Workshop Manual

Golf 2020 ➤
Golf Variant 2021 ➤

Heating, air conditioner

Edition 09.2020

List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

80 - Heating

87 - Air conditioning system

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

Contents

00 – Technical data

1 Safety information

(VRL014662; Edition 09.2020)

1.1 Safety precautions when working on air conditioning systems

Risk of fatal injury and explosion from sources of ignition

Risk of fatal injury and explosion from sources of ignition in the vicinity of air conditioning systems and refrigerant tanks. Escaping refrigerant could ignite and cause an explosion. Risk of explosion leading to loss of life or serious injuries.

- Never bring sources of ignition close to air conditioning systems and refrigerant tanks.
- Avoid electrostatic discharge, sparks from tools striking surfaces and hot surfaces.

Risk of irreparable damage to refrigerant lines

There is a risk of irreparable damage to the refrigerant lines due to rupture of the inner foil.

- Never bend refrigerant lines to a radius tighter than r < 100 mm.

1.2 Safety precautions when handling refrigerants

Risk of suffocation and poisoning from refrigerant

Coughing and nausea leading to suffocation and poisoning from refrigerant vapours possible.

- Never inhale refrigerant vapours.
- Only work on the refrigerant circuit and refrigerant tanks in well ventilated areas.
- Never work in or near cellars or other low lying areas.
- Switch on the extraction system.

Risk of freezing injury from refrigerant

When working on the air conditioning system, there is a risk of highly pressurised refrigerant escaping from the system. There is a risk of injury to the skin and parts of the body due to freezing.

– Wear protective gloves.
– Wear safety goggles.
– Extract refrigerant and open the refrigerant circuit immediately afterwards.
– If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.

1.3 Safety measures 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.

1.4 Safety precautions when working on high-voltage system

Danger to life from high voltage

The high-voltage system is under high voltage. Risk of severe or fatal injury due to electric shock.

– Persons with life-preserving or other electronic medical devices in or on their body must not perform any work on the high-voltage system. Such medical devices include internal analgesic pumps, implanted defibrillators, pacemakers, insulin pumps and hearing aids.
– Have a qualified technician de-energise the high-voltage system.

Risk of injury due to unexpected engine/motor start

The operational readiness of electric and hybrid vehicles is not obvious. There is a risk of parts of the body becoming trapped or drawn in.

– Switch off ignition.
– Always store the ignition key outside the vehicle.

Risk of damage to high-voltage cables

Improper handling can damage the insulation of high-voltage cables or connectors.

- Never support yourself on high-voltage cables or connectors.
- Never support tools on high-voltage cables or connectors.
- Never bend high-voltage cables tightly or kink them.
- Always connect high-voltage connectors according to coding.

Risk of injury from activated stationary air conditioning

On electric and hybrid vehicles with active stationary air conditioning, the stationary air conditioning could switch on unintentionally. Risk of limbs becoming trapped or drawn in by the radiator fan starting automatically.

- Deactivate the stationary air conditioning.

1.5 Safety precautions when working in vicinity of high-voltage components

Danger to life from high voltage

The high-voltage system is under high voltage. Damage to high-voltage components can result in severe or fatal injury from electric shock.

- Perform visual check of high-voltage components and high-voltage cables.
- Never use cutting or forming tools, or any other sharp-edged tools.
- Never use heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.

1.6 Safety precautions when working on cooling system

Danger of scalding by hot coolant

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and 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.

1.7 Safety precautions for working on vehicles with auxiliary/supplementary heater

Danger of fire and explosion from auxiliary/supplementary heater

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

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

Danger of poisoning from exhaust fumes

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

– In closed areas, switch on the auxiliary/supplementary heater only when it is connected to an exhaust extractor system.

– In closed areas without an exhaust extractor system, switch the auxiliary/supplementary heater off.

Risk of damage when starting the engine

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

If the vehicle’s timer for the auxiliary/supplementary 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/supplementary heater components as well as a risk of fire and explosions caused by high temperatures.

– Deactivate timer for auxiliary/supplementary heater.

2 Identification

⇒ o2.1 f heater and air conditioning unit", page 5

2.1 Identification of heater and air conditioning unit

⇒ o2.1.1 f heater and air conditioning unit made by Valeo", page 5

⇒ o2.1.2 f Denso heater and air conditioning unit", page 5

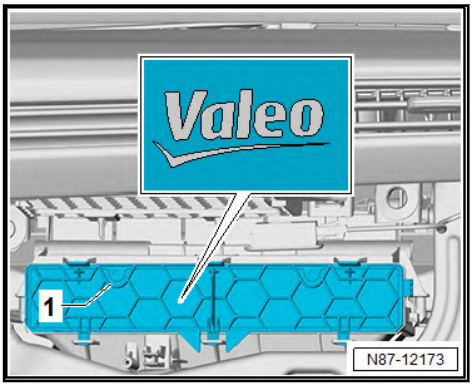
2.1.1 Identification of heater and air conditioning unit made by Valeo

Note

Pay attention to correct assignment when replacing components. The combination of different makes of component is not permitted ⇒ Electronic parts catalogue.

– Move glove compartment lid to service position ⇒ General body repairs, interior; Rep. gr. 68; Compartments and covers; Glove compartment lid, service position.

– Check dust and pollen filter cover -1- for information about manufacturer of heater and air conditioning unit.



2.1.2 Identification of Denso heater and air conditioning unit

Note

Pay attention to correct assignment when replacing components. The combination of different makes of component is not permitted ⇒ Electronic parts catalogue.

– Move glove compartment lid to service position ⇒ General body repairs, interior; Rep. gr. 68; Compartments and covers; Glove compartment lid, service position.

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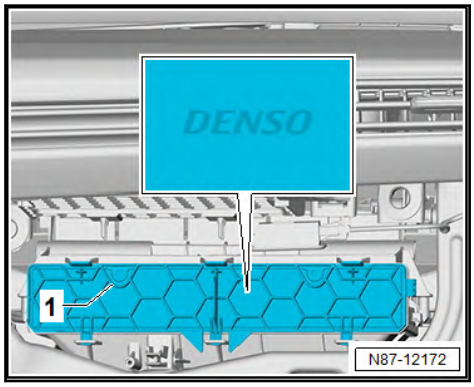
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3 General information

⇒ c3.1 oncerning odours in air conditioned vehicles", page 7

⇒ f3.2 or vehicles with start-stop system", page 7

⇒ p3.3 lates", page 7

3.1 Notes concerning odours in air conditioned vehicles

- If the evaporator emits unpleasant odours, clean the evaporator.
- Volkswagen has tested and approved the ultrasound A/C cleaner -VAS 6189B- as well as the suction feed spray-gun -V.A.G 1538- with the appropriate spray probe.
- Instructions on cleaning the evaporator are supplied with the equipment.
- As soon as new procedures get approved by Volkswagen, relevant information will be provided in the Workshop Manual ⇒ Air conditioning systems with refrigerant R134ayf - General information; Rep. gr. 87; Refrigerant circuit; Potential complaints.

3.2 Notes for vehicles with start-stop system

Observe the safety precautions for vehicles with a start/stop system ⇒ page 2 **.**

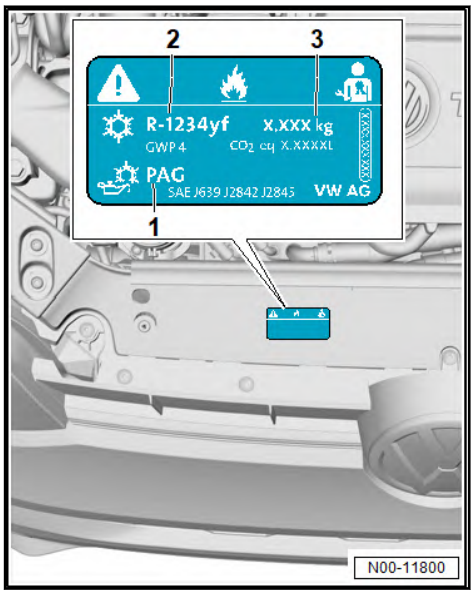
Refer to ⇒ Self-study programme No. 426; Start/Stop System 2009 for description of features.

3.3 Type plates

⇒ p3.3.1 lates, refrigerant R1234yf", page 7

3.3.1 Type plates, refrigerant R1234yf

Type plate with capacities in kg for refrigerant R1234yf and refrigerant oil



1 - Designation of refrigerant oil

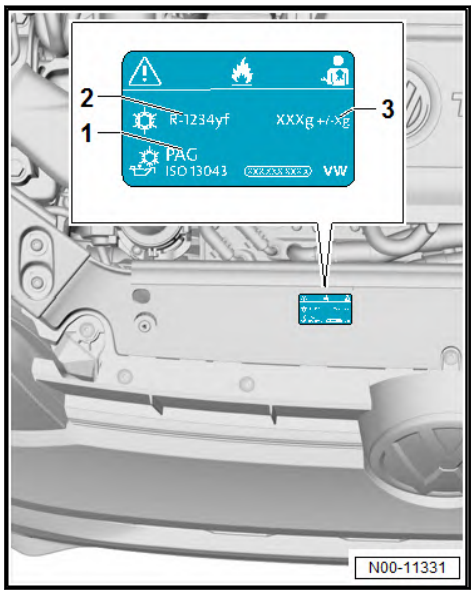
2 - Name of refrigerant

3 - Refrigerant capacity in kg

Note

- *A tolerance of ± 0.015 kg is permissible although not indicated on the type plate.*
- *Capacities for refrigerant R1234yf and refrigerant oil ⇒ d5 ata", page 11 .*

Type plate with capacities in g for refrigerant R1234yf and refrigerant oil



1 - Designation of refrigerant oil

2 - Name of refrigerant

3 - Refrigerant capacity in g

Note

- *A tolerance of ± 15 g is permissible although not indicated on the type plate.*
- *Capacities for refrigerant R1234yf and refrigerant oil ⇒ d5 ata", page 11 .*

4 Repair notes

4.1 Working on refrigerant circuit

In some countries special qualifications are required for any work for which the refrigerant circuit needs to be opened.

Additional information

- For information about repairs on climate controlled vehicles and handling refrigerant, refer to ⇒ Air conditioning systems with refrigerant R1234yf – General information; Rep. gr. 00; Safety instructions.
- For information on working with air conditioner service station on vehicles equipped with an air conditioning system, refer to ⇒ Air conditioning system with refrigerant R1234yf – General information; Rep. gr. 87; Working with air conditioner service station.
- For information on conditions for and procedure of flushing with refrigerant R1234yf, refer to ⇒ Air conditioning systems with refrigerant R1234yf – General information; Rep. gr. 87; Refrigerant circuit; Cleaning refrigerant circuit.
- For notes on testers and tools for repair work on climate controlled vehicles, refer to ELSA under ⇒ Air conditioning systems with refrigerant R1234yf – General information.

4.2 General repair instructions

Never attempt to repair any heating and air conditioning system components.

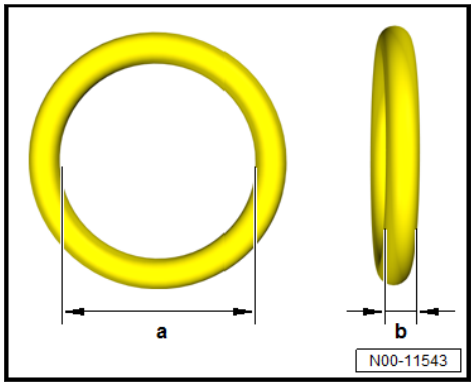
NAR market

- Perform visual check of new genuine part for damage and function.
- Defective components must be replaced with Genuine Parts. Evaporators must comply with the applicable SAE standards.

4.3 Refrigerant circuit seals

- Renew seals after removal.
- Moisten seals with refrigerant oil before installing.
- Ensure proper seating of seals on the pipe or in the groove.
- Work in a completely clean environment. Even the smallest contaminants, e.g. a hair, can cause leaks.
- Install only seals which are resistant to refrigerant R1234yf and its associated refrigerant oil ⇒ Electronic parts catalogue.

The dimensions -a- and -b- depend on the fitting location of the seal ⇒ Electronic parts catalogue.


a
b
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5 Technical data

5.1 Capacities for refrigerant R1234yf

Total capacity
0.460 kg ± 0.015 kg or 460 g ± 15 g

5.2 Refrigerant oil R1234yf – capacities

Note

- *Refrigerant oils from containers which have been open for a longer period of time are unusable.*
- *As refrigerant oil is extremely hygroscopic, open containers must be immediately re-sealed after use to prevent the ingress of moisture.*
- *Note the type plate on the air conditioner compressor.*

Air conditioner compressor manufacturer	Total amount of oil in refrigerant circuit [1]
Denso	110 ml ± 10 cm^3
Hanon	120 ml ± 10 cm^3
Mahle	75 ml ± 10 cm^3

1) This quantity of refrigerant oil is contained in a replacement air conditioner compressor and corresponds to the total capacity.

5.3 Oil distribution

- During operation of the air conditioner, the refrigerant oil in the air conditioner compressor prior to initial operation is distributed throughout the refrigerant circuit.
- The distribution of the refrigerant oil in the refrigerant circuit depends on the operating conditions prevailing before the air conditioner was switched off the last time (e.g. the ambient temperature). It is not possible to make a general statement about the distribution of the refrigerant oil within the refrigerant circuit. Observe notes on renewing components of refrigerant circuit ⇒ Air conditioning system with refrigerant R1234yf – General information; Rep. gr. 87; Refrigerant circuit; Renewing components.

80 – Heating

1 Heating system

Note

- *Only a heater with air conditioning is currently offered for this vehicle.*
- *For information on repairs, refer to ⇒ page 13 .*

87 – Air conditioning system

1 Overview of fitting locations - air conditioning system

⇒ o1.1 f fitting locations - components not located in passenger compartment", page 13

⇒ o1.2 f fitting locations - components located in front section of passenger compartment", page 21

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

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⇒ o1.1.3 f fitting locations - components not located in passenger compartment, Golf right-hand drive vehicles", page 17

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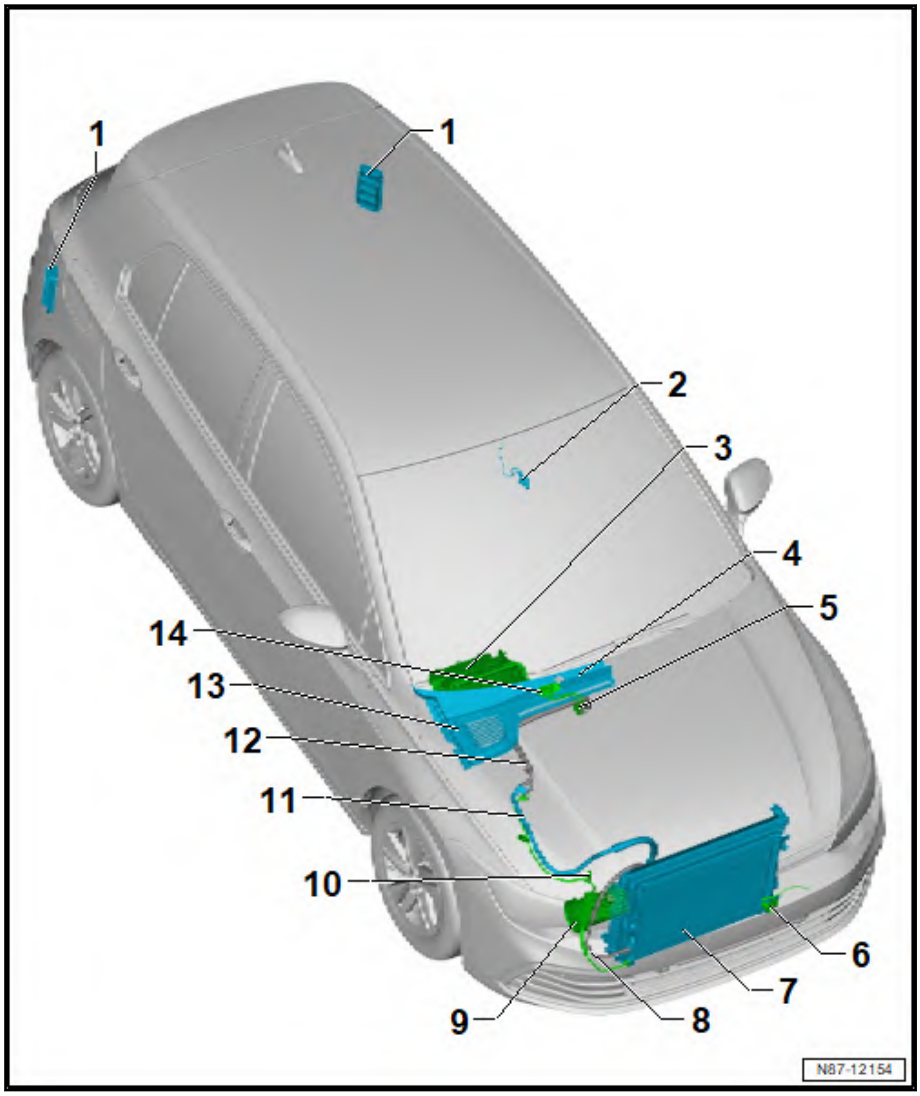
1.1.1 Overview of fitting locations - components not located in passenger compartment, Golf left-hand drive vehicles



1 - Forced ventilation of passenger compartment

- ❑ Checking ⇒ General body repairs, exterior; Rep. gr. 63; Rear bumper; Checking forced ventilation in passenger compartment
- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 63; Rear bumper; Removing and installing forced ventilation for passenger compartment

2 - Humidity sender for air conditioning system -G260-

- ❑ Check via onboard supply control unit -J519-, ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Removing and installing ⇒ page 247

3 - Fresh air intake

- ❑ Removing and installing ⇒ page 213

4 - Plenum chamber cover

- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Removing and installing plenum chamber cover.

5 - Expansion valve

- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 34
- ❑ System overview – refrigerant circuit and torque specifications ⇒ page 26

6 - Ambient temperature sensor -G17-

- ❑ Check via onboard supply control unit -J519-, ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Removing and installing ⇒ page 247

7 - Condenser

- ❑ With desiccant bag
- ❑ With integrated receiver
- ❑ Assembly overview ⇒ page 30
- ❑ Removing and installing ⇒ page 42

8 - Refrigerant line between condenser and air conditioner compressor

- ❑ Removing and installing ⇒ page 82

9 - Air conditioner compressor -VX81-

- ❑ Assembly overview ⇒ page 92

- ❑ Removing and installing ⇒ page 99
- ❑ Removing from and installing on bracket ⇒ page 95

10 - Evacuating and charging valve, high-pressure side

- ❑ Removing and installing ⇒ page 54

11 - Pressure sender for refrigerant circuit -G805-

- ❑ 8 Nm
- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 32

12 - Evacuating and charging valve, low-pressure side

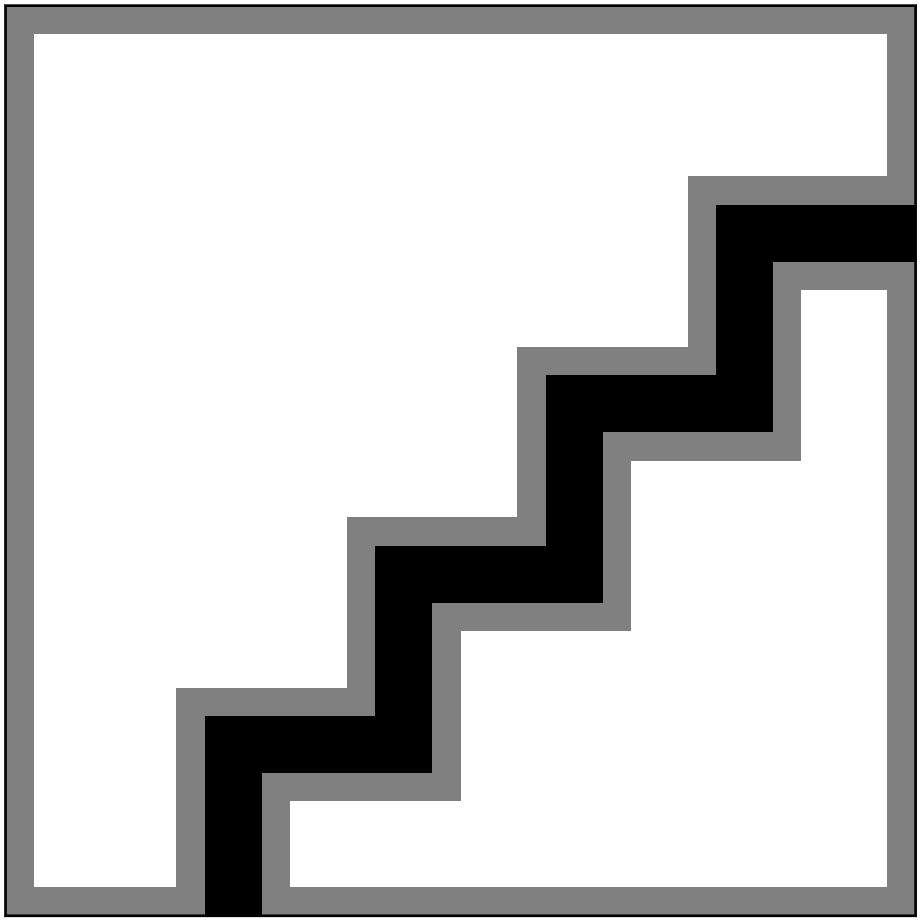
- ❑ Removing and installing ⇒ page 54

13 - Cover

14 - Air quality sensor -G238-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 244
- ❑ Principle of operation ⇒ page 245

1.1.2 Overview of fitting locations - components not located in passenger compartment, Golf estate, left-hand drive vehicles



1 - Forced ventilation of passenger compartment

- ❑ Checking ⇒ General body repairs, exterior; Rep. gr. 63; Rear bumper; Checking forced ventilation in passenger compartment
- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 63; Rear bumper; Removing and installing forced ventilation for passenger compartment

2 - Humidity sender for air conditioning system -G260-

- ❑ Check via onboard supply control unit -J519-, ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Removing and installing ⇒ page 247

3 - Cover for fresh air intake

- ❑ Removing and installing ⇒ page 216

4 - Plenum chamber cover

- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Removing and installing plenum chamber cover.

5 - Expansion valve

- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 34
- ❑ System overview – refrigerant circuit and torque specifications ⇒ page 26

6 - Refrigerant lines with internal heat exchanger

- ❑ Removing and installing ⇒ page 68

7 - Refrigerant line from evaporator to air conditioner compressor

- ❑ ⇒ a2.16 nd installing refrigerant line from evaporator to air conditioner compressor”, page 86

8 - Condenser

- ❑ With desiccant bag
- ❑ With integrated receiver
- ❑ Assembly overview ⇒ page 30
- ❑ Removing and installing ⇒ page 42

9 - Receiver with desiccant bag

- ❑ Denso condenser ⇒ page 45
- ❑ Modine condenser ⇒ page 49

10 - Ambient temperature sensor -G17-

- ❑ Check via onboard supply control unit -J519-, ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

- ❑ Removing and installing ⇒ page 247

11 - Refrigerant line between condenser and air conditioner compressor

- ❑ Removing and installing ⇒ page 82

12 - Refrigerant line from condenser to evaporator

- ❑ ⇒ a2.14 nd installing refrigerant line from air conditioner compressor to evaporator", page 76

13 - Air conditioner compressor -VX81-

- ❑ Assembly overview ⇒ page 92
- ❑ Removing and installing ⇒ page 99
- ❑ Removing from and installing on bracket ⇒ page 95

14 - Evacuating and charging valve, high-pressure side

- ❑ Removing and installing ⇒ page 54

15 - Pressure sender for refrigerant circuit -G805-

- ❑ 8 Nm
- ❑ Check with ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 32

16 - Evacuating and charging valve, low-pressure side

- ❑ Removing and installing ⇒ page 54

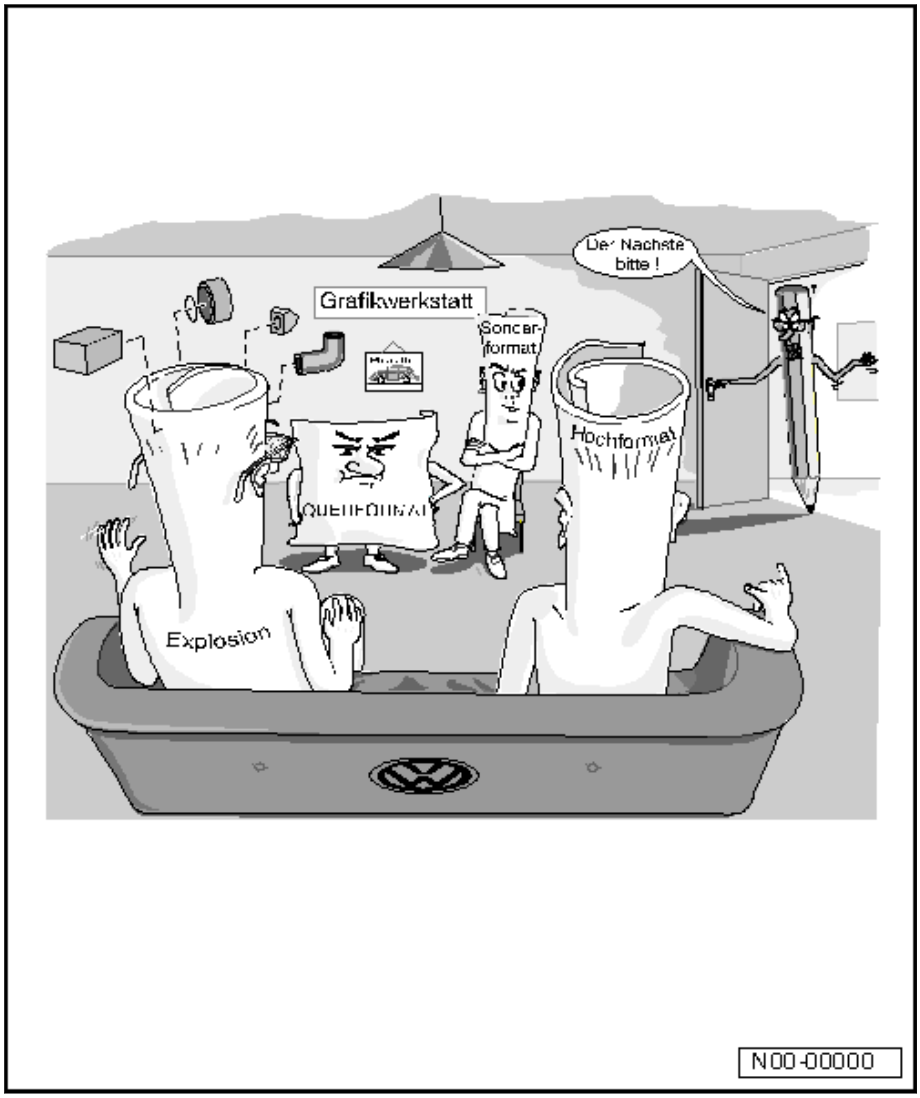
17 - Air quality sensor -G238-

- ❑ Check with ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 244
- ❑ Principle of operation ⇒ page 245

18 - Fresh air intake

- ❑ Removing and installing ⇒ page 213

1.1.3 Overview of fitting locations - components not located in passenger compartment, Golf right-hand drive vehicles



1 - Forced ventilation of passenger compartment

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- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 63; Rear bumper; Removing and installing forced ventilation for passenger compartment

2 - Humidity sender for air conditioning system -G260-

- ❑ Check via onboard supply control unit -J519-, ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Removing and installing ⇒ page 247

3 - Fresh air intake

- ❑ Removing and installing ⇒ page 214

4 - Plenum chamber cover

- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Removing and installing plenum chamber cover.

5 - Air quality sensor -G238-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 245
- ❑ Principle of operation ⇒ page 245

6 - Expansion valve

- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 34
- ❑ System overview – refrigerant circuit and torque specifications ⇒ page 26

7 - Desiccant bag

- ❑ In condenser

8 - Ambient temperature sensor -G17-

- ❑ Check via onboard supply control unit -J519-, with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Removing and installing ⇒ page 247

9 - Condenser

- ❑ With integrated receiver
- ❑ Assembly overview ⇒ page 30

- ❑ Removing and installing ⇒ page 42

10 - Air conditioner compressor -VX81-

- ❑ Assembly overview ⇒ page 92
- ❑ Removing and installing ⇒ page 99
- ❑ Removing from and installing on bracket ⇒ page 95

11 - Evacuating and charging valve, high-pressure side

- ❑ Removing and installing ⇒ page 54

12 - Pressure sender for refrigerant circuit -G805-

- ❑ 8 Nm
- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 32

13 - Evacuating and charging valve, low-pressure side

- ❑ Removing and installing ⇒ page 54

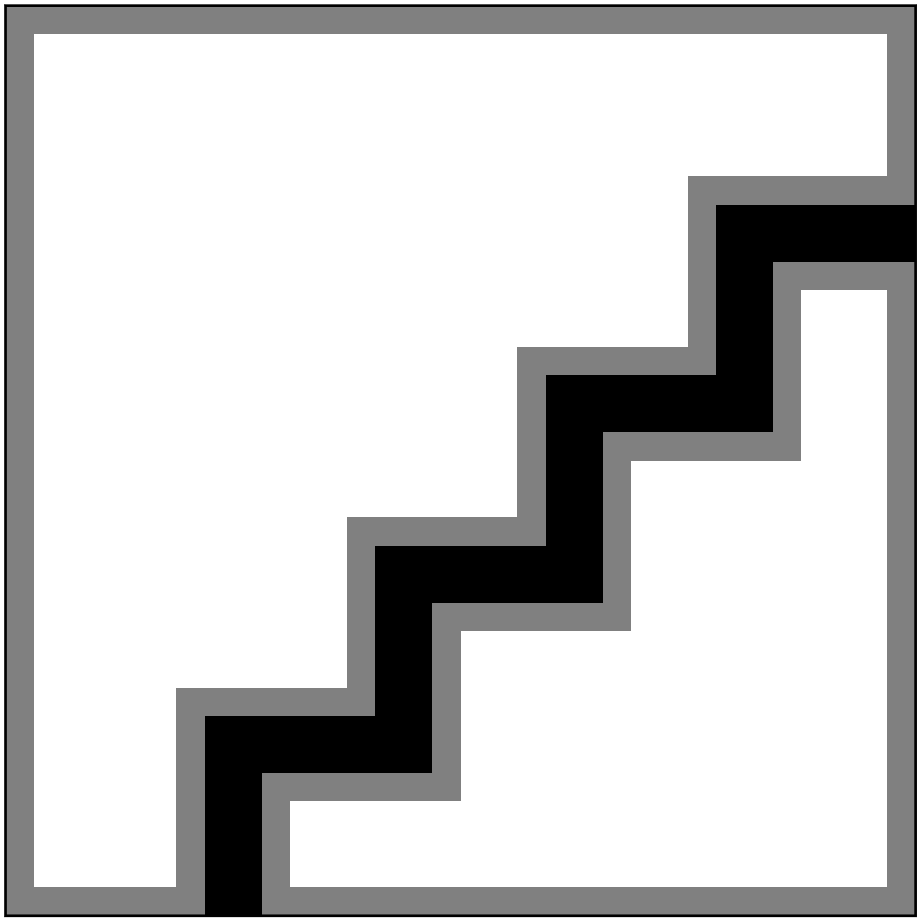
14 - Refrigerant line with internal heat exchanger

- ❑ From condenser and air conditioner compressor
- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 68

Note

The warm liquid refrigerant flowing through the internal heat exchanger on the high pressure side releases energy to the cold refrigerant vapour flowing on the low pressure side, thus enhancing the efficiency of the air conditioner.

1.1.4 Overview of fitting locations - components not located in passenger compartment, Golf estate, right-hand drive vehicles



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2 - Humidity sender for air conditioning system -G260-

- ❑ Check via onboard supply control unit -J519-, ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Removing and installing ⇒ page 247

3 - Fresh air intake

- ❑ Removing and installing ⇒ page 214

4 - Air quality sensor -G238-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 245
- ❑ Principle of operation ⇒ page 245

5 - Cover for fresh air intake

- ❑ Removing and installing ⇒ page 216

6 - Plenum chamber cover

- ❑ Removing and installing ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Removing and installing plenum chamber cover.

7 - Refrigerant line from evaporator to air conditioner compressor

- ❑ ⇒ a2.16 nd installing refrigerant line from evaporator to air conditioner compressor”, page 86

8 - Air conditioner compressor -VX81-

- ❑ Assembly overview ⇒ page 92
- ❑ Removing and installing ⇒ page 99
- ❑ Removing from and installing on bracket ⇒ page 95

9 - Desiccant bag

- ❑ In condenser

10 - Ambient temperature sensor -G17-

- ❑ Check via onboard supply control unit -J519-, with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ❑ Removing and installing ⇒ page 247

11 - Condenser

- ❑ With integrated receiver
- ❑ Assembly overview ⇒ page 30
- ❑ Removing and installing ⇒ page 42

12 - Refrigerant line between condenser and air conditioner compressor

- ❑ Removing and installing ⇒ page 82

13 - Refrigerant line from condenser to evaporator

- ❑ ⇒ a2.14 nd installing refrigerant line from air conditioner compressor to evaporator", page 76

14 - Evacuating and charging valve, high-pressure side

- ❑ Removing and installing ⇒ page 54

15 - Pressure sender for refrigerant circuit -G805-

- ❑ 8 Nm
- ❑ Check with ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 32

16 - Evacuating and charging valve, low-pressure side

- ❑ Removing and installing ⇒ page 54

17 - Refrigerant line with internal heat exchanger

- ❑ From condenser and air conditioner compressor
- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 68

Note

The warm liquid refrigerant flowing through the internal heat exchanger on the high pressure side releases energy to the cold refrigerant vapour flowing on the low pressure side, thus enhancing the efficiency of the air conditioner.

18 - Expansion valve

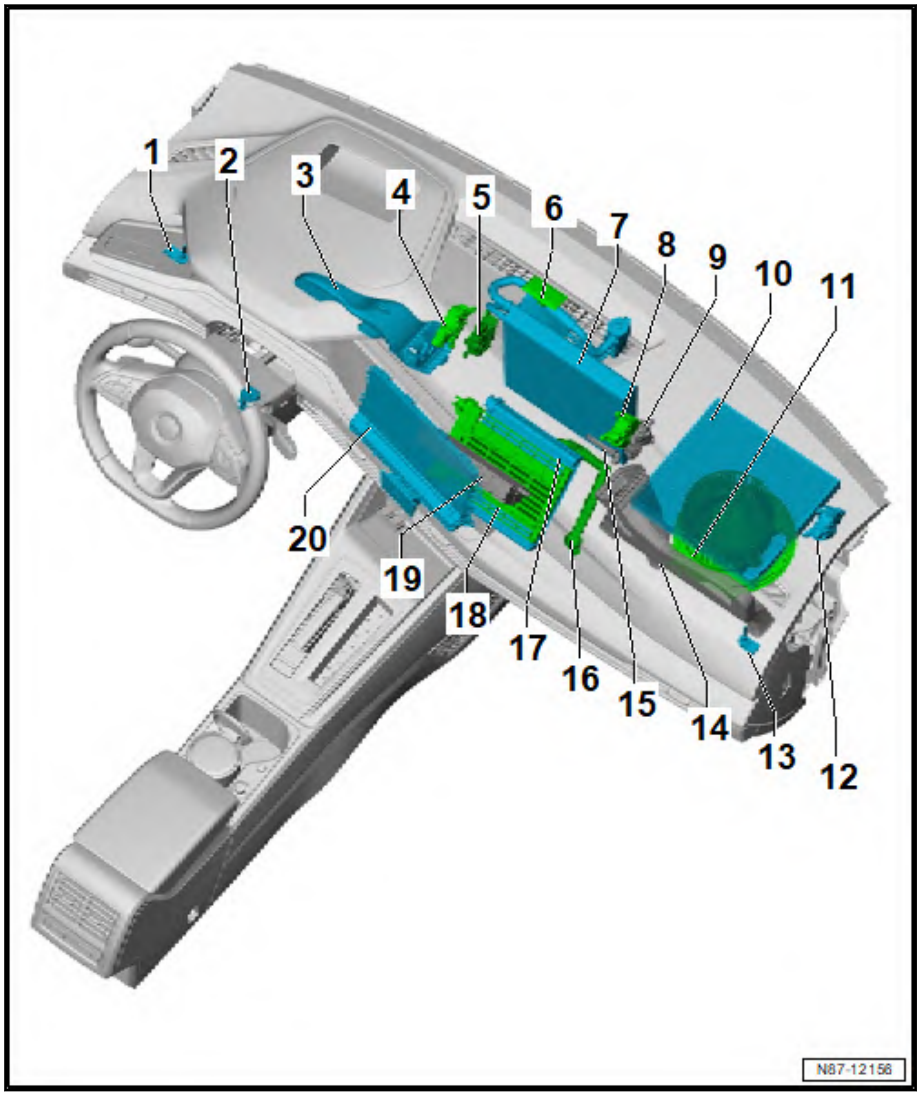
- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 34
- ❑ System overview – refrigerant circuit and torque specifications ⇒ page 26

1.2 Overview of fitting locations - components located in front section of passenger compartment

⇒ o1.2.1 f fitting locations - components inside of front passenger compartment, left-hand drive vehicles", page 21

⇒ o1.2.2 f fitting locations - components inside of front passenger compartment, right-hand drive vehicles", page 23

1.2.1 Overview of fitting locations - components inside of front passenger compartment, left-hand drive vehicles



1 - Left vent temperature sender -G150-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 248

2 - Vehicle interior temperature sensor -G1090-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 253

3 - Footwell vent on driver side

- ❑ Assembly overview ⇒ page 212
- ❑ Removing and installing ⇒ page 219

4 - Front air distribution flap control motor -V426-

- ❑ With potentiometer for front air distribution flap control motor -G642-
- ❑ ASSY air distribution flap -VX33-
- ❑ Fitting location overview ⇒ page 111
- ❑ Removing and installing ⇒ page 131

5 - Left temperature flap control motor -V158-

- ❑ With potentiometer for left temperature flap control motor -G220-
- ❑ ASSY front left temperature flap -VX34-
- ❑ Fitting location overview ⇒ page 111
- ❑ Removing and installing ⇒ page 119

6 - Sunlight penetration photosensor -G107-

- ❑ Removing and installing ⇒ page 243

7 - Evaporator

- ❑ Removing and installing ⇒ page 160

8 - Defroster flap control motor -V107-

- ❑ With potentiometer for defroster flap control motor -G135-
- ❑ ASSY defroster flap -VX47-
- ❑ Only in vehicles with 3-zone Climatronic
- ❑ Fitting location overview ⇒ page 111
- ❑ Removing and installing ⇒ page 115

9 - Right temperature flap control motor -V159-

- ❑ With potentiometer for right temperature flap control motor -G221-
- ❑ ASSY front right temperature flap -VX35-
- ❑ Fitting location overview ⇒ page 111
- ❑ Removing and installing ⇒ page 123

10 - Dust and pollen filter

- ❑ Removing and installing ⇒ page 163

11 - Fresh air blower -V2-

- ❑ Removing and installing ⇒ page 168

12 - Fresh air/air recirculation, air flow flap control motor -V425-

- ❑ With potentiometer for fresh air/recirculated air and air flow flap control motor -G644-
- ❑ Fresh air and air recirculation flap -VX96- assembly
- ❑ Fitting location overview ⇒ page 111
- ❑ Removing and installing ⇒ page 127

13 - Right vent temperature sender -G151-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 249

14 - Footwell vent on front passenger side

- ❑ Assembly overview ⇒ page 212
- ❑ Removing and installing ⇒ page 220

15 - Evaporator temperature sensor -G308-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 204

16 - Condensation drainage

- ❑ Checking ⇒ page 206
- ❑ Removing and installing ⇒ page 206

17 - Heat exchanger

- ❑ Removing and installing ⇒ page 175

18 - Auxiliary air heater element -Z35-

- ❑ With auxiliary air heater control unit -J604-
- ❑ Checking ⇒ page 171
- ❑ Removing and installing ⇒ page 173

19 - Heater and air conditioning system control unit -J979-

- ❑ Under centre vents
- ❑ Removing and installing ⇒ page 242

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

- ❑ Removing and installing ⇒ Communication; Rep. gr. 91; Infotainment system; Removing and installing infotainment system display

Not illustrated:

- ♦ Removing and installing operating and display unit for rear air conditioning system -E265- ⇒ page 241
- ♦ Removing and installing footwell vent temperature sender -G192- ⇒ page 252

1.2.2 Overview of fitting locations - components inside of front passenger compartment, right-hand drive vehicles

1 - Left vent temperature sender -G150-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 249

2 - Dust and pollen filter

- ❑ Removing and installing ⇒ page 166

3 - Fresh air blower -V2-

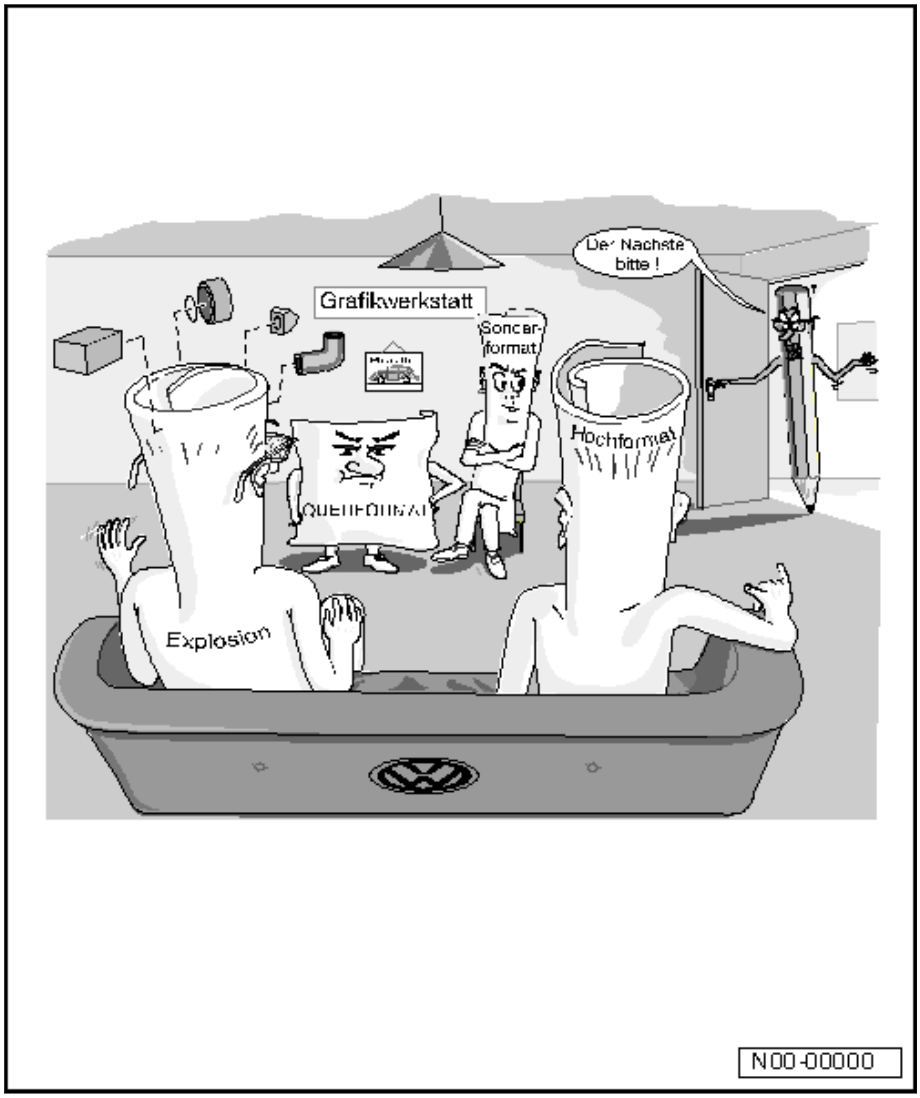
- ❑ Removing and installing ⇒ page 169

4 - Footwell vent on front passenger side

- ❑ Assembly overview ⇒ page 212
- ❑ Removing and installing ⇒ page 221

5 - Fresh air/air recirculation, air flow flap control motor -V425-

- ❑ With potentiometer for fresh air/recirculated air and air flow flap control motor -G644-
- ❑ Fresh air and air recirculation flap -VX96- assembly
- ❑ Fitting location overview ⇒ page 113
- ❑ Removing and installing ⇒ page 129



6 - Left temperature flap control motor -V158-

- ❑ With potentiometer for left temperature flap control motor -G220-
- ❑ ASSY front left temperature flap -VX34-
- ❑ Fitting location overview ⇒ page 113
- ❑ Removing and installing ⇒ page 121

7 - Defroster flap control motor -V107-

- ❑ With potentiometer for defroster flap control motor -G135-
- ❑ ASSY defroster flap -VX47-
- ❑ Only in vehicles with 3-zone Climatronic
- ❑ Fitting location overview ⇒ page 113
- ❑ Removing and installing ⇒ page 117

8 - Evaporator temperature sensor -G308-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 205

9 - Evaporator

- ❑ Removing and installing ⇒ page 160

10 - Sunlight penetration photosensor -G107-

- ❑ Removing and installing ⇒ page 243

11 - Front air distribution flap control motor -V426-

- ❑ With potentiometer for front air distribution flap control motor -G642-
- ❑ ASSY air distribution flap -VX33-
- ❑ Fitting location overview ⇒ page 113
- ❑ Removing and installing ⇒ page 133

12 - Right temperature flap control motor -V159-

- ❑ With potentiometer for right temperature flap control motor -G221-
- ❑ ASSY front right temperature flap -VX35-
- ❑ Fitting location overview ⇒ page 113
- ❑ Removing and installing ⇒ page 125

13 - Right vent temperature sender -G151-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 250

14 - Vehicle interior temperature sensor -G1090-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 253

15 - Footwell vent on driver side

- ❑ Assembly overview ⇒ page 212
- ❑ Removing and installing ⇒ page 219

16 - Footwell vent temperature sender -G192-

- ❑ Removing and installing ⇒ page 252

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

- ❑ Removing and installing ⇒ Communication; Rep. gr. 91; Infotainment system; Removing and installing infotainment system display

18 - Heater and air conditioning system control unit -J979-

- ❑ Under centre vents
- ❑ Removing and installing ⇒ page 242

19 - Heat exchanger

- ❑ Removing and installing ⇒ page 175

20 - Auxiliary air heater element -Z35-

- ❑ With auxiliary air heater control unit -J604-
- ❑ Checking ⇒ page 172
- ❑ Removing and installing ⇒ page 174

21 - Rear vent

- ❑ In rear centre console trim
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview – centre console

22 - Operating and display unit for rear air conditioning system -E265-

- ❑ Removing and installing ⇒ page 241

2 Refrigerant circuit

2.1 Assembly overview - refrigerant lines

2.1.1 Assembly overview - refrigerant lines

Note

The illustration shows a left-hand drive vehicle.

1 - Refrigerant line from evaporator to air conditioner compressor

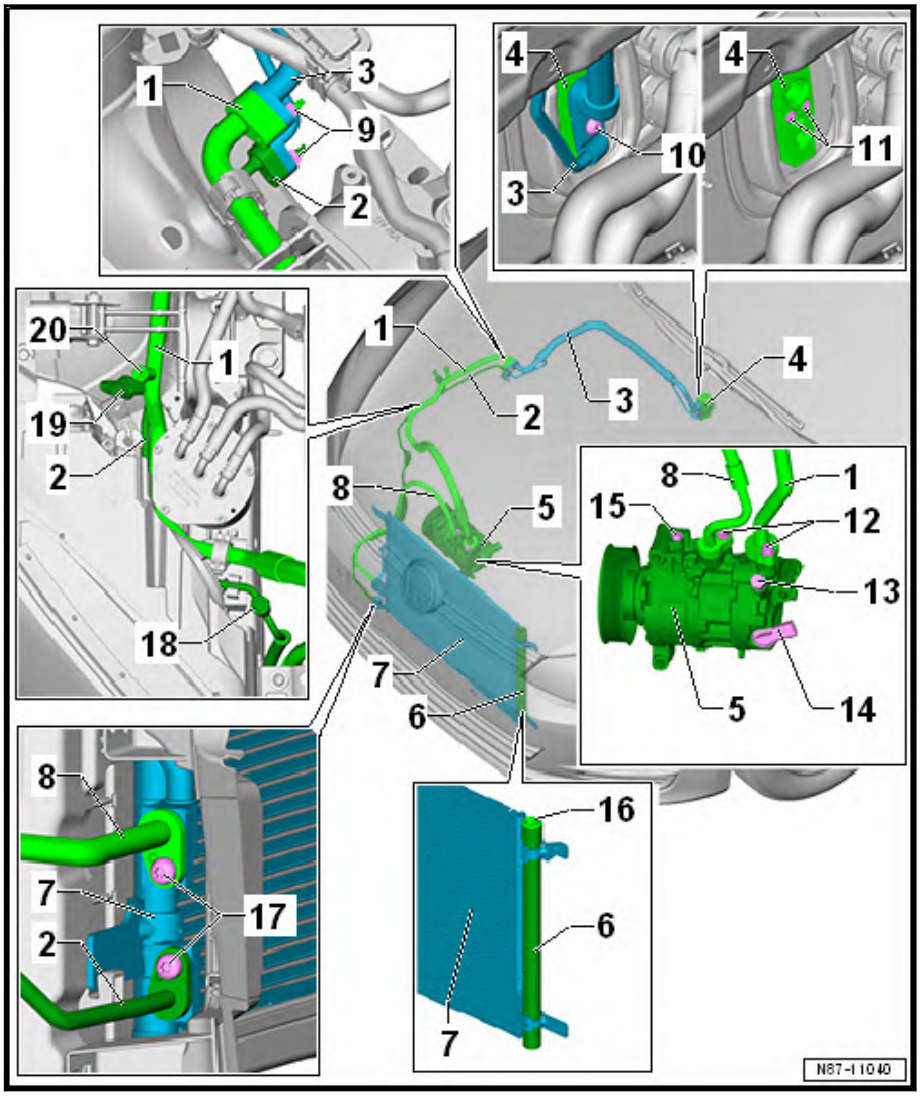
- ❑ Removing and installing ⇒ page 86

2 - Refrigerant line from condenser to evaporator

- ❑ Removing and installing ⇒ page 76

3 - Refrigerant lines with internal heat exchanger

- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 68



Note

The warm liquid refrigerant flowing through the internal heat exchanger on the high pressure side releases energy to the cold refrigerant vapour flowing on the low pressure side, thus enhancing the efficiency of the air conditioner.

4 - Expansion valve

- ❑ Renew seals after each removal
- ❑ Removing and installing ⇒ page 34

5 - Air conditioner compressor -VX81-

- ❑ Assembly overview ⇒ page 92
- ❑ Removing and installing ⇒ page 99
- ❑ Removing from and installing on bracket ⇒ page 95

6 - Receiver with desiccant bag

- ❑ Denso condenser ⇒ page 45
- ❑ Modine condenser ⇒ page 49

7 - Condenser

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Assembly overview ⇒ page 30
- ❑ Removing and installing ⇒ page 42

8 - Refrigerant line from air conditioner compressor to condenser

- ❑ Removing and installing ⇒ page 82

9 - Nut

- ❑ 8 Nm

10 - Bolt

- ❑ 8 Nm

11 - Bolt

- ❑ 10 Nm

12 - Bolt

- ❑ 22 Nm

13 - High-pressure safety valve on air conditioner compressor

- ❑ Checking ⇒ page 106

14 - Electrical connector

- ❑ With air conditioner compressor regulating valve -N280-

15 - Oil drain plug

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Tightening torques:

- ♦ Denso air conditioner compressor: 30 Nm
- ♦ Sanden air conditioner compressor: 10 Nm

16 - Cap

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Modine protective cap: 5 Nm

17 - Bolt

- ❑ 8 Nm

18 - Evacuating and charging valve, high-pressure side

- ❑ Removing and installing ⇒ page 54
- ❑ Protective cap: 0.4 ± 0.1 Nm
- ❑ Valve: 2 ± 0.2 Nm

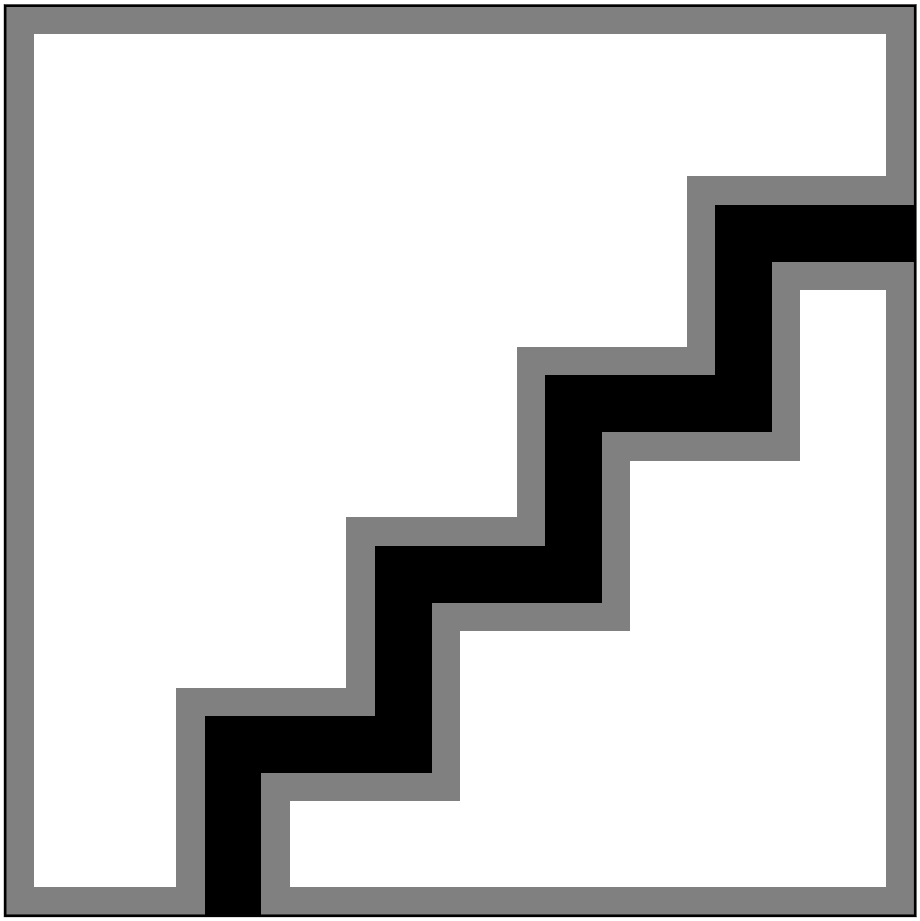
19 - Pressure sender for refrigerant circuit -G805-

- ❑ Removing and installing ⇒ page 32
- ❑ 5 ± 1 Nm

20 - Evacuating and charging valve, low-pressure side

- ❑ Removing and installing ⇒ page 54
- ❑ Protective cap: 0.4 ± 0.1 Nm
- ❑ Valve: 2 ± 0.2 Nm

2.1.2 Assembly overview - refrigerant lines, GTE



1 - Refrigerant lines with internal heat exchanger

- ❑ Removing and installing ⇒ page 68

2 - Union nut

- ❑ Qty. 2
- ❑ 16.5 Nm

3 - Seal

- ❑ Renew after removal
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Moisten with refrigerant oil before installation

4 - Seal

- ❑ Renew after removal
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Moisten with refrigerant oil before installation

5 - Bolt

- ❑ 8 Nm

6 - Refrigerant shut-off valve for heater and air conditioner unit -N541-

- ❑ Removing and installing ⇒ page 57

7 - Electrical connector

8 - Nut

- ❑ 8 Nm

9 - Refrigerant line from evaporator to air conditioner compressor

- ❑ Removing and installing ⇒ page 86

10 - Bolt

- ❑ 8 Nm

11 - Evacuating and charging valve, low-pressure side

- ❑ Removing and installing ⇒ page 54
- ❑ Protective cap: 0.4 ± 0.1 Nm
- ❑ Valve: 2 ± 0.2 Nm

12 - Bolt

- ❑ 22 Nm

13 - Bolt

- ❑ 8 Nm

14 - Refrigerant line from air conditioner compressor to condenser

- ❑ Removing and installing ⇒ page 82

15 - Refrigerant line from condenser to evaporator

- ❑ With refrigerant line with restrictor ⇒ page 30
- ❑ Removing and installing ⇒ page 76

16 - Evacuating and charging valve, high-pressure side

- ❑ Removing and installing ⇒ page 54
- ❑ Protective cap: 0.4 ± 0.1 Nm
- ❑ Valve: 2 ± 0.2 Nm

17 - Bolt

- ❑ 2.5 Nm

18 - Double clamp

19 - Electrical connector

20 - Refrigerant shut-off valve for high-voltage battery heat exchanger -N542-

- ❑ Removing and installing ⇒ page 60

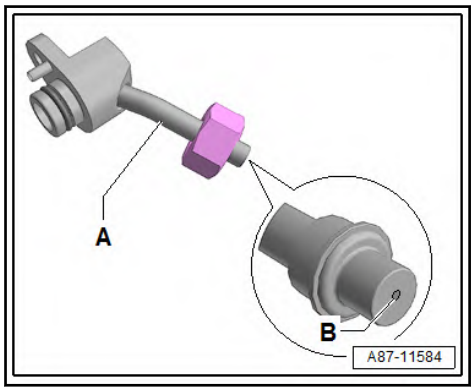
21 - Pressure sender for refrigerant circuit -G805-

- ❑ Removing and installing ⇒ page 32
- ❑ 5 ± 1 Nm

22 - Electrical connector

23 - Double clamp

Refrigerant line with restrictor



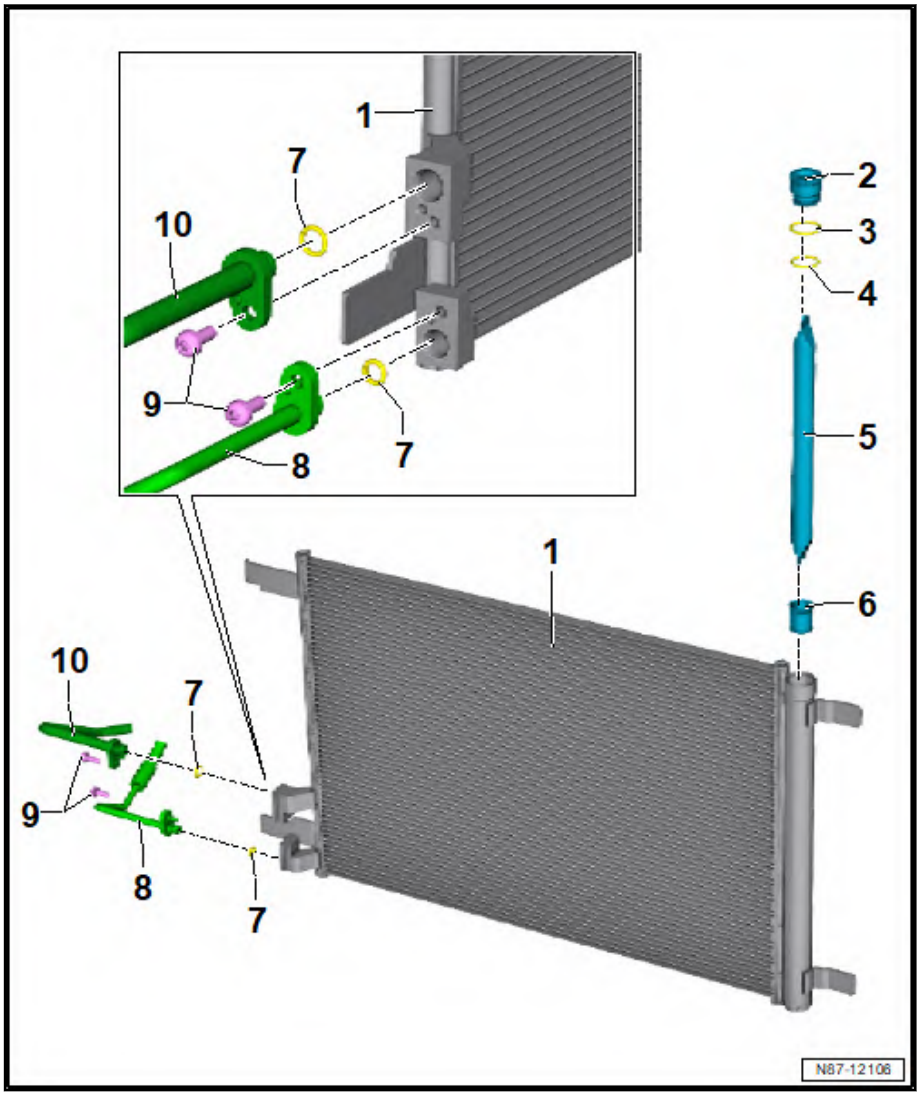
Note

- *The illustration shows a refrigerant line -A- with a permanently installed restrictor -B- (without strainer).*
- *The diameter of the shown restrictor hole -B- is approx. 0.7 mm. Depending on the refrigerant line version, this restrictor is permanently installed or it can be removed. For the removable version a strainer may be fitted to prevent the restrictor hole from being blocked by suspended particles.*
- *Check restrictor hole -B- for soiling, and clean it or renew refrigerant line as necessary.*
- *Different versions. Refer to ⇒ Electronic parts catalogue.*

2.2 Assembly overview - condenser

Note

The illustration shows a "Denso" heater and air conditioning unit.



1 - Condenser

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 42

2 - Locking element

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renew if damaged
- ❑ Denso condenser: 5 Nm screw plug
- ❑ Modine condenser: sealing cap with circlip

3 - Seal

- ❑ Renew after removal
- ❑ Moisten with refrigerant oil before installation

4 - Seal

- ❑ Renew after removal
- ❑ Moisten with refrigerant oil before installation

5 - Desiccant bag/cartridge

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing:

- ♦ Denso condenser ⇒ page 45
- ♦ Modine condenser ⇒ page 49
- ♦ Showa/Keihin condenser ⇒ page 53

Note

In some cases, it is no longer necessary on air conditioning systems with refrigerant R1234yf to renew the desiccant bag each time the refrigerant circuit is opened ⇒ Air conditioning system with refrigerant R1234yf; Rep. gr. 87; Refrigerant circuit; Renewing components.

6 - Filter

- ❑ Different versions ⇒ Electronic parts catalogue

7 - Seal

- ❑ Renew after removal
- ❑ Moisten with refrigerant oil before installation

8 - Refrigerant line, high-pressure side

- ❑ Leads to refrigerant line with internal heat exchanger

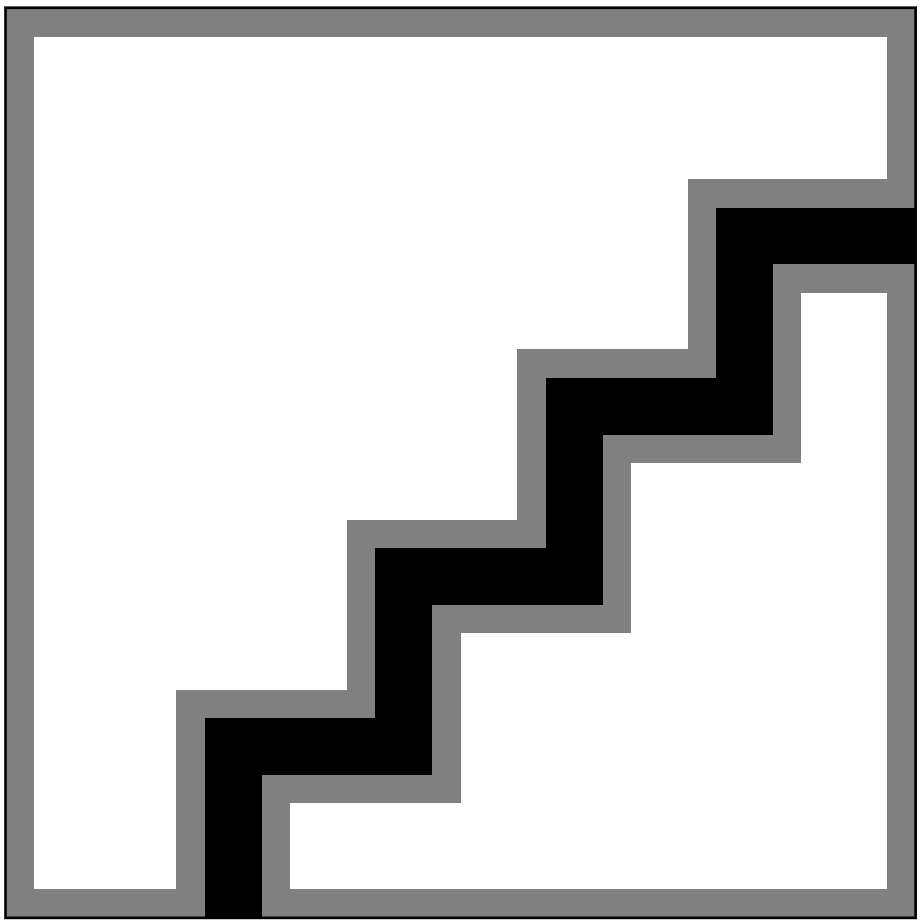
9 - Bolt

- ❑ 8 Nm

10 - Refrigerant line

- ❑ To air conditioner compressor

2.3 Assembly overview - heat exchanger for high-voltage battery



1 - Coolant hose

2 - Coolant hose

3 - Clip

4 - Bolt

- ❑ Qty. 2
- ❑ 4 Nm

5 - Rubber grommet

- ❑ Qty. 2

6 - Speed nut

- ❑ Qty. 2

7 - Heat exchanger for high-voltage battery

- ❑ Removing and installing ⇒ page 63

8 - Refrigerant line from condenser to evaporator

- ❑ Assembly overview ⇒ page 28
- ❑ Removing and installing ⇒ page 76

9 - Bolt

- ❑ Qty. 2
- ❑ 8 Nm

10 - Refrigerant line from evaporator to air conditioner compressor

- ❑ Assembly overview ⇒ page 28
- ❑ Removing and installing ⇒ page 86

11 - Nut

- ❑ 8 Nm

12 - Holder

13 - Bolt

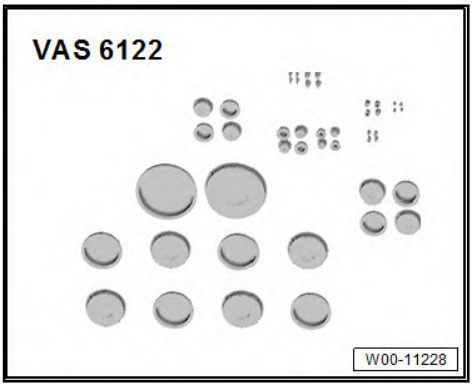
- ❑ 8 Nm

2.4 Removing and installing refrigerant circuit pressure sender -G805-

Special tools and workshop equipment required

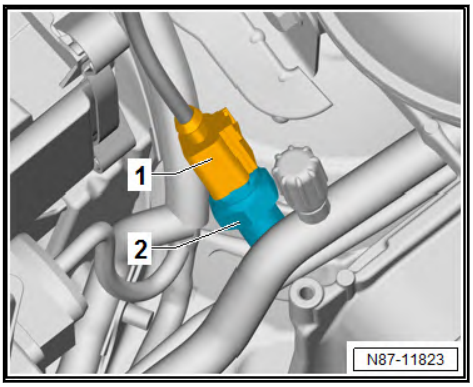
- Socket AF 24 -T40284-

- Engine bung set -VAS 6122-



Removing

– Release and disconnect electrical connector -1-.



⚠ CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant. If handled incorrectly, union could break off and refrigerant could escape.

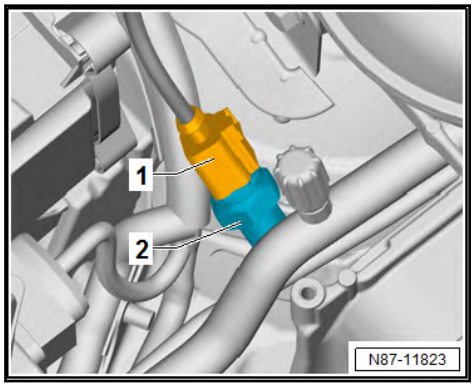
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Counterhold refrigerant lines using a suitable tool.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– Counterhold refrigerant line using a suitable tool.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.
– Unscrew pressure sender for refrigerant circuit -G805- -item 2-.



Installing

Install in reverse order of removal, observing the following:

– Renew seal.
– Moisten new seal with refrigerant oil before installing.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.
– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

Torque settings

◆ ⇒ o2.1 verview - refrigerant lines”, page 26

2.5 Removing and installing expansion valve

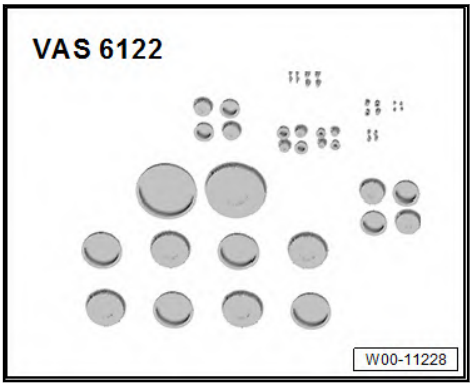
⇒ a2.5.1 nd installing expansion valve”, page 34

⇒ a2.5.2 nd installing expansion valve, GTE”, page 38

2.5.1 Removing and installing expansion valve

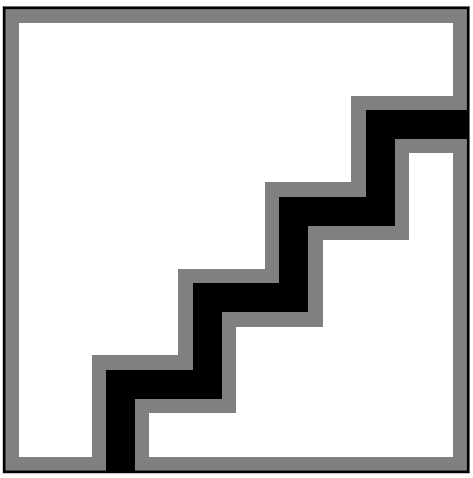
Special tools and workshop equipment required

- Engine bung set -VAS 6122-



Removing

– Remove clips -2-.



– If fitted, detach heat shield -1-.
– Unscrew clamping washers -3- and -5-.
– Fold heat shield -4- as far forwards as possible.

⚠ CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

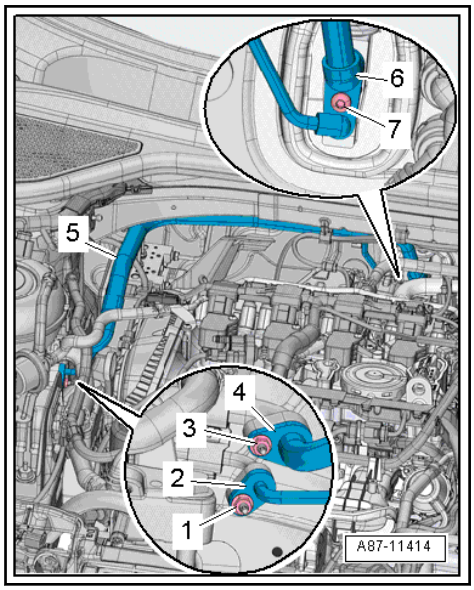
- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.
– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

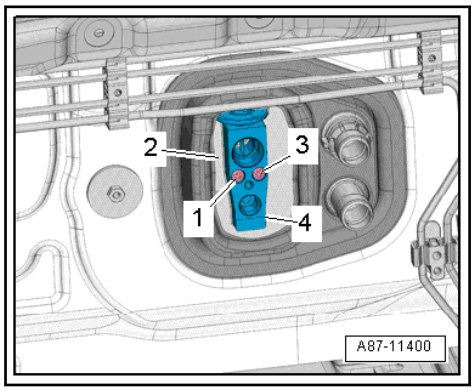
Note

The illustration shows a left-hand drive vehicle.

– Unscrew nuts -1- and -3- from refrigerant line connections -2- and -4-.



– Unscrew bolt -7-.
– Pull refrigerant line with internal heat exchanger -5- off expansion valve.
– Unscrew bolts -1- and -3-.

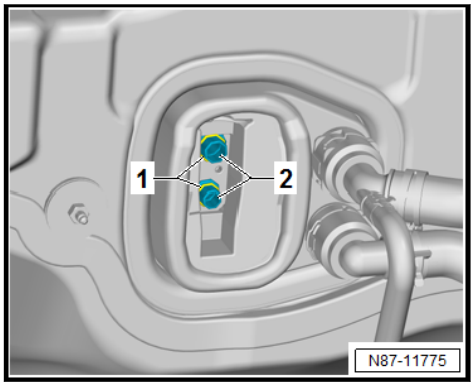


– Carefully pull expansion valve -4- out of heat insulation -2-.

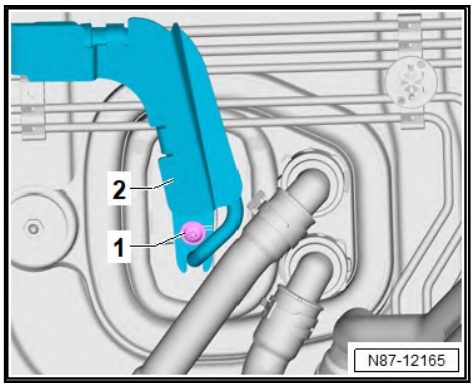
Installing

Install in reverse order of removal, observing the following:

– Moisten new seals -1- with refrigerant oil before installing.



– Check refrigerant lines and line connections on expansion valve -2- for soiling and damage.
– Insert refrigerant line with internal heat exchanger -2- by hand into expansion valve.

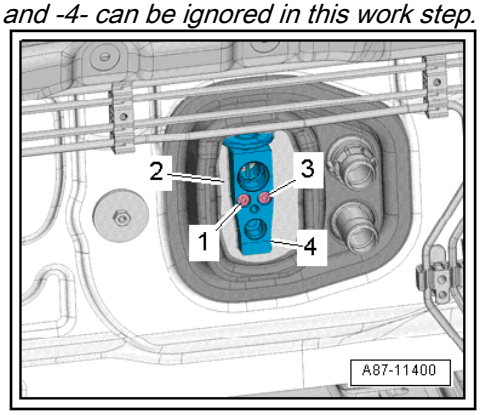


– Screw bolt -1- in by hand.
– Tighten bolt -1-.

Note

♦ *If heat insulation -2- is missing or improperly installed, it may lead to reduced performance of the air conditioning system (due to changes in the set mapped values through heat radiation).*

♦ *Items -1-, -3- and -4- can be ignored in this work step.*



NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

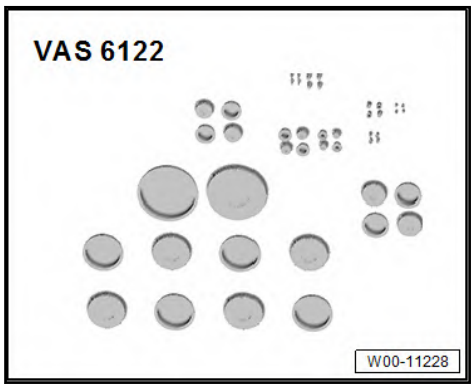
Torque settings

♦ ⇒ o2.1 verview - refrigerant lines", page 26

2.5.2 Removing and installing expansion valve, GTE

Special tools and workshop equipment required

♦ Engine bung set -VAS 6122-

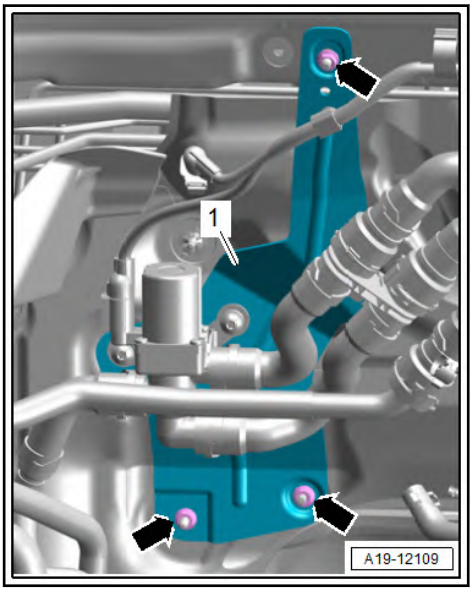


Removing

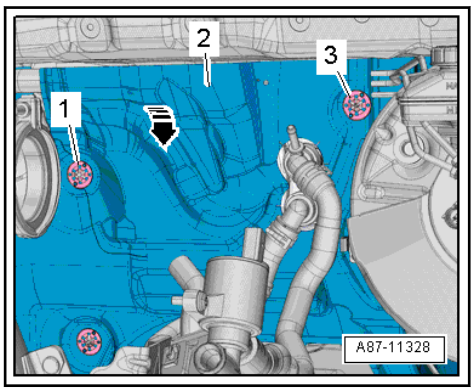
– Remove air pipe ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 21; Charge air system; Removing and installing air pipe

– Release and separate electrical connector for coolant valve for high-voltage battery -N688-.

– Unscrew nuts -arrows-.



– Detach bracket -1- from plenum chamber bulkhead and lay coolant valve for high-voltage battery -N688- to one side with coolant lines connected.
– Unscrew nuts -1- and -3-.



– Fold the heat shield -2- as far forwards as possible -arrow-.

⚠ CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

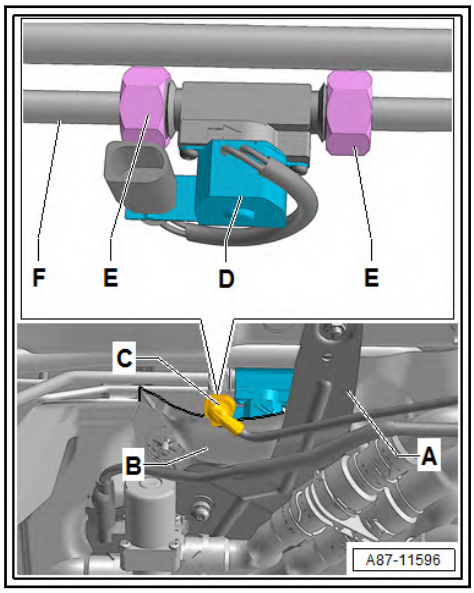
- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.
– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

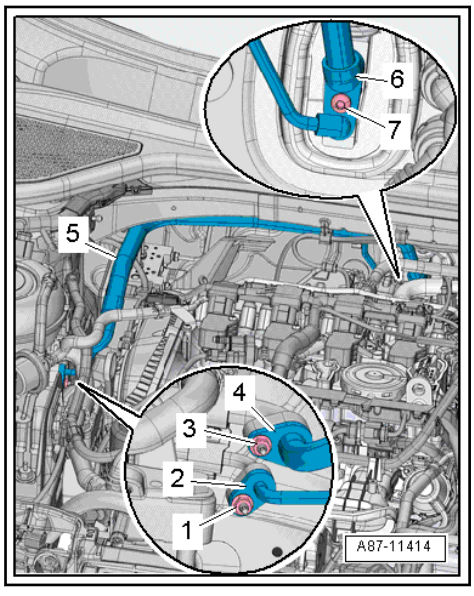
Note

On vehicles with high-voltage system, the refrigerant shut-off valve for heater and air conditioner unit -N541- is installed in the refrigerant line - high-pressure side ⇒ a2.10 nd installing refrigerant shut-off valve for heater and air conditioner unitN541", page 57 .

– Release and disconnect electrical connector -C- for refrigerant shut-off valve for heater and air conditioner unit -N541- -item D-.



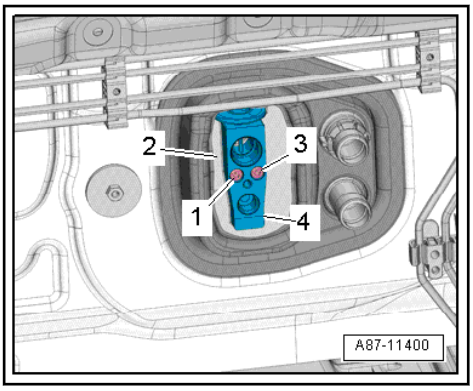
– Unscrew bolt -7-.



Note

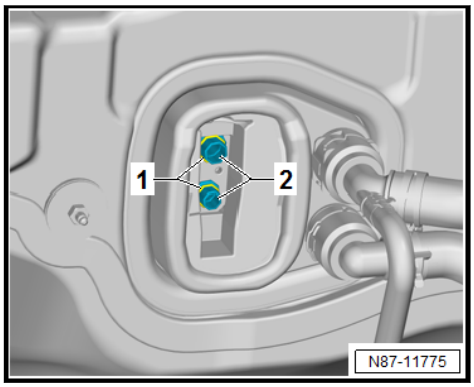
The diagram shows the configuration for vehicles without high-voltage system.

– Unscrew nuts -1- and -3- from refrigerant line with internal heat exchanger -5-.
– Pull refrigerant line with internal heat exchanger -5- off expansion valve.
– Unscrew bolts -1- and -3-.



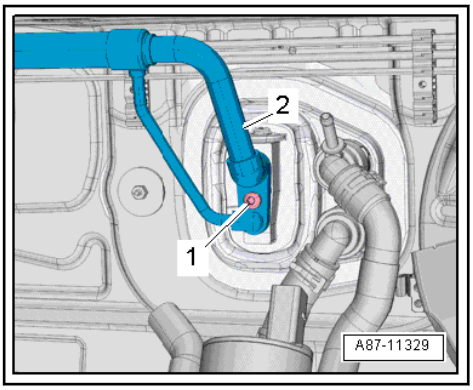
– Carefully pull expansion valve -4- out of heat insulation -2-.

Installing



Install in reverse order of removal, observing the following:

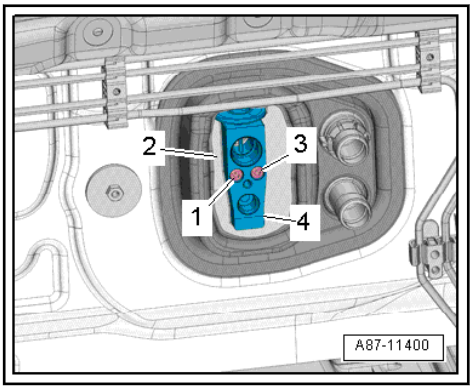
– Moisten new seals -1- with refrigerant oil before installing.
– Press new seals -1- on connecting pipes -2-.
– Check refrigerant lines for dirt and damage.
– Press refrigerant pipe -2- by hand into expansion valve.



– Start bolt -1- by hand, and only then tighten to specified torque.

Note

- *There are different versions of the expansion valve (identical housing, but different control characteristic). Allocation ⇒ Electronic parts catalogue.*
- *Ensure seals are properly seated on connecting pipes of evaporator.*
- *If heat insulation -2- is missing or improperly installed, it may lead to reduced performance of the air conditioning system (due to changes in the set mapped values through heat radiation).*



NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

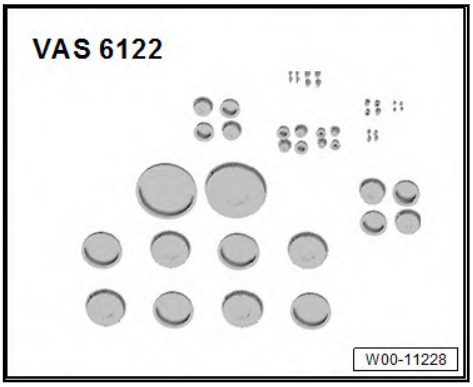
Torque settings

- ⇒ o2.1 verview - refrigerant lines”, page 26
- ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 19; Coolant pump/thermostat assembly; Removing and installing coolant valves

2.6 Removing and installing condenser

Special tools and workshop equipment required

- Engine bung set -VAS 6122-



Removing

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

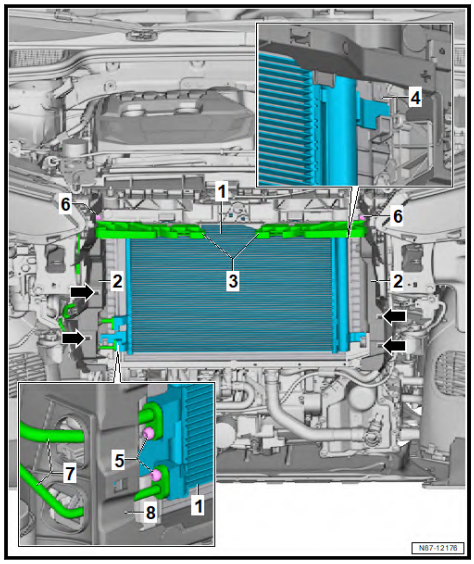
– Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Removing and installing bumper cover.

– Remove dampers from mounting points of condenser.

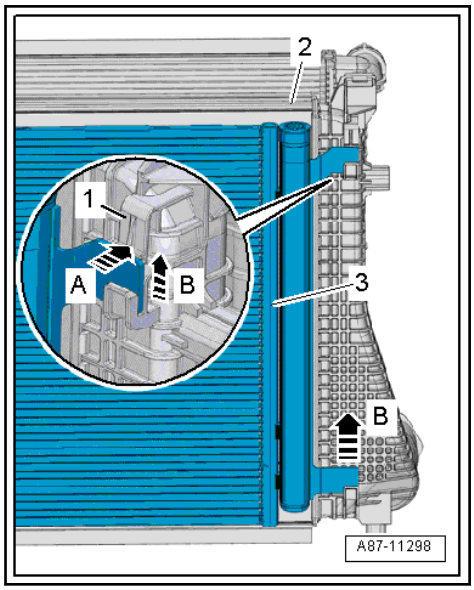
Note

For greater clarity, the impact bar is not shown in the illustration.

– Unscrew bolts -6-.



– Remove centre guide profile -3- and central support on lock carrier ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier; Assembly overview – lock carrier.
– Release air ducts -2- from mountings -arrow-.
– Remove air duct downwards.
– Unscrew bolts -5-.
– Detach refrigerant lines -7- from line connections on condenser -1-.
– Seal line connections with clean plugs from engine bung set -VAS 6122-.
– Press refrigerant lines -7- in direction of lock carrier -8-, and fix them in position if necessary.
– Release locking devices -4- on left and right.
– Guide condenser -3- via locking devices -1-, and remove it upwards -arrow B- from mountings.



– Remove condenser -3- downwards.

Installing

Install in reverse order of removal, observing the following:

– If the condenser has been renewed, 10 % of the total quantity of the refrigerant oil specified for the fitted air conditioning compressor must be filled into the refrigerant circuit ⇒ d5 ata", page 11 .

– Moisten new seals with refrigerant oil before installing refrigerant line.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

Torque settings

- ⇒ o2.2 verview - condenser", page 30
- ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier; Assembly overview – lock carrier
- ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Assembly overview – front bumper cover.

2.7 Removing and installing desiccant bag or cartridge

⇒ a2.7.1 nd installing desiccant bag, Denso condenser", page 45

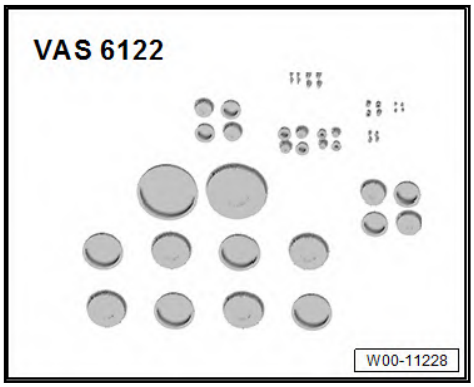
⇒ a2.7.2 nd installing desiccant bag, Modine condenser", page 49

⇒ a2.7.3 nd installing desiccant bag or cartridge, Showa/Keihin condenser", page 53

2.7.1 Removing and installing desiccant bag, Denso condenser

Special tools and workshop equipment required

- Engine bung set -VAS 6122-



- Pick-up tool/long-nosed pliers (commercially available)

Removing

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

– Remove air duct on left and right of lock carrier ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier; Assembly overview – lock carrier.

– Remove centre guide profile and central support on lock carrier ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier; Assembly overview – lock carrier.

– Remove dampers from mounting points of condenser.

Vehicles with diesel engine

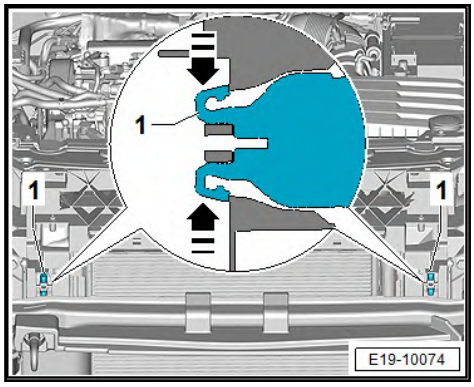
– Remove radiator cowling ⇒ Rep. gr. 19; Radiator/radiator fan; Removing and installing radiator cowling.

Continued for all vehicles

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

Vehicles with original radiator mounting carrier

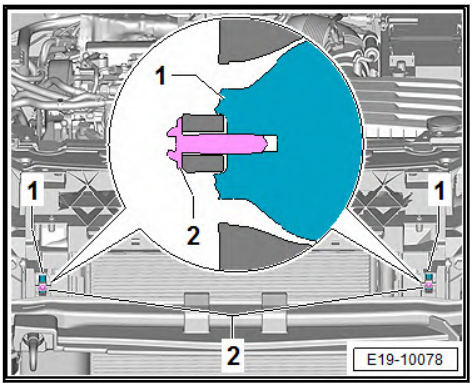


– Release fasteners -arrows- of radiator mounting -1-, or pinch them off using side cutters.

Note

The radiator mounting carrier will be reused for reinstallation. It will then be bolted to the lock carrier. Bolts ⇒ Electronic parts catalogue

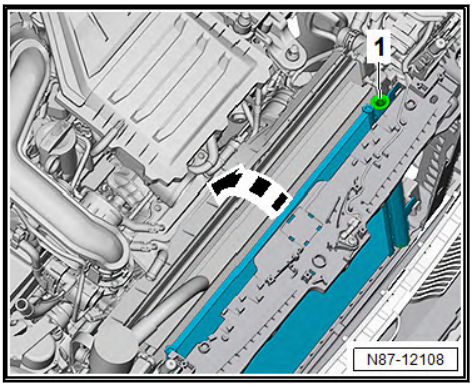
Vehicles with bolted radiator mounting carrier



– Unscrew bolts -2- of radiator mounting carrier -1-.

Continued for all vehicles

– Tilt radiator in direction of -arrow- towards engine as far as possible.



CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

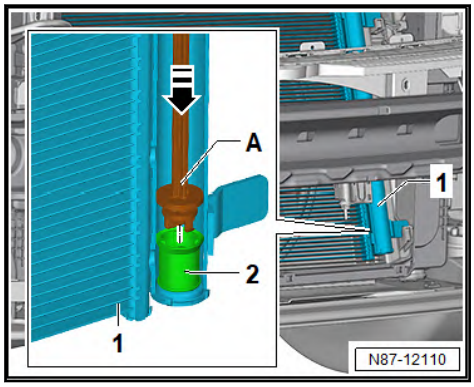
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Unscrew plug -1-.

– Using a commercially available pick-up tool, pull desiccant bag upwards out of receiver.

– Insert service tool -A- in receiver and engage with filter -2- in direction of -arrow-.



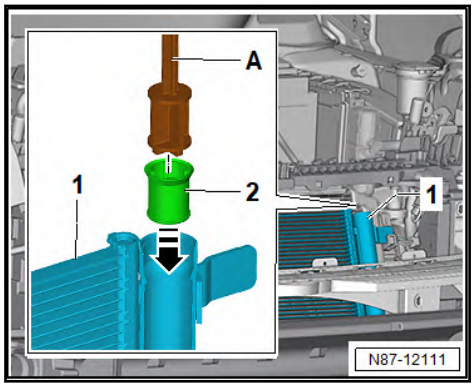
– Pull out filter -2- from condenser -1-.
– Seal open receiver with clean plugs from engine bung set -VAS 6122-.

Installing

Note

The plug, seals and desiccant bag are always to be renewed after opening the receiver ⇒ Electronic parts catalogue.

– Moisten new seals with refrigerant oil before installing refrigerant line.
– Through the opening, check threads and sealing surfaces of receiver on condenser for contamination or damage.
– Insert new filter -2- in condenser -1- in direction of -arrow- with service tool -A-.



NOTICE

If positioned incorrectly, condenser could fail.

– Place filter on base of receiver.

– Take desiccant bag out of transport bag and insert it into receiver.
– Start plug and screw in.
– Continue installation in reverse order of removal, observing the following:

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

– Commissioning air conditioning system after charging refrigerant circuit ⇒ page 56 .

Torque settings

Component	Specified torque
Plug	5 Nm

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

♦ ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Assembly overview – bumper cover

♦ ⇒ General body repairs, exterior; Rep. gr. 66; Radiator grille/front trim; Assembly overview – radiator grille

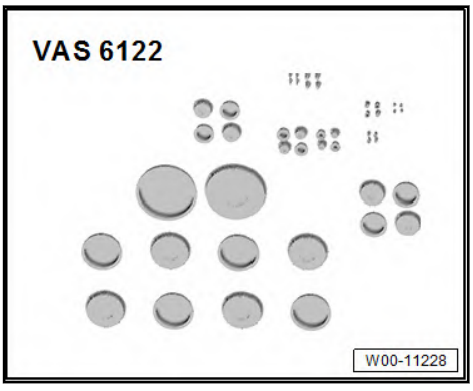
Vehicles with diesel engine

♦ ⇒ Rep. gr. 19; Radiator/radiator fan; Removing and installing radiator cowl

2.7.2 Removing and installing desiccant bag, Modine condenser

Special tools and workshop equipment required

♦ Engine bung set -VAS 6122-



♦ Socket T50

♦ Pick-up tool/long-nosed pliers (commercially available)

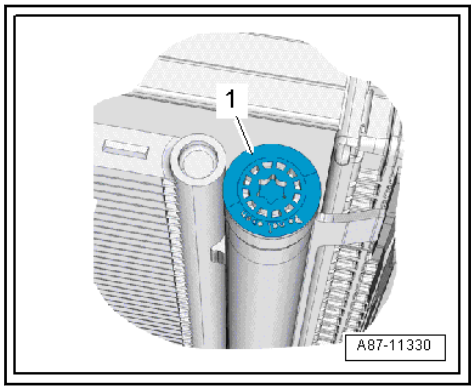
♦ M12 bolt

♦ Welding wire (2 mm in diameter)

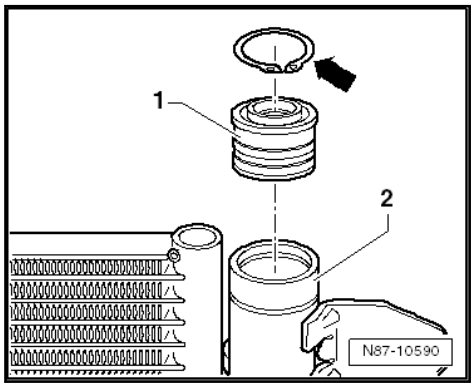
Removing

– Remove condenser ⇒ page 42 .

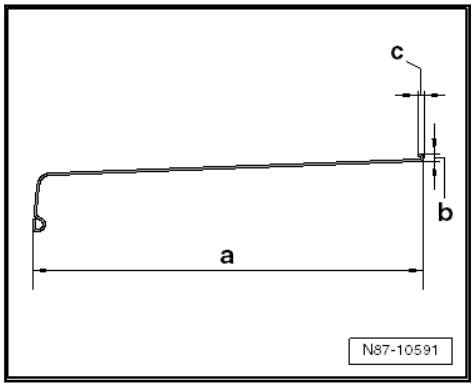
– Unscrew protective cap -1- using socket insert T50.



– Slightly press sealing cap -1- into receiver -2-.



– Remove circlip -arrow-.
– Screw M12 bolt into sealing cap, and carefully pull bolt and cap together out of receiver -2-.
– Using a commercially available pick-up tool, pull desiccant bag upwards out of receiver -2-.
– Manufacture tool from welding wire (2 mm ∅) according to following dimensions.

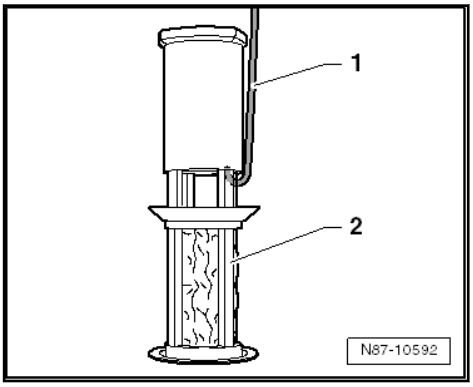


a - 380 mm

b - max. 7 mm

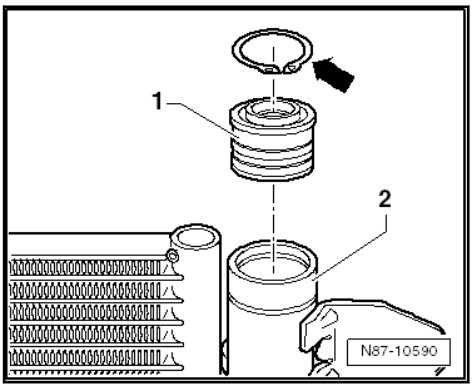
c - max. 6 mm

To prevent damage to receiver, hook welding wire into strainer as shown in illustration.



– Using welding wire -1-, carefully pull strainer -2- out of receiver.

– If repair work is interrupted, seal open receiver with plug -1- to prevent ingress of dirt and moisture.



Installing

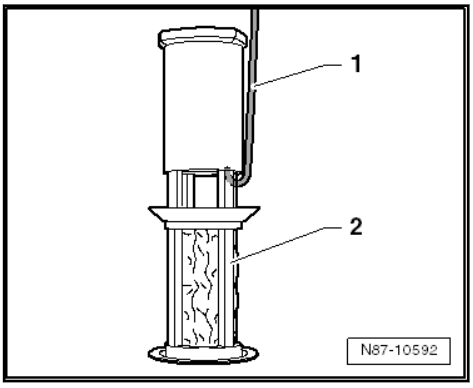
Install in reverse order of removal, observing the following:

Note

The protective cap, seals and desiccant bag are always to be renewed after opening the receiver ⇒ Electronic parts catalogue.

– Through opening, check threads and sealing surfaces of receiver on condenser for contamination or damage.

– Using welding wire -1-, carefully insert strainer -2- into receiver.



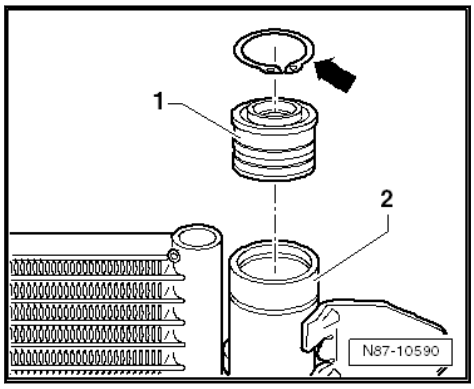
- The filter element (with strainer -2-) must be inserted as far as stop.

Note

Keep the air-tight transport bag, in which the desiccant bag is delivered, sealed as long as possible. Only open transport bag immediately before inserting the desiccant bag into the condenser. After the transport bag has been opened, the desiccant bag will become saturated with moisture within a short time and is then unusable.

– Take desiccant bag out of transport bag and insert it into receiver.

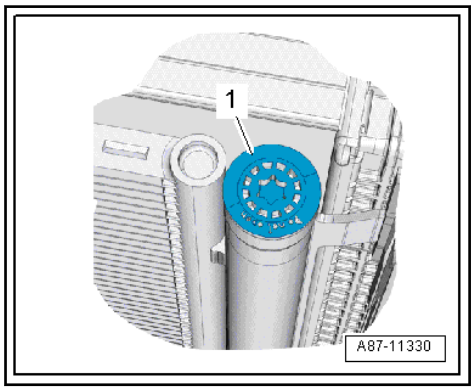
– Insert sealing cap -1-, and press it downwards until retaining ring -arrow- can engage in groove.



Note

Moisten seal of protective cap with refrigerant oil before installing.

– Screw in protective cap -1- using socket insert T50.



– Moisten new seals with refrigerant oil before installing refrigerant line.

Torque settings

Component	Specified torque
Plug	3 Nm

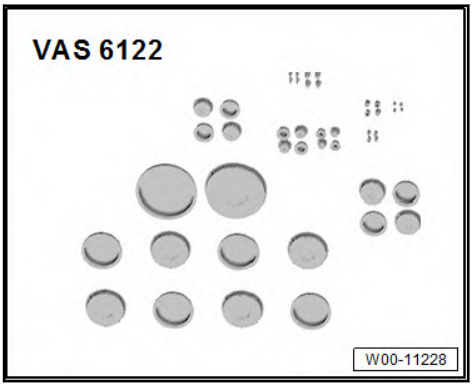
- ⇒ o2.2 verview - condenser", page 30
- ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier; Assembly overview – lock carrier

- ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Assembly overview – bumper cover
- ⇒ General body repairs, exterior; Rep. gr. 66; Radiator grille/ front trim; Assembly overview – radiator grille

2.7.3 Removing and installing desiccant bag or cartridge, Showa/Keihin condenser

Special tools and workshop equipment required

- Engine bung set -VAS 6122-

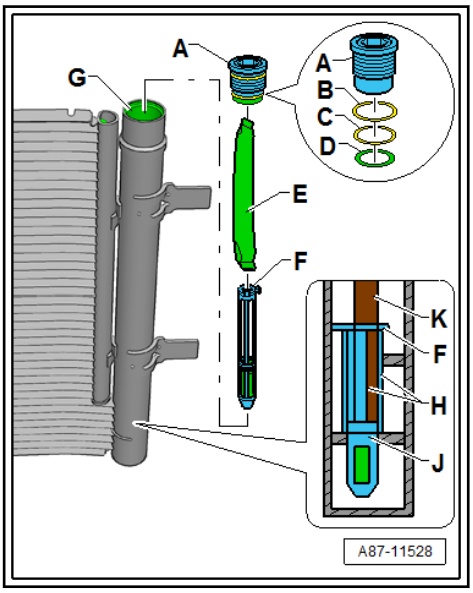


- Socket T50

Removing

– Remove condenser ⇒ page 42 .

– Unscrew plug -A- with seals -B-, -C- and -D-.



– Pull desiccant cartridge -E- upwards out of receiver.

– Seal open receiver with a cap -A- to prevent ingress of dirt and moisture.

Installing

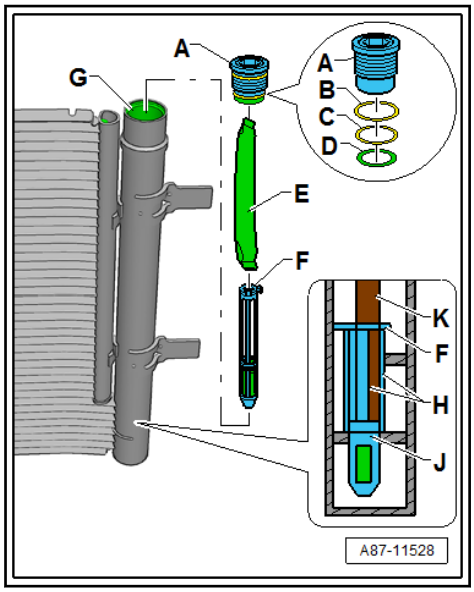
Install in reverse order of removal, observing the following:

Note

The protective cap, seals and desiccant bag are always to be renewed after opening the receiver ⇒ Electronic parts catalogue.

– Through opening, check threads and sealing surfaces of receiver on condenser for contamination or damage.

– Assemble plug -A- with seals -B-, -C- and -D-.



– Take desiccant cartridge -E- out of transport bag, and insert it in receiver.

– Fit and screw in the screw plug -A-.

Torque settings

Component	Specified torque
Plug	5 Nm

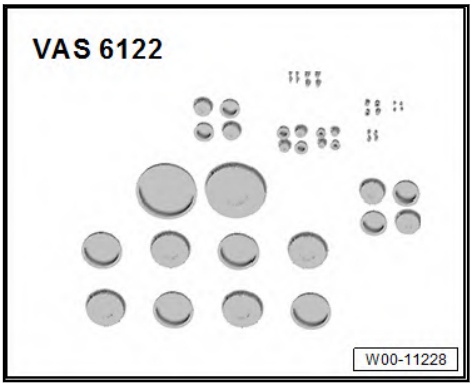
- ⇒ o2.2 verview - condenser", page 30
- ⇒ General body repairs, exterior; Rep. gr. 50; Lock carrier; Assembly overview – lock carrier
- ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Assembly overview – bumper cover
- ⇒ General body repairs, exterior; Rep. gr. 66; Radiator grille/ front trim; Assembly overview – radiator grille

2.8 Removing and installing evacuating and charging valves on low and high-pressure side

Special tools and workshop equipment required

- Socket -T10364/4A- (not shown in illustration)

- Engine bung set -VAS 6122-



Removing

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

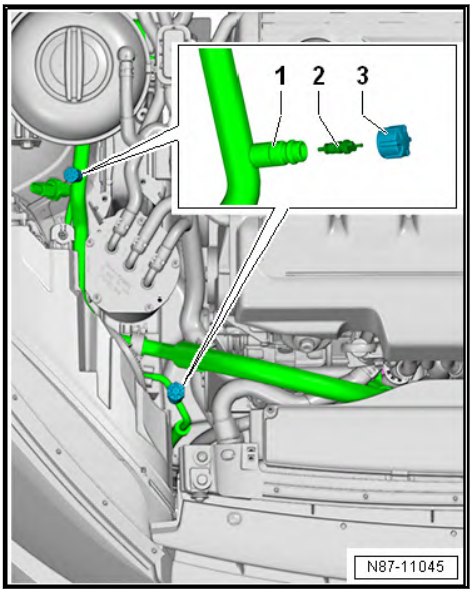
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

– Unscrew protective cap -3-.



– Unscrew valve insert -2- with bit -T10364/4A- from refrigerant line -1-.

Installing

Install in reverse order of removal, observing the following:

– Clean connections, and check for damage.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

Torque settings

◆ ⇒ o2.1 verview - refrigerant lines", page 26

2.9 Commissioning air conditioning system after filling refrigerant circuit

NOTICE

Risk of damage to air conditioner compressor. There may be an accumulation of refrigerant oil in the compression chamber of a removed air conditioner compressor.

– After installing a new air conditioner compressor or adding new refrigerant oil, fully turn the air conditioner compressor 10 times by hand before the poly V-belt is fitted.

– Start engine with air conditioner compressor switched off (version with magnetic clutch).

– Set air conditioner compressor to lowest possible output.

– Wait until idling speed has stabilised:

– Switch on air conditioner compressor, and let system run for at least 2 minutes at idling speed.

NOTICE

Risk of damage to the air conditioner compressor or air conditioner service station.

Opening the valves with the air conditioning system switched on can cause a short circuit between the high pressure and low pressure side.

– Never open valves on the high pressure or low pressure side with the air conditioning system switched on.

– If necessary, check pressures in refrigerant circuit using air conditioning service station.

– Switch off engine.

– Turn out handwheel on quick-release coupling adapter.

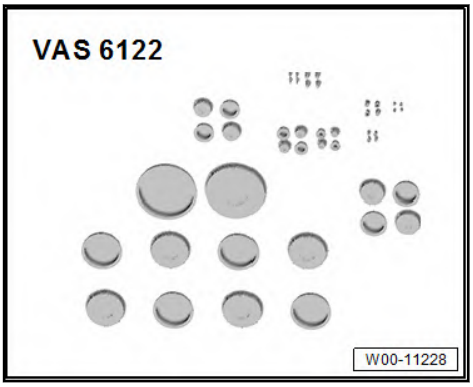
– Detach the charging hose from the refrigerant circuit.

– Screw protective caps back in.

2.10 Removing and installing refrigerant shut-off valve for heater and air conditioner unit -N541-

Special tools and workshop equipment required

- Engine bung set -VAS 6122-

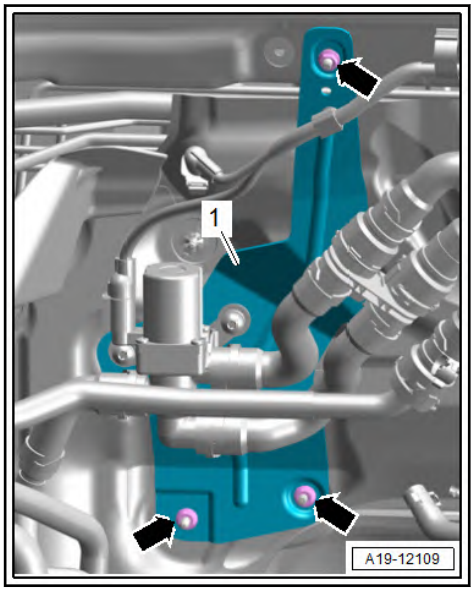


Removing

– Remove air pipe ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 21; Charge air system; Removing and installing air pipe

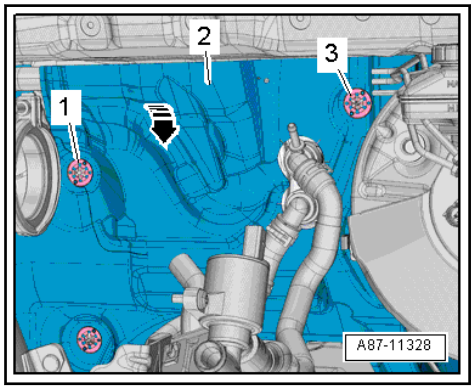
– Release and separate electrical connector for coolant valve for high-voltage battery -N688-.

– Unscrew nuts -arrows-.



– Detach bracket -1- from plenum chamber bulkhead and lay coolant valve for high-voltage battery -N688- to one side with coolant lines connected.

– Unscrew nuts -1- and -3-.



– Fold the heat shield -2- as far forwards as possible -arrow-.

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

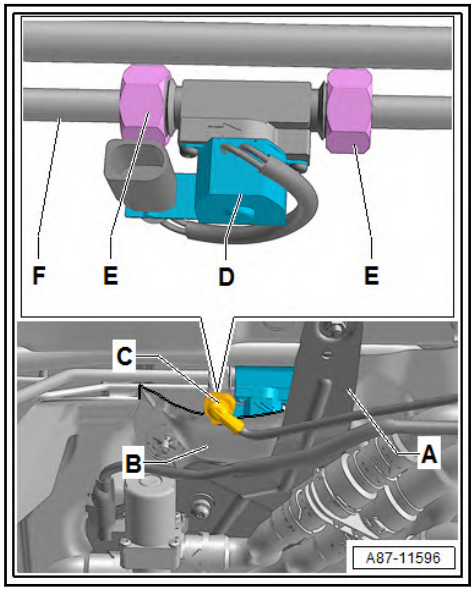
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

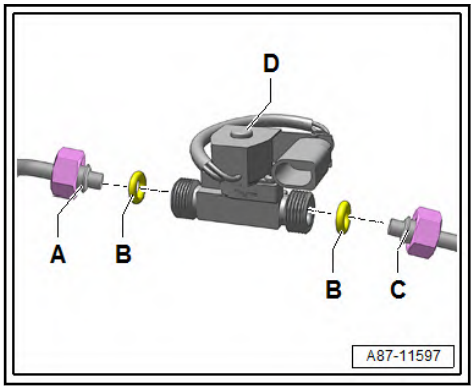
– Release and disconnect connector -C-.



– Loosen union nuts -E-. When doing this, counterhold on refrigerant shut-off valve for heater and air conditioner unit -N541- -item D-.

– Detach refrigerant line -F- (leading to connection on right longitudinal member) from retainer on plenum chamber bulkhead.

– Remove refrigerant shutoff valve for heater and air conditioner unit -N541- -item D-.



Installing

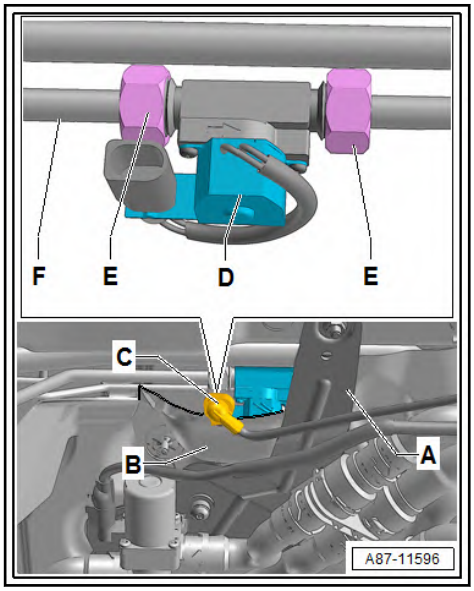
Install in the reverse order of removal, observing the following:

Note

- *Adhere to the installation instructions for seals -B- ⇒ page 9 .*
- *Check routing of refrigerant lines after attaching them. The refrigerant lines must be inserted in the retainers provided and not make contact with any other components.*

– Renew seals -B-; for correct version refer to ⇒ Electronic parts catalogue.

– Screw on union nuts -E- to stop by hand.



– Secure refrigerant line -F- (leading to connection on right longitudinal member) in retainer on plenum chamber bulkhead.

– Tighten union nuts -E-. When doing this, counterhold on refrigerant shut-off valve for heater and air conditioner unit -N541- -item D- and ensure that refrigerant lines are free of stress.

Note

- *When tightening the union nuts, make sure that the refrigerant lines remain free of stress.*
- *Check routing of refrigerant lines after attaching them. The refrigerant lines must be inserted in the retainers provided and not make contact with any other components.*

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

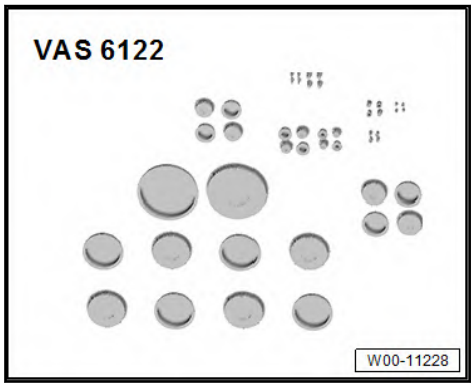
Torque setting

- ⇒ o2.1.2 verview - refrigerant lines, GTE”, page 28
- ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 19; Coolant pump/thermostat assembly; Removing and installing coolant valves

2.11 Removing and installing refrigerant shut-off valve for high-voltage battery heat exchanger -N542-

Special tools and workshop equipment required

- Engine bung set -VAS 6122-



Removing

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

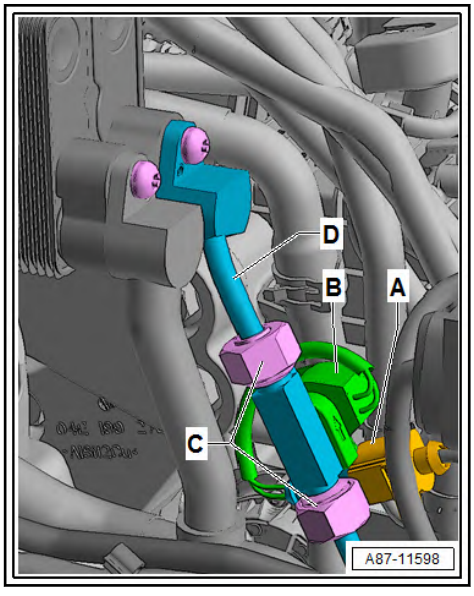
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

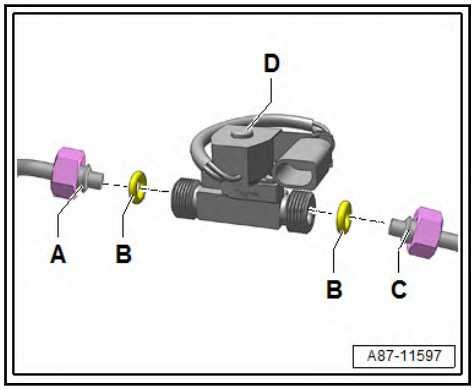
– Release and disconnect connector -A-.



– Loosen union nuts -C-. When doing this, counterhold on refrigerant shut-off valve for high-voltage battery heat exchanger -N542- -item B-.

– Remove refrigerant line -D- from heat exchanger for high-voltage battery.

– Remove refrigerant shut-off valve for high-voltage battery heat exchanger -N542- -item D-.



Installing

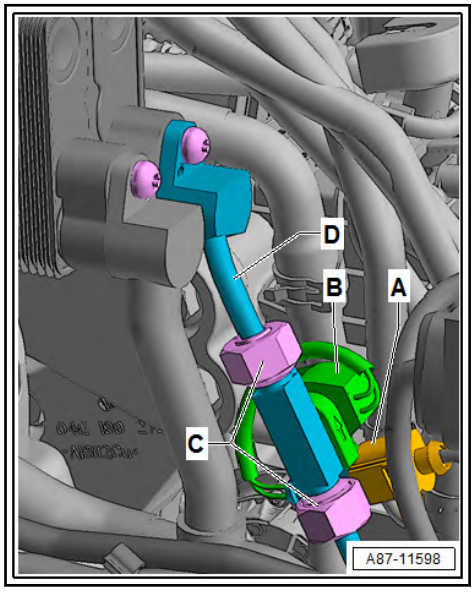
Install in the reverse order of removal, observing the following:

Note

- *Adhere to the installation instructions for seals -B- ⇒ page 9 .*
- *Check routing of refrigerant lines after attaching them. The refrigerant lines must be inserted in the retainers provided and not make contact with any other components.*

– Renew seals -B-; for correct version refer to ⇒ Electronic parts catalogue.

– Check restrictor in refrigerant line -D- (leading to heat exchanger for high-voltage battery) for soiling and damage.



– Screw on union nuts -C- to stop by hand.

– Install refrigerant line -D- on heat exchanger for high-voltage battery.

– Tighten union nuts -C-. When doing this, counterhold on refrigerant shut-off valve for heater and air conditioner unit -N541- -item B- and ensure that refrigerant lines are free of stress.

Note

- *When tightening the union nuts, make sure that the refrigerant lines remain free of stress.*
- *Check routing of refrigerant lines after attaching them. The refrigerant lines must be inserted in the retainers provided and not make contact with any other components.*

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

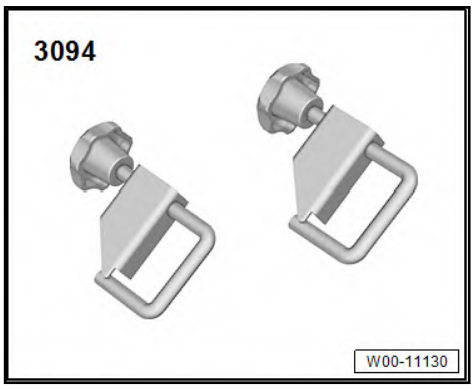
Torque settings

- ⇒ o2.1.2 verview - refrigerant lines, GTE”, page 28

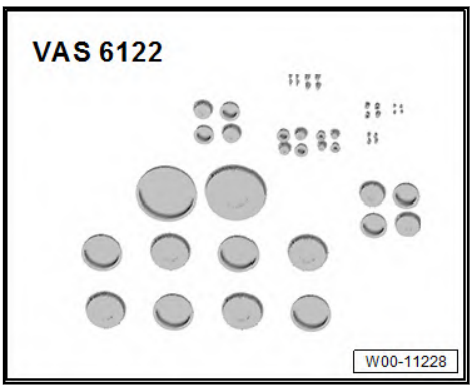
2.12 Removing and installing heat exchanger for high-voltage battery

Special tools and workshop equipment required

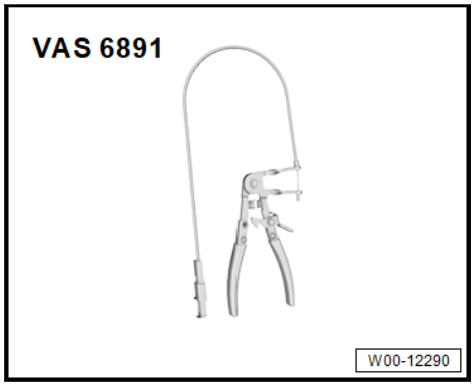
- Hose clamps to 25 mm -3094-



- Engine bung set -VAS 6122-



- Pliers for spring-type clips -VAS 6891-



- Cooling system tester -V.A.G 1274 B-

Removing

– Switch off ignition.

⚠ CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

CAUTION

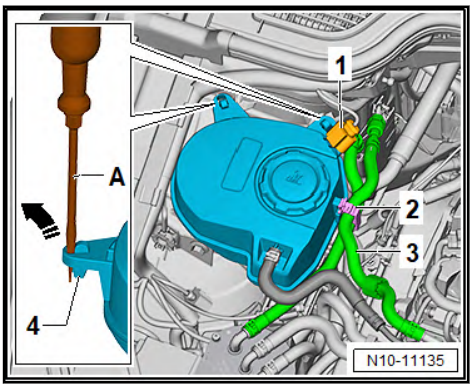
The cooling system is under high pressure when the engine is hot. Danger of scalding by steam and hot coolant.

There is a risk of injury to the skin and parts of the body due to scalding.

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

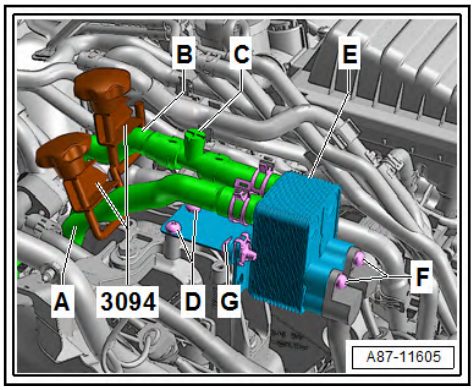
– Open filler cap on coolant expansion tank for high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant.

– Release and disconnect electrical connector -1- on coolant expansion tank.



– Using a screwdriver -A-, release fasteners -4- and move coolant expansion tank to one side.

– Clamp off coolant hoses -A- and -B- using hose clamps, up to 25mm -3094-.



Note

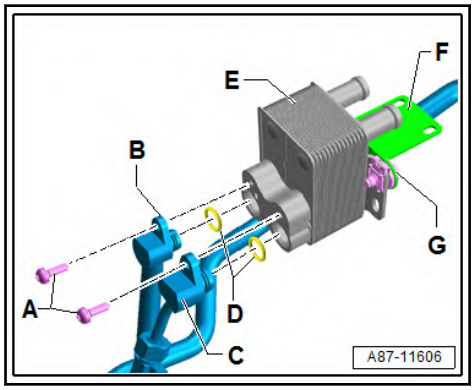
The heat exchanger is designed for a particular direction of flow of the coolant. Therefore, the coolant hoses must not be interchanged when connecting them.

– Cover area beneath connections for coolant hoses on heat exchanger -E- with absorbent paper.

– Disconnect coolant hoses -A- and -B- from connections on heat exchanger -E-.

– Unscrew bolts -F- and -D-.

– Detach heat exchanger -C- from refrigerant lines -B- and -C-, and remove it together with bracket -F-.



Note

Bracket -F- is secured to the heat exchanger -E- with 2 bolts -G-.

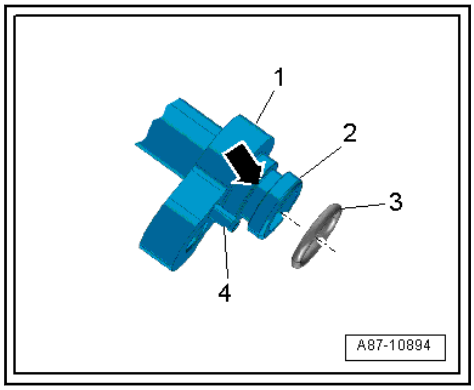
Installing

Install in reverse order of removal, observing the following:

Note

Adhere to the installation instructions for seals -B- ⇒ page 9 .

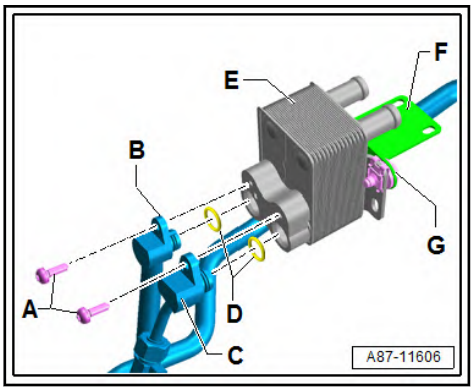
– Renew seals -D-; for correct version refer to ⇒ Electronic parts catalogue.
– Check connections of refrigerant lines -B- and -C- and on heat exchanger -E- for soiling and damage.
– Insert seal -3- into groove -arrow- on connection of refrigerant line -1-.



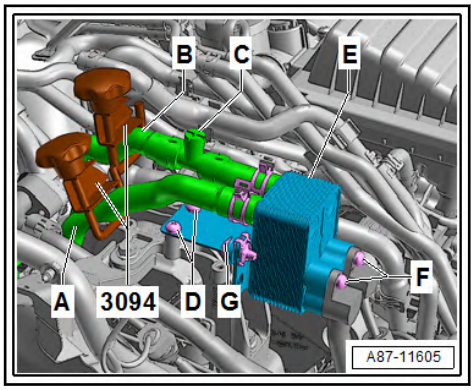
– If present, check to ensure that dowel pin -4- is correctly seated and not damaged.

Note

Bracket -F- is secured to the heat exchanger -E- with 2 bolts -G-. If the bolts -G- were loosened, insert these bolts (but do not tighten yet).



– Install refrigerant lines -B- and -C- to heat exchanger -E-, and secure them with bolts -A- (do not tighten bolts -A- yet).
– Align heat exchanger -E- free of stress, and insert bolts -D-.



– Tighten bolts -G-.
– Tighten bolts -D-.
– Tighten bolts -F-.
– Connect coolant hoses -A- and -B- to connections on heat exchanger -E-.
– Fill coolant in coolant expansion tank for high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant.
– Slightly increase pressure in coolant expansion tank for high-voltage system using e.g. cooling system tester -V.A.G 1274 B- ⇒ Rep. gr. 19; Cooling system, coolant.
– Carefully open bleeder valve -C-.
– Carefully open hose clamps to 25 mm -3094- on coolant hose -A- and allow coolant to flow into heat exchanger -E-.
– As soon as coolant escapes from bleeder valve -C-, close bleeder valve -C-.

Note

If the heat exchanger for high-voltage battery -E- has been removed and installed as described above, there should not be any air in the coolant circuit of the high-voltage system. If, however, there is still air in the coolant circuit, bleed coolant circuit ⇒ Rep. gr. 19; Cooling system, coolant.

- If necessary, fill coolant in coolant expansion tank for high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant.
- Remove hose clamps to 25mm -3094-.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

- **Never start the engine if the refrigerant circuit is empty.**

- Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.
- Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.
- Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

Torque settings

- ⇒ o2.1.2 verview - refrigerant lines, GTE”, page 28

2.13 Removing and installing refrigerant line with internal heat exchanger

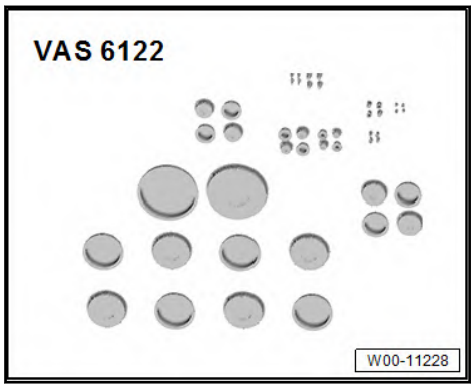
⇒ a2.13.1 nd installing refrigerant line with internal heat exchanger”, page 68

⇒ a2.13.2 nd installing refrigerant lines with internal heat exchanger, GTE”, page 71

2.13.1 Removing and installing refrigerant line with internal heat exchanger

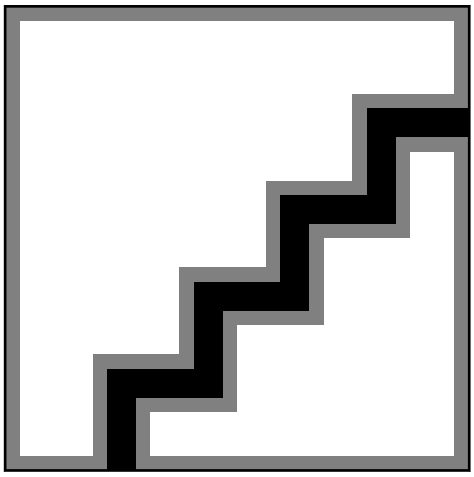
Special tools and workshop equipment required

- Engine bung set -VAS 6122-



Removing

– Remove clips -2-.



– If fitted, detach heat shield -1-.

– Unscrew clamping washers -3- and -5-.

– Fold heat shield -4- as far forwards as possible.

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

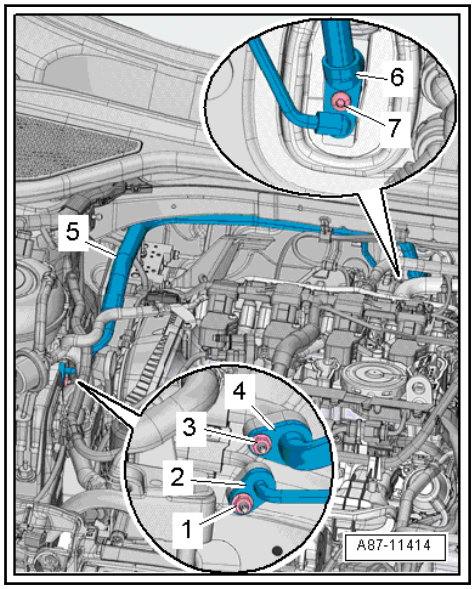
– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

Note

The illustration shows a left-hand drive vehicle.

– Unscrew bolt -7-.



– Unscrew nuts -1- and -3- and pull off refrigerant lines -2- and -4-.
– Pull off refrigerant line -6- with internal heat exchanger from expansion valve.
– Remove refrigerant line -5- with internal heat exchanger.

Installing

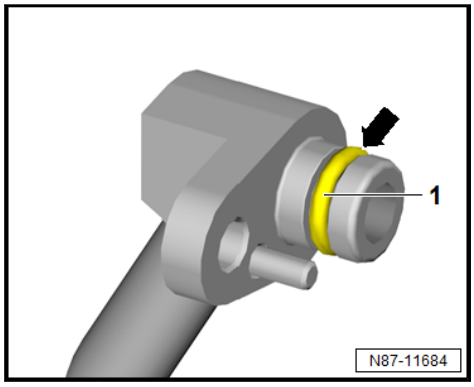
Install in reverse order of removal, observing the following:

– Clean connections, and check for damage.
– Thoroughly clean connections of refrigerant lines and check lines for damage.

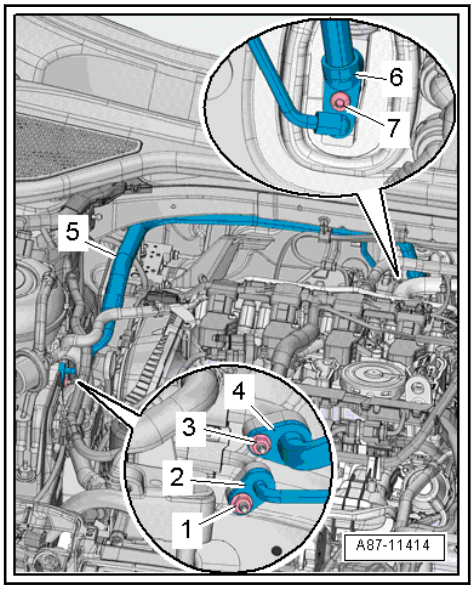
Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Ensure proper seating of seal -1- in groove -arrow- of respective refrigerant line.



– Insert internal heat exchanger -5- at expansion valve.



Note

The illustration shows a left-hand drive vehicle.

– Tighten bolt -7-.
– Connect refrigerant lines -2- and -4- with internal heat exchanger to connections.
– Screw on nuts -1- and -3- and tighten them.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.
– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

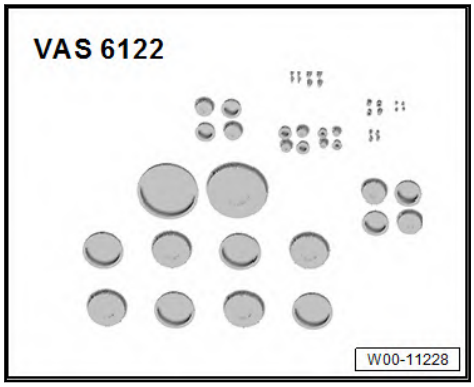
Torque settings

♦ ⇒ o2.1 verview - refrigerant lines”, page 26

2.13.2 Removing and installing refrigerant lines with internal heat exchanger, GTE

Special tools and workshop equipment required

- Engine bung set -VAS 6122-

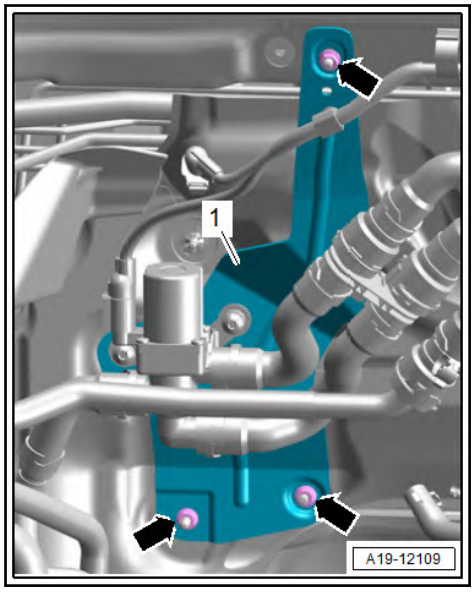


Removing

– Remove air pipe ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 21; Charge air system; Removing and installing air pipe

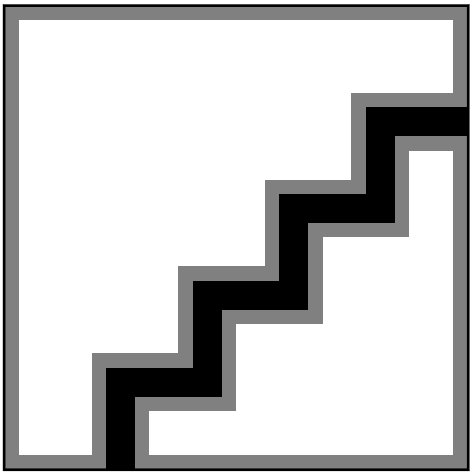
– Release and separate electrical connector for coolant valve for high-voltage battery -N688-.

– Unscrew nuts -arrows-.



– Detach bracket -1- from plenum chamber bulkhead and lay coolant valve for high-voltage battery -N688- to one side with coolant lines connected.

– Remove clips -2-.



– If fitted, detach heat shield -1-.
– Unscrew clamping washers -3- and -5-.
– Fold heat shield -4- as far forwards as possible.

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

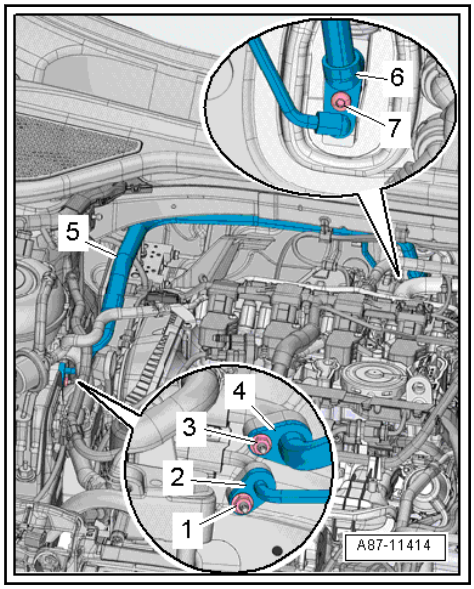
- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.
– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

Note

The illustration shows a left-hand drive vehicle.

– Unscrew bolt -7-.



– Unscrew nuts -1- and -3- and pull off refrigerant lines -2- and -4-.
– Pull off refrigerant line -6- with internal heat exchanger from expansion valve.
– Remove refrigerant line -5- with internal heat exchanger.

Installing

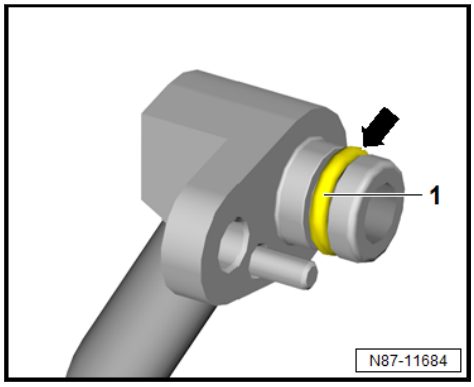
Install in reverse order of removal, observing the following:

– Clean connections, and check for damage.
– Thoroughly clean connections of refrigerant lines and check lines for damage.

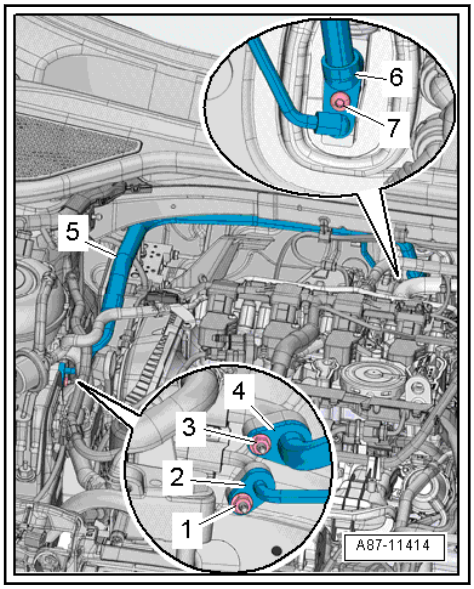
Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Ensure proper seating of seal -1- in groove -arrow- of respective refrigerant line.



– Insert refrigerant lines with internal heat exchanger -5- on expansion valve.



Note

The illustration shows a left-hand drive vehicle.

– Tighten bolt -7-.
– Connect refrigerant lines -2- and -4- with internal heat exchanger to connections.
– Screw on nuts -1- and -3- and tighten them.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.
– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

Torque settings

- ⇒ o2.1.2 verview - refrigerant lines, GTE", page 28
- ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 19; Coolant pump/thermostat assembly; Removing and installing coolant valves

2.14 Removing and installing refrigerant line from air conditioner compressor to evaporator

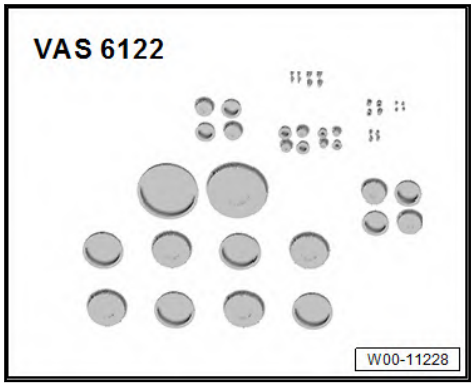
⇒ a2.14.1 nd installing refrigerant line from air conditioner compressor to evaporator", page 76

⇒ a2.14.2 nd installing refrigerant line from condenser to evaporator/heat exchanger for high voltage battery, GTE", page 79

2.14.1 Removing and installing refrigerant line from air conditioner compressor to evaporator

Special tools and workshop equipment required

- Engine bung set -VAS 6122-

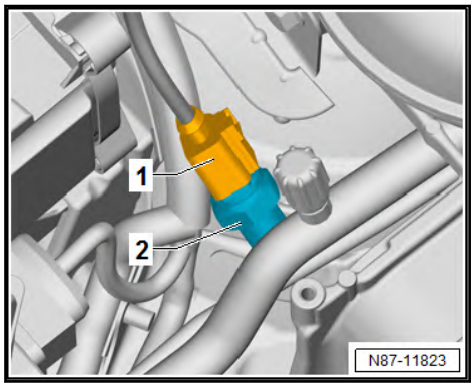


Removing

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

– Remove right engine mounting ⇒ Rep. gr. 10; Assembly mountings; Assembly overview - assembly mountings.

– Release and disconnect electrical connector -1- of pressure sender for refrigerant circuit -G805- -item 2-.



CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

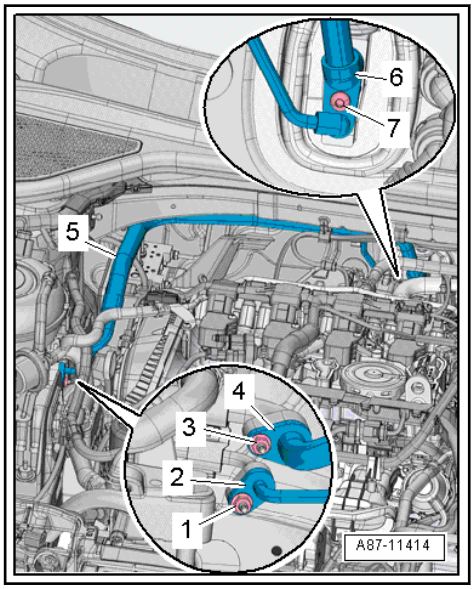
– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

Note

The illustration shows a left-hand drive vehicle.

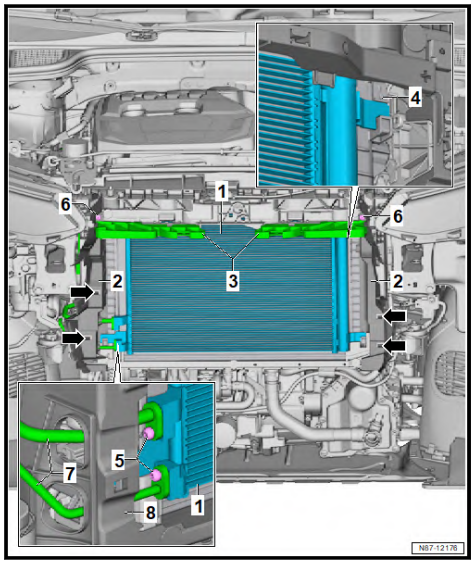
– Unscrew nuts -1- and -3-.



– Pull off refrigerant lines -2- and -4-.

– Unclip refrigerant line from evaporator to air conditioner compressor and lay aside.

– Unscrew bolt -5- of lower refrigerant line -7-.



– Pull lower refrigerant line -7- off condenser -1-.
– Unclip refrigerant line from retainers, and remove it.
– Disregard items -2-, -3-, -4-, -6- and -8- for this work step.

Installing

Install in reverse order of removal, observing the following:

Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Clean connections, and check for damage.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.
– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

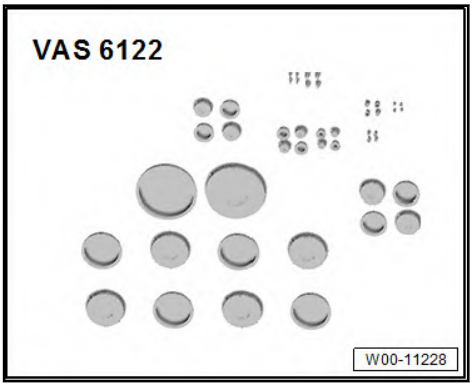
Torque settings

- ⇒ o2.1 verview - refrigerant lines", page 26
- ⇒ Rep. gr. 10; Assembly mountings; Assembly overview - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Removing and installing bumper cover

2.14.2 Removing and installing refrigerant line from condenser to evaporator/heat exchanger for high voltage battery, GTE

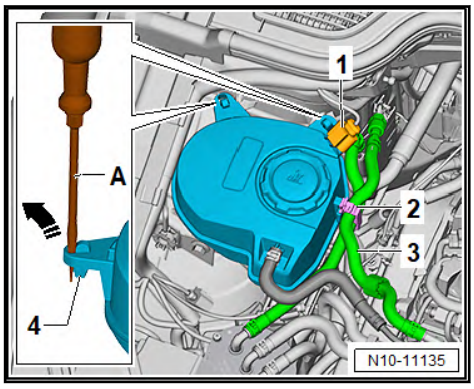
Special tools and workshop equipment required

- Engine bung set -VAS 6122-



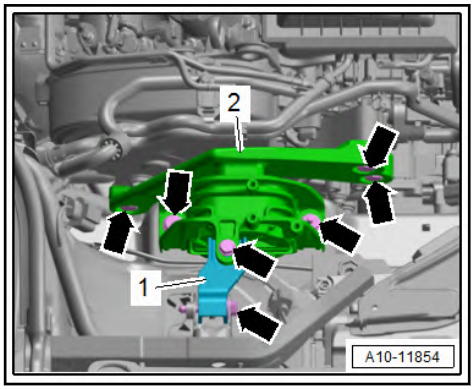
Removing

– Release and disconnect electrical connector -1- on coolant expansion tank.

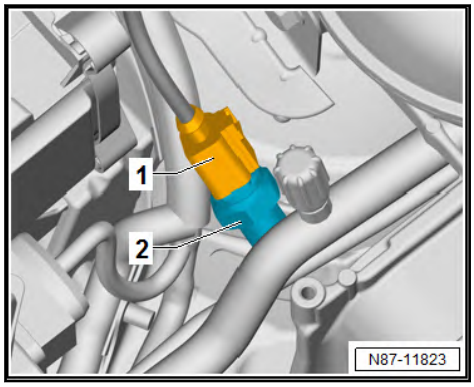


– Using a screwdriver -A-, release fasteners -4- and move coolant expansion tank to one side.

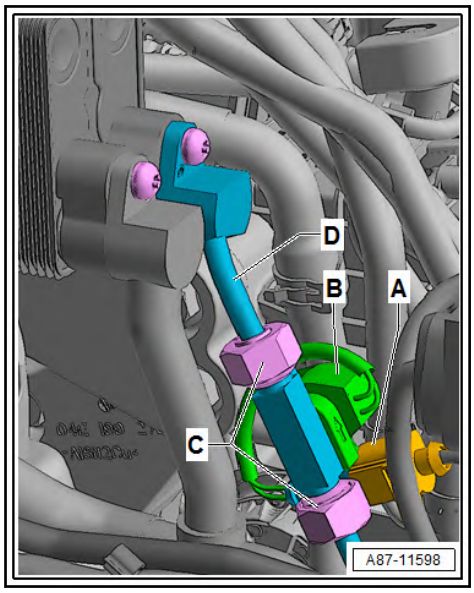
– Remove bracket -1- ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 10; Assembly mountings; Removing and installing engine mounting.



– Release and disconnect electrical connector -1- for pressure sender for refrigerant circuit -G805- -item 2-.



– Release and disconnect electrical connector -A- for refrigerant shut-off valve for high-voltage battery heat exchanger -N542- -item B-.



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

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

⚠ CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

There is a risk of injury to the skin and parts of the body due to freezing.

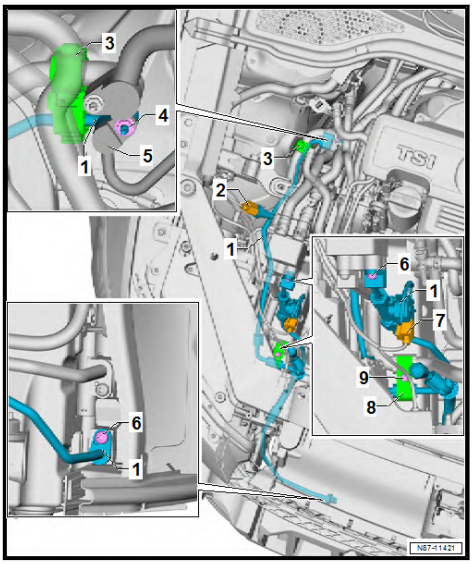
- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working

with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

– Unscrew nut -4-.



– Remove refrigerant line -5-.

– Unscrew bolts -6-.

– Separate connectors -2- and -7-.

– Unclip refrigerant line -1- from retainers -3-.

– Loosen bolt -9-, and remove retainer -8-.

– Remove refrigerant line -1-.

Installing

Install in reverse order of removal, observing the following:

Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Clean connections, and check for damage.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

Torque settings

- ⇒ o2.1 verview - refrigerant lines", page 26
- ⇒ Rep. gr. 10; Assembly mountings; Assembly overview - assembly mountings
- ⇒ General body repairs, exterior; Rep. gr. 63; Front bumper; Removing and installing bumper cover

2.15 Removing and installing refrigerant line from air conditioner compressor to condenser

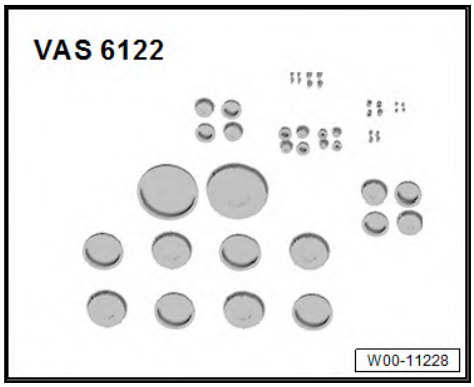
⇒ a2.15.1 nd installing refrigerant line from air conditioner compressor to condenser", page 82

⇒ a2.15.2 nd installing refrigerant line from air conditioner compressor to condenser, GTE", page 84

2.15.1 Removing and installing refrigerant line from air conditioner compressor to condenser

Special tools and workshop equipment required

- Engine bung set -VAS 6122-



Removing

– Depending on engine, remove parts of air filter ⇒ Rep. gr. 24; Air filter; Assembly overview - air filter housing or ⇒ Rep. gr. 23; Air filter; Assembly overview - air filter housing.

– Depending on engine, remove parts of air duct ⇒ Rep. gr. 24; Intake manifold; Assembly overview - intake manifold or ⇒ Rep. gr. 23; Intake manifold; Assembly overview - intake manifold.

– Depending on engine, remove relevant parts of the charge air system ⇒ Rep. gr. 21; Turbocharger; Charge air system.

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

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

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

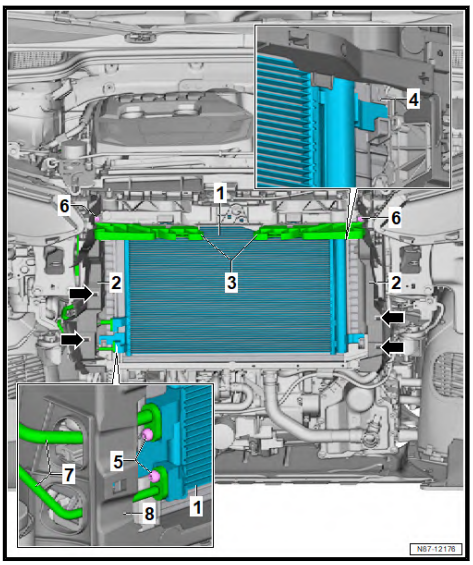
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

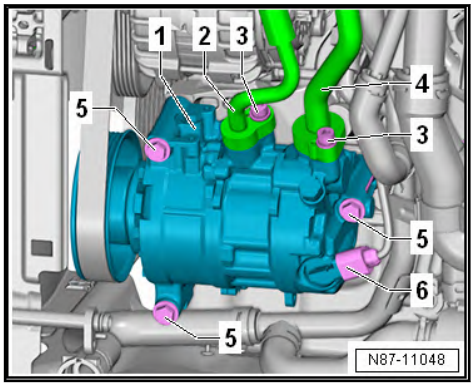
– Unscrew bolt -5- of upper refrigerant line -7-.



– Pull upper refrigerant line -7- off condenser -1-.

– Disregard items -2-, -3-, -4-, -6- and -8- for this work step.

– Unscrew bolt -3- of refrigerant line -2-.



– Pull off refrigerant line -2-.

– Disregard items -1-, -4-, -5-, and -6- for this work step.

Installing

Install in reverse order of removal, observing the following:

Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Clean connections, and check for damage.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

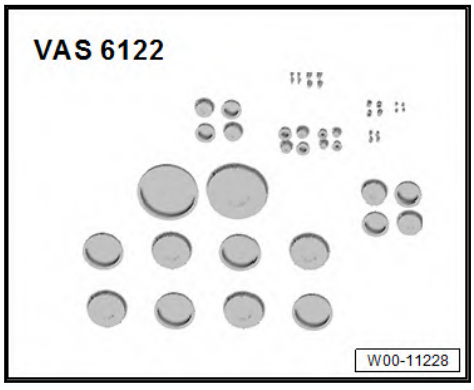
Torque settings

- ⇒ o2.1 verview - refrigerant lines”, page 26
- ⇒ o3.1 verview - air conditioner compressor”, page 92

2.15.2 Removing and installing refrigerant line from air conditioner compressor to condenser, GTE

Special tools and workshop equipment required

- Engine bung set -VAS 6122-



Removing

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

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

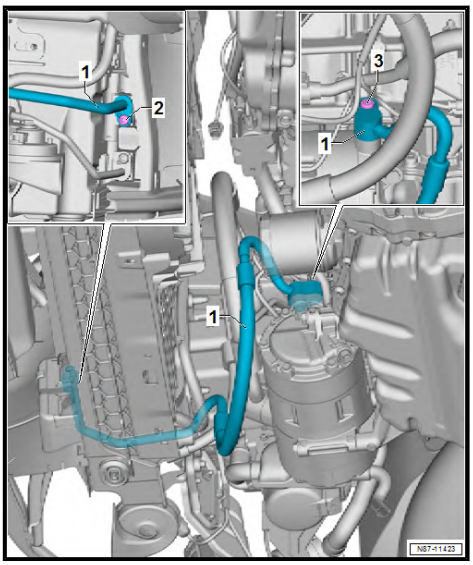
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

– Unscrew bolts -2- and -3-.



– Remove refrigerant line -1-.

Installing

Install in reverse order of removal, observing the following:

Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Clean connections, and check for damage.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

Torque settings

♦ ⇒ o2.1 verview - refrigerant lines", page 26

♦ ⇒ o3.1 verview - air conditioner compressor", page 92

2.16 Removing and installing refrigerant line from evaporator to air conditioner compressor

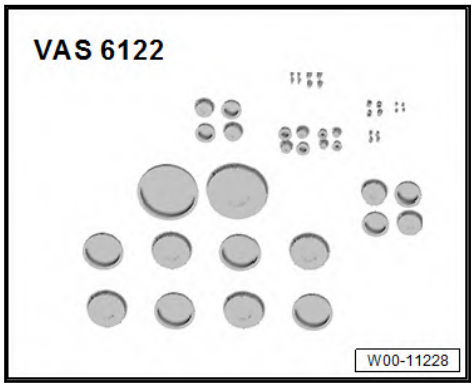
⇒ a2.16.1 nd installing refrigerant line from evaporator to air conditioner compressor", page 86

⇒ a2.16.2 nd installing refrigerant line from evaporator to air conditioner compressor/heat exchanger for high voltage battery, GTE", page 88

2.16.1 Removing and installing refrigerant line from evaporator to air conditioner compressor

Special tools and workshop equipment required

♦ Engine bung set -VAS 6122-



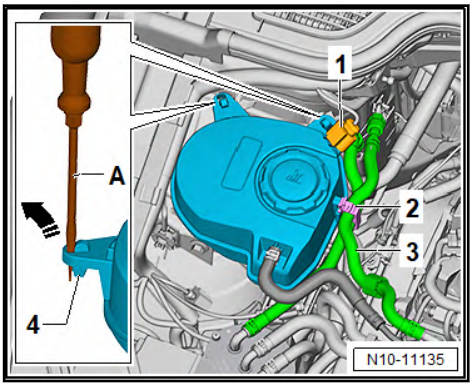
Removing

– Depending on engine, remove parts of air filter ⇒ Rep. gr. 24; Air filter; Assembly overview - air filter housing or ⇒ Rep. gr. 23; Air filter; Assembly overview - air filter housing.

– Depending on engine, remove parts of air duct ⇒ Rep. gr. 24; Intake manifold; Assembly overview - intake manifold or ⇒ Rep. gr. 23; Intake manifold; Assembly overview - intake manifold.

– Depending on engine, remove relevant parts of the charge air system ⇒ Rep. gr. 21; Turbocharger; Charge air system.

– Release and disconnect electrical connector -1- on coolant expansion tank.



– Using a screwdriver -A-, release fasteners -4- and move coolant expansion tank to one side.

⚠ CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

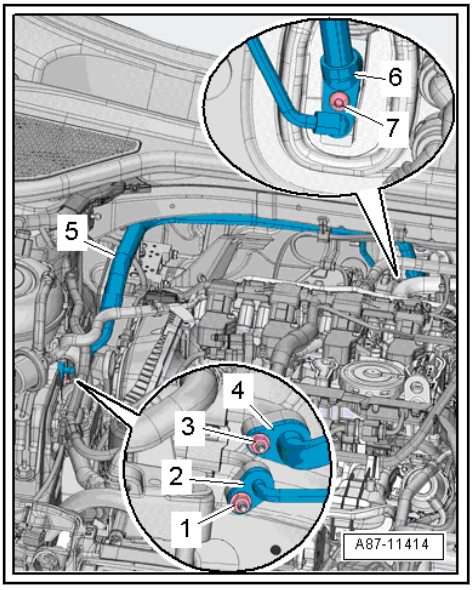
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

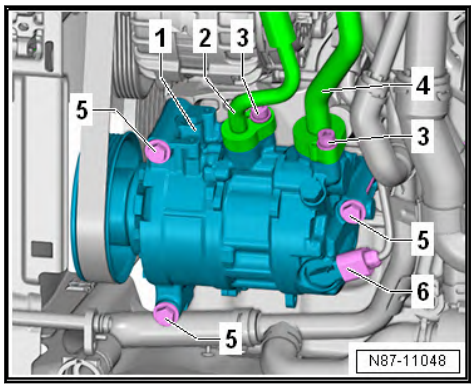
– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

– Unscrew nut -3-.



– Pull off refrigerant line -4-.
– Disregard items -1-, -2-, -5-, -6- and -7- for this work step.
– Unscrew bolt -3- of refrigerant line -4-.



– Unclip refrigerant line -4- from retainers, and pull it off.
– Disregard items -1-, -2-, -5-, and -6- for this work step.

Installing

Install in reverse order of removal, observing the following:

Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Clean connections, and check for damage.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.
– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

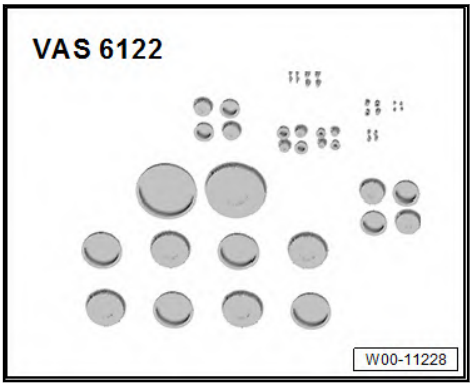
Torque settings

- ⇒ o2.1 verview - refrigerant lines”, page 26
- ⇒ o3.1 verview - air conditioner compressor”, page 92

2.16.2 Removing and installing refrigerant line from evaporator to air conditioner compressor/heat exchanger for high voltage battery, GTE

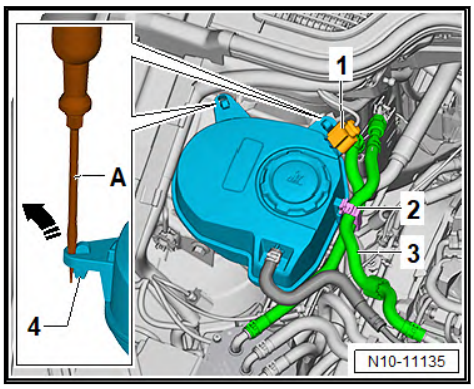
Special tools and workshop equipment required

♦ Engine bung set -VAS 6122-



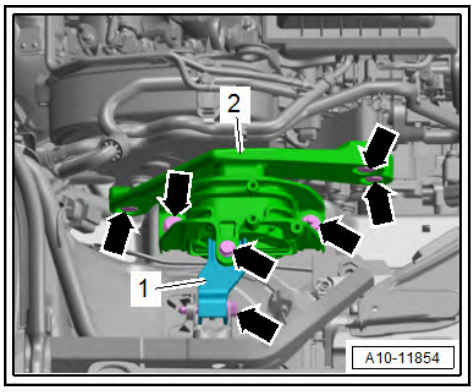
Removing

– Release and disconnect electrical connector -1- on coolant expansion tank.



– Using a screwdriver -A-, release fasteners -4- and move coolant expansion tank to one side.

– Remove bracket -1- ⇒ 4-cylinder direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 10; Assembly mountings; Removing and installing engine mounting.



CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

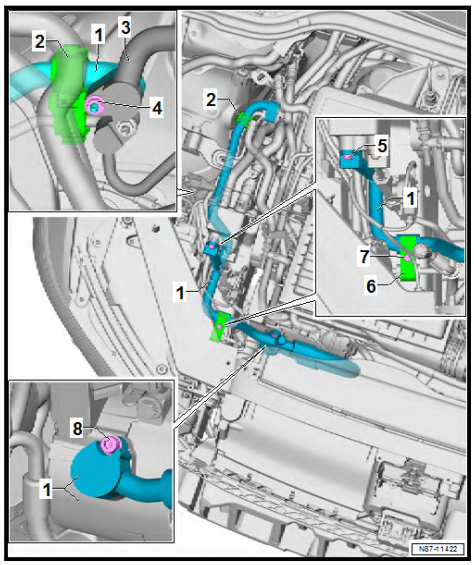
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

– Unscrew nut -4-.



– Remove refrigerant line -3-.

– Unscrew bolts -5- and -8-.

– Unclip refrigerant line -1- from retainers -2-.

– Loosen bolt -7-, and remove retainer -6-.

– Remove refrigerant line -1-.

Installing

Install in reverse order of removal, observing the following:

Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

– Clean connections, and check for damage.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

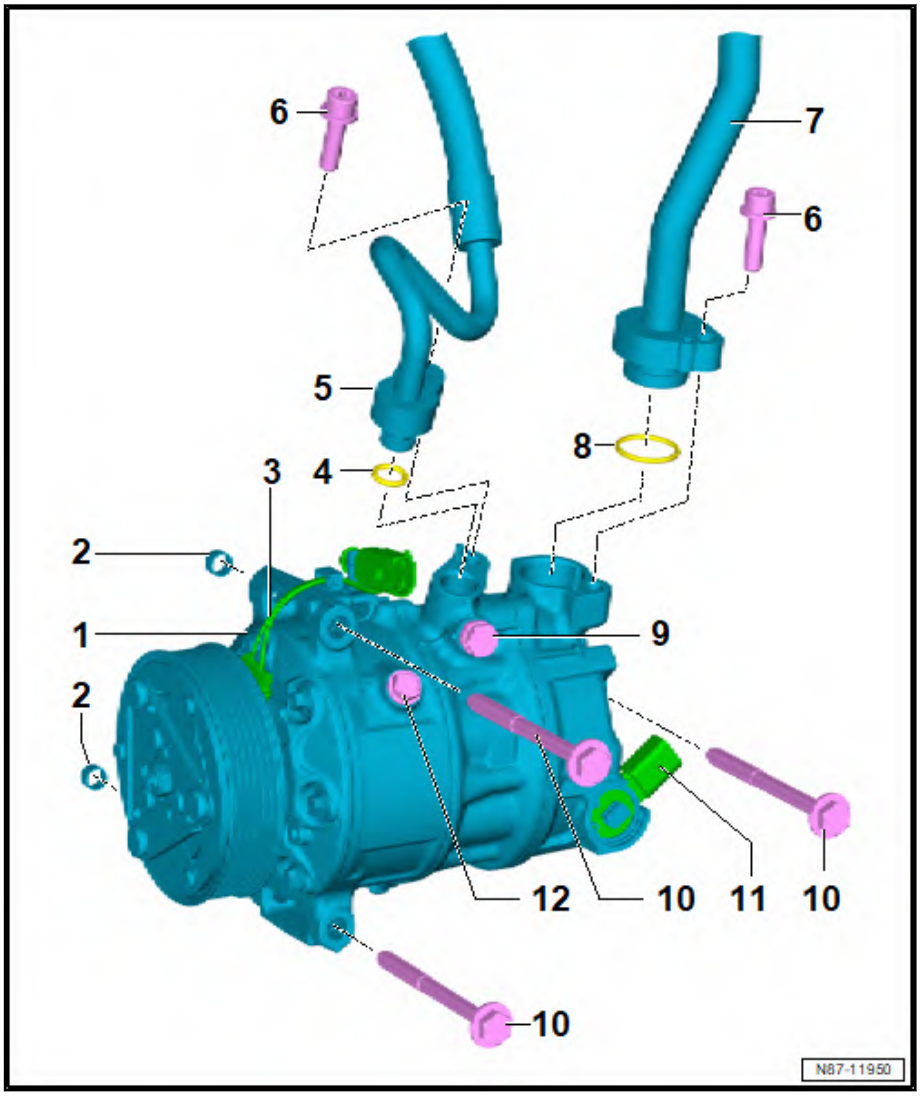
Torque settings

- ⇒ o2.1 verview - refrigerant lines”, page 26
- ⇒ o3.1 verview - air conditioner compressor”, page 92
- ⇒ Rep. gr. 10; Assembly mountings; Assembly overview - assembly mountings

3 Air conditioner compressor

3.1 Assembly overview - air conditioner compressor

3.1.1 Assembly overview - air conditioner compressor



1 - Air conditioner compressor -VX81-

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 99
- ❑ Removing from and installing on bracket ⇒ page 95

2 - Dowel sleeve

- ❑ Qty. 2

3 - Air conditioning system magnetic clutch -N25-

4 - Seal

- ❑ Renew after removal
- ❑ Different versions ⇒ Electronic parts catalogue

5 - Refrigerant line

- ❑ High-pressure side

6 - Bolt

- ❑ Qty. 2
- ❑ 22 Nm

7 - Refrigerant line

- ❑ Low-pressure side

8 - Seal

- ❑ Renew after removal
- ❑ Different versions ⇒ Electronic parts catalogue

9 - High-pressure safety valve on air conditioner compressor

- ❑ Checking ⇒ page 106

10 - Bolt

- ❑ Qty. 3
- ❑ 25 Nm

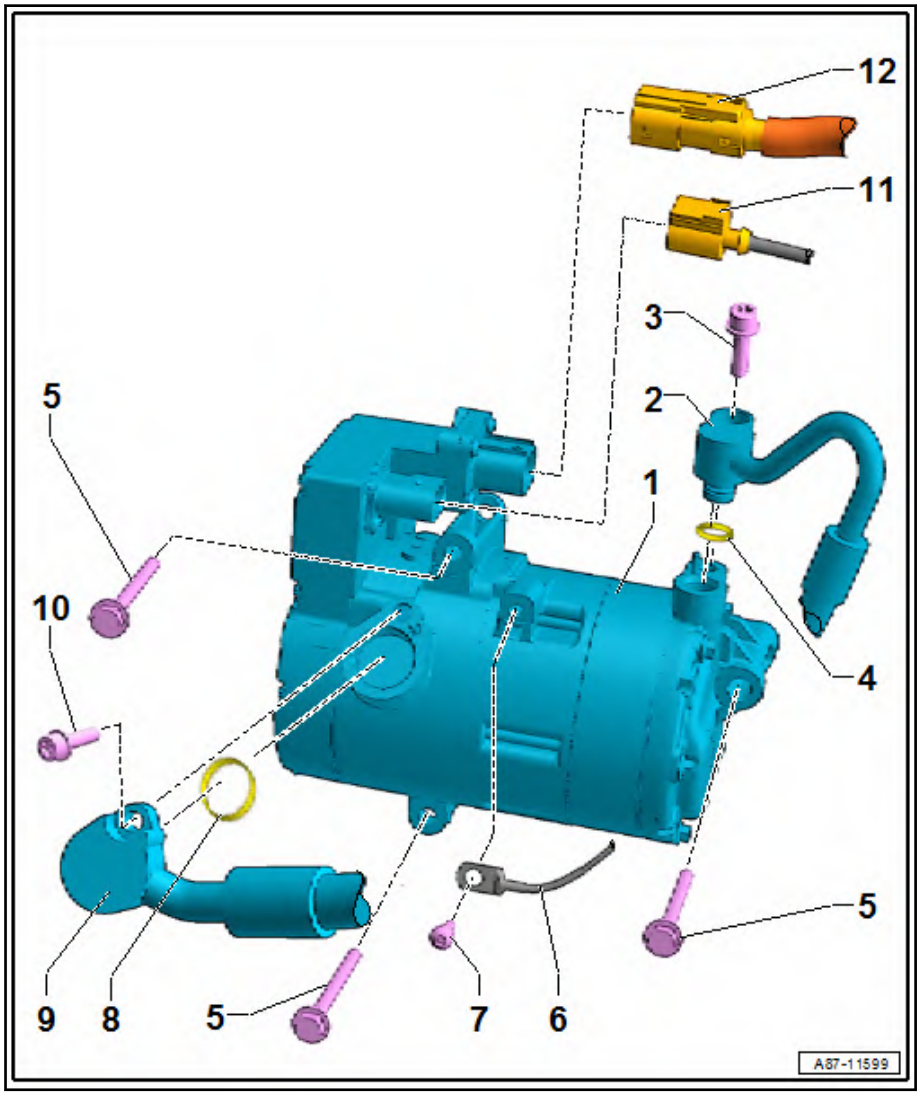
11 - Air conditioner compressor regulating valve -N280-

- ❑ Renew after removal
- ❑ Check with ⇒ Vehicle diagnostic tester

12 - Oil drain plug

- ❑ If oil drain plug is not available as replacement part - do not unscrew oil drain plug.
- ❑ Different versions ⇒ Electronic parts catalogue (ETKA)
- ❑ Do not remove unless refrigerant circuit is empty.
- ❑ Renew oil drain plug/seal after each removal
- ❑ Denso air conditioner compressor - 30 Nm
- ❑ Mahle/Delphi air conditioner compressor - 20 ± 1 Nm
- ❑ Sanden air conditioner compressor: 15 ± 1 Nm

3.1.2 Assembly overview - drive unit of air conditioner compressor, GTE



1 - Air conditioner compressor -VX81-

- ❑ With electrical air conditioner compressor -V470-
- ❑ With control unit for air conditioning compressor -J842-
- ❑ Removing from and installing on bracket ⇒ a3.3 ir conditioning compressor from and installing on bracket", page 95
- ❑ Removing and installing ⇒ a3.4 nd installing air conditioner compressor", page 99

2 - Refrigerant line, high-pressure side

3 - Bolt

- ❑ 22 Nm

4 - Seal

- ❑ Renewing ⇒ page 9 ; for versions, refer to ⇒ Electronic parts catalogue
- ❑ Before installing, moisten lightly with refrigerant oil

5 - Bolt

- ❑ Qty. 3
- ❑ 23 Nm

6 - Potential equalisation line

- ❑ Check and clean contact surface if necessary before installing

7 - Bolt

- ❑ 9 Nm

8 - Seal

- ❑ Renewing ⇒ page 9
- ❑ Version ⇒ Electronic parts catalogue
- ❑ Before installing, moisten lightly with refrigerant oil

9 - Refrigerant line, low-pressure side

10 - Bolt

- ❑ 22 Nm

11 - 8-pin connector

12 - High-voltage cable

- ❑ To power and control electronics for electric drive -JX1- (with control unit for high-voltage battery charging unit -J1050-)

3.2 Assembly overview – pulley, air conditioner compressor -VX81- with magnetic clutch

1 - Bolt

- ❑ Qty. 3
- ❑ 4.5 Nm

2 - Cap

3 - Nut

- ❑ 25 Nm

4 - Drive plate

- ❑ With overload protection. Deploys in the event of excessive torque (e.g. if the air conditioner compressor cannot rotate freely). The pulley then rotates without driving the air conditioner compressor.

5 - Retaining ring

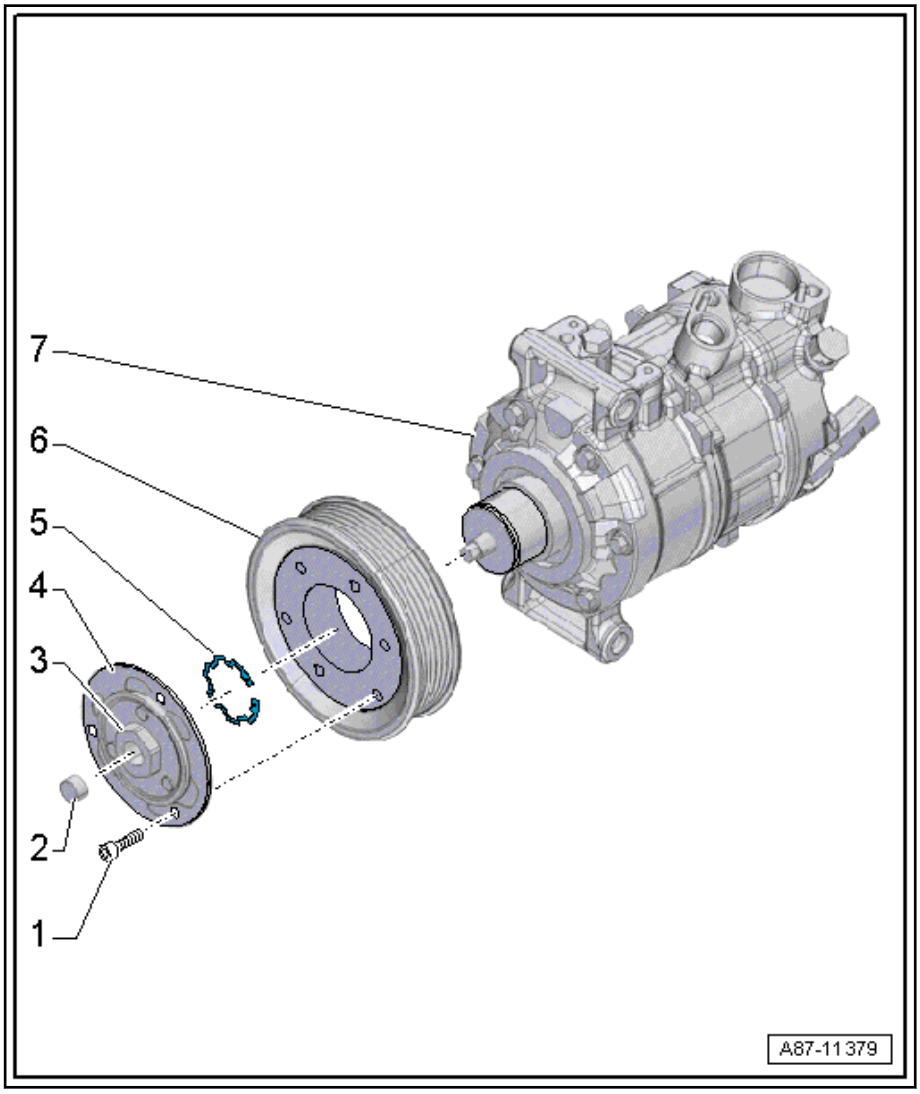
- ❑ Renew
- ❑ Do not reverse when installing (flat side faces air conditioner compressor)

6 - Pulley

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Fragile – handle with caution
- ❑ Removing and installing ⇒ page 107

7 - Air conditioner compressor -VX81-

- ❑ With air conditioning system magnetic clutch -N25-
- ❑ With air conditioner compressor regulating valve -N280-
- ❑ Clean the drive shaft of air conditioner compressor before fitting the pulley.



3.3 Removing air conditioning compressor from and installing on bracket

⇒ a3.3.1 ir conditioning compressor from and installing on bracket", page 95

⇒ a3.3.2 nd installing air conditioner compressor on bracket, GTE", page 98

3.3.1 Removing air conditioning compressor from and installing on bracket

Note

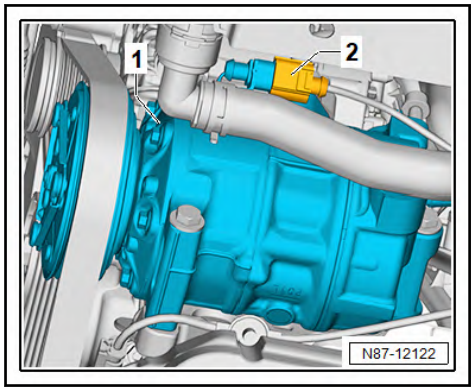
Observe abort conditions for the start/stop system. Refer to ⇒ Self-study programme No. 426; Start/Stop System 2009 for description of features.

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Removing and installing noise insulation.

– Depending on engine, remove front right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66; Wheel housing liner; Removing and installing front wheel housing liner.

– Disconnect electrical connector -2- of air conditioner compressor -1-.



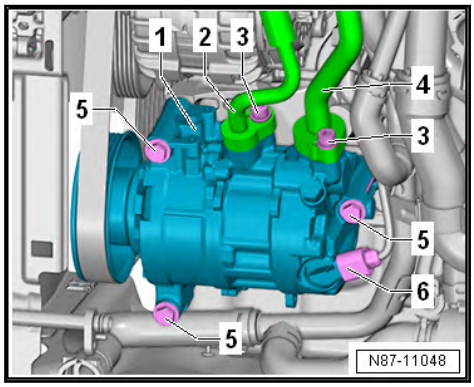
Note

Detach poly V-belt from air conditioner compressor pulley (do not remove completely).

– Relieve tension from poly V-belt ⇒ Rep. gr. 13; Cylinder block on pulley side; Removing and installing poly V-belt.

– Remove poly V-belt from air conditioner compressor pulley.

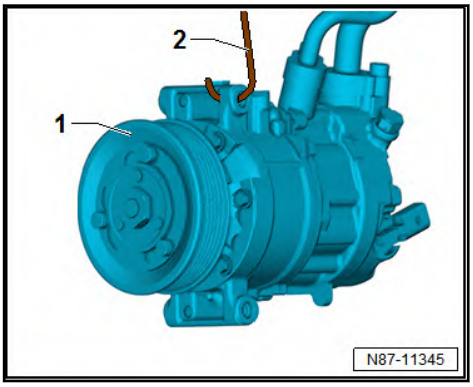
– Release and disconnect electrical connector -6- on air conditioner compressor -1-.



– Unscrew bolts -5- and remove air conditioner compressor -1-.

– Disregard items -2-, -3- and -4- for this work step.

– Secure air conditioner compressor -1- to body with suitable auxiliary item (e.g. welding wire -2-).

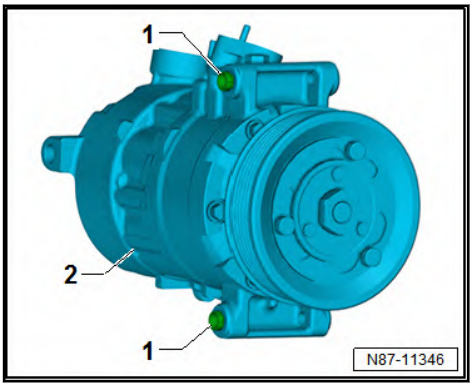


Installing

Install in reverse order of removal, observing the following:

– Thoroughly clean contact surfaces on air conditioner compressor and bracket.

– Insert dowel sleeves -1- into air conditioner compressor -2-.



Note

- *Renew seals after removal.*
- *Ensure proper seating of seals in the groove of the respective refrigerant line.*

Note

Ensure that dowel sleeves are properly seated and that contact surfaces are clean. Improperly fitted dowel sleeves or dirty or damaged contact surfaces can cause deviations in alignment of air conditioner compressor and engine. In the course of operation, misalignment will result in damage to the air conditioner compressor.

NOTICE

Risk of damage to air conditioner compressor. There may be an accumulation of refrigerant oil in the compression chamber of a removed air conditioner compressor.

– **After installing a new air conditioner compressor or adding new refrigerant oil, fully turn the air conditioner compressor 10 times by hand before the poly V-belt is fitted.**

Note the following when starting engine for first time after filling the refrigerant circuit:

– Refer to notes on commissioning of air conditioning system after installation of air conditioner compressor ⇒ Air conditioning systems with refrigerant R1234yf – General information; Rep. gr. 87; Refrigerant circuit; Renewing components.

Torque settings

♦ ⇒ o3.1 verview - air conditioner compressor", page 92

3.3.2 Removing and installing air conditioner compressor on bracket, GTE

Removing

DANGER

Danger to life from high voltage.

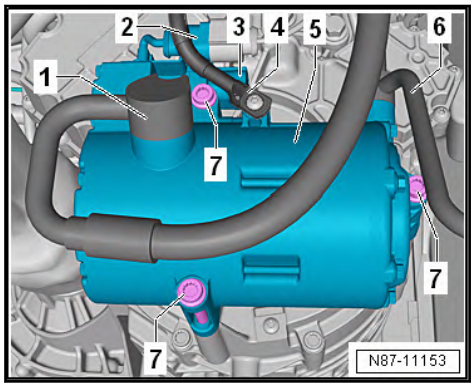
Risk of severe or fatal injury due to electric shock.

– Have a qualified technician de-energise the high-voltage system.

– De-energise high-voltage system ⇒ Rep. gr. 93; De-energising high-voltage system.

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview – noise insulation.

– Release and disconnect electrical connector -2-.



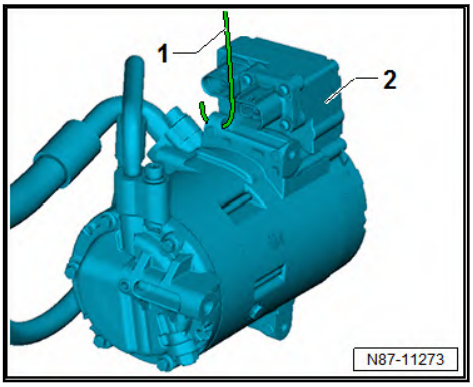
– Release and disconnect high-voltage wire -3-.

– Disconnect potential equalisation line -4-.

– Unscrew bolts -7-.

– Remove air conditioner compressor -VX81- -item 5-.

– Secure air conditioner compressor -VX81- -item 2- to body with suitable material (e.g. welding wire -1-).



Installing

Install in reverse order of removal, observing the following:

– Always assemble refrigerant circuit before starting engine.

– Always charge refrigerant circuit before starting engine.

Note

- *The bolting points of the air conditioner compressor -VX81- and the engine must be checked prior to installation.*
- *The contact surfaces must be clean, rust- and grease-free*

DANGER

Danger to life from high voltage.

Electrical shocks can cause serious injuries or death.

– Have a qualified technician re-energise the high-voltage system.

Torque settings

- ⇒ o3.1 verview - air conditioner compressor”, page 92

3.4 Removing and installing air conditioner compressor

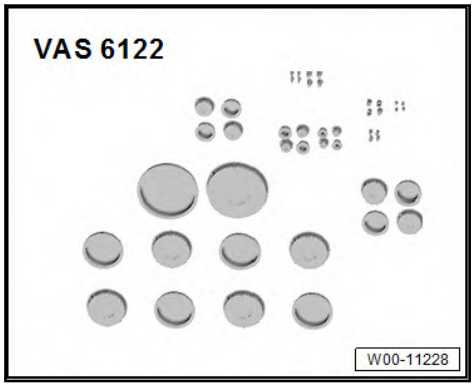
⇒ a3.4.1 nd installing air conditioner compressor”, page 99

⇒ a3.4.2 nd installing air conditioner compressor, GTE”, page 104

3.4.1 Removing and installing air conditioner compressor

Special tools and workshop equipment required

- Engine bung set -VAS 6122-



- Vehicle diagnostic tester

Note

- *If a new air conditioner compressor is installed, the function "Compressor first run" must be performed in the Guided Fault Finding.*
- *If only the ancillary bracket is to be removed, do not detach refrigerant lines on air conditioner compressor* *⇒ page 95* *.*

Removing

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

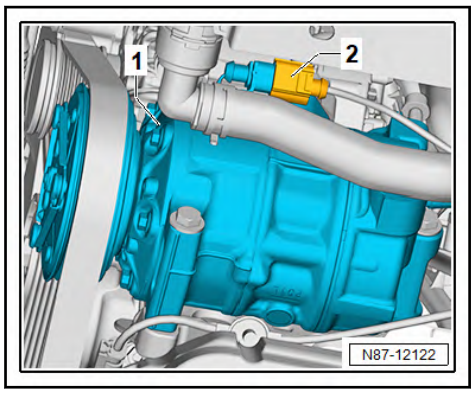
– Depending on engine, remove parts of air filter ⇒ Rep. gr. 24; Air filter; Assembly overview - air filter housing or ⇒ Rep. gr. 23; Air filter; Assembly overview - air filter housing.

– Depending on engine, remove front right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66; Wheel housing liner; Removing and installing front wheel housing liner.

– Depending on engine, remove parts of air duct ⇒ Rep. gr. 24; Intake manifold; Assembly overview - intake manifold or ⇒ Rep. gr. 23; Intake manifold; Assembly overview - intake manifold.

– Depending on engine, remove relevant parts of the charge air system ⇒ Rep. gr. 21; Turbocharger; Charge air system.

– Release and disconnect electrical connector -2- of air conditioner compressor -1-.



Note

Detach poly V-belt from air conditioner compressor pulley (do not remove completely).

– Relieve tension from poly V-belt ⇒ Rep. gr. 13; Cylinder block on pulley side; Removing and installing poly V-belt.

CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant.

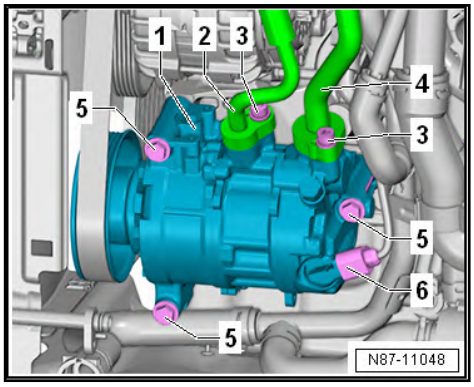
There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Extract refrigerant and open the refrigerant circuit immediately afterwards.**
- **If more than 10 minutes have elapsed since evacuation and the coolant circuit has not been opened, evacuate the refrigerant again. Pressure could build up in the refrigerant circuit from continued evaporation.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

– Release and disconnect electrical connector -6-.



– Unscrew bolts -3-.

– Disconnect refrigerant lines -2- and -4- from air conditioner compressor -1-.

– Unscrew bolts -5-.

Installing

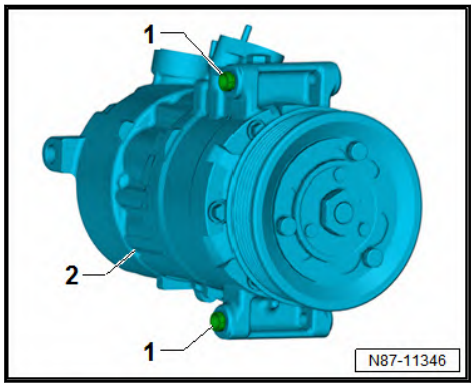
Install in reverse order of removal, observing the following:

– If air conditioner compressor has been renewed, check poly-V belt for damage, and renew it if necessary ⇒ Rep. gr. 13; Cylinder block, pulley end; Removing and installing poly-V belt.

– Carry out function “Compressor first run” in Guided Fault Finding using ⇒ Vehicle diagnostic tester.

– Clean contact surfaces of air conditioner compressor and bracket.

– Insert dowel sleeves -1- into air conditioner compressor -2-.



Note

- *Improperly fitted dowel sleeves or dirty or damaged contact surfaces can cause deviations in alignment of air conditioner compressor and engine. Deviations in alignment will eventually damage the air condition compressor.*
- *If the air conditioner compressor is renewed on account of complaints (e.g. internal damage), the refrigerant circuit must be cleaned ⇒ Air conditioning systems with refrigerant R1234yf – General information; Rep. gr. 87; Refrigerant circuit; Renewing components.*
- *When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason, it is important to observe the notes on renewing the air conditioner compressor ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Renewing components.*

If the air conditioner compressor is replaced, the following table gives an indication as to whether the refrigerant circuit needs to be flushed before the new air conditioner compressor is installed.

The necessity for flushing depends on the supplier and the refrigerant oil used.

		Supplier of replacement compressor		
		Denso	Mahle/ Delphi	Sanden
Supplier of air conditioner compressor installed in vehicle	Denso	Do not flush	Flush	Flush
	Mahle/ Delphi	Flush	Do not flush	Do not flush
	Sanden	Flush	Do not flush	Do not flush

– If necessary according to table, flush refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf – General information; Rep. gr. 87; Refrigerant circuit; Cleaning refrigerant circuit.

NOTICE

Risk of damage to air conditioner compressor. There may be an accumulation of refrigerant oil in the compression chamber of a removed air conditioner compressor.

- **After installing a new air conditioner compressor or adding new refrigerant oil, fully turn the air conditioner compressor 10 times by hand before the poly V-belt is fitted.**

Note the following when starting engine for first time after filling the refrigerant circuit:

- Start engine with air conditioner compressor switched off (warning lamp in CLIMA button must be off) and wait until idling speed is stable.
- Open dash panel vents.
- Set temperature to “Lo”.
- Switch on air conditioner compressor (warning lamp in CLIMA button lights up) and let it run for at least 5 minutes at idling speed.

Note

- *If an air conditioner compressor seizes, the overload protection separates from the air conditioner compressor shaft. The seizure can normally be detected by the bulges in the poly V-belt pulley. Rubber abrasion in the area of the poly V-belt pulley can also indicate a blockage.*
- *The air conditioner compressor has an internal oil circuit to ensure that the air conditioner compressor is not damaged when the refrigerant circuit is empty. This means that approx. 40 to 50 cm^3 of refrigerant oil remain in the air conditioner compressor.*
- *Only start engine when refrigerant circuits are charged.*
- *Only start engine when refrigerant circuit has been correctly installed. If, for example, the refrigerant lines are not connected to the air conditioner compressor and the engine is running, the compressor may heat up so much through internal warming that it will be damaged beyond repair.*
- *The air conditioner compressor regulating valve -N280- is not actuated if the refrigerant circuit is empty and the air conditioner compressor idles with the engine.*

Note

- *If it is necessary to start engine with an empty refrigerant circuit:*
- *The refrigerant circuit must be fully assembled.*
- *At least ¼ of the quantity of refrigerant oil specified for this refrigerant circuit must be in the air conditioner compressor.*
- *The engine speed must not exceed 2000 rpm.*
- *Run engine only as long as absolutely necessary, maximum 10 minutes.*

- Moisten new seals with refrigerant oil before installing refrigerant line.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

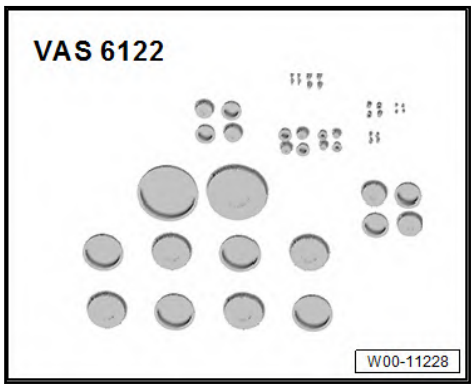
Torque settings

♦ ⇒ o3.1 verview - air conditioner compressor", page 92

3.4.2 Removing and installing air conditioner compressor, GTE

Special tools and workshop equipment required

♦ Engine bung set -VAS 6122-



♦ Vehicle diagnostic tester

Removing

DANGER

Danger to life from high voltage.

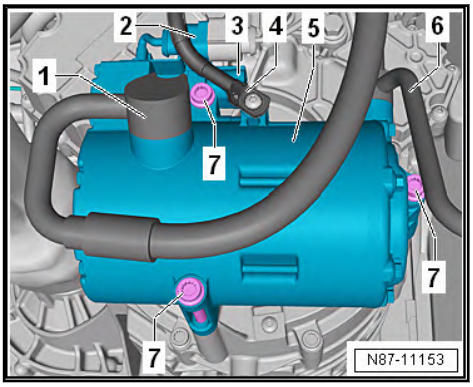
Risk of severe or fatal injury due to electric shock.

– Have a qualified technician de-energise the high-voltage system.

– De-energise high-voltage system ⇒ Rep. gr. 93; De-energising high-voltage system.

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation.

– Release and disconnect electrical connector -2-.



– Release and disconnect high-voltage wire -3-.
– Disconnect potential equalisation line -4-.

⚠ CAUTION

Risk of freezing injury caused by escaping pressurised refrigerant. If handled incorrectly, union could break off and refrigerant could escape.

There is a risk of injury to the skin and parts of the body due to freezing.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Counterhold refrigerant lines using a suitable tool.**

– Drain refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Draining refrigerant circuit.
– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.
– Remove refrigerant lines -1- and -6-.
– Unscrew bolts -7-.
– Remove air conditioner compressor -VX81- -item 5-.

Installing

Install in reverse order of removal, observing the following:

– Moisten new seals with refrigerant oil before installing refrigerant line.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

- **Never start the engine if the refrigerant circuit is empty.**

– Always assemble refrigerant circuit before starting engine.
– Always charge refrigerant circuit before starting engine.
– Carry out function “Compressor first run” in Guided Fault Finding using ⇒ Vehicle diagnostic tester.

Note

- *The bolting points of the air conditioner compressor and the engine bracket must be checked prior to installation. The contact surfaces must be clean, rust- and grease-free Otherwise, repair contact surfaces using contact surface cleaning set -VAS 6410- ⇒ Electrical system; General information; Rep. gr. 97.*
- *The electrical air conditioner compressor -V470- is supplied with power via a fuse installed in the power and control electronics for electric drive -JX1-.*

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.
– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

Torque settings

- ⇒ o3.1 verview - air conditioner compressor”, page 92

3.5 Removing and installing high-voltage system fuse 3 -S353-

Removal and installation of high-voltage system fuse 3 -S353- is described under ⇒ 4-cyl. direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 93; Power and control electronics for electric drive; Removing and installing high-voltage system fuse 3 S353.

3.6 Checking high-pressure safety valve on air conditioner compressor

Check

CAUTION

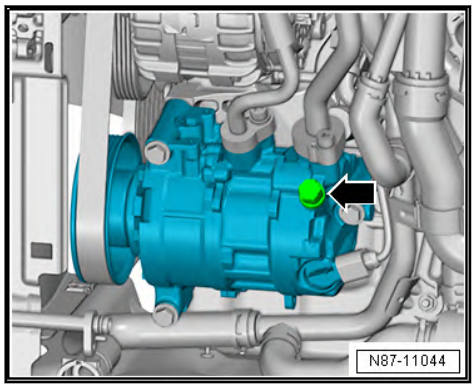
Risk of freezing injury caused by refrigerant. The high-pressure safety valve releases refrigerant when the engine is running and the pressure in the refrigerant circuit is too high.

There is a risk of injury on hands and other parts of the body due to freezing.

– Wear protective gloves.
– Wear safety goggles.
– Switch off engine.

Note

The illustration shows the high-pressure safety valve on an air conditioner compressor from Denso.



If there is refrigerant oil sticking in the immediate vicinity of the high-pressure safety valve -arrow-, this is an indication that the valve has been opened.

– In this case, take the vehicle to a qualified workshop ⇒ page 9 .

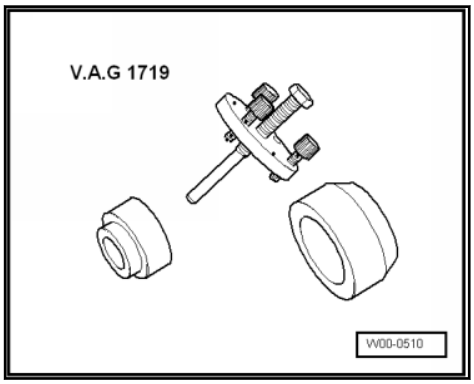
Note

On air conditioner compressors from other manufacturers the high-pressure safety valve is located in a similar position.

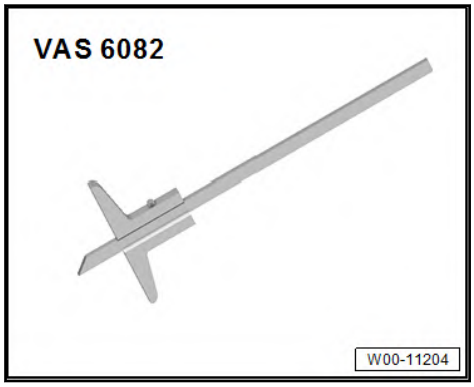
3.7 Removing and installing belt pulley, air conditioner compressor with air conditioning system magnetic clutch -N25-

Special tools and workshop equipment required

- Sleeve from magnetic clutch puller -V.A.G 1719-



- Depth gauge -VAS 6082-



If the belt pulley with air conditioning system magnetic clutch -N25- is not available as an individual part, the entire air conditioner compressor must be renewed ⇒ Electronic parts catalogue.

Removing and installing clutch plate ⇒ page 108

Pulling off belt pulley ⇒ page 109

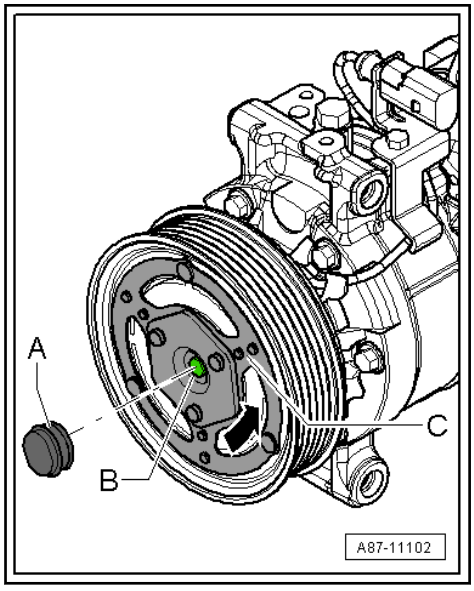
Checking clearance between belt pulley and clutch plate ⇒ page 110

Removing and installing clutch plate

– Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview – noise insulation.

– Relieve tension on poly V-belt and remove ⇒ Rep. gr. 13; Cylinder block (pulley end); Removing and installing poly V-belt.

– Remove sealing cap -A-.



– Use e.g. a commercially available hexagon socket wrench to counterhold drive shaft on air conditioner compressor -B-, and turn clutch plate -C- in direction of -arrow-.

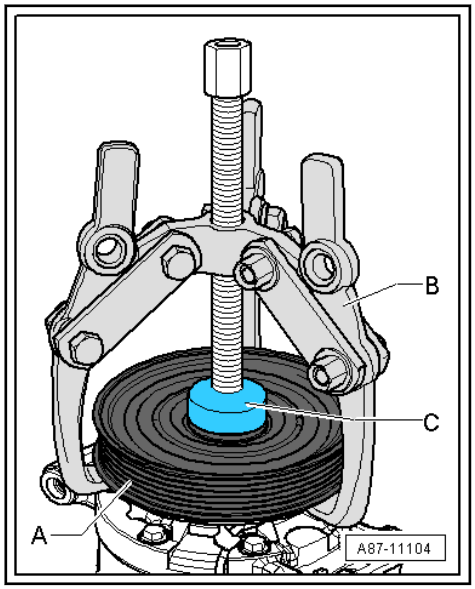
Note

- *The torque for driving the air conditioner compressor is applied to the compressor shaft via the threaded attachment of the clutch plate -C-.*
- *If the clutch plate -C- was tightened to the compressor shaft -B- during operation such that it can no longer be loosened (the 7 mm hexagon flats can no longer transmit the necessary torque), the air conditioner compressor must be renewed.*

Pulling off belt pulley

Note

If the retaining ring has been removed, but the belt pulley -A- cannot be pulled off the air conditioner compressor flange by hand (e.g. due to dirt), carefully pull off belt pulley as described below.



If the belt pulley -A- is to be reused, fit the arms of the puller in such a way that the outer side of the belt pulley will not be damaged.

– Carefully pull off belt pulley -A- using a puller -B- (with 3 arms).

Note

- *When pulling off belt pulley -A-, do not support the spindle of the puller -B- on the shaft of the air conditioner compressor.*
- *Use a sleeve -C- (e.g. sleeve from the magnetic clutch puller -V.A.G 1719-) to support the spindle of the puller -B- on the air conditioner compressor flange.*
- *After the belt pulley -A- has been pulled off, clean the air conditioner compressor thoroughly. It must be possible to push on the belt pulley -A- by hand.*

Checking clearance between belt pulley and clutch plate

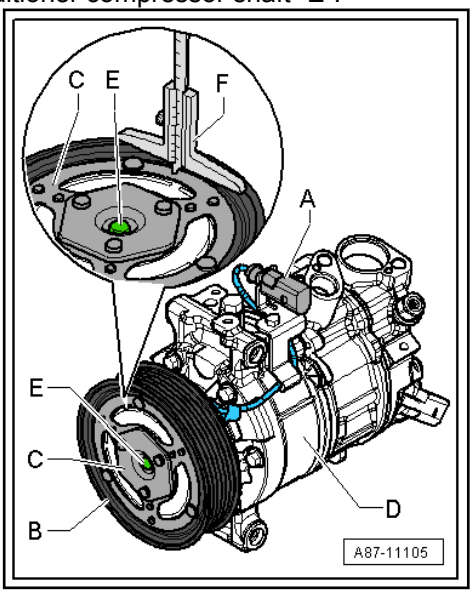
Note

- *The clearance must be within the permissible range over the complete circumference.*
- *The clearance can also be measured when the air conditioner compressor is installed.*
- *If the clearance is outside the permissible range, remove the clutch plate, and adjust the clearance to the specified value by removing or adding spacers.*

– Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation; Assembly overview – noise insulation.

– Relieve tension on poly V-belt and remove ⇒ Rep. gr. 13; Cylinder block (pulley end); Removing and installing poly V-belt.

• The clutch plate -C- is tightened to the specified torque of 30 Nm to the air conditioner compressor shaft -E-.



– Use a depth gauge -VAS 6082- to measure dimension “1” between pulley -B- and clutch plate -C- at 3 positions along the circumference of clutch plate -C- (note measured values).

– Apply a voltage of 12 V to 1-pin connector -A-.

– Connect compressor housing -D- to earth.

– Use a depth gauge -VAS 6082- -F- to measure dimension “2” between pulley -B- and clutch plate -C- at 3 positions along the circumference of clutch plate -C- (note measured values).

– Calculate clearance from dimensions “1” and “2”.

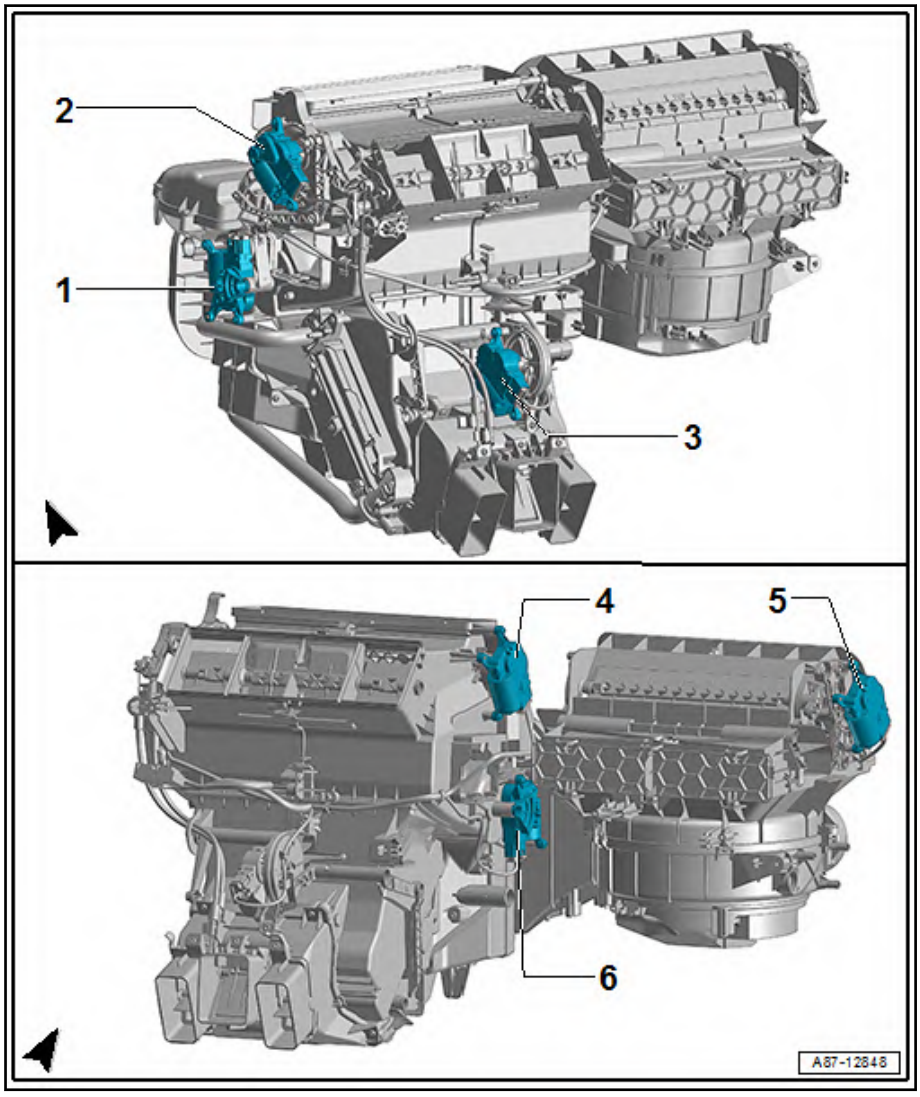
Specification for gap: 0.4 to 0.6 mm (up to 0.8 mm on a used magnetic clutch).

4 Control motors

4.1 Overview of fitting locations – front control motors

4.1.1 Overview of fitting locations - front control motors, LHD vehicles

Observe abort conditions for the start/stop system ⇒ page 7 .



1 - Front left temperature flap -VX34- control motor

- With left temperature flap control motor -V158-
- With potentiometer for left temperature flap control motor -G220-
- Check with ⇒ Vehicle diagnostic tester
- Removing and installing ⇒ page 119
- Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

2 - Air distribution flap -VX33- control motor

- With front air distribution flap control motor -V426-
- With potentiometer for front air distribution flap control motor -G642-
- Check with ⇒ Vehicle diagnostic tester
- Removing and installing ⇒ page 131
- Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

3 - Rear temperature flap - VX95- control motor

- With rear temperature flap control motor -V137-
- With potentiometer for rear temperature flap control motor -G479-
- Only in vehicles with 3-zone Climatronic
- Check with ⇒ Vehicle diagnostic tester
- Removing and installing ⇒ page 118
- Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

4 - Defroster flap -VX47- control motor

- With defroster flap control motor -V107-
- With potentiometer for defroster flap control motor -G135-
- Check with ⇒ Vehicle diagnostic tester
- Removing and installing ⇒ page 115
- Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

5 - Fresh air and air recirculation flap -VX96- control motor

- With fresh air/air recirculation, air flow flap control motor -V425-
- With potentiometer for fresh air/recirculated air and air flow flap control motor -G644-
- Check with ⇒ Vehicle diagnostic tester
- Removing and installing ⇒ page 127
- Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

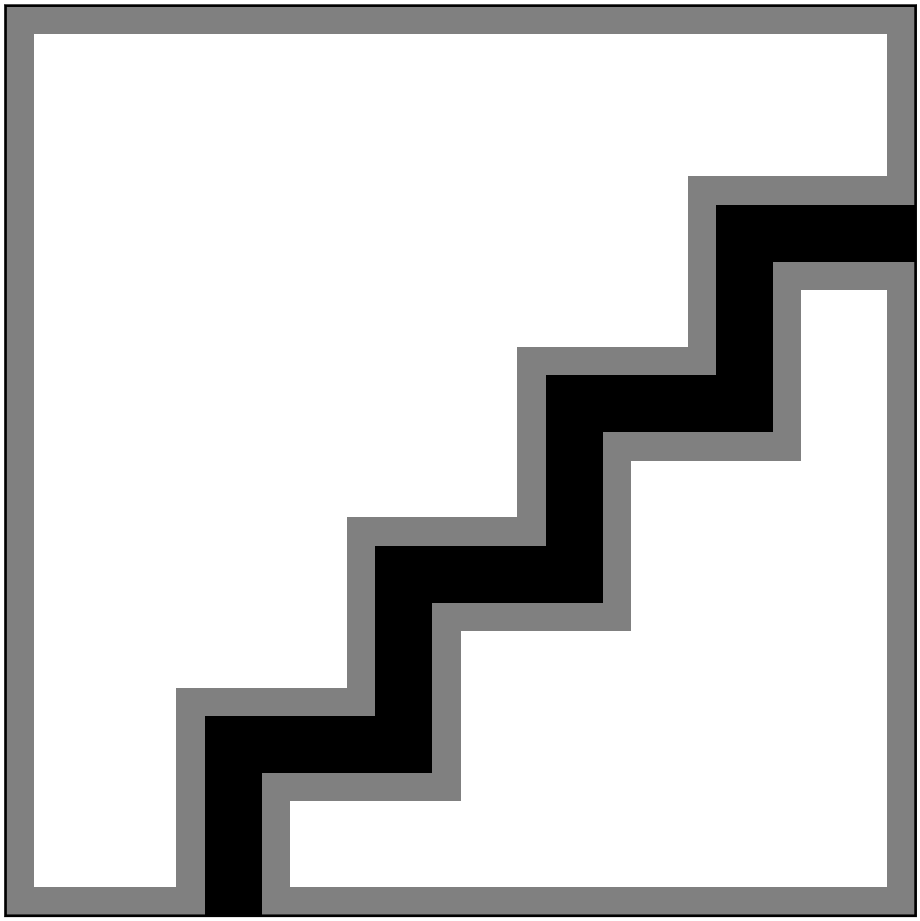
6 - Front right temperature flap -VX35- control motor

- With potentiometer for right temperature flap control motor -G221-
- With right temperature flap control motor -V159-

- ❑ Only in vehicles with 3-zone Climatronic
- ❑ Check with ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 123
- ❑ Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

4.1.2 Overview of fitting locations - front control motors, RHD vehicles

Observe abort conditions for the start/stop system ⇒ page 7 .



1 - Fresh air and air recirculation flap -VX96- control motor

- ❑ With fresh air/air recirculation, air flow flap control motor -V425-
- ❑ With potentiometer for fresh air/recirculated air and air flow flap control motor -G644-
- ❑ Check with ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 129
- ❑ Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

2 - Air distribution flap -VX33- control motor

- ❑ With front air distribution flap control motor -V426-
- ❑ With potentiometer for front air distribution flap control motor -G642-
- ❑ Check with ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 133
- ❑ Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

3 - Rear temperature flap -VX95- control motor

- ❑ With rear temperature flap control motor -V137-
- ❑ With potentiometer for rear temperature flap control motor -G479-
- ❑ Only in vehicles with 3-zone Climatronic
- ❑ Check with ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 118
- ❑ Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

4 - Front left temperature flap -VX34- control motor

- ❑ With left temperature flap control motor -V158-
- ❑ With potentiometer for left temperature flap control motor -G220-
- ❑ Check with ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 121
- ❑ Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

5 - Front right temperature flap -VX35- control motor

- ❑ With potentiometer for right temperature flap control motor -G221-
- ❑ With right temperature flap control motor -V159-
- ❑ Only in vehicles with 3-zone Climatronic
- ❑ Check with ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 125
- ❑ Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

6 - Defroster flap -VX47- control motor

- ❑ With defroster flap control motor -V107-
- ❑ With potentiometer for defroster flap control motor -G135-

- ❑ Check with ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 117
- ❑ Renew, initiate “basic setting” using ⇒ Vehicle diagnostic tester

4.2 Removing and installing defroster flap -VX47- control motor

⇒ a4.2.1 nd installing defroster flapVX47 control motor, left-hand drive vehicles”, page 115

⇒ a4.2.2 nd installing defroster flapVX47 control motor, right-hand drive vehicles”, page 117

4.2.1 Removing and installing defroster flap -VX47- control motor, left-hand drive vehicles

Special tools and workshop equipment required

- ♦ Vehicle diagnostic tester

Removing

– Switch off all electrical consumers.

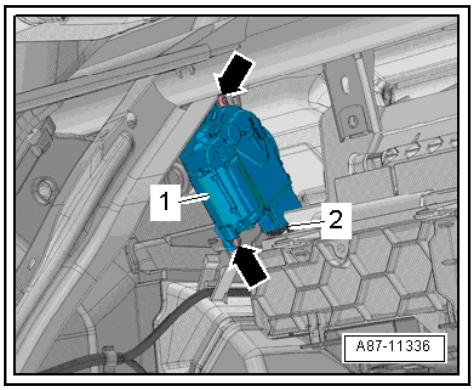
– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing glove compartment.

– Remove control unit 1 for information electronics -J794- ⇒ Communication; Rep. gr. 91; Infotainment system; Removing and installing control unit 1 for information electronics J794.

– Unscrew bolts -arrows-.



– Detach defroster flap -VX47- control motor -item 1-.

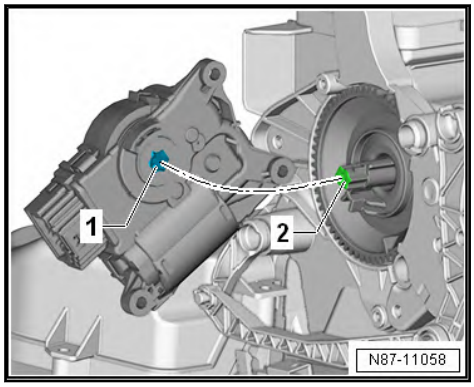
– Release and disconnect electrical connector -2-.

Installing

Install in reverse order of removal, observing the following:

– Perform functional check.

– Make sure levers and shafts are properly fitted in the mounts.



Note

- *Mounting -1- of defroster flap -VX47- control motor can be fitted onto relay lever -2- in only one position.*
- *Mounting -1- of defroster flap -VX47- control motor must align with relay lever -2- as shown in illustration. Rotate the receptacle in the control motor if the mount and actuating arm do not align.*
- *Rotate defroster flap -VX47- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.

– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).

– Wait until defroster flap -VX47- control motor has reached desired position.

– Switch off ignition.

– Position defroster flap -VX47- control motor on air distribution housing.

- Make sure that relay lever -2- engages in recess -1-.
- There must be no play between defroster flap -VX47- control motor and relay lever.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit”, page 142
- ⇒ Communication; Rep. gr. 91; Infotainment system; Overview of fitting locations – infotainment system

♦ ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Assembly overview – glove compartment

4.2.2 Removing and installing defroster flap -VX47- control motor, right-hand drive vehicles

Special tools and workshop equipment required

♦ Vehicle diagnostic tester

Removing

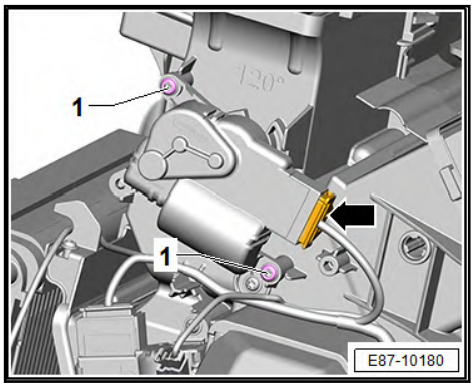
– Switch off all electrical consumers.

– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Remove footwell vent on driver side ⇒ page 219 .

– Unscrew bolts -1-.



– Detach defroster flap -VX47- control motor.

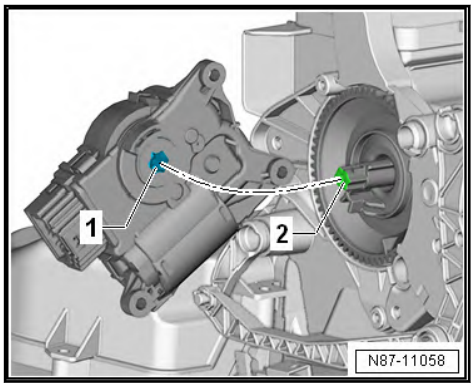
– Release and disconnect electrical connector -arrow-.

Installing

Install in reverse order of removal, observing the following:

– Perform functional check.

– Make sure levers and shafts are properly fitted in the mounts.



Note

- *Mounting -1- of defroster flap -VX47- control motor can be fitted onto relay lever -2- in only one position.*
- *Mounting -1- of defroster flap -VX47- control motor must align with relay lever -2- as shown in illustration. Rotate the receptacle in the control motor if the mount and actuating arm do not align.*
- *Rotate defroster flap -VX47- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.

– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).

– Wait until defroster flap -VX47- control motor has reached desired position.

– Switch off ignition.

– Position defroster flap -VX47- control motor on air distribution housing.

- Make sure that relay lever -2- engages in recess -1-.
- There must be no play between defroster flap -VX47- control motor and relay lever.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit”, page 142
- ⇒ a6.5.2 nd installing driver side footwell vents, right-hand drive vehicles”, page 219

4.3 Removing and installing rear temperature flap -VX95- control motor

Special tools and workshop equipment required

- Vehicle diagnostic tester

Note

Removal and installation are shown on a left-hand drive vehicle. Proceed analogously for a right-hand drive vehicle.

Removing

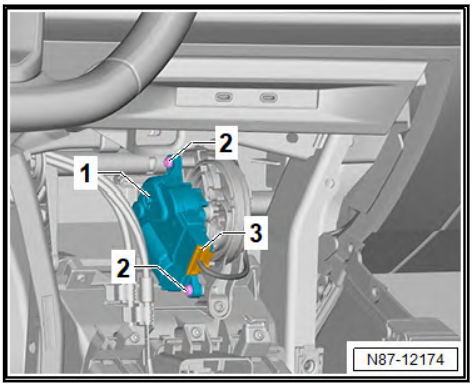
– Switch off all electrical consumers.

– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console.

– Unscrew bolts -2- of rear temperature flap -VX95- control motor -item 1-.



– Release and disconnect electrical connector -3-.

– Remove rear temperature flap -VX95- control motor -item 1-.

Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.

– Make sure levers and shafts are properly fitted in the mounts.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

4.4 Removing and installing front left temperature flap -VX34- control motor

⇒ a4.4.1 nd installing front left temperature flapVX34 control motor, left-hand drive vehicles”, page 119

⇒ a4.4.2 nd installing front left temperature flapVX34 control motor, right-hand drive vehicles”, page 121

4.4.1 Removing and installing front left temperature flap -VX34- control motor, left-hand drive vehicles

Special tools and workshop equipment required

- Vehicle diagnostic tester

Removing

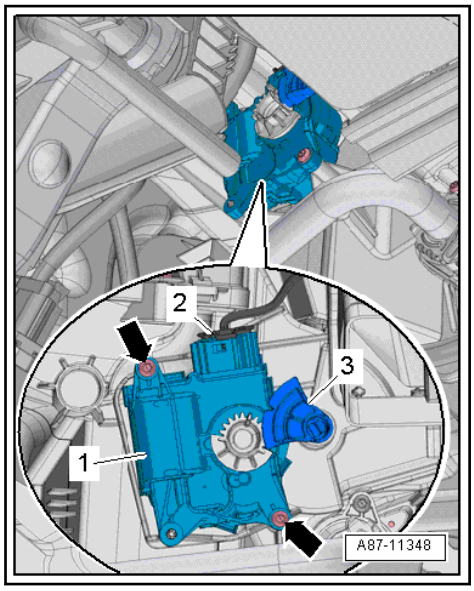
– Switch off all electrical consumers.

– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Remove footwell vent on driver side ⇒ page 219 .

– Pull off operating lever -3- of heater and air conditioning unit.



Note

The upper bolt can be accessed with a commercially available bit ratchet.

– Unscrew bolts -arrows-.

– Release and disconnect electrical connector -2-.

– Detach front left temperature flap -VX34- control motor -item 1-.

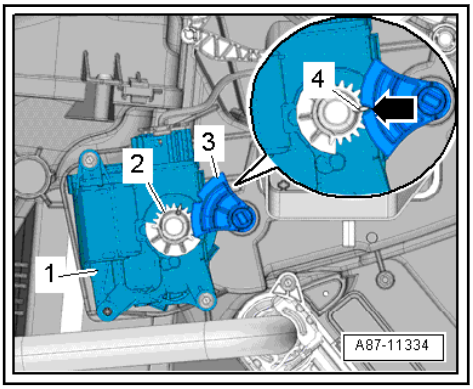
Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.

– Make sure levers and shafts are properly fitted in the mounts.

– Position front left temperature flap -VX34- control motor -item 1- on air distribution housing.



- Gear wheel -2- on front left temperature flap -VX34- control motor must engage in gear wheel on temperature flap operating lever -3-.
- The long tooth -4- must engage in recess -arrow- on operating lever.

Note

- *If the gear wheel on the front left temperature flap -VX34- control motor and the gear wheel on the temperature flap operating lever do not align, rotate the mounting in the control motor.*
- *Rotate the front left temperature flap -VX34- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.
– Connect respective control motor to vehicle wiring harness.
– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).
– Wait until front left temperature flap -VX34- control motor has reached desired position.
– Switch off ignition.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).
– Read event memory, and erase any entries displayed.
– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.
– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit”, page 142

4.4.2 Removing and installing front left temperature flap -VX34- control motor, right-hand drive vehicles

Special tools and workshop equipment required

◆ Vehicle diagnostic tester

Removing

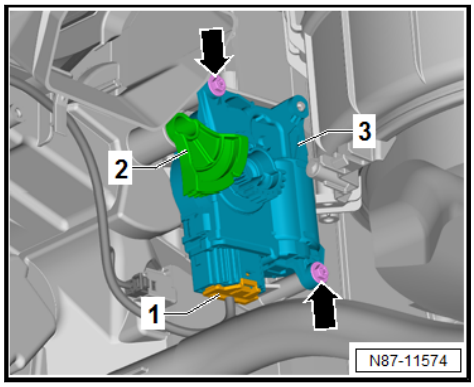
– Switch off all electrical consumers.

– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Remove footwell vent on front passenger side ⇒ page 221 .

– Release and disconnect electrical connector -1-.



– Pull off actuating lever -2- from air distribution housing.

– Unscrew bolts -arrows-.

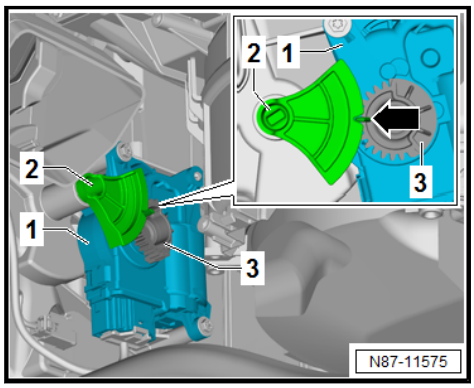
– Detach front left temperature flap -VX34- control motor -item 3- from air distribution housing.

Installing

– Check operation of flaps and hinge mechanism before fitting.

– Make sure levers and shafts are properly fitted in the mounts.

– Position front left temperature flap -VX34- control motor -item 1- on air distribution housing.



- Gear wheel -3- on front left temperature flap -VX34- control motor must engage in gear wheel on temperature flap operating lever -2-.
- The long tooth must engage in recess -arrow- on operating lever.

Note

- *If the gear wheel on the front left temperature flap -VX34- control motor and the gear wheel on the temperature flap operating lever do not align, rotate the mounting in the control motor.*
- *Rotate the front left temperature flap -VX34- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.

– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).

– Wait until front left temperature flap -VX34- control motor has reached desired position.

– Switch off ignition.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit”, page 142
- ⇒ a6.6.2 nd installing front passenger side footwell vents, right-hand drive vehicles”, page 221

4.5 Removing and installing front right temperature flap -VX35- control motor

⇒ a4.5.1 nd installing front right temperature flapVX35 control motor, left-hand drive vehicles”, page 123

⇒ a4.5.2 nd installing front right temperature flapVX35 control motor, right-hand drive vehicles”, page 125

4.5.1 Removing and installing front right temperature flap -VX35- control motor, left-hand drive vehicles

Special tools and workshop equipment required

- Vehicle diagnostic tester

Removing

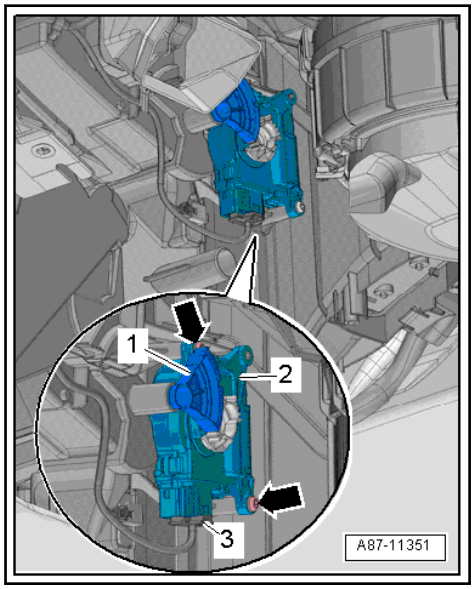
– Switch off all electrical consumers.

– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.

– Pull off actuating lever -1- for temperature flap.



– Unscrew bolts -arrows-.

– Detach front right temperature flap -VX35- control motor -item 2-.

– Release and disconnect electrical connector -3-.

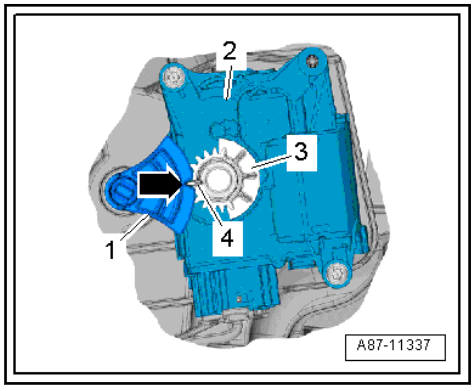
Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.

– Make sure levers and shafts are properly fitted in the mounts.

– Position front right temperature flap -VX35- control motor -item 2- on air distribution housing.



- Gear wheel -3- on front right temperature flap -VX35- control motor -item 2- must engage in gear wheel on temperature flap operating lever -1-.
- The long tooth -4- must engage in recess -arrow- on operating lever.

Note

- *If the gear wheel on the front right temperature flap -VX35- control motor and the gear wheel on the temperature flap operating lever do not align, rotate the mounting in the control motor.*
- *Rotate the front right temperature flap -VX35- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.

– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring front right temperature flap -VX35- control motor to desired position (e.g. centre position).

– Wait until front right temperature flap -VX35- control motor has reached desired position.

– Switch off ignition.

Note

If the bolts cannot be started, the front right temperature flap -VX35- control motor is not properly seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit”, page 142

4.5.2 Removing and installing front right temperature flap -VX35- control motor, right-hand drive vehicles

Special tools and workshop equipment required

- Vehicle diagnostic tester

Removing

– Switch off all electrical consumers.

– Switch off ignition.

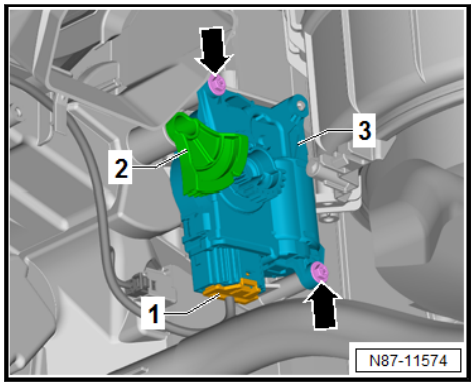
– Lay aside ignition key outside the vehicle.

– Remove footwell vent on driver side ⇒ page 219 .

Note

The illustration shows a left-hand drive vehicle.

– Release and disconnect electrical connector -1-.

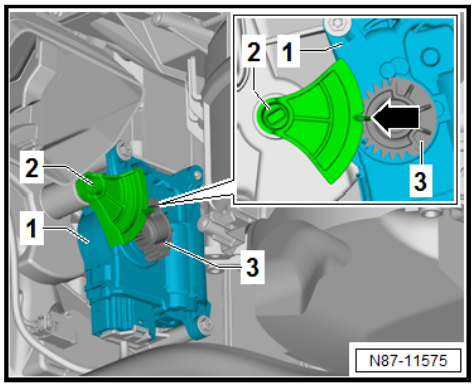


– Pull off actuating lever -2- for temperature flap.
– Unscrew bolts -arrows-.
– Detach front right temperature flap -VX35- control motor -item 3-.

Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.
– Make sure levers and shafts are properly fitted in the mounts.
– Position front right temperature flap -VX35- control motor -item 1- on air distribution housing.



- Gear wheel -3- on front right temperature flap -VX35- control motor -item 1- must engage in gear wheel on temperature flap operating lever -2-.
- The long tooth must engage in recess -arrow- on operating lever.

Note

- *If the gear wheel on the front right temperature flap -VX35- control motor and the gear wheel on the temperature flap operating lever do not align, rotate the mounting in the control motor.*
- *Rotate the front right temperature flap -VX35- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.
– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring front right temperature flap -VX35- control motor to desired position (e.g. centre position).
– Wait until front right temperature flap -VX35- control motor has reached desired position.
– Switch off ignition.

Note

If the bolts cannot be started, the front right temperature flap -VX35- control motor is not properly seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).
– Read event memory, and erase any entries displayed.
– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.
– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit”, page 142

4.6 Removing and installing fresh air and air recirculation flap -VX96-control motor

⇒ a4.6.1 nd installing fresh air and air recirculation flapVX96control motor, left-hand drive vehicles”, page 127

⇒ a4.6.2 nd installing fresh air and air recirculation flapVX96control motor, right-hand drive vehicles”, page 129

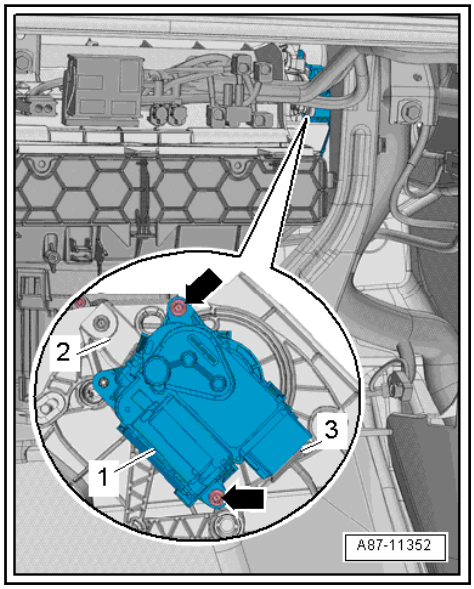
4.6.1 Removing and installing fresh air and air recirculation flap -VX96-control motor, left-hand drive vehicles

Special tools and workshop equipment required

♦ Vehicle diagnostic tester

Removing

– Switch off all electrical consumers.
– Switch off ignition.
– Lay aside ignition key outside the vehicle.
– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.
– Unclip wiring harness.
– Unscrew bolts -arrows-.

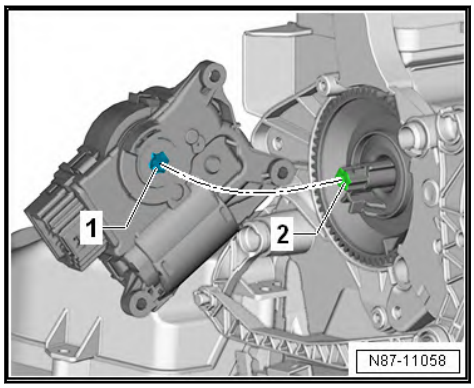


– Detach fresh air and air recirculation flap -VX96- control motor -item 1- from intake duct -2-.
– Release and disconnect electrical connector -3-.

Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.
– Make sure levers and shafts are properly fitted in the mounts.



- Mounting of fresh air and air recirculation flap -VX96- control motor -item 1- can be fitted onto relay lever -2- in only one position.

Note

- *Rotate the receptacle in the control motor if the mount and actuating arm do not align.*
- *Rotate fresh air and air recirculation flap -VX96- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.
– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).
– Wait until fresh air and air recirculation flap -VX96- control motor has reached desired position.
– Switch off ignition.
– Position fresh air and air recirculation flap -VX96- control motor on air distribution housing.
• Make sure that relay lever engages in mounting.
• There must not be any play in the connection between control motor and actuating lever.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).
– Read event memory, and erase any entries displayed.
– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.
– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit”, page 142

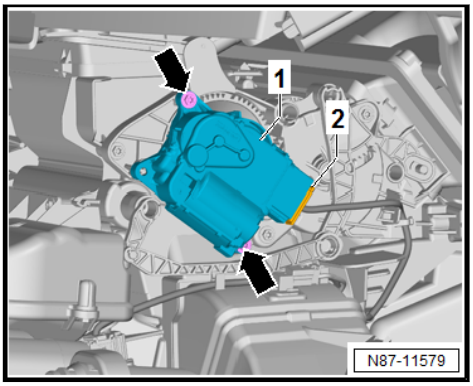
4.6.2 Removing and installing fresh air and air recirculation flap -VX96-control motor, right-hand drive vehicles

Special tools and workshop equipment required

♦ Vehicle diagnostic tester

Removing

– Switch off all electrical consumers.
– Switch off ignition.
– Lay aside ignition key outside the vehicle.
– Remove bracket for onboard supply control unit -J519- ⇒ Electrical system; Rep. gr. 97; Control units.
– Unscrew bolts -arrows-.



– Detach fresh air and air recirculation flap -VX96- control motor -item 1- from intake duct.

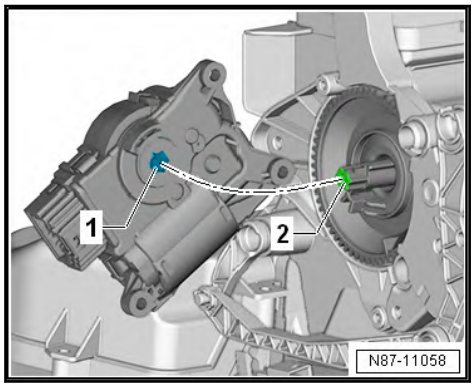
– Release and disconnect electrical connector -2-.

Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.

– Make sure levers and shafts are properly fitted in the mounts.



- Mounting of fresh air and air recirculation flap -VX96- control motor -item 1- can be fitted onto relay lever -2- in only one position.

Note

♦ *Rotate the receptacle in the control motor if the mount and actuating arm do not align.*

♦ *Rotate fresh air and air recirculation flap -VX96- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.

– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).

– Wait until fresh air and air recirculation flap -VX96- control motor has reached desired position.

– Switch off ignition.

– Position fresh air and air recirculation flap -VX96- control motor on air distribution housing.

- Make sure that relay lever engages in mounting.
- There must not be any play in the connection between control motor and actuating lever.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit", page 142

4.7 Removing and installing air distribution flap -VX33- control motor

⇒ a4.7.1 nd installing air distribution flapVX33 control motor, left-hand drive vehicles", page 131

⇒ a4.7.2 nd installing air distribution flapVX33 control motor, right-hand drive vehicles", page 133

4.7.1 Removing and installing air distribution flap -VX33- control motor, left-hand drive vehicles

Special tools and workshop equipment required

♦ Vehicle diagnostic tester

Removing

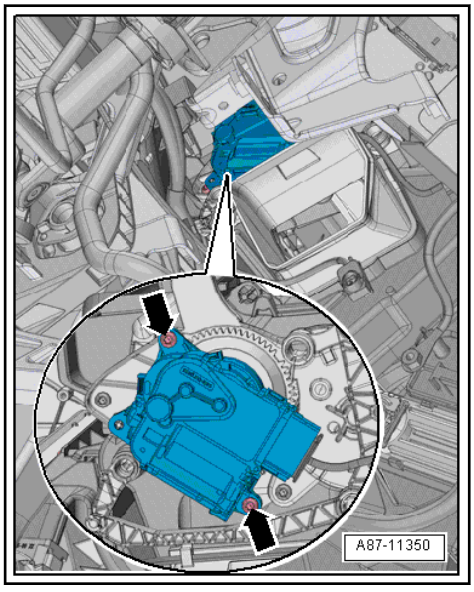
– Switch off all electrical consumers.

– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70; Dash panel; Removing and installing dash panel.

– Unscrew bolts -arrows-.



Note

The bolts are accessible from underneath behind the central tube.

– Detach air distribution flap -VX33- control motor.

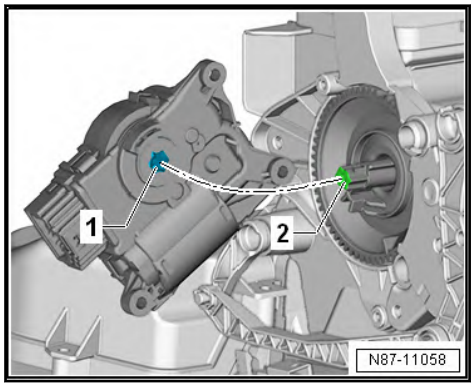
– Release and disconnect electrical connector.

Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.

– Make sure levers and shafts are properly fitted in the mounts.



- Mounting -1- of air distribution flap -VX33- control motor can be fitted onto relay lever -2- in only one position.

Note

♦ *Rotate the receptacle in the control motor if the mount and actuating arm do not align.*

♦ *Rotate air distribution flap -VX33- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.

– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).

– Wait until air distribution flap -VX33- control motor has reached desired position.

– Switch off ignition.

– Position air distribution flap -VX33- control motor on air distribution housing.

- Make sure that relay lever engages in mounting -1-.
- There must not be any play in the connection between control motor and actuating lever.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit", page 142

4.7.2 Removing and installing air distribution flap -VX33- control motor, right-hand drive vehicles

Special tools and workshop equipment required

- Vehicle diagnostic tester

Removing

– Switch off all electrical consumers.

– Switch off ignition.

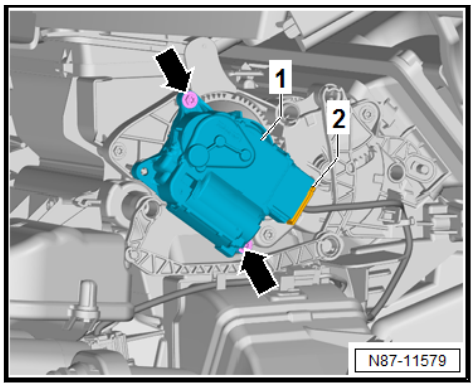
– Lay aside ignition key outside the vehicle.

– Remove control unit 1 for information electronics -J794- ⇒ Communication; Rep. gr. 91; Infotainment system; Removing and installing control unit 1 for information electronics -J794-.

Note

The bolts are accessible from underneath behind the central tube.

– Unscrew bolts -arrows-.



– Detach air distribution flap -VX33- control motor -item 1-.

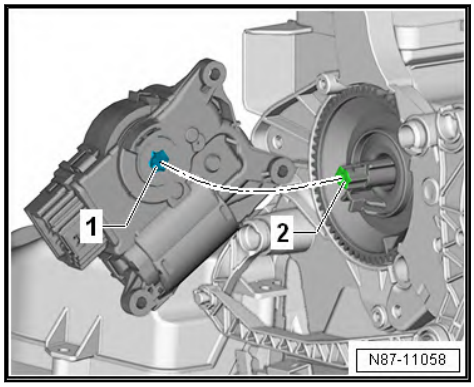
– Release and disconnect electrical connector -arrow-.

Installing

Install in reverse order of removal, observing the following:

– Check operation of flaps and hinge mechanism before fitting.

– Make sure levers and shafts are properly fitted in the mounts.



- Mounting -1- of air distribution flap -VX33- control motor can be fitted onto relay lever -2- in only one position.

Note

- *Rotate the receptacle in the control motor if the mount and actuating arm do not align.*
- *Rotate air distribution flap -VX33- control motor until it reaches a convenient position for installation. The direction of rotation can be changed by changing polarities.*

– Switch on ignition.

– Connect respective control motor to vehicle wiring harness.

– Via the operating and display unit, select a setting to bring control motor to desired position (e.g. centre position).

– Wait until air distribution flap -VX33- control motor has reached desired position.

– Switch off ignition.

– Position air distribution flap -VX33- control motor on air distribution housing.

- Make sure that relay lever engages in mounting -1-.
- There must not be any play in the connection between control motor and actuating lever.

Note

If the bolts cannot be fitted, the control motor is not completely seated on the housing.

– Route wiring harness so that it cannot come into contact with any moving parts (e.g. actuating arm on control motor).

– Read event memory, and erase any entries displayed.

– Initiate “basic setting” using ⇒ Vehicle diagnostic tester.

– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit”, page 142

4.8 Removing and installing fresh air/air recirculation, air flow flap actuator

⇒ a4.8.1 nd installing fresh air/air recirculation, air flow flap actuator, LHD vehicles", page 135

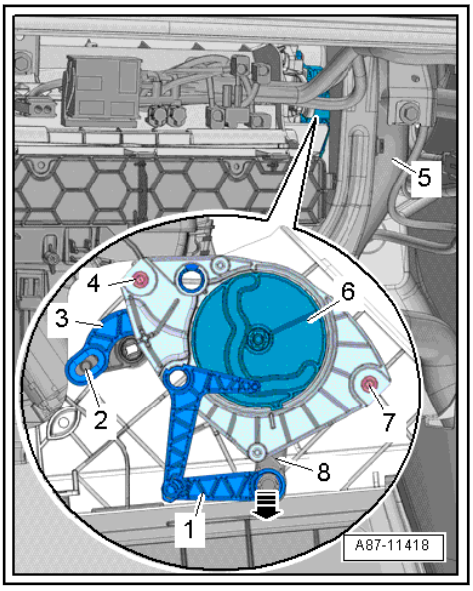
⇒ a4.8.2 nd installing fresh air/air recirculation, air flow flap actuator, RHD vehicles", page 136

4.8.1 Removing and installing fresh air/air recirculation, air flow flap actuator, LHD vehicles

Removing

– Remove fresh air/recirculated air, air flow flap control motor -V425- ⇒ page 127 .

– Lay wiring harness -5- to one side.

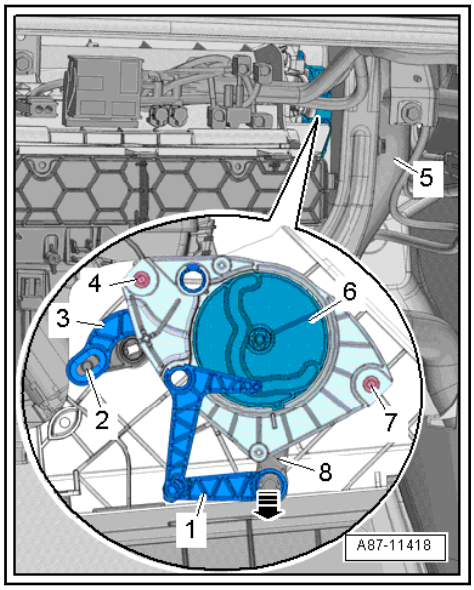


– Carefully press operating lever -1- off fresh air/air recirculation flap lever -8- -arrow-.

– Unscrew bolts -4- and -7-.

– Remove actuator -6- with operating lever -3-.

Installing



Install in reverse order of removal, observing the following:

- When fitting actuator, make sure that operating lever -3- engages in lever -2- of air flow flap.

– Install fresh air/air recirculation, air flow flap control motor -V425- ⇒ page 127 .

Specified torques

♦ ⇒ o5.2 verview - add-on parts of heater and air conditioning unit and of air intake box", page 146

4.8.2 Removing and installing fresh air/air re-circulation, air flow flap actuator, RHD vehicles

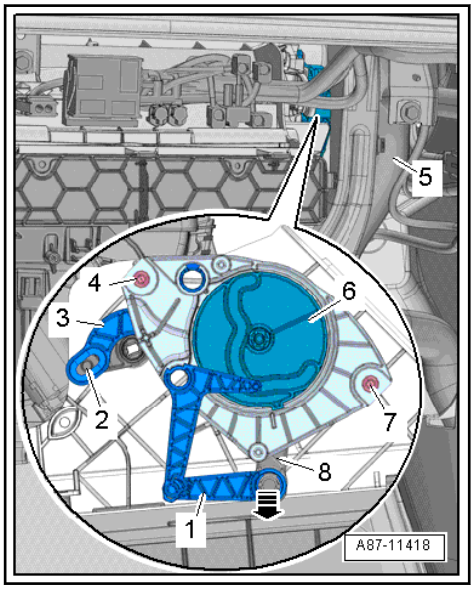
Removing

Note

The illustrations show a left-hand drive vehicle.

– Remove fresh air/recirculated air, air flow flap control motor -V425- ⇒ page 127 .

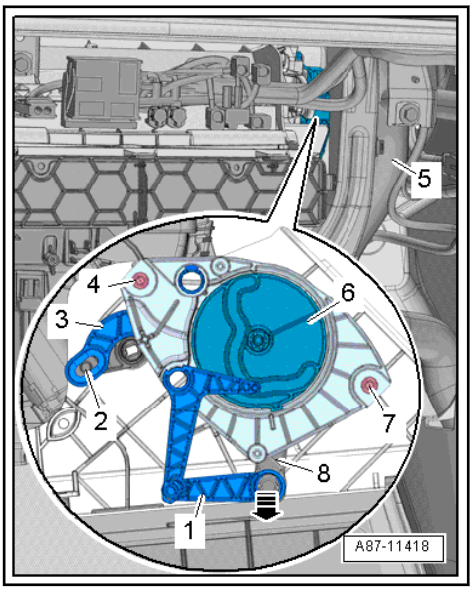
– Lay wiring harness -5- to one side.



– Carefully press operating lever -1- off fresh air/air recirculation flap lever -8- -arrow-.
– Unscrew bolts -4- and -7-.
– Remove actuator -6- with operating lever -3-.

Installing

Install in reverse order of removal, observing the following:



- When fitting actuator, make sure that operating lever -3- engages in lever -2- of air flow flap.

– Install fresh air/air recirculation, air flow flap control motor -V425- ⇒ page 127 .

Specified torques

♦ ⇒ o5.2 verview - add-on parts of heater and air conditioning unit and of air intake box", page 146

4.9 Removing and installing air distribution flap actuator

⇒ a4.9.1 nd installing air distribution flap actuator, LHD vehicles", page 138

⇒ a4.9.2 nd installing air distribution flap actuator, RHD vehicles", page 139

4.9.1 Removing and installing air distribution flap actuator, LHD vehicles

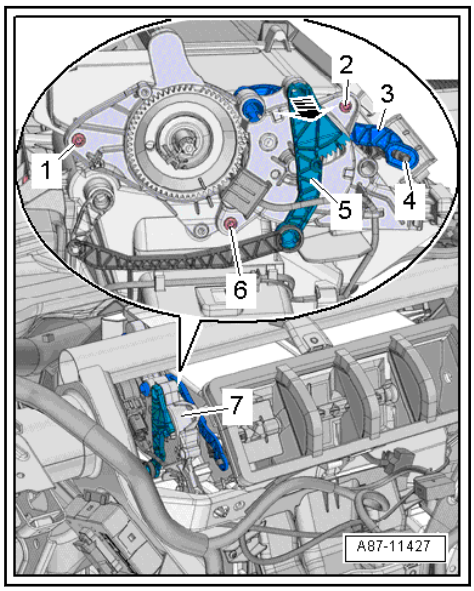
Removing

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70; Dash panel; Removing and installing dash panel.

– Remove air duct for defroster vent ⇒ page 223 .

– Release front air distribution flap control motor -V426- ⇒ page 131 .

– Carefully press off actuating lever -5- -arrow-.



– Remove bolts -1-, -2- and -6-.

– Remove actuation unit -7- upwards.

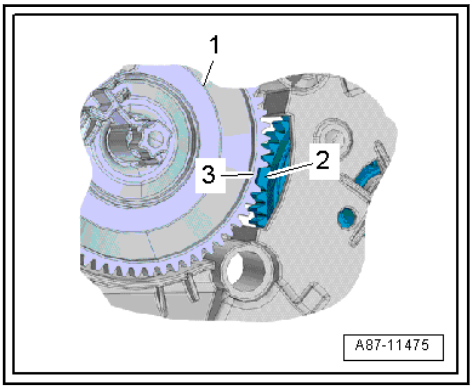
Installing

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

– Check operation of flaps and hinge mechanism before fitting.

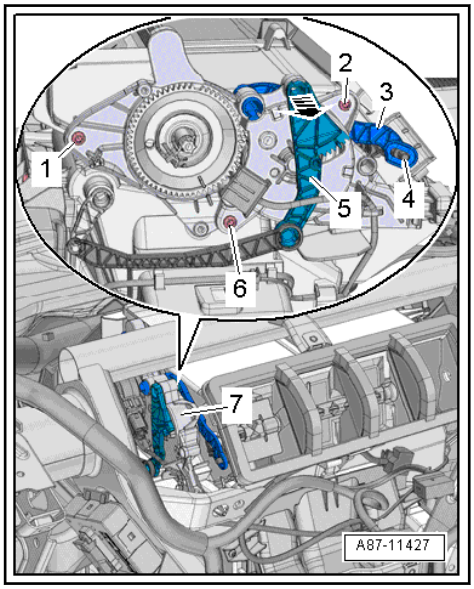
– Make sure levers and shafts are properly fitted in the mounts.

– Check that the two gear wheels are correctly aligned.



- The rectangular tooth -2- must engage in the gap -3- of the gear wheel -1-.

– When fitting the actuator, the operating lever -3- must engage in lever -4- of centre vent flap.



Torque settings

◆ ⇒ o5.1 verview – heater and air conditioning unit", page 142

4.9.2 Removing and installing air distribution flap actuator, RHD vehicles

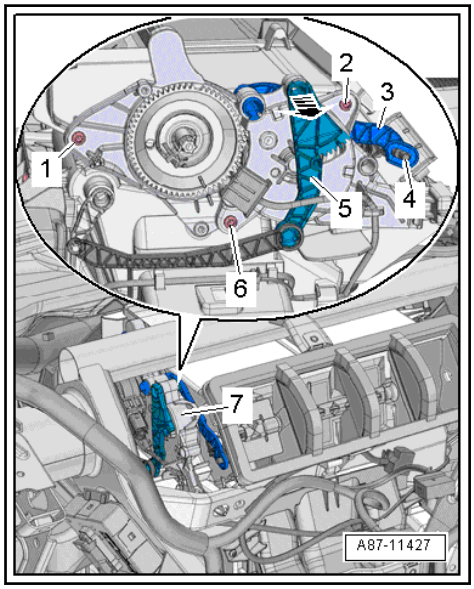
Removing

– Remove central tube for dash panel ⇒ General body repairs, interior; Rep. gr. 70; Dash panel.

– Remove air duct for defroster vent ⇒ page 223 .

– Release front air distribution flap control motor -V426- ⇒ page 133 .

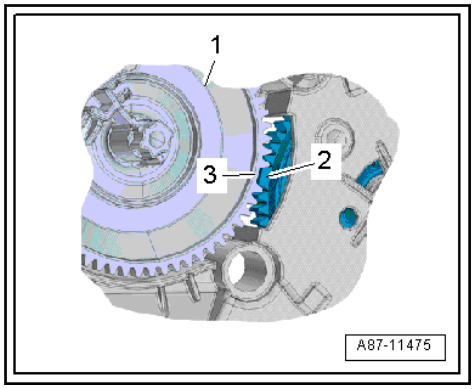
– Carefully press off actuating lever -5- -arrow-.



– Remove bolts -1-, -2- and -6-.
– Remove actuation unit -7- upwards.

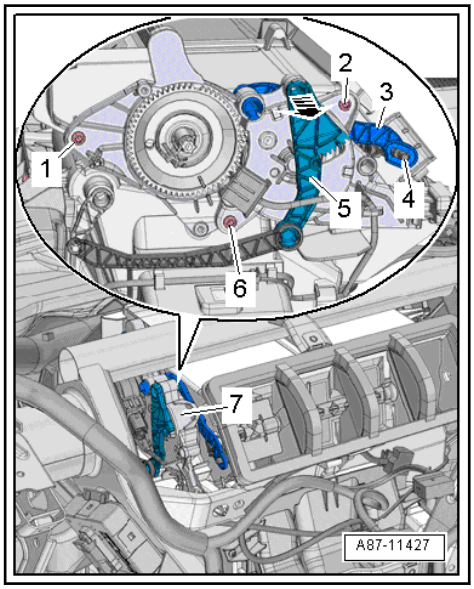
Installing

– Install in reverse order of removal, observing the following:
– Check operation of flaps and hinge mechanism before fitting.
– Make sure levers and shafts are properly fitted in the mounts.
– Check that the two gear wheels are correctly aligned.



- The rectangular tooth -2- must engage in the gap -3- of the gear wheel -1-.

– When fitting the actuator, the operating lever -3- must engage in lever -4- of centre vent flap.



Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit", page 142

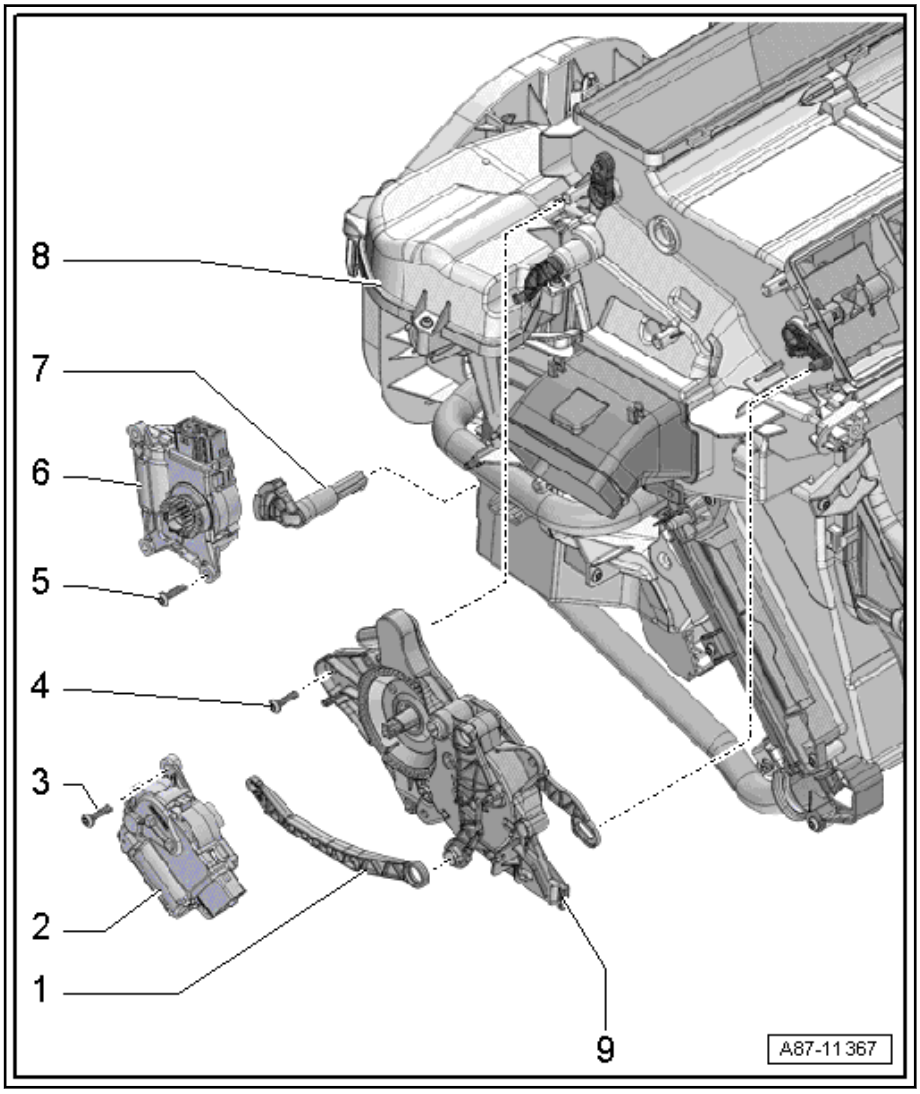
5 Front heater and air conditioning unit

5.1 Assembly overview – heater and air conditioning unit

Note

- *There are different designs and makes of heater and air conditioning unit. The individual components of the different heater and air conditioning units are similar. Interchanging components from different manufacturers is not permissible ⇒ Electronic parts catalogue.*
- *The illustration shows a "Valeo" heater and air conditioning unit.*

Assembly overview – heater and air conditioning unit, flap control (left side)



1 - Operating lever

- For actuation of defroster and air distributor flap

2 - Front air distribution flap control motor -V426-

- With potentiometer for front air distribution flap control motor -G642-
- ASSY air distribution flap -VX33-
- Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 131

3 - Bolt

- Qty. 2
- 1 Nm

4 - Bolt

- Qty. 3
- 1 Nm

5 - Bolt

- Qty. 2
- 1 Nm

6 - Left temperature flap control motor -V158-

- With potentiometer for left temperature flap control motor -G220-
- ASSY front left temperature flap -VX34-
- Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 119

7 - Operating lever

- For warm air flap

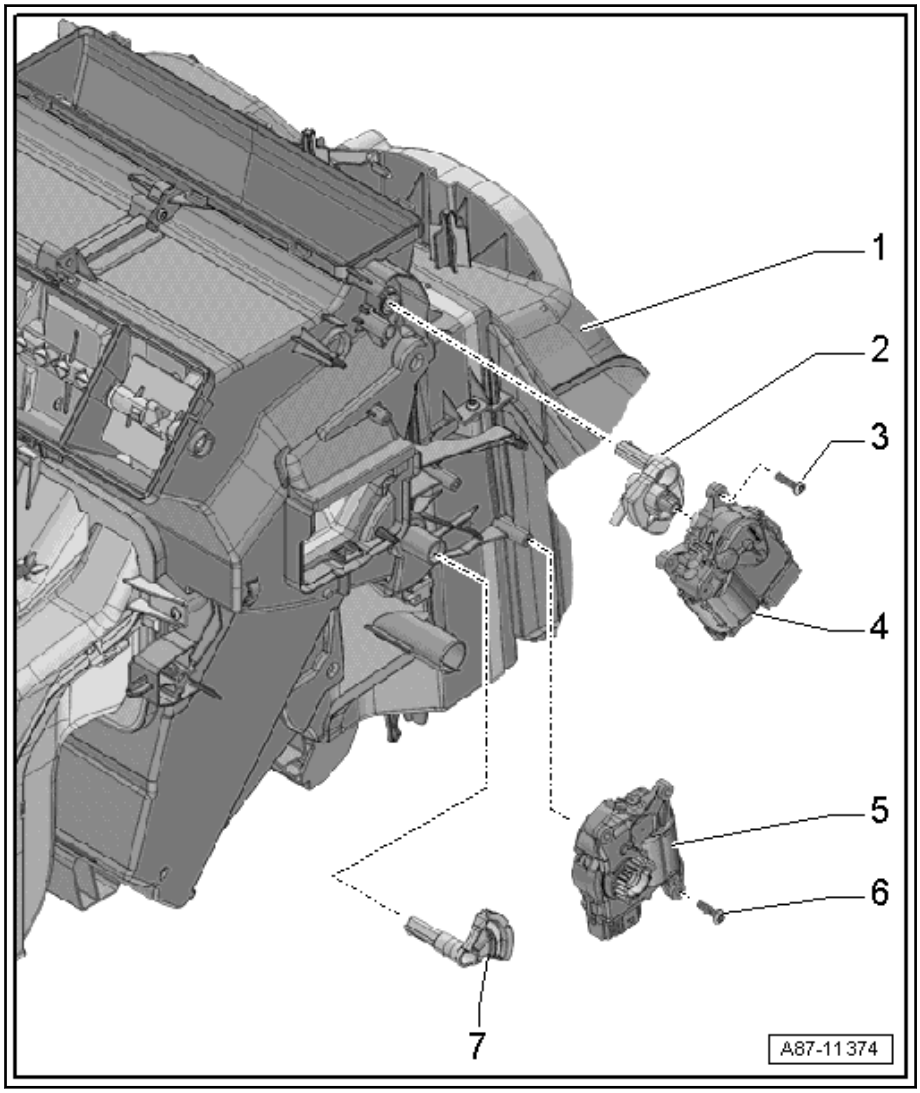
8 - Heater and air conditioning unit

- Removing and installing ⇒ page 152

9 - Defroster and air distribution flap actuation unit

- Removing and installing ⇒ page 138

Assembly overview - heater and air conditioning unit, flap control (right side)



1 - Heater and air conditioning unit

- ❑ Removing and installing ⇒ page 152

2 - Operating lever

- ❑ For defroster flap

3 - Bolt

- ❑ Qty. 2
- ❑ 1 Nm

4 - Defroster flap control motor -V107-

- ❑ With potentiometer for defroster flap control motor -G135-
- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 115

5 - Right temperature flap control motor -V159-

- ❑ With potentiometer for right temperature flap control motor -G221-
- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 123

6 - Bolt

- ❑ Qty. 2
- ❑ 1 Nm

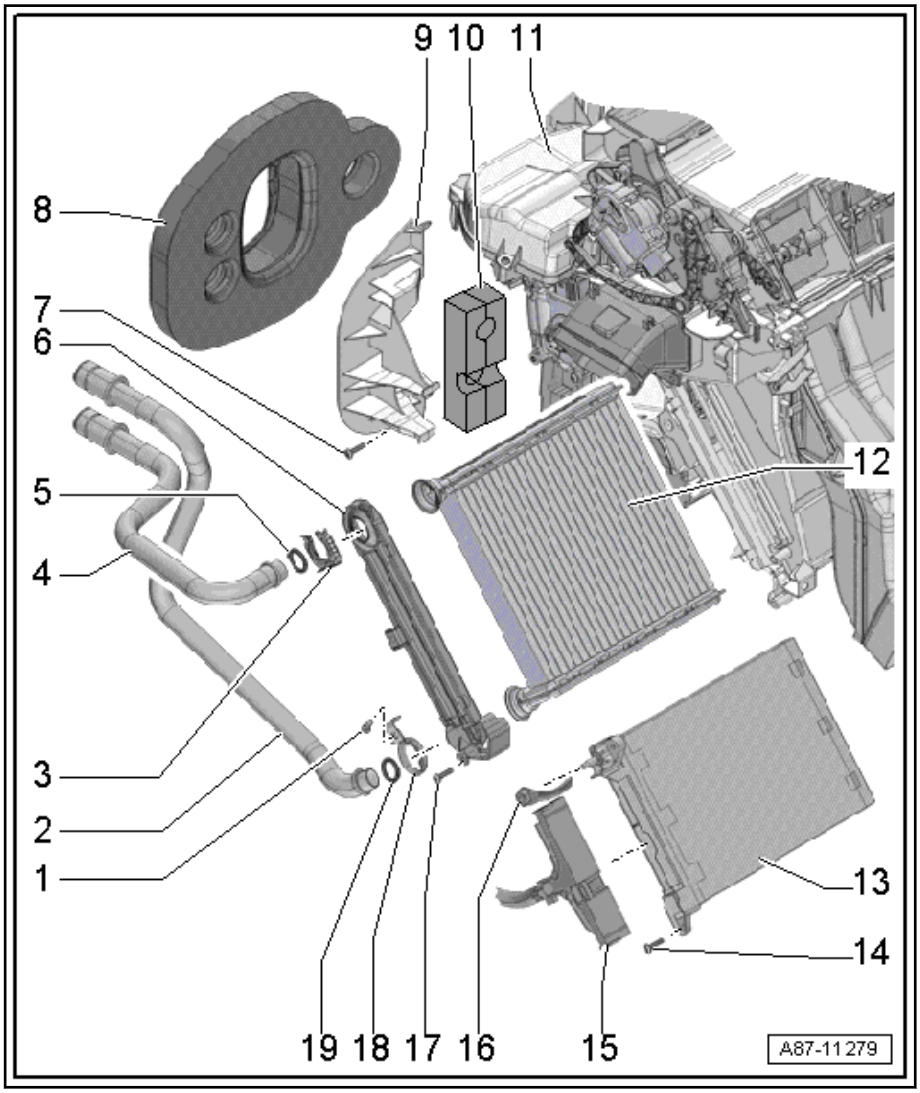
7 - Operating lever

- ❑ For warm air flap

Assembly overview - heater and air conditioning unit, heat exchanger, auxiliary air heater element

Note

The illustration shows a “Valeo” heater and air conditioning unit.



1 - Bolt

- ❑ 2 Nm

2 - Coolant pipe with heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Coolant supply from engine
- ❑ Removing and installing ⇒ page 175

3 - Clip

4 - Coolant pipe with heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Coolant return to the engine
- ❑ Removing and installing ⇒ page 175

5 - Seal

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renew after removal

6 - Cover

- ❑ For heat exchanger

7 - Bolt

- ❑ 2 Nm

8 - Foam spacer

- ❑ For sealing and insulation
- ❑ Observe installation position

9 - Bracket

- ❑ For coolant pipes

10 - Foam

- ❑ For insulation
- ❑ Observe installation position

11 - Heater and air conditioning unit

- ❑ Removing and installing ⇒ page 152
- ❑ Dismantling and assembling ⇒ page 157

12 - Heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 175

13 - Auxiliary air heater element -Z35- with auxiliary air heater control unit -J604-

- ❑ If not fitted, opening for auxiliary air heater element -Z35- is sealed.
- ❑ Checking activation ⇒ page 171
- ❑ Removing and installing ⇒ page 173

14 - Bolt

- ❑ Qty. 2

- ❑ 2 Nm

15 - Electrical wire

- ❑ For auxiliary air heater element -Z35- with auxiliary air heater control unit -J604-.

16 - Earth cable

- ❑ For auxiliary heater
- ❑ Nut 9 ± 1 Nm

17 - Bolt

- ❑ Qty. 3
- ❑ 2 Nm

18 - Screw-type clip

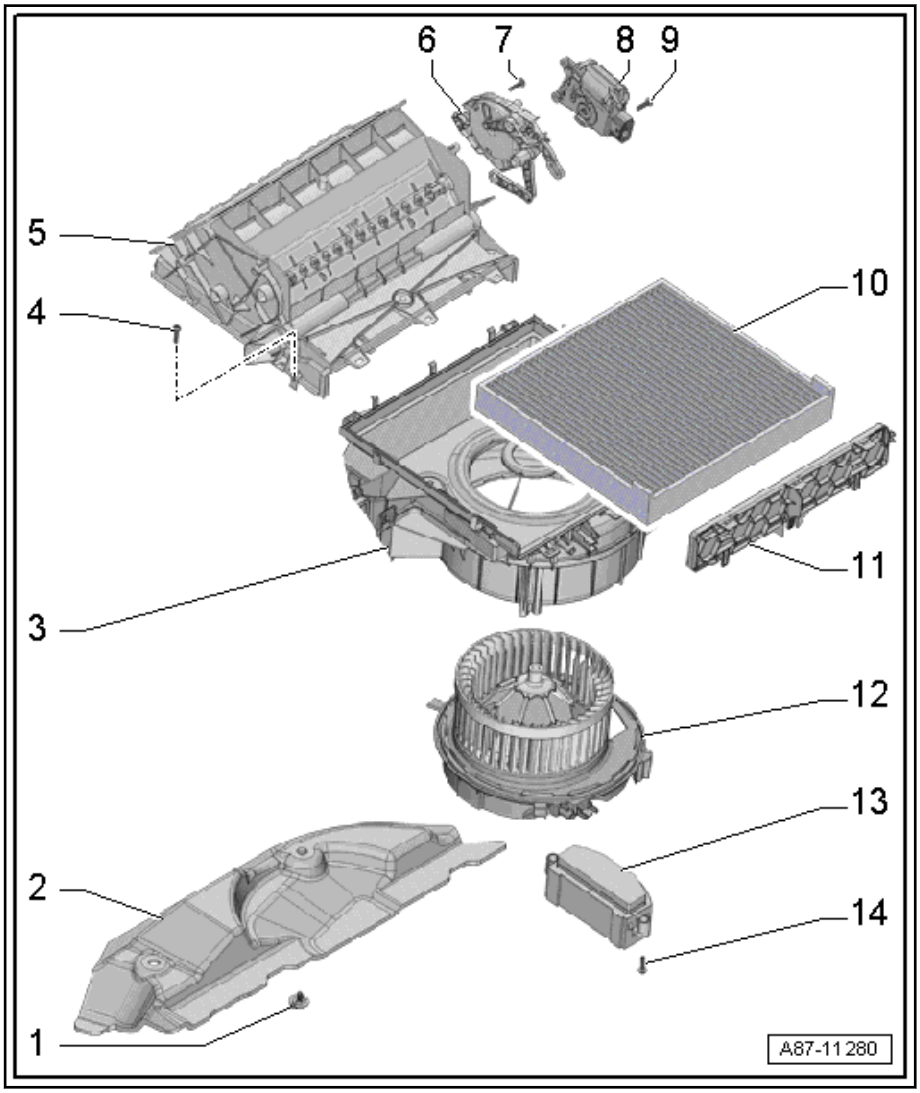
19 - Seal

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renew after removal

5.2 Assembly overview - add-on parts of heater and air conditioning unit and of air intake box

Note

- *There are different designs and makes of heater and air conditioning unit. The individual components of the different heater and air conditioning units are similar. Interchanging components from different manufacturers is not permissible ⇒ Electronic parts catalogue.*
- *The illustration shows a “Valeo” air intake box.*



1 - Plastic screw

- ❑ Plug on some equipment versions
- ❑ Qty. 2
- ❑ 0.3 Nm

2 - Plate

3 - Upper part of housing for fresh air blower

4 - Bolt

- ❑ Qty. 2
- ❑ 1 Nm

5 - Air intake duct

- ❑ With fresh air and air recirculation flap
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 218
- ❑ Do not dismantle

6 - Fresh air and air recirculation flap actuation unit

- ❑ Removing and installing ⇒ page 138

7 - Bolt

- ❑ Qty. 2
- ❑ 1 Nm

8 - Fresh air/air recirculation, air flow flap control motor -V425-

- ❑ With potentiometer for fresh air/recirculated air and air flow flap control motor -G644-
- ❑ Fresh air and air recirculation flap -VX96- assembly
- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 127

9 - Bolt

- ❑ Qty. 2
- ❑ 1 Nm

10 - Dust and pollen filter

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Change interval ⇒ Maintenance tables
- ❑ Removing and installing ⇒ page 163

11 - Cover

- ❑ For dust and pollen filter

12 - Fresh air blower -V2-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 168

13 - Fresh air blower control unit -J126-

- ❑ Check with ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 162

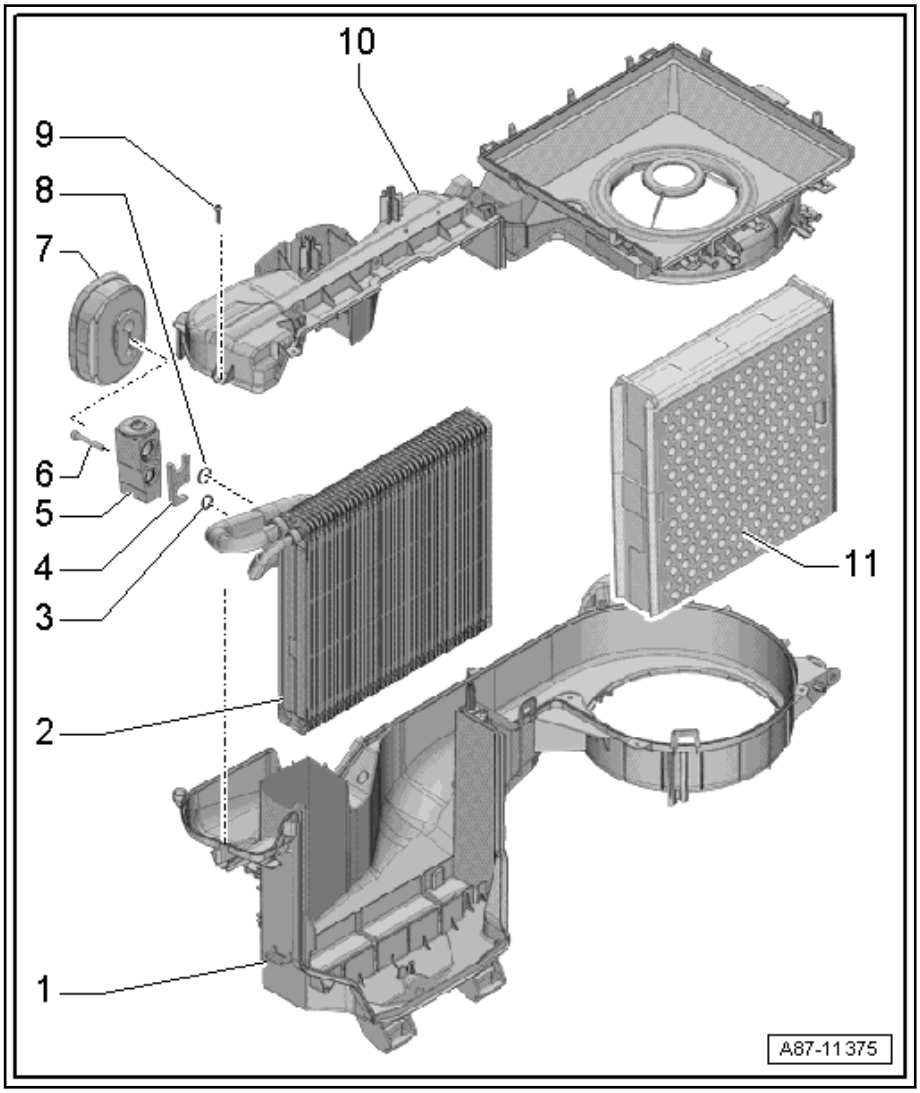
14 - Bolt

- ❑ Qty. 2
- ❑ 1 Nm

5.3 Assembly overview – evaporator housing

Note

- *There are different designs and makes of heater and air conditioning unit. The individual components of the different heater and air conditioning units are similar. Interchanging components from different manufacturers is not permissible ⇒ Electronic parts catalogue.*
- *The illustration shows a “Valeo” evaporator housing.*



1 - Evaporator housing, lower part

2 - Evaporator

- ❑ Check foam seals for damage and proper attachment
- ❑ Removing and installing ⇒ page 160

3 - Seal

- ❑ Renew after removal
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Moisten with refrigerant oil before installation

4 - Retaining plate

- ❑ For securing refrigerant lines and expansion valve

5 - Expansion valve

- ❑ Removing and installing ⇒ page 34

6 - Bolt

- ❑ Qty. 2
- ❑ 4.5 Nm

7 - Sealing and insulation

- ❑ Heat insulation for expansion valve
- ❑ There is no opening for the expansion valve in the plenum chamber back wall seal, or this is closed off by a foam pad on vehicles with no air conditioner

8 - Seal

- ❑ Renew after removal
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Moisten with refrigerant oil before installation

9 - Bolt

- ❑ Qty. 8
- ❑ 1.5 Nm

10 - Evaporator housing, upper part

11 - Flow rate limiter

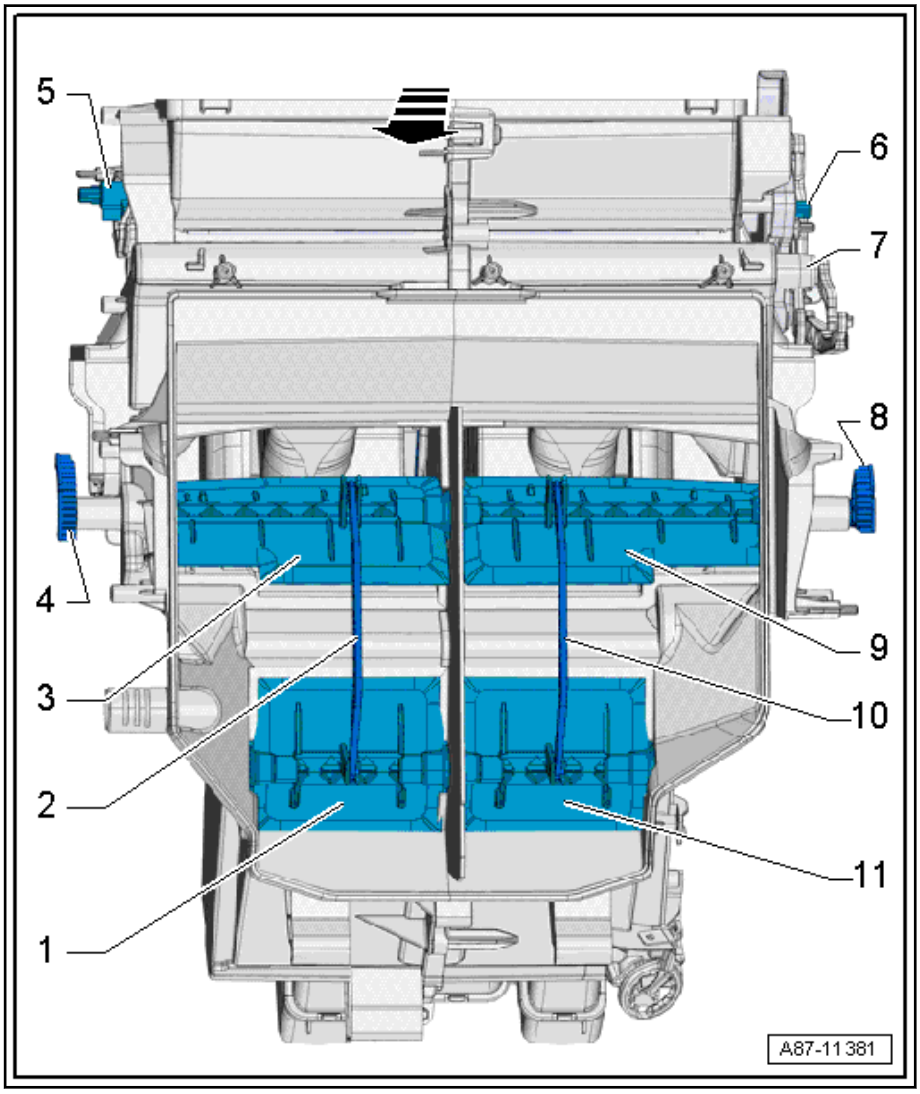
- ❑ Equipment version

5.4 Assembly overview - flaps and partitions in air distribution housing

View from front

Note

- *-Arrow- = direction of travel*
- *⇒ o5.1 verview – heater and air conditioning unit", page 142* .



1 - Right heated air flap

- From heat exchanger
- Actuated via right cold air flap

2 - Operating lever

- For flap control

3 - Right cold air flap

- From evaporator
- Various versions
- Actuated by right temperature flap control motor -V159- via right operating lever

4 - Actuating lever on right of temperature control flap

- Equipment version
- Only in vehicles with 3-zone Climatronic
- Actuated by right temperature flap control motor -V159-

5 - Actuating lever of flap for “defrost”.

- To windscreen and door windows
- Equipment version
- Only in vehicles with 3-zone Climatronic
- Actuated by defroster flap control motor -V107-

6 - Actuating lever of flap for “defrost”.

- To windscreen and door windows
- Equipment version
- Only in vehicles with 5-zone Climatronic
- Actuated by air distribution flap control motor -V428- via defroster and air distribution actuator

7 - Air distribution flap actuating lever

- Actuated by front air distribution flap control motor -V426- via defroster and air distribution actuator

8 - Left actuating lever

- Actuated by left temperature flap control motor -V158-

9 - Left cold air flap

- From evaporator
- Various versions
- Actuated by left temperature flap control motor -V158- via left operating lever

10 - Operating lever

- For flap control

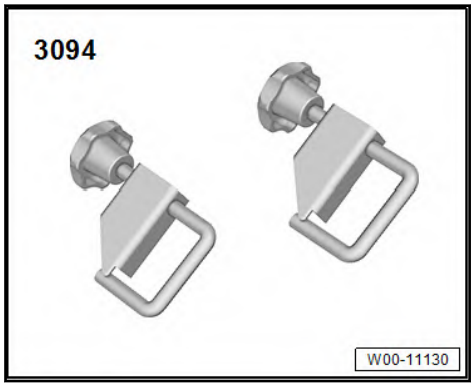
11 - Left heated air flap

- From heat exchanger
- Actuated via left cold air flap

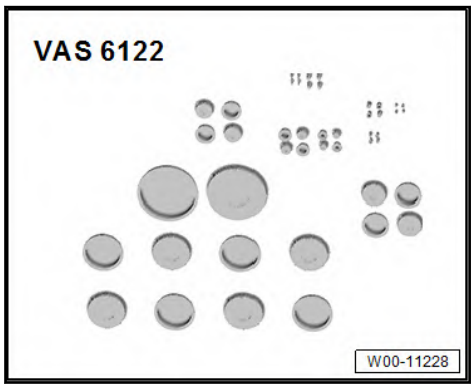
5.5 Removing and installing heater and air conditioning unit

Special tools and workshop equipment required

- Hose clamps, up to 25 mm in dia. -3094-



- Engine bung set -VAS 6122-



- Drip tray for workshop hoist -VAS 6208-

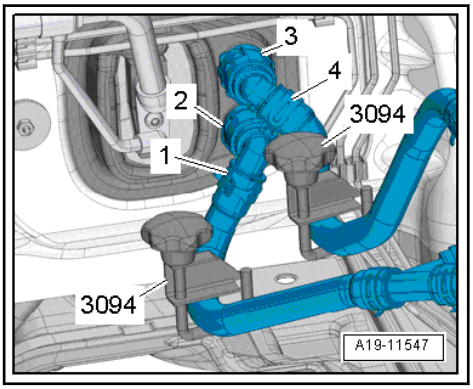
- Compressed air gun, commercially available

Removing

– Disconnect the refrigerant line with internal heat exchanger at the expansion valve ⇒ a2.13 nd installing refrigerant line with internal heat exchanger", page 68 .

– For any further work, immediately seal open lines and connections with clean plugs from engine bung set -VAS 6122-.

– Place drip tray for workshop hoist -VAS 6208- beneath engine.



– Mark coolant hoses -1- and -4-.

Note

The heat exchanger is designed for a particular direction of flow of the coolant. Therefore, the coolant hoses must not be interchanged when connecting them.

– Clamp off coolant hoses -1- and -4- using hose clamps, up to 25 mm in dia. -3094-.

CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

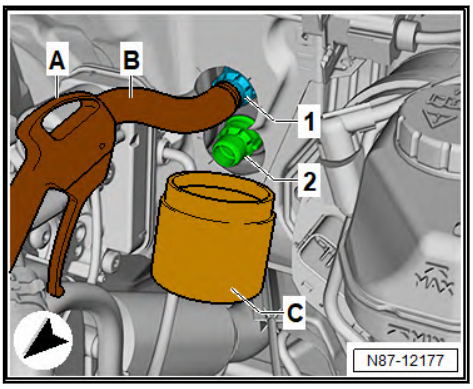
There is a risk of injury to the skin and parts of the body due to scalding.

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

– Lift retaining clips -2- and -3-.

– Disconnect coolant hoses -1- and -4- from heat exchanger for heater.

– Push hose -B- onto connection -1-.



– Insert compressed air gun -A- into end of hose -B-.

– Hold container -C- under connection -2-, and carefully blow coolant out of heat exchanger using compressed air gun -A-.

– Remove central tube for dash panel ⇒ General body repairs, interior; Rep. gr. 70; Central tube for dash panel; Removing and installing central tube for dash panel.

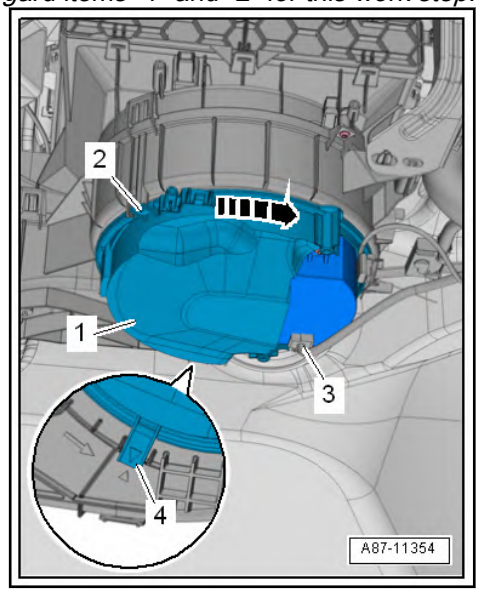
– Remove air duct leading to the rear vent ⇒ page 222 .

– Lift rear footwell vents under front seats and pull them towards rear to ease removal of footwell vents from heater and air conditioning unit.

– Push rear footwell vent of heater and air conditioning unit towards rear.

Note

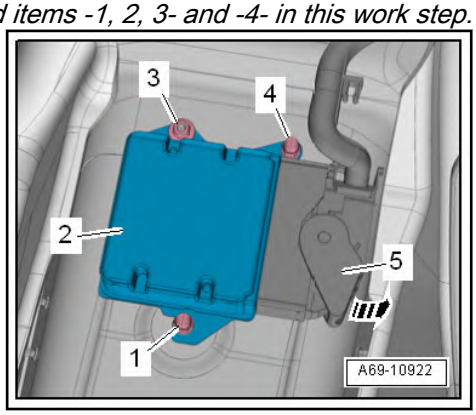
Disregard items -1- and -2- for this work step.



– Release and disconnect electrical connector -3-.

Note

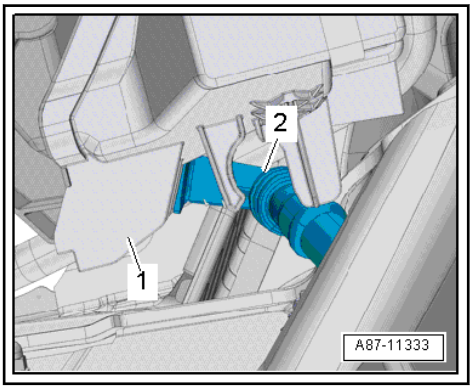
Disregard items -1, 2, 3- and -4- in this work step.



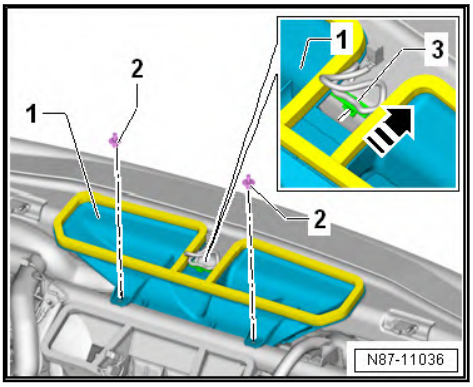
– Release and disconnect electrical connector -5-.

– Cover floor covering and airbag control unit -J234- in interior of vehicle with a waterproof sheet and absorbent paper.

– Pull condensation drain -2- off heater and air conditioning unit -1-.

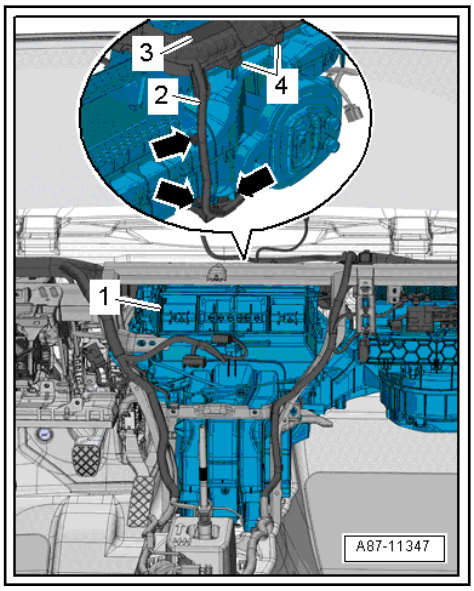


– Unclip wiring harness -3- of sunlight penetration photosensor -G107- in direction of -arrow-.



– If fitted, disconnect wiring harnesses of auxiliary air heater element -Z35-.

– Pull heater and air conditioning unit -1- off retainers on plenum chamber bulkhead.



– Lay aside duct -3-.

– Lay wiring harness -2- on mountings -4- to one side -arrows-.

Note

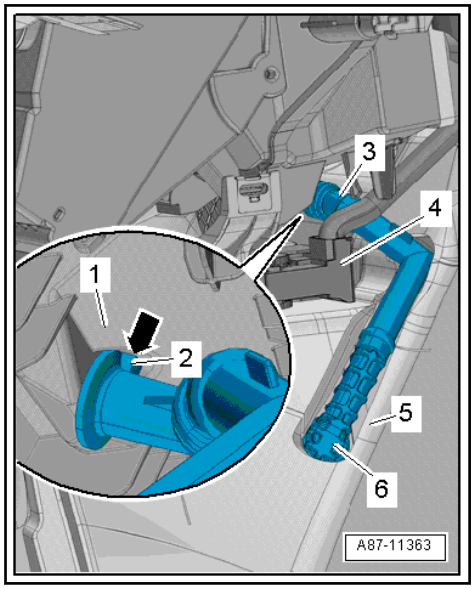
The following work steps must be performed by a second mechanic.

– Remove heater and air conditioning unit to the side.

Installing

Install in reverse order of removal, observing the following:

– Ensure that the condensation drain -3- is properly seated.



- Coding -2- and -arrow- must align with heater and air conditioning unit -1-.

– If a cable tie was installed to retain the condensation drain -3-, renew cable tie.

– Route condensation drain below wiring harness for airbag control unit -J234- -item. 4-.

– Moisten new seals with refrigerant oil before installing refrigerant line.

NOTICE

Risk of damage to air conditioner compressor if refrigerant circuit is empty.

– Never start the engine if the refrigerant circuit is empty.

– Charge refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - general information; Rep. gr. 87; Working with air conditioner service station; Charging refrigerant circuit.

– Perform leakage test on re-established line connections of refrigerant circuit ⇒ Air conditioning systems with refrigerant R1234yf - General information; Rep. gr. 87; Refrigerant circuit; Detecting leaks.

– Fill up with coolant ⇒ Rep. gr. 19; Cooling system/coolant; Draining and filling coolant.

– Perform functional check.

Torque settings

- ⇒ o5.1 verview – heater and air conditioning unit", page 142
- ⇒ o2.1 verview - refrigerant lines", page 26
- ⇒ General body repairs, interior; Rep. gr. 70; Central tube for dash panel; Assembly overview – central tube for dash panel

5.6 Dismantling and assembling heater and air conditioning unit

Note

- *There are different designs and makes of heater and air conditioning unit. The individual components of the different heater and air conditioning units are similar. Interchanging components from different manufacturers is not permissible ⇒ Electronic parts catalogue.*
- *The illustration shows a "Valeo" heater and air conditioning unit.*

1 - Air distribution housing
- ❑ Distinguishing makes ⇒ page 5

2 - Electrical wiring harness
- ❑ Different versions ⇒ Electronic parts catalogue

3 - Evaporator housing

4 - Bolt
- ❑ Qty. 3
- ❑ 1 Nm

5 - Plug, left
- ❑ Removing and installing ⇒ page 159

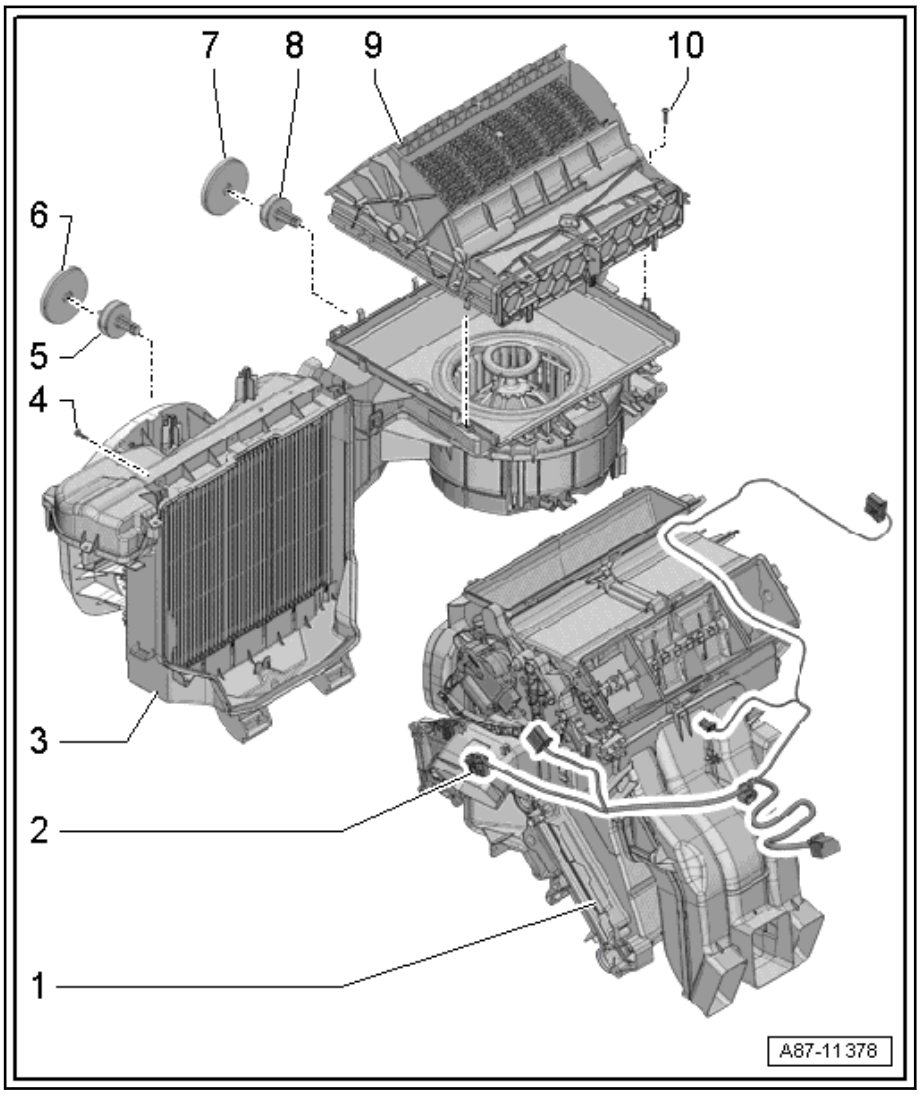
6 - Nut
- ❑ 4.5 Nm

7 - Nut
- ❑ 4.5 Nm

8 - Plug, right
- ❑ Removing and installing ⇒ page 159

9 - Air intake box
- ❑ Different versions ⇒ Electronic parts catalogue

10 - Bolt
- ❑ Qty. 2
- ❑ 1 Nm



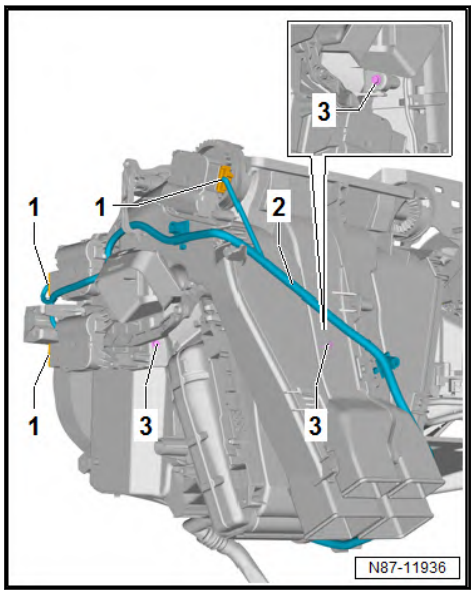
5.7 Removing and installing air distribution housing

Removing

– Remove heater and air conditioning unit ⇒ page 152 .

– Remove coolant pipes on heat exchanger ⇒ page 200 .

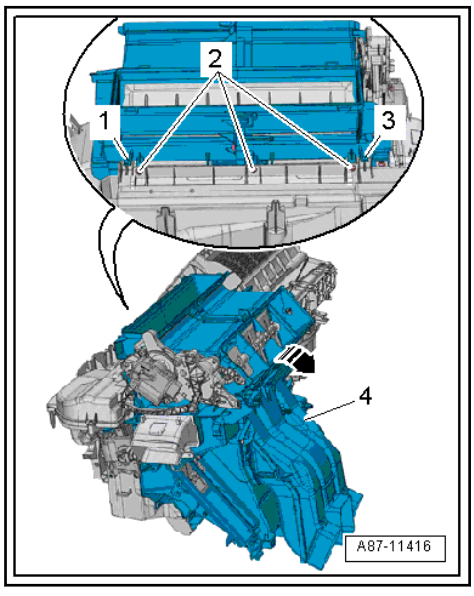
– Release and disconnect electrical connectors -1-.



– Unclip wiring harness -2-, and place it aside.

– Unscrew bolts -3-.

– Release retaining tabs -1- and -3-.



– Unscrew bolts -2-.

– Swivel air distribution housing -4- to rear in direction of -arrow- and disengage.

Installing

Install in reverse order of removal, observing the following:

Torque settings

Component	Specified torque
Bolts -2-	1 Nm
Bolts -3-	1 Nm

5.8 Removing and installing holder for heater and air conditioning unit

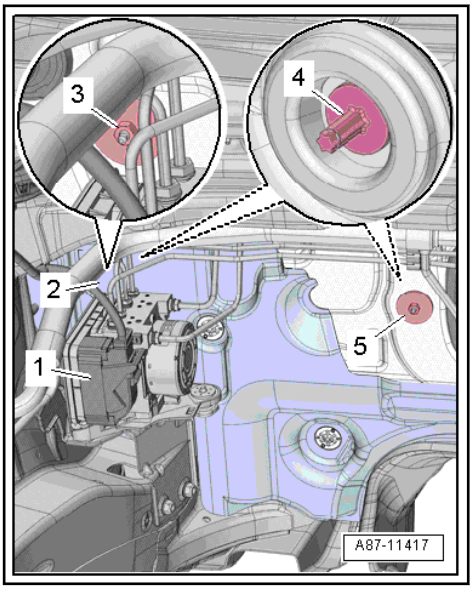
Note

- *Plugs are installed in the plenum chamber bulkhead ⇒ Electronic parts catalogue.*
- *The plugs must remain installed in the vehicle when the heater and air conditioning unit is removed.*

Removing

– Remove heater and air conditioning unit ⇒ page 152 .

– Release and disconnect electrical connector -1-.



– Fold aside heat shield -2- behind ABS unit.

– Unscrew nuts -3- and -5-.

– Detach plugs -4- in interior.

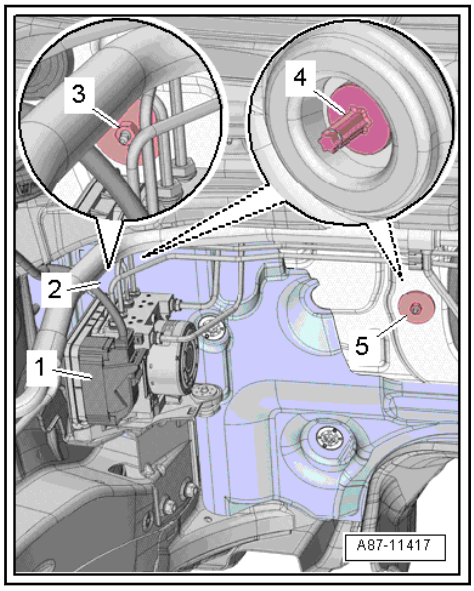
Note

The refrigerant pipe with the internal heat exchanger must be removed if the nut above the ABS unit is not accessible as described ⇒ page 68 .

Installing

Install in reverse order of removal, observing the following:

– Insert plugs into mounting on heater and air conditioning unit, and bring heater and air conditioning unit in installation position.
– Install heater and air conditioning unit ⇒ page 152 .
– Tighten nuts -3- and -5- on plugs.



– Install remaining components.
– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.
– Perform functional check.

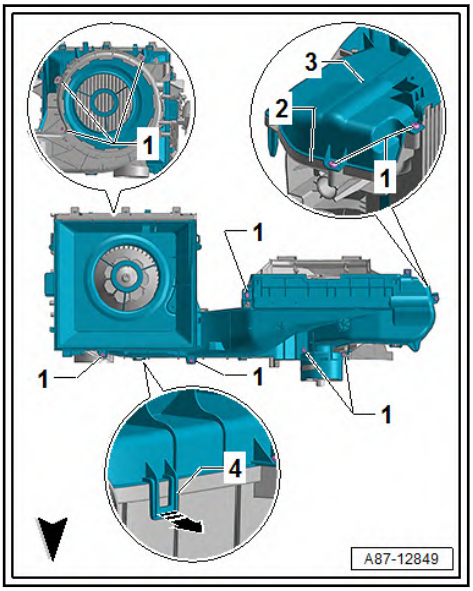
Torque settings

Component	Specified torque
Nut	4.5 Nm

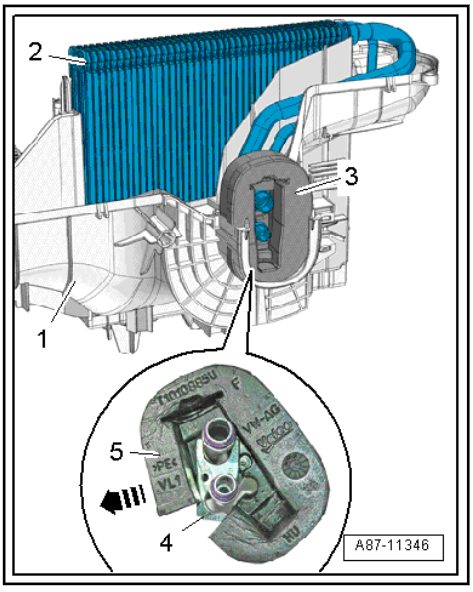
5.9 Removing and installing evaporator

Removing

– Remove heater and air conditioning unit ⇒ page 152 .
– Remove fresh air blower -V2- ⇒ page 168 .
– Remove air intake ⇒ page 218 .
– Detach coolant pipes on heat exchanger ⇒ page 200 .
– Separate air distribution housing and evaporator housing ⇒ page 158 .
– Unscrew bolts -1-.



– Release retainer tabs -4- all round -arrows-.
– Detach the top part of the evaporator housing -3- from the bottom part -2-.
– Pull the evaporator -2- out of the bottom part of the evaporator housing -1-.



– Remove expansion valve ⇒ page 34 .
– Detach the seal/insulation -3-. To do so, pull aside the movable part -5- -arrow-.
– Detach locking element -4- for refrigerant lines.
– Observe instructions when working on refrigerant circuit ⇒ page 9 .

Installing

Install in reverse order of removal, observing the following:

– If the new evaporator is not equipped with an expansion valve, use the expansion valve from the old evaporator ⇒ page 34 .

– Inspect seals -3- for damage. Renew if necessary ⇒ Electronic parts catalogue.
– Moisten new seals with refrigerant oil before installing refrigerant line.
– Clean evaporator housing.
– Check the condensation drain ⇒ page 206 .

Torque settings

◆ ⇒ o5.3 verview – evaporator housing", page 148

5.10 Removing and installing fresh air blower control unit -J126-

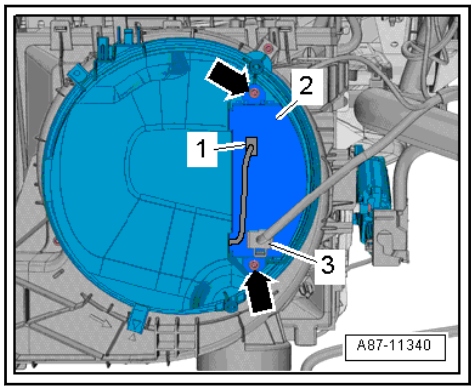
⇒ a5.10.1 nd installing fresh air blower control unitJ126, left-hand drive vehicles", page 162

⇒ a5.10.2 nd installing fresh air blower control unitJ126, right-hand drive vehicles", page 163

5.10.1 Removing and installing fresh air blower control unit -J126-, left-hand drive vehicles

Removing

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.
– Release and disconnect electrical connectors -1- and -3-.



– Unscrew bolts -arrows-.

CAUTION

Risk of burns when touching hot cooling surface of control unit.

Risk of burns to the hands.

– Wear protective gloves.

– Detach fresh air blower control unit -J126- -item 2- from fresh air blower -V2-.

Installing

Install in reverse order of removal, observing the following:

– Perform functional check.

Torque settings

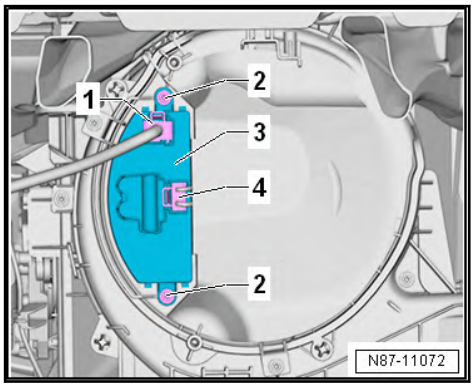
- ⇒ o5.2 verview - add-on parts of heater and air conditioning unit and of air intake box", page 146

5.10.2 Removing and installing fresh air blower control unit -J126-, right-hand drive vehicles

Removing

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.

– Release and disconnect electrical connectors -1- and -4-.



– Unscrew bolts -2-.

CAUTION

Risk of burns when touching hot cooling surface of control unit.

Risk of burns to the hands.

– Wear protective gloves.

– Detach fresh air blower control unit -J126- -item 3- from fresh air blower -V2-.

Installing

Install in reverse order of removal, observing the following:

– Check operation of fresh air blower -V2-.

Specified torque

- ⇒ o5.2 verview - add-on parts of heater and air conditioning unit and of air intake box", page 146

5.11 Removing and installing dust and pollen filter

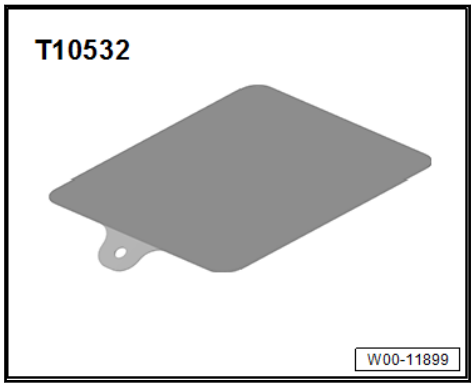
⇒ a5.11.1 nd installing dust and pollen filter, left-hand drive vehicles", page 163

⇒ a5.11.2 nd installing dust and pollen filter, right-hand drive vehicles", page 166

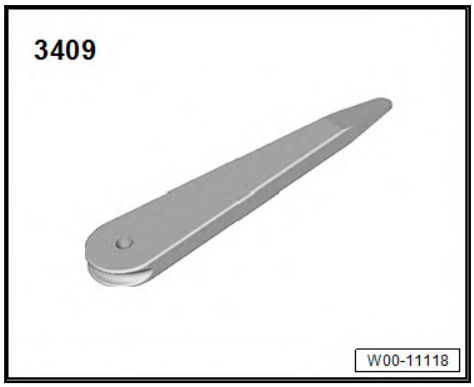
5.11.1 Removing and installing dust and pollen filter, left-hand drive vehicles

Special tools and workshop equipment required

- Vacuum cleaner, commercially available
- Cover plate -T10532-



- Removal wedge -3409-



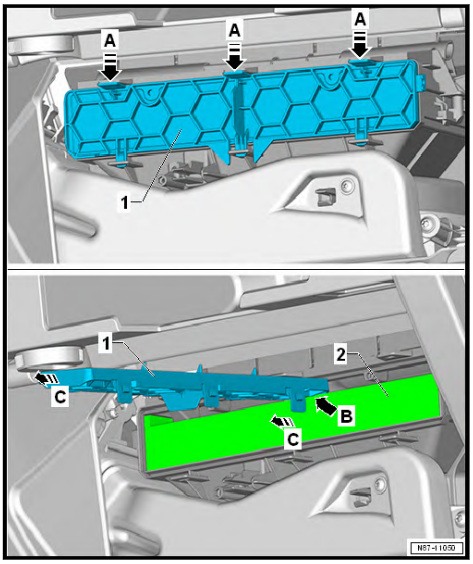
Removing

Note

- *Treat customer property in the glove compartment with respect.*
- *Store any objects from the glove compartment in a sealable plastic bag.*

– Move glove compartment lid to service position ⇒ General body repairs, interior; Rep. gr. 68; Compartments and covers; Glove compartment lid, service position.

– Release cover -1- in direction of -arrow- and remove.



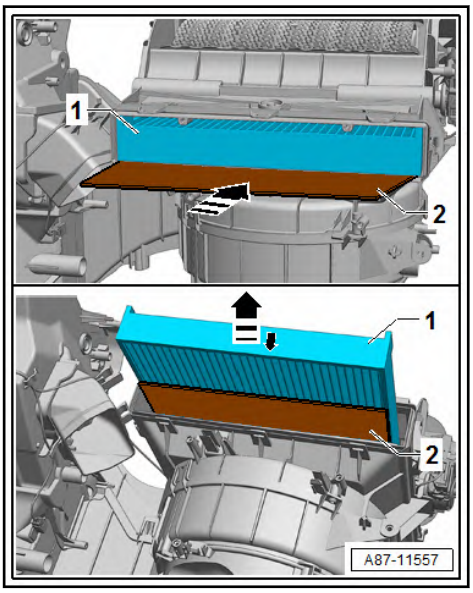
– Engage cover -1- into dust and pollen filter -2- -arrow B-.
– Slightly pull out cover -1- with dust and pollen filter -2- in direction of -arrow C-.

NOTICE

Risk of damage to fresh air blower caused by dirt dropping out of the dust and pollen filter when the cover plate is not seated properly.

- **Carefully pull out dust and pollen filter.**
- **Keep dust and pollen filter covered by cover plate.**

– Push cover plate -T10532- -item 2- under dust and pollen filter -1-.



– Pull out dust and pollen filter -1- in direction of -arrow-.

Note

Make sure that the cover plate -T10532- -item. 2- is not pulled out as well.

– Remove any dirt and leaves from cover plate -T10532- -item. 2- using a commercially available vacuum cleaner.

Installing

Install in reverse order of removal, observing the following:

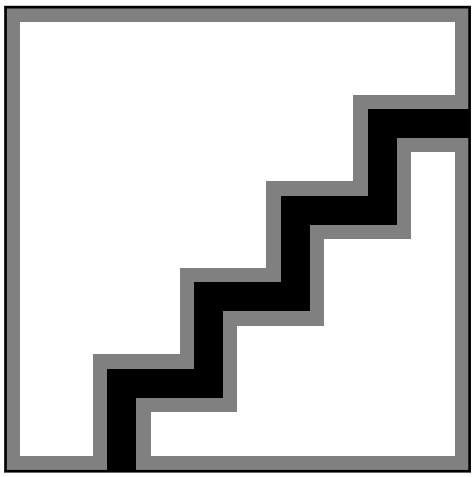
Note

Observe installation position of dust and pollen filter.

5.11.2 Removing and installing dust and pollen filter, right-hand drive vehicles

Special tools and workshop equipment required

- Cover plate -T10609-

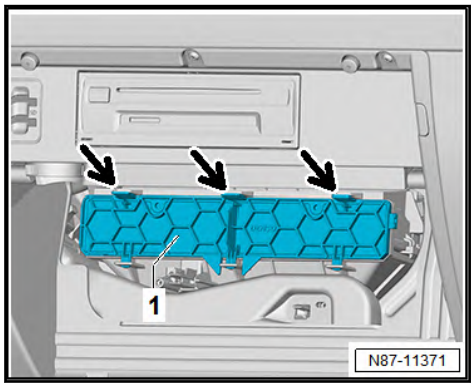


Removing

– Move glove compartment lid to service position ⇒ General body repairs, interior; Rep. gr. 68; Compartments and covers; Glove compartment lid, service position.

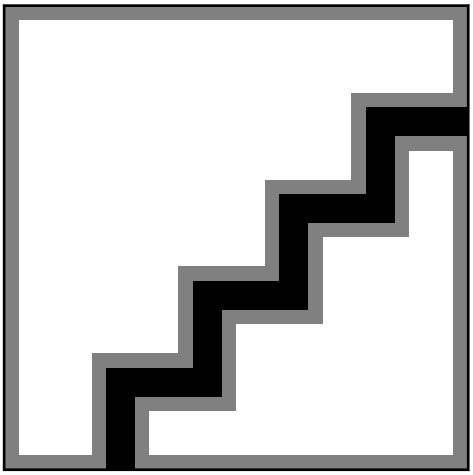
– Remove insulation.

– Release cover -1- -arrows-.

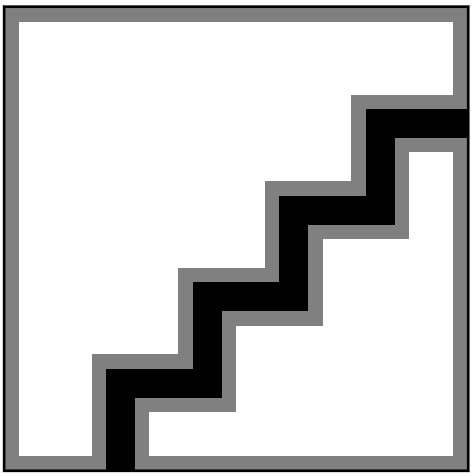


– Detach cover -1-.

– Push cover plate -T10609- -2- in -direction of arrow A- under pollen filter -1-.



- Push cover plate -T10609- -2- to stop in -direction of arrow B-.
- Push cover plate -T10609- -3- in -direction of arrow C- under cover plate -T10609- -2- and pollen filter -1-.
- Push cover plate -T10609- -3- to stop in -direction of arrow D-.
- Hook bracket -4- into cover plate -T10609- -2- and cover plate -T10609- -3-.
- Use cover -1- as a tool and hook the hooks on the side of the cover -arrow- into the dust and pollen filter -2-.



NOTICE

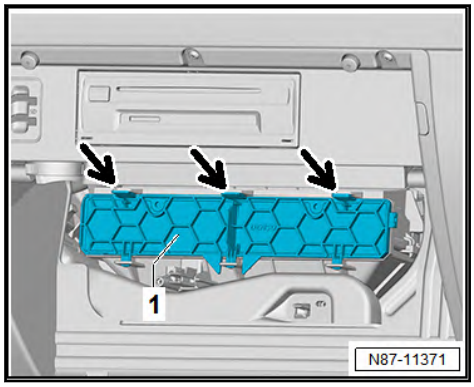
Risk of damage to fresh air blower caused by dirt dropping out of the dust and pollen filter when the cover plate is not seated properly.

- **Carefully pull out dust and pollen filter.**
- **Keep dust and pollen filter covered by cover plate.**

- Pull out dust and pollen filter -2- with cover -1-.
- Counterhold cover plate -T10609- -3-, but do not pull it out.
- Remove dirt and foliage from cover plate -T10609-.
- Remove cover plate -T10609- -3-.

Installing

Install in reverse order of removal, observing the following:



– Insert dust and pollen filter noting installation position.
– Attach and engage cover -1- -arrows-.
– Insert insulation.
– Move glove compartment lid back from service position ⇒ General body repairs, interior; Rep. gr. 68; Compartments and covers; Glove compartment lid, service position.

5.12 Removing and installing fresh air blower -V2-

⇒ a5.12.1 nd installing fresh air blowerV2, left-hand drive vehicles", page 168

⇒ a5.12.2 nd installing fresh air blower V2, right-hand drive vehicles", page 169

5.12.1 Removing and installing fresh air blower -V2-, left-hand drive vehicles

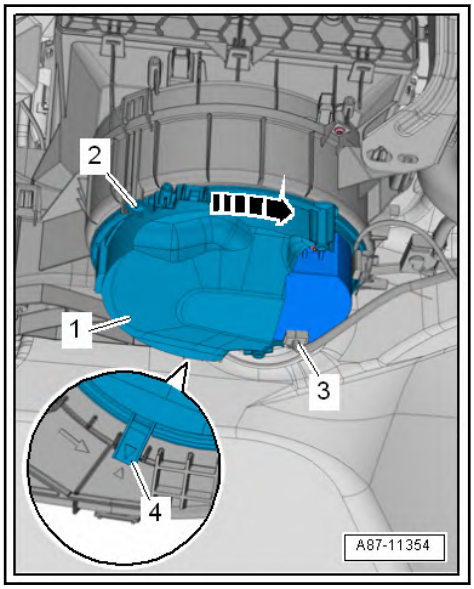
Note

If only the fresh air blower -V2- is defective, remove and install fresh air blower control unit -J126- ⇒ page 162 .

Removing

The fresh air blower -V2- is accessible from the footwell on the front passenger side.

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.
– Release and disconnect electrical connector -3-.



– If fitted, unscrew bolt -2-.
– Lift the locking lug -4- and turn the fresh air blower -1- clockwise -arrow-.

NOTICE

Improper handling may damage the fresh air blower.

Imbalance leading to customer complaints may occur during operation.

– **Avoid applying excessive pressure to the fan wheel.**
– **Never change position of the balancing weights on fan wheel.**

– Remove fresh air blower -V2- -item 1- downwards.

Installing

Install in reverse order of removal, observing the following:

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.
– Perform functional check.

Torque settings

◆ ⇒ o5.2 verview - add-on parts of heater and air conditioning unit and of air intake box”, page 146

5.12.2 Removing and installing fresh air blower - V2-, right-hand drive vehicles

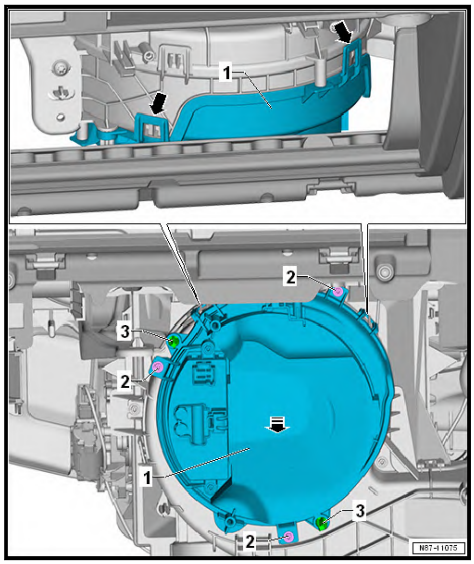
Note

If only the fresh air blower -V2- is defective, remove and install fresh air blower control unit -J126- ⇒ page 163 .

Removing

The fresh air blower -V2- is accessible from the footwell on the front passenger side.

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.
– Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing glove compartment.
– Remove footwell vent on front passenger side ⇒ page 221 .
– Release and disconnect electrical connector.
– Unscrew bolts -2-.



– Unclip retaining tabs -arrows-.

NOTICE

Improper handling may damage the fresh air blower.

Imbalance leading to customer complaints may occur during operation.

- **Avoid applying excessive pressure to the fan wheel.**
- **Never change position of the balancing weights on fan wheel.**

– Remove fresh air blower -V2- -item 1- downwards -arrow-.

Installing

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

– Push fresh air blower -V2- onto centring pins -3-.
– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.
– Perform functional check.

Specified torque

◆ ⇒ o5.2 verview - add-on parts of heater and air conditioning unit and of air intake box”, page 146

5.13 Checking auxiliary air heater element -Z35- with auxiliary air heater control unit -J604-

⇒ a5.13.1 uxiliary air heater elementZ35 with auxiliary air heater control unitJ604, left-hand drive vehicles", page 171

⇒ a5.13.2 uxiliary air heater element Z35 with auxiliary air heater control unit J604, right-hand drive vehicles", page 172

5.13.1 Checking auxiliary air heater element -Z35- with auxiliary air heater control unit -J604-, left-hand drive vehicles

Special tools and workshop equipment required

- ♦ Vehicle diagnostic tester with 100 A pick-up clamp -VAS 5051B/7-

Prerequisites for check

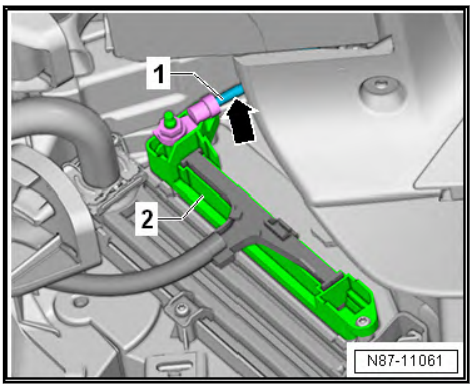
- Ambient temperature lower than 5°C
- Coolant temperature less than 80°C
- Passenger compartment temperature approx. 20°C
- Battery voltage greater than 11 V
- Alternator load not greater than 50% (terminal DF)
- Engine speed greater than 450 rpm and stable
- Interior temperature is set to high

Check

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview - centre console.

– Use ⇒ Vehicle diagnostic tester and 100 A pick-up clamp -VAS 5051B/7- to measure current draw at earth wire -1- of auxiliary air heater element -Z35- -item 2- -arrow-.



3-level -Z35- 1000 W

Low heat output: ≈ 30 amps

Medium heat output: ≈ 60 amps

High heat output: ≈ 80 amps

Stepless -Z35- 1400 W

– Run -Z35- at maximum output without steps.

Maximum current value ≈ 100 A

5.13.2 Checking auxiliary air heater element - Z35- with auxiliary air heater control unit - J604-, right-hand drive vehicles

Special tools and workshop equipment required

◆ Vehicle diagnostic tester with 100 A pick-up clamp -VAS 5051B/7-

Prerequisites for check

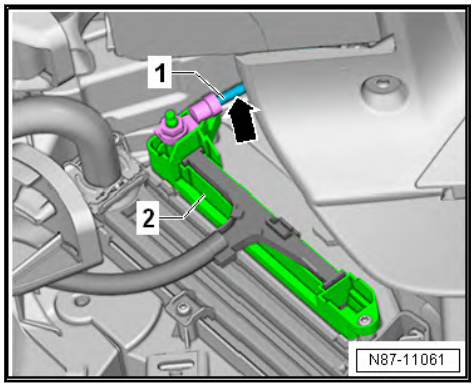
- Ambient temperature lower than 5°C
- Coolant temperature less than 80°C
- Passenger compartment temperature approx. 20°C
- Battery voltage greater than 11 V
- Alternator load not greater than 50% (terminal DF)
- Engine speed greater than 450 rpm
- Turn rotary knob for interior temperature to highest temperature (on vehicles with Climatronic select high).

Check

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview - centre console.

– Using vehicle diagnostic tester and 100 A pick-up clamp -VAS 5051B/7-, measure current draw -arrow- at earth wire -1- of auxiliary air heater element -Z35- -item 2-.



Low heat output: ≈ 30 amps

Medium heat output: ≈ 60 amps

High heat output: ≈ 80 amps

5.14 Removing and installing auxiliary air heater element -Z35- with auxiliary air heater control unit -J604-

⇒ a5.14.1 nd installing auxiliary air heater elementZ35 with auxiliary air heater control unitJ604, left-hand drive vehicles", page 173

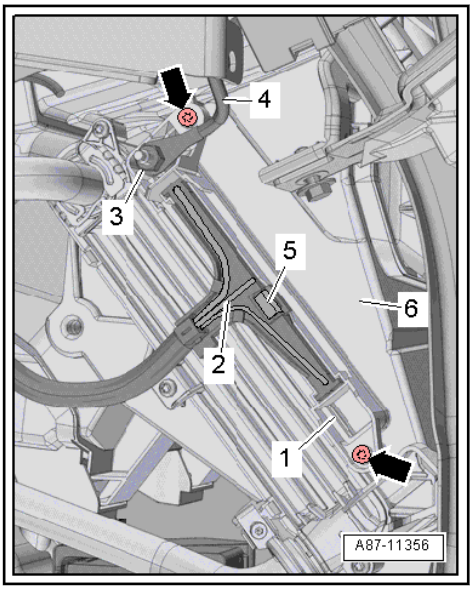
⇒ a5.14.2 nd installing auxiliary air heater element Z35 with auxiliary air heater control unit J604, right-hand drive vehicles", page 174

5.14.1 Removing and installing auxiliary air heater element -Z35- with auxiliary air heater control unit -J604-, left-hand drive vehicles

Removing

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console.

– Loosen nut -3-.



– Detach earth cable -4-.

CAUTION

Risk of burns on metal surfaces of auxiliary air heater element. The heater elements may become very hot.

Risk of burns to the skin.

- **Wear protective gloves.**
- **Never touch the metal surfaces of the heater element.**

– Release and disconnect electrical connector -2- by sliding locking element -5- upwards and pressing catch inwards.

– Unscrew bolts -arrows-.

– Pull auxiliary air heater element -Z35- with auxiliary air heater control unit -J604- -item 1- toward left and out of heater and air conditioning unit -6-.

Installing

Install in reverse order of removal, observing the following:

Note

Ensure that the earth wire is in proper position and bolted on correctly.

Torque settings

Component	Specified torque
Nut -3-	9 Nm
Bolts -arrow-	1 Nm

- ⇒ o5.1 verview – heater and air conditioning unit", page 142
- ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview – centre console

5.14.2 Removing and installing auxiliary air heater element - Z35- with auxiliary air heater control unit - J604-, right-hand drive vehicles

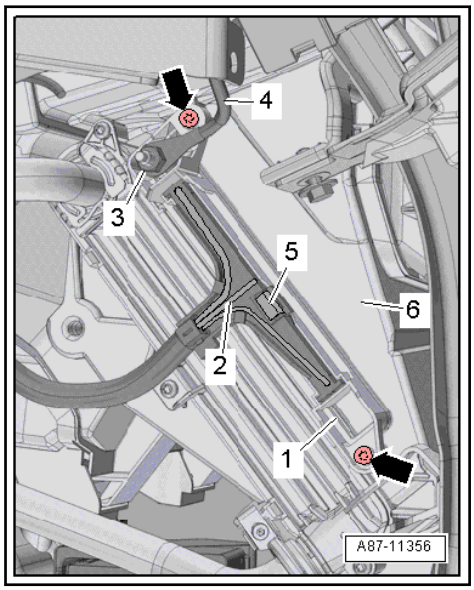
Removing

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview - centre console.

– Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing glove compartment.

– Detach dash board in vicinity of glove compartment far enough that dash board can be pulled away sufficiently to pull out auxiliary air heater element - Z35-.

– Loosen nut -3-.



– Detach earth cable -4-.

CAUTION

Risk of burns on metal surfaces of auxiliary air heater element. The heater elements may become very hot.

Risk of burns to the skin.

- **Wear protective gloves.**
- **Never touch the metal surfaces of the heater element.**

– Release and disconnect electrical connector -2- by sliding locking element -5- upwards and pressing catch inwards.

– Unscrew bolts -arrows-.

– Pull auxiliary air heater element -Z35- with auxiliary air heater control unit -J604- -item 1- toward left and out of heater and air conditioning unit -6-.

Installing

Install in reverse order of removal, observing the following:

Note

Ensure that the earth wire is in proper position and bolted on correctly.

Torque settings

Component	Specified torque
Nut -3-	9 Nm
Bolts -arrow-	1 Nm

- ⇒ o5.1 verview – heater and air conditioning unit", page 142
- Centre console; Assembly overview – centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview – centre console
- Compartments/covers; Assembly overview - glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Assembly overview - glove compartment

5.15 Removing and installing heat exchanger

⇒ a5.15.1 nd installing Valeo heat exchanger, left-hand drive vehicles", page 175

⇒ a5.15.2 nd installing Valeo heat exchanger, right-hand drive vehicles", page 182

⇒ a5.15.3 nd installing Denso heat exchanger, left-hand drive vehicles", page 188

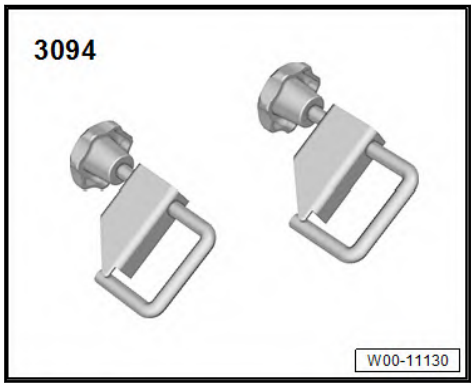
⇒ a5.15.4 nd installing Denso heat exchanger, right-hand drive vehicles", page 194

5.15.1 Removing and installing Valeo heat exchanger, left-hand drive vehicles

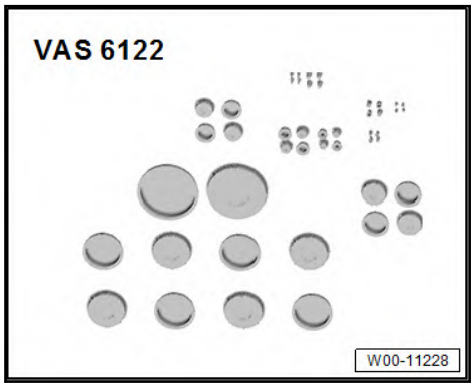
Special tools and workshop equipment required

- Drip tray for workshop hoist -VAS 6208-

- Hose clamps, up to 25 mm in dia. -3094-

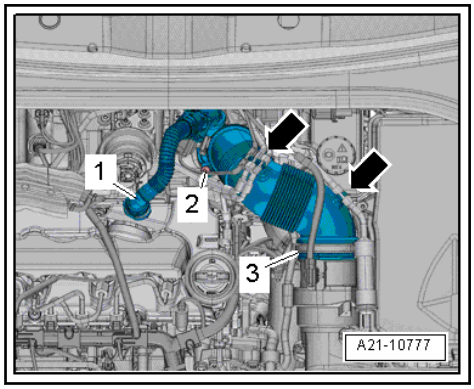


- Compressed air gun, commercially available
- Container
- Engine bung set -VAS 6122-



Removing

Vehicles with TDI engine

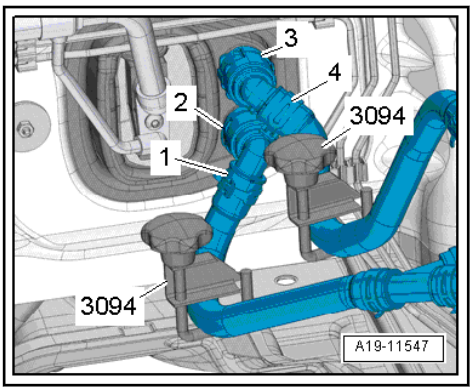


– Press release tabs on hose -1- for crankcase breather.

– Detach hose -1- from cylinder head cover.
– Remove air intake pipe.

Continued for all vehicles

– Mark installation position of coolant hoses -1- and -4-.



Note

The heat exchanger is designed for a particular direction of flow of the coolant. Therefore, the coolant hoses must not be interchanged when connecting them.

– Clamp off coolant hoses -1- and -4- using hose clamps, up to 25 mm in dia. -3094-.

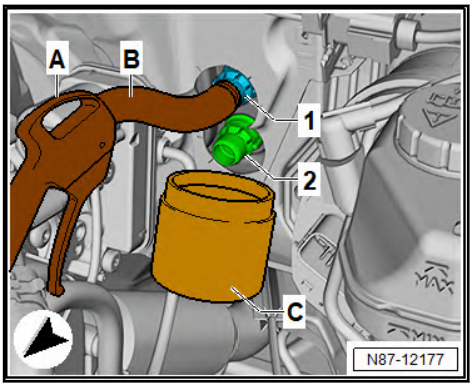
CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

There is a risk of injury to the skin and parts of the body due to scalding.

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

– Lift retaining clips -2- and -3-.
– Disconnect coolant hoses -1- and -4- from heat exchanger for heater.
– Push hose -B- onto connection -1-.



– Insert compressed air gun -A- into end of hose -B-.

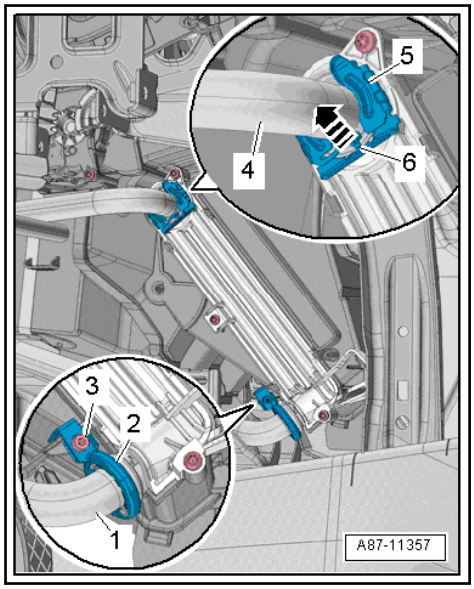
– Hold container -C- under connection -2-, and carefully blow coolant out of heat exchanger using compressed air gun -A-.
– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.
– Remove footwell vent on driver side ⇒ page 219 .
– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console cover.

Vehicles with auxiliary air heater

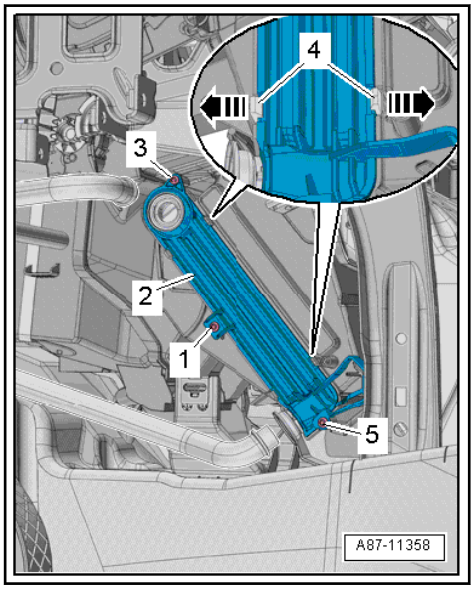
– Remove auxiliary air heater element -Z35- with auxiliary air heater control unit -J604- ⇒ page 173 .

Continued for all vehicles

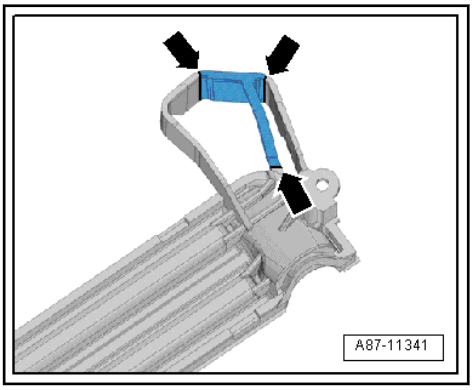
– Cover the area beneath the connections for the coolant hoses in the plenum chamber with impermeable sheeting and absorbent paper, for example.
– Lift locking element -6- -arrow-, and pull off clip -5-.



– Pull coolant pipe -4- off heat exchanger.
– Unscrew bolt -3-.
– Remove screw-type clip -2-.
– Pull coolant pipe -1- off heat exchanger.
– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.
– Remove bolts -1-, -3- and -5-.



– Release retainer tabs -4- -arrows- and detach cover -2-.
– If noise insulation cannot be pulled out, cut open tabs on cover -arrows-.



– Remove heat exchanger to left.

Installing

Install in reverse order of removal, observing the following:

Note

Renew oil seas.

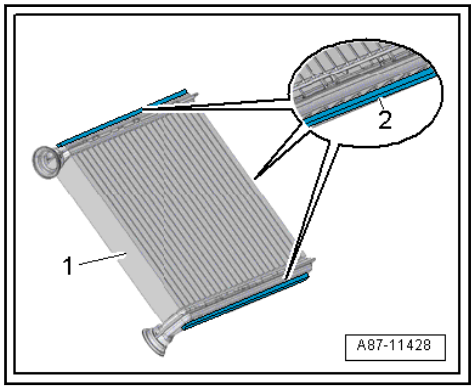
– Check heater slot for dirt with heat exchanger removed.
– If necessary, remove any dirt and coolant residue.

Vehicles with auxiliary air heater

– With auxiliary air heater element -Z35- removed, check heater element slot for soiling, and clean it if necessary.

Continued for all vehicles

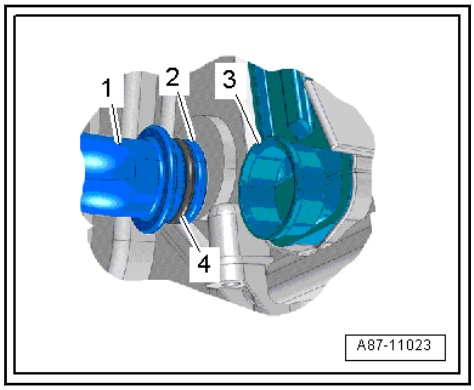
– If fitted, check foam seals -2- attached to heat exchanger -1- for damage, and replace if necessary.



Note

- *The foam seals -2- are not always installed (depending on version and production date).*
- *If the foam seal is not properly bonded in, it may roll up when the heat exchanger is fitted.*
- *Cold air may flow past the heat exchanger if the foam seal is damaged or not installed properly.*

– Check connection -3- of heat exchanger and coolant line connection -2- for damage or soiling.



– Clean and smooth sealing surface for seals.
– Moisten new seals -4- with coolant (or lubricate lightly with silicone grease), and fit them onto coolant pipe -1-.
– Carefully slide heat exchanger into heater and air conditioning unit as far as stop.

Note

When sliding in the heat exchanger, make sure not to damage the connections and coolant pipes.

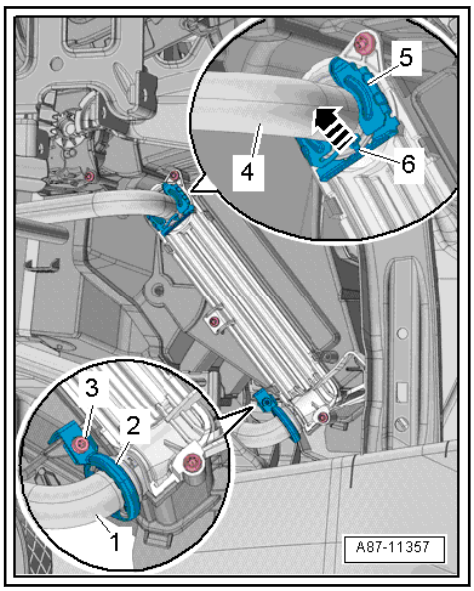
– Push coolant lines into heat exchanger as far as stop.

NOTICE

Risk of heat exchanger malfunction due to defective seals and leaks.

- **Never pinch seals.**
- **Never tilt coolant pipes.**
- **Slide on coolant pipes completely.**

– Fit new clip -5- or screw-type clip -2- onto joint between coolant pipe and heat exchanger -arrow-.



– Tighten bolt -3- ⇒ o5.1 verview – heater and air conditioning unit", page 142 .

• Neither clip nor screw-type clip may be in contact with air distribution housing or any other components.

– Check clip and screw-type clip for proper seating on connections of heat exchanger and coolant lines.

Vehicles with TDI engine

Procedure for installing new heat exchanger:

– Flush cooling system ⇒ Rep. gr. 19; Cooling system, coolant; Flushing cooling system.

Continued for all vehicles

– Fill up with coolant ⇒ Rep. gr. 19; Cooling system/coolant; Draining and filling coolant.

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode.

– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit", page 142

♦ ⇒ Rep. gr. 21; Turbocharger; Assembly overview – turbocharger

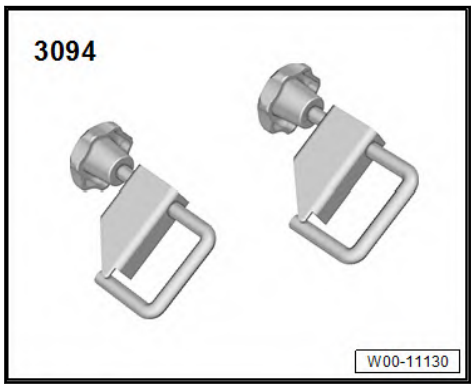
♦ ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview – centre console

5.15.2 Removing and installing Valeo heat exchanger, right-hand drive vehicles

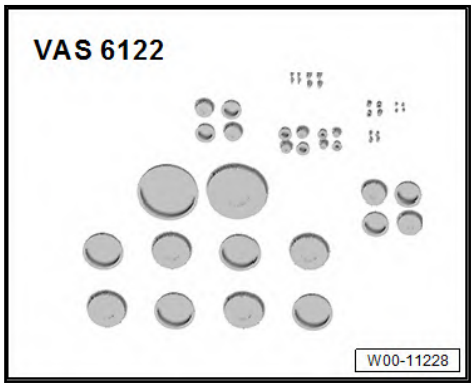
Special tools and workshop equipment required

- Drip tray for workshop hoist -VAS 6208-

- Hose clamps, up to 25 mm in dia. -3094-

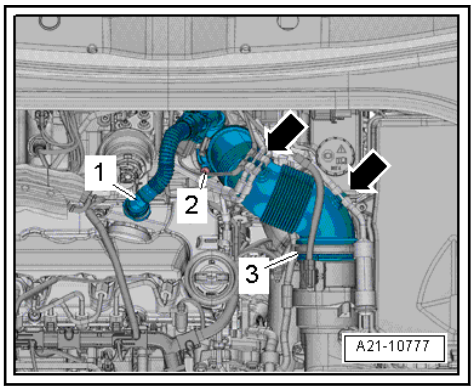


- Compressed air gun, commercially available
- Container
- Engine bung set -VAS 6122-



Removing

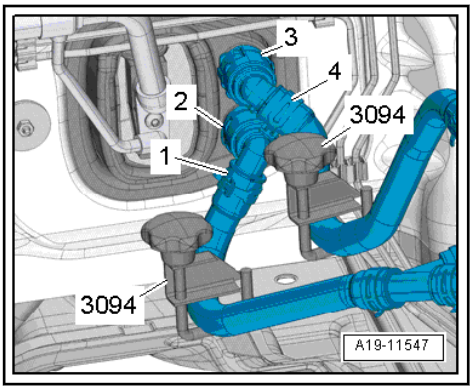
Vehicles with TDI engine



– Press release tabs on hose -1- for crankcase breather.
– Detach hose -1- from cylinder head cover.
– Remove air intake pipe.

Continued for all vehicles

– Mark installation position of coolant hoses -1- and -4-.



Note

The heat exchanger is designed for a particular direction of flow of the coolant. Therefore, the coolant hoses must not be interchanged when connecting them.

– Clamp off coolant hoses -1- and -4- using hose clamps, up to 25 mm in dia. -3094-.

CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

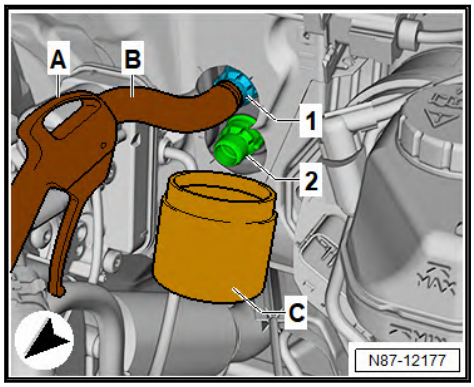
There is a risk of injury to the skin and parts of the body due to scalding.

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

– Lift retaining clips -2- and -3-.

– Disconnect coolant hoses -1- and -4- from heat exchanger for heater.

– Push hose -B- onto connection -1-.



– Insert compressed air gun -A- into end of hose -B-.

– Hold container -C- under connection -2-, and carefully blow coolant out of heat exchanger using compressed air gun -A-.

– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.

– Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing glove compartment.

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.

– Remove footwell vent on front passenger side ⇒ page 221 .

– Remove centre console trim in footwell ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview - centre console.

Vehicles with auxiliary air heater

– Remove auxiliary air heater element -Z35- with auxiliary air heater control unit -J604- ⇒ page 174 .

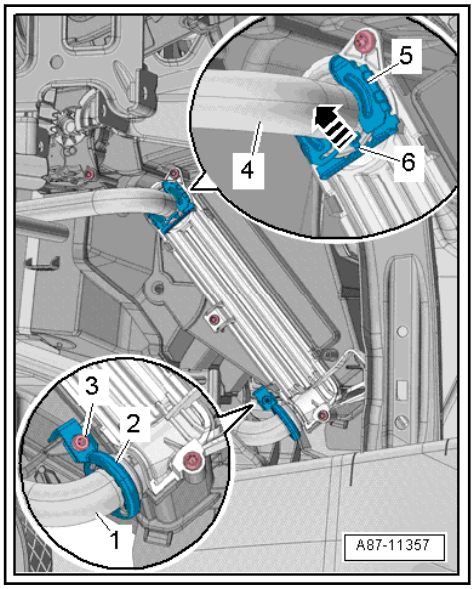
Continued for all vehicles

– Cover the area beneath the connections for the coolant hoses in the plenum chamber with impermeable sheeting and absorbent paper, for example.

Note

The illustration shows a left-hand drive vehicle.

– Lift locking element -6- -arrow-, and pull off clip -5-.

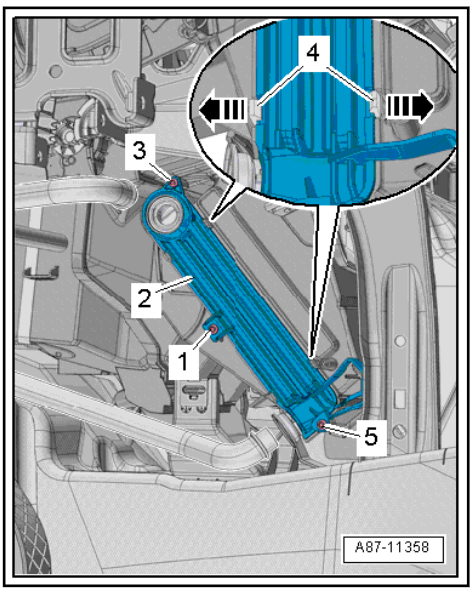


– Pull coolant pipe -4- off heat exchanger.
– Unscrew bolt -3-.
– Remove screw-type clip -2-.
– Pull coolant pipe -1- off heat exchanger.
– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.

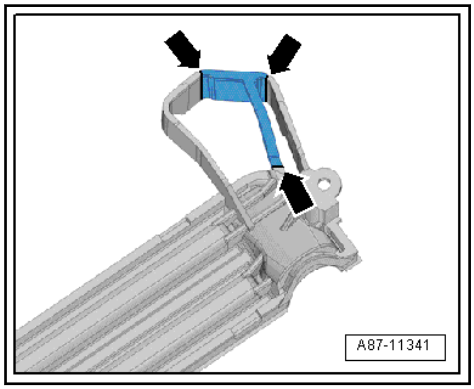
Note

The illustration shows a left-hand drive vehicle.

– Remove bolts -1-, -3- and -5-.



– Release retainer tabs -4- -arrows- and detach cover -2-.
– If noise insulation cannot be pulled out, cut open tabs on cover -arrows-.



– Remove heat exchanger to left.

Installing

Install in reverse order of removal, observing the following:

Note

Renew oil seas.

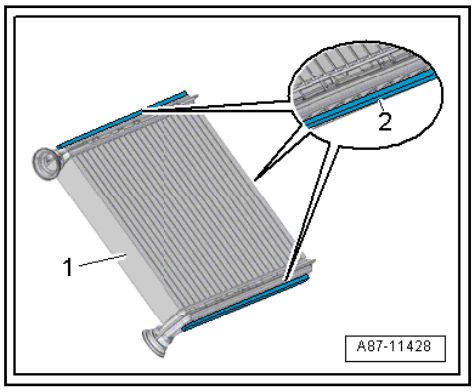
– Check heater slot for dirt with heat exchanger removed.
– If necessary, remove any dirt and coolant residue.

Vehicles with auxiliary air heater

– With auxiliary air heater element -Z35- removed, check heater element slot for soiling, and clean it if necessary.

Continued for all vehicles

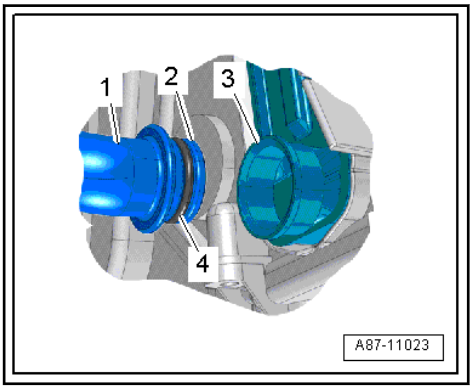
– If fitted, check foam seals -2- attached to heat exchanger -1- for damage, and renew them if necessary.



Note

- *The foam seals -2- are not always installed (depending on version and production date).*
- *If the foam seal is not properly bonded in, it may roll up when the heat exchanger is fitted.*
- *Cold air may flow past the heat exchanger if the foam seal is damaged or not properly fitted.*

– Check connection -3- of heat exchanger and coolant line connection -2- for damage or soiling.



– Clean and smooth sealing surface for seals.
– Moisten new seals -4- with coolant (or lubricate lightly with silicone grease) and fit them to coolant pipe -1-.
– Carefully slide heat exchanger into heater and air conditioning unit as far as stop.

Note

When sliding in the heat exchanger, make sure not to damage the connections and coolant pipes.

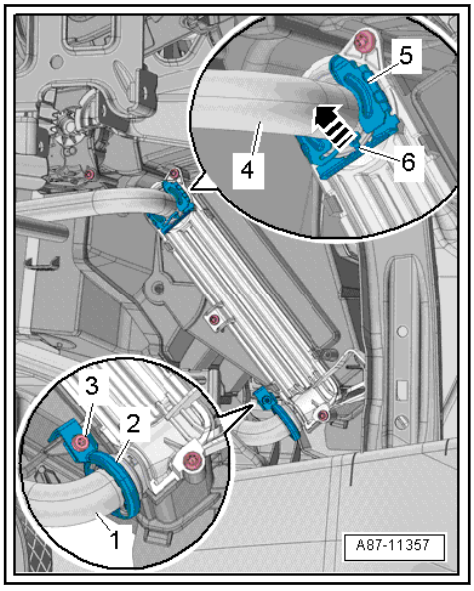
– Push coolant pipes into heat exchanger as far as stop.

NOTICE

Risk of heat exchanger malfunction due to defective seals and leaks.

- **Never pinch seals.**
- **Never tilt coolant pipes.**
- **Slide on coolant pipes completely.**

– Fit new clip -5- or screw-type clip -2- onto joint between coolant pipes and heat exchanger.



– Tighten bolt -3- ⇒ o5.1 verview – heater and air conditioning unit", page 142 .

- Neither clip nor screw-type clip may be in contact with air distribution housing or any other components.

– Check clip and screw-type clip for proper seating on connections of heat exchanger and coolant pipes.

Vehicles with TDI engine

Procedure for installing new heat exchanger:

– Flush cooling system ⇒ Rep. gr. 19; Cooling system, coolant; Flushing cooling system.

Continued for all vehicles

– Fill up with coolant ⇒ Rep. gr. 19; Cooling system/coolant; Draining and filling coolant.

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit”, page 142

♦ Turbocharger; Assembly overview - turbocharger ⇒ Rep. gr. 21; Turbocharger; Assembly overview - turbocharger.

♦ Centre console; Assembly overview – centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview – centre console

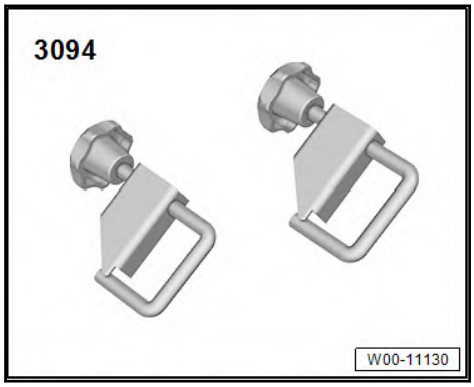
♦ Compartments/covers; Assembly overview - glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Assembly overview - glove compartment

5.15.3 Removing and installing Denso heat exchanger, left-hand drive vehicles

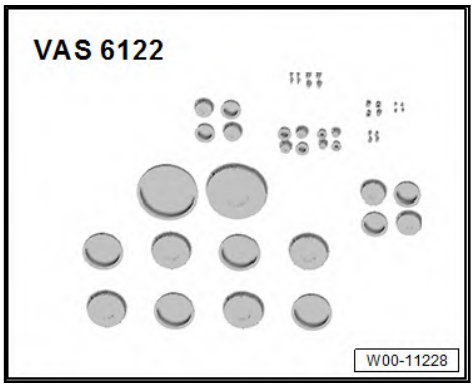
Special tools and workshop equipment required

♦ Drip tray for workshop hoist -VAS 6208-

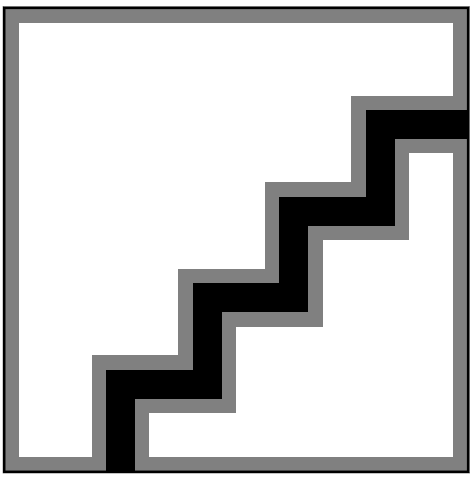
♦ Hose clamps, up to 25 mm in dia. -3094-



- Compressed air gun, commercially available
- Container
- Engine bung set -VAS 6122-

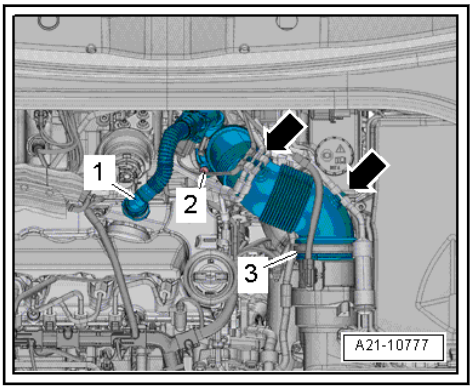


- Pliers -T40147-



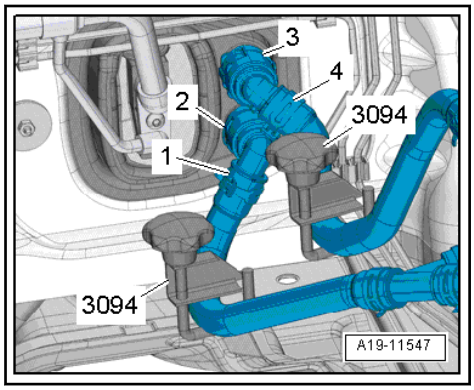
Removing

Vehicles with TDI engine



– Press release tabs on hose -1- for crankcase breather.
– Detach hose -1- from cylinder head cover.
– Remove air intake pipe.

Continued for all vehicles



– Mark installation position of coolant hoses -1- and -4-.

Note

The heat exchanger is designed for a particular direction of flow of the coolant. Therefore, the coolant hoses must not be interchanged when connecting them.

– Clamp off coolant hoses -1- and -4- using hose clamps, up to 25 mm in dia. -3094-.

CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

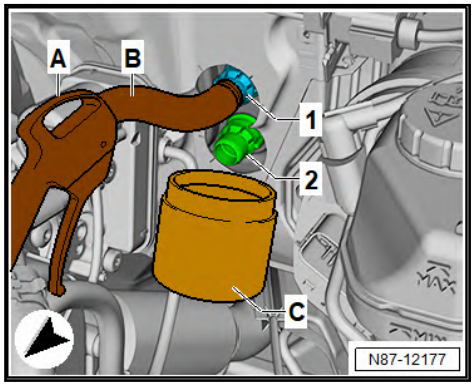
There is a risk of injury to the skin and parts of the body due to scalding.

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

– Lift retaining clips -2- and -3-.

– Disconnect coolant hoses -1- and -4- from heat exchanger for heater.

– Push hose -B- onto connection -1-.



– Insert compressed air gun -A- into end of hose -B-.

– Hold container -C- under connection -2-, and carefully blow coolant out of heat exchanger using compressed air gun -A-.

– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.

– Remove footwell vent on driver side ⇒ page 219 .

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console.

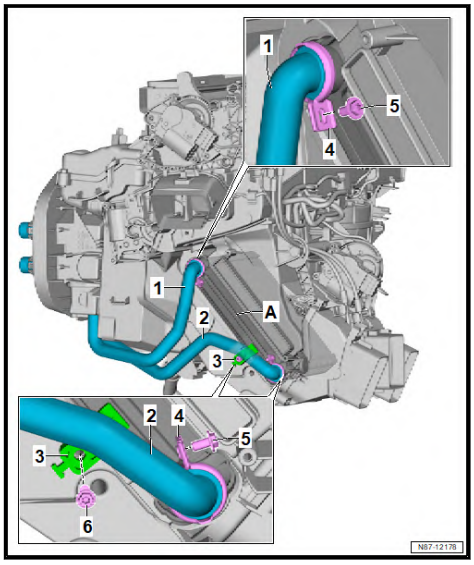
Vehicles with auxiliary air heater

– Remove auxiliary air heater element -Z35- with auxiliary air heater control unit -J604- ⇒ page 173 .

Continued for all vehicles

– Cover area beneath line connections for coolant hoses in plenum chamber as well as airbag control unit -J234-, e.g. with impermeable sheeting and absorbent paper.

– Unscrew bolts -5-.



– Detach screw-type clips -4-.

– Separate coolant pipes -1- and -2-.

– Remove bolt -6- and detach heat exchanger bracket -3-.

Note

If the coolant pipes cannot be separated because the seals are gummed up, cut through coolant pipes -1- and -2- using pliers -T40147-.

– Pull heat exchanger -A- out towards left.

– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.

Installing

Install in reverse order of removal, observing the following:

Note

Renew oil seas.

– Check heater slot for dirt with heat exchanger removed.

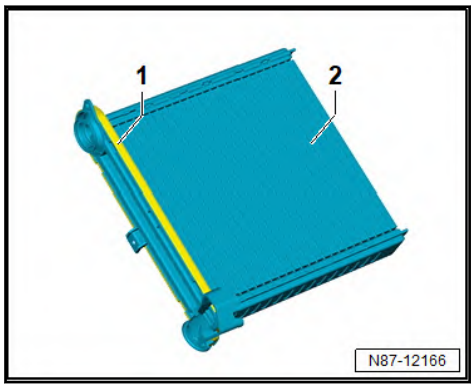
– Remove any dirt and coolant residue.

Vehicles with auxiliary air heater

– With auxiliary air heater element -Z35- removed, check heater element slot for soiling, and clean it if necessary.

Continued for all vehicles

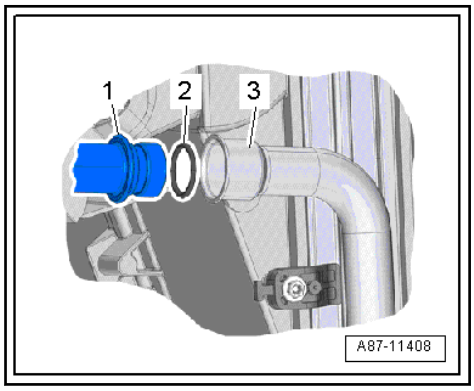
– Check foam seal -1- on heat exchanger -2- for damage, and renew if necessary.



Note

- *If the foam seal is not properly bonded in, it may roll up when the heat exchanger is fitted.*
- *If the foam seal is damaged or improperly fitted, cold air can flow past the heat exchanger.*

– Check connection -3- of heat exchanger and connection of coolant pipes -1- for damage or dirt.



– Clean and smooth sealing surface -2- for seals.

– Moisten new seals -2- with coolant (or lubricate lightly with silicone grease) and fit them to coolant pipe.

– Carefully slide heat exchanger into heater and air conditioning unit as far as stop.

Note

When sliding in the heat exchanger, make sure not to damage the connections and coolant pipes.

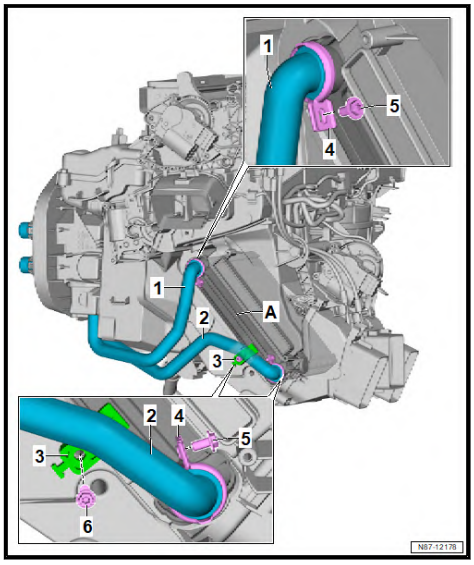
– Push coolant pipes into heat exchanger as far as stop.

NOTICE

Risk of heat exchanger malfunction due to defective seals and leaks.

- **Never pinch seals.**
- **Never tilt coolant pipes.**
- **Slide on coolant pipes completely.**

– Fit new screw-type clamps -4- on coolant pipe/heat exchanger joint.



– Position retainer -3- on coolant pipe -2-.

– Check screw-type clips -4- for correct seating at heat exchanger connections -A- and at connections of coolant pipes -1- and -2-.

• Coolant pipes -1- and -2- must not be in contact with air distribution housing or any other components.

– Tighten bolt -6-.

– Tighten bolts -5-.

Vehicles with TDI engine

Procedure for installing new heat exchanger:

– Flush cooling system ⇒ Rep. gr. 19; Cooling system, coolant; Flushing cooling system.

Continued for all vehicles

– Fill up with coolant ⇒ Rep. gr. 19; Cooling system/coolant; Draining and filling coolant.

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit”, page 142

♦ ⇒ Rep. gr. 21; Turbocharger; Assembly overview – turbocharger

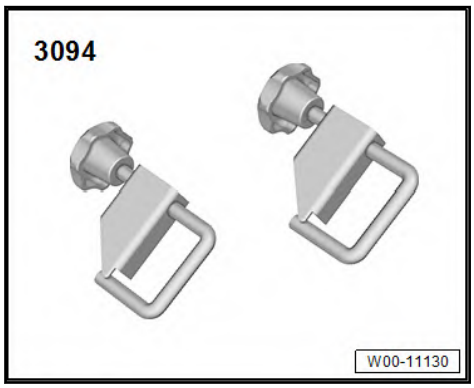
♦ ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview – centre console

5.15.4 Removing and installing Denso heat exchanger, right-hand drive vehicles

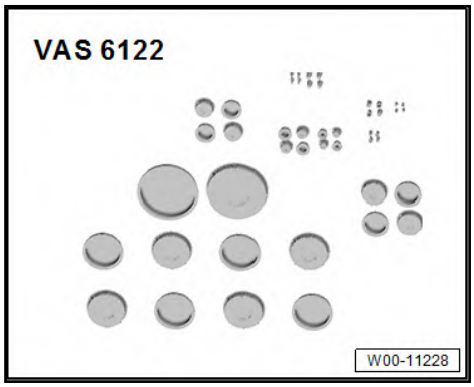
Special tools and workshop equipment required

- Drip tray for workshop hoist -VAS 6208-

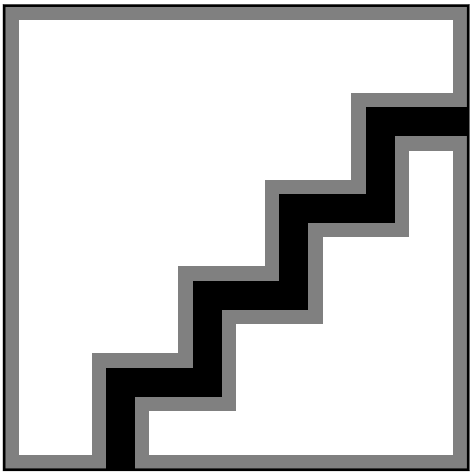
- Hose clamps, up to 25 mm in dia. -3094-



- Compressed air gun, commercially available
- Container
- Engine bung set -VAS 6122-

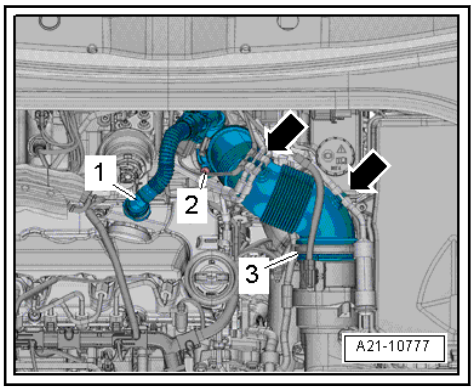


◆ Pliers -T40147-



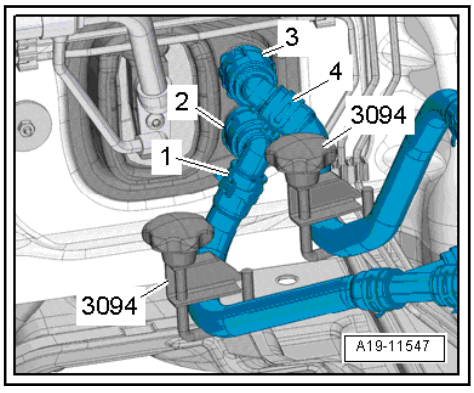
Removing

Vehicles with TDI engine



– Press release tabs on hose -1- for crankcase breather.
– Remove air intake pipe.

Continued for all vehicles



– Mark installation position of coolant hoses -1- and -4-.

Note

The heat exchanger is designed for a particular direction of flow of the coolant. Therefore, the coolant hoses must not be interchanged when connecting them.

– Clamp off coolant hoses -1- and -4- using hose clamps, up to 25 mm in dia. -3094-.

CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

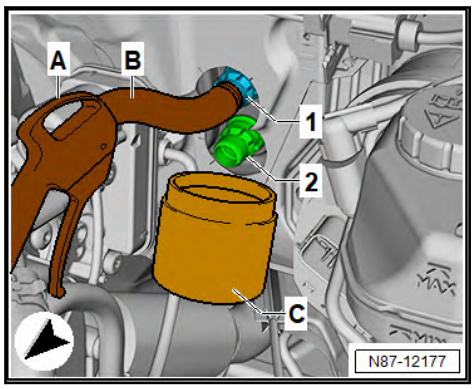
There is a risk of injury to the skin and parts of the body due to scalding.

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

– Lift retaining clips -2- and -3-.

– Disconnect coolant hoses -1- and -4- from heat exchanger for heater.

– Push hose -B- onto connection -1-.



– Insert compressed air gun -A- into end of hose -B-.

– Hold container -C- under connection -2-, and carefully blow coolant out of heat exchanger using compressed air gun -A-.

– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.

– Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing glove compartment.

– Remove baffle plate ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing footwell cover on front passenger side.

– Remove footwell vent on front passenger side ⇒ page 221 .

– Remove centre console trim in footwell ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview - centre console.

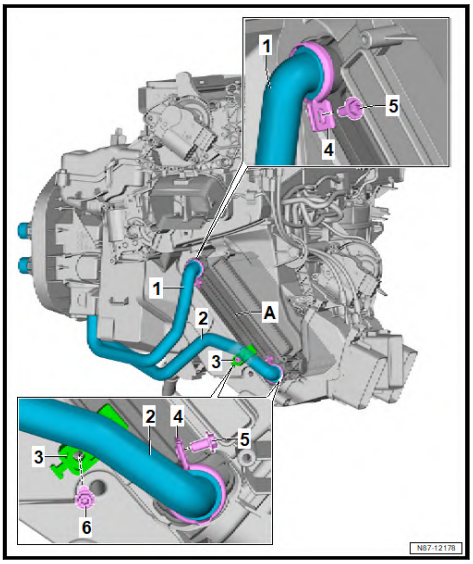
Vehicles with auxiliary air heater

– Remove auxiliary air heater element -Z35- with auxiliary air heater control unit -J604- ⇒ page 174 .

Continued for all vehicles

– Cover area beneath connections for coolant hoses in plenum chamber as well as airbag control unit -J234- with, for example, impermeable sheeting and absorbent paper.

– Unscrew bolts -5-.



– Detach screw-type clips -4-.
– Separate coolant pipes -1- and -2-.
– Remove bolt -6- and detach heat exchanger bracket -3-.

Note

If the coolant pipes cannot be separated because the seals are gummed up, cut through coolant pipes -1- and -2- using pliers -T40147-.

– Pull heat exchanger -A- out towards left.
– Seal open lines and connections using clean plugs from engine bung set -VAS 6122-.

Installing

Install in reverse order of removal, observing the following:

Note

Renew oil seas.

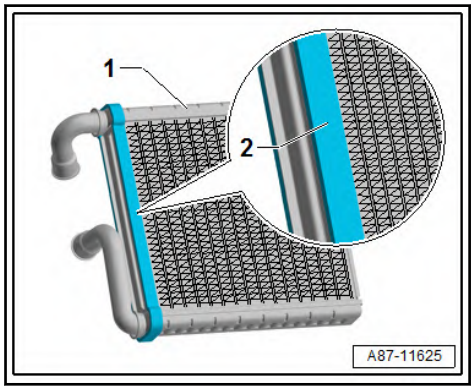
– Check heater slot for dirt with heat exchanger removed.
– If necessary, remove any dirt and coolant residue.

Vehicles with auxiliary air heater

– With auxiliary air heater element -Z35- removed, check heater element slot for soiling, and clean it if necessary.

Continued for all vehicles

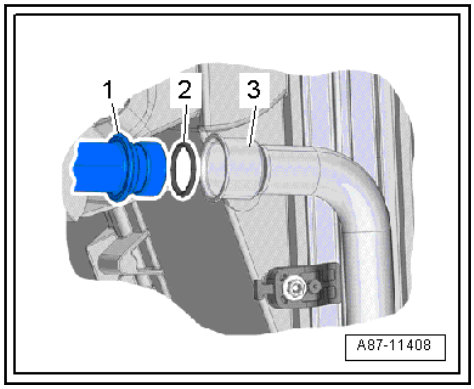
– Check foam seal -2- on heat exchanger -1- for damage, and renew if necessary.



Note

- *If the foam seal is not properly bonded in, it may roll up when the heat exchanger is fitted.*
- *If the foam seal is damaged or improperly fitted, cold air can flow past the heat exchanger.*

– Check connection -3- of heat exchanger and connection of coolant pipes -1- for damage or dirt.



– Clean and smooth sealing surface -2- for seals.
– Moisten new seals -2- with coolant (or lubricate lightly with silicone grease) and fit them to coolant pipe.
– Carefully slide heat exchanger into heater and air conditioning unit as far as stop.

Note

When sliding in the heat exchanger, make sure not to damage the connections and coolant pipes.

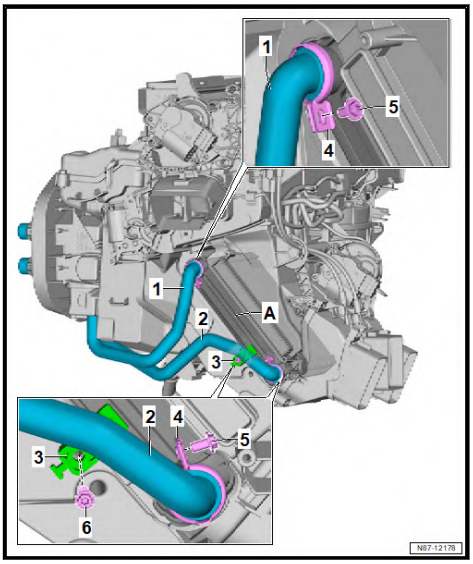
– Push coolant pipes into heat exchanger as far as stop.

NOTICE

Risk of heat exchanger malfunction due to defective seals and leaks.

- **Never pinch seals.**
- **Never tilt coolant pipes.**
- **Slide on coolant pipes completely.**

– Fit new screw-type clamps -4- on coolant pipe/heat exchanger joint.



– Position retainer -3- on coolant pipe -2-.

– Check screw-type clips -4- for correct seating at heat exchanger connections -A- and at connections of coolant pipes -1- and -2-.

• Coolant pipes -1- and -2- must not be in contact with air distribution housing or any other components.

– Tighten bolt -6-.

– Tighten bolts -5-.

Vehicles with TDI engine

Procedure for installing new heat exchanger:

– Flush cooling system ⇒ Rep. gr. 19; Cooling system, coolant; Flushing cooling system.

Continued for all vehicles

– Fill up with coolant ⇒ Rep. gr. 19; Cooling system/coolant; Draining and filling coolant.

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit”, page 142

♦ Turbocharger; Assembly overview - turbocharger ⇒ Rep. gr. 21; Turbocharger; Assembly overview - turbocharger.

♦ Centre console; Assembly overview – centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview – centre console

♦ Compartments/covers; Assembly overview - glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Assembly overview - glove compartment

5.16 Removing and installing coolant pipes on heat exchanger

⇒ a5.16.1 nd installing coolant pipes at heat exchanger (Valeo)", page 200

⇒ a5.16.2 nd installing coolant pipes at heat exchanger (Denso)", page 202

5.16.1 Removing and installing coolant pipes at heat exchanger (Valeo)

Note

There are different designs and makes of heater and air conditioning unit. The individual components of the different heater and air conditioning units are similar. Interchanging components from different manufacturers is not permissible ⇒ Electronic parts catalogue.

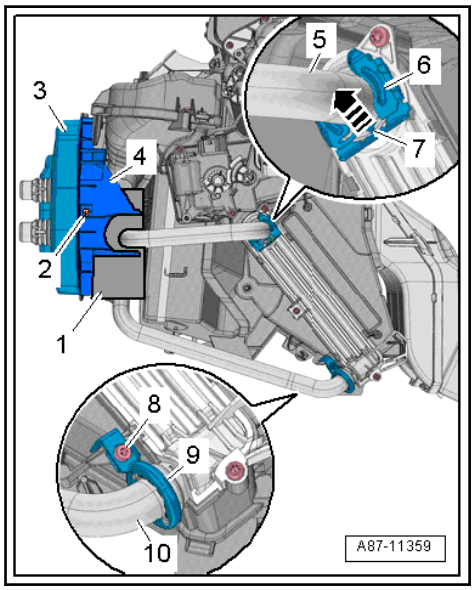
Note

The illustrations show a left-hand drive vehicle. Proceed analogously for a right-hand drive vehicle.

Removing

– Remove heater and air conditioning unit ⇒ page 152 .

– Detach the sealing collar -3- to the plenum chamber bulkhead.



– Unscrew bolt -2-.

– Detach the coolant pipe holder -4- to the left.

– Detach the foam -1-.

– Lift locking element -7- -arrow-, and pull off clip -6-.

– Pull coolant pipe -5- off heat exchanger.

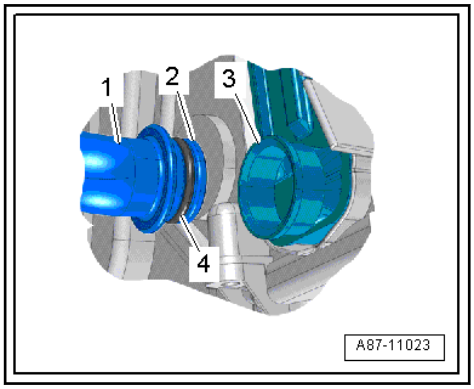
– Unscrew bolt -8-.

– Remove screw-type clip -9-.
– Pull coolant pipe -10- off heat exchanger.
– Detach coolant pipes.

Installing

Install in reverse order of removal, observing the following:

– Check connection -3- of heat exchanger and connection -2- of coolant pipes for damage or contamination.



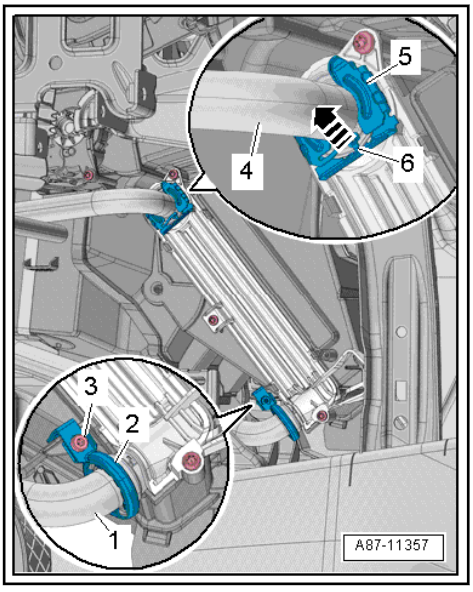
– Clean and smooth sealing surface for seals.
– Moisten new seals -4- with coolant (or lubricate lightly with silicone grease) and fit them to coolant pipe -1-.
– Push coolant pipes into heat exchanger as far as stop.

NOTICE

Risk of heat exchanger malfunction due to defective seals and leaks.

- **Never pinch seals.**
- **Never tilt coolant pipes.**
- **Slide on coolant pipes completely.**

– Fit new clip -5- or screw-type clip -2- onto joint of coolant pipe and heat exchanger.



– Tighten bolt -3-.

– Check clip and screw-type clip for proper seating at connections of heat exchanger and coolant pipes.

• Neither clip nor screw-type clip may be in contact with air distribution housing or any other components.

– Install heater and air conditioning unit ⇒ page 152 .

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit”, page 142

5.16.2 Removing and installing coolant pipes at heat exchanger (Denso)

Note

There are different designs and makes of heater and air conditioning unit. The individual components of the different heater and air conditioning units are similar. Interchanging components from different manufacturers is not permissible ⇒ Electronic parts catalogue.

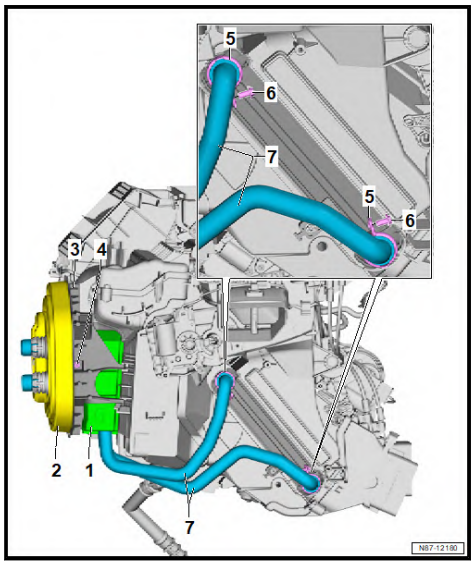
Note

The illustrations show a left-hand drive vehicle. Proceed analogously for a right-hand drive vehicle.

Removing

– Remove heater and air conditioning unit ⇒ page 152 .

– Detach the sealing collar -2- to the plenum chamber bulkhead.



– Unscrew bolt -4-.

– Detach the coolant pipe holder -3- to the left.

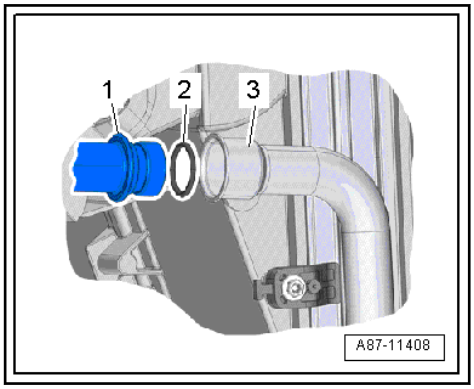
– Detach the foam -1-.

– Unscrew bolts -6-.
– Detach screw-type clips -5-.
– Pull off coolant hoses -7- from heat exchanger.

Installing

Install in reverse order of removal, observing the following:

– Check connection -3- of heat exchanger and connection of coolant pipes -1- for damage or dirt.



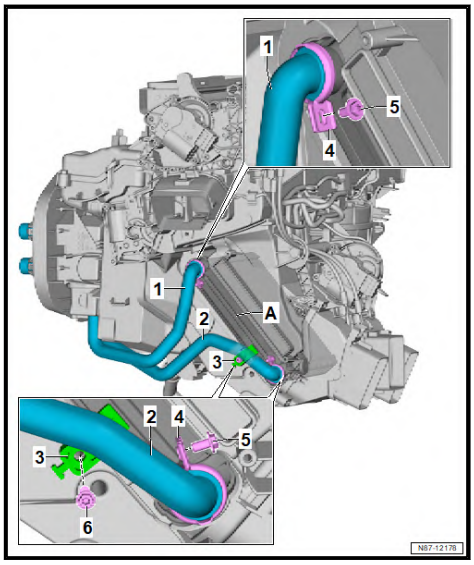
– Clean and smooth sealing surface for seals.
– Moisten new seals -2- with coolant (or lubricate lightly with silicone grease) and fit them to coolant pipe -1-.
– Push coolant pipes into heat exchanger as far as stop.

NOTICE

Risk of heat exchanger malfunction due to defective seals and leaks.

- **Never pinch seals.**
- **Never tilt coolant pipes.**
- **Slide on coolant pipes completely.**

– Fit new screw-type clamps -4- on coolant pipe/heat exchanger joint.



– Position retainer -3- on coolant pipe -2-.

– Check screw-type clips -4- for correct seating at heat exchanger connections -A- and at connections of coolant pipes -1- and -2-.

• Coolant pipes -1- and -2- must not be in contact with air distribution housing or any other components.

– Tighten bolt -6-.

– Tighten bolts -5-.

– Install heater and air conditioning unit ⇒ page 152 .

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

– Perform functional check.

Torque settings

♦ ⇒ o5.1 verview – heater and air conditioning unit”, page 142

5.17 Removing and installing evaporator temperature sensor -G308-

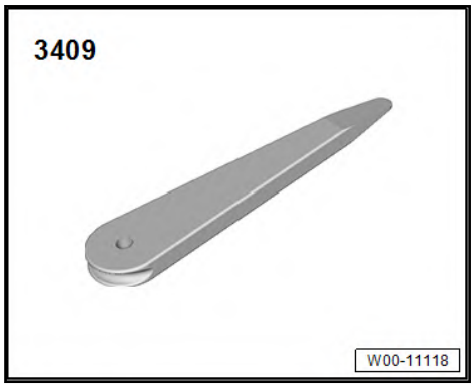
⇒ a5.17.1 nd installing evaporator temperature sensorG308, LHD vehicles”, page 204

⇒ a5.17.2 nd installing evaporator temperature sensorG308, right-hand drive vehicles”, page 205

5.17.1 Removing and installing evaporator temperature sensor -G308-, LHD vehicles

Special tools and workshop equipment required

♦ Removal wedge -3409-



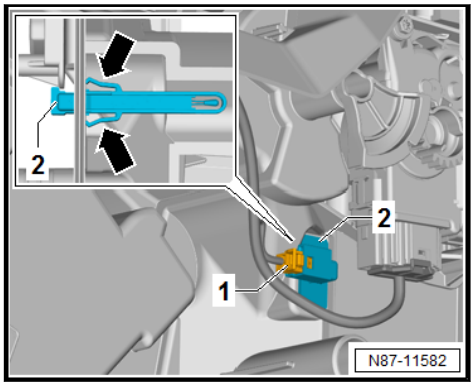
Removing

– Remove footwell trim ⇒ General body repairs, interior; Rep. gr. 70; Trims, interior; Removing and installing floor covering.

Note

Levering with removal wedge -3409- causes both retaining hooks -arrows- to be pushed together.

– Lever out evaporator temperature sensor -G308- -item 2- using removal wedge -3409-.



– Release and disconnect electrical connector -1-.

Installing

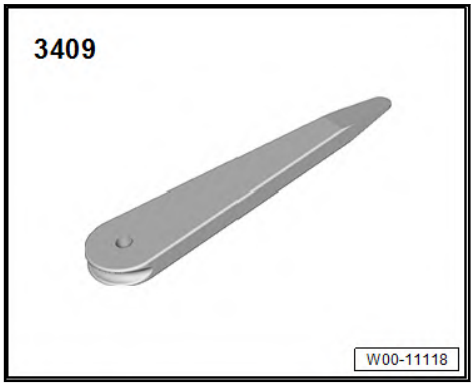
Install in reverse order of removal, observing the following:

– Check retaining hooks -arrows- for damage; renew component if necessary ⇒ Electronic parts catalogue.

5.17.2 Removing and installing evaporator temperature sensor -G308-, right-hand drive vehicles

Special tools and workshop equipment required

♦ Removal wedge -3409-

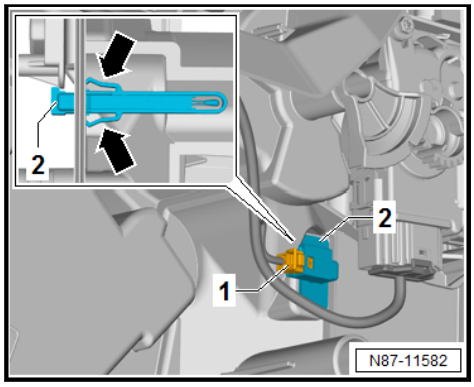


Removing

Note

Levering with removal wedge -3409- causes both retaining hooks -arrows- to be pushed together.

– Lever out evaporator temperature sensor -G308- -item 2- using removal wedge -3409-.



– Release and disconnect electrical connector -1-.

Installing

Install in reverse order of removal, observing the following:

– Check retaining hooks -arrows- for damage; renew component if necessary ⇒ Electronic parts catalogue.

5.18 Checking condensation drain

Procedure

– Remove condensation drain ⇒ page 206 .

– Check condensation drain for bottlenecks, damage and blockage; clean component if necessary, or renew.

5.19 Removing and installing condensation drain

⇒ a5.19.1 nd installing condensation drain, left-hand drive vehicles", page 206

⇒ a5.19.2 nd installing condensation drain, right-hand drive vehicles", page 209

5.19.1 Removing and installing condensation drain, left-hand drive vehicles

Removing

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Assembly overview - centre console.

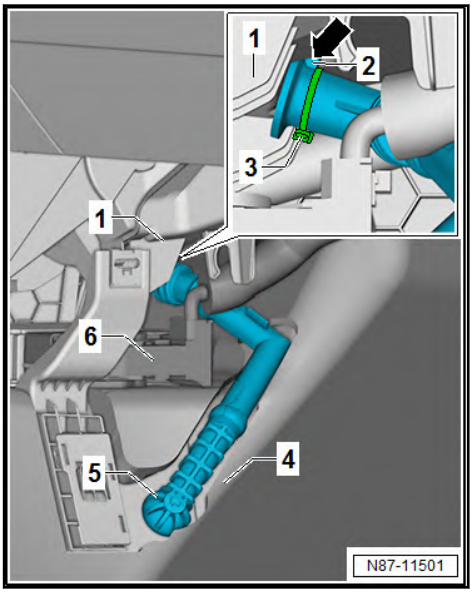
– Disconnect battery earth cable with ignition switched on ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.

NOTICE

Risk of damage to airbag control unit. Connectors may corrode if moisture enters.

– After disconnecting, cover or seal off connectors to prevent the ingress of moisture.

– Release and disconnect electrical connector of airbag control unit -J234- -item 6-.



– Separate cable ties -3- if fitted.
– Cover airbag control unit -J234- and electrical connector -6- with waterproof sheet.
– Carefully push aside floor covering -4-, and cover it in area under condensation drain -5- with waterproof sheeting and absorbent paper.
– Carefully pull condensation drain -5- off heater and air conditioning unit -1- and body.

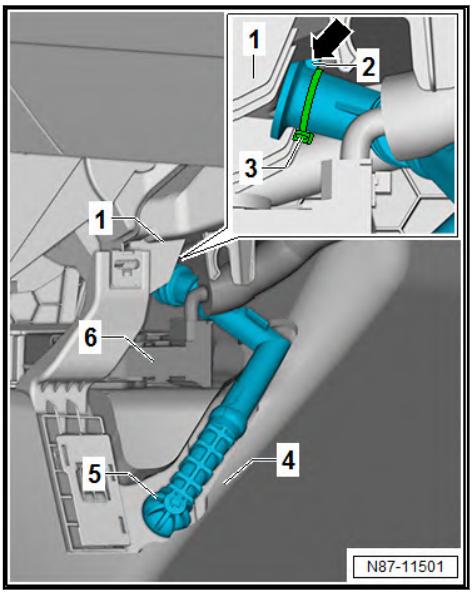
Installing

Install in reverse order of removal, observing the following:

Note

Disregard position -4-.

Condensation drain -3- can be fully pushed onto heater and air conditioning unit -1- as far as stop in only one position.

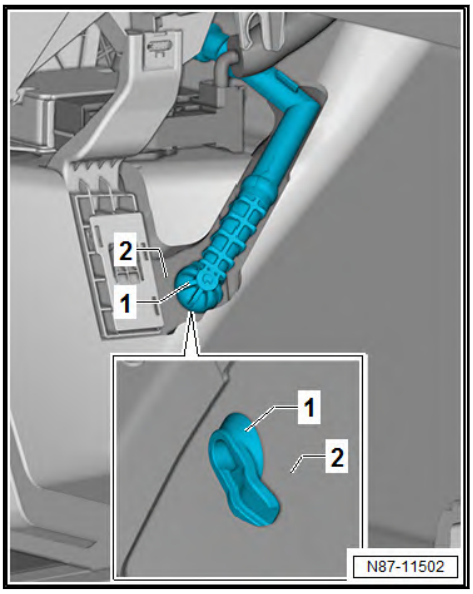


• Hook -arrow- on connecting piece must engage in guide -2-.

- If a commercially available cable tie -3- was installed to retain the condensation drain -5-, renew it.
- Condensation drain -5- must be routed below wiring harness of airbag control unit -J234-.

– Insert condensation drain -5- into body opening until it engages.

- Condensation drain -1- must be properly clipped (pre-tensioned) into body aperture -2-.



- The sealing lip must not be loosely seated on the body aperture.
- Hooks must be fully engaged.
- If the holder is not sufficiently pre-tensioned, seal off joint between body and holder, e.g. with silicon adhesive sealant ⇒ Electronic parts catalogue.

Note

- *Install condensation drain so that it is not twisted or pinched.*
- *When installing floor covering, make sure that the condensation drain is not pinched by the floor covering.*
- *If the condensation drain is too loose on the heater and air conditioning unit connection, secure it e.g. with a hose clip to prevent it from slipping. Hose clip ⇒ Electronic parts catalogue.*

CAUTION

Risk of injury from accidental triggering of pyrotechnic components.

– Battery should only ever be connected with ignition switched on.
– Ensure that nobody is in vehicle when connecting battery.
– If ignition is not switched on after reconnecting battery, only switch on ignition while sitting on driver seat in rearmost position.

– Connect battery earth cable with ignition switched on ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.

5.19.2 Removing and installing condensation drain, right-hand drive vehicles

Removing

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console.

– Disconnect battery earth cable with ignition switched on ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.

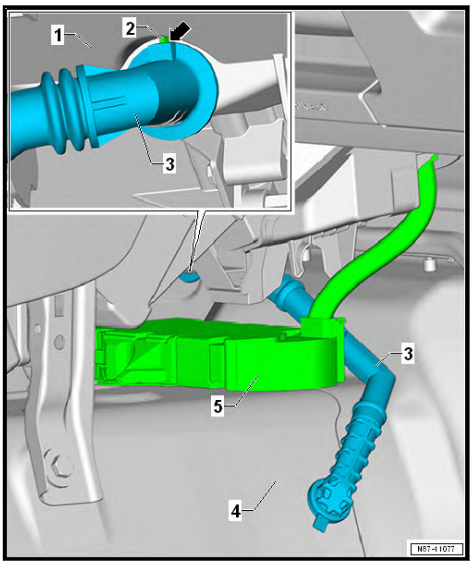
– Remove footrest ⇒ General body repairs, interior; Rep. gr. 70; Trims, interior; Removing and installing footrest.

NOTICE

Risk of damage to airbag control unit. Connectors may corrode if moisture enters.

– After disconnecting, cover or seal off connectors to prevent the ingress of moisture.

– Release and disconnect electrical connector of airbag control unit -J234- -item 5-.



– Cover airbag control unit -J234- and electrical connector -5- with waterproof sheet.

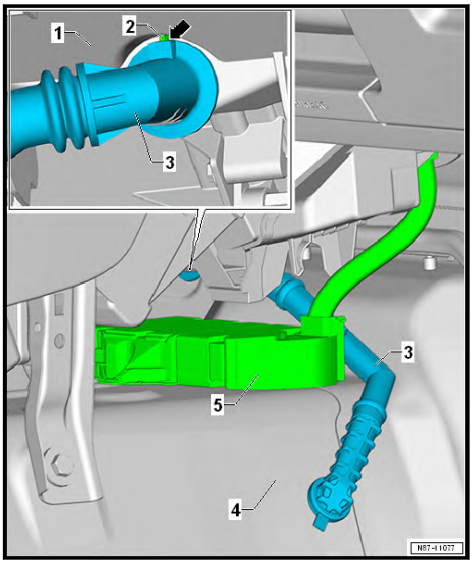
– Carefully push aside floor covering, and cover it in area under condensation drain -3- with waterproof sheeting and absorbent paper.

– Carefully pull condensation drain -3- off heater and air conditioning unit -1- and off body -4- .

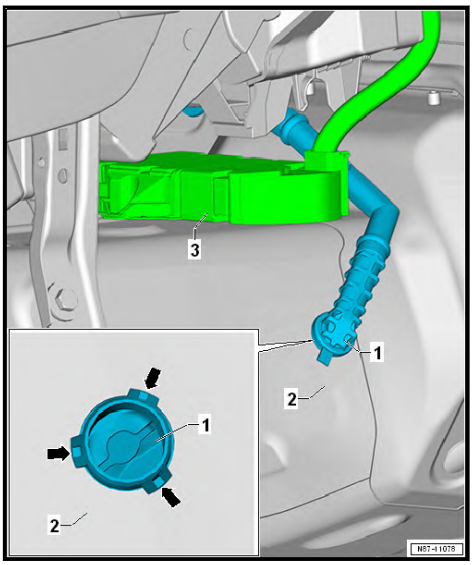
Installing

Install in reverse order of removal, observing the following:

- Condensation drain -3- can be fully pushed onto heater and air conditioning unit -1- as far as stop in only one position.



- Hook -arrow- on connecting piece must engage in guide -2-.
- If a commercially available cable tie was installed to retain the condensation drain -3-, renew it.
- Condensation drain -3- must be routed below wiring harness of airbag control unit -J234- -item 5-, as shown in illustration.
- Condensation drain -1- must be properly clipped (pre-tensioned) into body aperture -2-.



- Sealing lip must not be seated at body aperture -2- loosely.
- Hooks -arrows- must be fully engaged.
- If the holder is not sufficiently pre-tensioned, seal off joint between body and holder, e.g. with silicon adhesive sealant ⇒ Electronic parts catalogue.

Note

- *Install condensation drain -1- so that it is not twisted or pinched.*
- *When installing floor covering, make sure that the condensation drain -1- is not pinched by the floor covering.*
- *If the condensation drain -1- is seated on the heater and air conditioning unit connection too loosely, secure it e.g. with a hose clip to prevent it from slipping. Hose clip ⇒ Electronic parts catalogue.*

CAUTION

Risk of injury from accidental triggering of pyrotechnic components.

- **Battery should only ever be connected with ignition switched on.**
- **Ensure that nobody is in vehicle when connecting battery.**
- **If ignition is not switched on after reconnecting battery, only switch on ignition while sitting on driver seat in rearmost position.**

– Connect battery earth cable with ignition switched on ⇒ Electrical system; Rep. gr. 27; Battery; Disconnecting and connecting battery.

6 Air duct system

6.1 Assembly overview - air duct and air distribution in passenger compartment

Note

The illustration shows a left-hand drive vehicle.

1 - Defrost function vent air duct

- ❑ Removing and installing ⇒ page 223

2 - Centre vent air duct

- ❑ Removing and installing ⇒ page 223

3 - Footwell vent on front passenger side

- ❑ Removing and installing ⇒ page 220

4 - Rear right footwell vent

- ❑ Removing and installing ⇒ page 221

5 - Air duct for rear vent in centre console

- ❑ Removing and installing ⇒ page 222

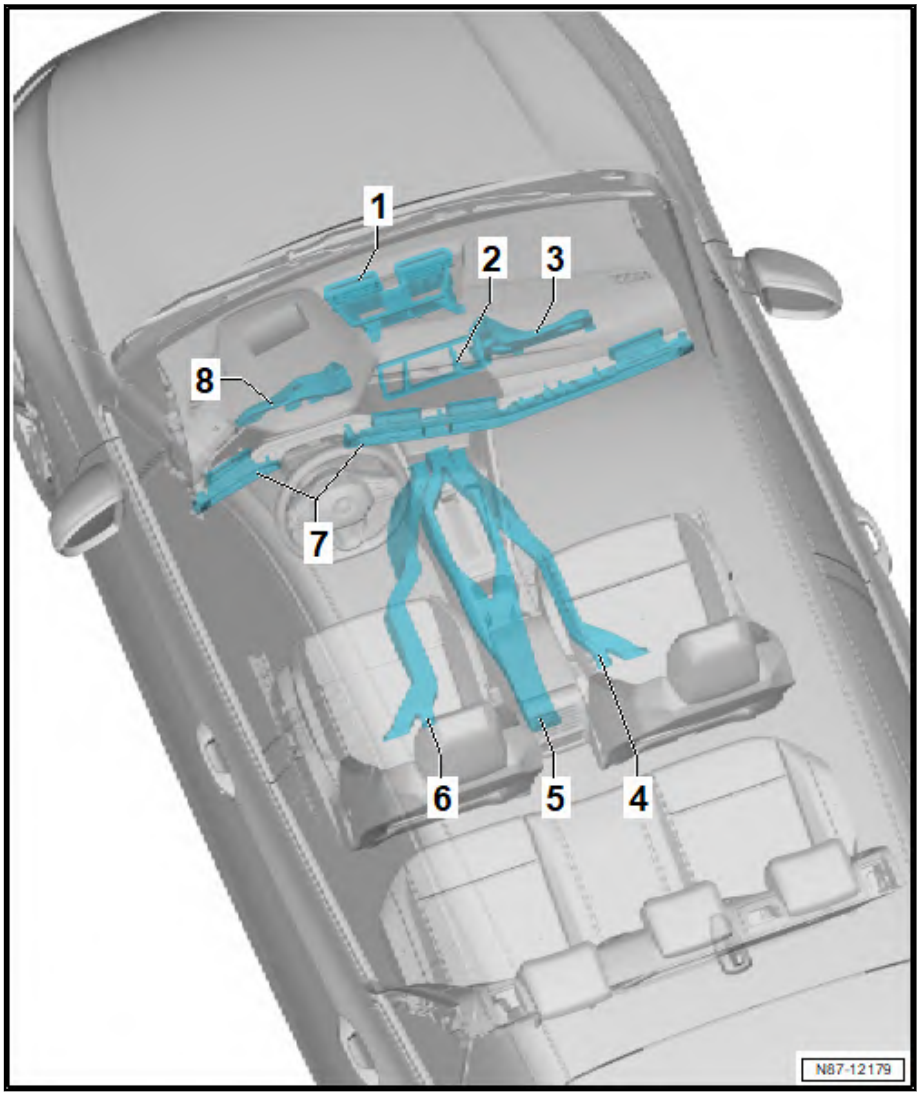
6 - Rear left footwell vent

- ❑ Removing and installing ⇒ page 221

7 - Air ducts in dash panel

8 - Footwell vent on driver side

- ❑ Removing and installing ⇒ page 219



6.2 Removing and installing fresh air intake

⇒ a6.2.1 nd installing fresh air intake, left-hand drive vehicles", page 213

⇒ a6.2.2 nd installing fresh air intake , right-hand drive vehicles", page 214

6.2.1 Removing and installing fresh air intake, left-hand drive vehicles

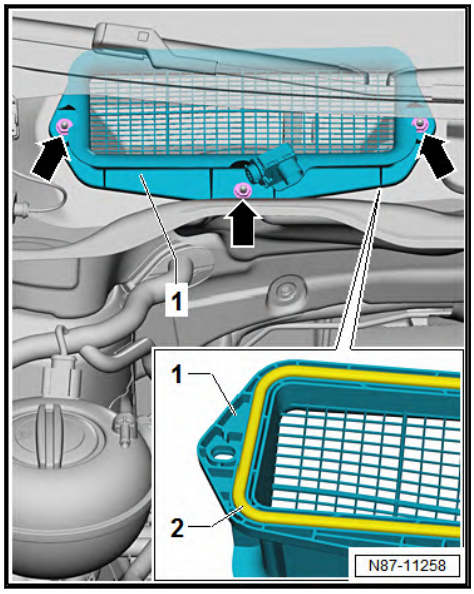
Removing

– Remove right plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Removing and installing plenum chamber cover.

– Remove cover for fresh air intake ⇒ page 216 .

– Remove bracket with air quality sensor -G238-.

– Unscrew nuts -arrows-.



– Remove fresh air intake -1- from plenum chamber.

Installing

Install in reverse order of removal, observing the following:

– Align air intake grille on metal collar.

– Hold air intake grille in position, and screw in nut (vehicle exterior) up to middle of weld stud.

– Tighten nut (centre of vehicle).

– Tighten nut (vehicle exterior).

– Tighten nut (bulkhead).

Note

♦ *The seal -2- must be properly seated on the air intake grille.*

♦ *Water may enter the fresh air intake if the grille is damaged or not properly fitted. This may result in complaints about odours from the heater and air conditioning system and/or about moisture in the vehicle.*

Torque settings

Component	Specified torque
Nut	3 Nm

6.2.2 Removing and installing fresh air intake , right-hand drive vehicles

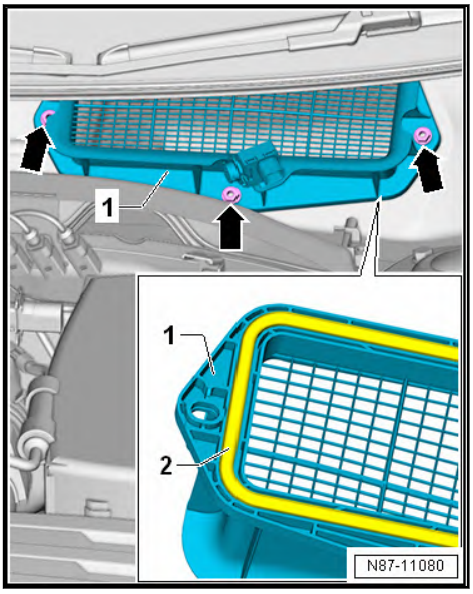
Removing

– Remove left plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50; Bulkhead; Removing and installing plenum chamber cover.

– Remove cover for fresh air intake ⇒ page 217 .

– Remove bracket with air quality sensor -G238-.

– Unscrew nuts -arrows-.



– Remove fresh air intake -1- from plenum chamber.

Installing

Install in reverse order of removal, observing the following:

– Align air intake grille on metal collar.

– Hold air intake grille in position, and screw in nut (vehicle exterior) up to middle of weld stud.

– Tighten nut (centre of vehicle).

– Tighten nut (vehicle exterior).

– Tighten nut (bulkhead).

Note

♦ *The seal -2- must be properly seated on the air intake grille.*

♦ *Water may enter the fresh air intake if the grille is damaged or not properly fitted. This may result in complaints about odours from the heater and air conditioning system and/or about moisture in the vehicle.*

Torque settings

Component	Specified torque
Nut	3 Nm

6.3 Removing and installing cover for fresh air intake

⇒ a6.3.1 nd installing cover for fresh air intake, LHD vehicles", page 216

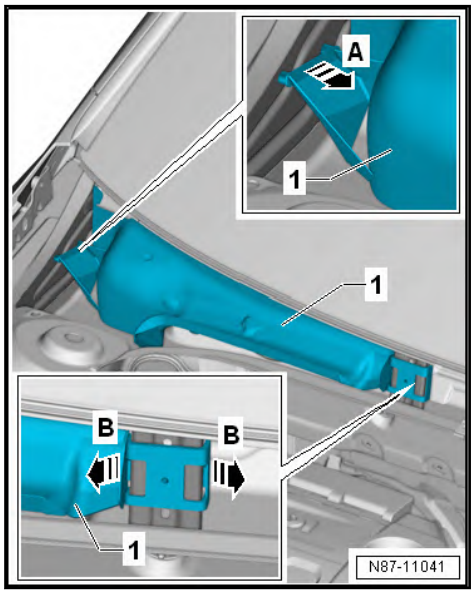
⇒ a6.3.2 nd installing cover for fresh air intake, RHD vehicles", page 217

6.3.1 Removing and installing cover for fresh air intake, LHD vehicles

Removing

– Remove right plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50; Plenum chamber bulkhead; Removing and installing plenum chamber cover.

– For vehicles with heated windscreen, detach wiring from cover for fresh air intake -1-.



– Unhook cover for fresh air intake -1- in direction of -arrow B- and pull it out in direction of -arrow A-.

Installing

Install in reverse order of removal, observing the following:

Note

- *Water could enter the fresh air intake if the cover for fresh air intake is damaged or not properly fitted. This may result in complaints about odours from the heater and air conditioning system and/or about moisture in the vehicle.*
- *If the plenum chamber cover is damaged or not properly fitted, water may likewise enter the fresh air intake via the cover for fresh air intake. This may result in complaints about odours from the heater and air conditioning system and/or about moisture in the vehicle.*

6.3.2 Removing and installing cover for fresh air intake, RHD vehicles

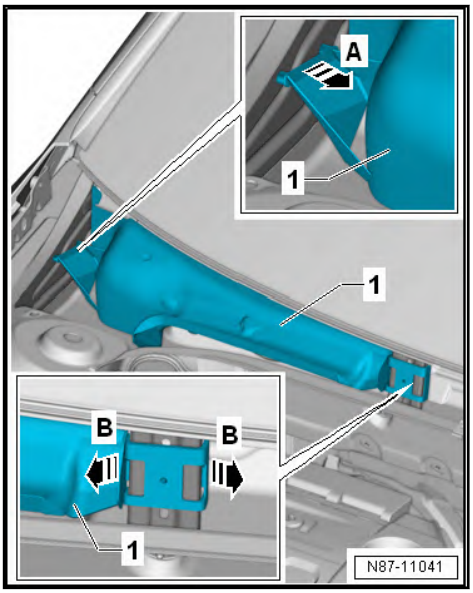
Removing

– Remove left plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50; Bulkhead; Removing and installing plenum chamber cover.

Note

The illustration shows a left-hand drive vehicle.

– For vehicles with heated windscreen, detach wiring from cover for fresh air intake -1-.



– Unhook cover for fresh air intake -1- in direction of -arrow B- and pull it out in direction of -arrow A-.

Installing

Install in reverse order of removal, observing the following:

Note

- *Water could enter the fresh air intake if the cover for fresh air intake is damaged or not properly fitted. This may result in complaints about odours from the heater and air conditioning system and/or about moisture in the vehicle.*
- *If the plenum chamber cover is damaged or not properly fitted, water may likewise enter the fresh air intake via the cover for fresh air intake. This may result in complaints about odours from the heater and air conditioning system and/or about moisture in the vehicle.*

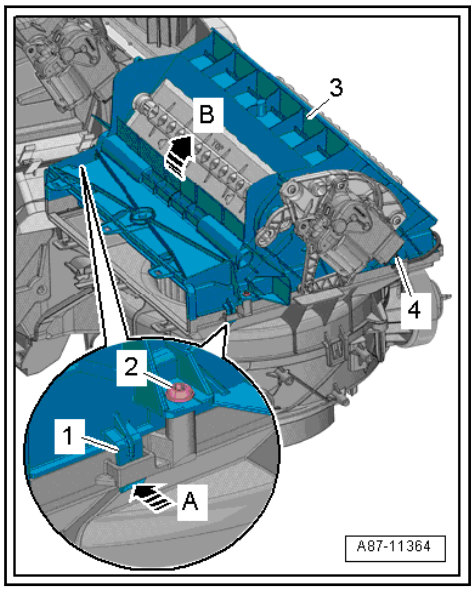
6.4 Removing and installing air intake duct

Removing

Note

The illustration shows a left-hand drive vehicle. Proceed analogously for a right-hand drive vehicle.

– Remove central tube for dash panel ⇒ General body repairs, interior; Rep. gr. 70; Central tube for dash panel; Removing and installing central tube for dash panel.



– Remove dust and pollen filter ⇒ page 163 .
– Release and disconnect electrical connector -4-.
– Lay wiring harness aside.
– Pull heater and air conditioning unit slightly towards front.
– If fitted, unscrew bolts -2-.
– Release retaining tab -1- -arrow A-.
– Swivel the air intake housing -3- upwards -arrow B- and disengage.

Installing

Install in reverse order of removal, observing the following:

Torque settings

◆ ⇒ o5.2 verview - add-on parts of heater and air conditioning unit and of air intake box”, page 146

6.5 Removing and installing driver side footwell vents

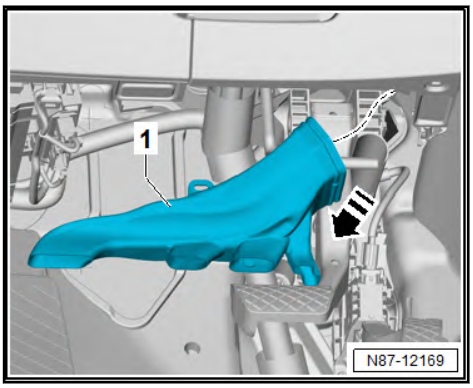
⇒ a6.5.1 nd installing driver side footwell vents, left-hand drive vehicles", page 219

⇒ a6.5.2 nd installing driver side footwell vents, right-hand drive vehicles", page 219

6.5.1 Removing and installing driver side footwell vents, left-hand drive vehicles

Removing

– If fitted, unscrew bolt.



– Detach footwell vent on driver side -1- in direction of -arrow-.

Installing

Install in reverse order of removal, observing the following:

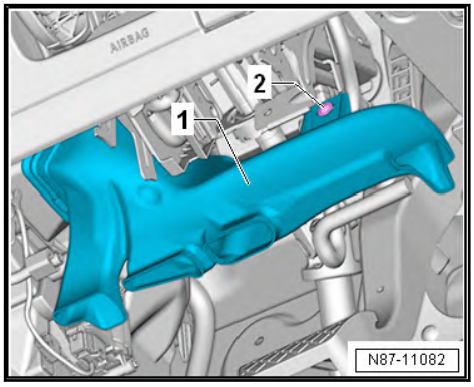
Torque settings

Component	Specified torque
Bolt	1.5 Nm

6.5.2 Removing and installing driver side footwell vents, right-hand drive vehicles

Removing

– Unscrew bolt -2-.



– Remove footwell vent on driver side -1-.

Installing

Install in reverse order of removal, observing the following:

Torque settings

Component	Specified torque
Bolt	1.5 Nm

6.6 Removing and installing front passenger side footwell vents

⇒ a6.6.1 nd installing front passenger side footwell vents, left-hand drive vehicles", page 220

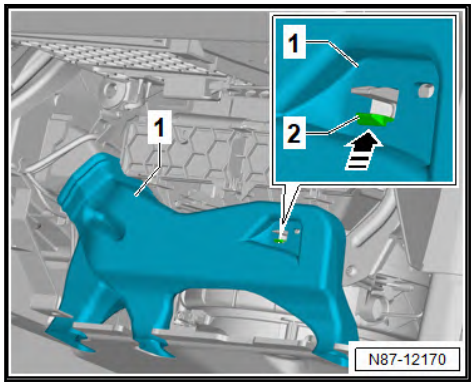
⇒ a6.6.2 nd installing front passenger side footwell vents, right-hand drive vehicles", page 221

6.6.1 Removing and installing front passenger side footwell vents, left-hand drive vehicles

Removing

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70; Dash panel; Removing and installing dash panel.

– If fitted, unscrew bolt.



– Release locking devices -2-.

– Pull footwell vent on front passenger side -1- over locking devices -2-, and remove it downwards.

Installing

Install in reverse order of removal, observing the following:

Note

If the vehicle has glove compartment cooling, ensure that the cooling hose is properly seated.

Torque settings

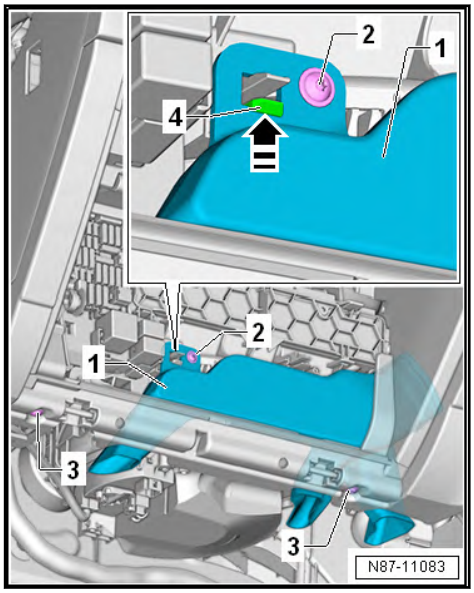
Component	Specified torque
Bolt	1.5 Nm

6.6.2 Removing and installing front passenger side footwell vents, right-hand drive vehicles

Removing

– Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing glove compartment.

– Unscrew bolt -2-.



– Unscrew bolts -3-.

– Push clip -4- upwards in direction of -arrow-, and detach footwell vent on front passenger side -1-.

– Pull out dash panel frame slightly.

– Remove footwell vent on front passenger side -1-.

Installing

Install in reverse order of removal, observing the following:

Note

If the vehicle has glove compartment cooling, ensure that the cooling hose is properly seated.

Torque settings

Component	Specified torque
Bolt	1.5 Nm

6.7 Removing and installing rear footwell vent

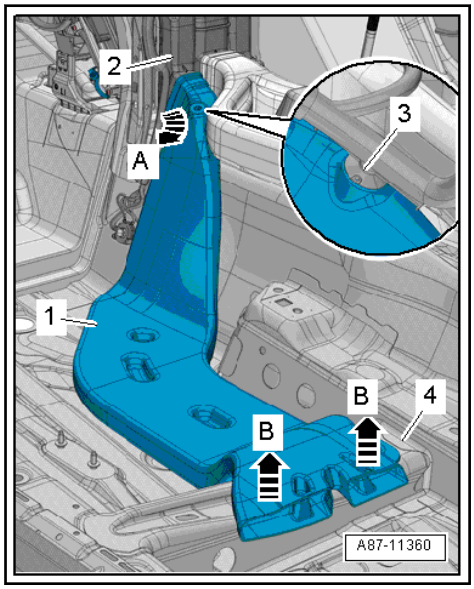
Removing

– Remove sill panel trim ⇒ General body repairs, interior; Rep. gr. 70; Trims, interior; Removing and installing sill panel trim.

– Remove the front seat ⇒ General body repairs, interior; Rep. gr. 72; Front seats; Removing and installing front seat.

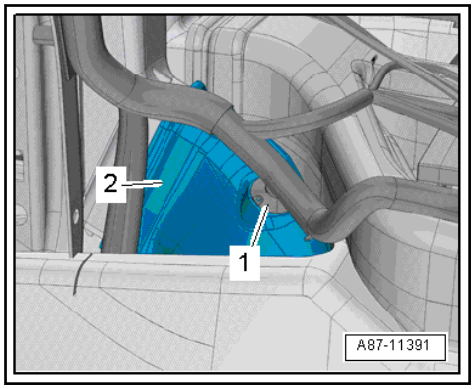
– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console.

– Lift the floor covering in the area of the vent.



– Lift up the rear footwell vent -1- -arrows B-, detach from the heater and air conditioning unit -2- -arrow A- and take out to the side.

Installing



Install in reverse order of removal, observing the following:

– When renewing footwell vent, check plug -1- for damage before inserting it into footwell vent -2-.

Note

A loose plug or damaged seal can lead to flow noise.

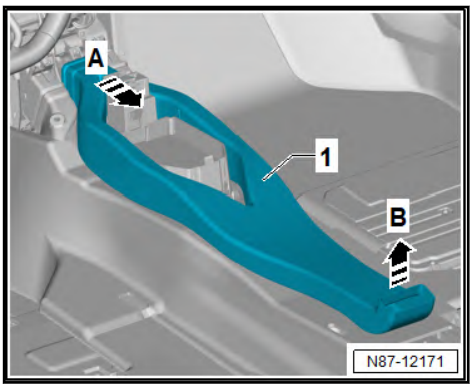
6.8 Removing and installing rear centre console vent duct

Removing

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console.

– Remove front centre console bracket ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing centre console bracket.

– Swing air duct -1- upwards in direction of -arrow B-, pull it in direction of -arrow A- out of catches in air distribution housing, and remove it.



Installing

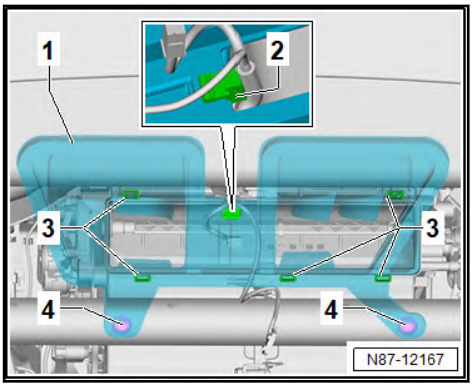
Install in reverse order of removal.

6.9 Removing and installing air duct for defroster vent

Removing

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70; Dash panel; Removing and installing dash panel.

– Detach clips -2- for wiring harness of sunlight penetration photosensor -G107-.



– Remove clips -4-.

– Release locking devices -3-.

– Detach air duct for defroster vent -1- upwards.

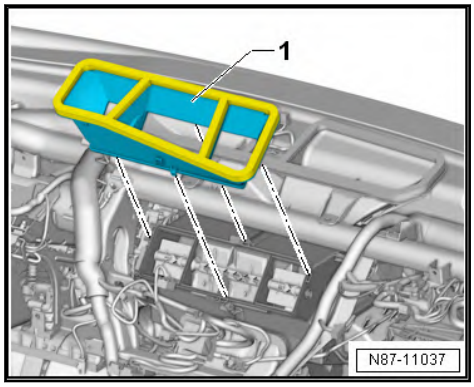
Installing

Install in reverse order of removal.

6.10 Removing and installing air duct for centre dash panel vent

Removing

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70; Dash panel; Removing and installing dash panel.



– Remove air duct for centre vent -1- upwards from heater and air conditioning unit.

Installing

Install in reverse order of removal.

7 Coolant circuit

7.1 Connection diagram - high-voltage heater

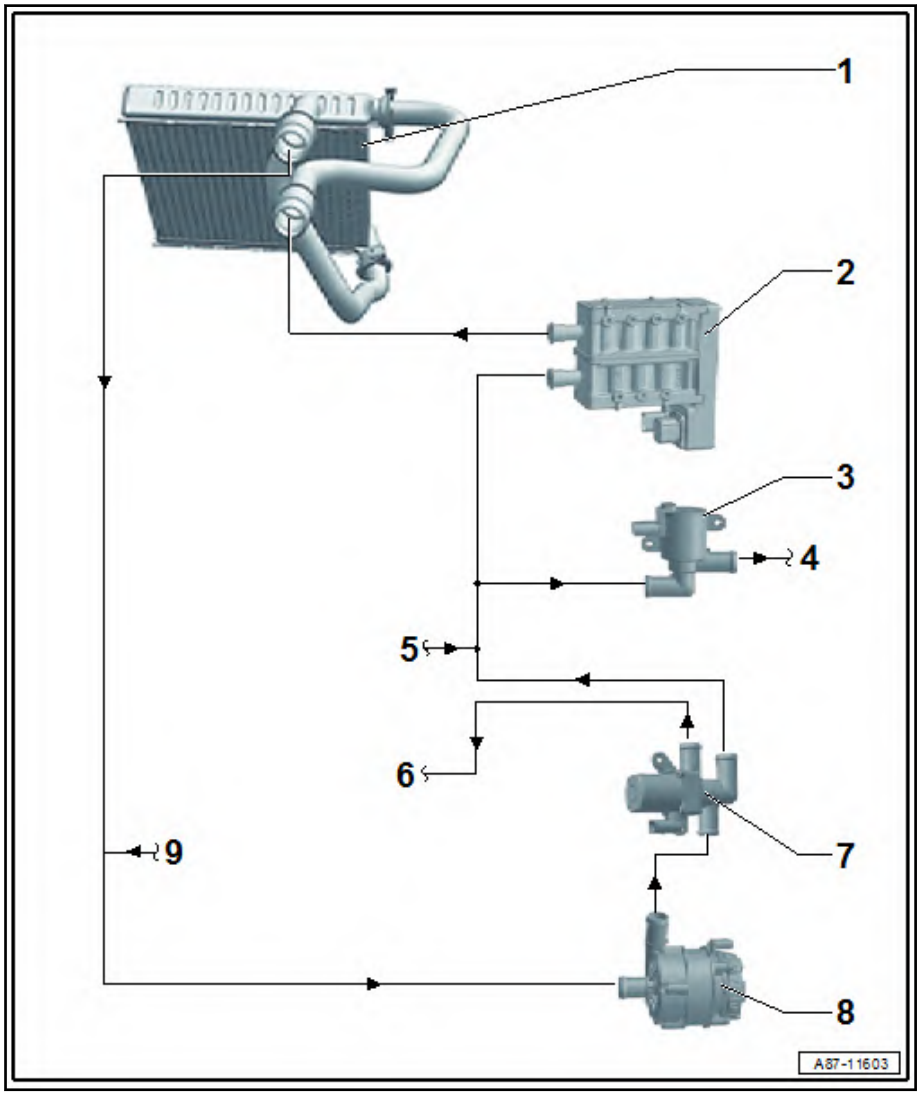
High-voltage heater (PTC) -ZX17-

Note

- *In vehicles with a high-voltage system and an auxiliary heater installed as optional equipment, the high-voltage heater (PTC) -ZX17- can be used for heating the passenger compartment instead of the auxiliary heater. For additional information, refer to ⇒ Auxiliary heater, supplementary heater; Rep. gr. 00; General notes.*
- *In vehicles with a high-voltage system without an auxiliary heater installed as optional equipment, the passenger compartment can be heated via the "Stationary air conditioning" function and the high-voltage system (PTC) -ZX17- when the ignition is switched off and at low ambient temperatures (or cooled via the air conditioning system at high ambient temperatures).*

Note

The -arrows- indicate the direction of coolant flow.



1 - Heat exchanger for heater in air conditioning unit

- ❑ Integration of heat exchanger in coolant circuit of engine ⇒ Rep. gr. 19; Cooling system, coolant; Connection diagram - coolant hoses of high-voltage system

2 - High-voltage heater (PTC) -ZX17-

- ❑ With high-voltage heater (PTC) - Z115-
- ❑ With control unit for high-voltage heater (PTC) - J848-
- ❑ Checking: use vehicle diagnosis tester in “Guided Fault Finding”.
- ❑ Removing and installing ⇒ page 231
- ❑ For additional information on vehicles with an “auxiliary heater” as optional equipment, refer to ⇒ Auxiliary heater; Rep. gr. 00; General notes.

3 - Coolant valve for gearbox -N488-

- ❑ Removing and installing ⇒ Rep. gr. 19; Coolant pump/coolant regulator unit

4 - Coolant supply to gearbox

- ❑ Integration of heat exchanger in coolant circuit of engine and gearbox ⇒ Rep. gr. 19; Cooling system, coolant; Connection diagram - coolant hoses of high-voltage system

5 - Coolant supply from engine

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

6 - Coolant return to the engine

- ❑ Integration of auxiliary heater in coolant circuit of engine ⇒ Rep. gr. 19; Cooling system, coolant; Connection diagram - coolant hoses of high-voltage system
- ❑ Depending on engine there may be a valve installed between coolant changeover valve 2 -N633- and engine in coolant return line. The valve prevents coolant flowing from the engine to -N633- when the engine is running ⇒ Rep. gr. 19; Cooling system, coolant.

7 - Coolant changeover valve 2 -N633-

- ❑ Integration of auxiliary heater in coolant circuit of engine ⇒ Rep. gr. 19; Cooling system, coolant
- ❑ Removing and installing ⇒ Rep. gr. 19; Coolant pump, thermostat; Removing and installing coolant valves

Note

- ♦ *If customer complains about poor heat output of the air conditioning system when engine is running and/or at standstill (irrespective of whether high-voltage heater (PTC) -ZX17- is acti-*

vated or not), ensure that part is installed with correct orientation and that it works properly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and vehicle diagnostic tester in "Guided Fault Finding" mode.

- *To ensure that the coolant heated by the high-voltage heater (PTC) -ZX17- is conveyed through the heat exchanger of heater and air conditioning unit, the coolant pump for high-temperature circuit -V467- and the coolant valve for gearbox -N488- must be activated as well. To make sure that the coolant flows in the appropriate direction, the non-return valves must be installed correctly in the coolant circuit and they must work properly. For further information: ⇒ Rep. gr. 19; Cooling system/coolant, Vehicle diagnostic tester in "Guided Fault Finding" and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

8 - Coolant pump for high-temperature circuit -V467-

- ❑ Integration of coolant circuit of engine ⇒ Rep. gr. 19; Cooling system, coolant
- ❑ Removing and installing ⇒ Rep. gr. 19; Coolant pump/coolant regulator unit

Note

- *Coolant pump for high-temperature circuit -V467- is actuated by engine/motor control unit -J623- when heating output is requested from air conditioning system. Use ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and vehicle diagnostic tester in "Guided Fault Finding" mode.*
- *If customer complains about poor heat output of the air conditioning system when engine is running and/or at standstill irrespective of whether high-voltage heater (PTC) -ZX17- is activated or not, ensure that -V467- is installed with correct orientation and that it works properly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and vehicle diagnostic tester in "Guided Fault Finding" mode.*
- *To ensure that the coolant heated by the high-voltage heater (PTC) -ZX17- is conveyed through the heat exchanger of heater and air conditioning unit, the coolant changeover valve 2*

-N633- and the coolant valve for gearbox -N488- must be activated as well. To make sure that the coolant flows in the appropriate direction, the non-return valves must be installed correctly in the coolant circuit and they must work properly. For further information: ⇒ Rep. gr. 19; Cooling system, coolant; Connection diagram - coolant hoses high-voltage system (connection diagram for coolant hoses), Vehicle diagnostic tester in "Guided Fault Finding" and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

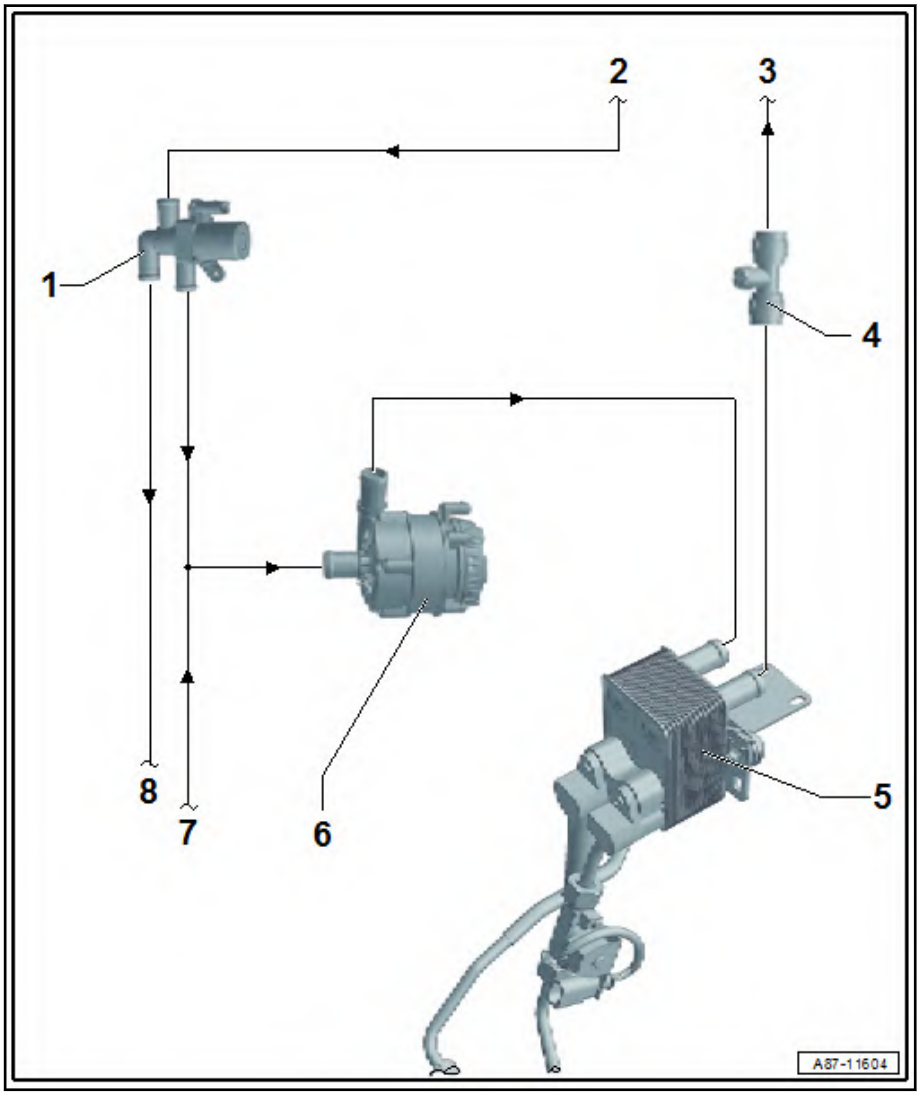
9 - Coolant return from gearbox

- ❑ Integration of heat exchanger in coolant circuit of engine and gearbox ⇒ Rep. gr. 19; Cooling system, coolant; Connection diagram - coolant hoses of high-voltage system

Heat exchanger for high-voltage battery

Note

If there is a problem with insufficient cooling output for cooling the components of the high-voltage system and the cooling output of the air conditioning system is OK, check the cooling capacity of the heat exchanger for high-voltage battery by means of the cooling output. When doing this, verify that the heat exchanger for high-voltage battery is actually cooled down. The operation of the refrigerant shut-off valve for high-voltage battery heat exchanger -N542- and of the restrictor installed in the refrigerant circuit must be OK. If no fault in the refrigerant circuit is detected, check the incorporation of the coolant pump for high-voltage battery -V590-, the coolant circulation pump before power and control electronics for electric drive -V508-, the coolant changeover valve 1 -N632- and the coolant valve for high-voltage battery -N688- in the coolant circuit of the high-voltage system as well as the activation and operation of these components ⇒ Rep. gr. 19; Cooling system, coolant and vehicle diagnostic tester in "Guided Fault Finding" mode (for the air conditioning system and the hybrid battery energy management system).



1 - Coolant valve for high-voltage battery -N688-

- ❑ Integration of coolant circuit of high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant
- ❑ Checking: use vehicle diagnosis tester in “Guided Fault Finding”.
- ❑ Removing and installing ⇒ page 238

2 - Coolant return from high-voltage battery 1 -AX2-

- ❑ Coolant circuit of high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant

3 - Coolant supply to high-voltage battery 1 -AX2-

- ❑ Coolant circuit of high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant

4 - Bleed screw

- ❑ Bleed ⇒ Rep. gr. 19; Cooling system, coolant

5 - Heat exchanger for high-voltage battery

- ❑ Integration of coolant circuit of high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant
- ❑ Checking: use vehicle diagnosis tester in “Guided Fault Finding”.
- ❑ Removing and installing ⇒ page 63

6 - Coolant pump for high-voltage battery -V590-

- ❑ Integration of coolant circuit of high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant
- ❑ Checking: use vehicle diagnosis tester in “Guided Fault Finding”.
- ❑ Removing and installing ⇒ page 238

Note

- ♦ *If there is a problem with insufficient cooling output for cooling the components of the high-voltage system, check for correct orientation and proper operation vehicle diagnostic tester in “Guided Fault Finding” mode and ⇒ Rep. gr. 19; Cooling system, coolant.*
- ♦ *To ensure that power and control electronics for electric drive -JX1- and control unit for high-voltage battery charging unit -J1050- are cooled, the coolant circulation pump before power and control electronics for electric drive -V508- and the cool-*

ant changeover valve 1 -N632- must be actuated and their function must be in order. For further information: Vehicle diagnostic tester in "Guided Fault Finding" (for hybrid battery power management system) and ⇒ Rep. gr. 19; Cooling system, coolant.

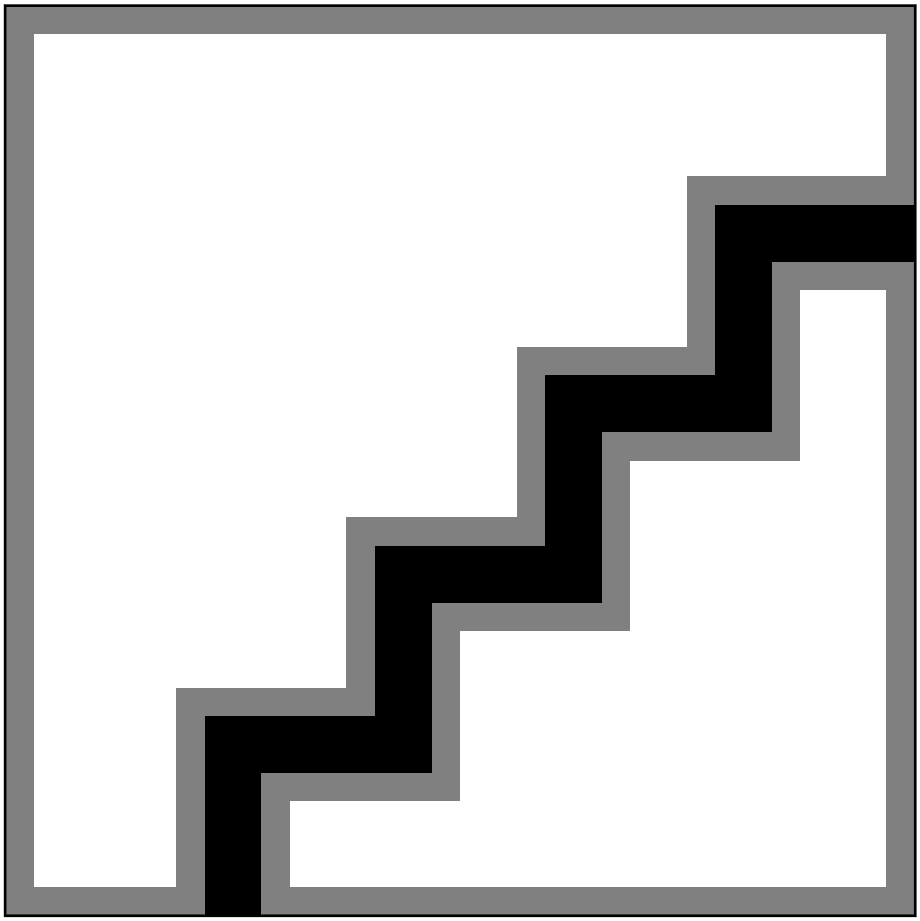
7 - Coolant supply from radiator for high-voltage system

- ❑ Coolant circuit of high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant

8 - Coolant supply to coolant circulation pump before power and control electronics for electric drive -V508-

- ❑ Coolant circuit of high-voltage system ⇒ Rep. gr. 19; Cooling system, coolant

7.2 Assembly overview - high-voltage heater (PTC) -ZX17-



1 - Nut
- ❑ Qty. 2
- ❑ 8 Nm

2 - Wires
- ❑ For pressure differential sender for particulate filter -G1037-

3 - Centre hex stud
- ❑ Qty. 2
- ❑ 20 Nm

4 - Bolt
- ❑ Qty. 3
- ❑ Thread-cutting
- ❑ 8 Nm

5 - Heat shield

6 - Holder

7 - Bolt
- ❑ 20 Nm

8 - Nut
- ❑ Qty. 2
- ❑ 9 Nm

9 - Pin
- ❑ Qty. 2

10 - High-voltage heater (PTC) -ZX17-
- ❑ With high-voltage heater (PTC) -Z115-
- ❑ With control unit for high-voltage heater (PTC) -J848-
- ❑ Removing and installing ⇒ page 231

11 - Warning stickers
- ❑ Check ⇒ 4-cyl. direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 93; Warning stickers

12 - Holder
- ❑ For earth stud

13 - Electrical connector
- ❑ High-voltage cable

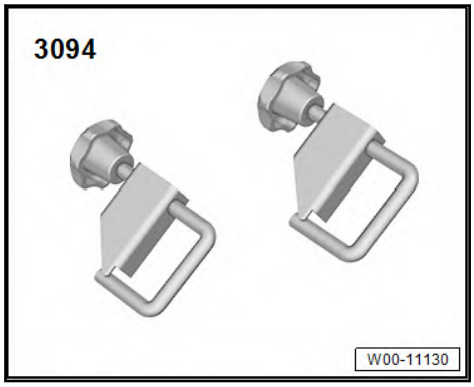
14 - Nut
- ❑ Qty. 2
- ❑ 8 Nm

15 - Electrical connector

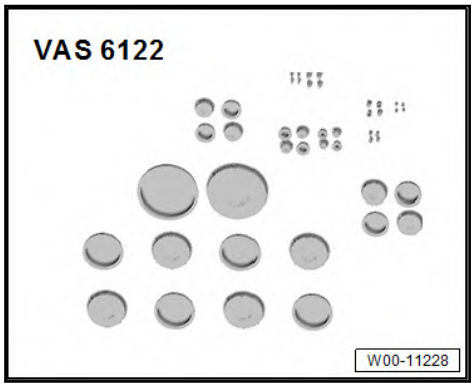
7.3 Removing and installing high-voltage heater (PTC) -ZX17-

Special tools and workshop equipment required

- Hose clamps to 25 mm -3094-

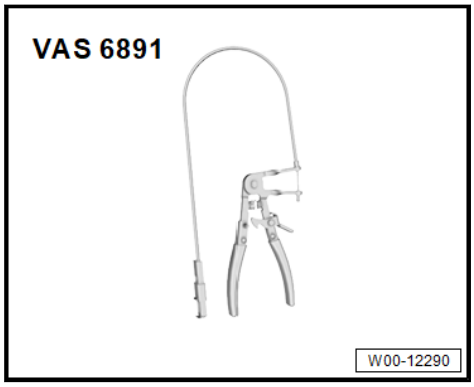


- Engine bung set -VAS 6122-



- Cooling system tester -V.A.G 1274 B-

- Pliers for spring-type clips -VAS 6891-



- Torx-30 IPR or TS, commercially available

Removing

– Switch off ignition.

– Note safety precautions ⇒ p1.1 recautions when working on air conditioning systems", page 1 .

– Observe notes ⇒ o4.1 n refrigerant circuit", page 9 .
– Note safety precautions ⇒ p1.6 recautions when working on cooling system", page 3 .
– Observe safety precautions when working on the high-voltage system ⇒ p1.4 recautions when working on high-voltage system", page 2 .
– Observe safety precautions when working in the vicinity of high-voltage components ⇒ p1.5 recautions when working in vicinity of high-voltage components", page 3 .
– Observe the risk category of the high-voltage system ⇒ Rep. gr. 00; Risk category of the high-voltage system.

DANGER

Danger to life from high voltage.

Risk of severe or fatal injury due to electric shock.

– **Have a qualified technician de-energise the high-voltage system.**

– De-energise high-voltage system ⇒ Rep. gr. 93; De-energising high-voltage system.

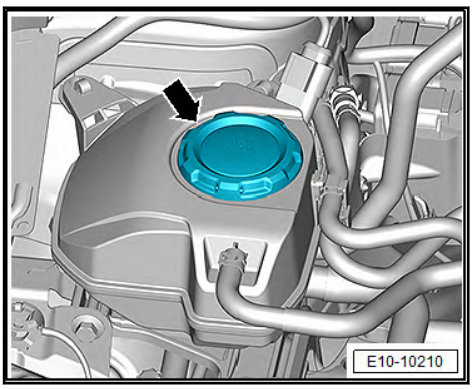
CAUTION

The cooling system is under high pressure when the engine is hot. Danger of scalding by steam and hot coolant.

There is a risk of injury to the skin and parts of the body due to scalding.

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

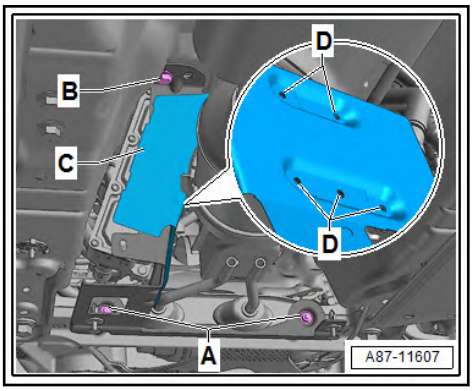
– Open filler cap -arrow- for coolant expansion tank of coolant circuit for engine.



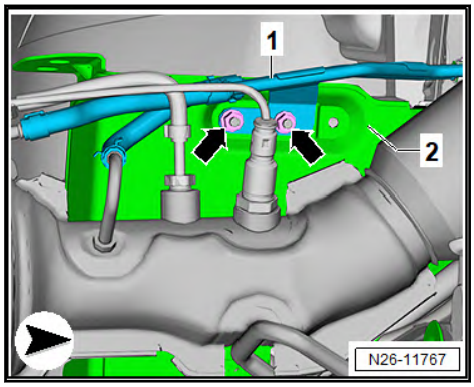
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66; Noise insulation.

Note

The high-voltage heater (PTC) -ZX17- is installed to the underbody in the centre tunnel near the catalytic converter together with the bracket and the heat shield -C-.

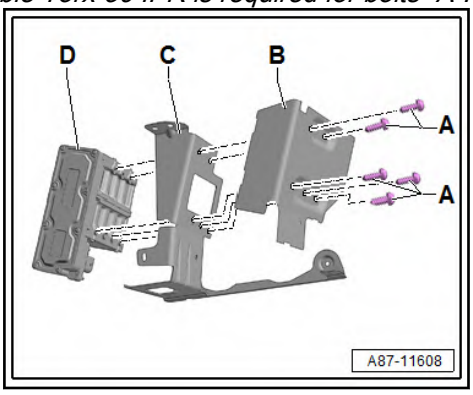


– Unscrew bolts -A- and -B-.
– Carefully tilt high-voltage heater (PTC) -ZX17- with bracket and heat shield -C- downwards.
– Unscrew nuts -arrows- and push retainers for pressure differential lines to one side.



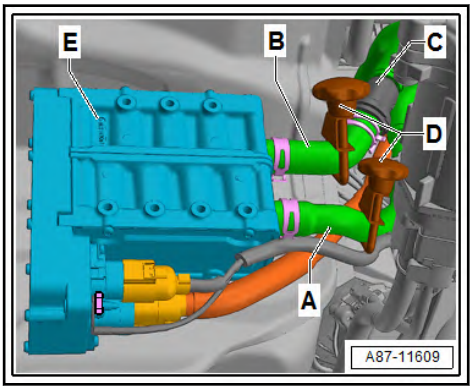
Note

A commercially available Torx-30 IPR is required for bolts -A-.



– Unscrew centre hex studs and bolts -A-.
– Remove heat shield -B- and bracket -C- from high-voltage heater (PTC) -ZX17- -D-.

– Clamp off coolant hoses -A- and -B- using hose clamps, up to 25 mm -3094- -D-.



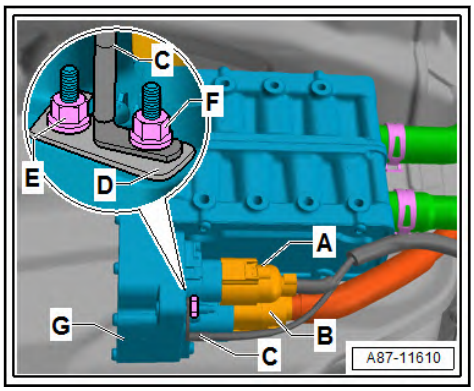
Note

- *The high-voltage heater (PTC) -ZX17- -E- is designed for a particular direction of flow of the coolant. Therefore, the coolant hoses must not be interchanged when connecting them.*
- *On vehicles with an auxiliary heater installed as optional equipment, a non-return valve is installed in the coolant line -C- ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82; Coolant circuit with auxiliary heater.*

– Disconnect coolant hoses -A- and -B- from connections on high-voltage heater (PTC) -ZX17- -E-.

– Seal open connections for coolant hoses on high-voltage heater (PTC) -ZX17- -E- with clean plugs from engine bung set -VAS 6122-.

– Release and disconnect electrical connectors -A- (for low voltage) and -B- (high-voltage cable).



– Cover electrical connector on high-voltage heater (PTC) -ZX17- -G- with clean plugs from engine bung set -VAS 6122-.

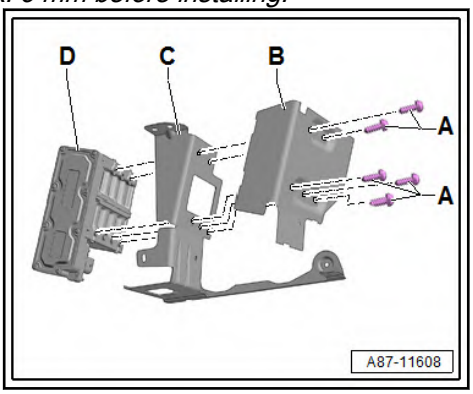
Unscrew nut -F- (or -E-), and remove earth cable -C- (or earth cable -C- with bracket -D-).

Installing

Install in reverse order of removal, observing the following:

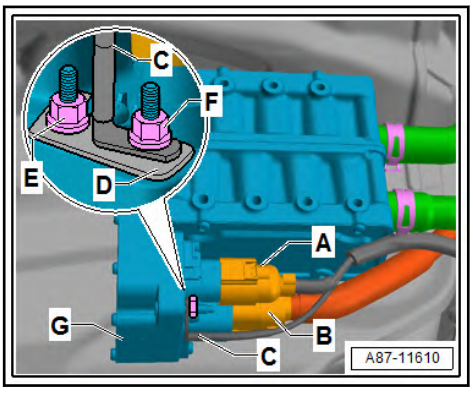
Note

- *The heat shield -B- and bracket -C- are bolted to high-voltage heater (PTC) -ZX17- -D- with self-tapping pan head bolts -A-.*
- *If a new high-voltage heater (PTC) -ZX17- -D- is installed, there is no thread provided at the bolting points. To ease installation of the bolts when installing, start bolts -A- and screw them in approx. 6 mm before installing.*

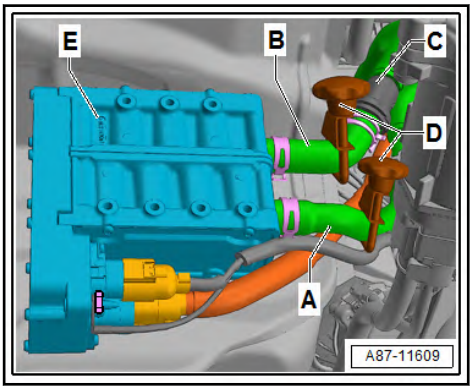


Note

Check bolting points on high-voltage heater (PTC) -ZX17- -G- and on bracket -D- as well as earth cable -C- on nut -F- before installing. The contact surfaces must be clean, rust- and grease-free Otherwise, repair contact surfaces using contact surface cleaning set -VAS 6410-.



– Check contact surfaces for earth cable -C- and bracket -D- before bolting on and clean if necessary.
– Bolt bracket -D- and earth cable -C- to high-voltage heater (PTC) -ZX17- -G-.
– Join electrical connectors -A- (for low voltage) and -B- (high-voltage cable).
– If necessary, fill coolant in coolant expansion tank for engine ⇒ Rep. gr. 19; Cooling system, coolant.
– Attach coolant hose -A-.



Note

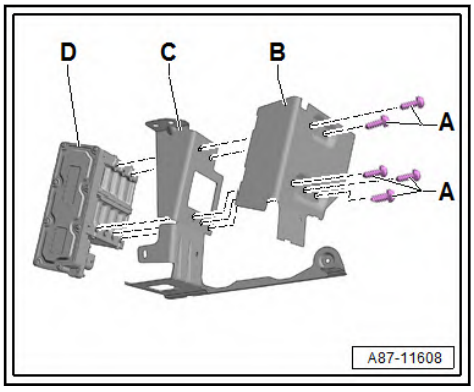
To make sure the high-voltage heater (PTC) -ZX17- -E- is completely filled with coolant, hold connection for coolant hose -B- as high as possible when the coolant flows in.

– Carefully open hose clip -D- on coolant hose -A- and allow coolant to flow in until coolant escapes from connection for coolant hose -B-.
– Attach coolant hose -B-.

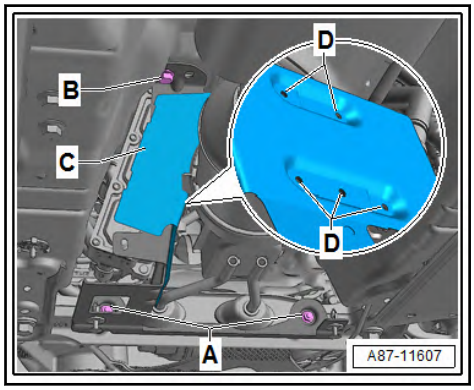
Note

If the high-voltage heater (PTC) -ZX17- -E- has been removed and installed as described above there should not be any air in the coolant circuit of the engine. If, however, there is still air in the coolant circuit, bleed coolant circuit ⇒ Rep. gr. 19; Cooling system, coolant.

– Remove hose clip -D- from coolant hose -B-.
– Check contact surfaces for bracket -C- on heat shield -B- before bolting on, and clean them as necessary.



– Mount heat shield -B- and bracket -C-.
– Install bracket -C- with high-voltage heater (PTC) -ZX17-.



– If necessary, fill coolant in coolant expansion tank for coolant circuit of engine ⇒ Rep. gr. 19; Cooling system, coolant.
– After the high-voltage heater (PTC) -ZX17- has been installed, switch on ignition and activate the vehicle's drive system (the engine must not be running), set the air conditioning system to max. heat output, and operate the air conditioning system for 2 minutes with this setting.

Torque settings

♦ ⇒ o7.2 verview - high-voltage heater (PTC)ZX17", page 230

7.4 Removing and installing coolant changeover valve 1 -N632-

Removal and installation of coolant changeover valve 1 -N632- is described under ⇒ 4-cyl. direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 19; Coolant pump/thermostat assembly; Removing and installing coolant valves.

7.5 Removing and installing coolant valve for high-voltage battery -N688-

Removal and installation of coolant valve for high-voltage battery -N688- is described under ⇒ 4-cyl. direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 19; Coolant pump/thermostat assembly; Removing and installing coolant valves.

7.6 Removing and installing coolant pump for high-voltage battery -V590-

Removal and installation of coolant pump for high-voltage battery -V590- is described under ⇒ 4-cyl. direct injection (1.4 l engine, 4V, EA 211, turbocharger, hybrid); Rep. gr. 19; Coolant pump/thermostat assembly.

8 Operating and display unit

⇒ o8.1 f fitting locations – operating and display unit", page 239

⇒ a8.2 nd installing operating and display unit", page 240

8.1 Overview of fitting locations – operating and display unit

⇒ o8.1.1 f fitting locations – operating and display unit, front", page 239

⇒ o8.1.2 f fitting locations – operating and display unit, rear", page 239

8.1.1 Overview of fitting locations – operating and display unit, front

Note

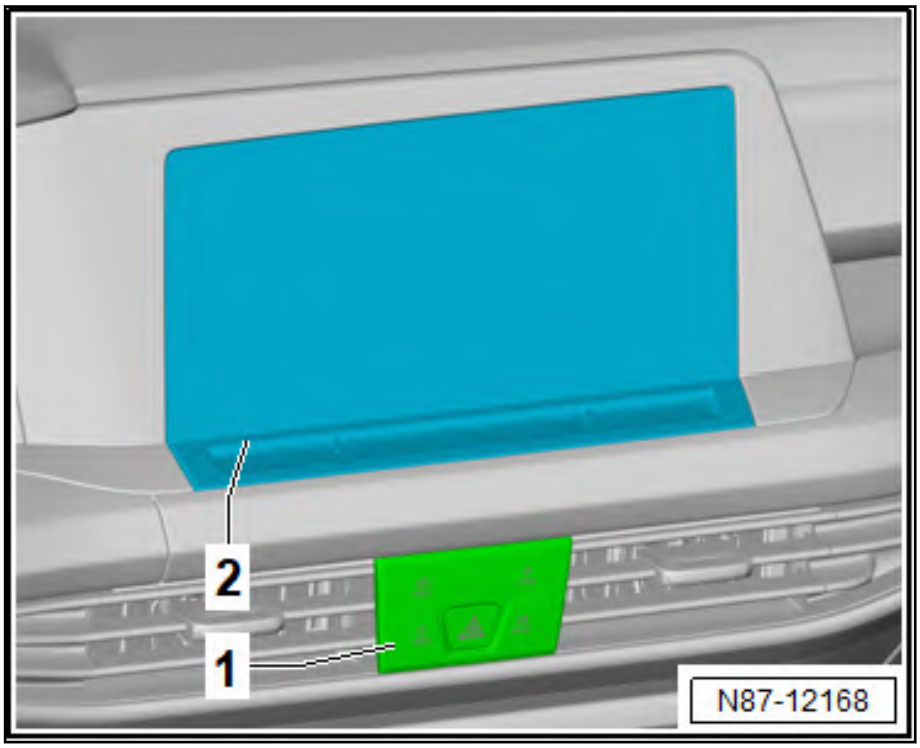
The illustration shows a left-hand drive vehicle.

1 - Controls

- With CLIMA button for air conditioning system
- Removing and installing ⇒ page 240
- Refer to ⇒ owner's manual for description of features and further information.

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

- Refer to ⇒ owner's manual for description of features and further information.
- Removing and installing ⇒ Communication; Rep. gr. 91; Infotainment system; Removing and installing infotainment system display



8.1.2 Overview of fitting locations – operating and display unit, rear

1 - Rear centre console trim

- ❑ Between front seat

2 - Operating and display unit for rear air conditioning system -E265-

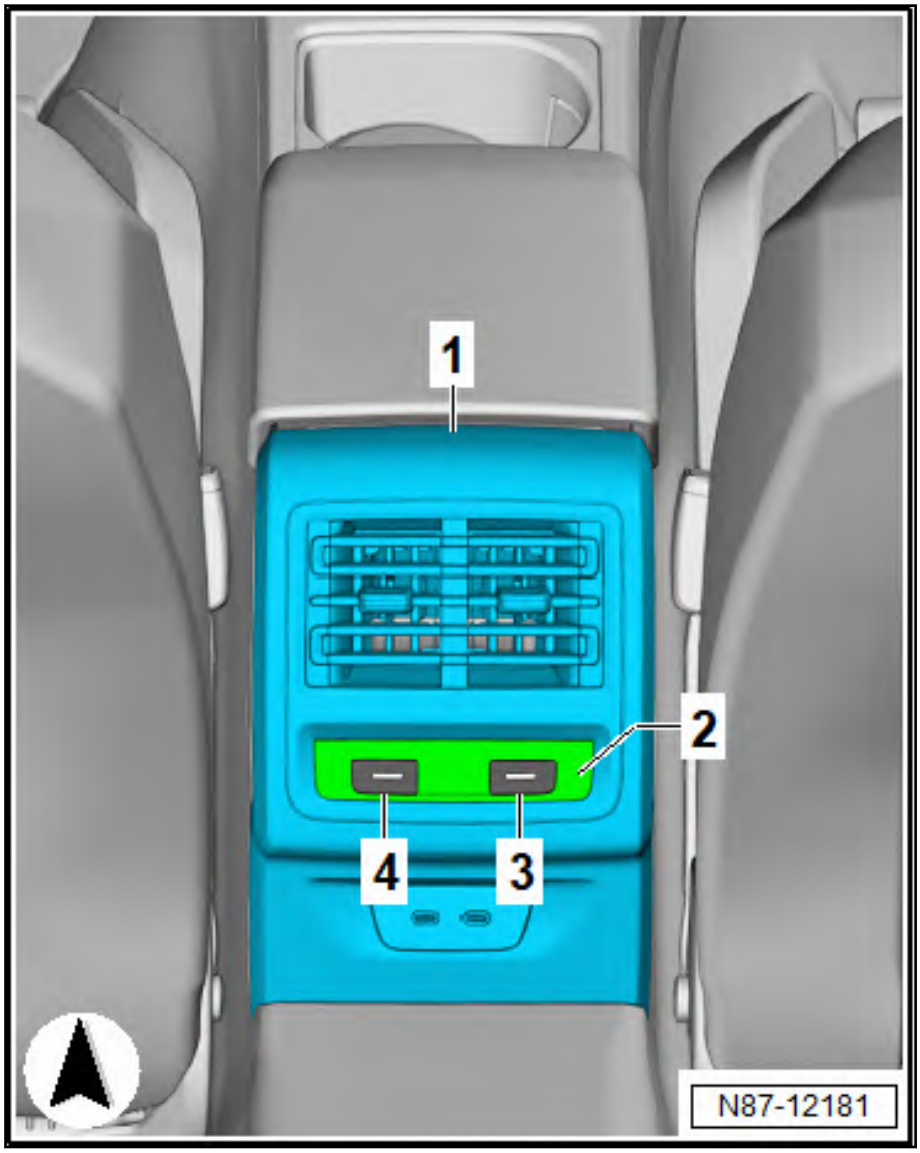
- ❑ Integrated in centre switch module in dash panel -EX22-
- ❑ Removing and installing ⇒ page 240

3 - Button to regulate temperature

- ❑ Right

4 - Button to regulate temperature

- ❑ Left



8.2 Removing and installing operating and display unit

⇒ a8.2.1 nd installing operating and display unit, front", page 240

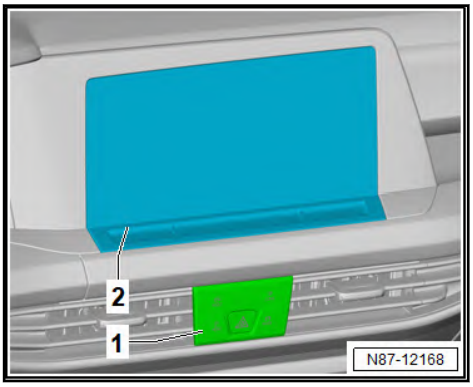
⇒ a8.2.2 nd installing operating and display unit for rear air conditioning systemE265", page 241

8.2.1 Removing and installing operating and display unit, front

Note

The illustration shows a left-hand drive vehicle.

For removal and installation of display unit for front information display and operating unit control unit -J685- -item 2-, refer to ⇒ Communication; Rep. gr. 91; Infotainment system; Overview of fitting locations – infotainment system.

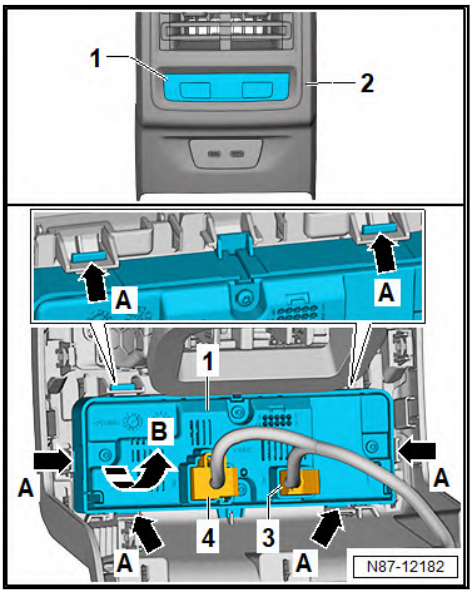


For removal and installation of centre switch module in dash panel -EX22- -item 1-, refer to ⇒ Electrical system; Rep. gr. 96; Controls; Overview of fitting locations – controls in dash panel.

8.2.2 Removing and installing operating and display unit for rear air conditioning system -E265-

Removing

– Remove rear centre console trim -2- ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing rear centre console trim.



– Release and disconnect electrical connectors -3- and -4-.
– Release retaining hooks -A-.
– Remove operating and display unit for rear air conditioning system -E265- -item 1- -arrow B-.

Installing

Install in reverse order of removal.

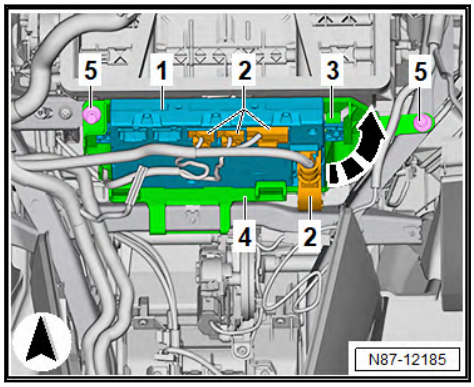
9 Other controlling and regulating components

9.1 Removing and installing heater and air conditioning system control unit -J979-

Removing

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing dash panel trim on driver side.

– Release and disconnect electrical connectors -2-.



– Press retaining hooks -3- towards rear, and push heater and air conditioning system control unit -J979- -item 1- over retaining hooks -3-.

– Remove heater and air conditioning system control unit -J979- -item 1-.

– To remove bracket -4-, loosen spreader rivets -5-, and detach bracket -4-.

Installing

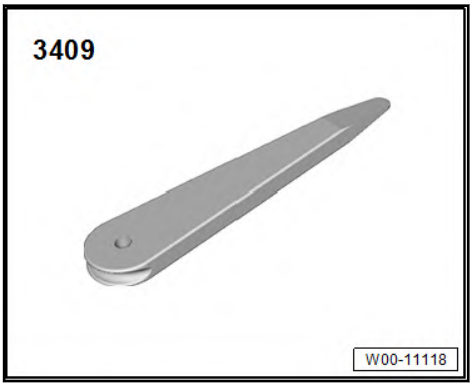
Install in reverse order of removal, observing the following:

When renewing heater and air conditioning system control unit -J979-, follow instructions as per ⇒ Vehicle diagnostic tester.

9.2 Removing and installing sunlight penetration photosensor -G107-

Special tools and workshop equipment required

- Removal wedge -3409-



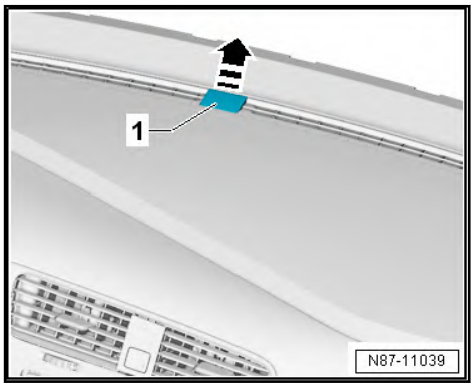
Removing

– Switch off all electrical consumers.

– Switch off ignition.

– Lay aside ignition key outside the vehicle.

– Unclip sunlight penetration photosensor -G107- -item 1- from dash panel in direction of -arrow- using removal wedge -3409-.



– Release and disconnect electrical connector.

Installing

Install in reverse order of removal.

9.3 Removing and installing air quality sensor -G238-

⇒ a9.3.1 nd installing air quality sensorG238, left-hand drive vehicles", page 244

⇒ a9.3.2 nd installing air quality sensorG238, right-hand drive vehicles", page 245

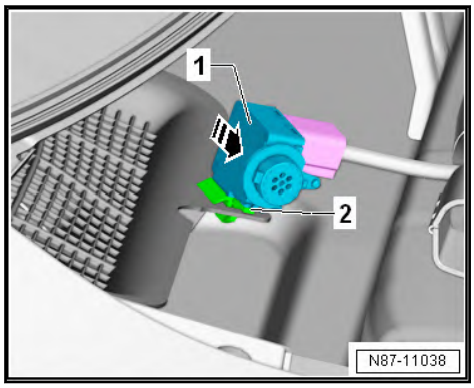
9.3.1 Removing and installing air quality sensor -G238-, left-hand drive vehicles

Note

- *The air quality sensor -G238- is installed on the front right (in direction of travel) of the air intake grille in the plenum chamber.*
- *The air quality sensor -G238- is a highly sensitive electronic component which could be destroyed by direct contact with solvents, fuels and certain chemical compounds.*
- *Do not install a sensor that has been kept, for example, in a tool box.*

Removing

– Remove cover for fresh air intake ⇒ page 216 .



– Release retaining tab -2- downwards.
– Pull air quality sensor -G238- -item 1- in direction of -arrow-.
– Release and disconnect electrical connector.

NOTICE

Risk of damage to component due to contact with chemicals

– After removal, store the air quality sensor -G238- away from chemicals such as solvents, fuels and certain chemical compounds to avoid direct contact.

Installing

Install in reverse order of removal, observing the following:

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode.

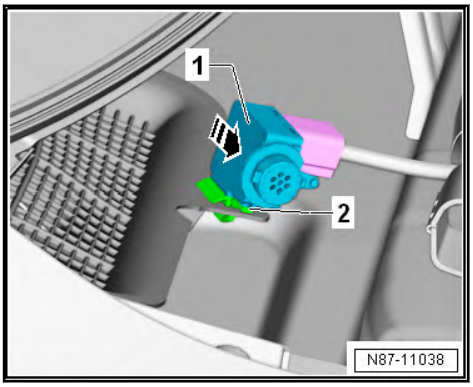
9.3.2 Removing and installing air quality sensor -G238-, right-hand drive vehicles

Note

- *The air quality sensor -G238- is installed on the air intake grille in the front left (from the driver's perspective) of the plenum chamber.*
- *The air quality sensor -G238- is a highly sensitive electronic component which could be destroyed by direct contact with solvents, fuels and certain chemical compounds.*
- *Do not install a sensor that has been kept, for example, in a tool box.*

Removing

– Remove cover for fresh air intake ⇒ page 217 .



– Release retaining tab -2- downwards.
– Pull air quality sensor -G238- -item 1- in direction of -arrow-.
– Release and disconnect electrical connector.

NOTICE

Risk of damage to component due to contact with chemicals

– After removal, store the air quality sensor -G238- away from chemicals such as solvents, fuels and certain chemical compounds to avoid direct contact.

Installing

Install in reverse order of removal, observing the following:

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

9.4 Principle of operation of air quality sensor -G238-

- The air quality sensor detects noxious substances in the ambient air (primarily petrol and/or diesel fumes).
- The heater and air conditioning system control unit -J979- evaluates the signal from the air quality sensor -G238-. The air conditioning system is actuated depending on the degree and manner of ambient air pollution.

- At an ambient temperature higher than approx. +2°C, air recirculation is actuated even when there is a minimal increase in noxious substances in the ambient air.
- At an ambient temperature between approx. +2°C and approx. -5°C, air recirculation is not actuated until there is a strong increase in noxious substances in the ambient air. The air conditioner compressor is also actuated at the same time.
- At an ambient temperature less than approx. -5°C, air recirculation is not actuated until there is a strong increase in noxious substances in the outside air, but only for approx. 15 seconds, and the air conditioning compressor is not actuated. When the concentration decreases, the air conditioning system is switched back to fresh air mode.
- The “automatic recirculation mode” can be switched off at any time. If the function is active, the air conditioner compressor will be switched on even at an ambient temperature below +2°C when “automatic recirculation mode” is required. However, even with this function, it is not possible to operate the air conditioning compressor at temperatures below -5°C.
- On vehicles with “automatic recirculation mode”, the air conditioner compressor can also be switched on at temperatures down to approx. –5 °C even if the air recirculation mode has been activated manually.
- So that the air conditioning system does not operate continually in air recirculation mode in areas with consistently high levels of pollutants, the "intelligent" sensor adapts its sensitivity to the prevailing environmental pollution.
- If the level of noxious substances in the ambient air remains relatively high over a long period of time, the intelligent sensor starts to adapt to the change in environmental conditions so that, generally, the demand for recirculated air lasts less than 12 minutes in areas where the ambient air exhibits a constant level of pollution. If a series of pollution peaks occur, the air conditioning system may operate over a longer period of time in air recirculation mode.
- A certain amount of time is required for repositioning of the air conditioning system flaps. To prevent noxious substances from entering the passenger compartment while the flaps are closing (e.g. when driving through a cloud of diesel smoke), a dust and pollen filter with an activated charcoal layer is installed. A saturated filter cannot perform this task and should be renewed.
- To prevent too frequent operation of the recirculation/fresh air flap, the flap is not actuated immediately if there is a minimal increase in noxious substances in the ambient air (the sensor does not send a request to the heater and air conditioning system control unit -J979-). The effect of the activated charcoal filter in the dust and pollen filter is adequate for this.
- To prevent the air recirculation/fresh air flap from switching too frequently, the sensor's request for “automatic recirculation” continues for at least 25 seconds (minimum duration) even if the air pollutants decrease to a level that no longer requires air recirculation.
- If the air conditioner compressor is switched off (CLIMA button is off), the maximum time assigned to the “automatic recirculation mode” is limited to approx. 15 seconds by the heater and air conditioning system control unit -J979-, so that condensation does not develop on the windows.
- To clear condensation from windows as quickly as possible, the heater and air conditioning system control unit -J979-

does not permit air recirculation when the “defrost function” is activated.

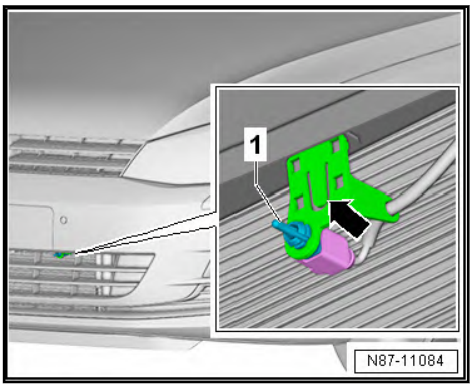
- The air quality sensor -G238- requires approx. 30 seconds to become operational once the ignition has been switched on (warm-up time). During this time, the sensor can send no request for “automatic recirculation mode” to the heater and air conditioning system control unit -J979-.
- The air quality sensor -G238- is a highly sensitive electronic component which direct contact with solvents, fuels and certain chemical compositions could damage beyond repair. For this reason, do not install sensors that may have come into contact with these substances.

9.5 Removing and installing ambient temperature sensor -G17-

Removing

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

– Unclip ambient temperature sensor -G17- -item 1- from bracket -arrow-.



– Remove ambient temperature sensor -G17- -item 1- upwards -arrow-.

– Release and disconnect electrical connector.

Installing

Install in reverse order of removal, observing the following:

Note

Ensure electrical wiring connector is properly seated to prevent ingress of water (spray water).

9.6 Removing and installing humidity sender for air conditioning system -G260-

The humidity sender for air conditioning system -G260- and the light and rain sensor -G397- form one component and are installed depending on vehicle equipment.

For removal and installation procedures, refer to ⇒ Electrical system; Rep. gr. 92; Windscreen wiper system; Removing and installing rain and light sensor -G397-.

9.7 Removing and installing left vent temperature sender -G150-

⇒ a9.7.1 nd installing left vent temperature senderG150, left-hand drive vehicles", page 248

⇒ a9.7.2 nd installing left vent temperature senderG150, right-hand drive vehicles", page 249

9.7.1 Removing and installing left vent temperature sender -G150-, left-hand drive vehicles

Special tools and workshop equipment required

♦ Vehicle diagnostic tester

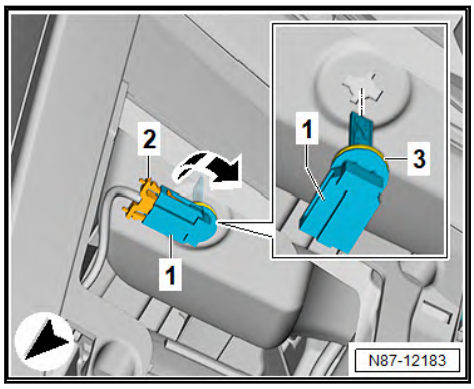
Removing

– Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing dash panel trim on driver side.

Note

The illustration shows a right-hand drive vehicle.

– Release and disconnect electrical connector -2-.



– Turn left vent temperature sender -G150- -item 1- in direction of -arrow-, and pull it out of mounting.

Installing

Install in reverse order of removal, observing the following:

– Renew seal -3- if damaged or defective.

Note

An incorrectly installed vent temperature sender will cause flow noise

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in "Guided Fault Finding" mode.

9.7.2 Removing and installing left vent temperature sender -G150-, right-hand drive vehicles

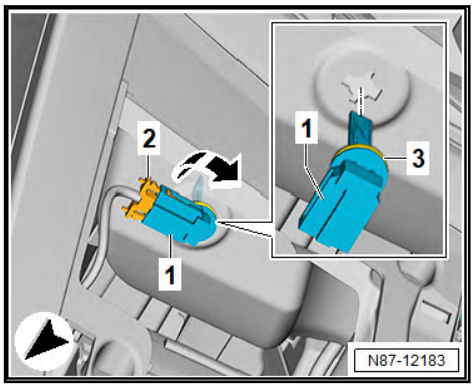
Special tools and workshop equipment required

- Vehicle diagnostic tester

Removing

– Move glove compartment lid to service position ⇒ General body repairs, interior; Rep. gr. 68; Compartments and covers; Glove compartment lid, service position.

– Release and disconnect electrical connector -2-.



– Turn left vent temperature sender -G150- -item 1- in direction of -arrow-, and pull it out of mounting.

Installing

Install in reverse order of removal, observing the following:

– Renew seal -3- if damaged or defective.

Note

An incorrectly installed vent temperature sender will cause flow noise

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

9.8 Removing and installing right vent temperature sender -G151-

⇒ a9.8.1 nd installing right vent temperature senderG151, left-hand drive vehicles”, page 249

⇒ a9.8.2 nd installing right vent temperature senderG151, right-hand drive vehicles”, page 250

9.8.1 Removing and installing right vent temperature sender -G151-, left-hand drive vehicles

Special tools and workshop equipment required

- Vehicle diagnostic tester

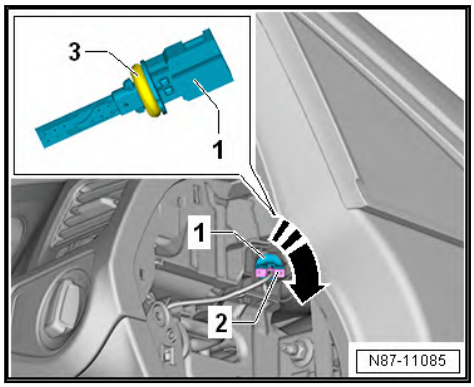
Removing

– Move glove compartment lid to service position ⇒ General body repairs, interior; Rep. gr. 68; Compartments and covers; Glove compartment lid, service position.

Note

The illustration shows a right-hand drive vehicle.

– Turn right vent temperature sender -G151- -item 1- in direction of -arrow-, and pull it out of mounting.



– Release and disconnect electrical connector -2-.

Installing

Install in reverse order of removal, observing the following:

– Renew seal -3- if damaged or defective.

Note

An incorrectly installed vent temperature sender will cause flow noise

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

9.8.2 Removing and installing right vent temperature sender -G151-, right-hand drive vehicles

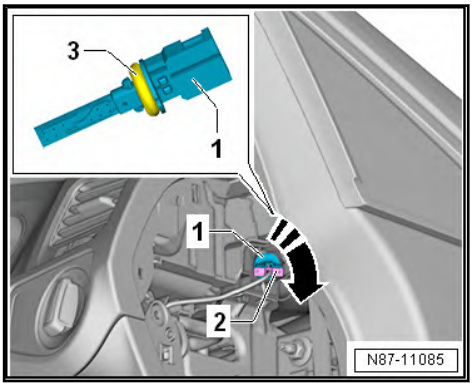
Special tools and workshop equipment required

♦ Vehicle diagnostic tester

Removing

– Remove dash panel trim on driver side ⇒ General body repairs, interior; Rep. gr. 68; Compartments/covers; Removing and installing dash panel trim on driver side.

– Turn right vent temperature sender -G151- -item 1- in direction of -arrow-, and pull it out of mounting.



– Release and disconnect electrical connector -2-.

Installing

Install in reverse order of removal, observing the following:

– Renew seal -3- if damaged or defective.

Note

An incorrectly installed vent temperature sender will cause flow noise

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

9.9 Removing and installing rear vent temperature sender -G174-

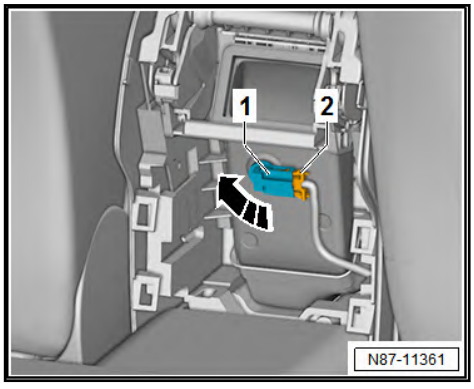
Special tools and workshop equipment required

♦ Vehicle diagnostic tester

Removing

– Remove rear centre console trim ⇒ General body repairs, interior; Rep. gr. 68; Centre console; Removing and installing rear centre console trim.

– Release and disconnect electrical connector -2-.



– Turn rear vent temperature sender -G174- -item 1- clockwise -arrow-, and pull it out of mounting.

Installing

Install in reverse order of removal, observing the following:

– Renew seal if damaged or defective.

Note

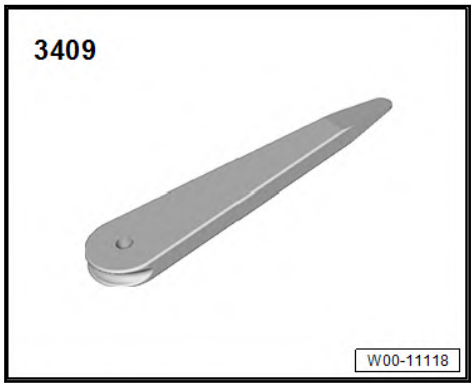
An incorrectly installed vent temperature sender will cause flow noise

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

9.10 Removing and installing footwell vent temperature sender -G192-

Special tools and workshop equipment required

♦ Removal wedge -3409-

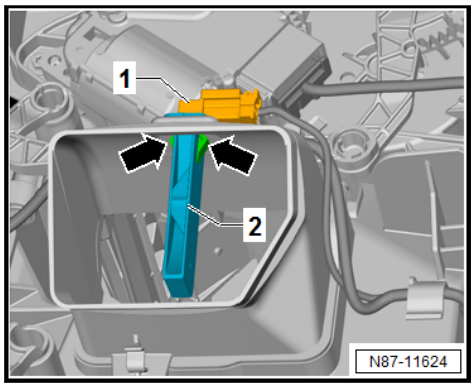


♦ Vehicle diagnostic tester

Removing

– Remove footwell vent on driver side ⇒ page 219 .

– Slightly raise footwell vent temperature sender -G192- -item 2-.



– Release retaining tabs -arrows- using removal wedge -3409-.

– Pull out footwell vent temperature sender -G192- -item 2- upwards.

– Release and disconnect electrical connector -1-.

Installing

Install in reverse order of removal, observing the following:

– Renew seal if damaged or defective.

Note

An incorrectly installed vent temperature sender will cause flow noise

9.11 Removing and installing vehicle interior temperature sensor -G1090-

Special tools and workshop equipment required

- Vehicle diagnostic tester

Removing

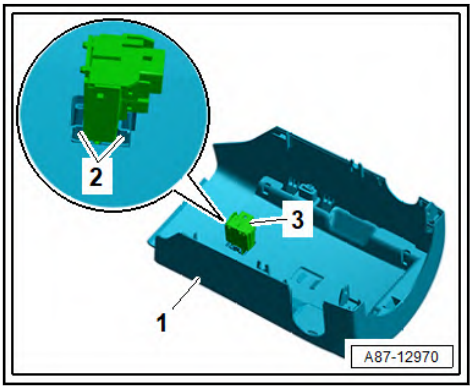
Note

The vehicle interior temperature sensor -G1090- is shown in the illustration without steering column trim.

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

– Release and disconnect electrical connector.

– Release fasteners -2-, and pull vehicle interior temperature sensor -G1090- -3- out of steering column trim -1-.



Installing

Install in reverse order of removal, observing the following:

– Read event memory and clear any entries displayed using ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.