sensor (flame monitor/overheating sensor) is defective or there is a discontinuity in the electrical cable, the heater unit starts and the malfunction shut-down occurs only during the start phase.
- ◆ The speed of the blower motor is continuously monitored. A malfunction shut-down will occur after 30 seconds if the blower motor does not start or if the speed fluctuates by more than 10%.
- ◆ When the heater unit is switched off, the glow plug is switched on for 40 seconds during blower run-on (post-glow) to burn off combustion residues.

Switching off in an emergency

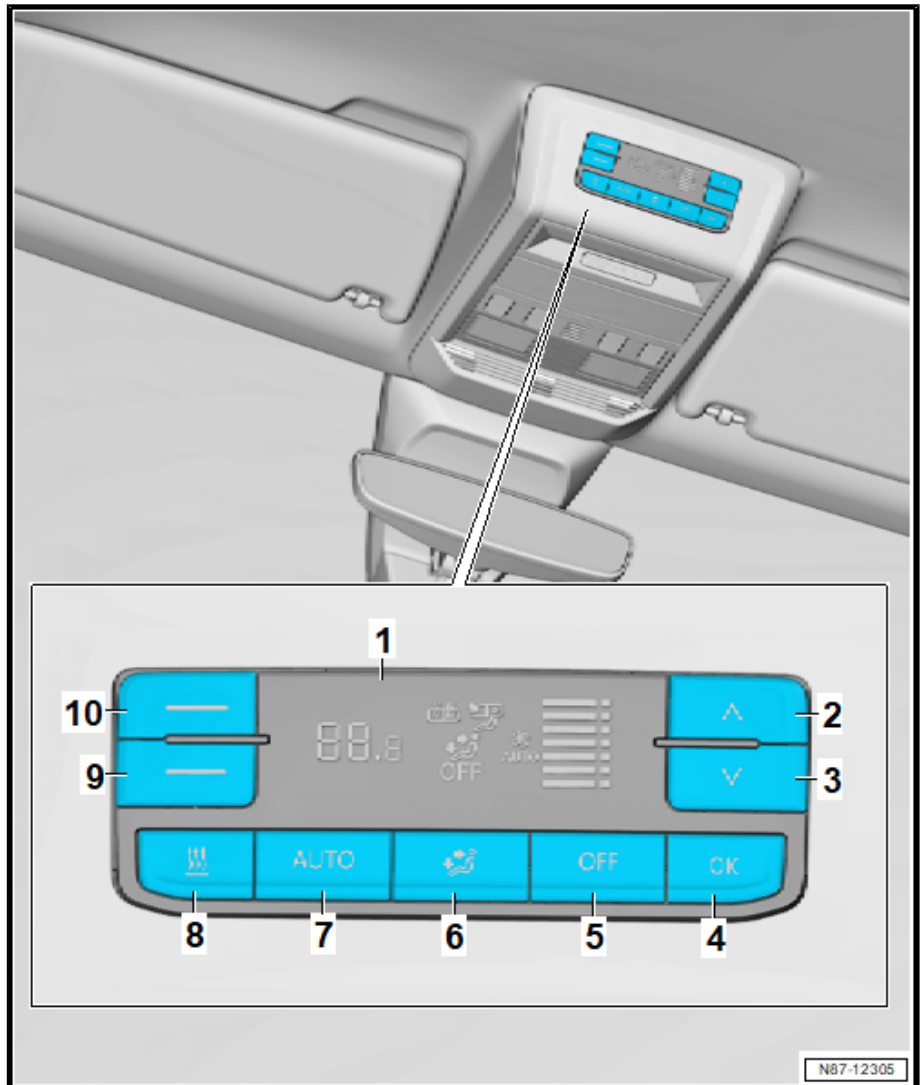
If an emergency shut-off (emergency off) is required during operation, proceed as follows:

- Switch off heater unit via control element, or
- Pull out fuse, or
- Isolate heater unit from battery.

9.2 Function of auxiliary air heater operating and display unit - E407- or roof display unit - J702-



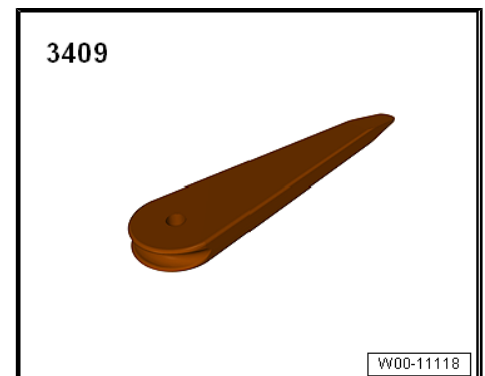
- 1 - Selected settings (temperature, blower speed) display
- 2 - Increase blower output button
- 3 - Decrease blower output button
- 4 - **OK**
 - ☐ Depending on equipment
- 5 - **OFF** button for switching rear air conditioning system on/off
 - ☐ Depending on equipment
- 6 - Air distribution selection display
- 7 - **AUTO** function button
 - ☐ This button is used to switch the automatic mode of the Climatronic for the rear area on or off.
- 8 - Button for switching the instant heating function of the auxiliary/supplementary heater on/off
 - ☐ Depending on equipment
- 9 - Adjustment button for lower temperature setting
- 10 - Adjustment button for higher temperature setting



9.3 Removing and installing auxiliary air heater operating and display unit - E407- or roof display unit - J702-

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-





Note

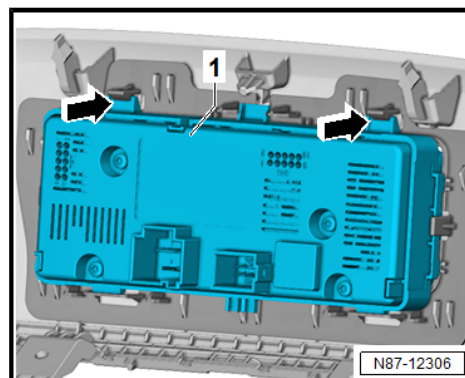
If the display of the auxiliary heater operating and display unit - E407- or roof display unit - J702- flashes, there is a fault in the system.

Removing

- Remove storage compartment in headliner ⇒ General body repairs, interior; Rep. gr. 68 ; Compartments and covers; Removing and installing storage compartment in headliner .
- Disconnect electrical connectors for rear Climatronic operating and display unit - E265- -1-.
- Detach rear Climatronic operating and display unit - E265- -1- at retaining tabs -arrows-, and remove it.

Installing

Install in reverse order of removal.





10 Other components of auxiliary air heater

⇒ ["10.1 Function description of remote control", page 59](#)

10.1 Function description of remote control



Note

- ◆ The auxiliary/supplementary heater can be switched on and off from a distance of several 100 metres (open space) using the remote control. This range is restricted in built-up areas or from within buildings.
- ◆ The remote control should be held upright when operating the buttons (the radio signals can be received optimally by the vehicle aerial in this way and the greatest transmission range is achieved).
- ◆ Following disconnection of the vehicle batteries, the auxiliary/supplementary heater remote control does not have to be re-adapted.
- ◆ If the remote control does not work properly, check the remote control battery ⇒ [page 60](#).
- ◆ If the remote control is renewed, it must be adapted using ⇒ Vehicle diagnostic tester.
- ◆ Start guided fault finding or guided functions in ⇒ Vehicle diagnostic tester, and then start "Adapt remote control".

Switching on auxiliary/supplementary heater using remote control

- Press button -3-. The indicator lamp -1- must light up green.

When the auxiliary/supplementary heater is switched on, its operating time is determined by means of the setting on the multi-function display.

Switching off auxiliary/supplementary heater using remote control

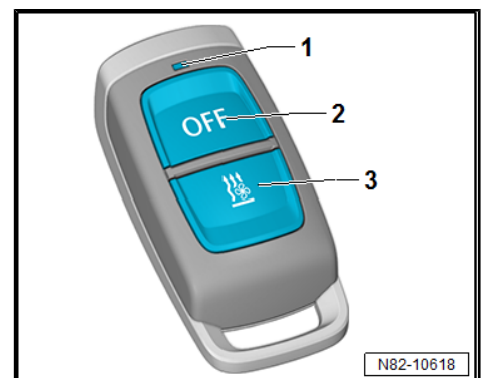
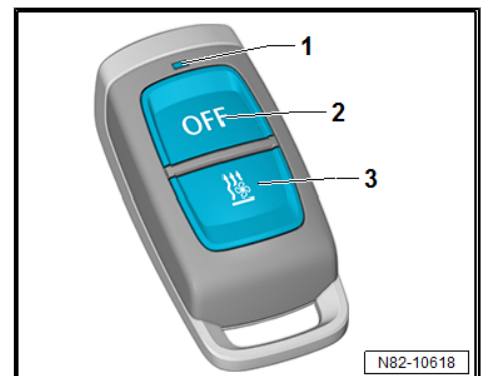
- Press button -2-. The indicator lamp -1- must light up red.

The auxiliary heater switches to run-on mode and then switches off.

Renewing remote control battery

Special tools and workshop equipment required

- ◆ Removal wedge - 3409-





Note

- ◆ *Note installation position of battery.*
 - ◆ *Use only the same type of 3-volt battery.*
 - ◆ *Allocation of the remote control to the auxiliary/supplementary heater remains intact. Re-adapting is not necessary.*
- Release battery compartment cover -1- using a removal wedge - 3409- .
 - Remove battery.
 - Insert new battery and refit cover.

Indicator lamp in remote control

Once you have pressed a button, the indicator in the remote control -1- indicates whether the signal from the remote control has been received by the auxiliary/supplementary heater and whether the battery in the remote control is low.

Display -1-	Meaning
LED lights up green for 2 seconds	The auxiliary/supplementary heater has been switched on with button -3-.
LED lights up red for 2 seconds	The auxiliary/supplementary heater has been switched off with -2- "OFF".
LED slowly flashes green for 2 seconds	The signal to switch on was not received.
LED quickly flashes green for 2 seconds	The auxiliary/supplementary heater is blocked, e.g. because the fuel tank is nearly empty or there is a fault in the auxiliary/supplementary heater.
LED flashes red for 2 seconds	The signal to switch off was not received.
Lights up orange for 2 seconds, then green or red	The battery charge is low, but the switch on/switch off signal was received.
Lights up orange for 2 seconds, then flashes green or red	The battery charge is low and the switch on/switch off signal was not received.
Flashes orange for 5 seconds	The battery is dead and the switch on/switch off signal was not received.
LED does not light up	The battery is dead.

