Workshop Manual

Audi A4 2015 ➤ , Audi A4 Avant 2015 ➤ , Audi A4 China 2016 ➤ , Audi A4 allroad quattro 2016 ➤ , Audi A5 2016 ➤ , Audi Q5 2017 ➤ , Audi Q5 China 2019 ➤

Heating, air conditioning

Edition 06.2019

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List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

80 - Heating

87 - Air conditioning system

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

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00 – Technical data

1 Safety precautions

(ARL006467; Edition 06.2019)

⇒ “1.1 Safety precautions when working on air conditioners”, page 1

⇒ “1.2 Safety precautions when handling refrigerants”, page 1

⇒ “1.3 Safety precautions when working on vehicles with high-voltage system”, page 2

⇒ “1.4 Safety precautions when working in the vicinity of high-voltage components”, page 2

⇒ “1.5 Safety precautions when working on vehicles with start/stop system”, page 3

⇒ “1.6 Safety precautions when using testers and measuring instruments during a road test”, page 3

⇒ “1.7 Safety precautions when working on the cooling system”, page 4

⇒ “1.8 Safety precautions when working on vehicles with auxiliary/supplementary heater”, page 4

1.1 Safety precautions when working on air conditioners

Risk of explosion due to ignition sources - risk of death!

Danger to life and risk of explosion if ignition sources are close to air conditioners and refrigerant vessels. Escaping refrigerant may ignite and cause an explosion. Danger of severe or fatal injuries due to explosion.

– Always keep ignition sources away from air conditioners or refrigerant vessels.

– Avoid electrostatic discharge, sparks from the striking of tools and hot surfaces.

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1.2 Safety precautions when handling refrigerants

Risk of frostbite from refrigerant

Pressurised refrigerant can escape during work on the air conditioner. Risk of frostbite on skin and other parts of the body

– Put on protective gloves.

– Put on safety goggles.

– Extract/drain refrigerant and then immediately open up refrigerant circuit.

– Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.

Danger of asphyxiation and poisoning from refrigerant

Refrigerant vapour can cause dry coughs, nausea and even asphyxiation or poisoning.

– Never inhale refrigerant vapour.
– Always perform work on the refrigerant circuit and keep refrigerant vessels in well ventilated areas.
– Never work in cellars, near cellar entrances or in or near other underground areas.
– Switch on extraction systems.

1.3 Safety precautions when working on vehicles with high-voltage system

Electric and magnetic fields can cause fatal injury.

The high-voltage system generates electric and magnetic fields. Danger of severe or fatal injuries caused by malfunctioning of active implants (e.g. pacemakers, insulin pumps).

– Persons with active implants must not perform work on the high-voltage system.

Risk of injury - engine may start unexpectedly

It is difficult to determine whether the drive system of an electric vehicle or hybrid vehicle is active. Moving parts can trap or draw in parts of the body.

– Switch off ignition.
– Place ignition key outside vehicle.

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Risk of injury if auxiliary air conditioner is activated

On electric and hybrid vehicles, the auxiliary air conditioner can switch itself on if it has been activated. The radiator fans can start up automatically and trap or draw in parts of the body.

– Deactivate auxiliary air conditioner.

1.4 Safety precautions when working in the vicinity of high-voltage components

High voltage can cause fatal injury.

The voltage levels in the high-voltage system constitute a safety hazard. Danger of severe or fatal injuries from electric shock or electric arcs if high-voltage components or high-voltage wiring are damaged.

– Carry out a visual check of high-voltage components and high-voltage wiring.

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– Never use cutting/forming tools or other sharp-edged implements in the vicinity of high-voltage components and high-voltage wires.
– Never perform work using welding, brazing, thermal bonding or hot air in the vicinity of high-voltage components or high-voltage wires.

Risk of damage to high-voltage wiring

Incorrect handling may result in damage to the insulation of high-voltage wires or high-voltage connectors.

– Never use high-voltage wiring or high-voltage connectors as a support.
– Never prop tools against high-voltage wiring or high-voltage connectors.
– High-voltage cables must not be excessively bent or kinked.
– Pay attention to coding when connecting high-voltage connections.

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

Risk of injury - engine may start unexpectedly

The engine can start unexpectedly if the vehicle's start/stop system is activated. A message in the instrument cluster indicates whether the start/stop system is activated.

– To deactivate the start/stop system, switch off the ignition.

1.6 Safety precautions when using testers and measuring instruments during a road test

Risk of injury if test equipment is not secured

If an accident occurs and the front passenger's airbag is triggered, test equipment which is not secured adequately may be catapulted through the vehicle with potentially serious consequences.

– Secure test equipment on the rear seat with a strap.

Or:

– Have a second mechanic operate test equipment on the rear seat.

1.7 Safety precautions when working on the cooling system

Risk of scalding as hot coolant can escape

The cooling system is under pressure when the power unit is hot.
Risk of scalding due to hot steam and hot coolant.

– Put on protective gloves.

– Put on safety goggles.

– Cover filler cap on expansion tank with a cloth and open carefully to release pressure.

1.8 Safety precautions when working on vehicles with auxiliary/supplementary heater

Danger of accident and injury if the timer for the auxiliary/supplementary heater is activated

If the timer for the auxiliary/supplementary heater is activated, the auxiliary/supplementary heater may switch itself on. This may result in poisoning from exhaust gases and burn injuries from hot auxiliary/supplementary heater components; there is a risk of fire and explosion due to high temperatures.

– Deactivate timer for auxiliary/supplementary heater.

Risk of fire and explosion from auxiliary/supplementary heater

In areas where there is a danger of fire and explosion, a fire or explosion may be caused by a spark or high temperatures in the auxiliary/supplementary heater. Risk of burn injuries.

– Switch off auxiliary/supplementary heater in areas where there is a danger of fire/explosion.

Danger from toxic exhaust gases

The auxiliary/supplementary heater produces toxic exhaust gases during operation. There is a risk of poisoning and of damage to the respiratory tract.

– In enclosed spaces, only switch on the auxiliary/supplementary heater if there is an exhaust extraction system.

– In enclosed spaces without an exhaust extraction system, switch off the auxiliary/supplementary heater.

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2 Identification

⇒ “2.1 Identification of heater and air conditioning unit”, page 5

2.1 Identification of heater and air conditioning unit

⇒ “2.1.1 Identification of Mahle heater and air conditioning unit (version 1)”, page 5

⇒ “2.1.2 Identification of Mahle heater and air conditioning unit (version 2)”, page 5

2.1.1 Identification of Mahle heater and air conditioning unit (version 1)

At the start of production, this vehicle was only fitted with version 1 “Mahle” heaters and air conditioning units. At a later date, this vehicle may also be fitted with different heater and air conditioning unit versions from the same or another manufacturer (e.g. “Mahle”, version 2; introduction not yet finalised).

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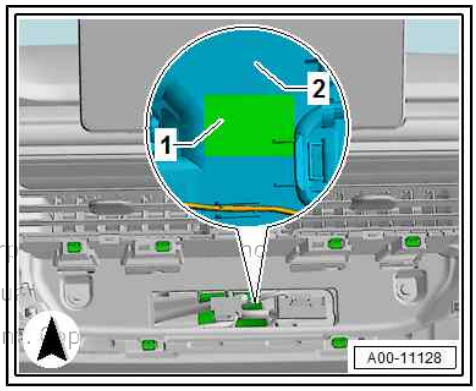
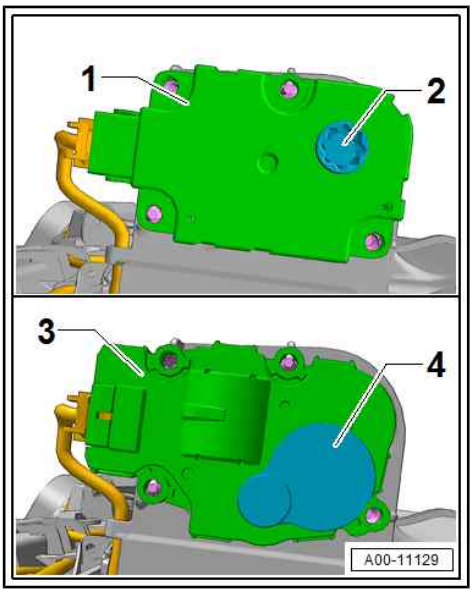


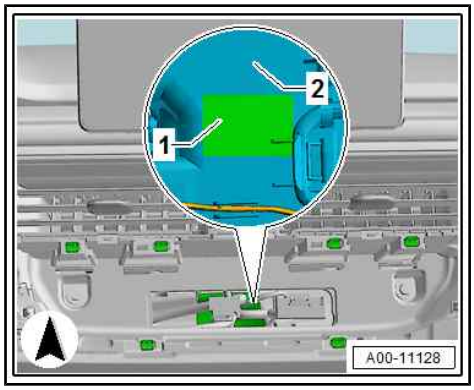
- The manufacturer's sticker -1- is visible through an opening in the dash panel at the heater and air conditioning unit -2- after the operating and display unit for front air conditioning system - E87- has been removed
  ⇒ “9.2.1 Removing and installing operating and display unit for front air conditioning system E87 - Audi A4, Audi A5”, page 314 .
- Control motors -1- with open shaft -2- at heater and air conditioning unit



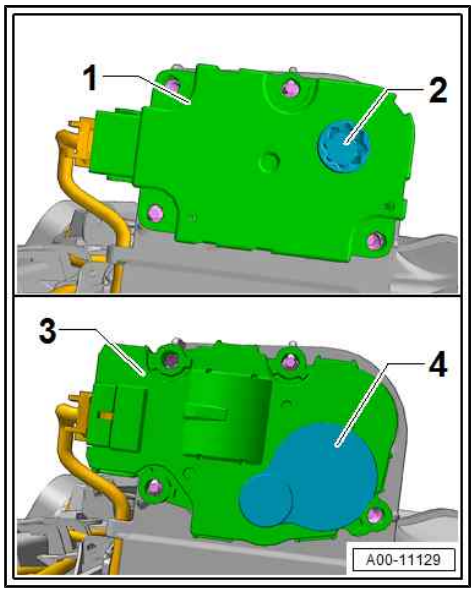
2.1.2 Identification of Mahle heater and air conditioning unit (version 2)

At the start of production, this vehicle was only fitted with version 1 “Mahle” heaters and air conditioning units. At a later date, this vehicle may also be fitted with different heater and air conditioning

unit versions from the same or another manufacturer (e.g. “Mahle”, version 2; introduction not yet finalised).



- The manufacturer's sticker -1- is visible through an opening in the dash panel at the heater and air conditioning unit -2- after the operating and display unit for front air conditioning system - E87- has been removed
  ⇒ “9.2.1 Removing and installing operating and display unit for front air conditioning system E87 - Audi A4, Audi A5”, page 314 .
- Control motors -3- with closed shaft -4- at heater and air conditioning unit



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3 General notes

⇒ “3.1 Type plates”, page 7

⇒ “3.2 Notes on odours in vehicles without air conditioner”, page 8

⇒ “3.3 Notes on odours in vehicles with air conditioner”, page 9

3.1 Type plates

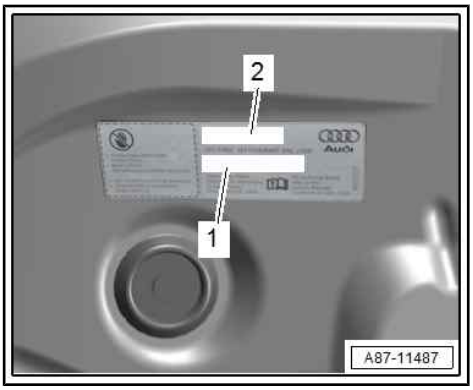
The type plate indicating the type of refrigerant and refrigerant capacity is located on the bonnet.

- The label indicates the type of refrigerant used and the quantity of refrigerant and refrigerant oil with which the system was charged during production.
- Refrigerant and refrigerant oil capacities ⇒ “5 Technical data”, page 18 .
- Symbols on the label indicate the hazards which may be encountered when handling the refrigerant or working on the refrigerant circuit.
- Standards and regulations may also be listed, such as certain SAE standards applicable in the USA.
- Depending on the version and production period, the GWP (global warming potential) value may be included for the refrigerant used.

Version 1

1 - Refrigerant designation, e.g. R134a or R1234yf (depending on production date and version)

2 - Refrigerant capacity

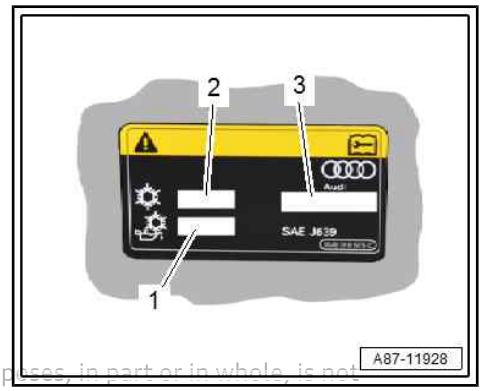


Version 2

1 - Refrigerant oil designation

2 - Refrigerant designation

3 - Refrigerant capacity



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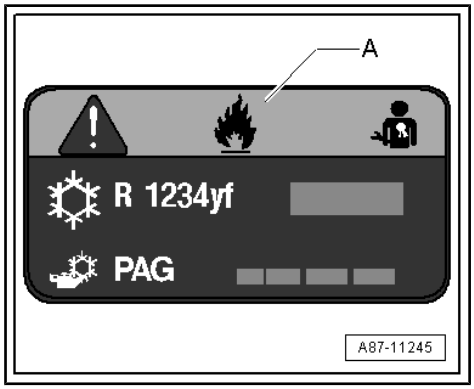
Version 3

- Explanation of information on label -A- ⇒ page 7 .



3.2 Notes on odours in vehicles without air conditioner

Odours emanating from the heater can have various causes; not all these odours originate in the heater.

Type of odour	Possible cause and remedy
Smell of burnt oil	♦ Usually originates in engine compartment due to leak(s) in engine or gearbox – Eliminate leak(s) in engine or gearbox.
Sulphurous smell of exhaust gas	♦ Leak(s) in exhaust system ♦ Exhaust gas entering passenger compartment (e.g. when reversing through a cloud of exhaust fumes) – Eliminate leak(s) in exhaust system.
Fishy smell of coolant	♦ Leak(s) in engine cooling system or heat exchanger for heater – If fishy odour occurs in both fresh air and air recirculation mode, check heat exchanger for leaks.
Scorched clutch smell	♦ Clutch linings worn or clutch operated incorrectly – Check clutch.
Other odours	♦ Floor mats, retrofitted protective seat covers etc. – Check and renew or clean floor mats or protective covers.
Mouldy smell from front end of vehicle	♦ Water can enter fresh air intake via drip rail if plenum chamber cover is damaged or not installed properly. – Check fresh air intake of heater unit ⇒ page 300 . ♦ Deposits (leaves, pine needles etc.) may have accumulated in plenum chamber. – Check plenum chamber for deposits ⇒ “7.9 Checking plenum chamber water drain”, page 303 . ♦ Water may not be able to drain out of plenum chamber. – Check water drains ⇒ “7.9 Checking plenum chamber water drain”, page 303 .

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Type of odour	Possible cause and remedy
Odour from heater	♦ Odours originating in the heater are usually perceptible in both fresh air mode and air recirculation mode. If an odour problem occurs only in fresh air mode or only in air recirculation mode, the heater is usually not the cause of the problem. ♦ If a heat exchanger is leaking, the odour of the escaping coolant will be perceptible in both fresh air and air recirculation mode. However, the odour may be less noticeable in the "cold" setting of the heater control unit - J65- than in heating mode. Reason: Not all the air flows through the heat exchanger constantly; however, there is a constant flow of coolant through the heat exchanger. ♦ Old or severely contaminated dust and pollen filter – Check dust and pollen filter ⇒ page 264 . ♦ Deposits on evaporator fins – Clean evaporator ⇒ page 249 .

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- The evaporator is not used on vehicles without air conditioner. However, under certain ambient conditions, deposits on the evaporator fins can nevertheless contribute to odour formation.

3.3 Notes on odours in vehicles with air conditioner

Odours coming from the air conditioner can have various causes. Only some of these odours originate in the evaporator of the heater and air conditioning unit and can therefore be eliminated by cleaning the evaporator.

Type of odour	Possible cause and remedy
Smell of burnt oil	♦ Usually originates in engine compartment due to leak(s) in engine or gearbox – Eliminate leak(s) in engine or gearbox.
Sulphurous smell of exhaust gas	♦ Leak(s) in exhaust system ♦ Exhaust gas entering passenger compartment (e.g. when reversing through a cloud of exhaust fumes) – Eliminate leak(s) in exhaust system.
Fishy smell of coolant	♦ Leak(s) in engine cooling system or air conditioner heat exchanger – If fishy odour occurs in both fresh air and air recirculation mode, check heat exchanger of front or rear heater and air conditioning unit for leaks.
Scorched clutch smell	♦ Clutch linings worn or clutch operated incorrectly – Check clutch.
Other odours	♦ Floor mats, retrofitted protective seat covers etc. – Check and renew or clean floor mats or protective covers. ♦ Dirt or moisture in passenger footwell or under front seats – Check passenger footwell for moisture; dry and clean footwell.

Type of odour	Possible cause and remedy
Mouldy smell from front end of vehicle	♦ Water can enter fresh air intake via drip rail if plenum chamber cover is damaged or not installed properly. – Check fresh air intake of heater and air conditioning unit ⇒ page 300 . ♦ Deposits (leaves, pine needles etc.) may have accumulated in plenum chamber. – Check plenum chamber for deposits ⇒ “7.9 Checking plenum chamber water drain”, page 303 . ♦ Water may not be able to drain out of plenum chamber. – Check water drains ⇒ “7.9 Checking plenum chamber water drain”, page 303 .
Odour from heater and air conditioning unit	♦ Too much condensation in heater and air conditioning unit – Check condensation drain of heater and air conditioning unit ⇒ page 276 . ♦ Old or severely contaminated dust and pollen filter – Check dust and pollen filter ⇒ page 264 . ♦ Deposits on evaporator fins – Clean evaporator ⇒ page 249 .

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4 Repair instructions

⇒ “4.1 Rules for cleanliness”, page 11

⇒ “4.2 General notes”, page 11

⇒ “4.3 General repair instructions”, page 12

⇒ “4.4 Contact corrosion”, page 12

⇒ “4.5 Routing and attaching lines and wiring”, page 12

⇒ “4.6 Installing radiators and condensers”, page 13

⇒ “4.7 Checking heating output”, page 13

⇒ “4.8 Checking cooling output”, page 13

⇒ “4.9 Checking air conditioning system functions - vehicles with high-voltage system”, page 14

⇒ “4.10 Working on refrigerant circuit”, page 14

⇒ “4.11 Paintwork repairs on vehicles with air conditioning system”, page 15

⇒ “4.12 Refrigerant circuit seals”, page 16

⇒ “4.13 Notes on high-voltage components and potential equalisation lines”, page 16

⇒ “4.14 Use of impact wrenches”, page 16

⇒ “4.15 Identification plates”, page 17

4.1 Rules for cleanliness

Even small quantities of dirt can lead to defects. Therefore it is important to observe the following rules for cleanliness when working on the air conditioner:

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- Immediately seal off open lines and connections with clean plugs, e.g. from engine bung set - VAS 6122- .
- Place removed parts on a clean surface and cover them. Use only lint-free cloths.
- Carefully cover or seal open components if repairs cannot be carried out immediately.
- Only install clean components; replacement parts should only be unpacked immediately prior to installation. Do not use parts that have been stored without their packaging (e.g. in toolboxes).
- Do not work with compressed air when the system is open.
- Protect unplugged electrical connectors against dirt and moisture and make sure connections are dry when attaching.

4.2 General notes

- For the applicable current flow diagrams, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- A label in the engine compartment indicates the capacity and the refrigerant used ⇒ page 7 .
- For further information on performing repair work on vehicles with air conditioning systems and on handling refrigerant, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Repair instructions; Refrigerant and refrigerant oil .

4.3 General repair instructions

Servicing work must not be performed on any components of the heater and air conditioning unit. Always use genuine parts when renewing faulty components.

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

The air conditioner refrigerant circuit may only be discharged and opened:

- If this is required by the safety precautions (⇒ "1.2 Safety precautions when handling refrigerants", page 1).
- If this is necessary for the removal of other components.
- If components of the air conditioner refrigerant circuit have to be removed or renewed.

The air conditioner refrigerant circuit must remain closed during all other normal vehicle repair steps.

If it is necessary for certain repair measures of the heater and air conditioner to discharge and open the air conditioner refrigerant circuit, the steps involved are described in the corresponding work procedure. Specific tools are required for discharging the refrigerant circuit; such work may only be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

4.4 Contact corrosion

Contact corrosion can occur if unsuitable connecting elements (bolts, nuts, washers), rivets, plugs, grommets, adhesives, etc. are used.

For this reason, the manufacturer only fits connecting elements with a special coating. In addition, rubber components, plastic components and adhesives are made of non-conductive materials. These tested, aluminium-compatible components are also available as replacement parts ⇒ Electronic parts catalogue .

Please note:

- If you have any doubts about whether certain parts can be reused, always use new components.
- We recommend the use of genuine replacement parts only as these have been checked and are compatible with aluminium ⇒ Electronic parts catalogue .
- We recommend using Audi Accessories ⇒ Electronic parts catalogue .
- Damage caused by contact corrosion is not covered by the warranty.

4.5 Routing and attaching lines and wiring

- To prevent mix-ups and to ensure that all components are reinstalled in their original installation positions, mark components such as fuel lines, hydraulic lines, vacuum lines, lines for activated charcoal filter system or electrical wiring before removing them. Make sketches or take photographs if necessary.
- To avoid damaging lines and wiring, ensure sufficient clearance from all moving or hot components in engine compartment (limited space in engine compartment).

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- After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

4.6 Installing radiators and condensers

- Even if fitted correctly, there may be slight pressure marks on the radiator and condenser fins. This does not mean that the components are damaged. If the fins are only very slightly distorted, this does not justify renewal of the radiator or the condenser.
- If the condenser and radiator are no longer parallel as a result of slight deformation at the securing lugs on the sides of the condenser (e.g. following an accident), this can be corrected by bending the lugs back into position, provided that the condenser is still functioning properly and that there is no leakage. If the lugs are slightly deformed, the condenser does not have to be renewed.
- Slight bending of the condenser (up to 4 mm) is not a problem as long as there is enough of a gap (at least 4 mm) between the condenser and the radiator, the condenser is still functioning properly and there is no leakage. If there are slight deformations, the condenser does not have to be renewed.

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4.7 Checking heating output

The heating output test is performed using a test routine in the ⇒ Vehicle diagnostic tester; for this test, proceed as follows:

Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

- Body
- Heating, ventilation, air conditioning system
- Self-diagnosis compatible systems
- 08 - AC/heater electronics - E87
- 08 - AC/heating electronics, functions
- 08 - Other functions
- ⇒ Vehicle heating not functioning

4.8 Checking cooling output

The cooling output test is performed using a test routine in the ⇒ Vehicle diagnostic tester; for this test, proceed as follows:

Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

- Body
- Heating, ventilation, air conditioning system

- Self-diagnosis compatible systems
- 08 - AC/heater electronics - E87
- 08 - AC/heating electronics, functions
- 08 - Other functions
- ⇒ Vehicle cooling not functioning

4.9 Checking air conditioning system functions - vehicles with high-voltage system

On vehicles with high-voltage system, a check of the system functions can be performed in the thermal management control unit - J1024- ⇒ Vehicle diagnostic tester.

Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

- General body repairs
- Self-diagnosis compatible systems
- 00C5 - Thermal management control unit J1024
- 00C5 - Thermal management control unit J1024, functions
- 00C5 - Basic setting

4.10 Working on refrigerant circuit

Always perform work on the refrigerant circuit in well ventilated areas. Make sure that there are no inspection pits, shafts or cellar entrances within a radius of 5 metres. Switch on extraction systems. Take note of the information in the Workshop Manual for the specific refrigerant type ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems and ⇒ Air conditioners with R1234yf - General information; Rep. gr. 00 ; Repair notes .

Reason:

The refrigerant emerging is not only colourless and odourless, but also heavier than air and thus displaces oxygen. Should refrigerant gas escape even though the safety precautions have been observed, this can result in an imperceptible danger of asphyxiation in poorly ventilated areas and inspection pits.

Welding, brazing and soldering work must not be performed on components of air conditioning system when charged. This also applies to welding and soldering work on the vehicle if there is a danger of air conditioner components becoming hot.

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Reason:

Exposure to heat generates considerable pressure in the system, which could cause it to burst.

Remedy:

Discharge refrigerant circuit.

When servicing the air conditioner, re-seal all open components and pipe connections immediately.

Reason:

Moisture will enter air conditioner components if they are left open for more than a certain amount of time. For this reason, air conditioners which have been left open for a long period cannot be re-charged without renewing parts of the system.

- For information on working on air-conditioned vehicles with the air conditioner service station , refer to ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station , or ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit .

Vehicles with high-voltage system

In order to discharge, evacuate and fill the refrigerant circuit on vehicles with high-voltage system, the electrically actuated valves installed in the refrigerant circuit must be open. The valves must be activated and opened via a routine stored in the thermal management control unit - J1024- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

Reason:

Various electrically operated valves and non-return valves are installed in the refrigerant circuit. These electrically operated valves are closed or open, depending on the air conditioner's most recent operating state (cooling the passenger compartment, cooling the high-voltage system components, or heat pump mode). If more than one electrically operated valve is closed, the refrigerant circuit may no longer be able to be fully discharged, evacuated or charged
⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 45 and ⇒ Vehicle diagnostic tester.

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Risk of irreparable damage to refrigerant lines

Risk of irreparable damage to refrigerant lines if the inside film is torn.

– Never bend refrigerant lines which have a radius smaller than r = 100 mm.

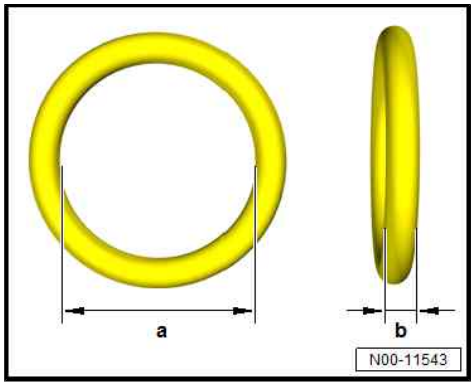
4.11 Paintwork repairs on vehicles with air conditioning system

When performing paintwork repairs, object temperatures of 80 ° C must not be exceeded in drying booths or their preheating zones.

Reason:

Exposure to heat generates considerable pressure in the system, which could cause it to burst.

4.12 Refrigerant circuit seals



- O-rings can only be used once and must then be renewed.
- Lubricate O-rings lightly with refrigerant oil before fitting.
- Make sure O-rings are positioned correctly on pipe or in groove.
- Check connections at components and refrigerant lines for damage (even slight scratches can cause leaks).
- Ensure absolute cleanliness when working (even the slightest contamination, e.g. a single hair, could cause leakage).
- Only install O-rings which are resistant to refrigerant R134a and/or R1234yf and the corresponding refrigerant oils ⇒ Electronic parts catalogue .

Dimensions -a- and -b- differ depending on where the O-ring is fitted ⇒ Electronic parts catalogue .

4.13 Notes on high-voltage components and potential equalisation lines

A potential equalisation measurement must be performed on the high-voltage components affected after installation of high-voltage components or potential equalisation lines.

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– Connect vehicle diagnostic tester .
– Select and start `ODIS-Service` mode.
– Select `Special functions` tab.
– Select the following:

- `High-voltage`
- `Potential equalisation measurement on high-voltage components`
- `8C - Potential equalisation measurement hybrid battery unit AX1`

4.14 Use of impact wrenches

In general, it is permitted to use an impact wrench to unscrew bolts and nuts. An exception to this is when work is performed inside an open high-voltage battery. For this work, it is not permitted to use an impact wrench.

An impact wrench may be used to screw in bolts and nuts when performing repair work if the following requirements are observed. In general, electric and compressed-air impact wrenches should be used.

Requirements:

- Only screw in bolts with locking fluid or self-locking nuts at low speed.
- Use a suitable impact wrench with variable speed and adjustable torque range.
- Use suitable bits when working in the vicinity of sensitive surfaces, e.g. plastic-coated bits for aluminium rims.

- When working in the vicinity of natural gas systems, observe the information in the Workshop Manual “Natural gas engines - General information”.

Use:

- Fit bolts/nuts by hand.
- Only use an impact wrench to screw in bolts/nuts until the head of the bolt/nut makes contact and then continue tightening with a torque wrench.
- Clean threaded pins before unscrewing the bolt/nut.

4.15 Identification plates

When renewing vehicle components, the identification plates on the old parts that have a replacement part number (see ⇒ Electronic parts catalogue) must be attached to the new parts due to approval regulations.

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5 Technical data

⇒ “5.1 Refrigerant capacities”, page 18

⇒ “5.2 Approved refrigerant oils and refrigerant oil capacities”, page 18

⇒ “5.3 Oil distribution”, page 21

5.1 Refrigerant capacities

⇒ “5.1.1 Capacities for refrigerant R134a”, page 18

⇒ “5.1.2 Capacities for refrigerant R1234yf”, page 18

5.1.1 Capacities for refrigerant R134a

For refrigerant R134a and refrigerant oil capacities, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .

5.1.2 Capacities for refrigerant R1234yf

- Unless otherwise stated, the capacities specified for refrigerant R1234yf also apply to the S and RS versions of this vehicle model.

Capacity for refrigerant R1234yf

Vehicle model	Production period	Capacity in grams	Differing characteristics of this refrigerant circuit
Audi A4 Audi A5 Audi Q5	From 06.16 onwards	525^{+} / - 15	• None
Audi Q5 TFSI e	From 04.19 onwards	610^{+} / - 15	• Electrical air conditioner compressor

5.2 Approved refrigerant oils and refrigerant oil capacities

⇒ “5.2.1 Approved refrigerant oils for refrigerant R134a”, page 18

⇒ “5.2.2 Refrigerant oil capacities for refrigerant R134a”, page 19

⇒ “5.2.3 Approved refrigerant oils for refrigerant R1234yf”, page 19

⇒ “5.2.4 Refrigerant oil capacities for refrigerant R1234yf”, page 21

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5.2.1 Approved refrigerant oils for refrigerant R134a

The special refrigerant oil to be used exclusively for refrigerant circuits with refrigerant R134a is not available on the refrigerant oil market ⇒ Electronic parts catalogue .

- The refrigerant circuit must only be charged with approved refrigerant oils ⇒ Electronic parts catalogue . The correct refrigerant oil depends on the make and type of the air conditioner compressor fitted.
- Too much refrigerant oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the system.

- Too little refrigerant oil in the refrigerant circuit may result in failure of the air conditioner compressor due to lubrication problems.
- Refrigerant oil absorbs moisture. Never use refrigerant oil from containers which have been open for a lengthy period ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems .

Important information:

As refrigerant oil is extremely hygroscopic, open containers must be closed and re-sealed immediately after use to prevent moisture from entering.

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- A use-by date for the refrigerant oil is stated on the bottle in which the refrigerant oil is supplied.
- This date is not relevant if the bottle is sealed air-tight.
- If the bottle is sealed air-tight, the refrigerant oil can also be used after the date stated on the bottle.

5.2.2 Refrigerant oil capacities for refrigerant R134a

For refrigerant R134a and refrigerant oil capacities, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .

5.2.3 Approved refrigerant oils for refrigerant R1234yf

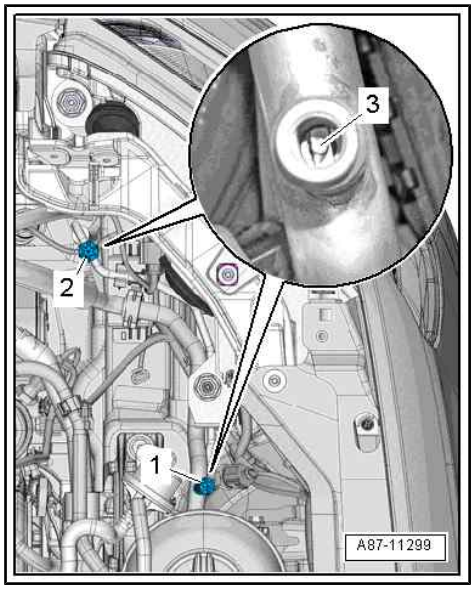
- The refrigerant circuit must only be charged with approved refrigerant oils ⇒ Electronic parts catalogue . The correct refrigerant oil depends on the make and type of the air conditioner compressor fitted.
- Too much refrigerant oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the system.
- Too little refrigerant oil in the refrigerant circuit may result in failure of the air conditioner compressor due to lubrication problems.
- Refrigerant oil absorbs moisture. Never use refrigerant oil from containers which have been open for a long period of time ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Repair instructions; Refrigerant and refrigerant oil .

Important information:

As refrigerant oil is extremely hygroscopic, open containers must be closed and re-sealed immediately after use to prevent moisture from entering.

- A use-by date for the refrigerant oil is stated on the bottle in which the refrigerant oil is supplied.
- This date is not relevant if the bottle is sealed air-tight.
- If the bottle is sealed air-tight, the refrigerant oil can also be used after the date stated on the bottle.

- The refrigerant oils used with refrigerant R134a are not appropriate for use with refrigerant R1234yf ⇒ Electronic parts catalogue .
- The special refrigerant oil to be used exclusively for refrigerant circuits with refrigerant R1234yf is not always available on the refrigerant oil market ⇒ Electronic parts catalogue .
- Refrigerant oils intended specifically for a particular air conditioner compressor can therefore be obtained from the replacement parts range ⇒ Electronic parts catalogue .
- If a defective air conditioner compressor is replaced by a compressor from a different manufacturer, it is important to check whether the refrigerant oil already in the refrigerant circuit (from the removed compressor) is also approved for the new compressor. If a different refrigerant oil is approved for the new air conditioner compressor than for the removed compressor, the refrigerant circuit must be cleaned (flushed) ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .
- Using other refrigerant oils may cause the system to fail, as it cannot be guaranteed that they will mix and circulate with refrigerant R1234yf to lubricate the air conditioner compressor.
- The refrigerant oil (part no. G 055 535 M2, external designation ND 12) for use in refrigerant circuits with “Denso” air conditioner compressors is the same for mechanical and electric air conditioner compressors ⇒ Electronic parts catalogue .
- For refrigerant circuits with mechanically or electrically driven “Sanden”, “Delphi/Mahle” or “Visteon” air conditioner compressors, use refrigerant oil with part no. G 052 535 M2 (external designation SP A2) ⇒ Electronic parts catalogue .
- To ensure that air conditioner service stations do not always need to be cleaned before starting work on a different type of vehicle (due to the different refrigerant oils used depending on the manufacturer of the air conditioner compressor), specified small quantities (up to max. 10 %) of the total quantity of refrigerant oil in the corresponding refrigerant circuit are permitted to meet a different specification from that of the air conditioner compressor installed. On Audi vehicles, this means that it is permitted to use max. 10 % refrigerant oil of the type SP A2 on vehicles with a “Denso” air conditioner compressor (with ND 12 refrigerant oil) or max. 10 % refrigerant oil of the type ND 12 on vehicles with a “Sanden”, “Delphi/Mahle” or “Visteon” air conditioner compressor (with SP A2 refrigerant oil). However, other refrigerant oils not listed here must not be used (different properties due to different viscosity, different/missing additives etc.).
- Instead of using an air conditioner service station, refrigerant oil extracted when emptying the refrigerant circuit can be added via an open connection or, when valve -3- is removed, via a service connection -1- or -2- using a commercially available disposable syringe before evacuating the refrigerant circuit ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station . This may be practical e.g. if the refrigerant oil specified for the refrigerant circuit is normally only rarely used. Always use fresh refrigerant oil ⇒ Electronic parts catalogue . Service connection -1- or -2- may be in a different location in the vehicle
⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 32 .



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5.2.4 Refrigerant oil capacities for refrigerant R1234yf

- The compressor version may differ depending on the production period and engine ⇒ Electronic parts catalogue .
- There may be different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor ⇒ Electronic parts catalogue .
- Depending on the manufacturer of the air conditioner compressor, different refrigerant oils must be used ⇒ Electronic parts catalogue .
- ⇒ “5.2.3 Approved refrigerant oils for refrigerant R1234yf”, page 19

Vehicle model	Production period	Total quantity of oil in refrigerant circuit in cm^3	Quantity of refrigerant oil in replacement compressor in cm^3	Differing characteristics of this refrigerant circuit
Audi A4 Audi A5 Audi Q5	From 06.16 onwards	110 +/- 10	110 +/- 10	• “Denso” air conditioner compressor
		100+ / - 10	100+ / - 10	“Sanden” air conditioner compressor
Audi Q5 TFSI e	From 04.19 onwards	160+ / - 10	160+ / - 10	• Electrically driven air conditioner compressor manufactured by “Sanden” (refrigerant oil SP-A2 ⇒ “5.2.3 Approved refrigerant oils for refrigerant R1234yf”, page 19) • Ensure correct refrigerant oil ⇒ Electronic parts catalogue

- The replacement compressor (mechanically driven) contains a certain amount of refrigerant oil (depending on the air conditioner compressor). This quantity of refrigerant oil corresponds to the quantity of oil specified for this refrigerant circuit on vehicles with one evaporator. If the air conditioner compressor is renewed without having to clean the refrigerant circuit, the quantity of refrigerant oil in the new compressor to be fitted should be adjusted in line with the quantity of oil poured out of the old compressor ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .
- The air conditioner compressor may have been fitted at the factory with a type plate indicating the part number and the quantity of refrigerant oil in the air conditioner compressor.

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5.3 Oil distribution

- During operation of the air conditioner, the refrigerant oil that was in the air conditioner compressor before it was activated for the first time is distributed throughout the refrigerant circuit.
- The extent to which the refrigerant oil is distributed throughout the refrigerant circuit differs depending on the last air conditioner operating status before it was switched off, the ambient temperatures etc. Therefore it is not possible to give generally applicable information on the distribution of the refrigerant oil in the refrigerant circuit. It is important, therefore, to observe the notes on renewing components of the refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit .

- Alternatively, refer to ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

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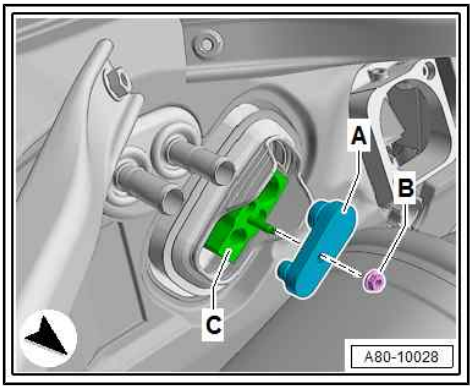
80 – Heating

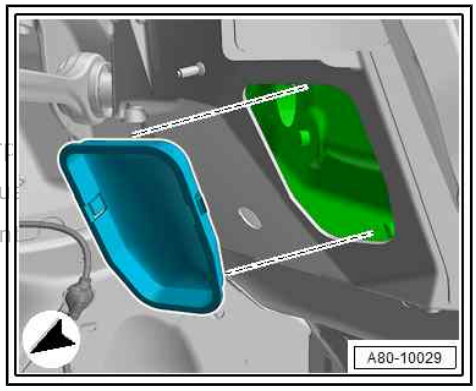
1 Overview of fitting locations - heater

⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 23

⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 24

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





- On vehicles with no air conditioner (heater only), the layout, operation and removal and installation procedures for the components required for operation of the heater (e.g. coolant circulation pump - V50- , coolant shut-off valve - N82- , ambient temperature sensor - G17-) are the same as on vehicles with a “Low” air conditioner.
- Components only required for the air conditioner (e.g. air conditioner compressor, condenser, high-pressure sender - G65- , refrigeration lines etc.) are however not fitted on a vehicle with no air conditioner.
- On vehicles with no air conditioner, the expansion valve -C- is only fitted for sealing the opening in the grommet to the passenger compartment.
- On vehicles with no air conditioner, the connections at the expansion valve (for the air conditioner refrigerant lines) are sealed with a cap -A- (tightening torque of nut -B- 8 Nm) ⇒ Electronic parts catalogue .
- On vehicles without air conditioner, the leadthrough for the air conditioner refrigerant lines (from area beneath left wing into plenum chamber) is sealed with a cap -A- ⇒ Electronic parts catalogue .

⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 32

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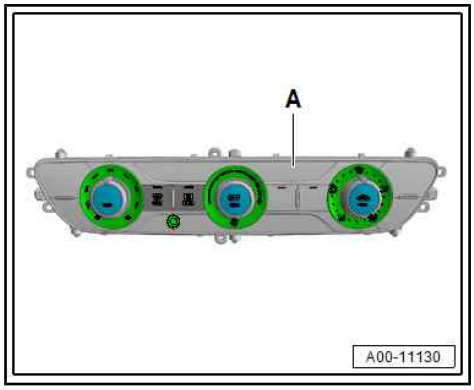
1.2 Overview of fitting locations - components in passenger compartment (front)



- On vehicles with no air conditioner (heater only), the layout, operation and removal and installation procedures for the components required for operation of the heater (e.g. heat exchanger, heater, control motors, temperature sensors) are the same as on vehicles with a “Low” air conditioner.
- On a vehicle with no air conditioner, the heater is the same as the heater and air conditioning unit on vehicles with a “Low” air conditioner. The evaporator installed in the heater has no function. It serves only as a spacer element and to reduce noise ⇒ Electronic parts catalogue .
- The heater operating and display unit -A- -E87- largely corresponds to the front air conditioner operating and display unit -E87- for vehicles with a “Low” air conditioner (same removal and installation procedures for example). Certain functions and actuators associated with an air conditioner are however not provided (e.g. no A/C and A/C MAX buttons and no printed temperature setting scale)
⇒ “4 Operating and display unit”, page 29 and ⇒ Electronic parts catalogue .
- In the Workshop Manual, Guided Fault Finding and current flow diagrams, the heater operating and display unit -A- has the same designation as the air conditioner component operating and display unit for front air conditioning system - E87-
⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and
⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 37

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2 Heater

⇒ “2.1 Exploded view - heater unit”, page 25

⇒ “2.2 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 26

⇒ “2.3 Removing and installing auxiliary air heater element Z35 ”, page 26

⇒ “2.4 Removing and installing temperature flap control motor V68 ”, page 26

⇒ “2.5 Removing and installing air recirculation flap control motor V113 ”, page 26

⇒ “2.6 Removing and installing air distribution flap control motor V428 ”, page 26

⇒ “2.7 Removing and installing dust and pollen filter”, page 26

⇒ “2.8 Removing and installing heat exchanger”, page 26

⇒ “2.9 Removing and installing heater unit”, page 26

⇒ “2.10 Dismantling and assembling heater unit”, page 27

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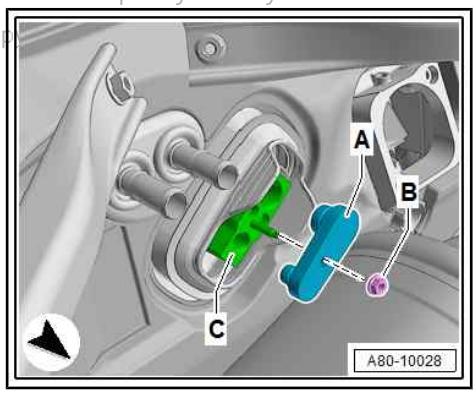
2.1 Exploded view - heater unit



- There are different designs and makes of heater and air conditioning unit. The individual components of the various heater and air conditioning units are similar but not identical; the combination of components by different manufacturers is therefore not permissible ⇒ Electronic parts catalogue .
- On a vehicle with no air conditioner, the heater is the same as the heater and air conditioning unit on vehicles with a “Low” air conditioner. The evaporator installed in the heater has no function. It serves only as a spacer element and to reduce noise ⇒ Electronic parts catalogue .
- On vehicles with no air conditioner, the expansion valve -C- is only fitted for sealing the opening in the grommet to the passenger compartment.
- On vehicles with no air conditioner, the connections at the expansion valve (for the air conditioner refrigerant lines) are sealed with a cap -A- (tightening torque of nut -B- 8 Nm) ⇒ Electronic parts catalogue .
- The layout, as well as removal and installation of the various heater components is the same as for the heater and air conditioning unit of a “Low” air conditioner.
- The removal and installation procedures for the heater unit are the same as for the heater and air conditioning unit of a “Low” air conditioner. Merely the work affecting the components only fitted with an air conditioner does not have to be performed (draining and charging refrigerant circuit, detaching refrigerant lines from expansion valve/attaching).

⇒ “5.1.1 Overview of fitting locations - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 199

⇒ “5.2 Exploded view - control motors (front)”, page 202

⇒ “6 Front heater and air conditioning unit”, page 240

⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

2.2 Removing and installing fresh air blower - V2- with fresh air blower control unit - J126-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “6.11 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 265 .

2.3 Removing and installing auxiliary air heater element - Z35-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255 .

2.4 Removing and installing temperature flap control motor - V68-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203 and
⇒ “5.7 Removing and installing temperature flap control motor V68 ”, page 219 .

2.5 Removing and installing air recirculation flap control motor - V113-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “5.6 Removing and installing air recirculation flap control motor V113 ”, page 217 .

2.6 Removing and installing air distribution flap control motor - V428-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205 and
⇒ “5.12 Removing and installing air distribution flap control motor V428 ”, page 226 .

2.7 Removing and installing dust and pollen filter

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The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “6.10 Removing and installing dust and pollen filter”, page 264 .

2.8 Removing and installing heat exchanger

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “6.12 Removing and installing heat exchanger”, page 267 .

2.9 Removing and installing heater unit

The removal and installation procedures are basically the same as for the heater and air conditioning unit
⇒ “6 Front heater and air conditioning unit”, page 240 .

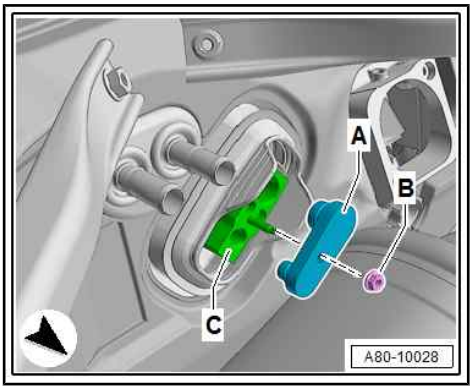
- The removal and installation procedures for the heater unit are the same as for the heater and air conditioning unit of a “Low”

air conditioner. Merely the work affecting the components only fitted with an air conditioner does not have to be performed (draining and charging refrigerant circuit, detaching refrigerant lines from expansion valve/attaching).

2.10 Dismantling and assembling heater unit

The heater dismantling and assembly operations are the same as for the heater and air conditioning unit of a “Low” air conditioner ⇒ “6 Front heater and air conditioning unit”, page 240 .

- On a vehicle with no air conditioner, the heater is the same as the heater and air conditioning unit on vehicles with a “Low” air conditioner. The evaporator installed in the heater has no function. It serves only as a spacer element and to reduce noise ⇒ Electronic parts catalogue .
- On vehicles with no air conditioner, the expansion valve -C- is only fitted for sealing the opening in the grommet to the passenger compartment.
- On vehicles with no air conditioner, the connections at the expansion valve (for the air conditioner refrigerant lines) are sealed with a cap -A- (tightening torque of nut -B- 8 Nm) ⇒ Electronic parts catalogue .



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3 Air duct

⇒ “3.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 28

⇒ “3.2 Removing and installing vents (front)”, page 28

⇒ “3.3 Removing and installing fresh air intake”, page 28

⇒ “3.4 Checking forced ventilation vents in passenger compartment”, page 28

⇒ “3.5 Removing and installing forced ventilation vents in passenger compartment”, page 28

⇒ “3.6 Checking plenum chamber water drain”, page 28

3.1 Exploded view - routing of air flow and air distribution in passenger compartment

On a vehicle with no air conditioner, the heater and the air distribution in the passenger compartment are the same as for the heater and air conditioning unit on vehicles with a “Low” air conditioner
⇒ “7.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 280 .

3.2 Removing and installing vents (front)

Removal and installation are the same as for vehicles with an air conditioner; layout, removing and installing
⇒ “7.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 280 and ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

3.3 Removing and installing fresh air intake

The removal and installation procedures are the same as for vehicles with air conditioner; checking, removing and installing
⇒ “7.8 Removing and installing fresh air intake”, page 300 .

3.4 Checking forced ventilation vents in passenger compartment

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “7.7 Checking forced ventilation vents in passenger compartment”, page 298 .

3.5 Removing and installing forced ventilation vents in passenger compartment

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298 .

3.6 Checking plenum chamber water drain

The procedures for checking, removal and installation are the same as for vehicles with air conditioner
⇒ “7.9 Checking plenum chamber water drain”, page 303 .

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4 Operating and display unit

⇒ “4.1 Overview of fitting locations - operating and display unit”, page 29

⇒ “4.2 Removing and installing operating and display unit”, page 29

4.1 Overview of fitting locations - operating and display unit

The same designation is used for the operating and display unit for heater as for the air conditioner with operating and display unit for front air conditioning system - E87-
⇒ “9.1 Overview of fitting locations - operating and display unit”, page 314 .

4.2 Removing and installing operating and display unit

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “9.2 Removing and installing operating and display unit”, page 314 .

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5 Further control components

⇒ “5.1 Removing and installing ambient temperature sensor G17 ”, page 30

⇒ “5.2 Removing and installing coolant shut-off valve N82 ”, page 30

⇒ “5.3 Removing and installing sunlight penetration photosensor G107 ”, page 30

⇒ “5.4 Removing and installing humidity sender in fresh air intake duct G657 ”, page 30

⇒ “5.5 Removing and installing left footwell vent temperature sender G261 ”, page 31

⇒ “5.6 Removing and installing front left chest vent temperature sensor G385 ”, page 31

⇒ “5.7 Removing and installing evaporator output temperature sender G263 ”, page 31

5.1 Removing and installing ambient temperature sensor - G17-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “10.5 Removing and installing ambient temperature sensor G17 ”, page 325 .

5.2 Removing and installing coolant shut-off valve - N82-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “8.1 Incorporation of heater and air conditioner into coolant circuit”, page 305 .

- Depending on the engine version, the coolant shut-off valve - N82- is installed in the coolant circuit
  ⇒ “8.1 Incorporation of heater and air conditioner into coolant circuit”, page 305 , ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses , or
⇒ “8.2 Removing and installing coolant shut-off valve N82 ”, page 306

5.3 Removing and installing sunlight penetration photosensor - G107-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “10.3 Removing and installing sunlight penetration photosensor G107 ”, page 321 .

5.4 Removing and installing humidity sender in fresh air intake duct - G657-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “10.4 Removing and installing humidity sender in fresh air intake duct G657 / air quality sensor G238 ”, page 323 .

- Different versions; a vehicle with a heater and no air conditioner is fitted with the same humidity sender in fresh air intake

duct - G657- as a vehicle with a “Low” air conditioner (without air quality sensor - G238- in each case) ⇒ Electronic parts catalogue .

5.5 Removing and installing left footwell vent temperature sender - G261-

The removal and installation procedures are the same as for a vehicle with a “Low” air conditioner
⇒ “10.8 Removing and installing right footwell vent temperature sender G262 ”, page 329 .

5.6 Removing and installing front left chest vent temperature sensor - G385-

The removal and installation procedures are the same as for a vehicle with a “Low” air conditioner
⇒ “10.6 Removing and installing front chest vent temperature sensor G385 / G386 ”, page 326 .

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5.7 Removing and installing evaporator output temperature sender - G263-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “10.9 Removing and installing evaporator output temperature sender G263 ”, page 330 .

- The evaporator has no function on vehicles with a heater but no air conditioner. The measured value of -G263- is however used for heater control.

87 – Air conditioning system

1 Overview of fitting locations - air conditioner

⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 32

⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 37

⇒ “1.3 Overview of fitting locations - components in passenger compartment (rear)”, page 39

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

⇒ “1.1.1 Overview of fitting locations - components not located in passenger compartment, vehicles without high-voltage system”, page 32

⇒ “1.1.2 Overview of fitting locations - components not located in passenger compartment, Q5 vehicles with high-voltage system”, page 35

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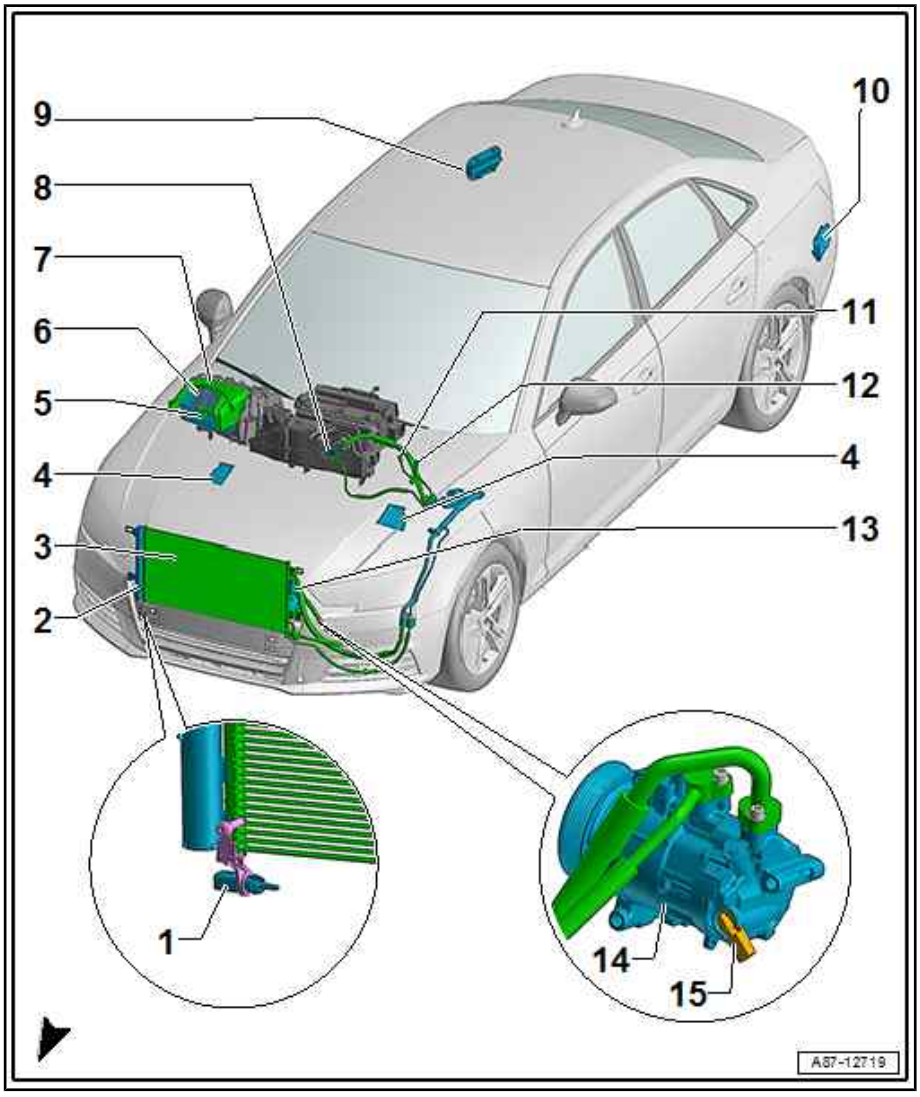
1.1.1 Overview of fitting locations - components not located in passenger compartment, vehicles without high-voltage system

- The following illustration shows the layout of the components on an Audi A4 Saloon; the layout may differ on vehicles with a different body version (e.g. on the Audi A5).



1 - Ambient temperature sensor - G17-

- ❑ Removing and installing ⇒ “10.5 Removing and installing ambient temperature sensor G17 ”, page 325

2 - Receiver with desiccant cartridge

- ❑ Exploded view ⇒ “2.3 Exploded view - condenser”, page 60
- ❑ Removing and installing ⇒ “2.20 Removing and installing desiccant bag/ desiccant cartridge”, page 116

3 - Condenser

- ❑ Exploded view ⇒ “2.2 Exploded view - refrigerant lines”, page 48
- ❑ Removing and installing ⇒ “2.17 Removing and installing condenser”, page 99

4 - Plenum chamber water drain

- ❑ Checking and cleaning ⇒ “7.9 Checking plenum chamber water drain”, page 303
- ❑ One drain each on right and left in plenum chamber
- ❑ At present the two water drains have no valve; the water runs off into the area behind the front right and left wheel housing liner ⇒ “7.9 Checking plenum chamber water drain”, page 303 .

5 - Humidity sender in fresh air intake duct - G657- with or without air quality sensor - G238-

- ❑ A vehicle with a “Low” air conditioner (or no air conditioner) is not fitted with -G238-
- ❑ On a vehicle with a “High” air conditioner, -G238- and -G657- are combined in one component
- ❑ Removing and installing ⇒ “10.4 Removing and installing humidity sender in fresh air intake duct G657 / air quality sensor G238 ”, page 323

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6 - Fresh air intake

- ❑ Removing and installing ⇒ “7.8 Removing and installing fresh air intake”, page 300
- ❑ Check that intake grille is properly seated. Intake grille stops foreign matter (leaves etc.) entering intake duct of heater and air conditioning unit.
- ❑ Depending on the version, a filter designed to stop the fresh air blower from drawing in dust and sand may be fitted instead of the intake grille for certain countries with a high dust level in the ambient air (e.g. for China) ⇒ “7.8 Removing and installing fresh air intake”, page 300 and ⇒ Electronic parts catalogue .

7 - Cover for fresh air intake

- ❑ Removing and installing ⇒ “7.8 Removing and installing fresh air intake”, page 300
- ❑ Check cover for correct positioning and damage. The cover prevents water from entering the fresh air intake duct of the heater and air conditioning unit.

8 - Expansion valve

- ❑ Exploded view
  ⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51
- ❑ Different versions ⇒ Electronic parts catalogue

9 - Forced ventilation vent in passenger compartment (right-side)

- ❑ Checking
  ⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298
- ❑ Removing and installing
  ⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298

10 - Forced ventilation vent in passenger compartment (left-side)

- ❑ Checking
  ⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298
- ❑ Removing and installing
  ⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298

11 - Service connection (low-pressure side)

- ❑ For measuring and discharging
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Exploded view
  ⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51

12 - Service connection (high-pressure side)

- ❑ For measuring, discharging and charging
- ❑ Exploded view
  ⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51
- ❑ Different versions ⇒ Electronic parts catalogue

13 - High-pressure sender - G65-

- ❑ ⇒ “2.9 Removing and installing high-pressure sender G65 ”, page 73
- ❑ Checking signal ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

14 - Air conditioner compressor

- ❑ For correct version refer to ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ “4.1 Exploded view - air conditioner compressor”, page 153
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ With or without air conditioning system magnetic clutch - N25- , depending on engine version and air conditioner compressor pulley

15 - Air conditioner compressor regulating valve - N280-

- ❑ Removing and installing ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components
- ❑ Different versions ⇒ Electronic parts catalogue

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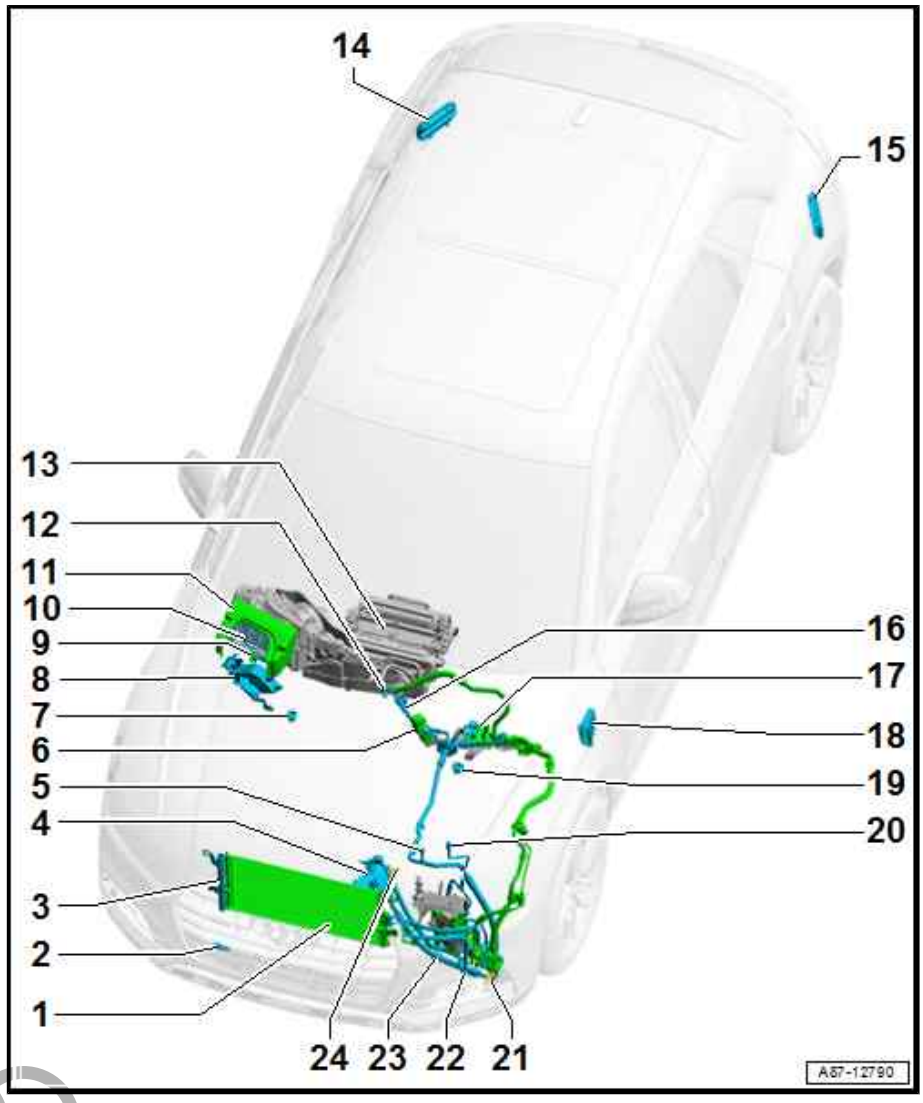
1.1.2 Overview of fitting locations - components not located in passenger compartment, Q5 vehicles with high-voltage system



1 - Condenser

- ❑ Exploded view ⇒ “2.3 Exploded view - condenser”, page 60
- ❑ Removing and installing ⇒ “2.17 Removing and installing condenser”, page 99

2 - Ambient temperature sensor - G17-

- ❑ Removing and installing ⇒ “10.5 Removing and installing ambient temperature sensor G17 ”, page 325

3 - Desiccant cartridge

- ❑ Exploded view ⇒ “2.3 Exploded view - condenser”, page 60
- ❑ Removing and installing ⇒ “2.20 Removing and installing desiccant bag/ desiccant cartridge”, page 116

4 - Air conditioner compressor

- ❑ Exploded view ⇒ “4.1.3 Exploded view - electrically driven air conditioner compressor”, page 158
- ❑ Removing and installing ⇒ “4.5 Removing and installing air conditioner compressor”, page 181

5 - Service connection (low-pressure side)

6 - Refrigerant expansion valve 2 - N637-

- ❑ Removing and installing ⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150

7 - Plenum chamber water drain (right-side)

- ❑ Checking and cleaning ⇒ “7.9 Checking plenum chamber water drain”, page 303

8 - High-voltage heater (PTC) - Z115-

- ❑ Removing and installing ⇒ “8.4 Removing and installing high-voltage heater (PTC) Z115 (with high-voltage heater (PTC) control unit J848)”, page 310

9 - Air quality sensor - G238- / external air quality and air humidity sensor - G935-

- ❑ Depending on equipment version
- ❑ Removing and installing ⇒ “10.4 Removing and installing humidity sender in fresh air intake duct G657 / air quality sensor G238 ”, page 323

10 - Fresh air intake

- ❑ Removing and installing ⇒ “7.8 Removing and installing fresh air intake”, page 300

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- ❑ Check that intake grille is properly seated. Intake grille stops foreign matter (leaves etc.) entering intake duct of heater and air conditioning unit.
- ❑ Depending on the version, a filter designed to stop the fresh air blower from drawing in dust and sand may be fitted instead of the intake grille for certain countries with a high dust level in the ambient air (e.g. for China) ⇒ “7.8 Removing and installing fresh air intake”, page 300 and ⇒ Electronic parts catalogue .

11 - Cover for fresh air intake

- ❑ Removing and installing ⇒ “7.8 Removing and installing fresh air intake”, page 300
- ❑ Check cover for correct positioning and damage. The cover prevents water from entering the fresh air intake duct of the heater and air conditioning unit.

12 - Expansion valve

- ❑ Removing and installing ⇒ “2.16 Removing and installing expansion valve”, page 96

13 - Heater and air conditioning unit

- ❑ Removing and installing ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258
- ❑ Removing and installing bracket ⇒ “6.4 Exploded view - evaporator housing”, page 245

14 - Forced ventilation vent in passenger compartment (right-side)

- ❑ Removing and installing ⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298

15 - Forced ventilation vent in passenger compartment (left-side)

- ❑ Removing and installing ⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298

16 - Refrigerant shut-off valve - V424-

- ❑ Removing and installing ⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81

17 - High-voltage battery heat exchanger

- ❑ Removing and installing ⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70

18 - Thermal management control unit - J1024-

- ❑ Removing and installing ⇒ “10.11 Removing and installing thermal management control unit J1024 ”, page 331

19 - Plenum chamber water drain (left-side)

- ❑ Checking and cleaning ⇒ “7.9 Checking plenum chamber water drain”, page 303

20 - Service connection (high-pressure side)

21 - Refrigerant pressure and temperature sender 2 - G826-

- ❑ Removing and installing ⇒ “2.11 Removing and installing refrigerant pressure and temperature sender 2 G826 ”, page 77

22 - Heat pump valve unit

- ❑ with

- ♦ Refrigerant shut-off valve 2 - N640-
- ♦ Refrigerant shut-off valve 3 - N641-
- ♦ Refrigerant shut-off valve 4 - N642-
- ♦ Refrigerant shut-off valve 5 - N643-

- ❑ Exploded view ⇒ “3.1 Exploded view - heat pump valve unit”, page 143

23 - Heat exchanger for heat pump operation with refrigerant receiver

- ❑ Removing and installing ⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

24 - Refrigerant pressure and temperature sender 1 - G395-

- ❑ Removing and installing ⇒ “2.10 Removing and installing refrigerant pressure and temperature sender G395 ”, page 75

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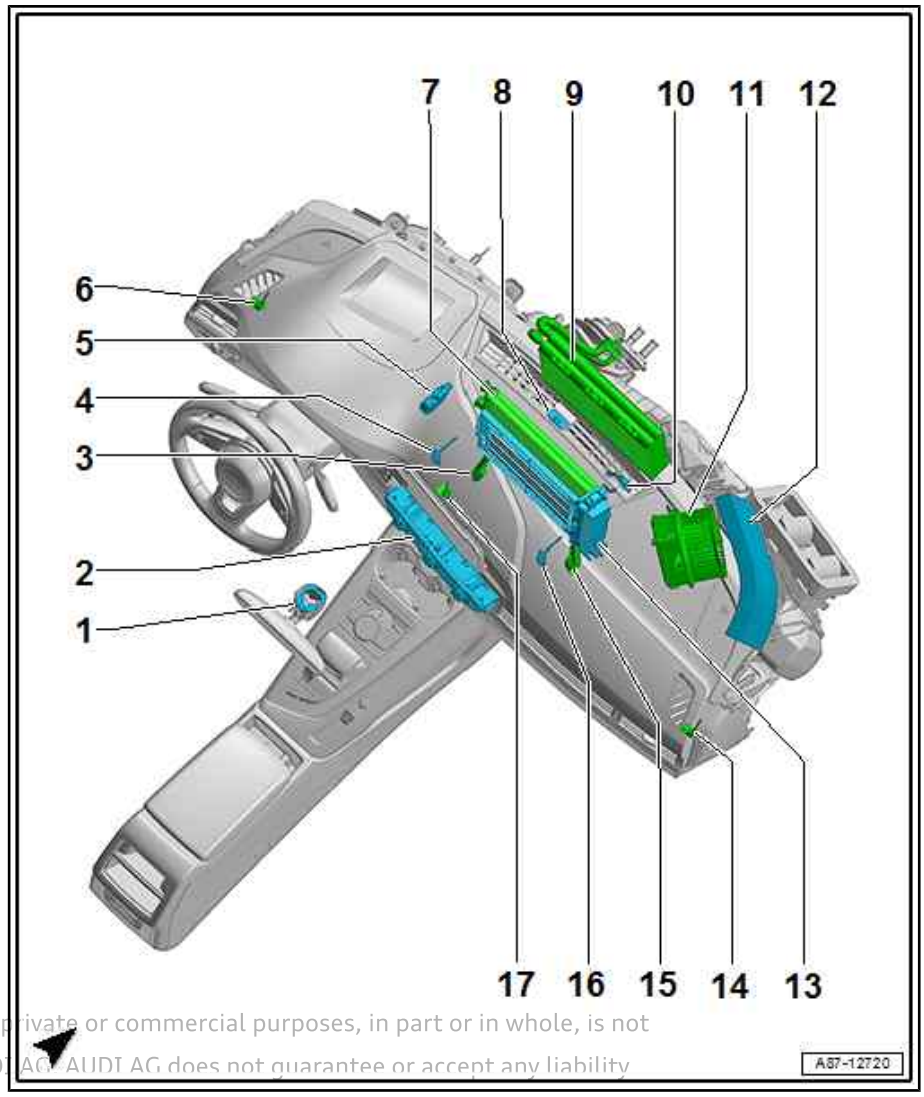
1.2 Overview of fitting locations - components in passenger compartment (front)



1 - Humidity sender - G355- / sunlight penetration photosensor - G107-

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Humidity sender - G355- and sunlight penetration photosensor - G107- are integrated in rain and light sensor - G397- (depending on equipment). They cannot be renewed separately if they are defective. Renewing ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing rain and light sensor
- ❑ Sunlight penetration photosensor - G107- can also be installed in defroster vent (depending on equipment) ⇒ Item 8 (page 38)

2 - Operating and display unit for front air conditioning system - E87-

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “9.2 Removing and installing operating and display unit”, page 314

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3 - Condensation drain (left-side)

- ❑ Removing and installing ⇒ “6.13 Removing and installing condensation drain”, page 276
- ❑ Checking ⇒ “6.14 Checking condensation drain”, page 278

4 - Left footwell vent temperature sender - G261-

- ❑ Removing and installing ⇒ “10.7 Removing and installing left footwell vent temperature sender G261 ”, page 329

5 - Control motor

- ❑ Shown as an example; all other control motors are similar
- ❑ Overview of fitting locations - control motors ⇒ “5.1 Overview of fitting locations - control motors (front)”, page 199

6 - Front left chest vent temperature sensor - G385-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Removing and installing ⇒ “10.6.2 Removing and installing front left chest vent temperature sensor G385 - vehicles with High air conditioner”, page 327
- ❑ A vehicle with a “Low” air conditioner (or no air conditioner) is not fitted with -G385- at this location. The opening in the air duct is sealed with a plug.
- ❑ On vehicles with “Low” air conditioner (or no air conditioner), -G385- is fitted in air duct to dash panel vent (centre) ⇒ Item 17 (page 38)

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7 - Heat exchanger

- ❑ Removing and installing ⇒ “6.12 Removing and installing heat exchanger”, page 267

8 - Sunlight penetration photosensor - G107-

- ❑ Removing and installing
  ⇒ “10.3 Removing and installing sunlight penetration photosensor G107 ”, page 321 or
  ⇒ “10.10 Removing and installing sensors G355 / G397 / G107 ”, page 331
- ❑ Depending on equipment version, sunlight penetration photosensor - G107- can also be integrated in rain and light sensor - G397- ⇒ Item 1 (page 37)

9 - Evaporator

- ❑ Removing and installing ⇒ “6.5 Removing and installing evaporator”, page 247

10 - Evaporator output temperature sender - G263-

- ❑ Removing and installing
  ⇒ “10.9 Removing and installing evaporator output temperature sender G263 ”, page 330

11 - Fresh air blower - V2- with fresh air blower control unit - J126-

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing
  ⇒ “6.11 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 265

12 - Dust and pollen filter (with or without activated charcoal filter insert)

- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “6.10 Removing and installing dust and pollen filter”, page 264

13 - Auxiliary air heater element - Z35-

- ❑ Removing and installing ⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255
- ❑ Only installed on some equipment versions ⇒ Electronic parts catalogue
- ❑ On vehicles with no -Z35- , opening in heater and air conditioning unit is sealed with a cover
  ⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255

14 - Front right chest vent temperature sensor - G386-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ A vehicle with a “Low” air conditioner (or no air conditioner) is not fitted with -G386- at this location. There is no opening in the air duct unit or the opening is sealed with a plug.
- ❑ Removing and installing
  ⇒ “10.6.3 Removing and installing front right chest vent temperature sensor G386 ”, page 328

15 - Condensation drains (right-side)

- ❑ Checking ⇒ “6.14 Checking condensation drain”, page 278
- ❑ Removing and installing ⇒ “6.13 Removing and installing condensation drain”, page 276

16 - Right footwell vent temperature sender - G262-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ A vehicle with a “Low” air conditioner (or no air conditioner) is not fitted with -G262- at this location. There is no opening in the heater and air conditioning unit or the opening is sealed with a plug.
- ❑ Removing and installing
  ⇒ “10.8 Removing and installing right footwell vent temperature sender G262 ”, page 329

17 - Front left chest vent temperature sensor - G385-

- ❑ Depending on equipment version; only fitted on vehicles with “Low” air conditioner
- ❑ A vehicle with a “High” air conditioner is not fitted with -G385- at this location. The opening in the air duct is sealed with a plug.
- ❑ Removing and installing
  ⇒ “10.6.2 Removing and installing front left chest vent temperature sensor G385 - vehicles with High air conditioner”, page 327
- ❑ On vehicles with “High” air conditioner, -G385- is fitted in air duct to dash panel vent (left-side)
  ⇒ Item 6 (page 37)

1.3 Overview of fitting locations - components in passenger compartment (rear)

- The illustration shows the fitting locations on the Audi A4; they differ slightly on the Audi Q5.

1 - Vent temperature sender for rear left footwell - G637-

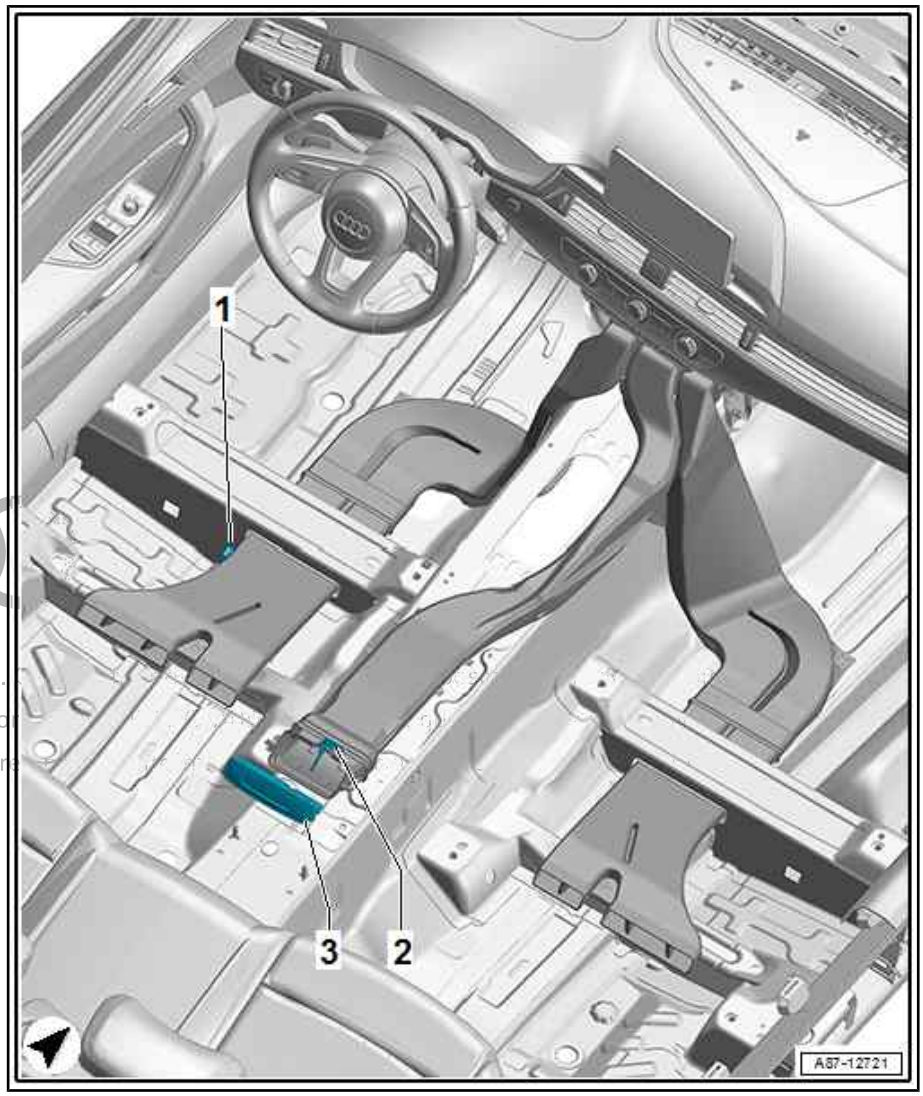
- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Removing and installing ⇒ “10.2 Removing and installing vent temperature sender for rear left footwell G637 ”, page 321

2 - Rear chest vent temperature sensor - G537-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Removing and installing ⇒ “10.1 Removing and installing rear chest vent temperature sensor G537 ”, page 319

3 - Rear Climatronic operating and display unit - E265-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Removing and installing ⇒ “9.2 Removing and installing operating and display unit”, page 314
- ❑ Different versions ⇒ Electronic parts catalogue



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2 Refrigerant circuit

⇒ “2.1 System overview - refrigerant circuit”, page 41

⇒ “2.2 Exploded view - refrigerant lines”, page 48

⇒ “2.3 Exploded view - condenser”, page 60

⇒ “2.4 Exploded view - heat exchanger for heat pump operation”, page 62

⇒ “2.5 Exploded view - heat exchanger for high-voltage battery”, page 63

⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

⇒ “2.7 Removing and installing refrigerant receiver”, page 67

⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70

⇒ “2.9 Removing and installing high-pressure sender G65 ”, page 73

⇒ “2.10 Removing and installing refrigerant pressure and temperature sender G395 ”, page 75

⇒ “2.11 Removing and installing refrigerant pressure and temperature sender 2 G826 ”, page 77

⇒ “2.12 Disconnecting and attaching refrigerant lines”, page 79

⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81

⇒ “2.14 Removing and installing refrigerant lines with internal heat exchanger”, page 83

⇒ “2.15 Removing and installing refrigerant lines in plenum chamber”, page 88

⇒ “2.16 Removing and installing expansion valve”, page 96

⇒ “2.17 Removing and installing condenser”, page 99

⇒ “2.18 Removing and installing non-return valves in refrigerant circuit”, page 104

⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112

⇒ “2.20 Removing and installing desiccant bag/desiccant cartridge”, page 116

⇒ “2.21 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)”, page 118

⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121

⇒ “2.23 Cleaning air conditioner refrigerant circuit - vehicles with high-voltage system”, page 124

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2.1 System overview - refrigerant circuit

⇒ “2.1.1 System overview - refrigerant circuit, vehicles without high-voltage system”, page 41

⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 45

2.1.1 System overview - refrigerant circuit, vehicles without high-voltage system

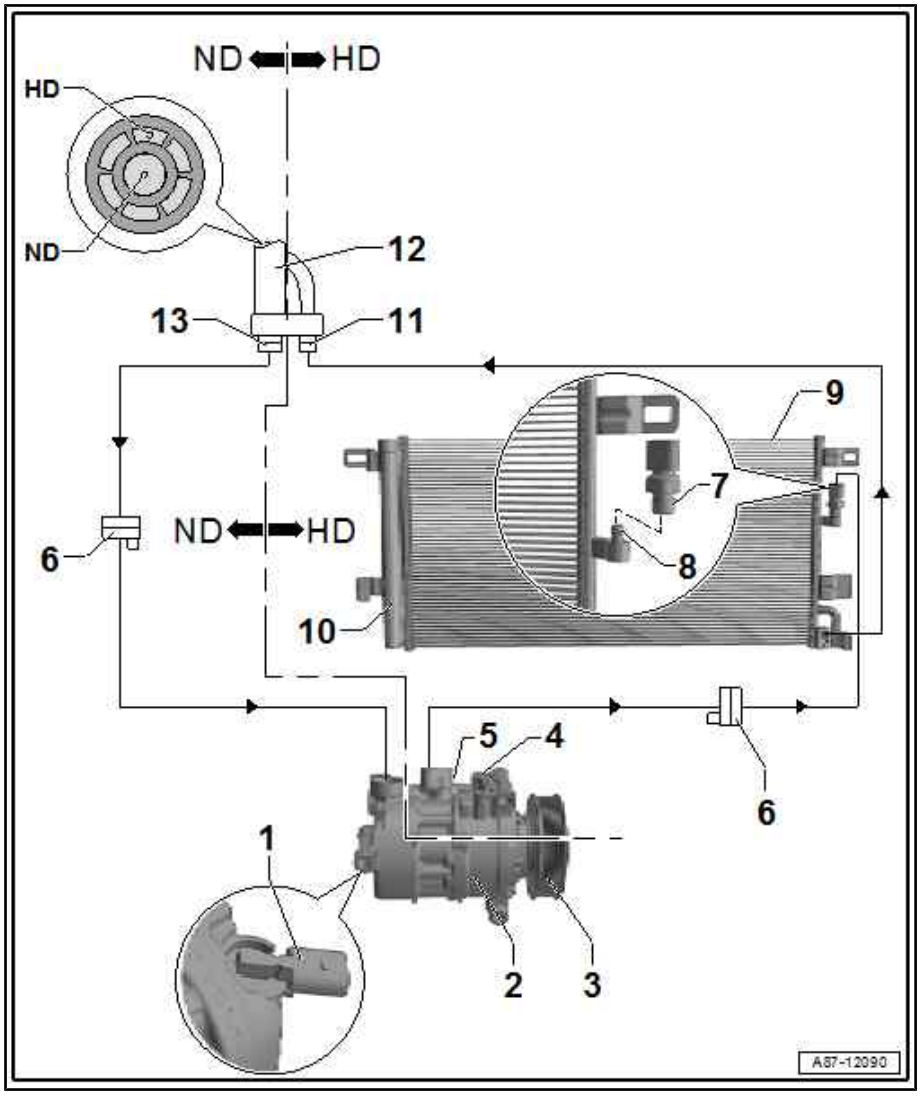
Air conditioner compressor, condenser and internal heat exchanger ⇒ page 42

Internal heat exchanger, expansion valve, evaporator, service connections ⇒ page 43

Air conditioner compressor, condenser and internal heat exchanger

HD = High-pressure side

ND = Low-pressure side



1 - Air conditioner compressor regulating valve - N280-

- Different versions depending on air conditioner compressor
- Exploded view ⇒ "4.1 Exploded view - air conditioner compressor", page 153
- Removing and installing ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components
- Not available as a replacement part for all air conditioner compressors ⇒ Electronic parts catalogue

2 - Air conditioner compressor

- Exploded view ⇒ "4.1 Exploded view - air conditioner compressor", page 153
- Different versions ⇒ Electronic parts catalogue

3 - Air conditioner compressor pulley

- Different versions, depending on engine version and air conditioner compressor
- Renewing pulley ⇒ "4.2 Exploded view - pulley", page 159
- Removing and installing poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt
- With or without air conditioning system magnetic clutch - N25- , depending on engine version and air conditioner compressor pulley

4 - Oil drain plug

5 - High-pressure safety valve

6 - Connection in refrigerant line

- ⇒ "2.2.1 Exploded view - air conditioner compressor, condenser and components underneath wing, vehicles without high-voltage system", page 48

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7 - High-pressure sender - G65-

- ❑ Removing and installing ⇒ “2.9 Removing and installing high-pressure sender G65 ”, page 73

8 - Connection with valve

9 - Condenser

- ❑ Exploded view ⇒ “2.3 Exploded view - condenser”, page 60

10 - Receiver (for condenser with desiccant cartridge)

- ❑ Receiver is integrated in condenser
- ❑ Exploded view ⇒ “2.3 Exploded view - condenser”, page 60

11 - Connection of refrigerant line (high-pressure side)

- ❑ Fitted in area around headlight (left-side) underneath wing

12 - Refrigerant line with internal heat exchanger

- ❑ Fitted in area underneath wing (left-side)
- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner

13 - Connection of refrigerant line (low-pressure side)

- ❑ Fitted in area around headlight (left-side) underneath wing

Internal heat exchanger, expansion valve, evaporator, service connections

HD = High-pressure side

ND = Low-pressure side

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1 - Refrigerant line with internal heat exchanger

- ❑ Fitted in area underneath wing (left-side)
- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner

2 - Leadthrough for refrigerant lines

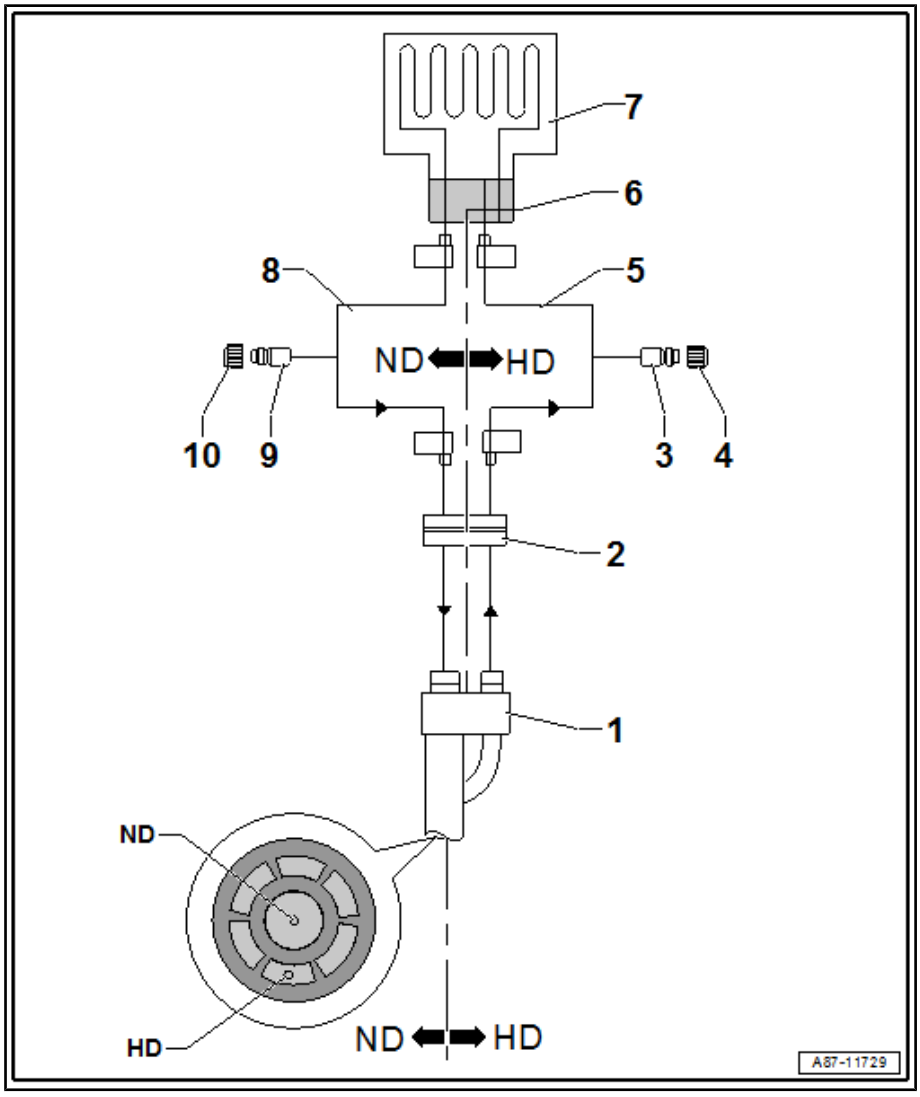
- ❑ From area underneath wing (left-side) into plenum chamber

3 - Service connection (high-pressure side)

- ❑ For measuring, discharging and charging
- ❑ Fitted in the plenum chamber on the left (next to the brake fluid reservoir) beneath the plenum chamber cover
- ❑ Different versions ⇒ Electronic parts catalogue

4 - Cap

- ❑ With seal
- ❑ Always screw on
- ❑ Different versions ⇒ Electronic parts catalogue



5 - Refrigerant line to expansion valve (high-pressure side)

6 - Expansion valve (front)

- ❑ Exploded view
  ⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51
- ❑ Different versions ⇒ Electronic parts catalogue

7 - Evaporator

- ❑ In the heater and air conditioning unit (fitted beneath the dash panel)

8 - Refrigerant line to expansion valve (low-pressure side)

9 - Service connection (low-pressure side)

- ❑ For measuring, discharging and charging
- ❑ Fitted in the plenum chamber on the left (next to the brake fluid reservoir) beneath the plenum chamber cover
- ❑ Different versions ⇒ Electronic parts catalogue

10 - Cap

- ❑ With seal
- ❑ Always screw on
- ❑ Different versions ⇒ Electronic parts catalogue

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2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system

- The valves are actuated and the individual circuits are interconnected depending on the operating mode of and request issued by the thermal management control unit - J1024- .

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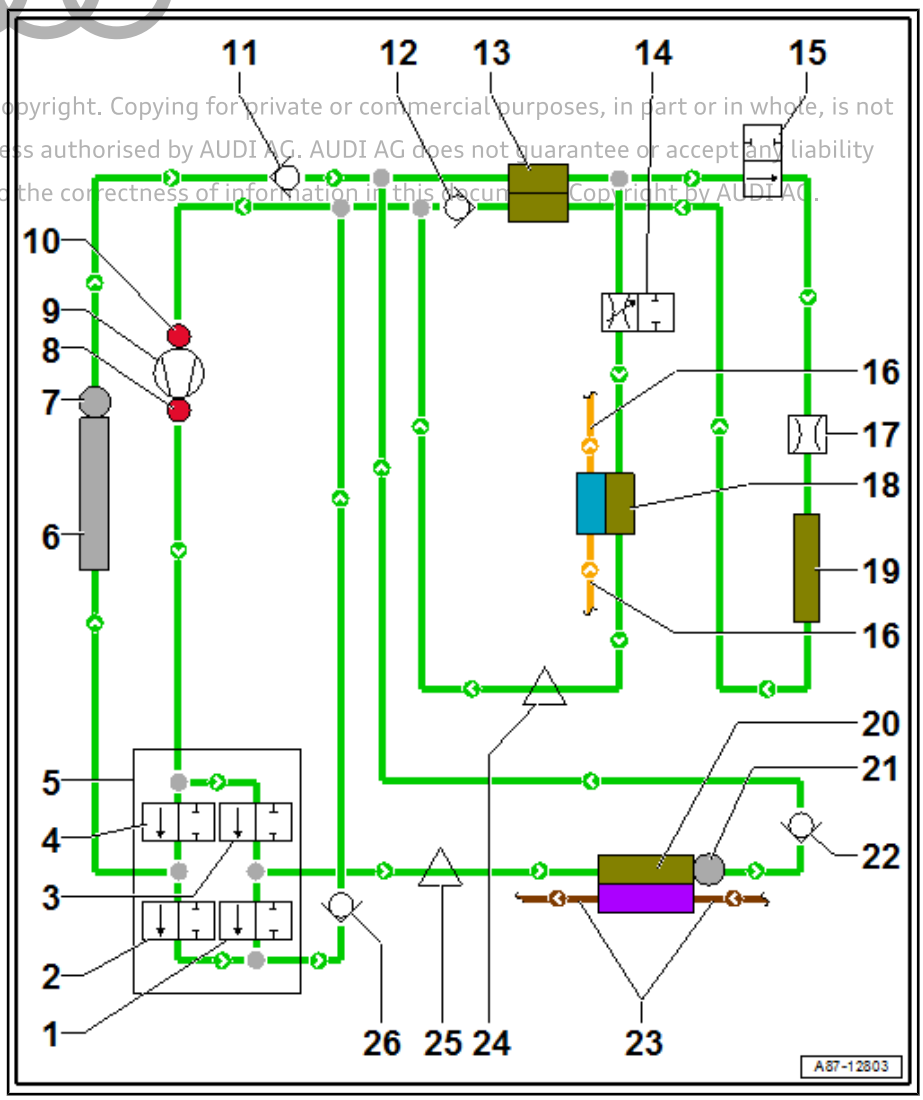

1 - Refrigerant shut-off valve 4 - N642-

- ❑ Removing and installing valve block ⇒ “3.2 Removing and installing heat pump valve unit”, page 145
- ❑ Layout of valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148
- ❑ Removing and installing valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

2 - Refrigerant shut-off valve 5 - N643-

- ❑ Removing and installing valve block ⇒ “3.2 Removing and installing heat pump valve unit”, page 145
- ❑ Layout of valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148
- ❑ Removing and installing valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

3 - Refrigerant shut-off valve 2 - N640-

- ❑ Removing and installing valve block ⇒ “3.2 Removing and installing heat pump valve unit”, page 145
- ❑ Layout of valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148
- ❑ Removing and installing valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

4 - Refrigerant shut-off valve 3 - N641-

- ❑ Removing and installing valve block ⇒ “3.2 Removing and installing heat pump valve unit”, page 145
- ❑ Layout of valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148
- ❑ Removing and installing valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

5 - Valve block in refrigerant circuit

- ❑ With valves -N640- , -N641- -N642- and -N643-
- ❑ Removing and installing valve block ⇒ “3.2 Removing and installing heat pump valve unit”, page 145
- ❑ Removing and installing valves in valve block ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

6 - Condenser

- ❑ Exploded view ⇒ “2.3 Exploded view - condenser”, page 60

7 - Receiver (for condenser with desiccant cartridge)

- ❑ Receiver is integrated in condenser
- ❑ Exploded view ⇒ “2.3 Exploded view - condenser”, page 60

8 - Refrigerant pressure and temperature sender - G395-

- ❑ Removing and installing
  ⇒ “2.10 Removing and installing refrigerant pressure and temperature sender G395 ”, page 75

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9 - Electrically driven air conditioner compressor

- ❑ Exploded view ⇒ “4.1.3 Exploded view - electrically driven air conditioner compressor”, page 158
- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ Removing and installing
  ⇒ “4.5.5 Removing and installing electrically driven air conditioner compressor”, page 185
- ❑ Different versions ⇒ Electronic parts catalogue

10 - Refrigerant pressure and temperature sender 2 - G826-

- ❑ Removing and installing
  ⇒ “2.11 Removing and installing refrigerant pressure and temperature sender 2 G826 ”, page 77

11 - Non-return valve in refrigerant line from condenser

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing
  ⇒ “2.18.3 Removing and installing non-return valve in refrigerant line from condenser”, page 108

12 - Non-return valve in refrigerant line from internal heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing
  ⇒ “2.18.1 Removing and installing non-return valve in refrigerant line with internal heat exchanger”, page 104

13 - Refrigerant line with internal heat exchanger

- ❑ Exploded view
  ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ❑ Removing and installing
  ⇒ “2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system”, page 85

14 - Refrigerant expansion valve 2 - N637-

- ❑ Removing and installing
  ⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150

15 - Refrigerant shut-off valve - V424-

- ❑ Removing and installing ⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81

16 - Incorporation into battery cooling circuit

- ❑ Incorporation into coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

17 - Expansion valve (front)

- ❑ Removing and installing ⇒ “2.16 Removing and installing expansion valve”, page 96
- ❑ Different versions ⇒ Electronic parts catalogue

18 - High-voltage battery heat exchanger

- ❑ Incorporation into coolant circuit for high-voltage system ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses
- ❑ Removing and installing
  ⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70

19 - Evaporator

- ❑ Exploded view ⇒ “6.4 Exploded view - evaporator housing”, page 245

20 - Heat exchanger for heat pump operation with refrigerant receiver

- ❑ Removing and installing
  ⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

21 - Refrigerant receiver at heat exchanger for heat pump operation

- ❑ Removing and installing ⇒ “2.7 Removing and installing refrigerant receiver”, page 67

22 - Non-return valve in refrigerant line from refrigerant receiver

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing
  ⇒ “2.18.2 Removing and installing non-return valve in refrigerant line from refrigerant receiver”, page 106

23 - Incorporation into heating circuit (vehicle interior)

- ❑ Incorporation into coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

24 - Service connection (low-pressure side)

- ❑ For measuring, discharging and charging
- ❑ Exploded view
  ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ❑ Different versions ⇒ Electronic parts catalogue

25 - Service connection (high-pressure side)

- ❑ For measuring, discharging and charging
- ❑ Exploded view
  ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ As the service connection is located in the refrigerant circuit, high pressure is only available at this connection during operation of the refrigerant circuit in heat pump mode. When operating the air conditioner, the same pressure is available here as at the service connection on the low-pressure side.
- ❑ To measure pressure in refrigerant circuit in air conditioner mode, read out measured value for refrigerant pressure and temperature sender - G395- from -J1024- ⇒ Vehicle diagnostic tester

26 - Non-return valve in refrigerant line from valve block in refrigerant circuit

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing
  ⇒ “2.18.4 Removing and installing non-return valve in refrigerant line from valve unit”, page 110

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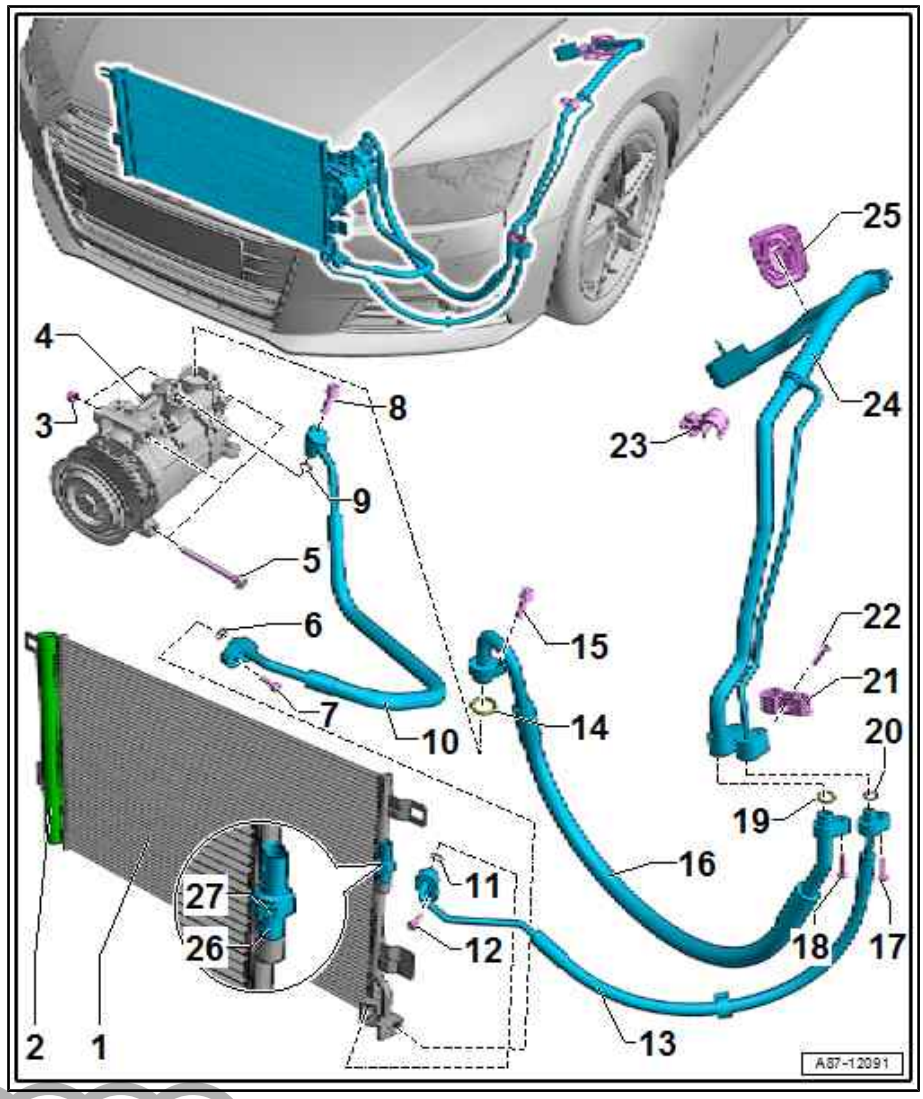
2.2 Exploded view - refrigerant lines

⇒ “2.2.1 Exploded view - air conditioner compressor, condenser and components underneath wing, vehicles without high-voltage system”, page 48

⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51

⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53

2.2.1 Exploded view - air conditioner compressor, condenser and components underneath wing, vehicles without high-voltage system



1 - Condenser (with receiver)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant lines ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112
- ❑ Removing and installing ⇒ “2.17 Removing and installing condenser”, page 99
- ❑ Receiver is part of condenser ⇒ “2.3 Exploded view - condenser”, page 60
- ❑ Different versions of receiver ⇒ Electronic parts catalogue

2 - Receiver with dryer

- ❑ Receiver is part of condenser ⇒ “2.3 Exploded view - condenser”, page 60
- ❑ Removing and installing dryer from receiver ⇒ “2.20 Removing and installing desiccant bag/ desiccant cartridge”, page 116

3 - Dowel sleeve

- ❑ Exploded view ⇒ “4.1 Exploded view - air conditioner compressor”, page 153

4 - Air conditioner compressor

- ❑ Exploded view ⇒ “4.1 Exploded view - air conditioner compressor”, page 153
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Illustration shows installation position on a vehicle with 6-cyl. engine

5 - Bolt

- ❑ For correct version refer to ⇒ Electronic parts catalogue
- ❑ Tightening torque ⇒ “4.1 Exploded view - air conditioner compressor”, page 153

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6 - O-ring

- ❑ Renew ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

7 - Bolt

- ❑ Depending on the condenser version, there may be only one bolt instead of bolts -item 7- and -item 12- (tightening torques remain the same)
- ❑ M6: 8 Nm
- ❑ M8: 20 Nm

8 - Bolt

- ❑ M6 - 9 Nm
- ❑ M8 - 25 Nm

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9 - O-ring

- ❑ Renew ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

10 - Refrigerant line (high-pressure side)

- ❑ From air conditioner compressor to condenser
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching at air conditioner compressor ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176
- ❑ Detaching and attaching at condenser ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112

11 - O-ring

- ❑ Renew ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

12 - Bolt

- ❑ Depending on the condenser version, there may be only one bolt instead of bolts -item 7- and -item 12- (tightening torques remain the same)
- ❑ M6: 8 Nm
- ❑ M8: 20 Nm

13 - Refrigerant line (high-pressure side)

- ❑ From condenser to internal heat exchanger
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112
- ❑ Detaching and attaching at internal heat exchanger ⇒ “2.14 Removing and installing refrigerant lines with internal heat exchanger”, page 83

14 - O-ring

- ❑ Renew ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

15 - Bolt

- ❑ M6 - 9 Nm
- ❑ M8 - 25 Nm
- ❑ Tightening torque for bolts with “M6” thread: 9 Nm
- ❑ Tightening torque for bolts with “M8” thread: 20 Nm

16 - Refrigerant line (low-pressure side)

- ❑ From internal heat exchanger to air conditioner compressor
- ❑ Different versions ⇒ Electronic parts catalogue

- ❑ Detaching and attaching at air conditioner compressor
  ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176
- ❑ Detaching and attaching at internal heat exchanger
  ⇒ “2.12 Disconnecting and attaching refrigerant lines”, page 79

17 - Bolt

- ❑ Tightening torque: 9 Nm

18 - Bolt

- ❑ Tightening torque: 9 Nm

19 - O-ring

- ❑ Renew ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

20 - O-ring

- ❑ Renew ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

21 - Bracket for internal heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue

22 - Bolt

- ❑ Tightening torque for bolts with “M3” thread: 3 Nm

23 - Bracket

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Not always fitted

24 - Refrigerant line with internal heat exchanger

- ❑ Further attachments
  ⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51
- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner
- ❑ Removing and installing
  ⇒ “2.14 Removing and installing refrigerant lines with internal heat exchanger”, page 83

25 - Bracket

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Not always fitted

26 - Connection with valve

27 - High-pressure sender - G65-

- ❑ ⇒ “2.9 Removing and installing high-pressure sender G65 ”, page 73
- ❑ Tightening torque ⇒ “2.3 Exploded view - condenser”, page 60

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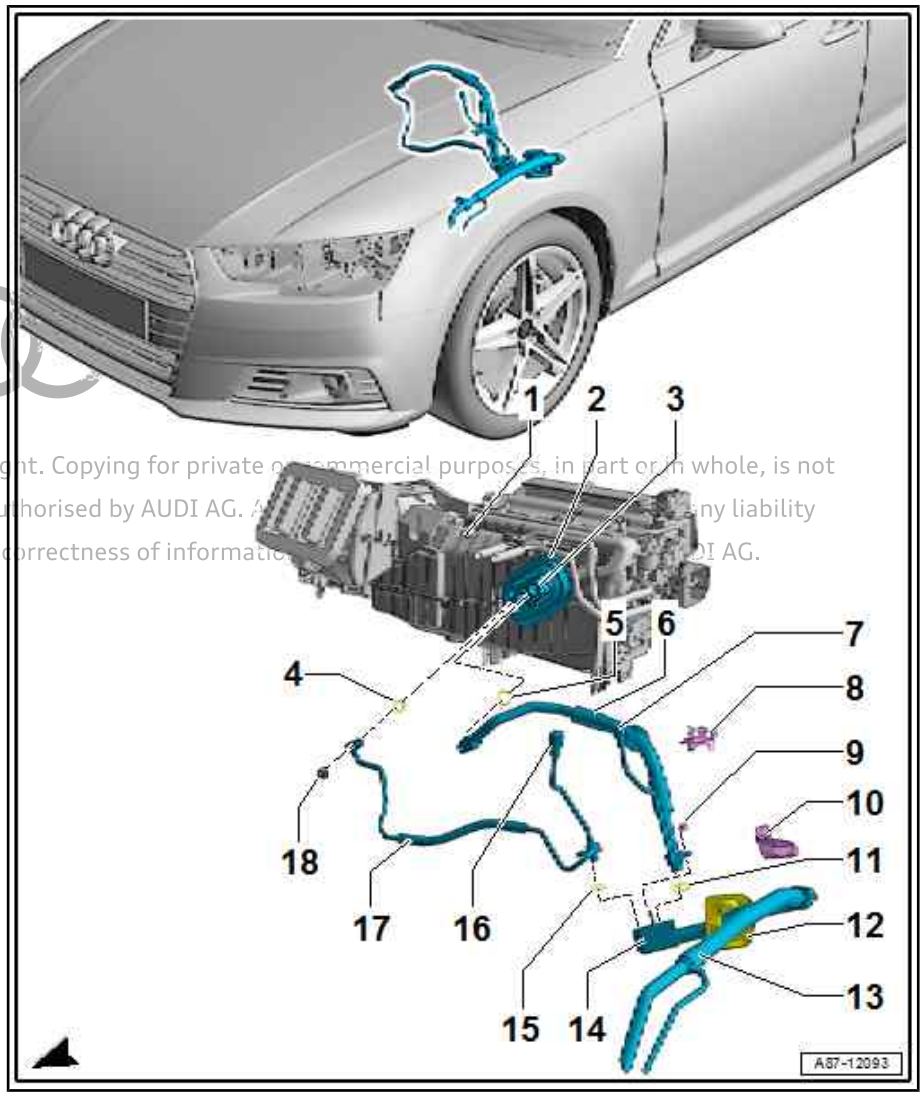
2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system



1 - Heater and air conditioning unit

- ❑ Exploded view ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240
- ❑ Removing and installing ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258
- ❑ Different versions ⇒ Electronic parts catalogue

2 - Grommet at leadthrough for refrigerant lines into passenger compartment

3 - Expansion valve (front)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant line ⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96
- ❑ Removing and installing ⇒ “2.16.2 Removing and installing expansion valve (front)”, page 98
- ❑ With threaded pin on expansion valve ⇒ Electronic parts catalogue
- ❑ If expansion valve does not have a threaded pin, refrigerant lines can also be secured with a bolt.

4 - O-ring

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

5 - O-ring

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

6 - Refrigerant line (low-pressure side)

- ❑ With service connection (low-pressure side)
- ❑ From expansion valve to leadthrough for refrigerant lines (into area underneath left wing)
- ❑ Removing and installing ⇒ “2.15 Removing and installing refrigerant lines in plenum chamber”, page 88

7 - Service connection (low-pressure side)

- ❑ For measuring and discharging
- ❑ Cap with seal, always screw on

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- ❑ Removing and installing evacuating and charging valve
⇒ “2.21 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)”, page 118
- ❑ Different versions ⇒ Electronic parts catalogue

8 - Retainer for refrigerant lines

- ❑ Different versions ⇒ Electronic parts catalogue

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9 - Nut

- ❑ On an expansion valve without a threaded pin, a bolt may also be fitted to the valve instead of a nut ⇒ Electronic parts catalogue
- ❑ 9 Nm

10 - Bracket for internal heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue

11 - O-ring

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

12 - Leadthrough for refrigerant lines into plenum chamber

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing
⇒ “2.14 Removing and installing refrigerant lines with internal heat exchanger”, page 83

13 - Refrigerant line with internal heat exchanger

- ❑ Exploded view
⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51
- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner
- ❑ Removing and installing
⇒ “2.14 Removing and installing refrigerant lines with internal heat exchanger”, page 83

14 - Connection to refrigerant line with internal heat exchanger

- ❑ Exploded view
⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51
- ❑ Removing and installing
⇒ “2.14 Removing and installing refrigerant lines with internal heat exchanger”, page 83

15 - O-ring

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

16 - Service connection (high-pressure side)

- ❑ For measuring, discharging and charging
- ❑ Cap with seal, always screw on
- ❑ Removing and installing evacuating and charging valve
⇒ “2.21 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)”, page 118
- ❑ Different versions ⇒ Electronic parts catalogue

17 - Refrigerant line (high-pressure side)

- ❑ With service connection (high-pressure side)
- ❑ To expansion valve from leadthrough for refrigerant lines (from area under left wing)
- ❑ Removing and installing
⇒ “2.15 Removing and installing refrigerant lines in plenum chamber”, page 88

18 - Nut

- ❑ On an internal heat exchanger without a stud, a bolt may also be fitted instead of a nut ⇒ Electronic parts catalogue

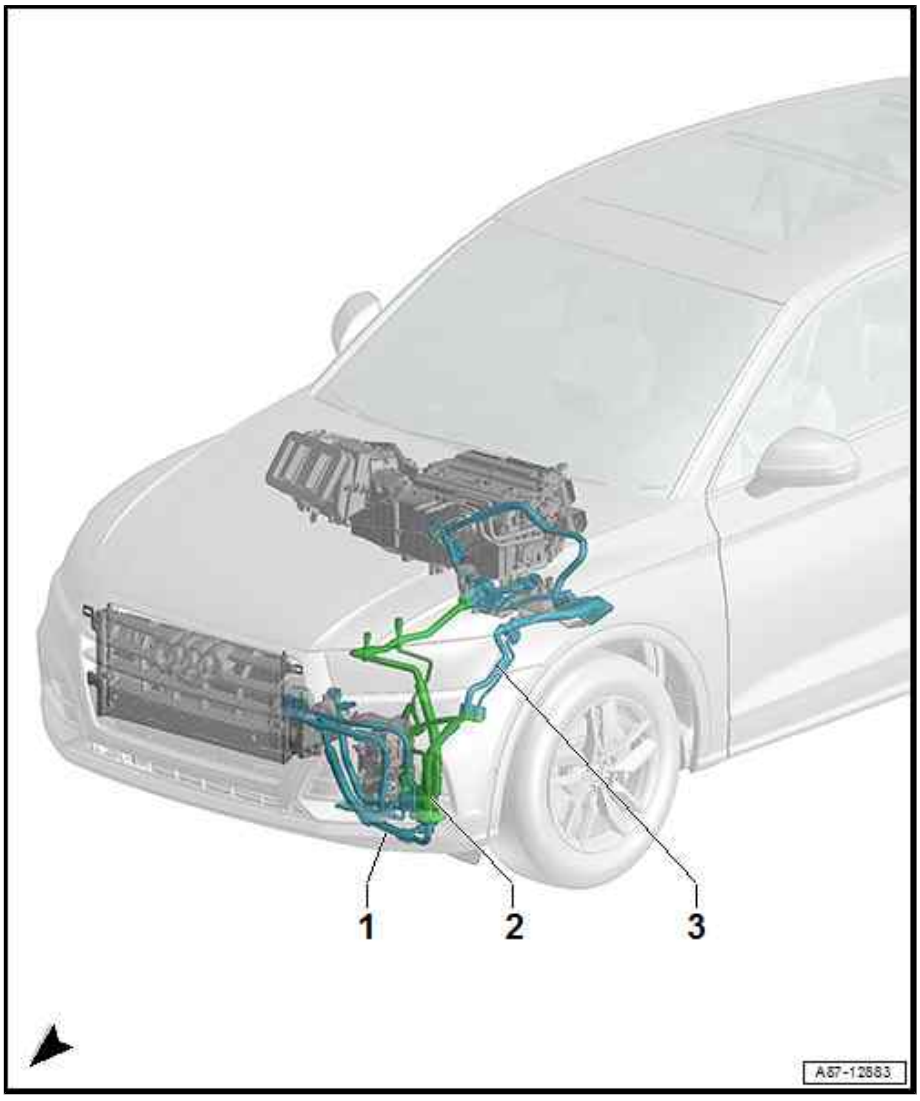
❑ 9 Nm

2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system

1 - Exploded view - refrigerant lines, air conditioner compressor, condenser and heat pump valve unit ⇒ page 53

2 - Exploded view - refrigerant lines for heat exchanger for heat pump operation, heat pump valve unit and engine compartment ⇒ page 56

3 - Exploded view - internal heat exchanger and refrigerant lines in plenum chamber ⇒ page 58



Exploded view - refrigerant lines, air conditioner compressor, condenser and heat pump valve unit

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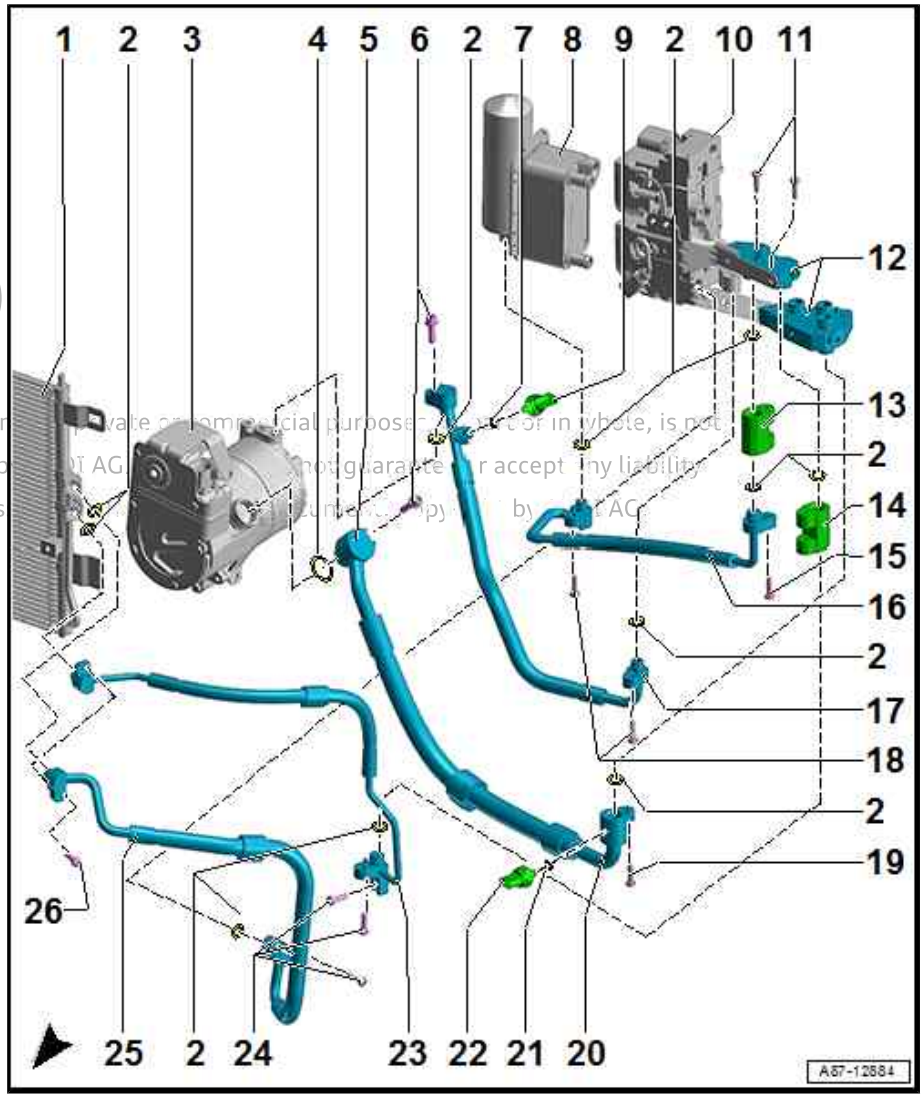

1 - Condenser (with receiver)

- ❑ Detaching and attaching refrigerant lines ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112
- ❑ Removing and installing ⇒ “2.17.3 Removing and installing condenser - Q5 vehicles with high-voltage system and SQ5 vehicles with TDI engine”, page 102
- ❑ Receiver is part of condenser ⇒ “2.3 Exploded view - condenser”, page 60
- ❑ Removing and installing dryer from receiver ⇒ “2.20 Removing and installing desiccant bag/ desiccant cartridge”, page 116

2 - O-ring

- ❑ Renew after removing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

3 - Air conditioner compressor

- ❑ Exploded view ⇒ “4.1.3 Exploded view - electrically driven air conditioner compressor”, page 158
- ❑ Removing and installing ⇒ “4.5.5 Removing and installing electrically driven air conditioner compressor”, page 185

4 - O-ring

- ❑ Renew after removing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

5 - Refrigerant line (low-pressure side)

- ❑ To air conditioner compressor
- ❑ Detaching and attaching at air conditioner compressor ⇒ “4.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - Q5 vehicles with high-voltage system”, page 179

6 - Bolt

- ❑ 25 Nm

7 - O-ring

- ❑ Renew after removing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

8 - Heat exchanger for heat pump operation with refrigerant receiver

- ❑ Exploded view ⇒ “2.4 Exploded view - heat exchanger for heat pump operation”, page 62

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- ❑ Removing and installing
  ⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

9 - Refrigerant pressure and temperature sender - G395-

- ❑ 10 Nm
- ❑ Removing and installing
  ⇒ “2.10 Removing and installing refrigerant pressure and temperature sender G395 ”, page 75

10 - Heat pump valve unit

- ❑ Exploded view ⇒ “3.1 Exploded view - heat pump valve unit”, page 143
- ❑ Removing and installing ⇒ “3.2 Removing and installing heat pump valve unit”, page 145
- ❑ Dismantling and assembling ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

11 - Bolts

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

12 - Base plates

- ❑ Exploded view ⇒ “3.1 Exploded view - heat pump valve unit”, page 143 and ⇒ page 56

13 - Non-return valve in refrigerant line from refrigerant receiver

- ❑ Removing and installing
  ⇒ “2.18.2 Removing and installing non-return valve in refrigerant line from refrigerant receiver”, page 106

14 - Non-return valve in refrigerant line from condenser

- ❑ Removing and installing
  ⇒ “2.18.3 Removing and installing non-return valve in refrigerant line from condenser”, page 108

15 - Bolt

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

16 - Refrigerant line

17 - Refrigerant line

18 - Bolts

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

19 - Bolt

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

20 - Refrigerant line

21 - O-ring

- ❑ Renew after removing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

22 - Refrigerant pressure and temperature sender 2 - G826-

- ❑ Removing and installing
  ⇒ “2.11 Removing and installing refrigerant pressure and temperature sender 2 G826 ”, page 77
- ❑ 10 Nm

23 - Refrigerant line

- ❑ Detaching and attaching at condenser
  ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112

24 - Bolts

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

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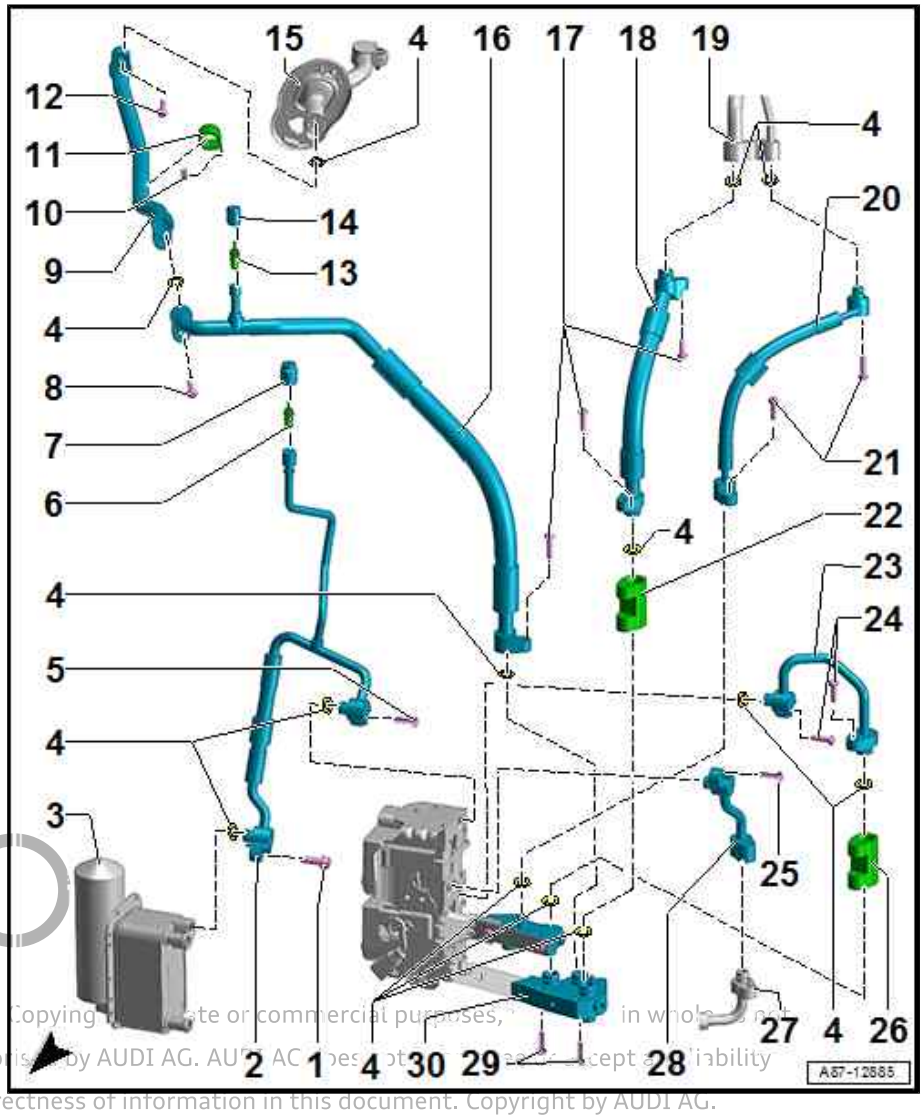
25 - Refrigerant line

- ❑ Detaching and attaching at condenser
  ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112

26 - Bolt

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

Exploded view - refrigerant lines for heat exchanger for heat pump operation, heat pump valve unit and engine compartment



1 - Bolt

- ❑ 20 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

2 - Refrigerant line (high-pressure side)

3 - Heat exchanger for heat pump operation with refrigerant receiver

- ❑ Exploded view
  ⇒ “2.4 Exploded view - heat exchanger for heat pump operation”, page 62
- ❑ Removing and installing
  ⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

4 - O-ring

- ❑ Renew after removing
  ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

5 - Bolt

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

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6 - Extracting and charging valve (high-pressure side)

- ❑ 1.5 Nm
- ❑ Removing and installing
  ⇒ “2.21 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)”, page 118
- ❑ Different versions depending on refrigerant ⇒ Electronic parts catalogue

7 - Cap for service connection (high-pressure side)

- ❑ Cap with seal, always screw on

8 - Bolt

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

9 - Refrigerant line

10 - Nut

- ❑ 8 Nm

11 - Clip

12 - Bolt

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

13 - Extracting and charging valve (low-pressure side)

- ❑ 1.5 Nm
- ❑ Removing and installing
  ⇒ “2.21 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)”, page 118
- ❑ Different versions depending on refrigerant ⇒ Electronic parts catalogue

14 - Cap for service connection (low-pressure side)

- ❑ Cap with seal, always screw on

15 - Refrigerant line with grommet

- ❑ Exploded view ⇒ page 58

16 - Refrigerant line

17 - Bolts

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

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18 - Refrigerant line

19 - Refrigerant line with internal heat exchanger

- ❑ In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner
- ❑ Removing and installing
  ⇒ “2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system”, page 85
- ❑ Exploded view ⇒ page 58

20 - Refrigerant line

21 - Bolts

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

22 - Non-return valve in refrigerant line with internal heat exchanger

- ❑ Removing and installing
  ⇒ “2.18.1 Removing and installing non-return valve in refrigerant line with internal heat exchanger”, page 104

23 - Refrigerant line

24 - Bolts

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

25 - Bolt

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

26 - Non-return valve in refrigerant line of valve unit

- ❑ Removing and installing
  ⇒ “2.18.4 Removing and installing non-return valve in refrigerant line from valve unit”, page 110

27 - Refrigerant line

- ❑ Exploded view ⇒ page 53

28 - Refrigerant line

29 - Bolts

- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

30 - Base plates

- ❑ 2x
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Secured to heat pump valve unit ⇒ “3.1 Exploded view - heat pump valve unit”, page 143

Exploded view - internal heat exchanger and refrigerant lines in plenum chamber

1 - Refrigerant line

- ❑ Exploded view
  ⇒ page 56

2 - Grommet

3 - O-ring

- ❑ Renew after removing
  ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

4 - Refrigerant line

5 - Bolt

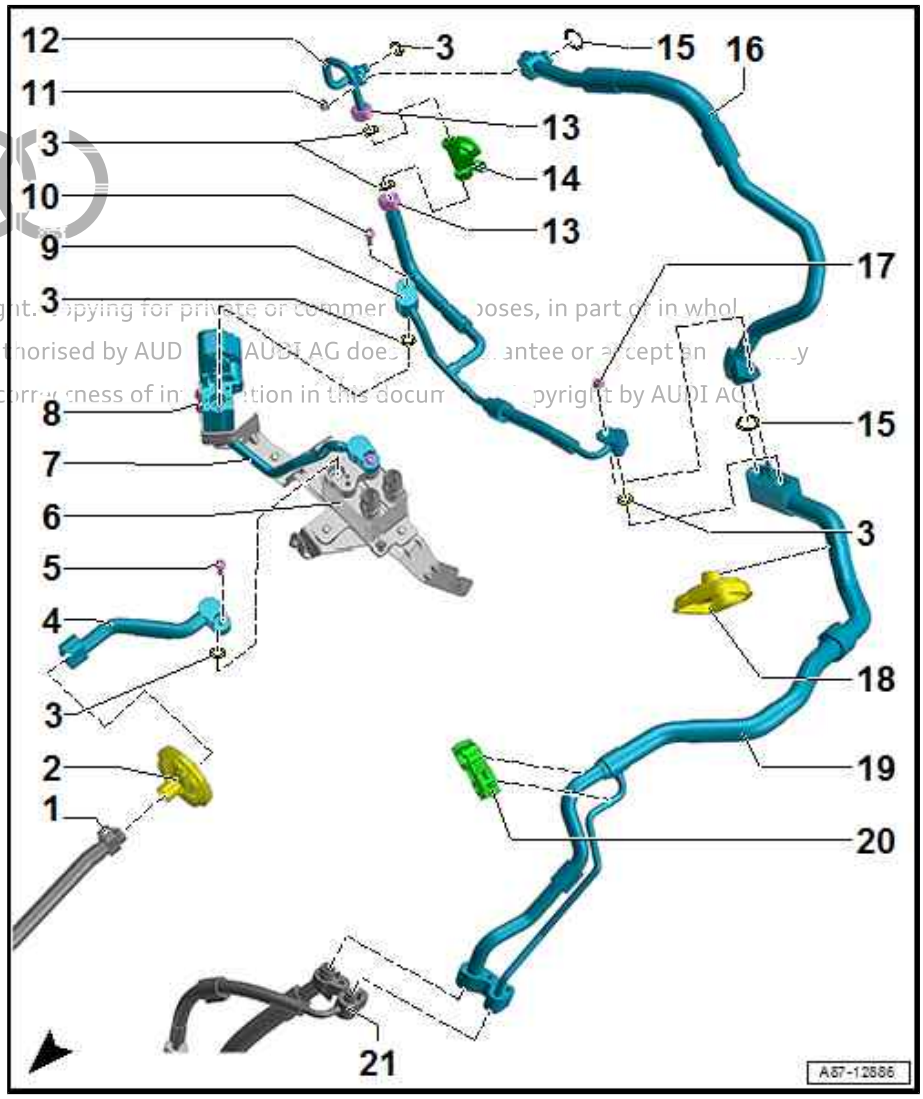
- ❑ 8 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

6 - High-voltage battery heat exchanger

- ❑ Exploded view
  ⇒ “2.5 Exploded view - heat exchanger for high-voltage battery”, page 63
- ❑ Removing and installing
  ⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70

7 - Refrigerant line

- ❑ Exploded view
  ⇒ “2.5 Exploded view - heat exchanger for high-voltage battery”, page 63



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8 - Refrigerant expansion valve 2 - N637-

- Removing and installing
  ⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150
- Exploded view ⇒ “2.5 Exploded view - heat exchanger for high-voltage battery”, page 63

9 - Refrigerant line

- Removing and installing
  ⇒ “2.15.2 Removing and installing refrigerant lines in plenum chamber - Q5 vehicles with high-voltage system”, page 89

10 - Bolt

- 8 Nm
- Different versions ⇒ Electronic parts catalogue

11 - Nut

- 8 Nm

12 - Refrigerant line

- Removing and installing
  ⇒ “2.15.2 Removing and installing refrigerant lines in plenum chamber - Q5 vehicles with high-voltage system”, page 89

13 - Union nut

- Unfastening and tightening
  ⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81
- 16.5 Nm

14 - Refrigerant shut-off valve - V424-

- Removing and installing ⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81

15 - O-ring

- Renew after removing ⇒ “4.12 Refrigerant circuit seals”, page 16
- Different versions ⇒ Electronic parts catalogue
- Before installing, lubricate lightly with refrigerant oil

16 - Refrigerant line

- From expansion valve to refrigerant line with internal heat exchanger
- Removing and installing
  ⇒ “2.15.2 Removing and installing refrigerant lines in plenum chamber - Q5 vehicles with high-voltage system”, page 89

17 - Nut

- 8 Nm

18 - Grommet

19 - Refrigerant line with internal heat exchanger

- In this refrigerant line, the hot liquid refrigerant flowing through the high-pressure side gives off energy to the cold refrigerant vapour flowing through the low-pressure side, thus enhancing the efficiency of the air conditioner.
- Removing and installing
  ⇒ “2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system”, page 85

20 - Bracket

21 - Refrigerant line

- Exploded view ⇒ page 56

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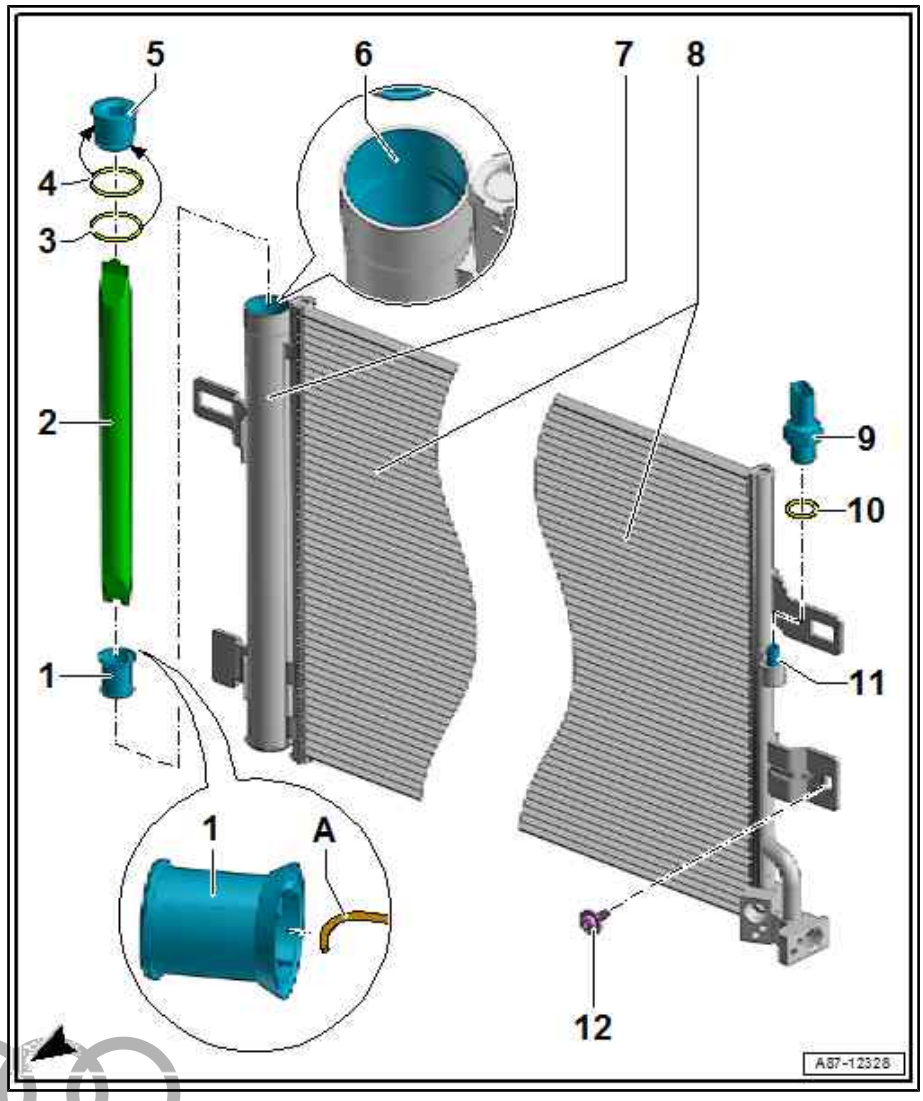
2.3 Exploded view - condenser



1 - Receiver insert

- ❑ Different versions
- ❑ Fit into mounting in receiver as far as stop; make sure it is in correct position
- ❑ With strainer
- ❑ This illustration shows an insert as fitted in a “Denso” condenser. An insert with a different contour is fitted in “Showa/Keihin” condensers; however, the operation and removal and installation procedures are the same.
- ❑ Check receiver; if it is dirty, clean refrigerant circuit or renew condenser if necessary ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Cleaning refrigerant circuit .
- ❑ Use a suitable hook -A- (made of 3 mm welding wire for example) to pull insert out of receiver.

2 - Desiccant bag

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “2.20 Removing and installing desiccant bag/desiccant cartridge”, page 116

3 - O-ring

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

4 - O-ring

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

5 - Plug with filter element

- ❑ Different versions
- ❑ Renew after removing
- ❑ Keihin: 5 Nm
- ❑ Denso: 2 Nm
- ❑ Removing and installing ⇒ “2.20 Removing and installing desiccant bag/desiccant cartridge”, page 116

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6 - Sealing surfaces in receiver

- ❑ Check for dirt and damage

7 - Receiver

- ❑ Receiver is part of condenser
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing desiccant bag
  ⇒ “2.20 Removing and installing desiccant bag/desiccant cartridge”, page 116

8 - Condenser

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant lines
  ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112
- ❑ Removing and installing ⇒ “2.17 Removing and installing condenser”, page 99

9 - High-pressure sender - G65-

- ❑ Not fitted on vehicles with high-voltage system
- ❑ Removing and installing ⇒ “2.9 Removing and installing high-pressure sender G65 ”, page 73
- ❑ 5 Nm

10 - O-ring

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Not fitted on vehicles with high-voltage system

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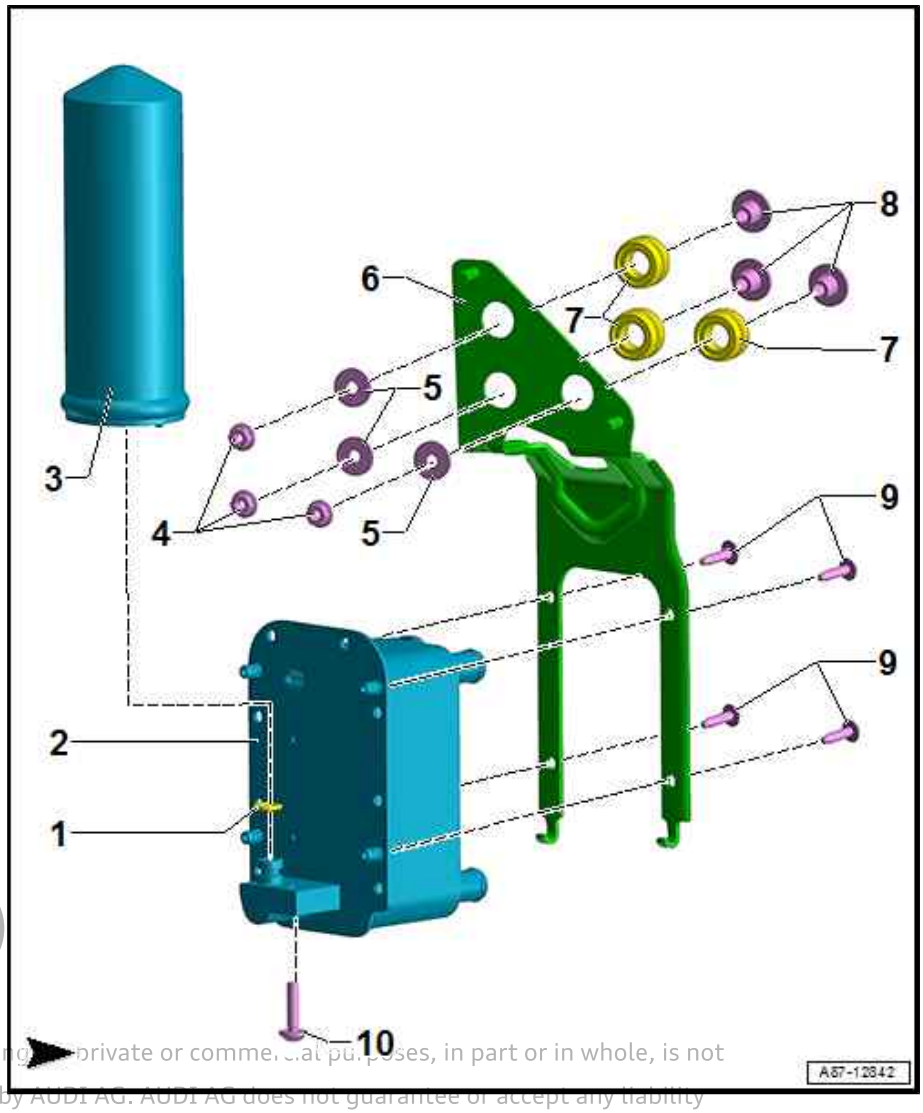
11 - Connection with valve

- ❑ Not fitted on vehicles with high-voltage system

12 - Bolt

- ❑ Not installed on all models
- ❑ 8 Nm

2.4 Exploded view - heat exchanger for heat pump operation



1 - O-ring

- ❑ Renew after removing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Before installing, lubricate lightly with refrigerant oil

2 - Heat exchanger for heat pump operation

- ❑ Removing and installing ⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

3 - Refrigerant receiver

- ❑ Removing and installing ⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

4 - Nut

- ❑ 8 Nm

5 - Washer

6 - Bracket

- ❑ Removing and installing ⇒ “2.6 Removing and installing heat exchanger for heat pump operation”, page 63

7 - Grommet

8 - Guide sleeve

9 - Bolt

- ❑ 8 Nm

10 - Bolt

- ❑ 8 Nm

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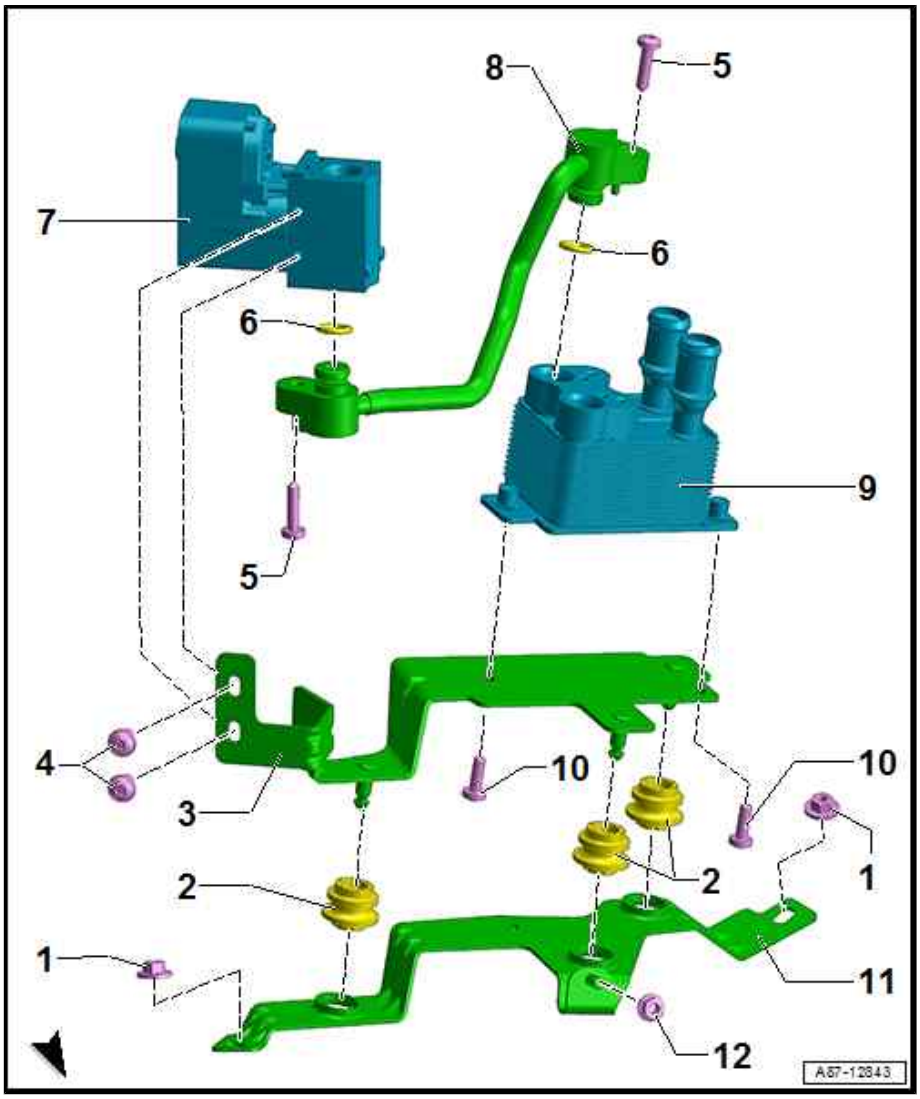
2.5 Exploded view - heat exchanger for high-voltage battery



1 - Nut

- ❑ 8 Nm

2 - Grommet

3 - Bracket

- ❑ Removing and installing ⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70

4 - Bolts

- ❑ 8 Nm

5 - Bolts

- ❑ 8 Nm

6 - O-ring

- ❑ Renew after removing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ Before installing, lubricate lightly with refrigerant oil

7 - Refrigerant expansion valve 2 - N637-

- ❑ Do not dismantle any further
- ❑ Removing and installing ⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150

8 - Refrigerant line

- ❑ Removing and installing ⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70

9 - High-voltage battery heat exchanger

- ❑ Removing and installing ⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70

10 - Bolts

- ❑ 10 Nm

11 - Bracket

12 - Nut

- ❑ 6 Nm

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2.6 Removing and installing heat exchanger for heat pump operation

Special tools and workshop equipment required

- Hose clamps up to 25 mm - 3094-

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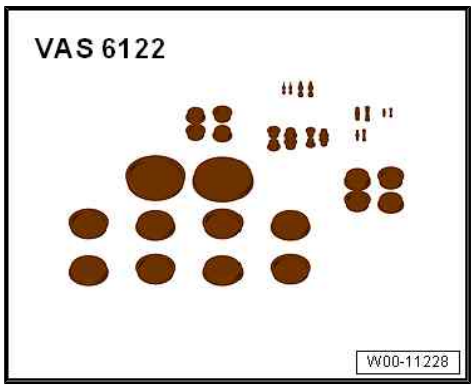
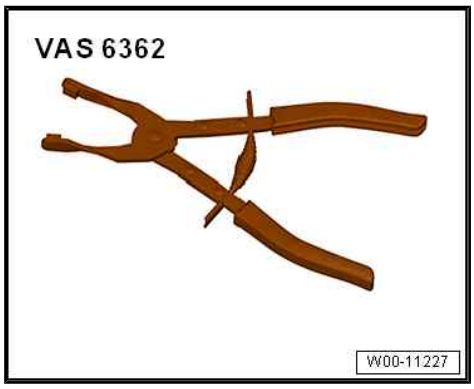
- Engine bung set - VAS 6122-



- Hose clip pliers - VAS 6362-



- Collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208-

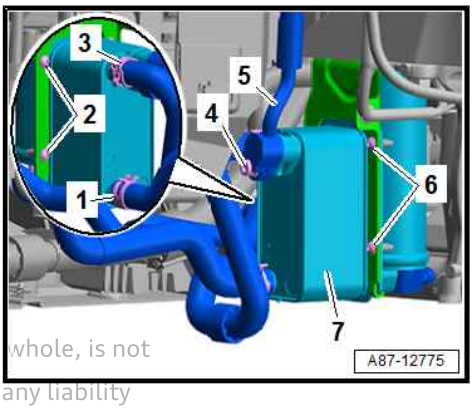
- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

Removing

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and

charge refrigerant circuit" routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit ; Working with the air conditioner service station, or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
– Drain coolant for engine coolant circuit ⇒ 4-cylinder direct injection engine (2.0 ltr. 4-valve TFSI, EA 888 Gen. III); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
– Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
– Remove longitudinal member (bottom left) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
– Clamp off coolant hoses at heat exchanger -7- with hose clamps up to 25 mm - 3094- and mark layout.
– Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
– Release hose clips -1, 3- and detach coolant hoses from connections on heat exchanger -7-.



⚠ CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

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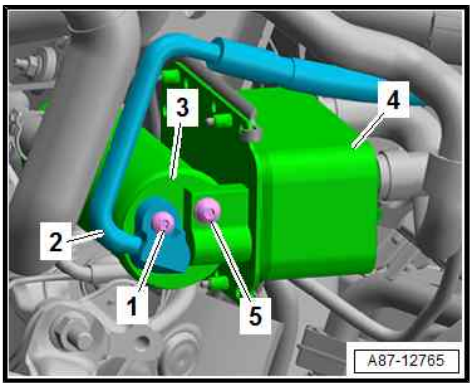
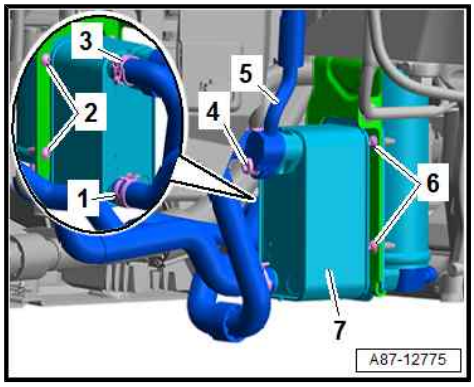
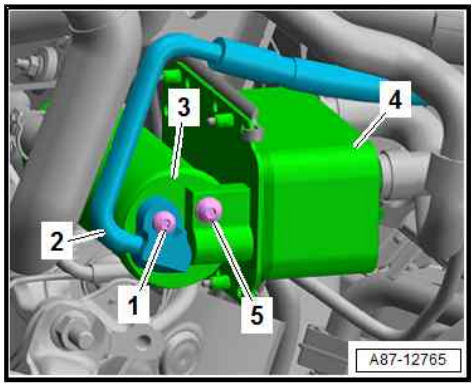
– Remove bolt -1- and detach refrigerant line -2-.



– Remove bolt -4- and detach refrigerant line -5-.
– Remove bolts -2, 6-.
– Detach heat exchanger -7- together with refrigerant receiver.



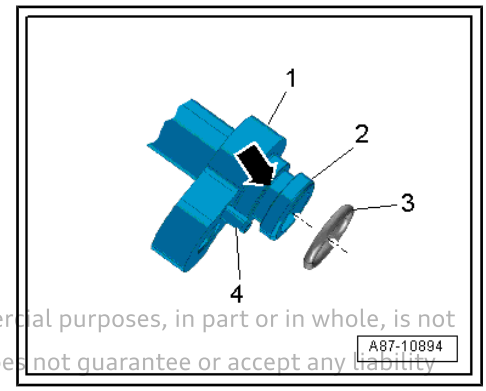
– To separate refrigerant receiver -3- from heat exchanger -4-, remove bolt -5-.



Installing

Installation is carried out in reverse order; note the following:

– Renew O-rings -3-
⇒ “4.12 Refrigerant circuit seals”, page 16 .
– If fitted, check that dowel pins -4- at refrigerant lines are not damaged and are seated correctly.
• When removed, the heat exchanger and refrigerant receiver contain refrigerant oil which must be returned to the refrigerant circuit if any of these components are renewed ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .
– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.



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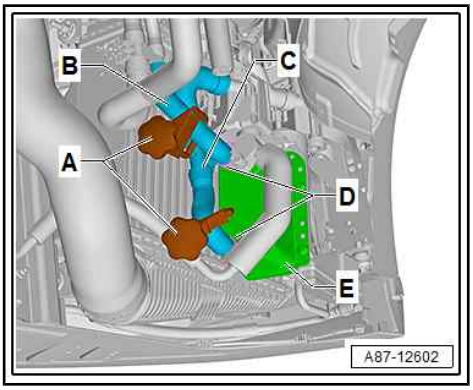


– Attach coolant hoses -B, C- to connections to heat exchanger -E- (observe marking) and secure them with a clip -D-.
– Remove hose clamps up to 25 mm - 3094- -A-.
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.
– Fill up and bleed engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

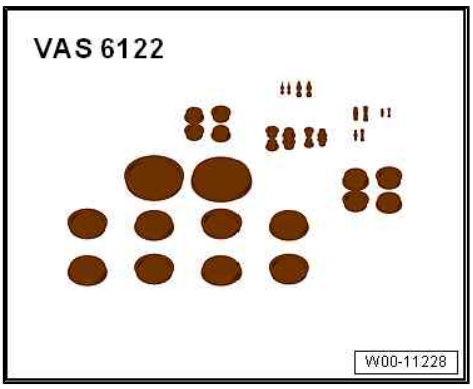
Tightening torques

- ⇒ “2.4 Exploded view - heat exchanger for heat pump operation”, page 62
- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

2.7 Removing and installing refrigerant receiver

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.
– Switch off ignition.
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit ; Working with the air conditioner service station, or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

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– Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
– Remove longitudinal member (bottom left) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

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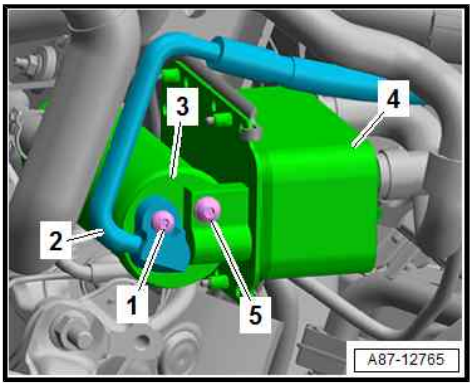
CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolts -1, 5-.

– Detach refrigerant line -2-.

– Detach refrigerant receiver -3-.

Installing

Installation is carried out in reverse order; note the following:

- When removed, the refrigerant receiver contains refrigerant oil which must be returned to the refrigerant circuit if any of these components are renewed ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Renew O-rings ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version, refer to ⇒ Electronic parts catalogue .

– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit ; Working with the air conditioner service station, or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ “2.4 Exploded view - heat exchanger for heat pump operation”, page 62
- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

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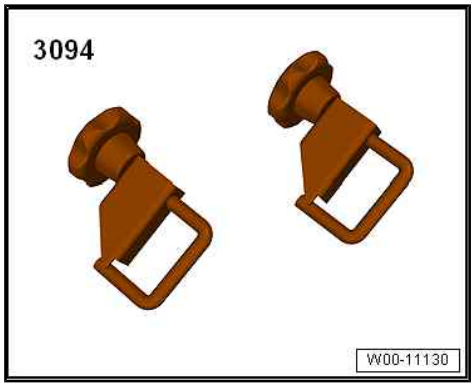
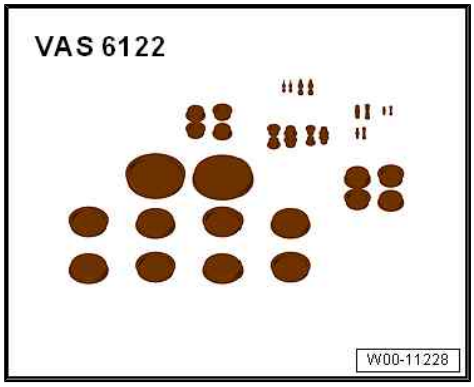
2.8 Removing and installing heat exchanger for high-voltage battery

Special tools and workshop equipment required

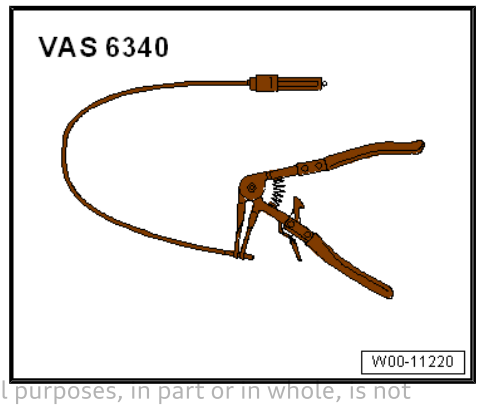
- Hose clamps up to 25 mm - 3094-



- Engine bung set - VAS 6122-



- Hose clip pliers - VAS 6340-



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Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

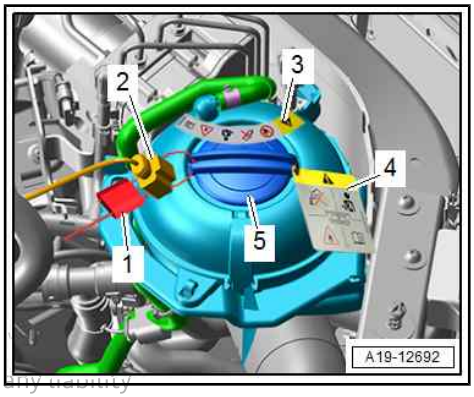
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit ; Working with the air conditioner service station, or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

CAUTION

The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

Danger of scalding skin and other parts of the body.

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Cover filler cap on expansion tank with a cloth and open carefully to release pressure.**



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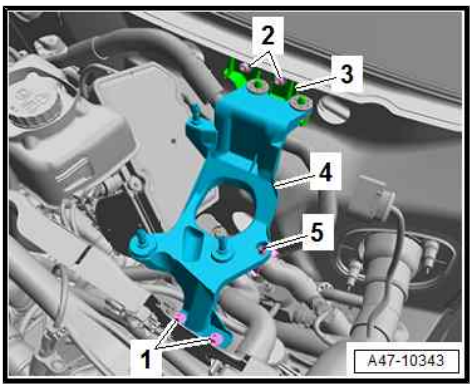
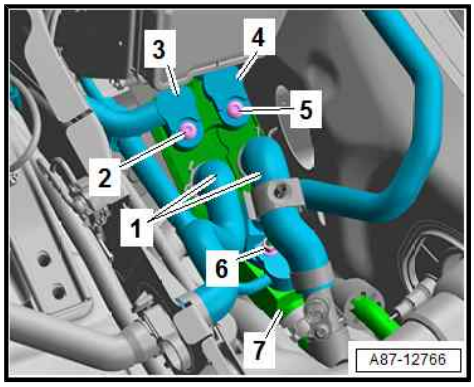
- Open filler cap -5- for coolant expansion tank of high-voltage coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system.
- Remove windscreen wiper motor ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing windscreen wiper motor - V- .
- Remove body brace ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Pull brake system pressure accumulator - VX70- off rubber mountings at bracket and place on one side with wiring connected ⇒ Brake system; Rep. gr. 47 ; Brake servo/brake master cylinder; Exploded view - brake servo/brake master cylinder .



- Remove bolts -1-.
- Unclip coolant hose -5- at bracket for brake system pressure accumulator -4-.
- Pull bracket -4- for brake system pressure accumulator upwards off bracket -3- and detach.

– Mark arrangement of coolant hoses -1- on connections at heat exchanger for high-voltage battery.
– Clamp off coolant hoses -1- with hose clamps up to 25 mm - 3094- .



NOTICE

Escaping coolant may result in dirt entering refrigerant circuit.

- **Seal off open pipes and connections immediately with clean plugs from engine bung set - VAS 6122- .**
- **Use absorbent paper to clean up any coolant which has escaped.**

• Catch escaping coolant and determine volume which has escaped.
– Release hose clips and disconnect coolant hoses -1- from connections on heat exchanger.

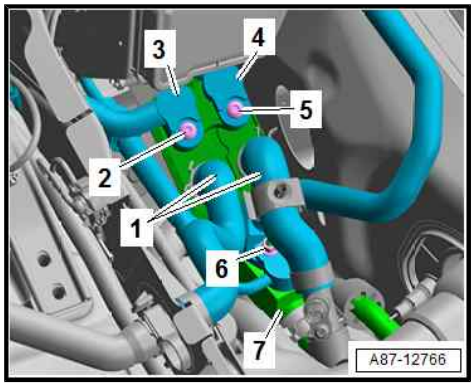
CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

– Remove bolts -2, 5-.
– Unscrew nut -6-.
– Move refrigerant line clear together with internal heat exchanger -7- and pull to one side
⇒ “2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system”, page 85 .
– Remove refrigerant expansion valve 2 - N637-
⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150 .
– Press heat exchanger for high-voltage battery -2- with bracket -3- out of rubber mountings -4- and pull it forwards slightly under brake master cylinder.
– Disconnect any already loosened refrigerant lines.



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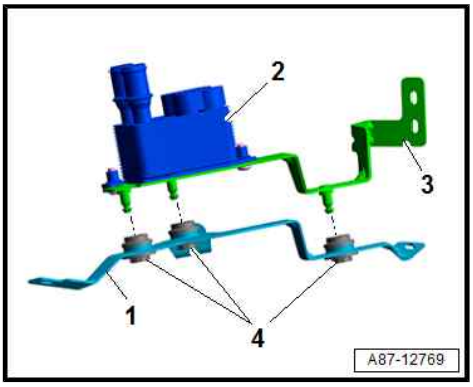

– Pull heat exchanger -2- with bracket -3- out of rubber mountings -4- in bracket -1-.
– Separate heat exchanger -2- from bracket -3-.
– Determine coolant volume in heat exchanger for high-voltage battery -A- by tipping it out.
– Determine total volume of escaped coolant (coolant from heat exchanger for high-voltage battery + coolant collected when disconnecting coolant hoses).

Installing

Installation is carried out in reverse order; note the following:

– Renew O-rings on refrigerant lines ⇒ “4.12 Refrigerant circuit seals”, page 16 .
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.
– If less than 500 ml of coolant has escaped from high-voltage coolant circuit, top up coolant and bleed cooling system (high-voltage coolant circuit) ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
– If more than 500 ml of coolant has escaped from high-voltage coolant circuit, drain and then refill cooling system (high-voltage coolant circuit) ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

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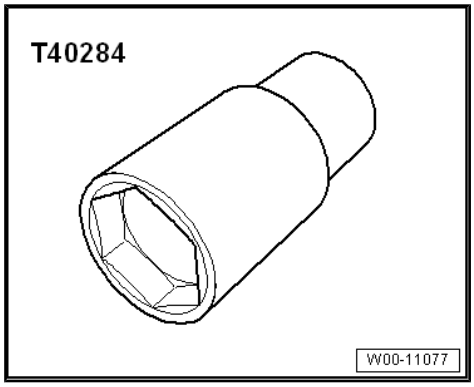
Tightening torques

- ⇒ “2.5 Exploded view - heat exchanger for high-voltage battery”, page 63
- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links
- ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Exploded view - windscreen wiper system

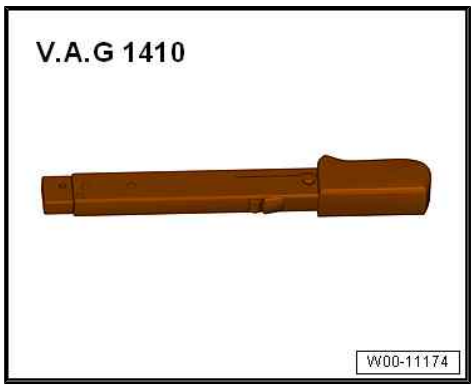
2.9 Removing and installing high-pressure sender - G65-

Special tools and workshop equipment required

- Socket (24 mm) - T40284-



- Torque wrench - V.A.G 1410-



Removing

– Switch off ignition.

Q5

– Remove radiator blind (top) ⇒ Engine; Rep. gr. 19 ; Radiator/ radiator fan(s) .

All vehicles (continued)

– Remove cover at lock carrier ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .

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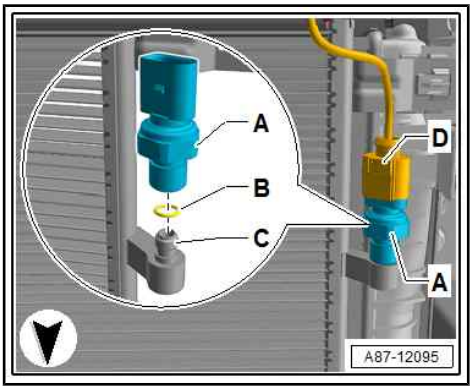
– Unplug electrical connector -D-.



CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **If refrigerant escapes from the refrigerant line for more than 1 sec. when the pressure sender is unfastened, tighten the pressure sender and renew the defective non-return valve.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

– Remove high-pressure sender - G65- -A- from connection on condenser -C- using socket (24 mm) - T40284- .

Installing

Installation is carried out in reverse order; note the following:

– Renew O-ring -B-; lubricate it lightly with refrigerant oil before fitting ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– Tighten high-pressure sender - G65- -A-.

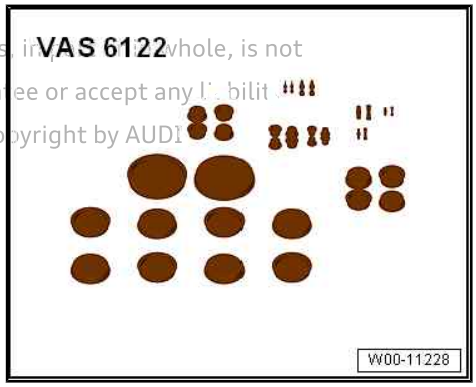
Tightening torque:

♦ ⇒ “2.3 Exploded view - condenser”, page 60

2.10 Removing and installing refrigerant pressure and temperature sender - G395-

Special tools and workshop equipment required

♦ Engine bung set - VAS 6122-



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Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

♦ The refrigerant pressure and temperature sender - G395- and the refrigerant pressure and temperature sender 2 - G826- are identical ⇒ Electronic parts catalogue . Their functions and fitting locations are only matched (addressing of senders) via the “Basic setting” function, based on their positions in the wiring ⇒ Vehicle diagnostic tester.

- ♦ If senders have been removed from the lines and installed in a different line, these senders will retain their old assignment (address) until the next time the basic setting function is performed.

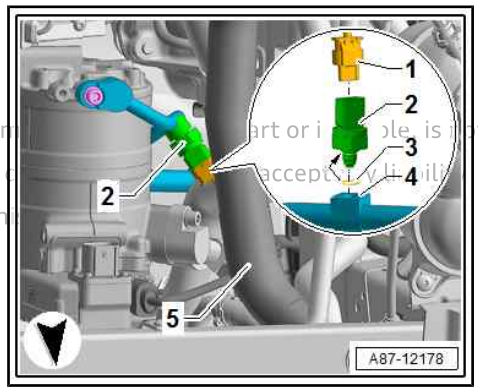
– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Unplug electrical connector -1-.

– Check refrigerant line and connection -4- for dirt; clean if necessary.



CAUTION

Risk of frostbite from escaping pressurised refrigerant

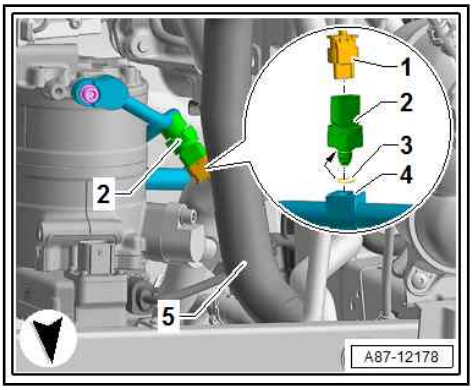
Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

– Loosen and remove sender -2-.

– Seal off open connection -4- with a clean plug from engine bung set - VAS 6122- .

Installing



Installation is carried out in reverse order; note the following:

– Renew O-ring -3-; lubricate it lightly with refrigerant oil before fitting ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– Insert and tighten sender -2-.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– If refrigerant pressure and temperature sender - G395- is being renewed, perform addressing.

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Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

♦ Systems with diagnostic capability

♦ 00C5 - Thermal management control unit J1024

♦ 00C5 - Basic setting

♦ ⇒ Automatic addressing of pressure and temperature senders

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

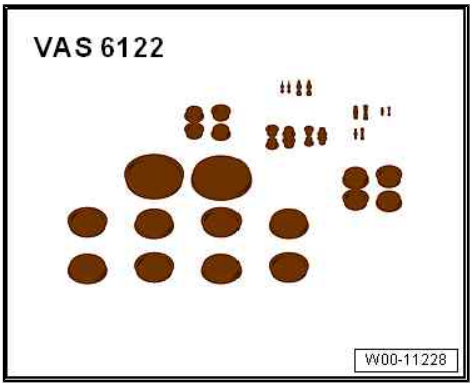
Tightening torques

♦ ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53

2.11 Removing and installing refrigerant pressure and temperature sender 2 - G826-

Special tools and workshop equipment required

♦ Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

♦ The refrigerant pressure and temperature sender - G395- and the refrigerant pressure and temperature sender 2 - G826- are identical ⇒ Electronic parts catalogue . Their functions and fitting locations are only matched (addressing of senders) via the “Basic setting” function, based on their positions in the wiring ⇒ Vehicle diagnostic tester.

♦ If senders have been removed from the lines and installed in a different line, these senders will retain their old assignment (address) until the next time the basic setting function is performed.

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

– Unplug electrical connector -4-.

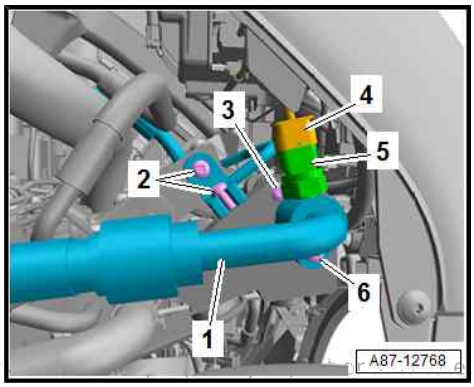
– Check connection at refrigerant line -1- for dirt; clean if necessary.

⚠ CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



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– Loosen and remove sender -5-.

– Seal off open connection at refrigerant line -1- with a clean plug from engine bung set - VAS 6122- .

Installing

Installation is carried out in reverse order; note the following:

– Renew O-ring -C-; lubricate it lightly with refrigerant oil before fitting ⇒ “4.12 Refrigerant circuit seals”, page 16 .

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– Insert and tighten sender -B-.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– If refrigerant pressure and temperature sender 2 - G826- is being renewed, perform addressing.

Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

♦ Systems with diagnostic capability

♦ 00C5 - Thermal management control unit J1024

♦ 00C5 - Basic setting

♦ ⇒ Automatic addressing of pressure and temperature senders

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

♦ ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53

♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

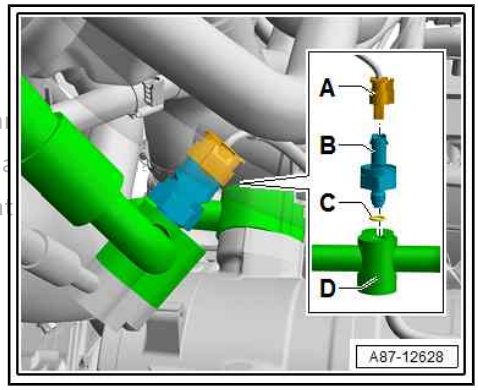
2.12 Disconnecting and attaching refrigerant lines

♦ The procedure for unfastening applies to all joints in the refrigerant circuit. There are differences in the diameters of the line connections, the version of the O-rings and the securing bolts.

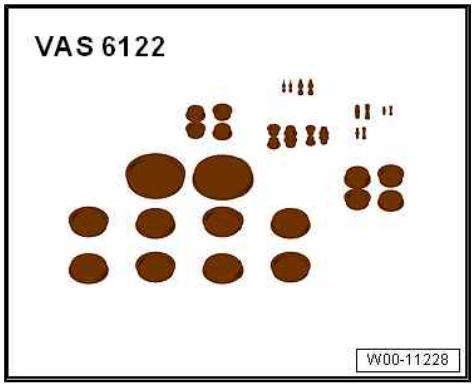
♦ In order to separate the connections, you may need to detach or remove various components in their vicinity, depending on the fitting location.

♦ As an example, the illustration below shows the joints between the refrigerant lines from the internal heat exchanger to the air conditioner compressor and the condenser as well as the joint at the leadthrough into the plenum chamber to the refrigerant lines leading to the evaporator in the heater and air conditioning unit. These joints are located in the area below the front left wing.

Special tools and workshop equipment required



♦ Engine bung set - VAS 6122-



- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

Unfastening

Vehicles with high-voltage system

– Switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Switch off ignition.

– Remove components which prevent access (depending on joint).

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

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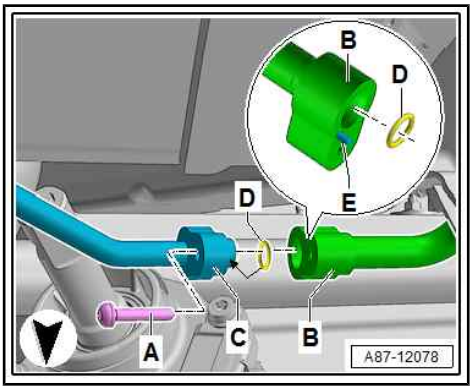
CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolt -A-.

– Disconnect connection points of refrigerant lines -B, C-.

Assembling

Installation is carried out in reverse order; note the following:

– Clean refrigerant lines thoroughly in connection area of connection points and check for damage.

– Renew O-rings -D-, for different versions refer to ⇒ Electronic parts catalogue .

– Lubricate O-rings -D- lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– If fitted, check that dowel pins are not damaged and are seated correctly.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– Re-install components removed previously in reverse order and/or re-attach detached components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

Vehicles with high-voltage system

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

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Tightening torques

◆ ⇒ “2.2 Exploded view - refrigerant lines”, page 48

2.13 Removing and installing refrigerant shut-off valve - V424-

Special tools and workshop equipment required

♦ Engine bung set - VAS 6122-

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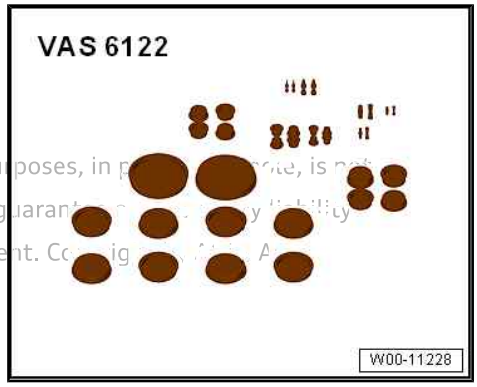


Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

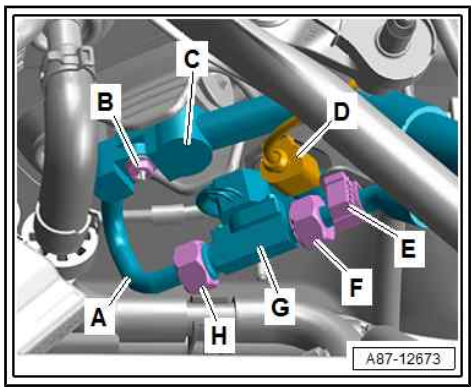
– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Unplug electrical connector -D-.



CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

– Check positions of refrigerant lines -A, E- in relation to refrigerant shut-off valve - V424- -item G-.

– Loosen union nuts -H, F- (counterhold at refrigerant shut-off valve -G-).

– Detach refrigerant shut-off valve - V424- -G-.

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Installing

Installation is carried out in reverse order; note the following:

– Renew O-rings -B-; lubricate them lightly with refrigerant oil before fitting ⇒ “4.12 Refrigerant circuit seals”, page 16 .

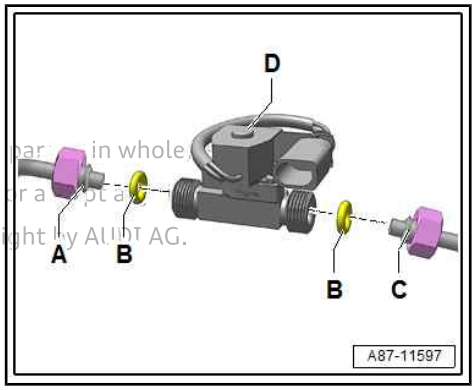
• When tightening the union nuts, make sure not to strain the refrigerant lines.

– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .



Tightening torques

♦ ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53

2.14 Removing and installing refrigerant lines with internal heat exchanger

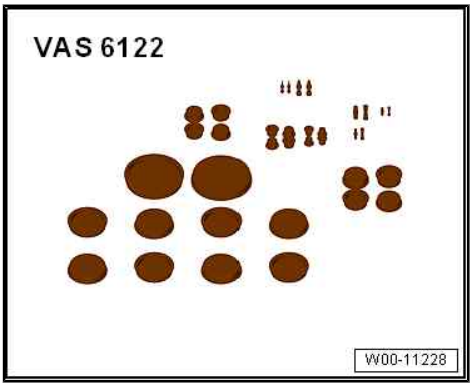
⇒ “2.14.1 Removing and installing refrigerant line with internal heat exchanger - vehicles without high-voltage system”, page 83

⇒ “2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system”, page 85

2.14.1 Removing and installing refrigerant line with internal heat exchanger - vehicles without high-voltage system

Special tools and workshop equipment required

♦ Engine bung set - VAS 6122-



Removing

• For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

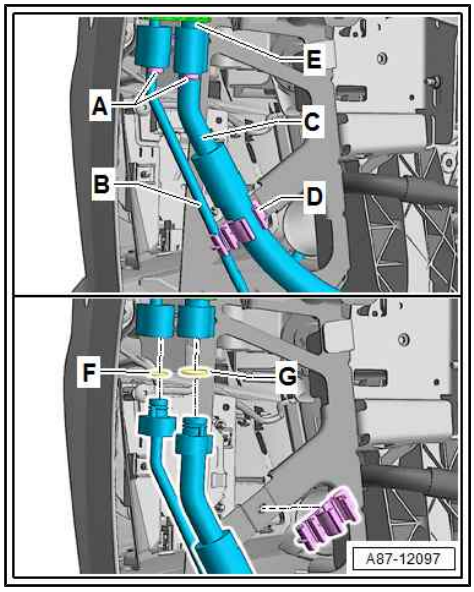
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
– Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

CAUTION

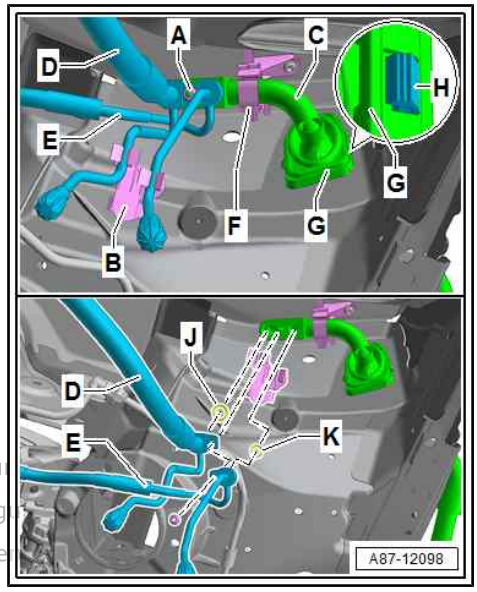
Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Unscrew bolts -A-.
– Unfasten refrigerant lines -B- and -C- (in area beneath left headlight) from bracket -D- and detach from refrigerant line with internal heat exchanger -E-.



– Remove nut -A-.
– Unfasten refrigerant lines to expansion valve -D, E- from bracket -B- and detach from internal heat exchanger -C-.
– Unfasten internal heat exchanger -C- from bracket -F-.
– Release fasteners -H- and slide grommet -G- under wing.

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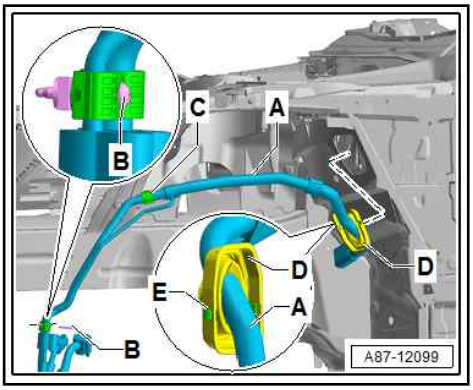
– Remove bolts -B-.

– Unfasten internal heat exchanger -A- from bracket -C- and remove.



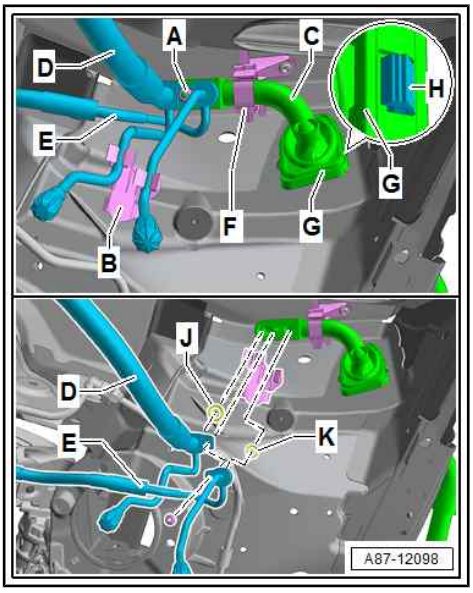
Installing

Installation is carried out in reverse order; note the following:

- Lubricate O-rings lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .
- Install refrigerant lines so that they are free of tension.

– Check that grommet -D- at leadthrough is not damaged and is seated correctly in body opening (check fasteners -E-).

– Insert refrigerant lines to expansion valve -D, E- in bracket -B- after attaching them to internal heat exchanger -C-.



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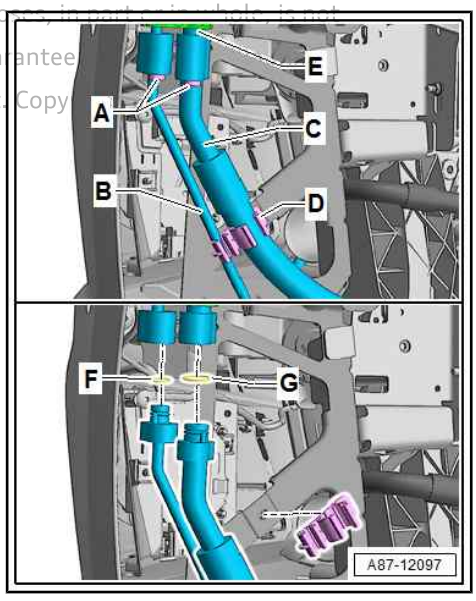
– Insert refrigerant lines -B, C- in bracket -D- after attaching them to internal heat exchanger -E-.

– Screw in bolts -A-.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .



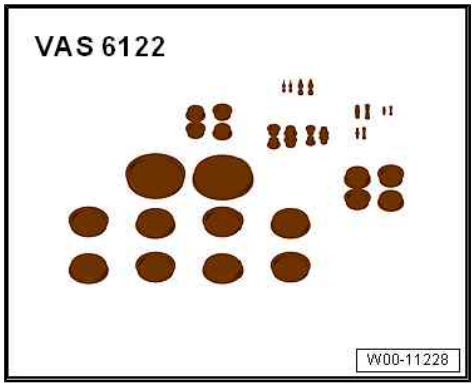
Tightening torques

♦ ⇒ “2.2 Exploded view - refrigerant lines”, page 48

2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system

Special tools and workshop equipment required

♦ Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

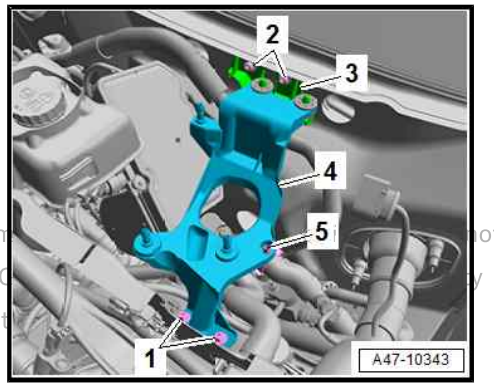
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .

– Remove windscreen wiper motor ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing windscreen wiper motor - V- .

– Pull brake system pressure accumulator - VX70- off rubber mountings at bracket and place on one side with wiring connected ⇒ Brake system; Rep. gr. 47 ; Brake servo/brake master cylinder; Exploded view - brake servo/brake master cylinder .

– Move coolant hose -5- clear at bracket -4- for brake system pressure accumulator and press coolant hose to one side.



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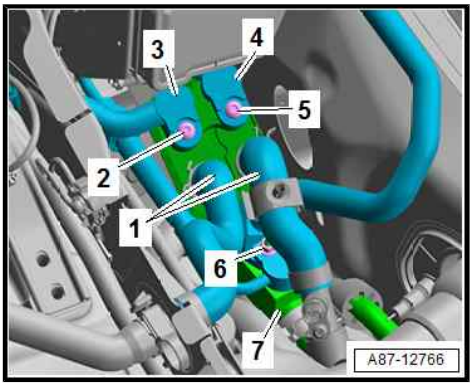
– Unscrew nut -6- (shown without bracket for brake system pressure accumulator in illustration).



CAUTION

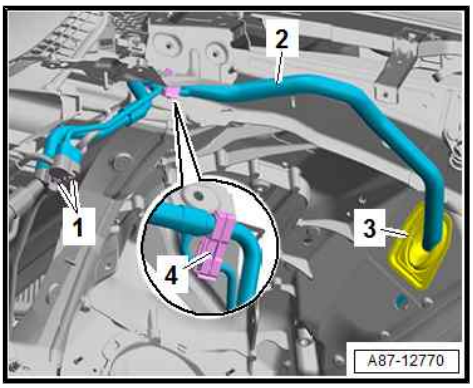
Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

– Disconnect refrigerant lines from refrigerant line with internal heat exchanger -7-.

– Unclip grommet -3- at leadthrough and pull in direction of wheel housing.



– Remove bolts -1- and disconnect refrigerant lines.

– Release refrigerant line with internal heat exchanger -2- from bracket -4- and detach.

Installing

Installation is carried out in reverse order; note the following:

• Lubricate O-rings lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– Check that grommet -3- at leadthrough is not damaged and is seated correctly in body opening.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

♦ ⇒ “2.2 Exploded view - refrigerant lines”, page 48

♦ ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Exploded view - windscreen wiper system

♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

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2.15 Removing and installing refrigerant lines in plenum chamber

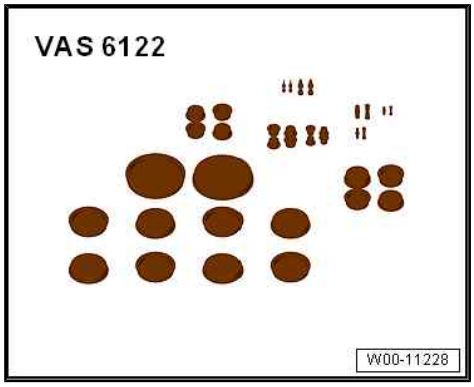
⇒ “2.15.1 Removing and installing refrigerant lines in plenum chamber - vehicles without high-voltage system”, page 88

⇒ “2.15.2 Removing and installing refrigerant lines in plenum chamber - Q5 vehicles with high-voltage system”, page 89

2.15.1 Removing and installing refrigerant lines in plenum chamber - vehicles without high-voltage system

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Removing

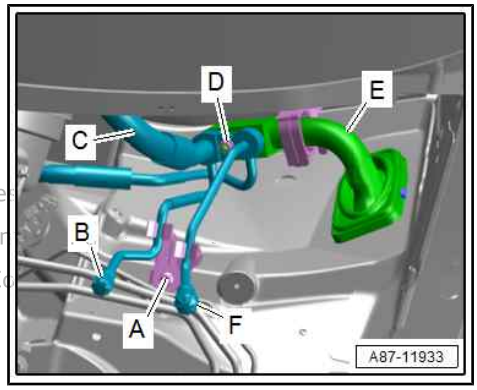
- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– To remove refrigerant line -C-, remove windscreen wiper motor ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing windscreen wiper motor - V- .

– Only if necessary (depends on vehicle version): Detach plenum chamber partition panel from vehicle and move it to one side (do not remove) ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel .



– Remove nut -D-.

– Unfasten service connections -B, F- of the two refrigerant lines to expansion valve from bracket -A- and detach from refrigerant line with internal heat exchanger -E-.

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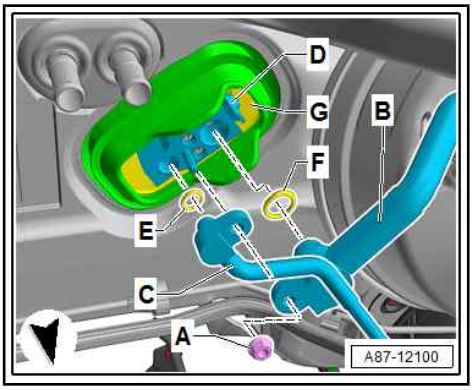
– Remove nut -A-.

– Detach refrigerant lines -B, C- from expansion valve (front) -D-
⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96 .

– Remove refrigerant line -B-.

– Remove refrigerant lines -C- towards left wing (beneath brake servo).



Installing

Installation is carried out in reverse order; note the following:

• Lubricate O-rings lightly with refrigerant oil before installing
⇒ “4.12 Refrigerant circuit seals”, page 16 .

– Thoroughly clean expansion valve, leadthrough and refrigerant lines in connection area and check for damage.

– Make sure that support ring -G- is correctly positioned and that grommet in plenum chamber back wall is not damaged and is fitted properly.

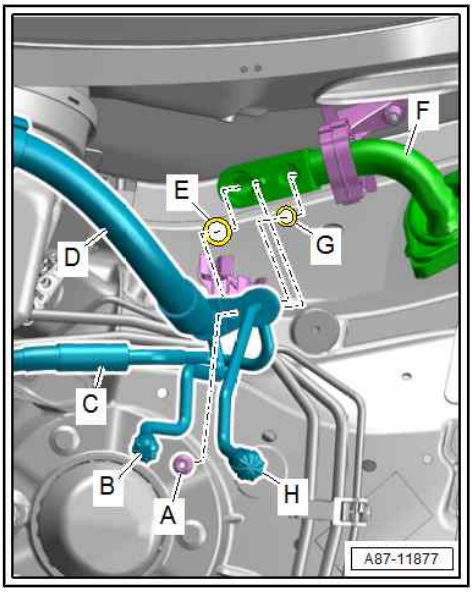
– Insert refrigerant lines -C, D- to expansion valve and service connections -B, H- in bracket after attaching them to internal heat exchanger -F-.

– Tighten nut -A-.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit
⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .



Tightening torques

♦ ⇒ “2.2 Exploded view - refrigerant lines”, page 48

2.15.2 Removing and installing refrigerant lines in plenum chamber - Q5 vehicles with high-voltage system

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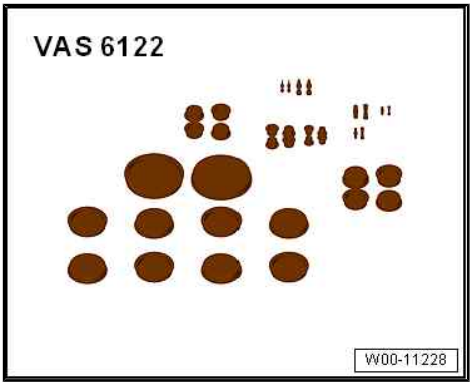
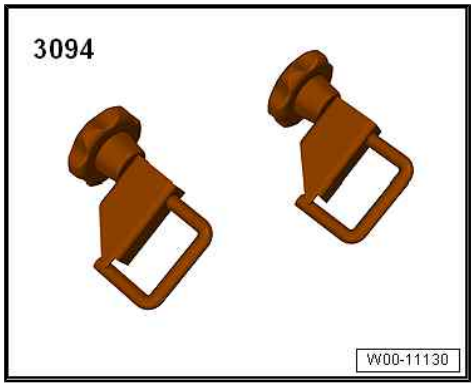
Special tools and workshop equipment required

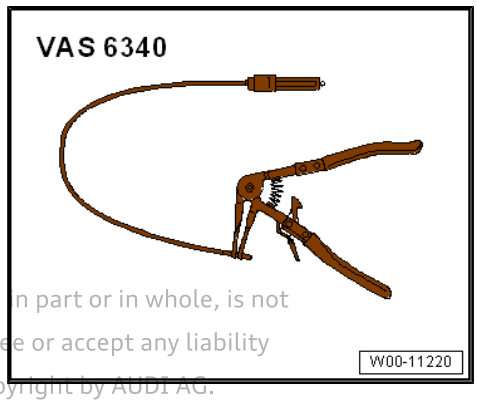
♦ Engine bung set - VAS 6122-



- Hose clamps up to 25 mm - 3094-



- Hose clip pliers - VAS 6340-



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Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove windscreen wiper motor ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Removing and installing windscreen wiper motor - V- .

Removing refrigerant line leading from refrigerant shut-off valve - V424- with branch to expansion valve 2 - N637- to refrigerant line with internal heat exchanger ⇒ page 91

Removing refrigerant line leading from refrigerant shut-off valve - V424- to expansion valve 1 ⇒ page 91

Removing refrigerant line leading from refrigerant line with internal heat exchanger to refrigerant expansion valve 1 - N636- ⇒ page 92

Removing refrigerant line leading from heat exchanger for high-voltage battery to expansion valve 2 ⇒ page 93

Removing refrigerant line from heat exchanger for high-voltage battery into engine compartment ⇒ page 94

Removing refrigerant line leading from refrigerant shut-off valve - V424- with branch to expansion valve 2 - N637- to refrigerant line with internal heat exchanger

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

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- Release refrigerant expansion valve 2 - N637- from bracket and disconnect refrigerant line. Remove refrigerant expansion valve 2 - N637-
  ⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150 .
- Disconnect refrigerant line at refrigerant shut-off valve - V424-
  ⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81 .
- Pull brake system pressure accumulator - VX70- off rubber mountings at bracket and place on one side with wiring connected ⇒ Brake system; Rep. gr. 47 ; Brake servo/brake master cylinder; Exploded view - brake servo/brake master cylinder .
- Disconnect refrigerant line at refrigerant line with internal heat exchanger
  ⇒ “2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system”, page 85 .
- Remove refrigerant line.

Removing refrigerant line leading from refrigerant shut-off valve - V424- to expansion valve 1

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

- Disconnect refrigerant line at refrigerant shut-off valve - V424-
  ⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81 .
- Disconnect refrigerant line at refrigerant expansion valve 1 - N636-
  ⇒ “2.16 Removing and installing expansion valve”, page 96 .

– Remove refrigerant line.

Removing refrigerant line leading from refrigerant line with internal heat exchanger to refrigerant expansion valve 1 - N636-

– Remove body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
– Pull brake system pressure accumulator - VX70- off rubber mountings at bracket and place on one side with wiring connected ⇒ Brake system; Rep. gr. 47 ; Brake servo/brake master cylinder; Exploded view - brake servo/brake master cylinder .

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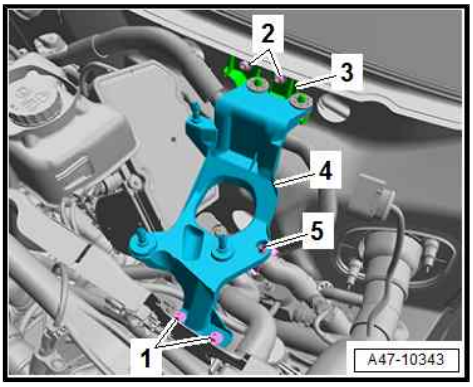

– Remove bolts -1-.
– Unclip coolant hose -5- at bracket for brake system pressure accumulator -4-.
– Pull bracket -4- for brake system pressure accumulator upwards off bracket -3- and detach.

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

– Disconnect refrigerant line at refrigerant line with internal heat exchanger
⇒ “2.14.2 Removing and installing refrigerant line with internal heat exchanger - Q5 vehicles with high-voltage system”, page 85 .
– Disconnect refrigerant line at refrigerant expansion valve 1 - N636-
⇒ “2.16 Removing and installing expansion valve”, page 96 .
– Remove refrigerant line.

Removing refrigerant line leading from heat exchanger for high-voltage battery to expansion valve 2

– Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

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– Disconnect refrigerant line at refrigerant expansion valve 2 - N637-
⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150 .
– Remove heat exchanger for high-voltage battery
⇒ “2.8 Removing and installing heat exchanger for high-voltage battery”, page 70 .
– Remove refrigerant line.

Removing refrigerant line from heat exchanger for high-voltage battery into engine compartment

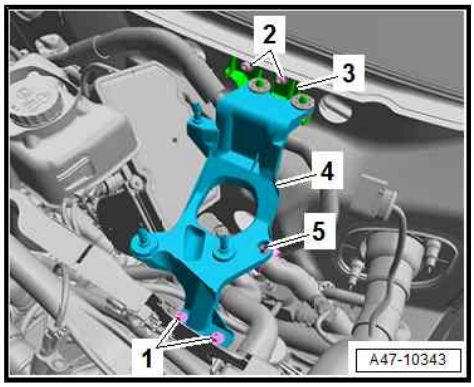
– Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .

– Pull brake system pressure accumulator - VX70- off rubber mountings at bracket and place on one side with wiring connected ⇒ Brake system; Rep. gr. 47 ; Brake servo/brake master cylinder; Exploded view - brake servo/brake master cylinder .

– Remove bolts -1-.

– Unclip coolant hose -5- at bracket for brake system pressure accumulator -4-.

– Pull bracket -4- for brake system pressure accumulator upwards off bracket -3- and detach.

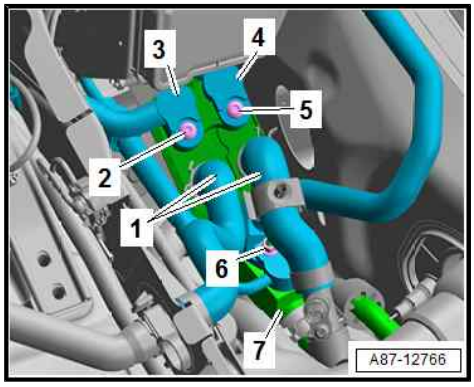


⚠ CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

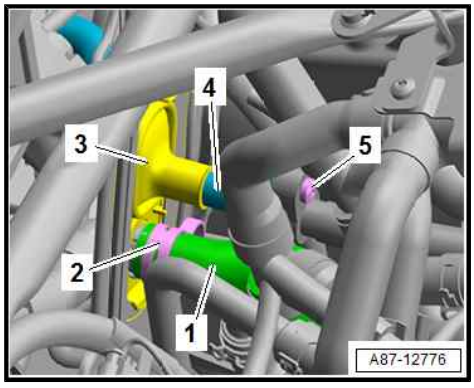
- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolt -2- and detach refrigerant line -3-.

– Clamp off coolant hose -1- before and after coupling point with hose clamps up to 25 mm - 3094- .

– Remove bolt -5- and disconnect refrigerant line -4-.



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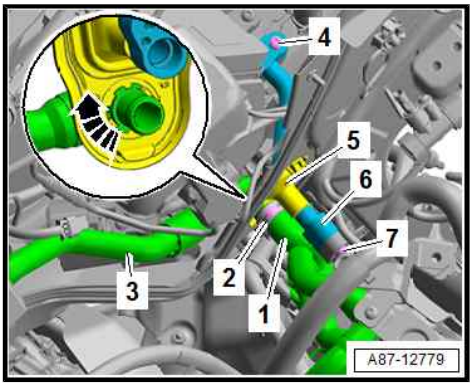

- Catch escaping coolant and determine volume which has escaped.

– Loosen hose clip -2- and detach coolant hose -1-.

– Unclip grommet -5- and disengage connection for coolant hose -3- by turning it approx. 45°.

– Detach refrigerant line -6- with grommet -5-.

Installing

Installation is carried out in reverse order; note the following:

– Renew all O-rings; lubricate them lightly with refrigerant oil before fitting ⇒ “4.12 Refrigerant circuit seals”, page 16 (different versions ⇒ Electronic parts catalogue).

– Thoroughly clean expansion valve, leadthrough and refrigerant lines in connection area and check for damage.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– If less than 500 ml of coolant has escaped from high-voltage coolant circuit, top up coolant and bleed cooling system (high-voltage coolant circuit) ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– If more than 500 ml of coolant has escaped from high-voltage coolant circuit, drain and then refill cooling system (high-voltage coolant circuit) ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system; Exploded view - windscreen wiper system
- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links
- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel

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2.16 Removing and installing expansion valve

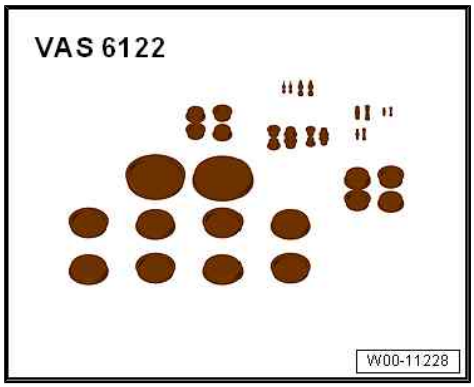
⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96

⇒ “2.16.2 Removing and installing expansion valve (front)”, page 98

2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

Q5 with high-voltage system

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

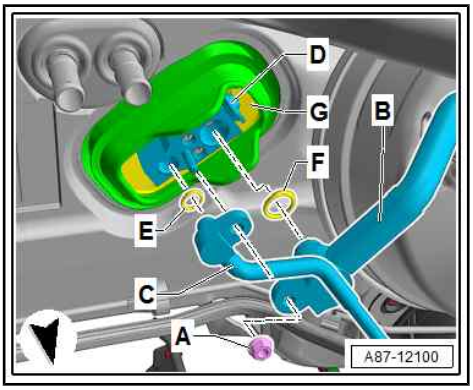
– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove nut -A-.

Vehicles without high-voltage system

– Disconnect refrigerant line -B- at refrigerant line with internal heat exchanger
⇒ “2.15 Removing and installing refrigerant lines in plenum chamber”, page 88 .

All vehicles (continued)

– Remove both refrigerant lines -B, C- from expansion valve (front) -D-.

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Installing

Installation is carried out in reverse order; note the following:

- Lubricate O-rings -E, F- lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– Make sure that support ring -G- is correctly positioned and that grommet in plenum chamber back wall is not damaged and is fitted properly.

– Thoroughly clean all connections in expansion valve -D- and at refrigerant lines -B- and -C- and check for damage.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

Q5 with high-voltage system

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Start up air conditioner after charging refrigerant circuit
⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

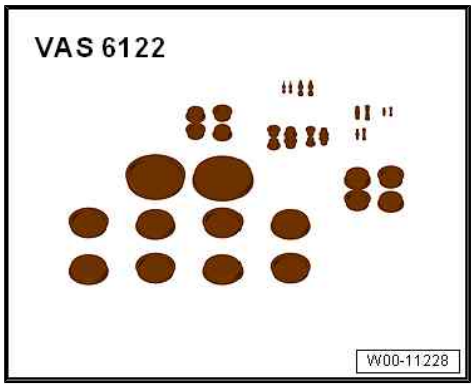
◆ ⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51

- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53

2.16.2 Removing and installing expansion valve (front)

Special tools and workshop equipment required

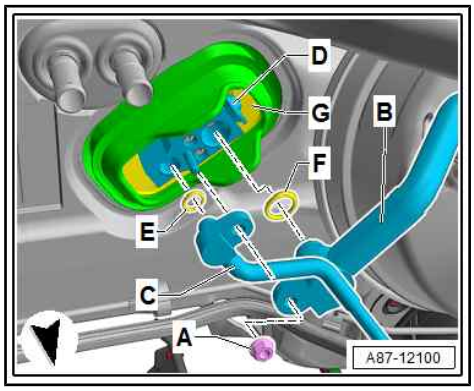
- Engine bung set - VAS 6122-



Removing

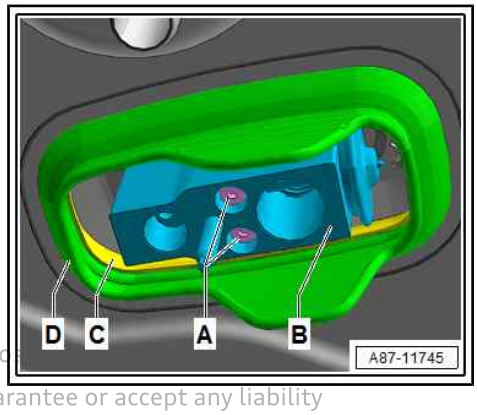
- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Detach refrigerant lines -B, C- from expansion valve -D- at front and place to one side (do not remove)
⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96 .



– Unscrew bolts -A-.

– Detach expansion valve -B- from refrigerant lines to evaporator.



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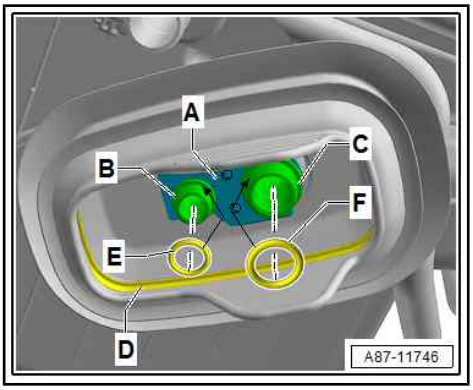
Installing

Installation is carried out in reverse order; note the following:

- Lubricate O-rings -E, F- lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .
- Install refrigerant lines so that they are free of tension.

– Make sure that support ring -D- is correctly positioned and that grommet in plenum chamber back wall is not damaged and is fitted properly.

– Clean connecting pipes -B- and -C- leading to evaporator and check for damage.

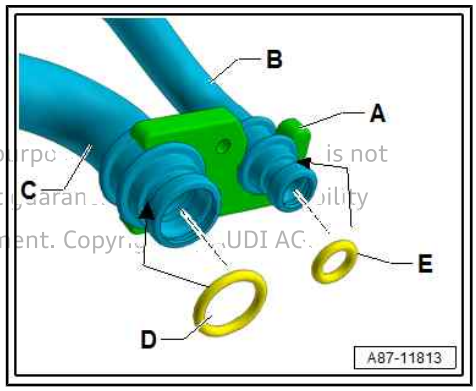


– Check that retainer -A- is seated correctly on evaporator connecting pipes -B- and -C-.

– Insert O-rings -D- and -E- in grooves on connecting pipes -B- and -C- -arrows-.

– Thoroughly clean expansion valve and refrigerant lines in connection area and check for damage.

– Make sure that O-rings are correctly positioned in grooves of refrigerant line connections at refrigerant lines -B, C-.



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Tightening torques

- ⇒ “2.2.2 Exploded view - components underneath wing and in plenum chamber, vehicles without high-voltage system”, page 51
- ⇒ “6.4 Exploded view - evaporator housing”, page 245

2.17 Removing and installing condenser

⇒ “2.17.1 Removing and installing condenser - all vehicles except RS models, Q5 vehicles with high-voltage system and SQ5 vehicles with TDI engine”, page 99

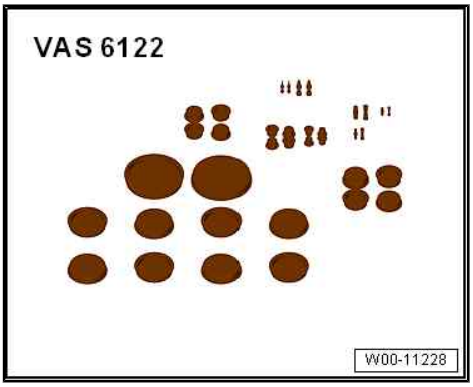
⇒ “2.17.2 Removing and installing condenser - RS models”, page 101

⇒ “2.17.3 Removing and installing condenser - Q5 vehicles with high-voltage system and SQ5 vehicles with TDI engine”, page 102

2.17.1 Removing and installing condenser - all vehicles except RS models, Q5 vehicles with high-voltage system and SQ5 vehicles with TDI engine

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
- Observe notes on condenser ⇒ “4.6 Installing radiators and condensers”, page 13 .

– Remove lock carrier cover and closure plate for bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .

– Vehicles with electric radiator blinds: Remove radiator blinds ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fan(s); Removing and installing radiator blind .

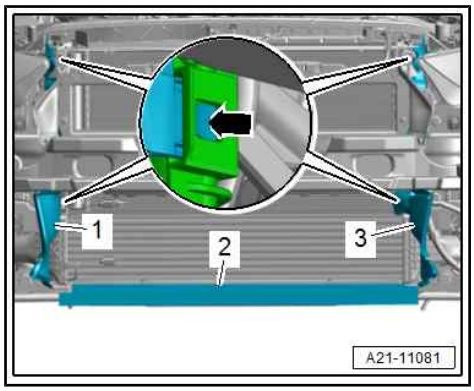
A4/A5 or S4/S5 vehicles with 6-cylinder TDI engine

– Remove charge air cooler ⇒ Engine; Rep. gr. 21 ; Charge air system; Removing and installing charge air cooler .

All vehicles (continued)

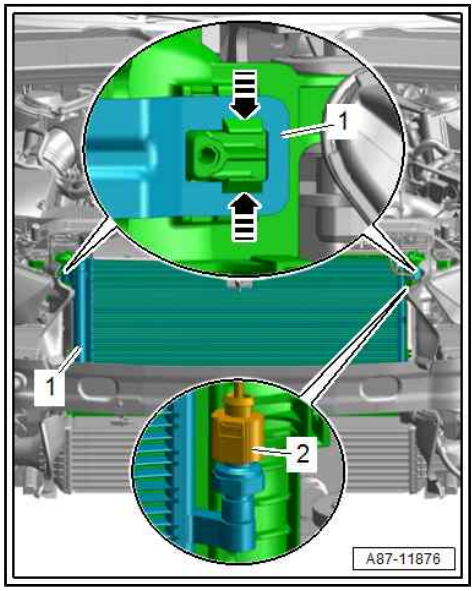
– Release catches -arrow- and detach air ducts -1, 3-.

– Separate refrigerant lines from condenser ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112 .



– Unplug electrical connector -2- for high-pressure sender - G65- .

– Release fasteners -arrows- on both sides, disengage condenser -1- from radiator and remove downwards.



Installing

Installation is carried out in reverse order; note the following:

– When it has been removed, the condenser contains refrigerant oil which must be returned to the refrigerant circuit (together with the new condenser) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

◆ ⇒ “2.2.1 Exploded view - air conditioner compressor, condenser and components underneath wing, vehicles without high-voltage system”, page 48

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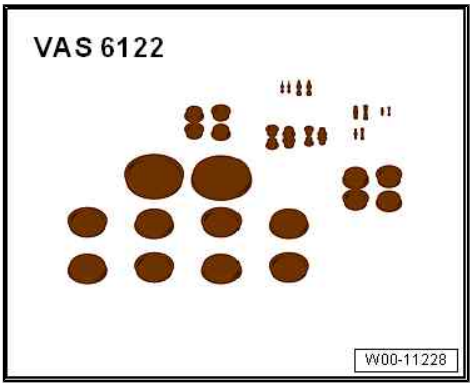
2.17.2 Removing and installing condenser - RS models

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



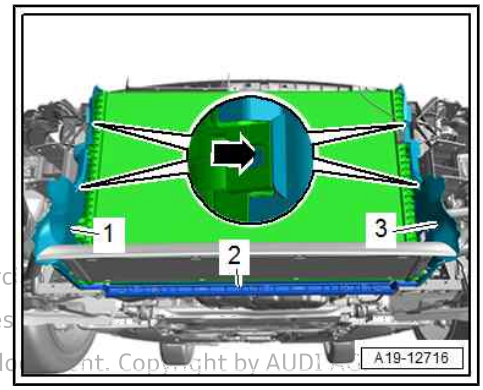
Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
- Observe notes on condenser ⇒ “4.6 Installing radiators and condensers”, page 13 .

– Remove bracket for bumper cover together with impact bar ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

– Separate refrigerant lines from condenser ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112 .

– Release catches -arrow- and detach air ducts -1, 3-.



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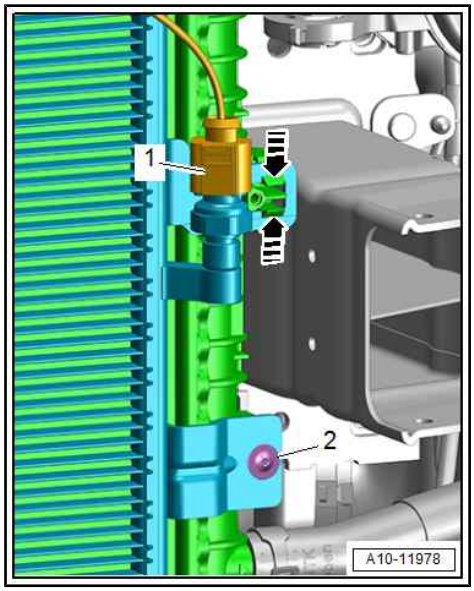
– Unplug electrical connector -1- for high-pressure sender - G65- .

– Remove bolt -2-.

– Release fasteners -arrows- on both sides, disengage condenser from radiator and detach it.



Installing

Installation is carried out in reverse order; note the following:

– When it has been removed, the condenser contains refrigerant oil which must be returned to the refrigerant circuit (together with the new condenser) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ “2.3 Exploded view - condenser”, page 60
- ⇒ “2.2.1 Exploded view - air conditioner compressor, condenser and components underneath wing, vehicles without high-voltage system”, page 48

2.17.3 Removing and installing condenser - Q5 vehicles with high-voltage system and SQ5 vehicles with TDI engine

Special tools and workshop equipment required

- Engine bung set - VAS 6122-

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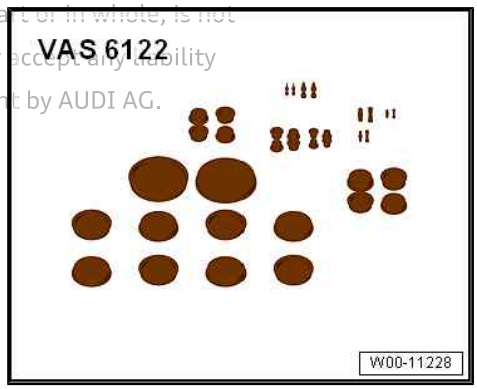


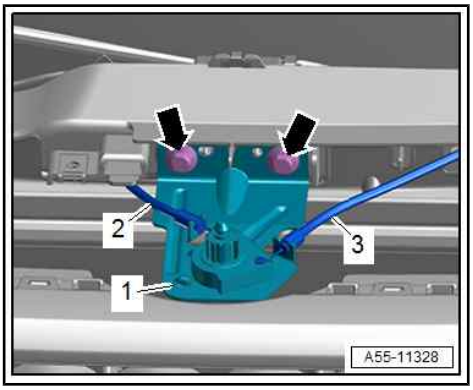
Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
- Observe notes on condenser ⇒ “4.6 Installing radiators and condensers”, page 13 .

– Remove lock carrier cover and closure plate at bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .

– Unscrew bolts -arrows- on mounting bracket -1- for operating lever for arrester.

– Detach mounting bracket -1- and move Bowden cables -2, 3- clear.

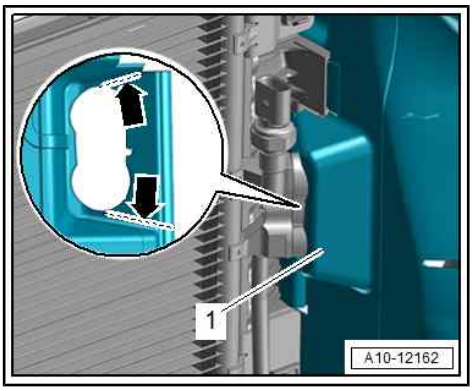


Q5 with high-voltage system

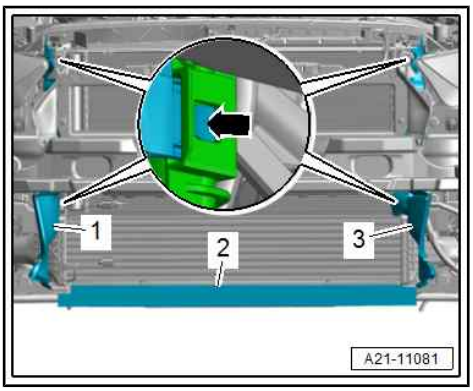
– Remove radiator for battery cooling circuit and leave it in installation position with coolant lines attached ⇒ Engine; Rep. gr. 19 ; Radiators/radiator fans; Exploded view - radiators/ radiator fans .

All vehicles (continued)

– Use side-cutting pliers to cut open air duct -1- in area of opening for refrigerant lines -arrows-.

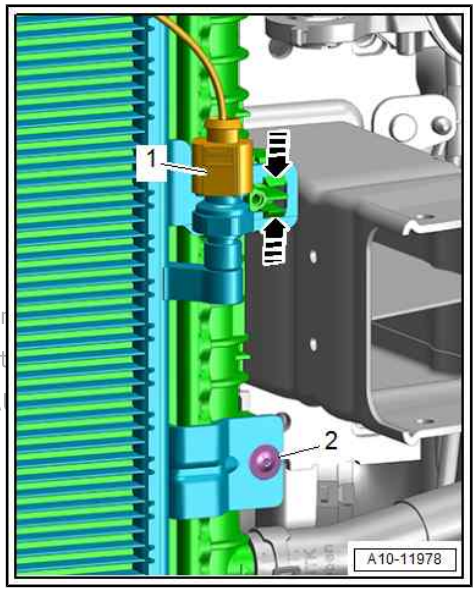


– Release fasteners -arrow- (left-side only), turn air duct -3- inwards and detach it upwards.



– If fitted, unplug electrical connector -1- for high-pressure sender - G65- .

– Separate refrigerant lines from condenser ⇒ “2.19 Detaching and attaching refrigerant lines at condenser”, page 112 .



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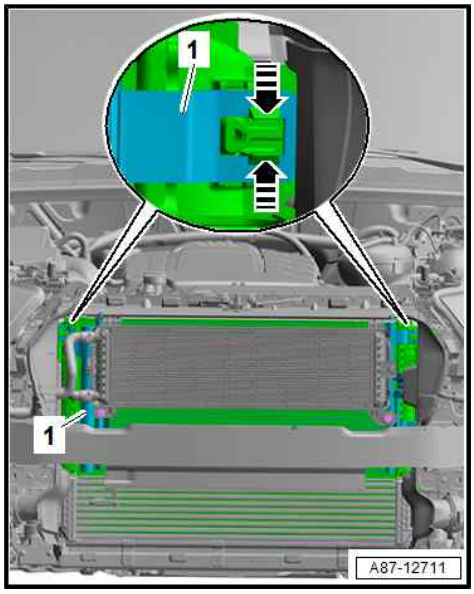
– Release fasteners -arrows- on both sides, disengage condenser -1- from radiator and remove upwards.



Installing

Installation is carried out in reverse order; note the following:

– When it has been removed, the condenser contains refrigerant oil which must be returned to the refrigerant circuit (together with the new condenser) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

Q5 with high-voltage system

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover

2.18 Removing and installing non-return valves in refrigerant circuit

⇒ “2.18.1 Removing and installing non-return valve in refrigerant line with internal heat exchanger”, page 104

⇒ “2.18.2 Removing and installing non-return valve in refrigerant line from refrigerant receiver”, page 106

⇒ “2.18.3 Removing and installing non-return valve in refrigerant line from condenser”, page 108

⇒ “2.18.4 Removing and installing non-return valve in refrigerant line from valve unit”, page 110

2.18.1 Removing and installing non-return valve in refrigerant line with internal heat exchanger

Special tools and workshop equipment required

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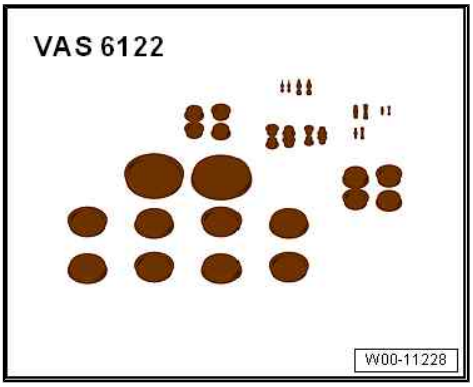
♦ Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
- There are different versions of the non-return valves (different connections and internal diameters for flow rate); ensure correct allocation ⇒ Electronic parts catalogue .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

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– Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

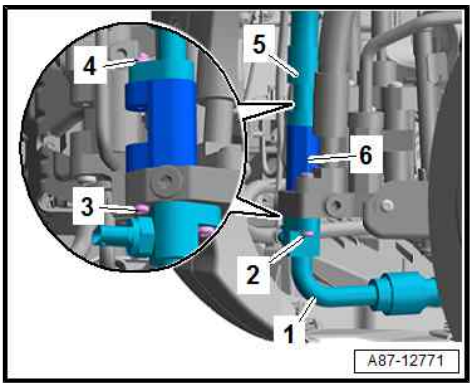
– Unfasten wheel housing liner (front left) and press towards rear ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

⚠ CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

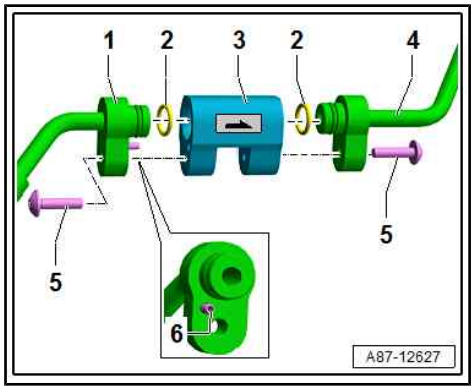


– Unscrew bolt -2- and disconnect refrigerant line -1- from connection.

– Unscrew bolts -3, 4- and disconnect refrigerant line -5- from connection.

– Detach non-return valve -6-.

Installing



- Pay attention to direction of flow of non-return valve -3- (sticker).

– Renew O-rings -2-
⇒ “4.12 Refrigerant circuit seals”, page 16 .

– If fitted, check that dowel pins -6- at connections are not damaged and are seated correctly.

– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit
⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

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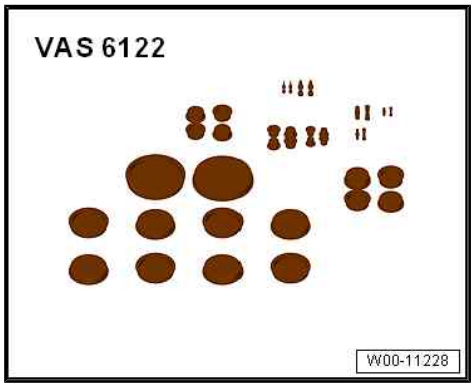
2.18.2 Removing and installing non-return valve in refrigerant line from refrigerant receiver

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
- There are different versions of the non-return valves (different connections and internal diameters for flow rate); ensure correct allocation ⇒ Electronic parts catalogue .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and

charge refrigerant circuit" routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

– Unfasten wheel housing liner (front left) and press towards rear ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

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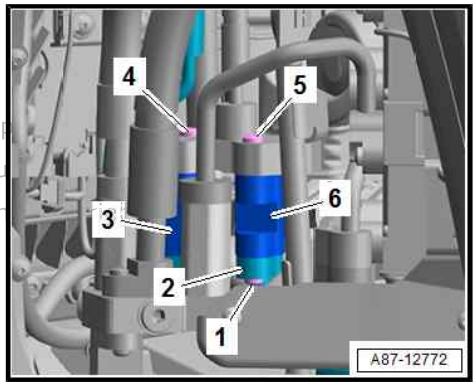


– Unscrew bolt -1- and disconnect refrigerant line -2- to refrigerant receiver from connection.

– Remove bolt -5- and detach non-return valve -6-.

Installing

Installation is carried out in reverse order; note the following:

- Pay attention to direction of flow of non-return valve -3- (sticker).

– Renew O-rings -2- ⇒ “4.12 Refrigerant circuit seals”, page 16 .

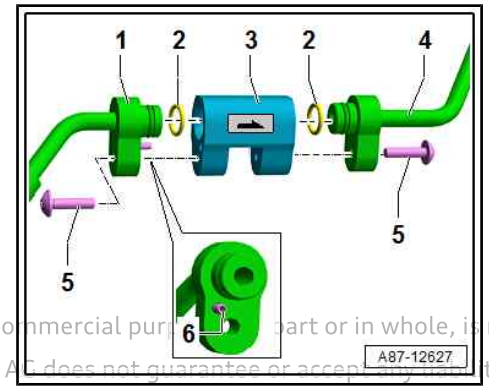
– If fitted, check that dowel pins -6- at connections are not damaged and are seated correctly.

– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .



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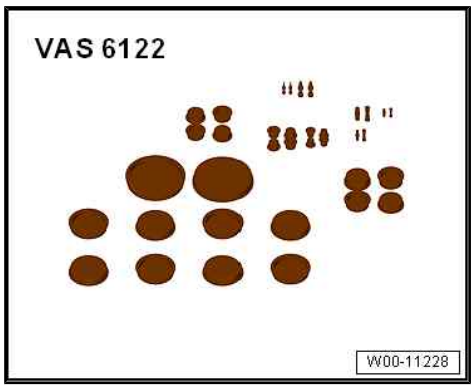
Tightening torques

- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

2.18.3 Removing and installing non-return valve in refrigerant line from condenser

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
- There are different versions of the non-return valves (different connections and internal diameters for flow rate); ensure correct allocation ⇒ Electronic parts catalogue .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and

charge refrigerant circuit" routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

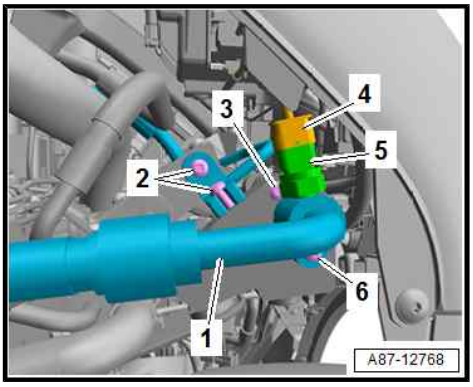
– Unfasten wheel housing liner (front left) and press towards rear ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

⚠ CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolts -2-.

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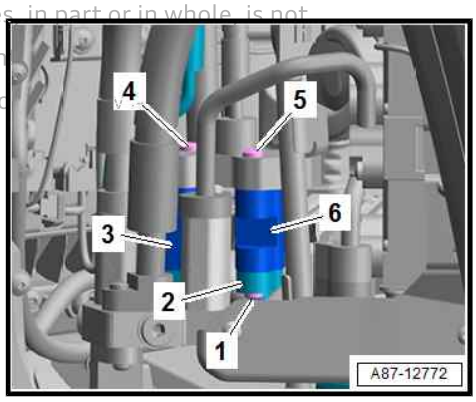
– Unscrew bolt -4- and disconnect refrigerant line from connection.

– Detach non-return valve -3-.



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Installing

Installation is carried out in reverse order; note the following:

- Pay attention to direction of flow of non-return valve -3- (sticker).

– Renew O-rings -2- ⇒ “4.12 Refrigerant circuit seals”, page 16 .

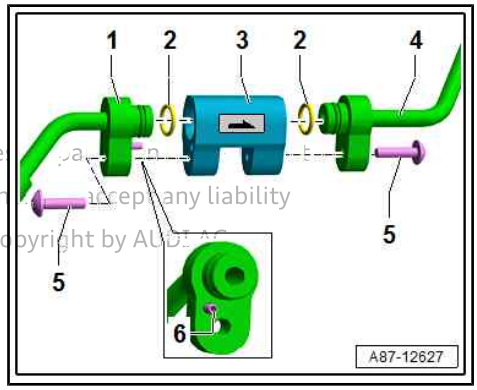
– If fitted, check that dowel pins -6- at connections are not damaged and are seated correctly.

– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .



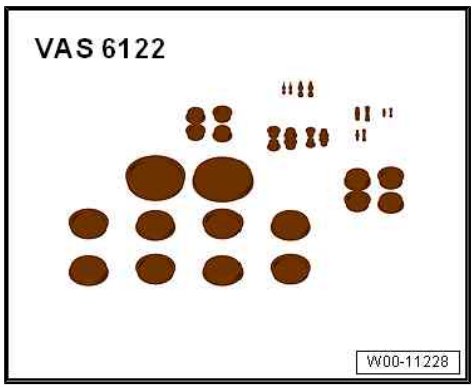
Tightening torques

- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

2.18.4 Removing and installing non-return valve in refrigerant line from valve unit

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .
- There are different versions of the non-return valves (different connections and internal diameters for flow rate); ensure correct allocation ⇒ Electronic parts catalogue .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and

charge refrigerant circuit" routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

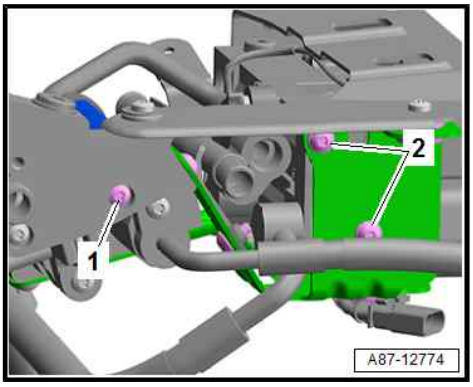
– Unfasten wheel housing liner (front left) and press towards rear ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

⚠ CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

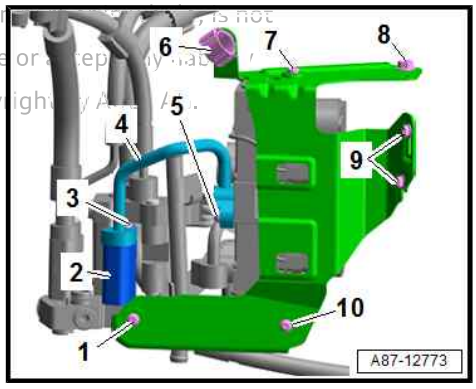
- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolts -2- at bottom on bracket for valve unit and bolt -1- on non-return valve.

– Remove bolts -1, 7, 10- on bracket for valve unit.

– Remove bolt -3- on non-return valve -2- and bolt -5- on connection at valve unit.



• The fixed coolant line -4- must not be deformed or strained.

– Press valve unit slightly to one side and pull refrigerant line -4- out of valve unit by turning non-return valve -2- slightly.

– Detach non-return valve -2-.

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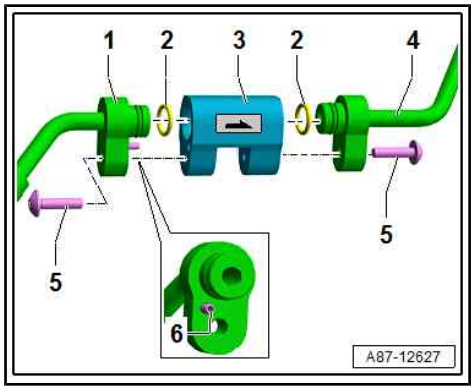
Installing



Installation is carried out in reverse order; note the following:

- Pay attention to direction of flow of non-return valve -3- (sticker).

– Renew O-rings -2- ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– If fitted, check that dowel pins -6- at connections are not damaged and are seated correctly.

– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

– Re-install components removed previously in reverse order and/or re-attach detached components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

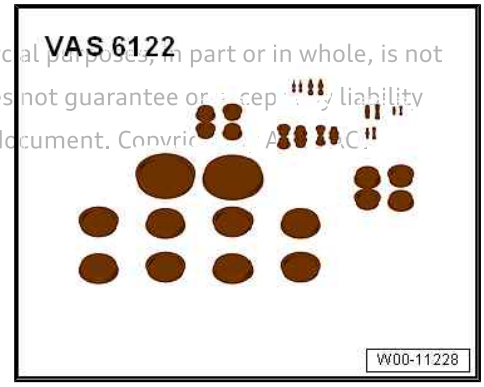
Tightening torques

- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

2.19 Detaching and attaching refrigerant lines at condenser

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



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Detaching

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

Vehicles with high-voltage system

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and

charge refrigerant circuit" routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove air intake grille (left-side) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .

RS 4/RS 5

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

SQ5

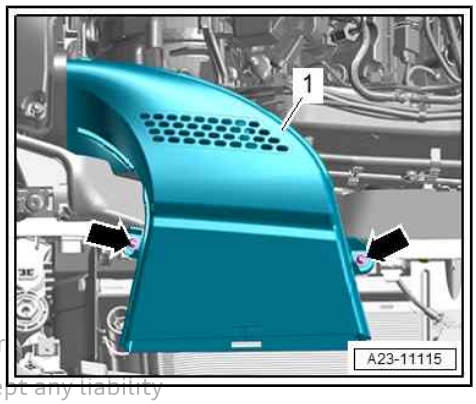
– Remove lock carrier cover, air intake grille (left and right) and closure plate at bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .

Q5 with high-voltage system

– Remove lock carrier cover and closure plate at bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .

SQ5, Q5 vehicles with high-voltage system

– Remove bolts -arrows- and detach air duct -1-.



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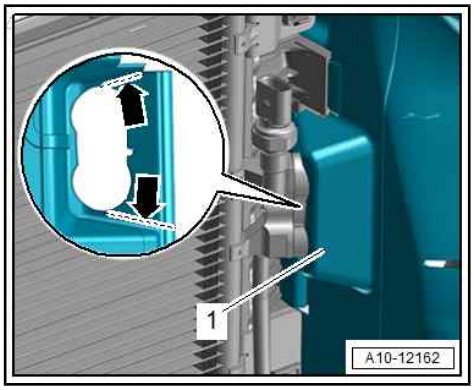
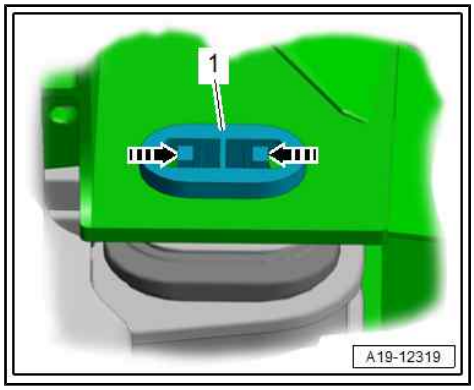
– Use side-cutting pliers to cut open air duct -1- in area of opening for refrigerant lines -arrows-.

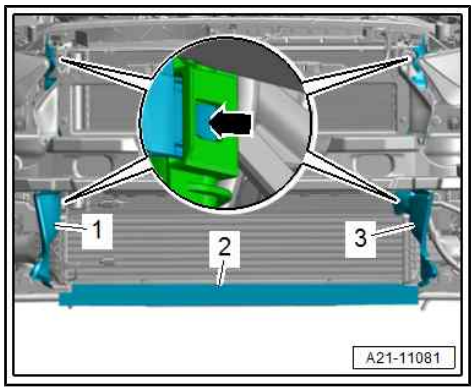


SQ5

– Release fasteners -arrows- on both sides and pull out retaining pins -1- for radiator upwards.

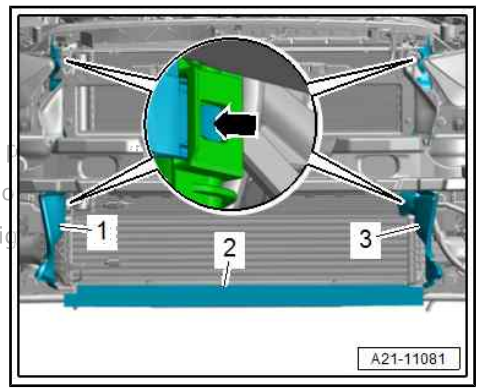


– Release catches -arrow- and detach air ducts -1, 3-.



Q5 with high-voltage system

– Release fasteners -arrow- (left-side only), turn air duct -3- inwards and detach it.



SQ5

– Secure top of radiator again with retaining pins.

All vehicles (continued)

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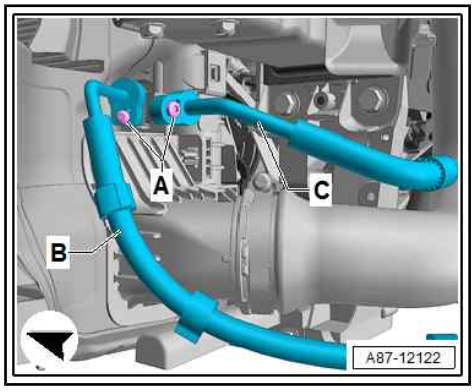
Version 1

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolt -A-.

– Detach refrigerant lines -B, C- from connections at condenser.

– Seal off open connections in lines and at condenser using clean plugs, e.g. from engine bung set - VAS 6122- .

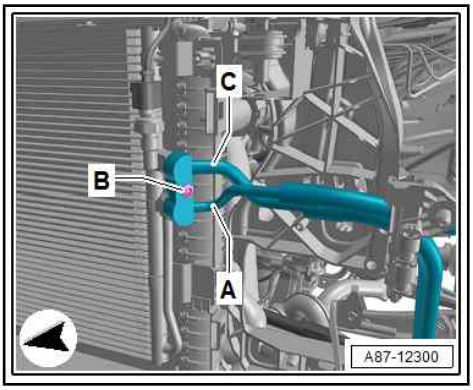
Version 2

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolt -B-.

– Detach refrigerant lines -A, C- from connections at condenser.

– Seal off open connections in lines and at condenser using clean plugs, e.g. from engine bung set - VAS 6122- .

Attaching

Install in reverse order of removal (same procedure for both versions); note the following:

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- Lubricate O-rings lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– Clean refrigerant line connections at condenser and refrigerant lines and check for damage.

– Check that dowel pin (fitted in connection at condenser or refrigerant line, not provided at all connections) is not damaged and is seated correctly.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

Q5 with high-voltage system

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ “2.2 Exploded view - refrigerant lines”, page 48
- ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front)

2.20 Removing and installing desiccant bag/ desiccant cartridge

Removing

Vehicles with high-voltage system

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

All vehicles (continued)

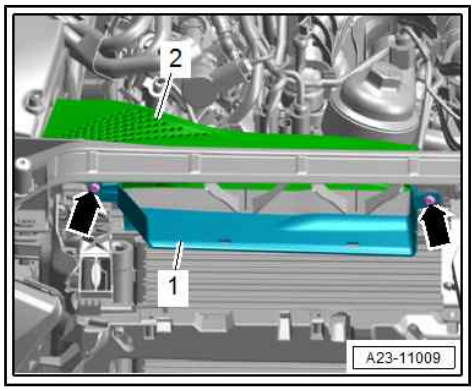
– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .

– Vehicles with electric radiator blinds: Remove radiator blinds ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fan(s); Removing and installing radiator blind .

– If fitted, remove bolts -arrows- and detach air duct -1-.



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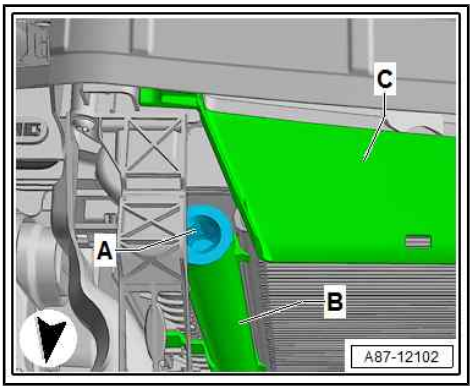
CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



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– Unscrew plug -A-.

– Pull desiccant bag out of receiver -B- of condenser ⇒ “2.3 Exploded view - condenser”, page 60 .

– Seal off open connection on receiver for condenser using screw plug -A- to prevent dirt and moisture from entering.

Installing

Installation is carried out in reverse order; note the following:

♦ Check receiver ⇒ Item 7 (page 61) ; if it is dirty, clean refrigerant circuit or renew condenser if necessary ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit .

♦ Make sure that receiver and thread on condenser are not damaged by checking through opening ⇒ Item 6 (page 61) , ⇒ “2.3 Exploded view - condenser”, page 60 .

♦ Renew screw plug -A- and the two O-rings (supplied together with dryer ⇒ “2.3 Exploded view - condenser”, page 60 and ⇒ Electronic parts catalogue).

♦ Lubricate O-rings lightly with refrigerant oil before fitting ⇒ “4.12 Refrigerant circuit seals”, page 16 .

♦ Make sure O-rings are seated correctly in grooves of corresponding components.

♦ Keep the storage bag with the air-tight seal containing the desiccant bag closed as long as possible. Only open bag immediately before inserting desiccant cartridge in receiver of condenser. After opening bag, desiccant cartridge soon becomes saturated with moisture from ambient air and becomes unusable ⇒ “2.3 Exploded view - condenser”, page 60 .

– Take desiccant bag out of its bag and insert it in receiver ⇒ “2.3 Exploded view - condenser”, page 60 .

– Screw in plug -A- with O-rings ⇒ “2.3 Exploded view - condenser”, page 60 .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

Vehicles with high-voltage system

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Start up air conditioner after charging refrigerant circuit
⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121.

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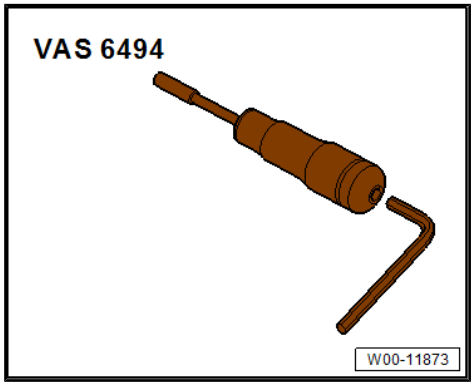
Tightening torques

- ⇒ “2.3 Exploded view - condenser”, page 60

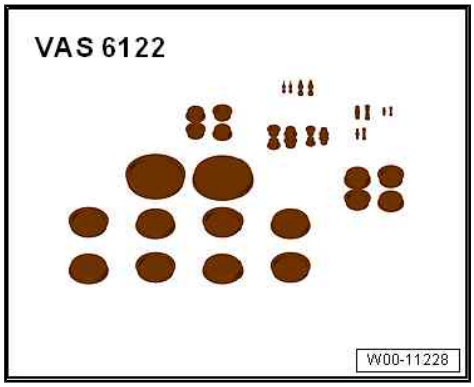
2.21 Removing and installing evacuating and charging valve (low-pressure and high-pressure sides)

Special tools and workshop equipment required

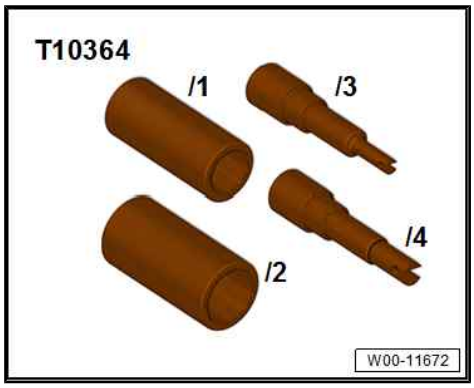
- Torque screwdriver - VAS 6494-



- Engine bung set - VAS 6122-



- Adapter set for service connections - T10364-



- For further information on the service connection, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

Removing

Depending on vehicle version, installed in plenum chamber (left-side, next to brake fluid reservoir, as illustrated) underneath plenum chamber cover or in engine compartment (left-side)
⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 32 .

Vehicles with high-voltage system

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

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– Depending on fitting location: Open cover (left-side) -D- of plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

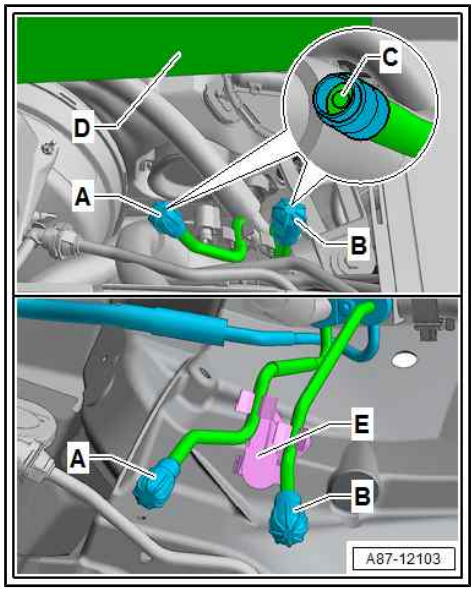
– Unscrew cap -A- or -B-.

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Unscrew valve -C- with suitable socket from adapter set for service connections - T10364- .

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Installing

Installation is carried out in reverse order; note the following:

♦ The evacuating and charging valves vary depending on the refrigerant type ⇒ Electronic parts catalogue .

– Check that refrigerant lines are attached properly to service connections in bracket -E-.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

Vehicles with high-voltage system

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

All vehicles (continued)

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

♦ Q5 with high-voltage system ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53

Vehicle model	Refrigerant	Component	Tightening torque
All models except Q5	All	Extracting and charging valve (low-pressure and high-pressure sides)	2.4 Nm
Q5	R134a, PR no. KK1	Extracting and charging valve (low-pressure and high-pressure sides)	2.4 Nm
Q5	R1234yf, PR no. KK3	Extracting and charging valve (low-pressure and high-pressure sides)	1.5 Nm

2.22 Starting up air conditioner after charging refrigerant circuit

⇒ “2.22.1 Procedure when starting the engine for the first time after charging the refrigerant circuit”, page 121

⇒ “2.22.2 Procedure if it is unavoidable to start the engine with an empty refrigerant circuit”, page 122

⇒ “2.22.3 Starting up air conditioner after charging refrigerant circuit - vehicles with high-voltage system”, page 122

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2.22.1 Procedure when starting the engine for the first time after charging the refrigerant circuit

- All components removed have been re-installed.
- The refrigerant circuit is charged ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging .
- Also observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging refrigerant circuit (before using air conditioner after it has been re-charged).
- If it has been removed, give the mechanically driven air conditioner compressor approx. 10 turns by hand prior to initial start-up (on or after installation, e.g. before fitting the belt) to prevent damage caused by fluid lock when first switched on (any refrigerant oil in the air conditioner compressor cylinder is forced out by the cranking action)
  ⇒ “4.5 Removing and installing air conditioner compressor”, page 181 .

If the air conditioner compressor has been renewed:

– Additionally perform test plan for automatic compressor run-in ⇒ Vehicle diagnostic tester.

Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

♦ Body

♦ Heating, ventilation, air conditioning system

♦ Self-diagnosis compatible systems

♦ 08 - AC/heater electronics - E87

♦ 08 - AC/heating electronics, functions

♦ 08 - Basic setting

♦ ⇒ Basic setting 3, compressor run-in

All vehicles (continued):

Proceed as follows when starting the engine for the first time after charging the refrigerant circuit:

– Open all dash panel vents.

– Switch on ignition.

– Set operating and display unit for front air conditioning system - E87- (and rear Climatronic operating and display unit - E265- on vehicles with “High” air conditioner) to “OFF”; lamps in A/C and A/C MAX buttons on -E87- off. Air conditioner and activation of air conditioner compressor via air conditioner compressor regulating valve - N280- are switched off.

– Start engine with air conditioner compressor switched off and wait for engine idling speed to stabilise.

Select following settings on operating and display unit for front air conditioning system - E87- :

• “Auto” mode (lamp in AUTO button on).

• Air conditioner compressor on - lamp in A/C button is on.

– On -E87- , select SYNC functions if possible.

– On -E87- (and on -E265- if fitted), check lamps in AUTO buttons. If these are off, press AUTO buttons.

– Set the temperature for the driver side (and the front passenger side) at -E87- to “cold”.

– Check temperature selected for passenger side on -E87- (and -E265- if fitted), and set to “cold” if necessary.

– Allow engine to idle for at least 5 minutes with air conditioner compressor switched on.

2.22.2 Procedure if it is unavoidable to start the engine with an empty refrigerant circuit

Should it be necessary to start the engine on a vehicle with an air conditioner compressor with no air conditioning system magnetic clutch - N25- after draining the refrigerant circuit:

♦ The refrigerant circuit must have been assembled completely.

♦ There must not be any vacuum in the refrigerant circuit.

♦ If air conditioner compressor was removed previously: There must be at least a quarter of the amount of refrigerant oil specified for this refrigerant circuit in the compressor.

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♦ Engine speed must not exceed 2500 rpm.

♦ The engine should only run as long as absolutely necessary (e.g. to move the vehicle in the workshop).

If only the refrigerant has been extracted (without removing the air conditioner compressor), the design of the refrigerant circuit ensures that there is sufficient refrigerant oil in the compressor to maintain lubrication of the compressor for a brief operating period.

2.22.3 Starting up air conditioner after charging refrigerant circuit - vehicles with high-voltage system

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “1 Safety precautions”, page 1 .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage ⇒ “1 Safety precautions”, page 1 .

Working with ignition switched on or high-voltage system active

- All components removed have been re-installed.
- The refrigerant circuit is charged ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging .
- Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Switch on ignition.

NOTICE

Risk of damage to electrically driven air conditioner compressor if air conditioner is started up when the refrigerant circuit is empty

– An electrically driven air conditioner compressor may only be started up when the refrigerant circuit is charged.

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– Start up the electrical air conditioner compressor - V470- via the “Compressor run-in” function; proceed as follows to do so.

Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

♦ Body

♦ Heating, ventilation, air conditioning system

♦ Self-diagnosis compatible systems

♦ C5 - Thermal management control unit J1024

♦ C5 - Basic setting

♦ ⇒ Compressor run-in, automatic start

2.23 Cleaning air conditioner refrigerant circuit - vehicles with high-voltage system

⇒ “2.23.1 Notes on cleaning (flushing) refrigerant circuit”, page 124

⇒ “2.23.2 Tools required for cleaning refrigerant circuit”, page 125

⇒ “2.23.3 Preparations for cleaning refrigerant circuit”, page 125

⇒ “2.23.4 Cleaning refrigerant circuit (routine 1)”, page 128

⇒ “2.23.5 Cleaning refrigerant circuit (routine 2)”, page 131

⇒ “2.23.6 Cleaning refrigerant circuit (routine 3) ”, page 134

⇒ “2.23.7 Cleaning refrigerant circuit (routine 4) ”, page 137

2.23.1 Notes on cleaning (flushing) refrigerant circuit

⇒ “2.23 Cleaning air conditioner refrigerant circuit - vehicles with high-voltage system”, page 124

- Before cleaning the refrigerant circuit of vehicles with a high-voltage system, various electrically operated valves must be in a certain position ⇒ Vehicle diagnostic tester. In addition, various components (non-return and shut-off valves) must be removed and replaced with manually activated shut-off valves ⇒ “2.23.4 Cleaning refrigerant circuit (routine 1)”, page 128 .
- To make sure that the entire refrigerant circuit is cleaned (flushed), the circuit must be flushed four times, with the refrigerant flowing in a different direction each time (see flushing routines “1” to “4”).
- Flush refrigerant circuit if particular problems occur which make it necessary to do so ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit .
- The cleanest, most environmentally responsible method of removing moisture, contaminants (e.g. abraded material from a defective air conditioner compressor) and old refrigerant oil is to clean (flush) the refrigerant circuit with refrigerant R134a or R1234yf as well. This conserves refrigerant and does not require extensive repair work.
- If only the air conditioner compressor needs to be renewed (e.g. due to an electrical fault), it is not always necessary to flush the entire refrigerant circuit. In this case, it may be sufficient to flush just the air conditioner compressor (e.g. to determine the amount of refrigerant oil in the air conditioner compressor after it has been removed) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning electrically driven air conditioner compressor .
- For additional information, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit .

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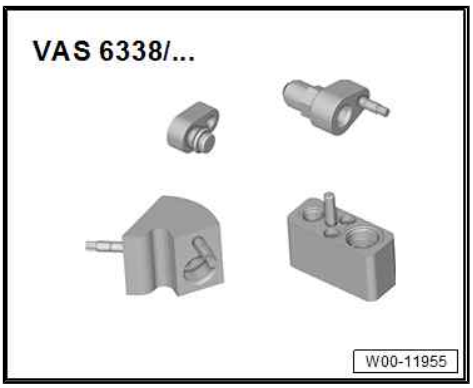
- After cleaning of the refrigerant circuit is complete, specific components must be renewed ⇒ page 140 .

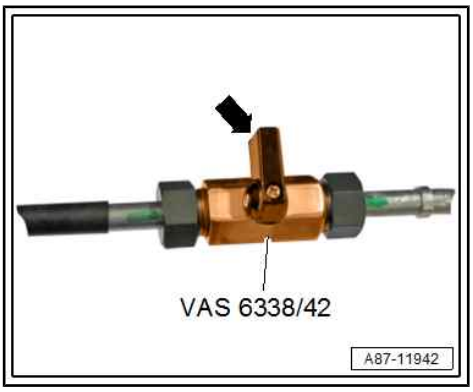
2.23.2 Tools required for cleaning refrigerant circuit

Special tools and workshop equipment required

- Air conditioner service station with flushing attachment (⇒ Electronic parts catalogue) and with sufficient refrigerant R134a or R1234yf ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit
- Adapters -VAS 6338/3- and -VAS 6338/12- from adapter set for refrigerant circuit - VAS 6338/1-



- Shut-off valve - VAS 6338/42-



- 2 x shut-off valve - VAS 6338/47-1- and 2 x shut-off valve - VAS 6338/47-2- from set of adapter valves - VAS 6338/47-

2.23.3 Preparations for cleaning refrigerant circuit

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “1 Safety precautions”, page 1 .

For the following steps, work in the vicinity of high-voltage system components is necessary. Therefore, perform a visual inspection of the high-voltage components and wiring to check for damage
⇒ “1 Safety precautions”, page 1 .

Working with ignition switched on or high-voltage system active

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DANGER

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

- **Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) de-energise the high-voltage system.**

- De-energise high-voltage system ⇒ Rep. gr. 93 ; De-energising high-voltage system .
- Switch on ignition.
- Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
- Switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .
- Switch off ignition.

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

- Remove electrically driven air conditioner compressor and attach adapters -VAS 6338/12- and -VAS 6338/3- to connection lines in vehicle
⇒ “4.5.5 Removing and installing electrically driven air conditioner compressor”, page 185 .

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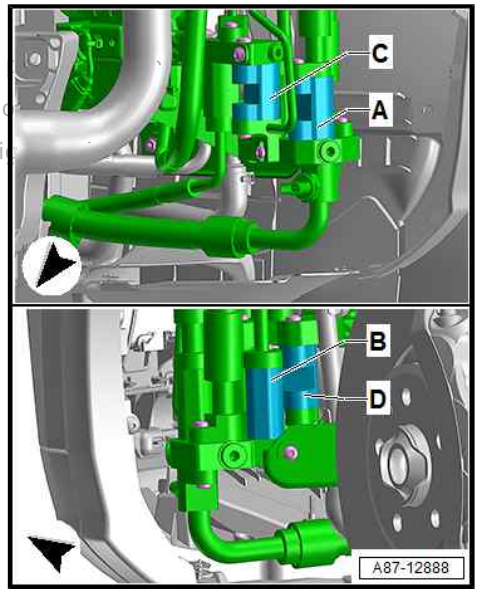
– Remove non-return valves -A, B, C, D- from refrigerant lines and install shut-off valves from adapter valve set - VAS 6338/47- in their place.



♦ Non-return valve -A- should be exchanged for shut-off valve - VAS 6338/47-2-
⇒ “2.18.1 Removing and installing non-return valve in refrigerant line with internal heat exchanger”, page 104 .

♦ Non-return valve -B- should be exchanged for shut-off valve - VAS 6338/47-1-
⇒ “2.18.4 Removing and installing non-return valve in refrigerant line from valve unit”, page 110 .

♦ Non-return valve -C- should be exchanged for shut-off valve - VAS 6338/47-1-
⇒ “2.18.3 Removing and installing non-return valve in refrigerant line from condenser”, page 108 .

♦ Non-return valve -D- should be exchanged for shut-off valve - VAS 6338/47-1-
⇒ “2.18.2 Removing and installing non-return valve in refrigerant line from refrigerant receiver”, page 106 .

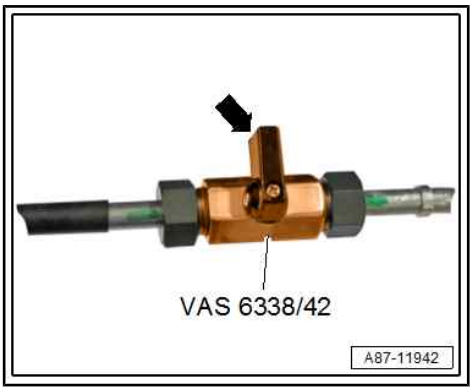
• It must be possible to move operating lever for shut-off valves from adapter valve set - VAS 6338/47- through its entire adjustment range after installation.

Note

♦ Mark allocation of shut-off valves -A, B, C, D- installed in vehicle to prevent mixing them up when opening/closing them before the different routines
⇒ “2.23.4 Cleaning refrigerant circuit (routine 1)”, page 128 .

– Remove expansion valve (front) and install adapter -VAS 6338/44- in its place
⇒ “2.16.2 Removing and installing expansion valve (front)”, page 98 .

– Remove refrigerant shut-off valve - V424- and install shut-off valve - VAS 6338/42- in its place
⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81 .



• It must be possible to move operating lever -arrow- through its entire adjustment range after installation.

– Remove desiccant bag from condenser receiver and then reseal receiver
⇒ “2.20 Removing and installing desiccant bag/desiccant cartridge”, page 116 .

– If necessary, clean filter element on cap before re-installing.

– Screw caps with seals onto both service connections of refrigerant circuit
⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 45 .

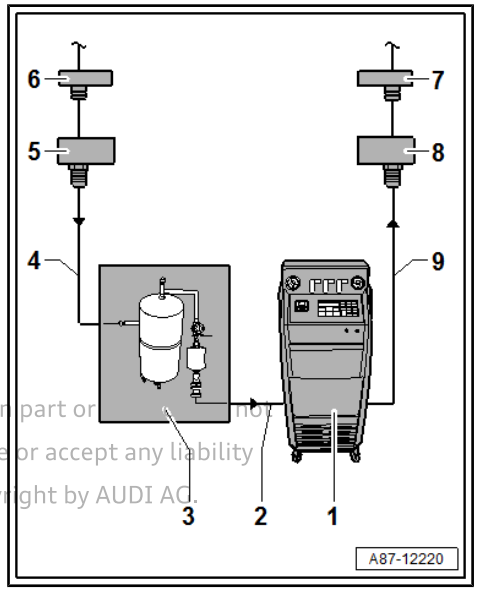
Note

♦ The refrigerant circuit cannot be evacuated properly if caps are not fitted, as air will enter when the vacuum in the refrigerant circuit causes the valves in the service connections to open.

– Connect air conditioner service station -1- to refrigerant circuit for flushing
⇒ “2.23.4 Cleaning refrigerant circuit (routine 1)”, page 128 .

♦ The -arrows- indicate the direction of refrigerant flow during the flushing procedure.

Connection diagram



1 - Air conditioner service station (with sufficient quantity of refrigerant)

2 - Refrigerant hose of air conditioner service station (low pressure side)

3 - Flushing device

4 - Refrigerant hose

5 - Adapter - VAS 6338/3-

6 - Vehicle refrigerant line with connection to air conditioner compressor (high-pressure side)

7 - Vehicle refrigerant line with connection to air conditioner compressor (low-pressure side)

8 - Adapter - VAS 6338/12-

9 - Refrigerant hose of air conditioner service station (high-pressure side)

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– Open all manual shut-off valves fitted in flushing circuit
⇒ “2.23.4 Cleaning refrigerant circuit (routine 1)”, page 128 .

– Evacuate flushing circuit using air conditioner service station.

♦ If the various electrically operated valves in the valve block (-N640- , -N641- , -N642- and -N643-) are not open or closed as specified, it will not be possible to clean all the components installed in the refrigerant circuit. The same applies to the electrically operated refrigerant expansion valve 2 - N637- .

♦ If the various manual shut-off valves installed are not in the correct position during the flushing procedure, it will not be possible to clean all the components installed in the refrigerant circuit.

♦ If one of the valves in the refrigerant circuit does not open or close correctly, the flushing procedure and subsequent evacuation of the refrigerant circuit may take considerably longer or, depending on the flow rate of the valve in question, may not be possible in the intended manner.

– Clean (flush out) first section of refrigerant circuit with refrigerant R134a or R1234yf
⇒ “2.23.4 Cleaning refrigerant circuit (routine 1)”, page 128 .

2.23.4 Cleaning refrigerant circuit (routine “1”)

In this flushing procedure, the following components are cleaned: evaporator in heater and air conditioning unit, condenser with receiver, part of valve block and corresponding refrigerant lines.

Requirements

♦ The preparations for cleaning the refrigerant circuit must have been carried out
⇒ “2.23.3 Preparations for cleaning refrigerant circuit”, page 125 .

Cleaning refrigerant circuit

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open or

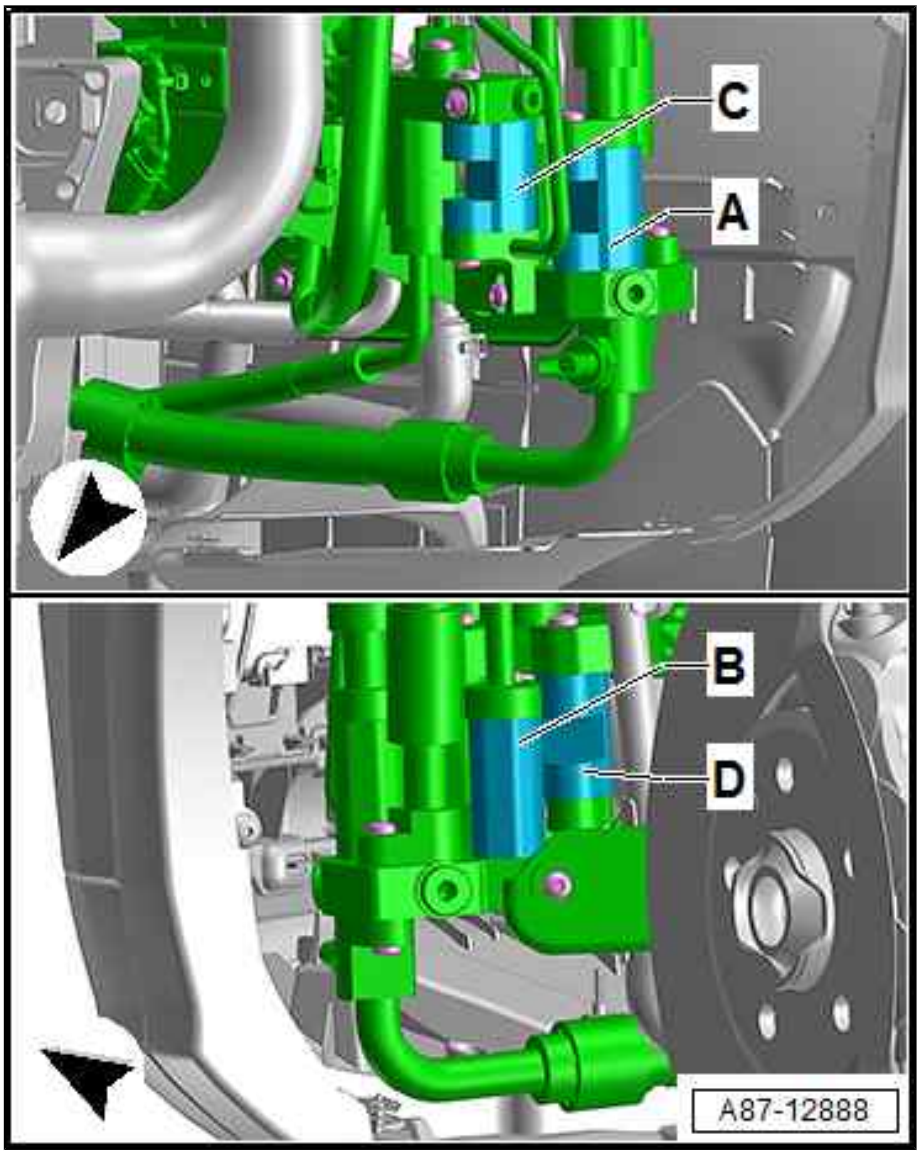
close the electrically activated valves for the first flushing procedure (flushing routine “1”) ⇒ Vehicle diagnostic tester.

1 - -A-
Shut-off valve - VAS 6338/47-2-

2 - -B-
Shut-off valve - VAS 6338/47-1-

3 - -C-
Shut-off valve - VAS 6338/47-1-

4 - -D-
Shut-off valve - VAS 6338/47-1-



– Close or open shut-off valves fitted in flushing circuit as shown in the following illustrations.

♦ The following illustrations only apply to components that are directly affected by the flushing procedure; for all components not described refer to
⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 45 .

♦ The colours of the lines in the following illustrations indicate which components are flushed (red lines) due to the different valve positions, which are only filled with refrigerant (green lines) and which are not affected (blue lines).

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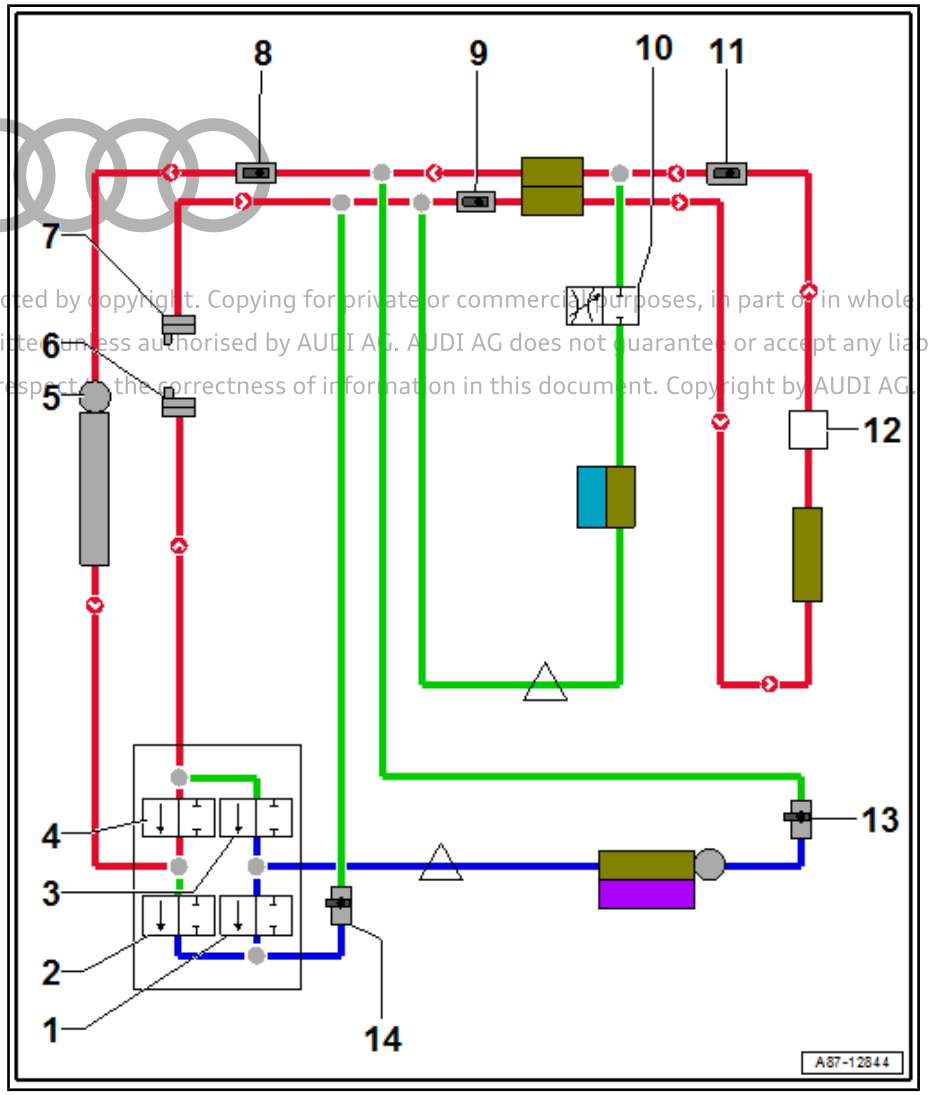

1 - Refrigerant shut-off valve 4 - N642- (closed via Basic setting function)

2 - Refrigerant shut-off valve 5 - N643- (closed via Basic setting function)

3 - Refrigerant shut-off valve 2 - N640- (closed via Basic setting function)

4 - Refrigerant shut-off valve 3 - N641- (opened via Basic setting function)

5 - Receiver on condenser (desiccant bag removed and re-sealed)

6 - Adapter - VAS 6338/3- (connected to refrigerant hose to flushing device)

7 - Adapter - VAS 6338/12- (connected to refrigerant hose of air conditioner service station on high-pressure side)

8 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from condenser, opened manually)
⇒ Item 3 (page 129)

9 - Shut-off valve - VAS 6338/47-2- (installed in refrigerant line from internal heat exchanger, opened manually)
⇒ Item 1 (page 129)

10 - Refrigerant expansion valve 2 - N637- (closed via Basic setting function)

11 - Shut-off valves - VAS 6338/42- (installed in refrigerant line to expansion valve, opened manually)

12 - Adapter - VAS 6338/44- (installed in place of expansion valve to evaporator in front heater and air conditioning unit)

13 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from refrigerant receiver, closed manually)
⇒ Item 4 (page 129)

14 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from valve block, closed manually)
⇒ Item 2 (page 129)

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– Select “Flush air conditioner” routine on connected air conditioner service station and start routine.

- Observe operating instructions supplied with air conditioner service station .
- For notes on flushing procedure, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit .

Wait until entire flushing procedure has been completed by air conditioner service station.

- The air conditioner service station displays when the flushing procedure has been completed.
- The flushing procedure is complete when the air conditioner service station has extracted the refrigerant from the flushing circuit after the final flushing cycle.
- If refrigerant reaches areas it is not actually intended to reach (areas indicated by blue lines) in this flushing routine because a valve has not closed correctly, it can take a very long time to extract all the refrigerant from the flushing circuit. You can recognise a valve that does not close correctly e.g. by the fact that this valve cools down due to refrigerant slowly evaporating. The valve then constricts the flow. In this case, open all manually operated shut-off valves and, if necessary, switch on the air conditioner service station again, extract the remaining refrigerant from the flushing circuit and evacuate the circuit again.

CAUTION

If the flushing procedure is interrupted or the cleaning procedure is not continued when this routine has been completed, there is a danger of frostbite from escaping pressurised refrigerant.

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Before removing components of the flushing circuit or detaching refrigerant lines, open all shut-off valves installed in the flushing circuit.**
- **Initiate air conditioner basic setting via the thermal management control unit - J1024- and use a routine stored there to open the various electrically activated valves ⇒ Vehicle diagnostic tester.**
- **Check pressure in flushing circuit using air conditioner service station. If necessary, extract any remaining refrigerant and open flushing circuit immediately afterwards.**

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When routine “1” has been completed, initiate and run routine “2”
⇒ “2.23.5 Cleaning refrigerant circuit (routine 2)”, page 131 .

2.23.5 Cleaning refrigerant circuit (routine “2”)

In this flushing procedure, the following components are cleaned: heat exchanger for high-voltage battery and, again, condenser with receiver, part of valve block and corresponding refrigerant lines.

Requirements

- Flushing routine “1” has been performed and completed successfully
⇒ “2.23.4 Cleaning refrigerant circuit (routine 1)”, page 128 .

Cleaning refrigerant circuit

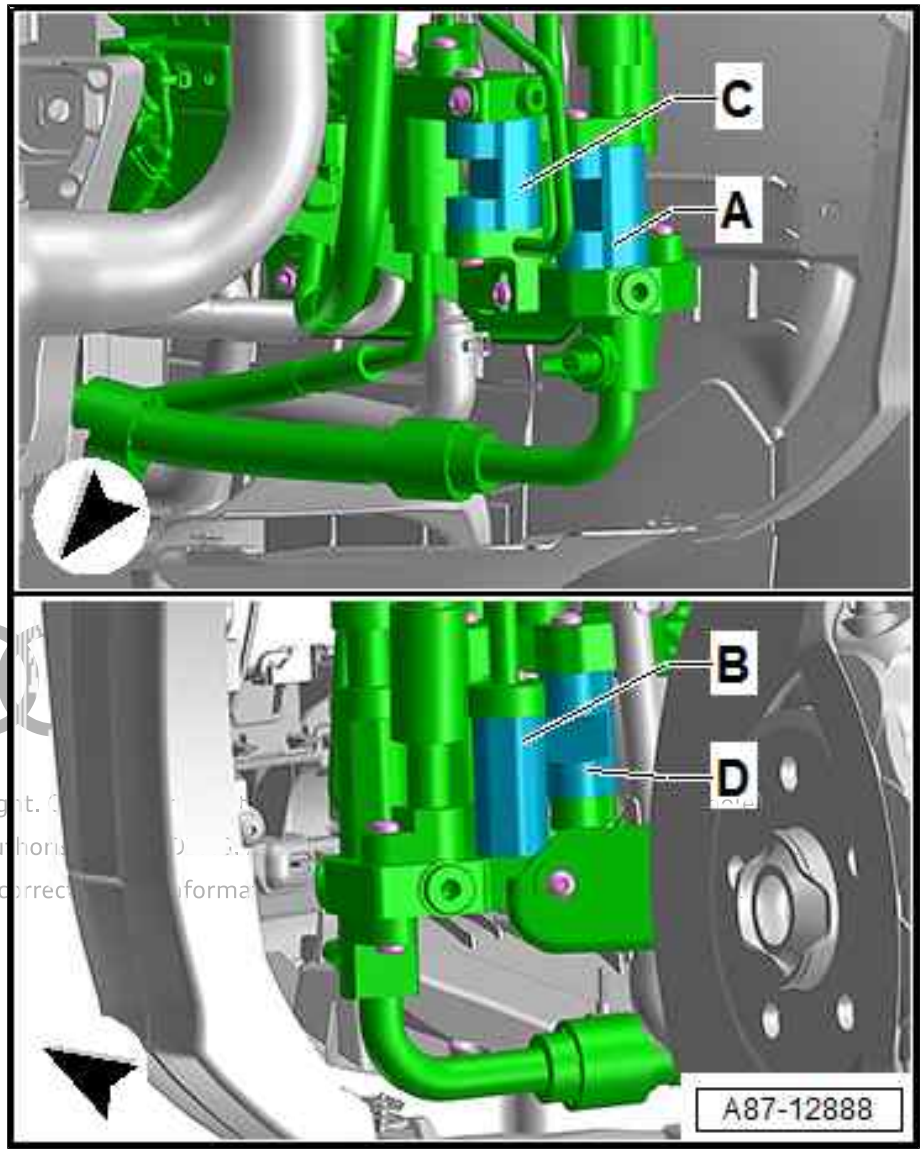
– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open or close the electrically activated valves for the second flushing procedure (flushing routine “2”) ⇒ Vehicle diagnostic tester.

1 - -A- Shut-off valve - VAS 6338/47-2-

2 - -B- Shut-off valve - VAS 6338/47-1-

3 - -C- Shut-off valve - VAS 6338/47-1-

4 - -D- Shut-off valve - VAS 6338/47-1-



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– Close or open shut-off valves fitted in flushing circuit as shown in the following illustrations.

♦ The following illustrations only apply to components that are directly affected by the flushing procedure; for all components not described refer to ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 45 .

♦ The colours of the lines in the following illustrations indicate which components are flushed (red lines) due to the different valve positions, which are only filled with refrigerant (green lines) and which are not affected (blue lines).

1 - Refrigerant shut-off valve 4 - N642- (closed via Basic setting function)

2 - Refrigerant shut-off valve 5 - N643- (closed via Basic setting function)

3 - Refrigerant shut-off valve 2 - N640- (closed via Basic setting function)

4 - Refrigerant shut-off valve 3 - N641- (opened via Basic setting function)

5 - Receiver on condenser (desiccant bag removed and re-sealed)

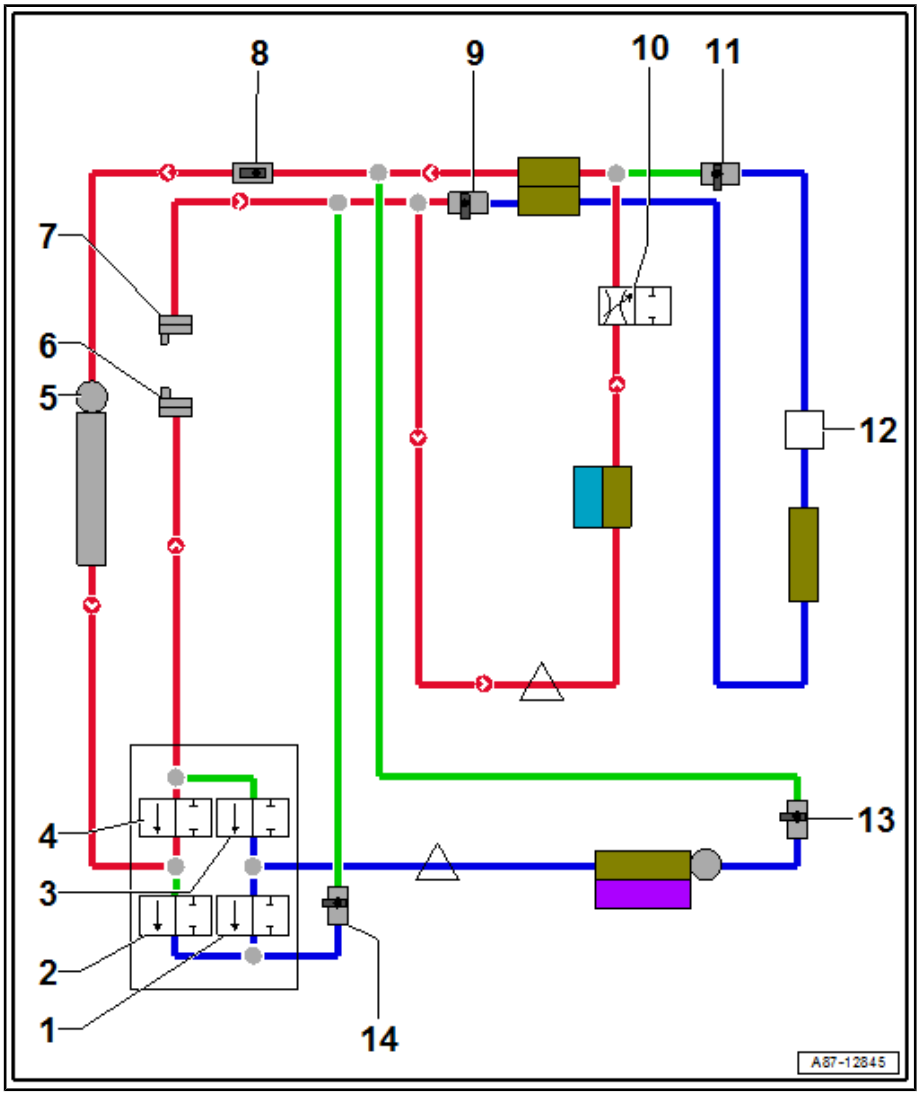
6 - Adapter - VAS 6338/3- (connected to refrigerant hose to flushing device)

7 - Adapter - VAS 6338/12- (connected to refrigerant hose of air conditioner service station on high-pressure side)

8 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from condenser, opened manually)
⇒ Item 3 (page 132)

9 - Shut-off valve - VAS 6338/47-2- (installed in refrigerant line from internal heat exchanger, closed manually)
⇒ Item 1 (page 132)

10 - Refrigerant expansion valve 2 - N637- (opened via Basic setting function)



11 - Shut-off valves - VAS 6338/42- (installed in refrigerant line to expansion valve, closed manually)

12 - Adapter - VAS 6338/44- (installed in place of expansion valve to evaporator in front heater and air conditioning unit)

13 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from refrigerant receiver, closed manually)
⇒ Item 4 (page 132)

14 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from valve block, closed manually)
⇒ Item 2 (page 132)

– Select “Flush air conditioner” routine on connected air conditioner service station and start routine.

- Observe operating instructions supplied with air conditioner service station .
- For notes on flushing procedure, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf ; General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit .

Wait until entire flushing procedure has been completed by air conditioner service station.

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- The air conditioner service station displays when the flushing procedure has been completed.
- The flushing procedure is complete when the air conditioner service station has extracted the refrigerant from the flushing circuit after the final flushing cycle.
- If refrigerant reaches areas it is not actually intended to reach (areas indicated by blue lines) in this flushing routine because a valve has not closed correctly, it can take a very long time to extract all the refrigerant from the flushing circuit. You can recognise a valve that does not close correctly e.g. by the fact that this valve cools down due to refrigerant slowly evaporating. The valve then constricts the flow. In this case, open all manually operated shut-off valves and, if necessary, switch on the air conditioner service station again, extract the remaining refrigerant from the flushing circuit and evacuate the circuit again.

CAUTION

If the flushing procedure is interrupted or the cleaning procedure is not continued when this routine has been completed, there is a danger of frostbite from escaping pressurised refrigerant.

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Before removing components of the flushing circuit or detaching refrigerant lines, open all shut-off valves installed in the flushing circuit.**
- **Initiate air conditioner basic setting via the thermal management control unit - J1024- and use a routine stored there to open the various electrically activated valves ⇒ Vehicle diagnostic tester.**
- **Check pressure in flushing circuit using air conditioner service station. If necessary, extract any remaining refrigerant and open flushing circuit immediately afterwards.**

When routine “2” has been completed, initiate and run routine “3”
⇒ “2.23.6 Cleaning refrigerant circuit (routine 3) ”, page 134 .

2.23.6 Cleaning refrigerant circuit (routine “3”)

In this flushing process, the following components are cleaned: heat exchanger for heat pump operation, refrigerant receiver, part of valve block and corresponding refrigerant lines. To achieve the highest possible flow rate, the refrigerant is conveyed through the heat exchanger for high-voltage battery and the evaporator.

Requirements

- Flushing routine “2” has been performed and completed successfully
⇒ “2.23.5 Cleaning refrigerant circuit (routine 2)”, page 131 .

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Cleaning refrigerant circuit

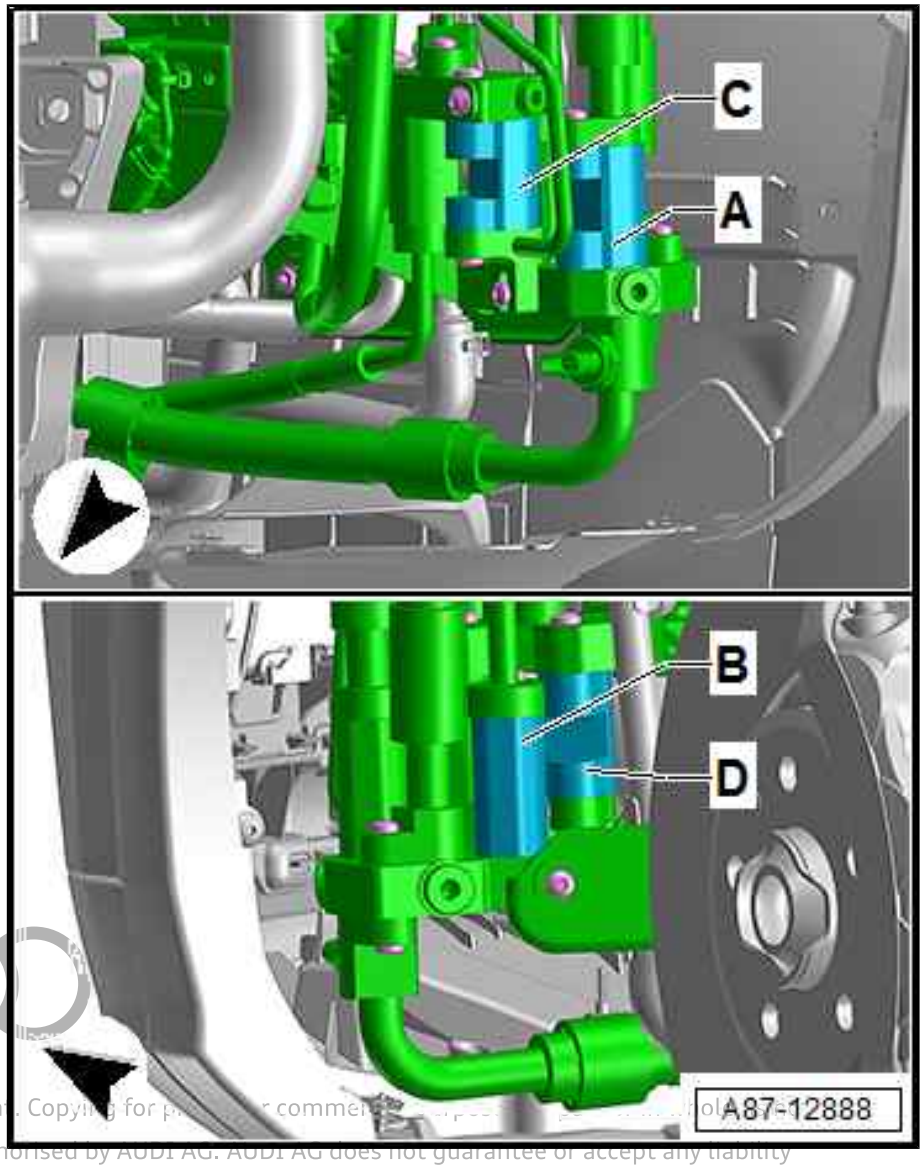
– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open or close the electrically activated valves for the third flushing procedure (flushing routine “3”) ⇒ Vehicle diagnostic tester.

1 - -A- Shut-off valve - VAS 6338/47-2-

2 - -B- Shut-off valve - VAS 6338/47-1-

3 - -C- Shut-off valve - VAS 6338/47-1-

4 - -D- Shut-off valve - VAS 6338/47-1-



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– Close or open shut-off valves fitted in flushing circuit as shown in the following illustrations.

♦ The following illustrations only apply to components that are directly affected by the flushing procedure; for all components not described refer to ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 45 .

♦ The colours of the lines in the following illustrations indicate which components are flushed (red lines) due to the different valve positions, which are only filled with refrigerant (green lines) and which are not affected (blue lines).

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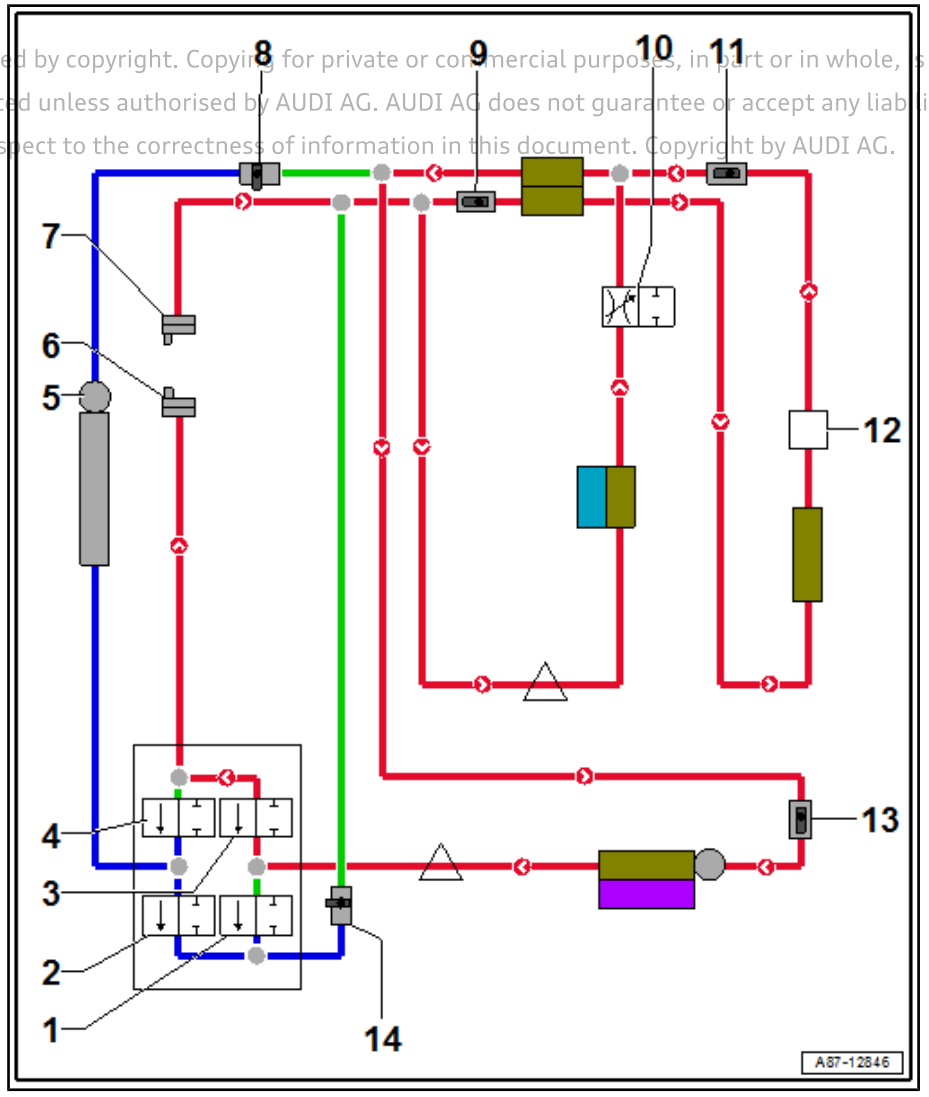

1 - Refrigerant shut-off valve 4 - N642- (closed via Basic setting function)

2 - Refrigerant shut-off valve 5 - N643- (closed via Basic setting function)

3 - Refrigerant shut-off valve 2 - N640- (opened via Basic setting function)

4 - Refrigerant shut-off valve 3 - N641- (closed via Basic setting function)

5 - Receiver on condenser (desiccant bag removed and re-sealed)

6 - Adapter - VAS 6338/3- (connected to refrigerant hose to flushing device)

7 - Adapter - VAS 6338/12- (connected to refrigerant hose of air conditioner service station on high-pressure side)

8 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from condenser, closed manually)
⇒ Item 3 (page 135)

9 - Shut-off valve - VAS 6338/47-2- (installed in refrigerant line from internal heat exchanger, opened manually)
⇒ Item 1 (page 135)

10 - Refrigerant expansion valve 2 - N637- (opened via Basic setting function)

11 - Shut-off valves - VAS 6338/42- (installed in refrigerant line to expansion valve, opened manually)

12 - Adapter - VAS 6338/44- (installed in place of expansion valve to evaporator in front heater and air conditioning unit)

13 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from refrigerant receiver, opened manually)
⇒ Item 4 (page 135)

14 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from valve block, closed manually)
⇒ Item 2 (page 135)

– Select “Flush air conditioner” routine on connected air conditioner service station and start routine.

- Observe operating instructions supplied with air conditioner service station .
- For notes on flushing procedure, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit .

Wait until entire flushing procedure has been completed by air conditioner service station.

- The air conditioner service station displays when the flushing procedure has been completed.
- The flushing procedure is complete when the air conditioner service station has extracted the refrigerant from the flushing circuit after the final flushing cycle.
- If refrigerant reaches areas it is not actually intended to reach (areas indicated by blue lines) in this flushing routine because a valve has not closed correctly, it can take a very long time to extract all the refrigerant from the flushing circuit. You can recognise a valve that does not close correctly e.g. by the fact that this valve cools down due to refrigerant slowly evaporating. The valve then constricts the flow. In this case, open all manually operated shut-off valves and, if necessary, switch on the air conditioner service station again, extract the remaining refrigerant from the flushing circuit and evacuate the circuit again.

⚠ CAUTION

If the flushing procedure is interrupted or the cleaning procedure is not continued when this routine has been completed, there is a danger of frostbite from escaping pressurised refrigerant.

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Before removing components of the flushing circuit or detaching refrigerant lines, open all shut-off valves installed in the flushing circuit.**
- **Initiate air conditioner basic setting via the thermal management control unit - J1024- and use a routine stored there to open the various electrically activated valves ⇒ Vehicle diagnostic tester.**
- **Check pressure in flushing circuit using air conditioner service station. If necessary, extract any remaining refrigerant and open flushing circuit immediately afterwards.**

When routine “3” has been completed, initiate and run routine “4”
⇒ “2.23.7 Cleaning refrigerant circuit (routine 4) ”, page 137 .

2.23.7 Cleaning refrigerant circuit (routine “4”)

In this flushing procedure, the following components are cleaned:
part of valve block and corresponding refrigerant lines.

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Requirements

- Flushing routine “3” has been performed and completed successfully
⇒ “2.23.6 Cleaning refrigerant circuit (routine 3) ”, page 134 .

Cleaning refrigerant circuit

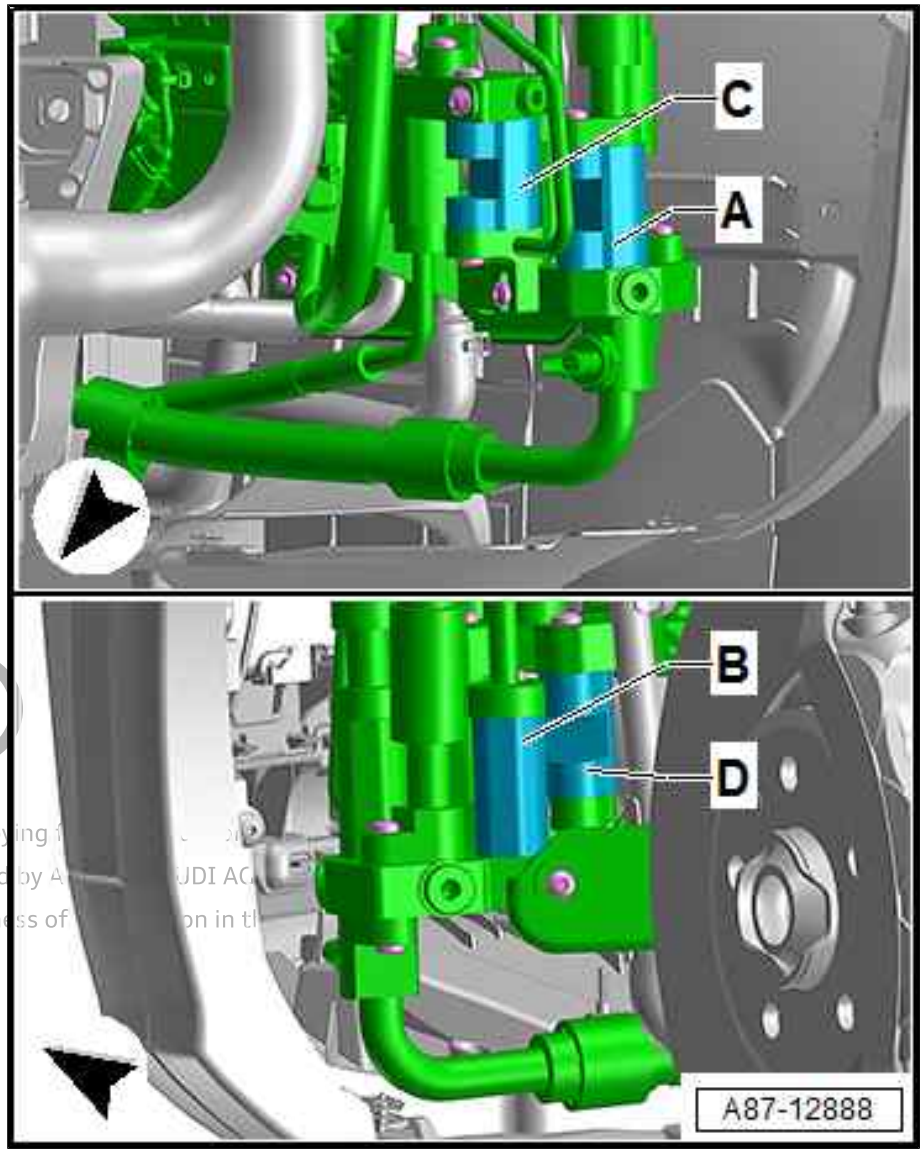
– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open or close the electrically activated valves for the fourth flushing procedure (flushing routine “4”) ⇒ Vehicle diagnostic tester.

1 - -A- Shut-off valve - VAS 6338/47-2-

2 - -B- Shut-off valve - VAS 6338/47-1-

3 - -C- Shut-off valve - VAS 6338/47-1-

4 - -D- Shut-off valve - VAS 6338/47-1-



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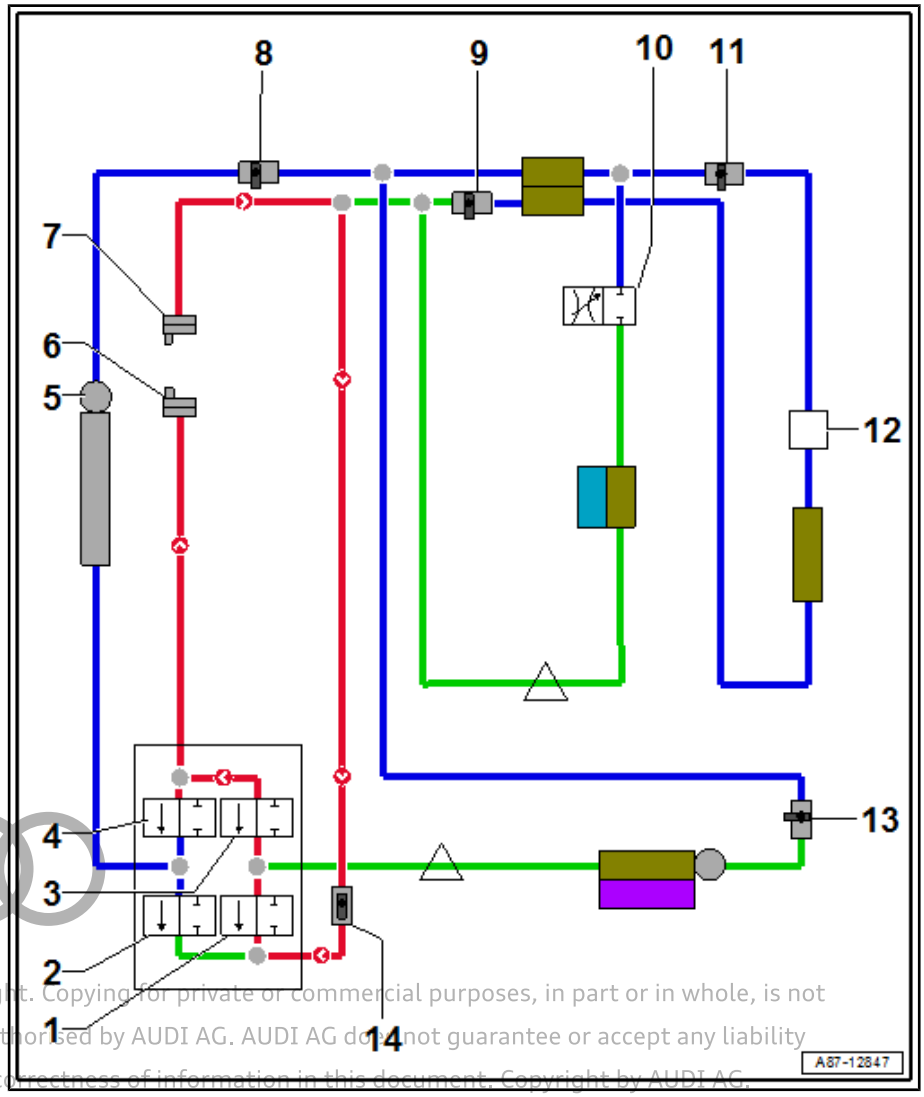
– Close or open shut-off valves fitted in flushing circuit as shown in the following illustrations.

- The following illustrations only apply to components that are directly affected by the flushing procedure; for all components not described refer to ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 45 .
- The colours of the lines in the following illustrations indicate which components are flushed (red lines) due to the different valve positions, which are only filled with refrigerant (green lines) and which are not affected (blue lines).



1 - Refrigerant shut-off valve 4 - N642- (opened via Basic setting function)

2 - Refrigerant shut-off valve 5 - N643- (closed via Basic setting function)

3 - Refrigerant shut-off valve 2 - N640- (opened via Basic setting function)

4 - Refrigerant shut-off valve 3 - N641- (closed via Basic setting function)

5 - Receiver on condenser (desiccant bag removed and re-sealed)

6 - Adapter - VAS 6338/3- (connected to refrigerant hose to flushing device)

7 - Adapter - VAS 6338/12- (connected to refrigerant hose of air conditioner service station on high-pressure side)

8 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from condenser, closed manually)
⇒ Item 3 (page 138)

9 - Shut-off valve - VAS 6338/47-2- (installed in refrigerant line from internal heat exchanger, closed manually)
⇒ Item 1 (page 138)

10 - Refrigerant expansion valve 2 - N637- (closed via Basic setting function)

11 - Shut-off valves - VAS 6338/42- (installed in refrigerant line to expansion valve, closed manually)

12 - Adapter - VAS 6338/44- (installed in place of expansion valve to evaporator in front heater and air conditioning unit)

13 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from refrigerant receiver, closed manually)
⇒ Item 4 (page 138)

14 - Shut-off valve - VAS 6338/47-1- (installed in refrigerant line from valve block, opened manually)
⇒ Item 2 (page 138)

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– Select “Flush air conditioner” routine on connected air conditioner service station and start routine.

- Observe operating instructions supplied with air conditioner service station .
- For notes on flushing procedure, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Cleaning refrigerant circuit with refrigerant R134a), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit .

Wait until entire flushing procedure has been completed by air conditioner service station.

- The air conditioner service station displays when the flushing procedure has been completed.
- The flushing procedure is complete when the air conditioner service station has extracted the refrigerant from the flushing circuit after the final flushing cycle.
- If refrigerant reaches areas it is not actually intended to reach (areas indicated by blue lines) in this flushing routine because a valve has not closed correctly, it can take a very long time to extract all the refrigerant from the flushing circuit. You can recognise a valve that does not close correctly e.g. by the fact that this valve cools down due to refrigerant slowly evaporating. The valve then constricts the flow. In this case, open all manually operated shut-off valves and, if necessary, switch on the air conditioner service station again, extract the remaining refrigerant from the flushing circuit and evacuate the circuit again.

– Open all manually operated shut-off valves in flushing circuit (see above).
– Switch on ignition.
– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.
– Check pressure in flushing circuit; only detach refrigerant hoses from the two adapters -6, 7- if pressure is below or equal to ambient pressure.

CAUTION

If the flushing procedure is interrupted or the cleaning procedure is not continued when this routine has been completed, there is a danger of frostbite from escaping pressurised refrigerant.

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Before removing components of the flushing circuit or detaching refrigerant lines, open all shut-off valves installed in the flushing circuit.**
- **Initiate air conditioner basic setting via the thermal management control unit - J1024- and use a routine stored there to open the various electrically activated valves ⇒ Vehicle diagnostic tester.**
- **Check pressure in flushing circuit using air conditioner service station. If necessary, extract any remaining refrigerant and open flushing circuit immediately afterwards.**

– Switch off air conditioner service station.

The following components must be renewed after the refrigerant circuit is cleaned:

- Desiccant bag in condenser receiver
⇒ “2.20 Removing and installing desiccant bag/desiccant cartridge”, page 116
- Refrigerant shut-off valve - V424-
⇒ “2.13 Removing and installing refrigerant shut-off valve V424 ”, page 81
- Refrigerant receiver at heat exchanger for heat pump operation
⇒ “2.7 Removing and installing refrigerant receiver”, page 67

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– Remove remaining flushing adapters and assemble refrigerant circuit.

♦ Pay attention to the correct quantity of refrigerant oil when assembling the refrigerant circuit. If renewing the air conditioner compressor, ensure that the replacement compressor contains the correct quantity of refrigerant oil. If the air conditioner compressor is not being renewed, determine how much refrigerant oil is in the compressor, and fill the correct quantity into the refrigerant circuit or air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Flushing electrically driven air conditioner compressor), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning refrigerant circuit , and
⇒ “5.2 Approved refrigerant oils and refrigerant oil capacities”, page 18 .

♦ These air conditioner compressors are available as replacement parts with different refrigerant oil capacities; attention must therefore be paid to the oil quantity in the air conditioner compressor
⇒ “5.2 Approved refrigerant oils and refrigerant oil capacities”, page 18 as well as the exact part number ⇒ Electronic parts catalogue .

♦ There are different refrigerant oil capacities for the refrigerant circuit depending on the layout of the refrigerant circuit and the refrigerant used. Too much oil in the circuit results in higher pressures and a reduced cooling output of the system. Too little oil may lead to lubrication problems in the air conditioner compressor
⇒ “5.2 Approved refrigerant oils and refrigerant oil capacities”, page 18 .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

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– Re-install remaining components removed in reverse order.

WARNING

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

– Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) re-energise the high-voltage system.

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

• After installing the electrically driven air conditioner compressor and then charging the refrigerant circuit, first start up the compressor by way of the “Compressor run-in” function of the basic setting routine. Otherwise, the air conditioner compressor may be damaged if refrigerant oil has accumulated in the compression chamber of the air conditioner compressor due to inappropriate storage prior to installation ⇒ Vehicle diagnostic tester.

• An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. The air con-

ditioner compressor may be damaged if it is allowed to run with the refrigerant circuit empty.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

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3 Heat pump valve unit

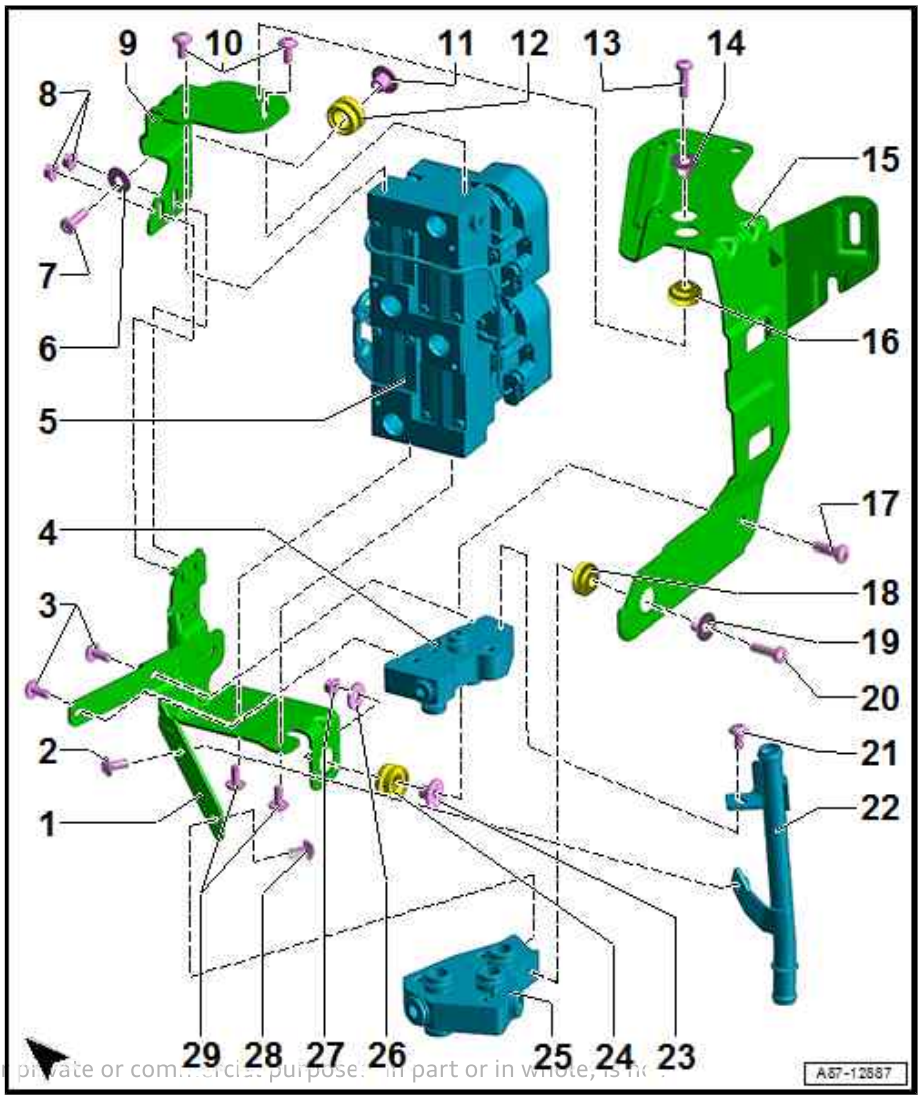
⇒ “3.1 Exploded view - heat pump valve unit”, page 143

⇒ “3.2 Removing and installing heat pump valve unit”, page 145

⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

⇒ “3.4 Removing and installing refrigerant expansion valve 2 N637 ”, page 150

3.1 Exploded view - heat pump valve unit



1 - Bracket

2 - Bolt

- ❑ 8 Nm

3 - Bolts

- ❑ 8 Nm

4 - Base plate

5 - Valve unit with wiring harness

- ❑ Mark routing of wiring harness before removal
- ❑ Make sure pin assignment of wiring harness connectors to valves on valve unit is correct ⇒ page 150
- ❑ The valves of the valve unit are currently identical. They are assigned by means of the pin assignment of the wiring harness connectors, and activated by the thermal management control unit - J1024- accordingly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Dismantling and assembling ⇒ “3.3 Dismantling and assembling heat pump valve unit”, page 148

6 - Washer

7 - Bolt

- ❑ 8 Nm

8 - Nuts

- ❑ 10 Nm

9 - Bracket

10 - Bolt

- ❑ 8 Nm

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11 - Guide sleeves

12 - Rubber grommet

13 - Bolt

14 - Guide sleeves

15 - Bracket

- ❑ Tightening torques for bracket for valve unit to longitudinal member ⇒ page 144

16 - Rubber bush

17 - Bolt

- ❑ 10 Nm

18 - Rubber bush

19 - Guide sleeve

20 - Bolt

- ❑ 8 Nm

21 - Bolt

- ❑ 8 Nm

22 - Coolant pipe

23 - Guide sleeve

24 - Rubber grommet

25 - Base plate

26 - Washer

27 - Nut

- ❑ 10 Nm

28 - Bolt

29 - Bolt

- ❑ 8 Nm

Bracket for valve unit to longitudinal member - tightening torques

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1 - Bracket

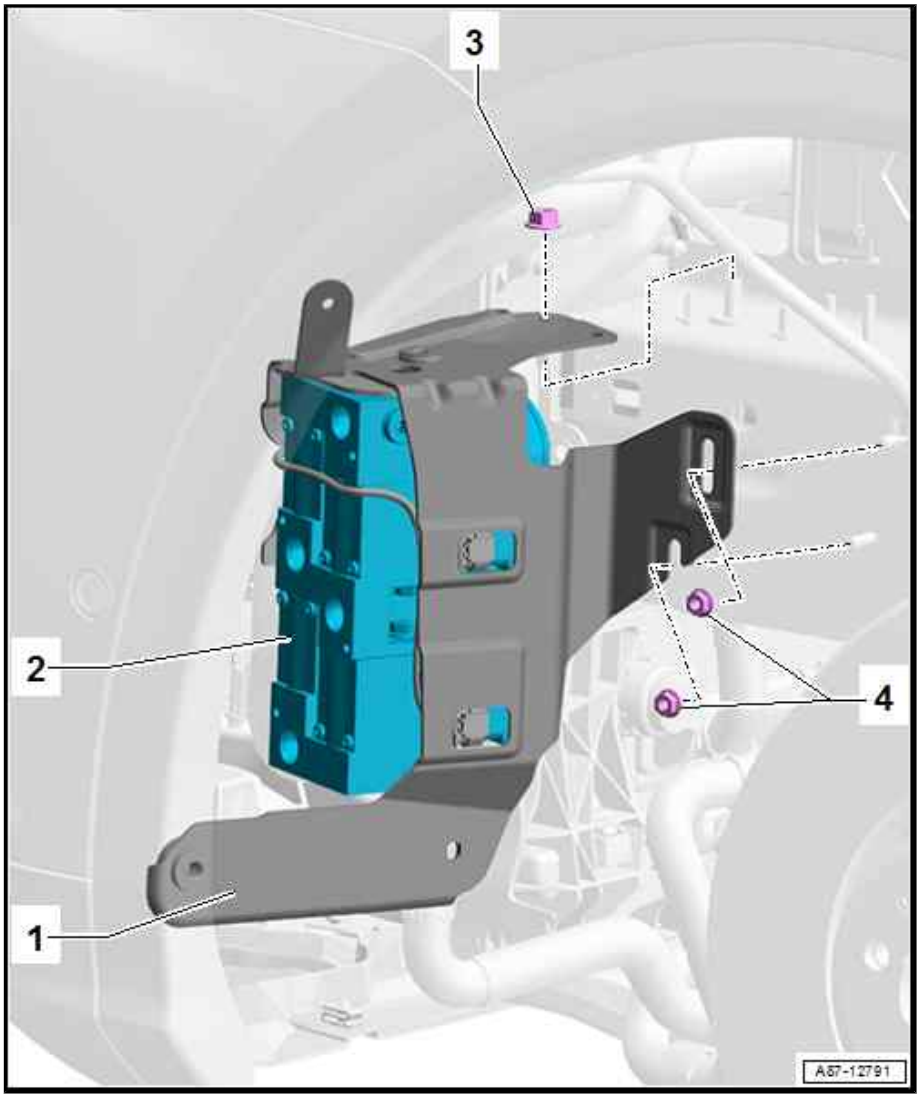
2 - Valve unit

3 - Nut

- ❑ 20 Nm

4 - Nut

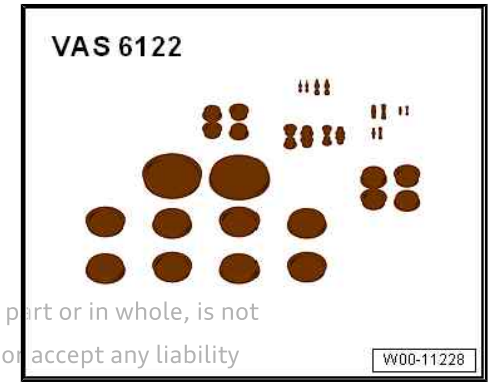
- ❑ 8 Nm



3.2 Removing and installing heat pump valve unit

Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-



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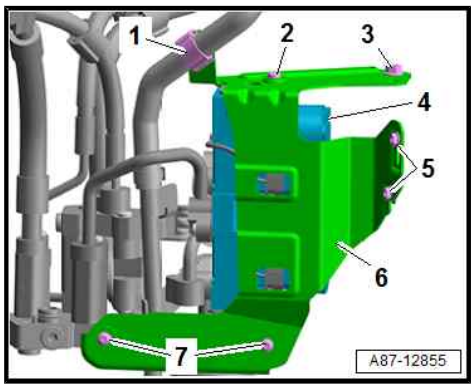
Removing

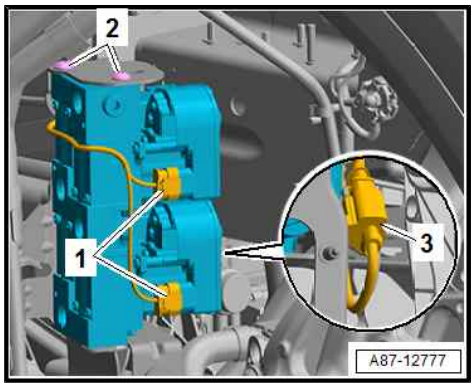
- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.
– Switch off ignition.
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
– Remove front wheel (left-side) ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
– Remove wheel housing liner and wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

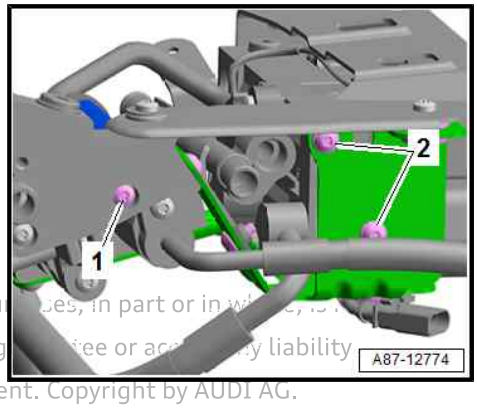
– Unscrew nuts -3 and 5-.
– Remove bolt -2- from above.
– Remove bolts -7-.
– Disengage refrigerant hose from retaining clip -1-.
– Detach bracket -6- for valve unit -4-.



– Remove bolts (top) -2- on valve unit.



– Remove bolts (bottom) -2- on valve unit.



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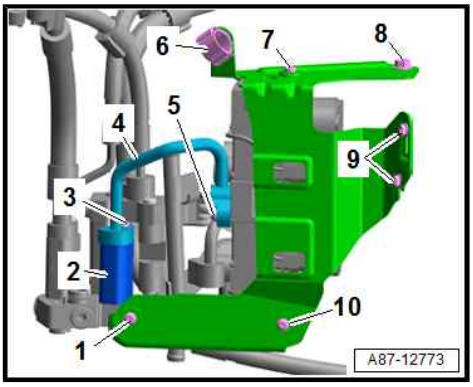
CAUTION

Risk of frostbite from escaping pressurised refrigerant

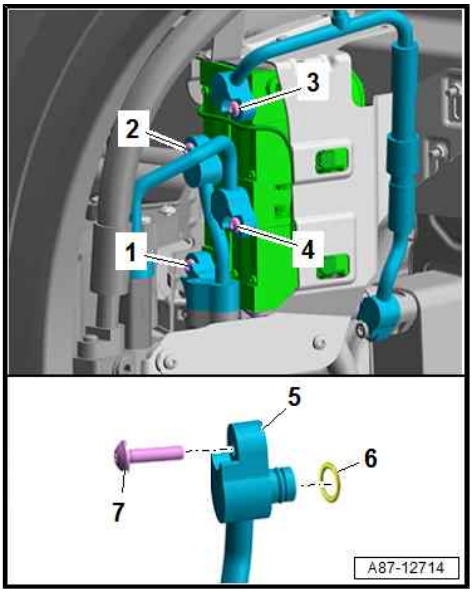
Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

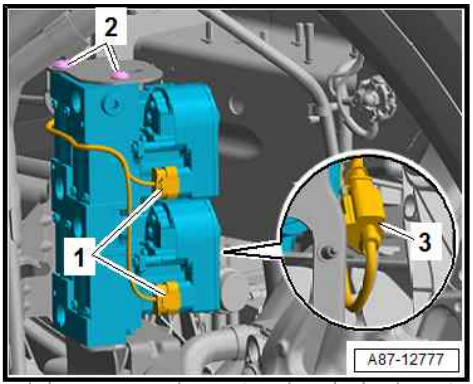


– Remove bolts -3, 5- on non-return valve.
– Release refrigerant line -4-.

– Remove bolt -3- for refrigerant line leading from valve unit to heat exchanger for heat pump operation.
– Remove bolt -2- for refrigerant line to non-return valve.
– Remove bolt -1- for refrigerant line to condenser.
– Detach refrigerant lines -5- from connections.



– Unplug visible connectors -1-.
– Pull valve unit forwards slightly and unplug rear connectors -3-.
– Remove valve unit.



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Installing

Installation is carried out in reverse order; note the following:

- When it has been removed, the valve unit may contain refrigerant oil which must be returned to the refrigerant circuit (together with the new component) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .
- Lubricate O-rings -6- lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .
- Install refrigerant lines -5- so that they are free of tension.

– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

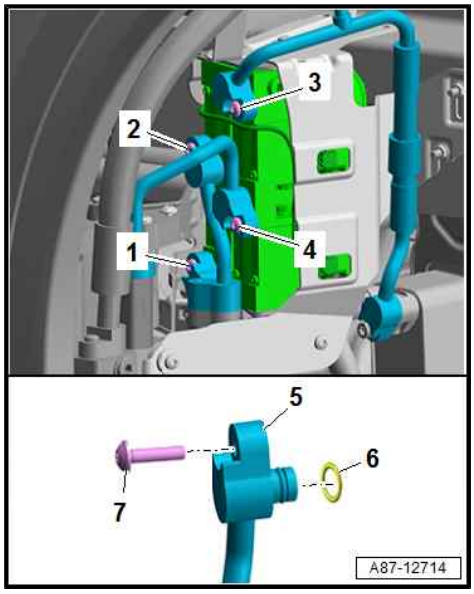
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ “3.1 Exploded view - heat pump valve unit”, page 143
- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres



3.3 Dismantling and assembling heat pump valve unit

Dismantling and assembling heat pump valve unit ⇒ page 148

Connection diagram - wiring harness to valve unit ⇒ page 150

- ⇒ “3.2 Removing and installing heat pump valve unit”, page 145

Dismantling and assembling heat pump valve unit

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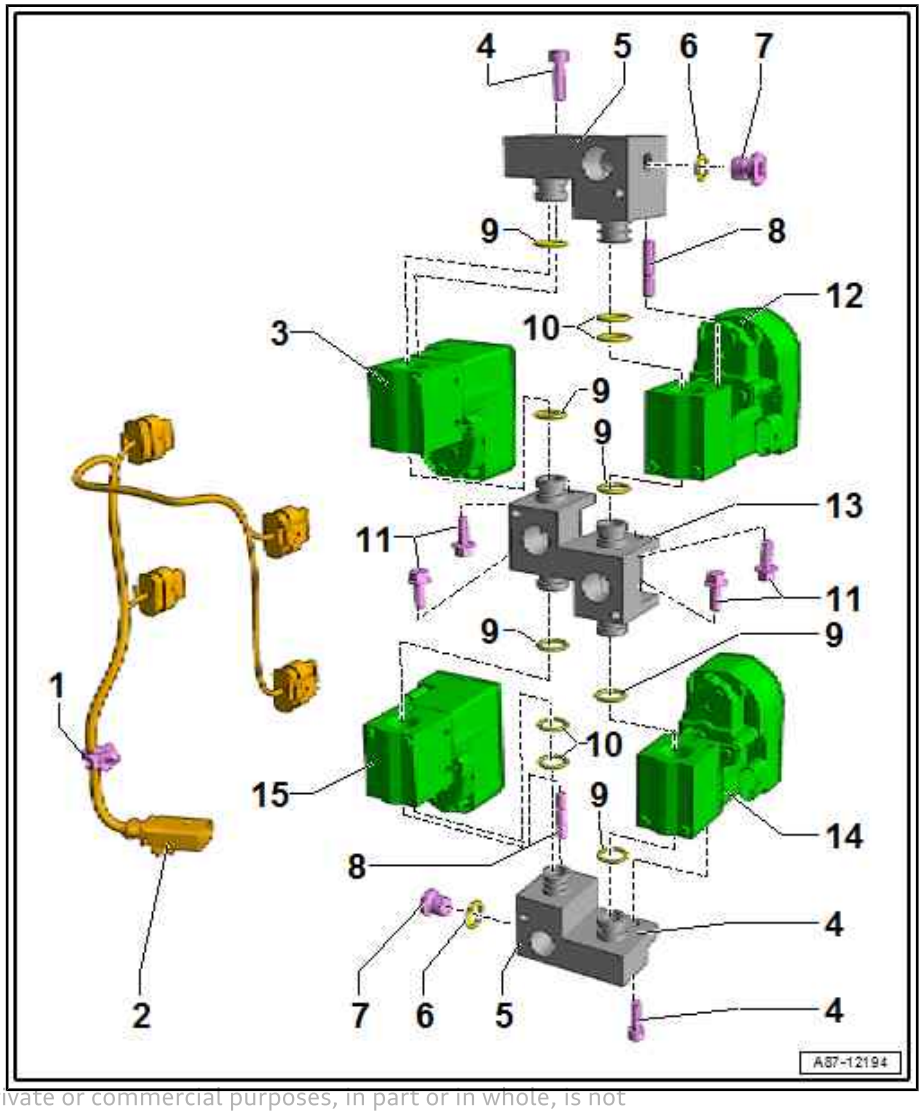

1 - Bracket for wiring harness

2 - Wiring harness for valve unit

- ❑ Mark routing before removal
- ❑ Observe correct pin assignment of connectors to valves ⇒ page 150
- ❑ The valves of the valve unit are currently identical. They are assigned by means of the pin assignment of the wiring harness connectors, and activated by the thermal management control unit - J1024- accordingly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

3 - Refrigerant shut-off valve 2 - N640-

- ❑ Mark before removal to ensure correct allocation later on
- ❑ The valves of the valve unit are currently identical. They are assigned by means of the pin assignment of the wiring harness connectors, and activated by the thermal management control unit - J1024- accordingly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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4 - Bolt

- ❑ 9 Nm

5 - Outer connector block

6 - Seal

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue

7 - Plug

- ❑ Renew if removed; for correct version refer to ⇒ Electronic parts catalogue
- ❑ 22 Nm

8 - Dowel pin with thread

- ❑ Ensure correct fitting location
- ❑ 4 Nm

9 - O-ring

- ❑ Renew if removed ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

10 - O-ring

- ❑ Renew if removed ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue

- ❑ Before installing, lubricate lightly with refrigerant oil

11 - Bolt

- ❑ 9 Nm

12 - Refrigerant shut-off valve 4 - N642-

- ❑ Mark before removal to ensure correct allocation later on
- ❑ The valves of the valve unit are currently identical. They are assigned by means of the pin assignment of the wiring harness connectors, and activated by the thermal management control unit - J1024- accordingly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

13 - Inner connector block

14 - Refrigerant shut-off valve 5 - N643-

- ❑ Mark before removal to ensure correct allocation later on
- ❑ The valves of the valve unit are currently identical. They are assigned by means of the pin assignment of the wiring harness connectors, and activated by the thermal management control unit - J1024- accordingly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

15 - Refrigerant shut-off valve 3 - N641-

- ❑ Mark before removal to ensure correct allocation later on
- ❑ The valves of the valve unit are currently identical. They are assigned by means of the pin assignment of the wiring harness connectors, and activated by the thermal management control unit - J1024- accordingly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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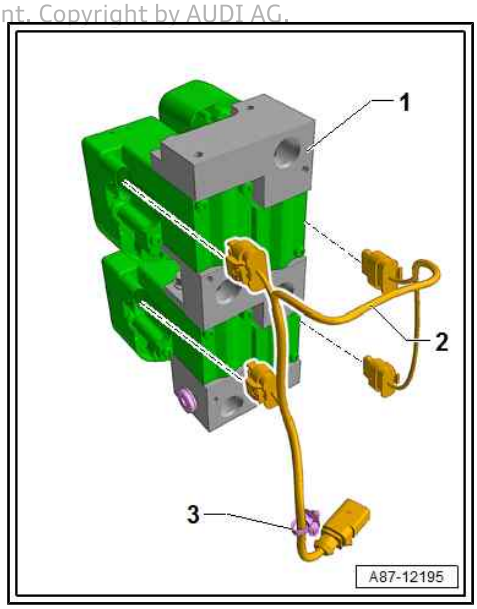
Connection diagram - wiring harness to valve unit

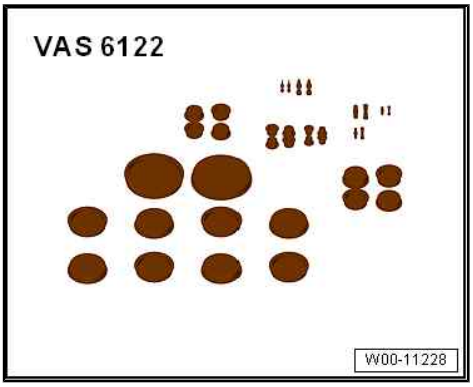
- ♦ The valves of valve unit -1- are currently identical. They are assigned by means of the pin assignment of the connectors on wiring harness -2-, and activated by the thermal management control unit - J1024- accordingly ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ♦ The valves (-N640- , -N641- , -N642- and -N643-) in the valve unit -1- are assigned and activated solely based on the layout of the connectors of the wiring harness -2-. If the valve unit is rotated by 180° in the bracket and the wiring harness is connected correctly as shown in the diagram, the function of the individual valves changes (they are mirrored), but the valve unit itself continues to operate properly.
- ♦ Valve unit -1-
- ♦ Wiring harness -2-
- ♦ Bracket -3-



3.4 Removing and installing refrigerant expansion valve 2 - N637-

Special tools and workshop equipment required

♦ Engine bung set - VAS 6122-



Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

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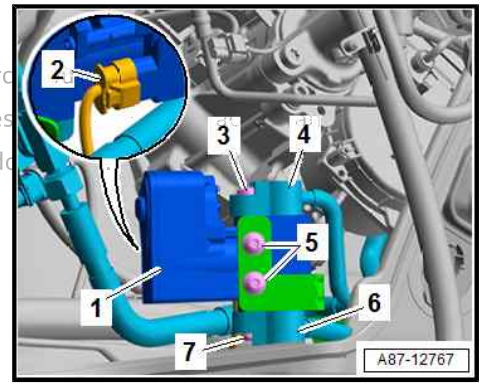
– Remove bolts -3, 7-.
– Remove bolts -5-.
– Unplug electrical connector -2- on back of refrigerant expansion valve 2 - N637- -item 1-.
– Detach refrigerant lines -4, 6-.
– Detach expansion valve -1-.



Installing

Installation is carried out in reverse order; note the following:

– If fitted, check that dowel pin at refrigerant line connections is not damaged and is seated correctly.
– Lubricate O-rings lightly with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .
– After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.
– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ⇒ “2.5 Exploded view - heat exchanger for high-voltage battery”, page 63
- ⇒ “2.2.3 Exploded view - refrigerant lines, Q5 vehicles with high-voltage system”, page 53
- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel

4 Air conditioner compressor

⇒ “4.1 Exploded view - air conditioner compressor”, page 153

⇒ “4.2 Exploded view - pulley”, page 159

⇒ “4.3 Detaching and attaching air conditioner compressor at bracket”, page 167

⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176

⇒ “4.5 Removing and installing air conditioner compressor”, page 181

⇒ “4.6 Preparations for renewing pulley”, page 189

⇒ “4.7 Removing and installing pulley”, page 190

4.1 Exploded view - air conditioner compressor

⇒ “4.1.1 Exploded view - air conditioner compressor, all vehicles except those with 6-cyl. 2.9 ltr. TFSI engine”, page 153

⇒ “4.1.2 Exploded view - air conditioner compressor, vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 156

⇒ “4.1.3 Exploded view - electrically driven air conditioner compressor”, page 158

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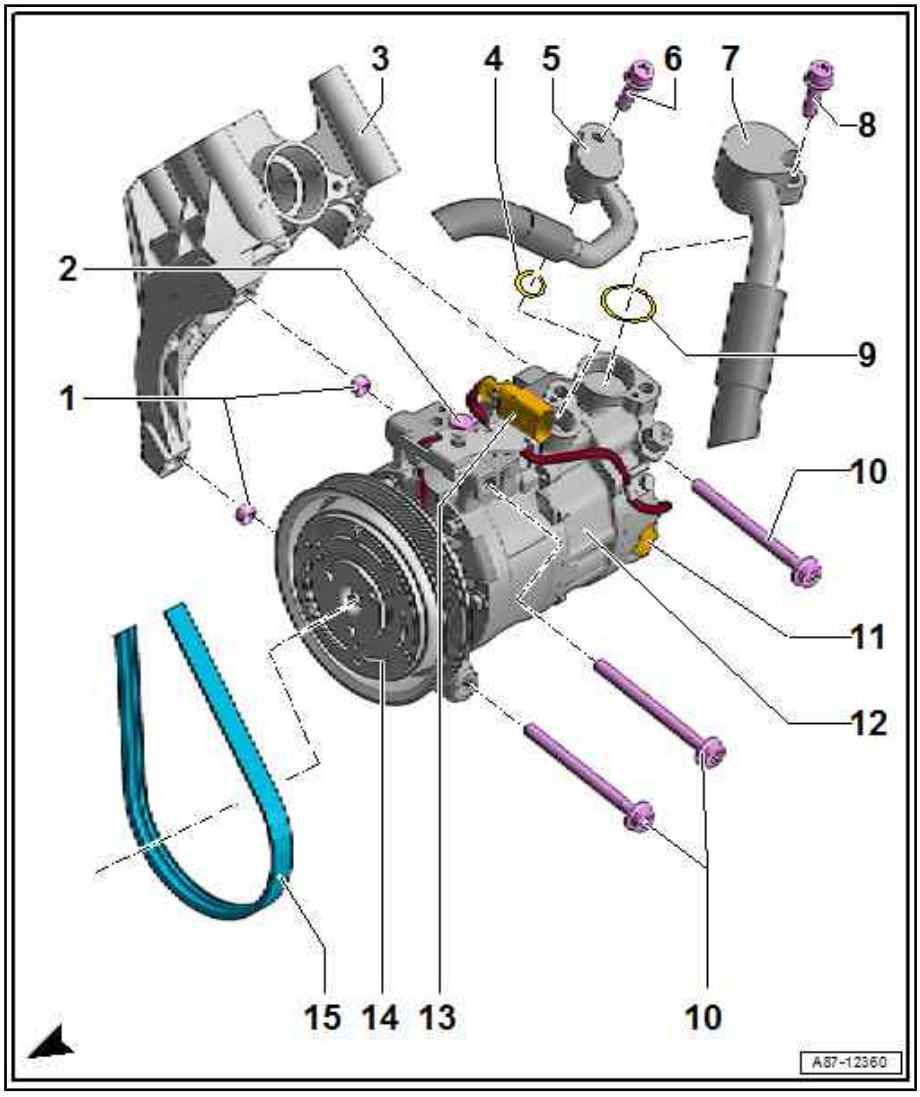
4.1.1 Exploded view - air conditioner compressor, all vehicles except those with 6-cyl. 2.9 ltr. TFSI engine



1 - Dowel sleeves

- ❑ 2x

2 - Oil drain plug with seal

- ❑ Denso: 30 Nm
- ❑ Denso: Seal can be reused
- ❑ Sanden: 15 Nm
- ❑ Sanden: Seal can be reused
- ❑ Seals, sealing surfaces and threads must be free from visible damage, dirt and particles

3 - Bracket for air conditioner compressor

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ Engine; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

4 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

5 - Refrigerant line (high-pressure side)

- ❑ Detaching and attaching refrigerant line ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176

6 - Bolt

- ❑ Exploded view ⇒ “2.2 Exploded view - refrigerant lines”, page 48

7 - Refrigerant line (low-pressure side)

- ❑ Detaching and attaching refrigerant line ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176

8 - Bolt

- ❑ Exploded view ⇒ “2.2 Exploded view - refrigerant lines”, page 48

9 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

10 - Bolt

- ❑ 3x
- ❑ Different versions ⇒ Electronic parts catalogue

Steel bolt with threaded head

- ❑ 25 Nm

Steel bolt

- ❑ 25 Nm

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Aluminium bolt

- ❑ Renew after removing
- ❑ 8 Nm +180°

11 - Air conditioner compressor regulating valve - N280-

- ❑ Checking ⇒ Vehicle diagnostic tester and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components

12 - Air conditioner compressor

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant line
  ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176
- ❑ Detaching and attaching at bracket
  ⇒ “4.3 Detaching and attaching air conditioner compressor at bracket”, page 167
- ❑ Removing and installing ⇒ “4.5 Removing and installing air conditioner compressor”, page 181

13 - Electrical connector

- ❑ For air conditioner compressor regulating valve - N280- and air conditioning system magnetic clutch - N25-

14 - Pulley with overload protection

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ “4.2 Exploded view - pulley”, page 159
- ❑ Depending on engine version and air conditioner compressor with or without air conditioning system magnetic clutch - N25-

15 - Poly V-belt

- ❑ Removing and installing ⇒ Engine; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt

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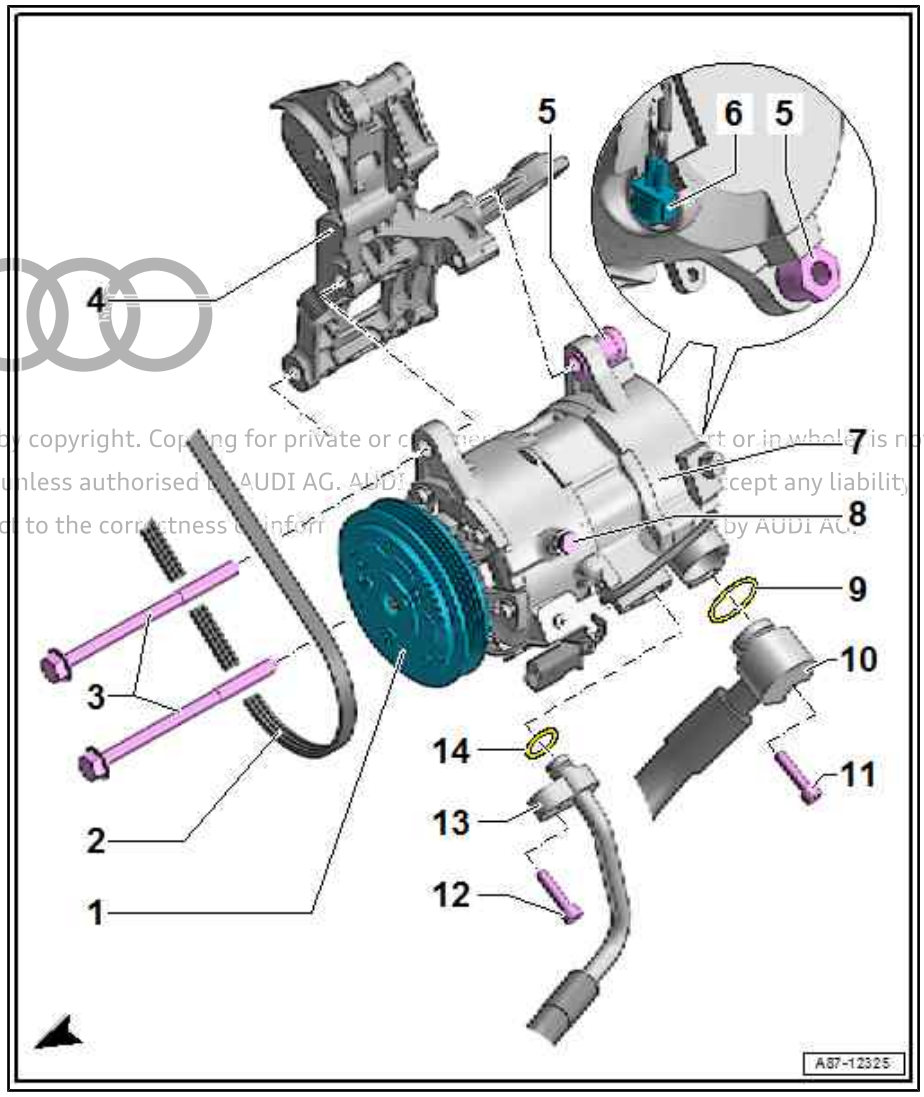
4.1.2 Exploded view - air conditioner compressor, vehicles with 6-cyl. 2.9 ltr. TFSI engine



1 - Pulley with overload protection

- Removing and installing ⇒ “4.2.3 Exploded view - Denso air conditioner compressor pulley (with air conditioning system magnetic clutch N25)”, page 162
- Exploded view ⇒ “4.2 Exploded view - pulley”, page 159
- With air conditioning system magnetic clutch - N25-
- Different versions ⇒ Electronic parts catalogue

2 - Poly V-belt

- Removing and installing poly V-belt for air conditioner compressor ⇒ 6-cyl. direct injection engine (2.9, 3.0 ltr. 4-valve TFSI engine EA 839); Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt

3 - Bolts

- 40 Nm

4 - Bracket for ancillaries

- Removing and installing ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

5 - Locking sleeve

6 - Air conditioner compressor regulating valve - N280-

- Checking ⇒ Vehicle diagnostic tester
- Removing and installing ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components

7 - Air conditioner compressor

- Different versions ⇒ Electronic parts catalogue
- Detaching and attaching refrigerant line ⇒ “4.4.2 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 6-cyl. engine”, page 178
- Detaching and attaching at bracket ⇒ “4.3.3 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 171
- Removing and installing ⇒ “4.5.4 Removing and installing air conditioner compressor - vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 184

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8 - Oil drain plug

- ❑ 30 Nm

9 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

10 - Refrigerant line (low-pressure side)

- ❑ Detaching and attaching refrigerant line
  ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176

11 - Bolt

- ❑ Exploded view ⇒ “2.2 Exploded view - refrigerant lines”, page 48

12 - Bolt

- ❑ Exploded view ⇒ “2.2 Exploded view - refrigerant lines”, page 48

13 - Refrigerant line (high-pressure side)

- ❑ Detaching and attaching refrigerant line
  ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176

14 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 16

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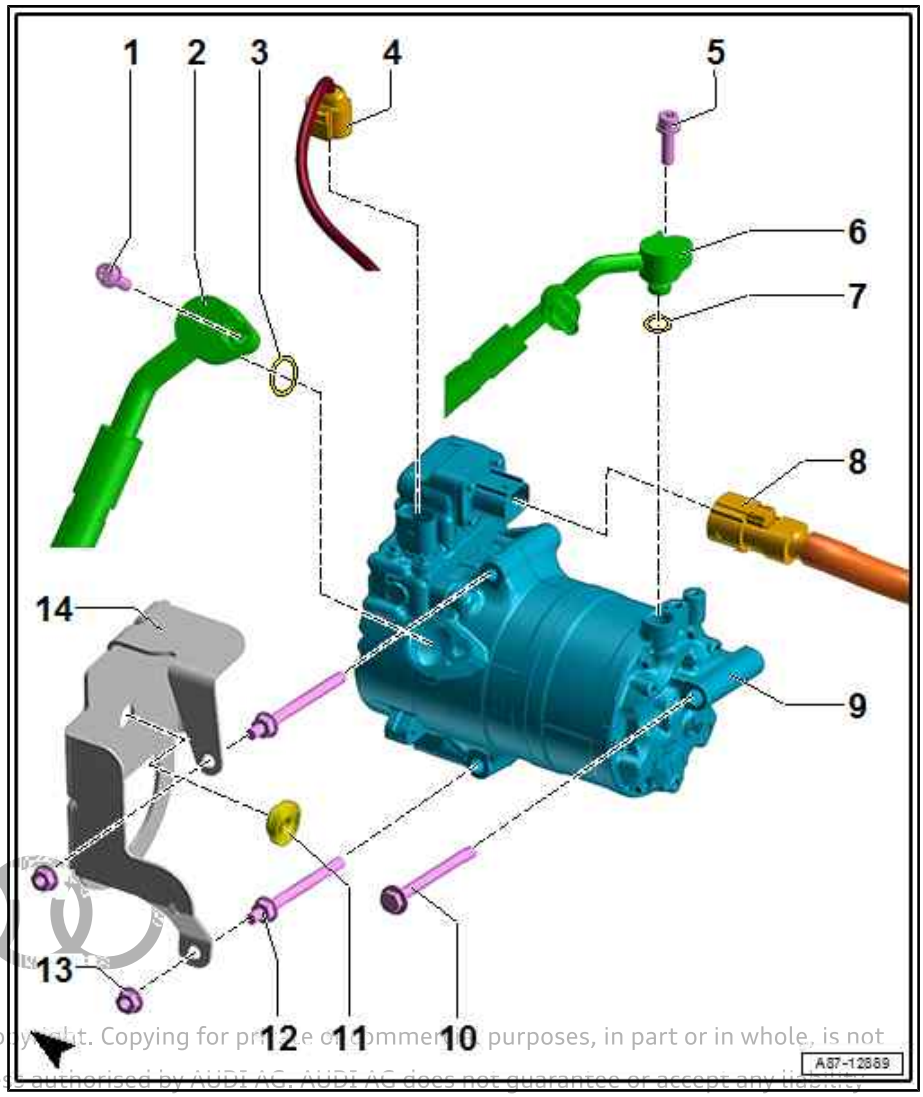
4.1.3 Exploded view - electrically driven air conditioner compressor



1 - Bolt

- ❑ 25 Nm

2 - Refrigerant line

- ❑ Low-pressure side
- ❑ Removing and installing ⇒ “4.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - Q5 vehicles with high-voltage system”, page 179

3 - O-ring

- ❑ Renew if removed ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

4 - 8-pin connector

5 - Bolt

- ❑ 25 Nm

6 - Refrigerant line

- ❑ High-pressure side
- ❑ Removing and installing ⇒ “4.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - Q5 vehicles with high-voltage system”, page 179

7 - O-ring

- ❑ Renew if removed ⇒ “4.12 Refrigerant circuit seals”, page 16 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Lubricate lightly with refrigerant oil prior to installing

8 - High-voltage wire to power and control electronics for electric drive - JX1- (with control unit for high-voltage battery charging unit - J1050-)

- ❑ Detaching and attaching ⇒ Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires

9 - Dowel sleeve

10 - Electrically driven air conditioner compressor

- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ Detaching and attaching at bracket ⇒ “4.3.4 Detaching and attaching electrically driven air conditioner compressor at bracket”, page 174
- ❑ Detaching and attaching refrigerant lines ⇒ “4.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - Q5 vehicles with high-voltage system”, page 179
- ❑ Removing and installing ⇒ “4.5.5 Removing and installing electrically driven air conditioner compressor”, page 185
- ❑ Electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in power and control electronics for electric drive - JX1-

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⇒ Fig. ""Fuse for electrical air conditioner compressor -V470- "" , page 159 and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

11 - Bolt

- ❑ 25 Nm

12 - Grommet

13 - Centre hex stud

- ❑ 25 Nm
- ❑ 2x

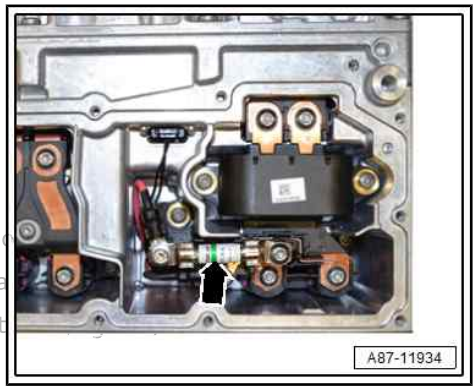
14 - Nut

- ❑ 25 Nm
- ❑ 2x

15 - Cover

Fuse for electrical air conditioner compressor - V470-

The fuse -arrow- for the electrical air conditioner compressor - V470- is fitted in the power and control electronics for electric drive - JX1- and cannot currently be renewed separately (introduction of fuse as replacement part not yet finalised) ⇒ Electronic parts catalogue .



– If necessary, renew fuse or power and control electronics for electric drive ⇒ Rep. gr. 93 ; Power and control electronics for electric drive; Removing and installing power and control electronics for electric drive .

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4.2 Exploded view - pulley

⇒ "4.2.1 Exploded view - Denso air conditioner compressor pulley (version 1)", page 159

⇒ "4.2.2 Exploded view - Denso air conditioner compressor pulley (version 2)", page 161

⇒ "4.2.3 Exploded view - Denso air conditioner compressor pulley (with air conditioning system magnetic clutch N25)", page 162

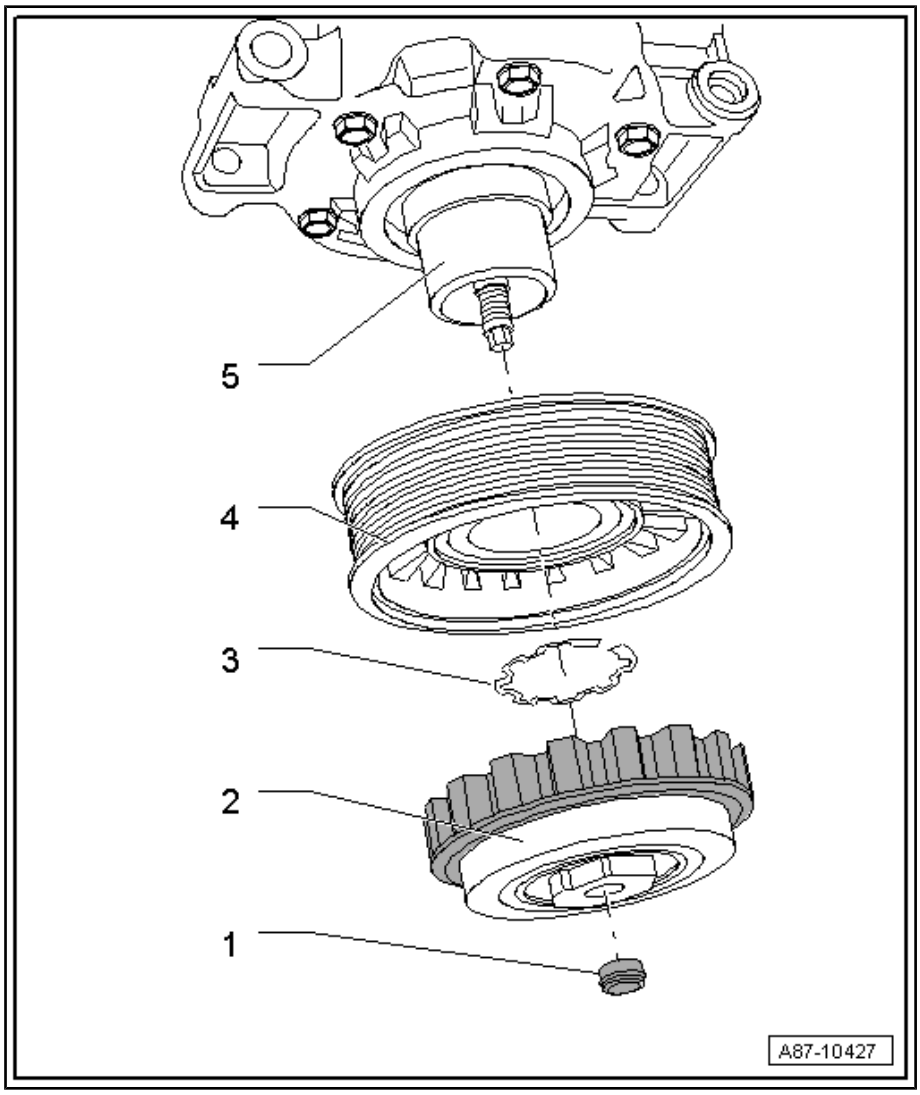
⇒ "4.2.4 Exploded view - Sanden air conditioner compressor pulley", page 163

⇒ "4.2.5 Exploded view - Sanden air conditioner compressor pulley (with air conditioning system magnetic clutch N25)", page 165

4.2.1 Exploded view - "Denso" air conditioner compressor pulley (version 1)

- ♦ If the pulley overload protection device has been triggered, check that the air conditioner compressor can rotate freely before renewing the pulley. The air conditioner compressor must be renewed completely if it does not rotate freely.
- ♦ Various pulley versions with differing diameters may be fitted depending on the type of air conditioner compressor and the engine version ⇒ Electronic parts catalogue .
- ♦ The replacement pulley is supplied with drive plate and cap. The pulley and the drive plate are held together by a bolt (bolt is not required; can be disposed of). This bolt is used during manufacturing to insert a pre-determined amount of a specific grease into the thread of the drive plate (sufficient for fitting the drive plate onto the compressor shaft once; do not re-use a

drive plate that has been unscrewed) ⇒ Electronic parts catalogue .



1 - Cap

2 - Drive plate

- ❑ Renew
- ❑ Tightening torque: 30 Nm
- ❑ Screwed onto compressor shaft
- ❑ Clean thread of compressor shaft before screwing on drive plate
- ❑ Thread of new drive plate has been lubricated at factory with a predetermined amount of a specific grease
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor
- ❑ Before fitting, coat rubber elements lightly with lubricant (e.g. tyre assembly paste or soap)
- ❑ Detaching and attaching
⇒ “4.7.1 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 1)”, page 190

3 - Circlip

- ❑ Renew
- ❑ Ensure correct installation position (flat side facing air conditioner compressor)
- ❑ Removing and installing
⇒ “4.7.1 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 1)”, page 190

4 - Pulley

- ❑ Different versions (depending e.g. on type of engine) ⇒ Electronic parts catalogue
- ❑ Detaching and attaching
⇒ “4.7.1 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 1)”, page 190

5 - Air conditioner compressor

- ❑ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue .
- ❑ Clean air conditioner compressor flange before fitting pulley
- ❑ Clean thread of compressor shaft and apply a small quantity of grease to thread

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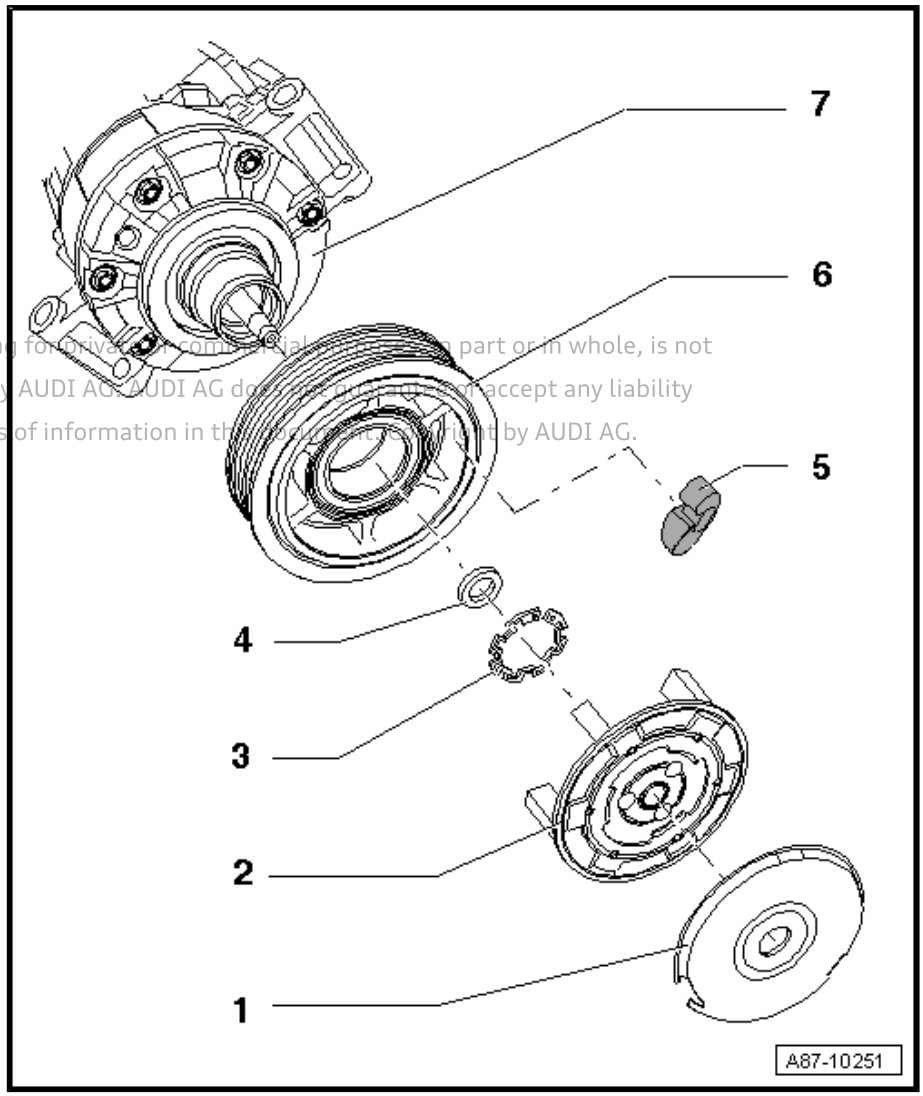
4.2.2 Exploded view - “Denso” air conditioner compressor pulley (version 2)

– Perform preparations
⇒ “4.6 Preparations for renewing pulley”, page 189 .



1 - Circlip with rubber disc

- ❑ Removing and installing ⇒ “4.7.2 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 2)”, page 192
- ❑ Vulcanised rubber disc provides noise insulation when compressor output is low and engine is idling

2 - Drive plate

- ❑ Screwed onto compressor shaft
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor
- ❑ Removing and installing ⇒ “4.7.2 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 2)”, page 192
- ❑ Tightening torque: 35 Nm

3 - Circlip

- ❑ Renew
- ❑ Ensure correct installation position (flat side facing air conditioner compressor)
- ❑ Removing and installing ⇒ “4.7.2 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 2)”, page 192

4 - Spacer

- ❑ Dimensions: 17.5 x 10 x 3 mm

5 - Rubber elements

- ❑ 6x, ensure correct installation ⇒ “4.7.2 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 2)”, page 192
- ❑ Before fitting, coat rubber elements with lubricant (e.g. tyre assembly paste or soap)

6 - Pulley

- ❑ Different versions ⇒ Electronic parts catalogue

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- ❑ Removing and installing
  ⇒ “4.7.2 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 2)”, page 192

7 - Air conditioner compressor

- ❑ Without air conditioning system magnetic clutch - N25-
- ❑ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue .
- ❑ Clean air conditioner compressor flange before fitting pulley

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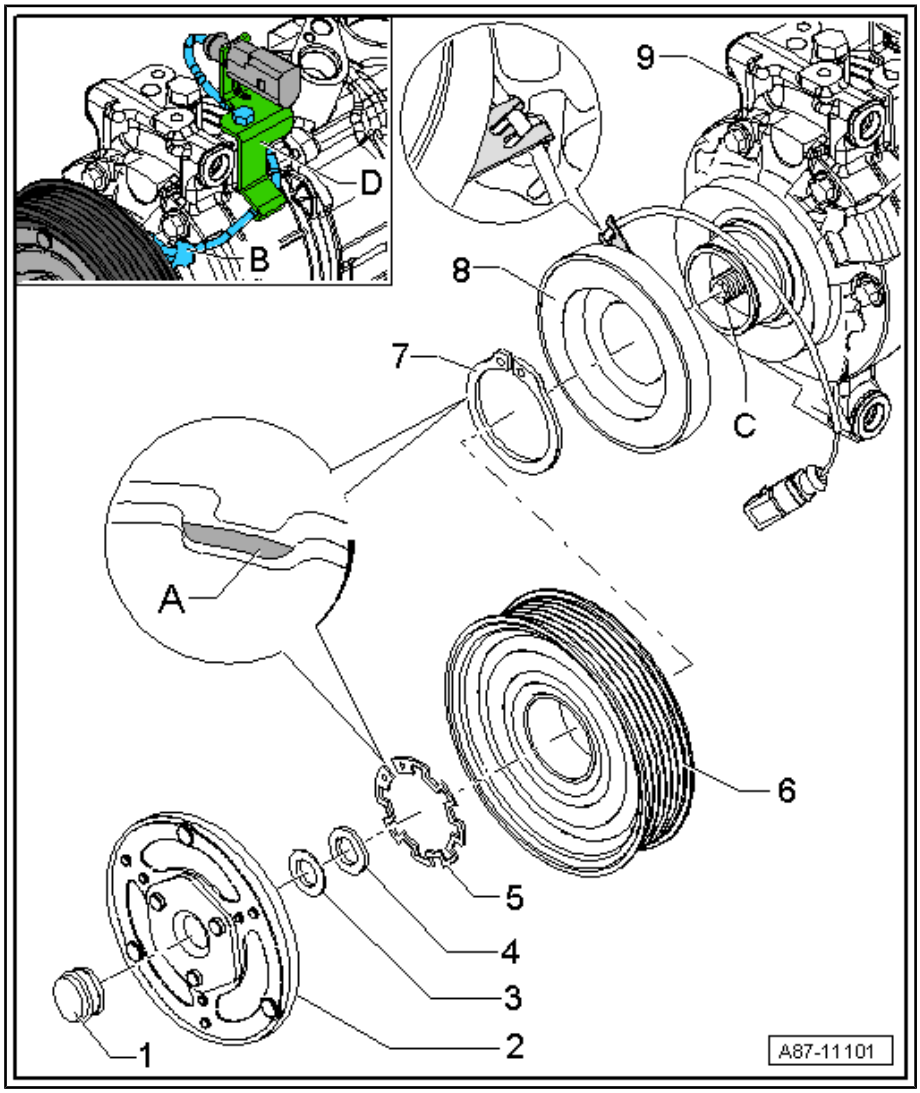
4.2.3 Exploded view - “Denso” air conditioner compressor pulley (with air conditioning system magnetic clutch - N25-)

– Perform preparations
⇒ “4.6 Preparations for renewing pulley”, page 189 .



1 - Cap

- ❑ Not always fitted

2 - Clutch plate

- ❑ Renew
- ❑ Tightening torque: 30 Nm
- ❑ Detaching and attaching
  ⇒ “4.7.5 Detaching and attaching clutch plate - Denso air conditioner compressor (with N25)”, page 195
- ❑ Screwed onto compressor shaft
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor when magnetic clutch -N25- is activated

3 - Washer

4 - Spacer

- ❑ For adjusting gap between clutch plate and pulley
- ❑ Checking gap
  ⇒ “4.7.8 Checking gap between pulley and clutch plate - Denso air conditioner compressor (with air conditioning system magnetic clutch N25)”, page 196

5 - Circlip

- ❑ Renew
- ❑ Ensure correct installation position (flat side facing air conditioner compressor)

❑ When fitting circlip, take care not to bend it open more than necessary.

– Ensure that circlip is fitted correctly (bevelled side -A- faces away from air conditioner compressor; flat side faces compressor).

6 - Pulley

❑ The pulley is sensitive to impact and should therefore be treated with care.

❑ Clean air conditioner compressor flange before fitting pulley.

❑ Different versions (depending e.g. on type of engine) ⇒ Electronic parts catalogue

❑ If pulley cannot be detached from air conditioner compressor flange by hand, refer to ⇒ “4.7.7 Detaching pulley (with air conditioning system magnetic clutch N25)”, page 196 .

7 - Circlip

❑ Renew

❑ Ensure correct installation position (flat side facing air conditioner compressor)

❑ When fitting circlip, take care not to bend it open more than necessary.

– Ensure that circlip is fitted correctly (bevelled side -A- faces away from air conditioner compressor; flat side faces compressor).

8 - Solenoid

❑ When installing, make sure retainer for cable -B- is positioned correctly.

❑ Depending on version, connector -D- may be attached to air conditioner compressor with a bracket.

❑ On air conditioner compressors on which wiring for activating -N25- and -N280- is combined in a 3-pin connector, eject wire leading to -N25- from connector using a suitable release tool from wiring harness repair set - VAS 1978 B- ⇒ Electrical system; Rep. gr. 97; Releasing and dismantling connector housings

9 - Air conditioner compressor

❑ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue .

❑ Clean air conditioner compressor flange before fitting pulley.

❑ Clean thread of compressor shaft and apply a small quantity of grease to thread.

4.2.4 Exploded view - “Sanden” air conditioner compressor pulley

– Perform preparations
⇒ “4.6 Preparations for renewing pulley”, page 189 .

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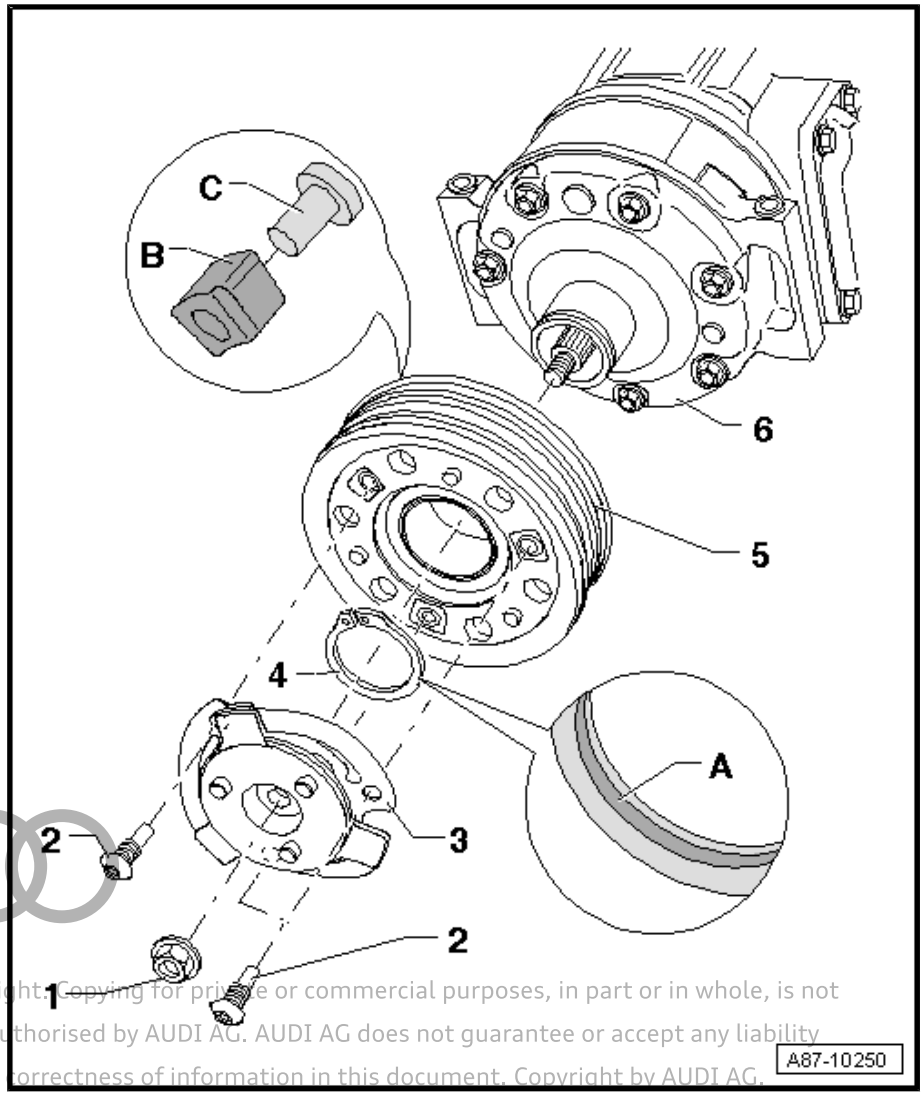

1 - Nut

- ❑ 25 Nm
- ❑ A plastic cap may be fitted additionally to protect thread of air conditioner compressor drive shaft (cap is not shown in illustration).
- – Hold pulley in position using a commercially available oil filter strap wrench when loosening or tightening hexagon nut.
- – Using e.g. a thread cutter, clean thread of nut (screwed in with locking fluid). Otherwise there is a danger of the drive shaft shearing off when it is removed again.
- – Using wire brush, clean thread of air conditioner compressor drive shaft.
- – Apply locking fluid and insert nut. For locking fluid, refer to ⇒ Electronic parts catalogue .

2 - Bolt

- ❑ 12 Nm
- – Hold pulley in position using a commercially available oil filter strap wrench when loosening or tightening bolts.
- – Threaded holes which take self-locking bolts or bolts coated with locking fluid must be cleaned using a thread tap or similar. Otherwise there is a danger of the bolts shearing off when removed again.
- – Using wire brush, clean threads of bolts screwed in with locking fluid. Then apply locking fluid and insert bolts. Locking fluid ⇒ Electronic parts catalogue

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3 - Drive plate

- ❑ With overload protection device (attachment of spring elements); triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor
- ❑ Spring elements of drive plate dampen vibrations and reduce noise

4 - Circlip

- ❑ Renew
- ❑ Install in correct position; insertion bevel -A- facing away from air conditioner compressor (flat side towards compressor)

5 - Pulley

- ❑ With rubber elements -B- and threaded plates -C- for decoupling pulley from drive shaft of air conditioner compressor (rubber elements dampen vibrations and reduce noise)
- ❑ Depending on version, threaded plates may also be linked via a ring.
- ❑ “Cold country” vehicles (e.g. for Central and Northern Europe) may be fitted with air conditioner compressors with a smaller capacity. On these air conditioner compressors, the pulley is slightly different to the version shown here (e.g. no rubber elements -B-) ⇒ Electronic parts catalogue .

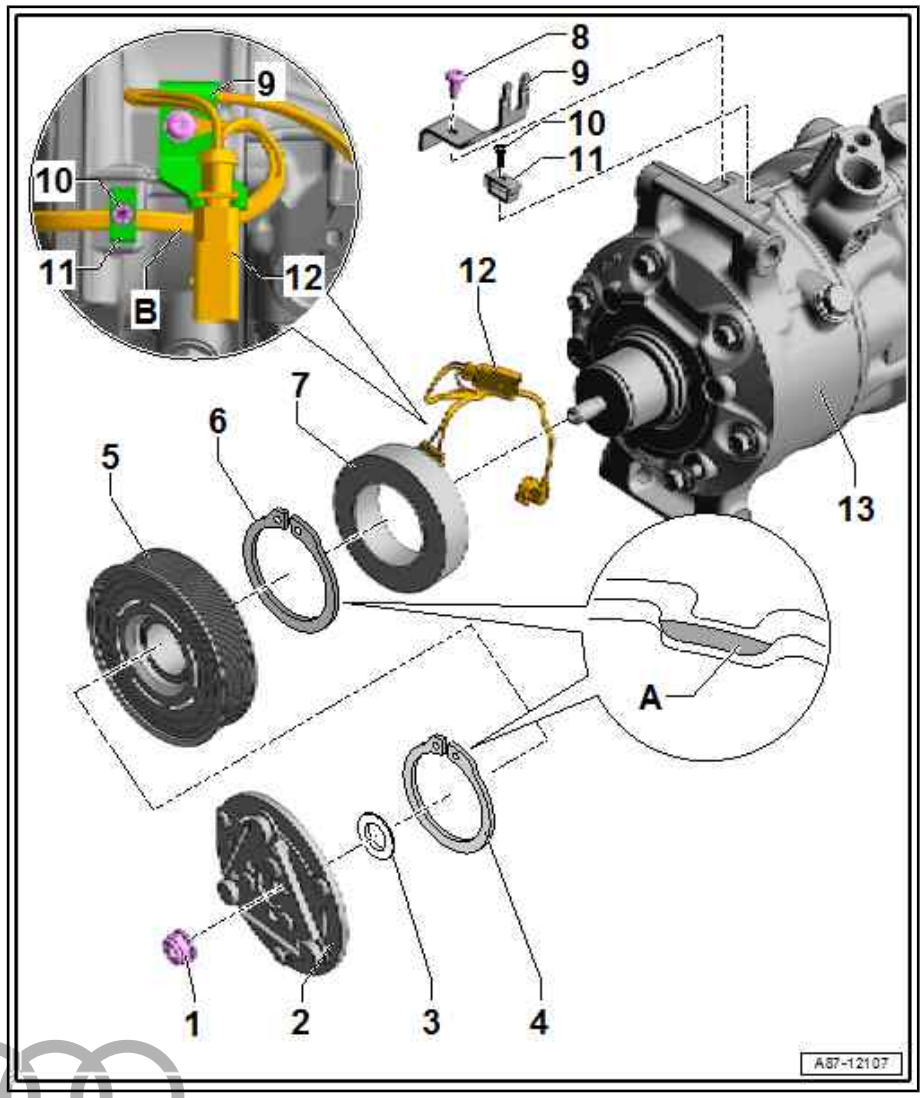
6 - Air conditioner compressor

- ❑ Clean air conditioner compressor drive shaft before fitting pulley

4.2.5 Exploded view - “Sanden” air conditioner compressor pulley (with air conditioning system magnetic clutch - N25-)

– Perform preparations ⇒ “4.6 Preparations for renewing pulley”, page 189 .

– Remove pulley with air conditioning system magnetic clutch - N25- ⇒ “4.7 Removing and installing pulley”, page 190 .



1 - Nut

- ❑ 25 Nm
- ❑ Apply locking fluid and insert nut. For locking fluid, refer to ⇒ Electronic parts catalogue .
- ❑ Clean thread of nut (screwed in with locking fluid). Otherwise there is a danger of the drive shaft shearing off when it is removed again.

2 - Clutch plate

- ❑ Renew
- ❑ Detaching and attaching ⇒ “4.7.6 Detaching and attaching clutch plate - Sanden air conditioner compressor (with N25)”, page 195
- ❑ Attached to air conditioner compressor drive shaft
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ With overload protection device; triggered if torque is too great (e.g. if air conditioner compressor cannot rotate freely) causing pulley to free-wheel without driving air conditioner compressor when magnetic clutch -N25- is activated

3 - Spacer

- ❑ For adjusting gap between clutch plate and pulley
- ❑ Checking gap ⇒ “4.7.9 Checking gap between pulley and clutch plate - Sanden air conditioner compressor (with N25)”, page 197

4 - Circlip

- ❑ Renew
- ❑ Ensure correct installation position (flat side facing air conditioner compressor)

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- ❑ When fitting circlip, take care not to bend it open more than necessary.
- – Ensure that circlip is fitted correctly (bevelled side -A- faces away from air conditioner compressor; flat side faces compressor).

5 - Pulley

- ❑ The pulley is sensitive to impact and should therefore be treated with care.
- ❑ Clean air conditioner compressor flange before fitting pulley.
- ❑ Different versions (depending e.g. on type of engine) ⇒ Electronic parts catalogue
- ❑ If pulley cannot be detached from air conditioner compressor flange by hand, refer to ⇒ “4.7.7 Detaching pulley (with air conditioning system magnetic clutch N25)”, page 196 .

6 - Circlip

- ❑ Renew
- ❑ When fitting circlip, take care not to bend it open more than necessary.
- – Ensure that circlip is fitted correctly (bevelled side -A- faces away from air conditioner compressor; flat side faces compressor).

7 - Solenoid

- ❑ When installing, make sure retainer for cable -B- is positioned correctly.
- ❑ Depending on version, connector may be attached to air conditioner compressor with a bracket.
- ❑ Air conditioner compressor on which wiring for activating -N25- and -N280- is combined in 3-pin connector: Unplug connector from -N280- or disconnect wire to -N25- from connector ⇒ Item 12 (page 166) using a suitable release tool from wiring harness repair set - VAS 1978 B- ⇒ Electrical system; Rep. gr. 97 ; Releasing and dismantling connector housings

8 - Bolt

- ❑ 3 Nm
- ❑ For securing bracket ⇒ Item 9 (page 166) , for connector ⇒ Item 12 (page 166) and earth connection of -N25-
- ❑ Before installing, check and if necessary clean contact surfaces on air conditioner compressor and bracket.

9 - Bracket

10 - Bolt

- ❑ 3 Nm

11 - Bracket

12 - Connector

- ❑ Different versions, depending on air conditioner compressor and -N280- (1, 2 or 3 pins)

13 - Air conditioner compressor

- ❑ Different versions may be fitted, depending on engine type and country-specific version of vehicle ⇒ Electronic parts catalogue .
- ❑ Clean air conditioner compressor flange before fitting pulley.
- ❑ Clean thread of compressor shaft and apply a small quantity of grease to thread.

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4.3 Detaching and attaching air conditioner compressor at bracket

⇒ “4.3.1 Detaching and attaching air conditioner compressor at bracket - vehicles with 4-cyl. engine”, page 167

⇒ “4.3.2 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. engine (except 6-cyl. 2.9 ltr. TFSI engine)”, page 169

⇒ “4.3.3 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 171

⇒ “4.3.4 Detaching and attaching electrically driven air conditioner compressor at bracket”, page 174

4.3.1 Detaching and attaching air conditioner compressor at bracket - vehicles with 4-cyl. engine

The air conditioner compressor can be detached and attached without opening the refrigerant lines on all vehicles except those with 2.0 ltr. TFSI engine and starter-alternator.

– Switch off ignition.

Detaching

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

Vehicles with 2.0 ltr. TFSI engine and starter-alternator

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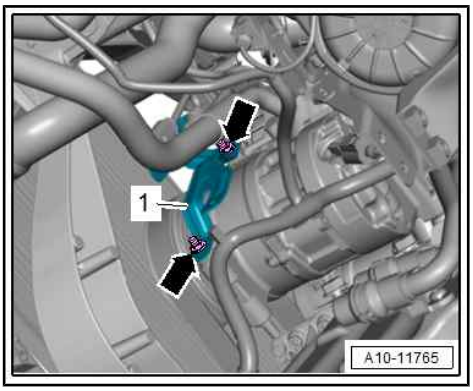
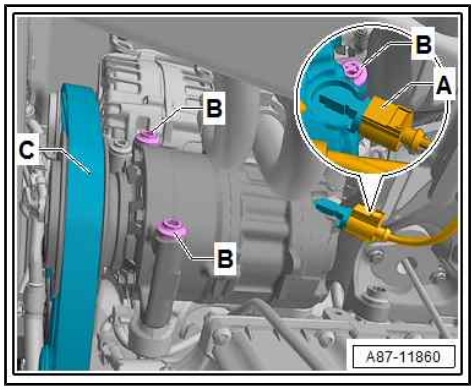
– Detach refrigerant lines from air conditioner compressor ⇒ “4.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 176 .

Vehicles with TDI engine

– Unscrew nuts -arrows- and move bracket -1- for SCR line clear.



All vehicles (continued)



– Detach poly V-belt -C- from air conditioner compressor ⇒ Engine; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
– Mark electrical connector -A- for air conditioner compressor regulating valve - N280- (to avoid possible interchange with other identical connectors).
– Unplug electrical connector -A-.

Note

- Depending on the version of the air conditioner compressor (e.g. on version with air conditioning system magnetic clutch - N25-), the connection -A- to -N280- and/or to -N25- can also be at the top of the air conditioner compressor.
- The connectors for air conditioner compressor regulating valve - N280- and the electrical engine mounting are identical. If the connectors are interchanged, no entry is made in the event memory, but the air conditioner compressor is constantly activated and the evaporator may ice up.

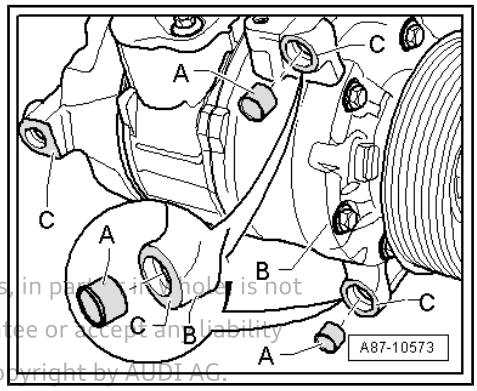
NOTICE

Risk of damage to refrigerant lines and hoses when detaching and pivoting air conditioner compressor.

– Do not stretch, kink or bend refrigerant lines and hoses.

– Remove bolts -B- and detach air conditioner compressor.
– Suspend air conditioner compressor from lock carrier with a piece of wire.

Attaching



Installation is carried out in reverse order; note the following:

– Thoroughly clean contact surfaces -C- on air conditioner compressor.
– Insert dowel sleeves -A- in air conditioner compressor -B-.

- There are different versions of the dowel sleeves -A- (different lengths); for correct version refer to ⇒ Electronic parts catalogue.
- Make sure that the dowel sleeves -A- are positioned correctly and that the contact surfaces are clean. If the dowel sleeves are not installed correctly or the contact surfaces -C- at the bracket or air conditioner compressor are dirty or damaged, this could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.

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Tightening torques

- ⇒ “4.1 Exploded view - air conditioner compressor”, page 153
- ⇒ “2.2 Exploded view - refrigerant lines”, page 48

4.3.2 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. engine (except 6-cyl. 2.9 ltr. TFSI engine)

Detaching

– Switch off ignition.

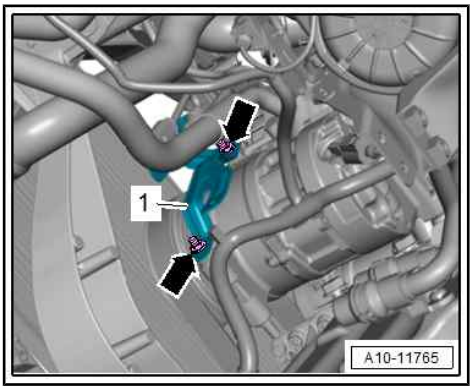
– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

SQ5

– Remove longitudinal member (bottom left) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .

Vehicles with TDI engine

– If fitted, unscrew nuts -arrows- and move bracket -1- for SCR line clear. Depending on version, bracket can be located on top of compressor (rear).



S4/S5/SQ5 with TDI engine

– Remove coolant pipe (front bottom) ⇒ Engine; Rep. gr. 19 ; Coolant pipes; Removing and installing coolant pipes .

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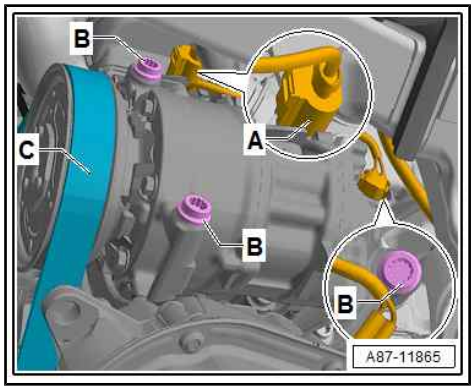
All vehicles (continued)



– Detach poly V-belt (for auxiliary drives) -C- from air conditioner compressor pulley ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

– Mark electrical connector -A- for air conditioner compressor regulating valve - N280- (to avoid possible interchange with other identical connectors).

– Unplug electrical connector -A-.

Note

- Depending on the version of the air conditioner compressor (e.g. on version with air conditioning system magnetic clutch - N25-), the connection -A- to -N280- and/or to -N25- can also be at the top of the air conditioner compressor.
- Depending on the version, the connectors for the air conditioner compressor regulating valve - N280- and the electrical engine mounting are identical. If the connectors are interchanged, no entry is made in the event memory, but the air conditioner compressor is constantly activated and the evaporator may ice up.

– Remove bolts -B-.

NOTICE

Risk of damage to refrigerant lines and hoses when detaching and pivoting air conditioner compressor.

– Do not stretch, kink or bend refrigerant lines and hoses.

– Detach air conditioner compressor and swivel it away from engine as far as possible without kinking or straining refrigerant hoses.

– Attach air conditioner compressor to vehicle (e.g. with a piece of wire) so that refrigerant hoses are not kinked or strained.

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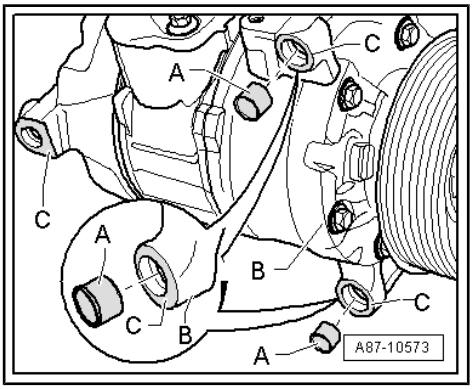
Attaching



Installation is carried out in reverse order; note the following:

– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.

– Thoroughly clean contact surfaces -C- on air conditioner compressor.

- There are different versions of the dowel sleeves -A- (different lengths); for correct version refer to ⇒ Electronic parts catalogue .
- Make sure that the dowel sleeves -A- are positioned correctly and that the contact surfaces are clean. If the dowel sleeves are not installed correctly or the contact surfaces -C- at the bracket or air conditioner compressor are dirty or damaged, this could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.

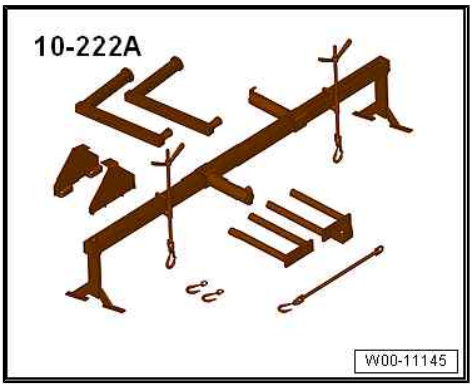
Tightening torques

- ⇒ “4.1 Exploded view - air conditioner compressor”, page 153
- ⇒ Engine; Rep. gr. 19 ; Coolant pipes; Exploded view - coolant pipes
- ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

4.3.3 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. 2.9 ltr. TFSI engine

Special tools and workshop equipment required

- Support bracket - 10-222A-



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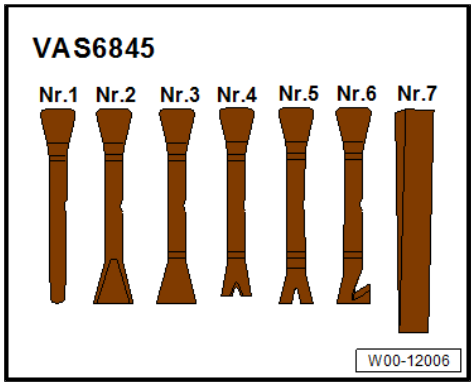
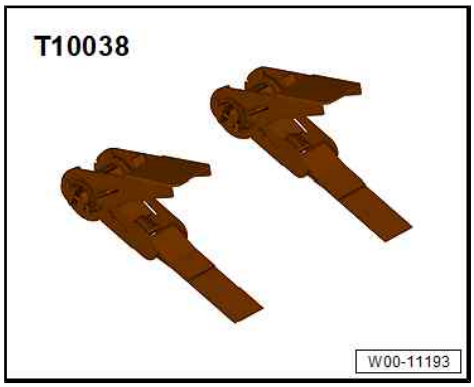
- Medium hard universal wedge from scraper set - VAS 6845-



- Tensioning strap - T10038-



Detaching

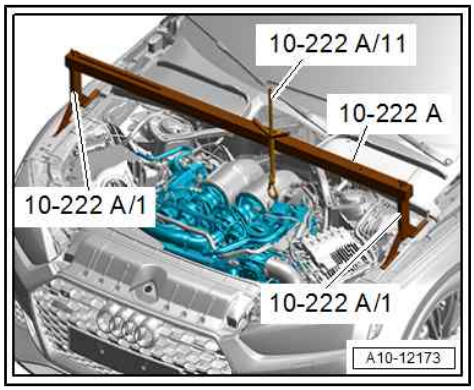
– Remove engine cover panel and heat shield ⇒ Engine; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

– Set up support bracket - 10-222A- on longitudinal members (left and right).

– Hook spindle - 10-222A/11- onto engine lifting eye (front left).

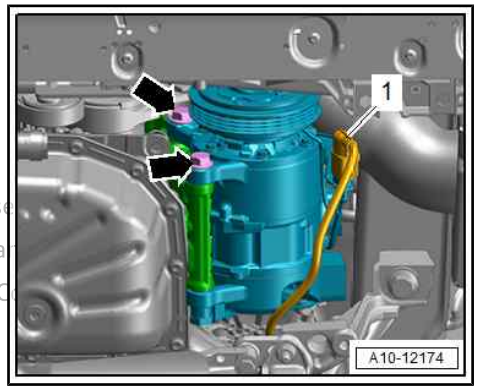
– Remove wheel spoilers (both sides) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

– Detach poly V-belt from pulley of air conditioner compressor ⇒ Engine; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



– Unplug electrical connector -1-.

– Remove bolts -arrows-.



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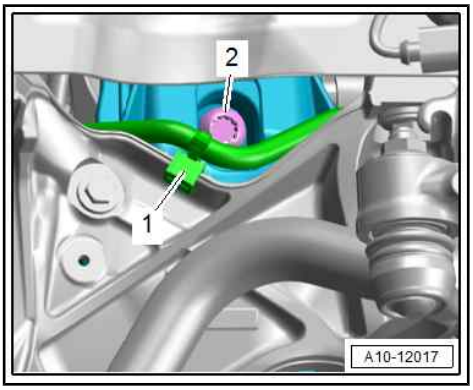
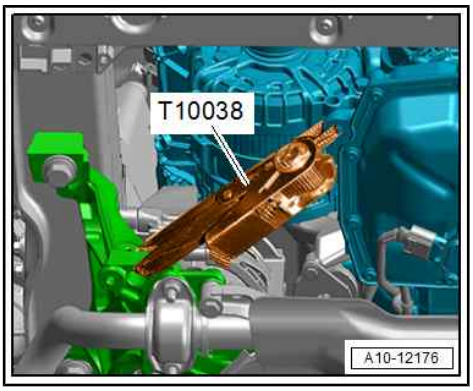
To remove bolts, proceed as follows:

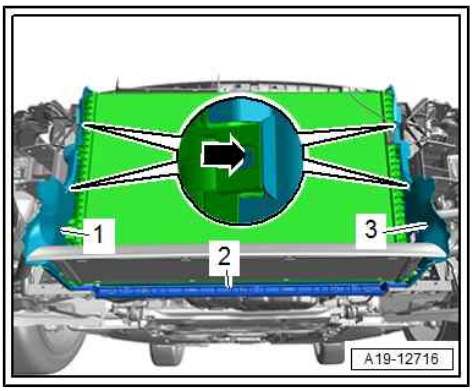
– Loosen bolt -2- for engine mounting (both sides) several turns.



– Pull engine slightly towards right side using tensioning strap - T10038- , as shown.
– Lift engine slightly with spindle - 10-222A/11- and remove bolt for air conditioner compressor at top.
– Detach spindle and tensioning strap.
– Release bumper cover (bottom) at lock carrier ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .



– Unclip and remove air duct -2-.



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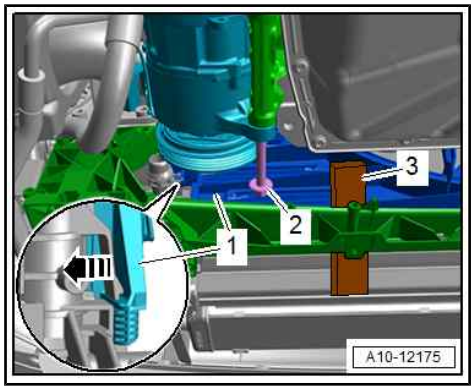
– Press locking tab on left of radiator cowl -1- -arrow-, push radiator cowl upwards slightly and secure it, as shown, with medium-hard universal wedge -3- from scraper set - VAS 6845- .



NOTICE

Risk of damage to refrigerant lines and hoses when detaching and pivoting air conditioner compressor.

– Do not stretch, kink or bend refrigerant lines and hoses.

– Detach bolt (bottom) -2-, detach air conditioner compressor and swivel it away from engine as far as possible without kinking or straining refrigerant hoses.

– Attach air conditioner compressor to vehicle (e.g. with a piece of wire) so that refrigerant hoses are not kinked or strained.

Installing

Installation is carried out in reverse order; note the following:

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– Install poly V-belt for air conditioner compressor ⇒ Engine; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

– Secure bumper cover (bottom) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .

– Install engine cover panel and heat shield ⇒ Engine; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ⇒ “4.1.2 Exploded view - air conditioner compressor, vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 156
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ⇒ 6-cylinder direct injection engine (2.9, 3.0 ltr. 4-valve TFSI); Rep. gr. 10 ; Assembly mountings; Exploded view - assembly mountings

4.3.4 Detaching and attaching electrically driven air conditioner compressor at bracket

Detaching

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “1.3 Safety precautions when working on vehicles with high-voltage system”, page 2 .

DANGER

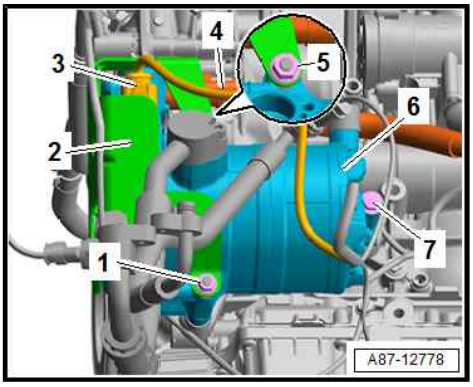
High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

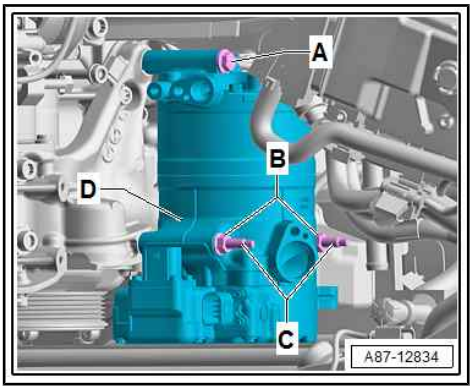
– Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) de-energise the high-voltage system.

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

– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
– Unplug electrical connector -3- for low-voltage wire.
– Remove nuts -1, 5- and detach crash retainer -2-.
– Detach electrical connector -4- (high-voltage wire) from air conditioner compressor ⇒ Engine; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .
– Cover low-voltage and high-voltage wire connectors and mating plug at air conditioner compressor to prevent damage and contamination (e.g. with clean plugs from engine bung set - VAS 6122-).



– Remove centre hex studs -C-.
– Remove bolt -A-.



NOTICE

Risk of damage to refrigerant lines and hoses when detaching and pivoting air conditioner compressor.

– Do not stretch, kink or bend refrigerant lines and hoses.

– Detach air conditioner compressor -D- and secure it to vehicle (e.g. with a piece of wire) so that refrigerant hoses are not kinked or strained.

Attaching

Installation is carried out in reverse order; note the following:

– Before bolting on air conditioner compressor -A-, check surfaces of compressor (at compressor and engine bracket) and clean if necessary ⇒ Electrical system; General information; Rep. gr. 97 ; Contact surface cleaning set - VAS 6410- .

WARNING

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

– Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) re-energise the high-voltage system.

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

Tightening torques

◆ ⇒ “4.1.3 Exploded view - electrically driven air conditioner compressor”, page 158

◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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4.4 Detaching and attaching refrigerant lines at air conditioner compressor

⇒ “4.4.1 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 4-cyl. engine”, page 176

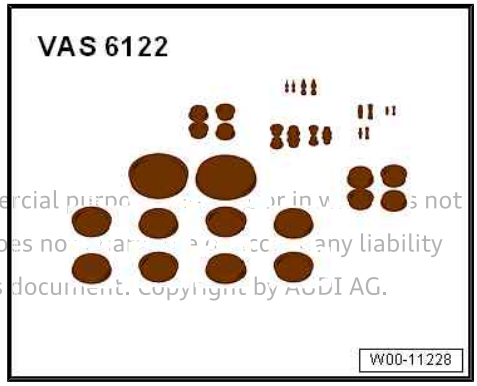
⇒ “4.4.2 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 6-cyl. engine”, page 178

⇒ “4.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - Q5 vehicles with high-voltage system”, page 179

4.4.1 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 4-cyl. engine

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



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Detaching

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Switch off ignition.

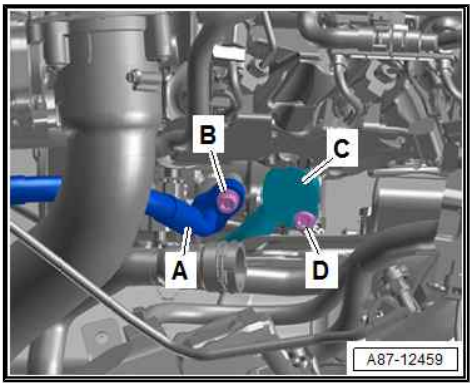
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolts -B, D- from above.

NOTICE

Danger of irreparable damage to refrigerant lines if the inside film is torn.

- **Never bend refrigerant lines which have a radius smaller than r = 100 mm.**

– Disconnect refrigerant lines -A, C- and take them out downwards.

– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

Attaching

Installation is carried out in reverse order; note the following:

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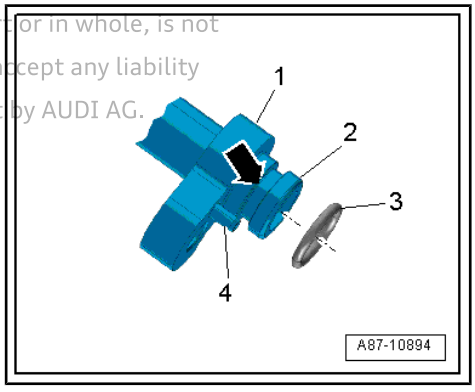
Installation is carried out in reverse order; note the following:

– Renew O-rings -3-; for correct version refer to ⇒ Electronic parts catalogue .



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

– Check guide ring -2- at refrigerant line connection for damage.

– Insert O-ring -3- in groove -arrow- in connection for refrigerant line -1-.

– Lubricate O-rings with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .

– Insert refrigerant lines in connections on air conditioner compressor so they are free of tension and bolt them on.

– After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

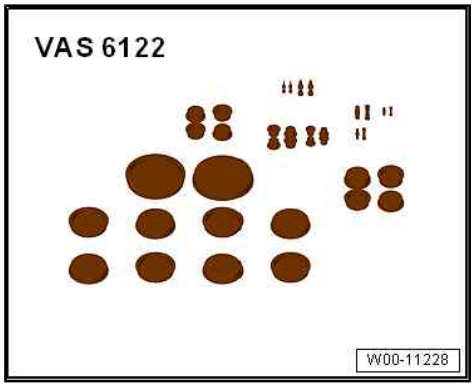
Tightening torques

◆ ⇒ “2.2 Exploded view - refrigerant lines”, page 48

4.4.2 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 6-cyl. engine

Special tools and workshop equipment required

- Engine bung set - VAS 6122-



Detaching

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Detach air conditioner compressor from bracket
⇒ “4.3.2 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. engine (except 6-cyl. 2.9 ltr. TFSI engine)”, page 169 , or
⇒ “4.3.3 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 171 .

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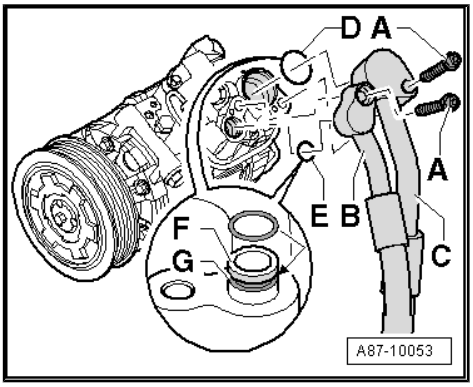
CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



NOTICE

Danger of irreparable damage to refrigerant lines if the inside film is torn.

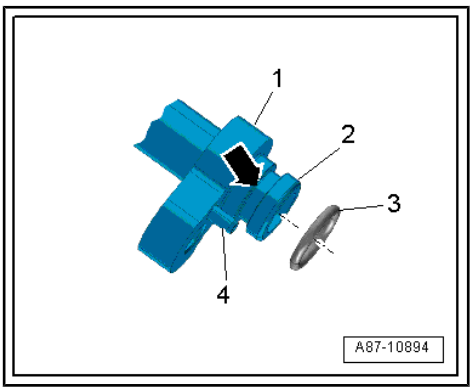
- **Never bend refrigerant lines which have a radius smaller than r = 100 mm.**

- Remove bolts -A- and detach refrigerant lines -B and C-.
- Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

Attaching

Installation is carried out in reverse order; note the following:

- Renew O-rings -3-; for correct version refer to ⇒ Electronic parts catalogue .
- If fitted, check that dowel pin -4- is not damaged and is seated correctly.
- Check guide ring -2- at refrigerant line connection for damage.
- Insert O-ring -3- in groove -arrow- in connection for refrigerant line -1-.
- Lubricate O-rings with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .
- Re-install remaining components (removed earlier).
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
- Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .



Tightening torques

- ⇒ “2.2 Exploded view - refrigerant lines”, page 48
- ⇒ “4.1.2 Exploded view - air conditioner compressor, vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 156

4.4.3 Detaching and attaching refrigerant lines at air conditioner compressor - Q5 vehicles with high-voltage system

Special tools and workshop equipment required

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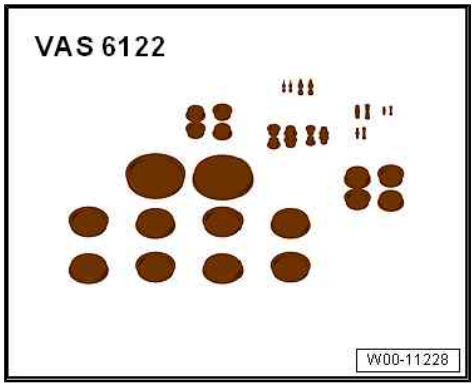
♦ Engine bung set - VAS 6122-



Detaching

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- , use the "Extract, evacuate and charge refrigerant circuit" routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester.

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

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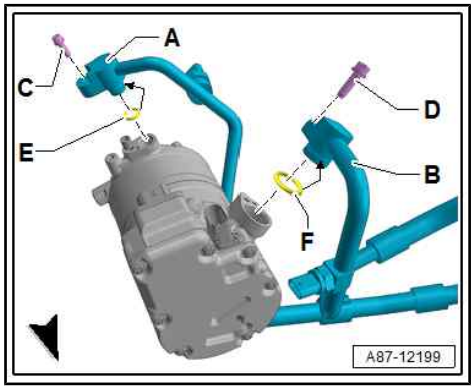
CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



– Remove bolts -C, D- from above.

NOTICE

Danger of irreparable damage to refrigerant lines if the inside film is torn.

- **Never bend refrigerant lines which have a radius smaller than r = 100 mm.**

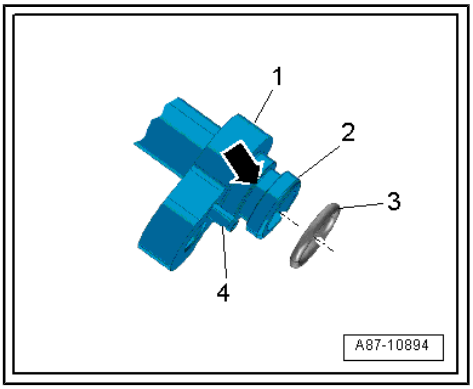
– Detach refrigerant lines -A, B-.

– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

Attaching

Installation is carried out in reverse order; note the following:

- Renew O-rings -3-; for correct version refer to ⇒ Electronic parts catalogue .
- If fitted, check that dowel pin -4- is not damaged and is seated correctly.
- Lubricate O-rings with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 16 .
- After attaching, check routing of refrigerant lines: they must be fitted tension-free in appropriate brackets and must not make contact with any other components.
- Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .
- Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester.
- Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .



Tightening torques

- ⇒ “2.2 Exploded view - refrigerant lines”, page 48

4.5 Removing and installing air conditioner compressor

⇒ “4.5.1 Notes on mechanically driven air conditioner compressors”, page 181

⇒ “4.5.2 Removing and installing air conditioner compressor - vehicles with 4-cyl. engine”, page 182

⇒ “4.5.3 Removing and installing air conditioner compressor - vehicles with 6-cyl. engine (except 6-cyl. 2.9 ltr. TFSI engine)”, page 183

⇒ “4.5.4 Removing and installing air conditioner compressor - vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 184

⇒ “4.5.5 Removing and installing electrically driven air conditioner compressor”, page 185

4.5.1 Notes on mechanically driven air conditioner compressors

- The compressor version may differ depending on the production period and engine ⇒ Electronic parts catalogue .
- An air conditioner compressor with or without air conditioning system magnetic clutch - N25- may be installed, depending on the vehicle model, production period and engine.
- The air conditioner compressor without air conditioning system magnetic clutch - N25- is always driven when the engine is running. Since the air conditioner compressor version (with or without -N25-) cannot always be distinguished clearly from above, only start the engine if the refrigerant circuit has been assembled properly. If, for example, the refrigerant lines are not connected to the air conditioner compressor when the engine is running, the compressor might heat up (internal heat generation) so much that this can lead to irreparable damage

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to the compressor. The internal heat generation is caused by the air conditioner compressor operating against a fixed resistance even at approximately 0 % delivery rate (sealed circuit).

- To prevent the air conditioner compressor from being damaged irreparably when the refrigerant circuit is empty, it is designed so that delivery is reduced to roughly 0 % and lubrication is maintained via an internal oil circuit with the residual oil left in the air conditioner compressor.
- As replacement air conditioner compressors of this type with different oil capacities are available, make sure to observe the oil quantity in the compressor ⇒ “5 Technical data”, page 18 .

4.5.2 Removing and installing air conditioner compressor - vehicles with 4-cyl. engine

Removing

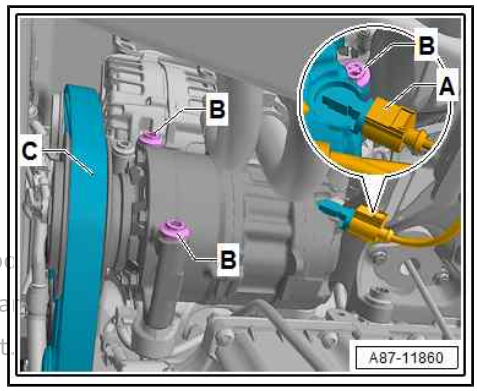
– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

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

– Detach refrigerant lines from air conditioner compressor ⇒ “4.4.1 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 4-cyl. engine”, page 176 .

– Detach air conditioner compressor from bracket ⇒ “4.3.1 Detaching and attaching air conditioner compressor at bracket - vehicles with 4-cyl. engine”, page 167 .



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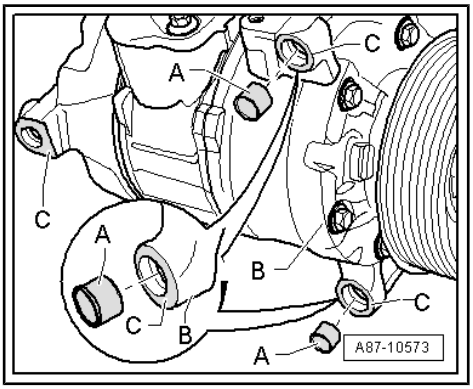
Installing

– If the air conditioner compressor is being renewed (e.g. due to internal damage), observe the notes on renewing the air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners 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 compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .



– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.

• There are different versions of the dowel sleeves -A- (different lengths); for correct version refer to ⇒ Electronic parts catalogue .

• Make sure that the dowel sleeves -A- are positioned correctly and that the contact surfaces are clean. If the dowel sleeves are not installed correctly or the contact surfaces -C- at the bracket or air conditioner compressor are dirty or damaged, this could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.

Before installing air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Before fitting poly V-belt, turn air conditioner compressor 10 times via pulley in direction of rotation (to prevent damage to compressor on initial activation).

– After installing a new air conditioner compressor or pouring in fresh refrigerant oil and before fitting the poly V-belt (e.g. after cleaning the refrigerant circuit), crank the compressor 10 turns by hand before starting the engine for the first time to prevent damage to the compressor.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

◆ ⇒ “4.1 Exploded view - air conditioner compressor”, page 153

4.5.3 Removing and installing air conditioner compressor - vehicles with 6-cyl. engine (except 6-cyl. 2.9 ltr. TFSI engine)

Removing

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– Detach air conditioner compressor from bracket ⇒ “4.3.2 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. engine (except 6-cyl. 2.9 ltr. TFSI engine)”, page 169 .

– Detach refrigerant lines from air conditioner compressor ⇒ “4.4.2 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 6-cyl. engine”, page 178 .

Installing

Installation is carried out in reverse order; note the following:

– If the air conditioner compressor is being renewed (e.g. due to internal damage), observe the notes on renewing the air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

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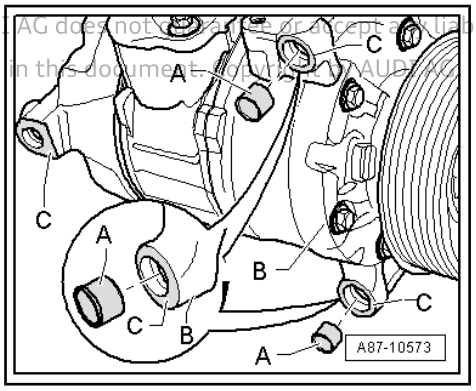
- ♦ When it is removed, the air conditioner compressor contains an indeterminate amount of refrigerant oil. For this reason it is important to observe the notes on renewing the compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Before securing air conditioner compressor, check position of both dowel sleeves -A- in bracket or compressor -B-.

- There are different versions of the dowel sleeves -A- (different lengths); for correct version refer to ⇒ Electronic parts catalogue .
- Make sure that the dowel sleeves -A- are positioned correctly and that the contact surfaces are clean. If the dowel sleeves are not installed correctly or the contact surfaces -C- at the bracket or air conditioner compressor are dirty or damaged, this could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment can cause damage to the poly V-belt or the air conditioner compressor.



Before installing air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Before fitting poly V-belt, turn air conditioner compressor 10 times via pulley in direction of rotation (to prevent damage to compressor on initial activation).

– After installing a new air conditioner compressor or pouring in fresh refrigerant oil and before fitting the poly V-belt (e.g. after cleaning the refrigerant circuit), crank the compressor 10 turns by hand before starting the engine for the first time to prevent damage to the compressor.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

- ♦ ⇒ “4.1 Exploded view - air conditioner compressor”, page 153

4.5.4 Removing and installing air conditioner compressor - vehicles with 6-cyl. 2.9 ltr. TFSI engine

Removing

– Detach air conditioner compressor from bracket ⇒ “4.3.3 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 171 .

– Detach refrigerant lines from air conditioner compressor ⇒ “4.4.2 Detaching and attaching refrigerant lines at air conditioner compressor - vehicles with 6-cyl. engine”, page 178 .

Installing

Installation is carried out in reverse order; note the following:

– If the air conditioner compressor is being renewed (e.g. due to internal damage), observe the notes on renewing the air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners 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 compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

Before installing air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Before fitting poly V-belt, turn air conditioner compressor 10 times via pulley in direction of rotation (to prevent damage to compressor on initial activation).

– After installing a new air conditioner compressor or pouring in fresh refrigerant oil and before fitting the poly V-belt (e.g. after cleaning the refrigerant circuit), crank the compressor 10 turns by hand before starting the engine for the first time to prevent damage to the compressor.

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

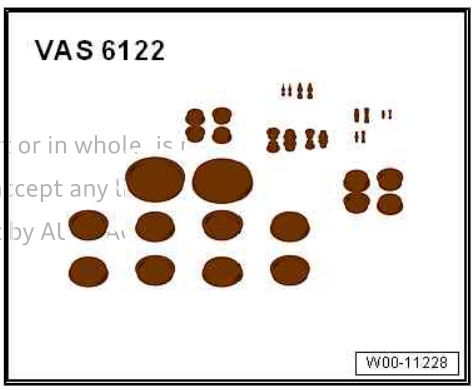
♦ ⇒ “4.1.2 Exploded view - air conditioner compressor, vehicles with 6-cyl. 2.9 ltr. TFSI engine”, page 156

♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

4.5.5 Removing and installing electrically driven air conditioner compressor

Special tools and workshop equipment required

♦ Engine bung set - VAS 6122-



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Removing

- For all subsequent work, seal off any open lines and connections immediately using clean plugs from engine bung set - VAS 6122- .

– Initiate basic setting of air conditioner via thermal management control unit - J1024- ; use the “Extract, evacuate and charge refrigerant circuit” routine stored there to open electrically actuated valves ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “1.3 Safety precautions when working on vehicles with high-voltage system”, page 2 .

DANGER

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

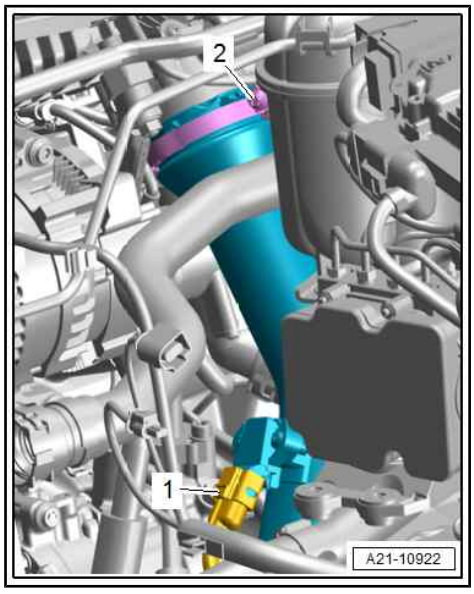
– Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) de-energise the high-voltage system.

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

– Unplug electrical connector -1- for charge pressure sender - G31- .

– Loosen screw-type clip -2- and detach air pipe from throttle valve module - GX3- .

– Carefully push air pipe towards rear, taking care not to damage it.



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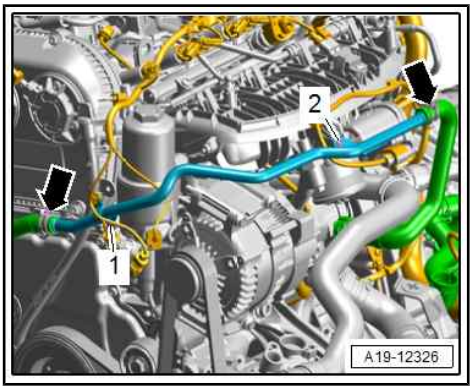
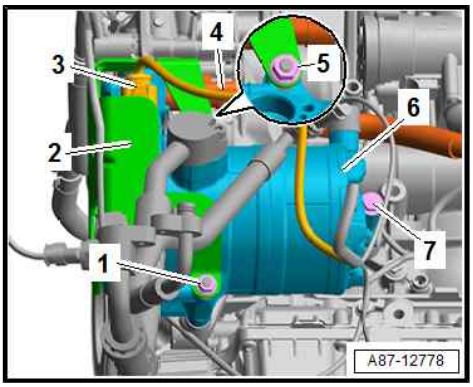
– Remove bolts -1, 2-.
– Push coolant pipe (left-side) slightly to one side.



– Unplug electrical connector -3- for low-voltage wire.

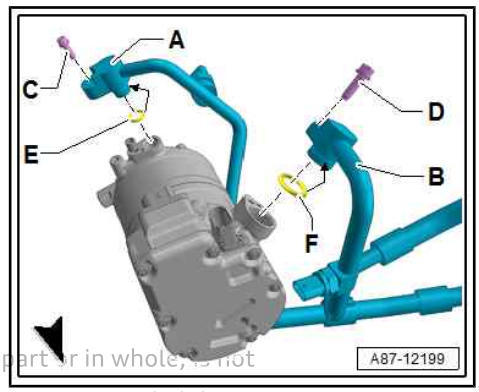


CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**



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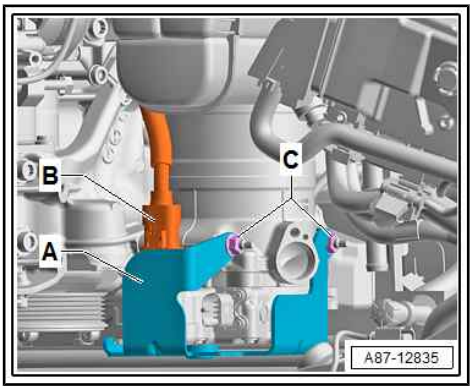
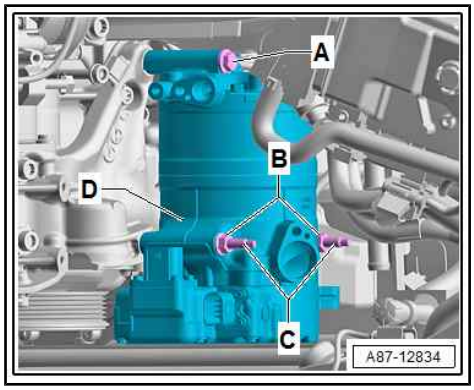
– Remove bolts -C, D- and detach refrigerant lines -A, B-.
– Seal off refrigerant lines -A, B- and connections immediately with clean plugs from engine bung set - VAS 6122- .

– Unscrew nuts -C- and detach crash retainer -A-.
– Detach electrical connector -B- (high-voltage wire) from air conditioner compressor ⇒ Engine; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .
– Cover low-voltage and high-voltage wire connectors and mating plug at air conditioner compressor to prevent damage and contamination (e.g. with clean plugs from engine bung set - VAS 6122-).



– Remove centre hex stud -C-.

– Unscrew bolt -A- and remove electrical air conditioner compressor - V470- -D- upwards.



Installing

Installation is carried out in reverse order; note the following:

– If the air conditioner compressor is being renewed (e.g. due to internal damage), observe the notes on renewing the air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners 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 compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

– Before bolting on air conditioner compressor -A-, check surfaces of compressor (at compressor and engine bracket) and clean if necessary ⇒ Electrical system; General information; Rep. gr. 97 ; Contact surface cleaning set - VAS 6410- .

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

WARNING

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

– Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) re-energise the high-voltage system.

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

– Initiate air conditioner basic setting via thermal management control unit - J1024- and use a routine stored there to open electrically actuated valves (“Stop routine: Charging/flushing refrigerant circuit”) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Start up electrical air conditioner compressor - V470- via “Compressor run-in” function ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and battery regulation).

– Start up air conditioner after charging refrigerant circuit ⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

Tightening torques

◆ ⇒ “4.1.3 Exploded view - electrically driven air conditioner compressor”, page 158

◆ ⇒ Engine; Rep. gr. 19 ; Coolant pipes; Exploded view - coolant pipes

◆ ⇒ Engine; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

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◆ ⇒ “2.2 Exploded view - refrigerant lines”, page 48

4.6 Preparations for renewing pulley

– Switch off ignition.

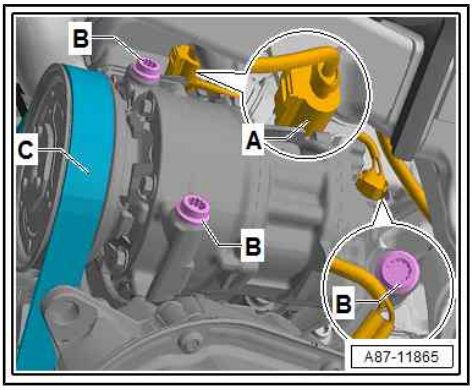
– Remove front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

– Detach poly V-belt (for auxiliary drives) -C- from air conditioner compressor pulley ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

– If necessary, remove air conditioner compressor from bracket and swivel forwards and downwards.

◆ ⇒ “4.3.1 Detaching and attaching air conditioner compressor at bracket - vehicles with 4-cyl. engine”, page 167

◆ ⇒ “4.3.2 Detaching and attaching air conditioner compressor at bracket - vehicles with 6-cyl. engine (except 6-cyl. 2.9 ltr. TFSI engine)”, page 169



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4.7 Removing and installing pulley

⇒ “4.7.1 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 1)”, page 190

⇒ “4.7.2 Removing and installing pulley (without N25) - Denso air conditioner compressor (version 2)”, page 192

⇒ “4.7.3 Removing and installing pulley (without N25) - Sanden air conditioner compressor”, page 193

⇒ “4.7.4 Notes on pulley with air conditioning system magnetic clutch N25 ”, page 194

⇒ “4.7.5 Detaching and attaching clutch plate - Denso air conditioner compressor (with N25)”, page 195

⇒ “4.7.6 Detaching and attaching clutch plate - Sanden air conditioner compressor (with N25)”, page 195

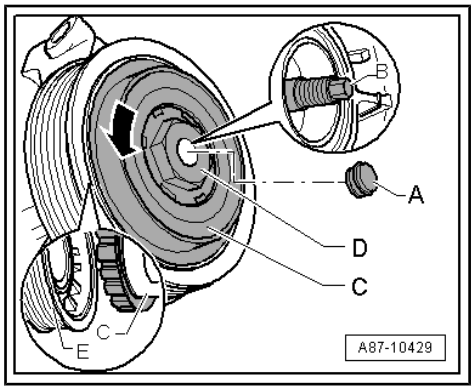
⇒ “4.7.7 Detaching pulley (with air conditioning system magnetic clutch N25)”, page 196

⇒ “4.7.8 Checking gap between pulley and clutch plate - Denso air conditioner compressor (with air conditioning system magnetic clutch N25)”, page 196

⇒ “4.7.9 Checking gap between pulley and clutch plate - Sanden air conditioner compressor (with N25)”, page 197

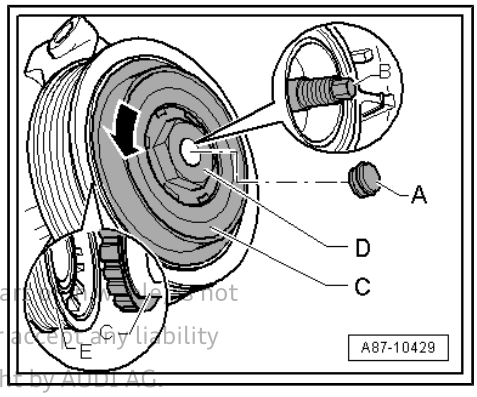
4.7.1 Removing and installing pulley (without -N25-) - “Denso” air conditioner compressor (version 1)

- Notes on renewing pulley -E-
  ⇒ “4.2.1 Exploded view - Denso air conditioner compressor pulley (version 1)”, page 159
- Pulley is made of plastic, is sensitive to impact and should be treated with care.
- If the overload protection device of the drive plate -C- has been triggered, the pulley -E- can rotate together with the outer section of the drive plate -C- without the compressor shaft -B- and the hexagonal bolt -D- attached to the drive plate (inner section of drive plate -C-) rotating simultaneously.



Detaching

– Perform preparations
  ⇒ “4.6 Preparations for renewing pulley”, page 189 .
– Remove cap -A-.
– Hold compressor shaft -B- e.g. with a commercially available hexagon socket wrench (7 mm) and turn drive plate -C- with pulley -E- in direction of -arrow-.



Note

- The torque for driving the air conditioner compressor is applied to the compressor shaft via the threaded connection between the drive plate -C- and the compressor shaft.
- If the drive plate -C- has become so firmly attached to the compressor shaft that it can no longer be loosened (the 7 mm hexagon socket wrench -B- can no longer transmit the necessary torque), the compressor must be renewed.

– Detach drive plate -C-.

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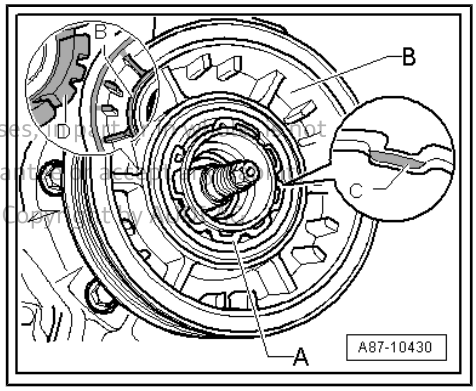
– Remove circlip -A-.

– Detach pulley -B-.



Attaching

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- Bend circlip -A- open only as far as it is necessary for assembly.

– Clean air conditioner compressor flange before fitting pulley -B-.

– Install pulley -B-.

– Ensure that new circlip -A- is fitted correctly (bevelled side -C- faces away from air conditioner compressor; flat side faces compressor).

– Clean thread of compressor shaft.

Note

♦ Thread of new drive plate has been lubricated at factory with a pre-determined amount of a specific grease.

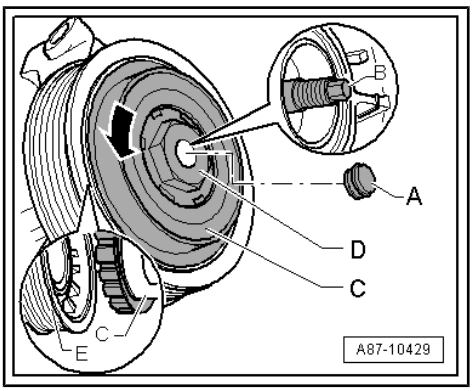
– Before installing drive plate, coat rubber elements -D- lightly with lubricant (e.g. tyre fitting paste or soap solution).

– Insert rubber elements -D- in pulley -B- as shown.

– Press rubber element of drive plate -C- into pulley -E- until drive plate -C- makes contact with thread of compressor shaft -B-.

– Secure drive plate -C- to compressor shaft -B- by turning in direction opposite to -arrow-.

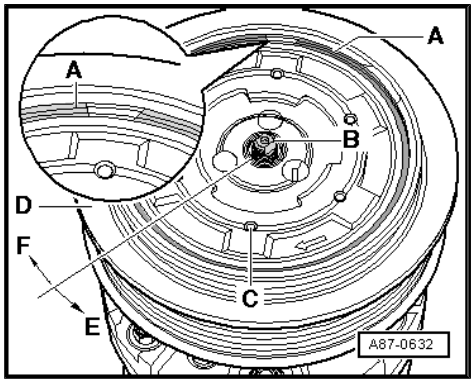
– Hold compressor shaft -B- e.g. with a commercially available hexagon socket wrench (7 mm) and turn drive plate -C- with pulley -E- in direction opposite to that of -arrow-.



Tightening torques

♦ ⇒ “4.2.1 Exploded view - Denso air conditioner compressor pulley (version 1)”, page 159

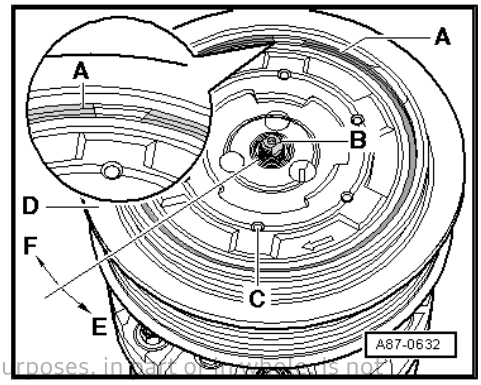
4.7.2 Removing and installing pulley (without -N25-) - “Denso” air conditioner compressor (version 2)



- Notes on renewing pulley
  ⇒ “4.2.2 Exploded view - Denso air conditioner compressor pulley (version 2)”, page 161
- Pulley is made of plastic, is sensitive to impact and should be treated with care.
- If overload protection device of drive plate -C- has been triggered, remove circlip -A- and then prise drive plate off pulley -D-.
- Circlip -A- with a vulcanised rubber disc is fitted to minimise noise
  ⇒ “4.2.2 Exploded view - Denso air conditioner compressor pulley (version 2)”, page 161 and ⇒ Electronic parts catalogue .

Removing

– Perform preparations
  ⇒ “4.6 Preparations for renewing pulley”, page 189 .
– Remove poly V-belt ⇒ Engine; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



– Using a small screwdriver or long-nose pliers, carefully remove circlip -A- (with vulcanised rubber disc).
– Hold compressor shaft -B- with a commercially available hexagon key and turn drive plate -C- with pulley -E- in direction of -arrow E-.
– Detach drive plate -C-.

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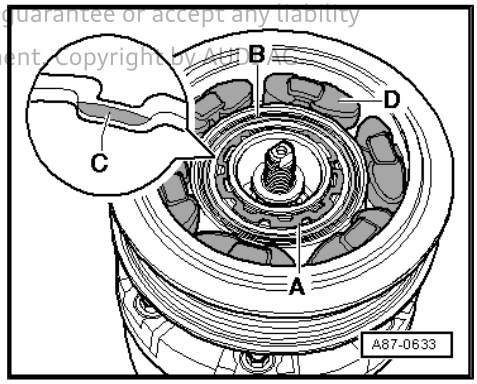
– Remove circlip -A-.
– Detach pulley -B-.



Note

- If the pulley cannot be detached with the air conditioner compressor installed, remove the air conditioner compressor
  ⇒ “4.5 Removing and installing air conditioner compressor”, page 181 .

Installing

– Clean air conditioner compressor flange before fitting pulley.

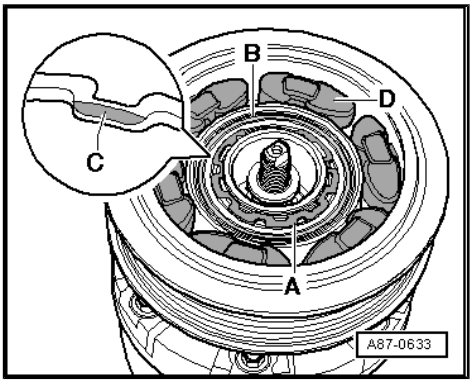
– Install pulley -B-.

• Bend circlip -A- open only as far as it is necessary for assembly.

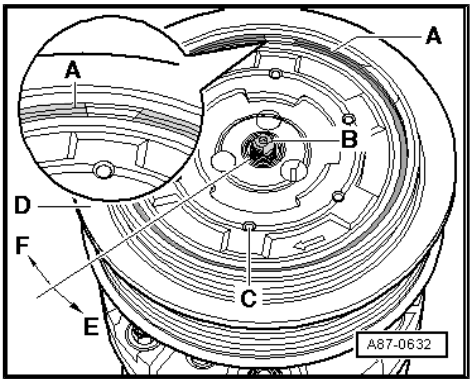
– Ensure that new circlip -A- is fitted correctly (bevelled side -C- faces away from air conditioner compressor; flat side faces compressor).

– Insert rubber elements -D- in pulley -B- as shown.

– Before installing drive plate, coat rubber elements -D- lightly with lubricant (e.g. tyre fitting paste or soap solution).



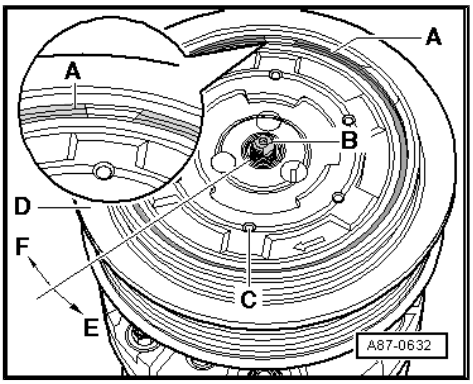
– Insert drive plate -C- in rubber elements -D- (refer to top illustration) until it makes contact with compressor shaft -B-.



– Secure drive plate -C- to compressor shaft -B- by turning in direction of -arrow F-.

– Tighten drive plate -C- (via pulley -D-) by turning in direction of arrow -F- with a commercially available strap wrench (with fabric strap). Counterhold compressor shaft -B- using a commercially available hexagon key while doing so.

– Fit circlip -A- (with vulcanised rubber disc).



Tightening torques

♦ ⇒ “4.2.2 Exploded view - Denso air conditioner compressor pulley (version 2)”, page 161

4.7.3 Removing and installing pulley (without -N25-) - “Sanden” air conditioner compressor

♦ Pulley is made of plastic, is sensitive to impact and should be treated with care.

♦ If the pulley overload protection device has been triggered, check that the air conditioner compressor can rotate freely before renewing the pulley. The air conditioner compressor must be renewed completely if it does not rotate freely.

♦ If the drive plate overload protection device has been triggered, the pulley can rotate with the outer section of the drive plate without the air conditioner compressor shaft and the hexagon flats attached to the drive plate (inner section of drive plate) also rotating.

– Remove poly V-belt ⇒ Engine; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

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– Removing and installing pulley
⇒ “4.2.4 Exploded view - Sanden air conditioner compressor pulley”, page 163 .

4.7.4 Notes on pulley with air conditioning system magnetic clutch - N25-

- If the pulley overload protection device has been triggered, check that the air conditioner compressor can rotate freely before renewing the pulley. The air conditioner compressor must be renewed completely if it does not rotate freely.
- It is usually not necessary to unfasten the air conditioner compressor from the engine to detach the pulley. Depending on the engine version, however, it may be necessary to unfasten the lock carrier from the vehicle and pull it forwards slightly (to create some space) ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Removing and installing lock carrier .
- If the pulley cannot be detached with the air conditioner compressor in position (this depends on the vehicle and engine version), detach the air conditioner compressor with the refrigerant lines connected
⇒ “4.3 Detaching and attaching air conditioner compressor at bracket”, page 167 .
- Various pulley versions with differing diameters may be fitted depending on the type of air conditioner compressor and the engine version ⇒ Electronic parts catalogue .
- The pulley and magnetic clutch are available as a replacement part (single part number). The pulley and the drive plate are held together by a bolt (bolt is not required; can be disposed of). This bolt is used during manufacturing to insert a pre-determined amount of a specific grease into the thread of the drive plate (sufficient for fitting the drive plate onto the compressor shaft once; do not re-use a drive plate that has been unscrewed) ⇒ Electronic parts catalogue .
- The following illustration shows an air conditioner compressor with a separate connector for the activation of -N25- ; this air conditioner compressor has a separate connector for the activation of the air conditioner compressor regulating valve -N280- . On a different version of the air conditioner compressor, the wiring for activating -N25- and -N280- is combined in a 3-pin connector. If necessary, remove the wire to -N25- from the connector using a suitable release tool from the wiring harness repair set - VAS 1978 B- ⇒ Electrical system; Rep. gr. 97 ; Releasing and dismantling connector housings .

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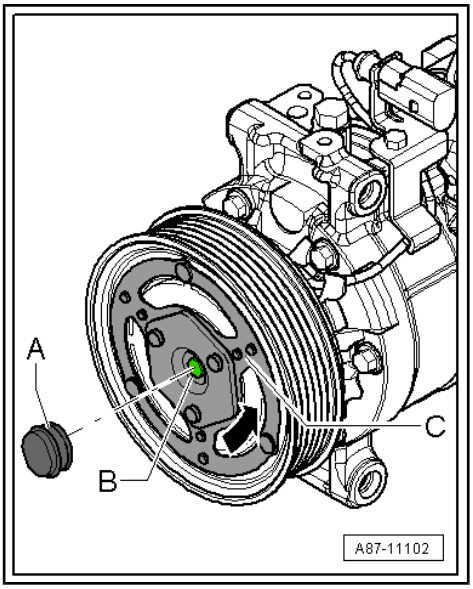
4.7.5 Detaching and attaching clutch plate - “Denso” air conditioner compressor (with -N25-)



Detaching

– Perform preparations
⇒ “4.6 Preparations for renewing pulley”, page 189 .

– Remove cap -A-.

– Hold compressor shaft -B- e.g. with a commercially available hexagon socket wrench (7 mm) 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- has become so firmly attached to the air conditioner compressor shaft -B- that it can no longer be loosened (the 7 mm hexagon socket wrench can no longer transmit the necessary torque), the compressor must be renewed.

Attaching

Attaching is carried out in the reverse order; note the following:

♦ Thread of new clutch plate has been lubricated at factory with a pre-determined amount of a specific grease.

– Clean contact surfaces of clutch plate and pulley before attaching.

– Clean thread of compressor shaft before screwing on clutch plate.

– After tightening, check gap width between pulley and clutch plate and correct if necessary
⇒ “4.7.8 Checking gap between pulley and clutch plate - Denso air conditioner compressor (with air conditioning system magnetic clutch N25)”, page 196

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Tightening torques

♦ ⇒ “4.2.3 Exploded view - Denso air conditioner compressor pulley (with air conditioning system magnetic clutch N25)”, page 162

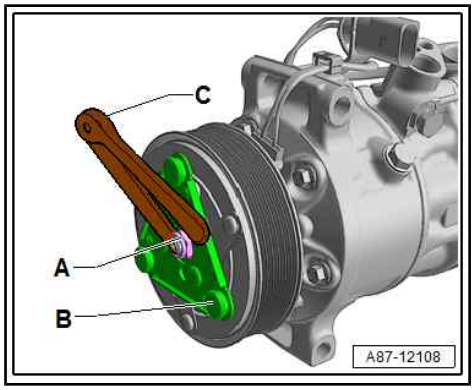
4.7.6 Detaching and attaching clutch plate - “Sanden” air conditioner compressor (with -N25-)

Detaching

– Perform preparations
⇒ “4.6 Preparations for renewing pulley”, page 189 .

– If fitted, remove cap (not fitted here).

– Using e.g. a commercially available two-hole pin wrench -C-, hold the clutch plate -B- in position and remove nut -A-.



Attaching

Attaching is carried out in the reverse order; note the following:

– Clean contact surfaces of clutch plate and pulley before attaching.

– Clean thread of compressor shaft before fitting clutch plate.

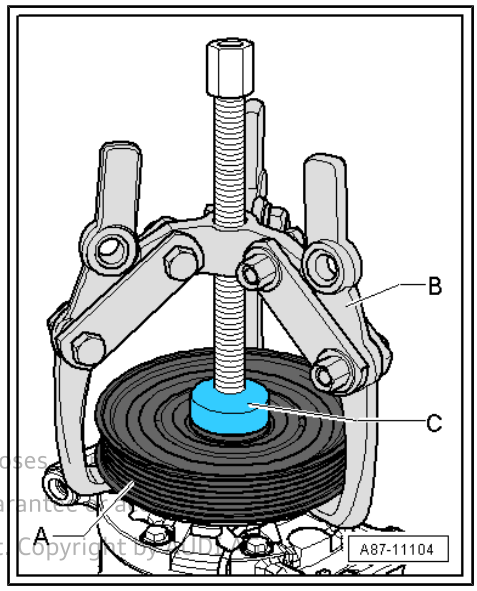
– Tighten nut -A-.

– After tightening nut, check gap width between pulley and clutch plate and correct if necessary
⇒ “4.7.9 Checking gap between pulley and clutch plate - Sanden air conditioner compressor (with N25)”, page 197 .

Tightening torques

♦ ⇒ “4.2.5 Exploded view - Sanden air conditioner compressor pulley (with air conditioning system magnetic clutch N25)”, page 165

4.7.7 Detaching pulley (with air conditioning system magnetic clutch - N25-)



♦ If the pulley -A- is supposed to be re-used, the arms of the puller must be applied so that the outside of the pulley is not squashed.

♦ If the pulley -A- cannot be detached by hand from the flange of the air conditioner compressor after removing the circlip (e.g. because of dirt), detach it carefully as described below.

– Carefully detach pulley -A- using a 3-arm puller -B-; note the following:

• Do not support spindle of puller -B- on compressor shaft when detaching pulley -A-.

• To support spindle of puller -B- at compressor flange, use a sleeve -C- (e.g. sleeve V.A.G 1719/1 from magnetic clutch puller - V.A.G 1719-).

– After detaching pulley -A-, thoroughly clean compressor flange; it must be possible to slide pulley -A- on by hand.

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4.7.8 Checking gap between pulley and clutch plate - “Denso” air conditioner compressor (with air conditioning system magnetic clutch - N25-)

• The gap must be within the permissible range around the entire circumference.

• The gap can also be measured when the air conditioner compressor is installed.

• If the gap is outside the permissible range, detach the clutch plate and adjust the gap to the correct dimension by removing or inserting spacers
⇒ “4.2.3 Exploded view - Denso air conditioner compressor pulley (with air conditioning system magnetic clutch N25)”, page 162 .

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Procedure

- Clutch plate -C- tightened to correct torque on air conditioner compressor shaft -E-
  ⇒ “4.7.5 Detaching and attaching clutch plate - Denso air conditioner compressor (with N25)”, page 195 .

– Use a depth gauge -F- to measure dimension “1” between pulley -B- and clutch plate -C- at 3 points on circumference of clutch plate -C-; note down measured values.

– Apply a voltage of 12 V to wire to solenoid in connector -A-.

♦ Depending on the version of the air conditioner compressor, connector -A- may have one or three pins. On 3-pin connectors, the two wires to the air conditioner compressor regulating valve - N280- are also incorporated into the connector.

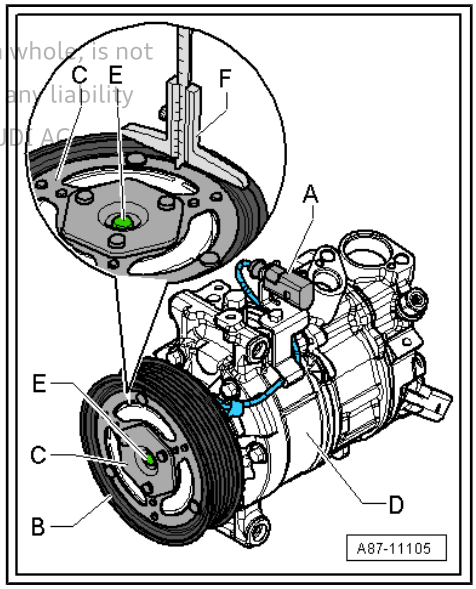
♦ There are different versions of the connector -A-; this illustration shows an air conditioner compressor on which the solenoid and -N280- are connected to the vehicle wiring harness via 2 connectors.

– Apply earth to compressor housing -D-.

– Use a depth gauge -F- to measure dimension “2” between pulley -B- and clutch plate -C- at 3 points on circumference of clutch plate -C-; note down measured values as dimension “2”.

– Calculate gap based on measured values (mean value of dimensions “1” and “2” in each case).

Gap specification: 0.4 ... 0.6 mm (up to 0.8 mm with a used magnetic clutch)



4.7.9 Checking gap between pulley and clutch plate - “Sanden” air conditioner compressor (with -N25-)

- The gap must be within the permissible range around the entire circumference.
- The gap can also be measured when the air conditioner compressor is installed.
- If the gap is outside the permissible range, detach the clutch plate and adjust the gap to the correct dimension by removing or inserting spacers
  ⇒ “4.2.5 Exploded view - Sanden air conditioner compressor pulley (with air conditioning system magnetic clutch N25)”, page 165 .

Procedure

- Nut -F- for securing drive unit of clutch plate -A- tightened to correct torque on air conditioner compressor shaft -E- ⇒ “4.2.5 Exploded view - Sanden air conditioner compressor pulley (with air conditioning system magnetic clutch N25)”, page 165

– Using slide gauge -C-, measure dimension of pulley -B- with clutch plate -A- at 3 points around circumference of clutch plate -A- (note down measured values as dimension “1”).

– Apply a voltage of 12 V to wire -D- to solenoid in connector -G- (in this case contact “3”).

♦ Depending on the version of the air conditioner compressor, connector -G- may have one or three pins. On 3-pin connectors, the two wires to the air conditioner compressor regulating valve - N280- are also incorporated into the connector.

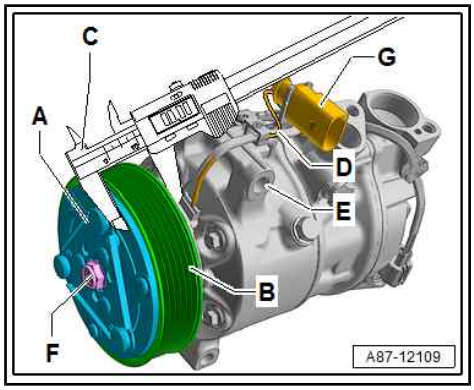
♦ There are different versions of connector -G-; this illustration shows an air conditioner compressor on which the solenoid and -N280- are connected to the vehicle wiring harness via a 3-pin connector ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Apply earth to compressor housing -E-.

– Using slide gauge -C-, measure dimension of pulley -B- with clutch plate -A- at 3 points around circumference of clutch plate -A- (note down measured values as dimension “2”).

– Calculate gap based on measured values (mean value of dimensions “1” and “2” in each case).

Gap specification: 0.35 ... 0.65 mm (up to 0.8 mm with a used magnetic clutch)



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5 Control motors

⇒ “5.1 Overview of fitting locations - control motors (front)”, page 199

⇒ “5.2 Exploded view - control motors (front)”, page 202

⇒ “5.3 General information and procedure for removing and installing control motors”, page 208

⇒ “5.4 Removing and installing fresh air flap control motor V438 , operation”, page 211

⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213

⇒ “5.6 Removing and installing air recirculation flap control motor V113 ”, page 217

⇒ “5.7 Removing and installing temperature flap control motor V68 ”, page 219

⇒ “5.8 Removing and installing rear temperature flap control motor V137 ”, page 220

⇒ “5.9 Removing and installing left temperature flap control motor V158 ”, page 221

⇒ “5.10 Removing and installing right temperature flap control motor V159 ”, page 223

⇒ “5.11 Removing and installing rear air distribution flap control motor V427 ”, page 225

⇒ “5.12 Removing and installing air distribution flap control motor V428 ”, page 226

⇒ “5.13 Removing and installing left side vent control motor V299 ”, page 227

⇒ “5.14 Removing and installing right side vent control motor V300 ”, page 229

⇒ “5.15 Removing and installing dash panel vent control motor V562 ”, page 230

⇒ “5.16 Removing and installing retainers for control motors at heater and air conditioning unit”, page 232

5.1 Overview of fitting locations - control motors (front)

⇒ “5.1.1 Overview of fitting locations - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 199

⇒ “5.1.2 Overview of fitting locations - control motors (front), vehicles with High air conditioner”, page 201

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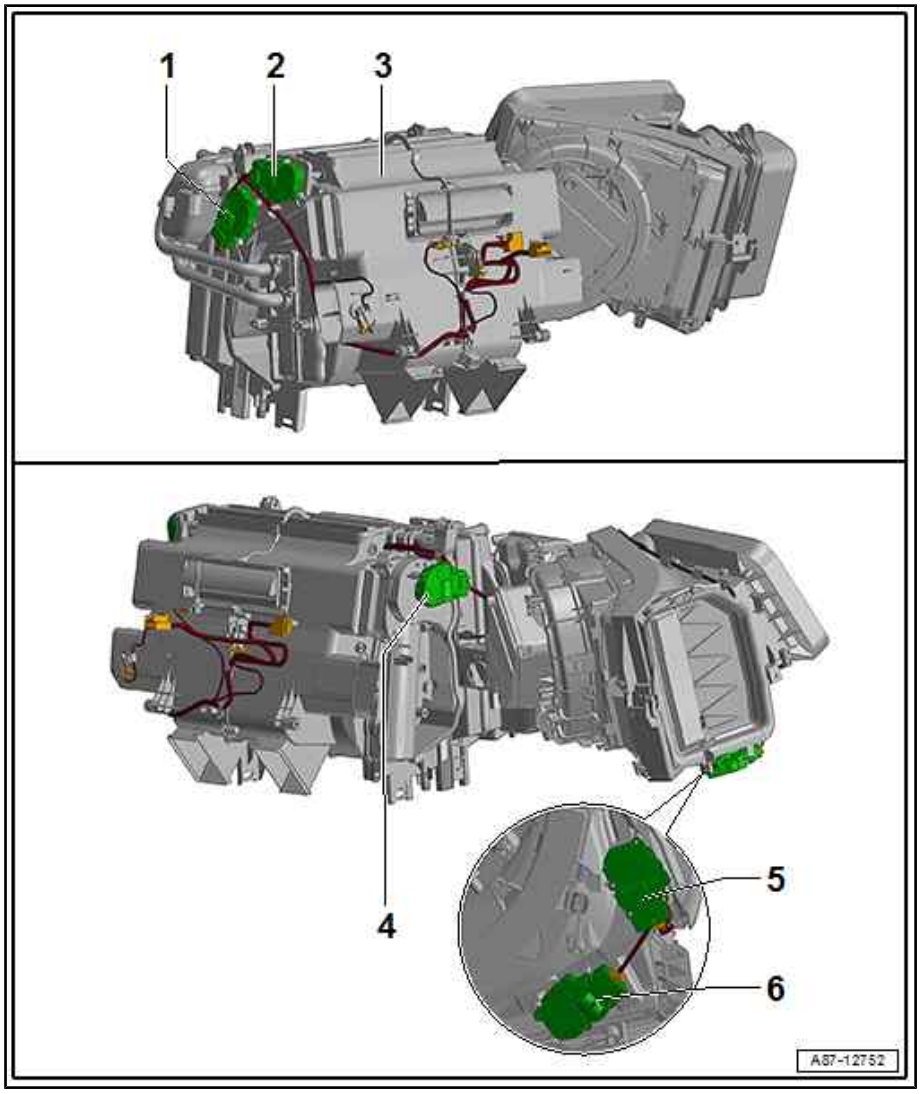
5.1.1 Overview of fitting locations - control motors (front), vehicles with “Low” air conditioner and heater without air conditioner

- At the start of production, this vehicle was only fitted with version 1 Mahle heater and air conditioning units. Later, this vehicle may also be fitted with version 2 Mahle heaters and air conditioning units (introduction not yet finalised) ⇒ “5.2.1 Distinguishing features of control motors from different manufacturers”, page 202 and ⇒ Electronic parts catalogue .
- Depending on the production period, different versions of the levers and connecting elements may be fitted at the heater and air conditioning unit ⇒ Electronic parts catalogue .



1 - Temperature flap control motor - V68-

- ❑ Removing and installing ⇒ “5.7 Removing and installing temperature flap control motor V68 ”, page 219
- ❑ Removing and installing bracket ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233

2 - Defroster flap control motor - V107-

- ❑ Removing and installing ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213
- ❑ Removing and installing bracket ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233
- ❑ On right-hand drive vehicles, -V107- is also fitted on the left of the heater and air conditioning unit ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213 .

3 - Heater and air conditioning unit

- ❑ Removing and installing ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258
- ❑ Exploded view ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240

4 - Air distribution flap control motor - V428-

- ❑ Removing and installing ⇒ “5.12 Removing and installing air distribution flap control motor V428 ”, page 226
- ❑ Removing and installing bracket ⇒ “5.16.4 Removing and installing retainers for control motors (right-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 235

5 - Air recirculation flap control motor - V113-

- ❑ Removing and installing ⇒ “5.6 Removing and installing air recirculation flap control motor V113 ”, page 217

6 - Fresh air flap control motor - V438-

- ❑ Removing and installing ⇒ “5.4 Removing and installing fresh air flap control motor V438 , operation”, page 211

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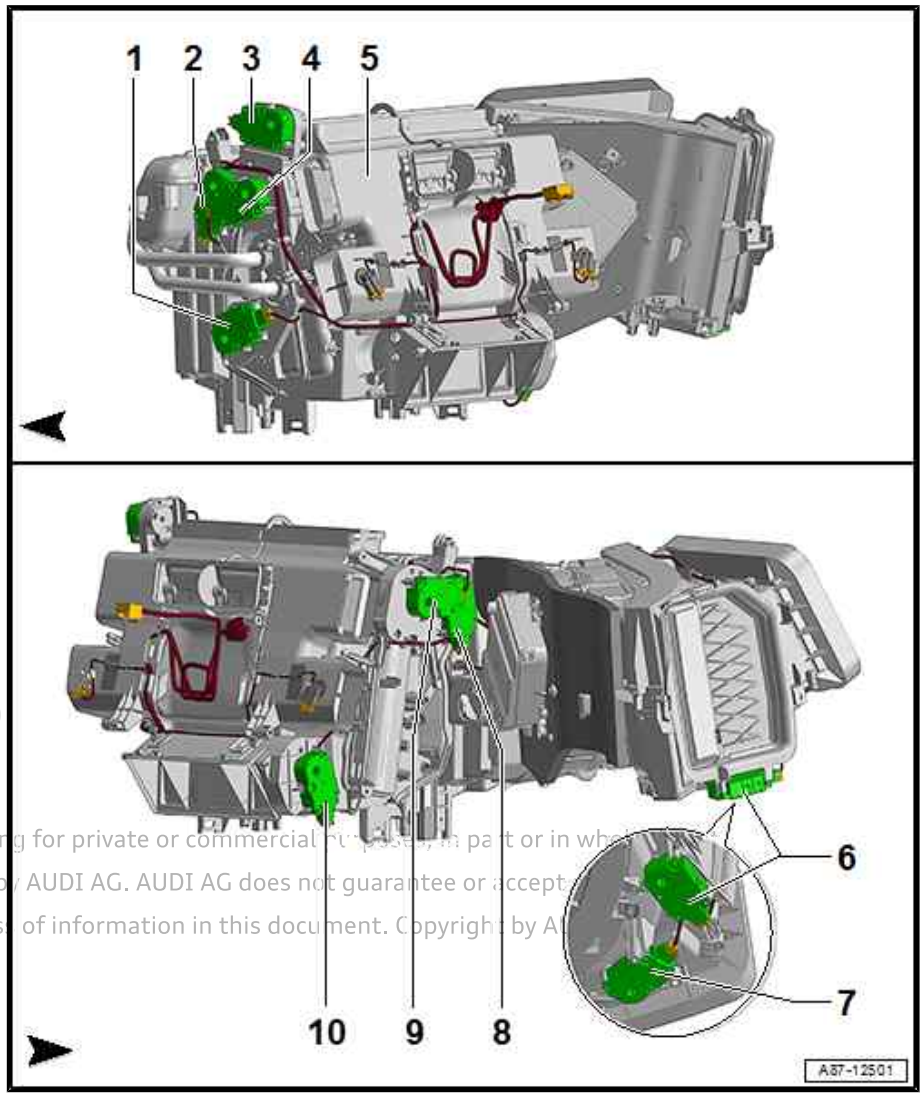
5.1.2 Overview of fitting locations - control motors (front), vehicles with “High” air conditioner

- At the start of production, this vehicle was only fitted with version 1 Mahle heater and air conditioning units. Later, this vehicle may also be fitted with version 2 Mahle heaters and air conditioning units (introduction not yet finalised) ⇒ “5.2.1 Distinguishing features of control motors from different manufacturers”, page 202 and ⇒ Electronic parts catalogue .
- Depending on the production period, different versions of the levers and connecting elements may be fitted at the heater and air conditioning unit ⇒ Electronic parts catalogue .



1 - Rear temperature flap control motor - V137-

- ❑ Removing and installing ⇒ “5.8 Removing and installing rear temperature flap control motor V137 ”, page 220
- ❑ Removing and installing bracket ⇒ “5.16.1 Removing and installing bracket for rear temperature flap control motor V137 ”, page 232

2 - Left temperature flap control motor - V158-

- ❑ Removing and installing ⇒ “5.9 Removing and installing left temperature flap control motor V158 ”, page 221
- ❑ Removing and installing bracket for control motors (left-side) ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233

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3 - Defroster flap control motor - V107-

- ❑ Removing and installing ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213
- ❑ Removing and installing bracket for control motors (left-side) ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233
- ❑ Right-hand drive vehicles: Defroster flap control motor - V107- is not installed on left side of heater and air conditioning unit, but on right side

4 - Left side vent control motor - V299-

- ❑ Removing and installing ⇒ “5.13 Removing and installing left side vent control motor V299 ”, page 227

- ❑ Removing and installing bracket for control motors (left-side)
  ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233

5 - Heater and air conditioning unit

- ❑ Removing and installing ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258
- ❑ Removing and installing bracket ⇒ “6.4 Exploded view - evaporator housing”, page 245
- ❑ Exploded view ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240

6 - Air recirculation flap control motor - V113-

- ❑ Removing and installing
  ⇒ “5.6 Removing and installing air recirculation flap control motor V113 ”, page 217

7 - Fresh air flap control motor - V438-

- ❑ Removing and installing
  ⇒ “5.4 Removing and installing fresh air flap control motor V438 , operation”, page 211

8 - Right temperature flap control motor - V159-

- ❑ Removing and installing
  ⇒ “5.10 Removing and installing right temperature flap control motor V159 ”, page 223
- ❑ Removing and installing bracket for control motors (right-side)
  ⇒ “5.16.5 Removing and installing retainers for control motors (right-side) - vehicles with High air conditioner”, page 237

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9 - Right side vent control motor - V300-

- ❑ Removing and installing
  ⇒ “5.14 Removing and installing right side vent control motor V300 ”, page 229
- ❑ Removing and installing bracket for control motors (right-side)
  ⇒ “5.16.5 Removing and installing retainers for control motors (right-side) - vehicles with High air conditioner”, page 237

10 - Rear air distribution flap control motor - V427-

- ❑ Removing and installing
  ⇒ “5.11 Removing and installing rear air distribution flap control motor V427 ”, page 225
- ❑ Removing and installing bracket
  ⇒ “5.16.6 Removing and installing retainer for rear air distribution flap control motor V427 ”, page 239

5.2 Exploded view - control motors (front)

⇒ “5.2.1 Distinguishing features of control motors from different manufacturers”, page 202

⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203

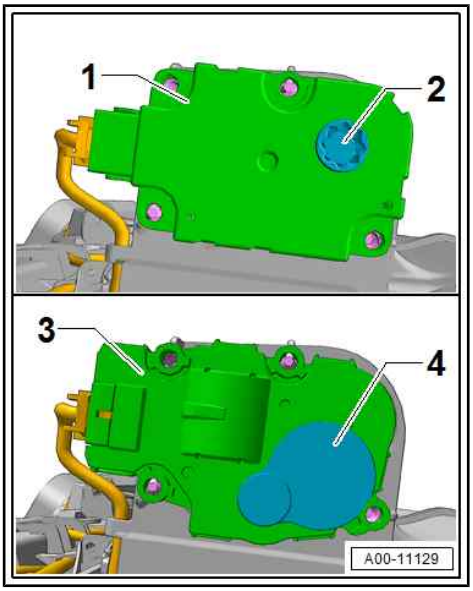
⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

⇒ “5.2.4 Exploded view - control motors on air intake box”, page 208

5.2.1 Distinguishing features of control motors from different manufacturers

At the start of production, this vehicle was only fitted with version 1 Mahle heater and air conditioning units. Later, this vehicle may also be fitted with version 2 Mahle heater and air conditioning units (introduction not yet finalised) ⇒ Electronic parts catalogue .

- Version 1 “Mahle” heater and air conditioning units have control motors -1- with open shaft -2-.
- Version 2 “Mahle” heater and air conditioning units have control motors -3- with closed shaft -4-.



5.2.2 Exploded view - control motors (front), vehicles with “Low” air conditioner and heater without air conditioner

Exploded view - control motors (front left) ⇒ page 203

Exploded view - control motors (front right) ⇒ page 204

Exploded view - control motors (front left)

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1 - Heater and air conditioning unit “Low” air conditioner (heater on vehicles with no air conditioner)

- Air distribution housing (view from left side)

2 - Lever and connecting element

- For temperature flaps

3 - Connecting element

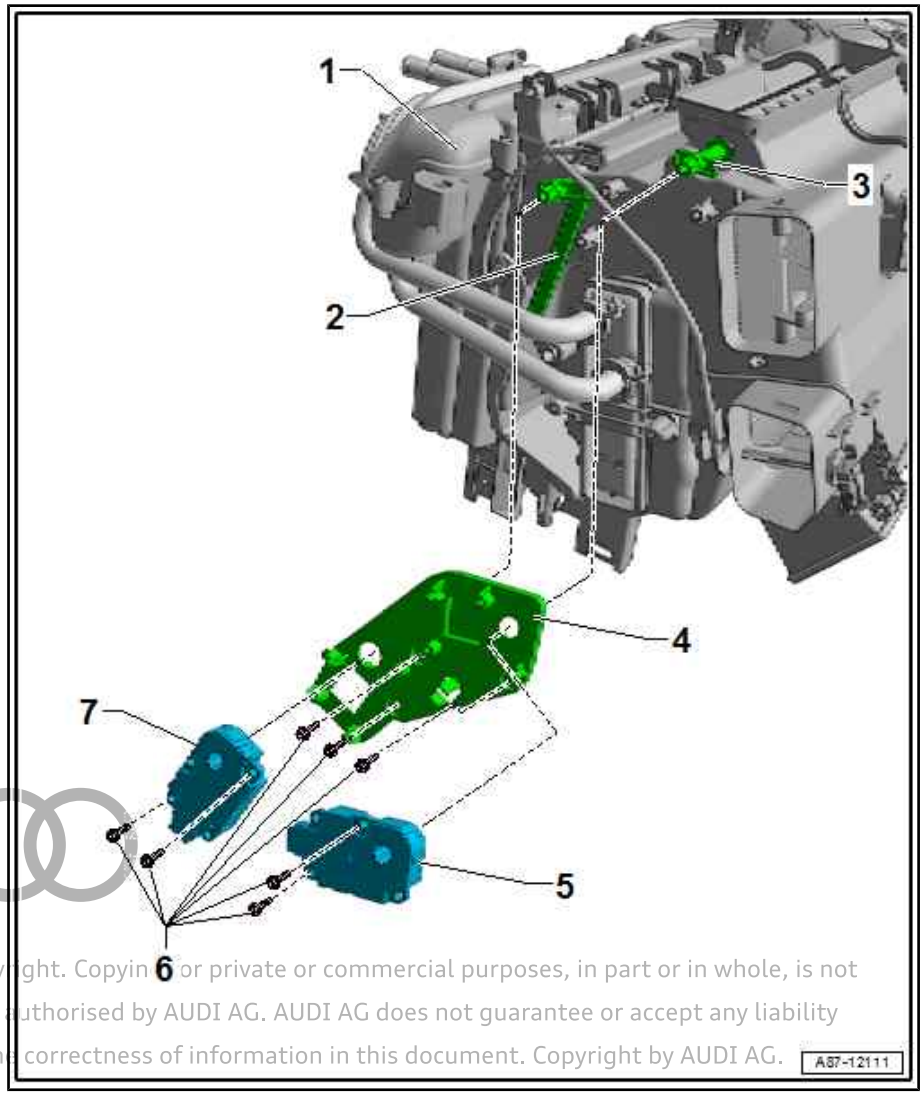
- For defroster flap

4 - Bracket for control motors (left-side)

- ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233

5 - Defroster flap control motor - V107-

- ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213
- On right-hand drive vehicles, -V107- is also fitted on the left of the heater and air conditioning unit ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213 .



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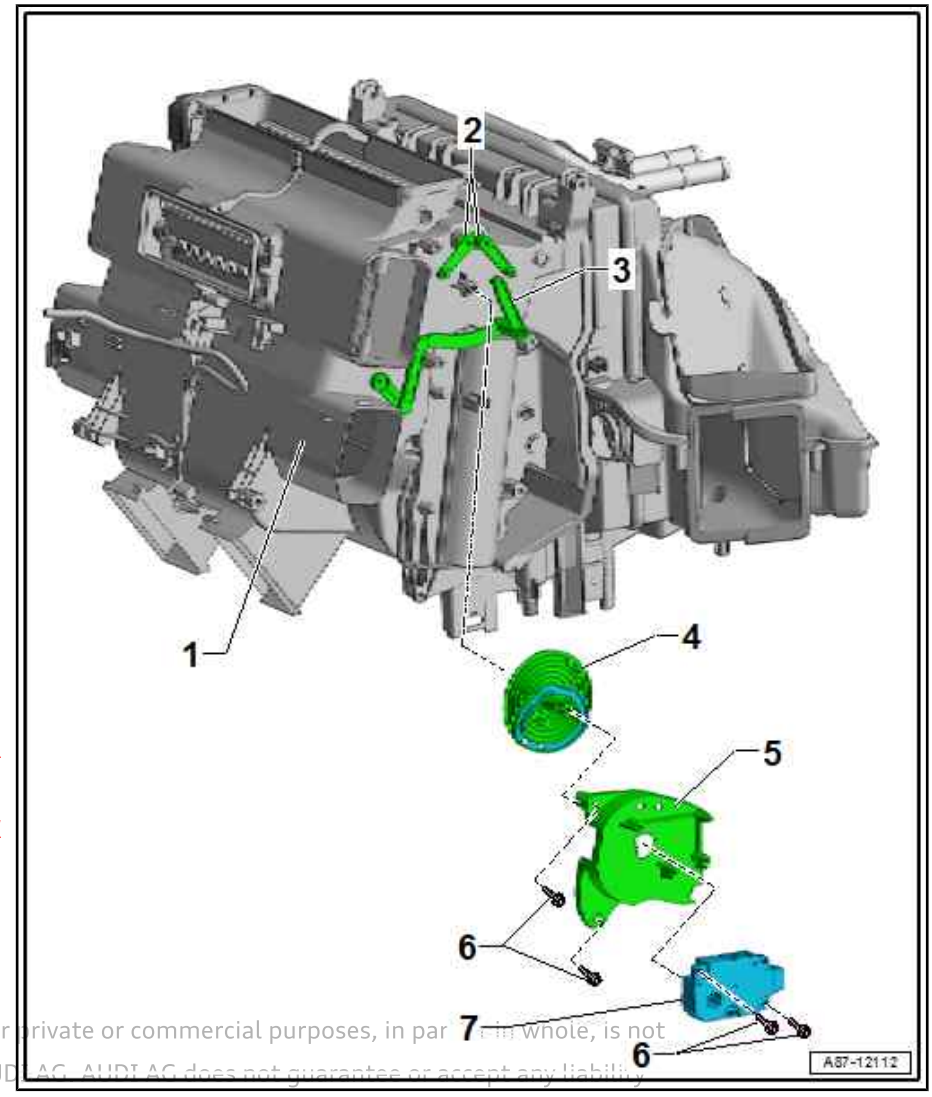
6 - Bolt

- Tightening torque: 1 Nm

7 - Temperature flap control motor - V68-

- ⇒ “5.7 Removing and installing temperature flap control motor V68 ”, page 219

Exploded view - control motors (front right)



1 - Heater and air conditioning unit “Low” air conditioner (heater on vehicles with no air conditioner)

- ❑ Air distribution housing (view from right side)

2 - Lever

- ❑ Do not remove due to connection with cam plate

3 - Connecting element

- ❑ Do not remove due to connection with cam plate

4 - Cam plate

- ❑ Do not remove due to connection with levers

5 - Retainer for control motor - V428-

- ❑ Do not remove due to cam plate installed behind
- ❑ ⇒ “5.16.4 Removing and installing retainers for control motors (right-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 235

6 - Bolt

- ❑ Tightening torque: 1 Nm

7 - Air distribution flap control motor - V428-

- ❑ ⇒ “5.12 Removing and installing air distribution flap control motor V428 ”, page 226
- ❑ ⇒ “5.16.4 Removing and installing retainers for control motors (right-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 235

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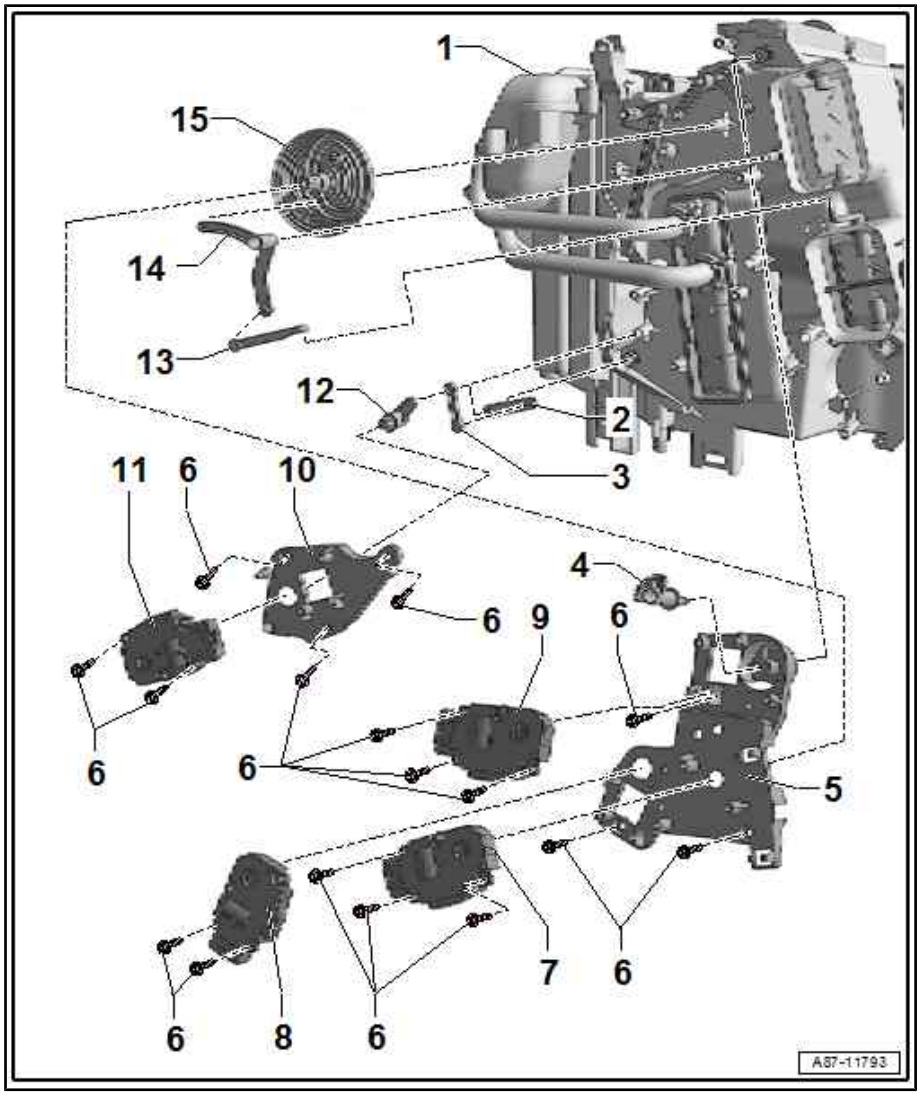
5.2.3 Exploded view - control motors (front), vehicles with “High” air conditioner

Exploded view - control motors (front left) ⇒ page 205

Exploded view - control motors (front right) ⇒ page 207

Exploded view - control motors (front left)



1 - Heater and air conditioning unit (“High” air conditioner)

- ❑ Air distribution housing (view from left side)

2 - Connecting element

3 - Connecting element

4 - Gear wheel

- ❑ This gear wheel has one wide tooth and one long tooth; this design ensures that it can only be assembled with the other gear wheel in one position ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213 .
- ❑ ⇒ “5.16.3 Removing and installing retainers for control motors (left-side) - vehicles with High air conditioner”, page 234

5 - Bracket for control motors (left-side)

- ❑ Do not remove due to cam plate installed behind
- ❑ ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233

6 - Bolt

- ❑ Tightening torque: 1 Nm

7 - Left side vent control motor - V299-

- ❑ ⇒ “5.13 Removing and installing left side vent control motor V299 ”, page 227

8 - Left temperature flap control motor - V158-

- ❑ ⇒ “5.9 Removing and installing left temperature flap control motor V158 ”, page 221

9 - Defroster flap control motor - V107-

- ❑ ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213
- ❑ Right-hand drive vehicles: Defroster flap control motor - V107- is not installed on left side of heater and air conditioning unit, but on right side

10 - Bracket for rear temperature flap control motor - V137-

- ❑ Removing and installing ⇒ “5.16.1 Removing and installing bracket for rear temperature flap control motor V137 ”, page 232

11 - Rear temperature flap control motor - V137-

- ❑ ⇒ “5.8 Removing and installing rear temperature flap control motor V137 ”, page 220

12 - Lever

13 - Connecting element

- ❑ Do not remove due to connection with cam plate

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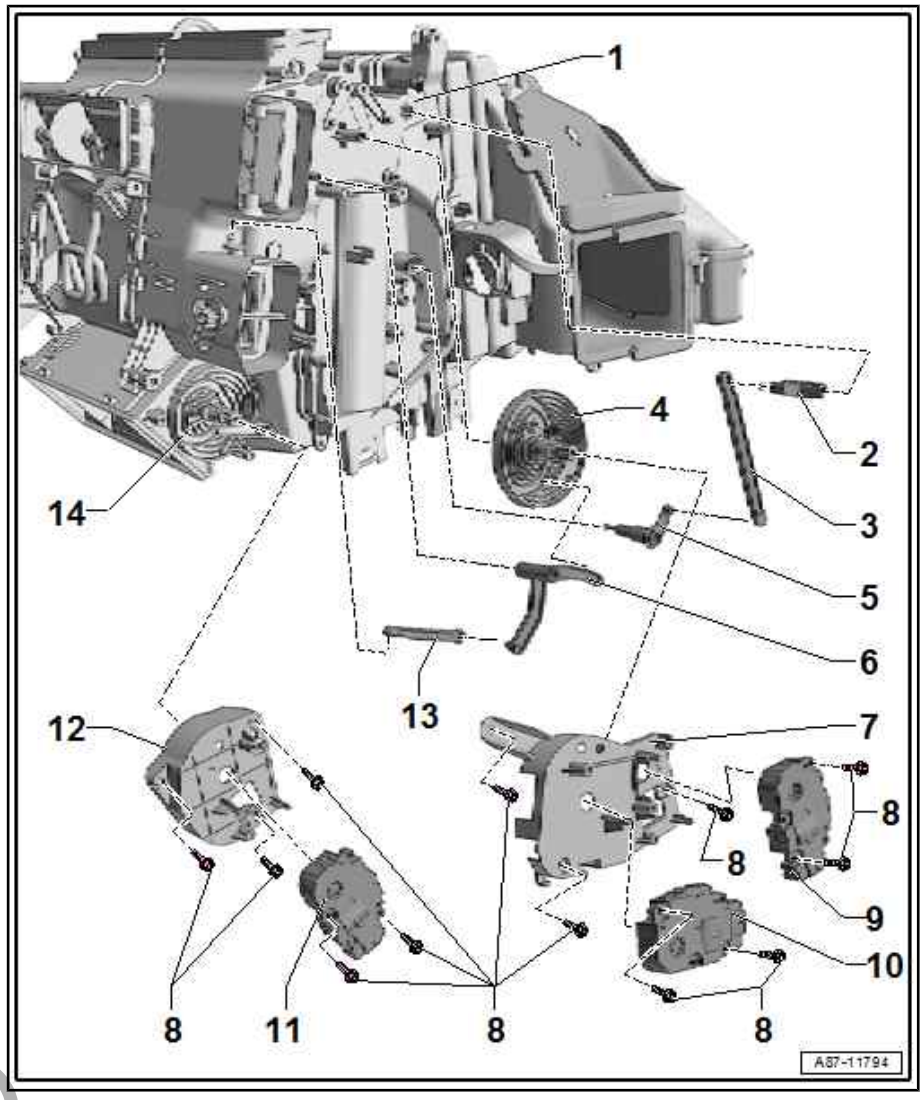
14 - Lever

- ❑ Do not remove due to connection with cam plate

15 - Cam plate

- ❑ Do not remove due to connection with levers

Exploded view - control motors (front right)



1 - Heater and air conditioning unit (“High” air conditioner)

- ❑ Air distribution housing (view from right side)

2 - Connecting element

- ❑ Do not remove due to connection with cam plate

3 - Connecting element

- ❑ Do not remove due to connection with cam plate

4 - Cam plate

- ❑ Do not remove due to connection with levers

5 - Lever

- ❑ Do not remove due to connection with cam plate

6 - Lever

- ❑ Do not remove due to connection with cam plate

7 - Bracket for control motors (right-side)

- ❑ Do not remove due to cam plate installed behind
- ❑ ⇒ “5.16.4 Removing and installing retainers for control motors (right-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 235

8 - Bolt

- ❑ Tightening torque: 1 Nm

9 - Right temperature flap control motor - V159-

- ❑ ⇒ “5.10 Removing and installing right temperature flap control motor V159 ”, page 223

10 - Right side vent control motor - V300-

- ❑ ⇒ “5.14 Removing and installing right side vent control motor V300 ”, page 229

11 - Rear air distribution flap control motor - V427-

- ❑ ⇒ “5.11 Removing and installing rear air distribution flap control motor V427 ”, page 225

12 - Bracket for control motor - V427-

- ❑ Do not remove due to cam plate installed behind

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- ⇒ “5.16.6 Removing and installing retainer for rear air distribution flap control motor V427 ”, page 239

13 - Connecting element

- Do not remove due to connection with levers and cam plate

14 - Cam plate

- Do not remove due to connection with levers

5.2.4 Exploded view - control motors on air intake box

1 - Bolt

- Tightening torque: 1 Nm

2 - Air recirculation flap control motor - V113-

- ⇒ “5.6 Removing and installing air recirculation flap control motor V113 ”, page 217

3 - Fresh air flap control motor - V438-

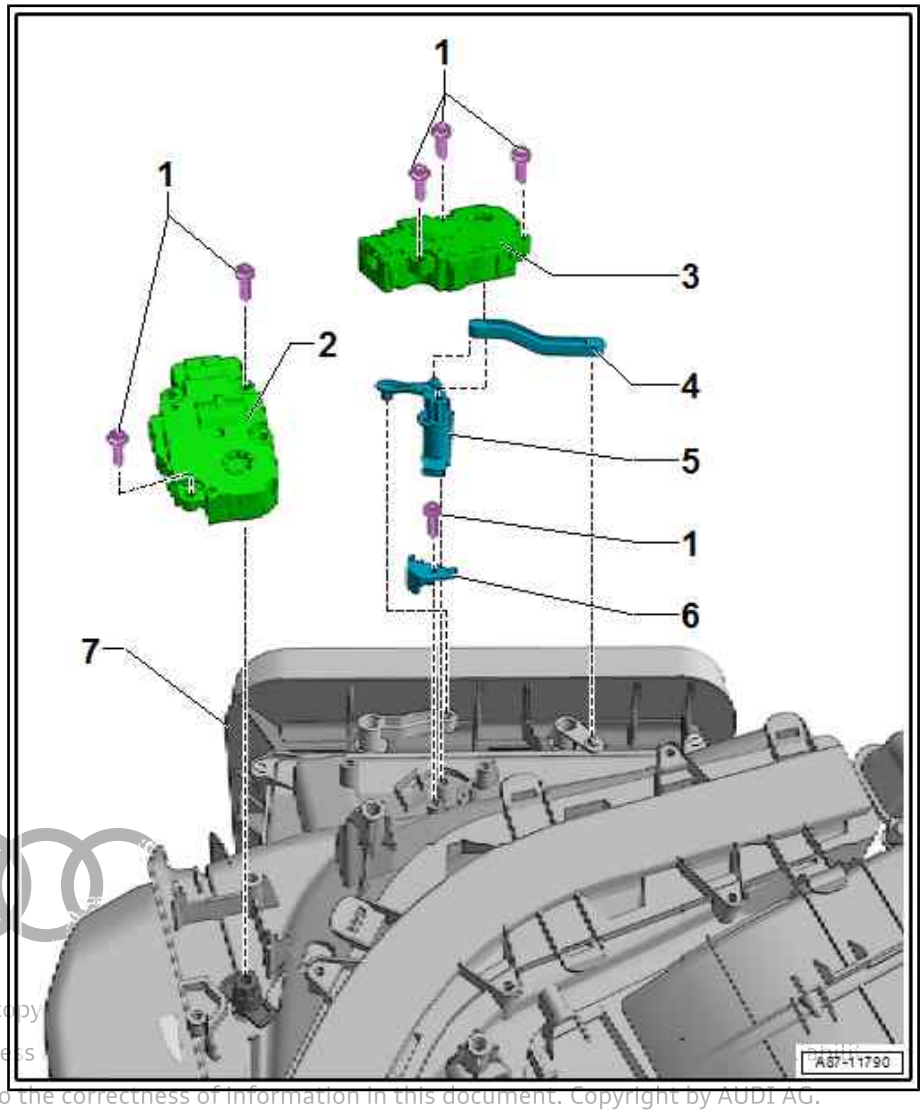
- ⇒ “5.4 Removing and installing fresh air flap control motor V438 , operation”, page 211

4 - Connecting element

5 - Shaft with lever

6 - Bracket

7 - Air intake box



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5.3 General information and procedure for removing and installing control motors

- At the start of production, this vehicle was only fitted with version 1 Mahle heater and air conditioning units. Later, this vehicle may also be fitted with version 2 Mahle heater and air conditioning units (introduction not yet finalised) ⇒ Electronic parts catalogue .
- Depending on the production period, different versions of the levers and connecting elements may be fitted at the heater and air conditioning unit ⇒ Electronic parts catalogue .

- The illustrations show the procedure for removing and installing a control motor with an open shaft.
- The control motors on this vehicle are equipped with an electronic feature which enables a new control motor to learn its position at the heater and air conditioning unit during basic setting; only then can it be activated by the onboard supply control unit - J519- (all control motors are currently identical) ⇒ Vehicle diagnostic tester.

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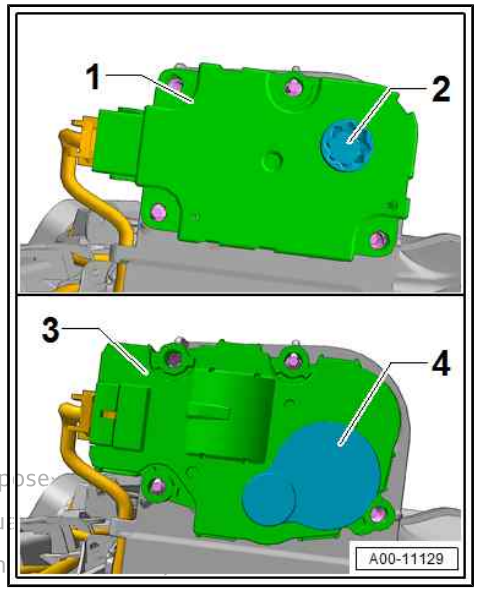

- ♦ Version 1 “Mahle” heater and air conditioning units have control motors -1- with open shaft -2-.
- ♦ Version 2 “Mahle” heater and air conditioning units have control motors -3- with closed shaft -4-.
- Before removing a control motor, mark the position of the connector and control motor on the heater and air conditioning unit.
- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- After installing a control motor, perform basic setting for the control motor.

Vehicles on which control motors have been renewed or installed at different positions:

– Additionally perform addressing of control motors by proceeding as follows:

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Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

- ♦ Body
- ♦ Heating, ventilation, air conditioning system
- ♦ Self-diagnosis compatible systems
- ♦ 08 - AC/heater electronics - E87
- ♦ 08 - AC/heating electronics, functions
- ♦ 08 - Basic setting
- ♦ ⇒ Basic setting 1, Automatic addressing of control motors

All vehicles (continued)

Procedure

– Connect ⇒ Vehicle diagnostic tester.

– Select `Diagnosis` mode and begin diagnosis.

– Select `Test plan` tab.

– Choose `Select own test` and select following options one after the other:

- ♦ Body
- ♦ Heating, ventilation, air conditioning system
- ♦ Self-diagnosis compatible systems
- ♦ 08 - AC/heater electronics - E87
- ♦ 08 - AC/heating electronics, functions
- ♦ 08 - Basic setting
- ♦ ⇒ Basic setting 2 (adapt flap limit stops)

5.4 Removing and installing fresh air flap control motor - V438- , operation

⇒ “5.4.1 Removing and installing fresh air flap control motor V438 ”, page 211

⇒ “5.4.2 Operation of fresh air flap control motor V438 ”, page 213

5.4.1 Removing and installing fresh air flap control motor - V438-

- Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Removing

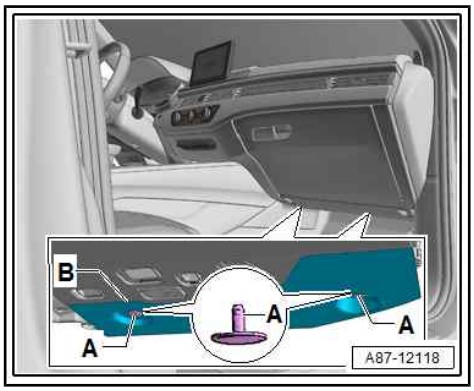
– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove threaded fasteners -A-.

– Unfasten and detach insulating mat -B- from air intake box of heater and air conditioning unit.

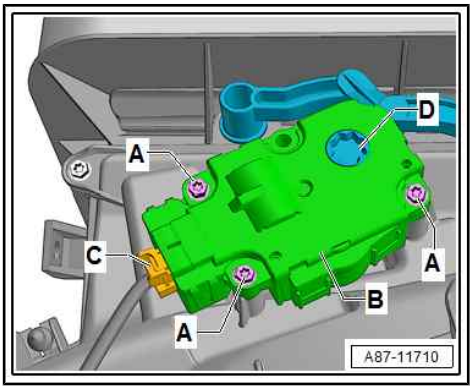


– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).

– Unscrew bolts -A-.

– Detach control motor -B- from shaft -D- of flap.

– Unplug connector -C-.



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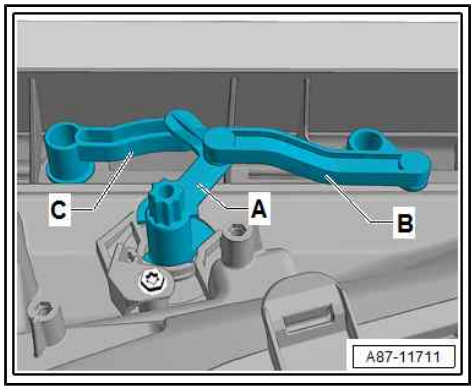
Installing

Installation is carried out in reverse order; note the following:

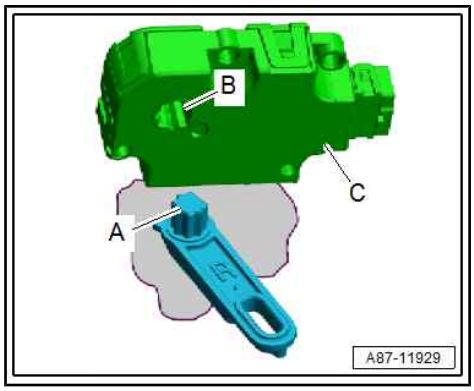
– Check that connecting elements and levers to flaps -A-, -B- and -C- are assembled correctly and can move freely.



NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**



- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.

– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.4 Exploded view - control motors on air intake box”, page 208

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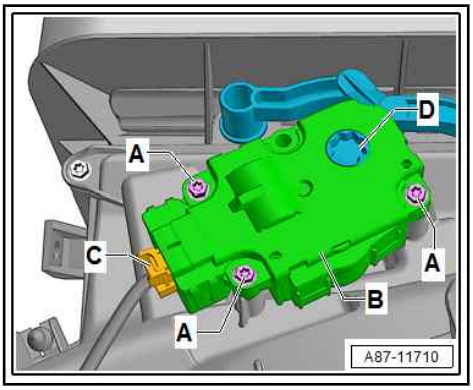
5.4.2 Operation of fresh air flap control motor - V438-



- With the air recirculation flap closed, the position of the fresh air and the air flow flap can be seen via the air intake opening in the plenum chamber (if necessary, remove plenum chamber cover and cover over fresh-air intake ⇒ “7.8 Removing and installing fresh air intake”, page 300).
- For the control of the air flow, the fresh air intake duct is partially closed via the air flow flap at higher vehicle speeds (from approx. 80 km/h) by the operating and display unit for front air conditioning system - E87- ; the position of the air recirculation flap is specified by -E87- .
- To reduce the change in the noise level of the fresh air blower - V2- caused by differences in the air intake when switching from fresh air mode to air recirculation mode or vice versa, -V438- and the air recirculation flap control motor - V113- are activated as follows:

– When switching from fresh air mode to air recirculation mode, the air recirculation flap is opened first and the fresh-air intake duct is then closed via the air flow/fresh air flap.

– When switching from air recirculation mode to fresh air mode, the fresh-air intake duct is opened first via the air flow/fresh air flap and the air recirculation flap is then closed.

– In partial air recirculation mode, the air recirculation flap is opened and the air flow/fresh air flap moved to the centre position by -E87- (fresh-air and air recirculation intake ducts are simultaneously opened slightly). This results in an improved cooling effect in certain temperature ranges and at the same time causes the intake of a certain proportion of fresh air.

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5.5 Removing and installing defroster flap control motor - V107-

⇒ “5.5.1 Removing and installing control motor V107 - Low air conditioners and heaters without air conditioner”, page 213

⇒ “5.5.2 Removing and installing control motor V107 - High air conditioners”, page 215

5.5.1 Removing and installing control motor - V107- - “Low” air conditioners and heaters without air conditioner

On right-hand drive vehicles, -V107- is also attached on the left of the heater and air conditioning unit. The fresh air blower - V2- also has to be removed on such vehicles ⇒ “6.11 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 265 .

- Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Move front left seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim

panels; Removing and installing dash panel cover (driver side) .

– Remove footwell vent (driver side)
⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296 .

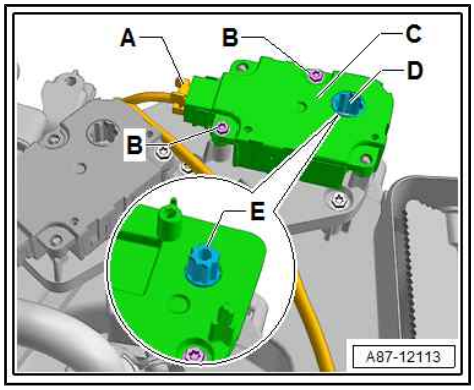
– Remove air duct to dash panel vent (left-side), unfasten air duct (left-side) above central tube and push it as far outwards as possible
⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280 .

– Mark connector -A- and control motor -C- (to prevent possible interchange if several connectors are unplugged at the same time).

– Unplug connector -A-.

– Remove bolts -B-.

– Detach the control motor -C- from the shaft of the defroster flap -E-.



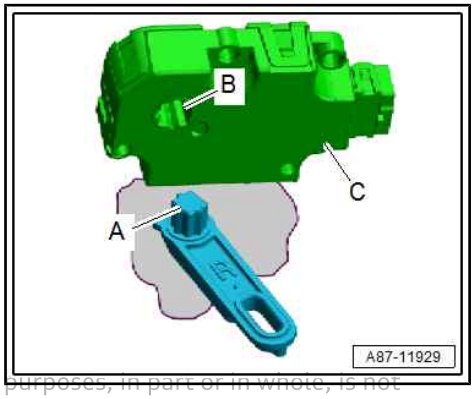
Installing

Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**



- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

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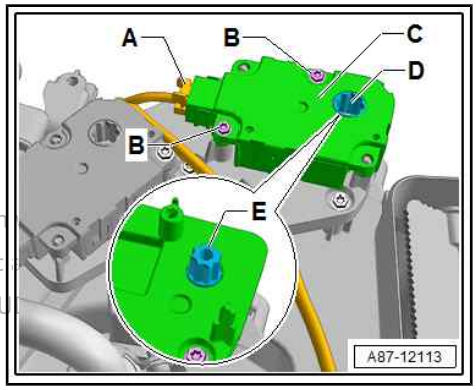

– Turn shaft -E- to check that defroster flap is actuated correctly and moves freely.
– Check shaft -E- and actuator socket -D- for control motor -C-. They must be properly aligned for assembly.
– Fit actuator socket -D- for control motor to shaft -E- of flap.
– Check connection between actuator socket -D- of control motor -C- and shaft -E-. There must not be any play.
– Tighten bolts -B-.
– Plug in connector -A-.
– Route wiring harness to connector -A- so that it cannot come into contact with moving components.
– Perform basic setting for air conditioner
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

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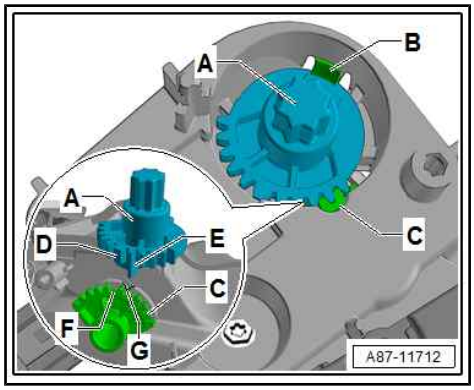
Tightening torque

◆ ⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203

5.5.2 Removing and installing control motor - V107- - “High” air conditioners

• Before removing control motors, note general information and procedure for removing and installing control motors
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .
• Right-hand drive vehicles: Defroster flap control motor - V107- is not fitted on left side of heater and air conditioning unit, but on right side.

- The defroster flap is not actuated directly, but by -V107- via gear wheels. The gear wheels -A- and -C- have one wide tooth -D- and one long tooth -E- / one wide tooth gap -F- and one long tooth gap -G- so that they can only be assembled in one position.
- The gear wheel -A- is held in position by a retaining lug -B- to prevent it from falling out of the mounting when -V107- is removed.
- If the gear wheel -A- was pulled out of the bracket while removing -V107- , the gear wheel must be inserted again ⇒ “5.16 Removing and installing retainers for control motors at heater and air conditioning unit”, page 232 .



Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Move driver seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Remove footwell vent (driver side) ⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296 .

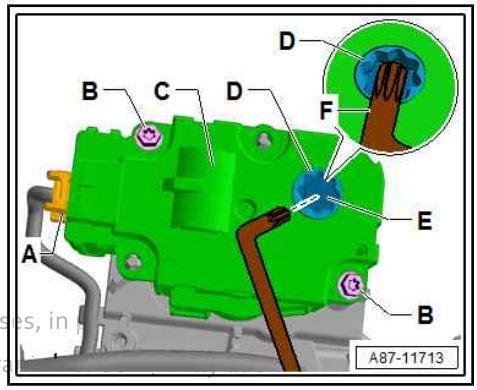
– Remove air duct to dash panel vent (left-side), unfasten air duct (left-side) above central tube and push it as far outwards as possible ⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280 .

– Mark connector -A- and control motor -C- (to prevent possible interchange if several connectors are unplugged at the same time).

– Remove bolts -B-.

– Pull control motor -C- off shaft of gear wheel -E-.

– Unplug connector -A-.



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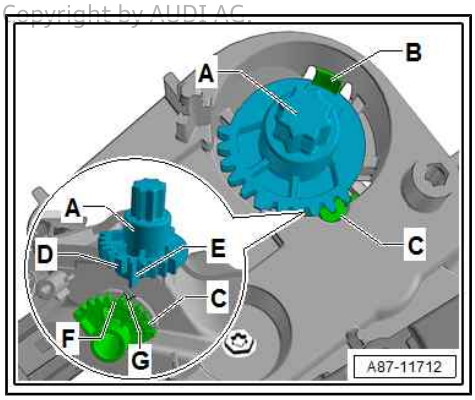
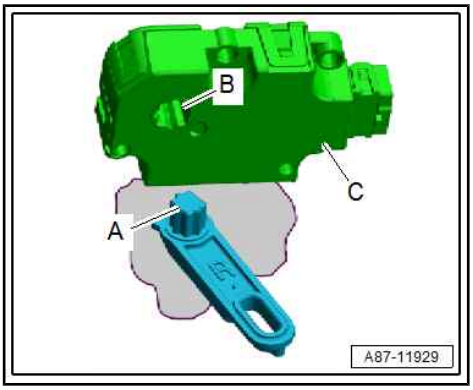
Installing

Installation is carried out in reverse order; note the following:

– Check that gear wheel -A- is installed correctly.

– Turn gear wheel -A- to check that defroster flap is actuated correctly and moves freely.





NOTICE

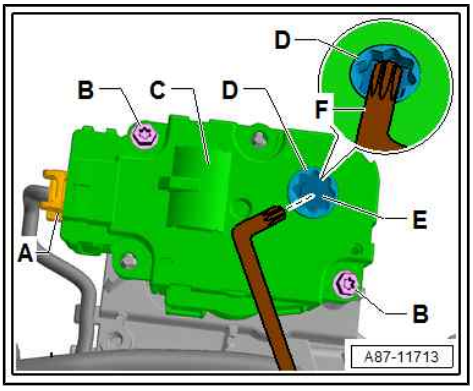
Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**

- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.

– Fit actuator socket -B- for control motor to shaft -A- of flap.



– Check connection between actuator socket -D- of control motor -C- and shaft -E-. There must not be any play.

– Plug in connector -A-.

– Tighten bolts -B-.

– Route wiring harness to connector -A- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

♦ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.6 Removing and installing air recirculation flap control motor - V113-

- Before removing control motors, note general information and procedure for removing and installing control motors
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Removing

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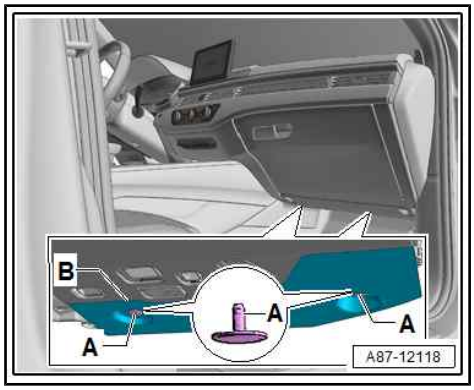
– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

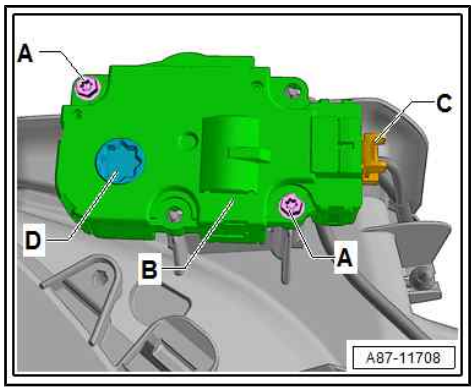
– Move front right seat to rearmost position.

– Switch off ignition.

– Remove threaded fasteners -A-.
– Unfasten and detach insulating mat -B- from air intake box of heater and air conditioning unit.



– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).
– Unscrew bolts -A-.
– Detach control motor -B- from shaft -D- of flap.
– Unplug connector -C-.



Installing

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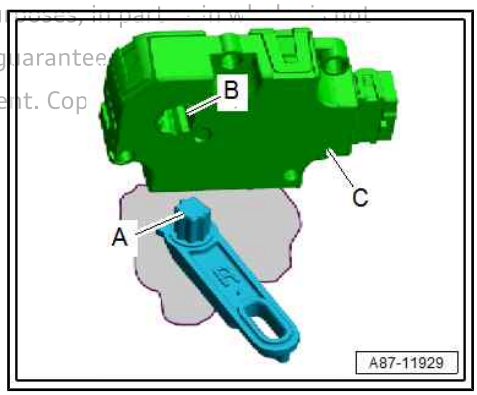
Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**



- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

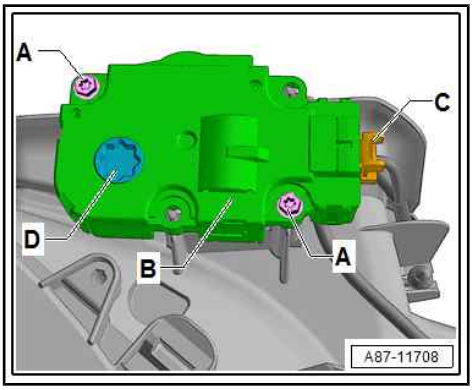
– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.
– Fit actuator socket -B- for control motor to shaft -A- of flap.

– Plug in connector -C-.

– Tighten bolts -A-.

– Route wiring harness to connector -C- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



Tightening torque

♦ ⇒ “5.2.4 Exploded view - control motors on air intake box”, page 208

5.7 Removing and installing temperature flap control motor - V68-

• Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

• On vehicles with right-hand drive, move the front passenger's seat to the rearmost position and remove the glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Move front left seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

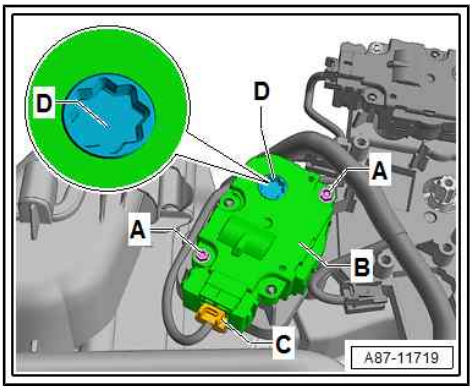
– Remove footwell vent (left-side) ⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296 .

– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).

– Unscrew bolts -A-.

– Detach control motor -B- from shaft -D- of flap.

– Unplug connector -C-.



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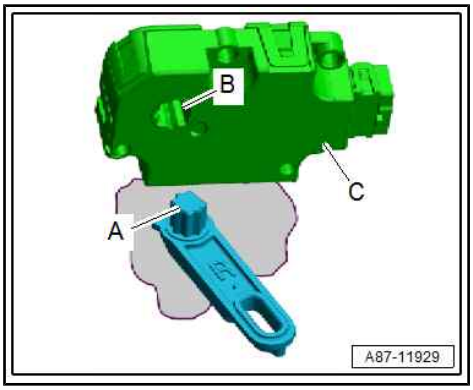
Installing

Installation is carried out in reverse order; note the following:



NOTICE

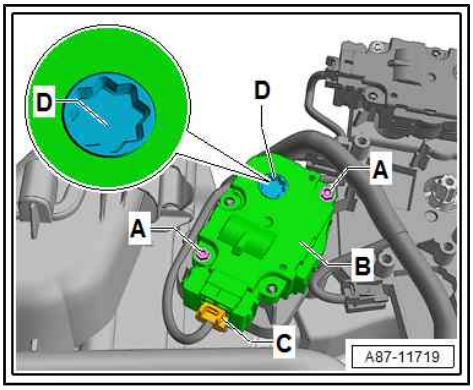
Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**

- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.

– Fit actuator socket -B- for control motor to shaft -A- of flap.



– Plug in connector -C-.

– Tighten bolts -A-.

– Route wiring harness to connector -C- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203

5.8 Removing and installing rear temperature flap control motor - V137-

- Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .
- On vehicles with right-hand drive, move the front passenger's seat to the rearmost position and remove the glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

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Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Move front left seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

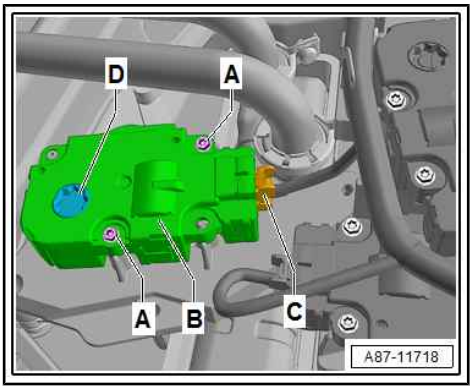
– Remove footwell vent (left-side)
⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296 .

– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).

– Unscrew bolts -A-.

– Detach control motor -B- from shaft -D- of flap.

– Unplug connector -C-.



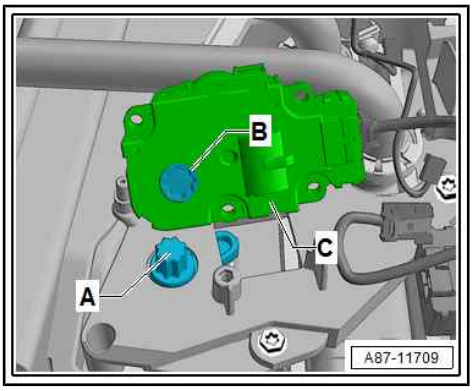
Installing

Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**



- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

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– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.

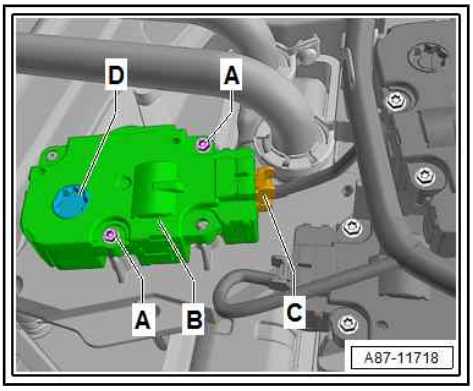
– Fit actuator socket -B- for control motor to shaft -A- of flap.

– Plug in connector -C-.

– Tighten bolts -A-.

– Route wiring harness to connector -C- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



Tightening torque

◆ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.9 Removing and installing left temperature flap control motor - V158-

- Before removing control motors, note general information and procedure for removing and installing control motors
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .
- On vehicles with right-hand drive, move the front passenger's seat to the rearmost position and remove the glove box ⇒

General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Move front left seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Remove footwell vent (left-side) ⇒ "7.3 Removing and installing footwell vent (driver side)", page 296 .

– Remove left side vent control motor - V299- ⇒ "5.13 Removing and installing left side vent control motor V299 ", page 227 .

– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).

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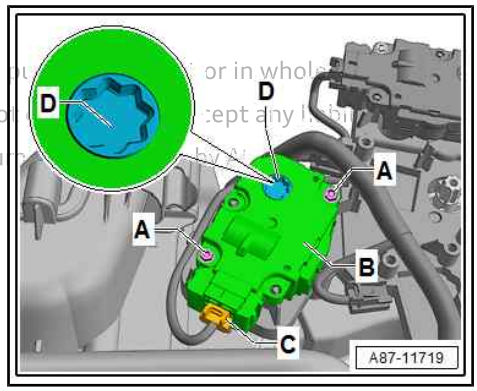
– Unscrew bolts -A-.

– Detach control motor -B- from shaft -D- of flap.

– Unplug connector -C-.



Installing

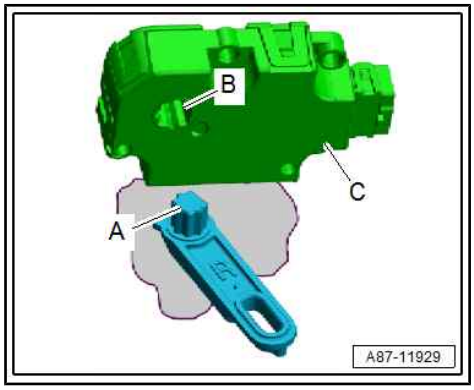
Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

– **Only turn actuator socket for control motor with wiring harness connected.**

– **Carefully turn actuator socket for control motor slowly and by hand.**



- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.

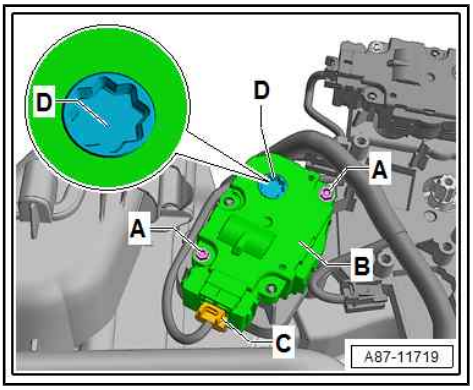
– Attach control motor -B- to shaft -D- of flap.

– Plug in connector -C-.

– Tighten bolts -A-.

– Route wiring harness to connector -C- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



Tightening torque

◆ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.10 Removing and installing right temperature flap control motor - V159-

• Before removing control motors, note general information and procedure for removing and installing control motors
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

• Right-hand drive vehicles: Move driver's seat to rearmost position and remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

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Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Move front right seat to rearmost position.

– Switch off ignition.

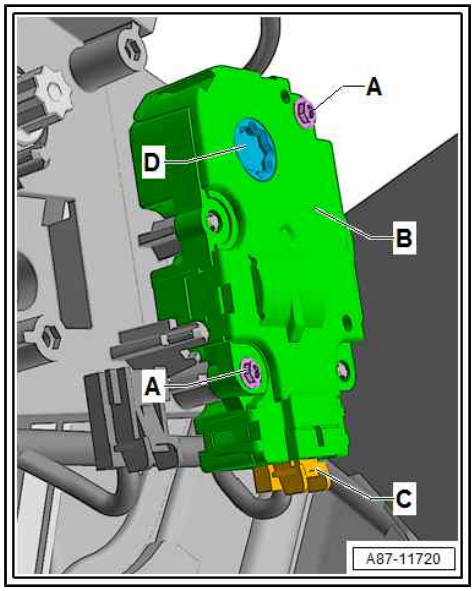
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– If fitted, remove air duct for glove box cooling
⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297 .

– Remove footwell vent (right-side)
⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296 .

– Remove right side vent control motor - V300-
⇒ “5.14 Removing and installing right side vent control motor V300 ”, page 229 .

– Mark connector -C- (to prevent interchange if several connectors are unplugged at the same time).
– Unscrew bolts -A-.
– Detach control motor -B- from shaft -D- of flap.
– Unplug connector -C-.



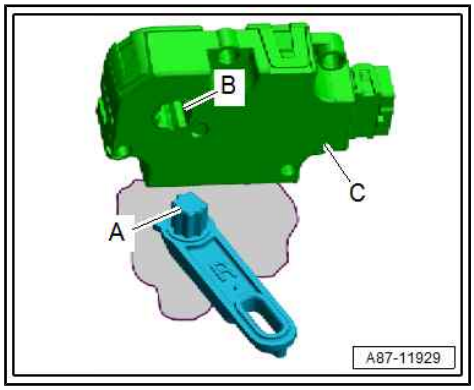
Installing

Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

– **Only turn actuator socket for control motor with wiring harness connected.**
– **Carefully turn actuator socket for control motor slowly and by hand.**



- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.
– Fit actuator socket -B- for control motor to shaft -A- of flap.

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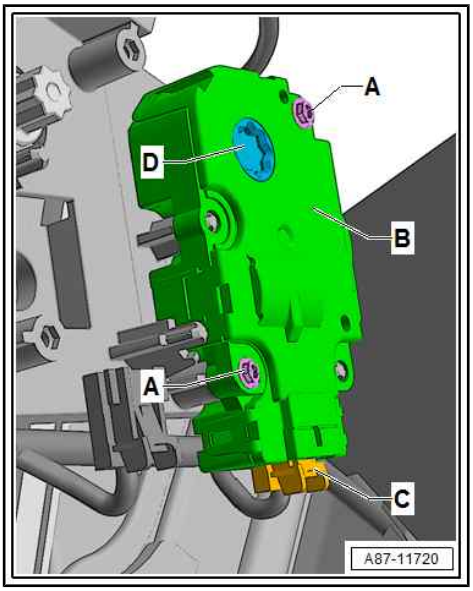
– Plug in connector -C-.
– Tighten bolts -A-.
– Route wiring harness to connector -C- so that it cannot come into contact with moving components.
– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



Tightening torque

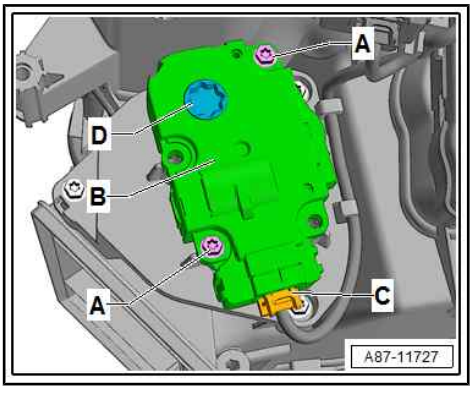
◆ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.11 Removing and installing rear air distribution flap control motor - V427-

• Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .
• Right-hand drive vehicles: Move driver's seat to rearmost position and remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .
– Set front passenger seat to rearmost position.
– Switch off ignition.
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).
– Press bracket for glove box to the side and remove bolts -A-.
– Detach control motor -B- from shaft -D- of flap.
– Unplug connector -C-.



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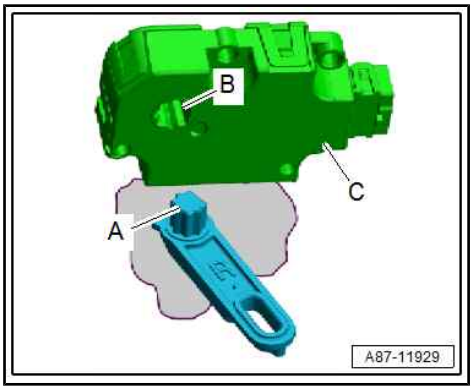
Installing

Installation is carried out in reverse order; note the following:



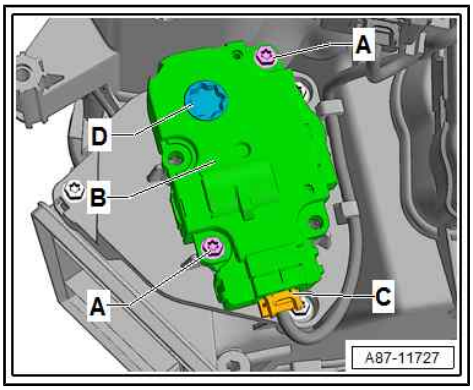
NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**

- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.



– Attach control motor -B- to shaft -D- of flap.

– Plug in connector -C-.

– Tighten bolts -A-.

– Route wiring harness to connector -C- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.12 Removing and installing air distribution flap control motor - V428-

- Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .
- Right-hand drive vehicles: Move driver's seat to rearmost position and remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

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Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

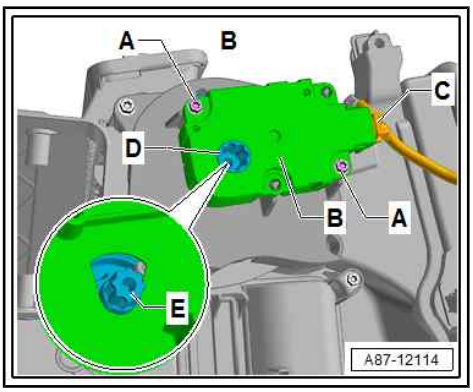
– Move front right seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove footwell vent (right-side) ⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296 .

– Remove air duct to dash panel vent, unfasten air duct above central tube and push it as far outwards as possible ⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280 .
– If fitted, remove air duct for glove box cooling ⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297 .
– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).
– Unscrew bolts -A-.
– Detach the control motor -B- from the shaft -E- of the cam plate.
– Unplug connector -C-.



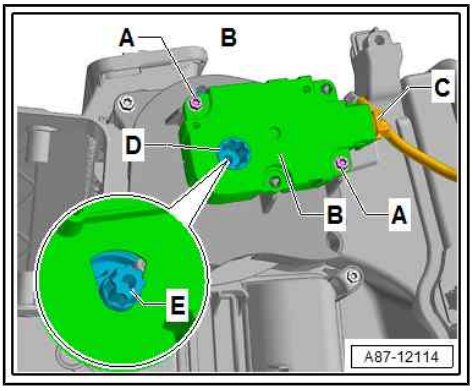
Installing

Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**



– Check shaft -E- and actuator socket -D- for control motor -B-. They must be properly aligned for assembly.
– Fit actuator socket -D- for control motor to shaft -E- of cam plate.
– Plug in connector -C-.
– Tighten bolts -A-.
– Route wiring harness to connector -C- so that it cannot come into contact with moving components.
– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203

5.13 Removing and installing left side vent control motor - V299-

• Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

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- On right-hand drive vehicles, remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/ covers/trim panels; Removing and installing glove box .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Move front left seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Remove footwell vent (left-side) ⇒ "7.3 Removing and installing footwell vent (driver side)", page 296 .

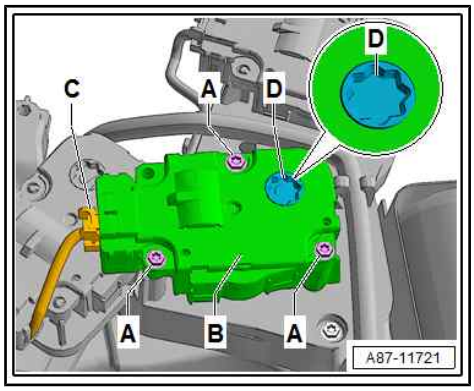
– Remove the pedal cluster mounting bracket ⇒ Brake system; Rep. gr. 46 ; Brake pedal; Removing and installing mounting bracket .

– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).

– Unscrew bolts -A-.

– Detach control motor -B- from shaft -D- of flap.

– Unplug connector -C-.



Installing

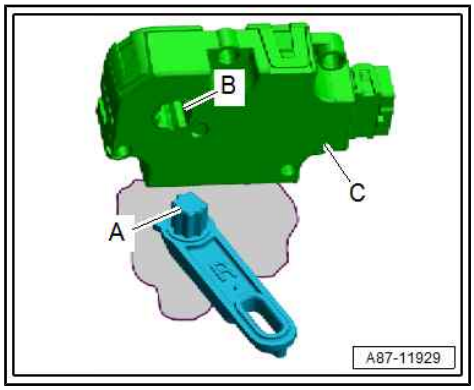
Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

– Only turn actuator socket for control motor with wiring harness connected.

– Carefully turn actuator socket for control motor slowly and by hand.



- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.

– Fit actuator socket -B- for control motor to shaft -A- of flap.

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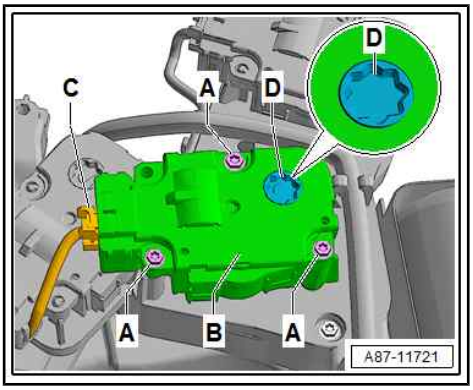
– Plug in connector -C-.

– Tighten bolts -A-.

– Route wiring harness to connector -C- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



Tightening torque

◆ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.14 Removing and installing right side vent control motor - V300-

- Before removing control motors, note general information and procedure for removing and installing control motors
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .
- Right-hand drive vehicles: Move driver's seat to rearmost position and remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Move front right seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– If fitted, remove air duct for glove box cooling
⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297 .

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– Remove footwell vent (right-side)
⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296.

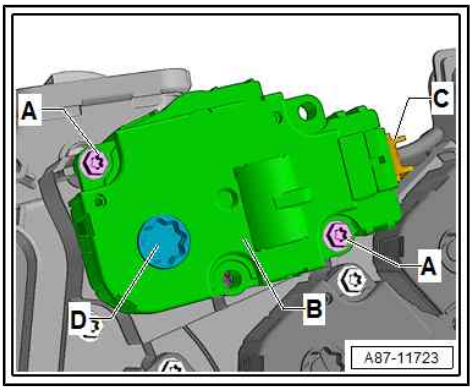
– Remove air duct to dash panel vent, unfasten air duct above central tube and push it as far outwards as possible
⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280 .

– Mark connector -C- and control motor -B- (to prevent possible interchange if several connectors are unplugged at the same time).

– Unscrew bolts -A-.

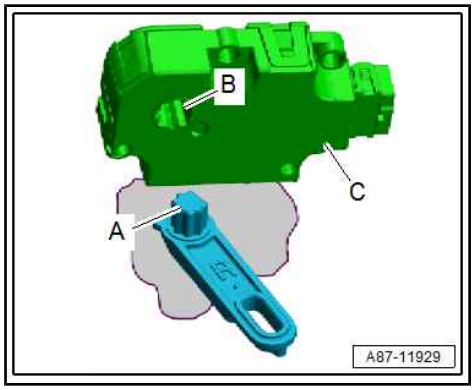
– Detach control motor -B- from shaft -D- of flap.

– Unplug connector -C-.



Installing

Installation is carried out in reverse order; note the following:



NOTICE

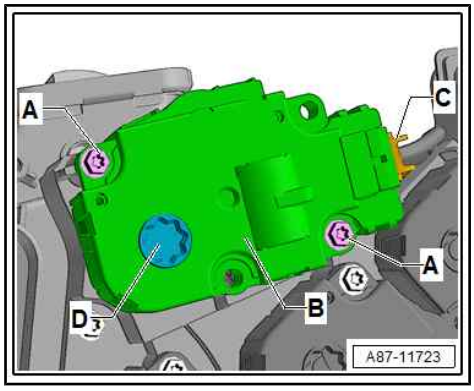
Risk of damage to electronics of control motor if actuator socket is turned.

- **Only turn actuator socket for control motor with wiring harness connected.**
- **Carefully turn actuator socket for control motor slowly and by hand.**

- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.

– Fit actuator socket -B- for control motor to shaft -A- of flap.



– Plug in connector -C-.

– Tighten bolts -A-.

– Route wiring harness to connector -C- so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.15 Removing and installing dash panel vent control motor - V562-

- Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Set front passenger seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove centre vent ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing centre vent .

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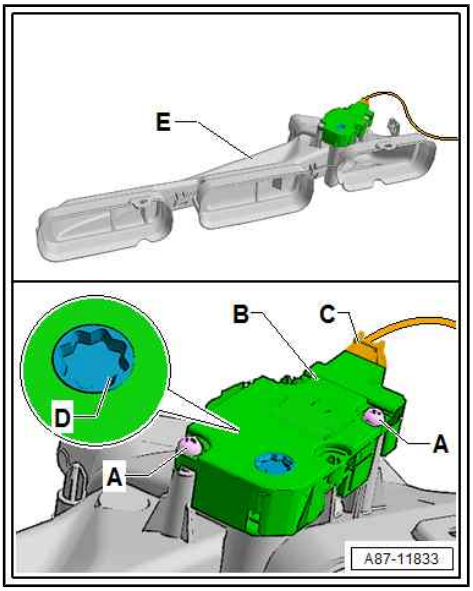
– Remove the air duct -E- (to the centre and right dash panel vents) ⇒ Item 10 (page 284) .
– Unscrew bolts -A-.
– Detach control motor -B- from shaft -D- of flap.



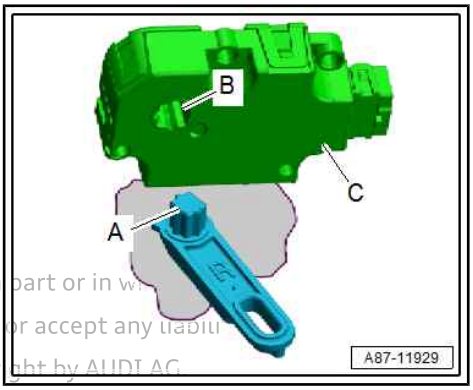
Installing

Installation is carried out in reverse order; note the following:

NOTICE

Risk of damage to electronics of control motor if actuator socket is turned.

– Only turn actuator socket for control motor with wiring harness connected.
– Carefully turn actuator socket for control motor slowly and by hand.



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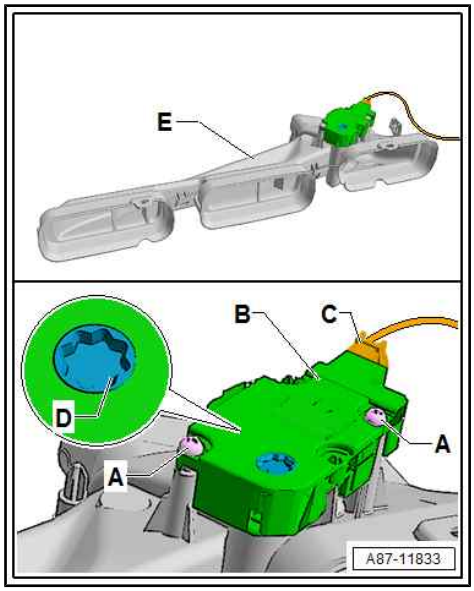
- The actuator socket for the control motor has no stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached.
- Check the connection between the actuator socket for the control motor and the shaft to ensure that there is no play.

– Check shaft -A- and actuator socket -B- for control motor -C-. They must be properly aligned for assembly.
– Fit actuator socket -B- for control motor to shaft -A- of flap.

– Tighten bolts -A-.
– Route wiring harness to connector -C- so that it cannot come into contact with moving components.
– Install the air duct -E- (to the centre and right dash panel vents) ⇒ Item 10 (page 284) .
– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



5.16 Removing and installing retainers for control motors at heater and air conditioning unit

⇒ “5.16.1 Removing and installing bracket for rear temperature flap control motor V137 ”, page 232

⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233

⇒ “5.16.3 Removing and installing retainers for control motors (left-side) - vehicles with High air conditioner”, page 234

⇒ “5.16.4 Removing and installing retainers for control motors (right-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 235

⇒ “5.16.5 Removing and installing retainers for control motors (right-side) - vehicles with High air conditioner”, page 237

⇒ “5.16.6 Removing and installing retainer for rear air distribution flap control motor V427 ”, page 239

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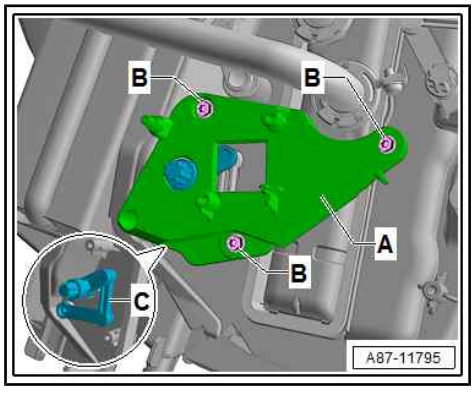
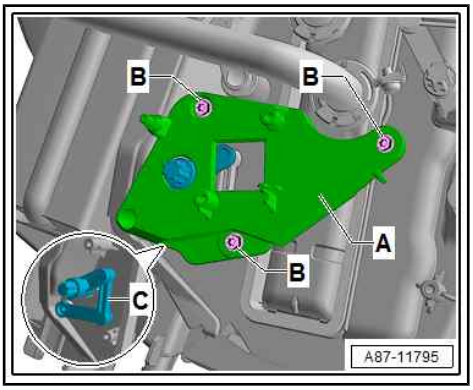
5.16.1 Removing and installing bracket for rear temperature flap control motor - V137-

Removing

– Remove rear temperature flap control motor - V137- ⇒ “5.8 Removing and installing rear temperature flap control motor V137 ”, page 220 .
– Remove bolts -B-.
– Detach bracket -A-.



Installing



Installation is carried out in reverse order; note the following:

- Check that connecting elements and levers -C- function properly and are fitted in correct installation position.
- Install bracket -A-.
- Tighten bolts -B-.
- Install rear temperature flap control motor - V137- ⇒ “5.8 Removing and installing rear temperature flap control motor V137 ”, page 220 .
- Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203

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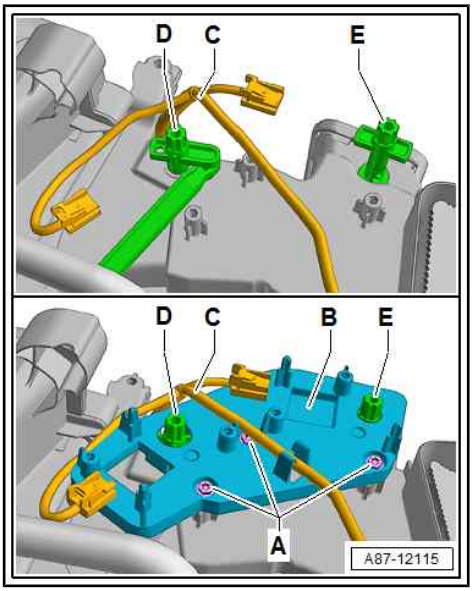
5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with “Low” air conditioner (or with heater and without air conditioner)

Removing

- Remove temperature flap control motor - V68- ⇒ “5.7 Removing and installing temperature flap control motor V68 ”, page 219 .
- Remove defroster flap control motor - V107- ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213 .
- Unscrew bolts -A-.
- Unfasten wiring harness -C- from retainer -B-.
- Remove bracket -B-.



Installing

Installation is carried out in reverse order; note the following:

- Check the lever and connecting element to the temperature flaps -D- and the defroster flap -E- for correct positioning and proper operation.
- Install retainer -B-.
- Tighten bolts -A-.
- Insert wiring harness -C- in retainer -B- so that it cannot come into contact with moving components.
- Check that actuators -D, E- are functioning correctly.
- Re-install control motors removed earlier in reverse sequence.
- Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203

5.16.3 Removing and installing retainers for control motors (left-side) - vehicles with “High” air conditioner

- Before removing control motors, note general information and procedure for removing and installing control motors ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Removing

– Move driver seat to rearmost position.

– Using FRONT (defrost button) of operating and display unit for front air conditioning system - E87- , set air distribution to windscreen and wait until air emerges from dash panel vents to windscreen.

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– Switch off ignition.

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

– Remove left footwell vent (driver side) ⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296 .

– Remove the following control motors:

♦ Removing left side vent control motor - V299- ⇒ “5.13 Removing and installing left side vent control motor V299 ”, page 227

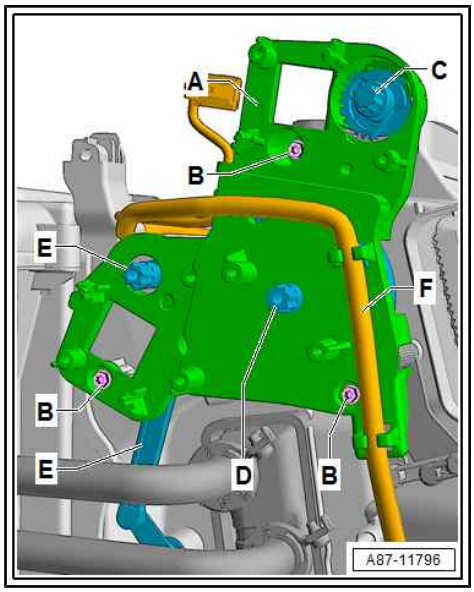
♦ Removing left temperature flap control motor - V158- ⇒ “5.9 Removing and installing left temperature flap control motor V158 ”, page 221

♦ Removing defroster flap control motor - V107- ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213

– Remove bolts -B-.

– Unfasten wiring harness -F- from bracket -A-.

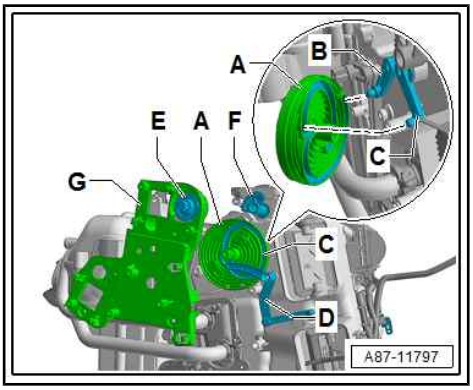
– Hold cam plate -D- and remove bracket -A- (together with gear wheel -C-).



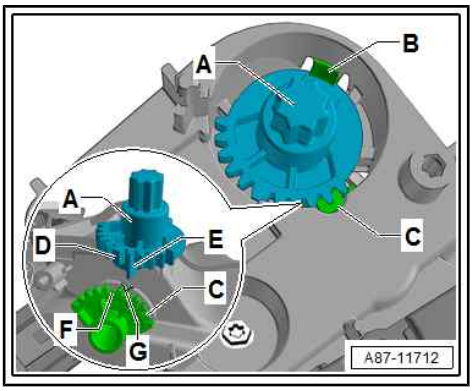
Installing

Installation is carried out in reverse order; note the following:

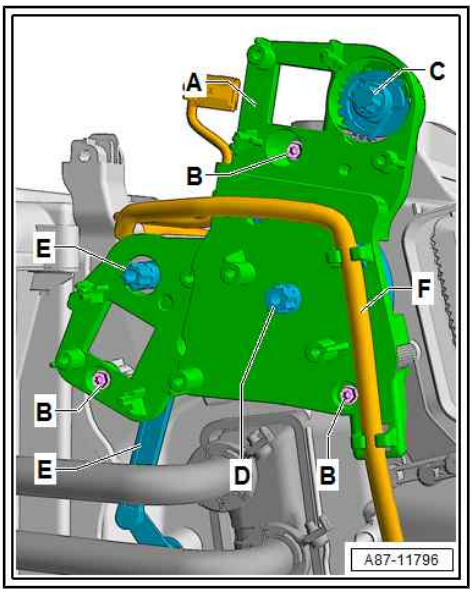
- Check that actuating arms to various flaps -B-, -C- are positioned correctly in cam plate -A- and function properly.
- Insert cam plate -A- and check that it functions correctly.
- Check that actuating arm -D- is positioned correctly in cam plate -A- and functions properly.
- Remove gear wheel -E- from retainer -G-.
- Install bracket -D- without gear wheel -E-.



- Fit gear wheel -A-; to do so, wide tooth -D- must be aligned with wide gap -F- and long tooth -E- with deep gap -G- on gear wheel -C-.



- Tighten bolts -B-.
- Insert wiring harness -F- in bracket -A- so that it cannot come into contact with moving components.
- Check that actuators -C, D, E- are functioning correctly.
- Re-install control motors removed earlier in reverse sequence.
- Route wiring to the various control motors so that it cannot come into contact with moving components.
- Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



Tightening torque

- ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.16.4 Removing and installing retainers for control motors (right-side) - vehicles with “Low” air conditioner (or with heater and without air conditioner)

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Removing

- Move front right seat to rearmost position.
- Switch off ignition.
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove right footwell vent (passenger side)
⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296 .
– If fitted, remove air duct for glove box cooling
⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297 .
– Remove air duct to dash panel vent
⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280 .
– Remove air distribution flap control motor - V428-
⇒ “5.12 Removing and installing air distribution flap control motor V428 ”, page 226 .
– Remove bolts -B-.
– Hold cam plate -C- and remove bracket -A-.

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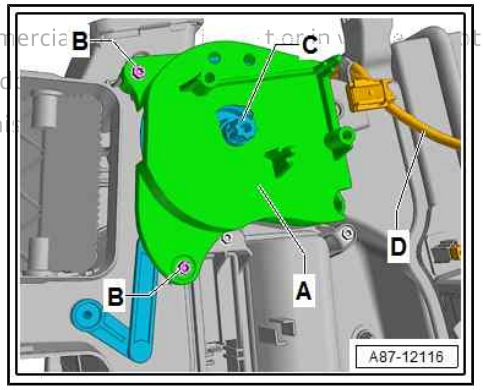
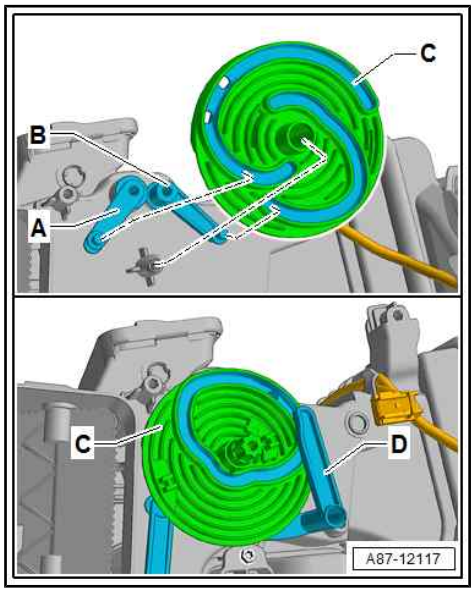
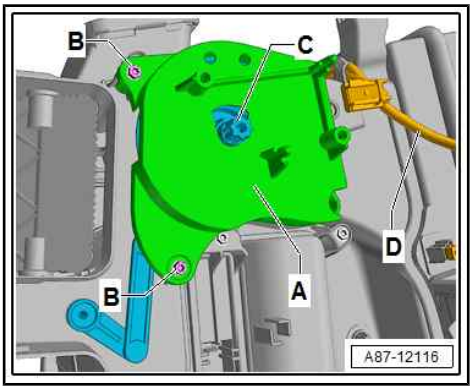


Installing

Installation is carried out in reverse order; note the following:

– Check that actuating arms to various flaps -A, B- are positioned correctly in cam plate -C- and are functioning properly.
– Insert cam plate -C- and check that it is functioning correctly.
– Check the actuating arm -D- for correct positioning in the cam plate -C- as well as for proper operation.





– Install bracket -A-.
– Tighten bolts -B-.
– Check the wiring harness -D-. It must not come into contact with moving components.
– Check operation of actuators by turning cam plate -C-
– Install air distribution flap control motor - V428-
⇒ “5.12 Removing and installing air distribution flap control motor V428 ”, page 226 .
– Perform basic setting for air conditioner
⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

◆ ⇒ “5.2.2 Exploded view - control motors (front), vehicles with Low air conditioner and heater without air conditioner”, page 203

5.16.5 Removing and installing retainers for control motors (right-side) - vehicles with “High” air conditioner

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Removing

– Set direction of air flow to “DEF” (to windscreen) on operating and display unit for front air conditioning system - E87- .
– On -E87- , set the temperature for the right side to “Warm”.
– Move front right seat to rearmost position.
– Switch off ignition.
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
– Remove footwell vent (right-side)
⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296 .
– If fitted, remove air duct for glove box cooling
⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297 .
– Remove air duct to dash panel vent
⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280 .

Note

◆ On right-hand drive vehicles, - V2- does not have to be removed to take out the defroster flap control motor - V107- , but the dash panel does have to be removed ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

– Remove the following control motors:

◆ Removing right side vent control motor - V300-
⇒ “5.14 Removing and installing right side vent control motor V300 ”, page 229

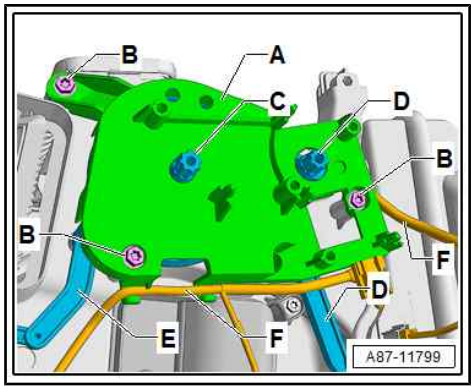
◆ Removing right temperature flap control motor - V159-
⇒ “5.10 Removing and installing right temperature flap control motor V159 ”, page 223

- Removing defroster flap control motor - V107-
  ⇒ “5.5 Removing and installing defroster flap control motor V107 ”, page 213 (only on vehicles with right-hand drive)

– Remove bolts -B-.

– Unfasten wiring harness -F- from bracket -A-.

– Hold cam plate -C- and remove bracket -A-.



Note

- Right-hand drive vehicles: Remove gear wheel to defroster flap control motor - V107-
  ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233 .

Installing

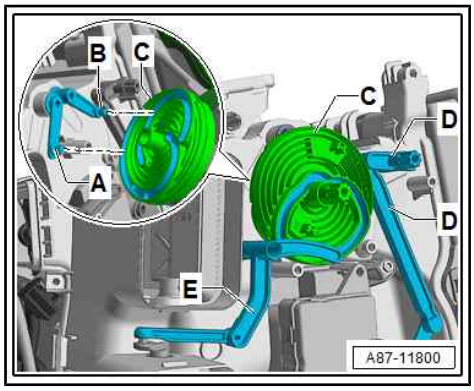
Installation is carried out in reverse order; note the following:

– Check that actuating arms to various flaps -A, B- are positioned correctly in cam plate -C- and are functioning properly.

– Insert cam plate -C- and check that it is functioning correctly.

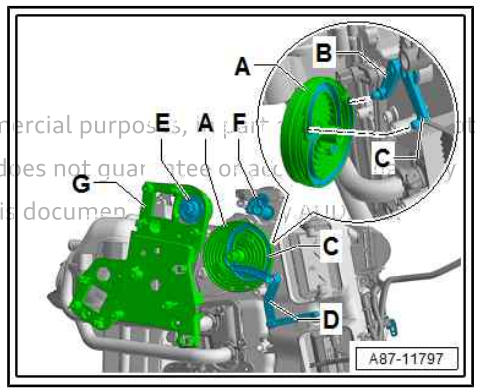
– Check that actuating arm -E- is positioned correctly in cam plate -C- and is functioning properly.

– Check that actuating arm -D- is positioned correctly and is functioning properly.



Note

- Right-hand drive vehicles: Remove gear wheel from bracket -A- and install bracket -A- again without gear wheel. Then insert gear wheel -F-, making sure it is positioned correctly in relation to gear wheel -F- (engage long and wide tooth on gear wheel -E- correctly in gear wheel -F-)
  ⇒ “5.16.2 Removing and installing retainers for control motors (left-side) - vehicles with Low air conditioner (or with heater and without air conditioner)”, page 233 .



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– Install bracket -A-.

– Tighten bolts -B-.

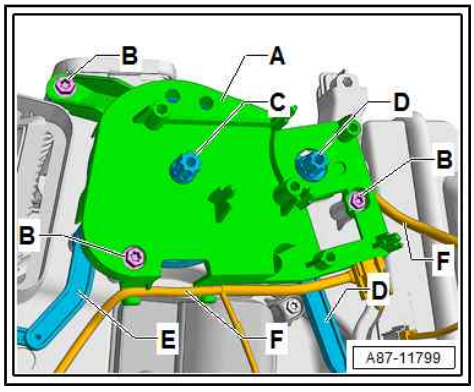
– Insert wiring harness -F- in bracket -A- so that it cannot come into contact with moving components.

– Check that actuators -C, D, E- are functioning correctly.

– Re-install control motors removed earlier in reverse sequence.

– Route wiring to the various control motors so that it cannot come into contact with moving components.

– Perform basic setting for air conditioner
  ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



Tightening torque

- ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205

5.16.6 Removing and installing retainer for rear air distribution flap control motor - V427-

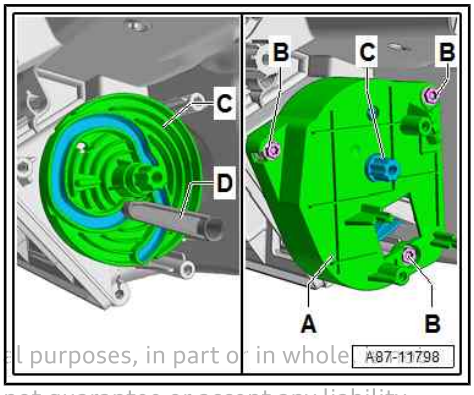
Removing

– Remove rear air distribution flap control motor - V427- ⇒ “5.11 Removing and installing rear air distribution flap control motor V427 ”, page 225 .

– Remove bolts -B-.

– “High” air conditioner: Hold cam plate -C- in position.

– Remove retainer -A- and move wiring harness clear.



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Installing

Installation is carried out in reverse order; note the following:

– Check that cam plate -C- and lever -D- are functioning properly and are fitted in correct installation position.

– Install bracket -A-.

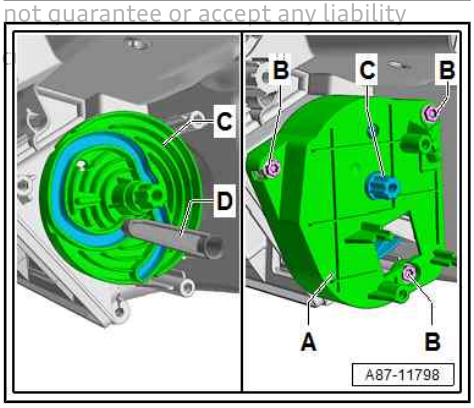
– Tighten bolts -B-.

– Install rear air distribution flap control motor - V427- ⇒ “5.11 Removing and installing rear air distribution flap control motor V427 ”, page 225 .

– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

♦ ⇒ “5.2.3 Exploded view - control motors (front), vehicles with High air conditioner”, page 205



6 Front heater and air conditioning unit

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⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240

⇒ “6.2 Exploded view - attachments for heater and air conditioning unit (air distribution housing, heat exchanger etc.)”, page 242

⇒ “6.3 Exploded view - air intake box of heater and air conditioning unit”, page 244

⇒ “6.4 Exploded view - evaporator housing”, page 245

⇒ “6.5 Removing and installing evaporator”, page 247

⇒ “6.6 Cleaning evaporator”, page 249

⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255

⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

⇒ “6.9 Detaching and attaching air intake box at heater and air conditioning unit”, page 264

⇒ “6.10 Removing and installing dust and pollen filter”, page 264

⇒ “6.11 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 265

⇒ “6.12 Removing and installing heat exchanger”, page 267

⇒ “6.13 Removing and installing condensation drain”, page 276

⇒ “6.14 Checking condensation drain”, page 278

6.1 Exploded view - heater and air conditioning unit

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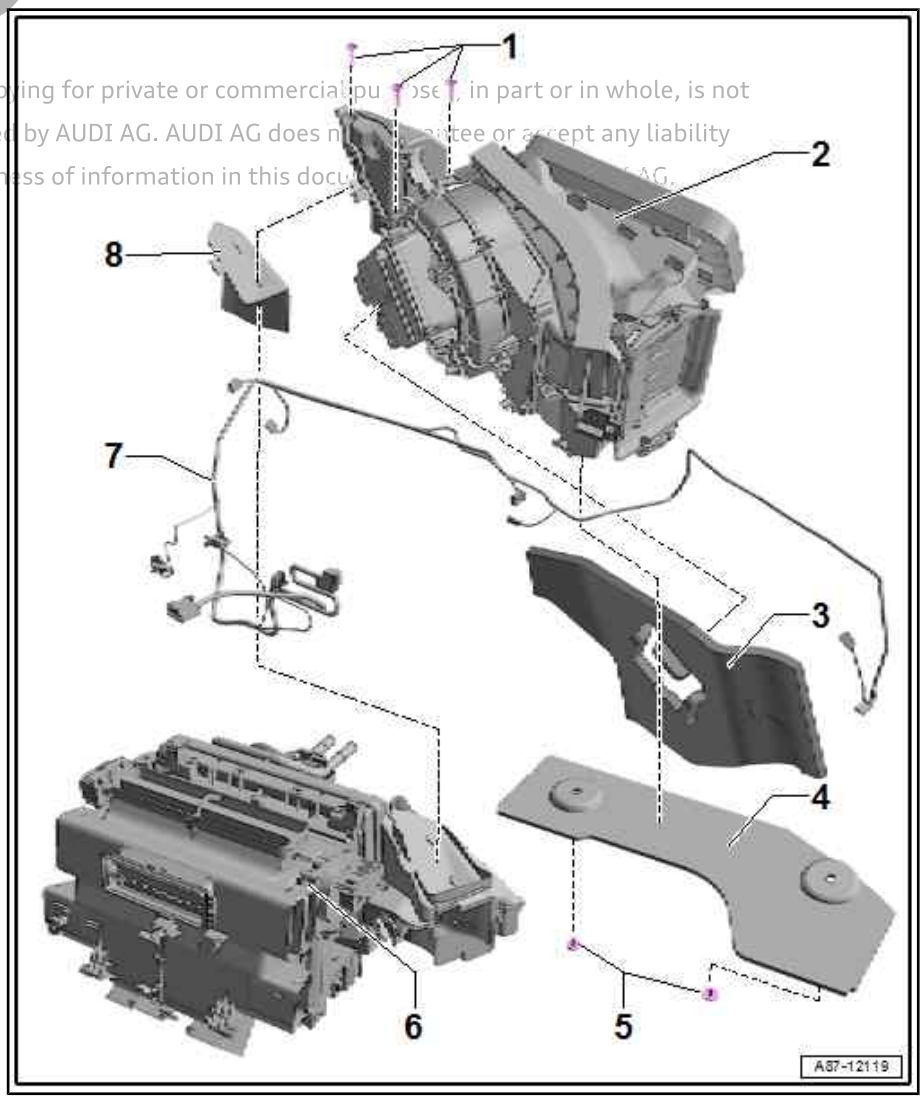

1 - Bolt

- ❑ 1 Nm

2 - Air intake box

- ❑ Detaching and attaching air intake box at heater and air conditioning unit
  ⇒ “6.9 Detaching and attaching air intake box at heater and air conditioning unit”, page 264

3 - Insulating mat

- ❑ Removing and installing
  ⇒ “6.11 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 265

4 - Noise insulation cover

- ❑ Removing and installing
  ⇒ “6.10 Removing and installing dust and pollen filter”, page 264

5 - Threaded fasteners

- ❑ Removing and installing
  ⇒ “6.10 Removing and installing dust and pollen filter”, page 264

6 - Air distribution housing (heater and air conditioning unit with evaporator)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching evaporator housing at air distribution housing
  ⇒ “6.5 Removing and installing evaporator”, page 247
- ❑ ⇒ “5.2 Exploded view - control motors (front)”, page 202

7 - Wiring harness for heater and air conditioning unit

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Mark assignment before unplugging connectors (identical connectors for different control motors and temperature sensors, risk of interchanging)
- ❑ Secure wiring harness to attachment points on housing (with cable ties or at mountings) so that harness cannot come into contact with moving components

8 - Insulating mat

- ❑ Fitted between air duct in air distribution housing and resonator chambers located there and in air intake box

6.2 Exploded view - attachments for heater and air conditioning unit (air distribution housing, heat exchanger etc.)

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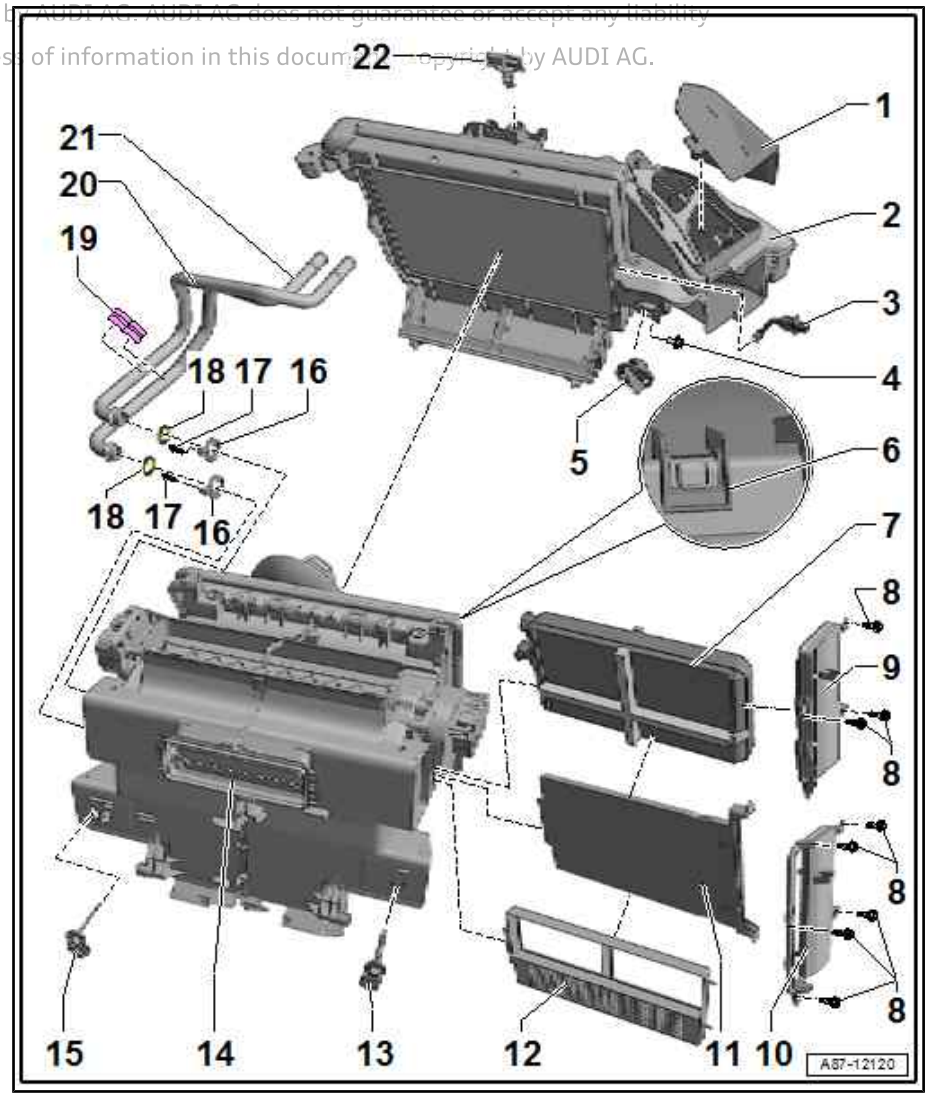

1 - Insulating mat

- ❑ Between air duct in air distribution housing and resonator chambers located there and in air intake box

2 - Evaporator housing

- ❑ With factory-fitted evaporator
- ❑ May not need to be dismantled further (depending on version) ⇒ “6.4 Exploded view - evaporator housing”, page 245
- ❑ Removing and installing evaporator ⇒ “6.5.2 Removing and installing evaporator in heater and air conditioning unit”, page 249

3 - Evaporator output temperature sender - G263-

- ❑ Removing and installing ⇒ “10.9 Removing and installing evaporator output temperature sender G263 ”, page 330

4 - Plug

- ❑ Plug e.g. 8D0 819 598 ⇒ Electronic parts catalogue
- ❑ Only on heater and air conditioning units with an evaporator that has already been cleaned once ⇒ “6.6.2 Cleaning evaporator in heater and air conditioning unit using pressure-feed spray gun V.A.G 1538 and spray lance”, page 251

5 - Cap

- ❑ For connection to glove box cooling system
- ❑ Not fitted on vehicles with glove box cooling system

6 - Retainer

- ❑ Open carefully

7 - Heat exchanger for heater

- ❑ Removing and installing ⇒ “6.12 Removing and installing heat exchanger”, page 267
- ❑ With foam seals; check that they are not damaged and are bonded on properly ⇒ “6.12 Removing and installing heat exchanger”, page 267

8 - Bolt

- ❑ 1 Nm

9 - Cover for heat exchanger

- ❑ For vehicles with no auxiliary air heater element - Z35- ⇒ Electronic parts catalogue
- ❑ Different versions ⇒ Electronic parts catalogue

- ❑ Removing and installing ⇒ “6.12 Removing and installing heat exchanger”, page 267

10 - Cover for heat exchanger

- ❑ For vehicles with auxiliary air heater element - Z35- ⇒ Electronic parts catalogue
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “6.12 Removing and installing heat exchanger”, page 267 and ⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255

11 - Auxiliary air heater element - Z35-

- ❑ Removing and installing ⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255
- ❑ Installed depending on equipment version and engine

12 - Zone divider

- ❑ Only for vehicles with a “High” air conditioner with no auxiliary air heater element - Z35- ⇒ Electronic parts catalogue
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “6.12 Removing and installing heat exchanger”, page 267 and ⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255

13 - Right footwell vent temperature sender - G262-

- ❑ For vehicles with a “High” air conditioner only
- ❑ Removing and installing ⇒ “10.8 Removing and installing right footwell vent temperature sender G262 ”, page 329
- ❑ Checking right footwell vent temperature sender - G262- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- ❑ Vehicles with a “Low” air conditioner (or heater with no air conditioner) have no mount at the heater and air conditioning unit or if so it is sealed with a plug.

14 - Air distribution housing (heater and air conditioning unit with evaporator)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing heater and air conditioning unit with evaporator ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

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15 - Left footwell vent temperature sender - G261-

- ❑ Removing and installing ⇒ “10.7 Removing and installing left footwell vent temperature sender G261 ”, page 329

16 - Screw-type clip

- ❑ Renew ⇒ Electronic parts catalogue
- ❑ Detaching and attaching at heat exchanger ⇒ “6.12 Removing and installing heat exchanger”, page 267

17 - Bolt

- ❑ 2 Nm
- ❑ Detaching and attaching at heat exchanger ⇒ “6.12 Removing and installing heat exchanger”, page 267

18 - O-ring

- ❑ Renew ⇒ Electronic parts catalogue
- ❑ Coat lightly with coolant before fitting ⇒ “6.12 Removing and installing heat exchanger”, page 267

19 - Spacer for coolant pipes

- ❑ Clipped onto both coolant pipes

20 - Coolant pipe to heat exchanger

- ❑ Coolant return line
- ❑ Detaching and attaching at heat exchanger ⇒ “6.12 Removing and installing heat exchanger”, page 267
- ❑ Can only be renewed after heater and air conditioning unit has been removed

21 - Coolant pipe to heat exchanger

- ❑ Coolant supply line

- ❑ Detaching and attaching at heat exchanger
  ⇒ “6.12 Removing and installing heat exchanger”, page 267
- ❑ Can only be renewed after heater and air conditioning unit has been removed

22 - Bracket for coolant pipes

6.3 Exploded view - air intake box of heater and air conditioning unit

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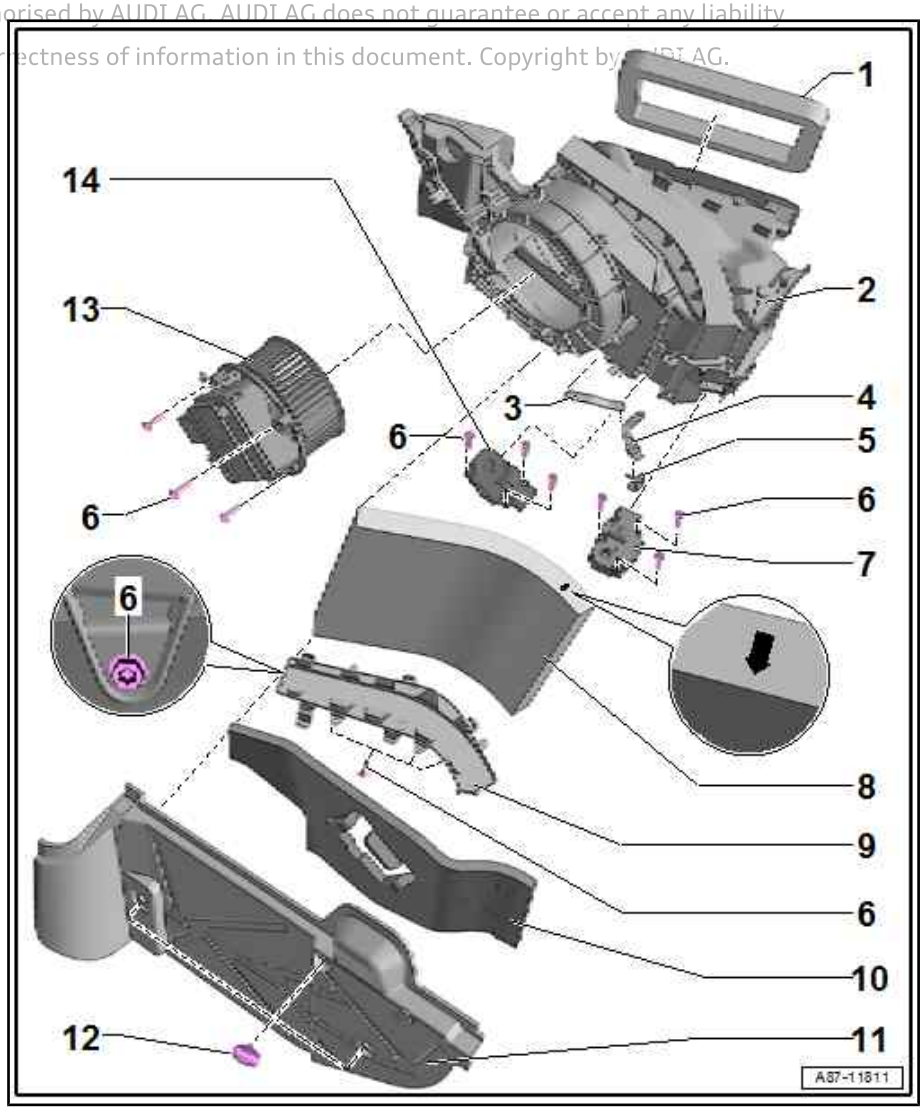

1 - Foam seal

- ❑ To seal off fresh-air intake duct at vehicle, bonded to intake duct
- ❑ Check for damage and renew if necessary ⇒ Electronic parts catalogue

2 - Air intake box

- ❑ With air flow/fresh air and air recirculation flap
- ❑ Do not dismantle any further

3 - Lever

- ❑ Removing and installing ⇒ “5.2.4 Exploded view - control motors on air intake box”, page 208
- ❑ Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease ⇒ Electronic parts catalogue .

4 - Connecting element with lever

- ❑ Removing and installing ⇒ “5.2.4 Exploded view - control motors on air intake box”, page 208
- ❑ Coat guides of cam plate, shaft bearings, toothed segments and pins on flap levers with a small quantity of grease ⇒ Electronic parts catalogue .

5 - Bracket

6 - Bolt

- ❑ 1 Nm

7 - Air recirculation flap control motor - V113-

- ❑ Removing and installing ⇒ “5.6 Removing and installing air recirculation flap control motor V113 ”, page 217

8 - Dust and pollen filter

- ❑ Removing and installing ⇒ “6.10 Removing and installing dust and pollen filter”, page 264
- ❑ Observe replacement intervals ⇒ Maintenance tables
- ❑ Different versions ⇒ Electronic parts catalogue

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9 - Cover for dust and pollen filter

- ❑ Removing and installing ⇒ “6.10 Removing and installing dust and pollen filter”, page 264
- ❑ Depending on version, a foam strip for insulating gap to insulating mat may have been attached to cover ⇒ “6.10 Removing and installing dust and pollen filter”, page 264 .

10 - Insulating mat

- ❑ Removing and installing ⇒ “6.11 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 265

11 - Noise insulation cover

- ❑ Removing and installing ⇒ “6.10 Removing and installing dust and pollen filter”, page 264

12 - Threaded fasteners

- ❑ Removing and installing ⇒ “6.10 Removing and installing dust and pollen filter”, page 264

13 - Fresh air blower - V2- with fresh air blower control unit - J126-

- ❑ Removing and installing ⇒ “6.11 Removing and installing fresh air blower V2 with fresh air blower control unit J126 ”, page 265

14 - Fresh air flap control motor - V438-

- ❑ Removing and installing ⇒ “5.4 Removing and installing fresh air flap control motor V438 , operation”, page 211

6.4 Exploded view - evaporator housing

- ♦ The evaporator is currently supplied with the evaporator housing as a replacement part. The evaporator housing should therefore not be dismantled. If the evaporator is also supplied as a separate part at a later time, the evaporator housing must be dismantled ⇒ Electronic parts catalogue .

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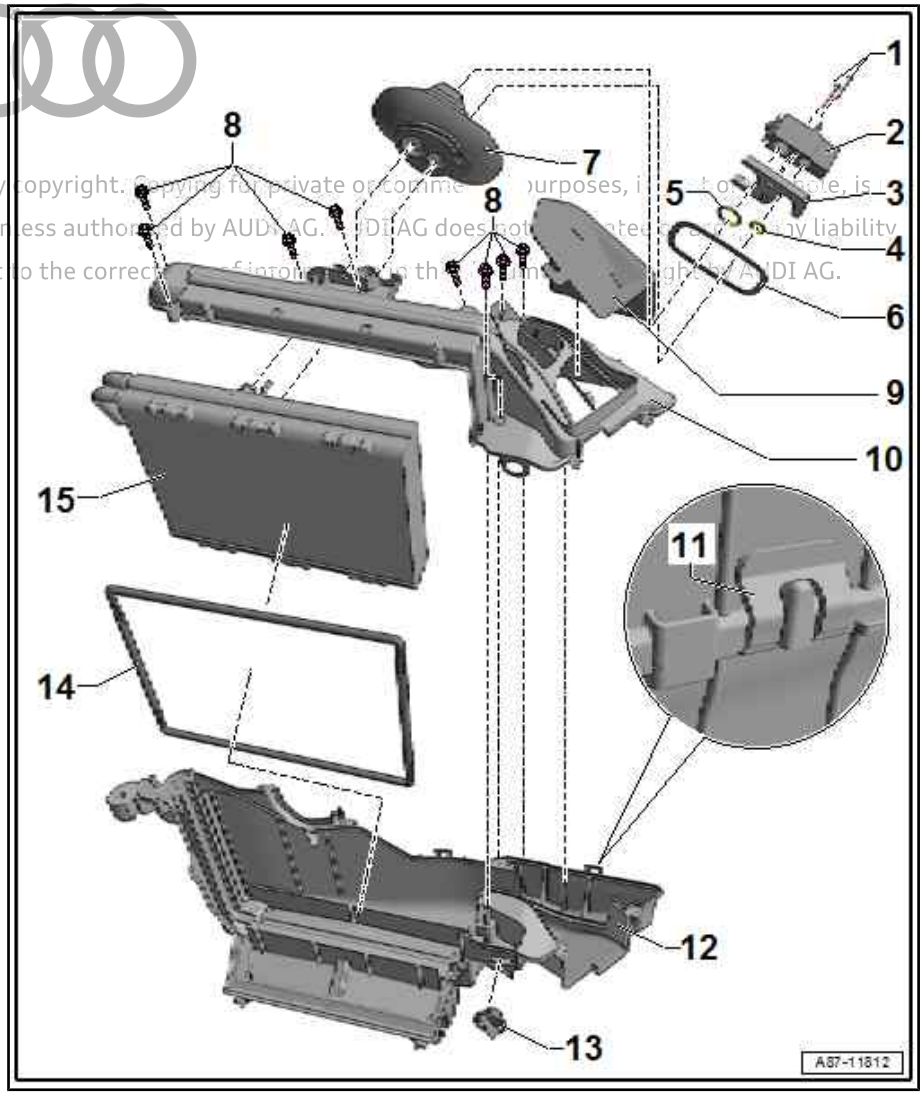

1 - Bolt

- ❑ Removing and installing ⇒ “2.16.2 Removing and installing expansion valve (front)”, page 98
- ❑ 5.5 Nm
- ❑ 2x

2 - Expansion valve

- ❑ Removing and installing ⇒ “2.16.2 Removing and installing expansion valve (front)”, page 98
- ❑ Cover for expansion valve (vehicles with heater but no air conditioner)
- ❑ On vehicles with no air conditioner, the connections at the expansion valve (for the air conditioner refrigerant lines) are sealed with a cap (tightening torque of nut: 8 Nm) ⇒ “2.10 Dismantling and assembling heater unit”, page 27 and ⇒ Electronic parts catalogue .
- ❑ On vehicles with no air conditioner, the expansion valve is only fitted for sealing the lead-through in the grommet to the passenger compartment.

3 - Retaining plate

- ❑ Removing and installing ⇒ “6.5.2 Removing and installing evaporator in heater and air conditioning unit”, page 249

4 - O-ring

- ❑ Renewing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ For correct version refer to ⇒ Electronic parts catalogue

5 - O-ring

- ❑ Renewing ⇒ “4.12 Refrigerant circuit seals”, page 16
- ❑ For correct version refer to ⇒ Electronic parts catalogue

6 - Support ring

- ❑ Support ring increases contact pressure of grommet to of plenum chamber back panel
- ❑ Checking position of support ring in grommet ⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96

7 - Grommet

- ❑ For sealing opening for refrigerant lines through plenum chamber back wall
- ❑ With support ring as a seal in plenum chamber back wall ⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96
- ❑ Currently forms part of replacement “evaporator housing” ⇒ Electronic parts catalogue

8 - Bolt

- ❑ 1 Nm

9 - Insulating mat

- ❑ Fitted between air duct in air distribution housing and resonator chambers located there and in air intake box

10 - Evaporator housing (top section)

11 - Retainer

- ❑ Open carefully

12 - Evaporator housing (bottom section)

- ❑ The two halves of the housing are held together by bolts ⇒ Item 8 (page 242) and retainers ⇒ Item 6 (page 242) .
- – Before assembly, check both halves of housing for dirt and clean if necessary.
- – Check “tongue-and-groove” joint to evaporator housing (top section) for damage.
- ❑ If connections are damaged or not assembled properly, noise may occur during operation

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13 - Cap

- ❑ For connection to glove box cooling system
- ❑ Only fitted on vehicles without glove box cooling as an optional extra ⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297

14 - Seal

- ❑ Check for damage and correct installation on evaporator

15 - Evaporator

- ❑ Supplied as replacement part (not available for all versions) with various components required for fitting (evaporator housing, O-rings, expansion valve etc.) ⇒ Electronic parts catalogue
- ❑ Check that foam seals are not damaged and are bonded on properly
- ❑ Removing and installing ⇒ “6.5.2 Removing and installing evaporator in heater and air conditioning unit”, page 249
- ❑ On a vehicle with no air conditioner (heater only), the evaporator installed in the heater unit has no function; it is only used as a spacer element and reduces noise.

6.5 Removing and installing evaporator

⇒ “6.5.1 Removing and installing evaporator housing at heater and air conditioning unit”, page 247

⇒ “6.5.2 Removing and installing evaporator in heater and air conditioning unit”, page 249

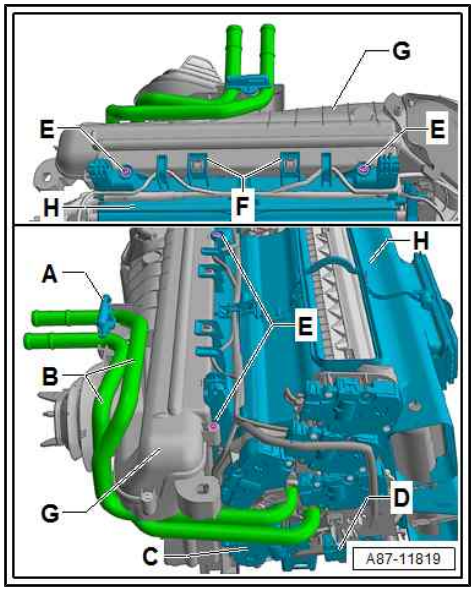
6.5.1 Removing and installing evaporator housing at heater and air conditioning unit

- ♦ Currently replacement units are not available for all versions of the evaporator. Therefore, please check in advance whether the replacement evaporator is available as a separate part or as a complete replacement unit with the evaporator housing ⇒ Electronic parts catalogue . If the evaporator is only available in combination with an evaporator housing, the evaporator housing does not have to be dismantled. The evaporator and the evaporator housing are then renewed completely ⇒ “6.4 Exploded view - evaporator housing”, page 245 .
- ♦ When it has been removed, the evaporator contains refrigerant oil which must be returned to the refrigerant circuit (together with the new evaporator) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

- On a vehicle with no air conditioner (heater only), the evaporator installed in the heater unit has no function; it is only used as a spacer element and reduces noise.

Detaching

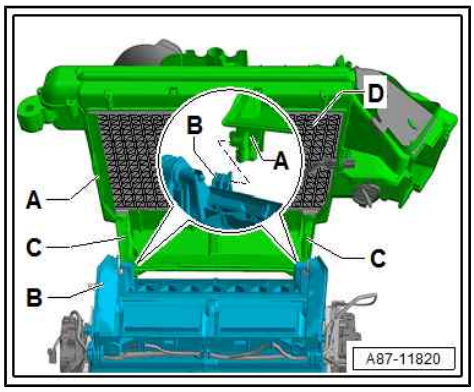
- Remove heater and air conditioning unit ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258 .
- Detach air intake box from heater and air conditioning unit ⇒ “6.9 Detaching and attaching air intake box at heater and air conditioning unit”, page 264 .
- Remove rear temperature flap control motor - V137- -C- and corresponding retainer ⇒ “5.8 Removing and installing rear temperature flap control motor V137 ”, page 220 .
- Remove bracket -A-.
- Detach and remove both coolant pipes -B- from heat exchanger ⇒ “6.12.2 Removing and installing heat exchanger”, page 268 .
- Detach connector from evaporator output temperature sender - G263- ⇒ “10.9 Removing and installing evaporator output temperature sender G263 ”, page 330 .
- Remove bolts -E-.
- Carefully release retaining tabs -F-.
- Separate evaporator housing -G- and air distribution housing -H-.



Installing

Installation is carried out in reverse order; note the following:

- Check evaporator housing -A- for dirt, paying special attention to condensation drain ducts -C- and evaporator -D- itself.
- Check that flaps in air distribution housing -B- are not damaged and are installed properly.
- Check air distribution housing -B- for dirt or damage.
- Check connection points between air distribution housing -B- and evaporator housing -A- (tongue-and-groove joint) for damage and coat them lightly e.g. with silicone grease to seal them completely ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 .
- Position evaporator housing on air distribution housing and assemble.
- Check connection of heat exchanger and coolant pipes for damage or dirt before installing ⇒ “6.12.2 Removing and installing heat exchanger”, page 268 .
- Re-install remaining components removed in reverse order.



Tightening torques

- ⇒ “6.4 Exploded view - evaporator housing”, page 245

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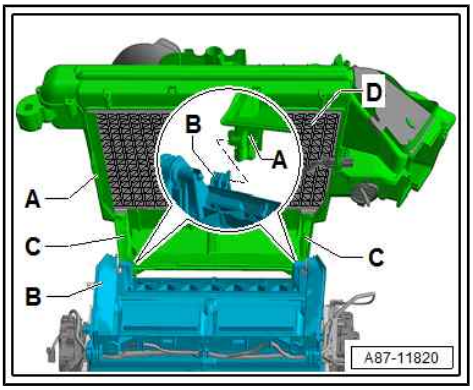
6.5.2 Removing and installing evaporator in heater and air conditioning unit

- Currently replacement units are not available for all versions of the evaporator. Therefore, please check in advance whether the replacement evaporator is available as a separate part or as a complete replacement unit with the evaporator housing ⇒ Electronic parts catalogue . If the evaporator is only available in combination with an evaporator housing, the evaporator housing does not have to be dismantled. The evaporator and the evaporator housing are then renewed completely ⇒ “6.4 Exploded view - evaporator housing”, page 245 .
- When it has been removed, the evaporator contains refrigerant oil which must be returned to the refrigerant circuit (together with the new evaporator) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

Removing

– Detach evaporator housing -A- from air distribution housing -B- on front heater and air conditioning unit ⇒ “6.5.1 Removing and installing evaporator housing at heater and air conditioning unit”, page 247 .

– Remove evaporator -D- from evaporator housing -A- ⇒ “6.4 Exploded view - evaporator housing”, page 245 .



Installing

Installation is carried out in reverse order; note the following:

– Check evaporator housing -A- for dirt, paying special attention to condensation drain ducts -C- and evaporator -D- itself.

– Attach evaporator housing -A- to air distribution housing -B- on front heater and air conditioning unit ⇒ “6.5.1 Removing and installing evaporator housing at heater and air conditioning unit”, page 247 .

6.6 Cleaning evaporator

⇒ “6.6.1 Cleaning evaporator in heater and air conditioning unit with ultrasonic A/C cleaner”, page 249

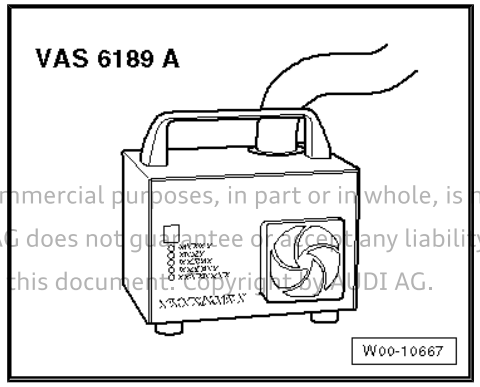
⇒ “6.6.2 Cleaning evaporator in heater and air conditioning unit using pressure-feed spray gun V.A.G 1538 and spray lance”, page 251

6.6.1 Cleaning evaporator in heater and air conditioning unit with ultrasonic A/C cleaner

On a vehicle with no air conditioner (heater only), the evaporator installed in the heater unit has no function; it is only used as a spacer element and reduces noise. If odours occur at the evaporator, the evaporator can be cleaned in the same way as on vehicles with an air conditioner.

Special tools and workshop equipment required

- Ultrasonic A/C cleaner (e.g. -VAS 6189A-); for currently available cleaners, refer to ⇒ Electronic parts catalogue .



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- Cleaning fluid - VAS 6189/1- ⇒ Electronic parts catalogue

Preparations

– Check whether the front heater and air conditioning unit evaporator is really the source of the odour by switching from fresh air to air recirculation mode.

• The odour can only be eliminated by cleaning with the ultrasonic air conditioner cleaner if it actually occurs in the evaporator.

– Check plenum chamber and water drain of plenum chamber and clean if necessary
⇒ “7.9 Checking plenum chamber water drain”, page 303 .

– Remove dust and pollen filter and check for odour and dirt
⇒ “6.10 Removing and installing dust and pollen filter”, page 264 .

– Clean installation slot for dust and pollen filter of front heater and air conditioning unit (remove leaves, dust and other dirt)
⇒ “6.10 Removing and installing dust and pollen filter”, page 264 .

• On this vehicle, the dust and pollen filter is installed in front of the fresh air blower - V2- and must therefore be removed when the evaporator is cleaned.

– Close cover for dust and pollen filter again on heater and air conditioning unit.

– Start engine.

– Set air conditioner to “air recirculation mode” and switch off air conditioner compressor (lamp in A/C or A/C MAX button off).

– Open all vents in dash panel and rear centre console (if fitted).

– Close windows and sun roof of vehicle.

– Set air conditioner to lowest possible temperature (temperature setting “cold”) for all zones.

– On -E87- , set the lowest fresh air blower speed and select “Dash panel vents” (rear centre console vents) as the air outflow direction.

– On -E87- , select “dash panel vents” as direction of air flow.

Cleaning

– Fill ultrasonic A/C cleaner with cleaning fluid - VAS 6189/1- (refer to operating instructions).

– Position ultrasonic A/C cleaner (e.g. -VAS 6189A-) in front passenger's footwell.

– Start up ultrasonic A/C cleaner (e.g. -VAS 6189A-) as specified in operating instructions, and position outlet hose so that

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vapour emerging is drawn in by fresh air blower - V2- via opening for air recirculation of heater and air conditioning unit (behind glove box in vicinity of right wheel housing).

– Close vehicle's doors.

• The cleaning process takes roughly 15 to 20 minutes and is completed when no further vapour emerges from the outlet hose.

Final steps

– Switch off ultrasonic A/C cleaner (e.g. -VAS 6189A-).

– Open doors and vent passenger compartment for at least 10 minutes.

– Remove ultrasonic A/C cleaner (e.g. -VAS 6189A-) from vehicle and clean it in accordance with its operating instructions.

– Switch off ignition.

– Install dust and pollen filter
⇒ “6.10 Removing and installing dust and pollen filter”, page 264 .

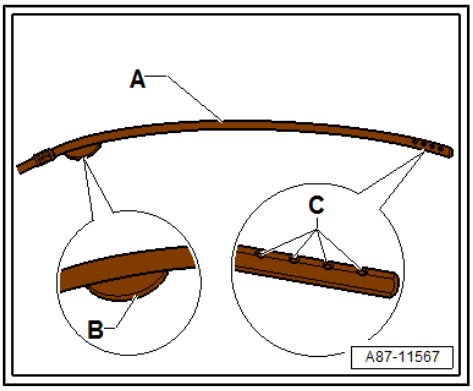
6.6.2 Cleaning evaporator in heater and air conditioning unit using pressure-feed spray gun - V.A.G 1538- and spray lance

On a vehicle with no air conditioner (heater only), the evaporator installed in the heater unit has no function; it is only used as a spacer element and reduces noise. If odours occur at the evaporator, the evaporator can be cleaned in the same way as on vehicles with an air conditioner.

Special tools and workshop equipment required

♦ Pressure-feed spray gun - V.A.G 1538- (for currently available pressure-feed spray guns, refer to ⇒ Electronic parts catalogue).

♦ Probe for evaporator cleaning, straight - V.A.G 1538/5- (short version: approx. 500 mm, bent as specified for this vehicle) -A- or probe for cleaning evaporator, curved - V.A.G 1538/6- (medium version: approx. 600 mm, pre-bent) -A-. (For currently available Lambda probes refer to ⇒ Electronic parts catalogue).



♦ Angle drill (commercially available) and short 9 mm drill bit (only required if evaporator has never been cleaned)

♦ Cleaning solution for evaporator in air conditioner “D 600 100 A2” (for currently available cleaning fluids, refer to ⇒ Electronic parts catalogue)

♦ Plug 8D0 819 598 ⇒ Electronic parts catalogue

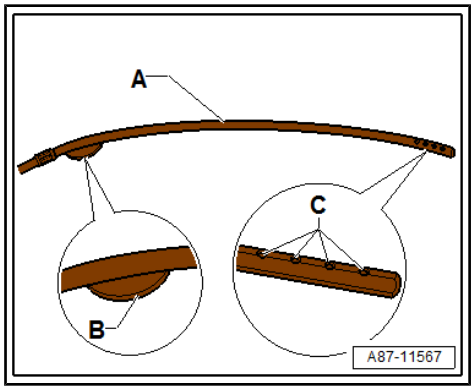
♦ Vacuum cleaner (commercially available)

• Observe product data sheet of cleaning solution.

♦ It is advisable to have several short and long spray lances at hand, as a straight lance is required for some vehicles, while for other vehicles it must be curved or bent into different

shapes. It is not a good idea to change the shape of the spray lance repeatedly as this will damage it.

Recommended bend radius of spray lance VAG 1538/5 (compact) or VAG 1538/6 (medium length) -A- for this vehicle as shown in illustration



Note

The guide washer -B- is fitted opposite the holes -C- on the spray lance; this allows you to identify the spray direction even when the spray lance is inserted.

Preparations

– Switch on ignition.

– Open all dash panel vents.

– Switch on heater and air conditioner.

– Check whether the front heater and air conditioning unit evaporator is really the source of the odour by switching from fresh air to air recirculation mode
⇒ “3.3 Notes on odours in vehicles with air conditioner”, page 9 .

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♦ Identify the cause or origin of the odour before cleaning the evaporator.

♦ Even if the cause of the odour is not inside the evaporator (e.g. contamination in the dust and pollen filter), it is worth cleaning the evaporator after eliminating the cause of the odour (the evaporator absorbs odours from the air which passes through it).

– Set heater and air conditioner to air recirculation mode.

– Switch off ignition (this also switches off air conditioner and fresh air blower - V2-).

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove and check dust and pollen filter; renew if necessary after cleaning evaporator
⇒ “6.10 Removing and installing dust and pollen filter”, page 264 .

Note

We recommend renewing the used dust and pollen filter every time the evaporator is cleaned.

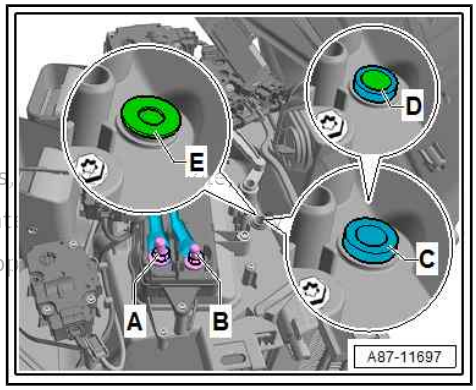
– With dust and pollen filter removed, check area in front of dust and pollen filter (to intake duct for air in fresh air and air recirculation mode) and clean, if necessary
⇒ “6.10 Removing and installing dust and pollen filter”, page 264 .

– Check plenum chamber and water drain of plenum chamber and clean if necessary
⇒ “7.9 Checking plenum chamber water drain”, page 303 .

– Place a drip tray under vehicle to collect cleaning fluid draining from condensation drain (for location of condensation drain opening, refer to
⇒ “6.13 Removing and installing condensation drain”, page 276).

– Cover floor in front right footwell with waterproof sheeting and absorbent paper.

– Vehicles with auxiliary air heater control unit - J604- : Cover electrical connections -A- and -B-.



Note

♦ Right-hand drive vehicles: Move driver's seat as far towards rear as possible, and remove dash panel cover (driver side).
Cover floor in driver's and front passenger's footwell with waterproof sheeting and absorbent paper ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

Vehicles with an evaporator that already been cleaned with a spray lance:

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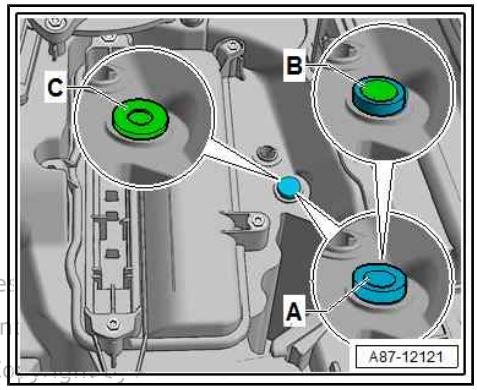
– Remove plug -C-.



Vehicles with an evaporator that has never been cleaned with a spray lance:

NOTICE

Risk of damage from drill to heater and air conditioning unit or flaps in heater and air conditioning unit

- **Arrange connecting wires on heater and air conditioning unit so that they cannot come into contact with drill bit or rotating parts of drill.**
- **Proceed very carefully when drilling; operate drill at low speed.**
- **Do not drill further than 10 mm into heater and air conditioning unit.**

– Using a commercially available angle drill and short drill bit (9 mm diameter), carefully drill a hole -B- into connection -A- attached to heater and air conditioning unit for cleaning evaporator.

– Deburr hole -B-.

Cleaning evaporator

CAUTION

Cleaning agent and its vapours pose a health hazard.

- **Wear safety goggles and protective gloves and protective clothing.**
- **Use the cleaning fluid only in well ventilated areas.**
- **Do not inhale cleaning agent vapours.**

NOTICE

Cleaning fluid can cause damage to the vehicle.

- **Ensure that fluid does not come into contact with electronic components.**
- **Do not spray cleaning fluid into the air ducts in or leading to the vehicle interior.**
- **Thoroughly clean any components in the passenger compartment which have come into contact with the cleaning fluid.**

NOTICE

Other materials can form deposits in the heater and air conditioning unit.

- **Only use pressure-feed spray guns and spray lances that have not been used with other fluids.**

• The ignition (and therefore the air conditioner) is switched off.

– Connect spray lance to pressure-feed spray gun - V.A.G 1538- and fill with 1 litre of cleaning solution for air conditioner evaporators.

– Set compressed-air supply for pressure-feed spray gun to a pressure of approx. 7.5 bar (minimum pressure 5 bar / maximum pressure 10 bar).

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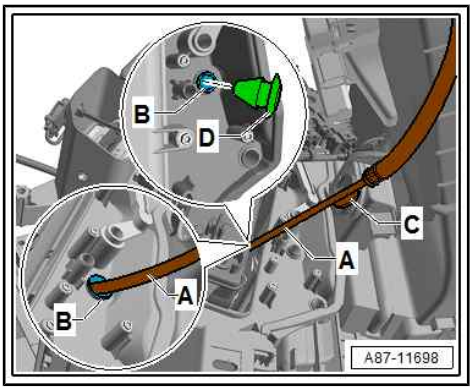
♦ Setting this pressure on the compressed-air supply means that the spray lance has an operating pressure between 3.5 and 4.5 bar.

– Connect pressure-feed spray gun - V.A.G 1538- to compressed-air supply.

– Insert spray lance -A- through opening -B- in heater and air conditioning unit and into evaporator housing with spray direction towards evaporator.



Note

The guide washer -C- is fitted opposite the outlet holes of the spray lance; this allows you to identify and set the spray direction even when the spray lance is inserted.

• During the cleaning process, always check that the cleaning fluid is flowing out through the condensation drain.

– Clean and rinse evaporator and surrounding area of housing with 0.1 to 0.2. ltr. of cleaning solution by operating metering lever on pressure-feed spray gun and moving spray lance -A- back and forth.

– Check that fluid actually drains through condensation drain and into drip tray under vehicle.

• If the fluid only drips out, the condensation drain must be cleaned before the cleaning process can continue ⇒ “6.13 Removing and installing condensation drain”, page 276 .

– Use entire contents of pressure-feed spray gun to clean evaporator.

– Remove drip tray and dispose of collected cleaning agent.

Allow at least 30 minutes for cleaning solution to take effect. The removed components can be re-installed in the vehicle during this time.

– Insert plug -D- into hole -B- and check that it is seated tightly.

– Re-install all components previously removed.

– Open all doors or open the windows.

– Open all vents in dash panel and in vehicle interior.

– Switch on ignition after letting cleaning solution take effect.

– Adjust direction of air flow on all vents using operating and display unit for front air conditioning system - E87- .

– On -E87- , set fresh air blower - V2- to maximum speed.

– Then start engine and switch on air conditioner (air conditioner compressor) (lamp in A/C or A/C MAX button on).

– Allow air conditioner to run in this setting for approx. 10 minutes (air conditioner compressor switched on), switching vent temperature setting on -E87- from cold to warm and back several times.

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6.7 Removing and installing auxiliary air heater element - Z35-

♦ The auxiliary air heater element - Z35- is only fitted on some versions of the vehicle.

♦ On right-hand drive vehicles, the auxiliary air heater element - Z35- is removed via the driver's footwell.

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Switch on ignition.

– Move front right seat to rearmost position.

– Switch off ignition.

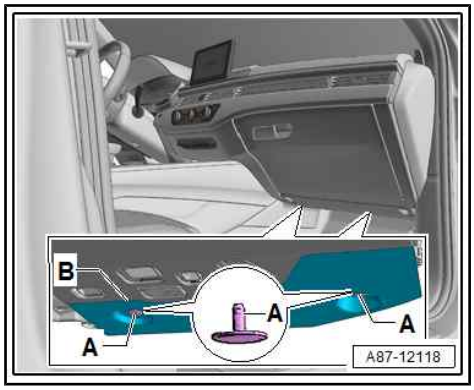
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove footwell vent (right-side) ⇒ "7.4 Removing and installing footwell vent (front passenger side)", page 296 .

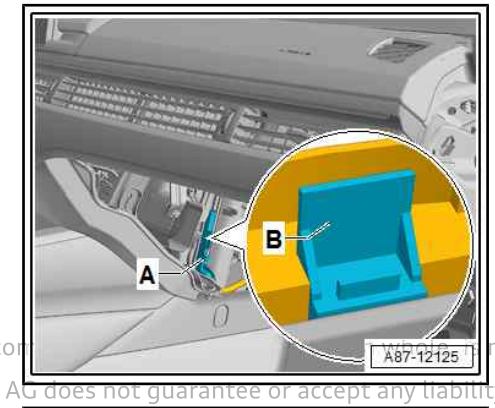
– Remove threaded fasteners -A-.

– Unfasten and detach insulating mat -B- from air intake box of heater and air conditioning unit.

– If fitted, remove air duct for glove box cooling ⇒ "7.5 Removing and installing air duct for glove box cooling", page 297 .



– Release the fastener -B- at the connector -A- to the auxiliary air heater element - Z35- and unplug the connector -A-.



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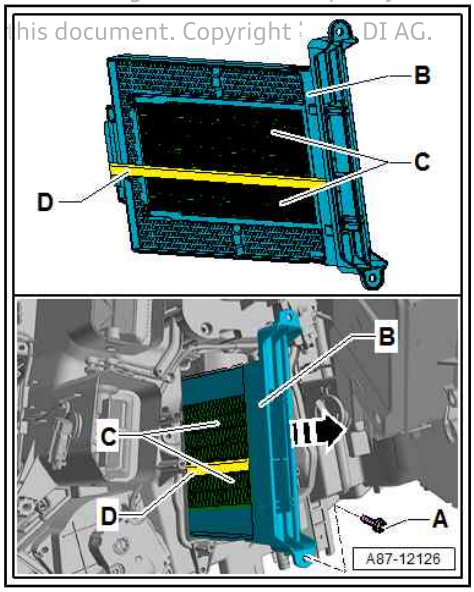
– Unscrew bolts -A-.

CAUTION

Danger of burns from metal surfaces of auxiliary air heater element. Heater elements may be extremely hot.

Danger of burning the skin.

- **Put on protective gloves.**
- **Never touch metal surfaces of heater element.**

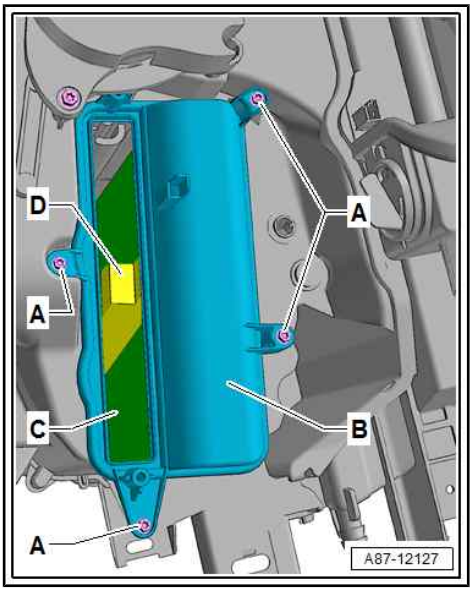


– Pull auxiliary air heater element - Z35- -B- out of installation slot of heater and air conditioning unit.

Installing

Installation is carried out in reverse order; note the following:

– Check heater and air conditioning unit for dirt through installation slot -C- (with cover -B- in position).
– If heater and air conditioning unit needs to be cleaned, unscrew bolts -A- and detach cover -B- for heat exchanger (right-side).
– Check that foam seal -D- (if fitted) is not damaged and that it is bonded on properly (check via installation slot -C- with cover -B- in position).



– Check that foam seals -B, C- bonded (depending on version) to heat exchanger -A- are not damaged and are bonded on properly (check via .installation slot).

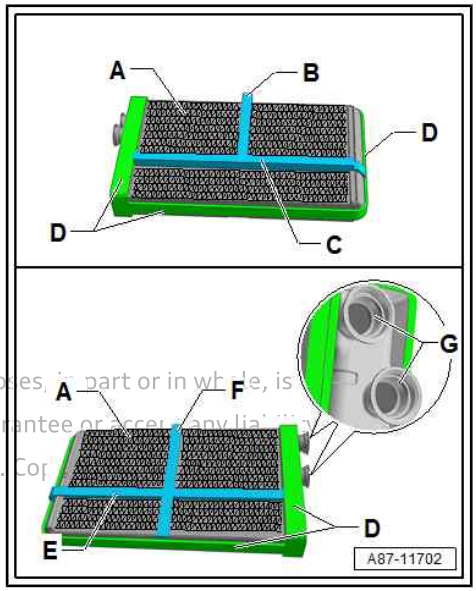
♦ The foam seals -B, C- are only fitted at the factory on a heat exchanger -A- for a “High” air conditioner. With a “Low” air conditioner (or heater with no air conditioner), there is no separation between the left and right side and between the rear and front in the air duct. The foam seals -B, C- are therefore not always fitted on heat exchangers in these heaters and air conditioning units. However, if they are bonded on, they must also be properly attached to the heat exchanger.

♦ If the foam seals -B- and -C- are damaged or not properly bonded on, they may work loose on inserting -Z35- (with -Z35-) and problems may be encountered with regard to separation and regulation of the outflow temperature between the left and right side and between the rear and front during operation of the “High” air conditioner depending on the setting on the front air conditioner operating and display unit - E87- . This may also cause noise.

♦ If foam seals -B- or -C- on a “High” air conditioner are not properly bonded on or are damaged, bond them firmly into position or renew them ⇒ Electronic parts catalogue .

♦ If foam seals -B- or -C- on a “Low” air conditioner (or heater without air conditioner) are not bonded on properly, bond them firmly into position or remove them ⇒ Electronic parts catalogue .

♦ On “High” air conditioners, the foam seal -B- separates the right and left sides of the heat exchanger -A-. Foam seal -C- separates air ducts for front and rear.



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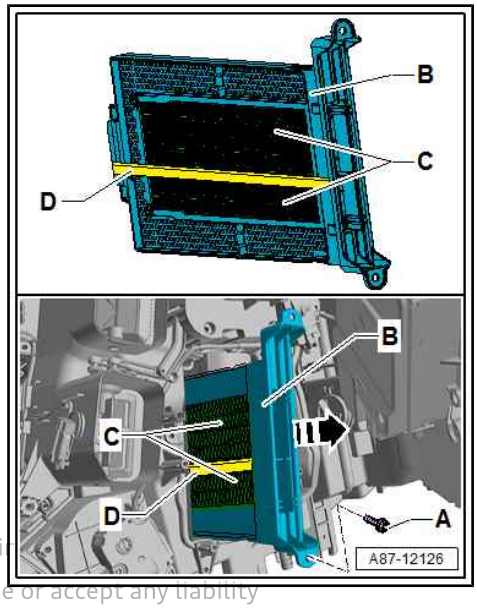
– Check that foam seal -D- at auxiliary air heater element - Z35- -B- is not damaged and is bonded on properly.

♦ The foam seal -D - is only needed for a “High” air conditioner and is therefore only fitted at the factory on a -Z35- -B- for a “High” air conditioner. With a “Low” air conditioner (or heater with no air conditioner), there is no separation between the left and right side and between the rear and front in the air duct. A -Z35- -B- in these heater and air conditioning units is therefore not always provided with the foam seals-D -. However, if it is bonded on, it must also be properly attached to -Z35- -B-.

♦ If the foam seal -D- is damaged or not properly bonded on, it may work loose on inserting -Z35- and problems may be encountered with regard to separation and regulation of the outflow temperature for rear and front during air conditioner operation depending on the version and the setting on -E87- . This may also cause noise.

♦ If foam seal -D- on a “High” air conditioner is damaged or not properly bonded on, bond it firmly into position or renew it ⇒ Electronic parts catalogue .

♦ If the foam seal -D- on a “Low” air conditioner (or heater with no air conditioner) is damaged or not properly bonded on, bond it firmly into position or remove it ⇒ Electronic parts catalogue .



– Insert auxiliary air heater element - Z35- -B- in installation slot of heater and air conditioning unit.

– Tighten bolts -A-.

– Plug connector -A- in at auxiliary air heater element - Z35- .

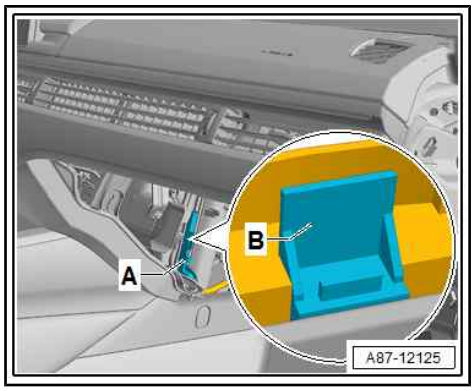
– Re-install remaining components (removed earlier).

– Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .

Tightening torque

♦ ⇒ “6.2 Exploded view - attachments for heater and air conditioning unit (air distribution housing, heat exchanger etc.)”, page 242

♦ ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - glove box



6.8 Removing and installing heater and air conditioning unit

⇒ “6.8.1 Removing and installing heater and air conditioning unit”, page 258

⇒ “6.8.2 Removing and installing heater and air conditioning unit - Audi Q5 Security”, page 263

6.8.1 Removing and installing heater and air conditioning unit

Special tools and workshop equipment required

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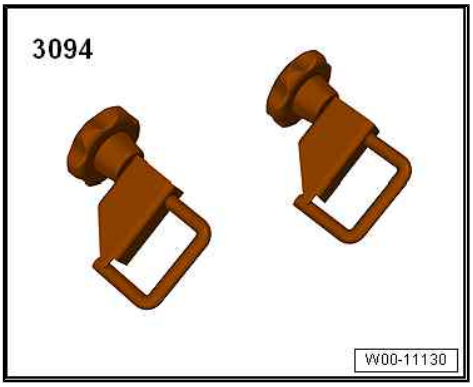
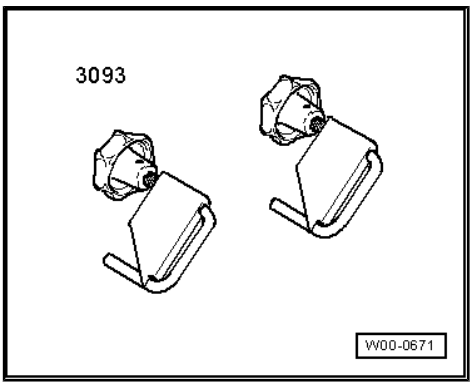
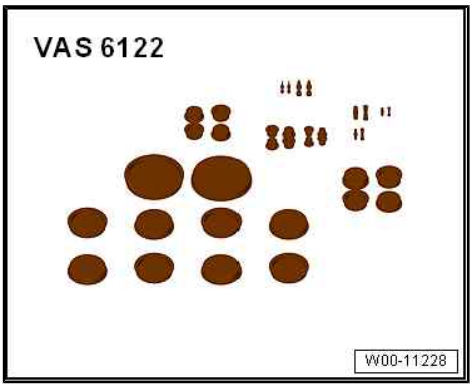
♦ Hose clamps up to 25 mm - 3094-



♦ Hose clamps up to 40 mm - 3093-



♦ Engine bung set - VAS 6122-



♦ Commercially available compressed-air gun with rubber mouthpiece

- When removing, note down bolt lengths and assignment for re-installation.
- All cable ties and other wiring harness fasteners detached or cut open during the removal of the heater and air conditioning unit must be re-attached in the same positions during installation.
- Seal off open connections in the lines at the connection point using clean plugs, e.g. from engine bung set - VAS 6122- .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Switch off ignition.

– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

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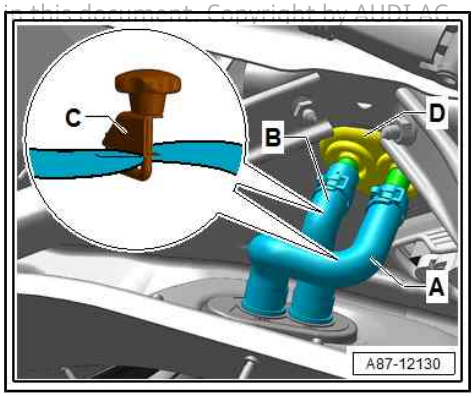
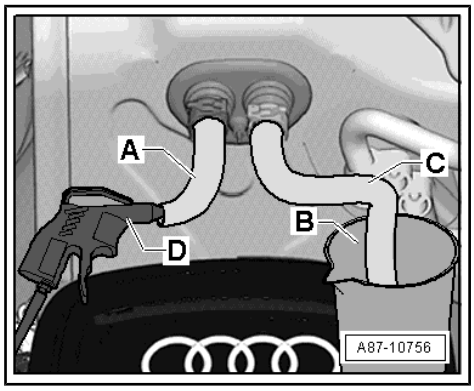
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Carefully open filler cap -A- for coolant expansion tank (do not unscrew completely).
- Drain coolant for engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Mark the layout of the coolant hoses at the connections to the heat exchanger -A- (supply to heat exchanger in heater and air conditioning unit) and -B- (return to engine).
- Use hose clamps -C- to pinch off coolant hoses -A- and -B-.
- Cover area beneath connections for coolant hoses -A- and -B- in plenum chamber e.g. with absorbent paper.
- Place a small container under connections for coolant hoses -A- and -B- (to heat exchanger).
- Detach coolant hoses -A- and -B- from connections to heat exchanger of heater and air conditioning unit.



- Attach a section of tubing (-A- and -C-) to each of the two connections at the heat exchanger.
- Place container -B- underneath other end of hose -C-.
- Using compressed-air gun -D-, carefully blow coolant out of heat exchanger via hose -A- (in direction opposite to normal coolant flow) into container -B-.



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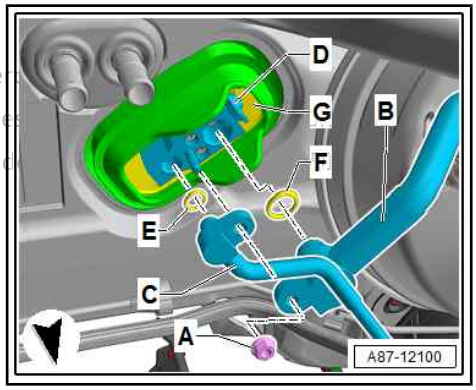
CAUTION

Risk of frostbite from escaping pressurised refrigerant

Risk of frostbite on skin and other parts of the body

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Extract/drain refrigerant and then immediately open up refrigerant circuit.**
- **Extract/drain refrigerant again if more than 10 minutes have passed since initial extraction and refrigerant circuit has not been opened up. Renewed evaporation has created pressure in the refrigerant circuit.**

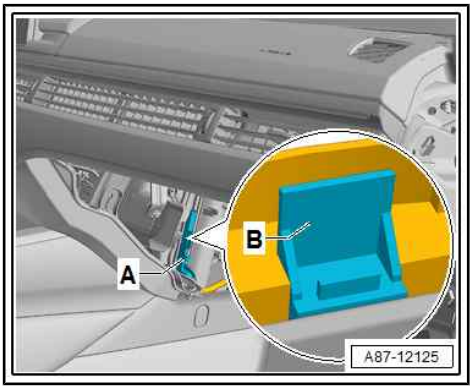


- Detach both refrigerant lines -B, C- from expansion valve (front) -D-
  ⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96 .
- Detach grommet with support ring -G- towards passenger compartment from plenum chamber back wall (removed and installed together with heater and air conditioning unit).
- Remove dash panel cross member ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel cross member .
- On a vehicle with a “High” air conditioner, remove the rear air duct
  ⇒ “7.1.3 Air ducts, temperature sensors and vents in passenger compartment (rear) - Audi A4 and Audi A5 models with High air conditioner”, page 288 .
- Detach air ducts leading to footwell vents (rear), but do not remove them
  ⇒ “7.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 280 .

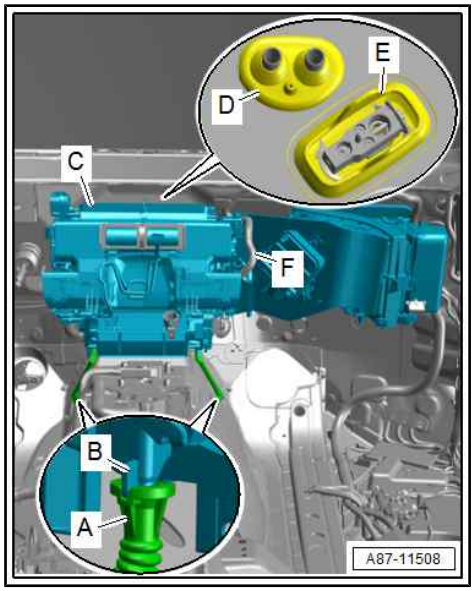
Vehicles with auxiliary air heater element - Z35-

- Release fastener -B- at connector -A- to -Z35- and unplug connector -A-.

All vehicles:



– Detach the two condensation drains -A- from connections -B- at heater and air conditioning unit.



Note

- ♦ Air conditioner wiring harness is removed together with heater and air conditioning unit.

– Protect floor covering in vicinity of centre tunnel with a sturdy mat.

– Move wiring harness -F- clear.

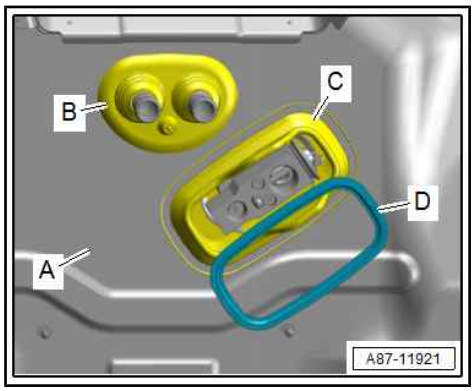
– Detach grommet -E- for coolant pipes to heat exchanger and grommet -D- for expansion valve from openings in plenum chamber back wall; carefully pull heater and air conditioning unit -C- slightly away from vehicle, making sure that no components are damaged by any connections that have not been unfastened yet, and remove in direction of footwell (front passenger side).

Installing

Installation is carried out in reverse order; note the following:

- Check all seals and grommets at heater and air conditioning unit for damage before installing, and renew any damaged components.

– Coat grommets -B, C- with lubricant and install in plenum chamber back panel -A-.



– Insert support ring -D- in grommet.

– Check position of coolant and refrigerant lines in the two grommets in plenum chamber back wall, and, if necessary, align heater and air conditioning unit so that lines in grommets are not strained.

– On vehicles with auxiliary air heater element - Z35- , fit connector
⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255 .

– Attach refrigerant line from expansion valve (front)
⇒ “2.16.1 Detaching and attaching refrigerant lines at expansion valve (front)”, page 96 .

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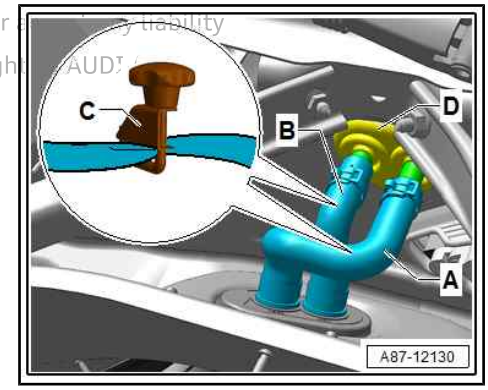
– Attach coolant hoses -A, B- to coolant pipes going to heat exchanger (observe marking) and secure with a clip.



– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station .

– Fill up and bleed coolant circuit ⇒ Engine; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Performing basic setting of air conditioner ⇒ Vehicle diagnostic tester (Guided Fault Finding).

– Start up air conditioner after charging refrigerant circuit
⇒ “2.22 Starting up air conditioner after charging refrigerant circuit”, page 121 .

6.8.2 Removing and installing heater and air conditioning unit - Audi Q5 Security

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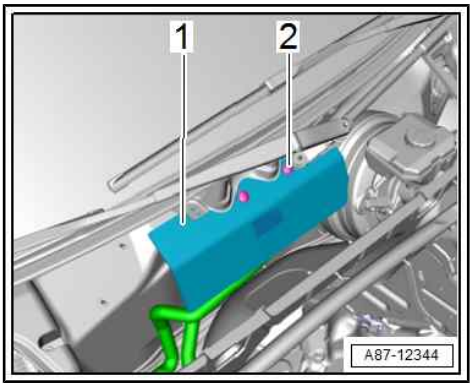
Removing

– Remove body brace (left and right) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .

– Remove bolts -2- and take off protective plate (cover) for refrigerant lines -1-.



– Continued procedure
⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

Installing

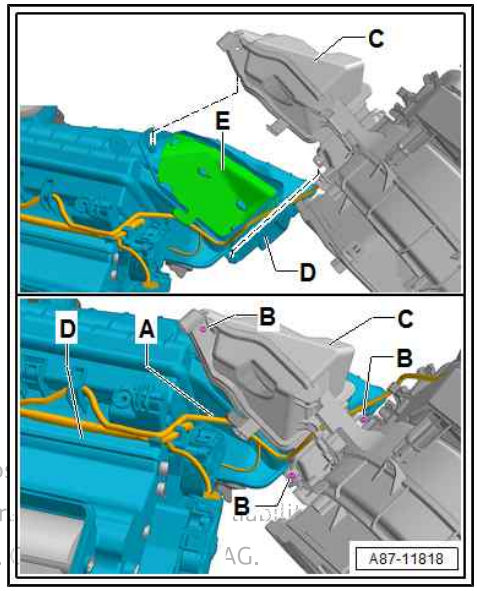
Installation is carried out in reverse sequence.

Tightening torques

- Bolts -2-: 21 Nm

6.9 Detaching and attaching air intake box at heater and air conditioning unit

Detaching



- Remove front heater and air conditioning unit ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258 .
- Detach noise insulation cover and insulating mat from air intake box -C- ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 .
- Mark and unplug connectors on control motors of air intake box ⇒ “5.2.4 Exploded view - control motors on air intake box”, page 208 .
- Mark routing of wiring harness -A- on air intake box -C- (or document e.g. with photos) and detach from air intake box ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 .
- Remove bolts -B-.
- Detach air intake box -C- from evaporator housing -D- on heater and air conditioning unit ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 .

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Attaching

Perform installation steps in reverse sequence; observe the following:

- Check that insulating mat -E- in evaporator housing -D- of heater and air conditioning unit is not dirty (does not smell) and that it is installed correctly.
- Check connection points between air intake box -C- and evaporator housing -D- of heater and air conditioning unit (tongue and groove joint) for damage and coat them lightly e.g. with silicone grease to seal them completely ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 .

Tightening torques

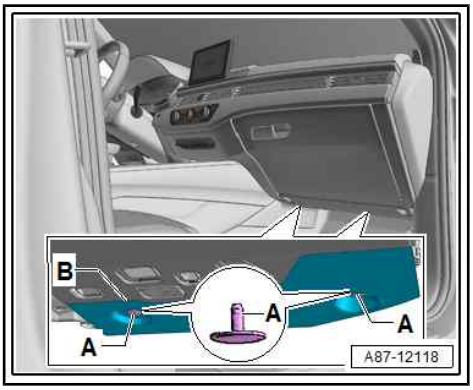
- ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240

6.10 Removing and installing dust and pollen filter

Removing

- On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .
- Set front passenger seat to rearmost position.
- Switch off ignition.

– Remove threaded fasteners -A-.
– Unfasten and detach insulating mat -B- from air intake box of heater and air conditioning unit.
– Cover floor covering beneath dust and pollen filter with paper.



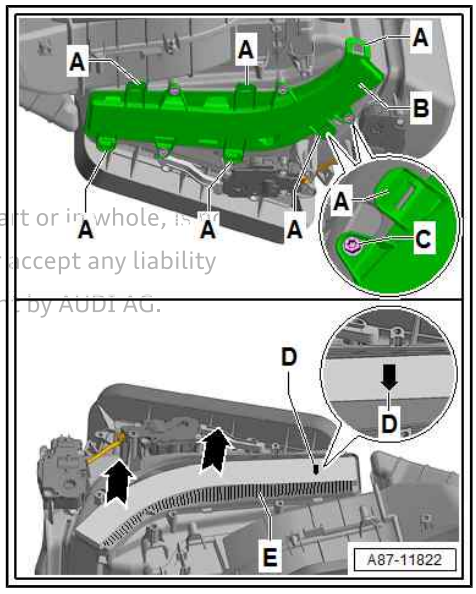
– Release catches -A- and detach slot cover -B-.
– Pull dust and pollen filter -E- out of slot in air intake box -arrow-.

Installing

Installation is carried out in reverse order; note the following:

– Clean air intake box via slot for dust and pollen filter (e.g. with a vacuum cleaner) after removing dust and pollen filter -E-.
– Install dust and pollen filter -E- correctly ("arrow" -item D- towards fresh air blower).

♦ If catches -A- no longer hold properly, slot cover -B- can also be secured using bolts -C- (e.g. 3.5 or 3.9 x 16 mm flange bolt) ⇒ Electronic parts catalogue .



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Tightening torques

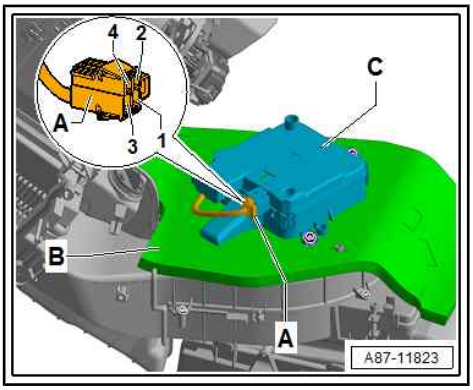
♦ ⇒ "6.3 Exploded view - air intake box of heater and air conditioning unit", page 244

6.11 Removing and installing fresh air blower - V2- with fresh air blower control unit - J126-

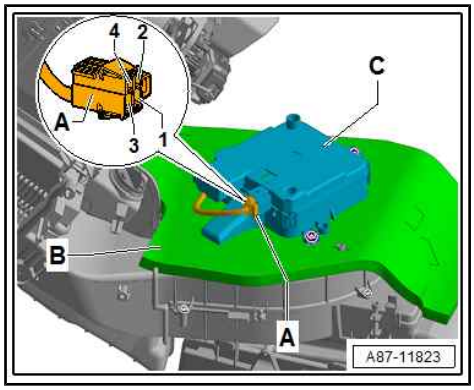
The fresh air blower - V2- and the fresh air blower control unit - J126- -C- form one component which must not be dismantled any further ⇒ Electronic parts catalogue .

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .
– Set front passenger seat to rearmost position.
– Switch off ignition.
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
– Remove footwell vent (passenger side) ⇒ "7.4 Removing and installing footwell vent (front passenger side)", page 296 .



– Release connector -A- and unplug from -V2- (with -J126-) -C-.
– Remove insulating mat -B-.



– Unscrew bolts -A-.

CAUTION

Danger of burns due to hot cooling surface on fresh air blower control unit

Take care not to burn your hands.

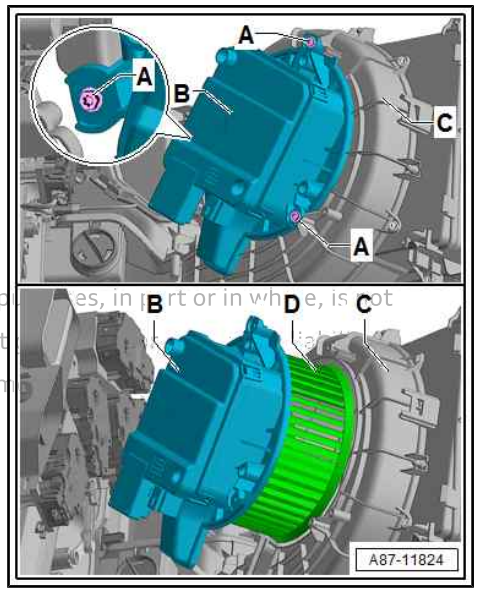
– Put on protective gloves.

NOTICE

Risk of damage to fresh air blower if handled incorrectly.

Risk of imbalance and operating problems.

– Avoid any force or strain on fan wheel.
– Do NOT move balancing weights on fan wheel.
– Do not set fresh air blower down on fan wheel.



– Carefully remove fresh air blower - V2- (with fresh air blower control unit - J126-) -B- from air intake box -C-.

Installing

Installation is carried out in reverse order; note the following:

– Check air intake box -C- for dirt via slot for -V2- -B- and clean if necessary.
– When installing, make sure fresh air blower - V2- -B- is correctly positioned in air intake box -C-.

Tightening torques

- ⇒ “6.3 Exploded view - air intake box of heater and air conditioning unit”, page 244
- ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - glove box

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6.12 Removing and installing heat exchanger

⇒ “6.12.1 Preparations for removing heat exchanger”, page 267

⇒ “6.12.2 Removing and installing heat exchanger”, page 268

⇒ “6.12.3 Removing and installing heat exchanger - Audi Q5 Security”, page 275

6.12.1 Preparations for removing heat exchanger

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner’s Manual .

– Switch on ignition.

– Set direction of air flow to “DEF” (to windscreen) on operating and display unit for front air conditioning system - E87- .

– On -E87- , set the temperature for the left and right side to “Cold”.

– Move driver and front passenger seats as far towards rear as possible.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

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– Remove footwell vent (left-side) ⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296 .

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– If fitted, remove air duct for glove box cooling ⇒ page 297 .

– Remove fresh air blower - V2- (with fresh air blower control unit - J126-) ⇒ page 265 .

Vehicles with a “High” air conditioner

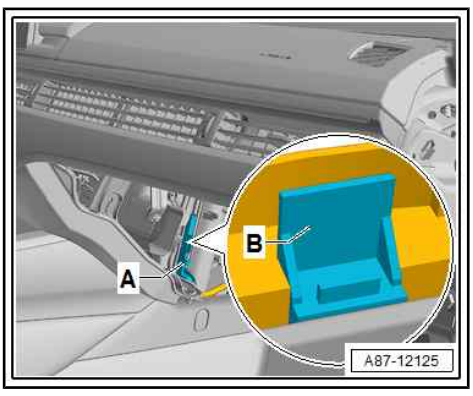
– Remove right temperature flap control motor - V159- (only fitted on “High” air conditioners) ⇒ page 223 .

– Remove rear temperature flap control motor - V137- ⇒ page 220 .

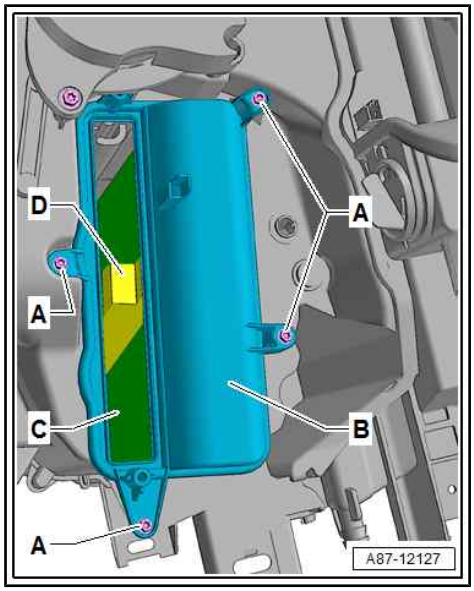
Vehicles with auxiliary air heater (continued)

– Release fastener -B- at connector -A- to -Z35- and unplug connector -A-.

– Remove auxiliary air heater element - Z35- ⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255 .



– Remove bolts -A- and detach cover -B- for heat exchanger (right-side).



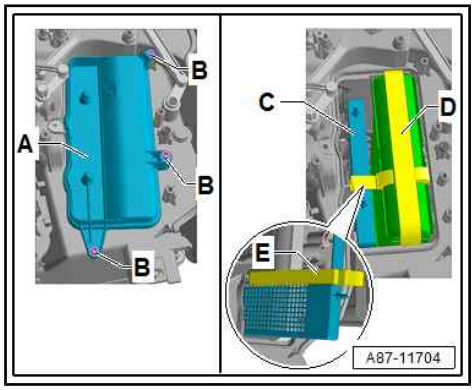
Vehicles without auxiliary air heater (continued)

– Unscrew bolts -B- and remove cover -A- for heat exchanger (right-side).

– Remove zone divider -C- (only fitted on vehicles with “High” air conditioner).

All vehicles (continued)

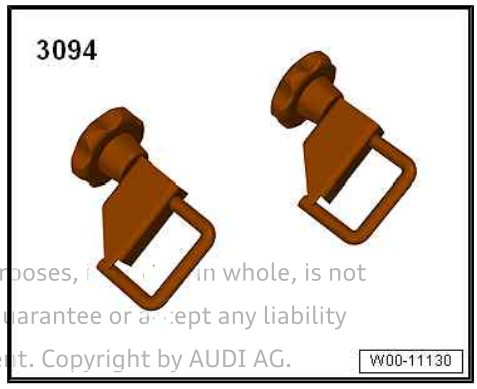
⇒ “6.12.2 Removing and installing heat exchanger”, page 268



6.12.2 Removing and installing heat exchanger

Special tools and workshop equipment required

♦ Hose clamps up to 25 mm - 3094- (or commercially available pinch-off tools)



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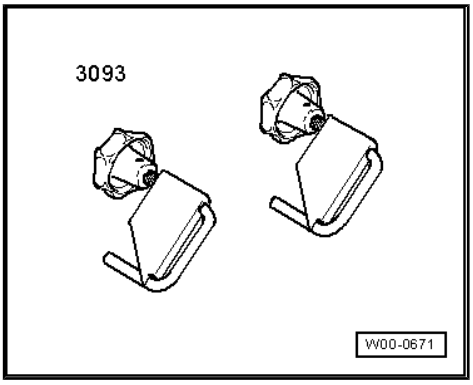
♦ Hose clamps up to 40 mm - 3093-



♦ Commercially available compressed-air gun with rubber mouthpiece

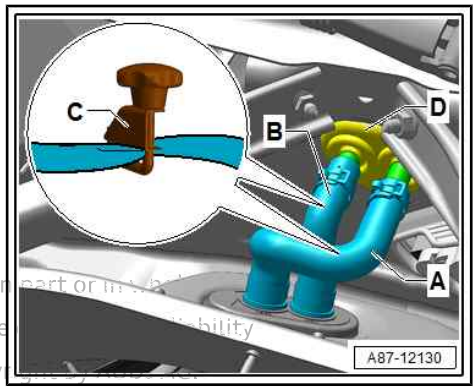
Removing

– Perform preparations for removing heat exchanger ⇒ page 267 .

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Drain coolant for engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Mark the layout of the coolant hoses at the connections to the heat exchanger -A- (supply to heat exchanger in heater and air conditioning unit) and -B- (return to engine).



– Use hose clamps -C- to pinch off coolant hoses -A- and -B-.

– Cover area beneath connections for coolant hoses -A- and -B- in plenum chamber e.g. with absorbent paper.

– Place a small container under connections for coolant hoses -A- and -B- (to heat exchanger).

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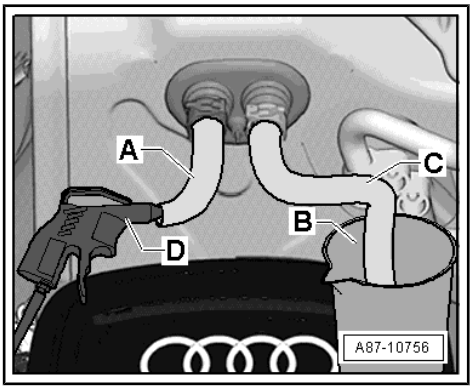
– Detach coolant hoses -A- and -B- from connections to heat exchanger of heater and air conditioning unit.

– Attach a section of tubing (-A- and -C-) to each of the two connections at the heat exchanger.

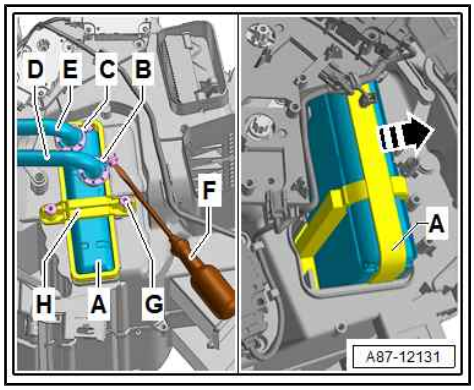


– Place a container -B- underneath other end of hose -C-.

– Using compressed-air gun -D-, carefully blow coolant out of heat exchanger via hose -A- (in direction opposite to normal coolant flow) into container -B-.

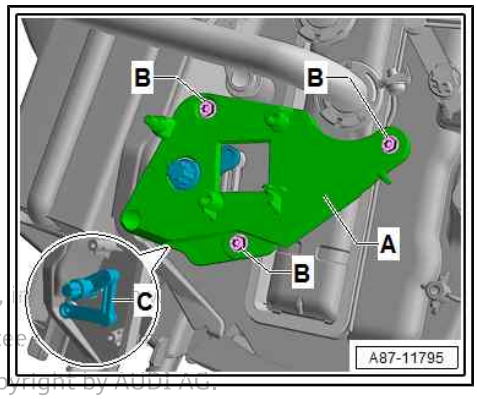
– Protect floor covering and centre tunnel beneath heat exchanger (both sides) -A- with impermeable sheeting and absorbent paper.

– Unscrew bolt from screw-type clip -B- and remove screw-type clip.



Note

- The bolts in screw-type clips -B- and -C- can be removed using a long T15 Torx wrench -F-. Depending on the version of the heater and air conditioning unit, hexagon socket head bolts with a width of 3 mm can be used instead of the Torx bolts on certain country-specific versions.
- If the position of the screw-type clips -B- and/or -C- prevents access to the bolts, the clips can be turned carefully (using a little force and a screwdriver).
- Leave bolt -G- and bracket -H- in position (e.g. on a “Low” air conditioner).
- If necessary for a “High” air conditioner (due to position of screw-type clips -B- and/or -C-), remove retainer -H-; otherwise retainer can be left in position
⇒ “5.16.1 Removing and installing bracket for rear temperature flap control motor V137 ”, page 232 .



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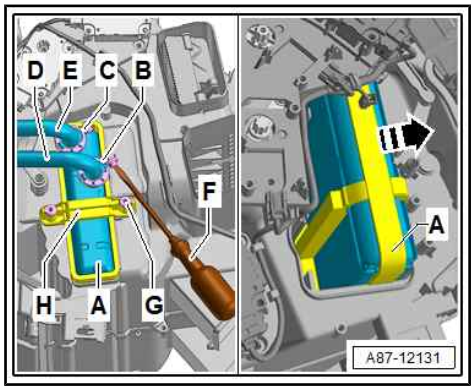
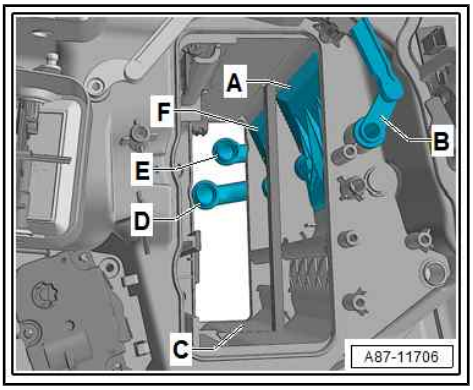
– Unscrew bolt from screw-type clip -C- and remove screw-type clip.



Vehicles with a “High” air conditioner

– Check position of temperature flap for right side -A- in heater and air conditioning unit with reference to position of lever -B-; lever -B- must be in position shown.



All vehicles (continued)

Note

Temperature flap (left-side) -F- was set to correct position before ignition was switched off
⇒ “6.12.1 Preparations for removing heat exchanger”, page 267 .

NOTICE

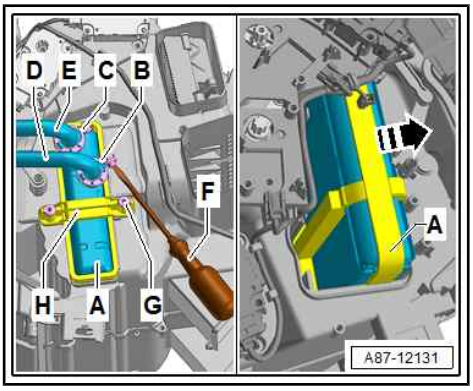
Risk of damaging temperature flaps -A- in heater and air conditioning unit when removing heat exchanger.

– Check lever -B- to ensure that temperature flap -A- is set to “cold” position.

– Slide heat exchanger towards footwell (right-side) and at the same time detach both coolant pipes -D- and -E- from connections of heat exchanger.

– Remove heat exchanger -A- from heater and air conditioning unit in footwell (right-side) in direction of -arrow-.

– Remove O-rings from coolant pipes -D- and -E- (or connections on heat exchanger).



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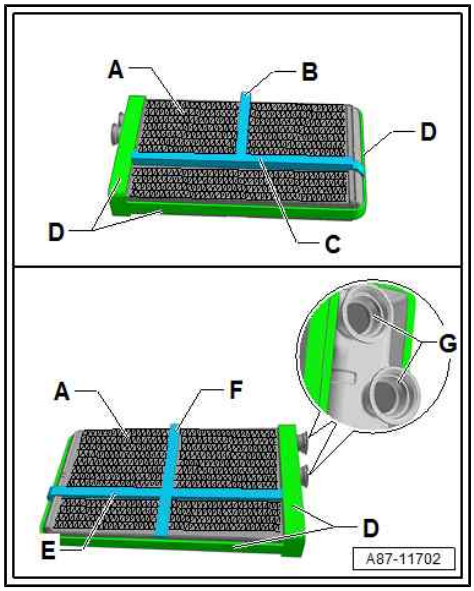
Installing

Installation is carried out in reverse order; note the following:



– Check that foam seals -B-, -C-, -D- and -E- on heat exchanger -A- are not damaged and are bonded on properly; only install heat exchanger if seals are not damaged and are bonded on properly.

♦ The foam seals -B, C, E, F- are only fitted at the factory on a heat exchanger -A- for a “High” air conditioner. With a “Low” air conditioner (or heater with no air conditioner), there is no separation between the left and right side and between the rear and front in the air duct. The foam seals -B, C, E, F- are therefore not always fitted on heat exchangers in these heater and air conditioning units. However, if they are bonded on, they must also be properly attached to the heat exchanger.

♦ If the foam seals -B, C, E, F- are damaged or not properly bonded on, they may work loose on inserting the heat exchanger (or -Z35-) and problems may be encountered with regard to separation and regulation of the outflow temperature between the left and right side and between the rear and front during operation of the “High” air conditioner depending on the setting on the front air conditioner operating and display unit -E87- . This may also cause noise.

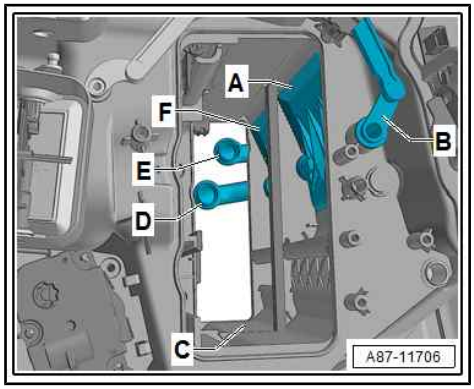
♦ Foam seals -D- seal off heat exchanger from housing and outside. If foam seals -D- are not properly bonded on or are damaged, bond them firmly into position or renew them ⇒ Electronic parts catalogue .

♦ Foam seals -B- and -F- separate left and right sides of the heat exchanger -A-.

♦ Foam seals -C- and -E- separate air duct for front and rear that passes through heat exchanger.

♦ If foam seals -B, C, E, F- on a “High” air conditioner are not properly bonded on or are damaged, bond them firmly into position or renew them ⇒ Electronic parts catalogue .

♦ If foam seals -B, C, E, F- on a “Low” air conditioner (or heater without air conditioner) are not bonded on properly, bond them firmly into position or remove them ⇒ Electronic parts catalogue .



– Check heater and air conditioning unit for dirt through installation slot for heat exchanger -C-.

– Remove any dirt or remnants of escaped coolant from the heater and air conditioning unit (e.g. after removing a leaking heat exchanger).

– Check that there are no edges or projections at installation slot (top and bottom) for heat exchanger or on heater and air conditioning unit (both sides).

– Remove any residual material left at separation points during manufacture of heater and air conditioning unit and round off any edges.

– Check position of temperature flap for right side -A- and left side -F- in heater and air conditioning unit. Temperature flaps are set to “cold” position (illustrated).

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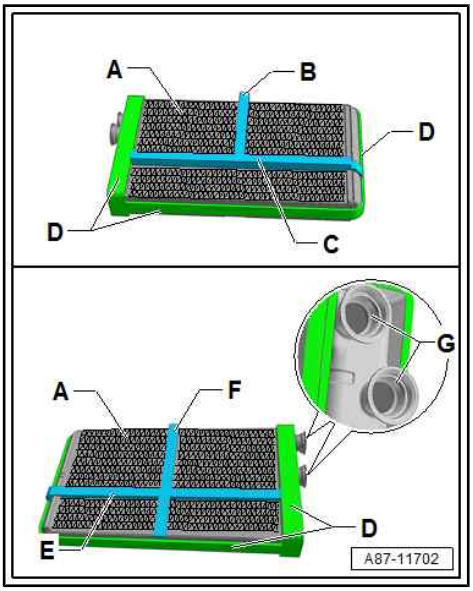
– Check that connections -G- of heat exchanger -A- are not damaged or dirty, then moisten with a small quantity of coolant.

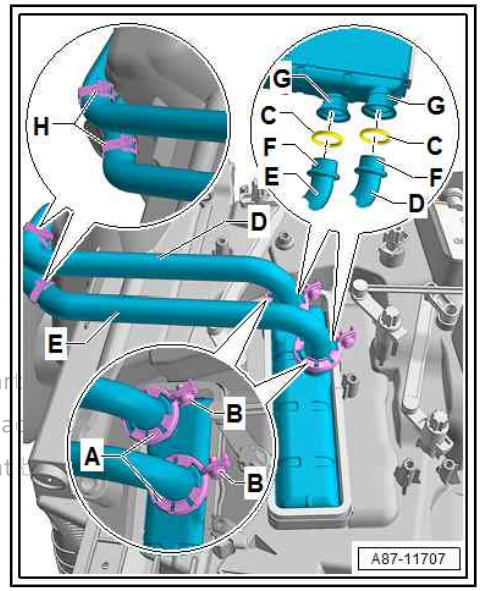


– Check connection area -F- for the two coolant pipes -D- and -E- to heat exchanger for damage or dirt.

– Position one new screw-type clip -A- with a socket head bolt -B- (M4 x 16 mm) in correct position on each of the two coolant pipes -D- and -E-.

Note

◆ The two screw-type clips include factory-fitted M4 x 10 mm socket head bolts; the screw-type clip can only be attached to the connections on the heat exchanger after these bolts have been removed. If M4 x 16 mm socket head bolts are used, the screw-type clips can also be attached to the connections on the heat exchanger with socket head bolts -B- fitted.



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– Moisten new seals -C- with a small amount of coolant and attach them to the two coolant pipes -D- and -E-.

– To prevent the heat exchanger from being inserted too far, install bracket for rear temperature flap control motor - V137- ⇒ “5.16.1 Removing and installing bracket for rear temperature flap control motor V137 ”, page 232 .

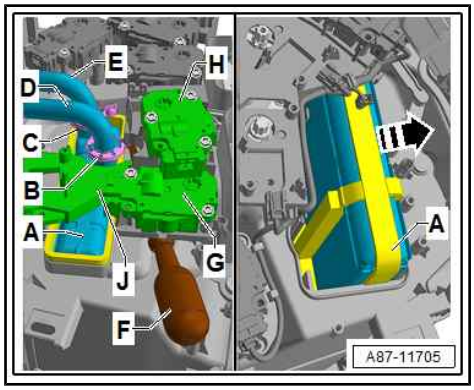
– Insert heat exchanger with the help of a second mechanic; while doing so, make sure that connections -G- do not touch housing of heater and air conditioning unit and are not damaged.

– When inserting heat exchanger, guide coolant pipes -D- and -E- (with O-rings -C-) into connections -G- on heat exchanger with the help of a second mechanic.

– Push coolant pipes -D- and -E- into connections on heat exchanger -G- one after the other until they engage audibly, and attach a screw-type clip -B- at connection point to heat exchanger, as shown.

Note

- Screw-type clips -B- engage when they are pressed together.
- The bolts in screw-type clips -B- and -C- can be installed using a long T15 Torx wrench -F-.
- If the position of screw-type clips -B- and/or -C- is not ideal, the clips can be turned carefully (using a little force and a screwdriver) before being tightened.



– Secure screw-type clips -A- by tightening bolt -B-.
– Check that screw-type clips -A- are positioned properly on connections of heat exchanger and coolant pipes.
– Check installation position of screw-type clips -A- and bolts -B-. They must not make contact with heater and air conditioning unit or other components.

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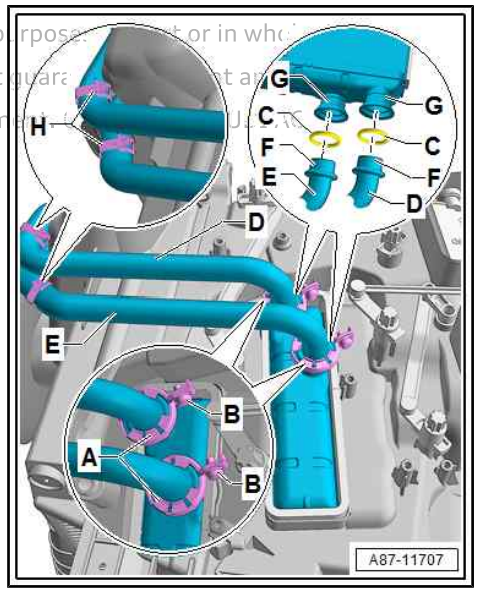
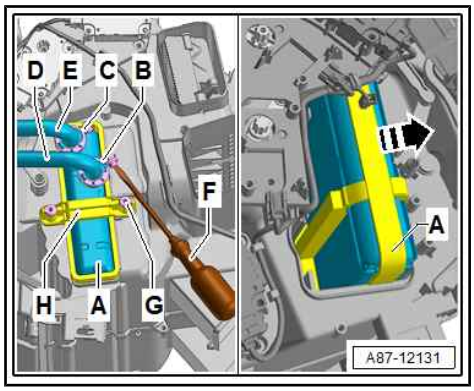


– Check that brackets for coolant pipes -H- are seated properly.

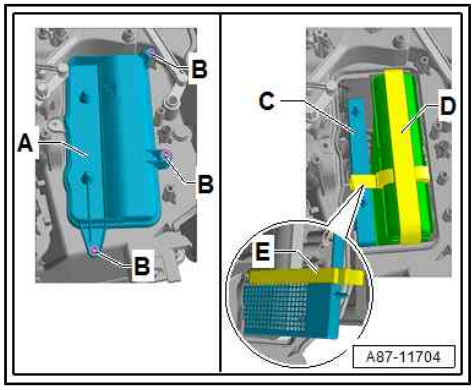
Vehicles with auxiliary air heater (continued)

– Install cover for heat exchanger (right-side) and install in heater and air conditioning unit (with auxiliary air heater element -Z35-)
⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255 .



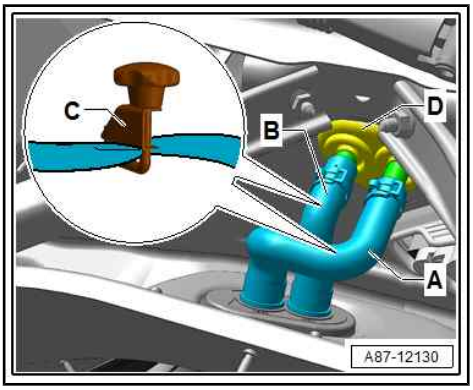
Vehicles with a “High” air conditioner and no supplementary air heater (continued)

– Check foam seal -E- on zone divider -C- for damage and make sure it is attached properly.
- If foam seals -B- are damaged or not bonded on properly, bond them on securely or renew them ⇒ Electronic parts catalogue .
– Install zone divider -C- and cover for heat exchanger (right-side) -A- on heater and air conditioning unit.



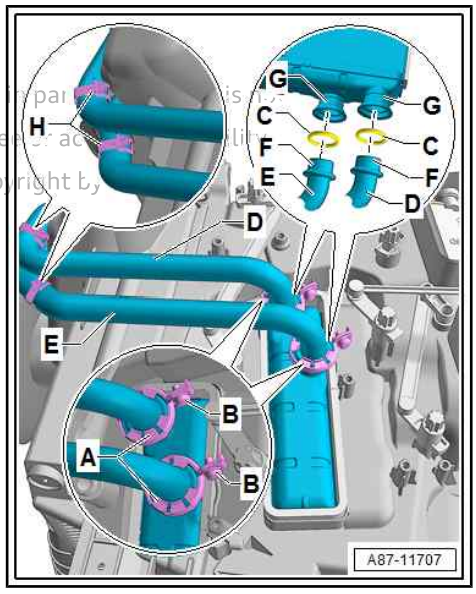
All vehicles (continued)

- Check that grommet -D- is correctly positioned in plenum chamber back wall.
- Attach coolant hoses -A, B- to coolant pipes going to heat exchanger (observe marking) and secure with a clip.
- Detach hose clamps -C-.
- Fill up and bleed engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



Check connections at heat exchanger for leaks as follows:

- Check coolant circuit for leaks, paying particular attention to connection between coolant pipes -D- and -E- and heat exchanger ⇒ Engine; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks .
- Re-install all components removed in reverse order ⇒ “6.12.1 Preparations for removing heat exchanger”, page 267 .
- Perform basic setting for air conditioner ⇒ “5.3 General information and procedure for removing and installing control motors”, page 208 .



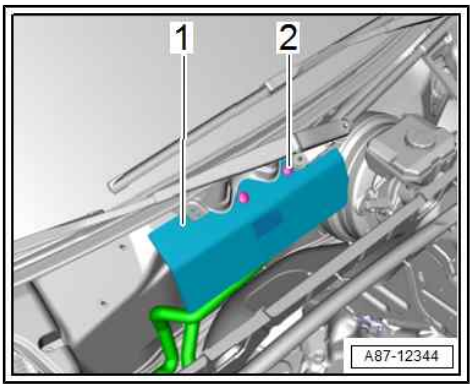
Tightening torques

- ⇒ “6.2 Exploded view - attachments for heater and air conditioning unit (air distribution housing, heat exchanger etc.)”, page 242

6.12.3 Removing and installing heat exchanger - Audi Q5 Security

Removing

- Remove body brace (left and right) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Remove bolts -2- and take off protective plate (cover) for refrigerant lines -1-.
- Continued procedure ⇒ “6.12.2 Removing and installing heat exchanger”, page 268



Installing

Installation is carried out in reverse sequence.

Tightening torques

- Bolts -2-: 21 Nm

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6.13 Removing and installing condensation drain

⇒ “6.13.1 Removing and installing condensation drain - Audi A4, Audi A5”, page 276

⇒ “6.13.2 Removing and installing condensation drain - Audi Q5”, page 277

6.13.1 Removing and installing condensation drain - Audi A4, Audi A5

Removing

– Switch off ignition.

– Remove glove box (to remove condensation drain on right side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

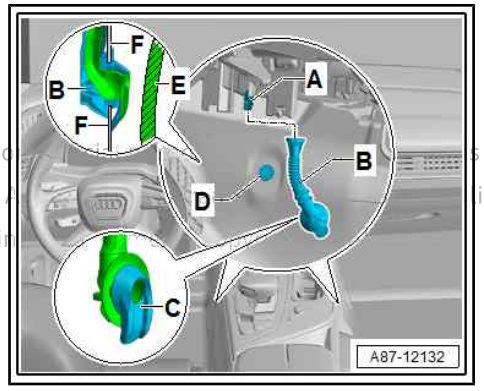
– Remove dash panel cover (driver side) (for condensation drain on left side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Carefully fold back floor covering in area of condensation drain hose (front left or front right of centre tunnel) until condensation drain is visible.

– Check that both condensation drain hoses -B- are routed correctly and not dirty. For example, eliminate any cross-sectional constrictions.

– Cover area beneath the two openings -D- (for drain holes of condensation drain -C-) with absorbent paper to prevent any water from running beneath floor covering.

– Remove the two condensation drain hoses -B-.



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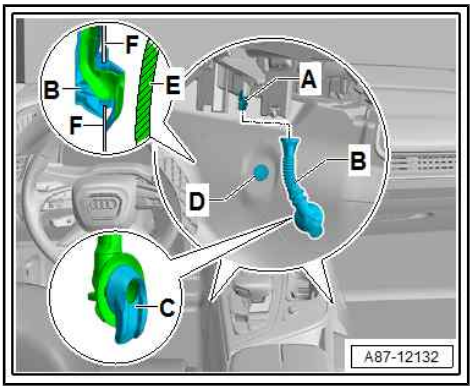
Installing

Installation is carried out in reverse order; note the following:



- Use e.g. a piece of wire to check for dirt in the two condensation drains of the heater and air conditioning unit -A-.
- Check distance between insulating mat -E- in centre tunnel and end of condensation drain hose -C- via openings -D- in floor panel -F-. There must be enough of a gap for condensate to drain out of condensation drain hose -B-.
- Install the two condensation drain hoses -B- so that they are not twisted or crushed (different versions for left and right sides) ⇒ Electronic parts catalogue .
- Insert condensation drain -B- and press it into floor panel -F- (with pre-tension).
- When fitting floor covering, take particular care to ensure that it does not squash condensation drain hose -B-.
- If a condensation drain hose -B- is not fitted securely enough to condensation drain of heater and air conditioning unit -A-, secure it e.g. with a clip if necessary to prevent it from slipping off.

Tightening torques

- ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - dash panel cover (driver side)
- ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - glove box

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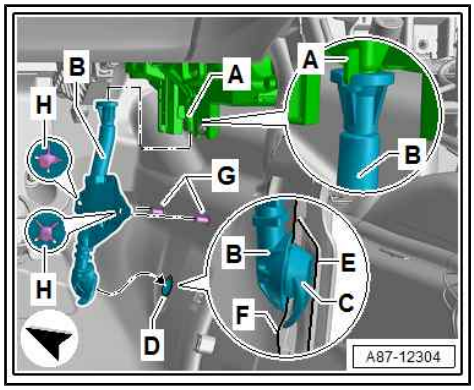
6.13.2 Removing and installing condensation drain - Audi Q5

Removing

- On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .
- Switch off ignition.
- Remove glove box (to remove condensation drain on right side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
- Remove dash panel cover (driver side) (for condensation drain on left side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .
- Carefully fold back floor covering in area of condensation drain hose (front left or front right of centre tunnel) until condensation drain is visible.

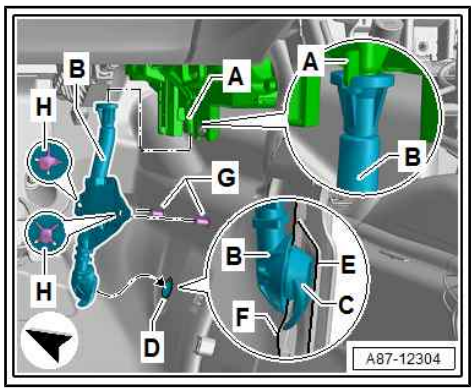
– Check that both condensation drain hoses -B- are routed correctly and not dirty. For example, eliminate any cross-sectional constrictions.
– Cover area beneath the two openings -D- (for drain holes of condensation drain -C-) with absorbent paper to prevent any water from running beneath floor covering.
– Unfasten retainer -H- from stud -G-.
– Unclip condensation drain hose -B- from floor panel -F- and remove.
– Detach condensation drain hose -B- from heater and air conditioning unit -A-.



Installing

Installation is carried out in reverse order; note the following:

– Use e.g. a piece of wire to check for dirt in the two condensation drains of the heater and air conditioning unit -A-.
– Check distance between insulating mat -E- in centre tunnel and end of condensation drain hose -C- via openings -D- in floor panel -F-. There must be enough of a gap for condensate to drain out of condensation drain hose -B-.
– Install the two condensation drain hoses -B- so that they are not twisted or crushed (different versions for left and right sides) ⇒ Electronic parts catalogue .
– Insert condensation drain -B- and press it into floor panel -F- (with pre-tension).
– When fitting floor covering, take particular care to ensure that it does not squash condensation drain hose -B-.
– If a condensation drain hose -B- is not fitted securely enough to condensation drain of heater and air conditioning unit -A-, secure it e.g. with a clip if necessary to prevent it from slipping off.



Tightening torques

♦ ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - dash panel cover (driver side)
♦ ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - glove box

6.14 Checking condensation drain

If there are problems with moisture in the passenger compartment, check the following in addition to the condensation drain:

– Water drains for plenum chamber
⇒ “7.9 Checking plenum chamber water drain”, page 303 .
– Plenum chamber cover and cover for fresh-air intake duct for correct installation and damage
⇒ “7.8 Removing and installing fresh air intake”, page 300
– Dust and pollen filter for dirt and correct installation
⇒ “6.10 Removing and installing dust and pollen filter”, page 264
– Forced ventilation system via luggage compartment
⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298
– Activation and operation of air flow/fresh-air flaps
⇒ “5.4 Removing and installing fresh air flap control motor V438 , operation”, page 211 and air recirculation flap

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⇒ “5.6 Removing and installing air recirculation flap control motor V113 ”, page 217 e.g. via “Final control diagnosis” function ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

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7 Air duct

⇒ “7.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 280

⇒ “7.2 Air intake and air outlet openings”, page 292

⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296

⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296

⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297

⇒ “7.6 Removing and installing forced ventilation vents in passenger compartment”, page 298

⇒ “7.7 Checking forced ventilation vents in passenger compartment”, page 298

⇒ “7.8 Removing and installing fresh air intake”, page 300

⇒ “7.9 Checking plenum chamber water drain”, page 303

⇒ “7.10 Cleaning plenum chamber water drain”, page 303

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7.1 Exploded view - routing of air flow and air distribution in passenger compartment

⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280

⇒ “7.1.2 Air ducts and vents in passenger compartment (rear) - vehicles with Low air conditioner or without air conditioner”, page 286

⇒ “7.1.3 Air ducts, temperature sensors and vents in passenger compartment (rear) - Audi A4 and Audi A5 models with High air conditioner”, page 288

⇒ “7.1.4 Air ducts, temperature sensors and vents in passenger compartment (rear) - Audi Q5 models with High air conditioner”, page 290

7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)

Dash panel air ducts ⇒ page 280

Air ducts in vehicle interior ⇒ page 282

Dash panel air ducts

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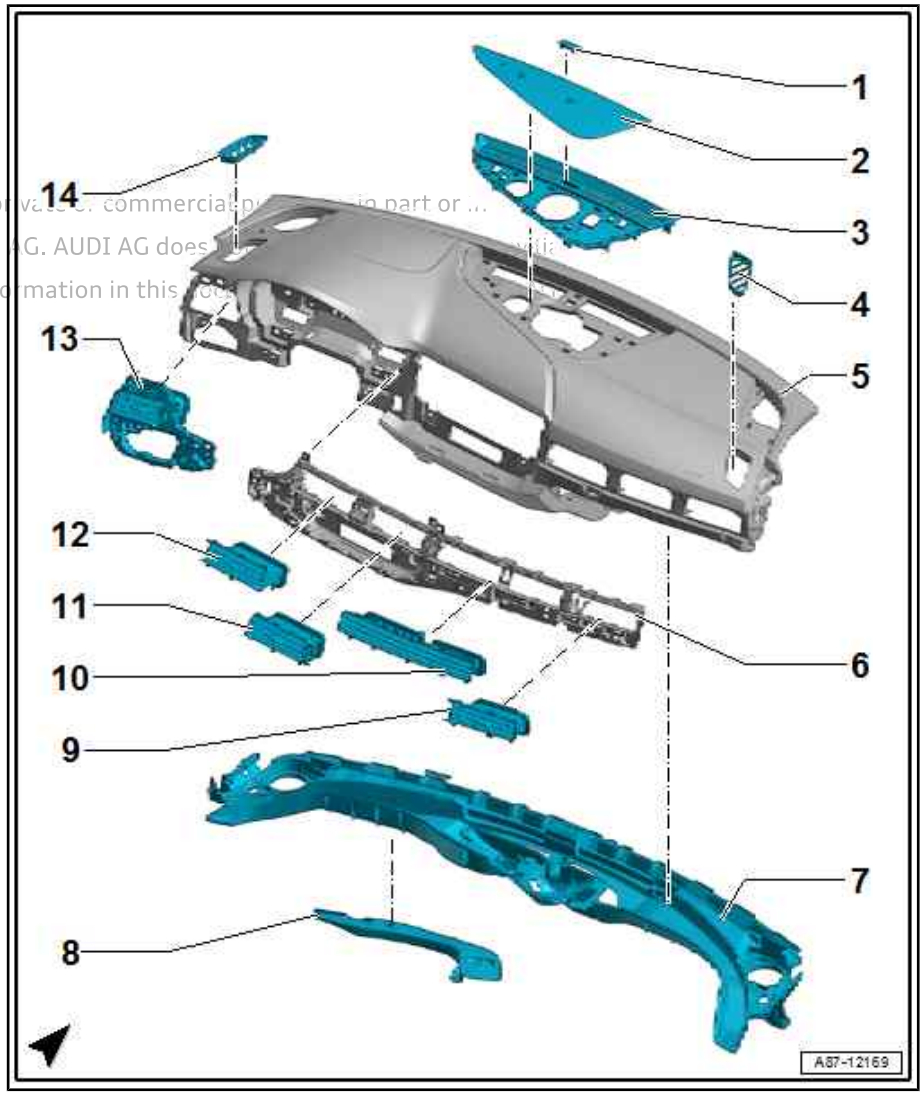

1 - Sunlight penetration photosensor - G107-

- ❑ Removing and installing ⇒ "10.3 Removing and installing sunlight penetration photosensor G107 ", page 321 or ⇒ "10.10 Removing and installing sensors G355 / G397 / G107 ", page 331
- ❑ Depending on equipment version, sunlight penetration photosensor - G107- can also be integrated in rain and light sensor - G397-

2 - Defroster vent cover grille

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

3 - Defroster vent/windscreen

- ❑ Air duct to windscreen
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel
- ❑ If the air duct/defroster intermediate piece ⇒ Item 2 (page 283) is crushed or squashed during the installation of the dash panel, this will result in uneven or inadequate routing of air flow to the windscreen.
- ❑ Illustration shows Audi A4/Audi A5; separate component on Audi Q5

4 - Vent to front right door (front passenger door)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

5 - Dash panel

- ❑ With air ducts to defroster vents and various dash panel vents
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel

6 - Wide air outlet with various vents

- ❑ Different versions. For correct version refer to ⇒ Electronic parts catalogue
- ❑ Installed depending on equipment and version
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

7 - Air duct/dash panel

- ❑ With air ducts to defroster vents and the various dash panel vents to windscreen and side windows
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ The air duct is part of the dash panel ⇒ Item 1 (page 283) and cannot be renewed separately ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel

8 - Air duct with vent for defroster vent (driver side)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

9 - Dash panel vent (right-side)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

10 - Vents for wide air outlet

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel
- ❑ The vents for wide air outlet are inactive on vehicles with “Low” air conditioner (or no air conditioner). The vents are sealed with caps from the rear
- ❑ Wide air outlet not available for Audi Q5

11 - Dash panel vent (centre right)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

12 - Dash panel vent (centre left)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

13 - Dash panel vent (left-side)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

14 - Vent to front left door (driver door)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

Air ducts in vehicle interior

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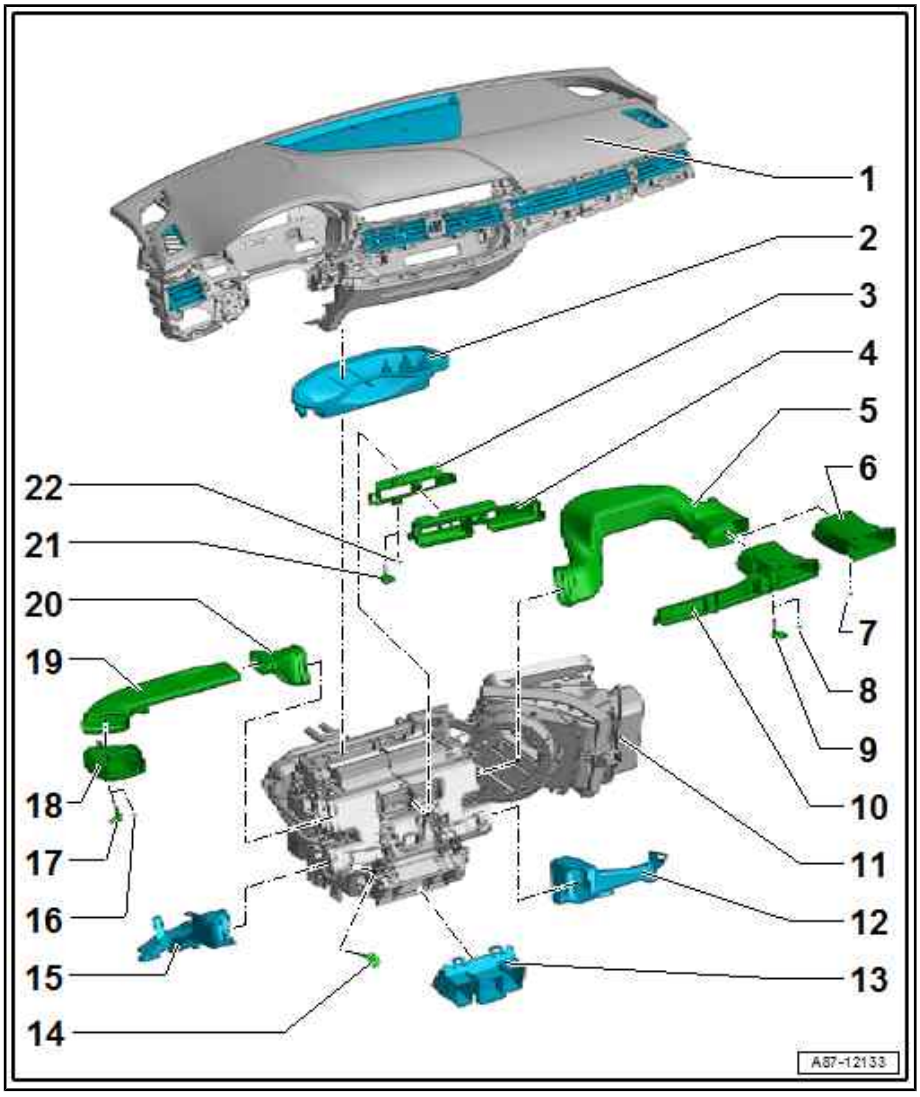

1 - Dash panel

- ❑ With air ducts to defroster vents and various dash panel vents
- ❑ Dash panel air ducts ⇒ page 280
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel

2 - Air duct/defroster intermediate piece

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

3 - Adapter for routing air to dash panel vents (centre)

Removing and installing:

- Remove wide air outlet ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .
- Remove air duct to dash panel vents (centre) ⇒ Item 4 (page 283) .
- Release catches (left and right) and detach air duct from heater and air conditioning unit.

4 - Air duct to dash panel vents (centre)

Removing and installing:

- Remove wide air outlet ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .
- Unfasten the clips on the left and right and detach the air duct.

5 - Air duct (right-side)

Removing and installing:

- Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
- Remove bolt from air intake box of heater and air conditioning unit.
- Detach air duct.

6 - Air duct to dash panel vent (right-side)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ This air duct is fitted on vehicles with a “Low” (or no) air conditioner

Removing and installing:

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– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove wide air outlet ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

– Detach air duct.

7 - Cap

❑ Vehicles with no front right chest vent temperature sensor - G386- either have no opening in the air duct or the opening is sealed with a cap (e.g. on vehicles with a “Low” or no air conditioner)

8 - Cap

❑ Vehicles with no front right chest vent temperature sensor - G386- either have no opening in the air duct or the opening is sealed with a cap (e.g. on vehicles with a “Low” or no air conditioner)

9 - Front right chest vent temperature sensor - G386-

❑ Currently only fitted with a “High” air conditioner

❑ ⇒ “10.6.3 Removing and installing front right chest vent temperature sensor G386 ”, page 328

❑ Checking -G386- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

10 - Air duct to dash panel vent (right-side) and wide air outlet

❑ Different versions ⇒ Electronic parts catalogue

❑ This air duct is fitted on vehicles with a “High” air conditioner

❑ Illustration shows Audi A4/Audi A5; wide air outlet not available for Audi Q5

Removing and installing:

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove wide air outlet ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

– Remove spreader rivet and unscrew bolt.

– Unplug the connector at the front right chest vent temperature sensor - G386- and the dash panel vent control motor - V562- and detach the air duct.

11 - Front heater and air conditioning unit

❑ Different versions ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 and ⇒ Electronic parts catalogue

❑ ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

❑ Air intake, air outlet and routing of air flow in heater and air conditioning unit
⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293

12 - Footwell vent (front right)

❑ ⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296

❑ For repairs, footwell vent can be bolted on additionally ⇒ Electronic parts catalogue ; tightening torque: 1.5 Nm

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13 - Air duct

❑ Different versions on “Low” air conditioners (without air conditioner) and “High” air conditioners ⇒ Electronic parts catalogue

❑ This air duct is fitted on vehicles with a “High” air conditioner

❑ Further air duct to rear
⇒ “7.1.2 Air ducts and vents in passenger compartment (rear) - vehicles with Low air conditioner or without air conditioner”, page 286 and
⇒ “7.1.3 Air ducts, temperature sensors and vents in passenger compartment (rear) - Audi A4 and Audi A5 models with High air conditioner”, page 288

Removing and installing:

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

– Remove the air ducts to the rear footwell vents and to the vent in the rear centre console.

– Release the fasteners and detach the air duct.

14 - Left footwell vent temperature sender - G261-

❑ Removing and installing
⇒ “10.7 Removing and installing left footwell vent temperature sender G261 ”, page 329

❑ Check left footwell vent temperature sender - G261- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

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15 - Footwell vent (front left)

❑ ⇒ “7.3 Removing and installing footwell vent (driver side)”, page 296

16 - Cap

❑ Vehicles with a “Low” air conditioner (or no air conditioner) on which the front left chest vent temperature sensor - G385- is installed in the air duct to the centre dash panel vent either have no opening in the air duct or the opening is sealed with a cap

17 - Front left chest vent temperature sensor - G385-

❑ Fitted at this location on vehicles with a “High” air conditioner

❑ ⇒ “10.6.2 Removing and installing front left chest vent temperature sensor G385 - vehicles with High air conditioner”, page 327

18 - Air duct to dash panel vent (left-side)

Removing and installing:

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Remove dash panel vent (left-side) ⇒ Item 13 (page 282) ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

– Air duct to left dash panel vent ⇒ Item 19 (page 285) .

– Remove spreader rivet.

19 - Air duct to dash panel vent (left-side)

Removing and installing:

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Remove dash panel vent (left-side) ⇒ Item 13 (page 282) ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

– Remove spreader rivet.

– Unplug the connector at the front left chest vent temperature sensor - G385- (“High” air conditioner) and detach the air duct.

20 - Intermediate piece in air duct

Removing and installing:

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Remove dash panel vent (left-side) ⇒ Item 13 (page 282) ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

– Air duct to left dash panel vent ⇒ Item 19 (page 285) .

– Air duct to left dash panel vent ⇒ Item 18 (page 285) .

21 - Front left chest vent temperature sensor - G385-

❑ Vehicles with a “Low” air conditioner (or no air conditioner) are fitted with -G385- at this location.

❑ ⇒ “10.6.1 Removing and installing front left chest vent temperature sensor G385 - vehicles with Low air conditioner (or without air conditioner)”, page 326

22 - Cap

❑ Vehicles with a “High” air conditioner (the front left chest vent temperature sensor - G385- is installed in the air duct to the left dash panel vent) either have no opening in the air duct or the opening is sealed with a cap

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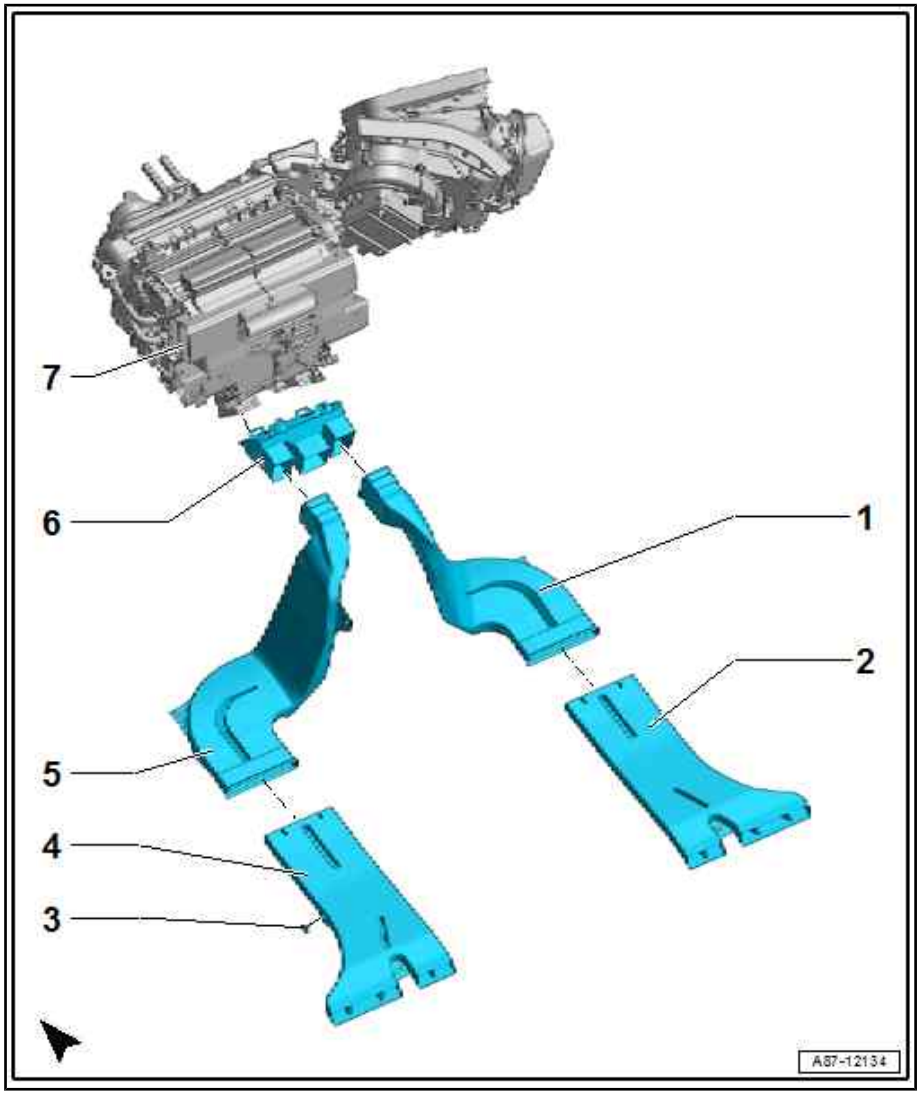
7.1.2 Air ducts and vents in passenger compartment (rear) - vehicles with “Low” air conditioner or without air conditioner



1 - Air duct to footwell vent beneath right seat (front passenger seat)

Removing and installing:

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

– Remove floor covering on front passenger side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

2 - Footwell vent beneath right seat (front passenger seat)

Removing and installing:

– Carefully lift the floor covering on the front passenger side at the rear ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

3 - Cap

❑ Only fitted if there is an opening for a temperature sensor in footwell vent beneath left seat ⇒ Item 4 (page 286) (to seal off opening)

4 - Footwell vent beneath left seat (driver seat)

❑ Different versions (with or without opening for temperature sensor) ⇒ Electronic parts catalogue

Removing and installing:

– Carefully lift the floor covering on the driver side at the rear ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

5 - Air duct to footwell vent beneath left seat (driver seat)

Removing and installing:

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Remove floor covering on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

6 - Air duct

❑ From the heater and air conditioning unit to the air ducts to the rear footwell vents

Removing and installing:

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Carefully detach the floor covering on the driver side and front passenger side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
- Detach the air ducts to the rear footwell vents from the air duct.

7 - Front heater and air conditioning unit with air intake box

❑ Different versions ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 and ⇒ Electronic parts catalogue

❑ Version for “Low” air conditioner (heater with no air conditioner)

❑ ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

❑ Air intake, air outlet and routing of air flow in heater and air conditioning unit
⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293

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7.1.3 Air ducts, temperature sensors and vents in passenger compartment (rear) - Audi A4 and Audi A5 models with “High” air conditioner

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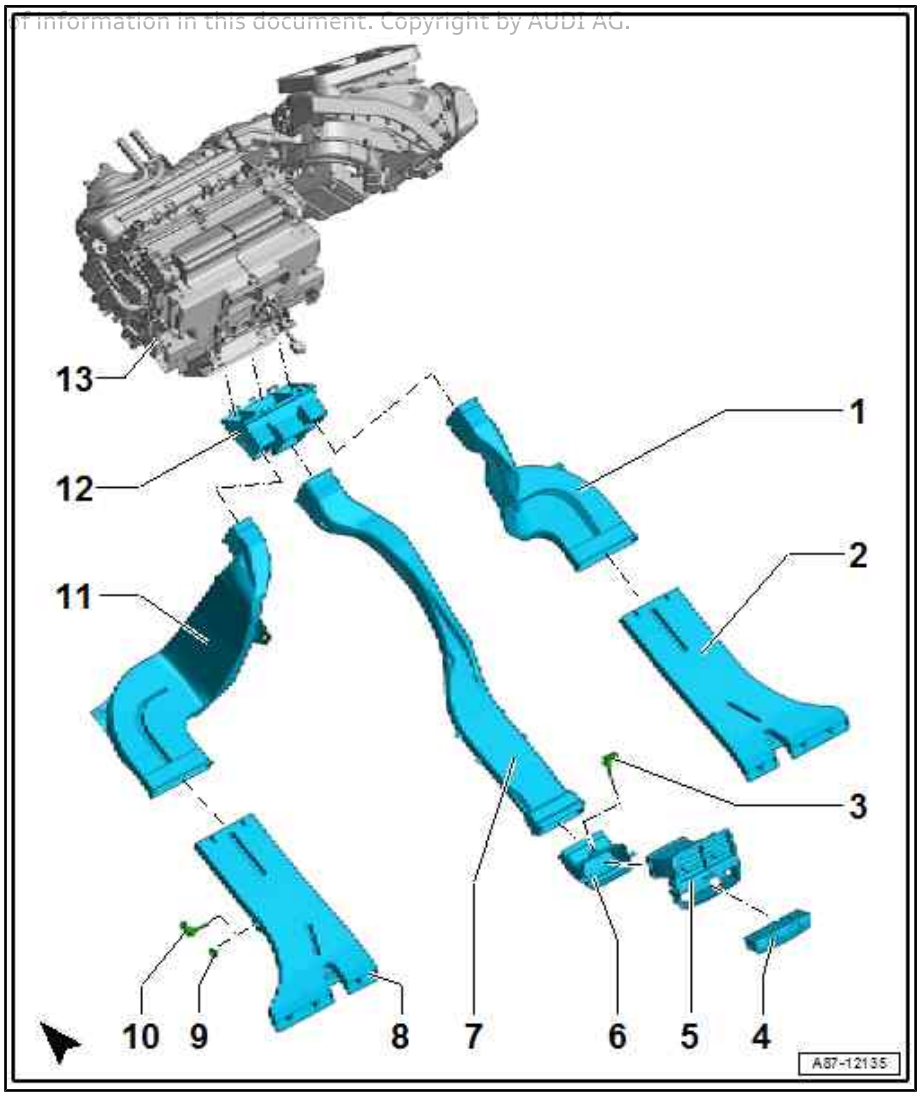

1 - Air duct to footwell vent beneath right seat (front passenger seat)

Removing and installing:

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Remove floor covering on front passenger side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

2 - Footwell vent beneath right seat (front passenger seat)

Removing and installing:

- Carefully lift the floor covering on the front passenger side at the rear ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

3 - Rear chest vent temperature sensor - G537-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Removing and installing ⇒ “10.1.1 Removing and installing rear chest vent temperature sensor G537 - Audi A4, Audi A5”, page 319

4 - Rear Climatronic operating and display unit - E265-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Different versions. For correct version refer to ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “9.2.3 Removing and installing rear Climatronic operating and display unit E265 - Audi A4 and Audi A5 models with High air conditioner”, page 317
- ❑ Notes ⇒ “9.2 Removing and installing operating and display unit”, page 314

5 - Rear vent in centre console

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .

6 - Air duct beneath rear centre console

- ❑ Different versions ⇒ Electronic parts catalogue

❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .

7 - Air duct (rear)

❑ From the air duct (from the front heater and air conditioning unit) to the vents in the rear centre console

❑ To remove component, first remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console

❑ To remove air duct, first remove bracket for centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing bracket for centre console

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8 - Footwell vent beneath left seat (driver seat)

❑ Different versions (with opening for temperature sensor in this illustration) ⇒ Electronic parts catalogue

Removing and installing:

– Carefully lift the floor covering on the driver side at the rear ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

– Unplug the connector from the vent temperature sender for rear left footwell - G637- .

9 - Cap

❑ Only fitted (to seal off opening) if there is an opening for a temperature sensor in footwell vent beneath left seat and no -G637- is installed

10 - Vent temperature sender for rear left footwell - G637-

❑ Only fitted on vehicles with “High” air conditioner

❑ Removing and installing
⇒ “10.2 Removing and installing vent temperature sender for rear left footwell G637 ”, page 321

11 - Air duct to footwell vent beneath left seat (driver seat)

Removing and installing:

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

– Remove floor covering on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

12 - Air duct

❑ From the heater and air conditioning unit to the air ducts under the centre console and to the rear footwell vents

Removing and installing:

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

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

– Carefully detach the floor covering on the driver side and front passenger side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

– Detach the air ducts to the rear footwell vents from the air duct.

13 - Front heater and air conditioning unit with air intake box

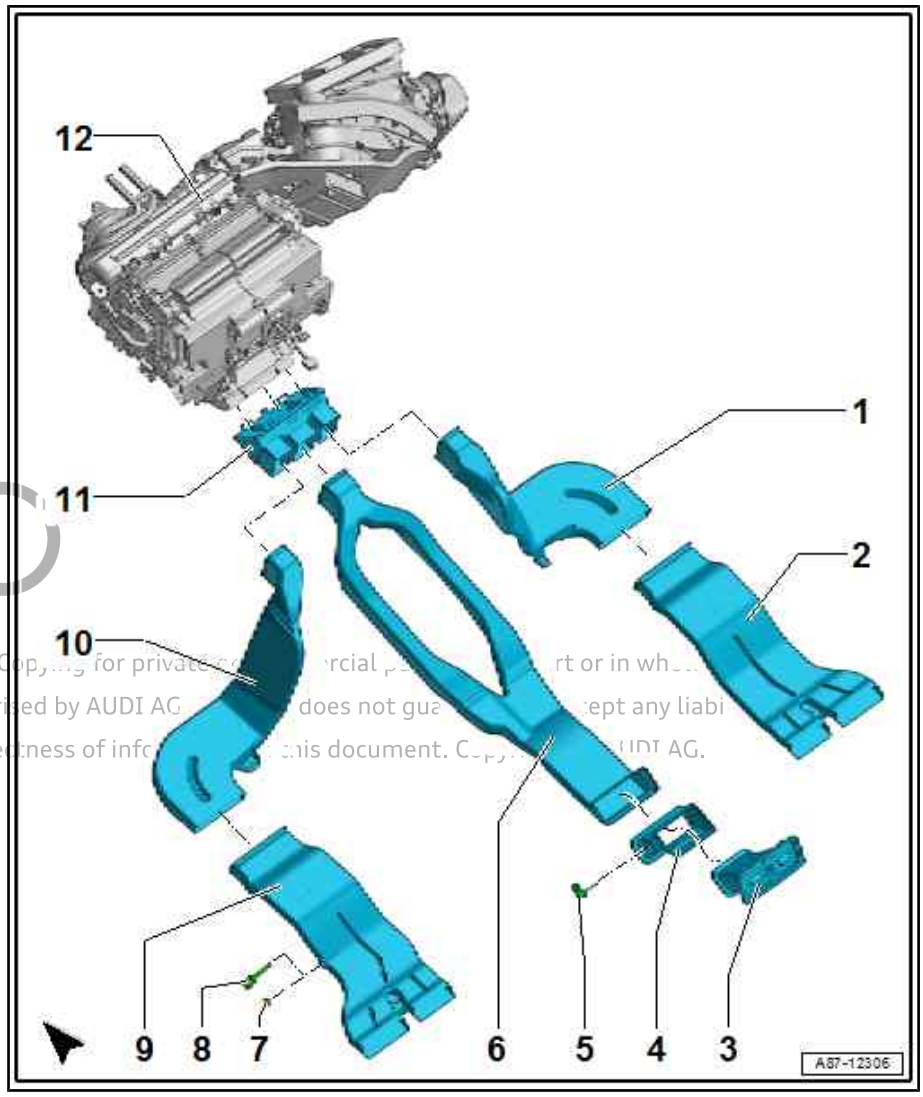
❑ Different versions ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 and ⇒ Electronic parts catalogue

❑ Version for “High” air conditioner

❑ ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

❑ Air intake, air outlet and routing of air flow in heater and air conditioning unit
⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293

7.1.4 Air ducts, temperature sensors and vents in passenger compartment (rear) - Audi Q5 models with “High” air conditioner



1 - Air duct to footwell vent beneath right seat (front passenger seat)

Removing and installing:

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Remove floor covering on front passenger side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

2 - Footwell vent beneath right seat (front passenger seat)

Removing and installing:

- Carefully lift the floor covering on the front passenger side at the rear ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

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3 - Rear vent in centre console

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .

4 - Air duct (rear)

- ❑ From the air duct (from the front heater and air conditioning unit) to the vents in the rear centre console
- ❑ To remove component, first remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console

5 - Rear chest vent temperature sensor - G537-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Removing and installing ⇒ “10.1.2 Removing and installing rear chest vent temperature sensor G537 - Audi Q5”, page 320
- ❑ Illustration shows installation position on Audi A4/Audi A5; on Audi Q5, rear chest vent temperature sensor - G537- is fitted at side on left

6 - Air duct beneath rear centre console

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .
- ❑ To remove air duct, first remove bracket for centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing bracket for centre console

7 - Cap

- ❑ Only fitted (to seal off opening) if there is an opening for a temperature sensor in footwell vent beneath left seat and no vent temperature sender for rear left footwell - G637- is installed

8 - Vent temperature sender for rear left footwell - G637-

- ❑ Only fitted on vehicles with “High” air conditioner
- ❑ Removing and installing
  ⇒ “10.2 Removing and installing vent temperature sender for rear left footwell G637 ”, page 321

9 - Footwell vent beneath left seat (driver seat)

- ❑ Different versions (with opening for temperature sensor in this illustration) ⇒ Electronic parts catalogue

Removing and installing:

- Carefully lift the floor covering on the driver side at the rear ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
- Unplug the connector from the vent temperature sender for rear left footwell - G637- .

10 - Air duct to footwell vent beneath left seat (driver seat)

Removing and installing:

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- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Remove floor covering on driver side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

11 - Air duct

- ❑ From the heater and air conditioning unit to the air ducts under the centre console and to the rear footwell vents

Removing and installing:

- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Remove the air duct under the centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Carefully detach the floor covering on the driver side and front passenger side ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
- Detach the air ducts to the rear footwell vents from the air duct.

12 - Front heater and air conditioning unit with air intake box

- ❑ Different versions ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240 and ⇒ Electronic parts catalogue
- ❑ Version for “High” air conditioner
- ❑ ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258
- ❑ Air intake, air outlet and routing of air flow in heater and air conditioning unit
  ⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293

7.2 Air intake and air outlet openings

⇒ “7.2.1 Air intake and air outlet openings - front heater and air conditioning unit”, page 292

⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293

7.2.1 Air intake and air outlet openings - front heater and air conditioning unit

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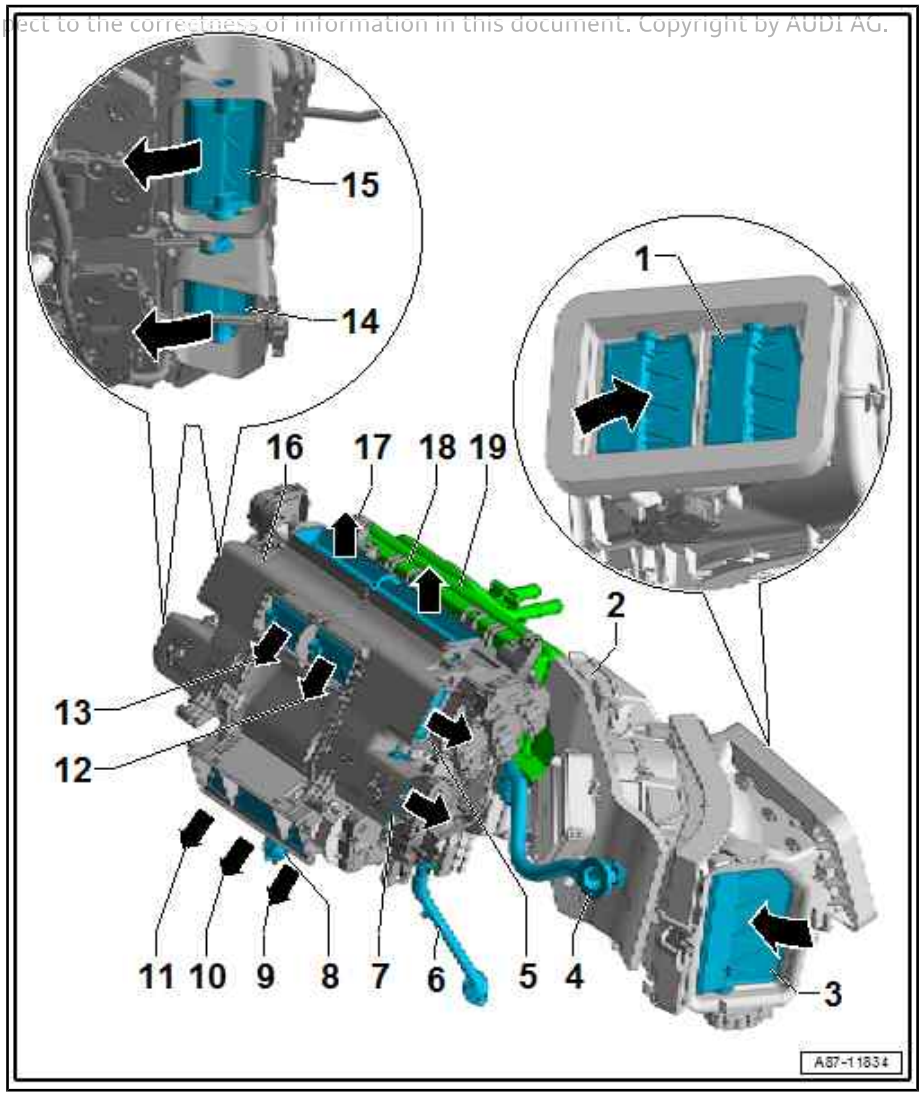

1 - Fresh air intake

- Air is drawn in from plenum chamber ⇒ “7.8 Removing and installing fresh air intake”, page 300

2 - Air intake box

- ⇒ “6.3 Exploded view - air intake box of heater and air conditioning unit”, page 244

3 - Air intake from passenger compartment (air recirculation mode)

- Air is drawn in from passenger's footwell underneath glove box

4 - Air duct for glove box cooling

- ⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297
- Vehicles without glove box cooling (optional extra): Connection is sealed off with a cap

5 - Air outlet to dash panel vents (right-side) and to wide air outlet

- Air is routed to different vents depending on version of heater and air conditioning unit ⇒ “7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)”, page 280

6 - Condensation drain (right-side)

- ⇒ “6.13 Removing and installing condensation drain”, page 276

7 - Air outlet to footwell vent (front right)

8 - Condensation drain (left-side)

- ⇒ “6.13 Removing and installing condensation drain”, page 276

9 - Air outlet to air duct to right footwell vent

- Equipment-specific, a flap is only fitted at this location on a vehicle with a “High” air conditioner
- Different air temperatures are possible for the left and right sides depending on the setting ⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293

10 - Air outlet to air duct in centre beneath centre console

- Equipment-specific, a flap is only fitted at this location on a vehicle with a “High” air conditioner

- ❑ Vehicles with a “Low” air conditioner (or no air conditioner) have no flap at this location and the opening in the heater and air conditioning unit is sealed
⇒ “7.1.2 Air ducts and vents in passenger compartment (rear) - vehicles with Low air conditioner or without air conditioner”, page 286 .

11 - Air outlet to air duct to left footwell vent

- ❑ Equipment-specific, a flap is only fitted at this location on a vehicle with a “High” air conditioner

12 - Air outlet to dash panel vent (centre right)

- ❑ Equipment-specific, a vehicle with a “High” air conditioner is fitted with one flap each for the left and right side
- ❑ Equipment-specific, a vehicle with a “Low” air conditioner (or no air conditioner) is only fitted with one flap for the left and right side
- ❑ With the “High” air conditioner, different air temperatures are possible for the left and right side depending on the setting ⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293 .

13 - Air outlet to dash panel vent (centre left)

- ❑ Equipment-specific, a vehicle with a “High” air conditioner is fitted with one flap each for the left and right side
- ❑ Equipment-specific, a vehicle with a “Low” air conditioner (or no air conditioner) is only fitted with one flap for the left and right side
- ❑ With the “High” air conditioner, different air temperatures are possible for the left and right side depending on the setting ⇒ “7.2.2 Routing of air flow in front heater and air conditioning unit”, page 293 .

14 - Air outlet to footwell vent (front left)

15 - Air outlet to dash panel vents (left-side)

16 - Air distribution housing of front heater and air conditioning unit

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240
- ❑ ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

17 - Air outlet to dash panel defroster vent (left-side)

18 - Air outlet to dash panel defroster vent (right-side)

19 - Evaporator housing

- ❑ ⇒ “6.4 Exploded view - evaporator housing”, page 245
- ❑ ⇒ “6.8 Removing and installing heater and air conditioning unit”, page 258

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7.2.2 Routing of air flow in front heater and air conditioning unit

- ♦ To illustrate the routing of air flow in the air intake box and the heater and air conditioning unit, the two components are shown in the form of sectional views “A - A”, “B - B” and “C - C”.
- ♦ This illustration shows a heater and air conditioning unit for a “High” air conditioner.
- ♦ On vehicles with glove box cooling, the cooled air routed into the glove box is tapped directly downstream of the evaporator ⇒ Item 11 (page 294) .
- ♦ The heater and air conditioning unit for the “High” air conditioner is fitted with partitions (not shown in detail here) to permit separate regulation of the temperature of the air from the front vents.
- ♦ With a heater and air conditioning unit for a “Low” air conditioner (heater with no air conditioner), there is no separation between the right and left side (there are no partitions and the various flaps are continuous and not separated). There are

also no flaps fitted in the air ducts to the vents for the rear footwell.

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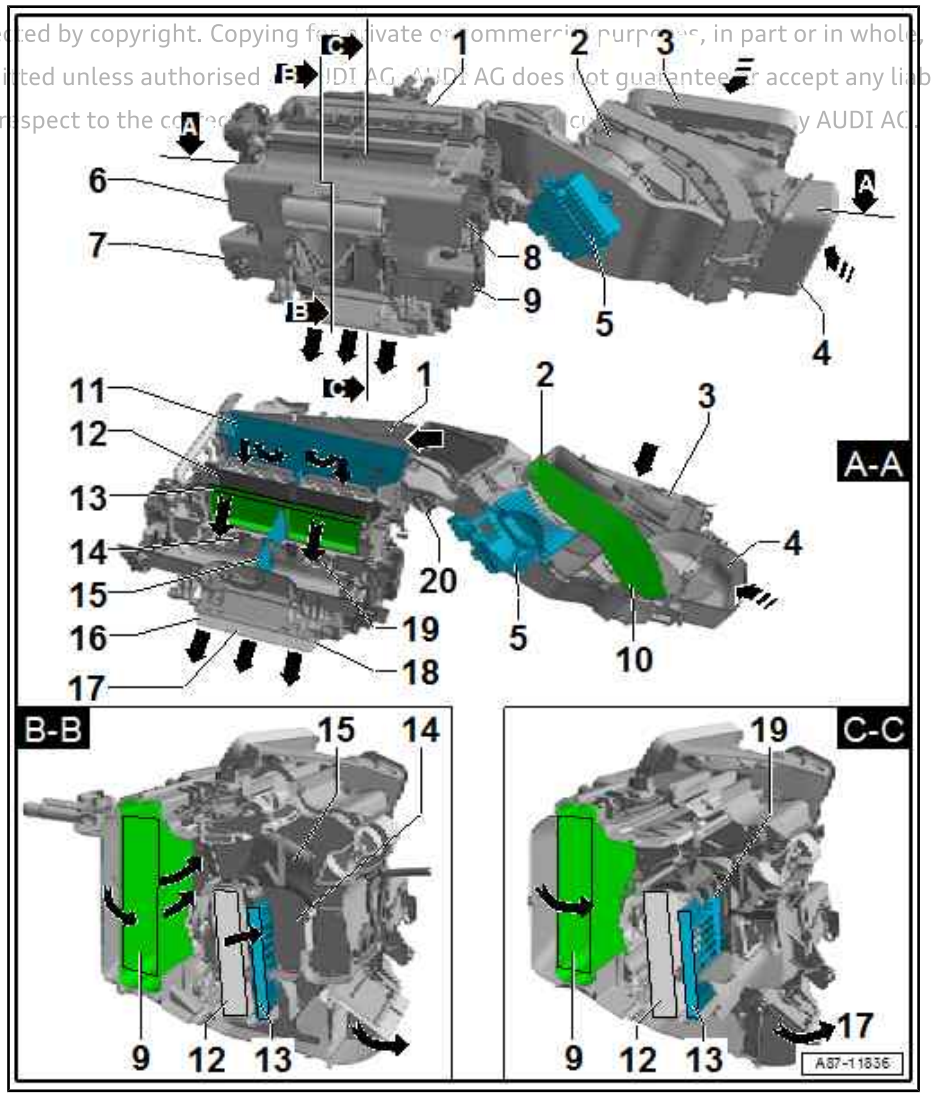

1 - Evaporator and air distribution housing of front heater and air conditioning unit

- Different versions ⇒ Electronic parts catalogue
- ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240

2 - Air intake box of front heater and air conditioning unit

3 - Fresh air intake

- Air is drawn in from plenum chamber ⇒ “7.8 Removing and installing fresh air intake”, page 300 .

4 - Air intake from passenger compartment (air recirculation mode)

- When air recirculation flap is open, air is drawn in beneath glove box from passenger's footwell
- Illustration shows the air recirculation flap in “closed” position.

5 - Fresh air blower - V2- with fresh air blower control unit - J126-

6 - Air outlet to left dash panel vent (driver side)

7 - Air outlet to left footwell vent (driver side)

8 - Air outlet to right dash panel vent (passenger side)

- Also to wide air outlet on vehicles with “High” air conditioner

9 - Air outlet to right footwell vent (passenger side)

- Equipment-specific, a flap is only fitted at this location on a vehicle with a “High” air conditioner

10 - Dust and pollen filter

- Different versions ⇒ Electronic parts catalogue

11 - Evaporator

- On a vehicle with no air conditioner, the heater is the same as the heater and air conditioning unit on vehicles with a “Low” air conditioner. The evaporator installed in the heater has no function. It serves only as a spacer element and to reduce noise ⇒ Electronic parts catalogue .

12 - Heat exchanger for heater

- ⇒ “6.12 Removing and installing heat exchanger”, page 267

13 - Zone divider or auxiliary air heater element - Z35-

- -Z35- is fitted on some equipment versions ⇒ “6.7 Removing and installing auxiliary air heater element Z35 ”, page 255

- There is no separation between the right and left side on vehicles with a “Low” air conditioner (heater with no air conditioner). Therefore there is currently no zone divider fitted instead of auxiliary air heater element - Z35- on these heater and air conditioning units.

14 - Mixing chamber (front left) for heated and non-heated air (driver side)

- The various temperature flaps direct a certain volume of air through the heat exchanger (and the auxiliary air heater element - Z35- or the zone divider) or past it
- Temperature flaps for front are not shown in illustration.
- There is no separation between the right and left side on vehicles with a “Low” air conditioner (heater with no air conditioner).

15 - Partition between driver and front passenger side (“High” air conditioner)

- Separates the air duct to the left and right vents; prerequisite for different air outlet temperatures with a “High” air conditioner. Depending on position of corresponding temperature flaps

16 - Air outlet to air duct to rear left footwell vent (driver side)

- Equipment-specific, a flap is only fitted at this location on a vehicle with a “High” air conditioner
- Depending on setting, heated or cooled air can be directed to vents.
- The rear temperature flap is not shown here (only fitted with a “High” air conditioner).
- In the case of a heater and air conditioning unit for a “High” air conditioner, the flaps for air outlet to the rear (⇒ Item 16 (page 295) , ⇒ Item 17 (page 295) and ⇒ Item 18 (page 295)) are closed or opened by way of a cam plate depending on position (only this flap and the flap ⇒ Item 18 (page 295) are linked via the shaft).

17 - Air outlet to air duct in centre beneath centre console

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- Equipment-specific, a flap is only fitted at this location on a vehicle with a “High” air conditioner
- Depending on setting, heated or cooled air can be directed to vents.
- The rear temperature flap is not shown here (only fitted with a “High” air conditioner).
- In the case of a heater and air conditioning unit for a “High” air conditioner, the flaps for air outlet to the rear (⇒ Item 16 (page 295) , ⇒ Item 17 (page 295) and ⇒ Item 18 (page 295)) are closed or opened by way of a cam plate depending on position (only the flap ⇒ Item 16 (page 295) and ⇒ Item 18 (page 295) are linked via the shaft).
- On vehicles with a “Low” air conditioner (or no air conditioner), the opening in the heater and air conditioning unit is sealed ⇒ “7.1.2 Air ducts and vents in passenger compartment (rear) - vehicles with Low air conditioner or without air conditioner”, page 286 .

18 - Air outlet to air duct to right footwell vent

- Equipment-specific, a flap is only fitted at this location on a vehicle with a “High” air conditioner
- Depending on setting, heated or cooled air can be directed to vents.
- The rear temperature flap is not shown here (only fitted with a “High” air conditioner).
- In the case of a heater and air conditioning unit for a “High” air conditioner, the flaps for air outlet to the rear (⇒ Item 16 (page 295) , ⇒ Item 17 (page 295) and ⇒ Item 18 (page 295)) are closed or opened by way of a cam plate depending on position (only this flap and the flap ⇒ Item 16 (page 295) are linked via the shaft).

19 - Mixing chamber (front right) for heated and non-heated air (passenger side)

- The various temperature flaps direct a certain volume of air through the heat exchanger (and the auxiliary air heater element - Z35- or the zone divider) or past it
- Temperature flaps for front are not shown in illustration.

20 - Connection for hose to air duct for glove box cooling

- On vehicles without glove box cooling as an optional extra, opening in heater and air conditioning unit is sealed with a cover ⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297
- Checking, removing and installing hose to air duct for glove box cooling ⇒ “7.5 Removing and installing air duct for glove box cooling”, page 297

7.3 Removing and installing footwell vent (driver side)

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

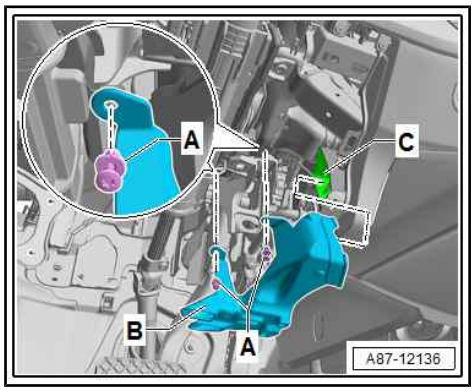
– Move driver seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Remove spreader rivets -A-.

– Remove footwell vent (left-side) -B- from heater and air conditioning unit -C-.



Installing

Installation is carried out in reverse sequence.

7.4 Removing and installing footwell vent (front passenger side)

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Set front passenger seat to rearmost position.

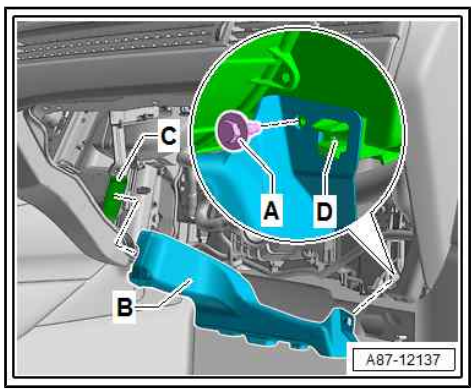
– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– If fitted, remove bolt -A-.

– Release fastener -D-.

– Remove footwell vent (right-side) -B- from heater and air conditioning unit -C-.



Installing

Installation is carried out in reverse order; note the following:

– If footwell vent (right-side) -B- cannot be secured properly via fastener -D-, screw in bolt -A- for repairs ⇒ Electronic parts catalogue .

Tightening torques

♦ ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - glove box

♦ ⇒ "7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)", page 280

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7.5 Removing and installing air duct for glove box cooling

⇒ “7.5.1 Removing and installing air duct for glove box cooling - Audi A4, Audi A5”, page 297

⇒ “7.5.2 Removing and installing air duct for glove box cooling - Audi Q5”, page 297

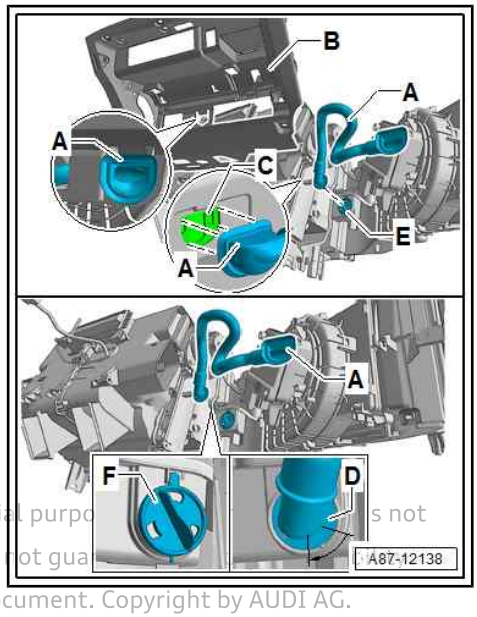
7.5.1 Removing and installing air duct for glove box cooling - Audi A4, Audi A5

Removing

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove right footwell vent (passenger side) ⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296 .

– Separate the air duct for glove box cooling -A- from the heater and air conditioning unit by turning at the connection point -D- (-arrow-) and remove.



Installing

Installation is carried out in reverse sequence.

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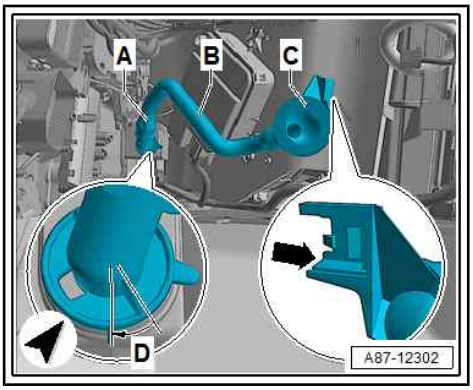
7.5.2 Removing and installing air duct for glove box cooling - Audi Q5

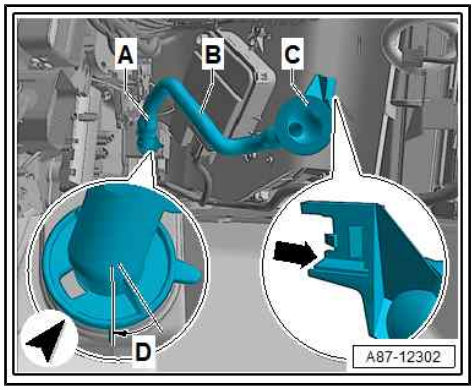
Removing

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove right footwell vent (passenger side) ⇒ “7.4 Removing and installing footwell vent (front passenger side)”, page 296 .



– To detach air duct for glove box cooling -B- from heater and air conditioning unit, turn connecting point -D- (-arrow-).
– Release air duct for glove box cooling -B- at glove box connection -C- -arrow- and remove.



Installing

Installation is carried out in reverse order; note the following:

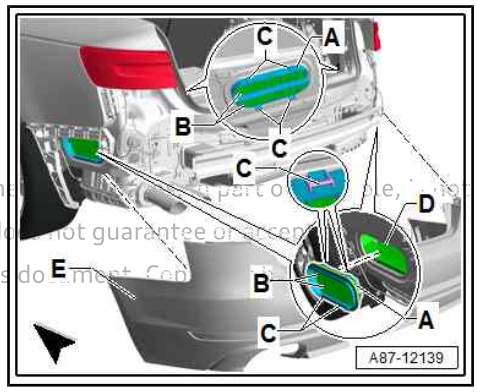
Tightening torques

- ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Exploded view - glove box
- ⇒ "7.1.1 Exploded view - routing of air flow and air distribution in passenger compartment (front)", page 280

7.6 Removing and installing forced ventilation vents in passenger compartment

Removing

– Remove the rear bumper cover -E- ⇒ General body repairs, exterior; Rep. gr. 63 ; Rear bumper; Removing and installing bumper cover .
– Open the cover in the left and/or right luggage compartment side trim.



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Note

- On vehicles without a cover in the luggage compartment side trim, if the forced ventilation frame -A- is to be reused after removal, the side trim (left and/or right) must be removed (so that the locking catches -C- on the ventilation frame -A- can be detached for removal). Removing luggage compartment side trim ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment side trim
- If the ventilation frame removed is not to be re-used, unfasten the ventilation frame -A- from the body opening -D- from outside (the ventilation frame is destroyed in the process).

A5 Coupé and Sportback

– Removing and installing mounting for bumper cover (side) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (rear)

All vehicles (continued)

– Release retaining clips -C- and press forced ventilation frame -A- outwards out of body opening -D-.

Installing

Installation is carried out in reverse order; note the following:

– Check seal on ventilation frame -A- for damage.
– Fit ventilation frame -A- in correct position to make sure sealing lips -B- close properly.
– Push forced ventilation frame -A- into opening in body -D- until all retaining tabs -C- engage audibly.

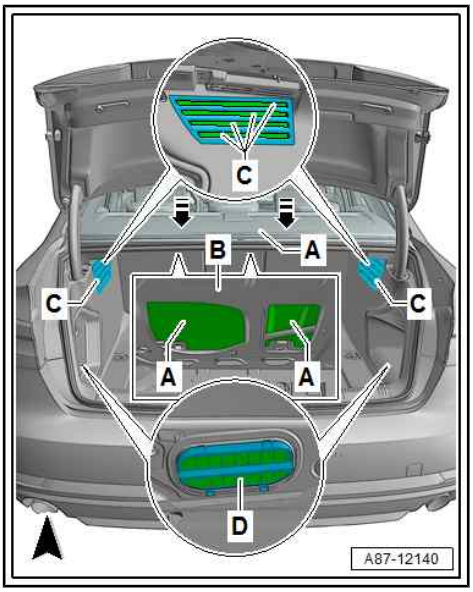
7.7 Checking forced ventilation vents in passenger compartment

The following shows the air ducts in the luggage compartment and through openings in the luggage compartment side trim by way of example for other vehicles for an Audi A4 Saloon and an Audi A4 Avant. The luggage compartment lining may differ in oth-

er vehicles (e.g. in the Audi A5Coupé) ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Removing and installing luggage compartment side trim ; however, the passenger compartment in these vehicles is ventilated in the same manner.

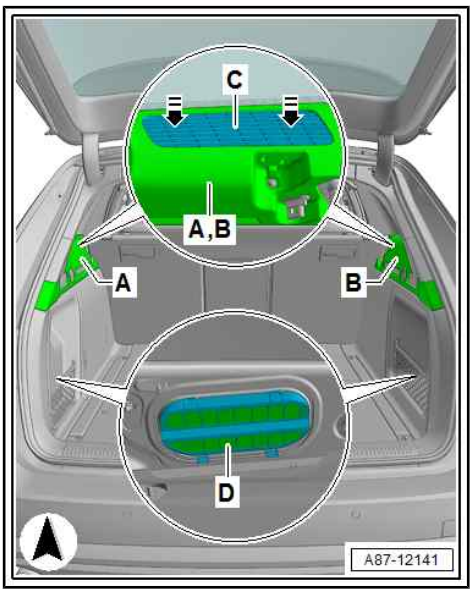
Routing of air flow to forced ventilation frames - Saloon:

- The air from the passenger compartment flows via openings in the vicinity of the rear window -arrows- past the rear shelf -A- into the area under the rear shelf -A-
- The air flows into the luggage compartment via openings in the shelf panel -B- under the rear shelf -A-.
- By way of openings in the luggage compartment side trim (left and right) -C-, the air flows out of the luggage compartment behind the luggage compartment side trim panels and from there to the ventilation frames on the left and right -D-



Routing of air flow to forced ventilation frames - Avant:

- The air from the passenger compartment flows via the ventilation grilles -C- (in the area of the rear side windows) -arrows- behind the luggage compartment side trim panels on the left and right -A, B- and from there to the ventilation frames on the left and right -D-



Checking forced ventilation frames - vehicles with covers in luggage compartment side trim

– Open the cover in the left and/or right luggage compartment side trim.

Checking forced ventilation frames - vehicles without covers in luggage compartment side trim

– Unfasten or remove luggage compartment side trim (left -A- and right -B-) ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Removing and installing luggage compartment side trim .

Note

- There may be an opening -E- in the luggage compartment side trim (left -A- and/or right -B-), depending on the version of the vehicle. The ventilation frame -D- can then be checked through this opening using e.g. an endoscope, without having to remove the corresponding luggage compartment side trim.

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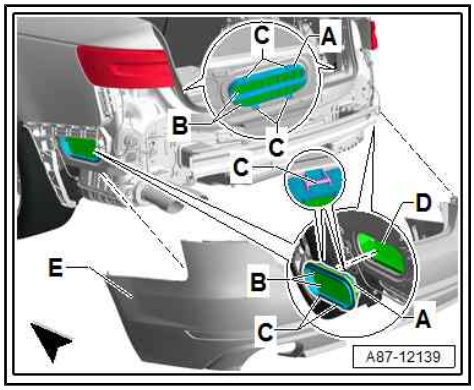
Checking forced ventilation frame from outside

- Only to be performed on vehicles with no covers in the luggage compartment side trim panel(s) if the rear bumper cover -E- has already been removed. In the event of problems relating to moisture in the passenger compartment, the air duct to the ventilation frames behind the luggage compartment side trim panels must however be checked as well.

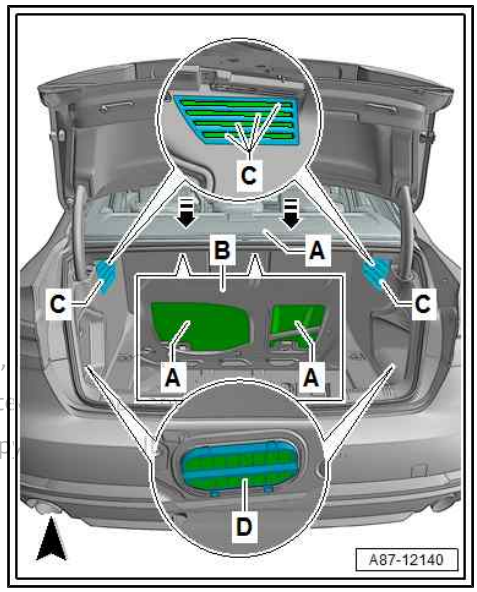
– Remove the rear bumper cover -E- ⇒ General body repairs, exterior; Rep. gr. 63 ; Rear bumper; Removing and installing bumper cover .



All vehicles (continued)

– Check that ventilation frame -D- (left and right) is not blocked.

- The sealing lips in the ventilation frame -D- must move freely and close automatically. Gummed-up sealing lips could cause the windscreen, rear window and door windows to mist up. The same also applies if the air ducts to the ventilation frames -D- are sealed or blocked.
- The sealing lips only close properly if the ventilation frame -D- has been installed correctly.
- To enable the air behind the luggage compartment side trim panels to flow to the ventilation frames on the left and right -D-, the spaces provided for the passage of air must not be blocked off or constricted by any objects or retrofitted components.



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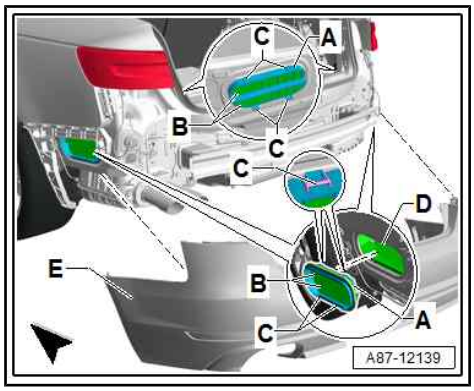
– Check that ventilation frame (left and right) -A- is not blocked and that sealing lips -B- operate properly.

♦ Gummed-up sealing lips -B- or loose objects lying in front of the ventilation frames -A- may cause the windscreen, rear window and door windows to mist up.

♦ The sealing lips -B- only close properly if the ventilation frame -A- has been installed in the correct position.



7.8 Removing and installing fresh air intake

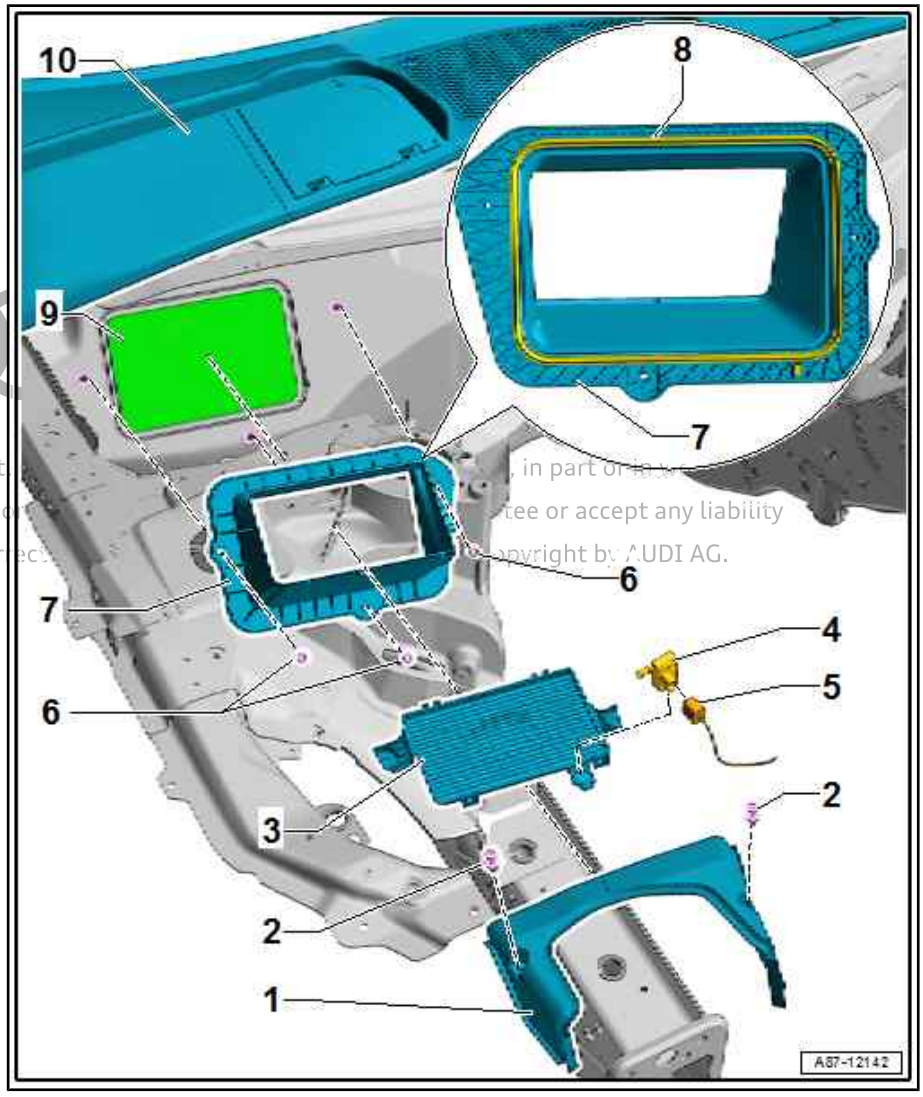
⇒ “7.8.1 Exploded view - fresh air intake of heater and air conditioning unit”, page 300

⇒ “7.8.2 Removing and installing fresh air intake”, page 302

⇒ “7.8.3 Checking fresh air intake”, page 302

7.8.1 Exploded view - fresh air intake of heater and air conditioning unit

There are different versions of fresh air intake depending on the vehicle version ⇒ Electronic parts catalogue .



1 - Outer cover for fresh air intake box (drip rail)

- ❑ Before installing, check outer cover for damage (water can enter heater and air conditioning unit through fresh air intake duct if cover is damaged)
- ❑ When installing, make sure fresh air intake is positioned correctly. If fresh air intake is not fitted correctly, water can run into intake duct of heater and air conditioning unit

Installing

– Slide outer cover under drip rail of window cross member and secure with fasteners at intake box.

2 - Fastener

3 - Fresh air intake grille

- ❑ Depending on the model, a dust filter may be fitted in the filter mount instead of the grille for certain countries with a high dust impact level in the ambient air (e.g. for China). The dust filter is designed to stop the fresh air blower - V2- from drawing in dust and sand. For correct version refer to ⇒ Electronic parts catalogue

4 - Humidity sender in fresh air intake duct - G657- / air quality sensor - G238-

- ❑ Different versions (with and without air quality sensor - G238-), depending on air conditioner version ⇒ Electronic parts catalogue
- ❑ Removing and installing
⇒ “10.4 Removing and installing humidity sender in fresh air intake duct G657 / air quality sensor G238 ”, page 323

5 - Electrical connector to -G657- / -G238-

6 - Nut

- ❑ Tightening torque: 3.5 Nm
- ❑ Tighten nuts to specified torque in several stages.
- ❑ It is important to observe specified tightening sequence; otherwise water may enter fresh air intake opening via sealing surface and then enter intake duct of heater and air conditioning unit.

7 - Intake box

- ❑ With leaf guard
- ❑ Sealed off from plenum chamber back wall
- ❑ Prior to installation, check the intake box, the leaf guard and the corresponding seal for damage and correct assembly
- ❑ Before installing, check intake box and corresponding seal for damage. If damaged, renew seal or renew entire intake box ⇒ Electronic parts catalogue .

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8 - Seal at intake box

- ❑ Before installing the intake box, check the seal for damage. If the seal is not properly fitted or damaged, water may run into the fresh air intake housing and thus into the heater and air conditioning unit.

9 - Opening for fresh air intake in plenum chamber back wall

10 - Plenum chamber cover

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

7.8.2 Removing and installing fresh air intake

Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Switch off ignition.

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Detach air quality sensor - G238- (with humidity sender in fresh air intake duct - G657-)
⇒ "10.4 Removing and installing humidity sender in fresh air intake duct G657 / air quality sensor G238 ", page 323 .

– Detach and remove intake duct as specified in installation instructions
⇒ "7.8.1 Exploded view - fresh air intake of heater and air conditioning unit", page 300 .

Installing

Install in reverse order of removal; note the following:

– Before installing components of fresh air intake, check plenum chamber and water drains for dirt and damage. If necessary, clean these components
⇒ "7.9 Checking plenum chamber water drain", page 303 .

• Observe tightening sequence for nuts when installing.

– Install intake duct as specified in installation instructions
⇒ "7.8.1 Exploded view - fresh air intake of heater and air conditioning unit", page 300 .

– Tighten nuts slightly by hand
⇒ "7.8.1 Exploded view - fresh air intake of heater and air conditioning unit", page 300 .

• Before installing components of fresh air intake, check bonded seal for damage. Renew seal or corresponding component of fresh air intake if damaged ⇒ Electronic parts catalogue .

• It is important to observe these instructions; otherwise water may enter intake duct of heater and air conditioning unit via sealing surface.

• When installing, make sure fresh air intake and corresponding seals are seated correctly. If fresh air intake is not fitted correctly, water can enter intake duct on heater and air conditioning unit.

7.8.3 Checking fresh air intake

– Switch off ignition.

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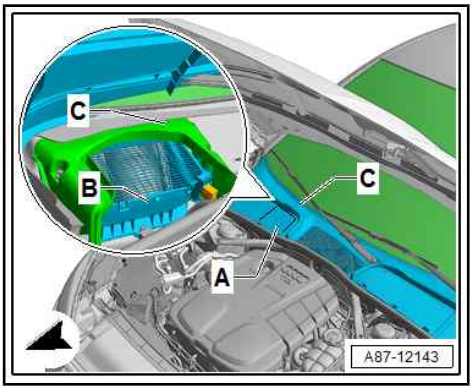
– Carefully unfasten plenum chamber cover (right-side) -A- and raise or remove it ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

♦ Depending on the model, a dust filter may be fitted in the filter mount instead of the grille for certain countries with a high dust impact level in the ambient air (e.g. for China). The dust filter is designed to stop the fresh air blower - V2- from drawing in dust and sand. For correct version refer to ⇒ Electronic parts catalogue .

– Check plenum chamber cover -A- for damage.

– Check that intake box -B- and outer cover (drip rail) -C- are not damaged and are fitted correctly.

– Check fasteners securing plenum chamber cover -A- to windscreen frame -C- for damage ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



7.9 Checking plenum chamber water drain

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Remove plenum chamber cover -A- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

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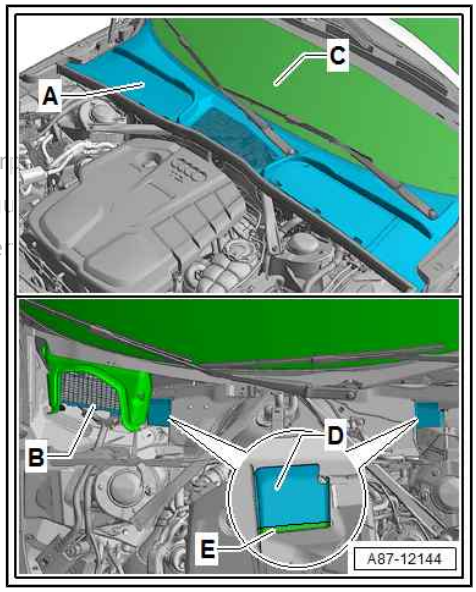
• The plenum chamber cover -A- must not be damaged so that it prevents water from entering the heater and air conditioning unit via the intake duct -B- when the cover -A- is in position. The plenum chamber cover -A- must also be engaged properly and completely in the windscreen frame -C-.

• Water may not drain properly from plenum chamber -A- if leaves, pine needles or other debris accumulate in water drains -D- (or -E- in front of opening). The water level in the plenum chamber then rises if the vehicle is taken to an automatic car wash or in the event of heavy rain, water ingresses by way of the intake housing -B- into the heater and air conditioning unit and is drawn by the fresh air blower - V2- into the dust and pollen and filter together with the air conveyed and possibly blown into the evaporator.

• If the water drain openings -E- (one on each side in plenum chamber) are clogged with leaves or pine needles, the drains may freeze up in winter and prevent water drainage. After a short journey, the heat emitted by engine and exhaust system melts the ice in the drains again. By the time the vehicle arrives at the workshop, the water may have already drained out of the plenum chamber.

• If the water drains -D- (one each on the right and left in the plenum chamber) or the plenum chamber itself are/is contaminated with leaves and pine needles, an odour nuisance may be encountered during operation of the heater and air conditioner.

• At present the two water drains -D- have no valve; the water runs off via the openings -E- into the area behind the front right and left wheel housing liner.



7.10 Cleaning plenum chamber water drain

Procedure

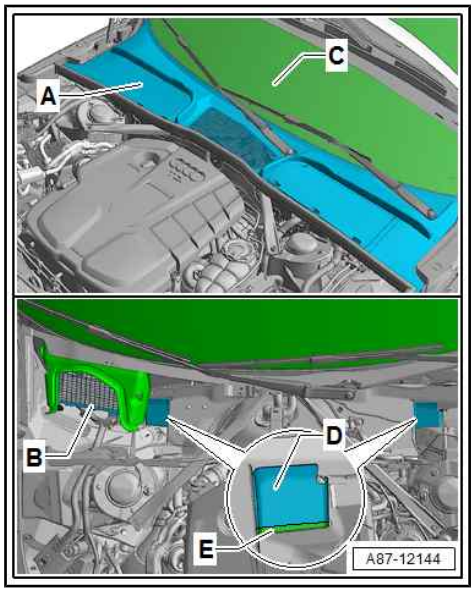
– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Switch off ignition.
– Remove plenum chamber cover -A- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
– Remove leaves, pine needles and other dirt from plenum chamber.

♦ Use a commercially available illuminated endoscope for example to check inaccessible water drains -D- (and the openings -E-). A version with a flexible, waterproof swan neck is most practical.

♦ To clean inaccessible water drains -D- (and the openings -E- to the water drain), use a commercially available flexible gripper tool for example to dislodge and remove coarse dirt. Then wash out the remaining dirt through the water drains -D-.

♦ At present the two water drains -D- have no valve; the water runs off via the openings -E- into the area behind the front right and left wheel housing liner.



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8 Coolant circuit

⇒ “8.1 Incorporation of heater and air conditioner into coolant circuit”, page 305

⇒ “8.2 Removing and installing coolant shut-off valve N82 ”, page 306

⇒ “8.3 Exploded view - high-voltage heater (PTC) Z115 ”, page 309

⇒ “8.4 Removing and installing high-voltage heater (PTC) Z115 (with high-voltage heater (PTC) control unit J848)”, page 310

8.1 Incorporation of heater and air conditioner into coolant circuit

⇒ “8.1.1 Notes on incorporation of heater and air conditioning unit into coolant circuit”, page 305

⇒ “8.1.2 Incorporation of heater and air conditioner into coolant circuit - vehicles without auxiliary or supplementary heater”, page 305

⇒ “8.1.3 Incorporation of heater and air conditioning unit into coolant circuit - vehicles with auxiliary heater”, page 306

8.1.1 Notes on incorporation of heater and air conditioning unit into coolant circuit

- Mark coolant hoses and coolant lines before removing them. Interchanging coolant hoses or coolant lines during installation can cause problems when bleeding heat exchanger in heater and air conditioning units and with vehicle operation.
- Air in coolant lines, coolant hoses or heat exchangers in heater and air conditioning units will cause noise in coolant circuit ⇒ Engine; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

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8.1.2 Incorporation of heater and air conditioner into coolant circuit - vehicles without auxiliary or supplementary heater

- Arrows show direction of coolant flow.

1 - Coolant hose (supply)

- ❑ In plenum chamber

2 - Connection piece for coolant supply from engine

- ❑ Incorporation of heater and air conditioning unit into engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram for coolant hoses

3 - Connection piece for coolant return to engine

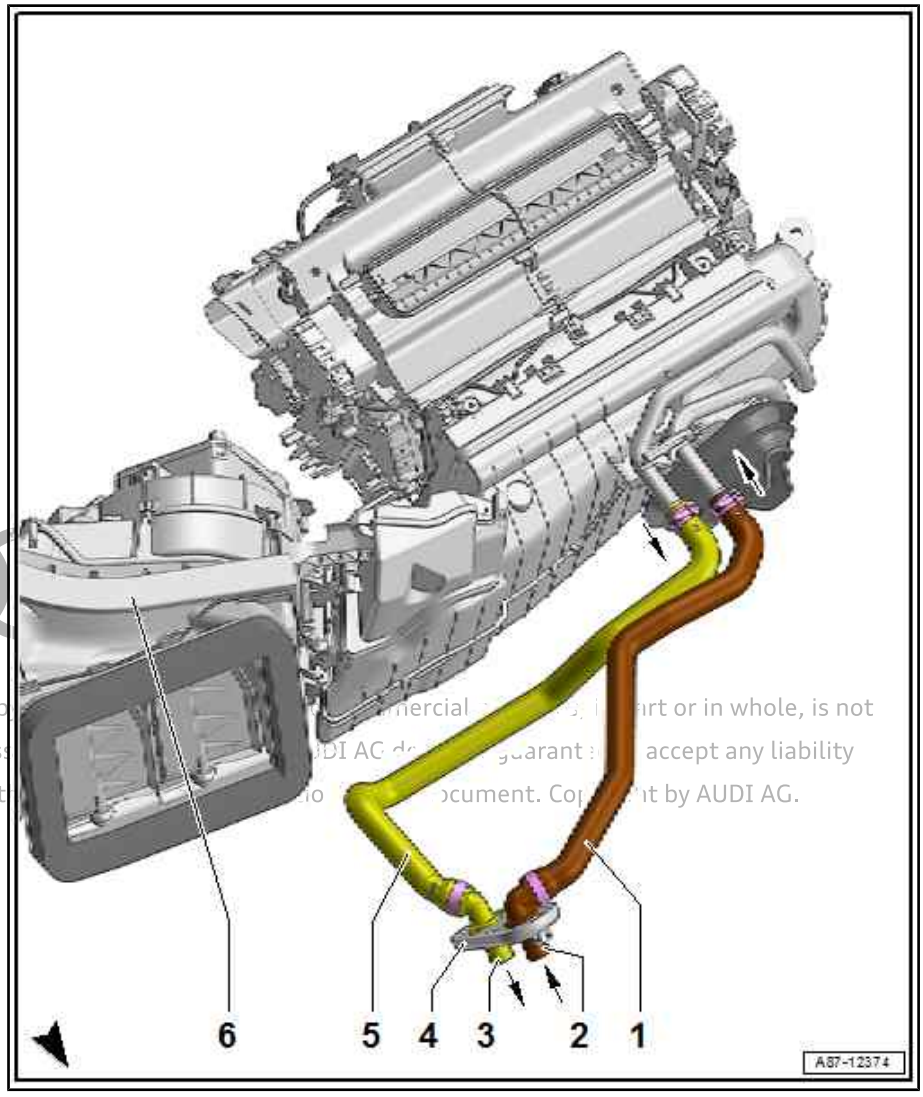
- ❑ Incorporation of heater and air conditioning unit into engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram for coolant hoses

4 - Leadthrough for coolant lines through plenum chamber partition panel

5 - Coolant hose (return)

- ❑ In plenum chamber
- ❑ Depending on version, coolant shut-off valve - N82- may also be fitted in this coolant hose ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

6 - Front heater and air conditioning unit



- ❑ Removing and installing heat exchanger with heater and air conditioning unit installed
  ⇒ “6.12 Removing and installing heat exchanger”, page 267
- ❑ Removing and installing heat exchanger with heater and air conditioning unit removed
  ⇒ “6.1 Exploded view - heater and air conditioning unit”, page 240

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8.1.3 Incorporation of heater and air conditioning unit into coolant circuit - vehicles with auxiliary heater

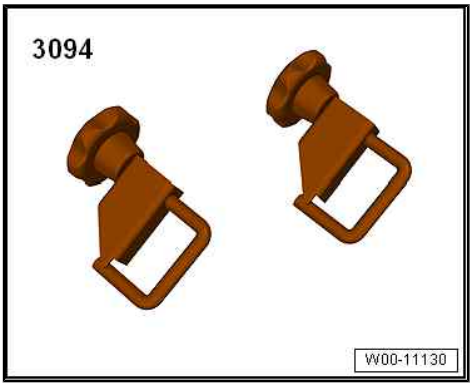
♦ Incorporation of heater and air conditioner as well as auxiliary and supplementary heater into coolant circuit ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Coolant circuit with auxiliary/supplementary heater

8.2 Removing and installing coolant shut-off valve - N82-

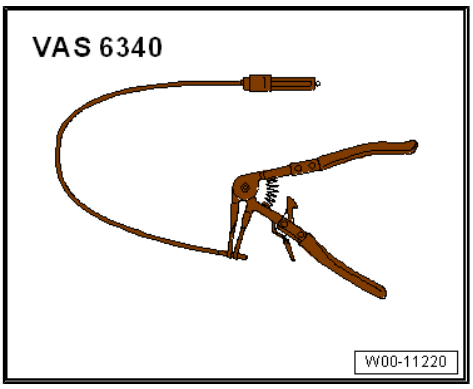
The coolant shut-off valve - N82- -A- is currently only fitted on certain engine versions on the right side of the plenum chamber (currently fitted e.g. on vehicles with 1.8 ltr. and 2.0 ltr. TFSI engine) ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

Special tools and workshop equipment required

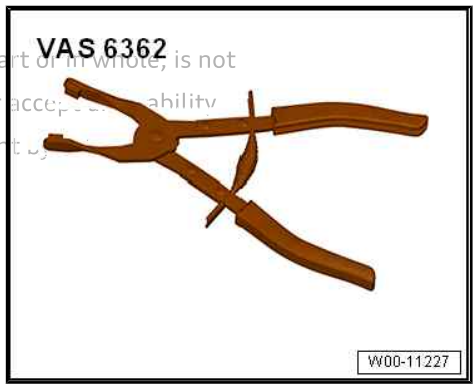
- Hose clamps up to 25 mm - 3094- (or commercially available pinch-off tools)



- Hose clip pliers - VAS 6340-



- Hose clip pliers - VAS 6362-



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Removing

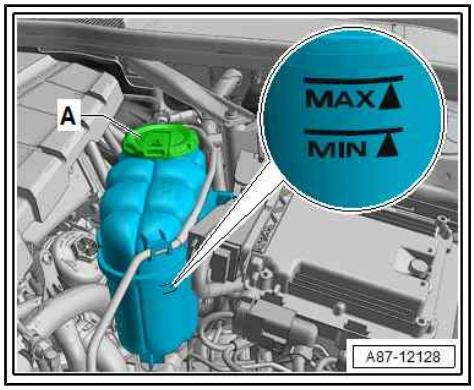
– Switch off ignition.

CAUTION

The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

Danger of scalding skin and other parts of the body.

- **Put on protective gloves.**
- **Put on safety goggles.**
- **Cover filler cap on expansion tank with a cloth and open carefully to release pressure.**



– Carefully open filler cap -A- for coolant expansion tank (do not unscrew completely).

Note

◆ There are different versions of the coolant expansion tank and different layouts in the plenum chamber and engine compartment ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

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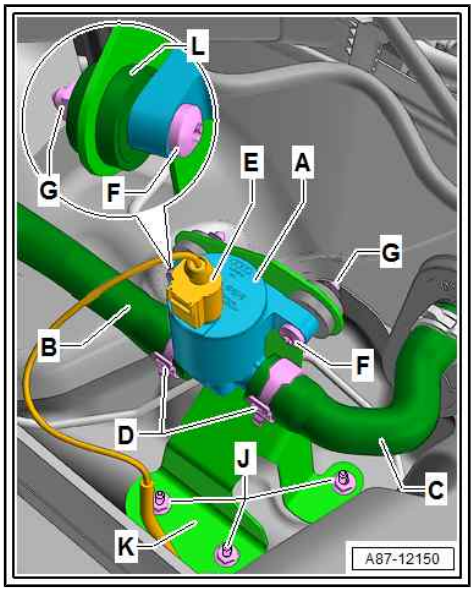
– Cover area beneath connections for coolant hoses -B, C- to coolant shut-off valve - N82- -A- e.g. with absorbent paper.
– Pinch off coolant hoses -B, C- with hose clamps up to 25 mm - 3094- (or using commercially available pinch-off tools).
– Unfasten hose clips -D- and detach coolant hoses -B, C-.
– Unplug electrical connector -E-.
– Remove nuts -G- and bolts -F-.
– Detach shut-off valve -A- with bracket -D-.
– If necessary, remove nuts with washers -J- and detach bracket -K-.



Note

♦ On the Audi Q5, the bracket -K- is only secured with two nuts with washers -J-.

Installing

Install in reverse order of removal; note the following.

Note

♦ As only a small quantity of coolant escapes from the coolant circuit when coolant shut-off valve - N82- is removed (as described above), coolant runs into the coolant shut-off valve - N82- following installation and after removing the hose clamps (also open coolant expansion tank cap).
♦ For noise insulation, the shut-off valve -A- is attached to bracket -K- via rubber bushes -L- (with mounting bushes and packing plates), nuts -G- and bolts -F-.
– Check that rubber bush -L- is seated correctly in bracket -K-.
– Fill up and bleed coolant circuit ⇒ Engine; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

Tightening torque

Component	Tightening torque
Coolant shut-off valve - N82- to bracket	8 Nm
Bracket for coolant shut-off valve - N82- to plenum chamber	8 Nm

8.3 Exploded view - high-voltage heater (PTC) - Z115-

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1 - High-voltage heater (PTC) - Z115-

- ❑ Removing and installing ⇒ “8.4 Removing and installing high-voltage heater (PTC) Z115 (with high-voltage heater (PTC) control unit J848)”, page 310

2 - Bolt

- ❑ 8 Nm

3 - Bracket

4 - Nut

Tightening torque ⇒ Motor; Rep. gr. 93 ; Potential equalisation lines; Overview of fitting locations - potential equalisation lines

5 - Spacer bush

6 - Grommet

7 - Bolt

- ❑ 8 Nm
- ❑ Observe tightening sequence ⇒ “8.4 Removing and installing high-voltage heater (PTC) Z115 (with high-voltage heater (PTC) control unit J848)”, page 310

8 - Washer

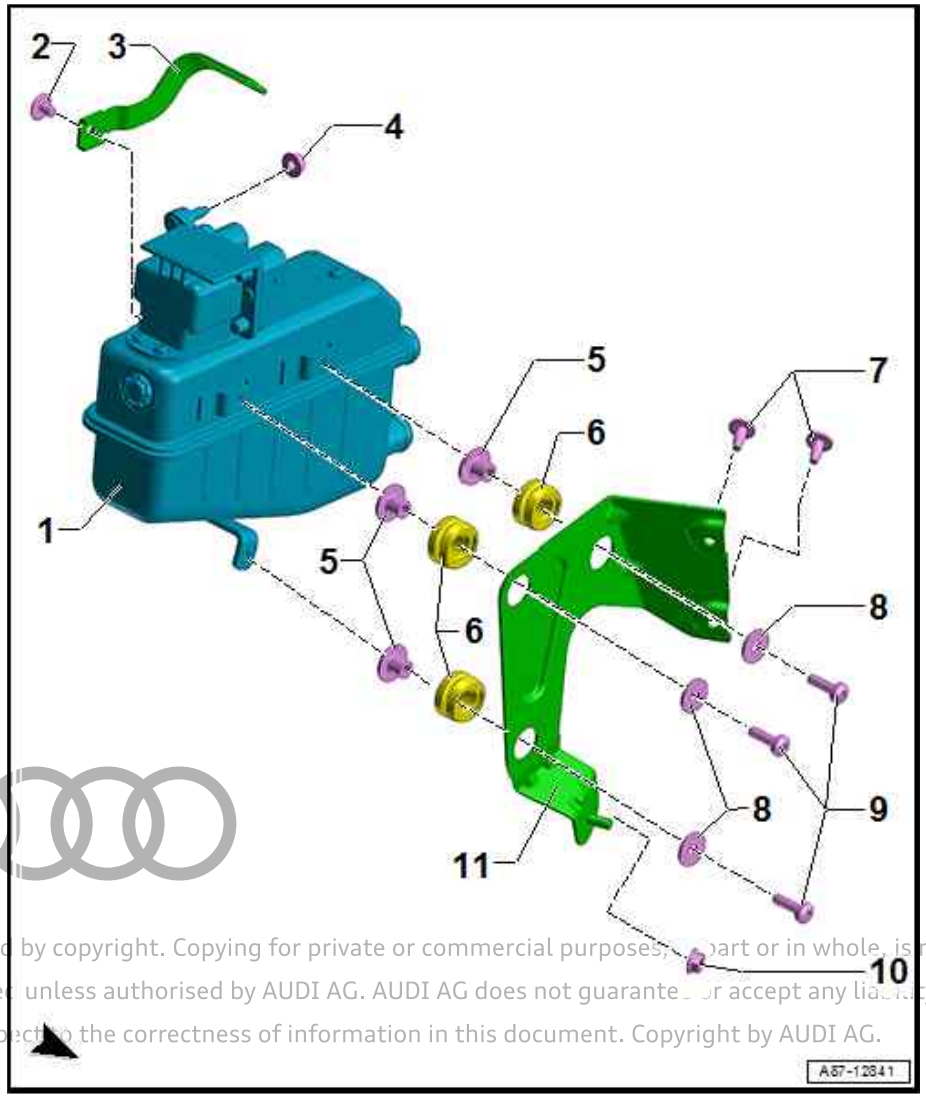
9 - Bolt

- ❑ 8 Nm

10 - Nut

- ❑ 8 Nm
- ❑ Observe tightening sequence ⇒ “8.4 Removing and installing high-voltage heater (PTC) Z115 (with high-voltage heater (PTC) control unit J848)”, page 310

11 - Bracket



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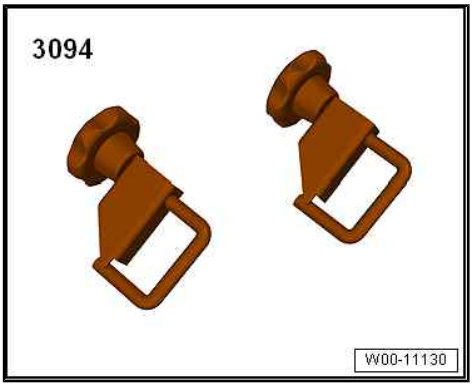
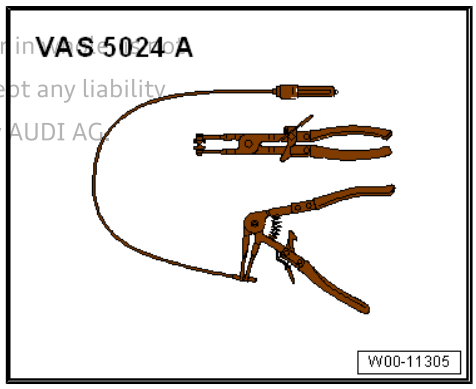
8.4 Removing and installing high-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-)

Special tools and workshop equipment required

♦ Hose clamps up to 25 mm - 3094-



♦ Spring-type clip pliers - VAS 5024A-



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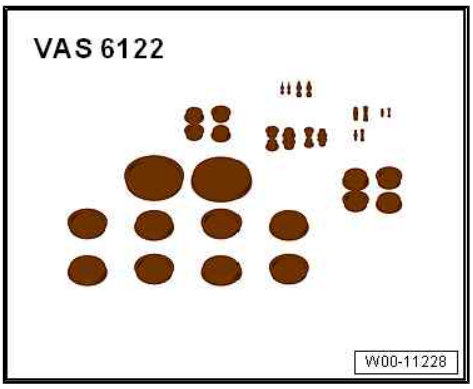
♦ Engine bung set - VAS 6122-



Removing

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “1.3 Safety precautions when working on vehicles with high-voltage system”, page 2 .

DANGER

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

– Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) de-energise the high-voltage system.

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

– Drain cooling system (engine coolant circuit) ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

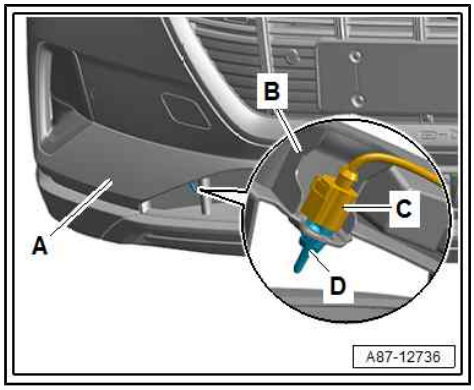
– Clamp off coolant hoses at high-voltage heater (PTC) - Z115- with hose clamps up to 25 mm - 3094- .

Mark arrangement of coolant hoses on connections to high-voltage heater (PTC) - Z115- .

– Line surrounding area with absorbent paper.

– Disconnect coolant hoses from connections to high-voltage heater (PTC) - Z115- ; to do so, release hose clips -1-.

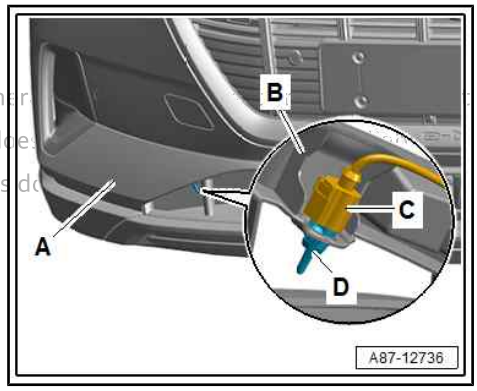
– Seal off connections on high-voltage heater (PTC) - Z115- with plugs (e.g. from engine bung set - VAS 6122-) and use absorbent paper to clean up any coolant which has escaped.



– Unplug electrical connectors -5- (for low voltage).

– Detach electrical connector -3- (high-voltage wire) ⇒ Engine; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Cover electrical connector of high-voltage wire and mating plug at high-voltage heater (PTC) - Z115- to prevent damage and contamination (e.g. with clean plugs from engine bung set - VAS 6122-).



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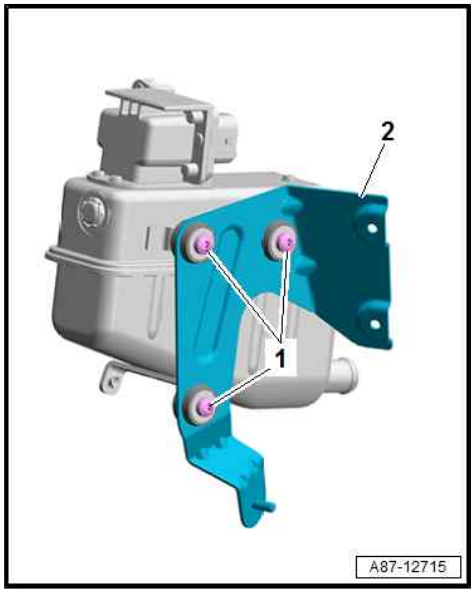
– Remove bolts -2-.

– Remove nut -6- in wheel housing.

– Detach potential equalisation line -4- from high-voltage heater (PTC) - Z115- ⇒ Engine; Rep. gr. 93 ; Potential equalisation lines; Overview of fitting locations - potential equalisation lines .

– Detach high-voltage heater (PTC) - Z115- together with bracket -2-.

– Remove bolts -1- and detach high-voltage heater (PTC) - Z115- from bracket -2-.



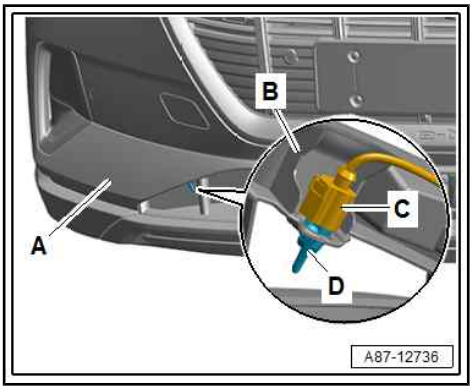
Installing

Installation is carried out in reverse order; note the following:

– Plug in electrical connectors -5- (for low voltage) and -3- (high-voltage wire) at high-voltage heater (PTC) - Z115- ⇒ Engine; Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Check and, if necessary, clean connection point at potential equalisation line -J- and at high-voltage heater (PTC) - Z115- before securing ⇒ Engine; Rep. gr. 93 ; Potential equalisation lines .

– Perform potential equalisation measurement ⇒ Engine; Rep. gr. 93 ; Potential equalisation lines; Overview of fitting locations - potential equalisation lines .



WARNING

High voltage can cause fatal injury.

Danger of severe or fatal injuries from electric shock or electric arcs.

– Have an Audi high-voltage technician (HVT) or an Audi high-voltage expert (HVE) re-energise the high-voltage system.

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

– Fill up and bleed engine coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

Tightening torques

♦ ⇒ “8.3 Exploded view - high-voltage heater (PTC) Z115 ”, page 309

♦ ⇒ Engine; Rep. gr. 93 ; Potential equalisation lines; Overview of fitting locations - potential equalisation lines

9 Operating and display unit

⇒ “9.1 Overview of fitting locations - operating and display unit”, page 314

⇒ “9.2 Removing and installing operating and display unit”, page 314

9.1 Overview of fitting locations - operating and display unit

The fitting locations of the operating and display units are included in the following overviews.

- ⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 37
- ⇒ “1.3 Overview of fitting locations - components in passenger compartment (rear)”, page 39

9.2 Removing and installing operating and display unit

⇒ “9.2.1 Removing and installing operating and display unit for front air conditioning system E87 - Audi A4, Audi A5”, page 314

⇒ “9.2.2 Removing and installing operating and display unit for front air conditioning system E87 - Audi Q5”, page 316

⇒ “9.2.3 Removing and installing rear Climatronic operating and display unit E265 - Audi A4 and Audi A5 models with High air conditioner”, page 317

⇒ “9.2.4 Removing and installing rear Climatronic operating and display unit E265 - Audi Q5 models with High air conditioner”, page 318

9.2.1 Removing and installing operating and display unit for front air conditioning system - E87- - Audi A4, Audi A5

- If the operating and display unit for front air conditioning system - E87- is renewed, the test plan for renewing the operating and display unit for front air conditioning system - E87- must be started before removal ⇒ Vehicle diagnostic tester.

Removing

– Switch off ignition.

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– Detach dash panel trim (right-side) -A- with -E87- -B- from dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

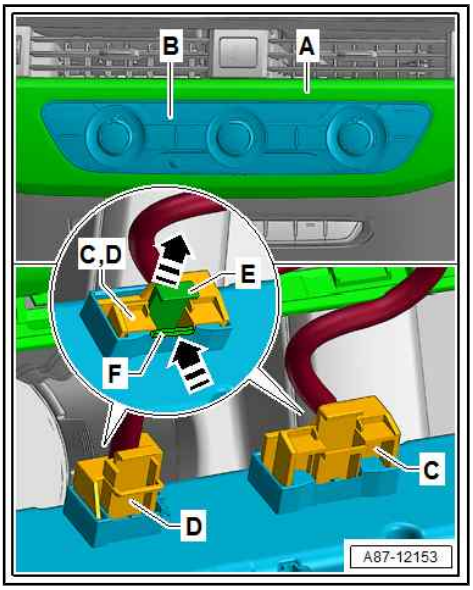
– If there are several identical connectors fitted in this area, mark connectors -C- and -D-.

Note

♦ Different arrangement of connectors -C- and -D- at operating and display unit for front air conditioning system - E87- depending on version; this illustration shows the layout for vehicles with a “Low” air conditioner.

– Pull fastener -E- of connectors -C- and -D- to release it -arrow-.

– Squeeze the fastener of the connectors -C- and -D- to release -arrow- and unplug the connectors.

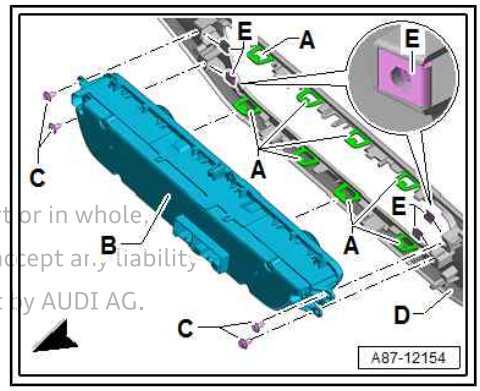


– If fitted, remove bolts -C-.

Note

♦ Depending on version (and if retaining tabs -A- are not holding component in place properly), operating and display unit for front air conditioning system - E87- -B- can also be secured to trim -D- with bolts -C- and speed nuts -E- ⇒ Electronic parts catalogue .

– Release retaining tabs -A- and unfasten operating and display unit for front air conditioning system - E87- -B- from trim -D-.



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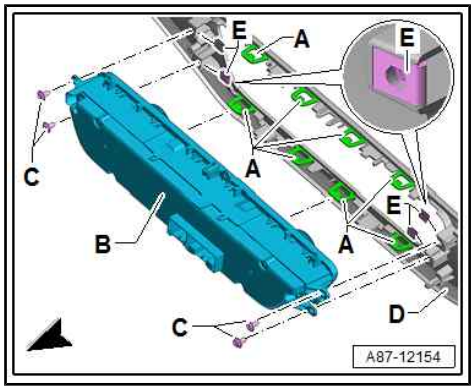
Installing



– Insert operating and display unit for front air conditioning system - E87- -B- in mounting slot on trim -D- and press it in until retaining tabs -A- engage audibly.

– After inserting operating and display unit for front air conditioning system - E87- -B- in trim -C-, check that it is seated correctly in retaining tabs -A-.

• Should the retaining tabs -A- not lock or hold the component in place correctly, the operating and display unit for front air conditioning system - E87- -B- must be secured to trim -D- with bolts -C- and speed nuts -E- (e.g. pan-head bolts 4.0 x 12 mm N 104 159 and speed nuts N 105 110 01) ⇒ Electronic parts catalogue).

– If fitted previously, screw in bolts -C-.

Perform remaining installation steps in reverse sequence; observe the following:

– After installing operating and display unit for front air conditioning system - E87- , check event memory and erase any entries ⇒ Vehicle diagnostic tester.

– If you are renewing the operating and display unit for front air conditioning system - E87- , complete the test plan ⇒ Vehicle diagnostic tester.

Tightening torque

Component	Tightening torque
Operating and display unit for front air conditioning system - E87- to trim	1.5 Nm

9.2.2 Removing and installing operating and display unit for front air conditioning system - E87- - Audi Q5

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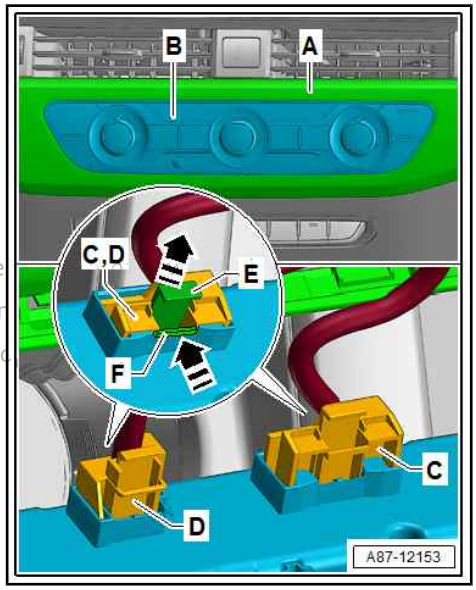
• If the operating and display unit for front air conditioning system - E87- is renewed, the test plan for renewing the operating and display unit for front air conditioning system - E87- must be started before removal ⇒ Vehicle diagnostic tester.

Removing

– Switch off ignition.

– Detach dash panel trim (right-side) -A- with operating and display unit for front air conditioning system - E87- -B- from dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

– If there are several identical connectors fitted in this area, mark connectors -C- and -D-.



Note

♦ Different arrangement of connectors -C- and -D- at operating and display unit for front air conditioning system - E87- depending on version; this illustration shows the layout for vehicles with a “Low” air conditioner.

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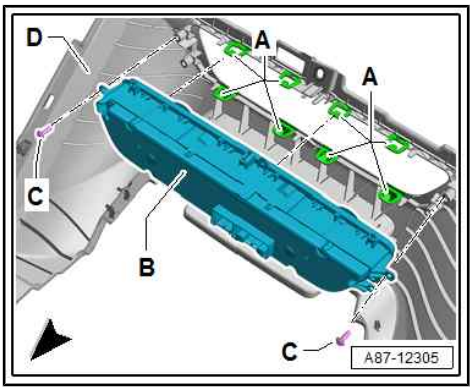
– Pull fastener -E- of connectors -C- and -D- to release it -arrow-.

– Squeeze the fastener of the connectors -C- and -D- to release -arrow- and unplug the connectors.

– Remove bolts -C-.

– Release retaining tabs -A- and unfasten operating and display unit for front air conditioning system - E87- -B- from trim -D-.

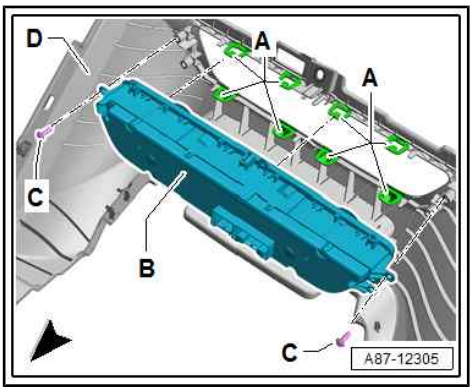


Installing

– Position operating and display unit for front air conditioning system - E87- -B- in guides on trim -D-.

– Slide operating and display unit for front air conditioning system - E87- -B- into trim -D- as far as stop (retaining tabs -A- must engage audibly).

– Screw in bolts -C-.



Perform remaining installation steps in reverse sequence; observe the following:

– After installing operating and display unit for front air conditioning system - E87- , check event memory and erase any entries ⇒ Vehicle diagnostic tester.

– If you are renewing the operating and display unit for front air conditioning system - E87- , complete the test plan ⇒ Vehicle diagnostic tester.

Tightening torque

Component	Tightening torque
Operating and display unit for front air conditioning system - E87- to trim	1.5 Nm

9.2.3 Removing and installing rear Climatronic operating and display unit - E265- -

Audi A4 and Audi A5 models with “High” air conditioner

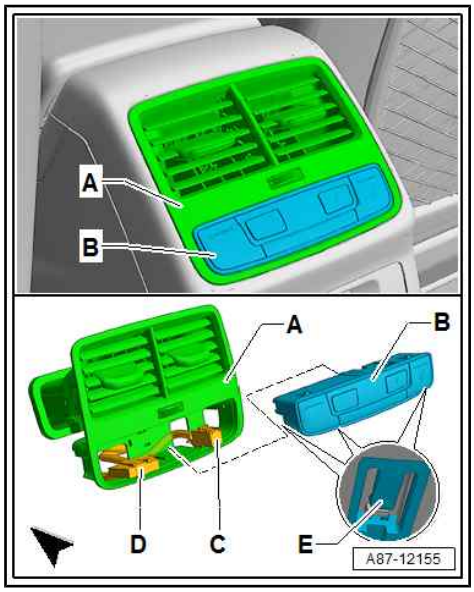
Removing

– Switch off ignition.

– Remove vent in rear centre console -A- ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .

– Unplug connectors -C- and -D- (if fitted) from operating and display unit for rear air conditioning system - E265- -B-.

– Release clips -E- and remove -E265- -B-.



Installing

Installation is carried out in reverse order; note the following:

- When renewing -E265- -B-, pay attention to exact assignment ⇒ Electronic parts catalogue
- Check for proper positioning of the clips -E- on -E265- -B-.

– Interrogate event memory of operating and display unit for front air conditioning system - E87- and erase any faults displayed ⇒ Vehicle diagnostic tester.

9.2.4 Removing and installing rear Climatronic operating and display unit - E265- - Audi Q5 models with “High” air conditioner

Removing

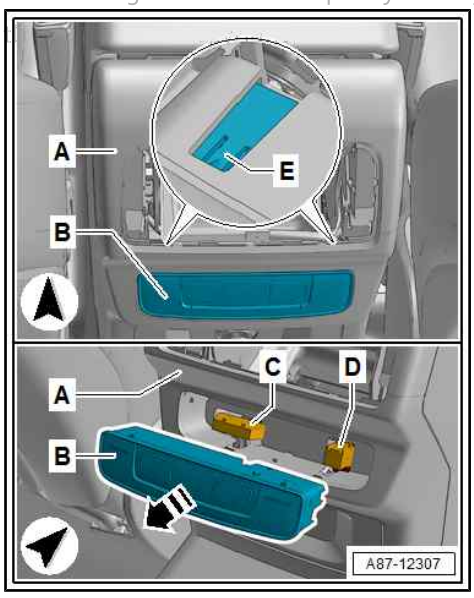
– Switch off ignition.

– Remove vent in rear centre console -A- ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .

– Release clips -E- of operating and display unit for rear air conditioning system - E265- .

– Press operating and display unit for rear air conditioning system - E265- out of rear centre console trim -A- -arrow-.

– Unplug connectors -C- and -D- (if fitted) from operating and display unit for rear air conditioning system - E265- -B-.



Installing

Installation is carried out in reverse order; note the following:

– Interrogate event memory of operating and display unit for front air conditioning system - E87- and erase any faults displayed ⇒ Vehicle diagnostic tester.

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10 Further control components

⇒ “10.1 Removing and installing rear chest vent temperature sensor G537 ”, page 319

⇒ “10.2 Removing and installing vent temperature sender for rear left footwell G637 ”, page 321

⇒ “10.3 Removing and installing sunlight penetration photosensor G107 ”, page 321

⇒ “10.4 Removing and installing humidity sender in fresh air intake duct G657 / air quality sensor G238 ”, page 323

⇒ “10.5 Removing and installing ambient temperature sensor G17 ”, page 325

⇒ “10.6 Removing and installing front chest vent temperature sensor G385 / G386 ”, page 326

⇒ “10.8 Removing and installing right footwell vent temperature sender G262 ”, page 329

⇒ “10.9 Removing and installing evaporator output temperature sender G263 ”, page 330

⇒ “10.10 Removing and installing sensors G355 / G397 / G107 ”, page 331

⇒ “10.11 Removing and installing thermal management control unit J1024 ”, page 331

10.1 Removing and installing rear chest vent temperature sensor - G537-

⇒ “10.1.1 Removing and installing rear chest vent temperature sensor G537 - Audi A4, Audi A5”, page 319

⇒ “10.1.2 Removing and installing rear chest vent temperature sensor G537 - Audi Q5”, page 320

10.1.1 Removing and installing rear chest vent temperature sensor - G537- - Audi A4, Audi A5

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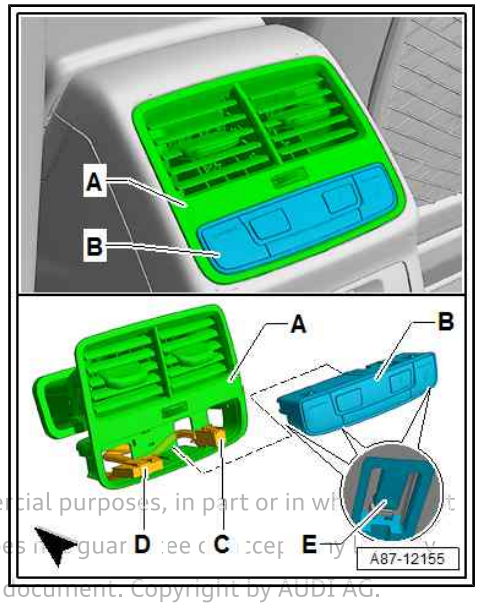
Rear chest vent temperature sensor - G537- is only fitted on some equipment versions.

Removing

– Switch off ignition.

– Remove vent in rear centre console -A- ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .
– Unplug connectors -C- and -D- (if fitted) from operating and display unit for rear air conditioning system - E265- -B-.



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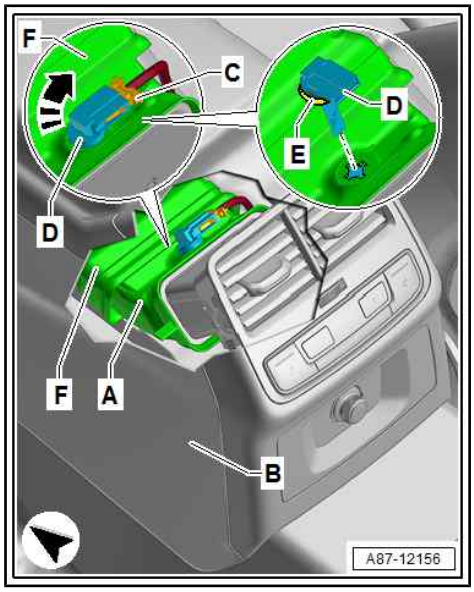
– Unfasten the rear air duct -A- from the air duct -F- and remove.
– Unplug the connector -C-.
– Turn sender -D- 90° -arrow- and remove.

Installing

Installation is carried out in reverse order; note the following:

– Check that seal -E- is not damaged and is seated correctly.



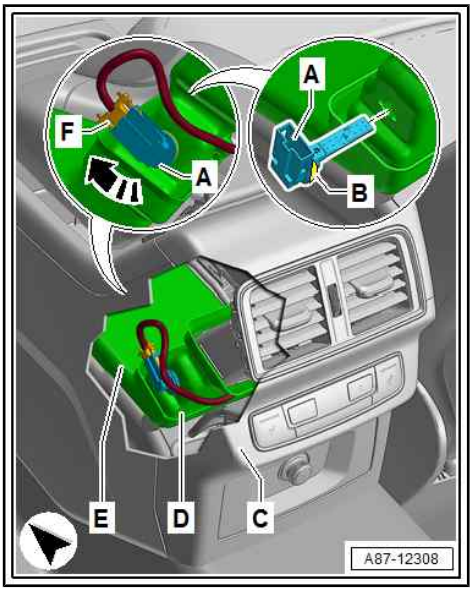
10.1.2 Removing and installing rear chest vent temperature sensor - G537- - Audi Q5

Rear chest vent temperature sensor - G537- is only fitted on some equipment versions.

Removing

– Switch off ignition.
– Remove rear centre console trim -C- ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console trim (rear) .

– Unfasten and remove air duct (rear) -D- from air duct -E-.
– Turn sender -A- 90° -arrow-.
– Unplug electrical connector -F-.
– Remove sender -A- from air duct -D-.



Installing

Installation is carried out in reverse order; note the following:

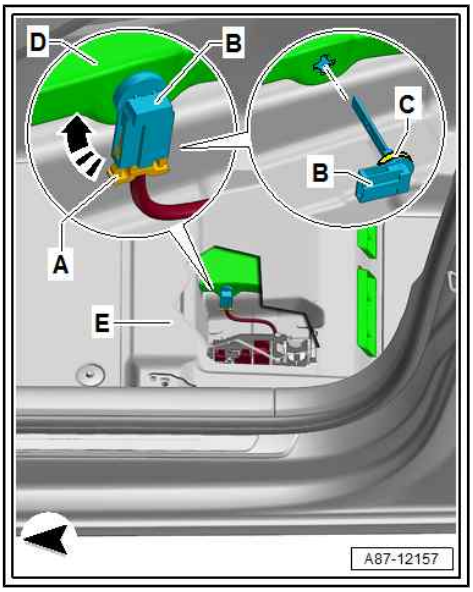
– Check seal -B- for damage and make sure it is seated correctly.

10.2 Removing and installing vent temperature sender for rear left footwell - G637-

-G637- is only fitted on vehicles with “High” air conditioner. The installation opening in the air duct may be open or sealed on a vehicle with a “Low” air conditioner (or with a heater with no air conditioner).

Removing

– Move front left seat to rearmost position.
– Switch off ignition.
– Remove the cover for the opening in the floor covering on the left ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .
– Carefully lift the floor covering on the left -E- at the opening so as to provide access to -G637- -B- (fitted in the air duct to the rear left footwell vent -D-).
– Turn sender -B- 90° and remove it from air duct to rear left footwell vent -D-.
– Release and unplug connector -A-.



Installing

Installation is carried out in the reverse order; note the following:

– Check that seal -C- is not damaged and is seated correctly.

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10.3 Removing and installing sunlight penetration photosensor - G107-

♦ Depending on the vehicle model, the sunlight penetration photosensor - G107- is no longer installed in the defroster vent; from 2016/2017 onwards, it is installed in the mirror base ⇒ “10.10 Removing and installing sensors G355 / G397 / G107 ”, page 331 . It is possible that a sunlight penetration photosensor - G107- is still fitted in the defroster vent in vehicles

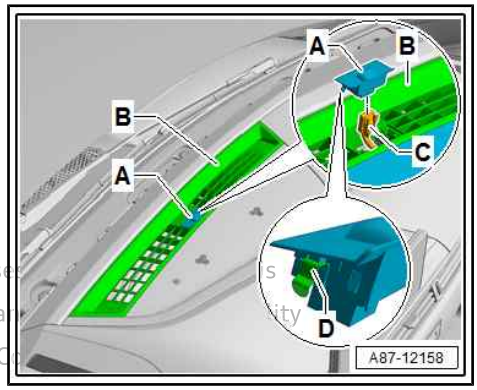
manufactured in the transition period; however, this sensor will not be wired up.

- On Audi Q5 vehicles, the sunlight penetration photosensor - G107- is always installed in the mirror base
⇒ “10.10 Removing and installing sensors G355 / G397 / G107 ”, page 331 .

Removing

– Switch off ignition.

– Using e.g. a small screwdriver, carefully prise sunlight penetration photosensor - G107- -A- out of defroster vent -B- (for windscreen).



Note

- Sunlight penetration photosensor - G107- -A- is held in position by clips -D- of defroster vent -B-.

– Release and detach connector -C-.

Installing

Installation is carried out in reverse sequence.

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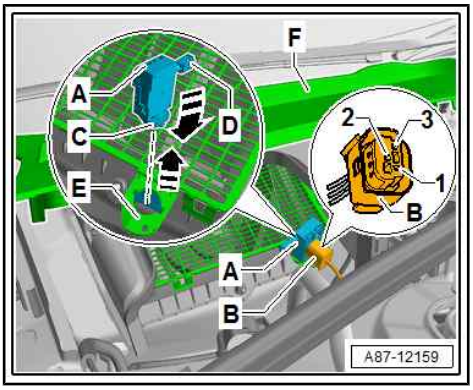
10.4 Removing and installing humidity sender in fresh air intake duct - G657- / air quality sensor - G238-



- There are different versions of -G238- / -G657- -A-; therefore pay attention to correct assignment ⇒ Electronic parts catalogue .
- -G238- (with -G657-) is only fitted on vehicles with “High” air conditioner ⇒ Electronic parts catalogue .
- Vehicles with “High” air conditioners are fitted with a sensor -A- on which -G238- -C- is combined with -G657- -D- in one component ⇒ Electronic parts catalogue and ⇒ Audi sales literature .
- Vehicles with “Low” air conditioner (or no air conditioner, heater only) only have a sensor -A- with -G657- -D- but with no -G238- -C- ⇒ Electronic parts catalogue and ⇒ Audi sales literature
- There are different versions of fresh air intake depending on the vehicle version ⇒ Electronic parts catalogue . The fitting location of -G238- (with -G657-) -A- also differs depending on the version of the fresh air intake ⇒ “7.8 Removing and installing fresh air intake”, page 300 . This and the following illustrations show -G238- (with -G657-) -A- for a fresh air intake of the type fitted at the start of production.
- The sensor -A- (combined sensor comprised of -G238- and -G657-) is a highly sensitive electronic component which could be irreparably damaged by direct exposure to fluids, solvents, fuels and certain chemical compounds (contamination may ingress e.g. via area -C- or -D-). In addition, direct contact with water can impair the function of -G657- to such an extent that the values for humidity levels can no longer be measured correctly (either temporarily or permanently, depending on the composition of the fluid). Sensors that have come into contact with such substances must not be installed in the vehicle.
- Following removal, do not set down -G238- / -G657- in areas where it could come into contact with solvents, fuels or certain chemical compounds (liquids or vapours).

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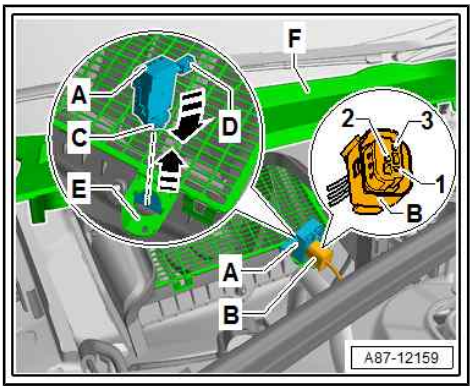
Removing

– Switch off ignition.

– Detach plenum chamber cover -F- from vehicle at front right and carefully raise it slightly ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

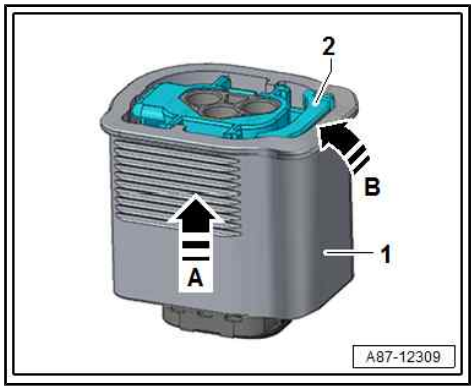


– Turn -G238- / -G657- -A- approx. 90° and remove it from mounting at fresh air intake -E-.

– Unplug electrical connector -B- from sensor -A-.

Note

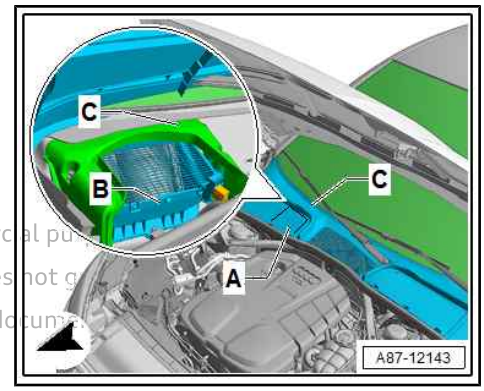
- To unplug connector, pull connector housing -1- in direction of -arrow A-.
- If this is not possible, connector can be unplugged by pressing retaining hook -2- in direction of -arrow B- and then pulling connector housing -1- in direction of -arrow A-.



Installing

Installation is carried out in reverse order; note the following:

- The plenum chamber cover -A- and the outer cover (drip rail) -C- must be intact to stop water running into the heater and air conditioning unit via the intake box -B- with the plenum chamber cover -A- fitted. The plenum chamber cover -A- must also be properly and fully engaged in the lower windscreen frame -D-.
- The intake grille must be intact (check) to stop foreign matter (e.g. leaves) entering into the intake box -B-.
- Depending on the model, a dust filter may be fitted in the filter mount instead of the grille for certain countries with a high dust impact level in the ambient air (e.g. for China). The dust filter is designed to stop the fresh air blower - V2- from drawing in dust and sand. For correct version refer to ⇒ Electronic parts catalogue .



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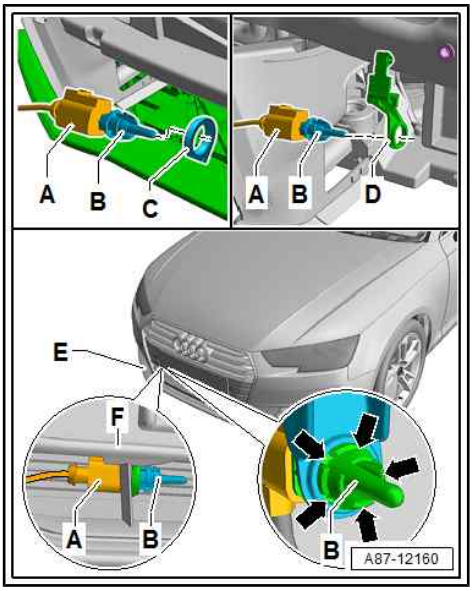
10.5 Removing and installing ambient temperature sensor - G17-



Removing

- There are different versions of the front bumper cover -E- and the bottom air intake grille -F-. The removal operations differ depending on the version of these components and the attachment of -G17- -B-.
- Depending on the vehicle model, the bracket for -G17- -B- may be part of the air duct (bottom) of the bumper -C- or of the air intake grille (bottom) -F-. However, -G17- -B- may also be attached to the impact bar of the bumper via bracket -D- ⇒ Electronic parts catalogue .
- Depending on the model, the bracket for the temperature sensor -D- is either clipped directly into the impact bar of the bumper or secured with a fastener.

– Switch off ignition.

If -G17- -B- is not accessible from the front by way of the bottom air intake grille -F-:

– Remove bumper cover (front) -E- ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .

– Unplug the connector -A- at the temperature sensor -B-.

– Carefully squeeze the retaining clips -arrows- and release the temperature sensor -G17- -B- from the mount.

If -G17- -B- is accessible from the front by way of the bottom air intake grille -F-:

– Unplug the connector -A- at the temperature sensor -B-.

– Carefully squeeze the retaining clips -arrows- and release the temperature sensor -G17- -B- from the mount.

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Installing

Installation is carried out in reverse order; note the following:

– Check that temperature sensor -B- is positioned correctly in bracket.

10.6 Removing and installing front chest vent temperature sensor - G385- / -G386-

⇒ “10.6.1 Removing and installing front left chest vent temperature sensor G385 - vehicles with Low air conditioner (or without air conditioner)”, page 326

⇒ “10.6.2 Removing and installing front left chest vent temperature sensor G385 - vehicles with High air conditioner”, page 327

⇒ “10.6.3 Removing and installing front right chest vent temperature sensor G386 ”, page 328

10.6.1 Removing and installing front left chest vent temperature sensor - G385- - vehicles with “Low” air conditioner (or without air conditioner)

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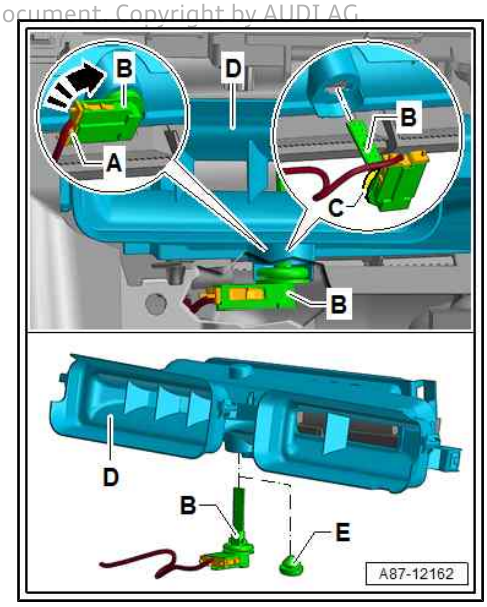
- ♦ - G385- -B- is only fitted on vehicles with “Low” air conditioner (or without air conditioner, heater only) in air duct to centre dash panel vents -D- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ♦ - G385- is fitted on vehicles with “High” air conditioner in air duct to dash panel vent (left-side) ⇒ “10.6.2 Removing and installing front left chest vent temperature sensor G385 - vehicles with High air conditioner”, page 327 .
- ♦ On vehicles with “High” air conditioner, there is either no opening in air duct -D- for - G385- -B-, or opening is sealed with plug -E- ⇒ Electronic parts catalogue .



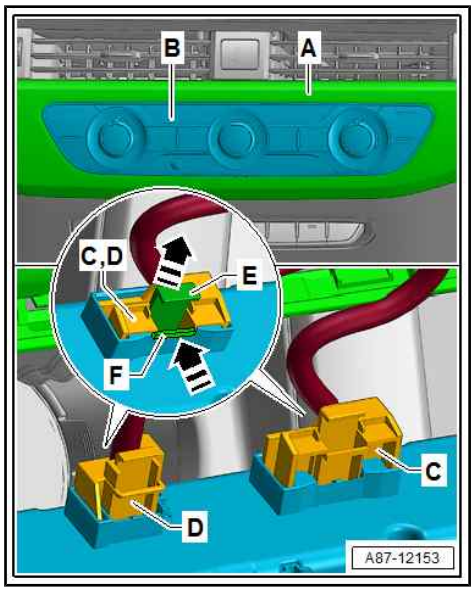
Removing:

– Move front seats as far back as they will go.

– Switch off ignition.

– Detach dash panel trim (right-side) -A- with -E87- -B- from dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .

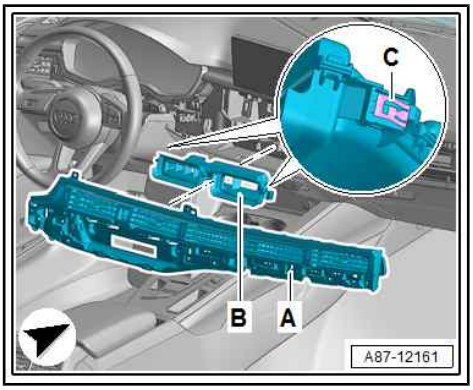
– Unplug connector from operating and display unit for front air conditioning system - E87- ⇒ “9.2.1 Removing and installing operating and display unit for front air conditioning system E87 - Audi A4, Audi A5”, page 314 .



– Remove dash panel vent (right-side) / wide air outlet -A- ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel .
– Remove the air duct to the centre dash panel vents -B-.

Note

♦ The air duct -B- is secured with 2 retaining clips -C- (left and right).

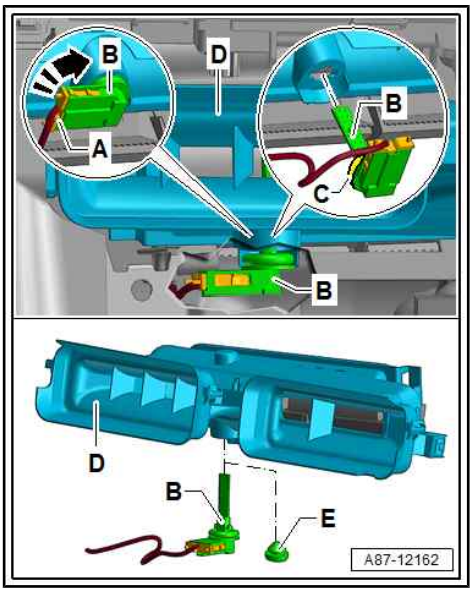


– Reach into opening in dash panel, and release and unplug connector -A-.
– Turn sender -B- 90° and remove it from air duct -D-.

Installing

Installation is carried out in reverse order; note the following:

– Check that seal -C- is not damaged and is seated correctly.



10.6.2 Removing and installing front left chest vent temperature sensor - G385- - vehicles with “High” air conditioner

♦ Front left chest vent temperature sensor - G385- is only fitted in air duct to dash panel vent (left-side) on vehicles with “High” air conditioner ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

♦ On vehicles with “Low” air conditioner (or without air conditioner, heater only), front left chest vent temperature sensor - G385- is fitted in air duct to dash panel vent (centre) ⇒ “10.6.1 Removing and installing front left chest vent temperature sensor G385 - vehicles with Low air conditioner (or without air conditioner)”, page 326 .

♦ On vehicles with “Low” air conditioner (or without air conditioner, heater only), there is either no opening in air duct for front left chest vent temperature sensor - G385- , or opening is sealed with a plug ⇒ Electronic parts catalogue .

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Removing

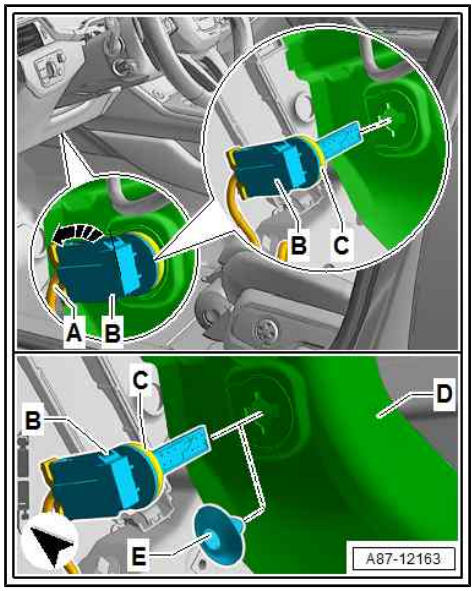
– Move front left seat to rearmost position.

– Switch off ignition.

– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

– Reach behind dash panel, and release and unplug connector -A-.

– Turn sender -B- 90° and remove it from air duct -D-.



Installing

Installation is carried out in reverse order; note the following:

– Check that seal -C- is not damaged and is seated correctly.

10.6.3 Removing and installing front right chest vent temperature sensor - G386-

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♦ Front right chest vent temperature sensor - G386- is only fitted in air duct to dash panel vent (right-side) (and to wide air outlet) on vehicles with “High” air conditioner ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

♦ On vehicles with “Low” air conditioner (or without air conditioner, heater only), there is either no opening in air duct for front right chest vent temperature sensor - G386- , or opening is sealed with a plug ⇒ Electronic parts catalogue .

Removing

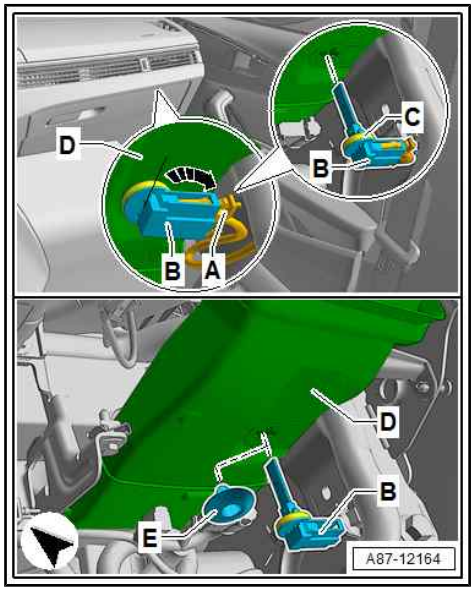
– Move front right seat to rearmost position.

– Switch off ignition.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Reach behind dash panel, and release and unplug connector -A-.

– Turn sender -B- 90° and remove it from air duct -D-.

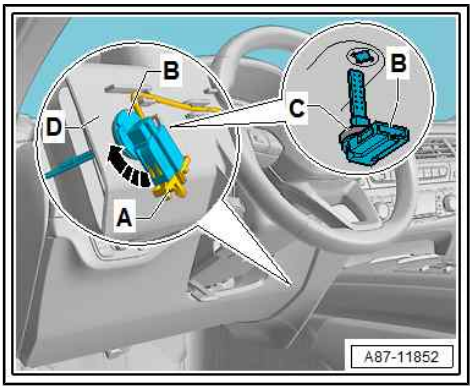


Installing

Installation is carried out in reverse order; note the following:

– Check that seal -C- is not damaged and is seated correctly.

10.7 Removing and installing left footwell vent temperature sender - G261-



Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Remove left footwell vent (driver side) ⇒ "7.3 Removing and installing footwell vent (driver side)", page 296 .

– Reach behind dash panel, and release and unplug connector -A-.

– Turn sender -B- 90° and remove it from air duct of heater and air conditioning unit -D-.

Installing

Installation is carried out in reverse order; note the following:

– Check that seal -C- is not damaged and is seated correctly.

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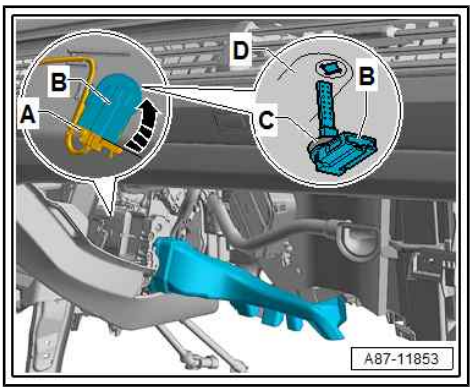
10.8 Removing and installing right footwell vent temperature sender - G262-

♦ Right footwell vent temperature sender - G262- is only fitted in vehicles with "High" air conditioner ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

♦ On vehicles with "Low" air conditioner (or without air conditioner, heater only), there is either no opening in heater and air conditioning unit for right footwell vent temperature sender - G262- , or opening is sealed (e.g. with a plug) ⇒ "10.6.1 Removing and installing front left chest vent temperature sensor G385 - vehicles with Low air conditioner (or without air conditioner)", page 326 and ⇒ Electronic parts catalogue .



Removing

– On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Remove right footwell vent (passenger side) ⇒ "7.4 Removing and installing footwell vent (front passenger side)", page 296 .

– Reach behind dash panel, and release and unplug connector -A-.

– Turn sender -B- 90° and remove it from air duct of heater and air conditioning unit -D-.

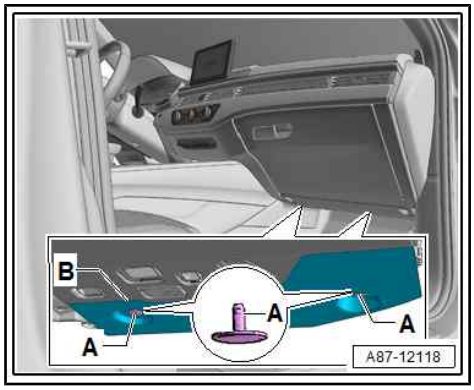
Installing

Installation is carried out in reverse order; note the following:

– Check that seal -C- is not damaged and is seated correctly.

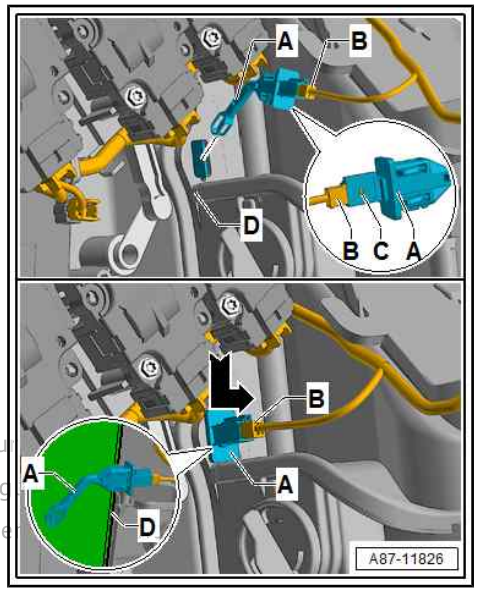
10.9 Removing and installing evaporator output temperature sender - G263-

On right-hand drive vehicles, the evaporator output temperature sender - G263- is installed from the left of the evaporator housing of the heater and air conditioning unit (in the area behind the coolant pipes to the heat exchanger).



Removing

- On vehicles with high-voltage system, switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .
- Set front passenger seat to rearmost position.
- Switch off ignition.
- Remove threaded fasteners -A-.
- Unfasten and detach insulating mat -B- from air intake box of heater and air conditioning unit.
- Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .
- If fitted, remove air duct for glove box cooling ⇒ "7.5 Removing and installing air duct for glove box cooling", page 297 .
- Remove right footwell vent (passenger side) ⇒ "7.4 Removing and installing footwell vent (front passenger side)", page 296 .



- Detach evaporator output temperature sender - G263- -A- (with connector -B- plugged in) from evaporator housing on heater and air conditioning unit -arrow- and remove.
- Release catch -C- and unplug connector -B-.

Installing

Installation is carried out in reverse order; note the following:

- Insert evaporator output temperature sender - G263- -A- in mounting of evaporator housing -D- in correct position and check that it is seated securely.

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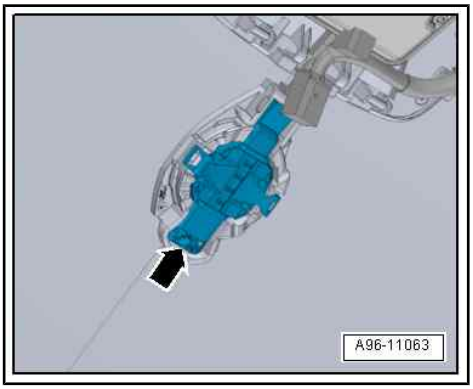
10.10 Removing and installing sensors - G355- / -G397- / -G107-



- Depending on the vehicle model, the sunlight penetration photosensor - G107- is no longer installed in the defroster vent; from 2016/2017 onwards, it is installed in the mirror base. It is possible that a sunlight penetration photosensor - G107- is still fitted in the defroster vent in vehicles manufactured in the transition period; however, this sensor will not be wired up and will not function
⇒ “10.3 Removing and installing sunlight penetration photosensor G107 ”, page 321 .
- On Audi Q5 vehicles, the sunlight penetration photosensor - G107- is always installed in the mirror base.
- On Audi Q5 vehicles, the sunlight penetration photosensor - G107- is combined as one unit with the humidity sender - G355- and the rain and light sensor - G397- (depending on equipment version) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Depending on the equipment version, the sunlight penetration photosensor - G107- and the humidity sender - G355- (vehicles with automatic air conditioner) as well as the rain and light sensor - G397- are fitted in the mirror base ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- The humidity sender - G355- and the sunlight penetration photosensor - G107- are integrated in the rain and light sensor - G397- and cannot be renewed separately if they are defective ⇒ Electronic parts catalogue .
- The removal procedure for the rain and light sensor - G397- (with sunlight penetration photosensor - G107- and humidity sender - G355-) is described in different assembly groups (depending on the vehicle).

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– Renew rain and light sensor - G397- (with humidity sender - G355- and sunlight penetration photosensor - G107-) ⇒ General body repairs, exterior; Rep. gr. 64 ; Windscreen; Exploded view - windscreen , or ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system .

10.11 Removing and installing thermal management control unit - J1024-

- If thermal management control unit - J1024- is being renewed, test plan for renewal of thermal management control unit - J1024- must be started before control unit is removed ⇒ Vehicle diagnostic tester.

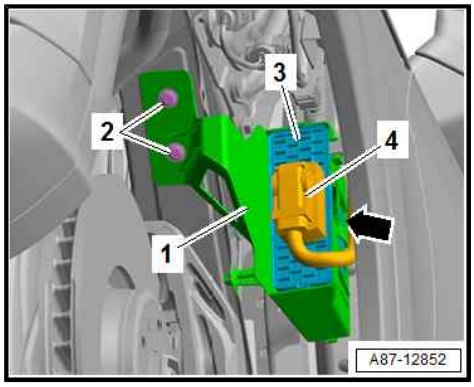
Removing

– Switch off (deactivate) auxiliary air conditioner function ⇒ Owner's Manual .

– Switch off ignition.

– Remove wheel housing liner (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

– Release and unplug electrical connector -4-.
– Release tab -arrow- and take control unit -3- out of bracket -1- towards front.
– To remove bracket, pull out both fasteners -2-, disengage bracket and detach it towards front.



Installing

Installation is carried out in reverse order; note the following:

– If thermal management control unit - J1024- is being renewed, complete test plan ⇒ Vehicle diagnostic tester.

Tightening torques

♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

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