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Workshop Manual

Audi A3 2013 ➤,
Audi A3 Cabriolet 2015 ➤,
Audi A3 Limousine 2014 ➤,
Audi A3 Limousine China 2014 ➤,
Audi A3 Sportback 2013 ➤,
Audi A3 Sportback China 2014 ➤,
Audi Q2 2016 ➤, Audi Q2 China 2019 ➤

Heating, air conditioning

Edition 04.2019

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 Identification

(ARL006396; Edition 04.2019)

⇒ “1.1 Identification of heater and air conditioning unit”, page 1

1.1 Identification of heater and air conditioning unit

⇒ “1.1.1 Identification of Valeo heater and air conditioning unit”, page 1

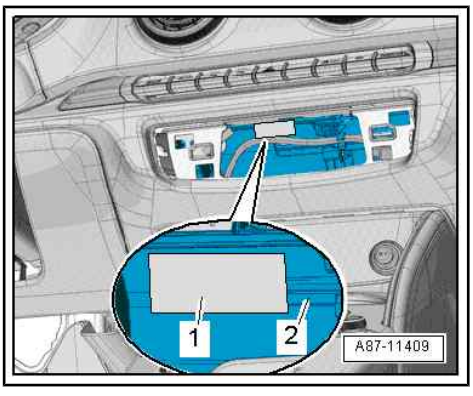
⇒ “1.1.2 Identification of Denso heater and air conditioning unit”, page 2

1.1.1 Identification of Valeo heater and air conditioning unit

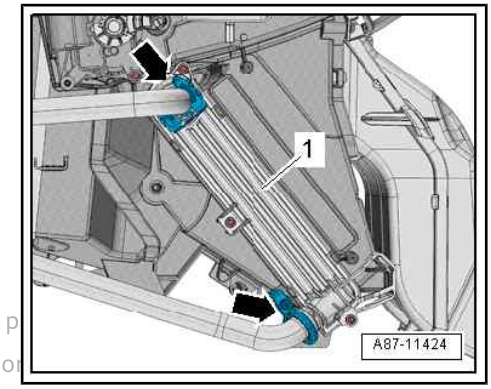
At the start of production, this vehicle was only fitted with “Valeo” heaters and air conditioning units. Later this vehicle may also be fitted with “Denso” heaters and air conditioning units (introduction not yet finalised).

Note

When renewing the components, make sure they are correctly allocated; the combination of components by different manufacturers is not permitted ⇒ Electronic parts catalogue .



- The manufacturer's sticker -1- on the heater and air conditioning unit -2- is visible only after the operating unit has been removed.
- The coolant pipe separation point -arrows- is located directly at the heat exchanger -1-.



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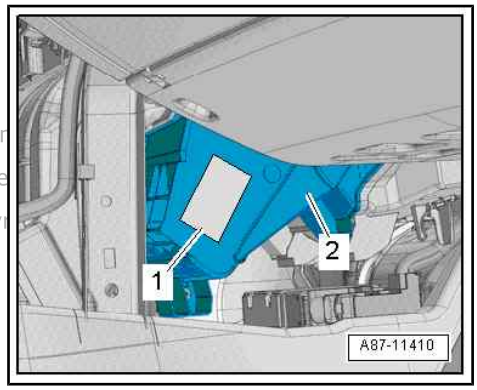
1.1.2 Identification of Denso heater and air conditioning unit

At the start of production, this vehicle was only fitted with “Valeo” heaters and air conditioning units. Later this vehicle may also be fitted with “Denso” heaters and air conditioning units (introduction not yet finalised).

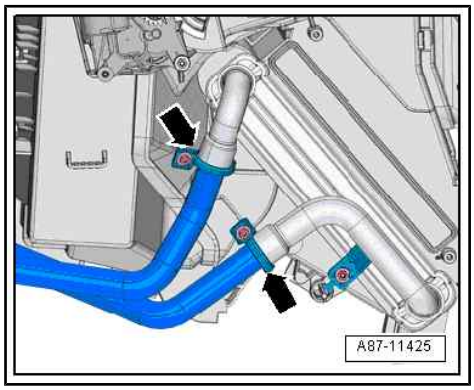
Note

When renewing the components, make sure they are correctly allocated; the combination of components by different manufacturers is not permitted ⇒ Electronic parts catalogue .

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- The manufacturer's sticker -1- on the heater and air conditioning unit -2- is visible only after the centre console has been removed.
- The coolant pipe separation point -arrows- is integrated into the coolant pipes.



2 General notes

⇒ “2.1 Type plates”, page 3

⇒ “2.2 Notes on odours in vehicles without air conditioner”, page 5

⇒ “2.3 Notes on odours in vehicles with air conditioner”, page 6

⇒ “2.4 Notes on operation of auxiliary/supplementary heater on vehicles with diesel engine”, page 8

⇒ “2.5 Seat heating”, page 10

⇒ “2.6 Heated rear window”, page 12

⇒ “2.7 Neck heating”, page 14

⇒ “2.8 Auxiliary air conditioner - vehicles with high-voltage system only”, page 16

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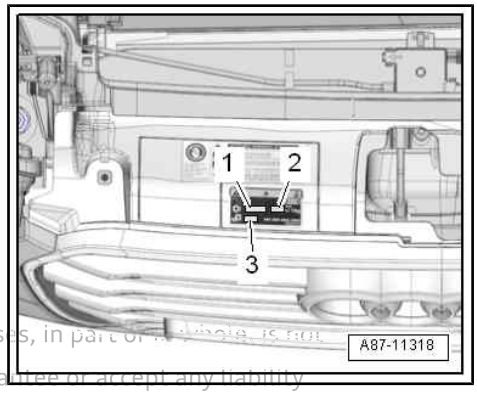
2.1 Type plates

The type plate indicating the type of refrigerant and the refrigerant capacity is located on the top right of the bumper cover.

Note

- *The label indicates the type of refrigerant used and the quantity of refrigerant and refrigerant oil with which the system was charged during production.*
- *Symbols on the label indicate the hazards which may be encountered when handling the refrigerant or working on the refrigerant circuit.*
- *For all air conditioners up to 06/2016, the refrigerant circuit is charged with refrigerant R134a. From 06/2016 onwards (gradual introduction), refrigerant R134a or R1234yf may be used, depending on the country version and vehicle model ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Laws and regulations .*
- *Standards and regulations may also be listed, such as certain SAE standards applicable in the USA. SAE J639 specifies the safety warnings for air conditioners in passenger cars. SAE J842 specifies that all components and materials must be approved for use with refrigerant R1234yf; SAE J2845 states that only trained and certified individuals may perform repairs and service on the refrigerant circuit of the air conditioner.*
- *Depending on the version and production period, the GWP (global warming potential) value may be included for the refrigerant used.*
- *The capacities and type of refrigerant oil listed on the label apply to the status at the time of the vehicle's production. Always refer to the vehicle-specific Workshop Manual for the current applicable values ⇒ “5 Technical data”, page 88 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ Air conditioners with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*

Version 1



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

2 - Refrigerant capacity

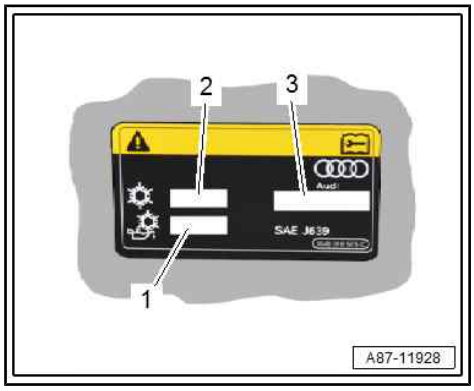
3 - Refrigerant oil designation, in this case PAG oil; for further details refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical and physical principles .

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Note

- *For refrigerant R134a and refrigerant oil capacities, as well as approved refrigerant oils, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *For refrigerant R1234yf and refrigerant oil capacities as well as approved refrigerant oils, refer to ⇒ "5 Technical data", page 88 , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Technical data .*

Version 2



1 - Refrigerant oil designation, in this case PAG oil (for further information, refer to ⇒ "5.2 Approved refrigerant oils and refrigerant oil capacities", page 90).

2 - Refrigerant designation, e.g. R134a or R1234yf (depending on production date and version). Depending on the type plate version and vehicle production period, the GWP (global warming potential) value may be included for the refrigerant used ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems ("Refrigerant R134a", "Environmental aspects for refrigerant R134a"), ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical and physical principles .

3 - Refrigerant capacity

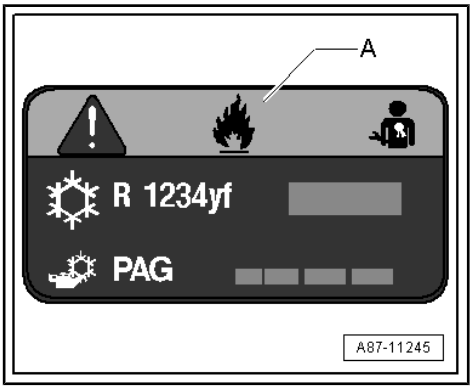
Note

- *For refrigerant R134a and refrigerant oil capacities, as well as approved refrigerant oils, refer to ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *For refrigerant R1234yf and refrigerant oil capacities as well as approved refrigerant oils, refer to ⇒ "5 Technical data", page 88 , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Technical data .*

Version 3

Note

Explanation of information on label -A- ⇒ page 4 .



2.2 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 329 . ♦ Deposits (leaves, pine needles etc.) may have accumulated in plenum chamber. – Check plenum chamber for deposits ⇒ page 333 . ♦ Water may not be able to drain out of plenum chamber. – Check water drains ⇒ page 333 .
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 293 .

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2.3 Notes on odours in vehicles with air conditioner

Odours coming from the air conditioner can have various causes. Not all of these odours originate in the evaporator of the 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 air conditioner 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 air conditioning unit ⇒ page 329 ♦ Deposits (leaves, pine needles etc.) may have accumulated in plenum chamber. – Check plenum chamber for deposits ⇒ page 333 . ♦ Water may not be able to drain out of plenum chamber. – Check water drains ⇒ page 333 .
Odour from air conditioning unit	♦ Too much water condensation in air conditioning unit – Check condensation drain ⇒ page 313 . ♦ Old or severely contaminated dust and pollen filter – Check dust and pollen filter ⇒ page 293 . ♦ Deposits on evaporator fins – Clean evaporator ⇒ page 277 .

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Note

- *Cleaning with the ultrasound A/C cleaner - VAS 6189A- or a pressure-feed spray gun - V.A.G 1538- will only eliminate the odour if it originates in the evaporator.*
- *There are numerous evaporator cleaning methods with different effects available on the market. Cleaning the evaporator using the ultrasound A/C cleaner - VAS 6189A- or a suction-feed spray gun - V.A.G 1538- is one of the methods currently checked and approved by Audi. Other methods checked and approved by Audi and the corresponding information can be found e.g. on the "Audi Partner Portal" or the "Audi ServiceNet" (⇒ table).*
- *The following procedures are examples of how to access "Audi ServiceNet". Depending on the country, "Air conditioner cleaning" may be found, for example, in the "Genuine parts" submenu. For precise details on how to find the instructions on "Air conditioner cleaning", follow the instructions provided on the "Audi Partner Portal" or on "Audi ServiceNet".*

– Select path:

Audi ServiceNet
Products
Maintenance and wear
Air conditioner cleaning

Or

Audi ServiceNet
AGP/AGA
Product information
Information according to categories
Maintenance and wear
Air conditioner cleaning

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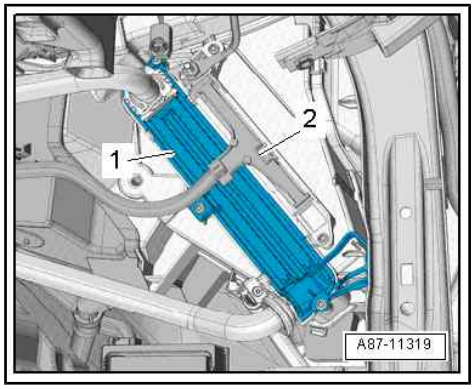
- ⇒ "5.6 Cleaning evaporator", page 277

2.4 Notes on operation of auxiliary/supplementary heater on vehicles with diesel engine

⇒ “2.4.1 Notes on supplementary heater (auxiliary air heater element Z35)”, page 8

⇒ “2.4.2 Checking activation of supplementary heater (auxiliary air heater element Z35)”, page 8

2.4.1 Notes on supplementary heater (auxiliary air heater element - Z35-)



- An auxiliary heater fitted as an optional extra is currently not activated as a supplementary heater ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Auxiliary/supplementary heater control; Functional description .
- An electric supplementary heater is currently only available for vehicles with a TDI engine (without high-voltage system); introduction for vehicles with petrol engine (without high-voltage system) not yet finalised.
- Currently a supplementary heater is not available for vehicles with petrol engine without a high-voltage system.
- On vehicles with a TDI engine (without high-voltage system), the electric supplementary heater (auxiliary air heater element - Z35-) is activated via the engine control unit (introduction and activation not yet finalised for vehicles with petrol engine without high-voltage system). The control units exchange the relevant information via the data bus ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Vehicles with high-voltage system are currently not fitted with an auxiliary air heater element - Z35- ; on these vehicles, the high-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-) assumes the function of the auxiliary air heater element
⇒ “4.15 Notes on high-voltage heater (PTC) Z115 (and high-voltage heater (PTC) control unit J848)”, page 85 .
- The auxiliary air heater element - Z35- -item 2- is installed in the vicinity of the heat exchanger -1- for heater ⇒ page 298 .
- Checking operation and resistance value of auxiliary air heater element -Z35- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

2.4.2 Checking activation of supplementary heater (auxiliary air heater element - Z35-)

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Components involved in activation of supplementary heater:

Heat energy is added to the air after it leaves the heat exchanger for the heater via the auxiliary air heater element - Z35- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”). This is only the case if there is a request from the operating unit (heater control unit - J65- on vehicles without air conditioner / air conditioning system control unit - J301- on vehicles with manually controlled air conditioner / Climatronic control unit - J255- on vehicles with automatically controlled air conditioner).

Note

- *To protect the battery - A- on vehicles with start/stop system, the activation of the auxiliary heater element -Z35- is switched off while the stop function is active. -Z35- is activated again as soon as the engine has been re-started via the start function ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *Vehicles with high-voltage system are currently not fitted with an auxiliary air heater element - Z35- ; on these vehicles, the high-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-) assumes the function of the auxiliary air heater element*
  ⇒ “4.15 Notes on high-voltage heater (PTC) Z115 (and high-voltage heater (PTC) control unit J848)”, page 85 .

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Cut-in criteria for activation of supplementary heater (-Z35-)

- The cut-in criteria must be met in the operating unit (-J65- , -J301- or -J255-) and in the engine control unit.

The following conditions must be met for the operating unit (-J65- , -J301- or -J255-) to transmit a request for the activation of the supplementary heater to the engine control unit:

- “Automatic supplementary heating” function not deactivated (on radio or MMI display) ⇒ Owner's Manual
- Engine running for at least 8 seconds and engine speed above 500 rpm
- Engine temperature below 75 °C
- Calculated ambient temperature below 6 °C
- Stop function of start/stop system not active
- Electrical system voltage above 12.2 V and onboard supply control unit - J519- not transmitting any request preventing activation
- No fault stored in operating unit (-J65- , -J301- or -J255-)
- No faults stored in engine control unit, and load of alternator - C- below 30 ... 77 % (depending on version of engine control unit) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Due to the setting and the measured temperatures, the operating unit (-J65- , -J301- or -J255-) has calculated that additional heating output is required to reach the temperature specified for the passenger compartment.
- More than 90 % of the air (position of temperature flaps) is being routed through the heat exchanger for the left or right side.

Note

The engine control unit activates the auxiliary air heater element - Z35- via the low heat output relay - J359- and the high heat output relay - J360- so that the load of the alternator -C- does not exceed 95%. The next stage is only switched on if the load of the alternator is below 30 ... 77 %, depending on the engine speed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Shut-off criteria for activation of supplementary heater

Note

Activation is switched off as soon as the "Automatic supplementary heating" function is deactivated (on radio or MMI display), a cut-in criterion in the operating unit (-J65- , -J301- or -J255-) or in the engine control unit is no longer met or one of the shut-off criteria is detected.

The operating unit (-J65- , -J301- or -J255-) deactivates the request for activation of the electric supplementary heater under the following conditions:

- One of the cut-in criteria is no longer met.
- The calculated ambient temperature is above approx. 8 °C.
- The load of the alternator -C- is above 95 %.
- Less than 60 % of the air is being routed through the heat exchanger for the left and right sides (position of temperature flaps).
- Stop function of start/stop system active

2.5 Seat heating

⇒ "2.5.1 Checking front seat heating", page 10

2.5.1 Checking front seat heating

Note

- *Currently seat ventilation is not available for this vehicle.*
- *Information on rear seat heating ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats , ⇒ Vehicle diagnostic tester ("Guided Fault Finding" function for onboard supply control unit - J519-) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

Components involved in activation of seat heating:

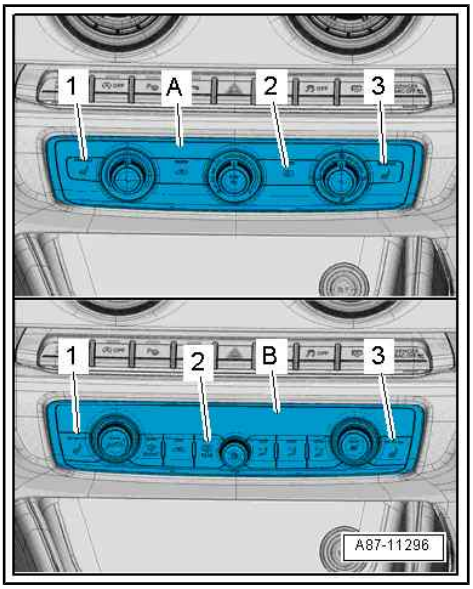
The operating unit (heater control unit - J65- on vehicles without air conditioner / air conditioning system control unit - J301- on vehicles with manually controlled air conditioner / Climatronic control unit - J255- on vehicles with automatically controlled air conditioner) transmits the request for activation of the seat heating via the data bus. The onboard supply control unit - J519- then activates the seat heating elements directly ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Checking operation and activation of seat heating ⇒ Vehicle diagnostic tester ("Guided Fault Finding" function for onboard supply control unit - J519-)

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Procedure

The seat heating setting is selected using buttons -1 and 3- on the operating unit -J65- / -J301- -item A- or -J255- -item B-.



- When the seat heating is switched on, the function indicator lamps in buttons -1 and 3- light up ⇒ Owner's Manual .
- If it is not possible to switch on the seat heating due to a shut-off criterion detected by -J519- , -J519- transmits a corresponding signal back to the operating unit via the data bus, and the function indicator lamps in buttons -1 and 3- either do not light up or go out.
- The seat heating setting is selected on the operating unit (-J65- , -J301- or -J255-). The specified temperatures for the different seat heating settings are stored in the onboard supply control unit - J519- . Depending on the version of -J519- , the specified seat heating temperature may therefore differ although the setting is the same on the operating unit ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- The seat heating setting for the driver's seat can be stored for a specific key in the operating unit (-J65- , -J301- or -J255-). The settings selected before the ignition is switched off are called up again the next time the vehicle is driven ⇒ Owner's Manual .
- Depending on the vehicle and operating unit (-J65- , -J301- or -J255-), the seat heating setting may be reduced automatically by one level after a certain time (e.g. after 10 minutes) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Owner's Manual .
- On vehicles with start/stop system, the seat heating may be switched off while the stop function is active to protect the battery - A- . However, the setting for activation of the seat heating remains stored in the operating unit (-J65- , -J301- or -J255-). The seat heating is switched on again as soon as the engine is restarted via the start function ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-).
- On vehicles with no seat occupied sensor for the front passenger's seat, the seat heating is currently not deactivated automatically by the operating unit (-J65- , -J301- or -J255-) if a seat is not occupied while the vehicle is being driven. However, if the ignition is switched off and not switched on again within approx. 10 minutes, the setting for activation of the seat heating is deleted ⇒ Owner's Manual .
- If e.g. the voltage measured at the onboard supply control unit - J519- at terminal 30 drops below a value stored in -J519- , the seat heating output is reduced or the seat heating is switched off completely to relieve the load on the alternator - C- ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-).
- Conditions preventing the activation of the driver's or front passenger's seat heating (e.g. open circuit in power supply to corresponding control unit etc.) are stored as faults in -J519- . On such vehicles, the information that the event memory in the corresponding control unit has to be read out may not be transmitted via the data bus to the control unit (-J65- , -J301- or -J255-) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”). If there are problems with seat heating, you should therefore first read out the event memories of the control units which can influence activation of the seat heating (e.g. onboard supply control unit - J519-).

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- Depending on the model and vehicle equipment, the various pieces of information on the activation of the seat heating (setting transmitted by the operating unit -J65- / -J301- / -J255- , specified and actual seat temperature, etc.) are displayed differently in the various measured value blocks in the different control units ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- The “Read measured values” function of the “Guided Fault Finding” routine for the operating unit (-J65- , -J301- or -J255-) indicates which seat heating setting has been selected. Depending on the vehicle version and equipment, the activation of the seat heating, the actual and specified temperatures in the seat and the actual current flowing via the seat heating etc. are displayed in the “Read measured values” function for -J519- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Description of how to check the operation and activation of the seat heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-).

Note

Checking operation of seat heating and servicing ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

2.6 Heated rear window

⇒ “2.6.1 Checking heated rear window Z1 ”, page 12

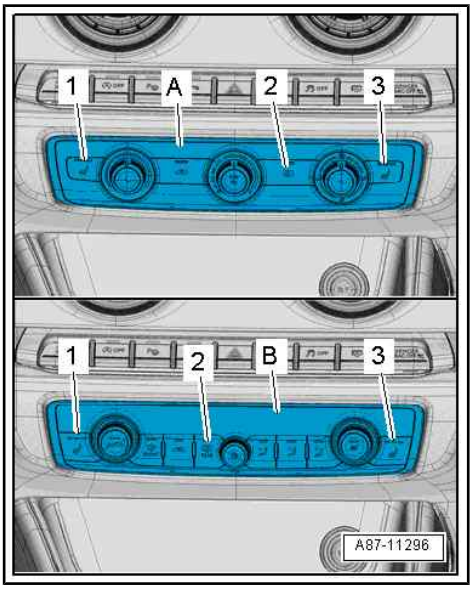
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2.6.1 Checking heated rear window - Z1-

Components involved in activation of heated rear window:

The operating unit (heater control unit - J65- on vehicles without air conditioner / air conditioning system control unit - J301- on vehicles with manually controlled air conditioner / Climatronic control unit - J255- on vehicles with automatically controlled air conditioner) transmits the request for activation of the heated rear window via the data bus. The onboard supply control unit - J519- then activates the heated rear window - Z1- via the heated rear window relay - J9- if there is no criterion preventing the activation in -J519- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Procedure



The rear window heating is switched on via button -2- on the operating unit -J65- / -J301- -item A- or -J255- -item B-.

- When button -2- is pressed with the ignition switched on, the onboard supply control unit - J519- is activated by the operating unit (-J65- , -J301- or -J255-) via the data bus. As soon as -J519- switches the rear window heating on (on vehicles without high-voltage system; only with engine running), the indicator lamp in button -2- lights up (-J519- sends feedback signal via data bus). The rear window heating is switched off by pressing the button again and switching off the ignition ⇒ Owner's Manual , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- On vehicles without a high-voltage system, -Z1- is only activated via -J9- by -J519- when the engine is running. If the engine is not running on vehicles without high-voltage system, there is no activation and no feedback from -J519- and the indicator lamp in the button either is not on or goes out again shortly after the button is pressed ⇒ Owner's Manual and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- On vehicles with high-voltage system, the rear window heating is activated irrespective of the engine when the vehicle's drive system is active. In electric mode with the engine stopped, it is activated just as it is on vehicles without high-voltage system with the engine running.
- -Z1- is switched off automatically by -J519- at ambient temperatures above 0 °C after the operating time stored in -J519- (approx. 10 minutes) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- At ambient temperatures below 0 °C, -Z1- remains switched on until the ignition is switched off (it can be switched off and on again manually at any time). If the temperature rises above 0 °C while the vehicle is being driven, -Z1- is switched off after the operating time stored in -J519- (approx. 10 minutes).
- If the button for rear window heating remains pressed for several seconds when the rear window heating is switched on, the rear window heating will remain switched on until the button is pressed again or the ignition is switched off ⇒ Owner's Manual .
- If e.g. the voltage measured at the onboard supply control unit - J519- at terminal 30 drops below a value stored in -J519- or in the operating unit (-J65- , -J301- or -J255-), the rear window heating output is reduced or the rear window heating is switched off completely to relieve the load on the alternator -C- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- If the activation of -Z1- has to be shut off by -J519- due to undervoltage, the indicator lamp in the button for rear window heating in the operating unit (-J65- , -J301- or -J255-) stays on. However, if it is shut off for a lengthy period, -J519- deactivates the request for activation of the indicator lamp in the button of the operating unit, and the indicator lamp in the button goes out.
- On vehicles with start/stop system, the rear window heating may be switched off while the stop function is active to protect the battery - A- . However, the setting for activation of -Z1- remains stored. The rear window heating is switched on again as soon as the engine is restarted via the start function ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-).

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- The “Read measured values” function of the Guided Fault Finding routine for the operating unit (-J65- , -J301- or -J255-) indicates that the rear window heating is switched on or why there is no activation although there is a corresponding request ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Checking activation signal from heated rear window ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function for onboard supply control unit - J519-

2.7 Neck heating

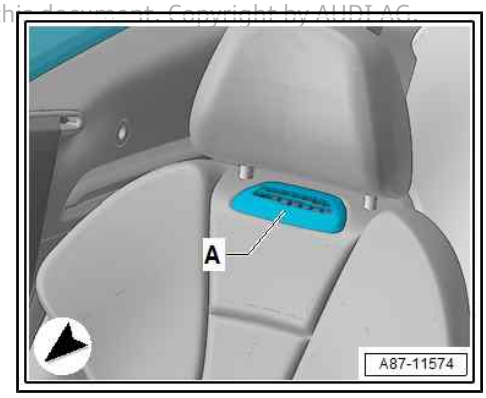
⇒ “2.7.1 Checking neck heating”, page 14

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2.7.1 Checking neck heating

Note

- *The neck heating function is currently only available in the Audi A3 Cabriolet. You can identify vehicles with neck heating e.g. by the vent -A- in the seat ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats .*
- *For further information on the neck heating function, see ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats , ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function (for onboard supply control unit - J519-) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

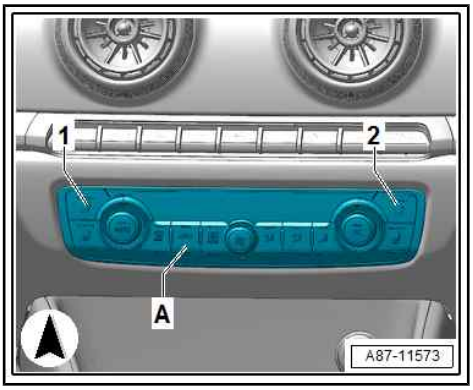


Components involved in activation of neck heating:

The operating unit (Climatronic control unit - J255- on vehicles with automatically controlled air conditioner) transmits a request for the activation of the neck heating (left and/or right) via the data bus. The onboard supply control unit - J519- then activates the control unit for left neck heating - J846- and/or the control unit for right neck heating - J847- via a data line ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Checking operation and activation of neck heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-)

Procedure



The neck heating setting is selected using buttons -1 and 2- on the operating unit -J255- -item A-.

- When the neck heating is switched on, the function indicator lamps in buttons -1 and 2- light up ⇒ Owner's Manual .
- If it is not possible to switch on the neck heating due to a shut-off criterion detected by -J519- , -J519- transmits a corresponding signal back to the operating unit via the data bus, and the function indicator lamps in buttons -1 and 2- either do not light up or go out.
- When the ignition is switched on but the engine is not running, the neck heating is only activated if -J519- has calculated that the battery - A- is sufficiently charged. If -J519- has calculated that the neck heating cannot be activated because the battery - A- is not sufficiently charged, the function indicator lamps in buttons -1 and 2- may still remain on (depending on version of -J519-) ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-).
- The neck heating setting is selected on the operating unit -J255- . The selected settings for the neck heating (left and right) are transmitted via -J519- to the control unit for left neck heating - J846- and control unit for right neck heating - J847- . The specified temperatures and speeds for the blower for left neck heating - V450- and blower for right neck heating - V451- for the various neck heating levels are stored in -J846- and -J847- . Depending on the versions of -J846- and -J847- , the specified neck heating temperature may therefore differ although the setting is the same on the operating unit -J255- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- The neck heating setting for the driver's seat can be stored for a specific key in the operating unit -J255- . The settings selected before the ignition is switched off can be called up again the next time the vehicle is driven ⇒ Owner's Manual .
- On vehicles with start/stop system, the neck heating might be switched off while the stop function is active to protect the battery - A- . However, the setting for the activation of the neck heating remains stored in the operating unit -J255- . The neck heating is switched on again as soon as the engine is restarted via the start function ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for onboard supply control unit - J519-).
- On vehicles with no seat occupied sensor for the front passenger's seat, the neck heating is currently not deactivated automatically by the operating unit -J255- if a seat is not occupied while the vehicle is being driven. However, if the ignition is switched off and not switched on again within approx. 10 minutes, the setting for activation of the neck and seat heating may be deleted ⇒ Owner's Manual .
- If e.g. the voltage measured at the onboard supply control unit - J519- at terminal 30 drops below a value stored in -J519- , the neck heating output is reduced or the neck heating is switched off completely to relieve the load on the alternator - C- ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-).

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- Conditions preventing the activation of the driver's or front passenger's neck heating (e.g. open circuit in power supply to corresponding control unit etc.) are stored as faults in -J519- . On such vehicles, the information that the event memory in the corresponding control unit has to be read out may not be transmitted via the data bus to the control unit -J255- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”). If there are problems with the neck heating function, you should therefore first read out the event memories of the control units which can influence activation of the neck and seat heating (e.g. onboard supply control unit - J519-).
- Depending on the model and vehicle equipment, the various pieces of information on the activation of the neck and seat heating (settings transmitted by the operating unit -J255-) are displayed differently in the various measured value blocks in the different control units ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- The “Read measured values” function of the “Guided Fault Finding” routine for the operating unit -J255- indicates which neck heating setting has been selected. The activation of the neck heating, the actual and specified temperatures and blower speeds for -V450- and -V451- , the actual current flowing via the control units -J846- and -J847- etc. are displayed in the “Read measured values” function of -J519- depending on the vehicle version and equipment ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Description of how to check the operation and activation of the neck heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding” function for onboard supply control unit - J519-).

Note

Checking operation of neck heating and servicing ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

2.8 Auxiliary air conditioner - vehicles with high-voltage system only

⇒ “2.8.1 Notes on auxiliary air conditioner”, page 16

2.8.1 Notes on auxiliary air conditioner

- On vehicles with high-voltage system, you will find the function “Auxiliary air conditioner” on the Multi Media Interface (MMI), where you can display and select the various functions of the auxiliary heater (via the high-voltage heater (PTC) - Z115-), the auxiliary ventilation and the cooling for the passenger compartment (via the air conditioner) ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .
- On vehicles with high-voltage system which do not feature an auxiliary heater as an optional extra, the passenger compartment can be ventilated, heated with the high-voltage heater (PTC) - Z115- or cooled with the air conditioner when ambient temperatures are high via the “Auxiliary air conditioner” function ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .
- On vehicles with high-voltage system which feature an auxiliary heater as an optional extra, the passenger compartment can be heated with the high-voltage heater (PTC) - Z115- or the auxiliary heater via the “Auxiliary air conditioner” function. As a general rule, the auxiliary heater is only activated at ambient temperatures below -10 °C. If the ambient temperature

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is above -10 °C, the air conditioner operating unit -J255- usually determines that the heating output of -Z115- is sufficiently high to heat up the passenger compartment ⇒ Auxiliary/supplementary heater; Rep. gr. 00 ; General notes , ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .

- If the “Auxiliary air conditioner” function is activated and the air conditioner control unit -J255- determines that heat output mode is necessary, various control units are interrogated by -J255- via the data bus, e.g. the battery regulation control unit - J840- (fitted in hybrid battery unit - AX1-) and the control unit for high-voltage battery charging unit - J1050- (fitted in power and control electronics for electric drive - JX1-). If -J255- is informed that the hybrid battery unit - AX1- is charged sufficiently, that enough energy is available to operate the high-voltage heater (PTC) (PTC) - Z115- and that there is enough fuel in the fuel tank, -J255- activates -Z115- or the auxiliary heater, depending on the ambient temperature.
- To ensure that the vehicle always operates correctly after the passenger compartment has been heated, ventilated or cooled via the “Auxiliary air conditioner” function, there must be enough fuel in the fuel tank (also on vehicles without auxiliary heater as optional extra) so that the “Auxiliary air conditioner” function for heating, ventilating or cooling the passenger compartment is activated by the air conditioner control unit -J255- . Reason: Energy is drawn from the hybrid battery unit - AX1- via the “Auxiliary air conditioner” function. It must be possible to start the engine so that the vehicle can be moved safely even after the charge level of -AX1- has been reduced ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .
- So that the passenger compartment can be heated or ventilated via the “Auxiliary air conditioner” function or cooled via the air conditioner if ambient temperatures are high, the air conditioner operating unit -J255- starts up and activates further components (e.g. the fresh air blower - V2- , various air conditioner control motors, the high-voltage heater (PTC) - Z115- or the auxiliary heater (if fitted) for heating the passenger compartment and the electrical air conditioner compressor - V470- for cooling the passenger compartment).
- So that the coolant heated up by -Z115- is conveyed through the air conditioner heat exchanger, the coolant pump for high-temperature circuit - V467- , the coolant changeover valve 2 - N633- and the coolant valve for gearbox - N488- must also be activated (by the corresponding engine control unit). To ensure that the coolant flows in the right direction, the non-return valves fitted in the coolant circuit must also be installed correctly and they must operate correctly. For further information, refer to ⇒ page 343 , ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- If -J255- is informed that the hybrid battery unit - AX1- is not sufficiently charged and therefore that not enough energy is available for the operation of the high-voltage heater (PTC) - Z115- , or that there is not enough fuel in the fuel tank, -J255- does not activate the “Auxiliary air conditioner” function (this means that -Z115- and the “Auxiliary heater” function are also not activated) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”), ⇒ Current flow diagrams, Electrical fault finding and Fitting locations, ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .
- On vehicles with high-voltage system which feature “Audi connect services” as an optional extra, the “Auxiliary air conditioner” function can also be switched on and off using a mobile phone (and control unit 1 for information electronics - J794-) ⇒ Communication; Rep. gr. 91 ; Telephone system; Layout -

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telephone , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations, ⇒ Owner's Manual and ⇒ Infotainment/ MMI Operating Manual .

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3 Safety precautions

⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19

⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19

⇒ “3.3 Safety precautions when handling refrigerants”, page 20

⇒ “3.4 Safety precautions when working on air conditioners”, page 21

⇒ “3.5 Safety precautions when working on vehicles with start/stop system”, page 21

⇒ “3.6 Safety precautions when using testers and measuring instruments during a road test”, page 21

⇒ “3.7 Safety precautions when working on the cooling system”, page 22

3.1 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.

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.

3.2 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

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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.
– 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.

3.3 Safety precautions when handling refrigerants

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.

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

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been opened up. Renewed evaporation has created pressure in the refrigerant circuit.

3.4 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.

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.

3.5 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.

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

Risk of injury if test equipment is not secured

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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.

3.7 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.

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4 Repair instructions

⇒ “4.1 Rules for cleanliness”, page 23

⇒ “4.2 General notes”, page 23

⇒ “4.3 General repair instructions”, page 24

⇒ “4.4 Contact corrosion”, page 25

⇒ “4.5 Routing and attaching pipes and wiring”, page 26

⇒ “4.6 Installing radiators and condensers”, page 26

⇒ “4.7 Checking heating output”, page 27

⇒ “4.8 Checking cooling output”, page 49

⇒ “4.9 Discharging refrigerant circuit”, page 78

⇒ “4.10 Working on refrigerant circuit”, page 79

⇒ “4.11 Paintwork repairs on vehicles with air conditioning system”, page 81

⇒ “4.12 Refrigerant circuit seals”, page 81

⇒ “4.13 Notes on control motors”, page 82

⇒ “4.14 Notes on dust and pollen filter”, page 83

⇒ “4.15 Notes on high-voltage heater (PTC) Z115 (and high-voltage heater (PTC) control unit J848)”, page 85

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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:

- 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 3 .
- 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 , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Repair instructions; Refrigerant and refrigerant oil .

4.3 General repair instructions

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

For the following steps, work in the vicinity of high-voltage components is necessary (Safety precautions when working in the vicinity of high-voltage components
⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19).

Working with ignition switched on or high-voltage system active

– To minimise the number of automatic engine starts when the vehicle's drive system is active during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; General information; Rep. gr. 27 ; Battery; Charging battery and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .
– For test and measurement work that requires the vehicle's drive system to be active (READY) or the ignition to be switched on, move the selector lever to position “P”, activate the parking brake and take care to keep well clear of the engine when it is running. Set up any tools needed so that they cannot come into contact with moving parts.

Note

- *Also move the selector lever to position “P” and activate the parking brake before performing test and measurement work for which the ignition must be switched on but where the vehicle's drive system does not need to be active (READY).*
- *The status of the drive system (READY) is shown by the control unit in dash panel insert - J285- via the “power meter” ⇒ Owner's Manual .*
- *Activating and deactivating drive system ⇒ Owner's Manual (note display of control unit in dash panel insert - J285-).*

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

All vehicles

Caution

Remove the relevant fuse(s) before working on electrical wiring.

Note

Disconnect battery before starting electric welding work on vehicle ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

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

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- If this is required by the safety precautions (⇒ "3.3 Safety precautions when handling refrigerants", page 20).
- 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.

Note

The connections for the senders/switches described in this Workshop Manual are fitted with a valve which closes automatically when the switches are unscrewed. These switches can therefore be renewed at any workshop without discharging the refrigerant circuit.

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 .

Note

It is not permissible to perform servicing work on the air conditioner refrigerant circuit which involves discharging and opening the refrigerant circuit without the necessary tools and expertise. The vehicle may have to be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel. There the refrigerant circuit can be discharged and opened in the specified manner ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

4.4 Contact corrosion

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

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

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

Always fit new components if you are not sure that the old components are suitable ⇒ Electronic parts catalogue .

Please note:

- We recommend using only genuine replacement parts; these have been tested and are compatible with aluminium.
- We recommend using Audi Genuine Accessories.

- Damage caused by contact corrosion is not covered by the warranty.

4.5 Routing and attaching pipes and wiring

- To avoid interchanging components and to make sure the components are re-installed in the original positions, mark e.g. fuel lines, hydraulic fluid lines, vacuum lines, activated charcoal filter system lines and electrical wiring before removing them. Make sketches or take photographs if necessary.
- To avoid damaging lines and wires, it is important to make sure there is enough clearance from all moving or hot components in the engine compartment due to the confined space.
- 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

⇒ “4.7.1 Notes on checking heating output and tools required”, page 27

⇒ “4.7.2 Checking heating output (and actuation of temperature flaps) - vehicles without air conditioner”, page 29

⇒ “4.7.3 Checking heating output (and actuation of temperature flaps) - vehicles with manually controlled air conditioner”, page 32

⇒ “4.7.4 Checking heating output (and actuation of temperature flaps) - vehicles with automatically controlled air conditioner (without high-voltage system)”, page 35

⇒ “4.7.5 Checking heating output (and actuation of temperature flaps) - vehicles with automatically controlled air conditioner (with high-voltage system)”, page 40

4.7.1 Notes on checking heating output and tools required

Note

This Workshop Manual only gives a general outline of the checking procedure. Perform the functional check of the heater as described in the "Guided Fault Finding" routine ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Special tools and workshop equipment required

- Vehicle diagnostic tester
- Commercially available thermometer (for measuring temperature; if applicable use thermometer with 2 probes for simultaneous measurement of temperature e.g. on right and left)

Note

If the coolant circuit is not completely bled after filling, air may accumulate in the heat exchanger and thus reduce the heating output. In addition, there may be problems with noises or with differences in the temperature of the air from the vents.

Remedy if there is poor heating output or noise from the coolant circuit

- On vehicles without a high-voltage system, perform a road test at a fairly high engine speed (for at least 10 minutes, engine speed above 2500 rpm). Select a low gear when doing so to avoid excessive road speeds.
- If a customer complains about poor heating output at certain engine speeds, check the connections between the heat exchanger and the engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- If a customer complains about poor heat output on a vehicle with a high-voltage system, check the connections between the heat exchanger and the coolant circuit as well as the activation and operation of the shut-off valves, coolant pumps and high-voltage heater (PTC) - Z115- ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 before checking the heating output ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Vehicle diagnostic

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tester (“Guided Fault Finding” for air conditioner and engine control unit).

Note

- *On vehicles without an air conditioner, but with a start/stop system, the stop function may be disabled depending on the setting on the operating unit (heater control unit - J65-), e.g. in heating mode. The engine is started as soon as there is a request for heating.*
- *On vehicles with a manually controlled air conditioner and a start/stop system, the stop function may be disabled depending on the setting on the operating unit (air conditioning system control unit - J301-), e.g. in heating mode. The engine is started as soon as there is a request for heating. In cooling mode, there are no limitations for the stop function via the air conditioning system control unit - J301- .*
- *On vehicles with air conditioning system control unit - J301- , no humidity sender - G355- is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the function “air recirculation mode” and the status of the windscreen wipers. In order for -J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.*
- *On vehicles with an automatically controlled air conditioner and a start/stop system, the stop function is disabled depending on the setting on the operating unit (Climatronic control unit - J255-). For example, the stop function is not possible, or the stop function is interrupted and the engine is switched on as soon as the “defrost” mode is selected. This also applies if the difference between the set specified temperature and the measured actual temperature exceeds a certain value in heating and cooling mode ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *On vehicles with a high-voltage system, the coolant flowing through the heat exchanger in the air conditioning unit is either heated by the engine or by the high-voltage heater (PTC) - Z115- depending on various conditions ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 , ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and engine control unit).*

- Depending on the engine version, the coolant circuit may be fitted with a continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) to assist the engine coolant pump on vehicles without high-voltage system ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations. On vehicles with a start/stop system, -V51- / -V488- may be activated in “stop mode” (engine stopped), e.g. if the engine is cold, to maintain the flow of coolant through the heat exchanger.
- Depending on the engine version, a coolant shut-off valve - N82- may be installed in the coolant circuit on vehicles without high-voltage system ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting

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locations. -N82- is activated by the engine control unit - J623- if e.g. no heating output is being requested by -J65- / -J301- / -J255- and the engine is still cold ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function (for engine control unit). No heated coolant can flow through the heat exchanger when -N82- is activated.

- Various shut-off valves, coolant pumps and a high-voltage heater (PTC) - Z115- are fitted in the coolant circuit of vehicles with a high-voltage system. These components ensure that the passenger compartment can be heated when the vehicle is in electric mode (engine stopped)
⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 .

4.7.2 Checking heating output (and actuation of temperature flaps) - vehicles without air conditioner

⇒ “4.7.1 Notes on checking heating output and tools required”, page 27

Test requirements

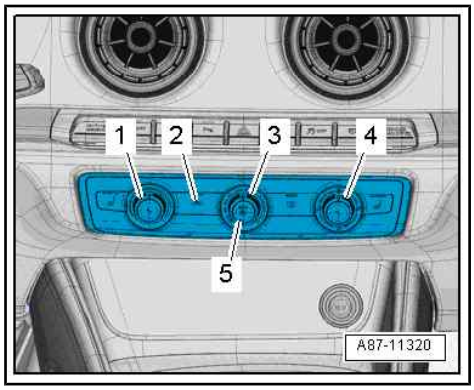
- Coolant circuit bled as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system
- All air ducts, covers and seals OK and properly installed
- Seal between engine compartment, bonnet and plenum chamber OK and fitted correctly; checking ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover
- If fitted: Operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) and coolant shut-off valve -N82- OK.
- Air flow in dust and pollen filter not impaired by dirt; checking
⇒ page 293
- Air intake of heater (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components
- Vehicle not exposed to sunlight
- Engine warm: coolant temperature above 80 °C
- Event memory of operating unit (heater control unit - J65-) interrogated and erased, basic setting performed in ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Encoding and adaption of operating unit (heater control unit - J65-) checked ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Vehicles with TDI engine: Activation and operation of auxiliary air heater element -Z35- OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Vehicles with petrol engine and -Z35- (introduction not yet finalised): activation and operation of auxiliary air heater element -Z35- OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Vehicles with auxiliary heater: Activation and operation of auxiliary heater OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Checking

– Close bonnet, doors, windows and sunroof.

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– Open all dash panel vents.
– Start the engine and make the following settings on the operating unit (heater control unit - J65-):



• Set rotary temperature control -1- to “cold” stop.
• Set rotary control -4- for air distribution to “Dash panel vents”.
• Set rotary control -5- for fresh air blower to maximum speed.
– Measure the ambient temperature.
– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

Specifications:

• After 5 minutes the measured values must not be more than 15 °C higher than the measured ambient temperature.
• The difference between the temperatures measured on the left and right sides should be less than 8 °C.

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Check the following if readout does not match specifications:

♦ Check and if necessary repair seal between engine compartment, bonnet and plenum chamber ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .
♦ Repeat the test using one of the two temperature sensors to measure the temperature of the air drawn in via the heater fresh air intake in the plenum chamber with the bonnet closed. Permissible increase in temperature of air in heater (between air entering fresh air intake and air emerging from dash panel vents): max. 10 °C.

Check the following if the temperature in the heater has increased by more than 10 °C:

♦ Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
♦ Operation of temperature flap in heater ⇒ page 273
♦ Foam seal at heat exchanger for heater ⇒ page 299

– Set the highest possible temperature.

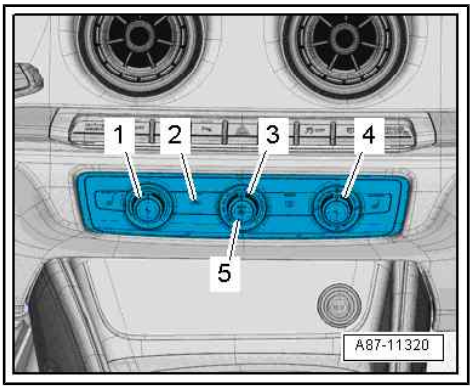
• Set rotary temperature control -1- to “warm” stop.

– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

Specifications at an engine temperature of approx. 90 °C:

• The temperature of the air emerging from the dash panel vents should increase above 55 °C.

• The difference between the temperatures measured on the left and right sides should be less than 8 °C.



Check the following if readout does not match specifications:

♦ Coolant circuit bled properly ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

♦ Incorporation of heat exchanger into coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

♦ Foam seal at heat exchanger for heater ⇒ page 299

♦ Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

♦ Operation of temperature flap in heater ⇒ page 273

♦ Engine thermostat The engine coolant may not become properly warm if the thermostat is defective ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat , or ⇒ Vehicle diagnostic tester (depending on engine).

♦ Engine coolant pump ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .

♦ If fitted: Check operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) and coolant shut-off valve - N82- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Note

♦ *On vehicles without -V51- / -V488- (different designations depending on engine version), set the engine speed to approx. 2000 rpm and repeat the test if necessary. If the temperature of the air increases to over 55 °C when the test is repeated with a higher engine speed, this indicates that not enough coolant is flowing through the heat exchanger for the heater. Cause: Delivery rate of engine coolant pump too low with engine idling or heat exchanger not incorporated into coolant circuit as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .*

♦ *The required heating output is not attained if insufficient heated coolant flows through the heat exchanger for the heater.*

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– Set the lowest possible temperature.

• Set rotary temperature control -1- to “cold” stop.

– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

Specifications:

• After 5 minutes the measured values must not be more than 15 °C higher than the measured ambient temperature.

• The difference between the temperatures measured on the left and right sides should be less than 8 °C.

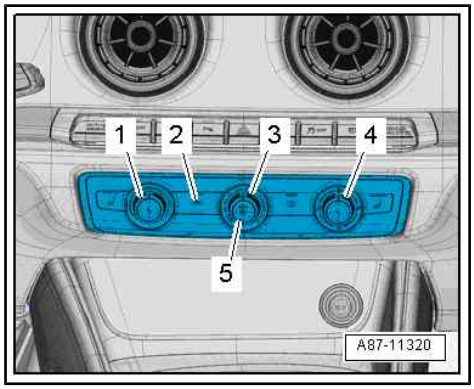
Check the following if readout does not match specifications:

♦ Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

♦ Operation of temperature flap in heater ⇒ page 273

♦ Foam seal at heat exchanger for heater ⇒ page 299

♦ Measured value for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)



4.7.3 Checking heating output (and actuation of temperature flaps) - vehicles with manually controlled air conditioner

⇒ “4.7.1 Notes on checking heating output and tools required”, page 27

Test requirements

• Coolant circuit bled as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system

• All air ducts, covers and seals OK and properly installed

• Seal between engine compartment, bonnet and plenum chamber OK and fitted correctly; checking ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover

• If fitted: Operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) and coolant shut-off valve -N82- OK.

• Air flow in dust and pollen filter not impaired by dirt; checking ⇒ page 293

• Air intake of air conditioning unit (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components

• Vehicle not exposed to sunlight

• Cooling output of air conditioner checked and OK ⇒ page 54

• Engine warm: coolant temperature above 80 °C

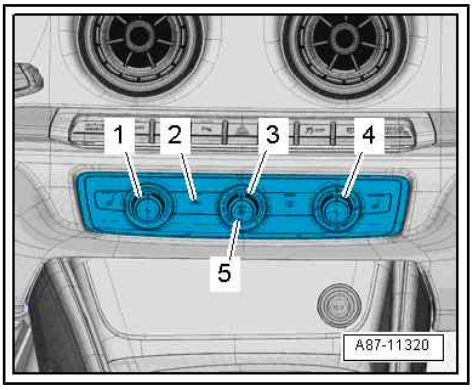
• Event memory of operating unit (air conditioning system control unit - J301-) interrogated and erased, basic setting performed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

• Encoding and adaption of operating unit (air conditioning system control unit - J301-) checked ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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- Vehicles with TDI engine: Activation and operation of auxiliary air heater element -Z35- OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Vehicles with petrol engine and -Z35- (introduction not yet finalised): activation and operation of auxiliary air heater element -Z35- OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Vehicles with auxiliary heater: Activation and operation of auxiliary heater OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Checking



– Close bonnet, doors, windows and sunroof.

– Open all dash panel vents.

– Start the engine and select the following settings on the operating unit:

- Set rotary temperature control -1- to “cold” stop.
- Set rotary control -4- for air distribution to “Dash panel vents”.
- Set rotary control -3- for fresh air blower to maximum speed.
- Air conditioner compressor on: Lamp in AC or A/C button -5- on

– With the engine running, operate the air conditioner for several minutes at maximum cooling output.

– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

– Compare measured values to measured value displayed for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Specifications:

- The measured values for the temperature of the air emerging from the vents (left and right) must not be lower than the measured value for -G263- ; after 5 minutes they must not be over 7 °C higher than this measured value ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- The difference in the measured temperature of the air emerging from the vents (left and right) should be less than 8 °C.

Check the following if readout does not match specifications:

- ♦ Activation and operation of temperature flap control motor -V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- ♦ Operation of temperature flap in air conditioning unit ⇒ page 293
- ♦ Foam seal at heat exchanger for heater ⇒ page 299

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– Set the highest possible temperature.

• Set rotary temperature control -1- to “warm” stop.

– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

Specifications at an engine temperature of approx. 90 °C:

• The temperature of the air emerging from the dash panel vents should increase above 55 °C.

• The difference between the temperatures measured on the left and right sides should be less than 8 °C.

Check the following if readout does not match specifications:

♦ Coolant circuit bled properly ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

♦ Incorporation of heat exchanger into coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

♦ Foam seal at heat exchanger for heater ⇒ page 299

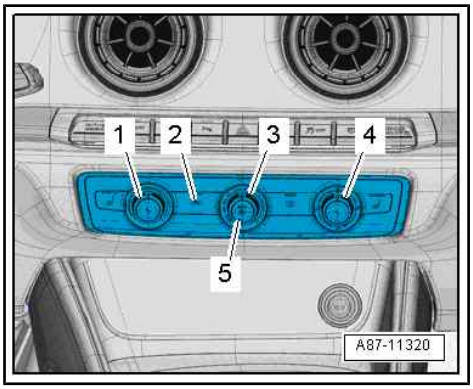
♦ Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

♦ Operation of temperature flap in air conditioning unit ⇒ page 293

♦ Engine thermostat The engine coolant may not become properly warm if the thermostat is defective ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat , or ⇒ Vehicle diagnostic tester (depending on engine).

♦ Engine coolant pump ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .

♦ If fitted: Check operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) and coolant shut-off valve - N82- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



Note

♦ *On vehicles without -V51- / -V488- (different designations depending on engine version), set the engine speed to approx. 2000 rpm and repeat the test if necessary. If the temperature of the air increases to over 55 °C when the test is repeated with a higher engine speed, this indicates that not enough coolant is flowing through the heat exchanger for the heater. Cause: Delivery rate of engine coolant pump too low with engine idling or heat exchanger not incorporated into coolant circuit as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .*

♦ *The required heating output is not attained if insufficient heated coolant flows through the heat exchanger for the heater.*

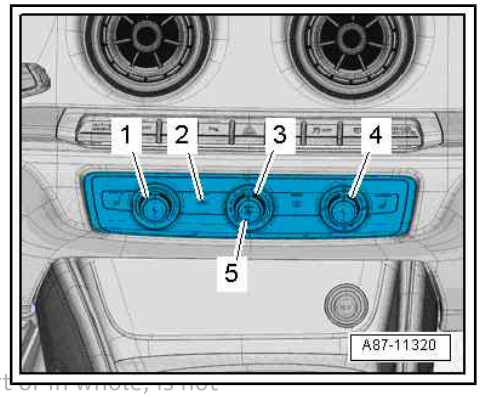
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– Set the lowest possible temperature.

• Set rotary temperature control -1- to “cold” stop.

– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

– Compare measured values to measured value displayed for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



Specifications:

• The measured values must not be lower than the measured value for -G263- ; after 5 minutes they must not be over 7 °C higher than this measured value ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

• The difference in the measured temperature of the air emerging from the vents (left and right) should be less than 8 °C.

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Check the following if readout does not match specifications:

♦ Activation and operation of temperature flap control motor - V68- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

♦ Operation of temperature flap in air conditioning unit ⇒ page 293

♦ Foam seal at heat exchanger for heater ⇒ page 299

4.7.4 Checking heating output (and actuation of temperature flaps) - vehicles with automatically controlled air conditioner (without high-voltage system)

⇒ “4.7.1 Notes on checking heating output and tools required”, page 27

Test requirements

• Coolant circuit bled as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system

• All air ducts, covers and seals OK and properly installed

• Seal between engine compartment, bonnet and plenum chamber OK and fitted correctly; checking ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover

• Air flow in dust and pollen filter not impaired by dirt; checking ⇒ page 293

• Air intake of air conditioning unit (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components.

• If fitted: Operation of continued coolant circulation pump - V51- / auxiliary pump for heating - V488- (different designations depending on engine version) and coolant shut-off valve - N82- OK.

• Vehicle not exposed to sunlight

• Cooling output of air conditioner checked and OK ⇒ page 59

• Engine warm: coolant temperature above 80 °C

• Event memory of operating unit (Climatronic control unit - J255-) interrogated and erased, basic setting performed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

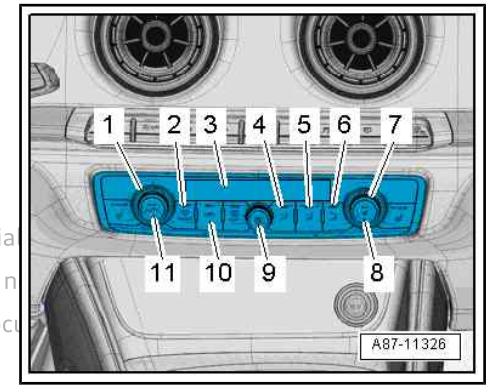
- Encoding and adaption of operating unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Vehicles with TDI engine: Activation and operation of auxiliary air heater element -Z35- OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Vehicles with petrol engine and -Z35- (introduction not yet finalised): activation and operation of auxiliary air heater element -Z35- OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Vehicles with auxiliary heater: Activation and operation of auxiliary heater OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Checking

– Close doors, bonnet, windows, sunroof and rear lid.

– Open all dash panel vents.

– Start engine.

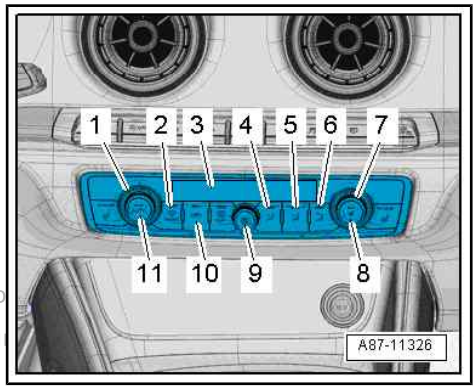


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Note

Vehicles with start/stop system: Should the engine not start or should it be switched off via the “start/stop function”, try starting the engine by changing the temperature setting on the operating unit -J255- e.g. to “LO” and activating the “A/C” function.

– Engine running (or started after changing setting):



- Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255- .
- Press buttons -5 and 6- for dash panel vents and footwell vents.
- Set rotary control -9- for fresh air blower to maximum speed.
- Air conditioner compressor on: Lamp in AC or A/C button -8- on
- “eco” mode not activated: display -3- of -J255- blank.

– With the engine running, operate the air conditioner for several minutes at maximum cooling output.

– “Read measured values” for vent temperature senders -G150- / -G151- and evaporator output temperature sender -G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Compare measured values for vent temperature senders -G150- / -G151- / -G192- to measured value for -G263- .

Specifications:

- The measured values for the vent temperature senders -G150- / -G151- / -G192- must not be lower than the value for -G263- ; after 5 minutes they must not be over 7 °C higher than this measured value ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- The difference between the two measured values for the vent temperature senders -G150- / -G151- must not be more than 8 °C.

Note

Check by hand to establish whether air is actually emerging from the activated vents.

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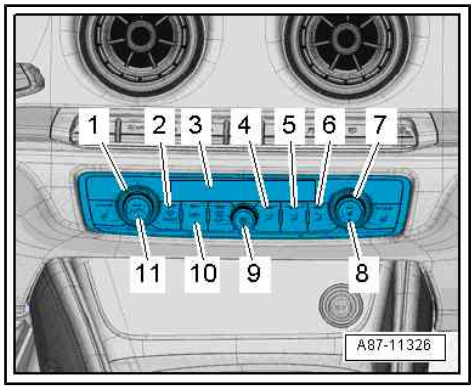
– Set the highest possible temperature for the driver side.

- Set temperature to “warm” using rotary control -1-: “HI” display for driver side in display -3- of -J255- .

– “Read measured values” for vent temperature senders -G150- / -G151- / -G192- .

Specifications at an engine temperature of approx. 90 °C:

- The temperature should increase to above 55 °C in the display zone with the measured value for -G150- / -G192- .
- The temperature should increase by less than 10 °C in the display zone with the measured value for -G151- .



Note

Applies to LHD vehicles only; on RHD vehicles -G192- is fitted in the right footwell vent duct.

Check the following if readout does not match specifications:

- Coolant circuit bled properly ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Incorporation of heat exchanger into coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Foam seal at heat exchanger for heater ⇒ page 299
- Activation and operation of left temperature flap control motor - V158- and right temperature flap control motor - V159- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Measured values for vent temperature senders -G150- / -G151- / -G192- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Operation of temperature flaps for left and right side in air conditioning unit ⇒ page 293
- Engine thermostat The engine coolant may not become properly warm if the thermostat is defective ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat , or ⇒ Vehicle diagnostic tester (depending on engine).
- Engine coolant pump ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .
- If fitted: Check operation of continued coolant circulation pump - V51-/ auxiliary pump for heating - V488- (different designations depending on engine version) and coolant shut-off valve - N82- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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Note

- *On vehicles without -V51- / -V488- (different designations depending on engine version), set the engine speed to approx. 2000 rpm and repeat the test if necessary. If the temperature of the air increases to over 55 °C when the test is repeated with a higher engine speed, this indicates that not enough coolant is flowing through the heat exchanger for the heater. Cause: Delivery rate of engine coolant pump too low with engine idling or heat exchanger not incorporated into coolant circuit as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .*
- *The required heating output is not attained if insufficient heated coolant flows through the heat exchanger for the heater.*

– Set the highest possible temperature for the front passenger side.

• Set temperature to “warm” using rotary control -7-: “HI” display for passenger side in display -3- of -J255- .

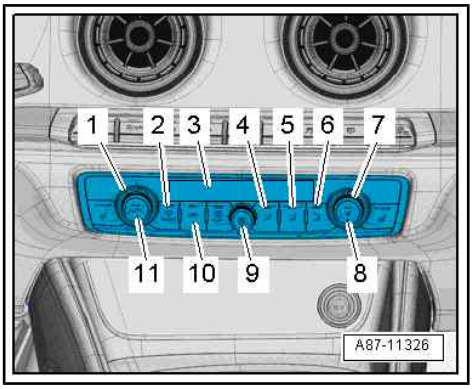
– “Read measured values” for vent temperature senders -G150- / -G151- / -G192- .

Specifications at an engine temperature of approx. 90 °C:

• The temperature should increase to above 55 °C in the display zone with the measured value for -G151- .

• The difference between the display zones for the measured values for -G150- / -G151- / -G192- should be less than 8 °C.

If the readings do not match the specifications, check the components as described above ⇒ page 38 .



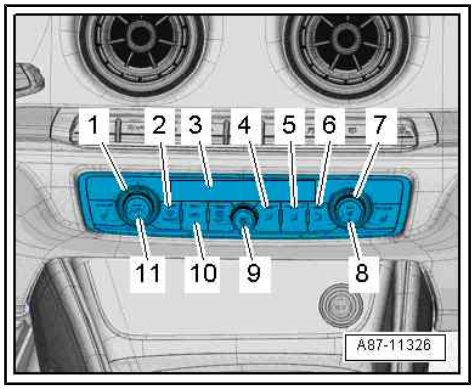
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– Set the lowest possible temperature for the driver and passenger side.

• Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255- .

– “Read measured values” for vent temperature senders -G150- / -G151- / -G192- and evaporator output temperature sender - G263-

– Compare measured values for vent temperature senders -G150- / -G151- / -G192- to measured value for -G263- .



Specifications:

• The measured values for the vent temperature senders -G150- / -G151- / -G192- must not be lower than the value for -G263- ; after 5 minutes they must not be over 7 °C higher than this measured value ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

• The difference between the measured values for the vent temperature senders -G150- / -G151- / -G192- must not be more than 8 °C.

Check the following if readout does not match specifications:

♦ Activation and operation of left temperature flap control motor - V158- and right temperature flap control motor - V159- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

♦ Operation of temperature flaps for left and right side in air conditioning unit ⇒ page 293

♦ Foam seal at heat exchanger for heater ⇒ page 299

♦ Check measured values for vent temperature senders -G150- / -G151- / -G192- and evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

4.7.5 Checking heating output (and actuation of temperature flaps) - vehicles with automatically controlled air conditioner (with high-voltage system)

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

In the following steps, work near high-voltage system components is necessary (Safety precautions when working in the vicinity of high-voltage system components
⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19 and ⇒ 4-cyl. direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA211); Rep. gr. 93 ; High-voltage components).

Working with ignition switched on or high-voltage system active

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DANGER!

When working on a vehicle with the ignition switched on or while the drive system is active, the engine can start unexpectedly and exhaust fumes can cause a health hazard in closed rooms. Moving parts can trap or draw in parts of the body and/or clothing (safety hazard).

Before switching on the ignition, perform the following steps:

- *Move selector lever to position P*
- *Activate parking brake*
- *Switch off ignition*
- *Open bonnet*
- *Connect battery charger (e.g. battery charger - VAS 5095A-) to jump-start connections of 12 V electrical system*
- *Switching on ignition*

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– To minimise the number of automatic engine starts when the vehicle's drive system is active during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; General information; Rep. gr. 27 ; Battery; Charging battery and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .

– For test and measurement work that requires the vehicle's drive system to be active (READY) or the ignition to be switched on, move the selector lever to position “P”, activate the parking brake and take care to keep well clear of the engine when it is running. Set up any tools needed so that they cannot come into contact with moving parts.

Note

- *Also move the selector lever to position “P” and activate the parking brake before performing test and measurement work for which the ignition must be switched on but where the vehicle's drive system does not need to be active (READY).*
- *The status of the drive system (READY) is shown by the control unit in dash panel insert - J285- via the “power meter” ⇒ Owner's Manual .*
- *Activating and deactivating drive system ⇒ Owner's Manual (note display of control unit in dash panel insert - J285-).*

⇒ “4.7.1 Notes on checking heating output and tools required”, page 27

Test requirements

- Coolant circuit bled as specified ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system
- All air ducts, covers and seals OK and properly installed
- Seal between engine compartment, bonnet and plenum chamber OK and fitted correctly; checking ⇒ General body repairs,

exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover

- Air flow in dust and pollen filter not impaired by dirt; checking ⇒ “5.13 Removing and installing dust and pollen filter”, page 293
- Air intake of air conditioning unit (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components.
- Operation of the various shut-off valves, coolant pumps and high-voltage heater (PTC) - Z115- OK ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 and ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and engine control unit).
- Vehicle not exposed to sunlight
- Cooling output of air conditioner checked and OK ⇒ “4.8.4 Checking cooling output - vehicles with automatically controlled air conditioner (without high-voltage system)”, page 59
- Engine warm: coolant temperature above 80 °C

Note

- *On vehicles with high-voltage system, the engine does not necessarily run when the vehicle's drive system is active. If the engine is too cold and the charge level of the hybrid battery unit - AX1- is such that the engine does not started, try starting and running the engine by changing the setting for the function “e-tron mode” in the “Car”/“Car systems” menu of the Multi Media Interface (MMI) e.g. to “Increase battery charge”, or by releasing the bonnet (with vehicle's drive system ready - see display in “power meter” in dash panel insert) ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .*
- *The engine is not always started if the hybrid battery unit - AX1- is sufficiently charged. If the coolant in the engine is colder than approx. 70 °C, the coolant flowing through the heat exchanger is first heated by the high-voltage heater (PTC) - Z115- and then delivered by the coolant pump for high-temperature circuit - V467- . In order for the coolant to flow through the heat exchanger correctly, it is important that not only -V467- , the coolant changeover valve 2 - N633- and the coolant valve for gearbox - N488- are activated correctly, but that the non-return valves are correctly installed in the coolant circuit and function correctly ⇒ page 343 and ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .*
- *If the temperature of the coolant in the engine exceeds 75 °C, -Z115- is no longer activated. The coolant pump for high-temperature circuit - V467- is activated when the engine is stopped so that the coolant flows through the heat exchanger. In order for the coolant to flow through the heat exchanger correctly, it is important that not only -V467- , the coolant changeover valve 2 - N633- and the coolant valve for gearbox - N488- are activated correctly, but that the non-return valves are correctly installed in the coolant circuit and function correctly ⇒ page 343 and ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .*

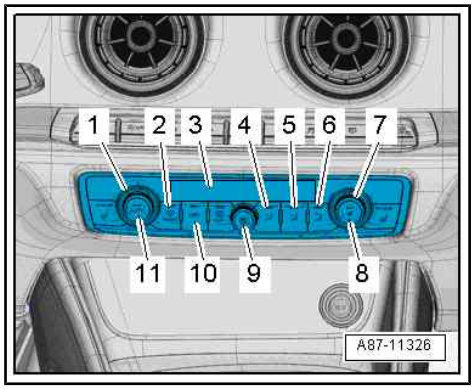
- Event memory of operating unit (Climatronic control unit - J255-) and of engine control unit (e.g. engine control unit - J623-) interrogated and erased, basic setting performed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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- Encoding and adaption of operating unit (Climatronic control unit - J255-) checked ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Vehicles with auxiliary heater: Activation and operation of auxiliary heater OK ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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Checking



– Close doors, bonnet, windows, sunroof and rear lid.
– Open all dash panel vents.
– Switch on ignition.

DANGER!

When working on a vehicle with the ignition switched on or while the drive system is active, the engine can start unexpectedly and exhaust fumes can cause a health hazard in closed rooms. Moving parts can trap or draw in parts of the body and/or clothing (safety hazard).

Before switching on the ignition, perform the following steps:

- ***Move selector lever to position P***
- ***Activate parking brake***
- ***Switch off ignition***
- ***Open bonnet***
- ***Connect battery charger (e.g. battery charger - VAS 5095A-) to jump-start connections of 12 V electrical system***
- ***Switching on ignition***

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– Activate vehicle's drive system (engine does not have to start at this point).
– Change “e-tron mode” setting on Multi Media Interface (MMI) or release bonnet; engine will start and run.

Note

- *On vehicles with high-voltage system, the engine does not necessarily run when the vehicle's drive system is active. If the engine is too cold and the charge level of the hybrid battery unit - AX1- is such that the engine does not start, try starting and running the engine by changing the setting for the function “e-tron mode” in the “Car”/“Car systems” menu of the Multi Media Interface (MMI) e.g. to “Increase battery charge”, or by releasing the bonnet (with vehicle's drive system ready - see display in “power meter” in dash panel insert) ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .*
- *With vehicle's drive system ready and temperature set to “warm” on air conditioner operating unit (Climatronic control unit - J255- - “HI” on display), the flow of coolant through the heat exchanger of the air conditioning unit is maintained by the coolant pump for high-temperature circuit - V467- when the engine is stopped ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 and ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .*

- Engine running (or started after changing setting):

Note

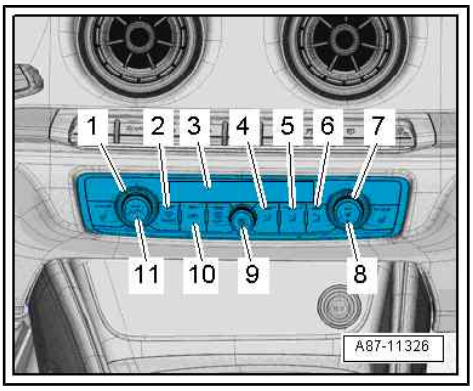
Vehicles with high-voltage system: Depending on the setting on the operating unit (Climatronic control unit - J255-), the coolant temperature, the charge level of the hybrid battery unit - AX1- etc., the engine may be running or switched off.

- Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255- .
- Press buttons -5 and 6- for dash panel vents and footwell vents.
- Set rotary control -9- for fresh air blower to maximum speed.
- Air conditioner compressor on: Lamp in A/C button -8- is on.
- “eco” mode not activated: display -3- of -J255- blank.

– With the vehicle's drive system ready, operate the air conditioner for several minutes at maximum cooling output.

– “Read measured values” for vent temperature senders - G150- / -G151- and evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Compare measured values for vent temperature senders - G150- / -G151- / -G192- to measured value for evaporator output temperature sender - G263- .



Specifications:

- The measured values for the vent temperature senders - G150- / -G151- / -G192- must not be lower than the value for the evaporator output temperature sender - G263- ; after 5 minutes they must not be over 7 °C higher than this measured value ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- The difference between the two measured values for the vent temperature senders -G150- / -G151- must not be more than 8 °C.

Note

Check by hand to establish whether air is actually emerging from the activated vents.

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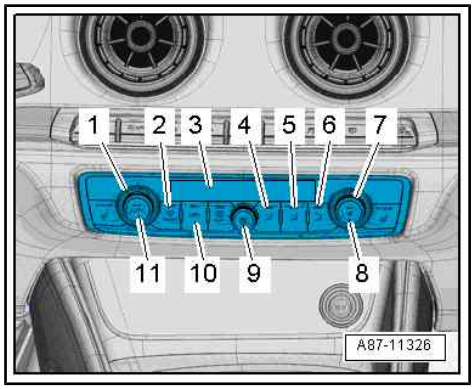
– Set the highest possible temperature for the driver side.

- Set temperature to “warm” using rotary control -1-: “HI” display for driver side in display -3- of -J255- .

– “Read measured values” for vent temperature senders -G150- / -G151- / -G192- .

Specifications at an engine temperature of approx. 90 °C:

- The temperature should increase to above 55 °C in the display zone with the measured value for -G150- / -G192- .
- The temperature should increase by less than 10 °C in the display zone with the measured value for -G151- .



Note

Applies to LHD vehicles only; on RHD vehicles -G192- is fitted in the right footwell vent duct.

Check the following if readout does not match specifications:

- Coolant circuit bled properly ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Incorporation of heat exchanger into coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Foam seal at heat exchanger for heater ⇒ page 299
- Activation and operation of left temperature flap control motor - V158- and right temperature flap control motor - V159- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Measured values for vent temperature senders -G150- / -G151- / -G192- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Operation of temperature flaps for left and right side in air conditioning unit ⇒ page 293
- Engine thermostat The engine coolant may not become properly warm if the thermostat is defective ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Checking thermostat , or ⇒ Vehicle diagnostic tester (depending on engine).
- Activation and operation of high-voltage heater (PTC) - Z115- , coolant pump for high-temperature circuit - V467- etc. ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 as well as connections between these components and coolant circuit ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .
- Engine coolant pump ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .

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Note

- *So that the coolant heated up by -Z115- or the engine is conveyed through the air conditioner heat exchanger, the coolant pump for high-temperature circuit - V467- , the coolant changeover valve 2 - N633- and the coolant valve for gearbox - N488- must also be activated (by the corresponding engine control unit). To ensure that the coolant flows in the right direction, the non-return valves fitted in the coolant circuit must also be installed correctly, and they must operate correctly. For further information, refer to ⇒ "8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit", page 343 , ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses , ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The required heating output is not attained if insufficient heated coolant flows through the heat exchanger for the heater.*

– Set the highest possible temperature for the front passenger side.

• Set temperature to "warm" using rotary control -7-: "HI" display for passenger side in display -3- of -J255- .

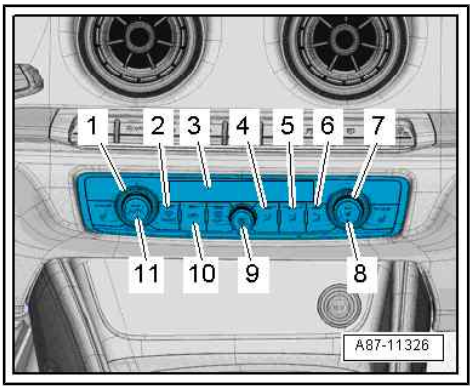
– "Read measured values" for vent temperature senders -G150- / -G151- / -G192- .

Specifications at an engine temperature of approx. 90 °C:

• The temperature should increase to above 55 °C in the display zone with the measured value for -G151- .

• The difference between the display zones for the measured values for -G150- / -G151- / -G192- should be less than 8 °C.

If the readings do not match the specifications, check the components as described above ⇒ page 46 .



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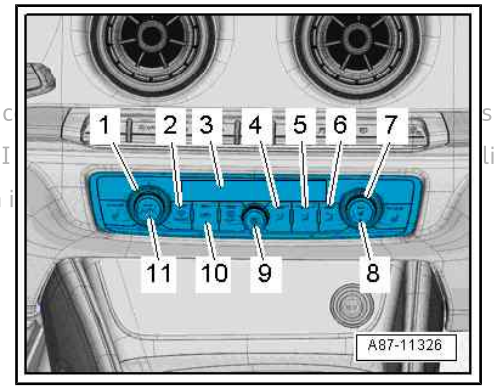
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– Set the lowest possible temperature for the driver and passenger side.

• Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255-.

– “Read measured values” for vent temperature senders -G150- / -G151- / -G192- and evaporator output temperature sender - G263-

– Compare measured values for vent temperature senders -G150- / -G151- / -G192- to measured value for -G263- .



Specifications:

• The measured values for the vent temperature senders -G150- / -G151- / -G192- must not be lower than the value for -G263- ; after 5 minutes they must not be over 7 °C higher than this measured value ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

• The difference between the measured values for the vent temperature senders -G150- / -G151- / -G192- must not be more than 8 °C.

Check the following if readout does not match specifications:

♦ Activation and operation of left temperature flap control motor - V158- and right temperature flap control motor - V159- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

♦ Operation of temperature flaps for left and right side in air conditioning unit ⇒ page 293

♦ Foam seal at heat exchanger for heater ⇒ page 299

♦ Check measured values for vent temperature senders -G150- / -G151- / -G192- and evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

4.8 Checking cooling output

⇒ “4.8.1 Notes on checking cooling output and tools required”, page 49

⇒ “4.8.2 Test requirements”, page 50

⇒ “4.8.3 Checking cooling output - vehicles with manually controlled air conditioner”, page 54

⇒ “4.8.4 Checking cooling output - vehicles with automatically controlled air conditioner (without high-voltage system)”, page 59

⇒ “4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)”, page 64

⇒ “4.8.6 Fault Finding if results do not match specifications”, page 74

⇒ “4.8.7 Fault Finding if temperature increases downstream of evaporator”, page 75

⇒ “4.8.8 Fault finding if ice forms at evaporator”, page 76

4.8.1 Notes on checking cooling output and tools required

Note

This Workshop Manual only gives a general outline of the checking procedure. Perform the functional check of the heater as described in the "Guided Fault Finding" routine ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Special tools and workshop equipment required

- Vehicle diagnostic tester
- Commercially available thermometer (for measuring temperature; if applicable use thermometer with 2 probes for simultaneous measurement of temperature e.g. on right and left)

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Note

- *On vehicles with start/stop function, the stop function may be disabled depending on the setting on the operating unit (air conditioning system control unit - J301-), e.g. in heating mode. The engine is started as soon as there is a request for heating. In cooling mode, there are no limitations for the stop function via the air conditioning system control unit - J301- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *On vehicles with air conditioning system control unit - J301- , no humidity sender - G355- is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the function “air recirculation mode” and the status of the windscreen wipers. In order for -J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.*
- *On vehicles with a start/stop system, the stop function is disabled depending on the setting on the operating unit (Climatronic control unit - J255-). For example, the stop function is not possible, or the stop function is interrupted and the engine is switched on as soon as the “defrost” mode is selected. This also applies if the difference between the set specified temperature and the measured actual temperature exceeds a certain value in heating and cooling mode ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*

4.8.2 Test requirements

- Ambient temperature above 15 °C
- Radiator and condenser clean; clean if necessary
- Poly V-belt for compressor drive OK and correctly tensioned, pulley actually driving air conditioner compressor (vehicles without high-voltage system).
- All air ducts, covers and seals OK and properly installed
- Seal between engine compartment, bonnet and plenum chamber OK and fitted correctly; checking ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover
- Air flow in dust and pollen filter not impaired by dirt; checking ⇒ page 293
- Air intake of air conditioning unit (in fresh air and air recirculation mode) not impeded by dirt or retrofitted components
- Vehicles without glove box cooling: Connection for glove box cooling at air conditioning unit sealed off ⇒ page 319 .
- Vehicles with glove box cooling: Connection for glove box cooling at air conditioning unit fitted as specified (currently not available, introduction not yet finalised) ⇒ page 319 .
- Vehicle not exposed to sunlight
- Engine warm: coolant temperature above 80 °C

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Note

On vehicles with high-voltage system, the engine does not necessarily run when the vehicle's drive system is active. If the engine is too cold and the charge level of the hybrid battery unit - AX1- is such that the engine does not start, try starting and running the engine by changing the setting for the function “e-tron mode” in the “Car”/“Car systems” menu of the Multi Media Interface (MMI) e.g. to “Increase battery charge”, or by releasing the bonnet (with vehicle's drive system ready - see display in “power meter” in dash panel insert) ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .

- Event memory of operating unit (air conditioning system control unit - J301- / Climatronic control unit - J255-) interrogated and erased, basic setting performed and coding checked for -J301- / -J255- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Adaption of -J301- / -J255- checked ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- All dash panel vents and any vents in rear centre console open.
- Air outlet from rear footwell vents (beneath front seats) not obstructed by floor mats or other objects; check.
- Front lid closed

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Vehicles with high-voltage system (hybrid vehicles)

- Ignition switched on and drive system active (READY; note display in “power meter”); engine only starts or runs if e.g. hybrid battery unit - AX1- is not sufficiently charged or bonnet is released ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .
- With ignition switched on and temperature set to “warm” on air conditioner operating unit (Climatronic control unit - J255- - “HI” on display), the flow of coolant through the heat exchanger of the air conditioning unit is maintained by the coolant pump for high-temperature circuit - V467- ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 and ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .

DANGER!

When working on a vehicle with the ignition switched on or while the drive system is active, the engine can start unexpectedly and exhaust fumes can cause a health hazard in closed rooms. Moving parts can trap or draw in parts of the body and/or clothing (safety hazard).

Before switching on the ignition, perform the following steps:

- ***Move selector lever to position P***
- ***Activate parking brake***
- ***Switch off ignition***
- ***Open bonnet***
- ***Connect battery charger (e.g. battery charger - VAS 5095A-) to jump-start connections of 12 V electrical system***
- ***Switching on ignition***

– Switch on ignition and activate vehicle's drive system (engine does not have to start).

Vehicles without high-voltage system

– Start engine.

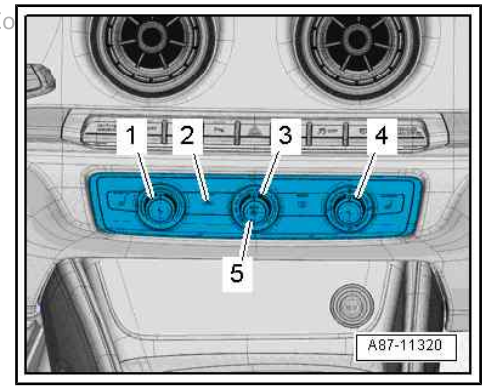
– Start engine, if necessary, change setting in operating unit (- J301- / -J255-) to “heat”.

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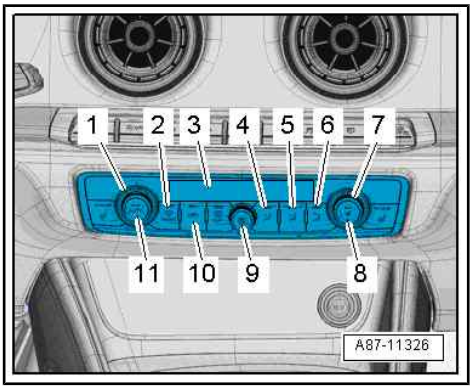
Vehicles with manually controlled air conditioner:

– Make the following settings on the operating unit (air conditioning system control unit - J301-):

- Set rotary temperature control -1- to “cold” stop.
- Air conditioner compressor on: Lamp in AC or A/C button -5- on
- Air recirculation mode on: Lamp in air recirculation button -2- is on.
- Set rotary control -4- for air distribution to “Dash panel vents”.
- Set rotary control -3- for fresh air blower to maximum speed.



Vehicles with automatically controlled air conditioner (with or without high-voltage system):



– Make the following settings on the operating unit (Climatronic control unit - J255-):

- "Auto" mode: Lamp in AUTO button -11- is on.
- Set temperature to "cold" using rotary controls -1 and 7-: "LO" display for driver and passenger side in display -3- of -J255- .
- Air conditioner compressor on: Lamp in AC or A/C button -8- on
- Set rotary control -9- for fresh air blower to maximum speed.
- "eco" mode not activated: display -3- of -J255- blank.

Note

If the fresh air blower speed is changed manually, the lamp in the AUTO button goes out.

All vehicles (continued):

Note

The maximum possible fresh air blower speed depends on several factors (electrical system voltage etc.).

Functions with engine running (vehicles without high-voltage system):

Functions with vehicle's drive system active (vehicles with high-voltage system):

- Radiator fan(s) -V7- / -V177- running. Activation and speed governed by pressure in refrigerant circuit and engine temperature.

Note

- *Depending on the version of the operating unit -J301- / -J255- , the radiator fan(s) -V7- / -V177- is/are either switched on immediately or not switched on until a certain pressure is reached in the refrigerant circuit (currently 9 bar). Activation of the radiator fan(s) is displayed in the "Read measured values" function ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*
- *Depending on the engine control unit, the specified and actual speeds of radiator fans -V7- and -V177- may differ ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

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- The fresh air blower runs at maximum speed.

Note

The maximum possible fresh air blower speed depends on several factors (electrical system voltage etc.).

- The air conditioner switches to air recirculation mode. Approx. 1 minute after starting the engine (i.e. activating the drive system), the air flow/fresh air flap is closed and the air recirculation flap is opened, air is drawn in by the fresh air blower from the passenger compartment beneath the dash panel/behind the glove box.

If one of these requirements is not met:

– Interrogate event memory, perform final control diagnosis and read out corresponding measured values ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Continued:

⇒ “4.8.3 Checking cooling output - vehicles with manually controlled air conditioner”, page 54

⇒ “4.8.4 Checking cooling output - vehicles with automatically controlled air conditioner (without high-voltage system)”, page 59

⇒ “4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)”, page 64

4.8.3 Checking cooling output - vehicles with manually controlled air conditioner

⇒ “4.8.1 Notes on checking cooling output and tools required”, page 49

Note

This Workshop Manual only gives a general outline of the checking procedure. Perform the functional check of the heater as described in the "Guided Fault Finding" routine ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Procedure

- Requirements for checking cooling output met ⇒ page 50

– Measure ambient temperature: It must be over 15 °C.

– Close doors, bonnet, windows, sunroof and rear lid.

– Open all dash panel vents.

– Start engine.

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– Switch off air conditioner compressor on operating unit (air conditioning system control unit - J301-): Lamp in AC or A/C button -5- not on.

– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Checking

– Read out activation of air conditioner compressor regulating valve -N280- .

• Activation of air conditioner compressor is switched off (via -N280-): Display is 0 A (amps) or 0 %.

– Read measured value of pressure sender for refrigerant circuit -G805- .

• Pressure in refrigerant circuit is identical to or above value in table below (depending on ambient temperature).

Ambient temperature in °C	Pressure displayed (in bar)
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0

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Note

♦ *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to approx. 1 bar absolute and 0 bar gauge pressure. On the scales of most pressure gauges, 0 bar gauge pressure corresponds to an absolute pressure of 1 bar (can be seen from -1 mark below 0).*

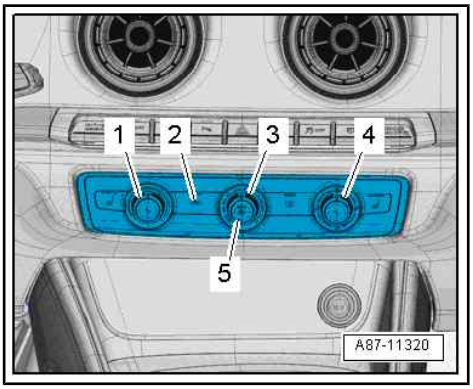
♦ *The pressure in the refrigerant circuit depends on the ambient temperature. Due to the radiation of heat by components (e.g. radiator), the pressure displayed when the engine is warm is slightly higher than that given for the corresponding ambient temperature.*

If the displayed pressure in the refrigerant circuit is lower than that indicated in the table:

– Check signal of -G805- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

If no fault is found on -G805- , there is not enough refrigerant in the circuit.

– The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.



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If pressure displayed in refrigerant circuit is OK:

– Select the following settings on operating unit -J301- :

♦ Set rotary temperature control -1- to “cold” stop.

♦ Set rotary control -4- for air distribution to “Dash panel vents”.

♦ Air conditioner compressor on: Lamp in AC or A/C button -5- on

♦ Air recirculation mode on: Lamp in air recirculation button -2- is on.

♦ Set rotary control -3- for fresh air blower to maximum speed.

– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Check display in display zones:

• Current calculated by air conditioning system control unit -J301- that flows via air conditioner compressor regulating valve - N280- is displayed as greater than 0.3 A (30 %) with air conditioner compressor switched on.

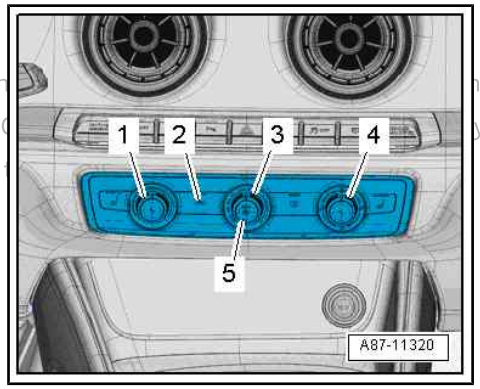
• Pressure indicated rises above value with air conditioner compressor switched off.

If there is no change in the pressure displayed and the activation of the air conditioner compressor is OK:

– Check again whether the calculated current is actually flowing via the air conditioner compressor regulating valve - N280- and the air conditioner compressor is actually being driven.

If the current is actually flowing via -N280- and the air conditioner compressor is being driven, there is a fault in the refrigerant circuit. There may be problems with the control of the air conditioner compressor.

– The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.



Note

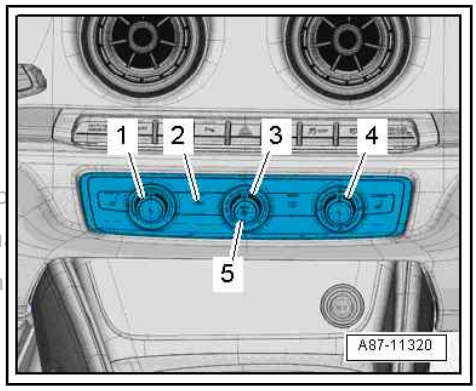
- *-N280- is activated by -J301- so that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 6 °C).*
- *After starting the vehicle, a value above 0.55 A (75 %) is displayed for the activation of -N280- depending on the measured temperature, engine speed and electrical system voltage. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, activation is cancelled and the compressor output thus reduced.*
- *Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at -N280- and at the expansion valve. Such ice formation impedes the control of the air conditioner compressor. The evaporator is cooled down too much and ices up. An iced-up evaporator may cause various problems* *⇒ page 76* *.*
- *If no current is displayed in the measured values for the activation of the air conditioner compressor regulating valve -N280- or if the current is too low, check the activation of -N280- ⇒ Vehicle diagnostic tester, "Guided Fault Finding".*

– Press `Air recirculation` button -2- on operating unit -J301- .

• Lamp indicating "Air recirculation" mode in button lights up.

– Set engine speed to 2000 rpm (start of time measurement).

– "Read measured values" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



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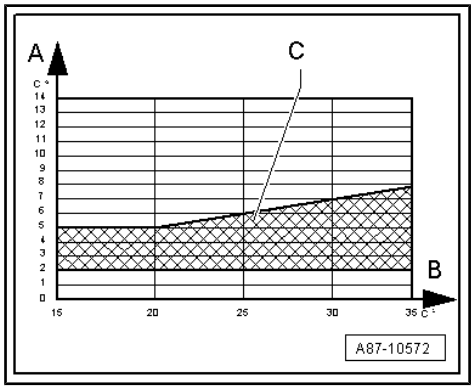
– Compare measured value displayed for evaporator output temperature sender - G263- to values in graph.

A - Air temperature measured by evaporator output temperature sender - G263-

B - Ambient temperature

C - Permissible tolerance range

- Depending on the ambient temperature, the measured air temperature should be within the stated tolerance range after 5 minutes.



If specified values are not attained:

– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

– Compare measured value to measured value displayed for evaporator output temperature sender - G263- .

If measured values only differ slightly:

– Perform Fault Finding measures to be taken if results do not match specification ⇒ page 74 .

If measured value for evaporator output temperature sender - G263- is higher than measured value determined:

– Check that -G263- is correctly installed ⇒ page 286 and perform electrical check for this sender ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Note

The operation of the air conditioner can be detected e.g. from the fact that the refrigerant pipe on the low-pressure side (thick pipe from internal heat exchanger to air conditioner compressor) cools down ⇒ page 133 .

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If the measured value for the evaporator output temperature sender - G263- and thus the air conditioner cooling output is OK:

– Use a thermometer to measure temperature of air emerging from dash panel vents (left and right).

– Compare measured values on thermometer and for evaporator output temperature sender - G263- .

- Measured values may not be lower nor (after 5 minutes) more than 7° C higher than value for evaporator output temperature sender - G263- .

If measured values determined are lower:

– Check that evaporator output temperature sender - G263- is installed correctly and check its wiring for any contact resistance; renew sender if defective ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

If specified values are not attained:

– Check activation and operation of temperature flap. To do so, perform Fault Finding in the event of an increase in temperature downstream of the evaporator ⇒ page 75 and ⇒ Vehicle diagnostic tester, “Guided Fault Finding”.

4.8.4 Checking cooling output - vehicles with automatically controlled air conditioner (without high-voltage system)

⇒ “4.8.1 Notes on checking cooling output and tools required”, page 49

Note

This Workshop Manual only gives a general outline of the checking procedure. Perform the functional check of the heater as described in the "Guided Fault Finding" routine ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Procedure

♦ Requirements for checking cooling output met ⇒ page 50

– Measure ambient temperature: It must be over 15 °C.

– Close doors, bonnet, windows, sunroof and rear lid.

– Open all dash panel vents and any vents in rear centre console.

– Start engine.

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– Switch off air conditioner compressor on operating unit (Climatronic control unit - J255-): Lamp in AC or A/C button -8- not on.

– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Checking

– Read out activation of air conditioner compressor regulating valve -N280- .

• The activation of air conditioner compressor is deactivated (via -N280-): Display is 0 A (amps) or 0 %.

– Read measured value of pressure sender for refrigerant circuit -G805- .

• Pressure in refrigerant circuit is identical to or above value in table below (depending on ambient temperature).

Ambient temperature in °C	Pressure displayed (in bar)
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0

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Note

◆ *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to approx. 1 bar absolute and 0 bar gauge pressure. On the scales of most pressure gauges, 0 bar gauge pressure corresponds to an absolute pressure of 1 bar (can be seen from -1 mark below 0).*

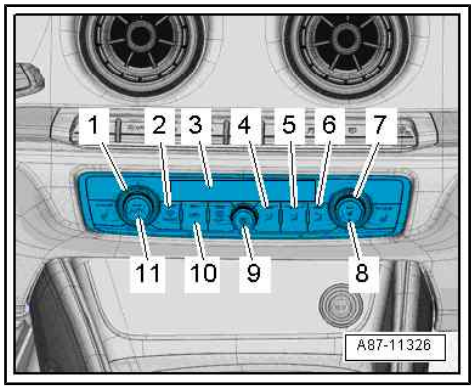
◆ *The pressure in the refrigerant circuit depends on the ambient temperature. Due to the radiation of heat by components (e.g. radiator), the pressure displayed when the engine is warm is slightly higher than that given for the corresponding ambient temperature.*

If the displayed pressure in the refrigerant circuit is lower than that indicated in the table:

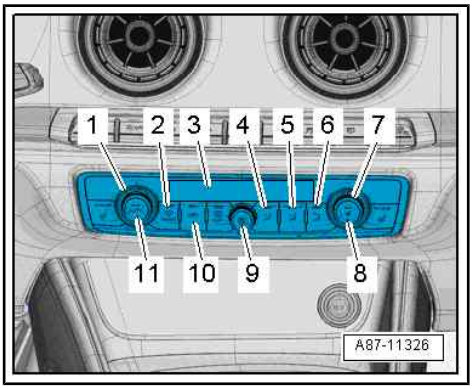
– Check signal of -G805- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

If no fault is found on -G805- , there is not enough refrigerant in the circuit.

– The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.



If pressure displayed in refrigerant circuit is OK:



– Select the following settings on operating unit -J255- :

• “Auto” mode: Lamp in AUTO button -11- is on.

• Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255- .

• Air conditioner compressor on: Lamp in AC or A/C button -8- on

• Set rotary control -9- for fresh air blower to maximum speed.

• “eco” mode not activated: display -3- of -J255- blank.

– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Check display in display zones:

• A current above 0.3 A (30%) is displayed (current flowing via air conditioner compressor regulating valve - N280-): Air conditioner compressor is switched on.

• Pressure indicated rises above value with air conditioner compressor switched off.

If there is no change in the pressure displayed and the activation of the air conditioner compressor is OK:

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– Check again whether the air conditioner compressor is actually being driven and the air conditioner compressor regulating valve - N280- is being activated.

If the current is actually flowing via the air conditioner compressor regulating valve - N280- and the air conditioner compressor is being driven, there is a fault in the refrigerant circuit. There may be problems with the control of the air conditioner compressor.

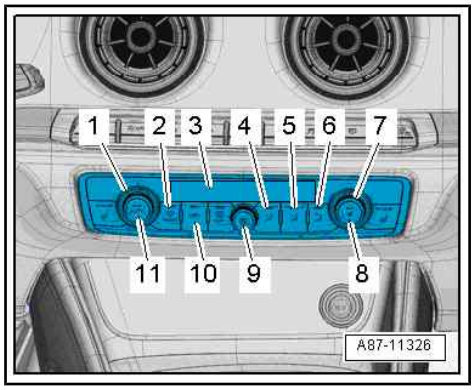
– The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

Note

- *The air conditioner compressor regulating valve - N280- is actuated by -J255- so that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 6 °C).*
- *After starting the vehicle, a value greater than 0.55 A is displayed for the activation of the air conditioner compressor regulating valve - N280- depending on the measured temperature, engine speed and voltage of the vehicle electrical system. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, the current is decreased and the air conditioner compressor output thus reduced.*
- *Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the air conditioner compressor regulating valve - N280- and at the expansion valve. Such ice formation impedes the control of the air conditioner compressor. The evaporator is cooled down too much and ices up. An iced-up evaporator may cause various problems ⇒ page 76 .*
- *If no current is displayed in the measured values for the activation of the air conditioner compressor regulating valve - N280- or if the current is too low, check the activation of the air conditioner compressor regulating valve - N280- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*

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– Press Air recirculation button -10- on operating unit -J255- .
• Lamp indicating “Air recirculation” mode in button lights up.
• “eco” mode not activated: display -3- of -J255- blank.
– Set engine speed to 2000 rpm (start of time measurement).
– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



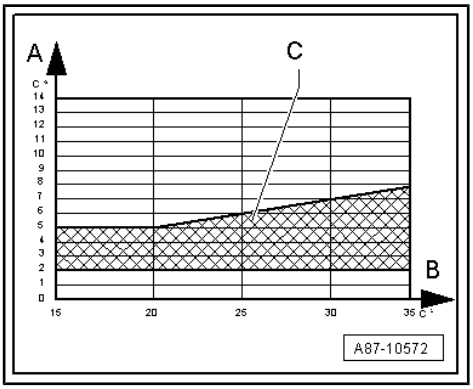
– Compare measured value displayed for evaporator output temperature sender - G263- to values in graph.

A - Air temperature measured by evaporator output temperature sender - G263-

B - Ambient temperature

C - Permissible tolerance range

- Depending on the ambient temperature, the measured air temperature should be within the stated tolerance range after 5 minutes.



If specified values are not attained:

– Compare measured values for left vent temperature sender - G150- and right vent temperature sender - G151- to measured value displayed for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Note

You can also use a thermometer to measure the temperature of the air emerging from the dash panel vents (left and right).

If measured values for -G263- and -G150- / -G151- only differ slightly:

– Perform Fault Finding measures to be taken if results do not match specification ⇒ page 74 .

If measured value for evaporator output temperature sender - G263- is higher than measured value for -G150- / -G151- :

– Check that -G263- is correctly installed ⇒ page 286 and perform electrical check for this sender ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Note

The operation of the air conditioner can be detected e.g. from the fact that the refrigerant pipe on the low-pressure side (thick pipe) cools down.

The cooling output test is completed if the measured value for the evaporator output temperature sender - G263- (and thus the cooling output of the air conditioner) is OK and there are no problems.

If measured value for -G263- (and thus air conditioner cooling output) is not OK:

– Perform Fault Finding if results do not match specification (required cooling output is not attained) ⇒ page 74 .

If measured value for -G263- (and thus air conditioner cooling output) is OK and there is a problem with excessively high or differing air conditioner vent temperatures:

– Check actuation of temperature flaps in air conditioning unit ⇒ page 293 and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)

⇒ “4.8.1 Notes on checking cooling output and tools required”, page 49

Note

This Workshop Manual only gives a general outline of the checking procedure. Perform the functional check of the heater as described in the "Guided Fault Finding" routine ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

In the following steps, work near high-voltage system components is necessary
⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19 and “General warning instructions for work on the high-voltage system” ⇒ 4-cyl. direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA211; Rep. gr. 93 ; High-voltage components .

Working with ignition switched on or high-voltage system active

DANGER!

When working on a vehicle with the ignition switched on or while the drive system is active, the engine can start unexpectedly and exhaust fumes can cause a health hazard in closed rooms. Moving parts can trap or draw in parts of the body and/or clothing (safety hazard).

Before switching on the ignition, perform the following steps:

- ***Move selector lever to position P***
- ***Activate parking brake***
- ***Switch off ignition***
- ***Open bonnet***
- ***Connect battery charger (e.g. battery charger - VAS 5095A-) to jump-start connections of 12 V electrical system***
- ***Switching on ignition***

– To minimise the number of automatic engine starts when the vehicle's drive system is active during test and measurement work, charge vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; General information; Rep. gr. 27 ; Battery; Charging battery .
– For test and measurement work that requires the vehicle's drive system to be active (READY) or the ignition to be switched on, move the selector lever to position “P”, activate the parking brake and take care to keep well clear of the engine when it is running. Set up any tools needed so that they cannot come into contact with moving parts.

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Note

- *Also move the selector lever to position “P” and activate the parking brake before performing test and measurement work for which the ignition must be switched on but where the vehicle's drive system does not need to be active (READY).*
- *The status of the drive system (READY) is shown by the control unit in dash panel insert - J285- via the “power meter” ⇒ Owner's Manual .*
- *Activating and deactivating drive system ⇒ Owner's Manual (note display of control unit in dash panel insert - J285-).*

Procedure

- Requirements for checking cooling output met ⇒ page 50

– Measure ambient temperature: It must be over 15 °C.

– Close doors, bonnet, windows, sunroof and rear lid.

– Open all dash panel vents and any vents in rear centre console.

Note

- *The status of the drive system (READY) is shown by the control unit in dash panel insert - J285- via the “power meter”.*
- *Activating vehicle drive system (check "READY" display in control unit in dash panel insert - J285-) ⇒ Owner's Manual*
- *Move the selector lever to position “P” and activate the parking brake before performing test and measurement work for which the ignition must be switched on but where the vehicle's drive system does not need to be active.*

– Ignition is switched on and drive system is active (READY), engine only starts or runs if e.g. hybrid battery unit - AX1- is not sufficiently charged.

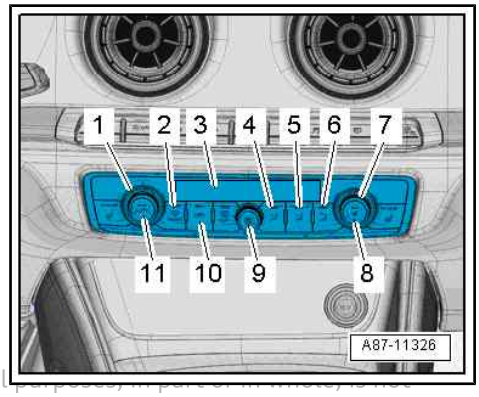
Note

On vehicles with a high-voltage system, it is not necessary for the engine to be running when the cooling output test is performed (electrical air conditioner compressor - V470-).

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– Switch off air conditioner compressor on operating unit (Climatronic control unit - J255-): Lamp in A/C button -8- off.

– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



Checking

- Read off activation of electrical air conditioner compressor - V470- (compressor shut-off criteria and compressor speed).
- Read out measured value for pressure sender for refrigerant circuit -G805- or refrigerant pressure and temperature sender - G395- , depending on vehicle version.

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Note

- *Various measured values can be selected in the Guided Fault Finding routine for the following test and displayed in a table ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1- ⇒ “9.8 Removing and installing fuse for electrical air conditioner compressor”, page 372 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

- The air conditioner compressor is deactivated, no compressor speed is displayed.
- Pressure in refrigerant circuit is identical to or above value in table below (depending on ambient temperature).

• Pressure in refrigerant circuit is identical to or above value in table below (depending on ambient temperature).

Ambient temperature in °C	Pressure displayed (in bar)
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0

Note

- *On the absolute pressure scale, 0 bar corresponds to an absolute vacuum. Normal ambient pressure thus corresponds to approx. 1 bar absolute and 0 bar gauge pressure. On the scales of most pressure gauges, 0 bar gauge pressure corresponds to an absolute pressure of 1 bar (can be seen from -1 mark below 0).*
- *Depending on the version of the air conditioner operating unit (Climatronic control unit - J255-), the measured values may only be displayed as whole numbers. The display fluctuates between two values if the measured pressure is between the two.*
- *The displays for the activation of the air conditioner compressor differ. For a mechanically driven air conditioner compressor, the tester displays the specified and actual current for activation of the air conditioner compressor regulating valve - N280- . The specified speed of the electrical air conditioner compressor - V470- calculated by -J255- and transmitted to the control unit for air conditioner compressor - J842- and the actual speed of -V470- determined by -J842- are displayed in a measured value ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner).*
- *The pressure in the refrigerant circuit depends on the ambient temperature. Due to the radiation of heat by components (e.g. radiator), the pressure displayed when the engine is warm is slightly higher than that given for the corresponding ambient temperature.*

If the displayed pressure in the refrigerant circuit is lower than that indicated in the table:

– Check signal from -G805- or -G395- (depending on vehicle version) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

If no fault is found on -G805- or -G395- (depending on vehicle version), there is not enough refrigerant in the circuit.

– The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

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If pressure displayed in refrigerant circuit is OK:

– Make the following settings on operating unit -J255- :

• “Auto” mode: Lamp in AUTO button -11- is on.

• Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255- .

• Air conditioner compressor on: Lamp in A/C button -8- is on.

• Set rotary control -9- for fresh air blower to maximum speed.

• “eco” mode not activated: display -3- of -J255- blank.

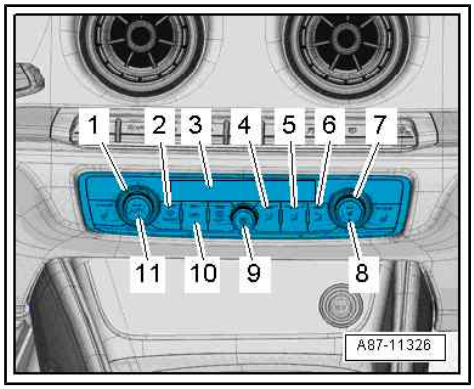
– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Check display in display zones:

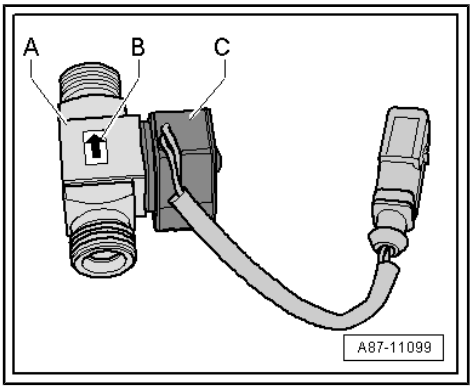
• Activation of electrical air conditioner compressor - V470- (compressor shut-off criteria and compressor speed). -V470- is activated by -J842- when requested by -J255- so that the speed is higher than 800 rpm.

• Check measured value of -G805- / -G395- (refrigerant pressure). Pressure indicated rises above value with air conditioner compressor switched off.

• Read off activation of refrigerant shut-off valve for heater and air conditioning unit - N541- and refrigerant shut-off valve for high-voltage battery heat exchanger - N542- -N541- is not activated; whether -N542- is activated depends on whether the hybrid battery unit - AX1- needs to be cooled.



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Note

- *The specified speed for -V470- is calculated by the air conditioner operating unit (Climatronic control unit - J255-). The request is transmitted via the data bus to the control unit for air conditioner compressor - J842- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *When driving, the air conditioner compressor operates over a speed range of 800 to 8600 rpm.*
- *When the vehicle is stationary or only moving slowly (up to a speed of approx. 45 km/h), the air conditioner compressor is not activated at the maximum specified speed (of approx. 8500 rpm); the air conditioner compressor speed is limited to approx. 5000 rpm.*
- *The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1- ⇒ “9.8 Removing and installing fuse for electrical air conditioner compressor”, page 372 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *At an air conditioner compressor speed of 5000 rpm, with a very high ambient temperature (in excess of 35 °C) and a high fresh air blower speed (unfavourable ambient conditions), the output (delivery volume) of the air conditioner compressor is at first not always sufficient to reduce the temperature of the air downstream of the evaporator to the specified value. One way of checking the control action of the air conditioner compressor under these conditions is to activate the fresh air blower with only approx. 40 % of the maximum voltage and to check the temperature at reduced fresh air blower speed ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).*
- *If an insufficient speed or no speed at all is displayed as the measured value (a speed of less than 4000 rpm although the required temperature of the air downstream of the evaporator has still not been reached), check the activation of the electrical air conditioner compressor - V470- by the control unit for air conditioner compressor - J842- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *-N541- and -N542- are open (de-energised).*
- *-N541- is activated e.g. when the air conditioner does not request any cooling output, but the hybrid battery unit - AX1- (power and control electronics for electric drive - JX1-) needs to be cooled.*
- *-N542- is activated e.g. when the air conditioner requests cooling output and -AX1- and/or -JX1- do not have to be cooled.*

– In the “Read measured values” function, read out the pressure in the refrigerant circuit measured by -G805- or -G395- . The pressure displayed increases to above the value with the air conditioner compressor switched off ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

If there is no change in the pressure displayed and the activation of the air conditioner compressor is OK:

– Check activation and operation of -N541- (it must not be activated) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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– Check installation position of -N541- (arrow must point in flow direction of refrigerant from condenser to expansion valve) ⇒ page 166 .

If the air conditioner compressor is being driven, but -N541- is not being activated (although it is installed correctly), there is a fault in the refrigerant circuit. There may be too little refrigerant in the circuit, or -N541- may be blocked.

– The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

Note

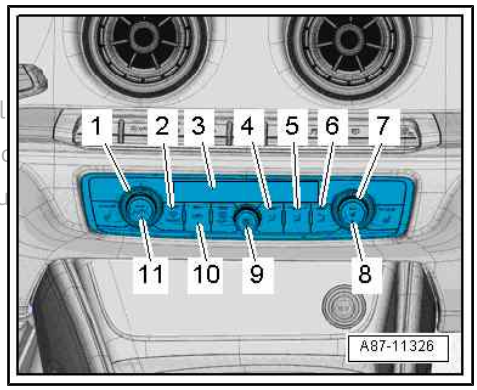
- *The electrical air conditioner compressor - V470- is activated by the control unit for air conditioner compressor - J842- when requested by the air conditioner operating unit (Climatronic control unit - J255-) in such a way that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 6 °C).*
- *After the engine is started, the air conditioner compressor is activated at a speed greater than 3000 rpm depending on the measured temperature, engine speed and electrical system voltage. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, the activation is reduced and the compressor output is decreased.*
- *Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the expansion valve for the evaporator in the air conditioning unit. This ice formation can impair the control function of the expansion valve/air conditioner compressor. The evaporator is insufficiently or excessively cooled and may ice up. An iced-up evaporator may cause various problems ⇒ page 76 .*

– Press Air recirculation button -10- on operating unit - J255- .

• Lamp indicating “Air recirculation” mode in button lights up.

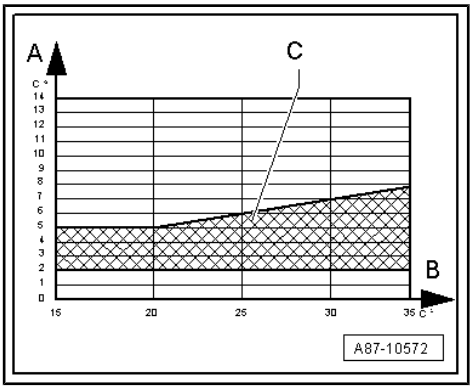
• “eco” mode not activated: display -3- of -J255- blank.

– “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



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– Compare measured value displayed for evaporator output temperature sender - G263- to values in graph.



A - Air temperature measured by evaporator output temperature sender - G263-

B - Ambient temperature

C - Permissible tolerance range

- Depending on the ambient temperature, the measured air temperature should be within the stated tolerance range after 5 minutes.

If specified values are not attained:

– Compare measured values for left vent temperature sender - G150- and right vent temperature sender - G151- to measured value displayed for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Note

- *You can also use a thermometer to measure the temperature of the air emerging from the dash panel vents (left and right).*
- *The operation of the air conditioner can be detected e.g. from the fact that the refrigerant pipe on the low-pressure side (thick pipe) cools down.*
- *When the vehicle is stationary or only moving slowly (up to a speed of approx. 45 km/h), the air conditioner compressor is not activated at the maximum specified speed (of approx. 8500 rpm); the air conditioner compressor speed is limited to approx. 5000 rpm.*
- *At an air conditioner compressor speed of 5000 rpm, with a high ambient temperature (in excess of 30 °C) and a high fresh air blower speed (unfavourable ambient conditions), the output (delivery volume) of the air conditioner compressor is at first not always sufficient to reduce the temperature of the air downstream of the evaporator to the specified value. One way of checking the control action of the air conditioner compressor under these conditions is to activate the fresh air blower with only approx. 40 % of the maximum voltage and to check the temperature at reduced fresh air blower speed ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).*

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If measured values for -G263- and -G150- / -G151- only differ slightly:

– Perform Fault Finding measures to be taken if results do not match specification ⇒ page 74 .

If measured value for evaporator output temperature sender - G263- is higher than measured value for -G150- / -G151- :

– Check that -G263- is correctly installed ⇒ page 286 and perform electrical check for this sender ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

The cooling output test is completed if the measured value for the evaporator output temperature sender - G263- (and thus the cooling output of the air conditioner) is OK and there are no problems.

If measured value for -G263- (and thus air conditioner cooling output) is not OK:

– Perform Fault Finding if results do not match specification (required cooling output is not attained) ⇒ page 74 .

If measured value for -G263- (and thus air conditioner cooling output) is OK and there is a problem with excessively high or differing air conditioner vent temperatures:

– Check actuation of temperature flaps in air conditioning unit ⇒ page 293 and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

If the measured value of the evaporator output temperature sender - G263- (and thus the cooling output of the air conditioner) is OK and there is a problem with a lack of cooling output for components of the high-voltage system:

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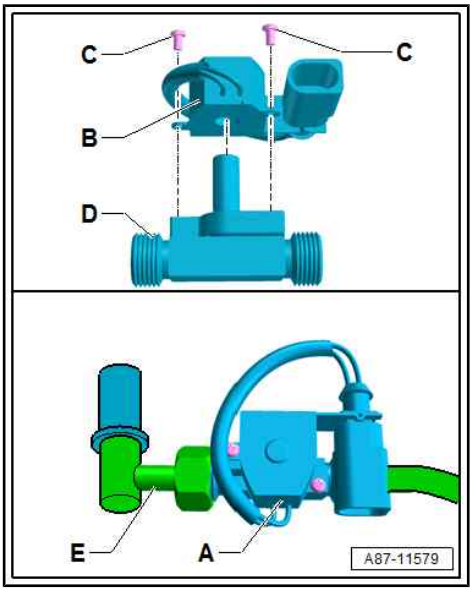
– Check activation and operation of -N542-; it must not be activated when cooling output is requested for cooling high-voltage system components ⇒ “8.2 Incorporation of heat exchanger for high-voltage battery into coolant circuit of high-voltage system”, page 347 and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Check installation position of -N542- (arrow must point in flow direction of refrigerant from condenser to heat exchanger for high-voltage battery) ⇒ page 169 .

– Check connections between heat exchanger for high-voltage battery ("chiller") and coolant circuit of high-voltage system ⇒ page 347 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

– Check operation and activation of coolant pump for high-voltage battery - V590- and coolant valve for high-voltage battery - N688- ⇒ “8.2 Incorporation of heat exchanger for high-voltage battery into coolant circuit of high-voltage system”, page 347 , ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for hybrid battery energy management system) and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

If the air conditioner compressor is being driven, but -N542- is not being activated (although it is installed correctly) and there is no fault in the coolant circuit of the high-voltage system, there is a fault in the refrigerant circuit. The constriction (restrictor) in the refrigerant circuit between -N542- and the heat exchanger for the high-voltage battery, or -N542- , may be blocked ⇒ page 146 .



Note

- *In air conditioner control mode -N542- is closed; it is activated by the air conditioner operating unit (Climatronic control unit - J255-). Only if there is a request for cooling output via the heat exchanger for the high-voltage battery from the hybrid battery unit - AX1- and/or the power and control electronics for electric drive - JX1- does -J255- switch off the activation of -N542- ; the refrigerant can then flow via the restrictor in the refrigerant line into the heat exchanger for the high-voltage battery and cool it. The hybrid battery unit - AX1- is only cooled if the coolant pump for high-voltage battery - V590- is also activated correctly. In order for the power and control electronics for electric drive - JX1- and the control unit for high-voltage battery charging unit - J1050- to be cooled, the coolant valve for high-voltage battery - N688- and the coolant circulation pump before power and control electronics for electric drive - V508- must also be activated correctly*
  ⇒ "8.2 Incorporation of heat exchanger for high-voltage battery into coolant circuit of high-voltage system", page 347 , ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for hybrid battery energy management system) and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .
- *If the air conditioner operating unit (Climatronic control unit - J255-) detects a fault in the connection between -J255- and -N542-, it switches off the activation of the electrical air conditioner compressor - V470- (depending on version of -J255-); cooling output is then stopped.*
- *Depending on the version of the air conditioner operating unit (Climatronic control unit - J255-), -N542- is not activated when the final control diagnosis for the electrical air conditioner compressor - V470- is being performed so that the cooling output for the heat exchanger for the high-voltage battery can be checked during the diagnosis ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- *The refrigerant shut-off valve for high-voltage battery heat exchanger - N542- -A- is open (de-energised); this means that the heat exchanger for the high-voltage battery is cooled as long as -N542- is not activated in air conditioning mode. If, with the ignition switched off, a different shut-off valve (with the same electrical values as -N542- -A-) is connected, or if coil -B- is removed from shut-off valve -D-, the cooling of the heat exchanger for the high-voltage battery can be checked without a fault being detected in the Climatronic control unit - J255-*
  ⇒ "8.9 Removing and installing heat exchanger for high-voltage battery", page 352 . (Should it be necessary to unplug the electrical connector for coil -B- in order to detach the coil, remember to plug it in again.)
- *Screws -C- must be removed to detach coil -B- (do not unplug connector with ignition switched on; if it has been detached plug it in again before switching on the ignition).*

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- *If there is a complaint and the vehicle's cooling output is OK and the heat exchanger for the high-voltage battery is cooled correctly while -N542- is not being activated, check the activation of -N542- as well as the connections between the heat exchanger for the high-voltage battery and the low-temperature coolant circuit; also check the activation and operation of the corresponding components ⇒ "8.2 Incorporation of heat exchanger for high-voltage battery into coolant circuit of high-voltage system", page 347 ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for hybrid battery energy management system) and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .*
- *If the vehicle's cooling output is OK and the heat exchanger for the high-voltage battery is not being cooled while -N542- is not being activated (or when coil -B- is detached), the cause could also be a blocked restrictor in refrigerant line -E- ⇒ page 146 .*

– If there is a fault in the refrigerant circuit, the necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

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4.8.6 Fault Finding if results do not match specifications

Required cooling output is not attained
⇒ "4.8.3 Checking cooling output - vehicles with manually controlled air conditioner", page 54 ,
⇒ "4.8.4 Checking cooling output - vehicles with automatically controlled air conditioner (without high-voltage system)", page 59 and
⇒ "4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)", page 64 .

Note

This Workshop Manual only gives a general outline of the checking procedure. Perform the functional check of the heater as described in the "Guided Fault Finding" routine ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

There may be various reasons for a readout not matching the specification:

– Determine cause ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

Possible reasons for deviation from specification:

- Radiator or air conditioner condenser dirty
- Components retrofitted at front end of vehicle
- Problem with activation or operation of radiator fans -V7- / -V177-
- Faults in coolant circuit, coolant becomes too hot

- Problem with activation of air conditioner compressor regulating valve -N280- by air conditioning system control unit - J301- / Climatronic control unit - J255- (vehicles without high-voltage system).
- Request(s) transmitted by other control units to air conditioning system control unit - J301- / Climatronic control unit - J255- for deactivation of -N280- (vehicles without high-voltage system).
- Problem with operation of air conditioner compressor regulating valve -N280- (vehicles without high-voltage system).
- Faults in refrigerant circuit or air conditioner compressor.
- Problem with activation or operation of battery regulation control unit - J840- , electrical air conditioner compressor - V470- , control unit for air conditioner compressor - J842- or refrigerant shut-off valve for heater and air conditioning unit - N541- (vehicles with high-voltage system).

If “Guided Fault Finding” reveals a fault in the refrigerant circuit:

– If there is a fault in the refrigerant circuit, the necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations . Inform the workshop of the problem detected.

4.8.7 Fault Finding if temperature increases downstream of evaporator

The increase in temperature in the air conditioning unit is excessive
⇒ “4.8.3 Checking cooling output - vehicles with manually controlled air conditioner”, page 54 ,
⇒ “4.8.4 Checking cooling output - vehicles with automatically controlled air conditioner (without high-voltage system)”, page 59 and
⇒ “4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)”, page 64 .

Note

This Workshop Manual only gives a general outline of the checking procedure. Perform the functional check of the heater as described in the "Guided Fault Finding" routine ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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There may be various reasons for a readout not matching the specification due to an increase in temperature downstream of the evaporator:

– Determine cause ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Possible reasons for deviation from specification:

- Temperature flaps in air conditioning unit do not reach end stops properly (faulty activation).
- One or more measured values for temperature sensors not OK.
- Warm air flowing past temperature flaps set to “cold” stop.

Note

This fault can be determined as follows: Clamp off the two coolant hoses from the engine to the heat exchanger of the air conditioning unit e.g. using hose clamps up to 40 mm - 3093- and repeat the cooling output test. If the measured values are then OK, this is an indication of a fault in the area of the temperature flaps.

4.8.8 Fault finding if ice forms at evaporator

Vehicles without high-voltage system

- The air conditioner compressor regulating valve - N280- is activated by the operating unit -J301- / -J255- so that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 6 °C).
- After starting the vehicle, a value above 0.55 A (75 %) may be displayed in the “Read measured values” function for the operating unit -J301- / -J255- for the activation of the air conditioner compressor regulating valve - N280- depending on the measured temperature, engine speed and voltage of the vehicle electrical system ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, the activation is reduced and the compressor output is decreased.
- Under extreme ambient conditions ice could form at the evaporator if certain settings are selected on the air conditioner, e.g. air outflow direction set to dash panel vents with these vents closed, maximum cooling output with minimum fresh air blower speed selected. When these settings are selected, air no longer flows through the evaporator, which means that the temperature measured by the evaporator output temperature sender - G263- is higher than the actual temperature at the evaporator. However, the air conditioner control uses the measured value of -G263- as the basis for the actual evaporator temperature and continues to activate -N280- ; as a consequence, the evaporator cools down too much.
- Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the compressor regulating valve and expansion valve. Such ice formation impedes the control of the air conditioner compressor. The evaporator is cooled down too much and ices up. An iced-up evaporator may cause the following problems ⇒ page 77 .

Vehicles with high-voltage system

- The electrical air conditioner compressor - V470- is activated via the control unit for air conditioning compressor - J842- by the air conditioner operating unit (Climatronic control unit - J255-) in such a way that the temperature of the air downstream of the evaporator reaches the specified value (approx. 2 to 6 °C).
- The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1- ⇒ “9.8 Removing and installing fuse for electrical air conditioner compressor”, page 372 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- After the ignition is switched on, a value greater than 3000 rpm is displayed for the air conditioner compressor speed depending on the road speed, the measured temperature and the

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voltage of the vehicle's electrical system. As soon as the temperature measured by the evaporator output temperature sender - G263- approaches the specified value, the activation is reduced and the compressor output is decreased.

- Under extreme ambient conditions ice could form at the evaporator if certain settings are selected on the air conditioner, e.g. air outflow direction set to dash panel vents with these vents closed, maximum cooling output with minimum fresh air blower speed selected. When these settings are selected, air no longer flows through the evaporator, which means that the temperature measured by the evaporator output temperature sender - G263- is higher than the actual temperature at the evaporator. The air conditioner control system however assumes that the measured value of -G263- corresponds to the actual evaporator temperature and continues to activate the electrical air conditioner compressor - V470- at increased speed, with the result that the evaporator is excessively cooled.
- If the air conditioner is switched off and there is a request for cooling output via the heat exchanger for the high-voltage battery from the battery regulation control unit - J840- (for the hybrid battery unit - AX1-) or from the power and control electronics for electric drive - JX1- , the evaporator also might ice up under unfavourable conditions if the operation of the refrigerant shut-off valve for heater and air conditioning unit - N541- is not OK. The air conditioner operating unit -J255- activates -V470- and -N541- . If -N541- does not close, the evaporator will cool down so much that the condensate water on the evaporator fins will freeze because the evaporator temperature will not be controlled. Check operation of -N541- ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).
- Under certain operating conditions, residual moisture in the refrigerant circuit may lead to the formation of ice at the expansion valve. Such ice formation impedes the control of the air conditioner compressor. The evaporator is cooled down too much and ices up. An iced-up evaporator may cause the following problems ⇒ page 77 .

Possible customer complaint (all vehicles, with or without high-voltage system):

- The air conditioner fails repeatedly or sporadically (no cooling/ heating output) after extended driving; after the vehicle has been stopped or the air conditioner has been switched off, the air conditioner functions properly again (after a short wait).
- The windows mist up on the inside after long journeys; initially the windows are not de-misted even after pressing the “defrost” button e.g. on vehicles with an automatic air conditioner; after the ignition is switched off and waiting a short while, the air conditioner functions properly again.

Remedy:

– Check measured value for evaporator output temperature sender - G263- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

If measured value for sender is too high under usage conditions described by customer (e.g. above 10 °C depending on ambient temperature) although air conditioner is functioning properly.

– Check evaporator output temperature sender - G263- . The evaporator may ice up as a result of an incorrect measured value.

If the measured value for the sender is too low under the usage conditions described by the customer (at ambient temperature above 0 °C, colder than 0 °C for lengthy period):

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– Check the refrigerant line between the connection on the right longitudinal member (from the internal heat exchanger/from the evaporator) and the air conditioner compressor (thick pipe, low-pressure side) with the engine running. If this line is severely iced up when the problem occurs (thin layer of ice is permissible), this indicates that evaporator temperature is too low.
– There is a fault in the refrigerant circuit. There may be problems with the control of the air conditioner compressor.
– Checking pressures in refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Checking pressures .

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Note

The necessary work may only be performed by appropriately qualified personnel. If this is not possible on your premises, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems . Inform the workshop of the faults found, or refer to ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

4.9 Discharging refrigerant circuit

Refrigerant must not be allowed to escape into the environment; it should be extracted from the refrigerant circuit with an air conditioner service station. The extracted refrigerant must then either be re-processed on site or returned to the manufacturer for proper disposal. Different or additional regulations may apply in other countries. For this reason, the vehicle must be taken to a workshop which is equipped with the necessary tools and at which the work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

Refrigerant must not be allowed to escape into the environment; it should be extracted from the refrigerant circuit with an air conditioner service station. The extracted refrigerant must then either be re-processed on site or returned to the manufacturer for proper disposal. Different or additional regulations may apply in other countries. For this reason, the vehicle must be taken to a workshop equipped with the necessary tools where this work can be performed by appropriately qualified personnel ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

Reason:

If refrigerant R134a or R1234yf escapes into the earth’s atmosphere, it contributes towards the greenhouse effect.

Note

- *Refrigerant R134a has far less of a greenhouse effect than R12.*
- *Refrigerant R1234yf has far less of a greenhouse effect than R134a.*
- *Refrigerant R134a and R1234yf do not affect the earth's ozone layer (R134a and R1234yf do not have any chlorine atoms). Depletion of the ozone layer in the upper atmosphere is only brought about by the splitting of carbon-chlorine bonds (as is the case, for example, with refrigerant R12).*
- *The global warming potential (GWP) of R1234yf is approx. 4; the GWP of R134a is approx. 1400 (GWP of carbon dioxide = 1) ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Laws and regulations .*

After discharging air conditioner, unplug electrical connector from air conditioner compressor regulating valve - N280- (vehicles without high-voltage system) or from pressure sender for refrigerant circuit - G805- (or -G395- depending on vehicle version).

Reason:

- The air conditioner compressor (air conditioner compressor regulating valve - N280-) is then no longer activated.
- The mechanically driven air conditioner compressor then merely idles with the engine. The mechanically driven air conditioner compressor is designed so that, when running at idle, lubrication of the components of the air conditioner compressor is guaranteed via an internal oil circuit (provided there is enough refrigerant oil in the air conditioner compressor).

4.10 Working on refrigerant circuit

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

In the following steps, work near high-voltage system components is necessary
⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19 and “General warning instructions for work on the high-voltage system” ⇒ 4-cyl. direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA211); Rep. gr. 93 ; High-voltage components .

Working with ignition switched on or high-voltage system active

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DANGER!

When working on a vehicle with the ignition switched on or while the drive system is active, the engine can start unexpectedly and exhaust fumes can cause a health hazard in closed rooms. Moving parts can trap or draw in parts of the body and/or clothing (safety hazard).

Before switching on the ignition, perform the following steps:

- *Move selector lever to position P*
- *Activate parking brake*
- *Switch off ignition*
- *Open bonnet*
- *Connect battery charger (e.g. battery charger - VAS 5095A-) to jump-start connections of 12 V electrical system*
- *Switching on ignition*

– To minimise the number of automatic engine starts when the vehicle's drive system is active during test and measurement work, charge the vehicle batteries e.g. with the battery charger 60A - VAS 5904- in battery standby mode ⇒ Electrical system; General information; Rep. gr. 27 ; Battery; Charging battery and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .

– For test and measurement work that requires the vehicle's drive system to be active (READY) or the ignition to be switched on, move the selector lever to position “P”, activate the parking brake and take care to keep well clear of the engine when it is running. Set up any tools needed so that they cannot come into contact with moving parts.

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Note

- *Also move the selector lever to position “P” and activate the parking brake before performing test and measurement work for which the ignition must be switched on but where the vehicle's drive system does not need to be active (READY).*
- *The status of the drive system (READY) is shown by the control unit in dash panel insert - J285- via the “power meter” ⇒ Owner's Manual .*
- *Activating and deactivating drive system ⇒ Owner's Manual (note display of control unit in dash panel insert - J285-).*

All vehicles

WARNING

Risk of injury due to pressure build-up in the air conditioner (exposure to heat).

- *Exposure to heat generates considerable pressure in the air conditioning system, which could cause it to burst.*
- *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.*
- *Renew damaged or leaking components of the air conditioner.*

Caution

The ingress of moisture will lead to the air conditioner malfunctioning.

- *When servicing the air conditioner, re-seal all open components and pipe connections immediately.*
- *If the air conditioner has been open for a certain amount of time, check components for corrosion and renew if necessary.*

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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:

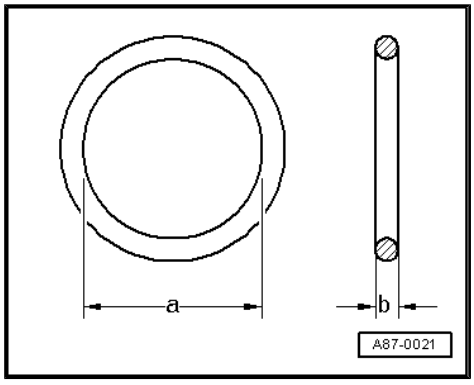
Exposure to heat generates considerable pressure in the system, which could cause it to burst.

4.12 Refrigerant circuit seals

- O-rings should always only be used once and must then be renewed.
- Coat O-rings with refrigerant oil before fitting.
- Make sure O-rings are seated correctly on pipe or in groove.
- Ensure absolute cleanliness when working (even the slightest contamination, e.g. a single hair, could cause leakage).

Note

- *Only install O-rings which are resistant to refrigerant R134a and/or R1234yf and the corresponding refrigerant oils. These O-rings may be colour-coded to prevent mix-ups (e.g. “red”, “purple” or “violet”) ⇒ Electronic parts catalogue .*
- *Dimensions -a- and -b- differ depending on where the O-ring is fitted ⇒ Electronic parts catalogue .*
- *In addition to the coloured O-rings, black O-rings are also used at the factory for certain connections.*



4.13 Notes on control motors

⇒ “4.13.1 Notes on control motors”, page 82

⇒ “4.13.2 Preparing adapter cable for activation of control motors”, page 83

4.13.1 Notes on control motors

Caution

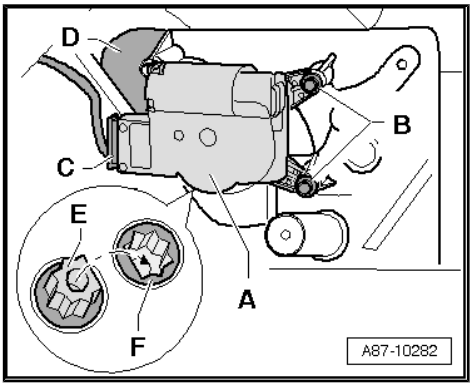
Heater and air conditioner malfunctions can occur.

- *The heater/air conditioner will not function properly if control motors and/or the corresponding connectors are interchanged.*
- *The connectors of the control motors are identical. If these are connected incorrectly, the corresponding flaps can no longer be properly matched and/or activated.*
- *The actuator socket in the control motor may not have a stop. It rotates permanently if the control motor is activated. A control motor should therefore not be activated after it has been detached (or only if necessary for installation).*

- There are various identical connectors on the heater/air conditioning unit. To avoid the risk of interchanging them, mark the connectors before unplugging them.
- Different control motors are fitted on the heater/air conditioning unit; these motors have different electrical values and part numbers ⇒ Electronic parts catalogue . The control motors must be marked before they are removed to avoid the risk of interchanging them.
- After installing a control motor, perform the basic setting of the air conditioner ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function.
- The activation of the electrical components of the air conditioner can be checked via the “Final control diagnosis” and “Basic setting” functions (e.g. to check for interchanged components) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- After installing a new control motor, perform the basic setting and check the activation by the operating unit (heater control unit - J65- , air conditioning system control unit - J301- , Climatronic control unit - J255-) and the operation of the control motor ⇒ Vehicle diagnostic tester, “Guided Fault Finding” function.

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Proceed as follows if actuator socket -F- of a control motor -A- (or a fitted connecting element) is positioned so that control motor cannot be installed:



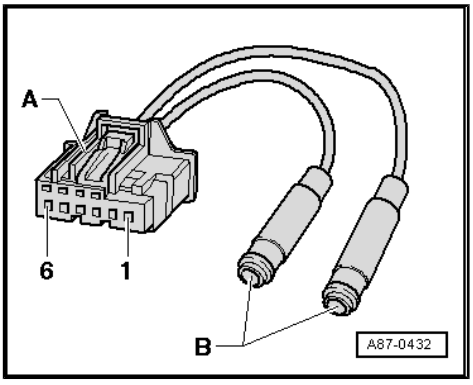
- If it is possible to switch on the ignition, connect the relevant control motor -A- to the vehicle wiring harness -C-, then switch on the ignition and select a setting on -J65- / -J301- or -J255- in which the control motor is moved to the desired position (e.g. to centre position). Wait until the control motor has reached the required position and then switch off the ignition.
- If it is not possible to switch on the ignition, you can use e.g. an adapter cable ⇒ page 83 (or a test lead from the adapter set - V.A.G 1594/C-) to connect contacts “5” and “6” of the control motor removed earlier to a 12 V battery via a 5 A fuse. Then turn the control motor until the actuator socket -F- of the control motor -A- (or the installed connecting element) reaches a position in which no pre-tension is required for attaching it or in which it can be joined in the specified position. The direction of rotation of the control motor can be reversed by interchanging positive and negative.

Note

For example, the lug of an adjustment unit -E- and the actuator socket -F- of a control motor -A- are only to be joined in the position in which no force is required to do so. If the lug -E- can only be inserted with force, check the shaft of the motor (it may be 180° out of position).

4.13.2 Preparing adapter cable for activation of control motors

Procedure



- Connect one cable each (with a cross section of 0.25 mm^2) to contacts “5” and “6” of connector -A- (flat contact housing with auxiliary contact lock - 6Q0 972 706-) ⇒ Electronic parts catalogue .
- Connect other end of each cable to a commercially available banana plug -B-.

4.14 Notes on dust and pollen filter

⇒ “4.14.1 Dust and pollen filter with activated charcoal filter insert”, page 83

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4.14.1 Dust and pollen filter with activated charcoal filter insert

The dust and pollen filter with activated charcoal filter insert is only fitted on vehicles with air quality sensor - G238- .

Note

- *Different filters are available for this vehicle depending on the equipment version.*
- *A dust and pollen filter without activated charcoal filter insert is fitted at the factory on vehicles without air conditioner and vehicles with a manually controlled air conditioner (both without air quality sensor - G238-). These vehicles may also be retro-fitted with a dust and pollen filter with activated charcoal filter insert ⇒ Electronic parts catalogue .*
- *A dust and pollen filter with activated charcoal filter insert is fitted at the factory on vehicles with automatically controlled air conditioner (with air quality sensor - G238-) ⇒ Electronic parts catalogue .*
- *From model year 2017 onwards, Audi A3 vehicles are gradually fitted with a dust and pollen filter with bioactive substances (from the start of production onwards on Audi Q2 vehicles). These bioactive substances reduce the amount of allergens in the air flowing through the filter. These filters can be retro-fitted in all vehicles ⇒ Electronic parts catalogue .*

The filter with activated charcoal acts as a dust and pollen filter. However, it can also filter gaseous pollutants such as ozone, benzene and nitrogen dioxide out of the air. The main function of the activated charcoal layer in the dust and pollen filter is to keep peak concentrations away from the passenger compartment.

However, the activated charcoal also absorbs certain gaseous impurities in the air passing through. The activated charcoal layer in the dust and pollen filter has different effects on the various pollutants in the air:

- Certain pollutants are firmly bound in the activated charcoal layer.
- Other pollutants are converted into harmless compounds, as in a catalytic converter.
- For the rest of the pollutants the activated charcoal functions like a capacitor. When the pollution increases, the activated charcoal initially absorbs pollutants until a certain level of saturation has been reached. If the pollutant level drops, the activated charcoal layer continuously emits the absorbed particles again.

As the activated charcoal layer permanently binds some of the particles in the air, we recommend renewing the dust and pollen filter earlier than specified under the following operating conditions:

- If the vehicle is driven in areas with a high level of air pollution
- If the vehicle is driven with the “automatic air recirculation” function deactivated

Note

- *The activated charcoal layer in the dust and pollen filter becomes saturated after a certain time.*
- *A saturated filter can no longer absorb pollutants; they will then pass through unfiltered.*

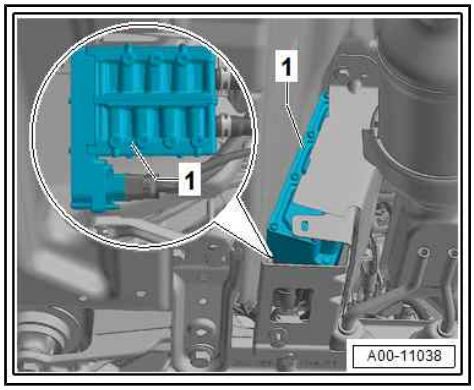
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4.15 Notes on high-voltage heater (PTC) - Z115- (and high-voltage heater (PTC) control unit - J848-)

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

In the following steps, work near high-voltage system components is necessary (Safety precautions when working in the vicinity of high-voltage system components
⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19 and ⇒ 4-cyl. direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA211); Rep. gr. 93 ; High-voltage components).

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- The high-voltage heater (PTC) - Z115- -1- has a nominal power of approx. 5000 W (watts). The nominal power is only produced at low coolant temperatures.
- The power delivered to the coolant flowing through the heater -Z115- depends greatly on the temperature of the coolant. If there is not enough coolant flowing through the heater -Z115- , the coolant will heat up more; however due to the small amount of coolant less energy is generated.

Components involved in activation of supplementary heater:

- Heat energy is delivered to the coolant via the high-voltage heater (PTC) - Z115- -1- before it enters the heat exchanger (in the air conditioning unit)
⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”). For this to happen, there must be a request from the operating unit (Climatronic control unit - J255-).
- If the air conditioner control unit -J255- determines that heat output mode is necessary, various control units are interrogated by -J255- via the data bus, e.g. the battery regulation control unit - J840- (fitted in the hybrid battery unit - AX1-) and the control unit for high-voltage battery charging unit - J1050- . If no conditions preventing the activation of -Z115- are transmitted by these control units, -J255- will activate -Z115- . For further information, refer to
⇒ “2.8 Auxiliary air conditioner - vehicles with high-voltage system only”, page 16 , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- So that the coolant heated up by -Z115- is conveyed through the air conditioner heat exchanger when the engine is running, in electric mode (with the engine stopped) and when the “Auxiliary air conditioner” function is active (with the ignition switched off), the coolant pump for high-temperature circuit - V467- , the coolant changeover valve 2 - N633- and the coolant valve for gearbox - N488- must also be activated (by the corresponding engine control unit). To ensure that the coolant flows in the right direction, the non-return valves fitted in the coolant circuit must also be installed correctly and they must operate correctly. For further information, refer to
⇒ “2.8 Auxiliary air conditioner - vehicles with high-voltage system only”, page 16 ,
⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 , ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- On vehicles with high-voltage system and an auxiliary heater fitted as an optional extra, the auxiliary heater or the high-voltage heater (PTC) - Z115- is activated by the air conditioner operating unit -J255- depending on various factors. For more information, refer to
⇒ “2.8 Auxiliary air conditioner - vehicles with high-voltage system only”, page 16 and ⇒ Auxiliary/supplementary heater; Rep. gr. 00 ; General notes (Notes on auxiliary heater operation - vehicles with high-voltage system).
- The air conditioner operating unit -J255- and the high-voltage heater (PTC) control unit - Z115- fitted in the high-voltage heater (PTC) - J848- exchange the data for switching -Z115- on and off via a data line (LIN bus) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Audi
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Criteria for activation of high-voltage heater (PTC) - Z115-

The operating unit -J255- transmits a request for the activation of the supplementary heater to the high-voltage heater (PTC) control unit - J848- fitted in -Z115- . If the conditions stored in -J255- are met and no fault is detected by -J848- , it will activate -Z115- . If any of the conditions for activating -Z115- stored in -J255- are not met, no request is transmitted or activation is switched off.

The cut-in criteria must be met in the operating unit -J255- , and/or no shut-off criterion may be active. For a list of the cut-in criteria, refer to ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).

Shut-off criteria for activation of supplementary heater

The operating unit -J255- deactivates the request for activation of -Z115- if one of the cut-in criteria is no longer met or a fault is detected by -J848- .

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4.16 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.

– 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`

5 Technical data

⇒ “5.1 Refrigerant capacities”, page 88

⇒ “5.2 Approved refrigerant oils and refrigerant oil capacities”, page 90

⇒ “5.3 Oil distribution”, page 96

5.1 Refrigerant capacities

⇒ “5.1.1 Capacities for refrigerant R134a”, page 88

⇒ “5.1.2 Capacities for refrigerant R1234yf”, page 89

5.1.1 Capacities for refrigerant R134a

Refrigerant R134a/refrigerant oil capacities ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/ refrigerant oil and approved refrigerant oils

– Discharging, evacuating and charging refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

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Note

- *The versions of the compressor and condenser may differ depending on the production period and engine ⇒ Electronic parts catalogue .*
- *The refrigerant and refrigerant oil capacities depend on the versions of the air conditioner compressor and condenser ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*
- *Always charge the refrigerant circuit as far as the upper tolerance limit (some refrigerant remains in filler hoses).*
- *For further information, refer to ⇒ page 3 and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station).*

5.1.2 Capacities for refrigerant R1234yf

Note

- *The capacities for the Audi A3 (8V_ or 85_ for China) apply to all versions (Saloon, Sportback, Cabriolet, etc.)*
- *When charging the high-pressure side of refrigerant circuits, always fill to the upper tolerance limit (some liquid refrigerant will remain in the filler hoses).*
- *Unless otherwise stated, the capacities specified for refrigerant R1234yf also apply to the S and RS versions of this vehicle model.*
- *When charging a vehicle's refrigerant circuit, the air conditioner service station must be on the same level as the vehicle (maximum difference 50 cm). Depending on how the air conditioner service station is designed, having too great a height difference can cause the amount of refrigerant shown to differ from the actual amount poured in. The accuracy of the air conditioner service station may change.*
- *The capacities for refrigerant R1234yf and the corresponding refrigerant oil are now listed in this manual rather than in the Workshop Manual for all models ⇒ "5.2.3 Refrigerant oil capacities for refrigerant R1234yf", page 94 , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 00 ; Technical data .*
- *Note different capacities for refrigerant R1234yf in vehicles without rear air conditioning unit (with one evaporator) and vehicles with high-voltage system (with two evaporators).*
- *For additional notes on evacuating and charging the refrigerant circuit, refer to ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*

– Discharge, evacuate and charge refrigerant circuit ⇒ 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 ⇒ page 199 .

Capacity for refrigerant R1234yf

Vehicle model	Production period	Capacity in grams	Differing characteristics of this refrigerant circuit
Audi Q2 Audi A3	From 06.16 onwards	460 +/- 15	• None
A3 e-tron	From 06.16 onwards	450 +/- 15	• Electrically driven air conditioner compressor • With second evaporator in heat exchanger for high-voltage battery ("chiller")

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Vehicle model	Production period	Capacity in grams	Differing characteristics of this refrigerant circuit
Audi RS 3 • With 5-cyl. engine	From 06.16 onwards	520 +/- 15	• Different type of condenser fitted ⇒ Electronic parts catalogue .

5.2 Approved refrigerant oils and refrigerant oil capacities

⇒ "5.2.1 Approved refrigerant oils and refrigerant oil capacities for refrigerant R134a", page 90

⇒ "5.2.2 Approved refrigerant oils for refrigerant R1234yf", page 91

⇒ "5.2.3 Refrigerant oil capacities for refrigerant R1234yf", page 94

5.2.1 Approved refrigerant oils and refrigerant oil capacities for refrigerant R134a

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

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 .

– Discharge, evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit .

– Starting up air conditioner after charging refrigerant circuit ⇒ page 199 , and ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a, General information on air conditioning systems). (before using air conditioner after it has been re-charged).

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Caution

Charging the refrigerant circuit with the wrong refrigerant oil will cause malfunctions of the air conditioner.

- *The refrigerant circuit must only be charged with approved refrigerant oils ⇒ Electronic parts catalogue . The correct refrigerant oil depends on the manufacturer and version of the air conditioner compressor installed ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/refrigerant oil and approved refrigerant oils .*

Charging the refrigerant circuit with the wrong quantity of refrigerant oil will cause malfunctions of the air conditioner.

- *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.*

Risk of corrosion in refrigerant circuit.

- *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.

Note

- *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 Approved refrigerant oils for refrigerant R1234yf

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Note

- *PAG (polyalkylene glycol) oil is highly hygroscopic (attracts water); open containers should therefore be closed immediately so that they are air-tight.*
- *PAG oil becomes unusable if it is stored in open containers for a long period of time.*

Caution

Charging the refrigerant circuit with the wrong refrigerant oil will cause malfunctions of the air conditioner.

- *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.*

Charging the refrigerant circuit with the wrong quantity of refrigerant oil will cause malfunctions of the air conditioner.

- *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.*

Risk of corrosion in refrigerant circuit.

- *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 .*

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Important information:

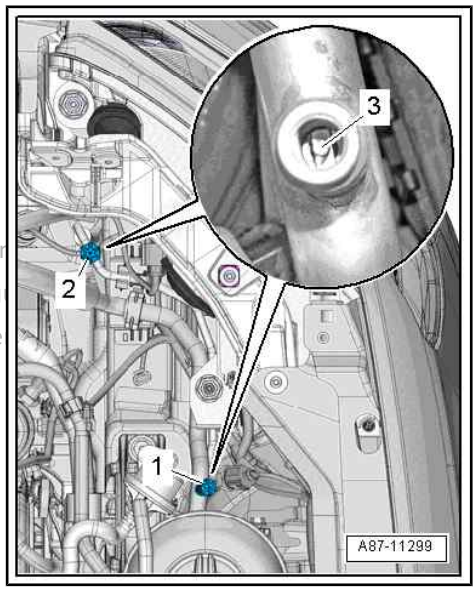
As refrigerant oil is extremely hygroscopic, open containers must be closed and re-sealed immediately after use to prevent moisture from entering.

Note

- *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.
- There are different refrigerant oils for “Denso”, “Delphi/Mahle”, “Visteon” and “Sanden” air conditioner compressors ⇒ Electronic parts catalogue .
- 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 .



Note

- *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 ⇒ “2.1 System overview - refrigerant circuit”, page 133 .*

⇒ “5.2.3 Refrigerant oil capacities for refrigerant R1234yf”, page 94

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5.2.3 Refrigerant oil capacities for refrigerant R1234yf

Note

- *The capacities for the Audi A3 (8V_ or 85_ for China) apply to all versions (Saloon, Sportback, Cabriolet, etc.)*
- *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 .*
- *There are different refrigerant oils for "Denso", "Delphi/Mahle", "Visteon" and "Sanden" air conditioner compressors ⇒ "5.2.2 Approved refrigerant oils for refrigerant R1234yf", page 91 , and ⇒ Electronic parts catalogue .*
- *For further notes on refrigerant oil, refer to ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Repair instructions; Refrigerant and refrigerant oil .*

- ⇒ "5.2.2 Approved refrigerant oils for refrigerant R1234yf", page 91
- Layout and characteristics of refrigerant circuit ⇒ "2.1 System overview - refrigerant circuit", page 133

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 Q2 Audi A3	From 06.16 onwards	110 +/- 10	110 +/- 10	• "Denso" air conditioner compressor
		75 +/- 10	75 +/- 10	• "Sanden" air conditioner compressor
		110 +/- 10	110 +/- 10	• "Delphi/Mahle" air conditioner compressor

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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 A3 e-tron	From 06.16 onwards	120 +/- 10	120 +/- 10	• Electrically driven air conditioner compressor • With second evaporator in high-voltage battery heat exchanger • Different type of refrigerant oil
Audi RS 3 • With 5-cyl. engine (PR no. TB9)	From 06.2016 to 07.2016	110 +/- 10	110 +/- 10	• “Sanden” air conditioner compressor with double-belt pulley and different type of condenser fitted ⇒ Electronic parts catalogue .
Audi RS 3 • With 5-cyl. engine (PR no. TM1)	From 02.2017 onwards	110 +/- 10	110 +/- 10	• “Denso” air conditioner compressor

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Note

- *The replacement compressor contains the full quantity of oil intended for the refrigerant circuit. If the air conditioner compressor is renewed, the quantity of oil in the compressor must therefore be adjusted accordingly ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- *Different air conditioner compressors are fitted depending on the production period and engine ⇒ Electronic parts catalogue .*
- *These air conditioner compressors are available as replacement parts with different refrigerant oil capacities, and attention must therefore be paid to the oil quantity in the air conditioner compressor as well as the exact part number ⇒ Electronic parts catalogue*
- *The different oil quantities in the air conditioner compressor may result from the design of the air conditioner compressor (with or without oil separator at high-pressure connection) or, in the case of identical air conditioner compressors, from the design of the refrigerant circuit; pay attention to these quantities. 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.*
- *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. Therefore observe the notes on renewing components of the refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Renewing components of refrigerant circuit (Air conditioner with refrigerant R134a; Renewing components of refrigerant circuit) or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .

80 – Heating

1 Overview of fitting locations - heater

⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 97

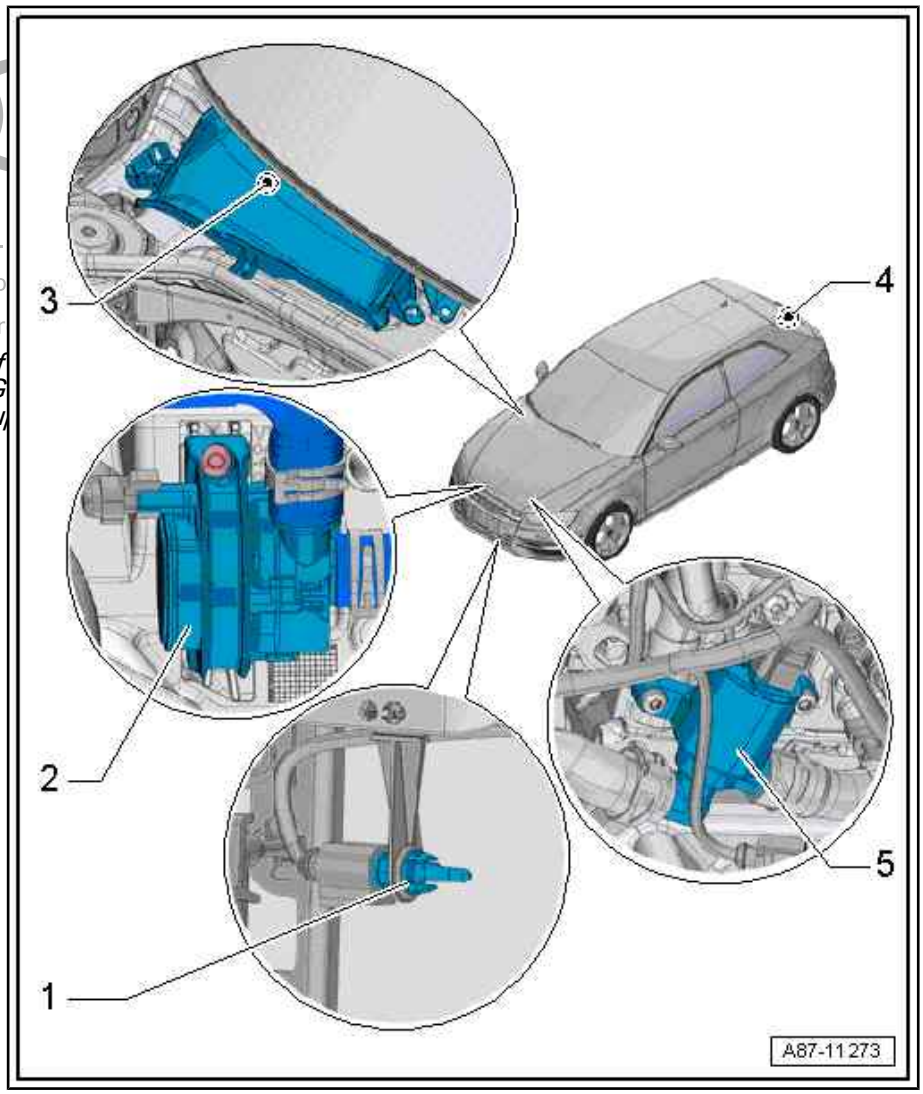
⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 99

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

Continued coolant circulation pump, coolant shut-off valve, heated rear window ⇒ page 97

Plenum chamber water drain, forced ventilation vents for passenger compartment ⇒ page 98

Continued coolant circulation pump, coolant shut-off valve, heated rear window



1 - Ambient temperature sensor - G17-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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Note

The measured value of temperature sensor - G ated by the onboard su unit - J519- .

- ❑ Removing and installing ⇒ “9.2 Removing and installing ambient temperature sensor G17 ”, page 362

2 - Continued coolant circulation pump - V51- / auxiliary pump for heating - V488-

- ❑ Different designations depending on engine version: -V51- or -V488-
- ❑ Shown on 1.4 ltr. TFSI engine as an example
- ❑ May be installed in coolant circuit (depending on engine version) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

- ❑ Activated by engine control unit when requested by operating unit (heater control unit - J65-)
- ❑ Also supports engine coolant pump to improve flow of coolant through heat exchanger at certain engine speeds to enhance heating output
- ❑ Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

3 - Fresh air intake

- ❑ Removing and installing ⇒ “6.7 Removing and installing fresh air intake”, page 329

4 - Heated rear window - Z1-

- ❑ Notes on operation of heated rear window ⇒ page 12
- ❑ Checking activation and operation of seat heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

5 - Coolant shut-off valve - N82-

- ❑ Shown on 1.8 ltr. TFSI engine as an example
- ❑ Installed in coolant circuit depending on engine version ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Overview of fitting locations - cooling system and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Activated by engine control unit following release by operating unit (heater control unit - J65-)
- ❑ Depending on setting on operating unit (heater control unit - J65-), blocks flow of coolant through heat exchanger when engine is cold e.g. to accelerate warm-up of engine
- ❑ Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Overview of fitting locations - cooling system

Plenum chamber water drain, forced ventilation vents for passenger compartment

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1 - Plenum chamber water drain (left-side)

- ❑ Checking and cleaning ⇒ “6.10 Checking plenum chamber water drain”, page 333

2 - Plenum chamber water drain (right-side)

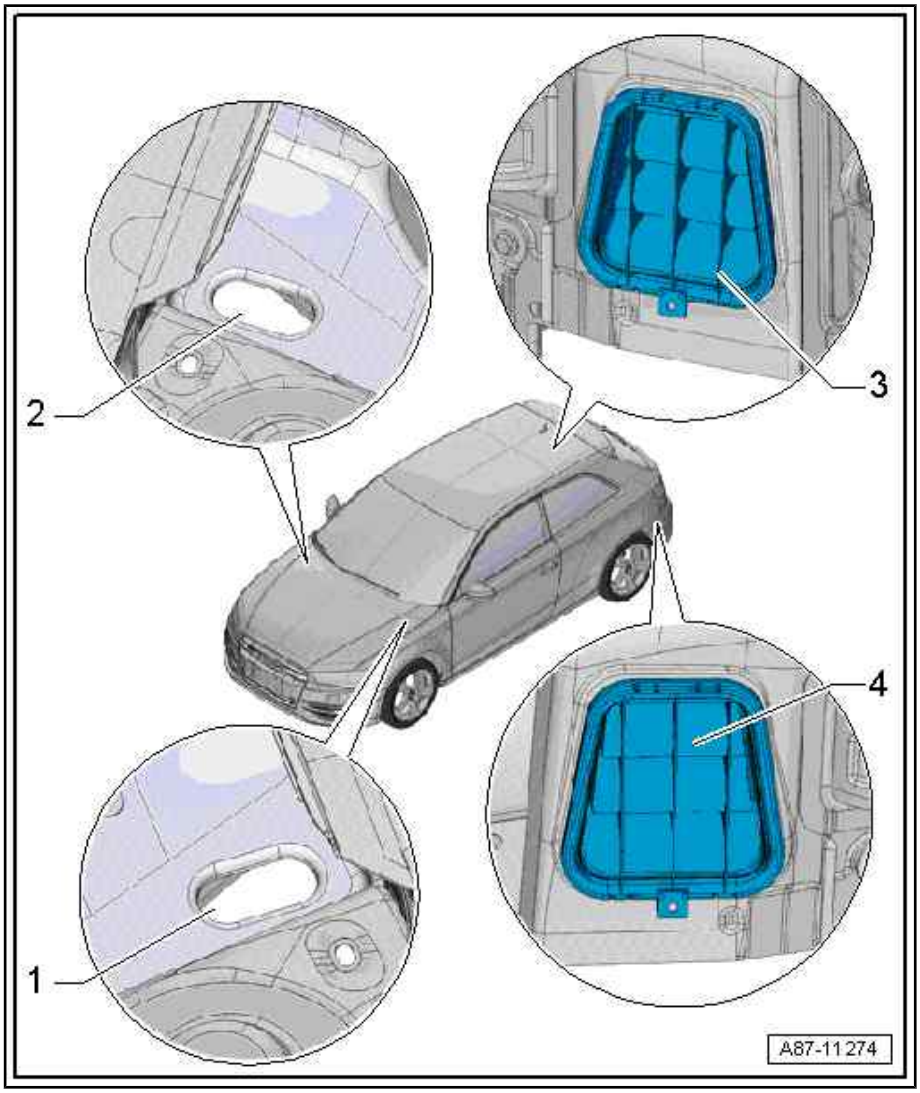
- ❑ Checking and cleaning ⇒ “6.10 Checking plenum chamber water drain”, page 333

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

- ❑ Checking ⇒ “6.8 Checking forced ventilation vents in passenger compartment”, page 329
- ❑ Removing and installing ⇒ “6.9 Removing and installing forced ventilation vents in passenger compartment”, page 332

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

- ❑ Checking ⇒ “6.8 Checking forced ventilation vents in passenger compartment”, page 329
- ❑ Removing and installing ⇒ “6.9 Removing and installing forced ventilation vents in passenger compartment”, page 332



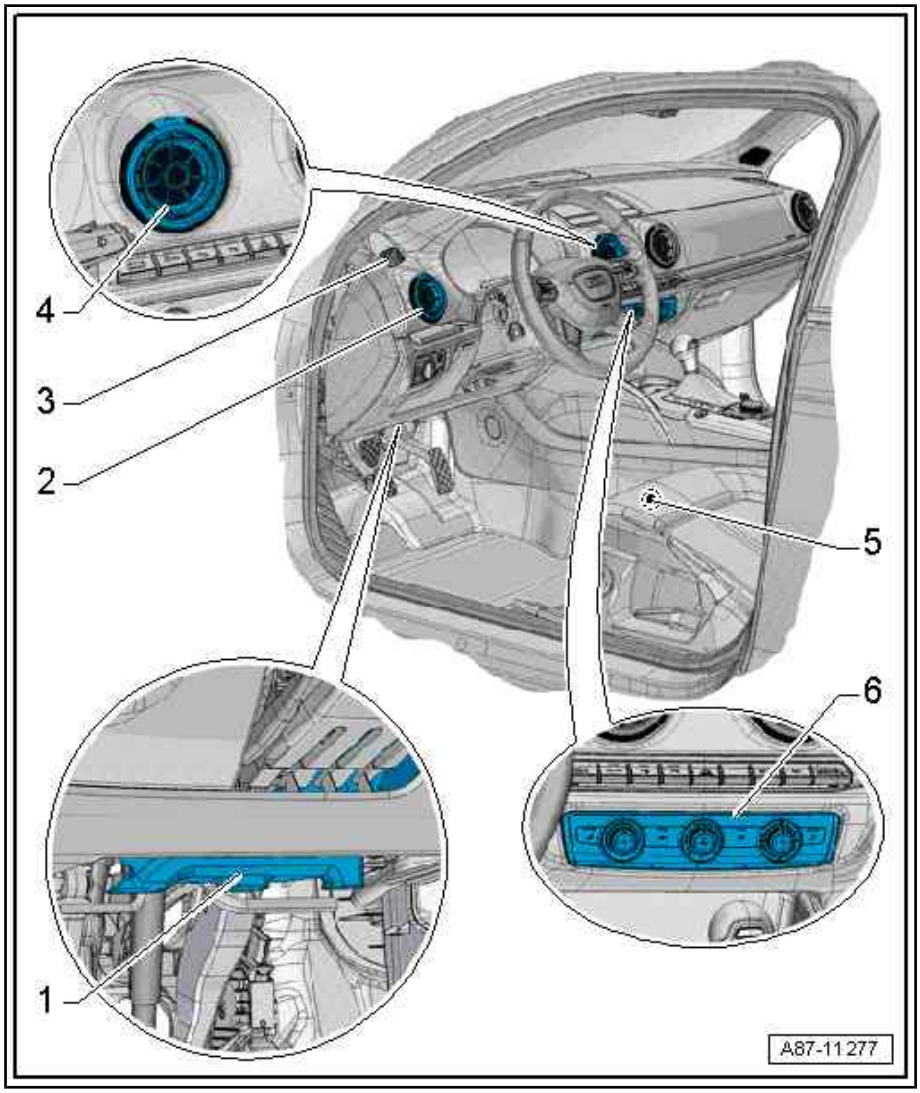
1.2 Overview of fitting locations - components in passenger compartment (front)

Passenger compartment (front left) ⇒ page 99

Passenger compartment (front right) ⇒ page 100

Passenger compartment (front left)

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1 - Footwell vent (left-side)

- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

2 - Dash panel vent (left-side)

- ❑ With sealing plug instead of vent temperature sender on vehicles without automatic air conditioner
- ❑ A loose or missing sealing plug will cause flow noise
- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

3 - Side dash panel vent (left-side)

- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

4 - Dash panel vent (centre left)

- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

5 - Front seat (left-side)

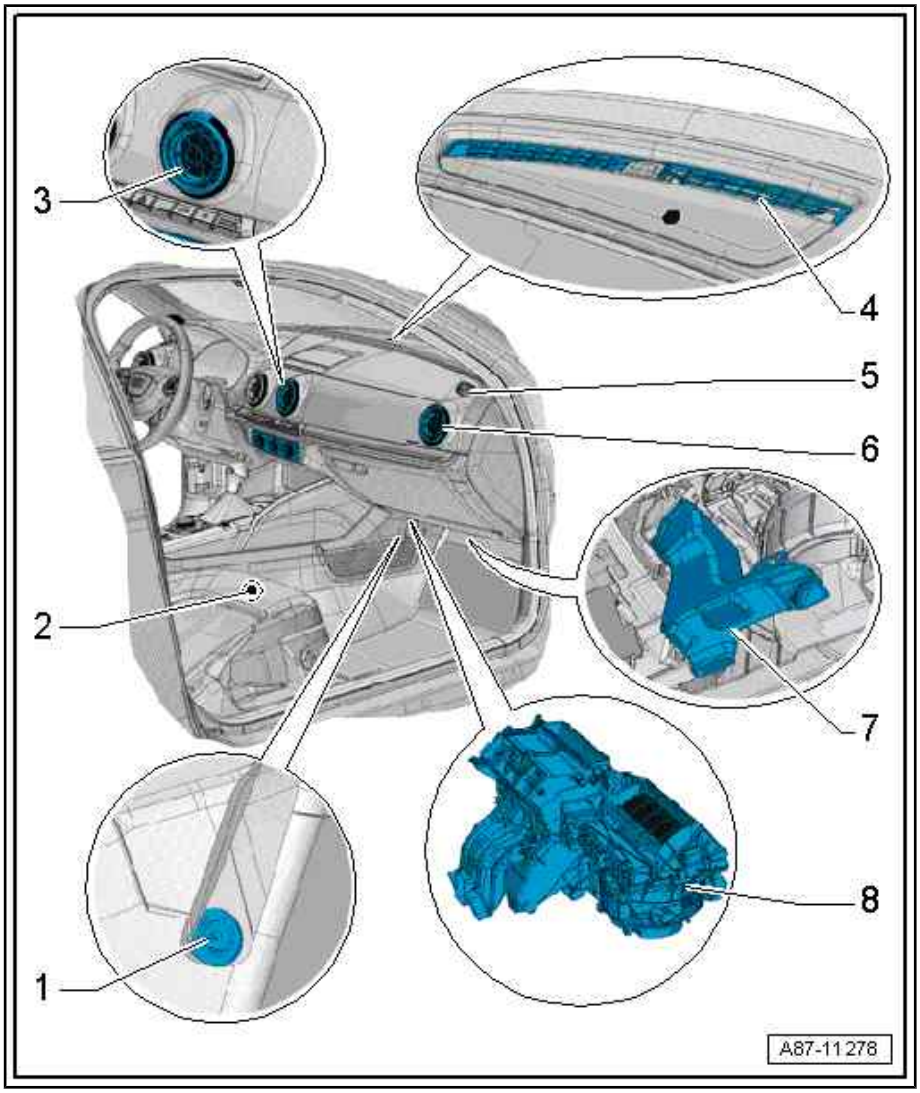
- ❑ Equipment version with seat heating
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Notes on operation of seat heating ⇒ page 10
- ❑ Checking activation and operation of seat heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Servicing seat heating ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats

6 - Operating unit (heater control unit - J65-)

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ “7.2 Removing and installing operating and display unit J65 / J301 / J255 ”, page 340

Passenger compartment (front right)

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1 - Plug

- In underbody (instead of condensation drain on vehicles with air conditioner)

2 - Front seat (right-side)

- Equipment version with seat heating
- Different versions ⇒ Electronic parts catalogue
- Notes on operation of seat heating ⇒ page 10
- Checking activation and operation of seat heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Servicing seat heating ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats

3 - Dash panel vent (centre right)

- Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

4 - Windscreen dash panel vent

- Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

5 - Side dash panel vent (right-side)

- Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

6 - Dash panel vent (right-side)

- With sealing plug instead of vent temperature sender on vehicles without automatic air conditioner
- A loose or missing sealing plug will cause flow noise
- Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

7 - Footwell vent (right-side)

- Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

8 - Heater

- Exploded view ⇒ “2.1 Exploded view - heater unit”, page 102

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2 Heater

⇒ “2.1 Exploded view - heater unit”, page 102

⇒ “2.2 Removing and installing fresh air blower V2 ”, page 107

⇒ “2.3 Removing and installing fresh air blower control unit J126 ”, page 107

⇒ “2.4 Removing and installing auxiliary air heater element Z35 ”, page 107

⇒ “2.5 Removing and installing temperature flap control motor V68 with potentiometer G92 ”, page 108

⇒ “2.6 Removing and installing air recirculation flap control motor V113 ”, page 108

⇒ “2.7 Removing and installing air distribution flap control motor V428 with potentiometer G645 ”, page 108

⇒ “2.8 Removing and installing dust and pollen filter”, page 108

⇒ “2.9 Removing and installing heat exchanger”, page 109

⇒ “2.10 Removing and installing heater unit”, page 109

⇒ “2.11 Dismantling and assembling heater unit”, page 109

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2.1 Exploded view - heater unit

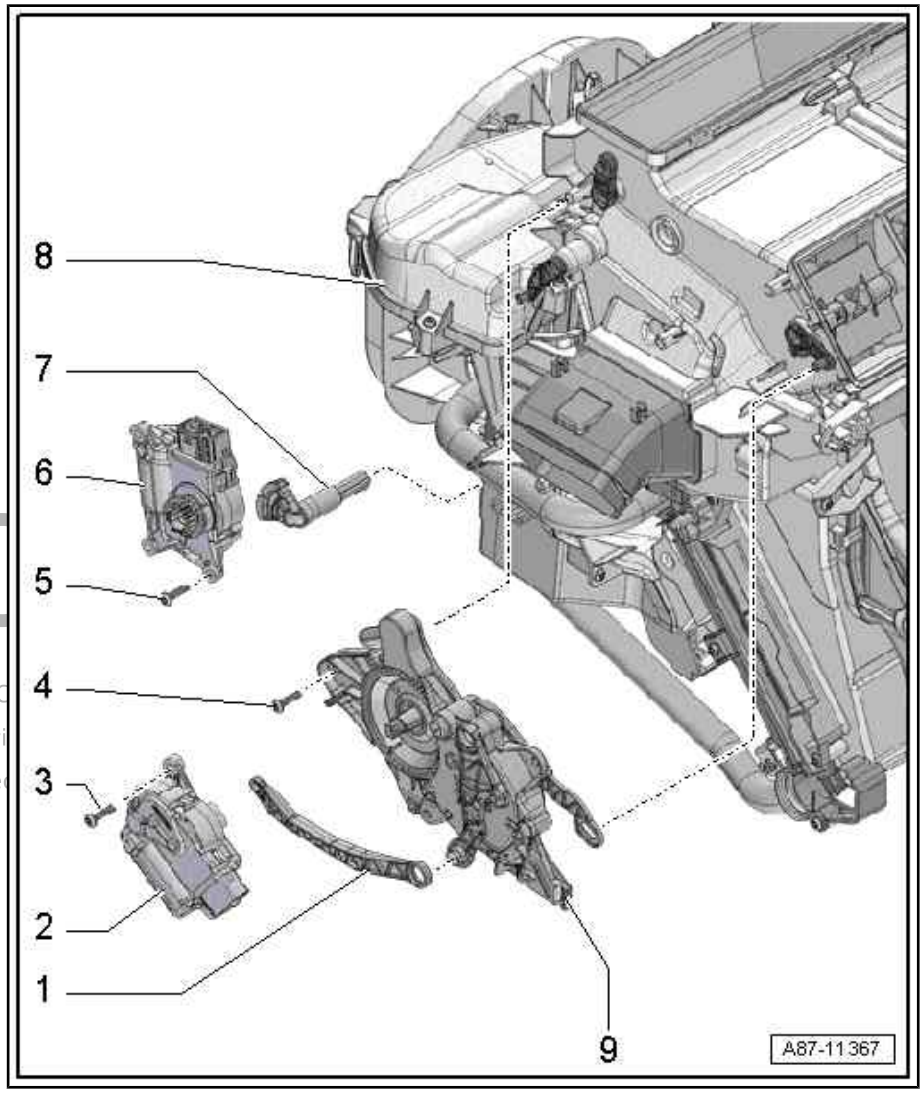
Note

- *The heater unit is available in different versions and from different manufacturers. The individual components of the various heaters are similar but not identical; the combination of components by different manufacturers is therefore not permissible ⇒ Electronic parts catalogue .*
- *The following illustrations show a Valeo heater; distinguishing features compared to heaters from other manufacturers ⇒ “1.1 Identification of heater and air conditioning unit”, page 1 .*

Heater, flap control ⇒ page 102

Heater unit, heat exchanger, auxiliary air heater element ⇒ page 104

Heater, flap control



1 - Operating lever

- For actuating defroster flap and air distribution flap

2 - Air distribution flap control motor - V428-

- With potentiometer for air distribution flap control motor - G645-
- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 253

3 - Bolt

- 2x
- Tightening torque ⇒ page 262

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4 - Bolt

- 3x
- Tightening torque ⇒ page 262

5 - Bolt

- 2x
- Tightening torque ⇒ page 262

6 - Temperature flap control motor - V68-

- With potentiometer for temperature flap control motor - G92-
- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 238

7 - Operating lever

- For actuation of warm air flap

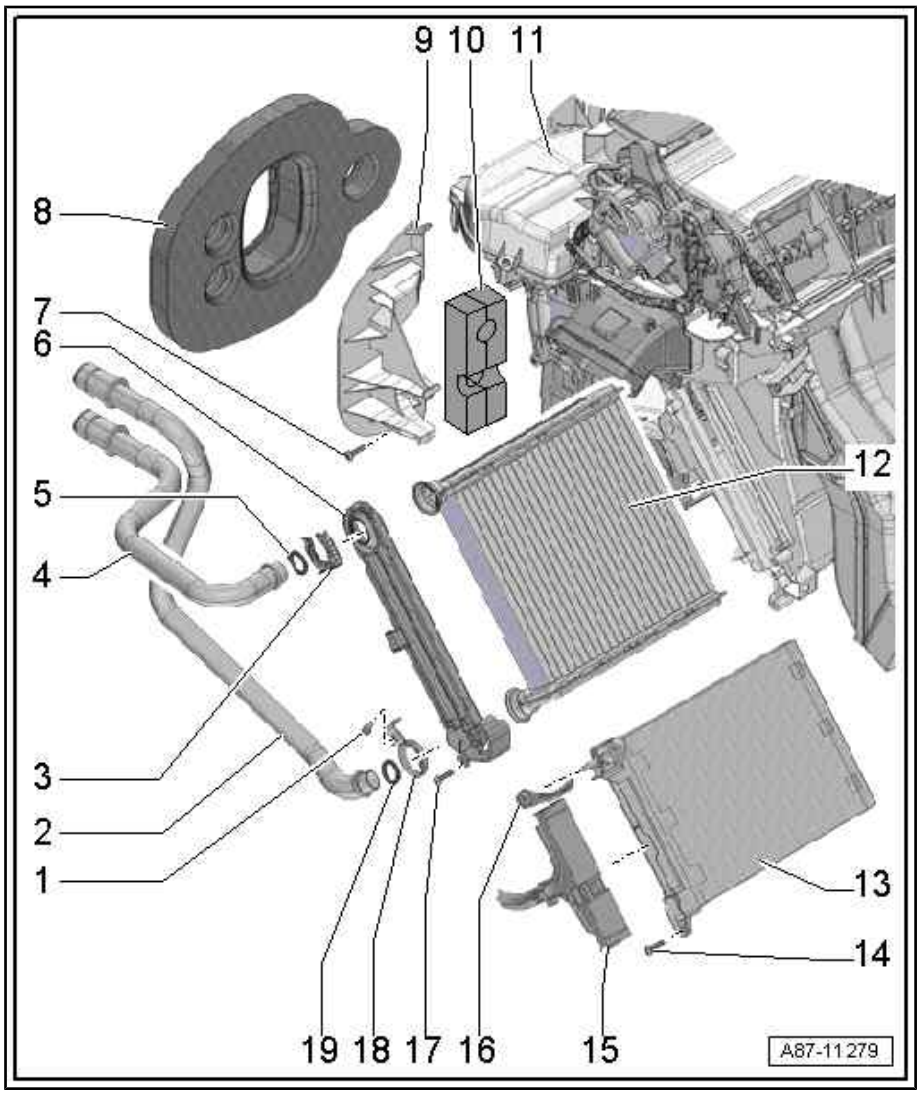
8 - Heater

- Different versions ⇒ page 1
- It is not permissible to combine components from different manufacturers ⇒ “1.1 Identification of heater and air conditioning unit”, page 1
- The following illustrations show a Valeo heater.
- The design is largely identical to that of the heater/air conditioning unit.
- Not fitted: expansion valve, condensation drain, evaporator etc.
- A honeycomb element is installed instead of the evaporator.
- There is no opening for the expansion valve in the seal for the plenum chamber back wall, or it is closed off by a foam pad.
- Exploded view ⇒ page 291

9 - Actuator for defroster and air distribution flap

- Removing and installing ⇒ page 257

Heater unit, heat exchanger, auxiliary air heater element



1 - Bolt

- Tightening torque ⇒ page 262

2 - Coolant pipe for heat exchanger

- Different versions ⇒ Electronic parts catalogue
- Coolant supply from engine
- Removing and installing ⇒ page 310

3 - Clip

- Can also be replaced by a clamp in the course of service work

4 - Coolant pipe for heat exchanger

- Different versions ⇒ Electronic parts catalogue
- Coolant return to engine
- Removing and installing ⇒ page 310

5 - O-ring

- Different versions ⇒ Electronic parts catalogue
- Renew

6 - Cover

- For heat exchanger

7 - Bolt

- Tightening torque ⇒ page 262

8 - Foam spacer

- For seal/insulation
- Vehicles without air conditioner: no opening for expansion valve ⇒ Electronic parts catalogue
- Note installation position

9 - Bracket

- For coolant pipes

10 - Foam

- For insulation
- Note installation position

11 - Heater

- The opening for the supplementary heater is sealed on vehicles without auxiliary air heater element -Z35-
- Removing and installing ⇒ page 287
- Dismantling and assembling ⇒ page 291

12 - Heat exchanger

- Different versions ⇒ Electronic parts catalogue
- Removing and installing ⇒ page 299

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13 - Auxiliary air heater element - Z35-

- ❑ Checking activation ⇒ page 8
- ❑ Removing and installing ⇒ page 298

14 - Bolt

- ❑ 2x
- ❑ Tightening torque ⇒ page 262

15 - Electrical wire

- ❑ For auxiliary air heater element - Z35-
- ❑ Detaching and attaching ⇒ “5.17 Removing and installing auxiliary air heater element Z35 ”, page 298

16 - Earth wire

- ❑ For supplementary heater
- ❑ Tightening torque ⇒ page 262

17 - Bolt

- ❑ 3x
- ❑ Tightening torque ⇒ page 262

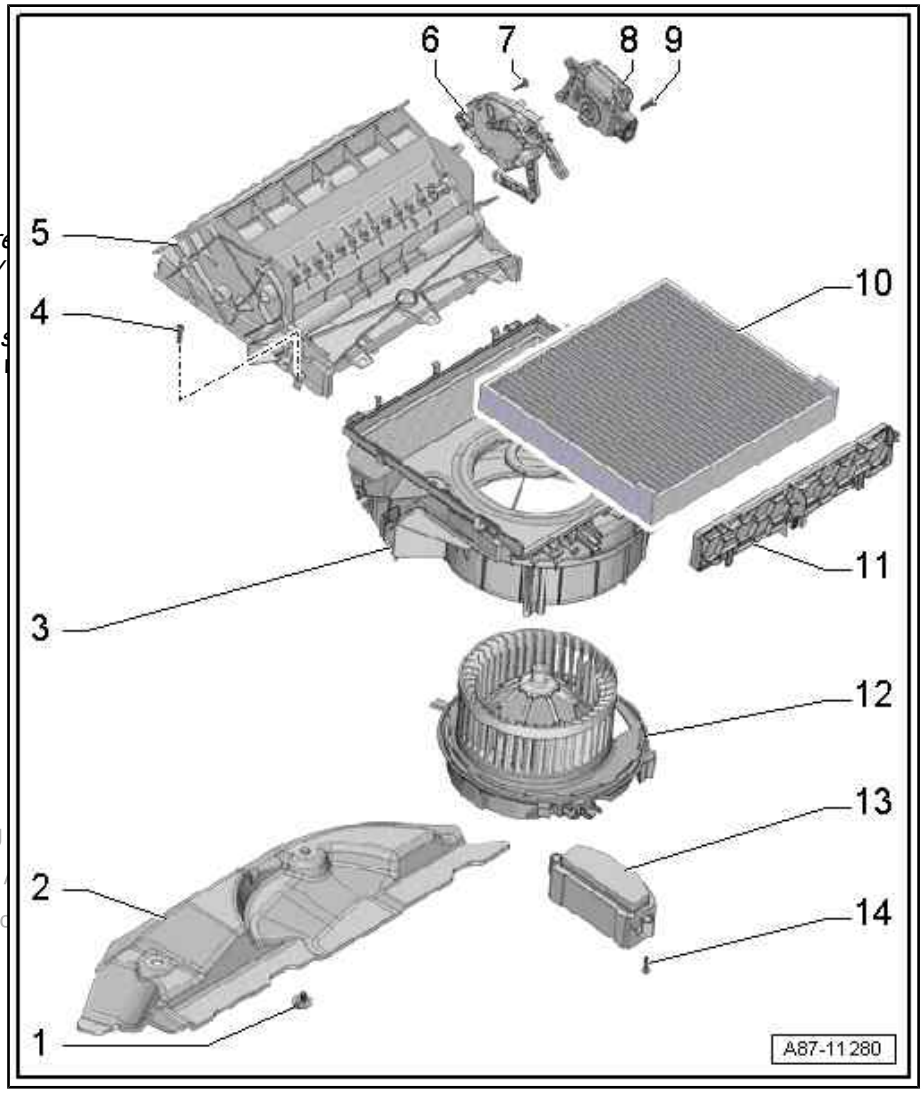
18 - Clamp

19 - O-ring

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renewing ⇒ “5.18 Removing and installing heat exchanger”, page 299

Air intake duct, dust and pollen filter, fresh air blower, flap control

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1 - Bolt/clip

- ❑ 2x
- ❑ Tightening torque for bolt ⇒ page 269

Note

- ◆ *Different versions; re version if necessary ic parts catalogue .*
- ◆ *Use e.g. pliers or a s to prise out version*

2 - Cover

3 - Housing (top section)

4 - Bolt

- ❑ 2x
- ❑ Tightening torque ⇒ page 262

5 - Air intake duct

- ❑ Do not dismantle
- ❑ With fresh air and air re-circulation flap
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 328

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6 - Not installed

Only installed on vehicles with automatic air conditioner
⇒ “5.2 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 269

7 - Not installed

Only installed on vehicles with automatic air conditioner
⇒ “5.2 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 269

8 - Air recirculation flap control motor - V113-

- ❑ Without potentiometer with limit switches at end stops ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 242

9 - Bolt

- ❑ 2x
- ❑ Tightening torque ⇒ page 262

10 - Dust and pollen filter

- ❑ Different versions ⇒ Electronic parts catalogue

Note

Not fitted with an activated charcoal filter insert at the factory on vehicles without air conditioner and vehicles with manually controlled air conditioner ⇒ page 83

- ❑ Change interval ⇒ Maintenance tables
- ❑ Removing and installing ⇒ page 293

11 - Cover

- ❑ For dust and pollen filter

12 - Fresh air blower - V2-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 297

13 - Fresh air blower control unit - J126-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 297

14 - Bolt

- ❑ 2x
- ❑ Tightening torque ⇒ page 262

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2.2 Removing and installing fresh air blower - V2-

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 296 .

Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

2.3 Removing and installing fresh air blower control unit - J126-

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 297 .

Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

2.4 Removing and installing auxiliary air heater element - Z35-

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 298 .

Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

2.5 Removing and installing temperature flap control motor - V68- with potentiometer -G92-

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 238 .

Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 242 .

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Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

2.7 Removing and installing air distribution flap control motor - V428- with potentiometer -G645-

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 253 .

Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

2.8 Removing and installing dust and pollen filter

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 293 .

Note

Different filters are available depending on equipment ⇒ page 83 and ⇒ Electronic parts catalogue .

2.9 Removing and installing heat exchanger

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 299 .

2.10 Removing and installing heater unit

Note

The design of the heater is largely identical to that of the heater/air conditioning unit. The expansion valve, condensation drain, evaporator etc. are not fitted.

The removal and installation procedures are the same as for the air conditioning unit ⇒ page 287 .

2.11 Dismantling and assembling heater unit

The dismantling and assembly procedures for the heater unit are the same as for the heater/air conditioning unit of the manually controlled air conditioner ⇒ page 291 .

Note

The design of the heater is largely identical to that of the heater/air conditioning unit. The expansion valve, condensation drain, evaporator etc. are not fitted; a honeycomb element is fitted in the heater unit instead of the evaporator. There is no opening for the expansion valve in the seal for the plenum chamber back wall, or it is closed off by a foam pad.

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3 Air duct

⇒ “3.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 110

⇒ “3.2 Removing and installing vents (front)”, page 110

⇒ “3.3 Removing and installing fresh air intake”, page 110

⇒ “3.4 Checking forced ventilation vents in passenger compartment”, page 110

⇒ “3.5 Removing and installing forced ventilation vents in passenger compartment”, page 110

⇒ “3.6 Checking plenum chamber water drain”, page 110

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

The exploded view of the routing of air flow and the air distribution in the passenger compartment is the same as for vehicles with a manually controlled air conditioner ⇒ page 319 .

3.2 Removing and installing vents (front)

The removal and installation procedures are the same as for vehicles with an air conditioner; removing and installing ⇒ “6.2.3 Removing and installing dash panel vents”, page 324 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 ⇒ page 329 .

3.4 Checking forced ventilation vents in passenger compartment

The removal and installation procedures are the same as for vehicles with air conditioner ⇒ page 329 .

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 ⇒ page 332 .

3.6 Checking plenum chamber water drain

Checking is the same as for a vehicle with air conditioner ⇒ page 333 .

4 Operating and display unit

⇒ “4.1.1 Overview of fitting locations - operating and display unit J65 ”, page 111

⇒ “4.2.1 Removing and installing operating and display unit J65 ”, page 112

4.1 Overview of fitting locations - operating and display unit

⇒ “4.1.1 Overview of fitting locations - operating and display unit J65 ”, page 111

4.1.1 Overview of fitting locations - operating and display unit -J65-

Heater control unit - J65-

A - Operating unit (heater control unit - J65-) for vehicles without seat heating

1 - Rotary temperature control

2 - Button for air recirculation mode

- ❑ If LED lights up, “air recirculation mode” is selected
- ❑ “Air recirculation mode” is cancelled when air distribution is set to “defrost” function (air to windscreen)

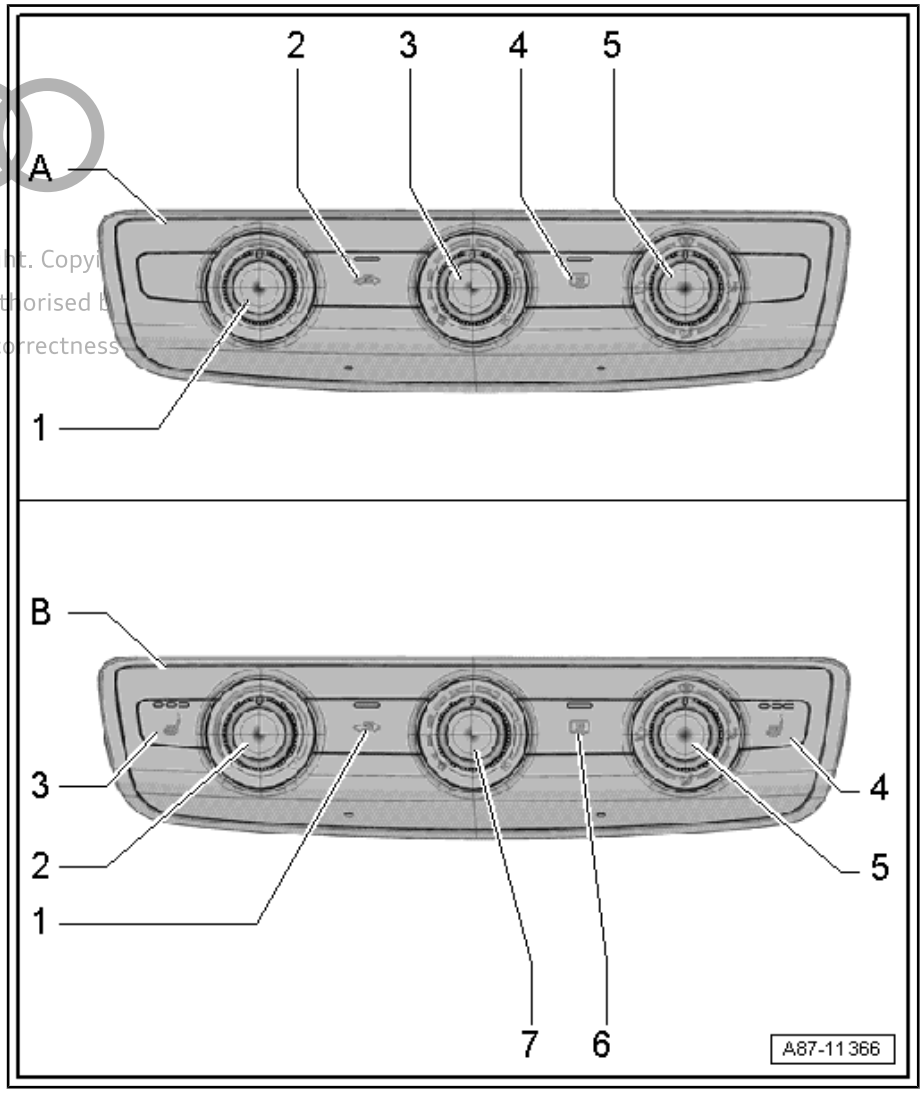
3 - Rotary control for fresh air blower - V2-

4 - Heated rear window button

- ❑ If LED lights up, “Rear window heating on” is selected
- ❑ Rear window heating can be permanently switched on by pressing and holding button ⇒ page 13

5 - Rotary control for setting air distribution

- ❑ Different versions (with different symbols) ⇒ Electronic parts cata-



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B - Operating unit (heater control unit - J65-) for vehicles with seat heating

1 - Button for air recirculation mode

- ❑ If LED lights up, “air recirculation mode” is selected
- ❑ “Air recirculation mode” is cancelled when air distribution is set to “defrost” function (air to windscreen)

2 - Rotary temperature control

3 - Button for left seat heating

- ❑ LEDs indicate selected setting
- ❑ Selected setting can be reduced by one level after a pre-set time has elapsed ⇒ page 11

4 - Button for right seat heating

- ❑ LEDs indicate selected setting
- ❑ Selected setting can be reduced by one level after a pre-set time has elapsed ⇒ page 11

5 - Rotary control for setting air distribution

- ❑ Different versions (with different symbols) ⇒ Electronic parts catalogue

6 - Heated rear window button

- ❑ If LED lights up, “Rear window heating on” is selected
- ❑ Rear window heating can be permanently switched on by pressing and holding button ⇒ page 13

7 - Rotary control for fresh air blower - V2-

4.2 Removing and installing operating and display unit

⇒ “4.2.1 Removing and installing operating and display unit J65 ”, page 112

4.2.1 Removing and installing operating and display unit -J65-

The removal and installation procedures are the same as for vehicles with air conditioner
⇒ “7.2 Removing and installing operating and display unit J65 / J301 / J255 ”, page 340 .

Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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5 Further control components

⇒ “5.1 Removing and installing ambient temperature sensor G17 ”, page 113

⇒ “5.2 Removing and installing continued coolant circulation pump V51 / auxiliary pump for heating V488 ”, page 113

⇒ “5.3 Removing and installing coolant shut-off valve N82 ”, page 113

5.1 Removing and installing ambient temperature sensor - G17-

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The removal and installation procedures are the same as for vehicles with air conditioner

⇒ “9.2 Removing and installing ambient temperature sensor G17 ”, page 362 .

Note

Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

5.2 Removing and installing continued coolant circulation pump - V51- / auxiliary pump for heating - V488-

Note

- *Different designations depending on engine version (-V51- or -V488-).*
- *-V51- / -V488- is installed in the coolant circuit (depending on engine version) ⇒ 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 ; Coolant pump/thermostat assembly; Exploded view - electric coolant pump

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

Note

Depending on the engine version, the coolant shut-off valve -N82- is installed in the coolant circuit ⇒ 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 .

87 – Air conditioning system

1 Overview of fitting locations - air conditioner

⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 114

⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 127

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

Continued coolant circulation pump, coolant shut-off valve, air quality sensor, heated rear window ⇒ page 114

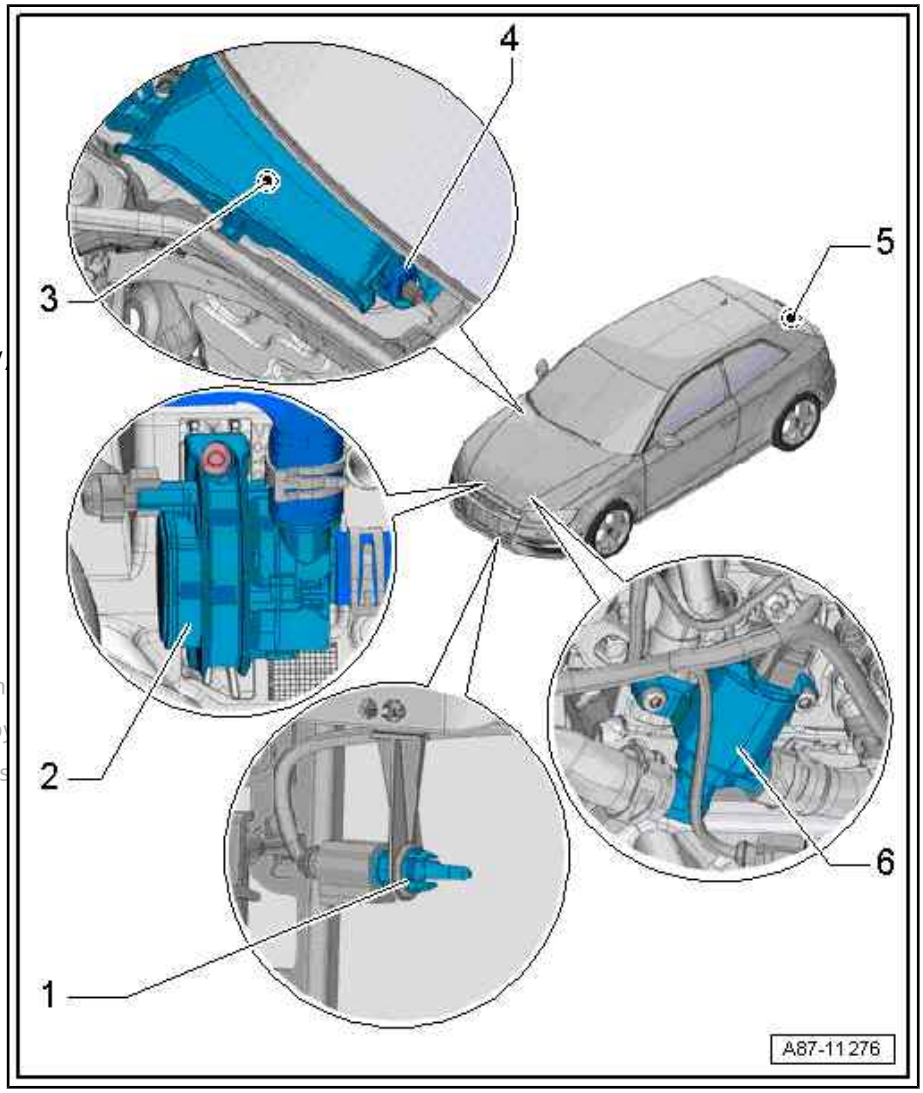
Mechanically driven air conditioner compressor, condenser, service connections, expansion valve, condensation drain ⇒ page 116

Plenum chamber water drain, forced ventilation vents for passenger compartment ⇒ page 119

Additional components (and components fitted differently on A3 e-tron) on vehicles with high-voltage system (A3 e-tron) ⇒ page 120

Continued coolant circulation pump, coolant shut-off valve, air quality sensor, heated rear window

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1 - Ambient temperature sensor - G17-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Note

Measured value of -G17- is evaluated by -J519- .

- ❑ Removing and installing ⇒ “9.2 Removing and installing ambient temperature sensor G17 ”, page 362

2 - Continued coolant circulation pump - V51-

- ❑ Shown on 1.4 ltr. TFSI engine as an example
- ❑ May be installed in coolant circuit (depending on engine version) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Activated by engine control unit when requested by operating unit (air conditioning system control unit - J301- / Climatronic control unit - J255-)
- ❑ Also supports engine coolant pump to improve flow of coolant through heat exchanger at certain engine speeds to enhance heating output
- ❑ Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - electric coolant pump

3 - Fresh air intake

- ❑ Removing and installing ⇒ page 329

Note

Depending on the vehicle version, a dust filter may be installed instead of the intake grille (introduction not yet finalised).

4 - Air quality sensor - G238- with humidity sender in fresh air intake duct - G657-

- ❑ Only installed on vehicles with automatically controlled air conditioner
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 371

5 - Heated rear window - Z1-

- ❑ Notes on operation of heated rear window ⇒ page 12

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- ❑ Checking activation and operation of heated rear window ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

6 - Coolant shut-off valve - N82-

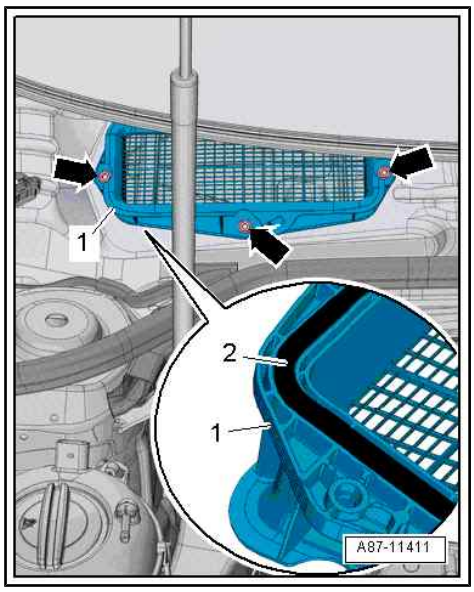
- ❑ Shown on 1.8 ltr. TFSI engine as an example
- ❑ May be installed in coolant circuit (depending on engine version) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Activated by engine control unit when enabled by operating unit (air conditioning system control unit - J301- / Climatronic control unit - J255-)
- ❑ Depending on setting on operating unit (air conditioning system control unit - J301- / Climatronic control unit - J255-), e.g. with air conditioner switched off, blocks flow of coolant through heat exchanger when engine is cold to accelerate warm-up of engine
- ❑ Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

Tightening torque for nuts at fresh air intake

Note

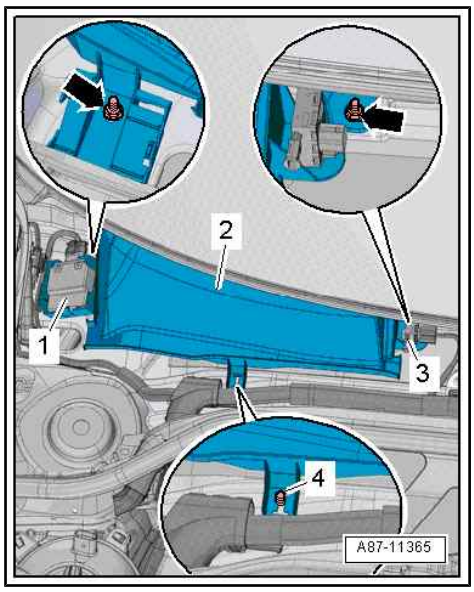
First tighten nuts on left and right -arrows- slightly and then tighten centre nut -arrow- before tightening all three nuts to the final torque in the same sequence.

– Tighten nuts -arrows- to 3 Nm.



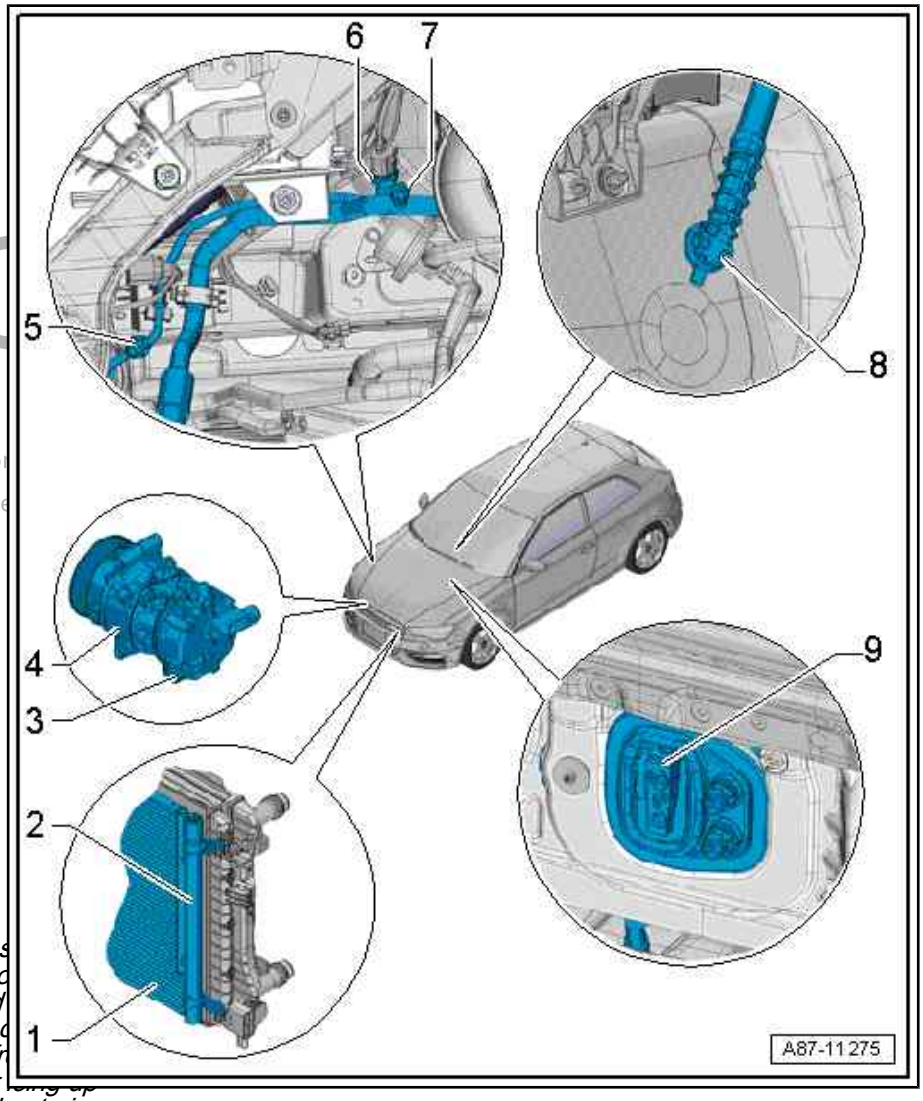
Tightening torque for nuts at drip rail

– Tighten nuts -arrows- to 3 Nm.



Mechanically driven air conditioner compressor, condenser, service connections, expansion valve, condensation drain

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1 - Condenser

- ❑ With integrated receiver
- ❑ Exploded view ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

2 - Desiccant cartridge

- ❑ Exploded view ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

3 - Air conditioner compressor regulating valve - N280-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Not on vehicles with high-voltage system

Note

- ♦ *Certain malfunctions (e.g. sticking valve cuit in coil) can lead with air conditioner (no cooling output fr ditioner, evaporator etc.). If -N280- (and not air conditioner compressor itself) is cause of problem, air conditioner compressor can be serviced by renewing -N280- ⇒ 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 .*
- ♦ *-N280- is not available as a replacement part for all air conditioner compressors. If -N280- cannot be obtained separately for a particular air conditioner compressor (different versions available), the entire air conditioner compressor must be renewed if problems occur ⇒ Electronic parts catalogue .*

4 - Air conditioner compressor

- ❑ Mechanically driven; not on vehicles with high-voltage system
- ❑ For correct version refer to ⇒ Electronic parts catalogue

- ❑ Exploded view ⇒ “3.1 Exploded view - drive unit for air conditioner compressor”, page 204
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

Note

Vehicles with a 5-cylinder engine (Audi RS 3) have 1 or 2 poly V-belts on the air conditioner compressor (depending on the engine type). The air conditioner compressor is therefore provided with a single or double-belt pulley ⇒ 5-cylinder direct injection engine (2.5 ltr. 4-valve TFSI); Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .

5 - Service connection (high-pressure side)

- ❑ For measuring, discharging and charging

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

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- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

6 - Pressure sender for refrigerant circuit - G805-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Exploded view ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146
- ❑ Removing and installing ⇒ “2.3 Removing and installing pressure sender for refrigerant circuit G805 ”, page 160

Note

Not always fitted on vehicles with high-voltage system ⇒ page 120

7 - Service connection (low-pressure side)

- ❑ For measuring and discharging

> **Caution**
>
> *Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.*
> *Danger of frostbite on skin and other parts of the body.*
> *Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

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- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

8 - Condensation drain

- ❑ Checking ⇒ “5.20 Checking condensation drain hose”, page 313
- ❑ Removing and installing ⇒ “5.21 Removing and installing condensation drain hose”, page 316

9 - Expansion valve

- ❑ Exploded view ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

Plenum chamber water drain, forced ventilation vents for passenger compartment

1 - Plenum chamber water drain (left-side)

- ❑ Checking and cleaning ⇒ “6.10 Checking plenum chamber water drain”, page 333

2 - Plenum chamber water drain (right-side)

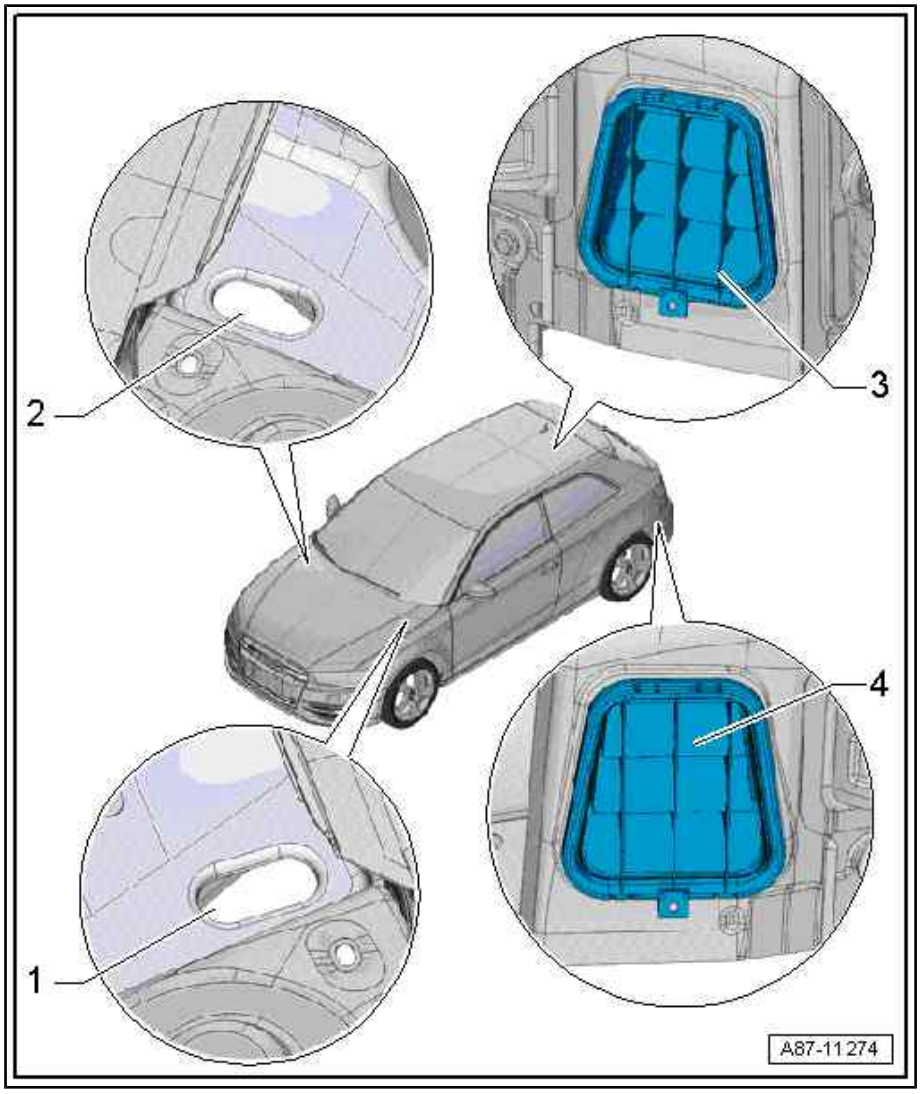
- ❑ Checking and cleaning ⇒ “6.10 Checking plenum chamber water drain”, page 333

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

- ❑ Checking ⇒ “6.8 Checking forced ventilation vents in passenger compartment”, page 329
- ❑ Removing and installing ⇒ “6.9 Removing and installing forced ventilation vents in passenger compartment”, page 332

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

- ❑ Checking ⇒ “6.8 Checking forced ventilation vents in passenger compartment”, page 329
- ❑ Removing and installing ⇒ “6.9 Removing and installing forced ventilation vents in passenger compartment”, page 332



Additional components (and components fitted differently on A3 e-tron) on vehicles with high-voltage system (A3 e-tron)

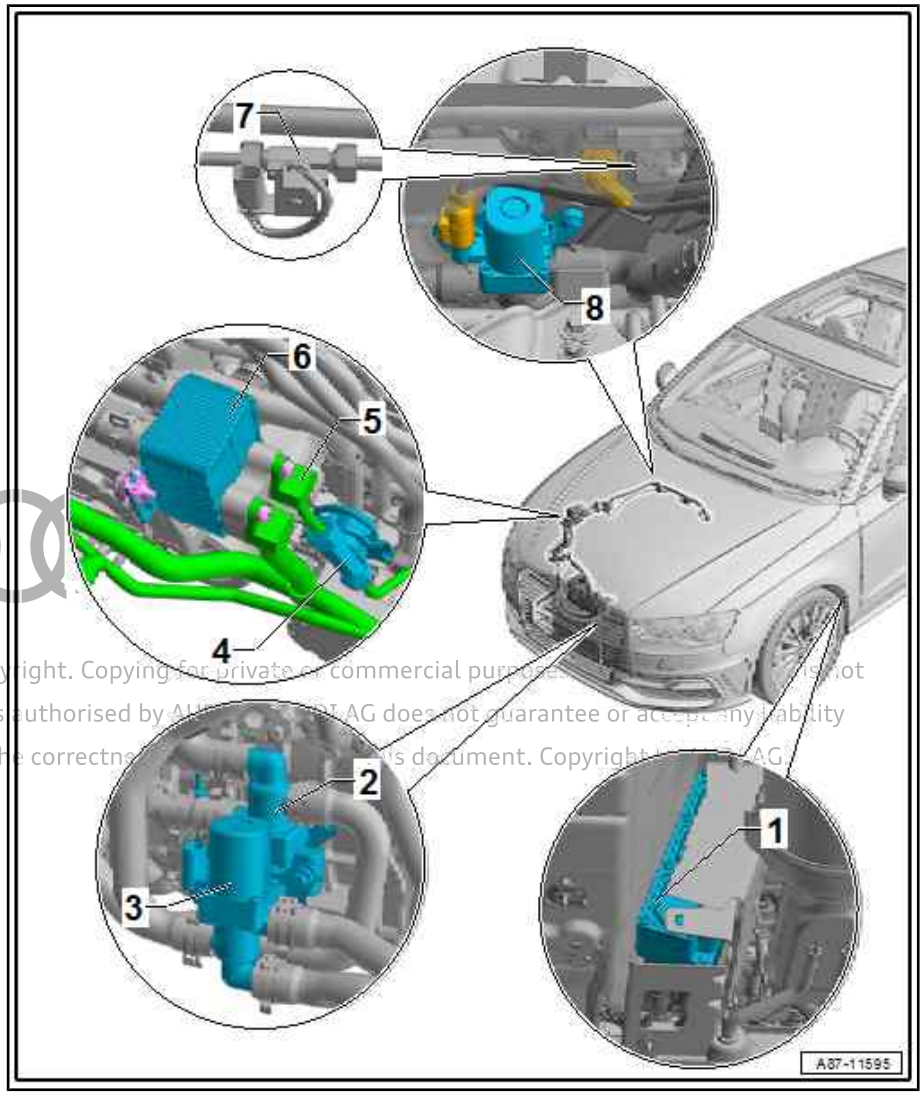
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1 - High-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-)

- ❑ For all work on - Z115- (and on vehicles with high-voltage system), note additional warnings for working on such vehicles ⇒ page 19 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 356
- ❑ Incorporation of - Z115- into coolant circuit to air conditioner heat exchanger ⇒ page 343

2 - Coolant changeover valve 2 - N633-

- ❑ Removing and installing ⇒ page 351 and ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly



- ❑ Checking activation and operation of -N633- ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for engine), ⇒ Rep. gr. 19 ; Coolant pump/thermostat assembly and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Checking connections between -N633- and engine coolant circuit ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 and ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly

Note

- ♦ *-N633- is activated by the corresponding engine control unit (e.g. by engine control unit - J623-) if heat output is requested from the air conditioner and the vehicle is in electric drive mode or the “Auxiliary air conditioner” function is active ⇒ “2.8 Auxiliary air conditioner - vehicles with high-voltage system only”, page 16 , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*

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- *Check correct installation position and operation if there is a problem with insufficient heat output from the air conditioner with engine stopped and/or running, regardless of whether -Z115- is activated ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *So that the coolant heated up by -Z115- is conveyed through the air conditioner heat exchanger, the coolant pump for high-temperature circuit - V467- and the coolant valve for gearbox - N488- must also be activated (by the corresponding engine control unit). To ensure that the coolant flows in the right direction, the non-return valves fitted in the coolant circuit must also be installed correctly and they must operate correctly. For further information, refer to ⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343 , ⇒ “2.8 Auxiliary air conditioner - vehicles with high-voltage system only”, page 16 , ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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3 - Coolant changeover valve 1 - N632-

- ❑ Removing and installing ⇒ page 351 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves
- ❑ Checking activation and operation of -N632- ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for engine), ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Checking connections between -N632- and coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

Note

-N632- is activated by the corresponding engine control unit (e.g. engine control unit - J623-) if the power and control electronics for electric drive - JX1- or the control unit for high-voltage battery charging unit - J1050- need to be cooled. For further information, refer to ⇒ Vehicle diagnostic tester (“Guided Fault Finding”), ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

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

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 169
- ❑ Further information
  ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138

5 - Refrigerant line with restrictor

- ❑ A restrictor (constriction) is fitted in this refrigerant line ⇒ page 146 .
- ❑ Before removing component, refrigerant shut-off valve for high-voltage battery heat exchanger - N542- must be detached ⇒ page 169 , and refrigerant line must be disconnected from high-voltage battery heat exchanger ⇒ page 352 .

Note

- *Diameter of restrictor hole is approx. 0.7 mm. Depending on the version of the refrigerant line, the restrictor is either only inserted or fixed in position in the refrigerant line. If it is inserted, there may be a strainer for separating float elements, which may block off the restrictor hole.*
- *When the refrigerant shut-off valve for high-voltage battery heat exchanger - N542- is open, the restrictor restricts the flow of coolant to the high-voltage battery heat exchanger (and thus its cooling output).*

6 - High-voltage battery heat exchanger

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 352
- ❑ Further information
  ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138

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

- ❑ Checking
  ⇒ “4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage

system)", page 64 , ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

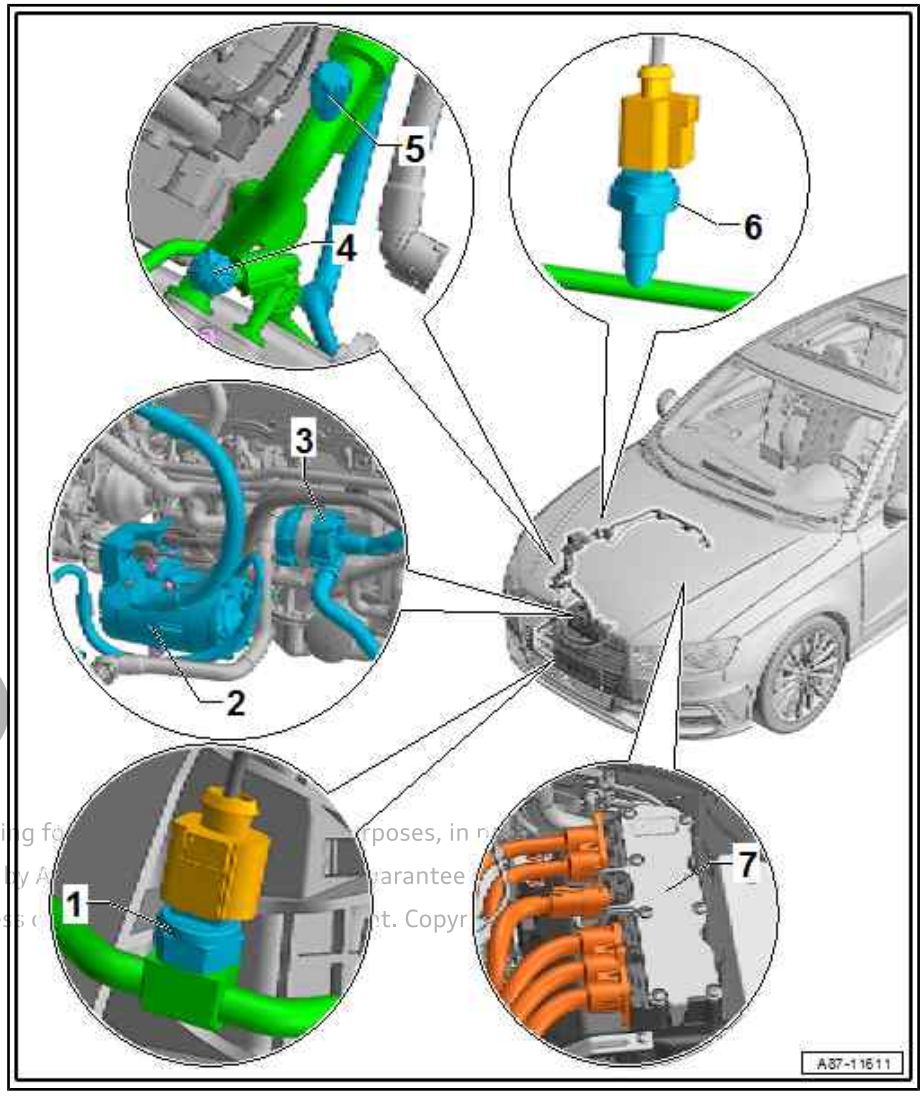
- ❑ Removing and installing ⇒ page 166
- ❑ Further information
  ⇒ "2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system", page 138

8 - Coolant valve for high-voltage battery - N688-

- ❑ Removing and installing ⇒ page 350 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves
- ❑ Checking connections between heat exchanger for high-voltage battery ("chiller"), coolant pump for high-voltage battery - V590- and -N688- in coolant circuit of high-voltage system
  ⇒ "8.2 Incorporation of heat exchanger for high-voltage battery into coolant circuit of high-voltage system", page 347 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .
- ❑ Checking operation and activation of -V590- and -N688- ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for hybrid battery energy management system) and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

1 - Refrigerant pressure and temperature sender - G395-

- ❑ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Only installed on certain versions (e.g. on vehicles for North America) ⇒ Electronic parts catalogue
- ❑ Exploded view - electrically driven air conditioner compressor, refrigerant lines, high-voltage battery heat exchanger (vehicles with high-voltage system) ⇒ page 153
- ❑ Further information
  ⇒ "2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system", page 138



2 - Electrically driven air conditioner compressor

- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ For all work on -V470- (and on vehicles with high-voltage system), note additional warnings for working on such vehicles ⇒ page 19 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .

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- Removing and installing
  ⇒ “3.5.2 Removing and installing electrically driven air conditioner compressor”, page 232
- ⇒ “3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor”, page 210
- Different versions (e.g. for vehicles for Europe or for North America) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- Further information
  ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138

Note

*The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1-
⇒ “9.8 Removing and installing fuse for electrical air conditioner compressor”, page 372 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

3 - Coolant pump for high-temperature circuit - V467-

- Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly
- Check connections between -V467- and engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .
- Check operation and activation of -V467- and coolant changeover valve 2 - N633- ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- For further information, refer to ⇒ Item 2 (page 121) .

4 - Service connection (high-pressure side)

- For measuring, discharging and charging

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- Exploded view ⇒ page 146

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- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

5 - Service connection (low-pressure side)

- ❑ For measuring and discharging

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

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- ❑ Exploded view ⇒ page 146
- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

6 - Pressure sender for refrigerant circuit - G805-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Exploded view ⇒ page 146
- ❑ Removing and installing ⇒ page 160
- ❑ Only installed on certain versions (e.g. not installed on vehicles for North America) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
- ❑ Further information
  ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138

7 - Power and control electronics for electric drive - JX1-

- ❑ With fuse protection for electrical air conditioner compressor - V470- ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 372 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive .
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and battery regulation)

Note

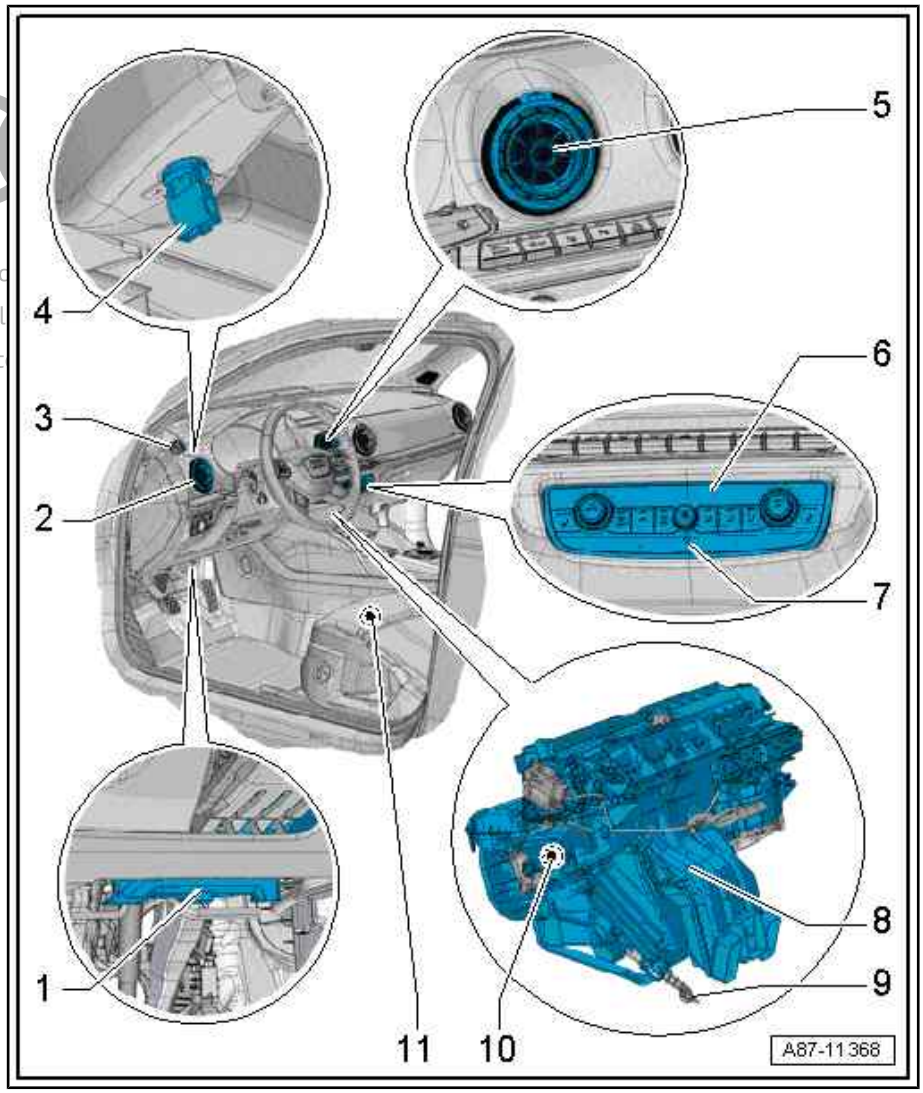
The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1- .

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

Passenger compartment (front left) ⇒ page 127

Passenger compartment (front right) ⇒ page 129

Passenger compartment (front left)



1 - Footwell vent (left-side)

- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

2 - Dash panel vent (left-side)

- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

3 - Side dash panel vent (left-side)

- ❑ Sealing plug instead of vent temperature sender on vehicles with heater or manually controlled air conditioner
- ❑ A loose or missing sealing plug or an incorrectly installed vent temperature sender will cause flow noise
- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

4 - Left vent temperature sender - G150-

- ❑ Only installed on vehicles with automatically controlled air conditioner
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ An incorrectly installed vent temperature sender will cause flow noise
- ❑ Removing and installing ⇒ “5.8 Removing and installing vent temperature sender G150 / G151 ”, page 286

5 - Dash panel vent (centre left)

- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

6 - Air conditioner operating unit

- ❑ Different versions ⇒ Electronic parts catalogue

♦ Air conditioning system control unit - J301- (manually controlled air conditioner)

- Climatronic control unit - J255- (automatically controlled air conditioner)
  - ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
  - ❑ Removing and installing
    ⇒ “7.2 Removing and installing operating and display unit J65 / J301 / J255 ”, page 340

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Note

- *On vehicles with air conditioning system control unit - J301- , no humidity sender - G355- is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the function “air recirculation mode” and the status of the windscreen wipers. In order for - J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.*
- *For the A3 Cabriolet, neck heating is available as optional equipment. Vehicles with neck heating are equipped with an additional vent in the seat and with additional buttons for switching the neck heating on and off in the air conditioner operating unit (Climatronic control unit - J255-). For further information, refer to ⇒ “2.7 Neck heating”, page 14 .*
- *Different versions of -J255- for vehicles with or without high-voltage system. Vehicles with high-voltage system: different versions e.g. for vehicles for Europe or for North America*

7 - Infrared sensor

- ❑ For determining temperature in passenger compartment
- ❑ With automatically controlled air conditioner only; integrated into operating unit -J255-
- ❑ A contaminated infrared sensor will cause problems with air conditioner control ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

8 - Heater and air conditioning unit (left-side)

- ❑ Exploded view ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262
- ❑ Removing and installing ⇒ “5.9 Removing and installing heater and air conditioning unit”, page 287
- ❑ Dismantling and assembling
  ⇒ “5.11 Dismantling and assembling heater and air conditioning unit”, page 291

9 - Condensation drain

- ❑ Checking ⇒ “5.20 Checking condensation drain hose”, page 313
- ❑ Removing and installing ⇒ “5.21 Removing and installing condensation drain hose”, page 316

10 - Footwell vent temperature sender - G192-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing
⇒ “5.16 Removing and installing footwell vent temperature sender G192 ”, page 297

Note

Right-hand drive vehicles: installed in duct for footwell vent (right-side)

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11 - Front seat (left-side)

- ❑ Equipment version with seat heating
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Notes on operation of seat heating ⇒ page 10
- ❑ Checking activation and operation of seat heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Servicing seat heating ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats

Note

For the A3 Cabriolet, neck heating is available as optional equipment. Vehicles with neck heating are equipped with an additional vent in the seat and with additional buttons for switching the neck heating on and off in the air conditioner operating unit (Climatronic control unit - J255-). For further information, refer to ⇒ “2.7 Neck heating”, page 14 .

Passenger compartment (front right)

1 - Heater and air conditioning unit (right-side)

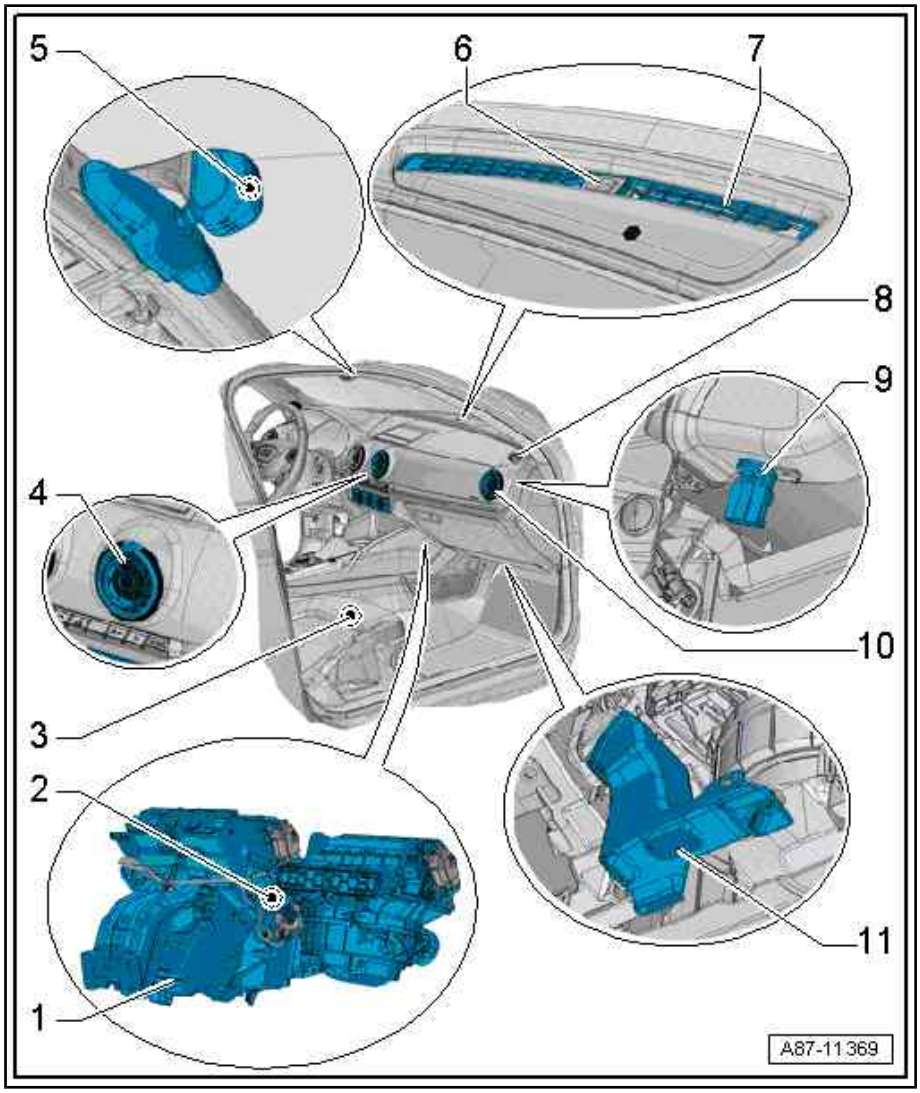
- ❑ Exploded view ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262
- ❑ Removing and installing ⇒ “5.9 Removing and installing heater and air conditioning unit”, page 287
- ❑ Dismantling and assembling ⇒ “5.11 Dismantling and assembling heater and air conditioning unit”, page 291

2 - Evaporator output temperature sender - G263-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ “5.7 Removing and installing evaporator output temperature sender G263 ”, page 286

3 - Front seat (right-side)

- ❑ Equipment version with seat heating
- ❑ Different versions ⇒ Electronic parts catalogue



- ❑ Notes on operation of seat heating ⇒ page 10
- ❑ Checking activation and operation of seat heating ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Servicing seat heating ⇒ General body repairs, interior; Rep. gr. 74 ; Covers and padding on front seats

Note

For the A3 Cabriolet, neck heating is available as optional equipment. Vehicles with neck heating are equipped with an additional vent in the seat and with additional buttons for switching the neck heating on and off in the air conditioner operating unit (Climatronic control unit - J255-). For further information, refer to ⇒ “2.7 Neck heating”, page 14 .

4 - Dash panel vent (centre right)

- ❑ Exploded view ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

5 - Humidity sender - G355-

- ❑ Only installed on vehicles with automatically controlled air conditioner

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- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ “9.7 Removing and installing sensors G355 / G397 / G107 ”, page 372
- ❑ On Audi Q2 vehicles with automatic air conditioner, sunlight penetration photosensor - G107- is combined as one unit with humidity sender - G355- and rain and light sensor - G397- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

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Note

- *On vehicles with air conditioning system control unit - J301- , no humidity sender - G355- (no sunlight penetration photosensor) is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the “air recirculation mode” function and the status of the windscreen wipers. In order for -J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.*
- *The humidity sender - G355- is integrated in the rain and light sensor - G397- and cannot be renewed separately in the event of a fault. Renewing rain and light sensor - G397- (with humidity sender - G355-) ⇒ General body repairs, exterior; Rep. gr. 64 ; Windscreen; Exploded view - windscreen or ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system .*
- *The removal procedure for - G397- (with -G355-) is described in different assembly groups depending on the vehicle.*

6 - Sunlight penetration photosensor - G107-

- ❑ Only installed on Audi A3 vehicles with automatic air conditioner
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing
⇒ “9.1 Removing and installing sunlight penetration photosensor G107 ”, page 361
- ❑ On Audi Q2 vehicles with automatic air conditioner, sunlight penetration photosensor - G107- is combined as one unit with humidity sender - G355- and rain and light sensor - G397- .
- ❑ Removing and installing - Audi Q2
⇒ “9.7 Removing and installing sensors G355 / G397 / G107 ”, page 372

7 - Windscreen dash panel vent

- ❑ Exploded view
⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

8 - Side dash panel vent (right-side)

- ❑ Exploded view
  ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

9 - Right vent temperature sender - G151-

- ❑ Only installed on vehicles with automatically controlled air conditioner
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing
  ⇒ “5.8 Removing and installing vent temperature sender G150 / G151 ”, page 286
- ❑ An incorrectly installed vent temperature sender will cause flow noise

10 - Dash panel vent (right-side)

- ❑ Sealing plug instead of vent temperature sender on vehicles with heater or manually controlled air conditioner
- ❑ A loose or missing sealing plug or an incorrectly installed vent temperature sender will cause flow noise
- ❑ Exploded view
  ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

11 - Footwell vent (right-side)

- ❑ Exploded view
  ⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

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2 Refrigerant circuit

⇒ “2.1 System overview - refrigerant circuit”, page 133

⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

⇒ “2.3 Removing and installing pressure sender for refrigerant circuit G805 ”, page 160

⇒ “2.4 Removing and installing refrigerant pressure and temperature sender G395 ”, page 161

⇒ “2.5 Checking cut-in signal for air conditioner compressor regulating valve N280 ”, page 163

⇒ “2.6 Removing and installing refrigerant shut-off valve for heater and air conditioner unit N541 ”, page 166

⇒ “2.7 Removing and installing refrigerant shut-off valve for high-voltage battery heat exchanger N542 ”, page 169

⇒ “2.8 Additional weight at refrigerant line”, page 171

⇒ “2.9 Removing and installing expansion valve”, page 171

⇒ “2.10 Detaching and attaching refrigerant lines at condenser”, page 173

⇒ “2.11 Removing and installing condenser”, page 177

⇒ “2.12 Removing and installing desiccant cartridge”, page 181

⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189

⇒ “2.15 Removing and installing service connections (low and high-pressure sides)”, page 197

⇒ “2.16 Starting up air conditioner after charging refrigerant circuit”, page 199

⇒ “8.9 Removing and installing heat exchanger for high-voltage battery”, page 352

2.1 System overview - refrigerant circuit

⇒ “2.1.1 System overview - refrigerant circuit, vehicles without high-voltage system”, page 133

⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138

⇒ “2.1.3 Refrigerant line with restrictor”, page 146

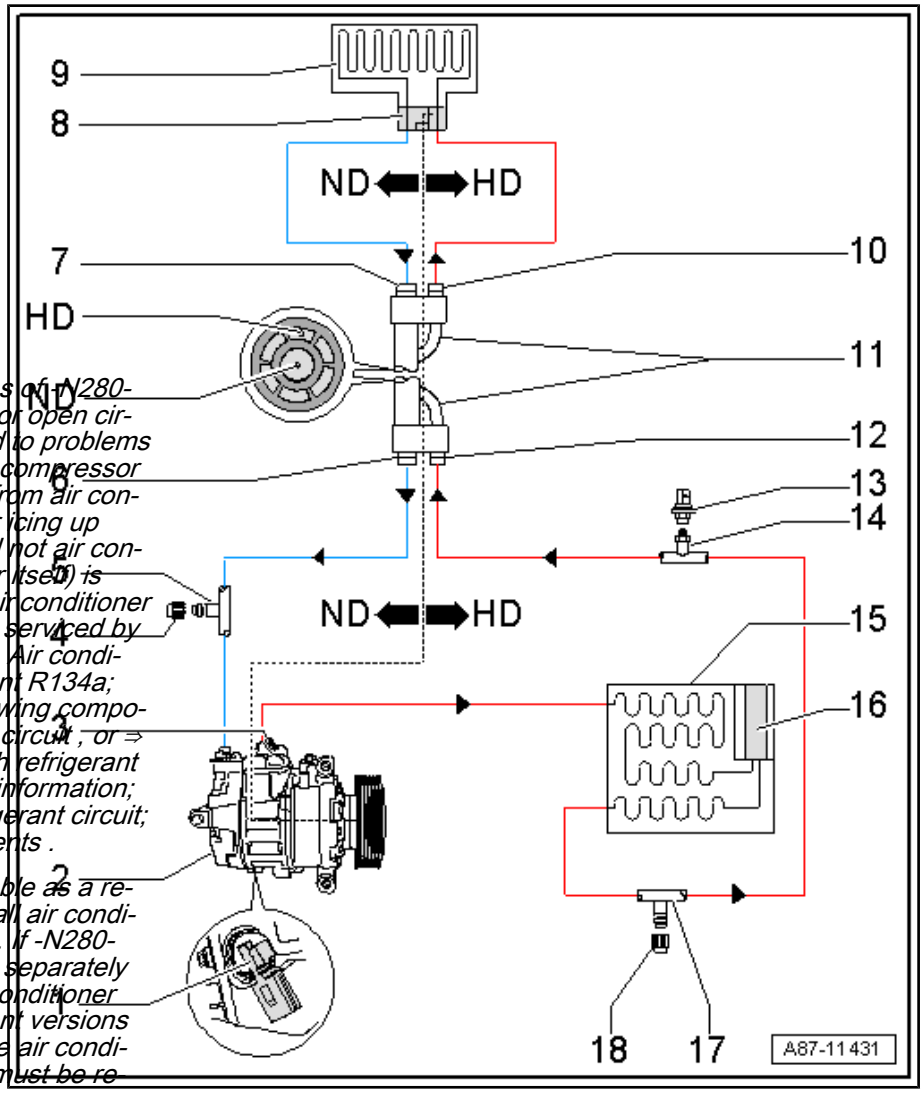
2.1.1 System overview - refrigerant circuit, vehicles without high-voltage system

HD = High-pressure side

ND = Low-pressure side

1 - Air conditioner compressor regulating valve - N280-

- ❑ Checking activation and operation ⇒ page 163 , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



Note

- *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not air conditioner compressor itself) is cause of problem, air conditioner compressor can be serviced by renewing -N280- ⇒ 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 .*
- *-N280- is not available as a replacement part for all air conditioner compressors. If -N280- cannot be obtained separately for a particular air conditioner compressor (different versions available), the entire air conditioner compressor must be renewed if problems occur ⇒ Electronic parts catalogue .*

2 - Air conditioner compressor

- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ page 204

Note

- *Depending on the design of the refrigerant line and the production period, the refrigerant line on the low-pressure side may be provided with an additional weight (vibration damper, resonator for reducing noise at refrigerant line) ⇒ page 171 . Make sure that this component is not in contact with other components and cannot come into contact during operation (noise) ⇒ Electronic parts catalogue .*

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- *Vehicles with a 5-cylinder engine (Audi RS 3) have 1 or 2 poly V-belts on the air conditioner compressor (depending on the engine type). The air conditioner compressor is therefore provided with a single or double-belt pulley ⇒ 5-cylinder direct injection engine (2.5 ltr. 4-valve TFSI); Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .*

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3 - High-pressure safety valve

Caution

Danger from escaping pressurised refrigerant if valve is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve.

4 - Cap

- ❑ With seal
- ❑ Always screw on
- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

5 - Service connection (low-pressure side)

- ❑ For measuring and discharging

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

6 - Connection in refrigerant line (low-pressure side)

- From internal heat exchanger to air conditioner compressor

7 - Connection in refrigerant line (low-pressure side)

- From expansion valve to internal heat exchanger

8 - Expansion valve

- Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- Exploded view ⇒ page 146
- Removing and installing ⇒ page 171

9 - Evaporator

- Exploded view ⇒ page 271

10 - Connection in refrigerant line (high-pressure side)

- From internal heat exchanger to expansion valve

11 - Refrigerant line with internal heat exchanger

- In the internal heat exchanger, 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 ⇒ page 189

12 - Connection in refrigerant line (high-pressure side)

- From condenser to internal heat exchanger

13 - Pressure sender for refrigerant circuit - G805-

- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 160

14 - Connection with valve

15 - Condenser

- Exploded view ⇒ page 146

16 - Desiccant cartridge

- Exploded view ⇒ page 146

17 - Service connection (high-pressure side)

- For measuring, discharging and charging

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Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

18 - Cap

- ❑ With seal
- ❑ Always screw on
- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

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

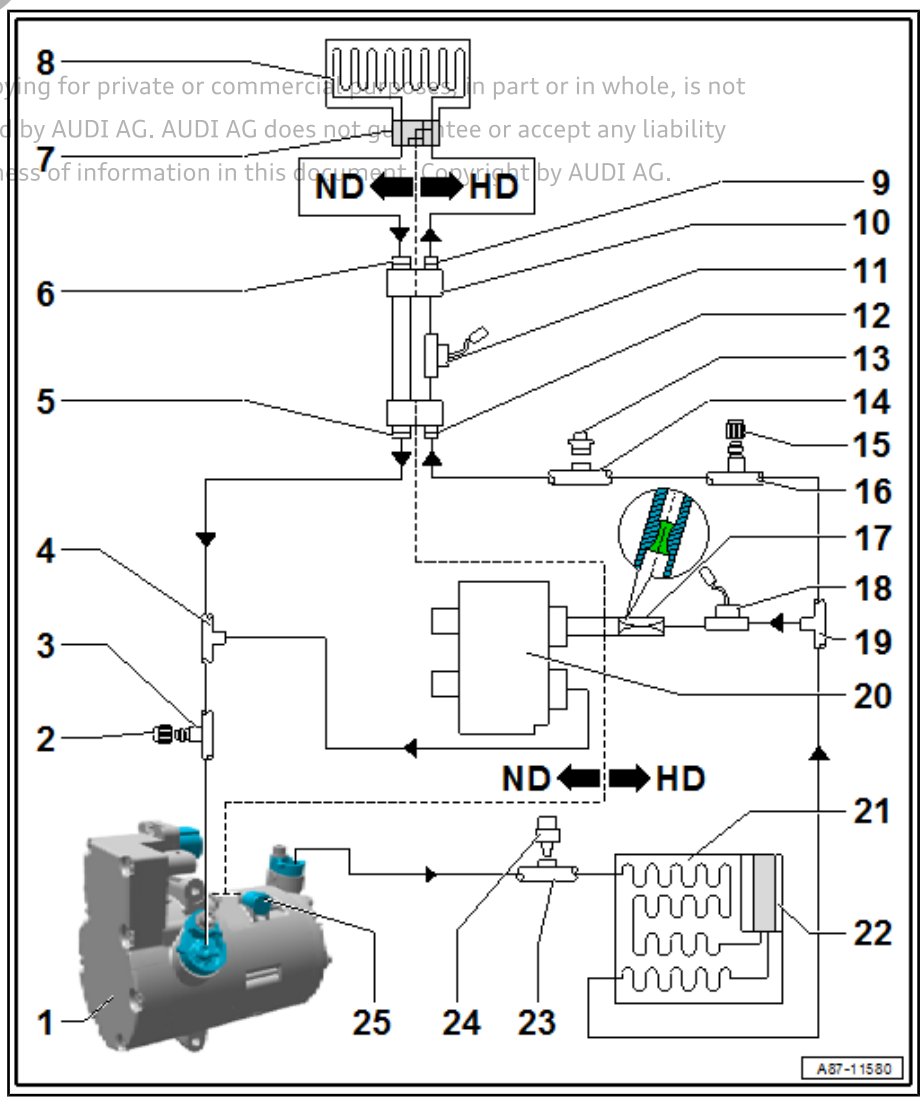
HD = High-pressure side

ND = Low-pressure side

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1 - Electrically driven air conditioner compressor

- ❑ Exploded view ⇒ “3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor”, page 210
- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ Removing and installing ⇒ “3.5.2 Removing and installing electrically driven air conditioner compressor”, page 232
- ❑ ⇒ “3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor”, page 210
- ❑ ⇒ “3.5.2 Removing and installing electrically driven air conditioner compressor”, page 232
- ❑ Different versions (e.g. for vehicles for Europe or for North America) ⇒ Electronic parts catalogue
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue



Note

- ♦ *On vehicles with -G805- or -G395- , there are also different versions of the electrical air conditioner compressor - V470- (with control unit for air conditioner compressor - J842-) and of the air conditioner operating unit (Climatronic control unit - J255-) in addition to the pressure sender ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Electronic parts catalogue .*

- *On vehicles with a high-voltage system, -V470- is activated (via -J842-) by the air conditioner operating unit (Climatronic control unit - J255-) via the LIN bus ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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- *The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1- ⇒ "9.8 Removing and installing fuse for electrical air conditioner compressor", page 372 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The compressor version may differ depending on the production period and engine ⇒ Electronic parts catalogue .*
- *The air conditioner compressors are available as replacement parts with different oil capacities; please observe the oil quantity in the compressor and the exact part number ⇒ Electronic parts catalogue and ⇒ "5.2 Approved refrigerant oils and refrigerant oil capacities", page 90 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/ refrigerant oil and approved refrigerant oils , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*

- *There may be different refrigerant oil capacities for the refrigerant circuit depending on the type of air conditioner compressor. The reason for the different oil quantities in the air conditioner compressor for an otherwise identical refrigerant circuit is the design of the actual compressor; please note the different oil quantities. Too much oil in the refrigerant circuit results in higher pressures and a reduction in the cooling output of the air conditioner. Lubrication problems may occur in the air conditioner compressor if there is insufficient oil ⇒ "5.2 Approved refrigerant oils and refrigerant oil capacities", page 90 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Capacities for refrigerant R134a/ refrigerant oil and approved refrigerant oils , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Technical data .*
- *When fitting refrigerant lines and the corresponding retainers, make sure there is adequate clearance from other components (such as belts and engine pulleys).*

2 - Cap

- ❑ With seal
- ❑ Always screw on
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ "2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 194 and ⇒ Electronic parts catalogue

3 - Service connection (low-pressure side)

- ❑ For measuring and discharging

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Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

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- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

4 - Connection in refrigerant line (low-pressure side)

- ❑ Outlet in refrigerant line to high-voltage battery heat exchanger

5 - Connection in refrigerant line (low-pressure side)

- ❑ Between refrigerant lines from expansion valve and to air conditioner compressor

6 - Connection in refrigerant line (low-pressure side)

- ❑ At expansion valve

7 - Expansion valve

- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ page 146
- ❑ Removing and installing ⇒ page 171

8 - Evaporator

- ❑ Exploded view ⇒ page 271

9 - Connection in refrigerant line (high-pressure side)

- ❑ At expansion valve

10 - Refrigerant line

- ❑ From expansion valve to refrigerant shut-off valve for heater and air conditioner unit - N541-
- ❑ Removing and installing
  ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189 and
  ⇒ “2.9 Removing and installing expansion valve”, page 171

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

- ❑ Checking ⇒ “4.8 Checking cooling output”, page 49 , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 166

12 - Connection in refrigerant line (high-pressure side)

- ❑ From condenser to expansion valve (via refrigerant shut-off valve for heater and air conditioner unit - N541-)

13 - Pressure sender for refrigerant circuit - G805-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Exploded view ⇒ page 146
- ❑ Removing and installing ⇒ page 160
- ❑ Only installed on certain versions (e.g. not installed on vehicles for North America) ⇒ Electronic parts catalogue

Note

- ♦ *On vehicles with -G805- or -G395- , there are also different versions of the electrical air conditioner compressor - V470- (with control unit for air conditioner compressor - J842-) and of the air conditioner operating unit (Climatronic control unit - J255-) in addition to the pressure sender ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Electronic parts catalogue .*
- ♦ *Depending on the version of the refrigerant line, -G805- may also be fitted on vehicles with refrigerant pressure and temperature sender - G395- so that the connection is effectively closed with a valve. On these vehicles, -G805- is not connected to the vehicle electrical system.*

14 - Connection with valve

- ❑ Only fitted on vehicles with -G805-

15 - Cap

- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and ⇒ Electronic parts catalogue
- ❑ With seal
- ❑ Always screw on

16 - Service connection (high-pressure side)

- ❑ For measuring, discharging and charging

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Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ "2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 194 and ⇒ Electronic parts catalogue

17 - Refrigerant line with restrictor

- ❑ A restrictor (constriction) is fitted in this refrigerant line ⇒ page 146 .
- ❑ Before removing component, refrigerant shut-off valve for high-voltage battery heat exchanger - N542- must be detached ⇒ page 169 , and refrigerant line must be disconnected from high-voltage battery heat exchanger ⇒ page 352 .

Note

- ♦ *Diameter of restrictor hole is approx. 0.7 mm. Depending on the version of the refrigerant line, the restrictor is either only inserted or fixed in position in the refrigerant line. If it is inserted, there may be a strainer for separating float elements, which may block off the restrictor hole.*
- ♦ *When the refrigerant shut-off valve for high-voltage battery heat exchanger - N542- is open, the restrictor restricts the flow of coolant to the high-voltage battery heat exchanger (and thus its cooling output).*

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

- ❑ Checking ⇒ "4.8 Checking cooling output", page 49 , ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 169

19 - Connection in refrigerant line (high-pressure side)

- ❑ From condenser to expansion valve (via a refrigerant line and - N541-) to high-voltage battery heat exchanger (via - N542-)

20 - High-voltage battery heat exchanger

- ❑ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

- ❑ Removing and installing ⇒ page 352

Note

Checking operation
⇒ "4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)", page 64

21 - Condenser

- ❑ Exploded view ⇒ page 146

22 - Desiccant cartridge

- ❑ Exploded view ⇒ page 146

23 - Connection without valve

- ❑ Only fitted on vehicles with -G395-

Caution

Danger from escaping pressurised refrigerant if -G395- is removed with refrigerant circuit not completely empty
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing -G395- ; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

24 - Refrigerant pressure and temperature sender - G395-

- ❑ Checking ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Only installed on certain versions (e.g. on vehicles for North America) ⇒ Electronic parts catalogue
- ❑ Exploded view - electrically driven air conditioner compressor, refrigerant lines, high-voltage battery heat exchanger (vehicles with high-voltage system) ⇒ page 153
- ❑ Removing and installing ⇒ page 161

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Note

On vehicles with -G395- , different versions of the electrical air conditioner compressor - V470- (with control unit for air conditioner compressor - J842-) and of the air conditioner operating unit (Climatronic control unit - J255-) are fitted in addition to the pressure sender ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Electronic parts catalogue .

Caution

Danger from escaping pressurised refrigerant if -G395- is removed with refrigerant circuit not completely empty
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing -G395- ; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

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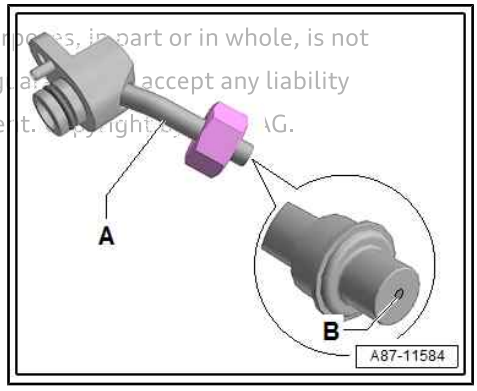
25 - High-pressure safety valve

Caution

Danger from escaping pressurised refrigerant if valve is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve.

2.1.3 Refrigerant line with restrictor

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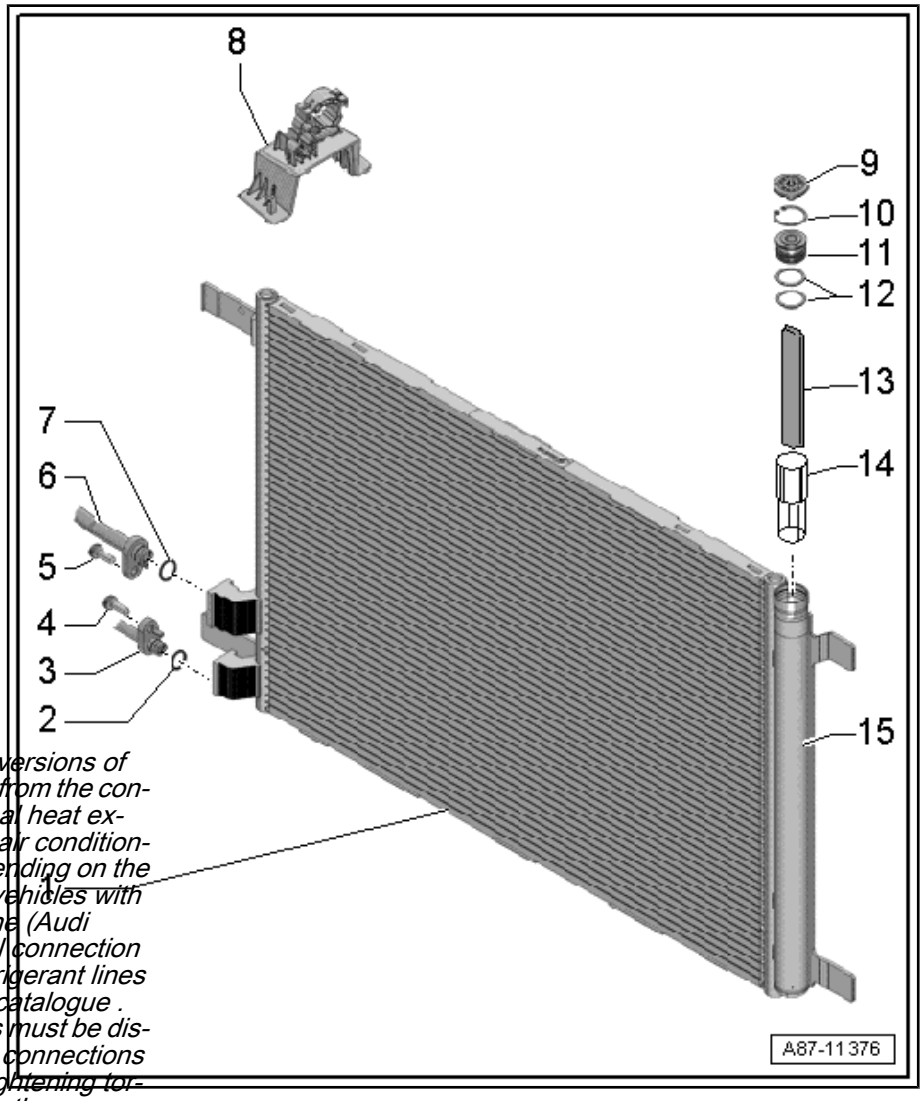
Note

- *The illustration shows a refrigerant line -A- with a permanently installed restrictor -B- (without strainer).*
- *Before removing the refrigerant line, the refrigerant shut-off valve for high-voltage battery heat exchanger - N542- must be detached ⇒ page 169 , and the refrigerant line must be disconnected from the high-voltage battery heat exchanger ⇒ page 352 .*
- *The diameter of the restrictor hole -B- is approx. 0.7 mm. Depending on the version of the refrigerant line, the restrictor is either only inserted or fixed in position in the refrigerant line. If it is inserted, there may be a strainer for separating float elements, which may block off the restrictor hole.*
- *Prior to installation, check the restrictor hole -B- for dirt, and clean or renew the component as necessary.*
- *Different versions ⇒ Electronic parts catalogue*

2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve

- Condenser, receiver ⇒ page 146
- Mechanically driven air conditioner compressor, refrigerant lines, expansion valve (vehicles without high-voltage system) ⇒ page 149
- Electrically driven air conditioner compressor, refrigerant lines, high-voltage battery heat exchanger (vehicles with high-voltage system) ⇒ page 153

Condenser, receiver



1 - Condenser

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “2.11 Removing and installing condenser”, page 177

2 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 81

3 - Refrigerant line

- ❑ From connection point on right longitudinal member (to internal heat exchanger)

Note

- ♦ *There are different versions of the refrigerant lines from the condenser to the internal heat exchanger and to the air conditioner compressor depending on the vehicle model. On vehicles with a 2.5 ltr. TFSI engine (Audi RS 3), an additional connection is fitted in these refrigerant lines ⇒ Electronic parts catalogue . The refrigerant lines must be disconnected at these connections if necessary. The tightening torques for the bolts on the connections are the same as those for the bolts on the refrigerant lines at the internal heat exchanger and at the condenser.*
- ♦ *On vehicles with a 2.5 ltr. TFSI engine (Audi RS 3), the refrigerant lines from the condenser can only be detached if the condenser has been removed. The refrigerant lines must be detached at their connections where necessary.*

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4 - Bolt

- ❑ 8 Nm

5 - Bolt

- ❑ 8 Nm

6 - Refrigerant line

- ❑ From air conditioner compressor

Note

- *There are different versions of the refrigerant lines from the condenser to the internal heat exchanger and to the air conditioner compressor depending on the vehicle model. On vehicles with a 2.5 ltr. TFSI engine (Audi RS 3), an additional connection is fitted in these refrigerant lines ⇒ Electronic parts catalogue . The refrigerant lines must be disconnected at these connections if necessary. The tightening torques for the bolts on the connections are the same as those for the bolts on the refrigerant lines at the internal heat exchanger and at the condenser.*
- *On vehicles with a 2.5 ltr. TFSI engine (Audi RS 3), the refrigerant lines from the condenser can only be detached if the condenser has been removed. The refrigerant lines must be detached at their connections where necessary.*

7 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 81

8 - Bracket

- ❑ For refrigerant lines

9 - Cap

- ❑ Different versions ⇒ Electronic parts catalogue

10 - Circlip

11 - Cap

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renew if damaged
- ❑ 2 Nm

12 - O-rings

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 81

13 - Desiccant cartridge

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

- ♦ Denso condenser ⇒ “2.12.1 Removing and installing desiccant cartridge - Denso condenser”, page 181
- ♦ Modine condenser ⇒ “2.12.2 Removing and installing desiccant cartridge - Modine condenser”, page 183
- ♦ Showa/Keihin condenser ⇒ “2.12.3 Removing and installing desiccant cartridge - Showa/Keihin condenser”, page 187

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14 - Strainer

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing
  ⇒ “2.12.2 Removing and installing desiccant cartridge - Modine condenser”, page 183

15 - Receiver

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Integrated in condenser on this version

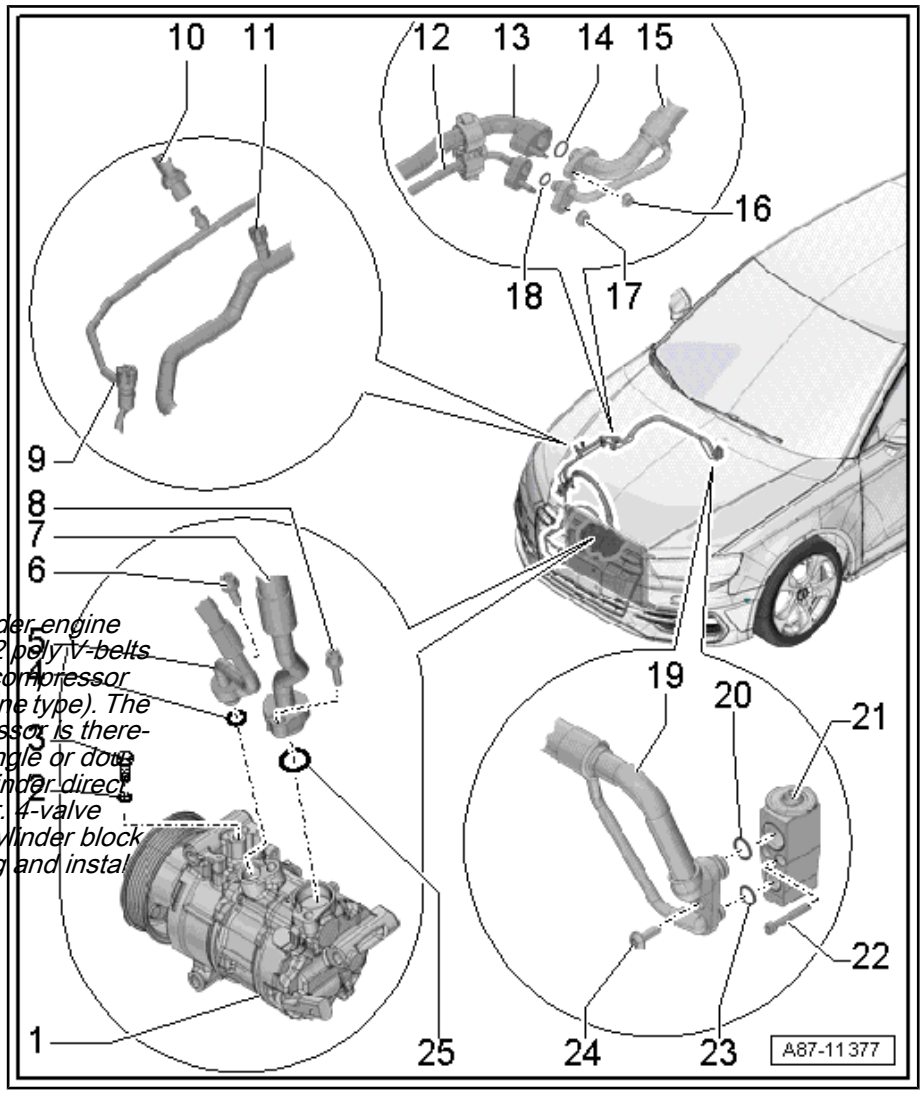
Mechanically driven air conditioner compressor, refrigerant lines, expansion valve (vehicles without high-voltage system)

1 - Mechanically driven air conditioner compressor

- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ “3.1 Exploded view - drive unit for air conditioner compressor”, page 204
- ❑ Not installed on vehicles with high-voltage system ⇒ page 153 (further components on vehicles with high-voltage system)

Note

Vehicles with a 5-cylinder engine (Audi RS 3) have 1 or 2 poly V-belts on the air conditioner compressor (depending on the engine type). The air conditioner compressor is therefore provided with a single or double-belt pulley ⇒ 5-cylinder direct injection engine (2.5 ltr. 4-valve TFSI); Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .



2 - Seal

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Lubricate O-ring with refrigerant oil before installing ⇒ “4.12 Refrigerant circuit seals”, page 81 .
- ❑ Renew

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3 - Oil drain plug

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

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

- ♦ Denso air conditioner compressor: 30 Nm
- ♦ Sanden air conditioner compressor: 10 Nm
- ♦ Not installed on vehicles with high-voltage system ⇒ page 153 (further components on vehicles with high-voltage system)

4 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 81

5 - Refrigerant line

- ❑ To condenser

6 - Bolt

- ❑ 22 Nm

7 - Refrigerant line

- ❑ To connection point on right longitudinal member (from internal heat exchanger)
- ❑ Additional weight at refrigerant line ⇒ “2.8 Additional weight at refrigerant line”, page 171

Note

Depending on the design of the refrigerant line and the production period, this refrigerant line may be provided with an additional weight (vibration damper, resonator for reducing noise at refrigerant line). Make sure that this component is not in contact with other components and cannot come into contact during operation (noise) ⇒ Electronic parts catalogue .

8 - Bolt

- ❑ 22 Nm

9 - Service connection (high-pressure side)

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- Removing and installing
  ⇒ “2.15 Removing and installing service connections (low and high-pressure sides)”, page 197
- Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

10 - Pressure sender for refrigerant circuit - G805-

- 5 Nm
- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing
  ⇒ “2.3 Removing and installing pressure sender for refrigerant circuit G805 ”, page 160

Note

Not always installed on vehicles with high-voltage system ⇒ page 153 (further components on vehicles with high-voltage system)

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11 - Service connection (low-pressure side)

> **Caution**
> *Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.*
> *Danger of frostbite on skin and other parts of the body.*
> *Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

- ❑ Removing and installing
  ⇒ “2.15 Removing and installing service connections (low and high-pressure sides)”, page 197
- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

12 - Refrigerant line (high-pressure side)

- ❑ To refrigerant line with internal heat exchanger

13 - Refrigerant line (low-pressure side)

- ❑ To refrigerant line with internal heat exchanger

14 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ “4.12 Refrigerant circuit seals”, page 81

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15 - Refrigerant line with internal heat exchanger

- ❑ From condenser and air conditioner compressor
- ❑ Removing and installing
  ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189

16 - Nut

- ❑ 8 Nm

17 - Nut

- ❑ 8 Nm

18 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

19 - Refrigerant line with internal heat exchanger

- ❑ To expansion valve
- ❑ Removing and installing
  ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189

20 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue

- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

21 - Expansion valve

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ “2.9 Removing and installing expansion valve”, page 171

22 - Bolt

- ❑ 2x
- ❑ 10 Nm

23 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

24 - Bolt

- ❑ 8 Nm

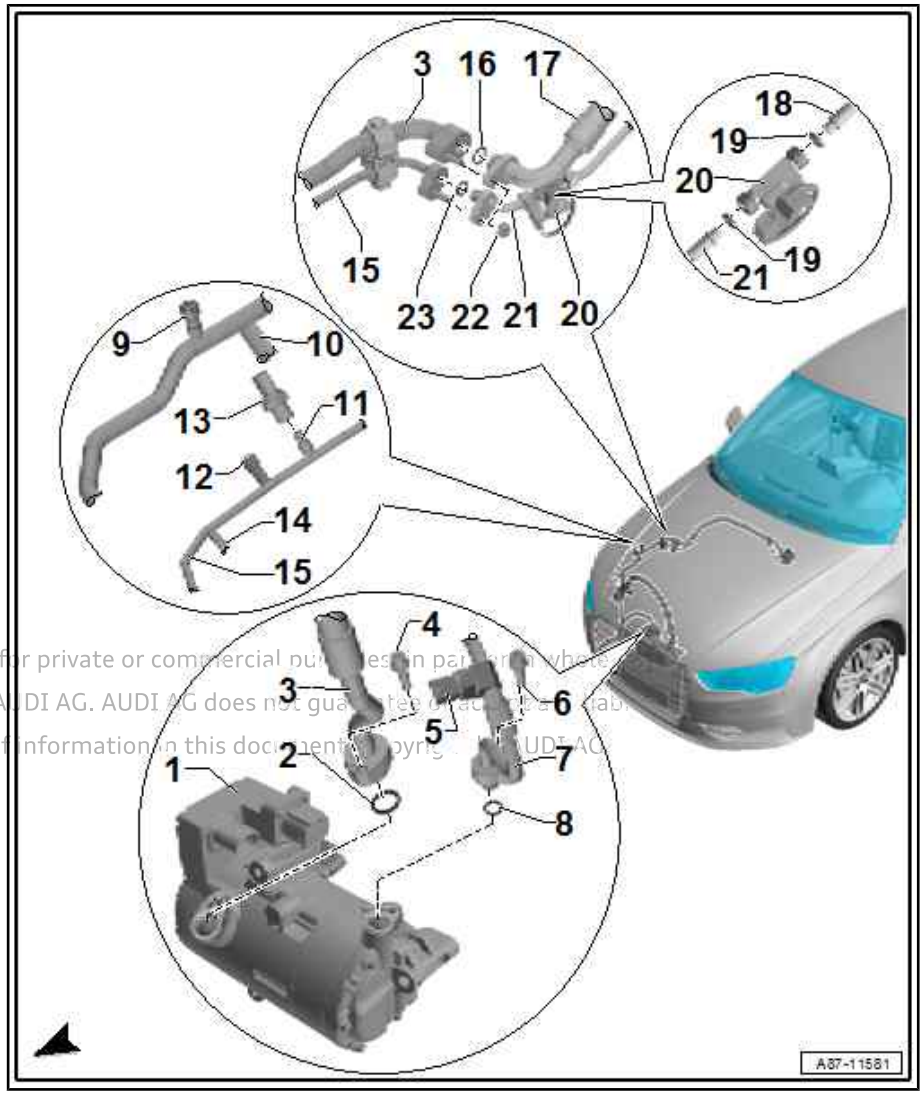
25 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

Electrically driven air conditioner compressor, refrigerant lines, high-voltage battery heat exchanger (vehicles with high-voltage system)

1 - Electrically driven air conditioner compressor

- ❑ Exploded view ⇒ page 210
- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ Removing and installing ⇒ page 232
- ❑ Different versions (e.g. for vehicles for Europe or for North America) ⇒ Electronic parts catalogue
- ❑ Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- ❑ Further notes on electrically driven air conditioner compressors ⇒ page 138



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2 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

3 - Refrigerant line (low-pressure side)

- ❑ From connection point

on right longitudinal
member (to air conditioner compressor)

- ❑ With outlet to high-voltage battery heat exchanger
- ❑ Additional weight at refrigerant line ⇒ page 171

Note

Depending on the design of the refrigerant line and the production period, this refrigerant line may be provided with an additional weight (vibration damper, resonator for reducing noise at refrigerant line). Make sure that this component is not in contact with other components and cannot come into contact during operation (noise) ⇒ Electronic parts catalogue .

4 - Bolt

- ❑ 22 Nm

5 - Refrigerant pressure and temperature sender - G395-

- ❑ 8 Nm
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Only installed on certain versions (e.g. on vehicles for North America) ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 161

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Note

On vehicles with -G395- , different versions of the electrical air conditioner compressor - V470- (with control unit for air conditioner compressor - J842-) and of the air conditioner operating unit (Climatronic control unit - J255-) are also fitted in addition to the pressure sender ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Electronic parts catalogue .

Caution

Danger from escaping pressurised refrigerant if -G395- is removed with refrigerant circuit not completely empty
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing -G395- ; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

6 - Bolt

- ❑ 22 Nm

7 - Refrigerant line

- ❑ To condenser
- ❑ Different versions (with or without connection for refrigerant pressure and temperature sender - G395-) ⇒ Electronic parts catalogue

8 - Outlet from refrigerant line (high-pressure side)

- ❑ To high-voltage battery heat exchanger

9 - Service connection (low-pressure side)

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- ❑ Removing and installing ⇒ page 197

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- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

10 - Outlet from refrigerant line (low-pressure side)

- ❑ To high-voltage battery heat exchanger

11 - Connection for pressure sender for refrigerant circuit - G805-

- ❑ Only installed on certain versions (e.g. not installed on vehicles for North America) ⇒ Electronic parts catalogue

12 - Service connection (high-pressure side)

Caution

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.
Danger of frostbite on skin and other parts of the body.
Always discharge refrigerant circuit before removing component; connection has no valve ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

- ❑ Removing and installing ⇒ page 197
- ❑ Different versions depending on refrigerant (R134a or R1234yf)
  ⇒ “2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)”, page 194 and
  ⇒ Electronic parts catalogue

13 - Pressure sender for refrigerant circuit - G805-

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- ❑ 5 Nm
- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 160
- ❑ Only installed on certain versions (e.g. not installed on vehicles for North America) ⇒ Electronic parts catalogue

Note

- ♦ *On vehicles with -G805- or -G395- , there are also different versions of the electrical air conditioner compressor - V470- (with control unit for air conditioner compressor - J842-) and of the air conditioner operating unit (Climatronic control unit - J255-) in addition to the pressure sender ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Electronic parts catalogue .*

- *Depending on the version of the refrigerant line, -G805- may also be fitted on vehicles with refrigerant pressure and temperature sender - G395- so that the connection is effectively closed with a valve. On these vehicles, -G805- is not connected to the vehicle electrical system.*

14 - Outlet from refrigerant line (high-pressure side)

- ❑ To high-voltage battery heat exchanger

15 - Refrigerant line (high-pressure side)

- ❑ From condenser to connection point on right longitudinal member
- ❑ With outlet to high-voltage battery heat exchanger
- ❑ Different versions (with or without connection for pressure sender for refrigerant circuit - G805-) ⇒ Electronic parts catalogue

16 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

17 - Refrigerant line (low-pressure side)

- ❑ From expansion valve to connection point on right longitudinal member
- ❑ Removing and installing ⇒ page 189

18 - Refrigerant line (high-pressure side)

- ❑ From refrigerant shut-off valve for heater and air conditioner unit - N541- to expansion valve
- ❑ From connection point on right longitudinal member to -N541-
- ❑ Removing and installing ⇒ “2.6 Removing and installing refrigerant shut-off valve for heater and air conditioner unit N541 ”, page 166 and ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189

19 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

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

- ❑ Checking ⇒ “4.8 Checking cooling output”, page 49 , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 166

21 - Refrigerant line (high-pressure side)

- ❑ From connection point on right longitudinal member to refrigerant shut-off valve for heater and air conditioner unit - N541-
- ❑ Removing and installing ⇒ page 189

22 - Nut

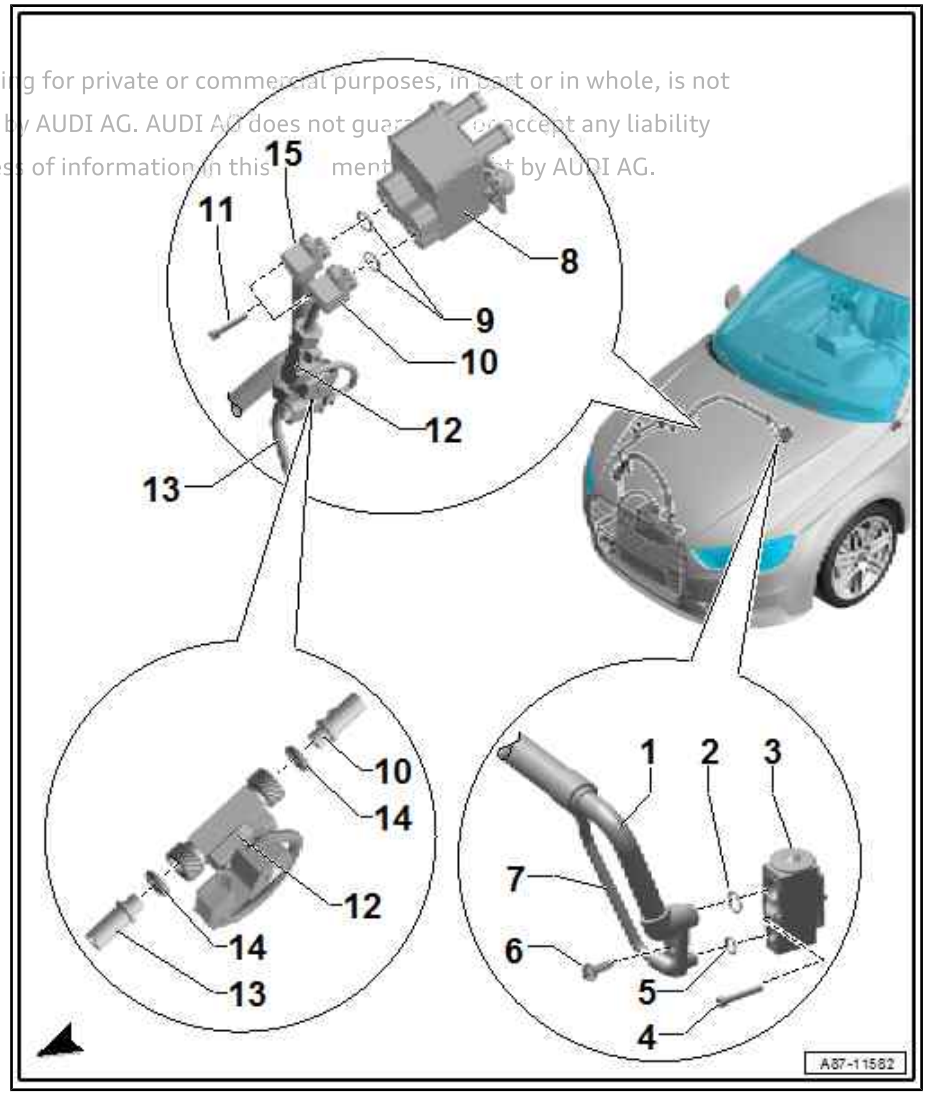
- ❑ 8 Nm

23 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

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1 - Refrigerant line (low-pressure side)

- From expansion valve to connection point on right longitudinal member
- Removing and installing ⇒ page 189

2 - O-ring

- Renew; for correct version refer to ⇒ Electronic parts catalogue
- Before installing, lubricate with refrigerant oil ⇒ page 81

3 - Expansion valve

- Different versions ⇒ Electronic parts catalogue
- Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue
- Removing and installing ⇒ page 171

4 - Bolt

- 2x
- 10 Nm

5 - O-ring

- Renew; for correct version refer to ⇒ Electronic parts catalogue
- Before installing, lubricate with refrigerant oil ⇒ page 81

6 - Bolt

- 8 Nm

7 - Refrigerant line (high-pressure side)

- From refrigerant shut-off valve for heater and air conditioner unit - N541- ⇒ Item 20 (page 157) to expansion valve
- Refrigerant line from connection point on right longitudinal member to -N541- ⇒ Item 21 (page 157)
- Removing and installing ⇒ “2.6 Removing and installing refrigerant shut-off valve for heater and air conditioner unit N541 ”, page 166 and ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189

8 - High-voltage battery heat exchanger

- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 352

9 - O-ring

- Renew; for correct version refer to ⇒ Electronic parts catalogue
- Before installing, lubricate with refrigerant oil ⇒ page 81

10 - Refrigerant line (high-pressure side) with restrictor

- From - N542- to high-voltage battery heat exchanger
- A restrictor (constriction) is fitted in this refrigerant line ⇒ page 146 .

❑ Before removing component, refrigerant shut-off valve for high-voltage battery heat exchanger - N542- must be detached ⇒ “2.7 Removing and installing refrigerant shut-off valve for high-voltage battery heat exchanger N542 ”, page 169 , and refrigerant line must be disconnected from high-voltage battery heat exchanger ⇒ “8.9 Removing and installing heat exchanger for high-voltage battery”, page 352 .

Note

- *Before removing component, refrigerant shut-off valve for high-voltage battery heat exchanger - N542- must be detached ⇒ page 169 , and refrigerant line must be disconnected from high-voltage battery heat exchanger ⇒ page 352 .*
- *Diameter of restrictor hole is approx. 0.7 mm. Depending on the version of the refrigerant line, the restrictor is either only inserted or fixed in position in the refrigerant line. If it is inserted, there may be a strainer for separating float elements, which may block off the restrictor hole.*
- *When the refrigerant shut-off valve for high-voltage battery heat exchanger - N542- is open, the restrictor restricts the flow of coolant to the high-voltage battery heat exchanger (and thus its cooling output).*

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11 - Bolt

❑ 8 Nm

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

❑ Checking ⇒ “4.8 Checking cooling output”, page 49 , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

❑ Removing and installing ⇒ page 169

13 - Refrigerant line (high-pressure side)

❑ Refrigerant line to - N542- from outlet in refrigerant line, high-pressure side (from condenser to connection point on right longitudinal member) ⇒ Item 14 (page 157)

14 - O-ring

❑ Renew; for correct version refer to ⇒ Electronic parts catalogue

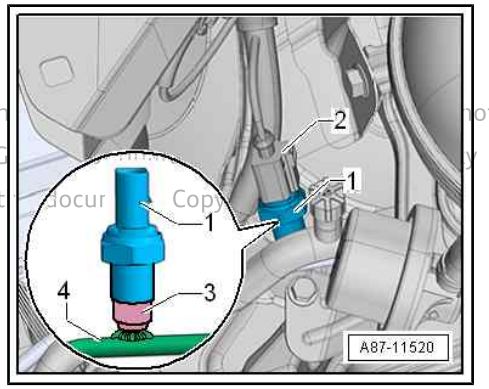
❑ Before installing, lubricate with refrigerant oil ⇒ page 81

15 - Refrigerant line (low-pressure side)

❑ Refrigerant line from high-voltage battery heat exchanger to outlet in refrigerant line, low-pressure side (from connection point on right longitudinal member to air conditioner compressor) ⇒ Item 10 (page 156)

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2.3 Removing and installing pressure sender for refrigerant circuit - G805-



WARNING

Danger from escaping pressurised refrigerant if the refrigerant line is damaged.

Danger of frostbite on skin and other parts of the body.

- *Carefully unfasten pressure sensor -1-, paying attention to joint between switch connection -3- and refrigerant line -4-.*
- *Should the joint between the switch connection -3- and the refrigerant line -4- become deformed when unfastening the pressure sensor -1- (e.g. because of a gummed-up O-ring), use suitable pliers to counterhold the switch connection -3- while unfastening the pressure sensor -1-.*

Danger from escaping pressurised refrigerant if valve in refrigerant line is defective.

Danger of frostbite on skin and other parts of the body.

- *If refrigerant emerges from the switch connection for more than 1 second when unfastening the pressure sensor -1-, tighten the pressure sensor -1- again immediately.*
- *Discharge refrigerant circuit before removing ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *If defective, renew valve in switch connection of refrigerant line ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .*

WARNING

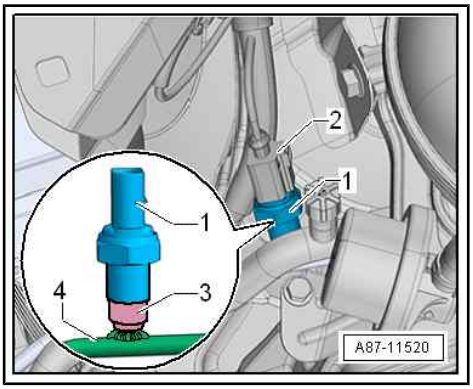
Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*

Note

Not always fitted on vehicles with high-voltage system
⇒ "2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system", page 138



Removing

– Unplug electrical connector -2-.

– Loosen and remove pressure sender -1-.

Installing

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

- Tightening torque
  ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

Note

Renew O-ring ⇒ page 81 . For correct version refer to ⇒ Electronic parts catalogue .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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

Note

Only installed on certain vehicles with a high-voltage system
⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138

Note

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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

Removing

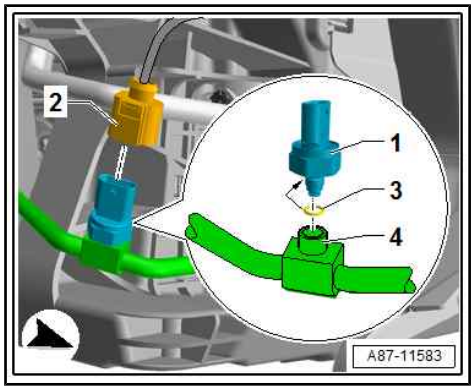
– Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working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

– Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) ; Exploded view - bumper (front).

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– Unplug electrical connector -2-.

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



Note

- *Should it not be possible to unplug the electrical connector -2- or unfasten the sender -1- due to the confined installation space, detach the refrigerant line from the condenser ⇒ page 173 .*
- *Refrigerant circuit must be empty when removing refrigerant pressure and temperature sender - G395- -1-; there is no valve at connection -4-.*

WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***

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– Loosen and remove sender -1-.

– 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:

- Check connection -4- for dirt or damage; clean or renew if necessary.
- Tightening torque ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146 (electrically driven air conditioner compressor, refrigerant lines, high-voltage battery heat exchanger)

Note

- *Renew O-ring -3- ⇒ page 81 . For correct version refer to ⇒ Electronic parts catalogue .*
- *At the start of production, -G395- is only available in combination with the refrigerant line. In this case, renew refrigerant line as well if renewing -G395- ⇒ Electronic parts catalogue .*

– 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 .

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

2.5 Checking cut-in signal for air conditioner compressor regulating valve - N280-

Note

- *The following sequence describes the procedure for testing air conditioner compressors without air conditioning system magnetic clutch - N25- . Perform the check in the same manner on vehicles with a different type of compressor or a compressor from a different manufacturer.*
- *The difference on air conditioner compressors with -N25- is that a 3-pin connector may be installed ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not air conditioner compressor itself) is cause of problem, air conditioner compressor can be serviced by renewing -N280- ⇒ 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 .*
- *-N280- is not available as a replacement part for all air conditioner compressors. If -N280- cannot be obtained separately for a particular air conditioner compressor (different versions available), the entire air conditioner compressor must be renewed if problems occur ⇒ Electronic parts catalogue .*
- *On air conditioner compressors with -N25- , you may have to discard plug contacts from connector housing on -N280- before renewing -N280- ⇒ 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 .*

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Special tools and workshop equipment required

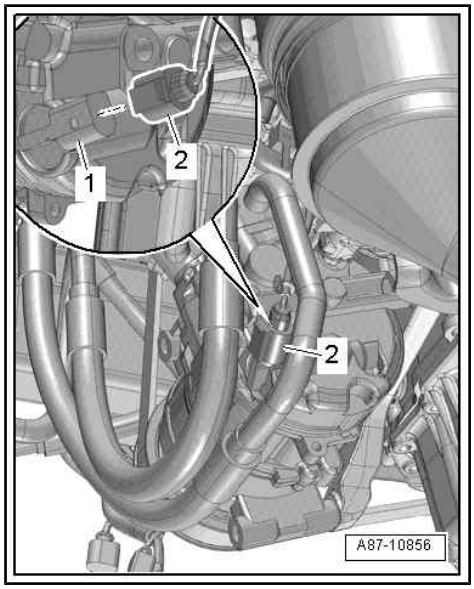
- Vehicle diagnostic tester
- Test instrument adapter/DSO (2-pin) - VAS 5256- , test instrument adapter/DSO (3-pin) - VAS 5257- or auxiliary measuring set - V.A.G 1594C-
- Probe - VAS 5051/8-

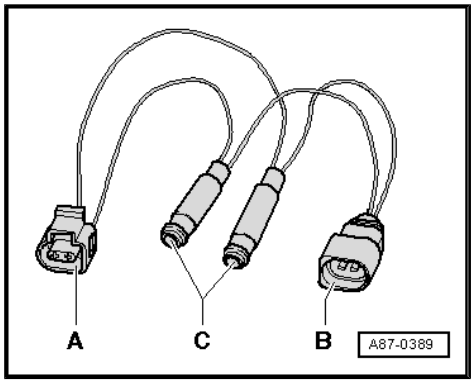
Test sequence

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

– Unplug electrical connector -2-.

– Use an adapter cable to re-establish connection between connector -2- and air conditioner compressor regulating valve - N280- -1-.



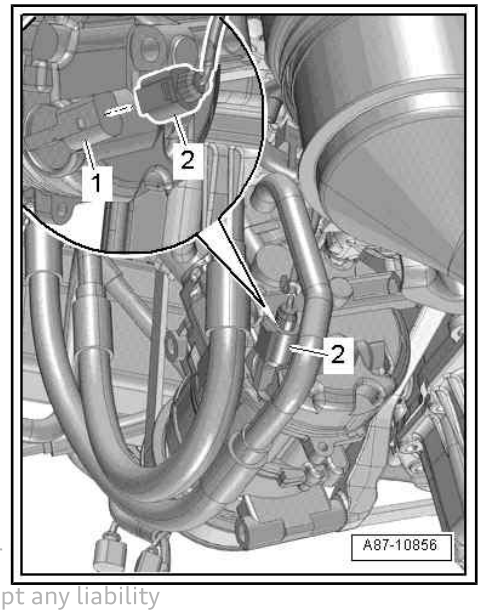


Note

- *Different adapter cables must be used, depending on the version of the air conditioner compressor (with or without air conditioning system magnetic clutch - N25-). For example, test instrument adapter/DSO (2-pin) - VAS 5256- must be used for an air conditioner compressor without -N25- , and test instrument adapter/DSO (3-pin) - VAS 5257- must be used for an air conditioner compressor with -N25- . If no suitable adapter is available, you can establish the connection between connector -1- and connector -2- with components from the auxiliary measuring set - V.A.G 1594 C- .*
- *Alternatively, you can use an improvised adapter cable for this test. For this you will need e.g. one 2-pin connector each (-A- and -B-; part numbers 1J0 973 702 and 1J0 973 802 and the corresponding plug contacts), two commercially available sockets for banana plugs -C- and two cables (cross-section = 0.5 mm^2) for an air conditioner compressor without -N25- .*
- *Activation of the air conditioner compressor regulating valve - N280- and the current flowing via the air conditioner compressor regulating valve - N280- as measured by the operating unit (Climatronic control unit - J255- or air conditioning system control unit - J301-) are displayed in the measured values of the operating unit. “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *On an air conditioner compressor with a different connector (e.g. a 3-pin connector on an air conditioner compressor with -N25-), pay attention to the pin assignment when connecting the test cables ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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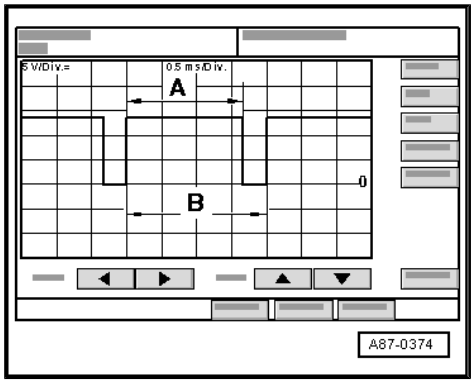
– Connect probe - VAS 5051/8- to adapter cables.
• Test lead (signal wire) to contact “2” of connector -2-
• Test lead (screen, earth) to contact “1” of connector -2-.
– Set “Test Instruments” mode on vehicle diagnostic tester: DSO (digital storage oscilloscope).
– Select setting 5V/div = 0.5 ms/div (5 V DC and 0.5 milliseconds per unit).
– Start engine.
– Set temperature for driver side and front passenger side to “Lo” on air conditioner operating unit. Use Auto and A/C buttons to activate and deactivate air conditioner compressor regulating valve - N280- .
– Set rotary temperature control to coldest position on operating unit. Use A/C button to activate and deactivate air conditioner compressor regulating valve - N280- .



Depending on the setting on the operating unit, the oscilloscope display will show:

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- In “OFF” mode (lamp in A/C button off), no square-wave signal (air conditioner compressor regulating valve - N280- is not activated).
- In “AUTO” mode (automatic air conditioner only) with A/C button pressed (lamp in A/C button on), square-wave signal with pulse width -A- between 75% and 100% (air conditioner compressor regulating valve - N280- is activated).



Note

- *The illustration shows a signal with a duty cycle of approx. 80 %.*
- *The pulse width -A- depends on the required cooling output, the electrical system voltage etc.; over the width of area -A-, the current is controlled via the air conditioner compressor regulating valve - N280- by the operating unit (Climatronic control unit - J255- / air conditioning system control unit - J301-).*
- *The signal distance -B- is always 2 milliseconds (corresponding to a frequency of 500 Hertz).*
- *The duty cycle is derived from the ratio of pulse width -A- to signal distance -B-.*

– The setting on the operating unit and the measured ambient influences govern the pulse width of the square-wave signal (duty cycle between 30 % and 100 %; the air conditioner compressor regulating valve - N280- is activated so that the compressor output required to obtain the specified temperatures is achieved).

Note

- *For example, in “Auto” mode (automatically controlled air conditioner) with “Lo” temperature setting and the A/C button pressed (lamp in A/C button lights up), the air conditioner compressor regulating valve - N280- is activated so that the maximum permissible current of approx. 0.65 A flows via the air conditioner compressor regulating valve - N280- (maximum compressor output).*
- *In control mode, the activation time is governed by the required cooling output and the voltage of the vehicle's electrical system, for example; however, it is always long enough to achieve a mean current of 0.3 A.*

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

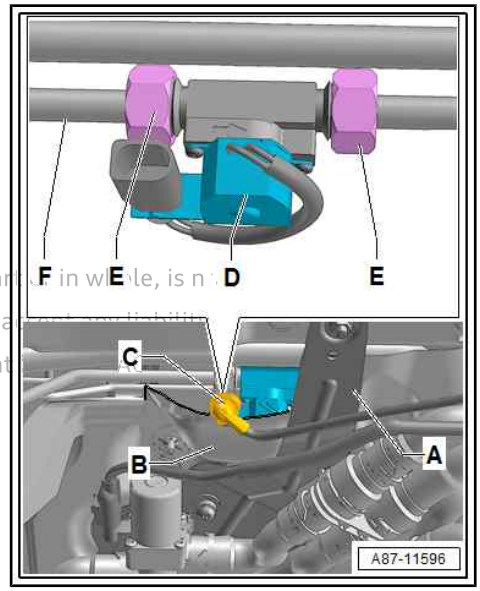
Removing

– 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 .

– Unfasten bracket -A- (for coolant valve for high-voltage battery - N688-) from plenum chamber partition panel.

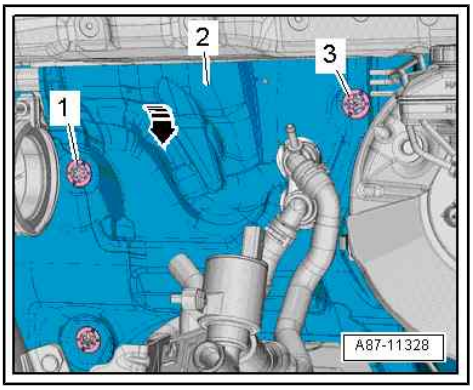
– Unfasten heat shield -B- from plenum chamber partition panel in vicinity of refrigerant shut-off valve for heater and air conditioner unit - N541- -D- and refrigerant line -F- (to connection point on right longitudinal member) and carefully bend it back.



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– Remove speed nuts -1 and 3-.

– Fold heat shield -2- as far forwards as possible (and necessary) -arrow-.



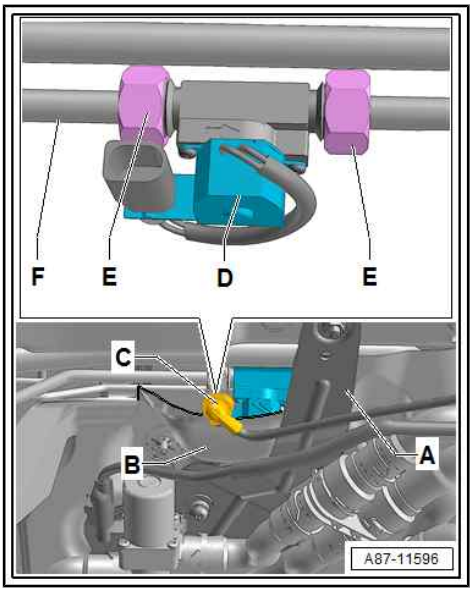
– Unplug electrical connector -C- from refrigerant shut-off valve for heater and air conditioner unit - N541- -D-.

WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*

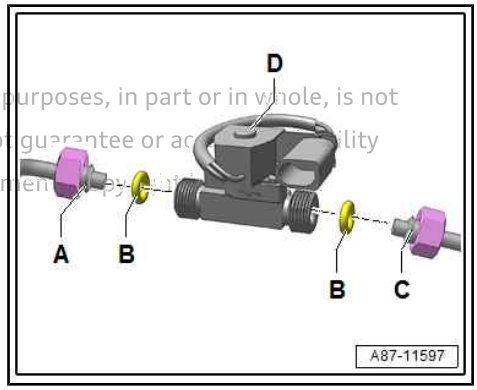


– Counterhold refrigerant shut-off valve for heater and air conditioner unit - N541- -D- and loosen union nuts -E-.

– Unfasten refrigerant line -F- (to connection point on right longitudinal member) from bracket on plenum chamber partition panel.

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– Remove refrigerant shut-off valve for heater and air conditioner unit - N541- -D-.



Installing

Install in reverse order of removal; note the following.

Note

- *Observe fitting instructions for O-rings -B- ⇒ page 81 .*
- *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

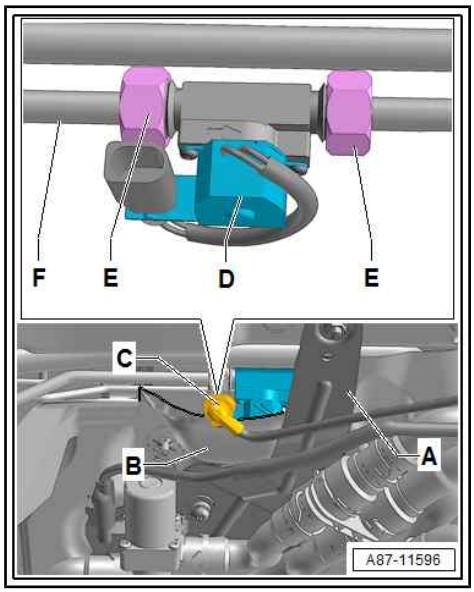
– Renew O-rings -B-; for correct version refer to ⇒ Electronic parts catalogue .

– Screw in union nuts -E- by hand until they make contact.

– Secure refrigerant line -F- (to connection point on right longitudinal member) in bracket on plenum chamber partition panel.

– Counterhold refrigerant shut-off valve for heater and air conditioner unit - N541- -D- and loosen union nuts -E-; make sure refrigerant lines are routed without tension.

- Tightening torque for union nuts -E-: 16.5 Nm



Note

- *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 (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 .

– Switch on ignition.

– Interrogate event memory of operating unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

Note

Observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; 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).

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

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Removing

– 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 .

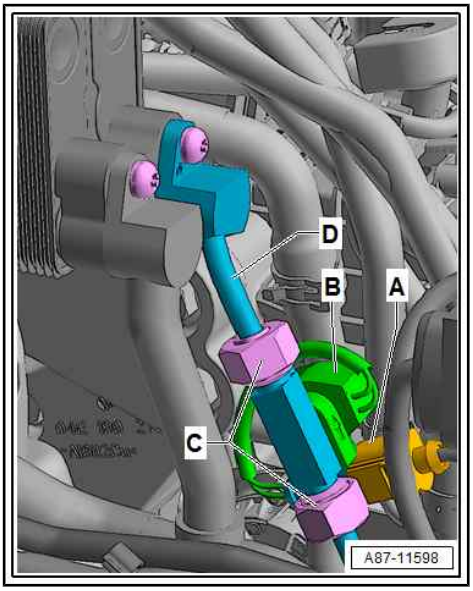
– Unplug electrical connector -A- from -N542- -B-.

WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

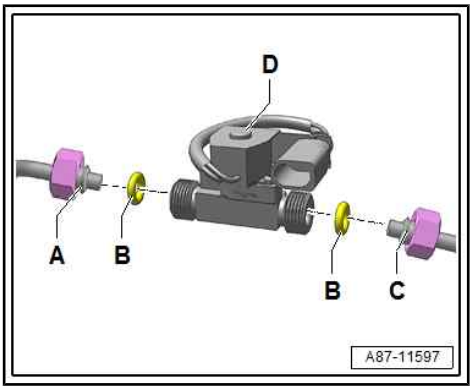
- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***



– Counterhold refrigerant shut-off valve for high-voltage battery heat exchanger - N542- -B- and loosen union nuts -C-.

– Detach refrigerant line -D- from high-voltage battery heat exchanger. ⇒ page 352

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



Installing

Install in reverse order of removal; note the following.

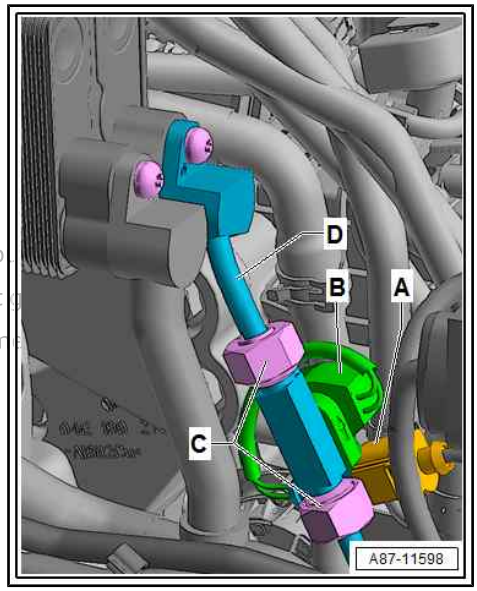
Note

- *Observe fitting instructions for O-rings -B- ⇒ page 81 .*
- *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

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

– Check restrictor in refrigerant line -D- (to high-voltage battery heat exchanger) for dirt ⇒ page 146 .
– Screw in union nuts -C- by hand until they make contact.
– Connect refrigerant line -D- to high-voltage battery heat exchanger ⇒ page 352 .
– Counterhold -N542- -B- and tighten union nuts -C-; make sure refrigerant lines are routed without tension.

♦ Tightening torque for union nuts -C-: 16.5 Nm



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Note

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

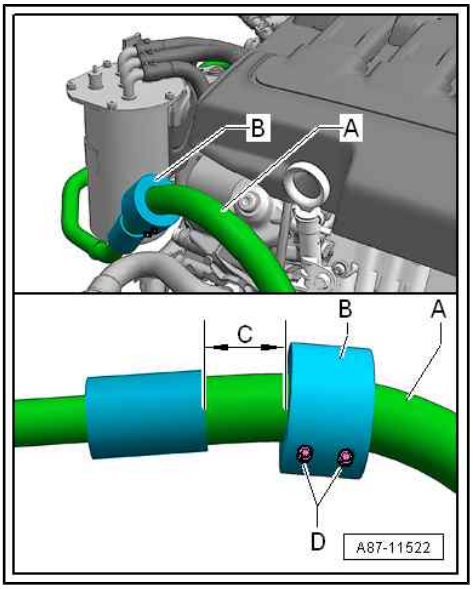
♦ *After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.*

– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (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 .
– Switch on ignition.
– Interrogate event memory of operating unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

Note

Observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; 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).

2.8 Additional weight at refrigerant line



Note

- *Depending on the vehicle version, the refrigerant line version and the production period, the refrigerant line -A- may be provided with an additional weight -B- (vibration damper, resonator for reducing noise) ⇒ Electronic parts catalogue .*
- *Make sure that this additional weight -B- is seated firmly on the refrigerant line, is not in contact with other components and cannot make contact during operation (noise).*
- *The additional weight -B- must not crush the refrigerant line -A-.*
- Tightening torque for bolts -D-: 10 Nm
- Dimension -C-: 30 mm

2.9 Removing and installing expansion valve

Note

- *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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*

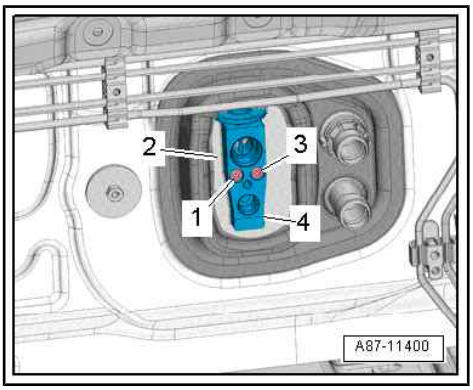
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Special tools and workshop equipment required

- Engine bung set - VAS 6122-

Removing

– Remove refrigerant lines with internal heat exchanger ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189 .

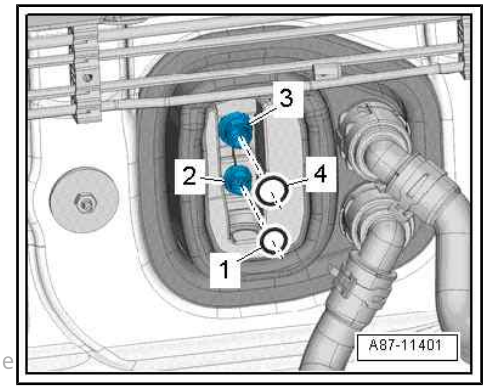


– Remove bolts -1, 3-.

– Pull expansion valve -4- out of heat insulation -2-.

– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

Installing



Note

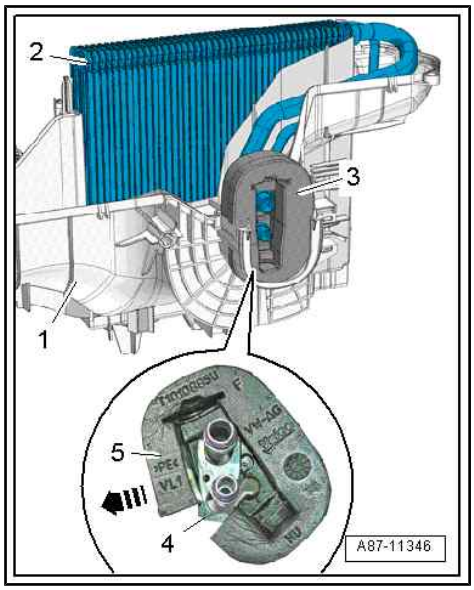
- *There are different versions of the expansion valve (identical housing, but different characteristic curve). For correct version refer to ⇒ Electronic parts catalogue .*
- *Check refrigerant pipes to evaporator for dirt and damage.*
- *Lubricate O-rings with refrigerant oil before installing ⇒ page 81 .*
- *Make sure O-rings are seated correctly on connecting pipes of evaporator.*

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– Renew O-rings; for correct version, refer to ⇒ Electronic parts catalogue .

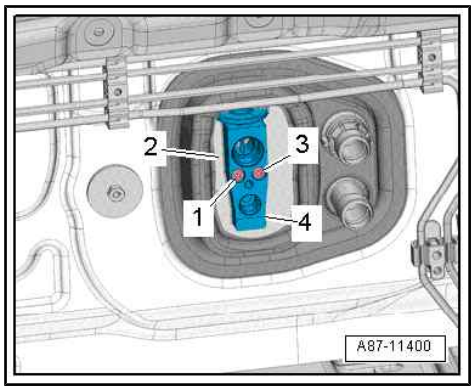
– Insert O-rings -1 and 4- at connecting pipes -2 and 3- to evaporator.

– Check that securing element -4- (retainer for securing expansion valve to evaporator pipes) is in correct position: It must not be pressed too far into foam body -5-; otherwise bolts may no longer seize.



– Fit expansion valve -4- on refrigerant lines leading to evaporator.

– Tighten bolts -1 and 3-.



Note

If the heat insulation -2- is not installed or is not installed properly, the output of the air conditioner may be reduced (change in set characteristic curve due to heat radiation).

Perform remaining installation steps in reverse sequence; observe the following:

– Install refrigerant lines with internal heat exchanger ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189 .

Tightening torques:

- ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

2.10 Detaching and attaching refrigerant lines at condenser

⇒ "2.10.1 Detaching and attaching refrigerant lines at condenser - A3", page 173

⇒ "2.10.2 Detaching and attaching refrigerant lines at condenser - Q2, Q2 China", page 175

2.10.1 Detaching and attaching refrigerant lines at condenser - A3

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Note

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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

Special tools and workshop equipment required

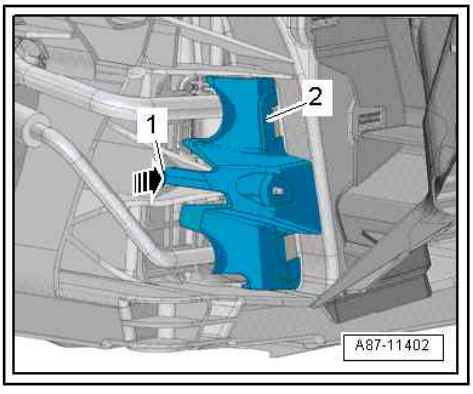
- Engine bung set - VAS 6122-

Removing

– 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 bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

– Release retaining tab -1- -arrow- and detach cover.

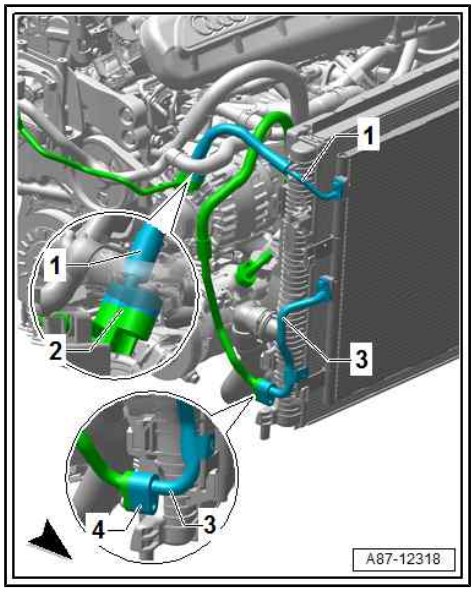


Note

Design of cover -2- varies depending on model, or cover is not fitted.

Note

- *There are different versions of the refrigerant lines from the condenser to the internal heat exchanger and to the air conditioner compressor depending on the vehicle model ⇒ Electronic parts catalogue . On vehicles with a 2.5 ltr. TFSI engine (Audi RS 3), an additional connection -2, 4- is fitted in these refrigerant lines -1, 3-. The refrigerant lines must be disconnected from these connections -2, 4- where necessary. The tightening torques for the bolts on the connections -2, 4- are the same as those for the bolts on the refrigerant lines at the internal heat exchanger and at the condenser.*
- *On vehicles with a 2.5 ltr. TFSI engine (Audi RS 3), the refrigerant line at the condenser -1, 3- can only be detached if the condenser has been removed. The refrigerant lines must be detached at the connections -2, 4- where necessary.*



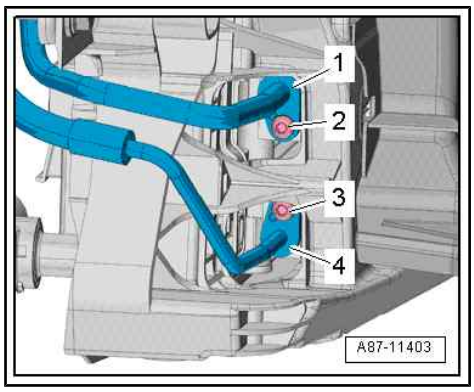
WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***

– Remove bolts -2 and 3- and detach refrigerant lines -1 and 4-.

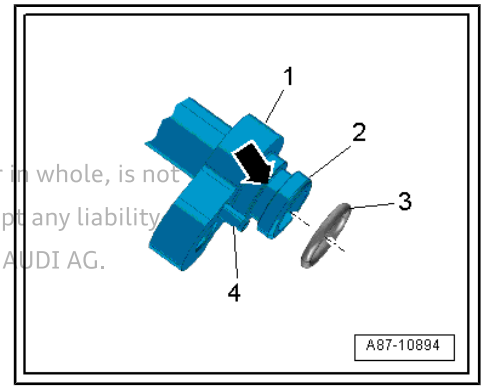


Note

- *This illustration shows a refrigerant line without a connection for refrigerant pressure and temperature sender - G395- . - G395- is installed on certain vehicles with a high-voltage system*
  ⇒ "2.4 Removing and installing refrigerant pressure and temperature sender G395 ", page 161 .
- *Vehicles with -G395- : Unplug connector to sender*
  ⇒ "2.4 Removing and installing refrigerant pressure and temperature sender G395 ", page 161 .

– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

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Installing

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

- Tightening torque
  ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

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– Renew O-rings; 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-.

Note

- *Lubricate O-rings with refrigerant oil before installing ⇒ page 81 .*
- *Check refrigerant pipes to evaporator for dirt and damage.*
- *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*
- *Routing and attaching refrigerant lines ⇒ page 26*

– 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 .
– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

2.10.2 Detaching and attaching refrigerant lines at condenser - Q2, Q2 China

Note

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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), and ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 00 ; Laws and regulations .

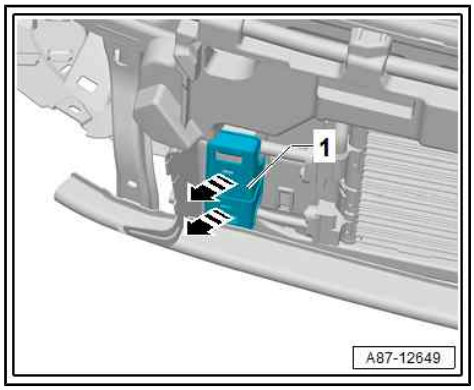
Special tools and workshop equipment required

- Engine bung set - VAS 6122-

Removing

– 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 .

– If possible, remove air intake grille (right-side) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
– If it is not possible to remove air intake grille, remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
– Release cover -1- and detach it in direction of -arrow-.



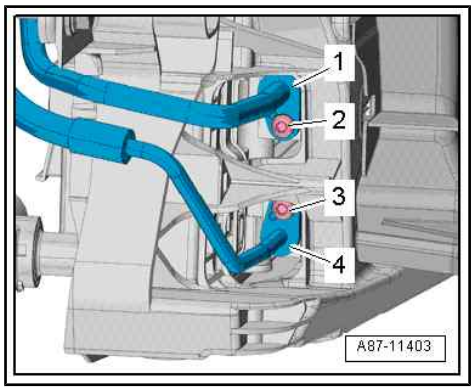
WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*

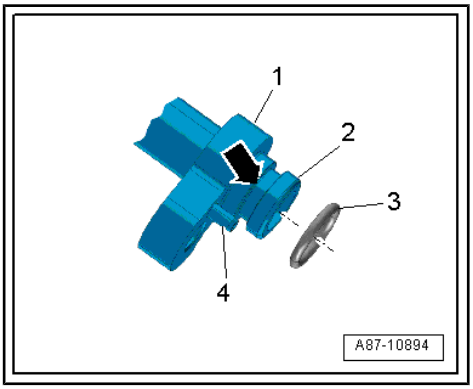
– Remove bolts -2 and 3- and detach refrigerant lines -1 and 4-.
– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .



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Installing

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



- Tightening torque
  ⇒ "2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve", page 146

– Renew O-rings; 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-.

Note

- *Lubricate O-rings with refrigerant oil before installing ⇒ page 81 .*
- *Check refrigerant pipes to evaporator for dirt and damage.*
- *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*
- *Routing and attaching refrigerant lines ⇒ page 26*

– 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 .

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

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2.11 Removing and installing condenser

⇒ "2.11.1 Removing and installing condenser - A3, Q2", page 177

⇒ "2.11.2 Removing and installing condenser - Q2 China", page 179

2.11.1 Removing and installing condenser - A3, Q2

Removing

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

– Separate refrigerant lines from condenser ⇒ page 173 .

– Remove radiator air ducts ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier .

Further steps depending on engine and vehicle version:

– Remove air cleaner housing (e.g. on vehicles with 1.8 ltr./2.0 ltr. TFSI engine or 1.6 ltr./2.0 ltr. TDI engine) ⇒ Engine, mechanics; Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing (vehicles with diesel engine) or ⇒ Rep. gr.

24 ; Air cleaner; Removing and installing air cleaner housing (vehicles with petrol engine).

– Remove radiator cowl (e.g. on vehicles with 1.8 ltr./2.0 ltr. TFSI engine, 1.6 ltr./2.0 ltr. TDI engine or 2.5 ltr. TFSI engine) ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator cowl and radiator fan .

– Vehicles with 1.4 ltr./2.5 ltr. TFSI engine and 1.6 ltr./2.0 ltr. TDI engine: Remove radiator ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Removing and installing radiator .

– Vehicles with 1.2 ltr. TFSI engine and large water radiator for charge air cooling circuit: Remove radiator ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator cowl and radiator fan .

– Vehicles with 1.2 ltr. TFSI engine and small charge air cooler: Unfasten radiator and tilt as far as possible towards engine ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator cowl and radiator fan .

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Note

Vehicles with a 1.2 ltr. TFSI engine have different water radiators for charge air cooling circuit (large and small versions) ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator cowl and radiator fan .

– Vehicles with 1.8 ltr./2.0 ltr. TFSI engine: Remove water radiator for charge air cooling circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator cowl and radiator fan .

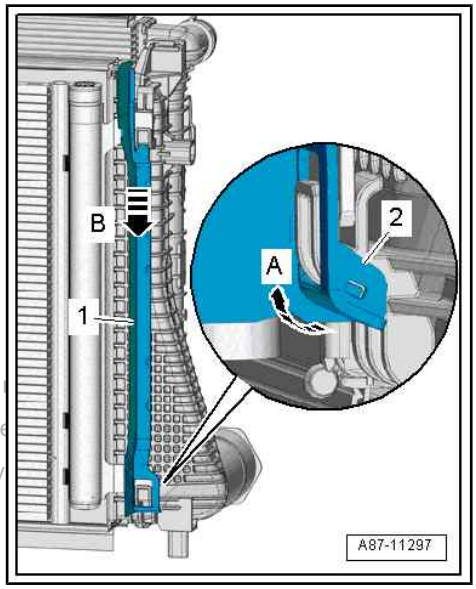
Note

Depending on the version of the water radiator for charge air cooling circuit, the radiator may also have to be removed in order to remove the water radiator ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator cowl and radiator fan .

– Vehicles with 1.8 ltr./2.0 ltr. TFSI engine with radiator installed: Unfasten radiator and tilt as far as possible towards engine ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans; Exploded view - radiator cowl and radiator fan .

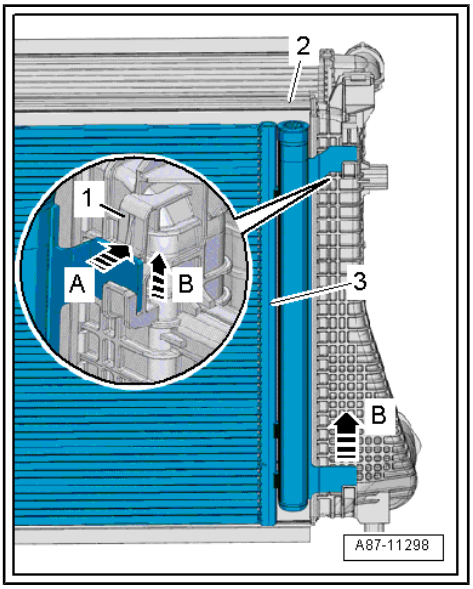
All vehicles (continued):

– Release sealing lip -1- at bottom of water radiator for charge air cooling circuit -item 2- -arrow A- and disengage at top -arrow B-.



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– Have a 2nd mechanic release retaining clips -1- in direction of -arrow A- and lift condenser -3- out of mountings on water radiator for charge air cooling circuit -item 2- -arrows B-.



Installing

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

Note

Installing radiators and condensers ⇒ page 26

– 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 .

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

2.11.2 Removing and installing condenser - Q2 China

Removing

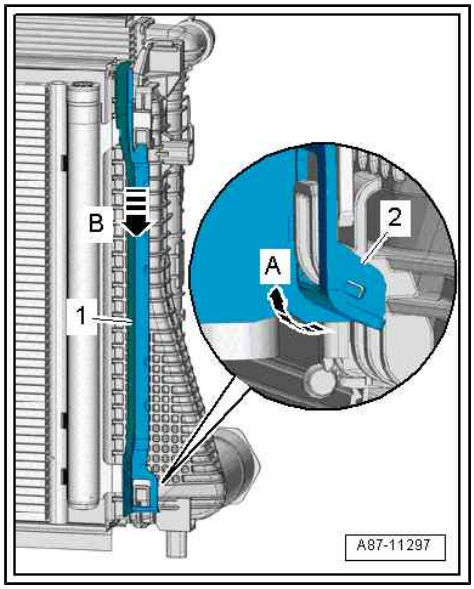
– Remove bumper cover (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .

– Separate refrigerant lines from condenser ⇒ page 175 .

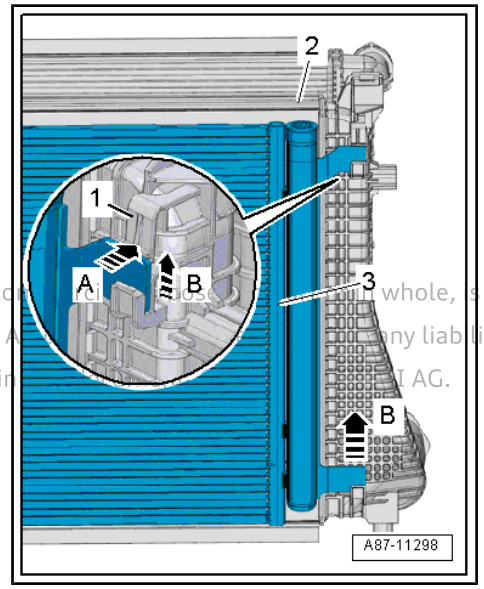
– Remove radiator air ducts ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier .

– Detach radiator and tilt it as far as possible towards engine ⇒ Engine, mechanics; Rep. gr. 19 ; Radiator/radiator fans (Exploded view - radiator cowl and radiator fans).

– Release sealing lip -1- at bottom of water radiator for charge air cooling circuit -item 2- -arrow A- and disengage at top -arrow B-.



– Have a 2nd mechanic release retaining clips -1- in direction of -arrow A- and lift condenser -3- out of mountings on water radiator for charge air cooling circuit -item 2- -arrows B-.



Installing

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

Note

Installing radiators and condensers ⇒ page 26

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– 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 .

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

2.12 Removing and installing desiccant cartridge

⇒ “2.12.1 Removing and installing desiccant cartridge - Denso condenser”, page 181

⇒ “2.12.2 Removing and installing desiccant cartridge - Modine condenser”, page 183

⇒ “2.12.3 Removing and installing desiccant cartridge - Showa/ Keihin condenser”, page 187

2.12.1 Removing and installing desiccant cartridge - Denso condenser

Note

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

Special tools and workshop equipment required

- Commercially available gripper tool

Removing

Perform steps for removing condenser until plug of desiccant cartridge is accessible; do NOT unfasten refrigerant lines at condenser ⇒ “2.11 Removing and installing condenser”, page 177 .

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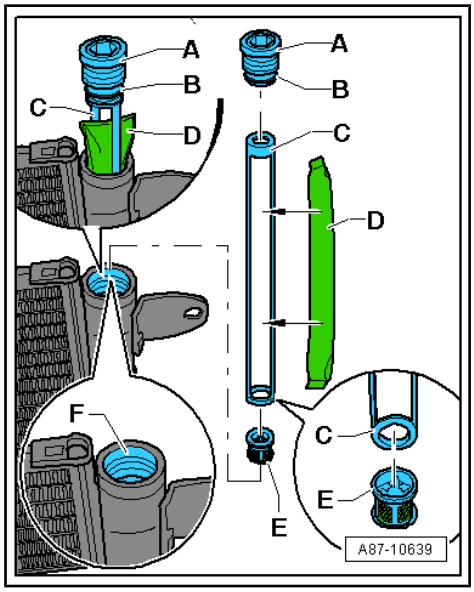
– Check pressure in refrigerant circuit via pressure gauge of air conditioner service station ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*



– Unscrew plug -A-.
– Lift dryer mount -C- with desiccant cartridge -D- out of condenser.
– Using e.g. a gripper tool, pull filter element -E- upwards out of condenser.
– Seal open receiver with plug -A- to prevent ingress of dirt and moisture.

Installing

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

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Note

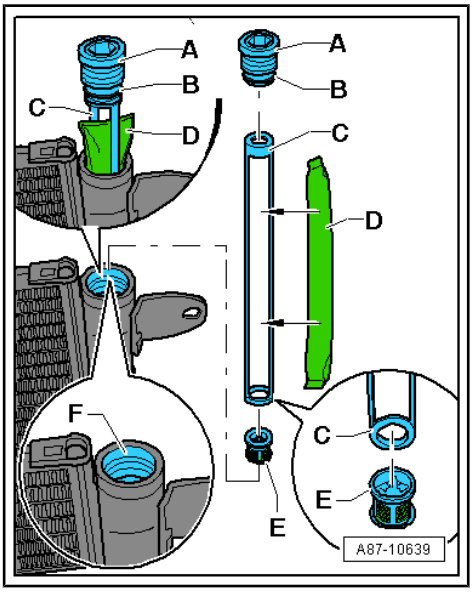
The plug, O-ring and desiccant cartridge must always be renewed after the receiver has been opened ⇒ Electronic parts catalogue .

– Check threads and sealing surfaces of receiver at condenser for contamination or damage via opening.

Note

- *Keep bag with air-tight seal containing desiccant cartridge closed as long as possible. Only open bag immediately before inserting desiccant cartridge in condenser. After opening bag, desiccant cartridge soon becomes saturated with moisture from ambient air and becomes unusable.*
- *Lubricate O-ring of plug slightly with refrigerant oil before fitting* *⇒ page 81* *.*

– Insert filter element -E- in correct position in receiver of condenser.
– Take desiccant cartridge -D- out of its bag and insert it in dryer mount -C-.
– Insert dryer mount together with desiccant cartridge in receiver of condenser.
– Fit and screw in plug -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 .
– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



Tightening torques:

♦ Tightening torque
⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

2.12.2 Removing and installing desiccant cartridge - Modine condenser

Note

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

Special tools and workshop equipment required

♦ Socket T70 - T10128- for condenser version 2

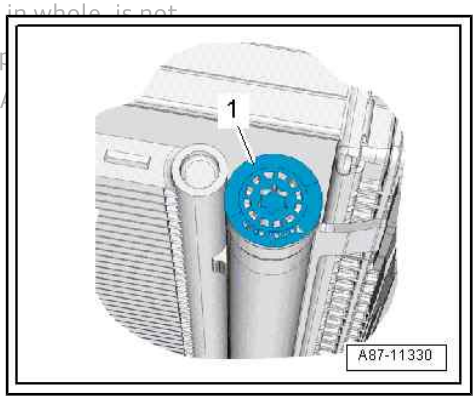
Removing

Perform steps for removing condenser until plug of desiccant cartridge is accessible; do NOT unfasten refrigerant lines at condenser ⇒ “2.11 Removing and installing condenser”, page 177 .

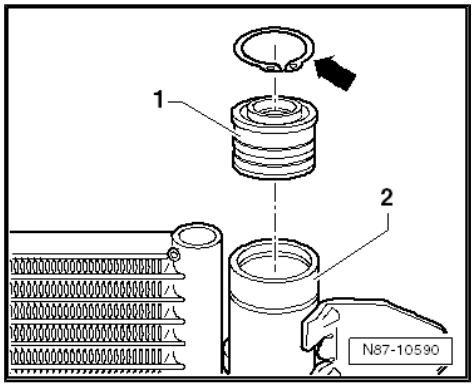
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Condenser version 1:

– Detach safety sticker (if applicable).
– Unscrew cap -1-.



– Check pressure in refrigerant circuit via pressure gauge of air conditioner service station ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .



WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

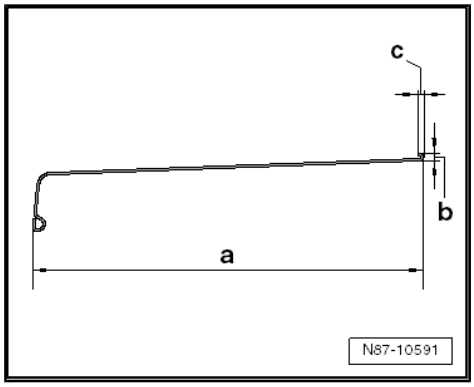
- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*

– Press cap -1- in slightly.

– Detach circlip -arrow- and pull cap out of condenser -2- using an M12 bolt.

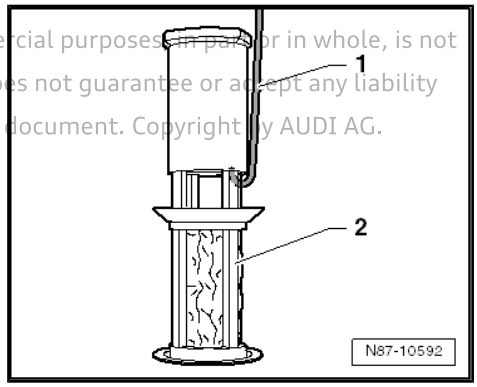
– Prepare a length of welding wire (∅ 2 mm) with the following dimensions:

- Dimension -a- = 380 mm
- Dimension -b- = max. 7 mm
- Dimension -c- = max. 6 mm



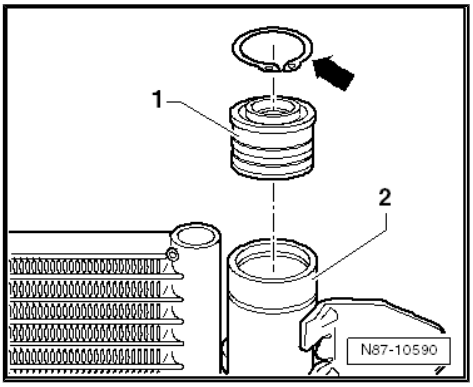
– To prevent damaging the condenser, it is important to hook the welding wire into the strainer as shown in the illustration.

– Using welding wire -1-, carefully pull filter element (strainer) -2- out of receiver.



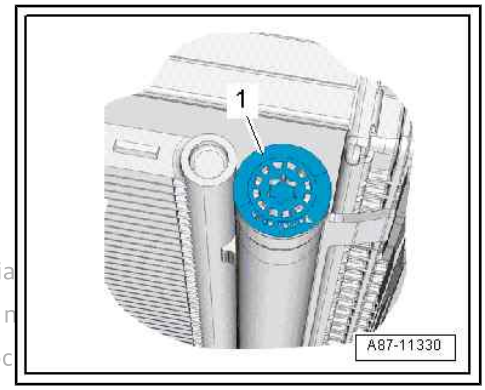
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– Seal open receiver with cap -1- to prevent ingress of dirt and moisture.



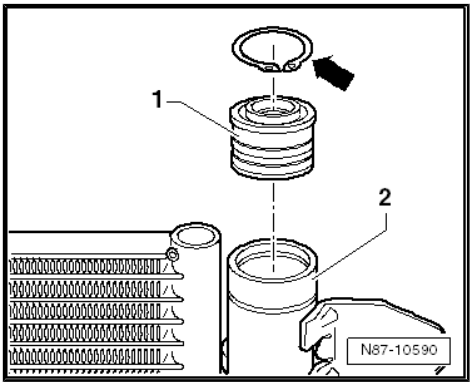
Condenser version 2:

– Unscrew protective cap -1- with socket T70 - T10128- .



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– Check pressure in refrigerant circuit via pressure gauge of air conditioner service station ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .



WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

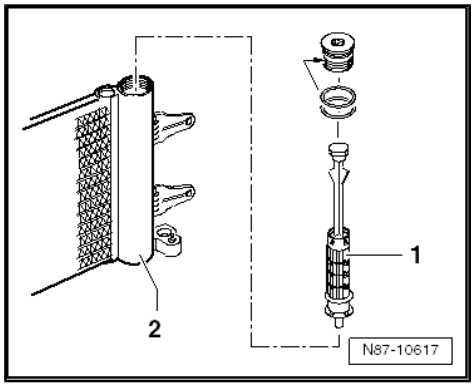
- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***

– Press cap -1- in slightly.

– Detach circlip -arrow- and pull cap out of condenser -2- using an M12 bolt.

– Using long-nose pliers, pull dryer unit -1- out of condenser -2-.

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



Installing

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

Note

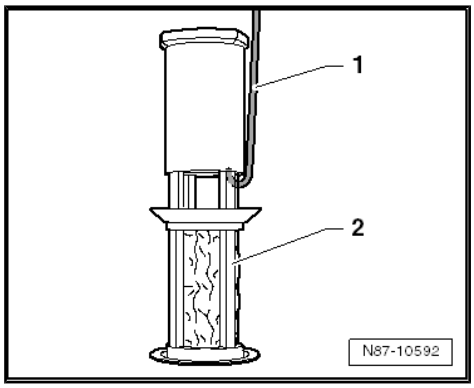
The plug, O-ring and desiccant cartridge must always be renewed after the receiver has been opened ⇒ Electronic parts catalogue .

– Check threads and sealing surfaces of receiver at condenser for contamination or damage via opening.

Version 1:

– Insert filter element (with strainer) -2- in correct position in receiver of condenser.

• Make sure filter element is pressed in as far as possible (over studs near bottom).



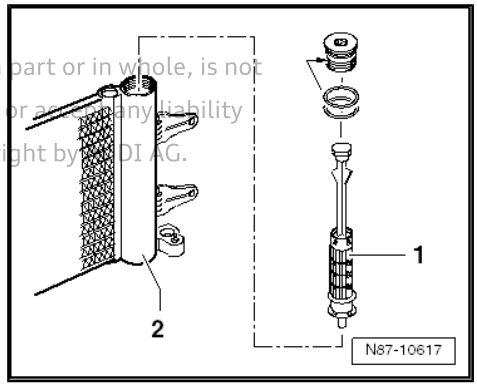
Note

Keep bag with air-tight seal containing desiccant cartridge closed as long as possible. Only open bag immediately before inserting desiccant cartridge in condenser. After opening bag, desiccant cartridge soon becomes saturated with moisture from ambient air and becomes unusable.

– Take desiccant cartridge out of its bag and insert it in receiver of condenser.

Version 2:

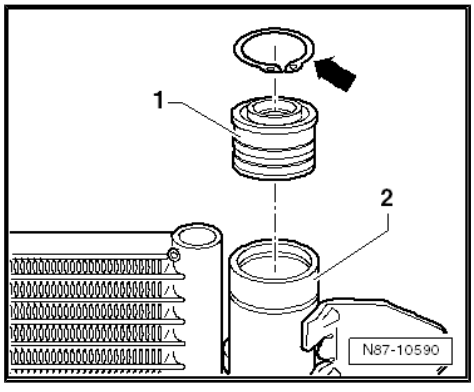
– Take dryer unit -1- out of its bag and insert it in condenser -2-.



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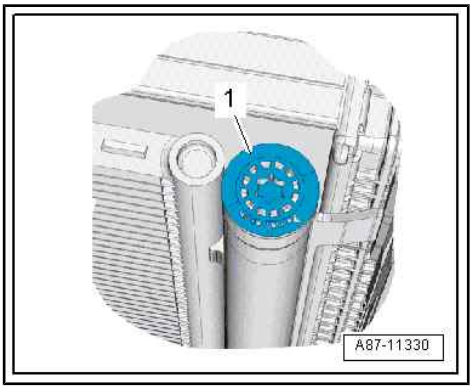
All versions (continued):

– Insert cap -1- and press it downwards until circlip -arrow- can engage in the groove.



Note

Moisten O-ring of cap slightly with refrigerant oil before fitting ⇒ page 81 .



- Version 1: Press on protective cap.
- Version 2: Screw in protective cap using socket T70 - T10128- .
- Attach safety sticker (if applicable).
- All components removed have been re-installed.
- 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 .
- Start up air conditioner after charging refrigerant circuit ⇒ page 199 .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Tightening torques:

- Tightening torque ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

2.12.3 Removing and installing desiccant cartridge - Showa/Keihin condenser

Note

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

Special tools and workshop equipment required

- Commercially available gripper tool

Removing

Perform steps for removing condenser until plug of desiccant cartridge is accessible; do NOT unfasten refrigerant lines at condenser ⇒ “2.11 Removing and installing condenser”, page 177 .

Note

Depending on the version, either the entire receiver or just the desiccant cartridge has to be renewed for the Showa/Keihin condenser (different versions ⇒ Electronic parts catalogue).

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– Check pressure in refrigerant circuit via pressure gauge of air conditioner service station ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

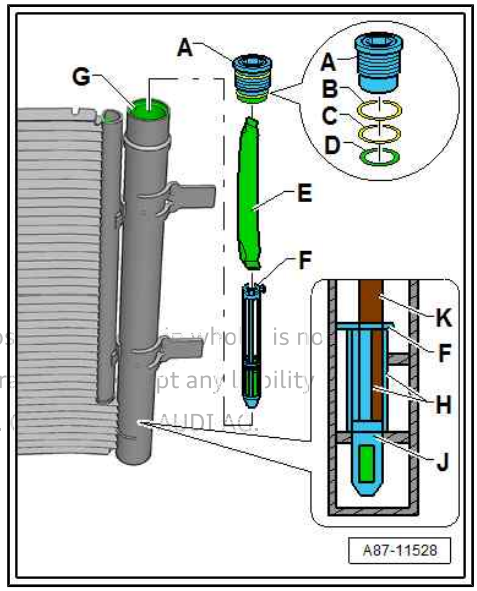
WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***

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– Unscrew plug -A-.
– Lift desiccant cartridge -E- out of receiver of condenser.
– Using e.g. a commercially available gripper tool, pull filter element -F- upwards out of receiver of condenser.
– Seal open receiver with plug -A- to prevent ingress of dirt and moisture.

Installing

Install in reverse order of removal; note the following:

Note

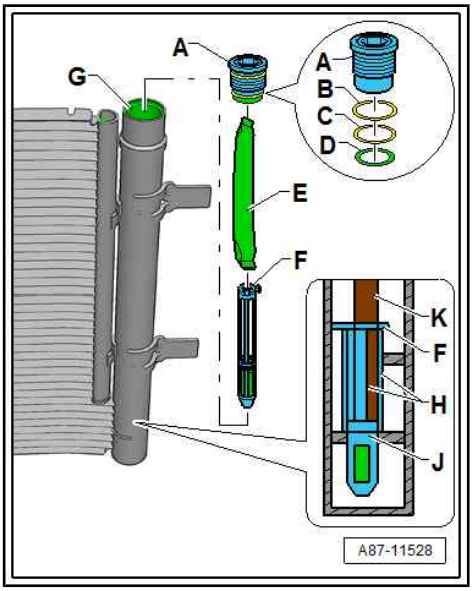
The plug, O-ring and desiccant cartridge must always be renewed after the receiver has been opened ⇒ Electronic parts catalogue .

– Check threads and sealing surfaces of receiver at condenser for dirt or damage via opening.

Note

- *Keep bag with air-tight seal containing desiccant cartridge 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.*
- *Lubricate O-ring of plug slightly with refrigerant oil before fitting ⇒ page 81 .*

– Lubricate filter element -F- in area of sealing surface -J- lightly with refrigerant oil before fitting
⇒ “4.12 Refrigerant circuit seals”, page 81 .
– Using a suitable tool -K-, insert filter element -F- as far as it will go in correct position in mounting on receiver, taking care not to damage webs -H-.
– Assemble plug -A- with O-rings -B- and -C- and support ring -D-.
– Take desiccant cartridge -E- out of its bag and insert it in receiver.
– Fit and screw in plug -A-.
– All components removed have been re-installed.
– 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 .
– Start up air conditioner after charging refrigerant circuit
⇒ page 199 .
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).



Tightening torques:

- Tightening torque
⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

2.13 Removing and installing refrigerant lines with internal heat exchanger

Note

- *The following describes the removal and installation procedures for the refrigerant line (going to the expansion valve) at the connection point on the right longitudinal member. This refrigerant line is designed to act as an internal heat exchanger on vehicles without high-voltage system.*
- *On vehicles with a high-voltage system, a refrigerant line without an internal heat exchanger but with a refrigerant shut-off valve for heater and air conditioner unit - N541- is installed. The removal and installation procedures for the different versions are basically the same. The only additional step required on vehicles with a high-voltage system is to unplug a connector to refrigerant shut-off valve for heater and air conditioner unit - N541-*
⇒ “2.6 Removing and installing refrigerant shut-off valve for heater and air conditioner unit N541 ”, page 166 .

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Note

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

Special tools and workshop equipment required

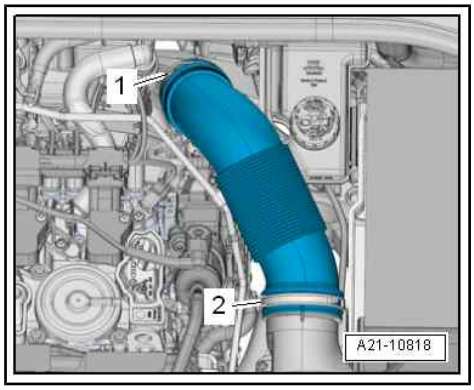
- Engine bung set - VAS 6122-

Removing

– 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 .

Vehicles with 1.8 ltr/2.0 ltr. TFSI engine:

– Release hose clips -1, 2- and remove air pipe.



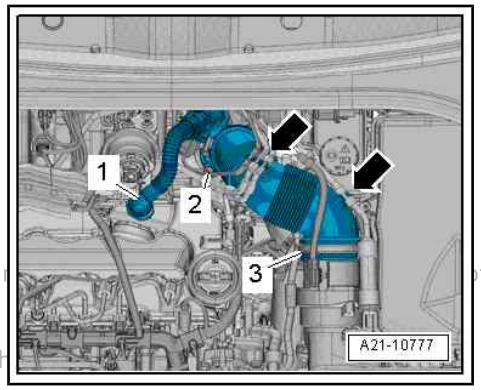
Vehicles with 2.0 ltr. TDI engine:

– Press release tabs at crankcase breather hose -1- and detach hose from cylinder head cover.

– Move vacuum hoses clear at air pipe -arrows-.

– Release hose clip -3-.

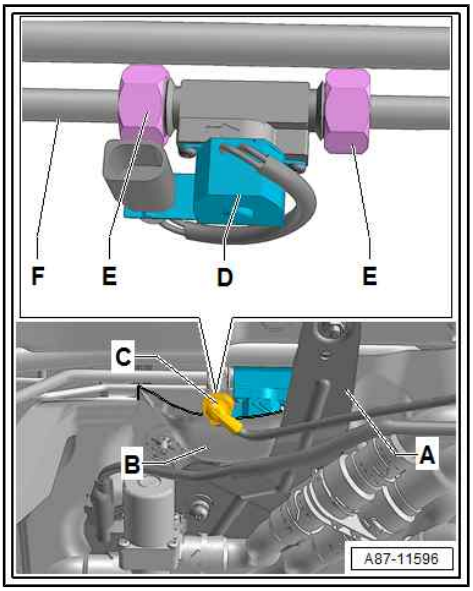
– Unscrew bolt -2-, swivel air pipe with connection to the rear and detach from turbocharger.



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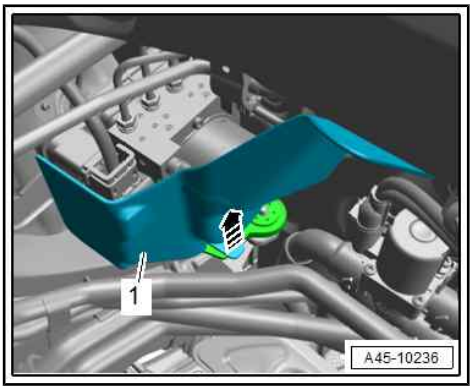
Vehicles with high-voltage system

– Unfasten bracket -A- (for coolant valve for high-voltage battery - N688-) from plenum chamber partition panel.
– Unfasten heat shield -B- from plenum chamber partition panel in vicinity of refrigerant shut-off valve for heater and air conditioner unit - N541- -D- and refrigerant line -F- (to connection point on right longitudinal member) and carefully bend it back.

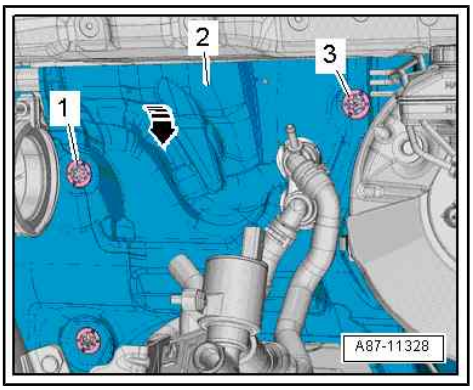


All vehicles (continued):

– Release fastener -arrow- (if fitted), pull off cover -1- towards left and detach.
– Unclip wiring duct.



– Remove speed nuts -1 and 3-.
– Fold heat shield -2- as far forwards as possible -arrow-.



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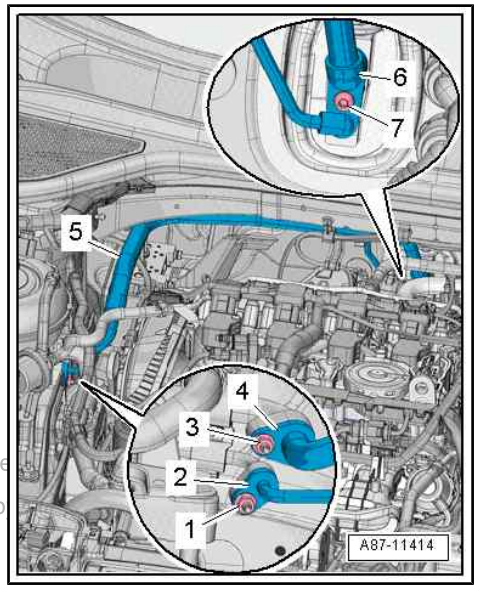
WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***

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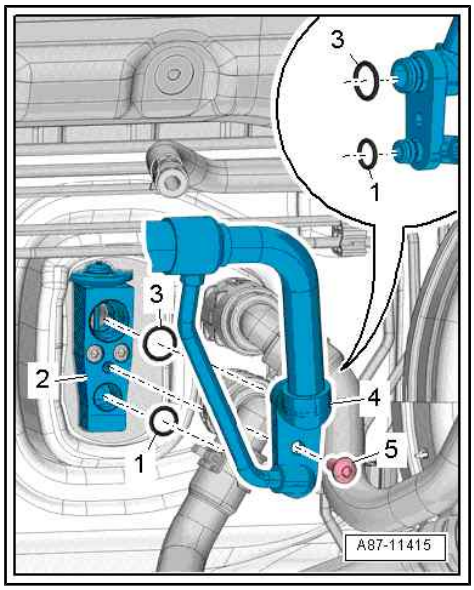


– Remove bolt -7-.
– Detach refrigerant line -6- with internal heat exchanger from expansion valve.
– Unscrew nuts -1, 3- and detach refrigerant lines -2, 4-.
– Take refrigerant line -5- with internal heat exchanger out towards right side.
– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

Installing

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

– Renew O-rings; for correct version, refer to ⇒ Electronic parts catalogue .
– Clean connections on expansion valve -2- and on internal heat exchanger -4- and check for damage.
– Thoroughly clean connection area of refrigerant lines and check for damage.

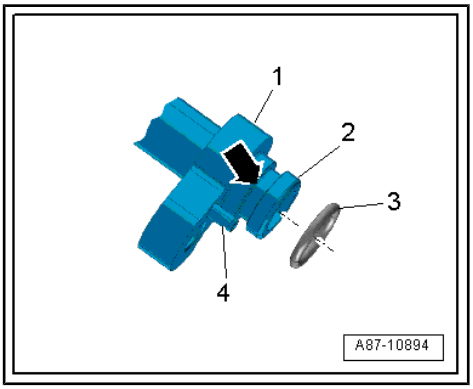


Note

- *Lubricate O-rings with refrigerant oil before installing* *⇒ page 90* .
- *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*

– Insert O-rings -1 and 3- in grooves at connection of internal heat exchanger.
– Insert internal heat exchanger at expansion valve.
– Tighten bolt -5-.

– Clean connections on refrigerant lines and check for damage.
– If fitted, check that dowel pin -4- is not damaged and is seated correctly.
– Check guide ring -2- at refrigerant line connection for damage.



Note

- *Lubricate O-rings with refrigerant oil before installing ⇒ page 90 .*
- *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*

– Insert O-ring -3- in groove -arrow- in connection for refrigerant line -1-.
– Insert refrigerant lines in corresponding connections.
– Tighten bolts.

Note

Routing and attaching refrigerant lines ⇒ page 26

– 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 .
– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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Tightening torques:

- ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146
- ⇒ Engine, mechanics; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger

2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)

Note

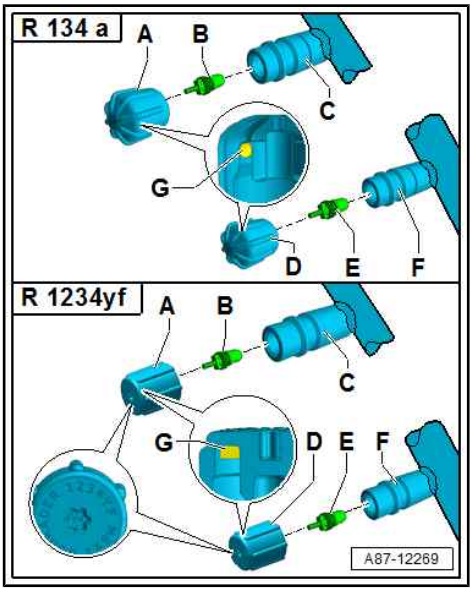
- *Only use valves and connections which are resistant to the corresponding refrigerant (R134a and/or R1234yf) and related refrigerant oils ⇒ Electronic parts catalogue .*
- *The service connections for the refrigerant circuits are designed such that only the specified service couplings for the specified refrigerant (R134a or R1234yf) can be connected.*
- *These illustrations show service connections in which a Schrader valve (needle valve or push pin) is installed. However, depending on the vehicle version or the type of refrigerant etc., service connections with a primary sealing valve (ball valve) may also be installed (different technology).*
- *Arrangement in vehicle and in refrigerant circuit ⇒ "1.1 Overview of fitting locations - components not located in passenger compartment", page 114 and ⇒ "2.1 System overview - refrigerant circuit", page 133*
- *There are different connections (outer diameter) for high and low-pressure sides.*
- *Discharge refrigerant circuit before removing valves or valve cores ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Removing and installing valve from service connection (low and high-pressure sides) ⇒ page 197 .*
- *Always screw on sealing caps with seal.*

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Service connections (refrigerant R134a and R1234yf)

WARNING

Before removing valves -B, E-, connect the air conditioner service station and extract refrigerant. Refrigerant circuit must be empty; danger of injury ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .



- Cap for service connection (high-pressure side) -A- with seal -G-
- Valve core on high-pressure side (version: Schrader valve or needle valve) -B-
- Service connection (high-pressure side) -C-
- Cap for service connection (high-pressure side) -D- with seal -G-
- Valve core on low-pressure side (version: Schrader valve or needle valve) -E-
- Service connection (low-pressure side) -F-

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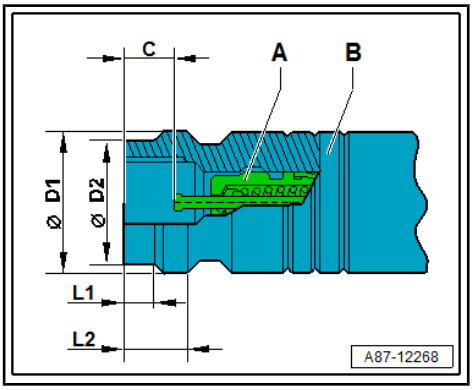
Note

- *Service connections -C, F- for refrigerant R134a and R1234yf are available in different versions (depending on manufacturer), with different sealing caps -A, D- and valves -B, E-. Ensure correct assignment ⇒ Electronic parts catalogue .*
- *Sealing caps -A, D- for the service connections on the R134a refrigerant circuit are currently black. The sealing caps for the service connections on the R1234yf refrigerant circuit are currently grey. The refrigerant type (e.g. "R1234yf") may also be printed on the sealing caps.*
- *After connecting, carefully screw the handwheel of the service coupling into the quick-release coupling adapter only to the extent required to reliably open the valve -B, E- in the service connection (observe the pressure gauge; do not open the valve -B, E- too far).*
- *The service connections -C, F- for R134a and R134yf refrigerant circuits are designed such that only the service couplings specified for the corresponding refrigerant can be connected (different dimensions ⇒ page 196).*
- *Service connections -C, F-, for example, are soldered into a refrigerant line and therefore cannot be renewed separately.*
- *To remove and install the valves -B, E- (with the refrigerant circuit drained), make use of an adapter from the socket - T10364- for example ⇒ page 197 .*
- *Take care when tightening the valves -B, E- (low torque) ⇒ page 197 .*
- *There are different versions of these valves; therefore tightening torques may vary. Tightening torque for valve core -C- with a VG5 thread (5.2 x 0.7 mm tyre valve): 0.4 Nm +- 0.1 Nm; tightening torque for valve core with an M6 x 0.75 mm thread: 0.9 mm +- 0.1 Nm; tightening torque for valve core with M8 x 1.0 mm thread: 2.0 Nm +- 0.2 Nm.*
- *There are different versions of valve caps -A, D-; therefore tightening torques vary. Tightening torque for valve cap with M8 x 1 mm or M10 x 1 mm thread: 0.4 Nm +- 0.1 Nm.*

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Dimensions of service connections

- Valve core -A- (different versions) ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems , and ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .
- Service connection -B- (different versions on high-pressure and low-pressure side depending on refrigerant)



Dimensions of service connections -B-	Service connection (refrigerant R134a)		Service connection (refrigerant R1234yf)	
	High-pressure side	**Low-pressure side**	**High-pressure side**	**Low-pressure side**
Outer diameter -D1-	16.0 mm	13.0 mm	17.0 mm	14.0 mm
Outer diameter -D2-	14.0 mm	11.0 mm	13.0 mm	12.0 mm
Offset -L1-	4.6 mm	6.15 mm	9.0 mm	4.75 mm
Offset -L2-	8.16 mm	9.16 mm	12.5 mm	7.2 mm
Installation position of valve (not actuated) -C-	6.1 - 7.1 mm	6.1 - 7.1 mm	8.3 - 9.3 mm	8.3 - 9.3 mm

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2.15 Removing and installing service connections (low and high-pressure sides)

Note

- *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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Different versions depending on refrigerant (R134a or R1234yf)*
  ⇒ "2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 194 and ⇒ Electronic parts catalogue

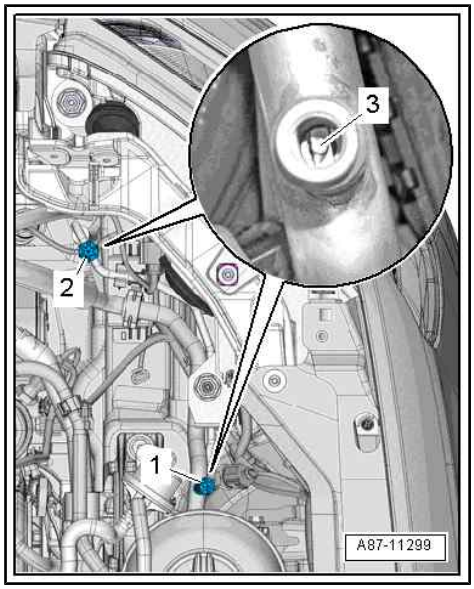
Special tools and workshop equipment required

- Socket - T10364-

Removing

– Unscrew caps (with seal) -1- or -2-.

– 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 .



WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***

– Remove service connection -3- using socket - T10364- and a suitable adapter.

Note

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For further information on the service connection, refer to ⇒ "2.14 Differences in service connections depending on refrigerant (R134a or R1234yf)", page 194 , ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; General description of refrigerant circuit components .

Installing

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

– 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 .

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

2.16 Starting up air conditioner after charging refrigerant circuit

⇒ “2.16.1 Procedure if it is unavoidable to start the engine with an empty refrigerant circuit”, page 199

⇒ “2.16.2 Procedure when starting the engine for the first time after charging the refrigerant circuit”, page 201

2.16.1 Procedure if it is unavoidable to start the engine with an empty refrigerant circuit

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

Caution

- *After installing the electrically driven air conditioner compressor and then charging the refrigerant circuit, first start up the compressor via 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 (“Guided Fault Finding” for air conditioner).*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).*

- All components removed have been re-installed.
- To prevent damage to the air conditioner compressor when the refrigerant circuit is empty, the electrical air conditioner compressor - V470- is not activated by the operating unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).

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Note

- *If the air conditioner compressor was removed or the engine was detached, start up the electrical air conditioner compressor - V470- via the "Compressor run-in" function after charging the refrigerant circuit ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner).*
- *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 (or attachment) prior to installation.*
- *Observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; 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).*

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Vehicles without high-voltage system

Caution

Risk of damage to the air conditioner compressor if the engine is run with the refrigerant circuit empty ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .

- ***The air conditioner compressor is always driven when the engine is running (there is no magnetic clutch). Therefore do not start the engine unless the refrigerant circuit has been properly assembled.***
- ***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 to the compressor.***
- ***If possible, only start the engine with the refrigerant circuit filled.***
- ***Do not start the engine while or after evacuating the refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .***
- ***The engine should only run as long as absolutely necessary.***

Note

The air conditioner compressor is equipped with an internal oil circuit to prevent damage if the refrigerant circuit is empty. For this there must still be a residual quantity of refrigerant oil in the air conditioner compressor.

- The refrigerant circuit must be assembled completely.

- The refrigerant circuit must not be under vacuum.
- The 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 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.

Note

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.

2.16.2 Procedure when starting the engine for the first time after charging the refrigerant circuit

Vehicles with high-voltage system (hybrid vehicles)

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

Caution

- ***After installing the electrically driven air conditioner compressor and then charging the refrigerant circuit, first start up the compressor via 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 (“Guided Fault Finding” for air conditioner).***
- ***An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).***

- All components removed have been re-installed.
- The refrigerant circuit is charged ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging .

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– Switch on ignition.
– Interrogate event memory of operating unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
– If the air conditioner compressor was removed or the engine was detached, start up the electrical air conditioner compres-

sor - V470- via the “Compressor run-in” function ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner).

Note

- *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 (or attachment) prior to installation.*
- *Observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; 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).*

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Vehicles without high-voltage system

- 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 (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Starting up air conditioner after charging .

– Open all dash panel vents and any vents in centre console.

– Switch on ignition.

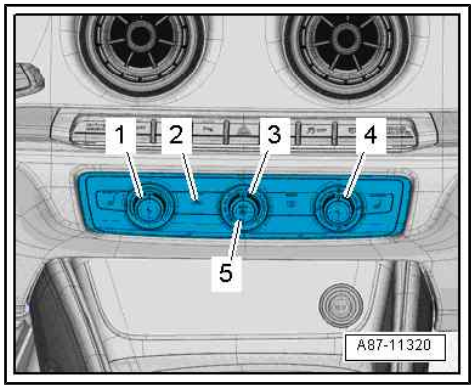
Vehicles with manually controlled air conditioner (without high-voltage system):

- Lamp in AC or A/C button -5- is off.

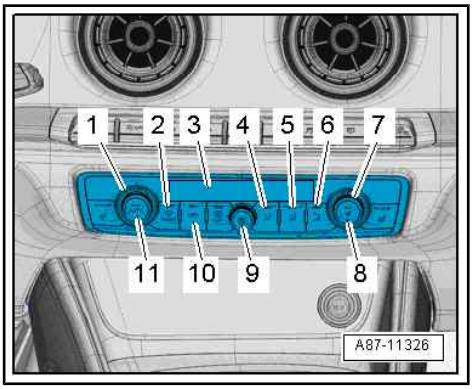
– Start engine with air conditioner compressor switched off and wait for engine idling speed to stabilise.

Make the following settings on the operating unit (air conditioning system control unit - J301-):

- Set rotary temperature control -1- to “cold” stop.
- Air conditioner compressor on: Lamp in AC or A/C button -5- on



Vehicles with automatically controlled air conditioner (without high-voltage system):



- Lamp in AC or A/C button -8- is off.

– Start engine with air conditioner compressor switched off and wait for engine idling speed to stabilise.

Make the following settings on the operating unit (Climatronic control unit - J255-):

- “Auto” mode: Lamp in AUTO button -11- is on.
- Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255- .
- Set rotary control -9- for fresh air blower to maximum speed.
- Air conditioner compressor on: Lamp in AC or A/C button -8- on

All vehicles without high-voltage system (continued):

– Run air conditioner compressor with engine at idling speed for at least 5 minutes.

Note

Observe notes on starting up air conditioner after charging ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; 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).

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3 Air conditioner compressor

⇒ “3.1 Exploded view - drive unit for air conditioner compressor”, page 204

⇒ “3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor”, page 210

⇒ “3.2 Exploded view - pulley, mechanically driven air conditioner compressor”, page 212

⇒ “3.3 Detaching and attaching air conditioner compressor at bracket”, page 216

⇒ “3.4 Detaching and attaching refrigerant lines at air conditioner compressor”, page 223

⇒ “3.5 Removing and installing air conditioner compressor”, page 229

⇒ “3.6 Removing and installing pulley”, page 234

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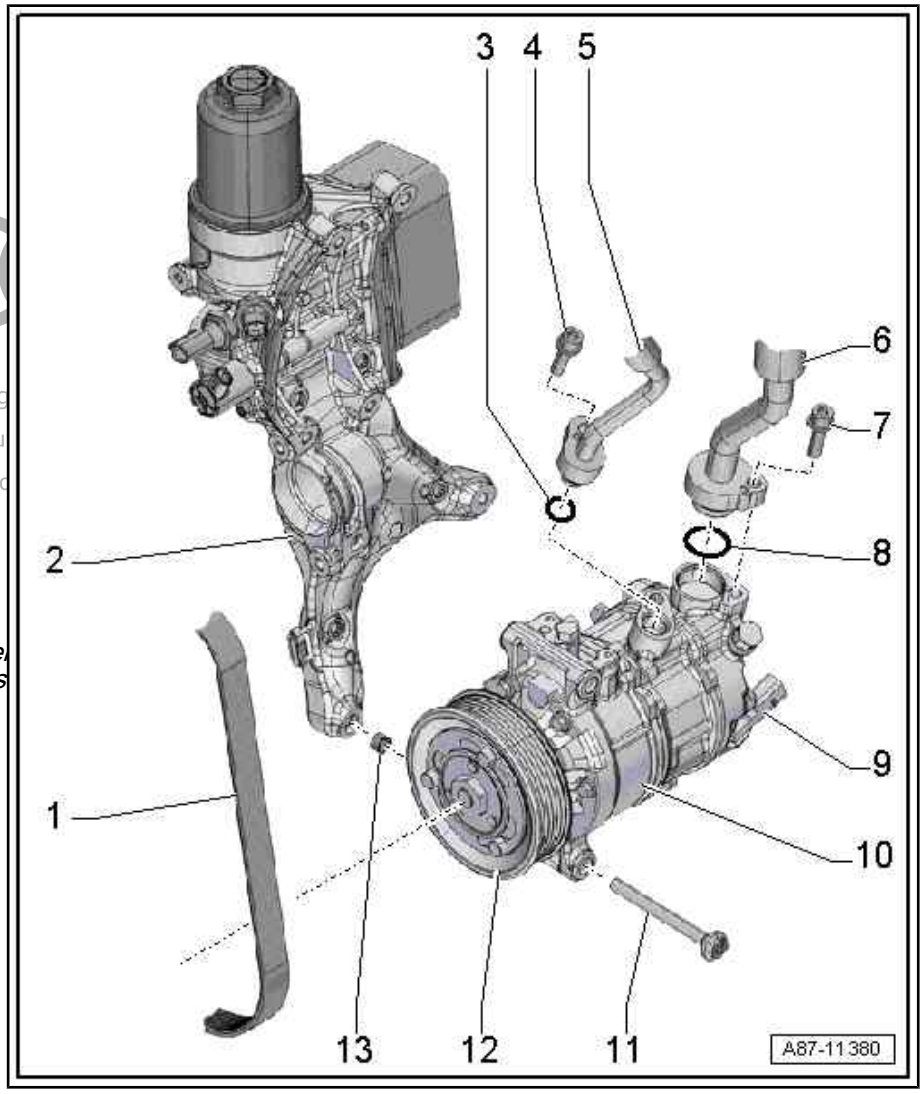
3.1 Exploded view - drive unit for air conditioner compressor

⇒ “3.1.1 Exploded view - drive unit for air conditioner compressor, vehicles with 3-cylinder and 4-cylinder engine”, page 204

⇒ “3.1.2 Exploded view - drive unit for air conditioner compressor, vehicles with 5-cylinder engine (Audi RS 3)”, page 207

⇒ “3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor”, page 210

3.1.1 Exploded view - drive unit for air conditioner compressor, vehicles with 3-cylinder and 4-cylinder engine



1 - Poly V-belt

- ❑ Check for wear
- ❑ Removing and installing ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt
- ❑ Mark direction; install in correct position ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt

2 - Bracket for ancillaries

- ❑ Removing and installing ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

Note

Different versions depe gine ⇒ Electronic parts

3 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

4 - Bolt

- ❑ Tightening torque ⇒ page 146

5 - Refrigerant line (high-pressure side)

6 - Refrigerant line (low-pressure side)

7 - Bolt

- ❑ Tightening torque ⇒ page 146

8 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

9 - Air conditioner compressor regulating valve - N280-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Note

- *Certain malfunctions of -N280- (e.g. sticking valve or open circuit in coil) can lead to problems with air conditioner compressor (no cooling output from air conditioner, evaporator icing up etc.). If -N280- (and not air conditioner compressor itself) is cause of problem, air conditioner compressor can be serviced by renewing -N280- ⇒ 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 .*
- *-N280- is not available as a replacement part for all air conditioner compressors. If -N280- cannot be obtained separately for a particular air conditioner compressor (different versions available), the entire air conditioner compressor must be renewed if problems occur ⇒ Electronic parts catalogue .*

10 - Air conditioner compressor

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant line ⇒ page 223
- ❑ Detaching and attaching at bracket ⇒ page 216
- ❑ Removing and installing ⇒ page 216

Note

Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

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11 - Bolt

- ❑ 3x
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Tightening torque for steel bolts: 25 Nm
- ❑ Tightening torque for aluminium bolts: 8 Nm +180°
- ❑ Use aluminium bolts only once; always renew.

12 - Pulley with overload protection

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ page 212

13 - Dowel sleeve

- ❑ 2x

3.1.2 Exploded view - drive unit for air conditioner compressor, vehicles with 5-cylinder engine (Audi RS 3)

Version 1 (with double-belt pulley) ⇒ page 207

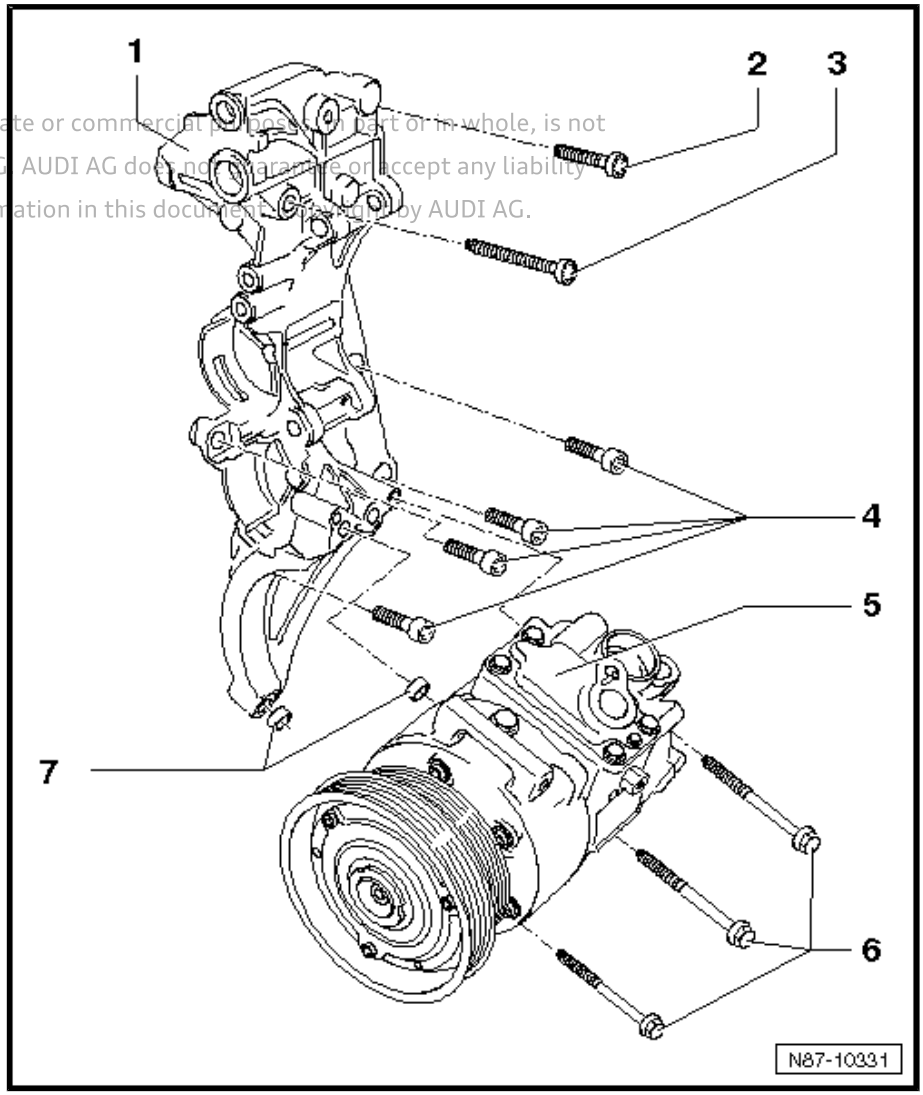
Version 2 (with single-belt pulley) ⇒ page 208

Note

Vehicles with a 5-cylinder engine (Audi RS 3) have 1 or 2 poly V-belts on the air conditioner compressor (depending on the engine type). The air conditioner compressor is therefore provided with a single or double-belt pulley.

Version 1 (with double-belt pulley)

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1 - Bracket for ancillaries

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

2 - Bolt

- ❑ Tightening torque ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end)

3 - Bolt

- ❑ Tightening torque ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end)

4 - Bolt

- ❑ Tightening torque ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end)

5 - Air conditioner compressor

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant line ⇒ page 223
- ❑ Detaching and attaching at bracket ⇒ page 217
- ❑ Removing and installing ⇒ page 216

Note

Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

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6 - Bolt

- ❑ 3x
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Tightening torque for steel bolts: 25 Nm
- ❑ Tightening torque for aluminium bolts: 8 Nm +180°
- ❑ Use aluminium bolts only once; always renew.

7 - Dowel sleeve

- ❑ 2x
- ❑ Make sure that correct version is being used and that components are properly positioned between bracket for ancillaries and air conditioner compressor

Version 2 (with single-belt pulley):

1 - Bracket for ancillaries

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

2 - Bolts

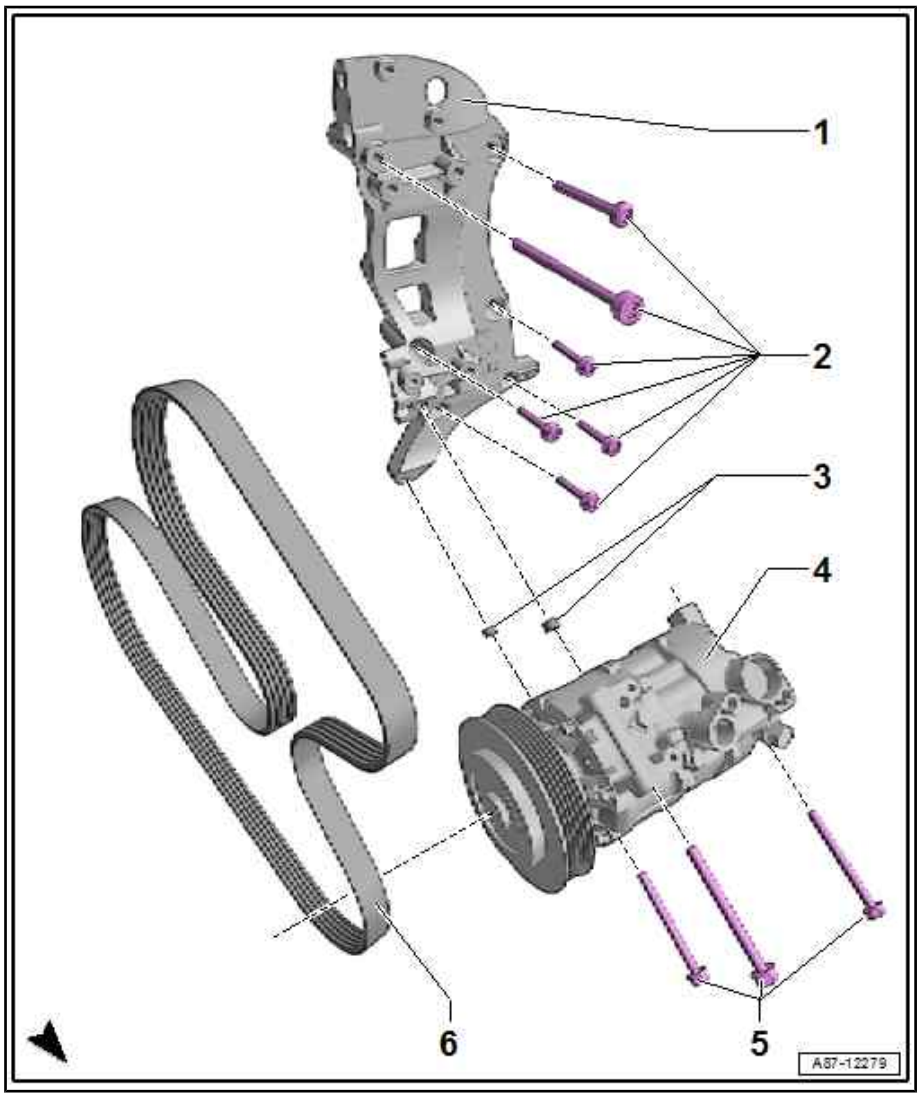
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

3 - Dowel sleeves

- ❑ 2x
- ❑ Make sure that correct version is being used and that components are properly positioned between bracket for ancillaries and air conditioner compressor

4 - Air conditioner compressor

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Detaching and attaching refrigerant line ⇒ page 223
- ❑ Detaching and attaching at bracket ⇒ page 217



- ❑ Removing and installing ⇒ page 216

Note

Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

5 - Bolts

- ❑ 3x
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Tightening torque for steel bolts: 25 Nm
- ❑ Tightening torque for aluminium bolts: 8 Nm +180°
- ❑ Use aluminium bolts only once; always renew.

6 - Poly V-belt

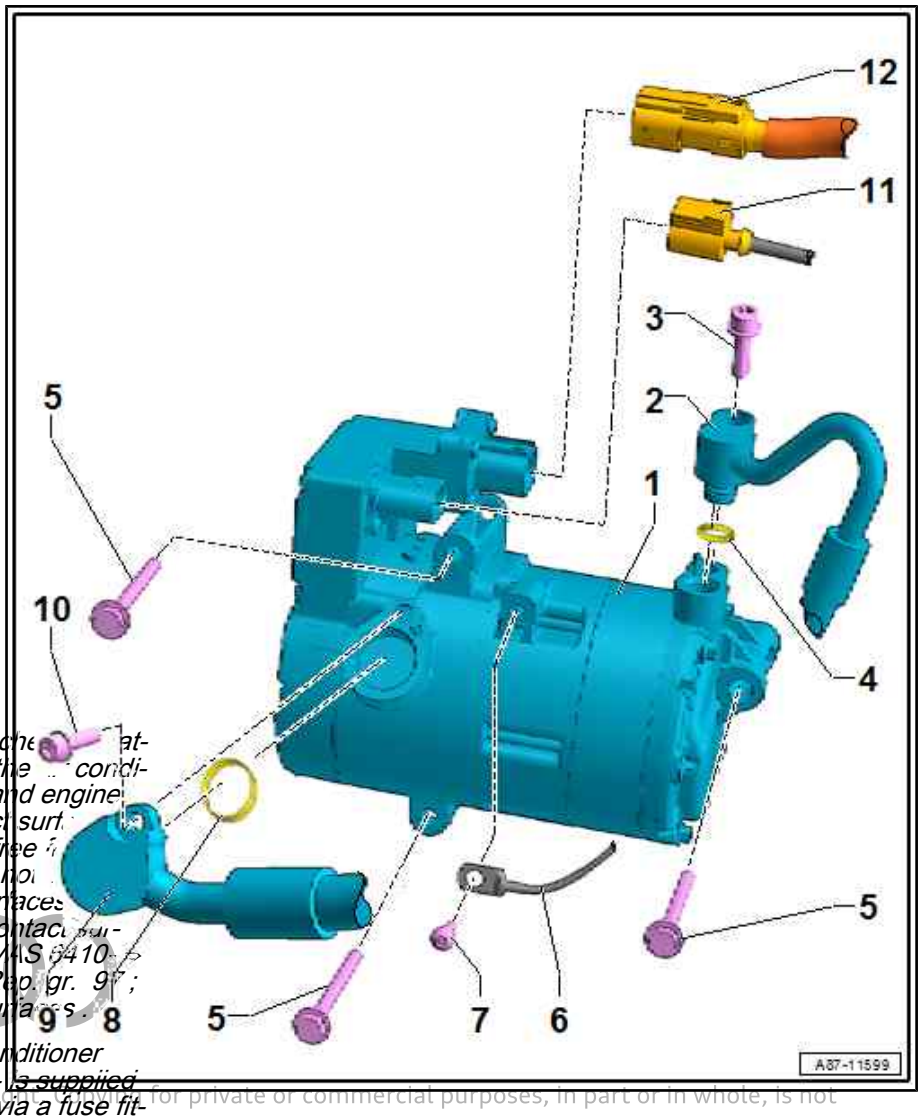
- ❑ Check for wear
- ❑ Removing and installing ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt
- ❑ Mark direction; install in correct position ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt

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3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor

1 - Electrically driven air conditioner compressor

- ❑ With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-
- ❑ ⇒ "3.3.3 Detaching and attaching electrically driven air conditioner compressor at bracket", page 219
- ❑ ⇒ "3.4.2 Detaching and attaching refrigerant lines at electrically driven air conditioner compressor", page 227
- ❑ Removing and installing ⇒ "3.5.2 Removing and installing electrically driven air conditioner compressor", page 232



Note

- *Prior to installation, check the attachment points of the air conditioner compressor and engine bracket. The contact surfaces must be clean and free from oil and grease. If this is not the case, treat the contact surfaces accordingly with the contact surface cleaning set - VAS 6410- ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .*
- *The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1- ⇒ "9.8 Removing and installing fuse for electrical air conditioner compressor", page 372 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*

2 - Refrigerant line

- ❑ High-pressure side

3 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

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4 - O-ring

- ❑ Renew ⇒ page 81 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

5 - Bolt

- ❑ Tightening torque for steel bolt: 25 Nm
- ❑ Different versions ⇒ Electronic parts catalogue

Note

If aluminium bolts have been used to secure the air conditioner compressor, (different versions ⇒ Electronic parts catalogue), renew the aluminium bolts (do not re-use). Tightening torque for aluminium bolts 8 Nm +180°.

6 - Earth wire

- ❑ Check and if necessary clean contact surface before screwing in bolts ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; High-voltage components

Note

The contact surfaces must be clean and free from rust and grease. If this is not the case, treat the contact surfaces accordingly with the contact surface cleaning set - VAS 6410- ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .

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7 - Bolt

- ❑ Tightening torque: 9 Nm

8 - O-ring

- ❑ Renew ⇒ page 81 ; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate lightly with refrigerant oil

9 - Refrigerant line

- ❑ Low-pressure side

10 - Bolt

- ❑ Tightening torque: 9 Nm (for bolts with M6 thread) / 25 Nm (for bolts with M8 thread)

11 - 8-pin connector

- ❑ With control wire from operating unit (Climatronic control unit - J255-) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

12 - 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 ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires

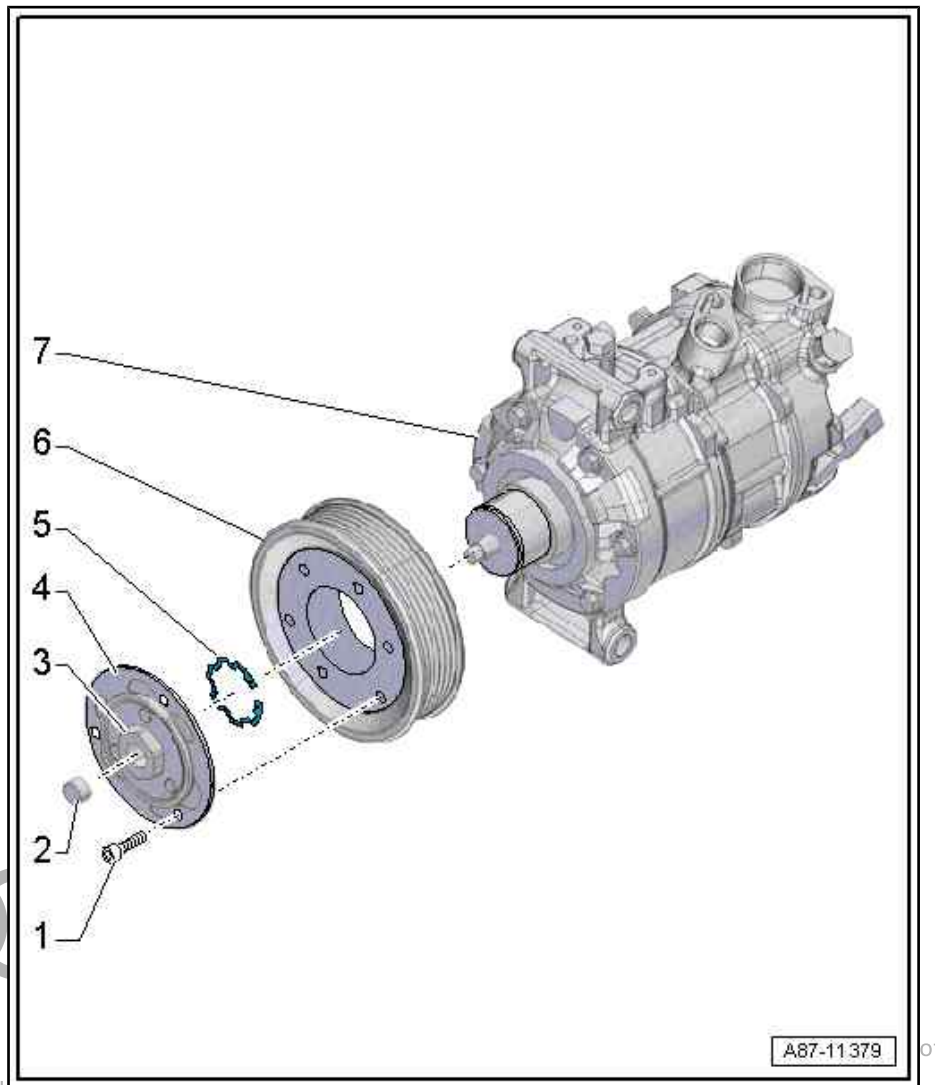
3.2 Exploded view - pulley, mechanically driven air conditioner compressor

⇒ “3.2.1 Exploded view - air conditioner compressor pulley (Denso)”, page 212

⇒ “3.2.2 Exploded view - Sanden air conditioner compressor pulley, version 1”, page 213

⇒ “3.2.3 Exploded view - Sanden air conditioner compressor pulley, version 2”, page 214

3.2.1 Exploded view - air conditioner compressor pulley (Denso)



1 - Bolt
- ❑ 3x
- ❑ 4.5 Nm

2 - Cap

3 - Nut
- ❑ 25 Nm

4 - Drive plate
- ❑ 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

5 - Circlip
- ❑ Renew
- ❑ Install correctly: flat side must face air conditioner compressor

6 - Pulley
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Sensitive to impact, handle with care
- ❑ Removing and installing ⇒ page 234

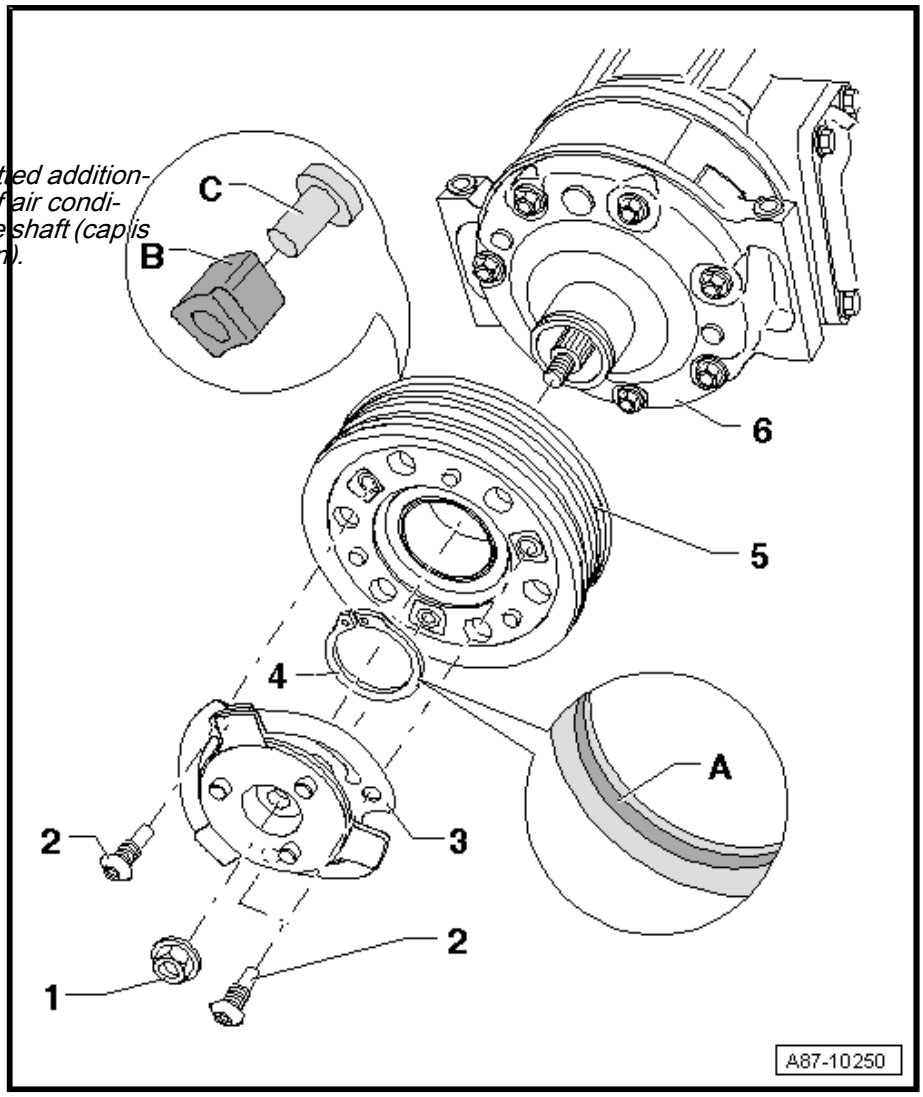
7 - Air conditioner compressor
- ❑ Clean air conditioner compressor drive shaft before fitting pulley

Note

Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

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3.2.2 Exploded view - Sanden air conditioner compressor pulley, version 1



1 - Nut

- ❑ 25 Nm

Note

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

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

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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)

Note

- *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

Note

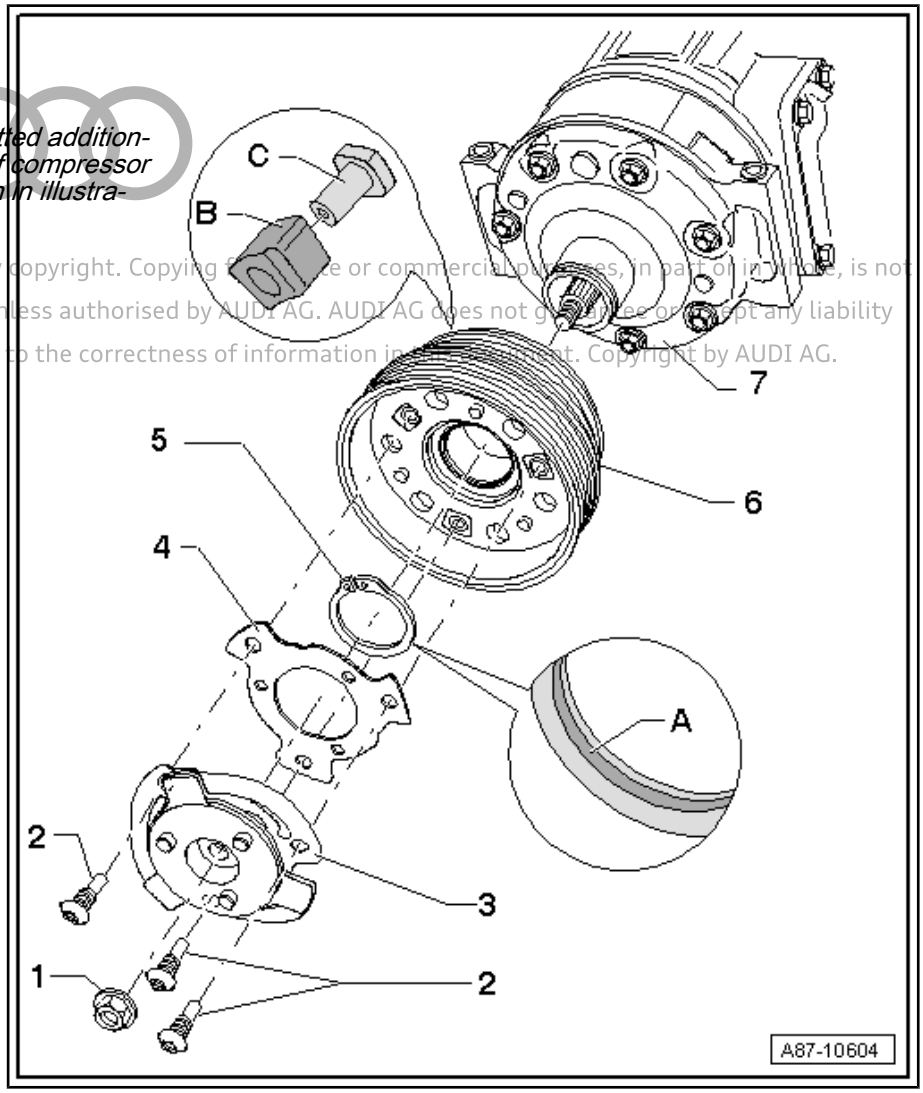
Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

3.2.3 Exploded view - Sanden air conditioner compressor pulley, version 2

Note

- *Installed on vehicles with 5-cylinder engine (Audi RS 3) with two poly V-belts on air conditioner compressor*
- *Vehicles with a 5-cylinder engine (Audi RS 3) have 1 or 2 poly V-belts on the air conditioner compressor (depending on the engine type). The air conditioner compressor is therefore provided with a single or double-belt pulley ⇒ 5-cylinder direct injection engine (2.5 ltr. 4-valve TFSI); Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .*
- *If the pulley overload protection has been tripped, check the freedom of movement of the air conditioner compressor before renewing the pulley. If the air conditioner compressor does not rotate freely, renew the complete unit.*
- *The air conditioner compressor can be detached from the bracket on the engine and re-attached without opening up the refrigerant lines.*
- *The air conditioner compressor can be detached from the bracket on the engine and re-attached without opening up the refrigerant lines.*

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1 - Hexagon nut

Note

A plastic cap may be fitted additionally to protect thread of compressor shaft (cap is not shown in illustration).

- ❑ Hold pulley using a commercially available strap wrench (fabric strap) when loosening or tightening hexagon nut
- ❑ Before installing, clean residual locking fluid off thread of hexagon nut and thread of air conditioner compressor shaft
- ❑ Apply locking fluid (e.g. D 000 600 A2) when fitting hexagon nut ⇒ Electronic parts catalogue
- ❑ Tightening torque for hexagon nut: 25 Nm

2 - Bolt

- ❑ To loosen and tighten bolts, hold pulley in position with a commercially available strap wrench (with fabric strap).
- ❑ Tightening torque: 12 Nm
- ❑ Before screwing in, remove old locking fluid from bolt threads and threads of pulley
- ❑ Apply locking fluid (e.g. D 000 600 A2) when fitting bolts ⇒ Electronic parts catalogue

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 - Spacer

5 - Circlip

- ❑ Renew
- ❑ Install in correct position; insertion bevel -A- facing away from air conditioner compressor (flat side towards compressor)
- ❑ When fitting circlip, take care not to bend it open more than necessary.

6 - Double-belt pulley

- ❑ Clean air conditioner compressor flange before fitting pulley
- ❑ With rubber elements -B- and threaded plates -C- for decoupling pulley from air conditioner compressor drive shaft (rubber elements dampen vibrations and reduce noise)

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Note

- *Depending on version, threaded plates -C- may also be linked via a ring.*
- *A double-belt pulley is fitted on vehicles with 5-cylinder engine (Audi RS 3).*

7 - 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

Note

Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

3.3 Detaching and attaching air conditioner compressor at bracket

⇒ "3.3.1 Detaching and attaching mechanically driven air conditioner compressor at bracket - vehicles with 3-cylinder and 4-cylinder engine", page 216

⇒ "3.3.2 Detaching and attaching air conditioner compressor at bracket - vehicles with 5-cylinder engine (Audi RS 3)", page 217

⇒ "3.3.3 Detaching and attaching electrically driven air conditioner compressor at bracket", page 219

3.3.1 Detaching and attaching mechanically driven air conditioner compressor at bracket - vehicles with 3-cylinder and 4-cylinder engine

Special tools and workshop equipment required

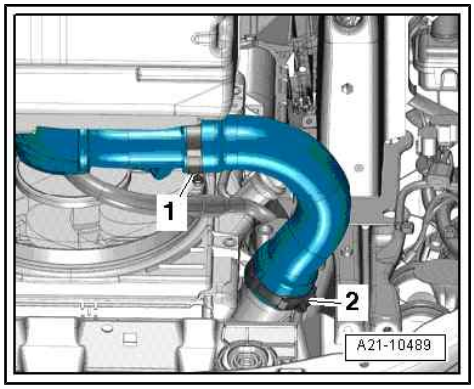
- Engine bung set - VAS 6122-

Removing

– If necessary, remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

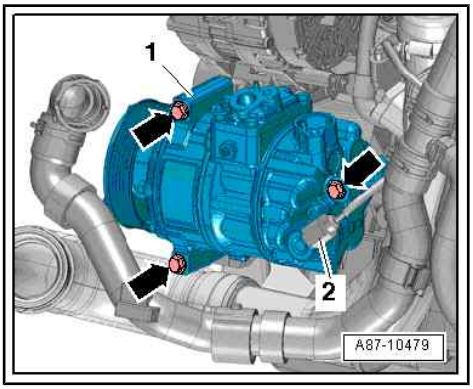
– Vehicles with air hose: Release hose clips -1 and 2- and remove air hose.

– After removing air hose, seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .



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– Remove poly V-belt ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
– Unplug electrical connector -2- at air conditioner compressor regulating valve - N280- .
– Unscrew bolts -arrows- and detach air conditioner compressor -1-.



Caution

Risk of damage to refrigerant lines and hoses

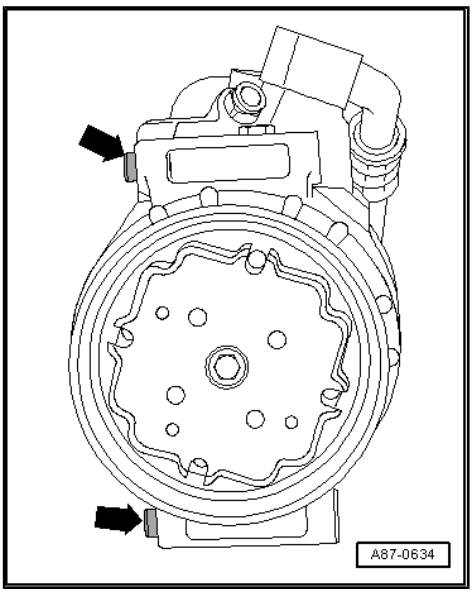
- *Do not stretch, kink or bend refrigerant lines and hoses.*

– Suspend air conditioner compressor from lock carrier with a piece of wire.

Installing

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

– Thoroughly clean contact surfaces on air conditioner compressor and bracket.
– Insert dowel sleeves -arrows- in air conditioner compressor.



Note

Make sure that the dowel sleeves are positioned correctly and that the contact surfaces are clean. Incorrectly fitted dowel sleeves or dirty/damaged contact surfaces could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment causes damage to the air conditioner compressor or belt drive.

Tightening torque

- ⇒ “3.1 Exploded view - drive unit for air conditioner compressor”, page 204

3.3.2 Detaching and attaching air conditioner compressor at bracket - vehicles with 5-cylinder engine (Audi RS 3)

Note

- *The air conditioner compressor can be detached from the bracket for ancillaries and re-attached without disconnecting refrigerant lines.*
- *The procedure for detaching and attaching a “Sanden” air conditioner compressor is as follows:*
- *Depending on the engine and the country-specific version, different air conditioner compressors may be installed; refer to ⇒ Electronic parts catalogue .*

Removing

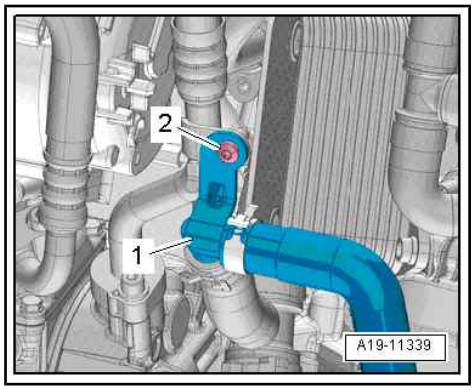
– Remove noise insulation (centre) and wheel housing liner (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

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Model with two poly V-belts on air conditioner compressor:

– Remove air pipe (right-side) ⇒ Rep. gr. 21 ; Charge air system; Exploded view - charge air system .

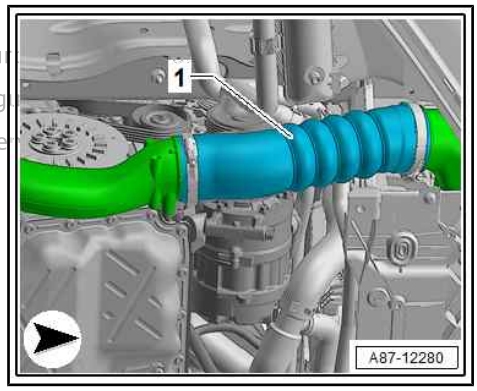
– Unscrew bolt -2- and move coolant line -1- clear.



Model with one poly V-belt on air conditioner compressor:

– Remove air hose -1- leading to air pipe (right-side) ⇒ Rep. gr. 21 ; Charge air system; Exploded view - charge air system .

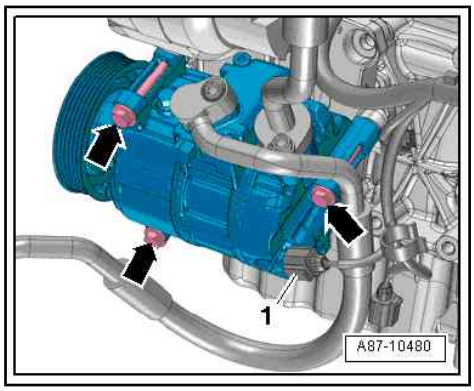
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All vehicles (continued):

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

– Unplug electrical connector -1- at air conditioner compressor regulating valve - N280- .

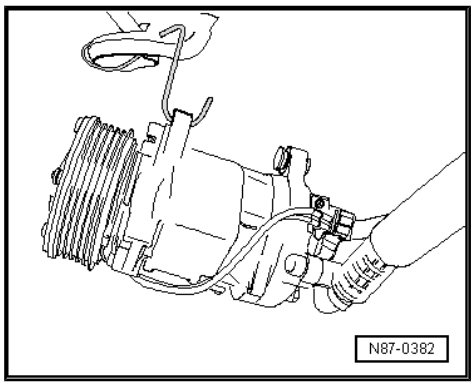


– Remove bolts -arrows-.

Caution

Risk of damage to refrigerant lines and hoses

- *Do not stretch, kink or bend refrigerant lines and hoses.*



– Suspend air conditioner compressor from lock carrier with a piece of wire.

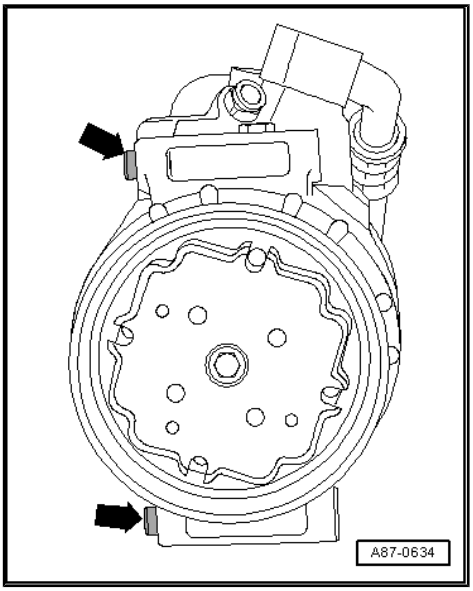
Installing

Install in reverse order of removal; note the following.

– Thoroughly clean contact surfaces on air conditioner compressor.

– Insert dowel sleeves -arrows- in air conditioner compressor.

– After installing air conditioner compressor, refrigerant lines and corresponding brackets, check that there is sufficient distance between belt, bracket and pulley.



Note

Make sure that the dowel sleeves are positioned correctly and that the contact surfaces are clean. Incorrectly fitted dowel sleeves or dirty/damaged contact surfaces could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment causes damage to the air conditioner compressor or poly V-belt.

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

– Install air pipe (right-side) ⇒ Rep. gr. 21 ; Charge air system; Exploded view - charge air system .

Tightening torques

- ⇒ “3.1.2 Exploded view - drive unit for air conditioner compressor, vehicles with 5-cylinder engine (Audi RS 3)”, page 207

3.3.3 Detaching and attaching electrically driven air conditioner compressor at bracket

Vehicles with high-voltage system

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles ⇒ page 19 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .

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Note

- *With control unit for air conditioning compressor - J842- and electrical air conditioner compressor - V470-*
- *The electrical air conditioner compressor - V470- is supplied with electric power via a fuse fitted in the power and control electronics for electric drive - JX1- ⇒ "9.8 Removing and installing fuse for electrical air conditioner compressor", page 372 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *The control unit for air conditioning compressor - J842- integrated into the air conditioner compressor regulates the speed and thus the output of the air conditioner compressor (electrical air conditioner compressor - V470-) on the basis of the requests received via the data bus from the operating unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner and battery regulation).*
- *The electrically driven air conditioner compressor is not fitted with an air conditioner compressor regulating valve - N280- . The output of the air conditioner compressor is regulated externally via the air conditioner compressor speed ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner and battery regulation).*
- *At present, the electrically driven air conditioner compressor operates on the principle of a scroll-type supercharger (similar to the "G-Lader" supercharger).*
- *The control unit for air conditioning compressor - J842- and the electrical air conditioner compressor - V470- form one component and cannot be separated at present.*

In the following steps, work on the high-voltage system is necessary; de-energise high-voltage system ⇒ page 19 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; De-energising high-voltage system and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .

Note

- *Do not discharge the refrigerant circuit when detaching the air conditioner compressor from the bracket. Do not detach refrigerant hoses and refrigerant lines from the compressor.*
- *After detaching the air conditioner compressor, secure it to the vehicle, e.g. with a piece of wire. Do not leave it hanging from the refrigerant lines.*
- *Depending on the engine and the country-specific version, different air conditioner compressors may be installed. ⇒ Electronic parts catalogue*

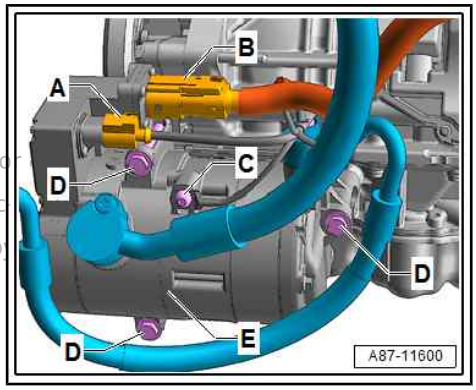
Detaching

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

– Switch off ignition.

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– De-energise high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; De-energising high-voltage system .
– Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .
– Detach electrical connectors -A- (low voltage) and -B- (high voltage) from air conditioner compressor ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .



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– Cover high-voltage wire connector and mating plug at air conditioner compressor to prevent damage and contamination (e.g. with clean plugs from engine bung set - VAS 6122-).
– Unscrew bolt -C- and detach earth wire.

Caution

Risk of damage to high-voltage system wire or refrigerant lines and hoses.

- ***Do not stretch, kink or bend refrigerant lines and hoses.***

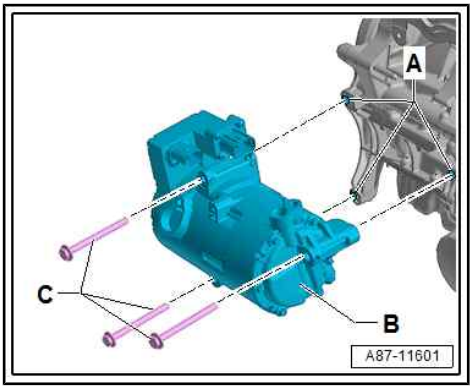
– Remove bolts -D-.
– Detach air conditioner compressor -E- and swivel it away from engine as far as possible without kinking or straining refrigerant hoses.
– Attach air conditioner compressor -E- to vehicle (e.g. with a piece of wire) so that refrigerant hoses are not kinked or strained.

Note

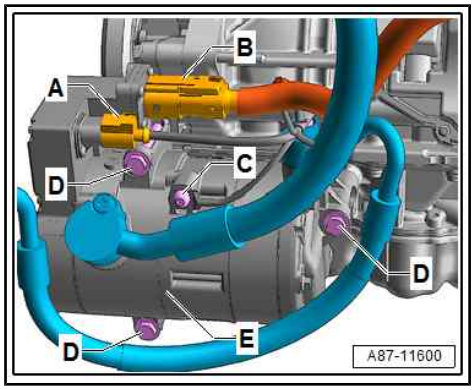
If the air conditioner compressor cannot be swivelled far enough away from the engine, the compressor must be removed completely
⇒ "3.5.2 Removing and installing electrically driven air conditioner compressor", page 232 .

Attaching

Install in reverse order of removal; note the following:



- Check and, if necessary, clean contact surfaces on air conditioner compressor -B- for engine bracket -A- and on engine bracket -A- itself before bolting on air conditioner compressor ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .
- Check and, if necessary, clean contact surfaces for earth wire (secured with bolt -C-) before bolting on ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .



Note

- *Prior to installation, check the attachment points of the air conditioner compressor, engine bracket, and earth wire at bolt -C-. The contact surfaces must be clean and free from rust and grease. If this is not the case, treat the contact surfaces accordingly with the contact surface cleaning set - VAS 6410- ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .*
- *After re-installing the electrically driven air conditioner compressor (if removed) and then charging the refrigerant circuit, first start up the compressor via 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 ("Guided Fault Finding" for air conditioner).*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner).*
- *After attaching air conditioner compressor, check routing of refrigerant lines. They must be inserted in the brackets provided (if fitted, depends on engine).*
- *Check that refrigerant lines and corresponding brackets have adequate clearance to other components, ensuring sufficient distance between belt, bracket and pulley.*

– Connect electrical wires to air conditioner compressor (-A- to -C-) and secure wires at specified positions on engine.
– Re-install remaining components (removed earlier).
– Re-energise power supply of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Re-energising high-voltage system .
– Switch on ignition.
– Interrogate event memory of operating and display unit (Climatronic control unit - J255-) and control unit for air conditioning compressor - J842- and erase any faults displayed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

Tightening torque

- ⇒ "3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor", page 210

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3.4 Detaching and attaching refrigerant lines at air conditioner compressor

⇒ "3.4.1 Detaching and attaching refrigerant lines at mechanically driven air conditioner compressor", page 223

⇒ "3.4.2 Detaching and attaching refrigerant lines at electrically driven air conditioner compressor", page 227

3.4.1 Detaching and attaching refrigerant lines at mechanically driven air conditioner compressor

Note

- *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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Depending on the design of the refrigerant line and the production period, the refrigerant line on the low-pressure side may be provided with an additional weight (vibration damper, resonator for reducing noise at refrigerant line) ⇒ page 171 . Make sure that this component is not in contact with other components and cannot come into contact during operation (noise) ⇒ Electronic parts catalogue .*

Special tools and workshop equipment required

- Socket - 3320/1-
- Engine bung set - VAS 6122-

Removing

– 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 air duct at lock carrier ⇒ Rep. gr. 23 ; Air cleaner; Removing and installing air cleaner housing (vehicles with diesel engine) or ⇒ Rep. gr. 24 ; Air cleaner; Removing and installing air cleaner housing (vehicles with petrol engine).

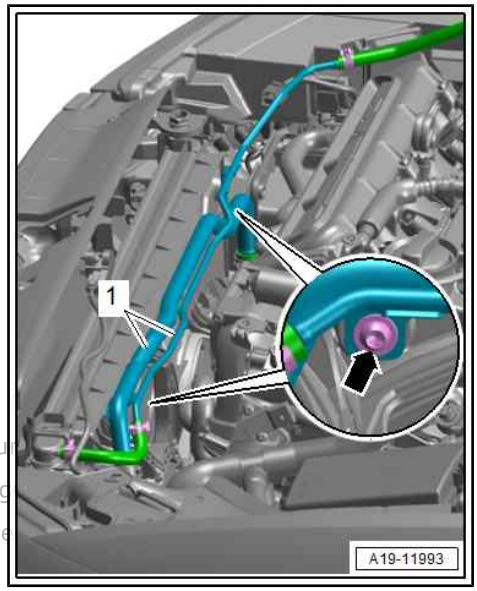
– If necessary, remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation .

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Audi RS 3 (continued) - version 1:

– Remove bolts -arrow-.

– Press coolant pipe and coolant line -1- slightly towards rear.



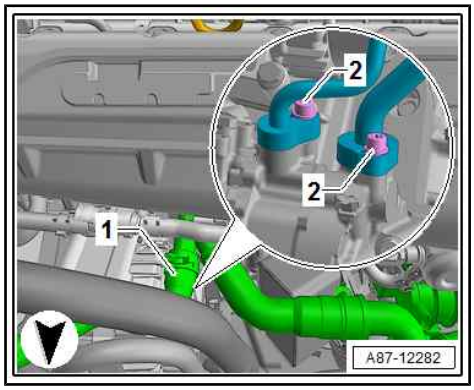
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Audi RS 3 (continued) - version 2:

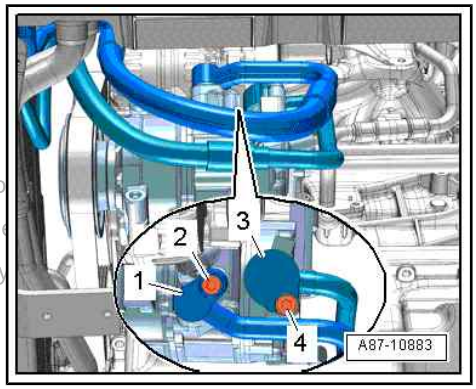
– If necessary, unfasten coolant hoses -1- from brackets and carefully press them slightly towards rear.

– Remove bolts -2- using e.g. T-bar and socket - 3320/1- .

– Detach refrigerant lines.



All vehicles (continued):



Caution

Risk of damage to refrigerant lines and hoses

- *Do not stretch, kink or bend refrigerant lines and hoses.*

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WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*

– Unscrew bolts -2, 4- using socket - 3320/1- and detach refrigerant lines -1, 3-.

– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

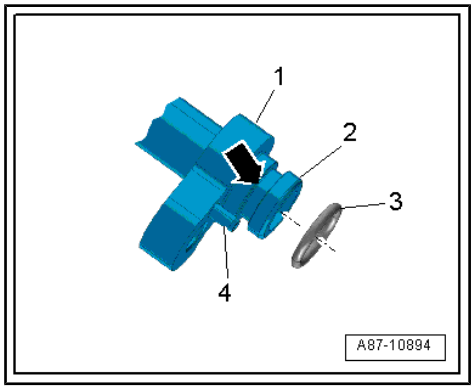
Caution

Risk of irreparable damage to air conditioner compressor.

- *The air conditioner compressor is always driven when the engine is running (there is no magnetic clutch). Therefore do not start the engine unless the refrigerant circuit has been properly assembled.*
- *If, for example, the refrigerant lines are not connected to the air conditioner compressor and the connections are sealed when the engine is running, the compressor might heat up (internal heat generation) so much that this can lead to irreparable damage to the compressor.*

Installing

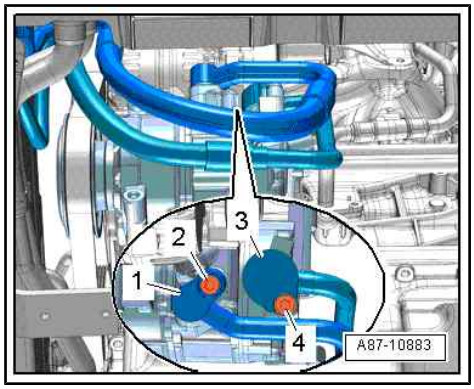
Installation is carried out in reverse order; note the following:



- Renew O-rings; 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-.

Note

- *Do not use O-rings from caps of replacement compressor connections.*
- *Lubricate O-rings with refrigerant oil before installing ⇒ page 81 .*
- *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*
- *Routing and attaching refrigerant lines ⇒ page 26*



- Insert refrigerant lines -1 and 3- in corresponding connections on air conditioner compressor.
- Tighten bolts -2 and 4- using socket - 3320/1- .
- 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 .

After completing the repairs, perform the following work on the operating unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

- Switch on ignition.
- Interrogate event memory of operating unit (-J255-) and erase any faults displayed.
- Start up air conditioner after charging refrigerant circuit ⇒ “2.16 Starting up air conditioner after charging refrigerant circuit”, page 199 .

Note

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 .

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Tightening torque

- ⇒ “2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve”, page 146

3.4.2 Detaching and attaching refrigerant lines at electrically driven air conditioner compressor

Special tools and workshop equipment required

- Engine bung set - VAS 6122-

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

For the following steps, work in the vicinity of high-voltage components is necessary (Safety precautions when working in the vicinity of high-voltage components
⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19).

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

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

Caution

Risk of damage to refrigerant lines and hoses

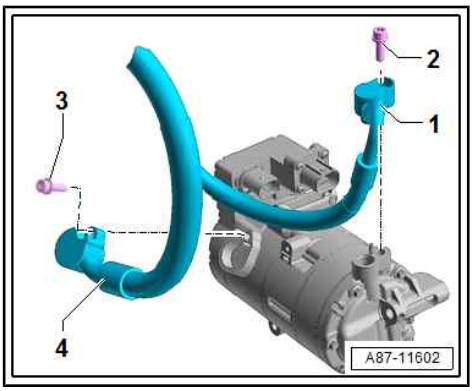
- *Do not stretch, kink or bend refrigerant lines and hoses.*

WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*



– Remove bolts -2 and 3- and detach refrigerant lines -1 and 4-.

– Seal off open lines and connections with clean plugs from engine bung set - VAS 6122-.

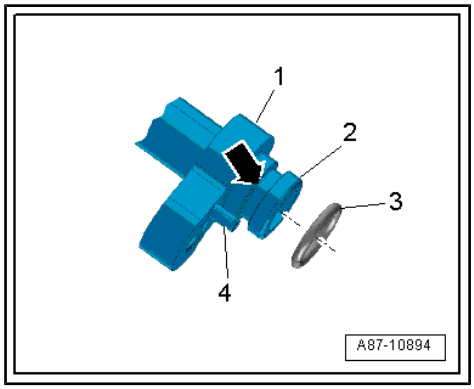
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Installing

Install in reverse order of removal; note the following:

– Renew O-rings; 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-.

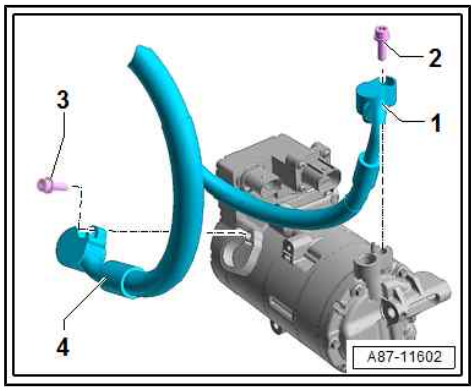


Note

- *Lubricate O-rings lightly with refrigerant oil before fitting ⇒ page 81 .*
- *Make sure O-rings are seated correctly in groove -arrow- of corresponding refrigerant line.*
- *After attaching the refrigerant lines to the air conditioner compressor (and after installing the air conditioner compressor) check the routing of the lines. They must be inserted in the brackets provided and must not make contact with other components.*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner and battery regulation).*

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– Insert refrigerant lines -1 and 4- in corresponding connections on air conditioner compressor.
– Tighten bolts -2 and 3-.
– Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .



After completing the repairs, perform the following work on the operating unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

– Switch on ignition.
– Interrogate event memory of Climatronic control unit - J255- and erase any faults displayed.
– Start up air conditioner after charging refrigerant circuit ⇒ "2.16 Starting up air conditioner after charging refrigerant circuit", page 199 .

Note

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 .

Tightening torque

- ⇒ "3.1.3 Exploded view - drive unit for electrically driven air conditioner compressor", page 210

3.5 Removing and installing air conditioner compressor

⇒ "3.5.1 Removing and installing mechanically driven air conditioner compressor", page 229

⇒ "3.5.2 Removing and installing electrically driven air conditioner compressor", page 232

3.5.1 Removing and installing mechanically driven air conditioner compressor

Note

- *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 (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*

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Special tools and workshop equipment required

- Engine bung set - VAS 6122-

Removing

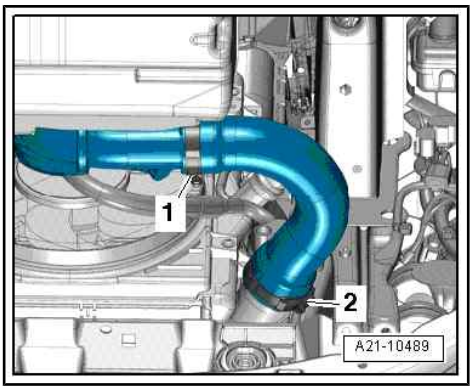
– Detach refrigerant lines from air conditioner compressor ⇒ "3.4 Detaching and attaching refrigerant lines at air conditioner compressor", page 223 .

– If necessary, remove washer fluid reservoir ⇒ Electrical system; Rep. gr. 92 ; Windscreen washer system; Removing and installing washer fluid reservoir .

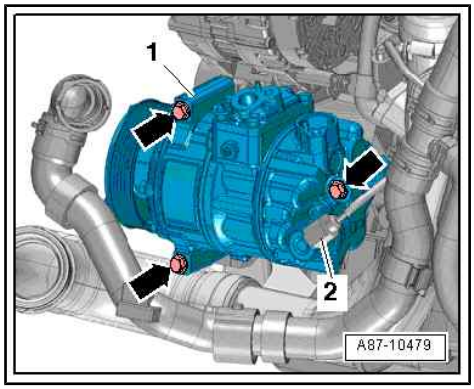
– Vehicles with air hose: Release hose clips -1 and 2- and remove air hose.

– After removing air hose, seal off open lines and connections with clean plugs from engine bung set - VAS 6122- .

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



– Unplug electrical connector -2- at air conditioner compressor regulating valve - N280- .
– Unscrew bolts -arrows- and detach air conditioner compressor -1-.



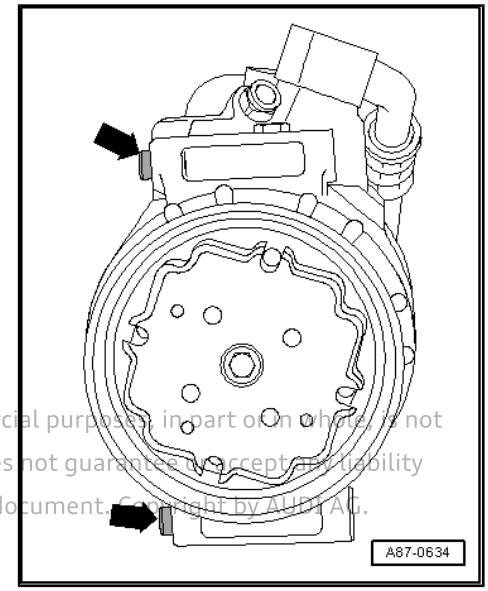
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Installing

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

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

– Insert dowel sleeves -arrows- in air conditioner compressor.



Note

- *Make sure that the dowel sleeves are positioned correctly and that the contact surfaces are clean. Incorrectly fitted dowel sleeves or dirty/damaged contact surfaces could lead to misalignment between the air conditioner compressor and the engine. After a period of operation, misalignment will cause damage to the air conditioner compressor.*
- *If the air conditioner compressor is renewed due to specific problems (e.g. internal damage), the refrigerant circuit must be cleaned ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station; Cleaning air conditioner service station .*
- *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 conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*

Caution

Risk of damage to air conditioner compressor.

- ***Depending on the position in which the air conditioner compressor is stored, refrigerant oil may accumulate in the compression chamber of the removed compressor.***
- ***To prevent damage to the air conditioner compressor when starting it up for the first time, turn the air conditioner compressor 10 times by hand before fitting the poly V-belt (after installing a new air conditioner compressor or adding fresh refrigerant oil).***

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

– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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– Observe notes on starting up air conditioner after installing air conditioner compressor ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; General information on air conditioning systems (Air conditioner with refrigerant R134a; General information on air conditioning systems), or ⇒ Air conditioner with refrigerant R1234yf - General notes; 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).

Tightening torque

◆ ⇒ “3.1 Exploded view - drive unit for air conditioner compressor”, page 204

3.5.2 Removing and installing electrically driven air conditioner compressor

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles ⇒ page 19 .

For the following steps, work in the vicinity of high-voltage components is necessary (Safety precautions when working in the vicinity of high-voltage components ⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19).

In the following steps, work on the high-voltage system is necessary; de-energise high-voltage system ⇒ page 19 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; De-energising high-voltage system and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 00 ; Safety precautions; Safety precautions when working on vehicles with high-voltage system .

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– Switch off ignition.

– De-energise high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; De-energising high-voltage system .

Removing

–

– Detach refrigerant lines from electrically driven air conditioner compressor
⇒ “3.4.2 Detaching and attaching refrigerant lines at electrically driven air conditioner compressor”, page 227 .

– Detach electrically driven air conditioner compressor from bracket
⇒ “3.3.3 Detaching and attaching electrically driven air conditioner compressor at bracket”, page 219 .

– Unscrew bolts and remove air conditioner compressor.

Installing

Install in reverse order of removal; note the following.

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 .

Note

- *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 conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Refrigerant circuit; Renewing components .*
- *Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue*

– Attach air conditioner compressor to bracket ⇒ page 219 .

– Attach refrigerant lines to air conditioner compressor ⇒ page 227 .

Note

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- *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 ("Guided Fault Finding" for air conditioner).*
- *An electrically driven air conditioner compressor may only be activated when the refrigerant circuit is charged. Running the air conditioner compressor with the refrigerant circuit empty could lead to compressor damage ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for air conditioner).*

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

– Re-install remaining components removed in reverse order.

– Re-energise power supply of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Re-energising high-voltage system .

– Switch on ignition.

– Interrogate event memory of operating unit (Climatronic control unit - J255-) and erase any entries displayed ⇒ 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 ⇒ "2.16 Starting up air conditioner after charging refrigerant circuit", page 199 .

Note

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 .

3.6 Removing and installing pulley

⇒ "3.6.1 Removing and installing pulley - Denso air conditioner compressor", page 234

⇒ "3.6.2 Removing and installing pulley - Sanden air conditioner compressor", page 236

⇒ "3.6.3 Removing and installing pulley - Delphi/Mahle air conditioner compressor", page 237

3.6.1 Removing and installing pulley - Denso air conditioner compressor

Note

- *The pulley is sensitive to impact and should therefore be treated with extreme care.*
- *If pulley overload protection device has been triggered, check freedom of movement of air conditioner compressor before renewing pulley. If air conditioner compressor cannot rotate freely it must be renewed.*
- *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.*
- *The following illustrations show the air conditioner compressor on a vehicle with a 4-cyl. engine. The layout of the components differs on vehicles with a 5-cyl. engine with one poly V-belt on the air conditioner compressor, but the removal and installation procedures are the same. For vehicles with a 5-cyl. engine with two poly V-belts on the air conditioner compressor, refer to ⇒ "3.6.2 Removing and installing pulley - Sanden air conditioner compressor", page 236 .*

Special tools and workshop equipment required

- Commercially available oil filter strap wrench

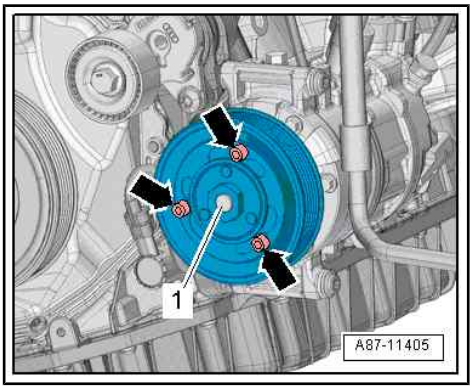
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Removing

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

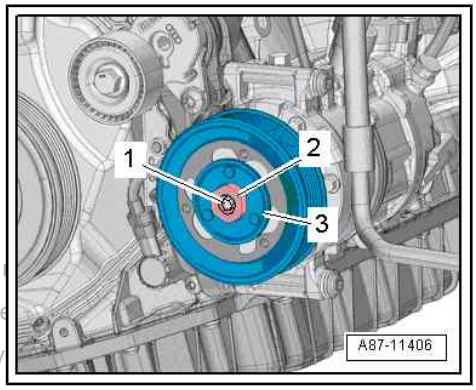
– Detach cap -1-.

– Counterhold pulley with oil filter strap wrench and remove bolts -arrows-.



– Remove nut -2-; to do so counterhold drive shaft -1- for air conditioner compressor.

– Detach drive plate -3- with nut.



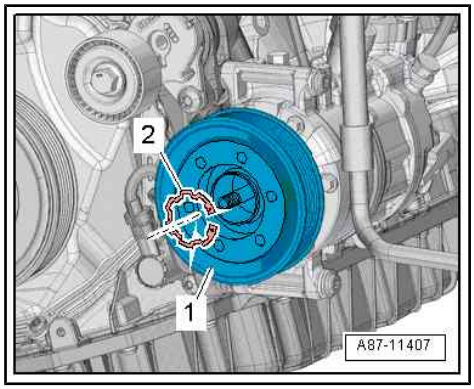
Note

- *The torque for driving the air conditioner compressor is applied to the air conditioner compressor shaft via the thread securing the drive plate.*
- *If the drive plate has become so firmly attached to the air conditioner compressor shaft that it can no longer be released (the 7 mm hexagon flats can no longer transmit the necessary torque), the air conditioner compressor must be renewed.*

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– Detach circlip -2-.

– Detach pulley -1-.



Installing

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

- Tightening torque
⇒ “3.2.1 Exploded view - air conditioner compressor pulley (Denso)”, page 212

Note

Renew circlip.

– Clean air conditioner compressor drive shaft before fitting pulley.

– Attach pulley to air conditioner compressor drive shaft.

- It should be possible to attach the component without having to exert force.

– Insert circlip in correct position.

- Flat side faces air conditioner compressor

– Clean thread of air conditioner compressor drive shaft before bolting on drive plate.

Note

Thread of new drive plate has been lubricated at factory with a pre-determined amount of a specific grease.

3.6.2 Removing and installing pulley - Sanden air conditioner compressor

Note

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- *The pulley is sensitive to impact and should therefore be treated with extreme care.*
- *If pulley overload protection device has been triggered, check freedom of movement of air conditioner compressor before renewing pulley. If air conditioner compressor cannot rotate freely it must be renewed.*
- *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 ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

– Removing and installing pulley
⇒ “3.2.2 Exploded view - Sanden air conditioner compressor pulley, version 1”, page 213 (vehicles with 4-cylinder engine)
or
⇒ “3.2.3 Exploded view - Sanden air conditioner compressor pulley, version 2”, page 214 (vehicles with 5-cylinder engine)

3.6.3 Removing and installing pulley - Delphi/ Mahle air conditioner compressor

Note

- *The pulley is sensitive to impact and should therefore be treated with extreme care.*
- *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 also rotating.*

Currently the pulley cannot be renewed separately on air conditioner compressors manufactured by “Delphi/Mahle”. If a customer reports a problem, the entire air conditioner compressor must be renewed.

– Renew air conditioner compressor ⇒ page 216 .

Pulley, version “1”

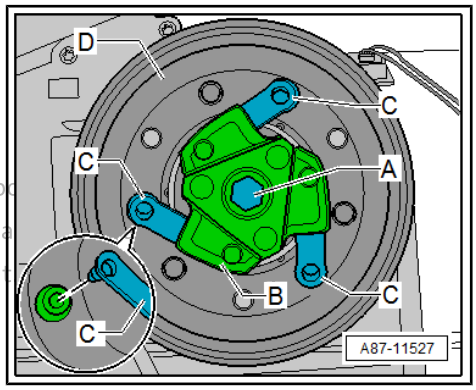
Note

Currently, the pulley of the “Delphi/Mahle” air conditioner compressor (version “1”) is identical to the pulley of the “Sanden” compressor
⇒ “3.2.2 Exploded view - Sanden air conditioner compressor pulley, version 1”, page 213 (vehicles with 4-cylinder engine). The only difference is that the drive plate is attached to the air conditioner compressor shaft with a self-locking bolt
⇒ Item 2 (page 213) .

Pulley, version “2”

Note

- *The drive plate -B- is bolted to the air conditioner compressor shaft with bolt -A- (tightening torque: 20 Nm).*
- *The spring elements (overload protection device) -C- of the drive plate -B- are triggered if the torque is too great (e.g. if air conditioner compressor cannot rotate freely), causing the pulley -D- to free-wheel without driving the compressor.*



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4 Control motors

⇒ “4.1 Removing and installing temperature flap control motor V68 with potentiometer G92 ”, page 238

⇒ “4.2 Removing and installing defroster flap control motor V107 with potentiometer G135 ”, page 240

⇒ “4.3 Removing and installing air recirculation flap control motor V113 ”, page 242

⇒ “4.4 Removing and installing left temperature flap control motor V158 with potentiometer G220 ”, page 245

⇒ “4.5 Removing and installing right temperature flap control motor V159 with potentiometer G221 ”, page 246

⇒ “4.6 Removing and installing fresh air/air recirculation, air flow flap control motor V425 with potentiometer G644 ”, page 248

⇒ “4.7 Removing and installing actuator for fresh air/air recirculation, air flow flap”, page 251

⇒ “4.8 Removing and installing air distribution flap control motor V428 with potentiometer G645 ”, page 253

⇒ “4.9 Removing and installing front air distribution flap control motor V426 with potentiometer G642 ”, page 255

⇒ “4.10 Removing and installing actuator for air distribution flap”, page 257

4.1 Removing and installing temperature flap control motor - V68- with potentiometer -G92-

Heater and manually controlled air conditioner

Removing

– Switch off ignition.

– Vehicles with ignition lock: Remove ignition key.

WARNING

Risk of injury from knee airbag.

- *Before handling pyrotechnic components, the mechanic must discharge any static electricity. Observe the safety precautions for working on airbags ⇒ General body repairs, interior; Rep. gr. 00 ; Safety precautions; Safety precautions when working on pyrotechnic components .*

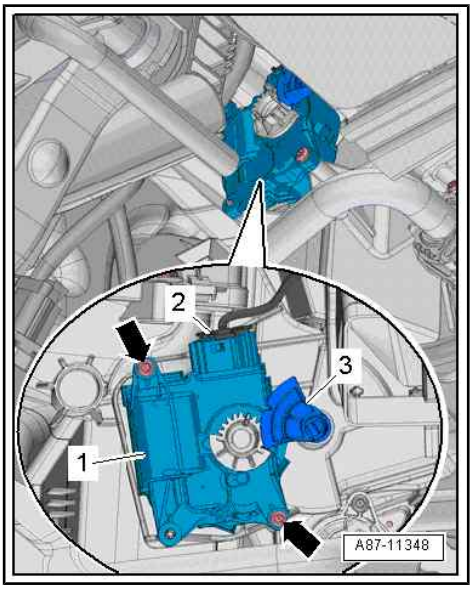
– Remove dash panel cover (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel cover (driver side) .

Note

Right-hand drive vehicles: Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

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– Remove bolts -arrows-.
– Swivel out temperature flap control motor - V68- -item 1- behind temperature flap operating shaft -3-.
– Unplug electrical connector -2-.
– Detach control motor.



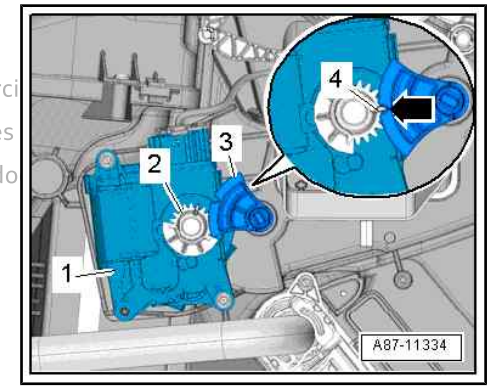
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Installing

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

- Tightening torque ⇒ "5.1 Exploded view - heater and air conditioning unit", page 262



Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

– Position control motor -1- on air distribution housing; gear wheel -2- on control motor must engage in gear wheel -3- at temperature flap lever.

- Long tooth -4- must engage in recess -arrow- in actuating arm.

Note

- *Turn actuator socket in control motor if gear wheels on control motor and temperature flap lever are not opposite one another. Observe notes ⇒ page 82 .*
- *The control motor is not positioned correctly on the housing if the bolts cannot be fitted.*

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts "5" and "6" of control motor to a 12 V battery via a 5 A fuse.

Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– Interrogate event memory and erase any entries displayed; then perform "Basic setting" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

– As a final step, check operation of heater/air conditioner.

4.2 Removing and installing defroster flap control motor - V107- with potentiometer -G135-

Automatically controlled air conditioner

Removing

– Switch off ignition.

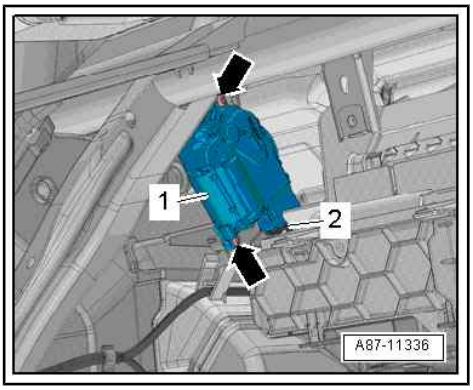
– Vehicles with ignition lock: Remove ignition key.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

Note

Right-hand drive vehicles: Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

– Remove bolts -arrows-.
– Detach defroster flap control motor - V107- -item 1-.
– Unplug electrical connector -2-.



Installing

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

- Tightening torque
  ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

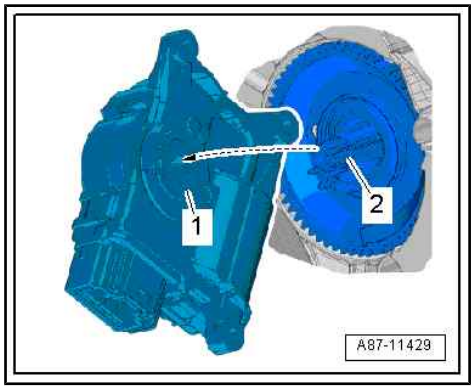
Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

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– The actuator socket in the control motor can only be fitted onto the actuating arm -2- in one position.

• The actuator socket in the control motor must be opposite the actuating arm as shown.



Note

If the actuator socket and actuating arm are not opposite one another, the socket in the control motor must be turned. Observe notes ⇒ page 82 .

– Position control motor on air distribution housing. The actuating arm must engage -arrow- in actuator socket -1-.

• There must not be any play in the connection between the control motor and actuating arm.

Note

The control motor is not positioned correctly on the housing if the bolts cannot be fitted.

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

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Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

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

Heater and manually controlled air conditioner

Note

The control motor has end stops with integrated limit switches instead of a potentiometer.

Removing

– Switch off ignition.

– Vehicles with ignition lock: Remove ignition key.

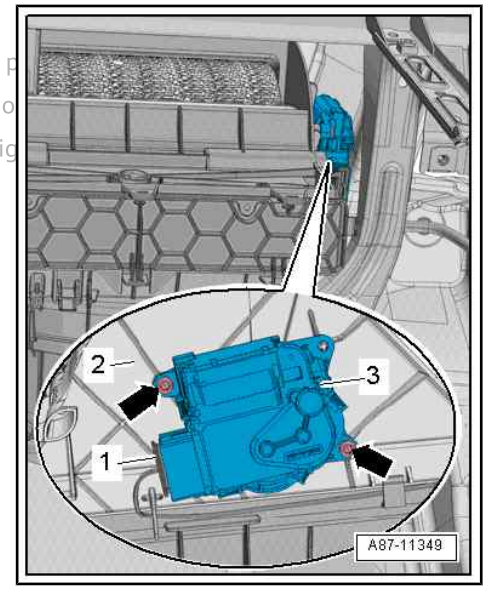
– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

Note

Right-hand drive vehicles: Remove centre tube for dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Centre tube for dash panel .

– Remove bolts -arrows-.
– Detach air recirculation flap control motor - V113- -item 3- from intake duct -2-.
– Unplug electrical connector -1-.

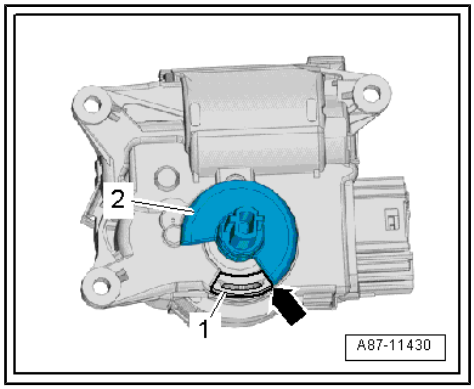
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Installing

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

- Tightening torque
  ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262



Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

– Fresh air flap must be in “open” position.

- Operating shaft -2- must make contact with stop -1- -arrow-, as shown.

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Note

If the control motor operating shaft is not on the stop for “fresh air mode”, the actuator socket in the control motor must be turned. Observe notes ⇒ page 82 .

– Position control motor on air intake box. Operating shaft must engage in actuator socket.

- There must not be any play in the connection between the operating shaft and the actuator socket.

Note

The control motor is not positioned correctly on the housing if the bolts cannot be fitted.

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

4.4 Removing and installing left temperature flap control motor - V158- with potentiometer -G220-

Automatically controlled air conditioner

Removing

WARNING

Risk of injury from knee airbag.

- *Before handling pyrotechnic components, the mechanic must discharge any static electricity. Observe the safety precautions for working on airbags ⇒ General body repairs, interior; Rep. gr. 00 ; Safety precautions; Safety precautions when working on pyrotechnic components .*

– Switch off ignition.

– Vehicles with ignition lock: Remove ignition key.

– 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) .

Note

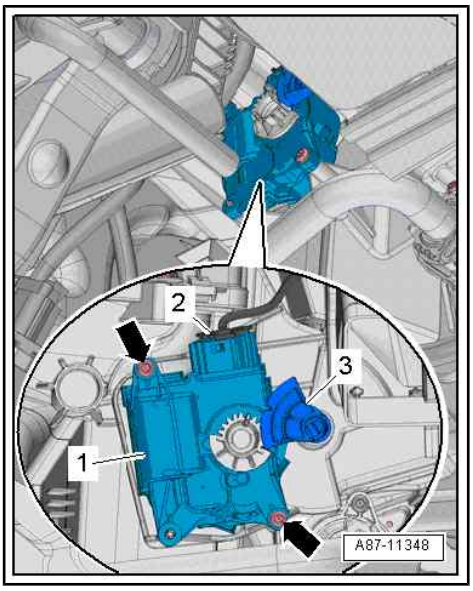
Right-hand drive vehicles: Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove bolts -arrows-.

– Swivel out left temperature flap control motor - V158- -item 1- behind temperature flap operating shaft -3-.

– Unplug electrical connector -2-.

– Detach control motor.

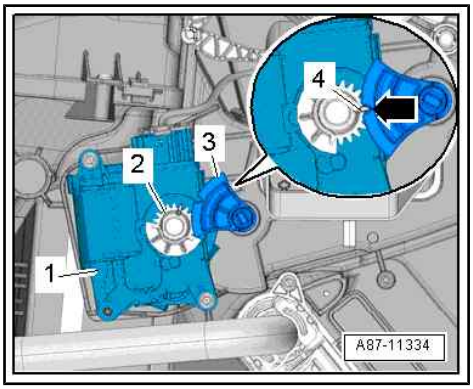


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Installing

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

- Tightening torque
⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262



Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

– Position control motor -1- on air distribution housing; gear wheel -2- on control motor must engage in gear wheel -3- at temperature flap lever.

- Long tooth -4- must engage in recess -arrow- in actuating arm.

Note

- *Turn actuator socket in control motor if gear wheels on control motor and temperature flap lever are not opposite one another. Observe notes ⇒ page 82 .*
- *The control motor is not positioned correctly on the housing if the bolts cannot be fitted.*

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

4.5 Removing and installing right temperature flap control motor - V159- with potentiometer -G221-

Automatically controlled air conditioner

Removing

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– Switch off ignition.

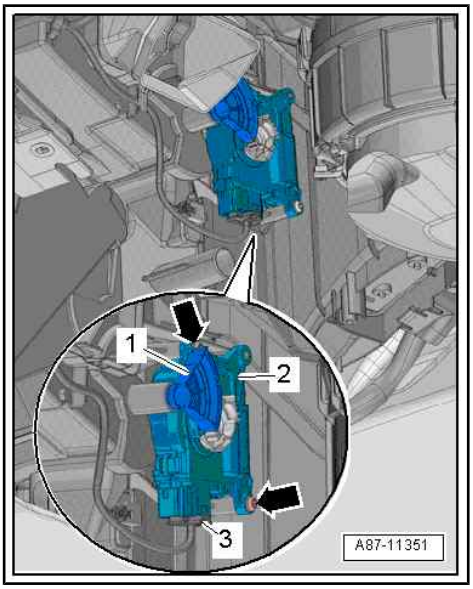
– Vehicles with ignition lock: Remove ignition key.

– Remove footwell vent (passenger side) ⇒ page 325 .

Note

Right-hand drive vehicles: 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) .

– Detach temperature flap operating shaft -1-.
– Remove bolts -arrows-.
– Detach right temperature flap control motor - V159- -item 2-.
– Unplug electrical connector -3-.

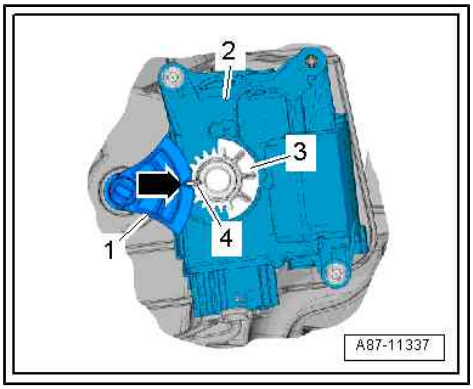


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Installing

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

- Tightening torque
⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262



Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

– Position control motor -2- on air distribution housing; gear wheel -3- on control motor must engage in gear wheel -1- at temperature flap lever.

- Long tooth -4- must engage in recess -arrow- in actuating arm.

Note

- *Turn actuator socket in control motor if gear wheels on control motor and temperature flap lever are not opposite one another. Observe notes ⇒ page 82 .*
- *The control motor is not positioned correctly on the housing if the bolts cannot be fitted.*

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

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Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

4.6 Removing and installing fresh air/air recirculation, air flow flap control motor - V425- with potentiometer -G644-

Automatically controlled air conditioner

Removing

– Switch off ignition.

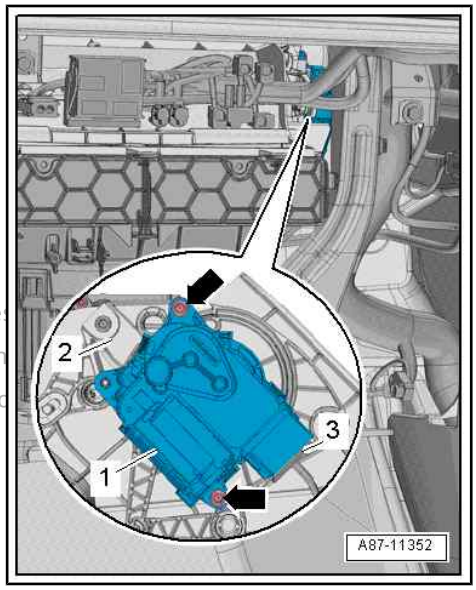
– Vehicles with ignition lock: Remove ignition key.

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

Note

Right-hand drive vehicles: Remove centre tube for dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Centre tube for dash panel .

– Remove bolts -arrows-.
– Detach fresh air/air recirculation, air flow flap control motor -V425- -item 1- from intake duct.
– Unplug electrical connector -3-.



Installing

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

- Tightening torque ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

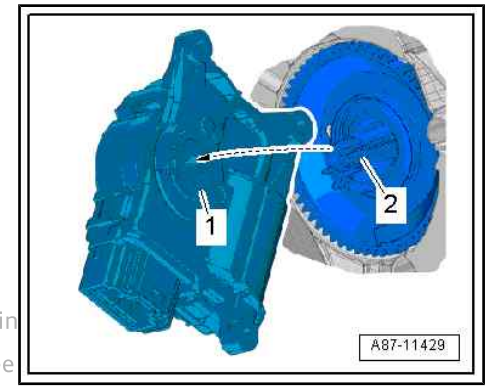
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Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

– The actuator socket in the control motor can only be fitted onto the actuating arm -2- in one position.

• The actuator socket in the control motor must be opposite the actuating arm as shown.



Note

If the actuator socket and actuating arm are not opposite one another, the socket in the control motor must be turned. Observe notes ⇒ page 82

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– Position control motor on air distribution housing. The actuating arm must engage -arrow- in actuator socket -1-.

• There must not be any play in the connection between the control motor and actuating arm.

Note

The control motor is not positioned correctly on the housing if the bolts cannot be fitted.

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

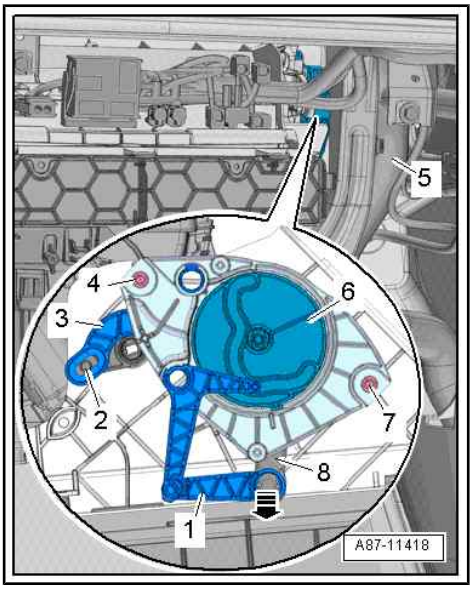
– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

4.7 Removing and installing actuator for fresh air/air recirculation, air flow flap

Automatically controlled air conditioner

Removing



– Remove fresh air/air recirculation, air flow flap control motor ⇒ page 248 .
– Move wiring harness -5- clear.
– Carefully press actuating lever -1- off fresh air/air recirculation flap lever -8- -arrow-.
– Remove bolts -4, 7-.
– Detach actuator -6-.

Installing

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

- Tightening torque ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

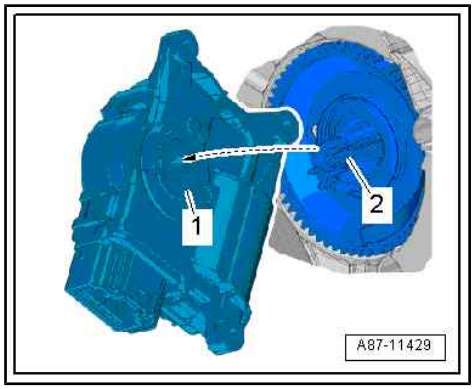
Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

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– The actuator socket in the control motor can only be fitted onto the actuating arm -2- in one position.

• The actuator socket in the control motor must be opposite the actuating arm as shown.



Note

If the actuator socket and actuating arm are not opposite one another, the socket in the control motor must be turned. Observe notes ⇒ page 82 .

– Position control motor on air distribution housing. The actuating arm must engage -arrow- in actuator socket -1-.

• There must not be any play in the connection between the control motor and actuating arm.

Note

The control motor is not positioned correctly on the housing if the bolts cannot be fitted.

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

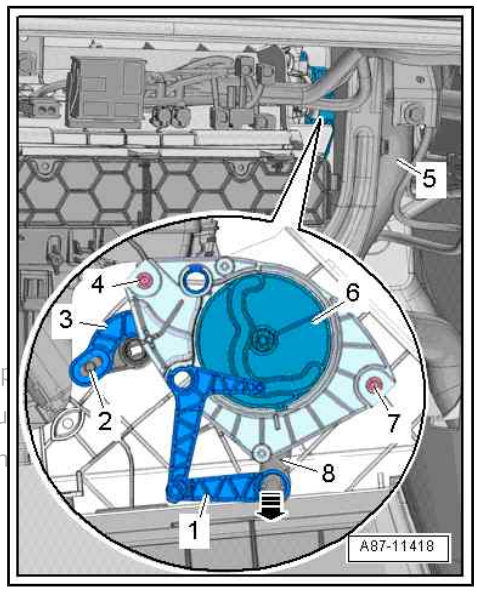
Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– When fitting actuator, actuating lever -3- must engage in air flow flap lever -2-.

– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.



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4.8 Removing and installing air distribution flap control motor - V428- with potentiometer -G645-

Heater unit and manually controlled air conditioner

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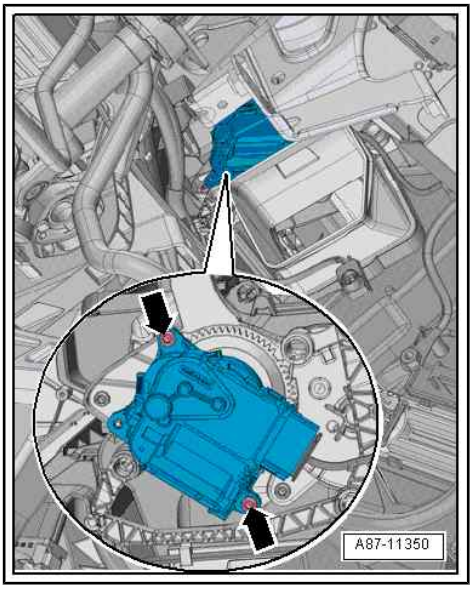
Removing

– Remove steering wheel ⇒ Rep. gr. 48 ; Steering wheel; Removing and installing steering wheel .
– Remove dash panel insert ⇒ Electrical system; Rep. gr. 90 ; Dash panel insert; Removing and installing dash panel insert .
– If fitted: Remove entry and start authorisation control unit -J518- ⇒ Electrical system; Rep. gr. 94 ; Entry and start authorisation; Overview - entry and start authorisation system .

Note

Right-hand drive vehicles: Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

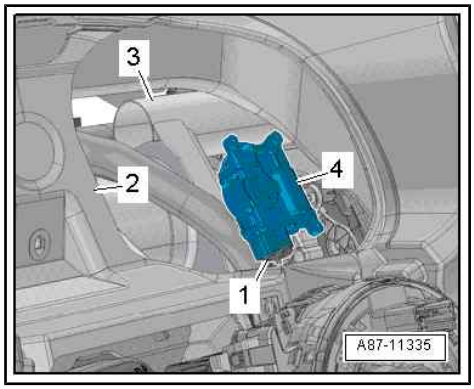
– Remove footwell vent (driver side) ⇒ page 325 .
– Remove bolts -arrows-.



Note

- *The bolts are accessible from underneath behind the central tube.*
- *Use a magnetic screwdriver to remove the bolts, or have a second mechanic hold a magnet over the bolt through the opening for the instrument cluster. If the bolt drops down, it will fall into the wiring duct pan where you cannot reach it. To take it out, the dash panel must be removed.*

– Detach air distribution flap control motor - V428- -item 4- and take control motor out between heater/air conditioning unit and central tube -3- through opening -2- for instrument cluster.
– Unplug electrical connector -1-.



Installing

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

- Tightening torque
⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

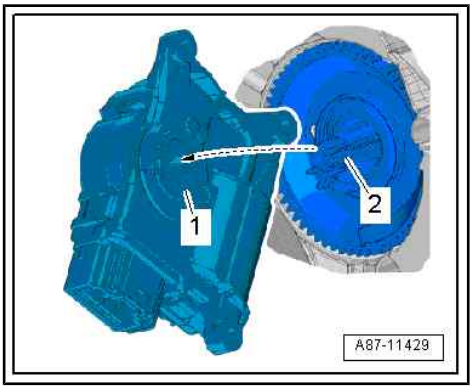
Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

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– The actuator socket in the control motor can only be fitted onto the actuating arm -2- in one position.

• The actuator socket in the control motor must be opposite the actuating arm as shown.



Note

If the actuator socket and actuating arm are not opposite one another, the socket in the control motor must be turned. Observe notes ⇒ page 82 .

– Position control motor on air distribution housing. The actuating arm must engage -arrow- in actuator socket -1-.

• There must not be any play in the connection between the control motor and actuating arm.

Note

The control motor is not positioned correctly on the housing if the bolts cannot be fitted.

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

4.9 Removing and installing front air distribution flap control motor - V426- with potentiometer -G642-

Automatically controlled air conditioner

Removing

– Remove steering wheel ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 48 ; Steering wheel; Removing and installing steering wheel .

– Remove dash panel insert ⇒ Electrical system; Rep. gr. 90 ; Dash panel insert; Removing and installing dash panel insert .

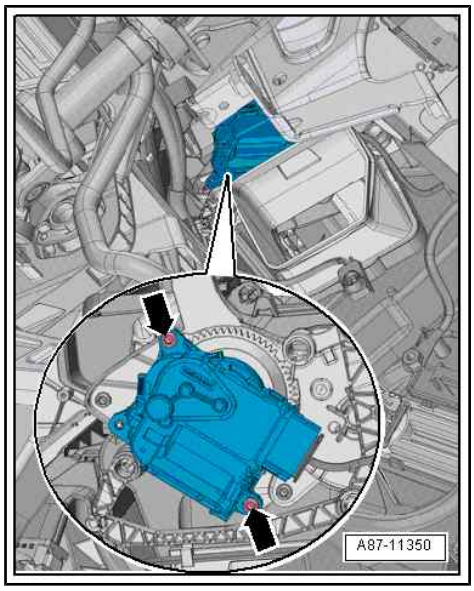
– If fitted: Remove entry and start authorisation control unit - J518- ⇒ Electrical system; Rep. gr. 94 ; Entry and start authorisation; Overview - entry and start authorisation system .

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Note

Right-hand drive vehicles: Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

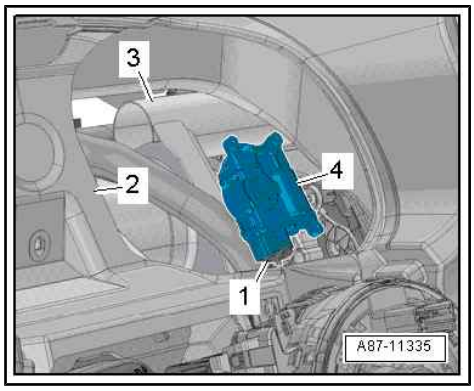
– Remove footwell vent (driver side) ⇒ page 325 .
– Remove bolts -arrows-.



Note

- *The bolts are accessible from underneath behind the central tube.*
- *Use a magnetic screwdriver to remove the bolts, or have a second mechanic hold a magnet over the bolt through the opening for the instrument cluster. If the bolt drops down, it will fall into the wiring duct pan where you cannot reach it. To take it out, the dash panel must be removed.*

– Detach front air distribution flap control motor - V426- -item 4- and take control motor out between heater/air conditioning unit and central tube -3- through opening -2- for instrument cluster.
– Unplug electrical connector -1-.



Installing

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

- Tightening torque ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

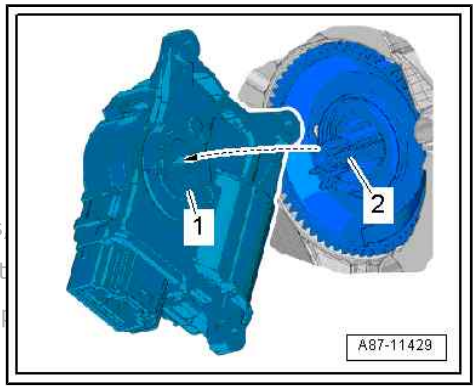
Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

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– The actuator socket in the control motor can only be fitted onto the actuating arm -2- in one position.

• The actuator socket in the control motor must be opposite the actuating arm as shown.



Note

If the actuator socket and actuating arm are not opposite one another, the socket in the control motor must be turned. Observe notes ⇒ page 82 .

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– Position control motor on air distribution housing. The actuating arm must engage -arrow- in actuator socket -1-.

• There must not be any play in the connection between the control motor and actuating arm.

Note

The control motor is not positioned correctly on the housing if the bolts cannot be fitted.

– Route electrical wiring harness so that it cannot come into contact with moving components (e.g. control motor lever).

– To check operation of control motor, connect an adapter cable ⇒ page 82 , or use a test lead from adapter set - V.A.G 1594C- to connect contacts “5” and “6” of control motor to a 12 V battery via a 5 A fuse.

Note

Turn control motor until it reaches a convenient position for installation. The direction of rotation can be reversed by interchanging positive and negative.

– Interrogate event memory and erase any entries displayed; then perform “Basic setting” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

4.10 Removing and installing actuator for air distribution flap

⇒ “4.10.1 Removing and installing actuator for front air distribution flap - heater and manually controlled air conditioner”, page 257

⇒ “4.10.2 Removing and installing actuator for front air distribution flap - automatically controlled air conditioner”, page 259

4.10.1 Removing and installing actuator for front air distribution flap - heater and manually controlled air conditioner

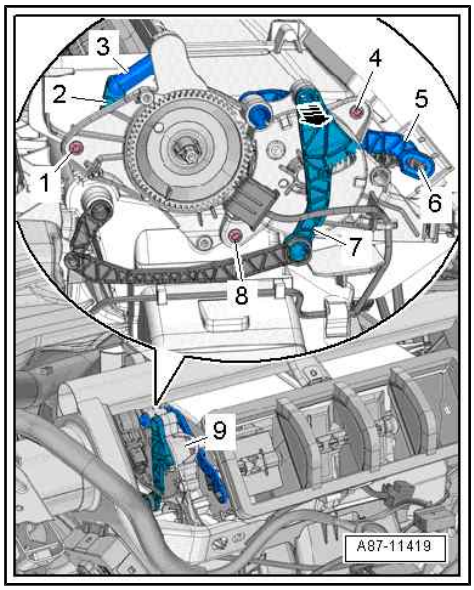
Removing

– Switch on ignition.

– Move front seats as far back as they will go and extend MMI display ⇒ Infotainment/MMI Operating Manual .

– Switch off ignition.

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .
– Remove air duct for defroster vent ⇒ page 324 .
– Remove front air distribution flap control motor ⇒ page 253 .
– Carefully press off actuating lever -7- -arrow-.
– Carefully press actuating lever -3- off defroster flap lever -2-.
– Remove bolts -1, 4, 8-.
– Lift off actuator -9-.



Installing

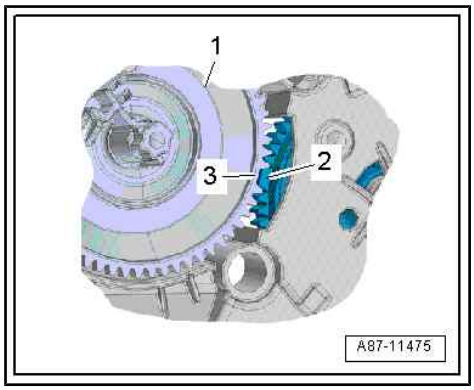
Installation is carried out in reverse order; note the following:

- Tightening torque ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

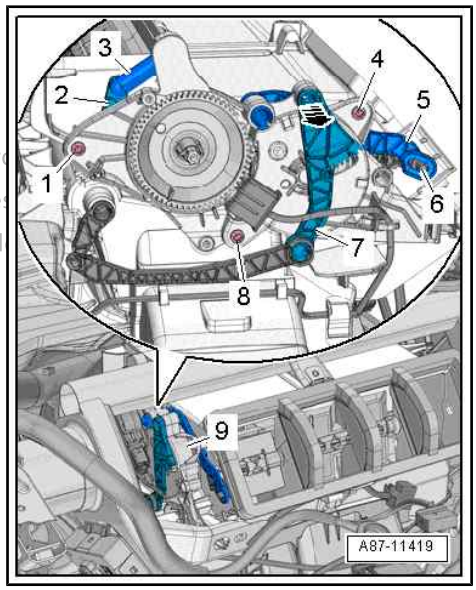
Note

- *Check operation of flaps and hinge mechanism before installing.*
- *Make sure levers and shafts are seated correctly in actuator sockets.*

– Check that the two gear wheels are correctly positioned.
- Rectangular tooth -2- must engage in gap -3- in gear wheel -1-.



– When fitting actuator, actuating lever -5- must engage in lever -6- of centre vent flap.



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4.10.2 Removing and installing actuator for front air distribution flap - automatically controlled air conditioner

Removing

– Switch on ignition.

– Move front seats as far back as they will go and extend MMI display ⇒ Infotainment/MMI Operating Manual .

– Switch off ignition.

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

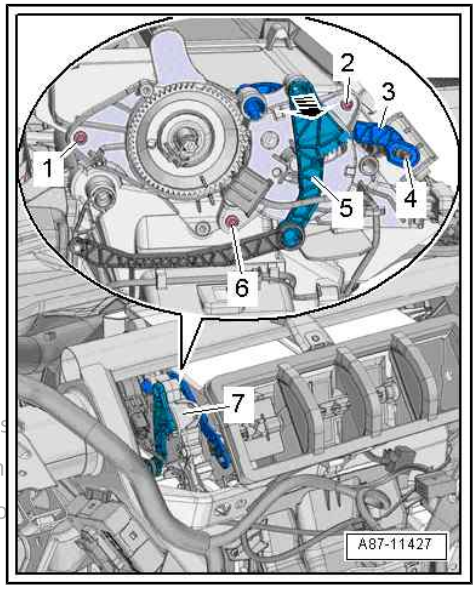
– Remove air duct for defroster vent ⇒ page 324 .

– Remove front air distribution flap control motor ⇒ page 253 .

– Carefully press off actuating lever -5- -arrow-.

– Remove bolts -1, 2, 6-.

– Lift off actuator -7-.



Installing

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

- Tightening torque ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

Note

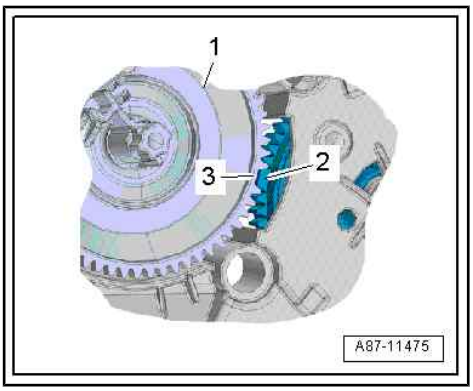
♦ *Check operation of flaps and hinge mechanism before installing.*

♦ *Make sure levers and shafts are seated correctly in actuator sockets.*

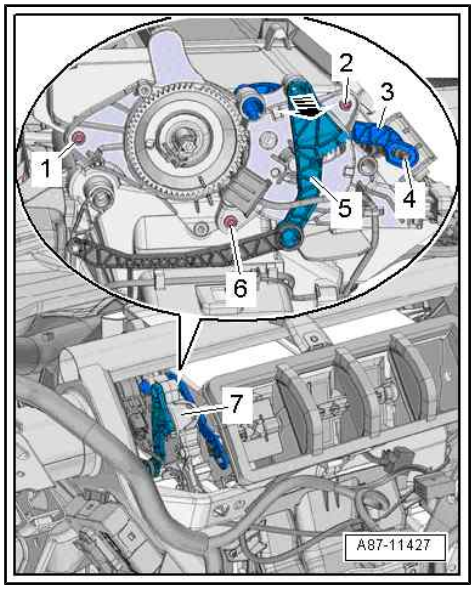
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– Check that the two gear wheels are correctly positioned.

- Rectangular tooth -2- must engage in gap -3- in gear wheel -1-.



– When fitting actuator, actuating lever -3- must engage in lever -4- of centre vent flap.



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5 Front heater and air conditioning unit

⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

⇒ “5.2 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 269

⇒ “5.3 Exploded view - evaporator housing”, page 271

⇒ “5.4 Exploded view - flaps and partitions in air distribution housing”, page 273

⇒ “5.5 Removing and installing evaporator”, page 275

⇒ “5.6 Cleaning evaporator”, page 277

⇒ “5.7 Removing and installing evaporator output temperature sender G263 ”, page 286

⇒ “5.8 Removing and installing vent temperature sender G150 / G151 ”, page 286

⇒ “5.9 Removing and installing heater and air conditioning unit”, page 287

⇒ “5.10 Removing and installing retainers for heater and air conditioning unit”, page 290

⇒ “5.11 Dismantling and assembling heater and air conditioning unit”, page 291

⇒ “5.12 Removing and installing air distribution housing”, page 293

⇒ “5.13 Removing and installing dust and pollen filter”, page 293

⇒ “5.14 Removing and installing fresh air blower V2 ”, page 296

⇒ “5.15 Removing and installing fresh air blower control unit J126 ”, page 297

⇒ “5.16 Removing and installing footwell vent temperature sender G192 ”, page 297

⇒ “5.17 Removing and installing auxiliary air heater element Z35 ”, page 298

⇒ “5.18 Removing and installing heat exchanger”, page 299

⇒ “5.19 Removing and installing coolant pipes at heat exchanger”, page 310

⇒ “5.20 Checking condensation drain hose”, page 313

⇒ “5.21 Removing and installing condensation drain hose”, page 316

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5.1 Exploded view - heater and air conditioning unit

Note

- *The heater and air conditioning unit is available in different versions and from different manufacturers. 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 .*

♦ *The following illustrations show a Valeo heater/air conditioning unit; distinguishing features compared to heaters from other manufacturers ⇒ page 1 .*

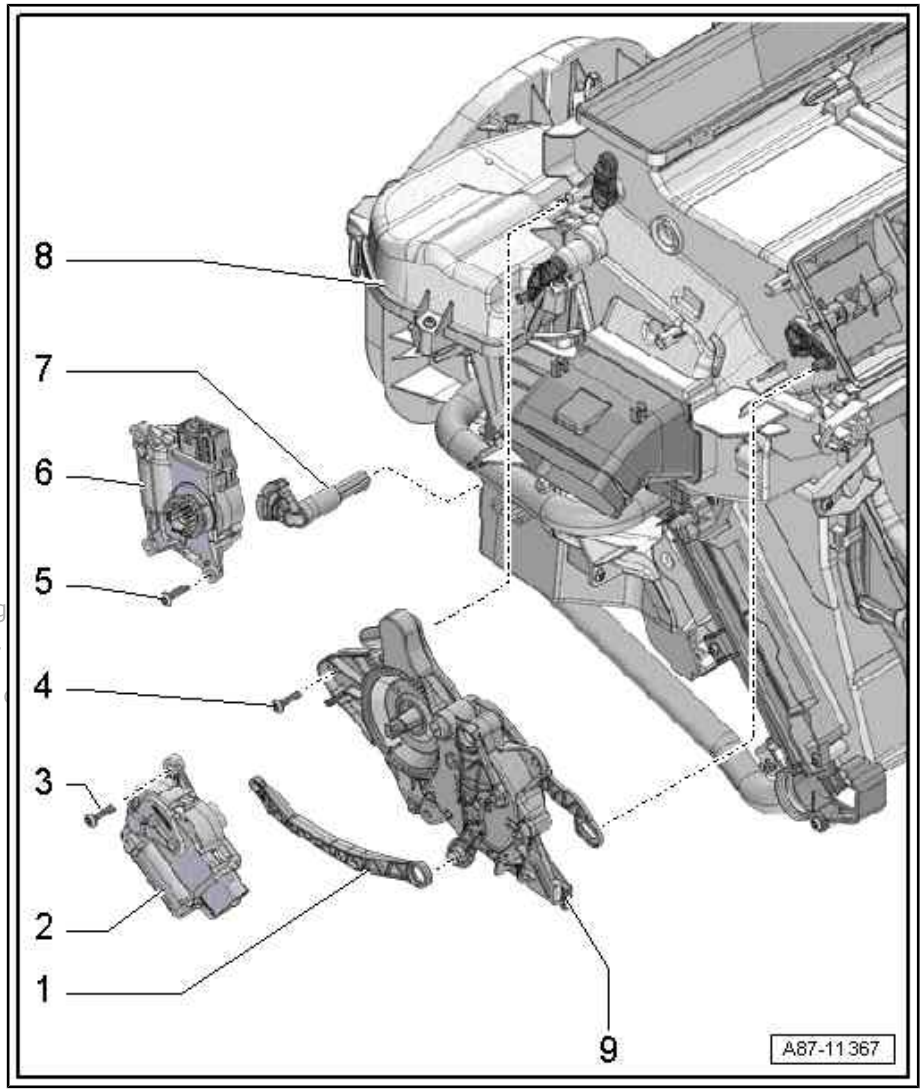
Exploded view - heater and air conditioning unit, flap control (left-side) ⇒ page 263

Exploded view - heater and air conditioning unit, flap control (right-side) ⇒ page 264

Exploded view - heater and air conditioning unit, heat exchanger, Valeo auxiliary air heater element ⇒ page 265

Exploded view - heater and air conditioning unit, heat exchanger, Denso auxiliary air heater element ⇒ page 267

Exploded view - heater and air conditioning unit, flap control (left-side)



1 - Operating lever

- ❑ For actuating defroster flap and air distribution flap

2 - Air distribution flap control motor

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Heater and manually controlled air conditioner:

Air distribution flap control motor - V428- with potentiometer for air distribution flap control motor - G645-

- ❑ Removing and installing ⇒ page 253

Automatically controlled air conditioner:

- ❑ Front air distribution flap control motor - V426- with potentiometer for front air distribution flap control motor - G642-
- ❑ Removing and installing ⇒ page 255

3 - Bolt

- ❑ 2x
- ❑ 1 Nm

4 - Bolt

- ❑ 3x
- ❑ 1 Nm

5 - Bolt

- ❑ 2x
- ❑ 1 Nm

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6 - Temperature flap control motor

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Heater and manually controlled air conditioner:

- ❑ Temperature flap control motor - V68- with potentiometer for temperature flap control motor - G92-
- ❑ Removing and installing ⇒ page 238

Automatically controlled air conditioner:

- ❑ Left temperature flap control motor - V158- with potentiometer for left temperature flap control motor - G220-
- ❑ Removing and installing ⇒ page 245

7 - Operating lever

- ❑ For warm air flap

8 - Heater and air conditioning unit

- ❑ Many components of the heater and heater/air conditioning unit are identical
- ❑ Different versions ⇒ page 1
- ❑ It is not permissible to combine components from different manufacturers ⇒ “1.1 Identification of heater and air conditioning unit”, page 1
- ❑ The following illustrations show a Valeo heater.
- ❑ Exploded view ⇒ page 291

9 - Actuator for defroster and air distribution flap

- ❑ Removing and installing ⇒ page 257

Exploded view - heater and air conditioning unit, flap control (right-side)

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1 - Heater and air conditioning unit

- Exploded view ⇒ page 291

2 - Operating lever

- For defroster flap

3 - Bolt

- 2x
- 1 Nm

4 - Defroster flap control motor - V107-

- With potentiometer for defroster flap control motor - G135-
- With automatically controlled air conditioner only
- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 240

5 - Right temperature flap control motor - V159-

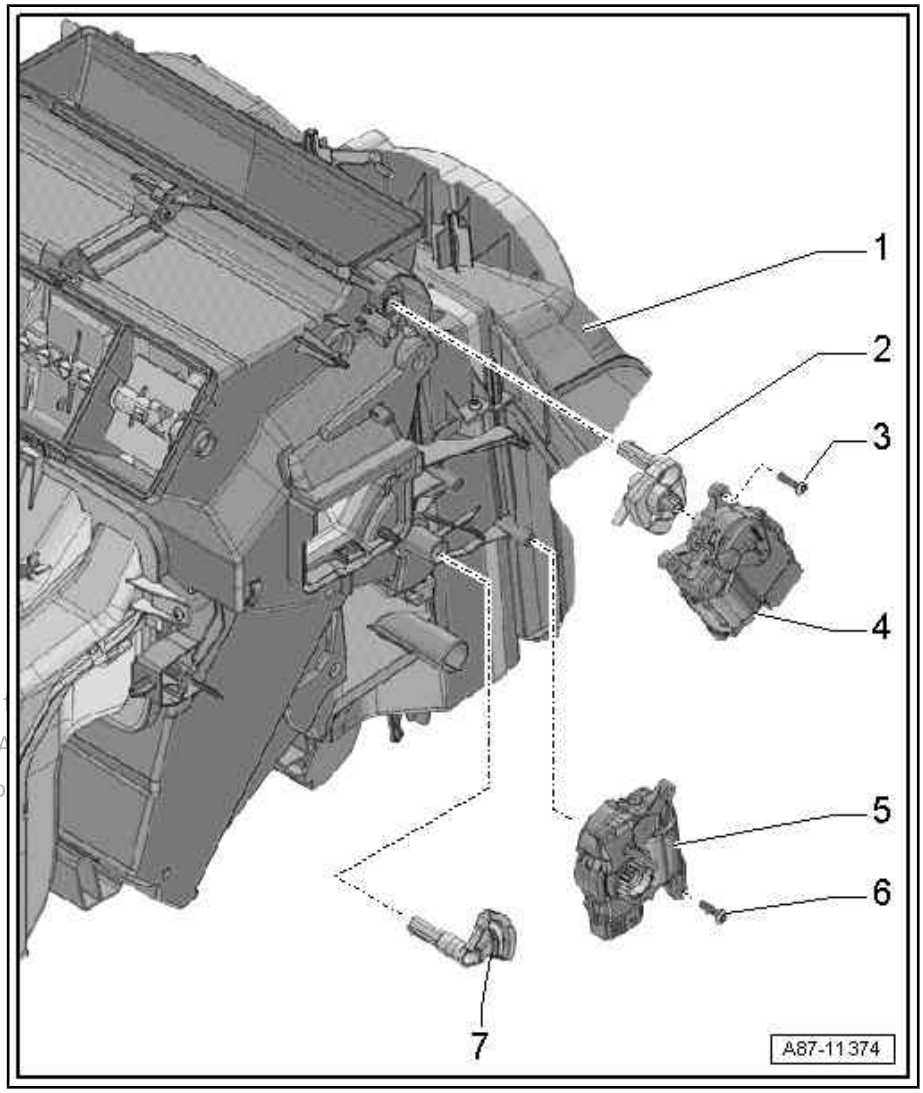
- With potentiometer for right temperature flap control motor - G221-
- With automatically controlled air conditioner only
- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 246

6 - Bolt

- 2x
- 1 Nm

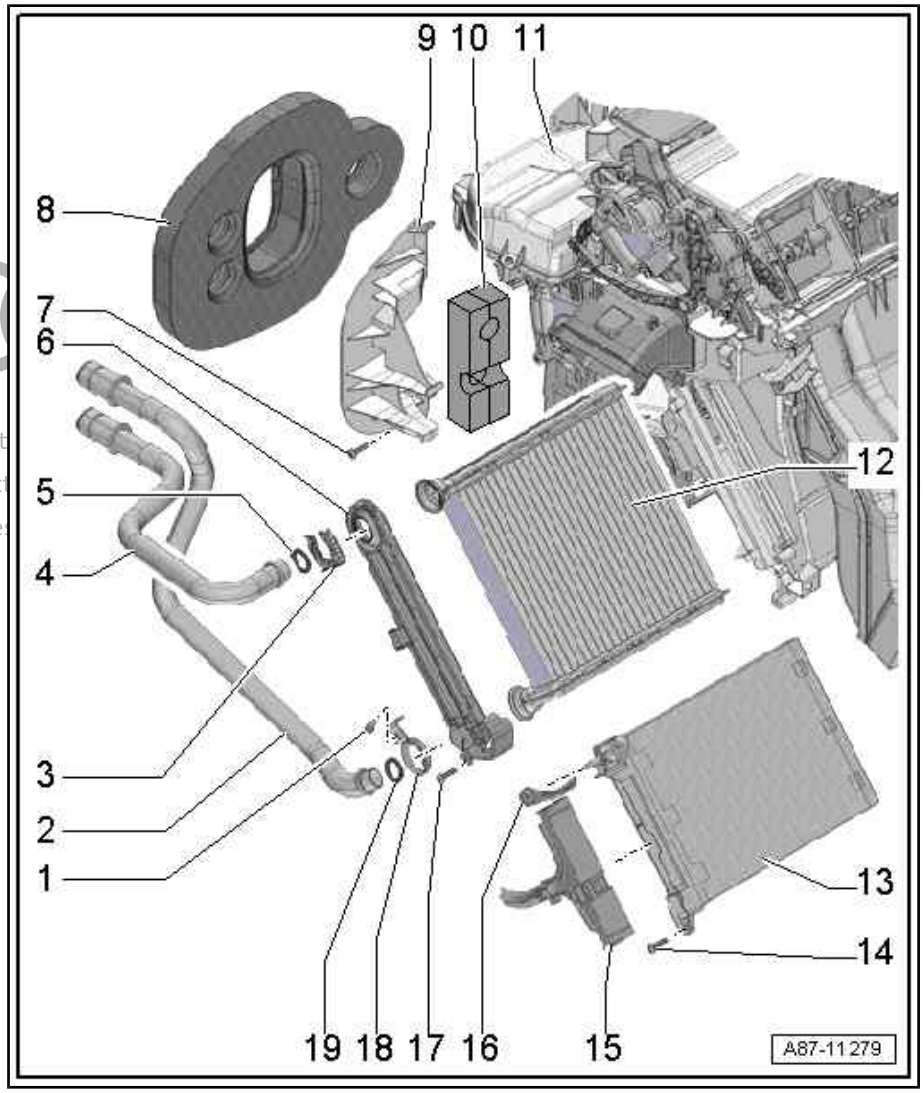
7 - Operating lever

- For warm air flap



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Exploded view - heater and air conditioning unit, heat exchanger, Valeo auxiliary air heater element



1 - Bolt

- ❑ 2 Nm

2 - Coolant pipe for heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Coolant supply from engine
- ❑ Removing and installing ⇒ page 299

3 - Clip

- ❑ Can also be replaced by a clamp in the course of service work

4 - Coolant pipe for heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Coolant return to engine
- ❑ Removing and installing ⇒ page 299

5 - O-ring

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renewing ⇒ “5.18 Removing and installing heat exchanger”, page 299

6 - Cover

- ❑ For heat exchanger

7 - Bolt

- ❑ 2 Nm

8 - Foam spacer

- ❑ For seal/insulation
- ❑ Note installation position

9 - Bracket

- ❑ For coolant pipes

10 - Foam

- ❑ For insulation
- ❑ Note installation position

11 - Heater and air conditioning unit

- ❑ The opening for the supplementary heater is sealed on vehicles without auxiliary air heater element - Z35-
- ❑ Removing and installing ⇒ page 287
- ❑ Dismantling and assembling ⇒ page 291

12 - Heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 299

13 - Auxiliary air heater element - Z35-

- ❑ Checking activation ⇒ page 8
- ❑ Removing and installing ⇒ page 298

Note

Vehicles with high-voltage system are currently not fitted with an auxiliary air heater element - Z35- ; on these vehicles, the high-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-) assumes the function of the auxiliary air heater element ⇒ "4.15 Notes on high-voltage heater (PTC) Z115 (and high-voltage heater (PTC) control unit J848)", page 85 .

14 - Bolt

- ❑ 2x
- ❑ 2 Nm

15 - Electrical wire

- ❑ For auxiliary air heater element - Z35-
- ❑ Detaching and attaching ⇒ "5.17 Removing and installing auxiliary air heater element Z35 ", page 298

16 - Earth wire

- ❑ For supplementary heater
- ❑ Nut, 9 Nm

17 - Bolt

- ❑ 3x
- ❑ 2 Nm

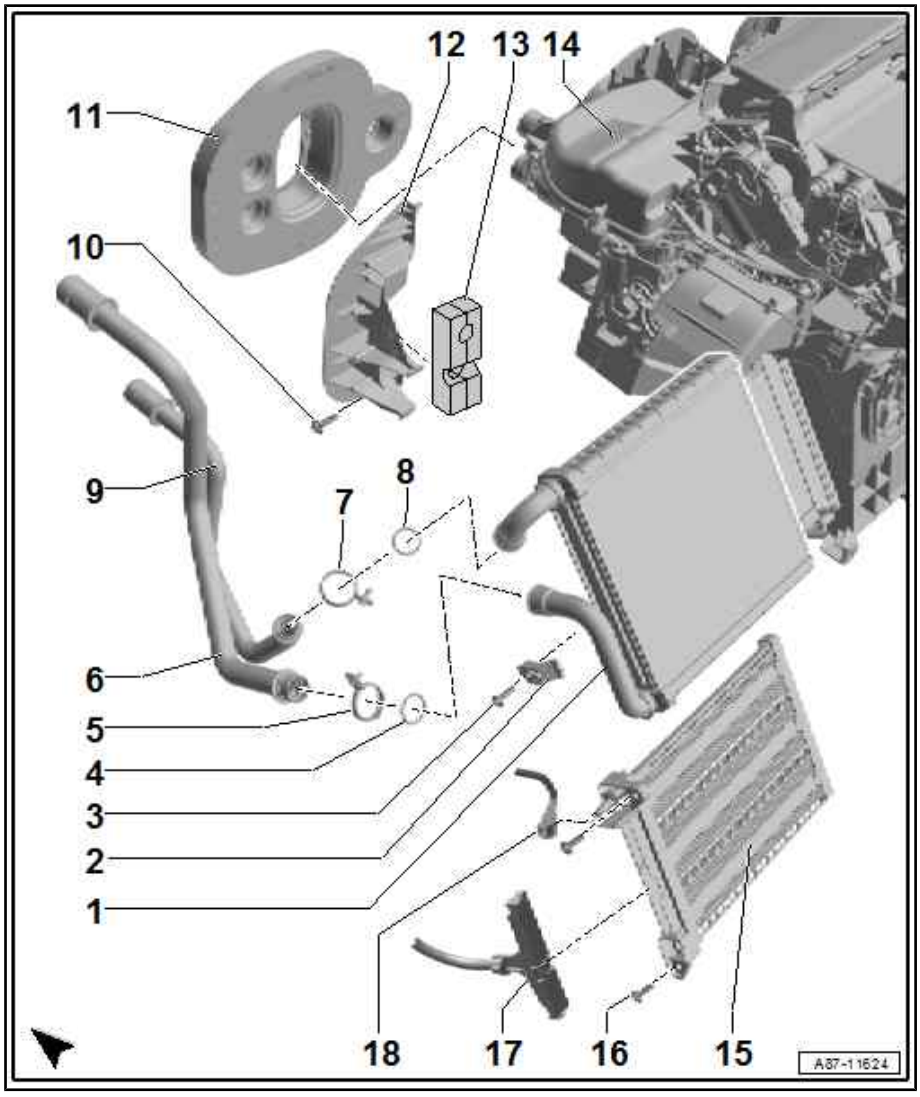
18 - Screw-type clip

19 - O-ring

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renewing ⇒ "5.18 Removing and installing heat exchanger", page 299

Exploded view - heater and air conditioning unit, heat exchanger, Denso auxiliary air heater element

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1 - Heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 299

2 - Bracket

3 - Bolt

- ❑ 2 Nm

4 - O-ring

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renewing ⇒ “5.18 Removing and installing heat exchanger”, page 299

5 - Screw-type clip

- ❑ Tightening torque for bolt: 2 Nm

6 - Coolant pipe for heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Coolant supply from engine
- ❑ Removing and installing ⇒ page 299

7 - Screw-type clip

- ❑ Tightening torque for bolt: 2 Nm

8 - O-ring

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Renewing ⇒ “5.18 Removing and installing heat exchanger”, page 299

9 - Coolant pipe for heat exchanger

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Coolant return to engine
- ❑ Removing and installing ⇒ page 299

10 - Bolt

- ❑ 2 Nm

11 - Foam spacer

- ❑ For seal/insulation
- ❑ Note installation position

12 - Bracket

- ❑ For coolant pipes

13 - Foam

- ❑ For insulation
- ❑ Note installation position

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14 - Heater and air conditioning unit

- ❑ The opening for the supplementary heater is sealed on vehicles without auxiliary air heater element - Z35-
- ❑ Removing and installing ⇒ page 287
- ❑ Dismantling and assembling ⇒ page 291

15 - Auxiliary air heater element - Z35-

- ❑ Checking activation ⇒ page 8
- ❑ Removing and installing ⇒ page 298

16 - Bolt

- ❑ 2x
- ❑ 2 Nm

17 - Electrical wire

- ❑ For auxiliary air heater element - Z35-
- ❑ Detaching and attaching ⇒ “5.17 Removing and installing auxiliary air heater element Z35 ”, page 298

18 - Earth wire

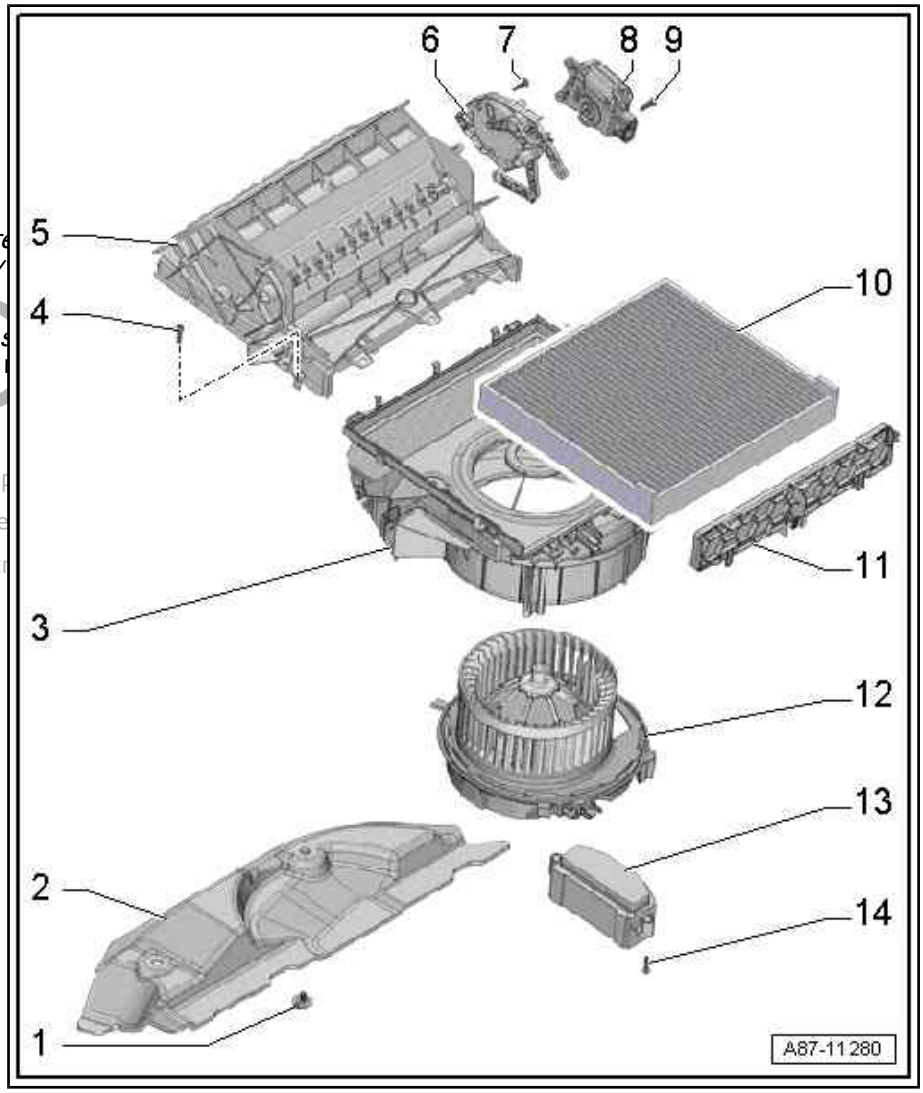
- ❑ For supplementary heater
- ❑ Nut, 9 Nm

5.2 Exploded view - attachments for heater and air conditioning unit and air intake box

Note

- ♦ *The heater and air conditioning unit is available in different versions and from different manufacturers. 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 .*
- ♦ *The following illustration shows a Valeo air intake box; distinguishing features compared to heater and air conditioning unit from other manufacturers ⇒ page 1 .*

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1 - Bolt/clip

- ❑ 2x
- ❑ Tightening torque for bolt: 1 Nm

Note

- ◆ *Different versions; re version if necessary ic parts catalogue .*
- ◆ *Use e.g. pliers or a s to prise out version*

2 - Cover

3 - Housing (top section)

4 - Bolt

- ❑ 2x
- ❑ 1 Nm

5 - Air intake duct

- ❑ With fresh air and air re-circulation flap
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 328
- ❑ Do not dismantle

6 - Actuator for fresh air and air recirculation flap

- ❑ With automatically controlled air conditioner only
- ❑ Removing and installing ⇒ page 251

7 - Bolt

- ❑ With automatically controlled air conditioner only
- ❑ 2x
- ❑ 1 Nm

8 - Control motor

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Heater and manually controlled air conditioner:

- ❑ Air recirculation flap control motor - V113- without potentiometer, with limit switches at end stops ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 242

Automatically controlled air conditioner:

- ❑ Fresh air/air recirculation, air flow flap control motor - V425- with potentiometer for fresh air/air recirculation, air flow flap control motor - G644-
- ❑ Removing and installing ⇒ page 248

9 - Bolt

- ❑ 2x
- ❑ 1 Nm

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10 - Dust and pollen filter

- ❑ Different versions ⇒ Electronic parts catalogue

Note

Not fitted with an activated charcoal filter insert at the factory on vehicles without air conditioner and vehicles with manually controlled air conditioner ⇒ page 83

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- ❑ Change interval ⇒ Maintenance tables
- ❑ Removing and installing ⇒ page 293

11 - Cover

- ❑ For dust and pollen filter

12 - Fresh air blower - V2-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 297

13 - Fresh air blower control unit - J126-

- ❑ Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Removing and installing ⇒ page 297

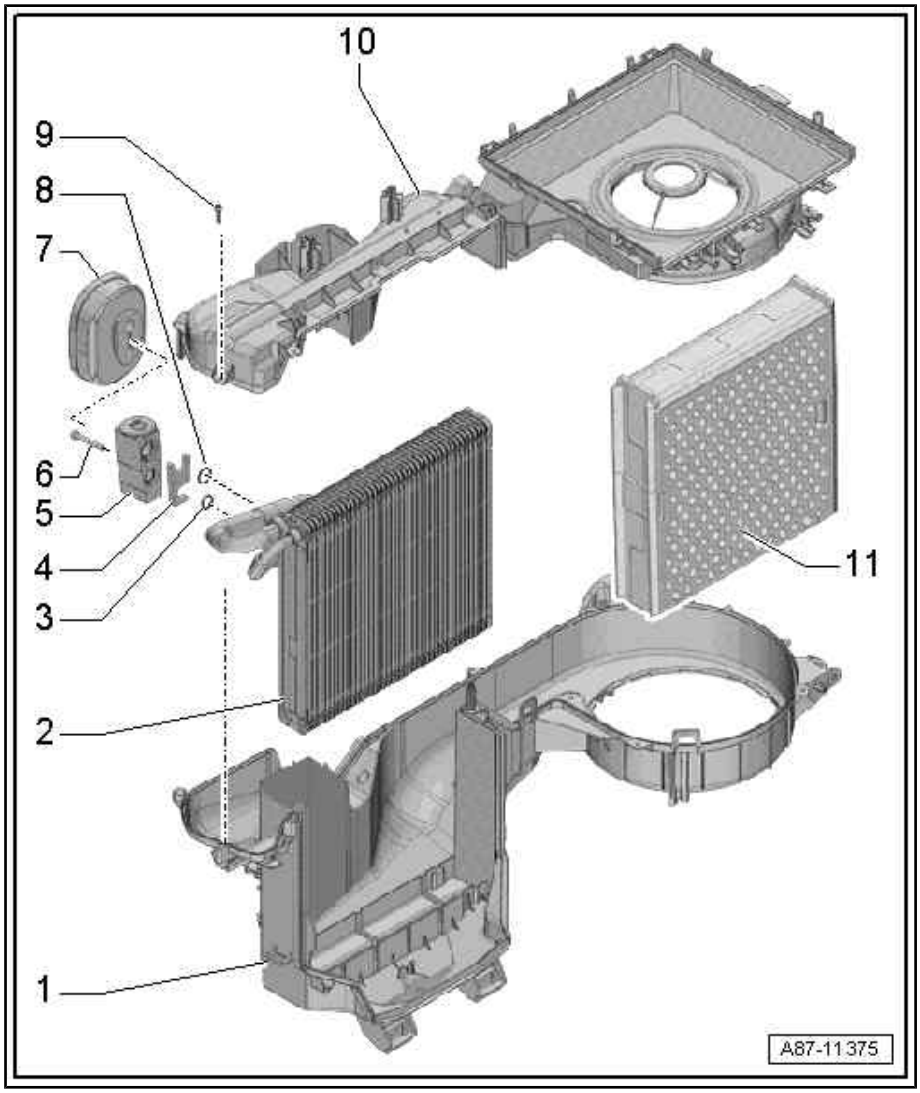
14 - Bolt

- ❑ 2x
- ❑ 1 Nm

5.3 Exploded view - evaporator housing

Note

- *The heater and air conditioning unit is available in different versions and from different manufacturers. 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 .*
- *The following illustration shows a Valeo evaporator housing; distinguishing features compared to heater and air conditioning unit from other manufacturers ⇒ page 1 .*



1 - Evaporator housing (bottom section)

2 - Evaporator

- ❑ Vehicles with air conditioner only
- ❑ Check that foam seals are not damaged and are bonded on properly
- ❑ Removing and installing ⇒ page 275

3 - O-ring

- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

4 - Retaining plate

- ❑ Vehicles with air conditioner only
- ❑ For fixing refrigerant line in position and securing expansion valve

5 - Expansion valve

- ❑ Vehicles with air conditioner only
- ❑ Exploded view ⇒ "2.2 Exploded view - condenser, air conditioner compressor, refrigerant lines and expansion valve", page 146

Note

Different versions depending on refrigerant (R134a or R1234yf) ⇒ Electronic parts catalogue

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6 - Bolt

- ❑ Vehicles with air conditioner only
- ❑ Tightening torque ⇒ Item 22 (page 153)

7 - Seal/insulation

- ❑ Heat insulation for expansion valve
- ❑ On vehicles without an air conditioner, there is no opening for the expansion valve in the seal in the plenum chamber back panel, or it is sealed off by a foam pad.

8 - O-ring

- ❑ Vehicles with air conditioner only
- ❑ Renew; for correct version refer to ⇒ Electronic parts catalogue
- ❑ Before installing, lubricate with refrigerant oil ⇒ page 81

9 - Bolt

- ❑ 8x
- ❑ 1.5 Nm

10 - Evaporator housing (top section)

11 - Honeycomb element

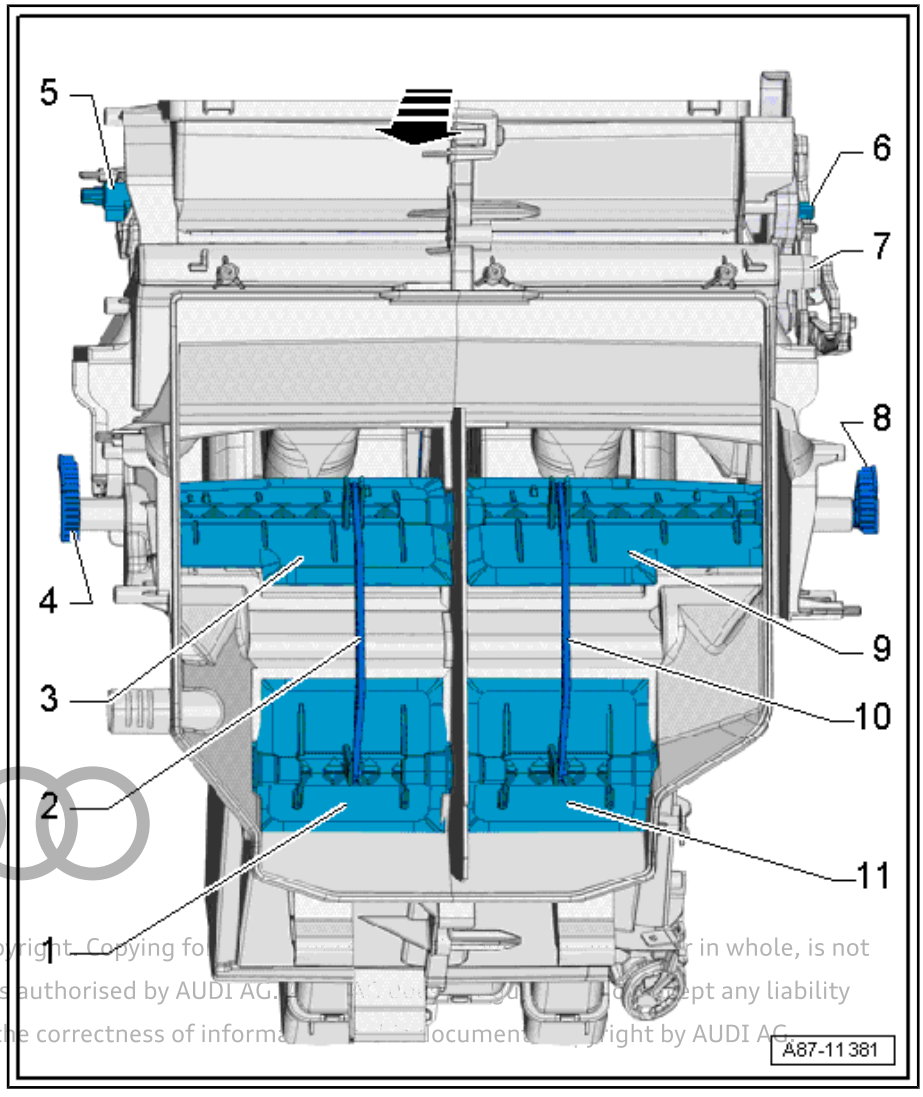
- ❑ Only fitted on vehicles with heater (without air conditioner)

5.4 Exploded view - flaps and partitions in air distribution housing

View from front

Note

- ♦ *-Arrow- = direction of travel*
- ♦ ⇒ *"5.1 Exploded view - heater and air conditioning unit", page 262*



1 - Warm air flap (right-side)

- ❑ From heat exchanger
- ❑ Activated via cold air flap (right-side)

2 - Operating lever

- ❑ For flap control

3 - Cold air flap (right-side)

- ❑ From evaporator
- ❑ Different versions

Heater unit and manually controlled air conditioner

- ❑ Activated jointly via shaft of cold air flap (left-side) by temperature flap control motor -V68- via actuating lever (left-side)

Automatically controlled air conditioner

- ❑ Activated by temperature flap control motor -V159- via actuating lever (right-side)

4 - Actuating lever (right-side) for temperature control flap

- ❑ Depending on version
- ❑ Automatically controlled air conditioner only
- ❑ Activated by temperature flap control motor -V159-

5 - Actuating lever of defroster flap

- ❑ To windscreen and door windows
- ❑ Depending on version
- ❑ Automatically controlled air conditioner only
- ❑ Activated by defroster flap control motor -V107-

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6 - Actuating lever of defroster flap

- ❑ To windscreen and door windows
- ❑ Depending on version
- ❑ Heater unit and manually controlled air conditioner only
- ❑ Activated by air distribution flap control motor -V428- via defroster and air distribution actuator

7 - Actuating lever for air distribution flap

Heater unit and manually controlled air conditioner

- ❑ Activated by air distribution flap control motor -V428- via defroster and air distribution actuator

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Automatically controlled air conditioner

- ❑ Activated by front air distribution flap control motor -V426- via defroster and air distribution actuator

8 - Actuating lever (left-side)

Heater unit and manually controlled air conditioner

- ❑ Activated by temperature flap control motor -V68-

Automatically controlled air conditioner

- ❑ Activated by temperature flap control motor -V158-

9 - Cold air flap (left-side)

- ❑ From evaporator
- ❑ Different versions

Heater unit and manually controlled air conditioner

- ❑ Activated by temperature flap control motor -V68- via actuating lever (left-side)

Automatically controlled air conditioner

- ❑ Activated by temperature flap control motor -V158- via actuating lever (left-side)

10 - Operating lever

- ❑ For flap control

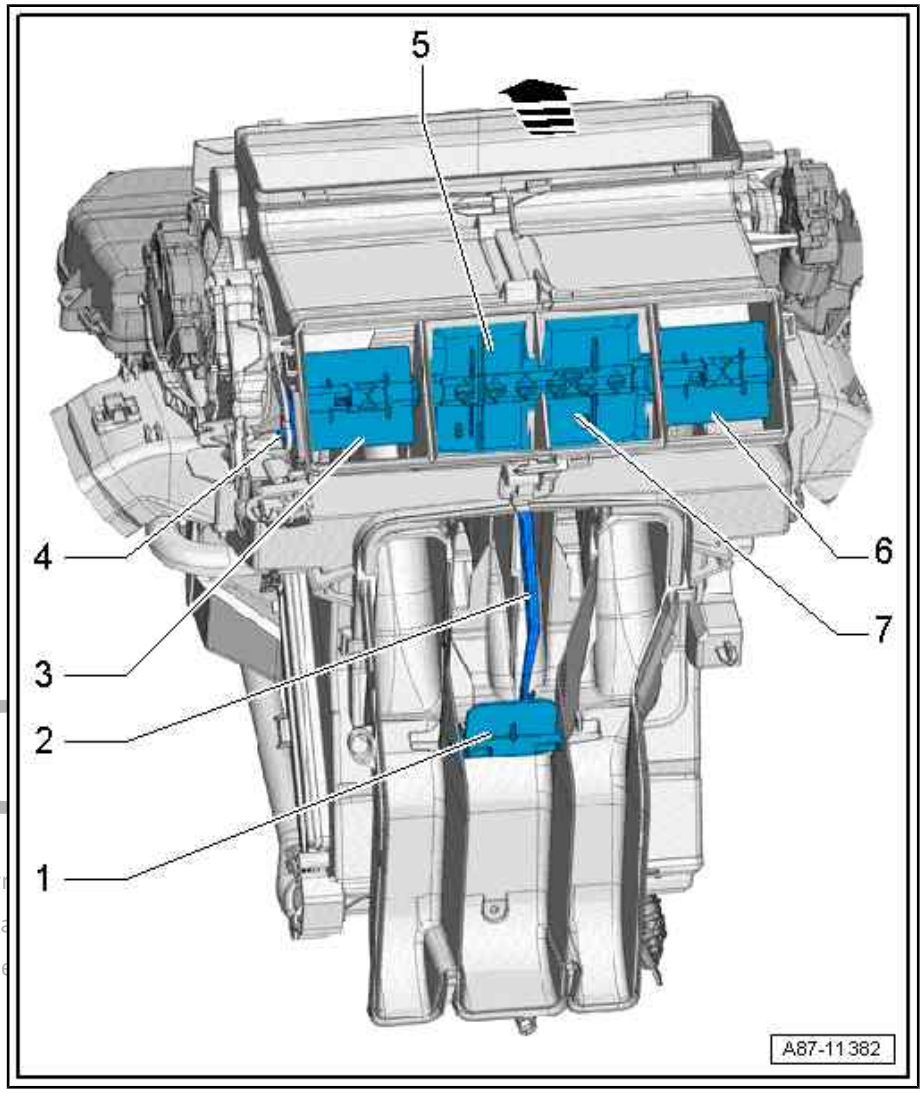
11 - Warm air flap (left-side)

- ❑ From heat exchanger
- ❑ Activated via cold air flap (left-side)

View from rear

Note

- *-Arrow- = direction of travel*
- *⇒ "5.1 Exploded view - heater and air conditioning unit", page 262*



1 - Flap for air duct (rear)

- ❑ Depending on version

Heater unit and manually controlled air conditioner

- ❑ Air duct is sealed with a plug
- ❑ Depending on manufacturer, not always fitted on version with heater and manually controlled air conditioner (not required as air duct is sealed off)

Automatically controlled air conditioner

- ❑ For centre console vent

2 - Operating lever

- ❑ For flap control
- ❑ Equipment-specific (with automatically controlled air conditioner)
- ❑ Not always fitted on version with heater unit and manually controlled air conditioner

⇒ Item 1 (page 275)

3 - Flap (left-side) for dash panel vent (left-side)

4 - Operating lever

- ❑ For activation of vent flaps
- ❑ Activated via actuator

5 - Flap (left-side) for dash panel vent (centre)

6 - Flap (right-side) for dash panel vent (right-side)

7 - Flap (right-side) for dash panel vent (centre)

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5.5 Removing and installing evaporator

WARNING

Danger from escaping pressurised refrigerant.

Danger of frostbite on skin and other parts of the body.

- *Extract the refrigerant and then immediately open up the refrigerant circuit.*
- *Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.*

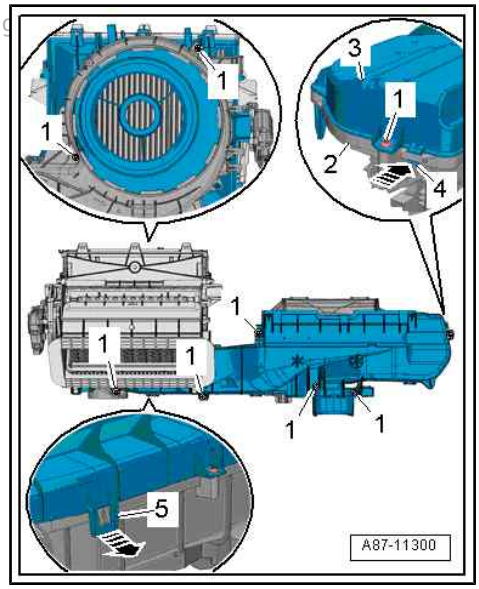
Note

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

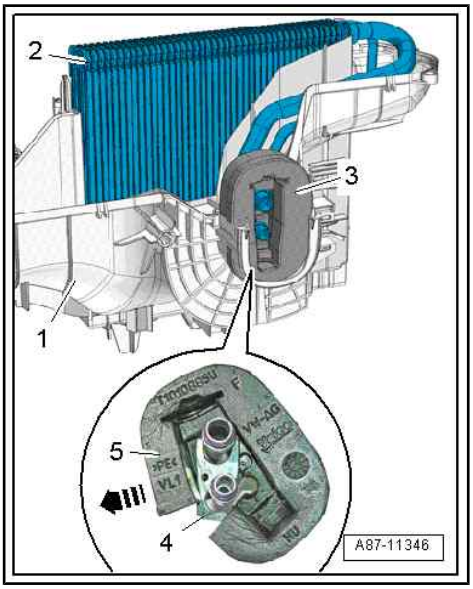
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Removing

– Remove heater and air conditioning unit ⇒ page 287 .
– Remove fresh air blower - V2- ⇒ page 296 .
– Remove intake duct ⇒ page 328 .
– Remove coolant pipes from heat exchanger ⇒ page 310 .
– Separate air distribution housing and evaporator housing.
– Remove bolts -1-.
– Release retaining tabs -4 and 5- -arrows-.
– Detach top section of evaporator housing -3- from bottom section -2-.



– Pull evaporator -2- out of evaporator housing (bottom section) -1-.
– Remove expansion valve ⇒ page 171 .
– Detach seal/insulation -3-; to do so, pull movable part -5- to the side -arrow-.
– Detach locking element -4- for refrigerant lines.



Installing

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

- Tightening torque
  ⇒ “5.3 Exploded view - evaporator housing”, page 271

Note

Even very small leaks at the "tongue-and-groove" joint between the top and bottom sections of the evaporator housing can lead to whistling noises caused by escaping air. For this reason, lubricate the connection points lightly with silicone grease or similar to completely seal the connection points. For silicone grease, refer to ⇒ Electronic parts catalogue

– 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 .
– Start up air conditioner after charging refrigerant circuit ⇒ page 199 .
– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

5.6 Cleaning evaporator

⇒ “5.6.1 Cleaning evaporator with an ultrasonic A/C cleaner”, page 277

⇒ “5.6.2 Cleaning evaporator using pressure-feed spray gun V.A.G 1538 and spray lance”, page 280

5.6.1 Cleaning evaporator with an ultrasonic A/C cleaner

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Note

There are numerous evaporator cleaning methods with different effects available on the market. For the cleaning method for e.g. the evaporator currently checked and approved by Audi, use an ultrasonic A/C cleaner and a pressure-feed spray gun. Other methods checked and approved by Audi and the corresponding information can be found e.g. in the “Audi ServiceNet” (⇒ “2.3 Notes on odours in vehicles with air conditioner”, page 6).

Special tools and workshop equipment required

- Ultrasonic A/C cleaner - VAS 6189A- (for currently available ultrasonic A/C cleaners, refer to ⇒ Electronic parts catalogue)
- Cleaning fluid - VAS 6189/1-

- Vacuum cleaner attachment - VAS 6288-
- Vacuum cleaner (commercially available)

Procedure

– Check whether the air conditioning unit evaporator is really the source of the odour by switching from fresh air to air recirculation mode
⇒ “2.3 Notes on odours in vehicles with air conditioner”, page 6 .

– Check and if necessary clean plenum chamber water drain
⇒ page 333 .

– Remove dust and pollen filter ⇒ page 293 .

– Clean installation slot for dust and pollen filter.

– Seal opening for dust and pollen filter at air conditioning unit.

– Start engine.

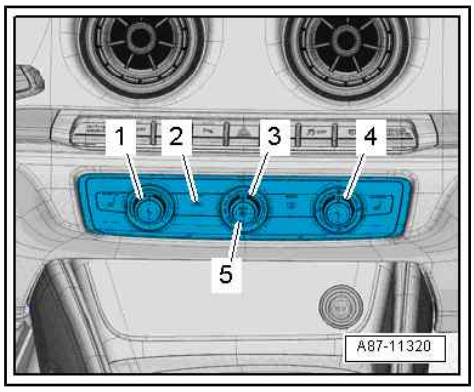
– Close windows, sun roof and rear lid.

– Open all dash panel vents.

Vehicles with manually controlled air conditioner:

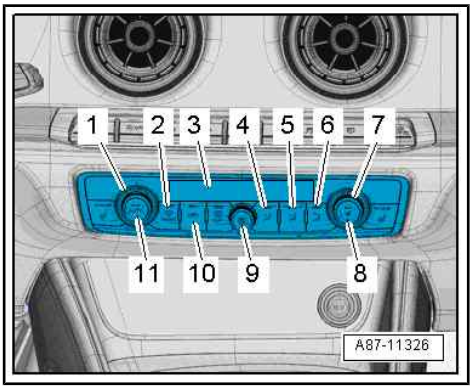
– Make the following settings on the operating unit (air conditioning system control unit - J301-):

- Air conditioner compressor off: Lamp in AC or A/C button -5- is off.
- Set rotary temperature control -1- to “cold” stop.
- Press Air recirculation button -2-: Lamp lights up.
- Set rotary control -3- for fresh air blower to speed “1”.
- Set rotary control -4- for air distribution to “Dash panel vents”.



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Vehicles with automatically controlled air conditioner:



– Make the following settings on the operating unit (Climatronic control unit - J255-):

- Air conditioner compressor off: Lamp in AC or A/C button -11- is off.
- Set temperature to “cold” using rotary controls -1 and 7-: “LO” display for driver and passenger side in display -3- of -J255- .
- Press buttons -5 and 6- for dash panel vents.
- Set rotary control -9- for fresh air blower to minimum speed: -V2- runs at minimum speed.

All vehicles (continued):

– Shake bottle of cleaning fluid - VAS 6189/1- and pour fluid into ultrasound A/C cleaner - VAS 6189A- .

Note

For information on how to use the ultrasound A/C cleaner, refer to the ⇒ Operating instructions of -VAS 6189A- .

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– Position ultrasound A/C cleaner - VAS 6189A- in front passenger's footwell.

– Start up ultrasound A/C cleaner - VAS 6189A- (in accordance with operating instructions) and position outlet hose so that vapour emerging is drawn in by fresh air blower - V2- via opening for air recirculation of air conditioning unit (in passenger's footwell behind glove box).

– Close vehicle doors.

Note

The cleaning procedure takes 15 to 20 minutes. It is completed when no further vapour emerges from the outlet hose of the ultrasound A/C cleaner - VAS 6189A- .

– Switch off ultrasonic A/C cleaner - VAS 6189A- .

– Open vehicle doors and vent vehicle for at least 10 minutes.

– Remove ultrasound A/C cleaner - VAS 6189A- from vehicle and clean it.

– Switch off ignition.

– Install dust and pollen filter ⇒ page 293 .

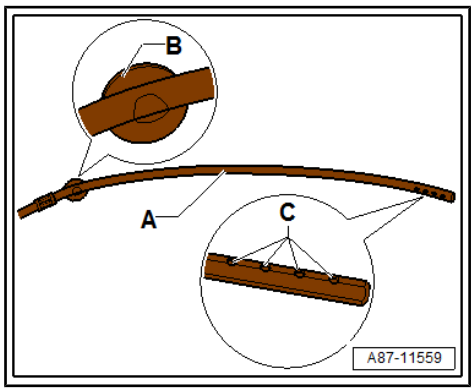
5.6.2 Cleaning evaporator using pressure-feed spray gun - V.A.G 1538- and spray lance

Note

There are numerous evaporator cleaning methods with different effects available on the market. For the cleaning method for e.g. the evaporator currently checked and approved by Audi, use an ultrasonic A/C cleaner and a pressure-feed spray gun. Other methods checked and approved by Audi and the corresponding information can be found e.g. in the "Audi ServiceNet" (*⇒ "2.3 Notes on odours in vehicles with air conditioner", page 6* *).*

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- -A- (short version: approx. 500 mm, curved or probe - VAS1538/9- as specified for this vehicle); for currently available probes, refer to ⇒ Electronic parts catalogue



- Cleaning solution for evaporator in air conditioner "D 600 100 A2" (for currently available cleaning fluids, refer to ⇒ Electronic parts catalogue)
- Vacuum cleaner attachment - VAS 6288-
- Vacuum cleaner (commercially available)

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WARNING

Other materials can form deposits in the air conditioning unit.

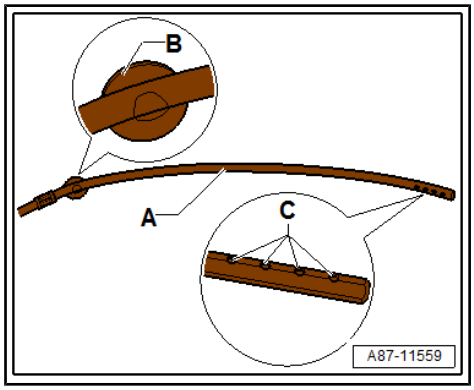
- ***Only use pressure-feed spray guns and spray lances that have not been used with other fluids.***

Note

- *The vacuum cleaner is only required if dirt has accumulated in the plenum chamber or the intake shaft of the air conditioner, or if dirt has entered the evaporator housing through the dust and pollen filter.*
- *The suction nozzle - VAS 6288- is only required if dirt has entered the evaporator housing through the dust and pollen filter.*
- *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.*

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Recommended bend radius of spray lance VAG 1538/5 (short) -A- for this vehicle



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.*
- *Spray lance V.A.G 1538/5 -A- with this bend radius is also compatible with the following additional vehicles, for example: Audi A1 from 2011 onwards, Audi A4 from MY 2008 onwards, Audi A5 from MY 2008 onwards, Audi Q5 from MY 2009 onwards, Audi A6 from 2011 onwards, Audi A7 from 2011 onwards and Audi A8 from 2010 onwards.*

Preparations

– Switch on ignition.

– Open all dash panel vents.

– Switch on air conditioner.

– Check whether the air conditioning unit evaporator is really the source of the odour by switching from fresh air to air recirculation mode
⇒ “2.3 Notes on odours in vehicles with air conditioner”, page 6 .

Note

- *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).*

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– Set 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 fresh air blower - V2- ⇒ page 297 .

– Remove and check dust and pollen filter; renew if necessary after cleaning evaporator ⇒ page 293 .

Note

We recommend renewing the used dust and pollen filter every time the evaporator is cleaned.

– Check the area between the dust and pollen filter and the mounting slot for the fresh air blower - V2- in the evaporator housing for contamination and clean it if necessary
⇒ page 297 .

– Check plenum chamber and water drain of plenum chamber and clean if necessary ⇒ page 333 .

Note

Prior to cleaning, check and, if necessary, clean the water drains in the plenum chamber as described in the Workshop Manual.

– Place a drip tray under vehicle to collect cleaning fluid draining from condensation drain (for location of condensation drain opening, refer to ⇒ “5.20 Checking condensation drain hose”, page 313).
– Cover floor in passenger footwell with waterproof sheeting and absorbent paper.

Cleaning evaporator

WARNING

The cleaning fluid is flammable, vapours can combine with the air to form an explosive mixture.

- *Keep away from ignitions sources; do not smoke.*
- *Use the cleaning fluid only in well ventilated areas.*

Cleaning fluid poses a potential health hazard!

Wear safety goggles to protect your eyes.

- *Use safety equipment such as safety goggles and gloves.*
- *Keep an eye-bath to hand.*
- *Should cleaning fluid come into contact with your eyes, rinse them thoroughly with cold or lukewarm water for about 15 minutes.*
- *Then apply eye drops and consult a doctor immediately, even if your eyes do not hurt.*
- *Inform the doctor which cleaning fluid made contact with your eyes.*

Wear rubber gloves to protect your hands.

- *Use safety equipment such as safety goggles and gloves.*
- *If cleaning fluid comes into contact with your hands or skin, wash with water and soap and then rinse thoroughly.*

Never swallow cleaning fluid, and do not inhale cleaning fluid vapours.

- *Use the cleaning fluid only in well ventilated areas.*
- *If liquid cleaning agent has been swallowed, do not induce vomiting; consult a doctor immediately.*
- *Inform the doctor which type of cleaning agent was swallowed.*

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Caution

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.*

- The ignition (and therefore the air conditioner) is switched off.
- Preliminary work has been carried out and affected components are removed ⇒ page 282 .

– Connect spray lance to pressure-feed spray gun 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).

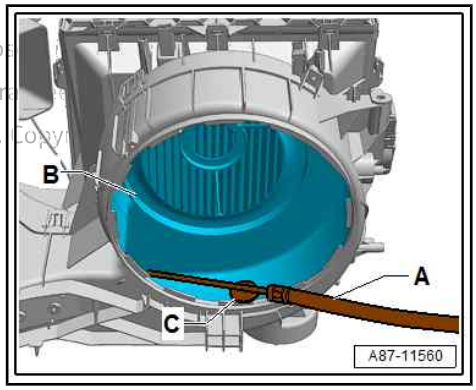
Note

Setting this pressure on the compressed-air supply means that the spray lance has an operating pressure between 3.5 and 4 bar.

– Connect pressure-feed spray gun VAS 1538 to compressed-air supply.

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– Insert spray lance -A- through opening for removed fresh air blower - V2- -B- and into evaporator housing with spray direction towards evaporator.



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Note

The spray direction is fixed by the guide washer -C- on the spray lance -A-.

Caution

Ensure that no cleaning fluid escapes from the evaporator housing of the air conditioning unit into the passenger compartment during cleaning.

- ***Cover the area under the spray lance in the evaporator housing with absorbent paper.***
- ***After spraying about 0.1 to 0.2 litres of cleaning fluid, check that it actually drains through the condensation drain and into the drip tray under the vehicle. If the fluid only drips out, the condensation drain must be cleaned before the cleaning process can continue***
  ⇒ "5.20 Checking condensation drain hose", page 313 .

– Clean and rinse evaporator and surrounding area of housing with cleaning solution by operating metering lever on pressure-feed spray gun and moving spray lance -A- back and forth.

Note

- *The dirty cleaning agent runs out through the condensation drain.*
- *During the cleaning process, always check that the cleaning fluid is flowing out through the condensation drain.*

– Use entire contents of pressure-feed spray gun to clean evaporator.

– Remove drip tray and dispose of collected cleaning agent.

Note

Used cleaning agent can be disposed of e.g. via the wastewater disposal system (observe official local regulations) ⇒ Audi ServiceNet, HSO Environmental Protection (or ⇒ Volkswagen ServiceNet, Handbooks, Service Handbook; Environmental Protection, Emission Control).

Allow at least 30 minutes for cleaning solution to take effect.

Note

The removed components can be installed again during this time.

– 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.
– Adjust direction of air flow on all vents using air conditioner operating unit.
– Set fresh air blower - V2- to maximum speed on air conditioner operating unit.
– Then start engine and switch on air conditioner (indicator lamp in AC or A/C button lights up).
– Allow air conditioner to run on this setting for approx. 10 minutes (air conditioner compressor is switched on), switching vent temperature setting on air conditioner operating unit from cold to warm and back several times.

5.7 Removing and installing evaporator output temperature sender - G263-

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Note

Vehicles with air conditioner only. On vehicles with a heater, the opening in the heater is sealed off.

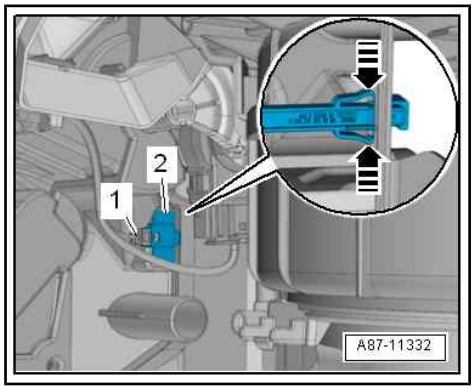
Removing

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

Note

Right-hand drive vehicles: 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) .

– Release retaining tabs -arrows- with a narrow screwdriver.
– Pull evaporator output temperature sender - G263- -item 2- out of housing.
– Unplug electrical connector -1-.



Installing

Installation is carried out in reverse sequence.

5.8 Removing and installing vent temperature sender -G150- / -G151-

Note

Vehicles with automatically controlled air conditioner only. On vehicles with a heater or manually controlled air conditioner, the openings in the air ducts are sealed with plugs.

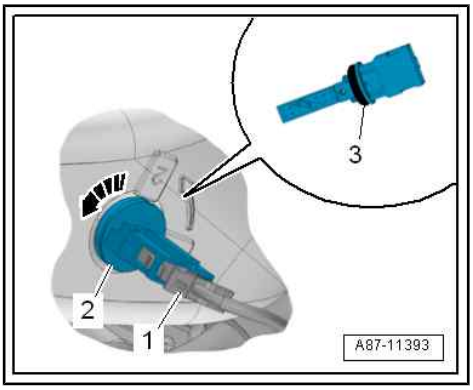
Removing

– Left vent temperature sender - G150- (driver side): Remove dash panel trim (driver side) ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing dash panel trim .

– Right vent temperature sender - G151- (passenger side): Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Turn vent temperature sender -2- anti-clockwise -arrow- and pull it out of mounting.

– Unplug electrical connector -1-.



Installing

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

– Renew seal -3- if damaged or defective.

Note

An incorrectly installed vent temperature sender will cause flow noise.

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

5.9 Removing and installing heater and air conditioning unit

Note

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

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Special tools and workshop equipment required

- Hose clamps up to 25 mm - 3094-
- Engine bung set - VAS 6122-
- Commercially available compressed-air gun

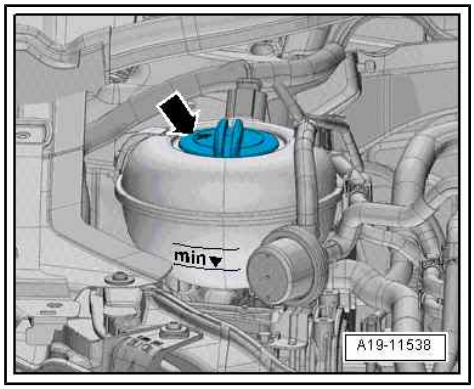
Removing

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

– Switch on ignition.

– Move front seats as far back as they will go and extend MMI display ⇒ Infotainment/MMI Operating Manual .

– Switch off ignition.



WARNING

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.

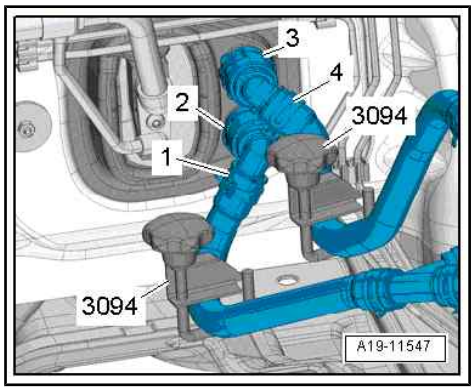
- ***Put on protective gloves.***
- ***Put on safety goggles.***
- ***Cover filler cap on expansion tank with a cloth and open carefully to release pressure.***

– Open filler cap -arrow- on coolant expansion tank.

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

– Vehicles with air conditioner: Disconnect refrigerant line with internal heat exchanger at expansion valve ⇒ “2.13 Removing and installing refrigerant lines with internal heat exchanger”, page 189 .

– Mark installation position of coolant hoses -1 and 4-.

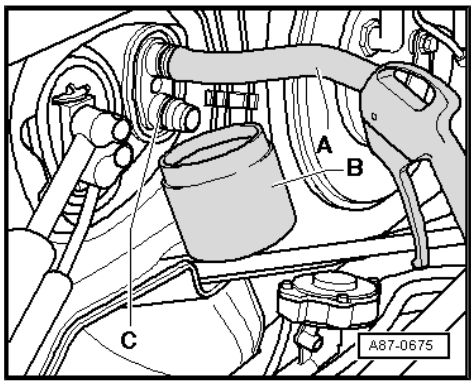


Note

The heat exchanger is designed for a certain coolant flow direction. Therefore it is important to connect the coolant hoses correctly.

– Clamp off coolant hoses using hose clamps -3094- .

– Lift retaining clips -2 and 3- and detach coolant hoses from heat exchanger for heater.



– Fit a short hose -A- to upper connection.

– Insert compressed air gun in end of hose.

– Hold container -B- under lower connection -C- and carefully blow coolant out of heat exchanger with compressed-air gun.

– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

– Remove footwell vent (rear) ⇒ page 326 .

– Remove centre tube for dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Centre tube for dash panel .

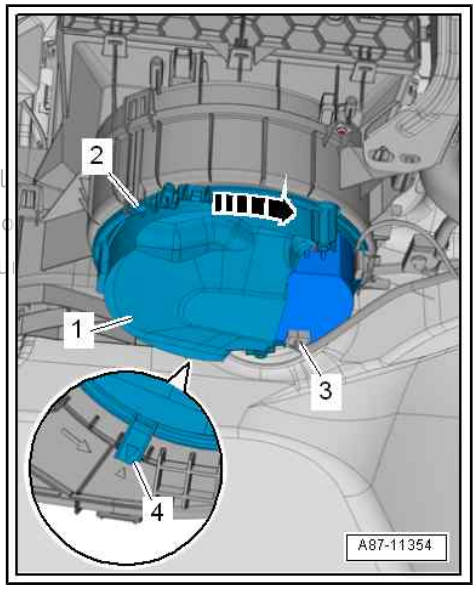
– If fitted: Remove entry and start authorisation control unit - J518- ⇒ Electrical system; Rep. gr. 94 ; Entry and start authorisation; Overview - entry and start authorisation system .

– If fitted: Remove air duct to rear vent ⇒ page 327 .

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– Unplug electrical connector -3- at fresh air blower -1-.
– Protect floor covering beneath heater and air conditioning unit with absorbent paper.

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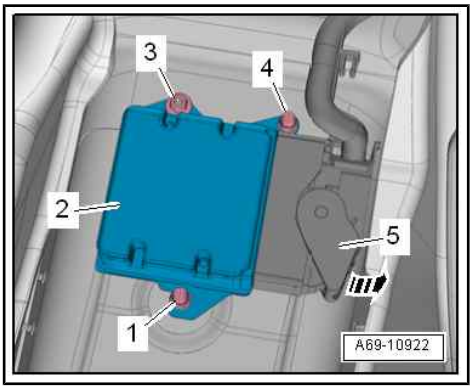


– Remove airbag control unit ⇒ General body repairs, interior; Rep. gr. 69 ; Airbag control unit; Exploded view - airbag control unit .

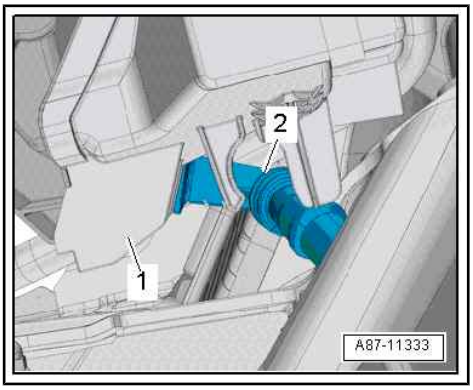
WARNING

Risk of airbag control unit malfunctioning due to corrosion in electrical connector.

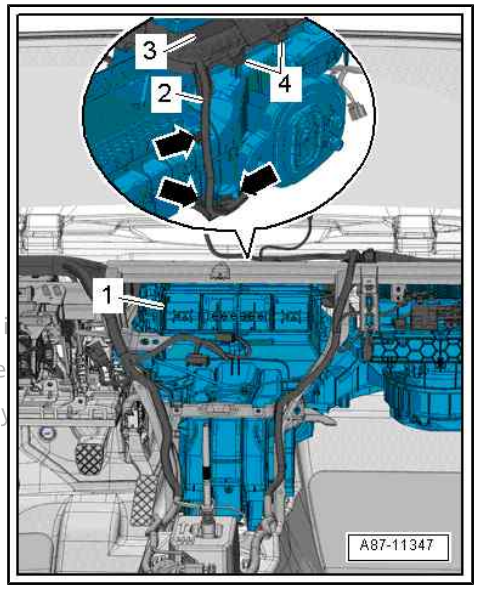
- ***After unplugging connector for airbag control unit, cover it or seal it off to prevent the ingress of moisture.***



– Detach condensation drain -2- from heater and air conditioning unit -1-.



– Detach heater and air conditioning unit -1- from retainers.
– Move duct -3- clear.
– Move wiring harness -2- clear at mountings -4- -arrows-.
– Take heater and air conditioning unit out towards right.



Installing

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

Note

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Renew O-rings.

– Top up coolant ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
– Vehicles with air conditioner: Evacuate and charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit (Air conditioner with refrigerant R134a; Refrigerant circuit; Working with the air conditioner service station), or ⇒ Air conditioner with refrigerant R1234yf - General notes; Rep. gr. 87 ; Working with the air conditioner service station .
– Vehicles with air conditioner: Start up air conditioner after charging refrigerant circuit ⇒ page 199 .
– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
– As a final step, check operation of heater/air conditioner.

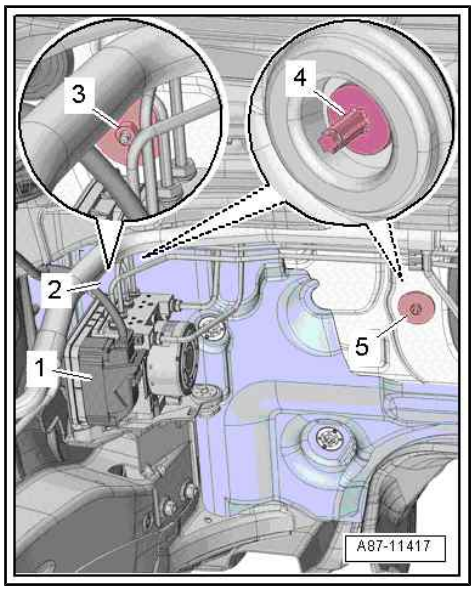
5.10 Removing and installing retainers for heater and air conditioning unit

Note

Leave the retainers in the vehicle when removing the heater and air conditioning unit.

Removing

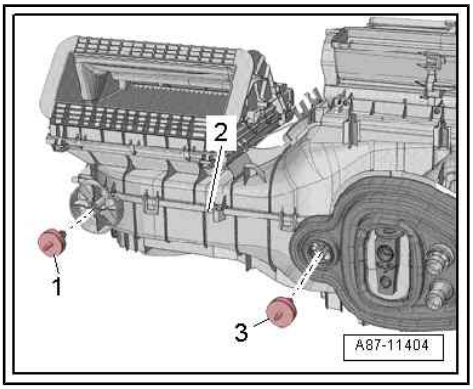
– Remove heater and air conditioning unit ⇒ page 287 .
– Unplug electrical connector -1-.
– Fold heat insulation -2- behind ABS unit to the side.
– Unscrew nuts -3 and 5-.
– Detach retainers -4- in passenger compartment.



Note

The refrigerant pipe with internal heat exchanger must be removed if the nut above the ABS unit is not accessible as described ⇒ page 189 .

Installing



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

- Tightening torque
  ⇒ “5.11 Dismantling and assembling heater and air conditioning unit”, page 291

– Insert retainers -1 and 3- in mounting on heater and air conditioning unit -2- and place air conditioning unit in installation position.

– Install heater and air conditioning unit ⇒ page 287 .

– Tighten nuts at retainers.

– Install remaining components.

– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

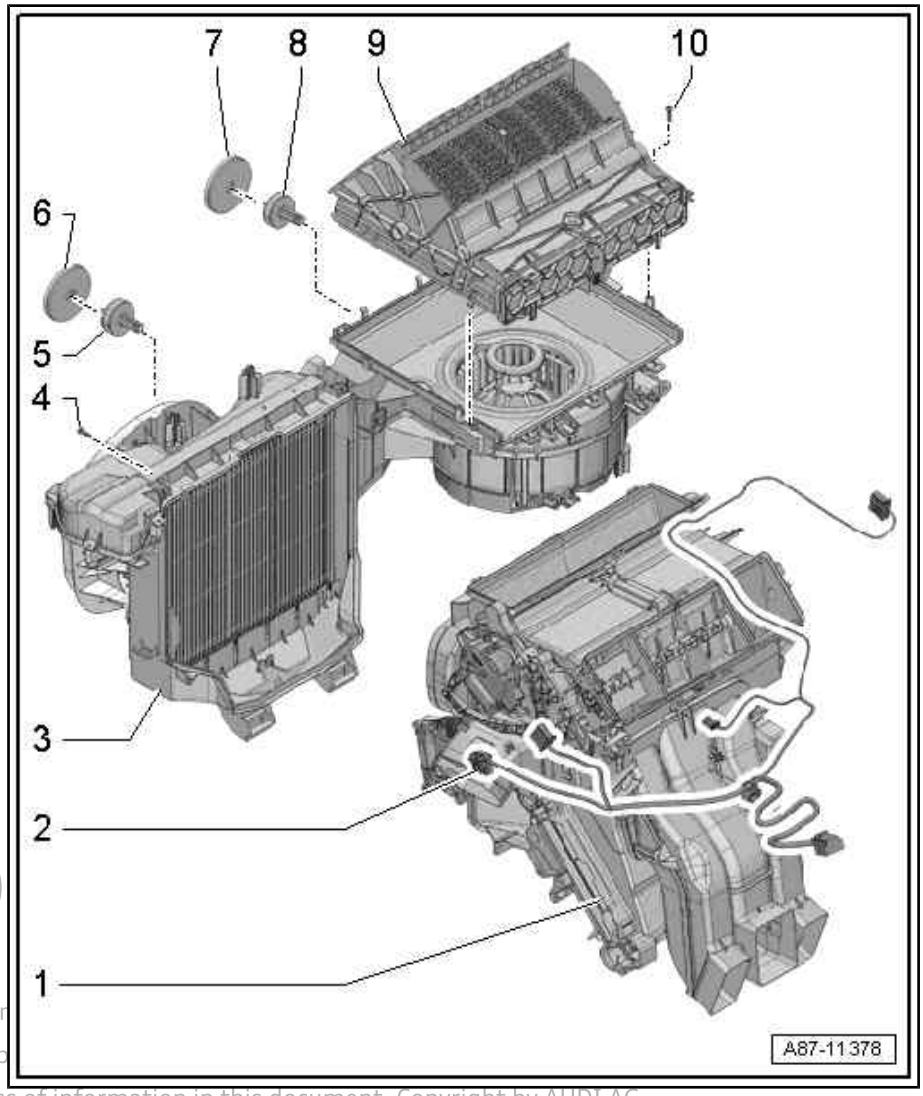
– As a final step, check operation of heater/air conditioner.

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5.11 Dismantling and assembling heater and air conditioning unit

Note

- *The heater and air conditioning unit is available in different versions and from different manufacturers. 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 .*
- *The following illustrations show a Valeo heater/air conditioning unit; distinguishing features compared to heaters from other manufacturers ⇒ page 1 .*



1 - Air distribution housing

- ❑ Different versions ⇒ page 1
- ❑ It is not permissible to combine components from different manufacturers ⇒ “1.1 Identification of heater and air conditioning unit”, page 1
- ❑ The following illustrations show a Valeo heater.
- ❑ With or without auxiliary air heater element -Z35- , depending on equipment
- ❑ Distinguishing features of components from different manufacturers ⇒ page 1
- ❑ Removing and installing ⇒ page 293

2 - Electrical wiring harness

- ❑ Different versions ⇒ Electronic parts catalogue

3 - Evaporator housing

- ❑ Exploded view ⇒ page 271

4 - Bolt

- ❑ 3x
- ❑ 1 Nm

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5 - Retainer (left-side)

- ❑ For heater and air conditioning unit
- ❑ Removing and installing ⇒ page 290

6 - Nut

- ❑ 4.5 Nm

7 - Nut

- ❑ 4.5 Nm

8 - Retainer (right-side)

- ❑ For heater and air conditioning unit
- ❑ Removing and installing ⇒ page 290

9 - Air intake box

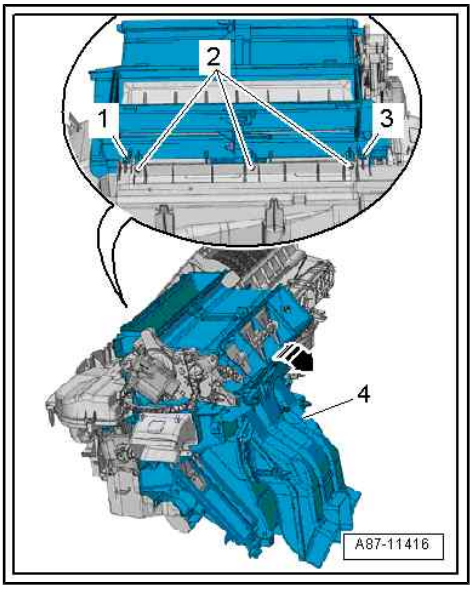
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Exploded view ⇒ page 269

10 - Bolt

- ❑ Tightening torque ⇒ Item 4 (page 270)

5.12 Removing and installing air distribution housing

Removing



– Remove heater and air conditioning unit ⇒ page 287 .
– Remove coolant pipes from heat exchanger ⇒ page 299 .
– Unplug electrical connector at fresh air and air recirculation flap control motor and move wiring harness clear.
– Remove bolts -2-.

Note

Five bolts -2- are currently fitted (three at top and two in lower area).

– Release retaining tabs -1 and 3-.
– Swivel air distribution housing -4- to rear -arrow- and disengage it.

Installing

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

- Tightening torque
⇒ “5.11 Dismantling and assembling heater and air conditioning unit”, page 291

Note

Even very small leaks at the "tongue-and-groove" joint between the air distribution housing and the evaporator housing can lead to whistling noises caused by escaping air. For this reason, lubricate the connection points lightly with silicone grease or similar to completely seal the connection points. For silicone grease, refer to ⇒ Electronic parts catalogue

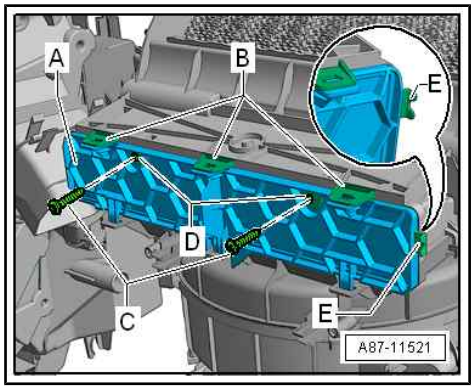
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– Install heater and air conditioning unit ⇒ page 287 .
– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
– As a final step, check operation of heater/air conditioner.

5.13 Removing and installing dust and pollen filter

Special tools and workshop equipment required

- Hook - T40207- (only necessary if there is no hook -E- on service cover -A-)



- Commercially available vacuum cleaner (only for vehicles exposed to high levels of dust or dirt)
- Cover plate - T10532- (only for vehicles exposed to high levels of dust or dirt)

Note

- *If the retaining tabs -B- for the service cover -A- have broken off at the heater/air conditioning unit or at the service cover, the service cover -A- can also be attached to the heater/air conditioning unit using two collar bolts -C- (e.g. 3.5 x 16 mm or 4.0 x 16 mm) and two corresponding washers ⇒ Electronic parts catalogue . To do so, drill holes (4.5 mm diameter) in the service cover -A- at both attaching points marked -D-.*
- *The service cover -A- is provided with a hook -E- for removing the dust and pollen filter. If there is no hook -E-, use hook - T40207- instead.*
- *From model year 2017 onwards, Audi A3 vehicles are gradually fitted with a dust and pollen filter with bioactive substances (from the start of production onwards on Audi Q2 vehicles). These bioactive substances reduce the amount of allergens in the air flowing through the filter. These filters can be retrofitted in all vehicles ⇒ Electronic parts catalogue .*

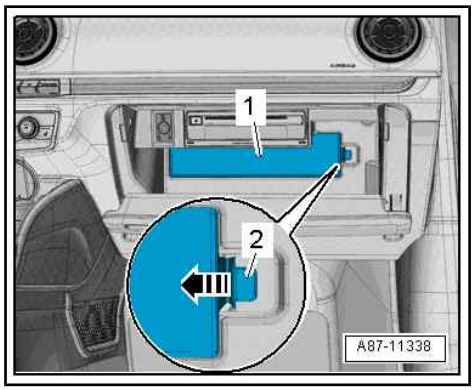
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Removing

Caution

Always handle the customer's belongings in the glove box with care.

- ***Store any items taken out of the glove box in a sealable plastic bag.***



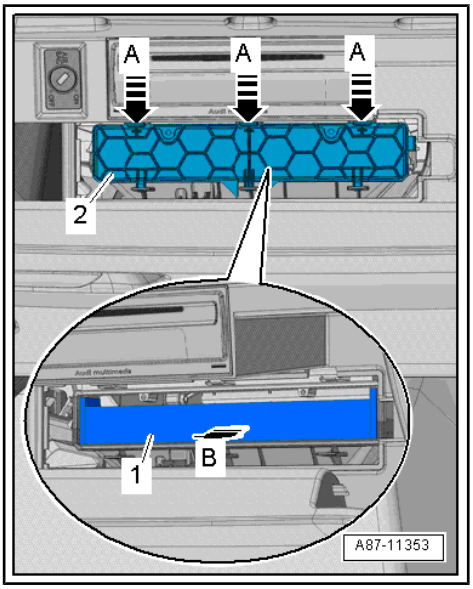
– Clean out glove box and line with paper.

– Unclip service cover -1- in glove box by releasing retaining tab -2- -arrow-.

– Release retaining tabs -arrows A-.

– Swivel cover -2- to the rear.

• This disengages guide tabs from mounting points.



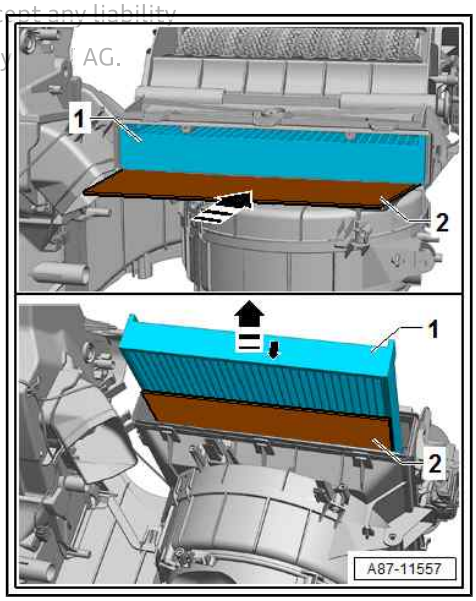
Caution

To avoid risk of damage, ensure that dirt from the dust and pollen filter does not fall into the fresh air blower -V2- .

- *If the dust and pollen filter is severely contaminated, insert a cover plate - T10532- underneath the dust and pollen filter and vacuum the dirt off the top of the cover plate after removing the dust and pollen filter.*
- *Carefully pull the dust and pollen filter out of the installation slot.*
- *If you suspect that dirt has entered the area between the dust and pollen filter and the fresh air blower - V2- , remove the fresh air blower ⇒ page 296 and clean the fresh air blower as well as the area between the fresh air blower and the installation slot for the dust and pollen filter.*

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– On vehicles exposed to high levels of dust or dirt, insert cover plate - T10532- -2- as far as possible into slot underneath dust and pollen filter -1-.



Note

- *You can assess the levels of dust and dirt the dust and pollen filter has been exposed to e.g. on the basis of the dirt deposits in the plenum chamber ⇒ "6.10 Checking plenum chamber water drain", page 333 .*
- *Dimensions of cover plate - T10532- : 252 mm x approx. 300 mm x 0.8 mm (round edges)*

– Pull out dust and pollen filter -1- (using hook on service cover or hook - T40207-) -arrow B-; at the same time hold cover plate - T10532- -2- in slot for dust and pollen filter in position it has been inserted.

– If necessary, vacuum dust and dirt off top of cover plate - T10532- -2-.

Installing

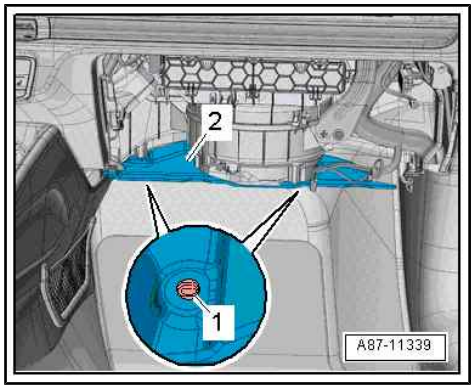
Installation is carried out in reverse order; note the following:

• Note installation position of dust and pollen filter (arrow on filter indicating direction of flow).

– Switch ignition on and check operation of -V2- .

5.14 Removing and installing fresh air blower - V2-

Removing



– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Use a screwdriver (or pliers) to unfasten quick-release fastener (bolt or clip) -1-.

Note

- *There are different types of fastener for the cover -2- (bolt or clip -1-); renew clip version if necessary ⇒ Electronic parts catalogue .*
- *Use e.g. pliers or a screwdriver to prise out version with clip.*

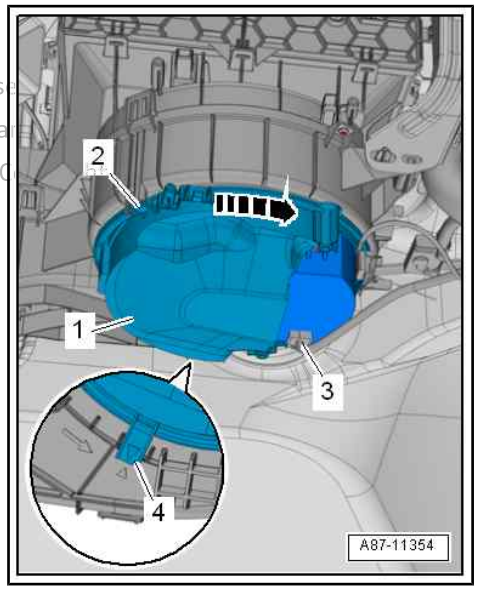
– Detach cover -2-.

– Unplug electrical connector -3-.

– If fitted, remove bolt -2-.

– Lift retaining tab -4- and turn fresh air blower -1- clockwise -arrow-.

– Pull fresh air blower out of evaporator housing (bottom section).



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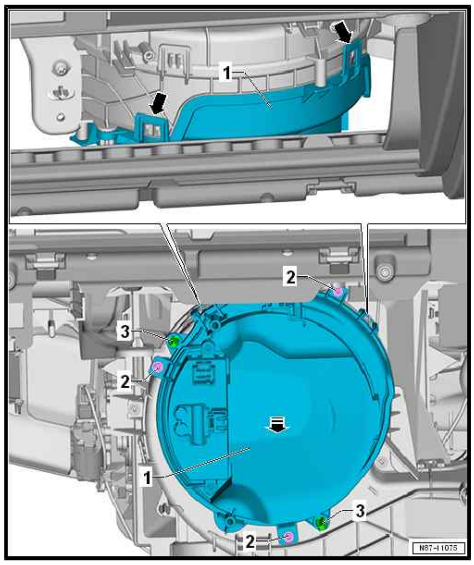
Caution

Risk of fan wheel imbalance.

- ***Do not touch the fan wheel of the fresh air blower -V2- . Applying force to the fan wheel or moving the balancing weights attached to the fan wheel could cause imbalance and therefore lead to operating problems.***

Note

Right-hand drive vehicles: Unscrew bolts -2-, unclip retaining tabs -arrows- and take out fresh air blower - V2- -1- downwards in direction of -arrow-.



Installing

Installation is carried out in reverse sequence.

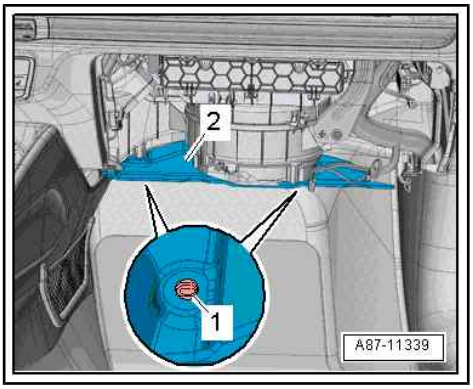
- Tightening torque
  ⇒ “5.2 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 269

– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of fresh air blower - V2- .

5.15 Removing and installing fresh air blower control unit - J126-

Removing



– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

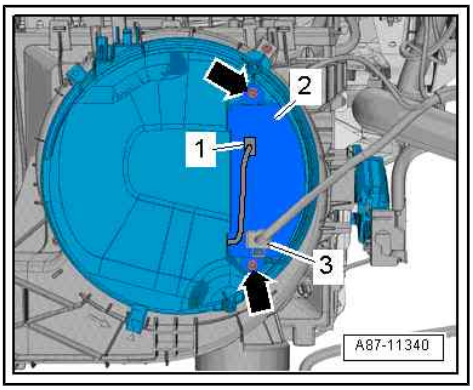
– Use a screwdriver (or pliers) to unfasten quick-release fastener (bolt or clip) -1-.

Note

♦ *There are different types of fastener for the cover -2- (bolt or clip -1-); renew clip version if necessary ⇒ Electronic parts catalogue .*

♦ *Use e.g. pliers or a screwdriver to prise out version with clip.*

– Detach cover -2-.



– Unplug electrical connectors -1 and 3-.

– Remove bolts -arrows-.

WARNING

Risk of burns.

♦ *The fresh air blower - V2- with fresh air blower control unit - J126- may be hot if it was in operation prior to removal.*

♦ *Do not touch the hot cooling surface of the fresh air blower control unit - J126- .*

– Detach control unit -2- from fresh air blower.

Installing

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

- Tightening torque
⇒ “5.2 Exploded view - attachments for heater and air conditioning unit and air intake box”, page 269

– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of fresh air blower - V2- .

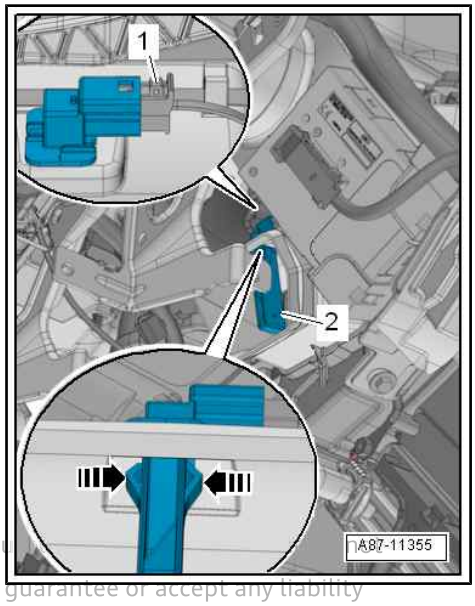
5.16 Removing and installing footwell vent temperature sender - G192-

Note

Vehicles with automatically controlled air conditioner only. On vehicles with a heater or manually controlled air conditioner, the opening in the air duct is sealed with plugs.

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Removing



Note

Right-hand drive vehicles: The footwell vent temperature sender - G192- is installed in the right footwell vent connection.

– Remove footwell vent (driver side) ⇒ page 325 .
– Release retaining tabs (left and right) -arrows- with a narrow screwdriver.
– Lift out footwell vent temperature sender - G192- -item 2-.
– Unplug electrical connector -1-.

Installing

Installation is carried out in reverse sequence.

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5.17 Removing and installing auxiliary air heater element - Z35-

Note

Vehicles with high-voltage system are currently not fitted with an auxiliary air heater element - Z35- ; on these vehicles, the high-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-) assumes the function of the auxiliary air heater element
⇒ "4.15 Notes on high-voltage heater (PTC) Z115 (and high-voltage heater (PTC) control unit J848)", page 85 .

Removing

– Remove knee airbag (driver side) ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .
– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .

Note

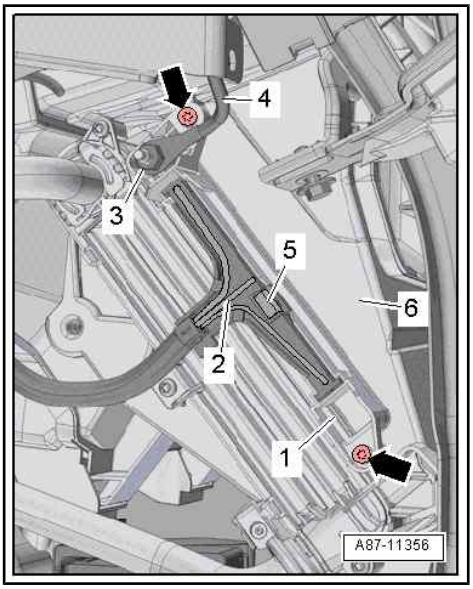
Right-hand drive vehicles: Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Unscrew nut -3- and detach earth wire -4-.

WARNING

Risk of burns.

- *The auxiliary air heater element - Z35- may be hot if it was in operation prior to removal.*
- *Do not take hold of the hot metal surface of the auxiliary air heater element -Z35- .*



– Unplug electrical connector -2- by sliding locking element -5- upwards and pressing catch inwards.

– Remove bolts -arrows-.

– Pull auxiliary air heater element - Z35- -item 1- to the left out of housing -6-.

Installing

Installation is carried out in reverse sequence.

- Tightening torques
⇒ "5.1 Exploded view - heater and air conditioning unit", page 262

5.18 Removing and installing heat exchanger

⇒ "5.18.1 Removing and installing Valeo heat exchanger", page 299

⇒ "5.18.2 Removing and installing Denso heat exchanger", page 305

5.18.1 Removing and installing Valeo heat exchanger

Note

The heater and air conditioning unit is available in different versions and from different manufacturers. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ⇒ page 1); the combination of components by different manufacturers is therefore not permissible ⇒ Electronic parts catalogue .

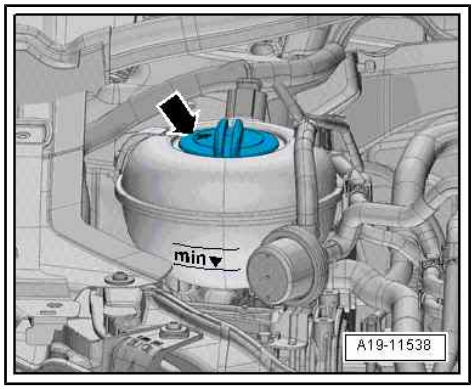
Special tools and workshop equipment required

- Engine bung set - VAS 6122-
- Commercially available compressed-air gun

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Removing

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



WARNING

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.*

– Open filler cap -arrow- on coolant expansion tank.

– Move front seats as far back as they will go.

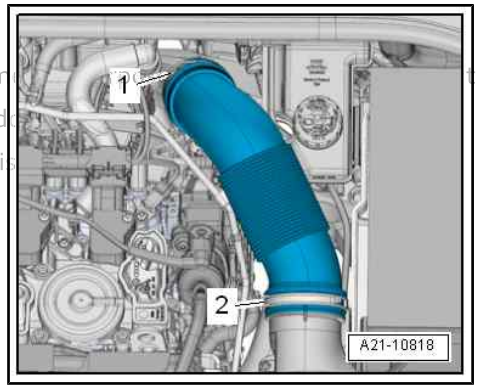
– Set direction of air flow to “defroster vent” for windscreen.

– Switch off ignition.

Vehicles with 1.8 ltr. TFSI engine:

– Release hose clips -1, 2- and remove air pipe.

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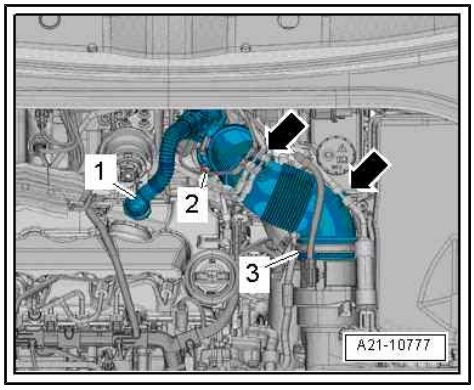
Vehicles with 2.0 ltr. TDI engine:

– Press release tabs at crankcase breather hose -1- and detach hose from cylinder head cover.

– Move vacuum hoses clear at air pipe -arrows-.

– Release hose clip -3-.

– Unscrew bolt -2-, swivel air pipe with connection to the rear and detach from turbocharger.



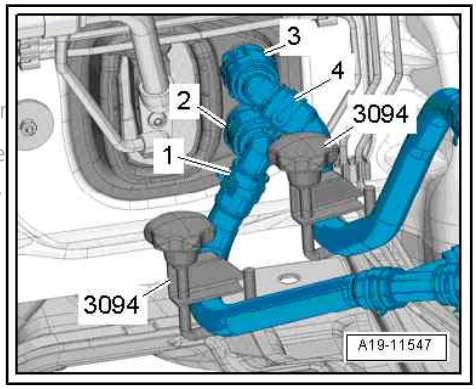
All vehicles (continued):

– Mark installation position of coolant hoses -1 and 4-.

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Note

The heat exchanger is designed for a certain coolant flow direction. Therefore it is important to connect the coolant hoses correctly.

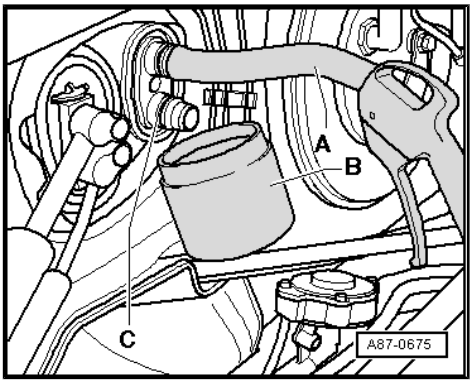


– Clamp off coolant hoses using hose clamps -3094- .

– Lift retaining clips -2 and 3- and detach coolant hoses from heat exchanger for heater.

– Fit a short hose -A- to upper connection.

Insert compressed air gun in end of hose.



– Hold container -B- under lower connection -C- and carefully blow coolant out of heat exchanger with compressed-air gun.

– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

– Remove knee airbag (driver side) ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .

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

Note

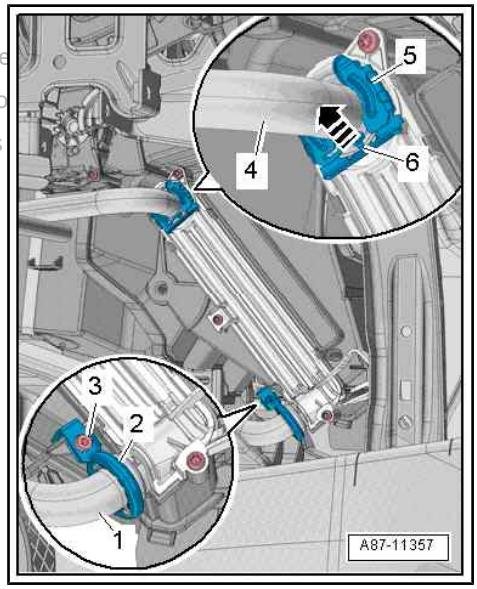
- *Right-hand drive vehicles: Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .*
- *Right-hand drive vehicles: Remove fresh air blower ⇒ page 296 .*

– Vehicles with auxiliary air heater: Remove auxiliary air heater element - Z35- ⇒ page 298 .

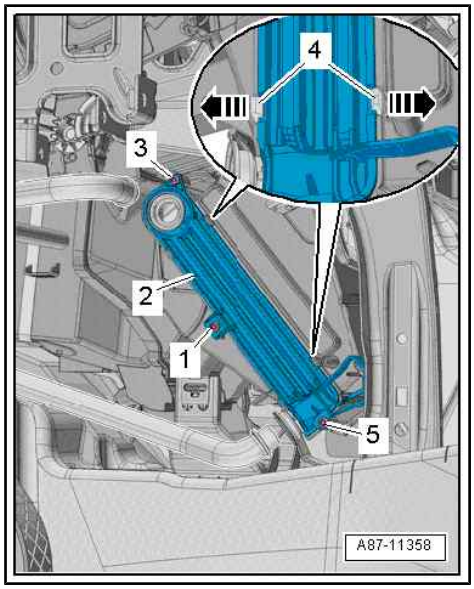
– Cover area beneath connections for coolant hoses in plenum chamber e.g. with impermeable sheeting and absorbent paper.

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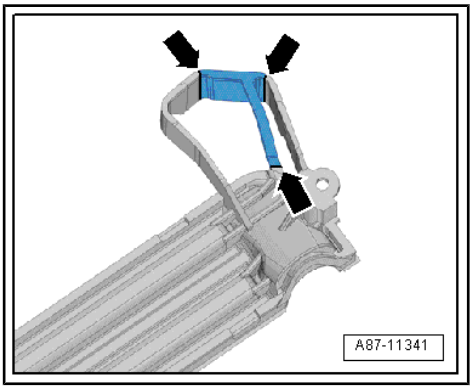
– Lift locking element -6-, remove securing clip -5- and detach coolant line (top) -4- from heat exchanger.
– Remove bolt -3-.
– Remove screw-type clip -2- and detach coolant line (bottom) -1- from heat exchanger.
– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .



– Remove bolts -1, 3, 5-.
– Release retaining tabs -4- -arrows- and detach cover -2-.



– Cut open tab at cover -arrows-.
– Take out heat exchanger towards left side.



Installing

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

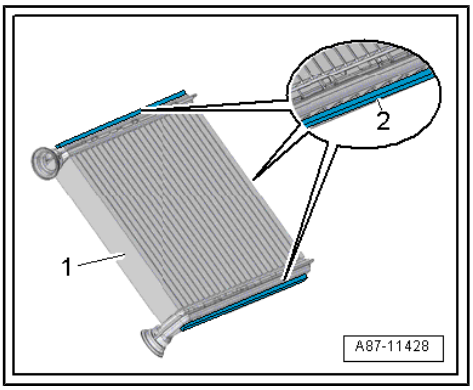
Tightening torques:

- ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262
- ⇒ Engine, mechanics; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger

Note

Renew O-rings.

– Check heater slot for dirt (heat exchanger removed).
– Remove any dirt or residual coolant.
– Vehicles with TDI engine: With auxiliary air heater element removed, check heating element slot for dirt and clean if necessary.
– If fitted, check foam seals -2- attached to heat exchanger -1- for damage and renew if necessary.

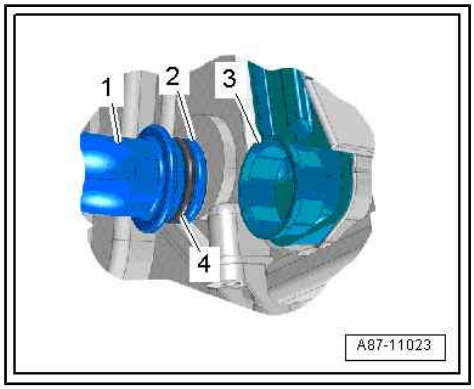


Note

- *Depending on the version and production period, the foam seals -2- are not fitted on all vehicles.*
- *The foam seal may curl up when it is inserted if it has not been bonded on properly.*
- *Cold air may flow past the heat exchanger if the foam seal is damaged or not fitted properly.*

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– Check connection -3- of heat exchanger and connection -2- of coolant pipes for damage or dirt.
– Clean and smooth sealing surface for O-ring.
– Coat new O-ring -4- lightly with coolant (or lubricate lightly with silicone grease) and attach to coolant pipe -1-.
– Carefully slide heat exchanger into heater/air conditioning unit as far as it will go.



Note

When inserting the heat exchanger, take care not to damage the connections and coolant pipes.

– Slide coolant pipes into heat exchanger as far as stop.

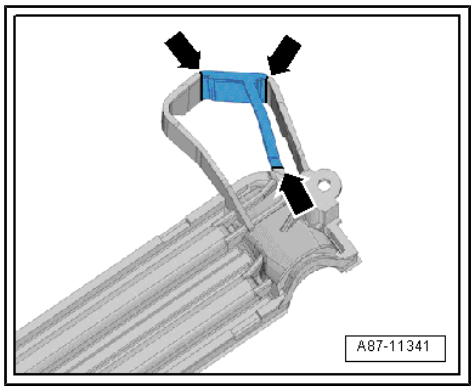
Caution

Risk of leaks at heat exchanger.

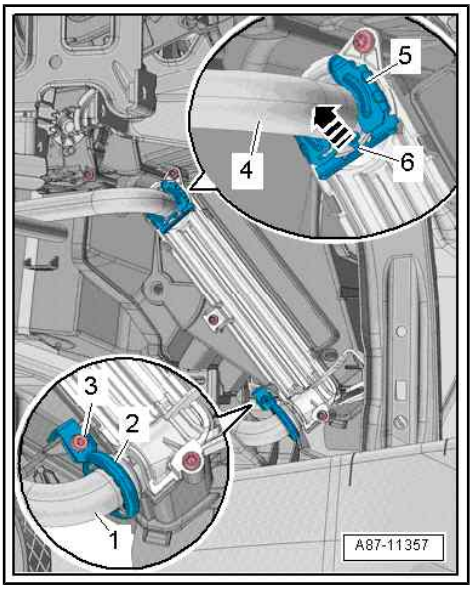
- ***Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.***

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– If cover cannot be attached to heat exchanger, cuts must be made at rubber support -arrows- as shown.



– Fit new securing clip -5- or screw-type clip -2- at connection of coolant pipe to heat exchanger.



Note

- *When performing repairs, a screw-type clip can also be fitted instead of securing clip -5-.*
- *-Arrow- can be ignored.*

– Tighten bolt -3-
⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262 .

– Check that screw-type clamps are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.

– Top up coolant ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater and air conditioner.

5.18.2 Removing and installing Denso heat exchanger

Note

The heater and air conditioning unit is available in different versions and from different manufacturers. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ⇒ page 1); the combination of components by different manufacturers is therefore not permissible ⇒ Electronic parts catalogue .

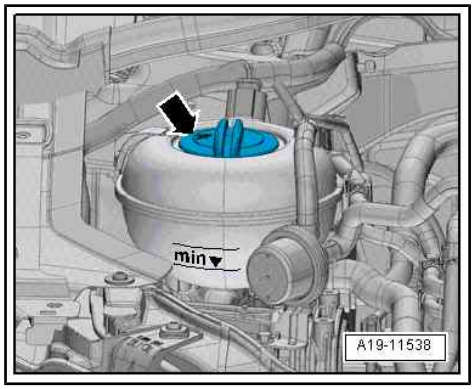
Special tools and workshop equipment required

- Engine bung set - VAS 6122-
- Pliers - T40147-
- Commercially available compressed-air gun

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Removing

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



WARNING

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.***

– Open filler cap -arrow- on coolant expansion tank.

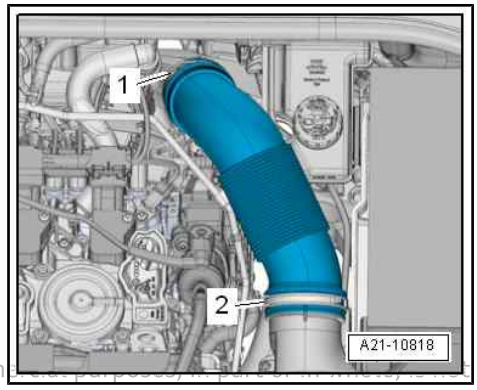
– Move front seats as far back as they will go.

– Set direction of air flow to “defroster vent” for windscreen.

– Switch off ignition.

Vehicles with 1.8 ltr. TFSI engine:

– Release hose clips -1, 2- and remove air pipe.



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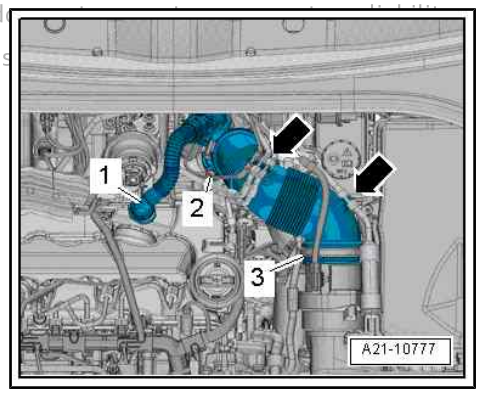
Vehicles with 2.0 ltr. TDI engine:

– Press release tabs at crankcase breather hose -1- and detach hose from cylinder head cover.

– Move vacuum hoses clear at air pipe -arrows-.

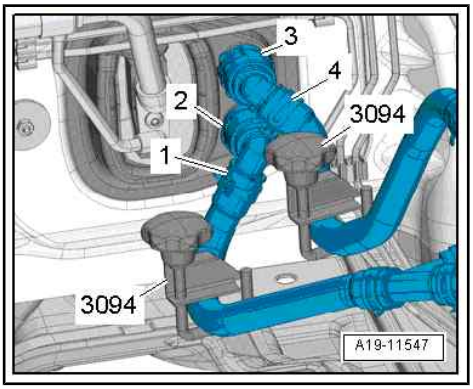
– Release hose clip -3-.

– Unscrew bolt -2-, swivel air pipe with connection to the rear and detach from turbocharger.



All vehicles (continued):

– Mark installation position of coolant hoses -1 and 4-.



Note

The heat exchanger is designed for a certain coolant flow direction. Therefore it is important to connect the coolant hoses correctly.

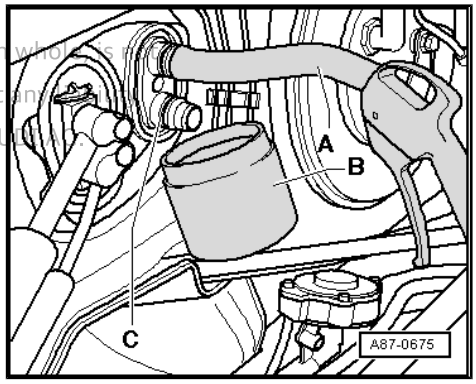
– Clamp off coolant hoses using hose clamps -3094- .

– Lift retaining clips -2 and 3- and detach coolant hoses from heat exchanger for heater.

– Fit a short hose -A- to upper connection.

– Insert compressed air gun in end of hose.

– Hold container -B- under lower connection -C- and carefully blow coolant out of heat exchanger with compressed-air gun.



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– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

– Remove knee airbag (driver side) ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .

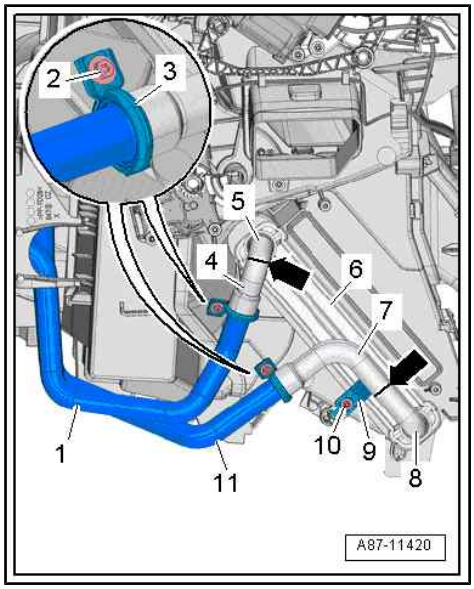
Note

Right-hand drive vehicles: Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Vehicles with auxiliary air heater: Unplug electrical connector ⇒ page 298 .

– Cover area beneath connections for coolant hoses in plenum chamber e.g. with impermeable sheeting and absorbent paper.

– Unscrew bolts -2- and detach screw-type clips -3-.
– Disconnect coolant pipes.



Note

- *If the coolant pipes cannot be disconnected because the O-ring is gummed up, cut through the coolant pipes at the marked locations -arrows- using pliers - T40147- .*
- *Bend remaining coolant pipes -5 and 8- at heat exchanger towards rear (as seen in direction of travel) far enough so that heat exchanger can be pulled out of housing.*
- *Detach severed coolant pipes -4 and 7- of heat exchanger from coolant pipes -1 and 11- to engine.*

– Remove bolt -10- and detach bracket -9- for heat exchanger.
– Pull out heat exchanger -6- towards left side.
– Seal open lines and connections with clean plugs from engine bung set - VAS 6122- .

Installing

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

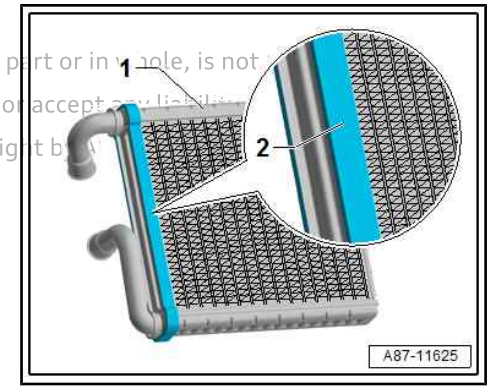
Tightening torques:

- ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262
- ⇒ Engine, mechanics; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger

Note

Renew O-rings.

– Check heater slot for dirt (heat exchanger removed).
– Remove any dirt or residual coolant.
– Vehicles with TDI engine: With auxiliary air heater element removed, check heating element slot for dirt and clean if necessary.
– Check foam seals -2- attached to heat exchanger -1- for damage and renew if necessary.

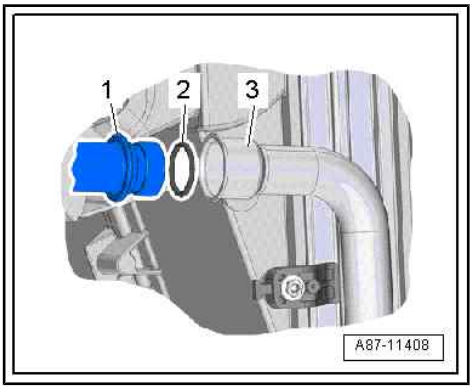


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Note

- *The foam seal may curl up when it is inserted if it has not been bonded on properly.*
- *Cold air may flow past the heat exchanger if the foam seal is damaged or not properly fitted.*

– Check connection -3- of heat exchanger and connection of coolant pipes -1- for damage or dirt.
– Clean and smooth sealing surface for O-ring.
– Coat new O-ring -1- lightly with coolant (or lubricate lightly with silicone grease) and attach to coolant pipe.
– Carefully slide heat exchanger into air conditioning unit as far as it will go.



Note

When inserting the heat exchanger, take care not to damage the connections and coolant pipes.

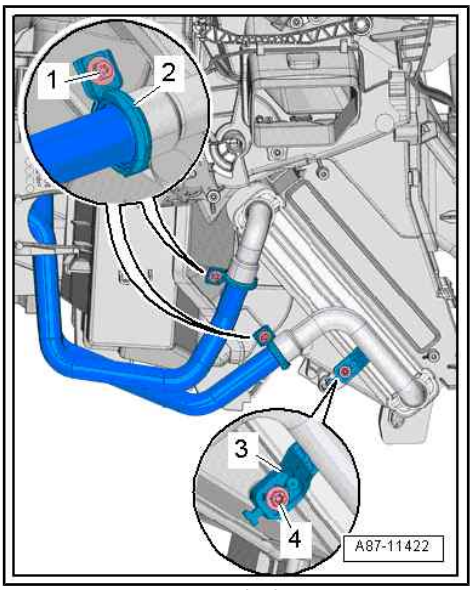
– Slide coolant pipes into heat exchanger as far as stop.

Caution

Risk of leaks at heat exchanger.

- ***Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.***

– Position bracket -3- for heat exchanger on air distribution housing and tighten bolt -4- to torque (2 Nm).
– Fit new screw-type clips -2- at connection of coolant pipe to heat exchanger.
– Tighten bolt -1- ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262 .
– Check that screw-type clamps are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.
– Top up coolant ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
– As a final step, check operation of heater and air conditioner.



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5.19 Removing and installing coolant pipes at heat exchanger

⇒ “5.19.1 Removing and installing coolant pipes at Valeo heat exchanger”, page 310

⇒ “5.19.2 Removing and installing coolant pipes at Denso heat exchanger”, page 311

5.19.1 Removing and installing coolant pipes at Valeo heat exchanger

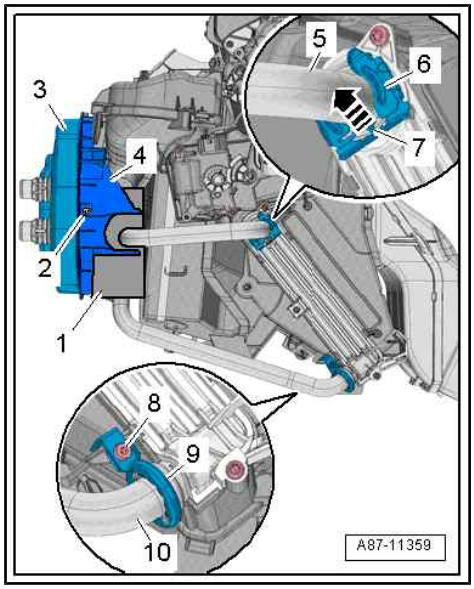
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Note

The heater and air conditioning unit is available in different versions and from different manufacturers. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ⇒ page 1); the combination of components by different manufacturers is therefore not permissible ⇒ Electronic parts catalogue .

Removing

– Remove heater and air conditioning unit ⇒ page 287 .
– Detach sealing collar -3- at plenum chamber partition panel.
– Remove bolt -2-.
– Detach bracket -4- for coolant pipe to the left.
– Detach foam -1-.
– Lift locking element -7-, remove securing clip -6- and detach coolant line (top) -5- from heat exchanger.
– Remove bolt -8-.
– Remove screw-type clip -9- and detach coolant line (bottom) -10- from heat exchanger.
– Detach coolant pipes.



Installing

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

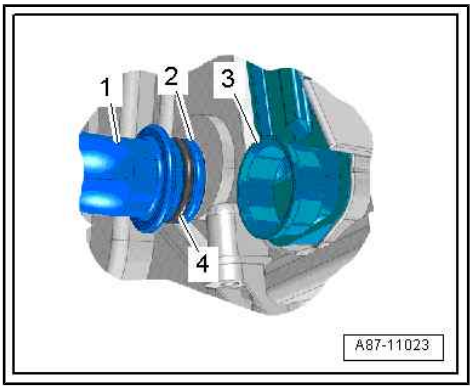
- Tightening torque
  ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

– Check connection -3- of heat exchanger and connection -2- of coolant pipes for damage or dirt.

– Clean and smooth sealing surface for O-ring.

– Coat new O-ring -4- lightly with coolant (or lubricate lightly with silicone grease) and attach to coolant pipe -1-.

– Slide coolant pipes into heat exchanger as far as stop.

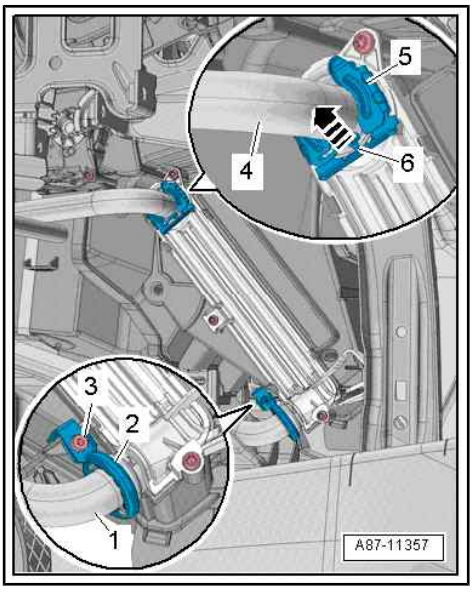


Caution

Risk of leaks at heat exchanger.

- ***Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.***

– Fit new screw-type clip -2- at connection of coolant pipe to heat exchanger.



Note

When performing repairs, a screw-type clip can also be fitted instead of clip -5-; -arrow- can be ignored.

– Tighten bolt -3- to torque.

– Check that screw-type clamps are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.

– Install heater and air conditioning unit ⇒ page 287 .

– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– As a final step, check operation of heater/air conditioner.

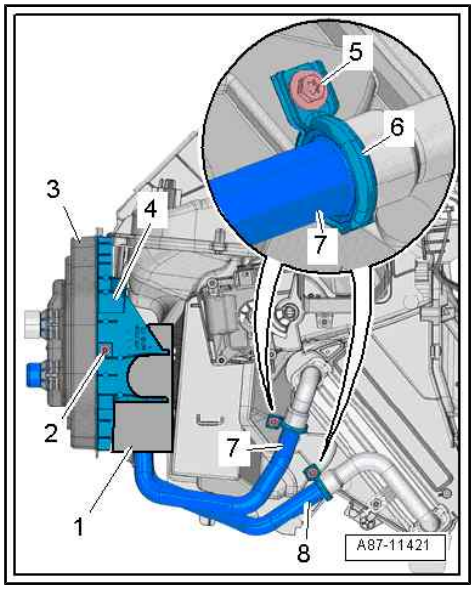
5.19.2 Removing and installing coolant pipes at Denso heat exchanger

Note

The heater and air conditioning unit is available in different versions and from different manufacturers. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ⇒ page 1); the combination of components by different manufacturers is therefore not permissible ⇒ Electronic parts catalogue .

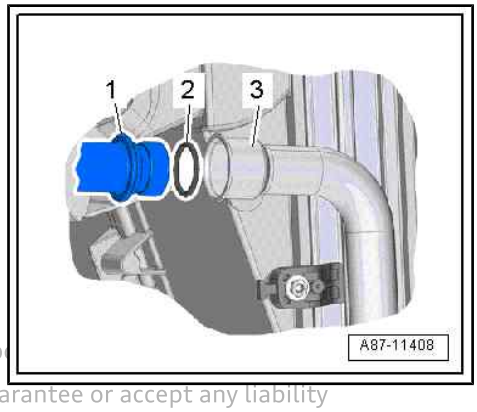
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Removing



- Remove heater and air conditioning unit ⇒ page 287 .
- Detach sealing collar -3- at plenum chamber partition panel.
- Remove bolt -2-.
- Detach bracket -4- for coolant pipe to the left.
- Detach foam -1-.
- Unscrew bolt -5- and detach screw-type clip -6-.
- Detach coolant pipes -7, 8- from heat exchanger.

Installing



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

- Tightening torque
  ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

- Check connection -3- of heat exchanger and connection of coolant pipes -2- for damage or dirt.
- Clean and smooth sealing surface for O-ring.
- Coat new O-ring -4- lightly with coolant (or lubricate lightly with silicone grease) and attach to coolant pipe -1-.
- Slide coolant pipes into heat exchanger as far as stop.

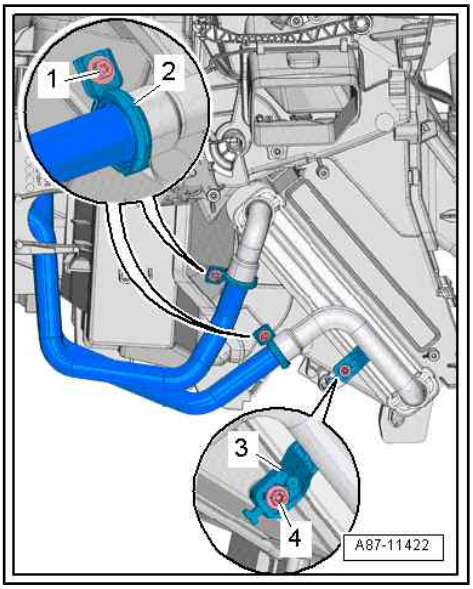
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Caution

Risk of leaks at heat exchanger.

- ***Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.***

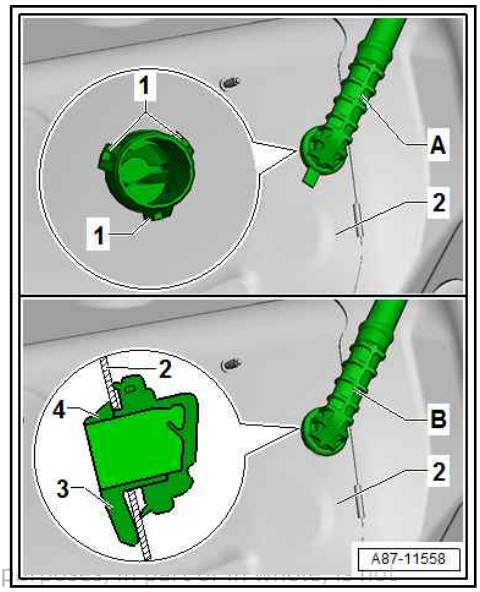
– Fit new screw-type clips -2- at connection of coolant pipe to heat exchanger.
– Tighten bolt -1- to torque.
– Check that screw-type clamps are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.
– Install heater and air conditioning unit ⇒ page 287 .
– Interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).
– As a final step, check operation of heater/air conditioner.



5.20 Checking condensation drain hose

Note

There are different versions of the condensation drain hose. On version -A-, the hose is engaged in the floor panel -2- with three retainers -1-. On version -B-, the hose is attached to the floor panel -2- with a lug -3- and engaged with a retainer -4-. Make sure the condensation drain hose is seated and engaged correctly in the floor panel.



Procedure

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

WARNING

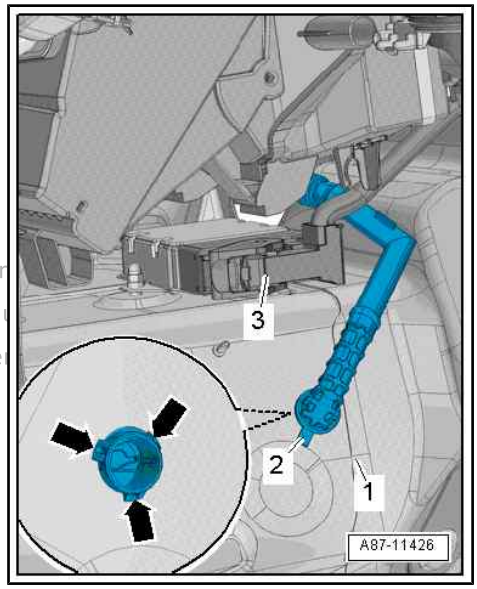
Risk of airbag control unit malfunctioning due to corrosion in electrical connector.

- ***Cover or seal off connector for airbag control unit to prevent the ingress of moisture.***

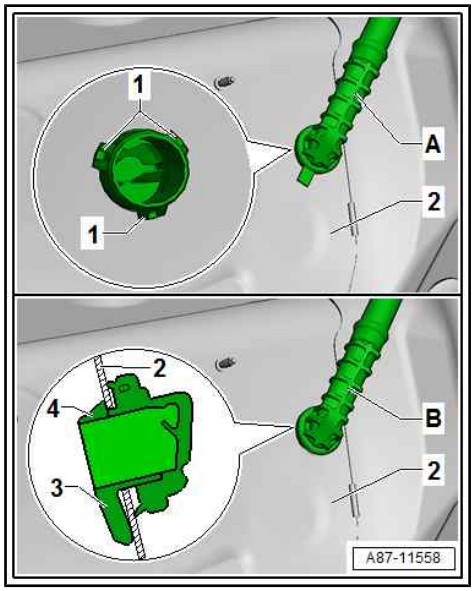
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– Cover airbag control unit -3-.
– Carefully fold back floor covering in vicinity of condensation drain hose until hose is visible.
– Retainers -arrows- at condensation drain hose must be properly engaged (pre-tensioned) in body opening in floor panel -1- (illustration shows version “A”).

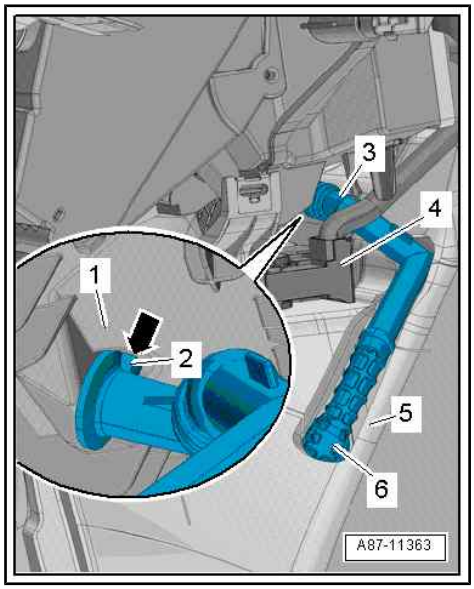
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- The sealing lip must be fitted firmly at the body opening.
- The retainers -1- (on version -A-) / -4- (on version -B-) must be engaged properly.
- If not sufficiently tensioned, seal the joint between the body and the bracket with silicone adhesive sealant or similar ⇒ Electronic parts catalogue .



– Check that condensation drain -3- is seated firmly at connection of heater and air conditioning unit -1-.
- Condensation drain -3- must not be loose at connection of heater and air conditioning unit -1- as otherwise condensate could escape.
- If not sufficiently tensioned, secure condensation drain -3- at connection of heater and air conditioning unit -1- with a cable tie or hose clip.
– If the bracket with the condensation drain hose is properly positioned in the body opening and at the connection of the heater and air conditioning unit, the condensation drain hose must be checked for dirt.
– Remove condensation drain hose ⇒ page 316 .

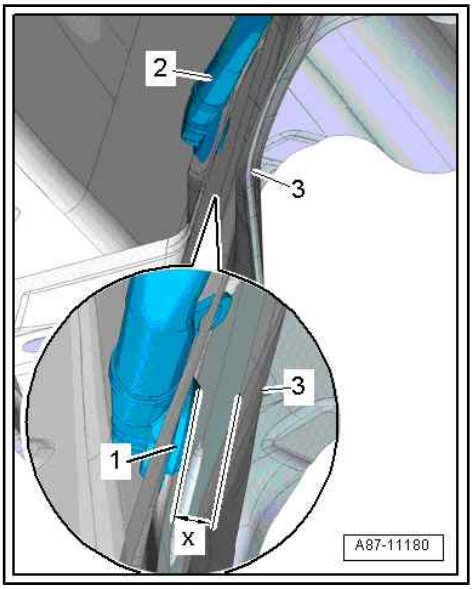


– Check distance between condensation drain opening -1- and heat shield -3-.

• The clearance (dimension -x-) must be sufficient to allow condensate to drain out of condensation drain hose -2-.

– Check for dirt in condensation drain of air conditioning unit and clean with a piece of wire if necessary.

• The cross-section of the condensation drain hose must not be constricted (squashed).



If there are problems with moisture in the passenger compartment, check the following components in addition to the condensation drain:

• Water drain for plenum chamber ⇒ page 333 .

• Drip rail for damage and correct installation ⇒ page 328 .

• Check that plenum chamber cover is installed correctly and not damaged ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .

• Dust and pollen filter for dirt and correct installation ⇒ page 293

• Forced ventilation vents in luggage compartment ⇒ page 329 .

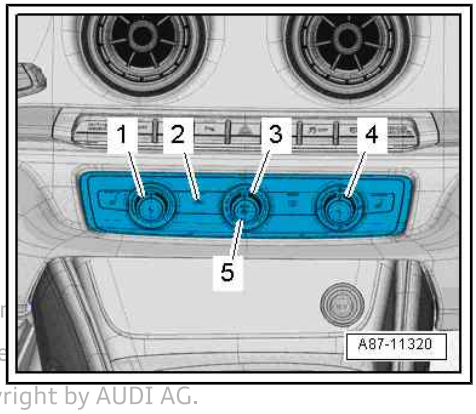
• Activation and operation of air recirculation flap (e.g. in “Final control diagnosis”) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)

If there are problems with moisture in the passenger compartment which only occurs when the air conditioner compressor is switched on under certain ambient conditions, also check the temperature of the air flowing out of the evaporator ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

• “Read measured value” for evaporator output temperature sender - G263-

– Check temperature of air flowing out of evaporator under usage conditions described by customer or with the following settings on operating unit:

Vehicles with manually controlled air conditioner:



– Make the following settings on the operating unit (air conditioning system control unit - J301-):

• Air conditioner compressor on: Lamp in AC or A/C button -5- on

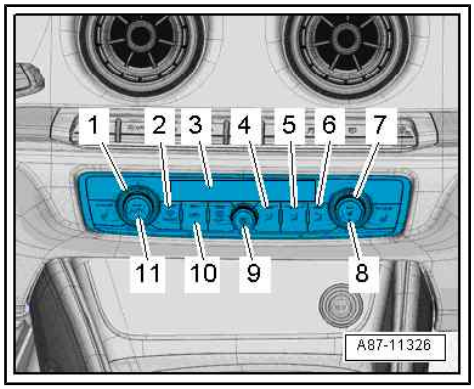
• Set rotary temperature control -1- to “cold” stop.

• Fresh air mode: Lamp in Air recirculation button -2- is off.

• Set rotary control -3- for fresh air blower to speed “1”.

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Vehicles with automatically controlled air conditioner:



– Make the following settings on the operating unit (Climatronic control unit - J255-):

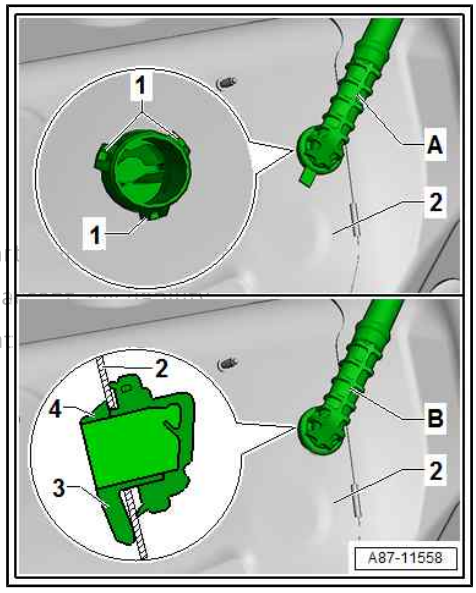
- "Auto" mode: Lamp in AUTO button -11- is on.
- Set temperature to "cold" using rotary controls -1 and 7-: "LO" display for driver and passenger side in display -3- of -J255- .
- Set rotary control -9- for fresh air blower to medium speed with a voltage of approx. 7 V at fresh air blower - V2- .
- Air conditioner compressor on: Lamp in A/C button -8- is on.
- Fresh air mode: Lamp in Air recirculation button -10- is off.

All vehicles (continued):

– Open dash panel vents.

– If measured value of evaporator output temperature sender - G263- is too low (at ambient temperature above 0 °C, colder than 0 °C for lengthy period) or too high (above e.g. 10 °C although air conditioner is functioning properly), observe notes on checking cooling output ⇒ page 49 .

5.21 Removing and installing condensation drain hose



Note

There are different versions of the condensation drain hose. On version -A-, the hose is engaged in the floor panel -2- with three retainers -1-. On version -B-, the hose is attached to the floor panel -2- with a lug -3- and engaged with a retainer -4-. Make sure the condensation drain hose is seated and engaged correctly in the floor panel.

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Removing

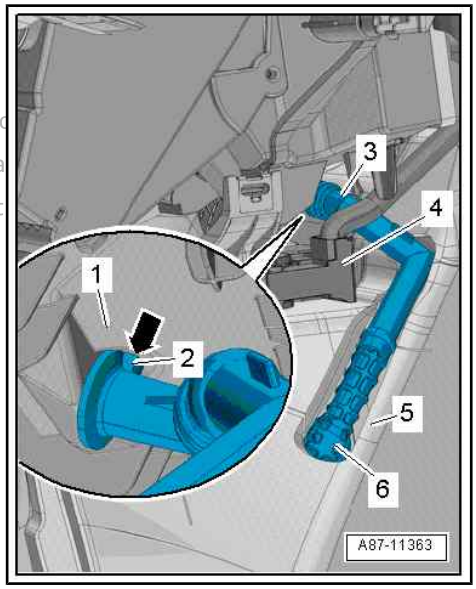
– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .

WARNING

Risk of airbag control unit malfunctioning due to corrosion in electrical connector.

- ***Seal off connector for airbag control unit to prevent the ingress of moisture.***

– Cover airbag control unit -4-.
– Carefully press floor covering to the side and protect area beneath condensation drain hose with waterproof sheeting and absorbent paper.
– Detach condensation hose -3- at heater and air conditioning unit -1- and at body -5-.



Installing

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

– Condensation drain hose can only be pressed properly as far as stop onto heater and air conditioning unit in one position.
• Lug -arrow- at connection must engage in guide -2-.
– Additionally secure condensation drain -3- at connection of heater and air conditioning unit -1- with a cable tie or hose clip.

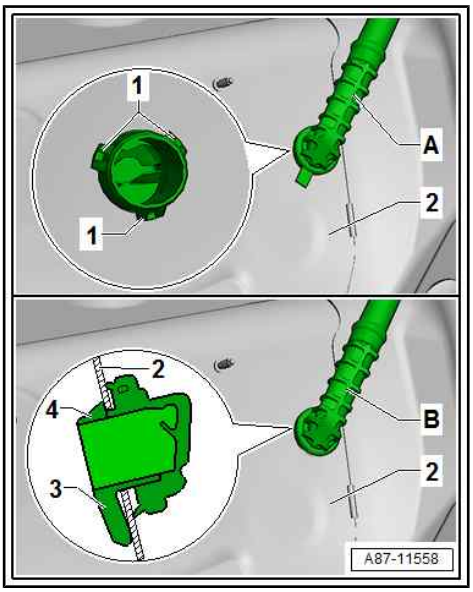
Note

Condensation drain -3- must not be loose at connection of heater and air conditioning unit -1- as otherwise condensate could escape.

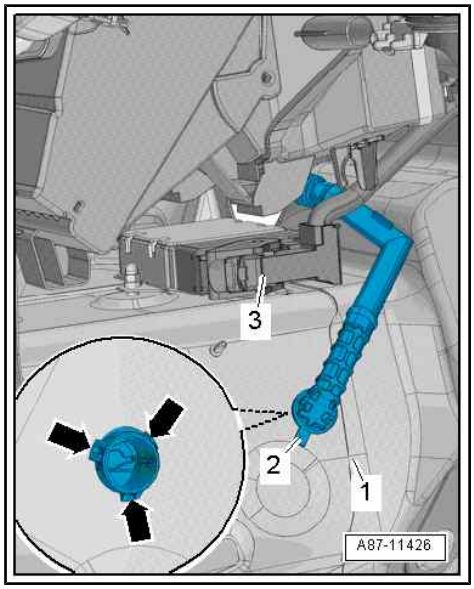
– Insert condensation drain hose -6- in body opening in floor panel so that it engages audibly (illustration shows version “A”).

Note

♦ *The sealing lip must be flush at the body opening in the floor panel.*
♦ *The retainers -1- (on version -A-) / -4- (on version -B-) must be engaged properly.*
♦ *If not sufficiently tensioned, seal the joint between the body and the condensation drain with silicone adhesive sealant or similar ⇒ Electronic parts catalogue .*



- Retainers -arrows- (illustration shows version “A”) on condensation drain hose must be properly engaged (pre-tensioned) in body opening -1-.
- Check that sealing lip is flush at body opening.
- If not sufficiently tensioned, seal the joint between the body floor panel and the condensation drain with silicone adhesive sealant or similar ⇒ Electronic parts catalogue .



Note

- *Install condensation drain hose so that it is neither twisted nor crushed.*
- *When fitting floor covering, make sure that it does not squash condensation drain hose.*
- *If the condensation drain hose is not fitted firmly enough at the heater and air conditioning unit connection, secure it e.g. with a hose clip or cable tie to prevent it from slipping and liquid from escaping. Cable tie and hose clip ⇒ Electronic parts catalogue .*

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6 Air duct

⇒ “6.1 Exploded view - routing of air flow and air distribution in passenger compartment”, page 319

⇒ “6.2 Removing and installing vents (front)”, page 323

⇒ “6.3 Removing and installing vents (rear)”, page 326

⇒ “6.4 Removing and installing air ducts”, page 327

⇒ “6.5 Removing and installing intake duct”, page 328

⇒ “6.6 Removing and installing drip rail”, page 328

⇒ “6.7 Removing and installing fresh air intake”, page 329

⇒ “6.8 Checking forced ventilation vents in passenger compartment”, page 329

⇒ “6.9 Removing and installing forced ventilation vents in passenger compartment”, page 332

⇒ “6.10 Checking plenum chamber water drain”, page 333

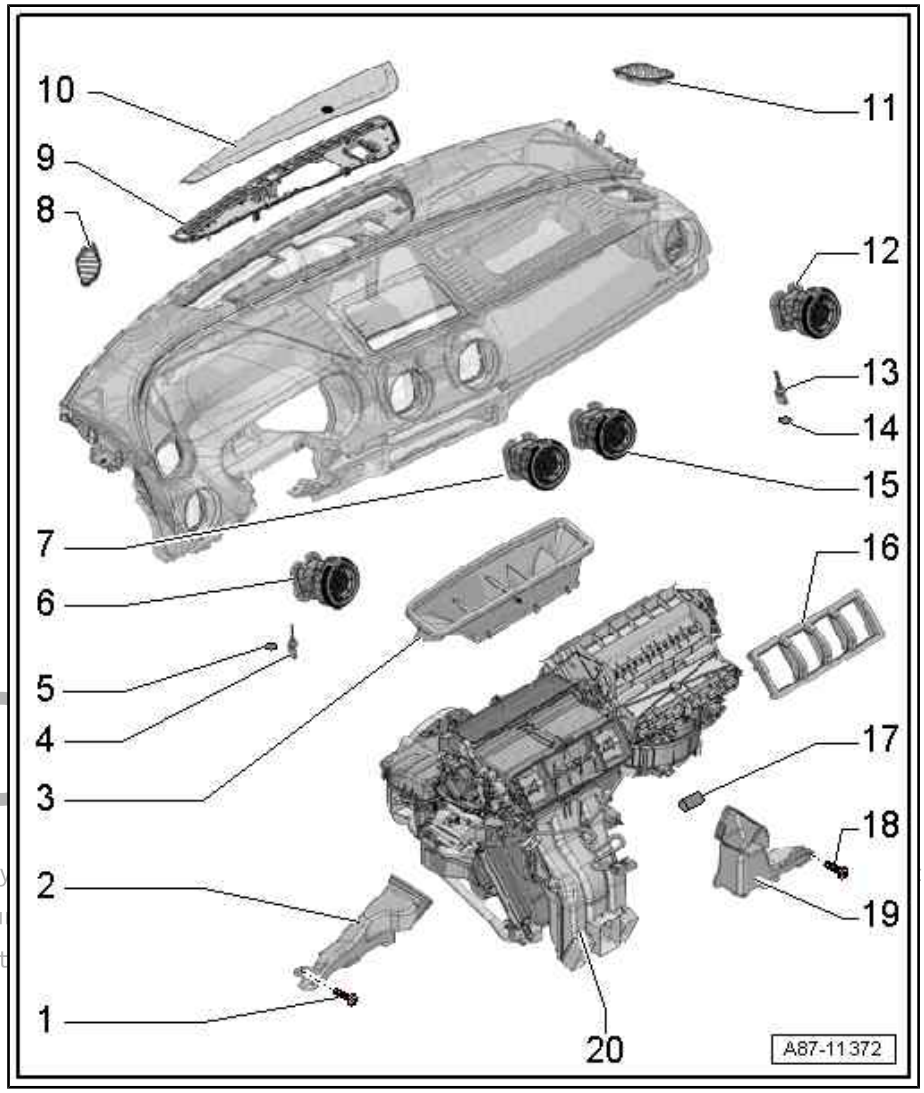
6.1 Exploded view - routing of air flow and air distribution in passenger compartment

Note

For the A3 Cabriolet, neck heating is available as optional equipment. Vehicles with neck heating are equipped with an additional vent in the seat and with additional buttons for switching the neck heating on and off in the air conditioner operating unit (Climatronic control unit - J255-). For further information, refer to ⇒ “2.7 Neck heating”, page 14 .

Air distribution housing, air ducts (front)

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1 - Bolt

- ❑ 1.5 Nm

2 - Air duct for footwell vent (left-side) - driver side

- ❑ Removing and installing ⇒ page 325

3 - Air duct

- ❑ To defroster vents
- ❑ Removing and installing ⇒ page 324

4 - Left vent temperature sender - G150-

- ❑ For equipment version with automatically controlled air conditioner
- ❑ Incorrectly installed vent temperature senders will cause flow noise
- ❑ Removing and installing ⇒ page 286

5 - Sealing plug for vent (left-side)

- ❑ For equipment version with heater or manually controlled air conditioner
- ❑ A loose or missing sealing plug will cause flow noise

Protected by
with respect

6 - Dash panel vent (left-side)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

7 - Dash panel vent (centre left)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

8 - Defroster vent (left-side)

- ❑ Removing and installing ⇒ page 323

9 - Defroster vent (centre)

- ❑ Removing and installing ⇒ page 323

10 - Loudspeaker trim (centre)

11 - Defroster vent (right-side)

- ❑ Removing and installing ⇒ page 323

12 - Dash panel vent (right-side)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

13 - Right vent temperature sender - G151-

- ❑ For equipment version with automatically controlled air conditioner
- ❑ Incorrectly installed vent temperature senders will cause flow noise
- ❑ Removing and installing ⇒ page 286

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14 - Sealing plug for vent (right-side)

- ❑ For equipment version with heater or manually controlled air conditioner
- ❑ A loose or missing sealing plug will cause flow noise

15 - Dash panel vent (centre right)

- ❑ Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

16 - Air duct to dash panel vent (centre)

- ❑ Removing and installing ⇒ page 324

17 - Plug

- ❑ For equipment version without glove box cooling
- ❑ Secure loose sealing plug with clamp ⇒ page 321

Note

- ♦ *Introduction of glove box cooling not yet finalised*
- ♦ *Depending on version, connection may also be sealed off directly at heater and air conditioning unit.*

18 - Bolt

- ❑ 1.5 Nm

19 - Air duct to footwell vent (right-side) - front passenger side

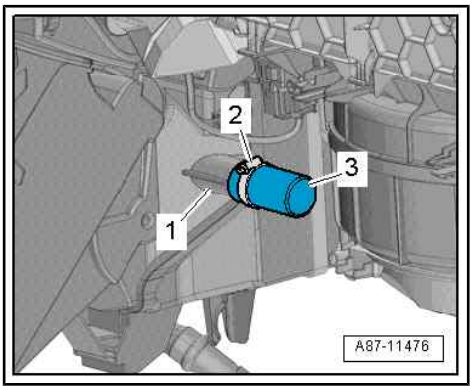
- ❑ Removing and installing ⇒ page 325

20 - Heater and air conditioning unit

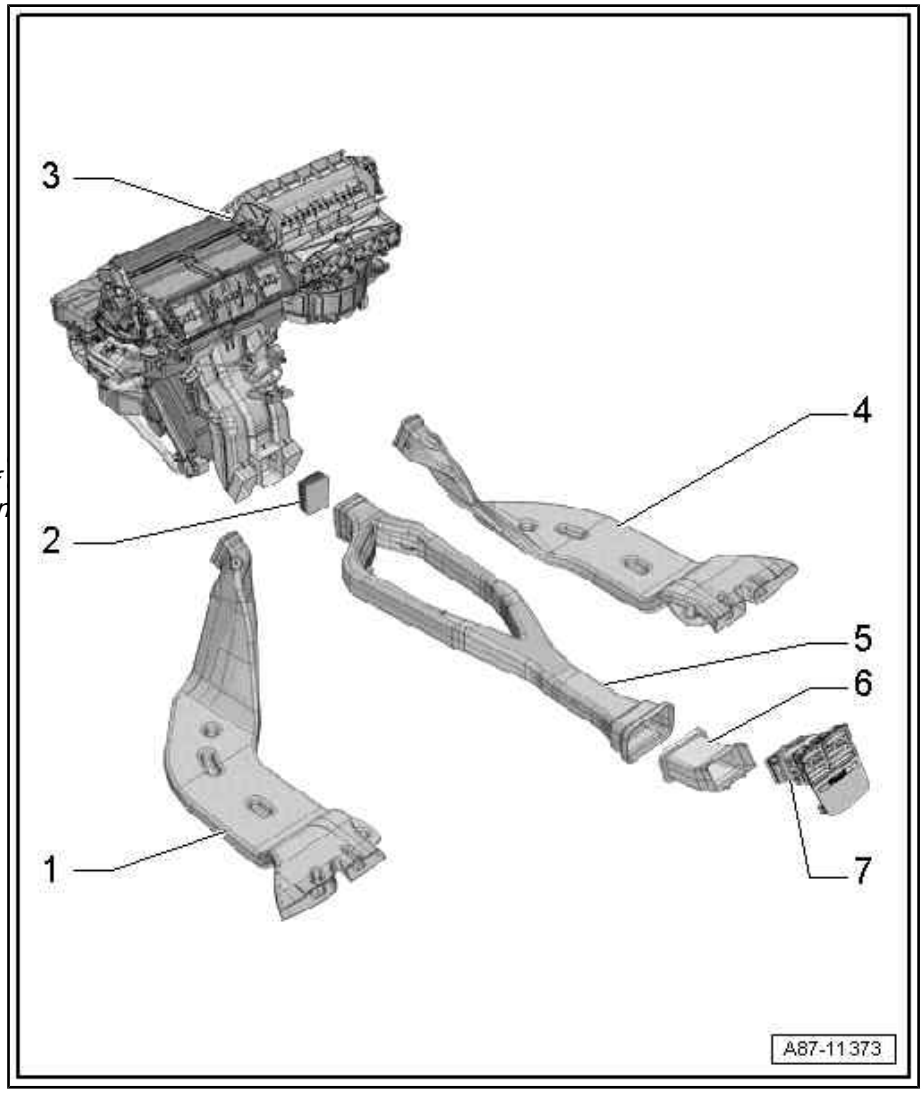
- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 287

Sealing plug for glove box cooling

– If sealing plug -3- is loose, it must be secured with a hose clip -2- at heater and air conditioning unit -1-. Hose clips ⇒ Electronic parts catalogue



Air distribution housing, air ducts (rear)



1 - Air duct to footwell vent (rear left)

- ❑ Removing and installing ⇒ page 326
- ❑ There may be noise if the wiring harness bracket is damaged or loose

2 - Plug

- ❑ For equipment version without air duct (rear)

Note

Depending on version, may also be sealed off heater and air condition *⇒ page 273* *.*

3 - Heater and air conditioning unit

- ❑ Different versions ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ page 287

4 - Air duct to footwell vent (rear right)

- ❑ Removing and installing ⇒ page 326
- ❑ There may be noise if the wiring harness bracket is damaged or loose

5 - Air duct (rear)

- ❑ Depending on version
- ❑ Removing and installing ⇒ page 327

6 - Air duct to rear vent

- ❑ Depending on version
- ❑ Removing and installing ⇒ page 327

7 - Rear centre console vent

- ❑ Equipment-specific version
- ❑ Removing and installing ⇒ page 327

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6.2 Removing and installing vents (front)

⇒ “6.2.1 Removing and installing vent (front centre)”, page 323

⇒ “6.2.2 Removing and installing side defroster vent”, page 323

⇒ “6.2.3 Removing and installing dash panel vents”, page 324

⇒ “6.2.4 Removing and installing air duct for defroster vent”, page 324

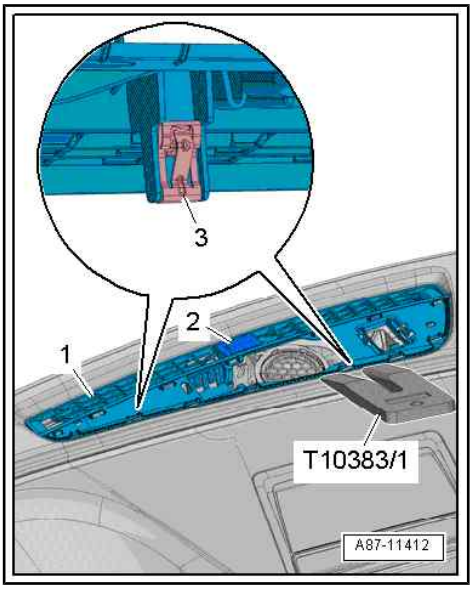
⇒ “6.2.5 Removing and installing air duct for dash panel vent (centre)”, page 324

⇒ “6.2.6 Removing and installing footwell vent (driver side)”, page 325

⇒ “6.2.7 Removing and installing footwell vent (front passenger side)”, page 325

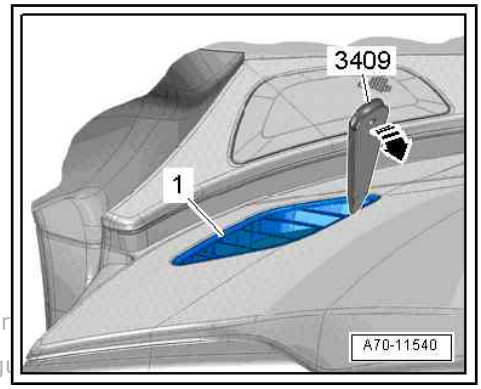
6.2.1 Removing and installing vent (front centre)

Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel



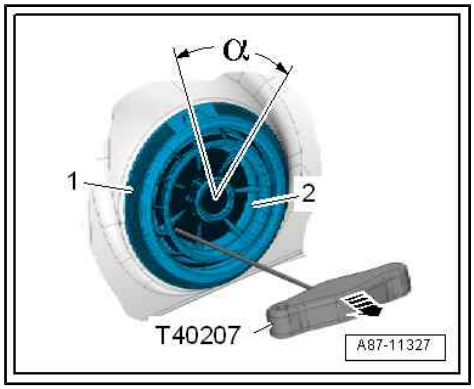
6.2.2 Removing and installing side defroster vent

Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel



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6.2.3 Removing and installing dash panel vents



Removing and installing ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Exploded view - dash panel

Note

Depending on the version, the dash panel vents are operated in different ways.

6.2.4 Removing and installing air duct for defroster vent

Removing

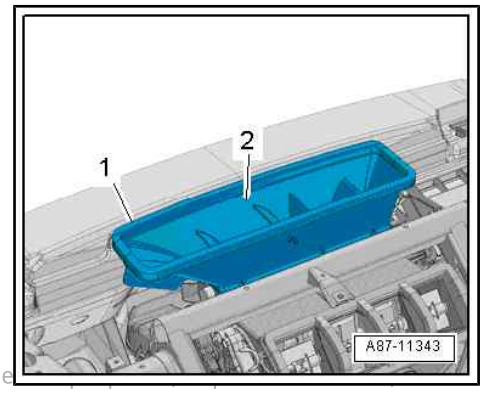
– Switch on ignition.

– Move front seats as far back as they will go and extend MMI display ⇒ Infotainment/MMI Operating Manual .

– Switch off ignition.

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

– Lift off air duct -2-.



Installing

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

– Renew damaged or defective foam seals -1-.

Note

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- *Take care not to squash the foam seal on the air duct when inserting the dash panel, as otherwise the flow of air to the windscreen will be uneven or inadequate.*
- *After installing the dash panel, check the direction and distribution of air flow from the defroster vent to the windscreen.*

6.2.5 Removing and installing air duct for dash panel vent (centre)

Removing

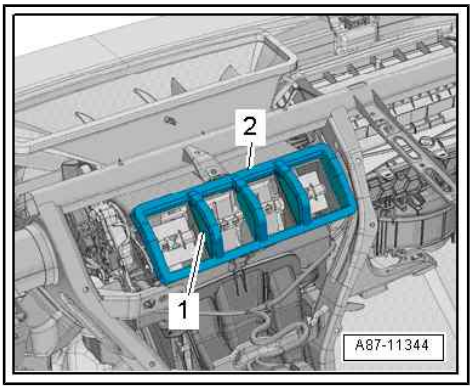
– Switch on ignition.

– Move front seats as far back as they will go and extend MMI display ⇒ Infotainment/MMI Operating Manual .

– Switch off ignition.

– Remove dash panel ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing dash panel .

– Detach air duct for dash panel vent (centre) -1-.



Installing

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

– Renew damaged or defective foam seals -2-.

Note

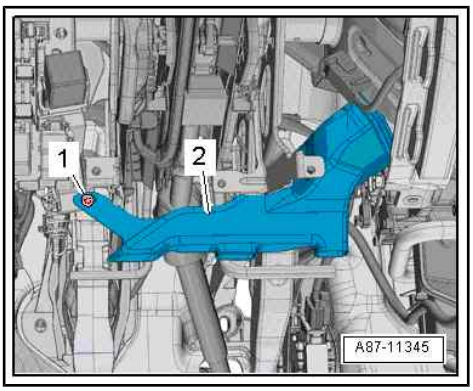
- *Take care not to squash the foam seal on the air duct when inserting the dash panel, as otherwise the flow of air to the dash panel vents will be uneven or inadequate.*
- *After installing the dash panel, check the direction and distribution of air flow from the dash panel vents.*

– Make sure that guides at air duct are correctly positioned in mountings.

6.2.6 Removing and installing footwell vent (driver side)

Removing

– Remove knee airbag (driver side) ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbags; Exploded view - knee airbag .



Note

Right-hand drive vehicles: Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– Remove bolt -1- and detach footwell vent (driver side) -2-.

Installing

Installation is carried out in reverse sequence.

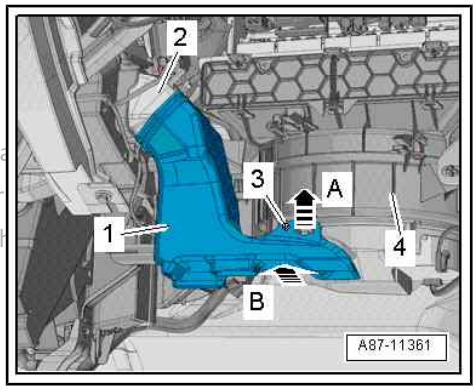
6.2.7 Removing and installing footwell vent (front passenger side)

Removing

– Remove glove box ⇒ General body repairs, interior; Rep. gr. 68 ; Storage compartments/covers/trim panels; Removing and installing glove box .

– If fitted, remove bolt -3-.

– Release retaining tab -arrow A-, pull footwell vent (passenger side) -1- off air distribution housing -4- in direction of -arrow B- and detach from vent -2-.



Installing

Installation is carried out in reverse sequence.

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6.3 Removing and installing vents (rear)

⇒ “6.3.1 Removing and installing rear footwell vent”, page 326

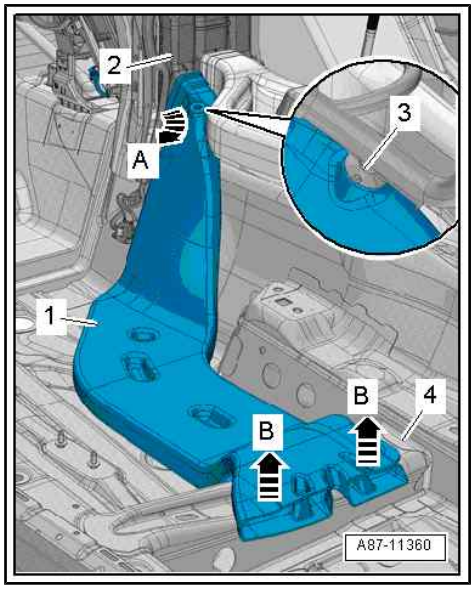
⇒ “6.3.2 Removing and installing rear centre console vent”, page 327

6.3.1 Removing and installing rear footwell vent

Note

The illustration shows the left side as an example.

Removing



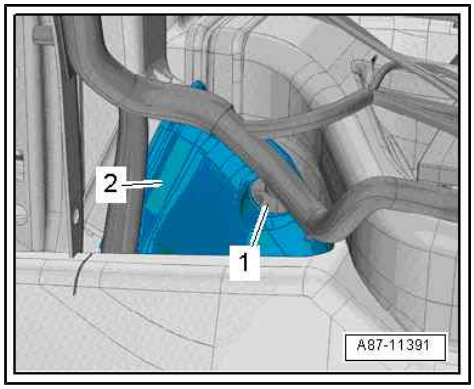
- Remove sill panel trim ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing sill panel trim .
- Remove front seat ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .
- Remove belt end fitting (front) ⇒ General body repairs, interior; Rep. gr. 69 ; Seat belts; Removing and installing three-point seat belt (front) .
- Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .
- Unfasten and lift floor covering in vicinity of vent.

Note

If necessary, remove A-pillar trim and fold back floor covering as far as possible ⇒ General body repairs, interior; Rep. gr. 70 ; Passenger compartment trim panels; Removing and installing floor covering .

- Prise off cable clip -3-.
- Lift up rear footwell vent -1- -arrows B-, detach from heater and air conditioning unit -2- -arrow A- and take out to the side.

Installing



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

- Check cable clip -1- for damage before pressing it on at footwell vent -2-.

Note

A loose cable clip or damaged seal can lead to flow noise.

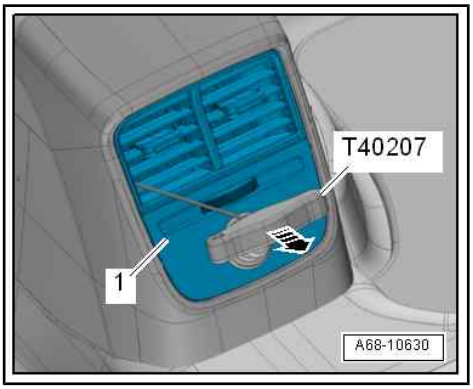
Tightening torques

- ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats; Exploded view - front seat
- ⇒ General body repairs, interior; Rep. gr. 69 ; Seat belts; Exploded view - three-point seat belt (front)
- ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console

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6.3.2 Removing and installing rear centre console vent

Removing and installing ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .



6.4 Removing and installing air ducts

⇒ "6.4.1 Removing and installing air duct for rear vent", page 327

⇒ "6.4.2 Removing and installing air duct for rear centre console vent", page 327

6.4.1 Removing and installing air duct for rear vent

Removing

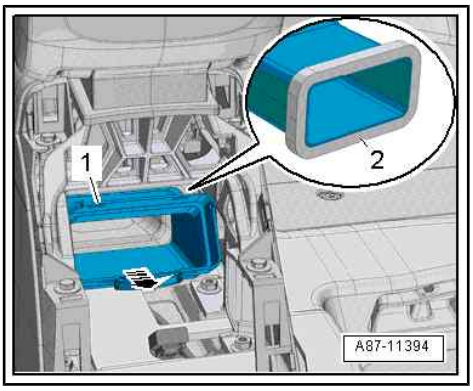
– Remove rear centre console vent ⇒ page 327 .

– Pull off air duct -1- towards rear.

Installing

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

– Renew damaged or defective foam seal -2- at air duct.



6.4.2 Removing and installing air duct for rear centre console vent

Removing

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

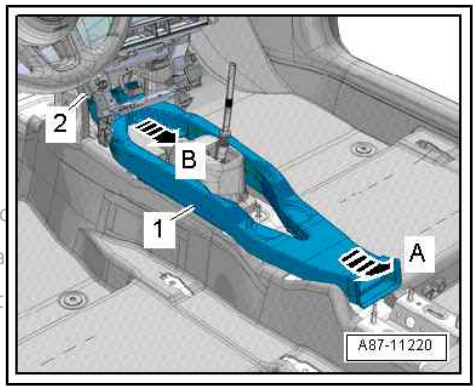
– Remove retaining frame for selector housing ⇒ Power transmission; Rep. gr. 34 ; Selector mechanism .

– Swivel air duct -1- upwards at rear -arrow A-, release it from fastener at air distribution housing -2- -arrow B- and detach.

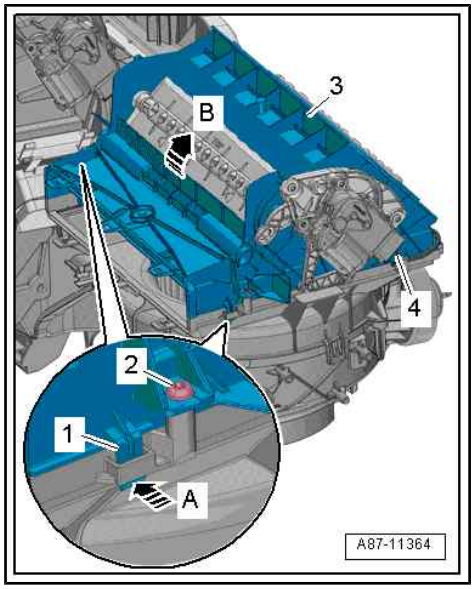
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Installing

Installation is carried out in reverse sequence.



6.5 Removing and installing intake duct



Removing

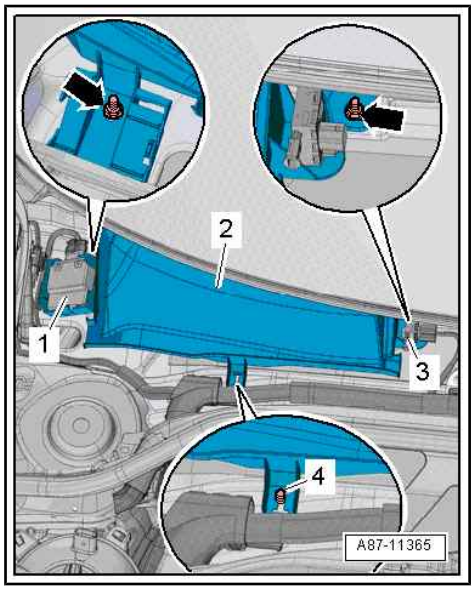
– Remove heater and air conditioning unit ⇒ page 287 .
– Remove dust and pollen filter ⇒ page 293 .
– Unplug electrical connector -4- and move wiring harness clear.
– Remove bolts -2-.
– Release retaining tabs -1- -arrow A-.
– Swivel intake duct -3- upwards -arrow B- and disengage.

Installing

Installation is carried out in reverse sequence.

- Tightening torques
  ⇒ “5.1 Exploded view - heater and air conditioning unit”, page 262

6.6 Removing and installing drip rail



Removing

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .
– If fitted: Remove control unit for structure-borne sound - J869- ⇒ Rep. gr. 23 ; Senders and sensors; Exploded view - actuator for structure-borne sound and control unit for structure-borne sound, vehicles with diesel engine , or ⇒ Rep. gr. 24 ; Senders and sensors; Exploded view - actuator for structure-borne sound and control unit for structure-borne sound, vehicles with petrol engine .
– If fitted: Unplug electrical connector -3- from air quality sensor - G238- .
– Remove nuts -arrows-.
– Detach drip rail -2- from threaded pin -4- and remove from plenum chamber.

Note

- *Water can enter the fresh air intake if the drip rail is damaged or not installed properly. This may result in complaints about odour from the heater/air conditioner and/or moisture in the passenger compartment.*
- *Water can enter the fresh air intake via the drip rail if the plenum chamber cover is damaged or not installed properly.*

Installing

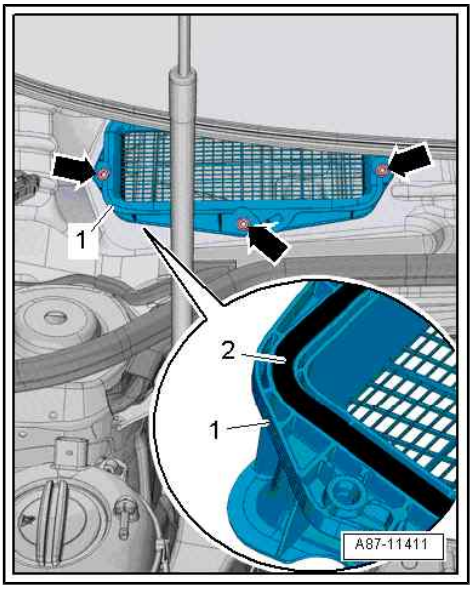
Installation is carried out in reverse sequence.

- Tightening torque
  ⇒ Fig. ““Tightening torque for nuts at drip rail”“ , page 116

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6.7 Removing and installing fresh air intake

Removing



– Remove drip rail ⇒ page 328 .
– Remove nuts -arrows-.
– Take fresh air intake -1- out of plenum chamber.

Note

Water can enter the fresh air intake if the fresh air intake grille is damaged or not installed properly. This may result in complaints about odour from the heater/air conditioner and/or moisture in the passenger compartment.

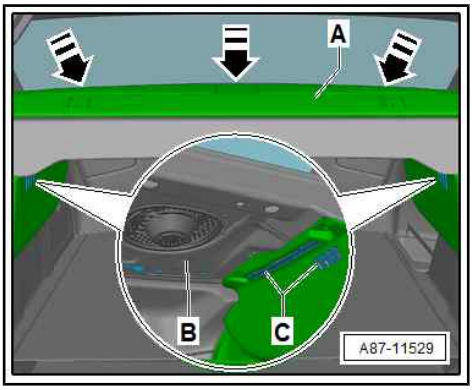
Installing

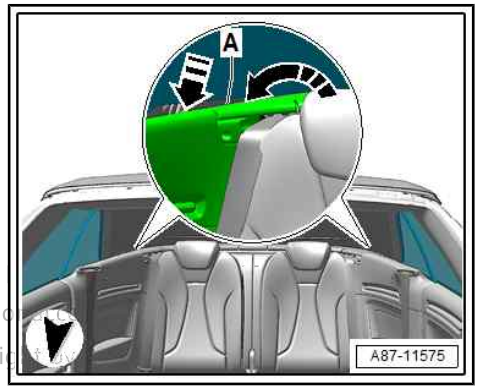
Installation is carried out in reverse order; note the following:

- Tightening torques
⇒ Fig. ""Tightening torque for nuts at fresh air intake"" , page 116

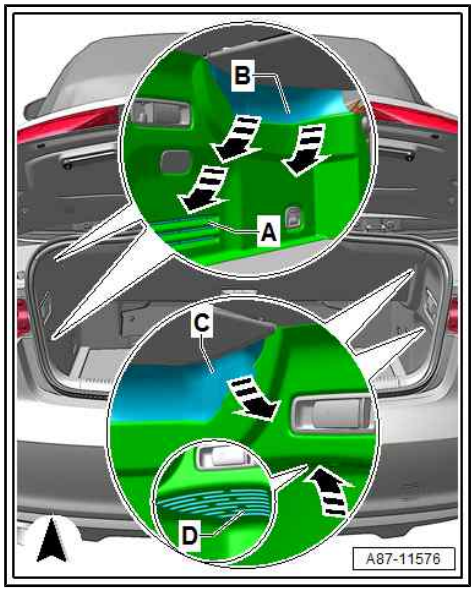
– Check bonded seal -2- between fresh air intake and body for damage.

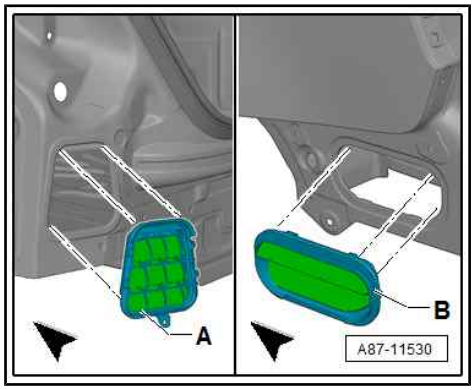
6.8 Checking forced ventilation vents in passenger compartment





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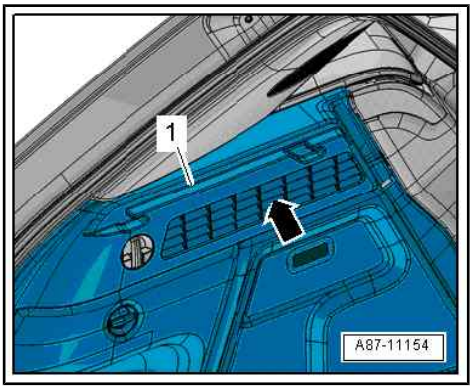
Note

- *The routing of air flow from the passenger compartment to the luggage compartment differs depending on the vehicle version.*
- *On the A3 Saloon, the passenger compartment is vented via a gap in the area between the rear shelf -A- and the cross member for the rear window. There are openings in the top part of the back panel -B- through which the air from the passenger compartment enters the luggage compartment.*
- *The air then flows from the luggage compartment via openings in the luggage compartment side trim -C- (different versions; illustration shows luggage compartment side trim in an Audi A3 Saloon) to the forced ventilation frame.*
- *On the Audi A3 Cabriolet, the passenger compartment is vented via area -A- (at C-pillar) into the convertible roof compartment.*
- *Some of the air flows from the convertible roof compartment into the luggage compartment via areas -B and C- and out of the luggage compartment via openings in the luggage compartment side trim -A and D- to the forced ventilation frames. The rest of the air flows to the forced ventilation frames behind the luggage compartment side trim.*
- *The routing of air flow and forced ventilation frames differ depending on the vehicle version ⇒ Electronic parts catalogue . The Audi A3 and Audi A3 Sportback for example are fitted with ventilation frame -A-, whereas the Audi A3 Saloon and Audi A3 Cabriolet are equipped with ventilation frame -B-.*
- *The following illustrations show the components fitted on the Audi A3 and Audi A3 Sportback. They differ on other vehicle versions (e.g. on the Audi A3 Saloon and the Audi A3 Cabriolet).*

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Checking ventilation slot in luggage compartment:

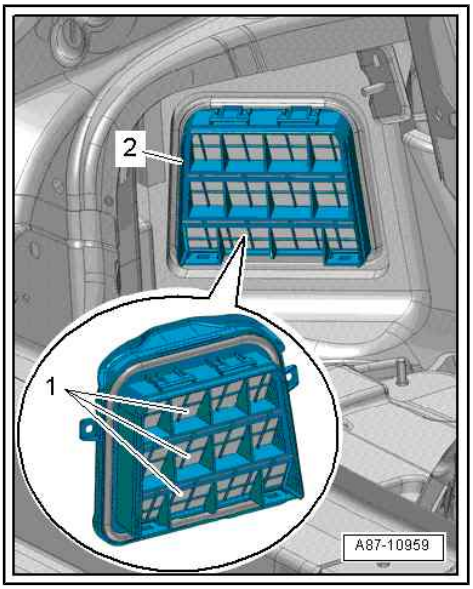
– Check flow of air through ventilation openings -arrow- in luggage compartment side trim -1- (both sides).



Note

If the air ducts to the forced ventilation frames are blocked or obstructed, the windows may mist up.

Checking forced ventilation frame from inside:



Note

- *Gummed up sealing lips could cause the windows to mist up.*
- *The sealing lips in the ventilation frame must move freely and close automatically.*
- *If the air ducts to the ventilation frames are sealed off or blocked, the windows may mist up.*

– Open cover in luggage compartment side trim.

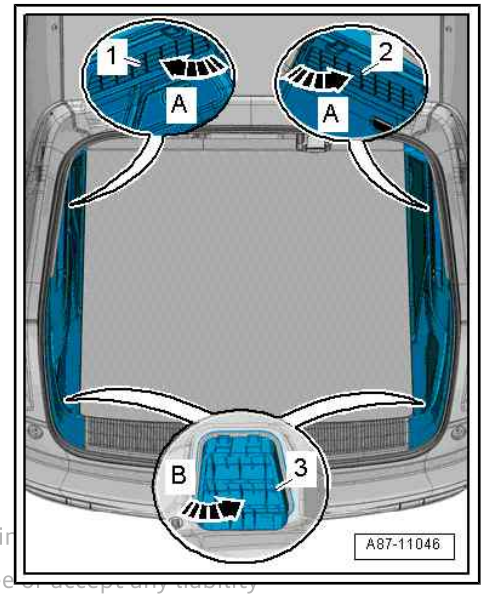
Note

On vehicles with no cover in the luggage compartment side trim (e.g. on left side in A3 Saloon, and in Audi A3 Cabriolet), you can also check whether the sealing lips -1- are functioning properly from outside (with bumper cover fitted).

– Check that ventilation frame -2- is not blocked, and check that sealing lips -1- are functioning properly.

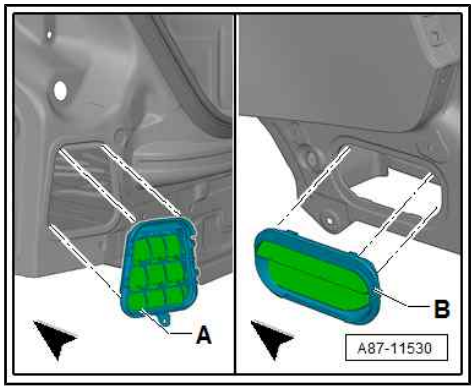
– To ensure proper ventilation of passenger compartment, ventilation openings in luggage compartment must not be blocked.

• It must be possible for the air -arrows A- to flow to the outside -arrow B- via ventilation openings -1 and 2- in the luggage compartment side trim to forced ventilation frames -3-.



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6.9 Removing and installing forced ventilation vents in passenger compartment



Note

- *The routing of air flow and forced ventilation frames differ depending on the vehicle version ⇒ Electronic parts catalogue . The Audi A3 and Audi A3 Sportback for example are fitted with ventilation frame -A-, whereas the Audi A3 Saloon and Audi A3 Cabriolet are equipped with ventilation frame -B-.*
- *The following illustrations show the components fitted on the Audi A3 and Audi A3 Sportback. They differ on other vehicle versions (e.g. on the Audi A3 Saloon and the Audi A3 Cabriolet).*
- *If the forced ventilation frame is to be re-used after it has been removed on vehicles with no cover in the luggage compartment side trim (e.g. on left side in A3 Saloon, or on both sides in Audi A3 Cabriolet), the side trim must not be removed (to ensure that the retaining tabs on the ventilation frame can be released for removal).*

Removing

Audi A3 Saloon, Audi A3 Cabriolet and Audi Q2

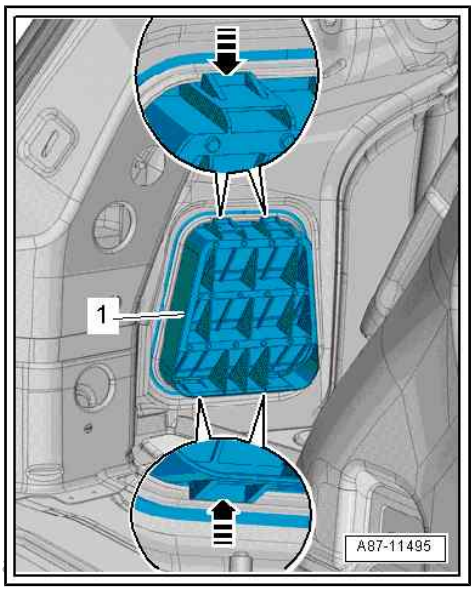
– Remove bumper cover (rear) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (rear); Exploded view - bumper cover .

Audi A3 Saloon

– If left ventilation frame is to be removed and re-used, remove left luggage compartment lining (side trim) - vehicles with luggage compartment lining without cover ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment side trim .

Audi A3 Cabriolet and Audi Q2

– If ventilation frame (left and/or right) is to be removed and re-used, remove corresponding luggage compartment lining (luggage compartment lining without cover) ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Exploded view - luggage compartment side trim .



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Audi A3 and Audi A3 Sportback

– Left side: Detach cover in luggage compartment side trim.

All vehicles (except Audi A3 Cabriolet and Audi Q2)

– Right side: Take out vehicle tool kit.

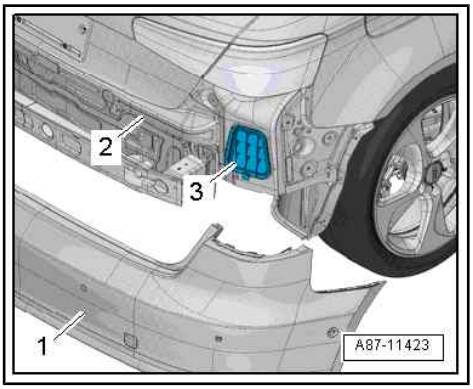
With bumper cover (rear) removed:

– Release retaining clips -arrows- and pull or press forced ventilation frame -1- outwards out of body opening.

With bumper cover (rear) installed:

– Release retaining clips -arrows- and press forced ventilation frame -1- outwards out of body opening.

– Take out ventilation frame -3- downwards between body -2- and bumper cover -1- (e.g. Audi A3, Audi A3 Sportback)



Note

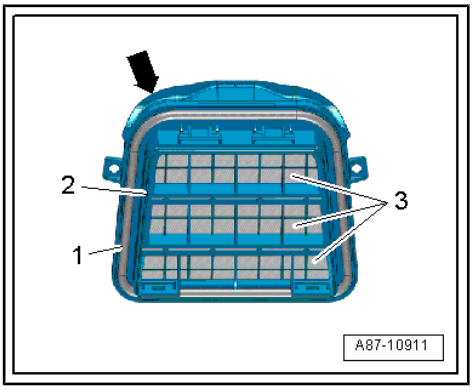
- *This illustration shows the ventilation frame -3- on the right side on an Audi A3 Sportback. It applies accordingly to the left side.*
- *For greater clarity the rear bumper cover of the Audi A3 Sportback has been removed.*

Installing

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

– Check seal -1- for damage.

– Fit ventilation frame -2- in correct position to make sure sealing lips -3- close properly.



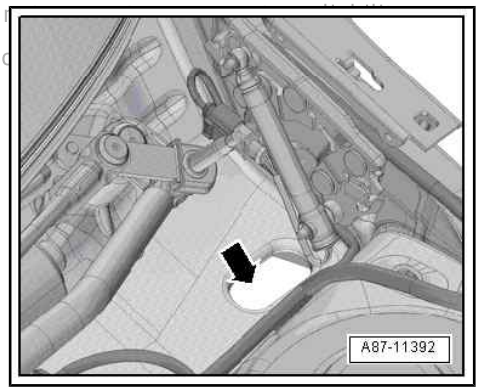
Note

To make sure that the sealing lips -3- close properly, the ventilation frame -2- may only be installed in one position e.g. on the Audi A3 and Audi A3 Sportback. On these vehicles, the large radius -arrow- is at the top.

– Press forced ventilation vent into body opening until all retaining clips engage audibly.

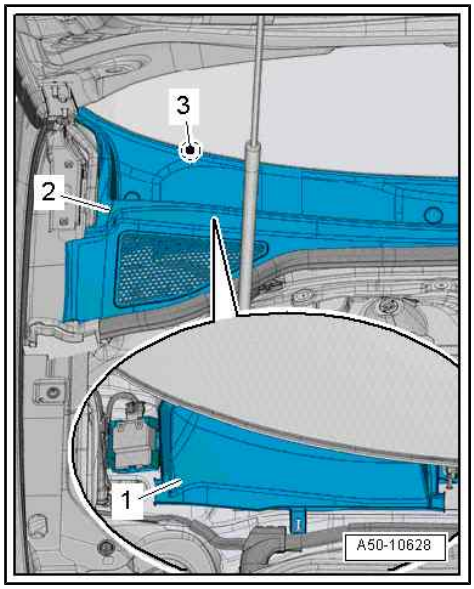
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6.10 Checking plenum chamber water drain



Note

- *Drainage of water out of the plenum chamber may be obstructed by deposits such as leaves and pine needles accumulating in the water drain -arrow-. The water level in the plenum chamber then rises if the vehicle is taken to a car wash or in the event of heavy rain; water enters the heater and air conditioning unit via the fresh air intake and is blown onto the evaporator by the fresh air blower together with the air delivered.*
- *If the water drains (left and right) -arrow- are clogged with leaves and 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.*
- *Water can enter the fresh air intake via the drip rail -1- if the plenum chamber cover -2- is damaged or not installed properly. This may result in complaints about odour from the heater/air conditioner and/or moisture in the passenger compartment.*
- *The plenum chamber cover must be fully engaged in the windscreen frame -3- ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .*



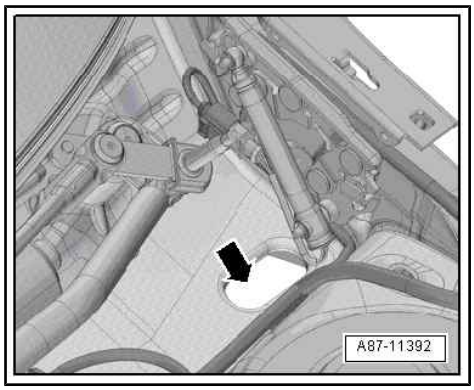
Procedure

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .

– Check for dirt in water drains -arrow-.

• The water must be able to drain off.

– Clean water drains if obstructed with dirt.



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7 Operating and display unit

⇒ “7.1 Overview of fitting locations - operating and display unit”, page 335

⇒ “7.2 Removing and installing operating and display unit J65 / J301 / J255 ”, page 340

7.1 Overview of fitting locations - operating and display unit

⇒ “7.1.1 Overview of fitting locations - operating and display unit J301 , vehicles with manually controlled air conditioner”, page 335

⇒ “7.1.2 Overview of fitting locations - operating and display unit J255 , vehicles with automatically controlled air conditioner”, page 336

7.1.1 Overview of fitting locations - operating and display unit -J301- , vehicles with manually controlled air conditioner

Air conditioning system control unit - J301-

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A - Operating unit (air conditioning system control unit - J301-) for vehicles without seat heating

1 - Rotary temperature control

2 - Button for air recirculation mode

- ❑ If LED lights up, “air recirculation mode” is selected
- ❑ “Air recirculation mode” is cancelled when air distribution is set to “defrost” function (air to windscreen)

3 - A/C button for air conditioner compressor

- ❑ If LED lights up, “air conditioner compressor on” is selected.

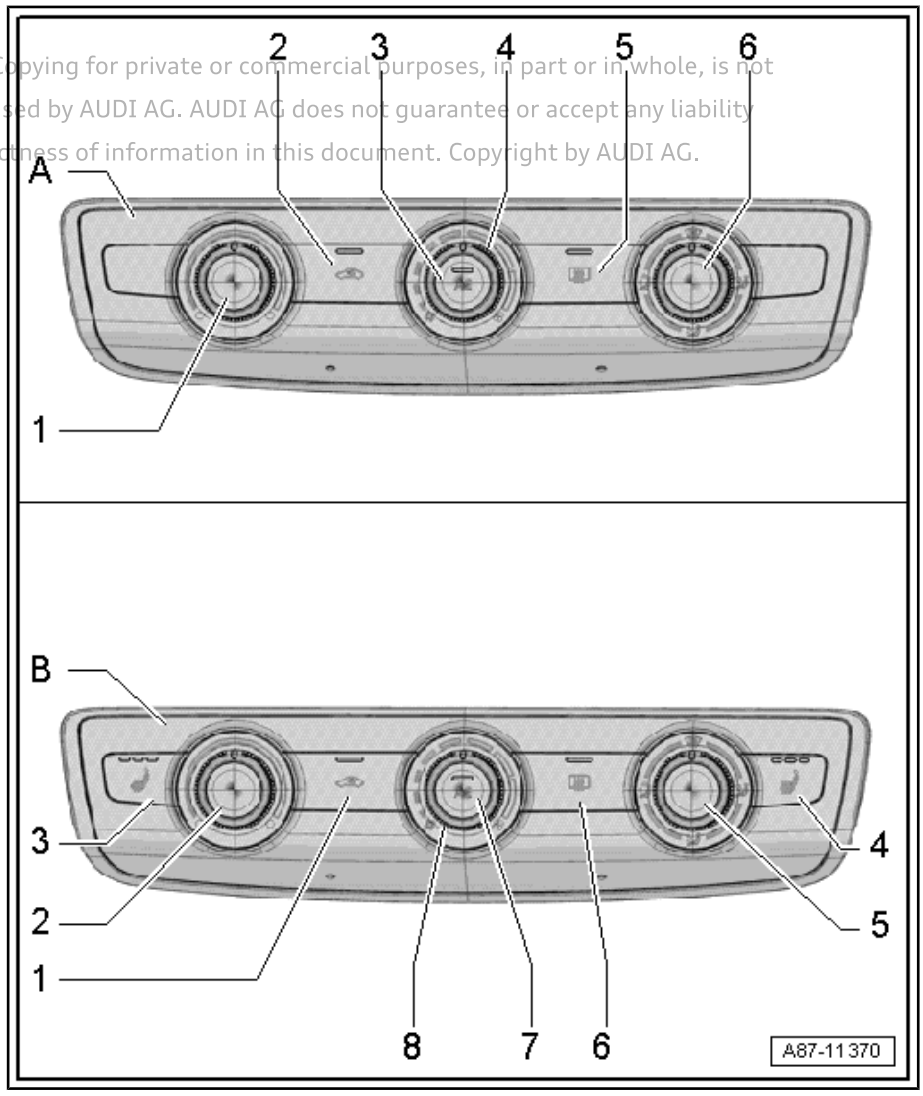
4 - Rotary control for fresh air blower - V2-

5 - Heated rear window button

- ❑ If LED lights up, “Rear window heating on” is selected
- ❑ Rear window heating can be permanently switched on by pressing and holding button ⇒ page 13

6 - Rotary control for setting air distribution

- ❑ Different versions (with



different symbols) ⇒
Electronic parts catalogue

B - Operating unit (air conditioning system control unit - J301-) for vehicles with seat heating

1 - Button for air recirculation mode

- ❑ If LED lights up, “air recirculation mode” is selected
- ❑ “Air recirculation mode” is cancelled when air distribution is set to “defrost” function (air to windscreen)

2 - Rotary temperature control

3 - Button for left seat heating

- ❑ LEDs indicate selected setting
- ❑ Selected setting is reduced by one level after a pre-set time has elapsed ⇒ page 11

4 - Button for right seat heating

- ❑ LEDs indicate selected setting
- ❑ Selected setting is reduced by one level after a pre-set time has elapsed ⇒ page 11

5 - Rotary control for setting air distribution

- ❑ Different versions (with different symbols) ⇒ Electronic parts catalogue

6 - Heated rear window button

- ❑ If LED lights up, “Rear window heating on” is selected
- ❑ Rear window heating can be permanently switched on by pressing and holding button ⇒ page 13

7 - A/C button for air conditioner compressor

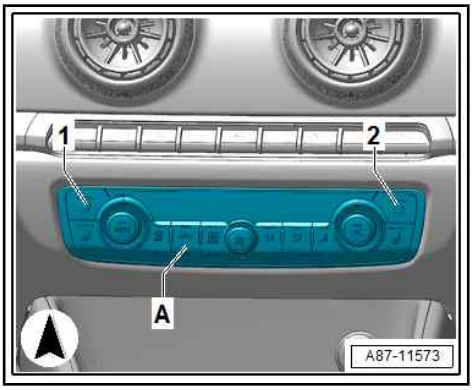
- ❑ If LED lights up, “air conditioner compressor on” is selected.

8 - Rotary control for fresh air blower - V2-

7.1.2 Overview of fitting locations - operating and display unit -J255- , vehicles with automatically controlled air conditioner

Climatronic control unit - J255-

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Note

- *For the A3 Cabriolet, neck heating is available as optional equipment. Vehicles with neck heating are equipped with an additional vent in the seat and with additional buttons -1 and 2- for switching the neck heating on and off in the air conditioner operating unit (Climatronic control unit - J255-). For further information, refer to ⇒ "2.7 Neck heating", page 14 .*
- *There are different versions of the air conditioner operating and display unit (Climatronic control unit - J255-) on vehicles with or without a high-voltage system ⇒ Electronic parts catalogue . On vehicles with a high-voltage system, a version of -J255- is fitted which has additional functions for activating the shut-off valves -N541- , -N542- , the electrical air conditioner compressor - V470- etc.; however, it does not have the option of activating a retro-fitted auxiliary heater or the air conditioner compressor regulating valve - N280- .*
- *There are different versions for vehicles with a high-voltage system e.g. for Europe or for North America. Vehicles for North America e.g. are fitted with a refrigerant pressure and temperature sender - G805- instead of the pressure sender for refrigerant circuit - G395- , and a different version of the electrical air conditioner compressor - V470- (with control unit for air conditioner compressor - J842-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Electronic parts catalogue .*
- *The following illustrations show an air conditioner operating and display unit (Climatronic control unit - J255-) without buttons for switching the neck heating on and off.*

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A - Operating unit (Climatronic control unit - J255-) for vehicles without seat heating

1 - Rotary temperature control (driver side)

2 - Display

3 - Rotary control for fresh air blower - V2-

4 - A/C button for air conditioner compressor

- ❑ If LED lights up, “air conditioner compressor on” is selected.

5 - Rotary temperature control (front passenger side)

6 - Button for setting air distribution at top

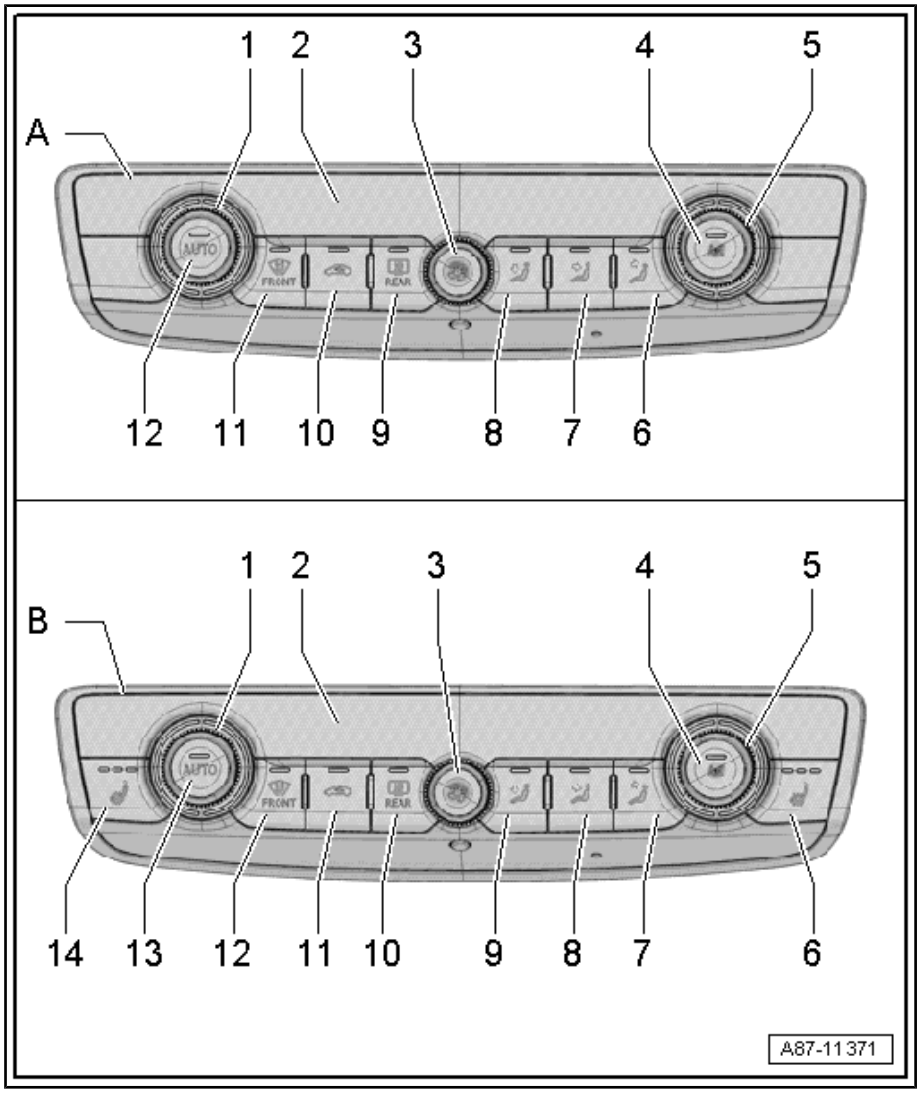
- ❑ If LED lights up, “air distribution at top” is selected
- ❑ Different versions (with different symbols on button) ⇒ Electronic parts catalogue

7 - Button for setting air distribution to centre

- ❑ If LED lights up, “air distribution to centre” is selected

8 - Button for setting air distribution at bottom

- ❑ If LED lights up, “air distribution at bottom” is



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selected

9 - Heated rear window button

- ❑ If LED lights up, “Rear window heating on” is selected
- ❑ Rear window heating can be permanently switched on by pressing and holding button ⇒ page 13

10 - Button for air recirculation mode

- ❑ If LED lights up, “air recirculation mode” is selected
- ❑ The “air recirculation mode” function is cancelled on pressing the button for defrost mode (air to windscreen)

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11 - Button for defrost mode

- ❑ If LED lights up, “defrost mode” is selected
- ❑ Different versions (with different lettering on button) ⇒ Electronic parts catalogue

12 - Auto button for automatic air conditioner control

- ❑ If LED lights up, “automatic control” is selected

B - Operating unit (Climatronic control unit - J255-) for vehicles with seat heating

1 - Rotary temperature control (driver side)

2 - Display

3 - Rotary control for fresh air blower - V2-

4 - A/C button for air conditioner compressor

- ❑ If LED lights up, “air conditioner compressor on” is selected.

5 - Rotary temperature control (front passenger side)

6 - Button for left seat heating

- ❑ LEDs indicate selected setting
- ❑ Selected setting is reduced by one level after a pre-set time has elapsed ⇒ page 11

7 - Button for setting air distribution at top

- ❑ If LED lights up, “air distribution at top” is selected
- ❑ Different versions (with different symbols on button) ⇒ Electronic parts catalogue

8 - Button for setting air distribution to centre

- ❑ If LED lights up, “air distribution to centre” is selected

9 - Button for setting air distribution at bottom

- ❑ If LED lights up, “air distribution at bottom” is selected

10 - Heated rear window button

- ❑ If LED lights up, “Rear window heating on” is selected
- ❑ Rear window heating can be permanently switched on by pressing and holding button ⇒ page 13

11 - Button for air recirculation mode

- ❑ If LED lights up, “air recirculation mode” is selected
- ❑ The “air recirculation mode” function is cancelled on pressing the button for defrost mode (air to windscreen)

12 - Button for defrost mode

- ❑ If LED lights up, “defrost mode” is selected
- ❑ Different versions (with different lettering on button) ⇒ Electronic parts catalogue

13 - Auto button for automatic air conditioner control

- ❑ If LED lights up, “automatic control” is selected

14 - Button for right seat heating

- ❑ LEDs indicate selected setting
- ❑ Selected setting is reduced by one level after a pre-set time has elapsed ⇒ page 11

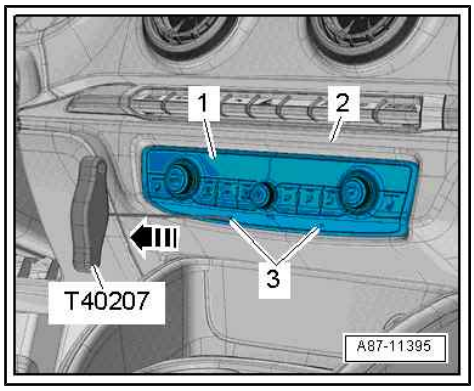
7.2 Removing and installing operating and display unit -J65- / -J301- / -J255-

Special tools and workshop equipment required

- Hook - T40207- (or hook - 3438-).
- Commercially available plastic wedge (see illustration below)

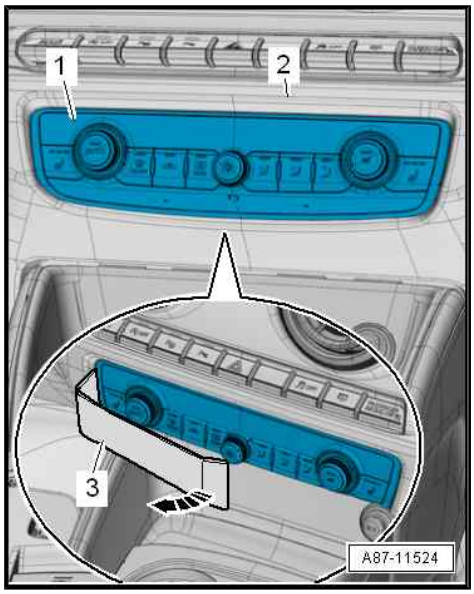
Removing

– Position hook - T40207- (or hook - 3438-) in openings -3- and carefully pull operating unit -1- out of mounting -2- -arrow-.

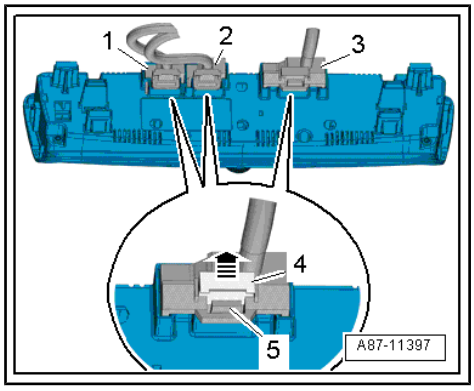


Note

- *If the operating unit -1- cannot be removed as described, use a plastic wedge -3- (e.g. removal wedge - T40233- or wedge T10383/2 from set of wedges - T10383-) while at the same time pulling with the hook -T40207- or -3438- , and carefully press the operating unit out of the mounting -2- -arrow-, as shown in illustration.*
- *If the operating unit -1- is seated so firmly in the mounting in the dash panel that the plastic wedge -3- becomes deformed when attempting to press out the operating unit, you can additionally insert a screwdriver between the plastic wedge -3- and the operating unit -1-.*
- *Depending on the version of the dash panel, a retaining clip (usually bottom right clip) may become caught in the dash panel fascia after the operating unit -1- is released; in this case, press the clip towards the operating unit -1- with your finger or a screwdriver.*



– Unplug electrical connectors -1, 2, 3- by sliding locking element -4- upwards -arrow- and pressing catch -5- inwards.

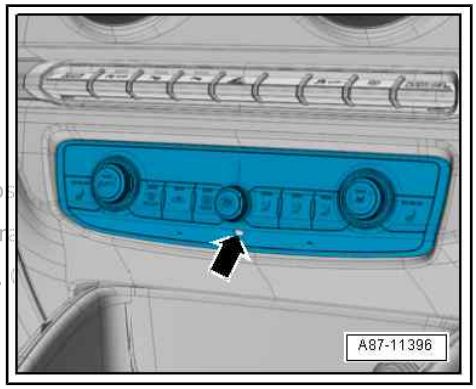


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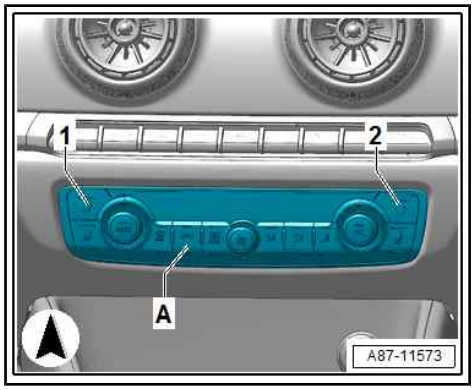
Installing

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

– Vehicles with automatically controlled air conditioner: Check infrared sensor -arrow- for contamination and clean if necessary.
– Check the four retaining clips on the operating unit; if a clip has been bent open too far, bend it back.



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Note

- *A contaminated infrared sensor will cause problems with air conditioner control ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- *There are different versions of the operating units -J65- / -J301- / -J255- (different functions, different symbols and lettering on buttons and rotary controls); for correct version refer to ⇒ Electronic parts catalogue .*
- *On vehicles with a manually controlled air conditioner, the operating unit (air conditioning system control unit - J301-) is available with different lettering on the buttons. At the start of production, -J301- with an AC button was installed. In model year 2013, the lettering for the button was gradually changed to A/C ⇒ Electronic parts catalogue .*
- *The operating unit (heater control unit - J65- on vehicles without air conditioner, air conditioning system control unit - J301- on vehicles with manually controlled air conditioner) are available with different symbols on the rotary control for air distribution. Note the different versions (gradual change-over from model year 2014 onwards) ⇒ Electronic parts catalogue .*
- *On vehicles with an automatically controlled air conditioner, the operating unit (Climatronic control unit - J255-) is available with different lettering on the buttons. At the start of production, operating units -J255- with a Front button (for defrost mode) were installed. In model year 2014, the lettering for the button was gradually changed to MAX ⇒ Electronic parts catalogue .*
- *There are different versions of the air conditioner operating and display unit (Climatronic control unit - J255-) on vehicles with or without a high-voltage system ⇒ Electronic parts catalogue*
  ⇒ "7.1.2 Overview of fitting locations - operating and display unit J255 , vehicles with automatically controlled air conditioner", page 336 .
- *If an operating unit is installed on which the clips are bent too far open, it might not be possible to remove it from the dash panel again (clips can become caught in mounting).*
- *For the A3 Cabriolet, neck heating is available as optional equipment. Vehicles with neck heating are equipped with an additional vent in the seat and with additional buttons -1 and 2- for switching the neck heating on and off in the air conditioner operating unit (Climatronic control unit - J255-). For further information, refer to*
  ⇒ "2.7 Neck heating", page 14 .

– Interrogate event memory and erase any entries displayed; then perform basic setting ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
– As a final step, check operation of heater/air conditioner.

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8 Coolant circuit

⇒ “8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit”, page 343

⇒ “8.2 Incorporation of heat exchanger for high-voltage battery into coolant circuit of high-voltage system”, page 347

⇒ “8.3 Removing and installing coolant valve for high-voltage battery N688 ”, page 350

⇒ “8.4 Removing and installing coolant pump for high-voltage battery V590 ”, page 350

⇒ “8.5 Removing and installing continued coolant circulation pump V51 ”, page 351

⇒ “8.6 Removing and installing coolant shut-off valve N82 ”, page 351

⇒ “8.7 Removing and installing coolant changeover valve 1 N632 ”, page 351

⇒ “8.8 Removing and installing coolant changeover valve 2 N633 ”, page 351

⇒ “8.9 Removing and installing heat exchanger for high-voltage battery”, page 352

⇒ “8.10 Removing and installing high-voltage heater (PTC) Z115 (with high-voltage heater (PTC) control unit J848)”, page 356

8.1 Incorporation of high-voltage heater (PTC) - Z115- into coolant circuit

Note

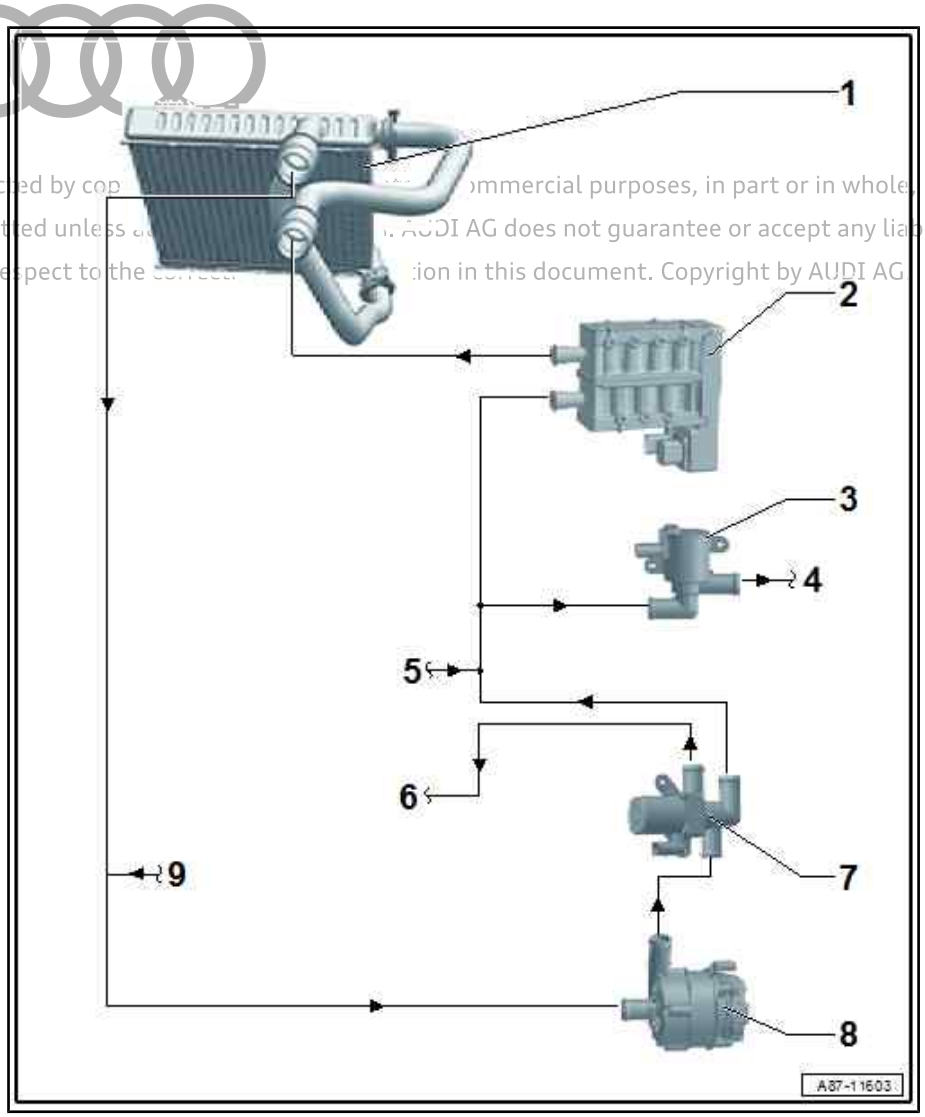
- *On vehicles with high-voltage system, the supplementary heating function is provided by the high-voltage heater (PTC) - Z115-*
  ⇒ “4.15 Notes on high-voltage heater (PTC) Z115 (and high-voltage heater (PTC) control unit J848)”, page 85 .
- *On vehicles with a high-voltage system and an auxiliary heater fitted as an optional extra, the high-voltage heater (PTC) - Z115- can be activated instead of the auxiliary heater to heat up the passenger compartment. For further information, refer to ⇒ Auxiliary/supplementary heater; Rep. gr. 00 ; General notes .*
- *On vehicles with high-voltage system which do not feature an auxiliary heater as an optional extra, the passenger compartment can be heated via the “Auxiliary air conditioner” function and - Z115- when ambient temperatures are low (or cooled via the air conditioner when ambient temperatures are high). For further information, refer to*
  ⇒ “2.8 Auxiliary air conditioner - vehicles with high-voltage system only”, page 16 .
- *Topping up coolant and bleeding coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system*
- *For incorporation of heat exchanger for air conditioner and high-voltage heater (PTC) - Z115- into engine coolant circuit, refer to ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .*

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Note

The -arrows- indicate the direction of coolant flow.

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1 - Heat exchanger for heater in air conditioning unit

- Incorporation of heat exchanger into engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

2 - High-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-)

- Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing ⇒ page 356
- Notes on - Z115- (and - J848-) ⇒ “4.15 Notes on high-voltage heater (PTC) Z115 (and high-voltage heater (PTC) control unit J848)”, page 85
- For further information on vehicles with an auxiliary heater (optional extra), refer to ⇒ Auxiliary/supplementary heater; Rep. gr. 00 ; General notes .

3 - Coolant valve for gearbox - N488-

- Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly

4 - Coolant supply to gearbox

- Incorporation of auxiliary heater into coolant circuit of engine (and gearbox) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

5 - Coolant supply from engine

- Incorporation of auxiliary heater into engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

6 - Coolant return to engine

- Incorporation of auxiliary heater into engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

Note

Depending on the engine, a valve may be fitted in the coolant return between the coolant changeover valve 2 - N633- and the engine; this valve prevents coolant from flowing from the engine to -N633- when the engine is running ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses .

7 - Coolant changeover valve 2 - N633-

- ❑ Incorporation of auxiliary heater into engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses
- ❑ Removing and installing ⇒ page 351 and ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly

Note

- ♦ *-N633- is activated by the corresponding engine control unit (e.g. by engine control unit - J623-) if heat output is being requested by the air conditioner and the vehicle is in electric mode ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ♦ *Check correct installation position and operation if there is a problem with insufficient heat output from the air conditioner with engine stopped and/or running, regardless of whether -Z115- is activated ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ♦ *So that the coolant heated up by -Z115- is conveyed through the air conditioner heat exchanger, the coolant pump for high-temperature circuit - V467- and the coolant valve for gearbox - N488- must also be activated (by the corresponding engine control unit). To ensure that the coolant flows in the right direction, the non-return valves fitted in the coolant circuit must also be installed correctly and they must operate correctly. For further information, refer to ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses , ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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8 - Coolant pump for high-temperature circuit - V467-

- ❑ Incorporated into engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses
- ❑ Removing and installing ⇒ Engine, mechanics; Rep. gr. 19 ; Coolant pump/thermostat assembly

Note

- *-V467- is activated by the corresponding engine control unit (e.g. by engine control unit -J623-) if heat output is being requested by the air conditioner ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *Check correct installation position and operation of -Z115- if there is a problem with insufficient heat output from the air conditioner with engine stopped and/or running, regardless of whether -V467- is activated ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *So that the coolant heated up by -Z115- is conveyed through the air conditioner heat exchanger, the coolant changeover valve 2 - N633- and the coolant valve for gearbox - N488- must also be activated (by the corresponding engine control unit). To ensure that the coolant flows in the right direction, the non-return valves fitted in the coolant circuit must also be installed correctly and they must operate correctly. For further information, refer to ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses , ⇒ Vehicle diagnostic tester (“Guided Fault Finding”) and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

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9 - Coolant return from gearbox

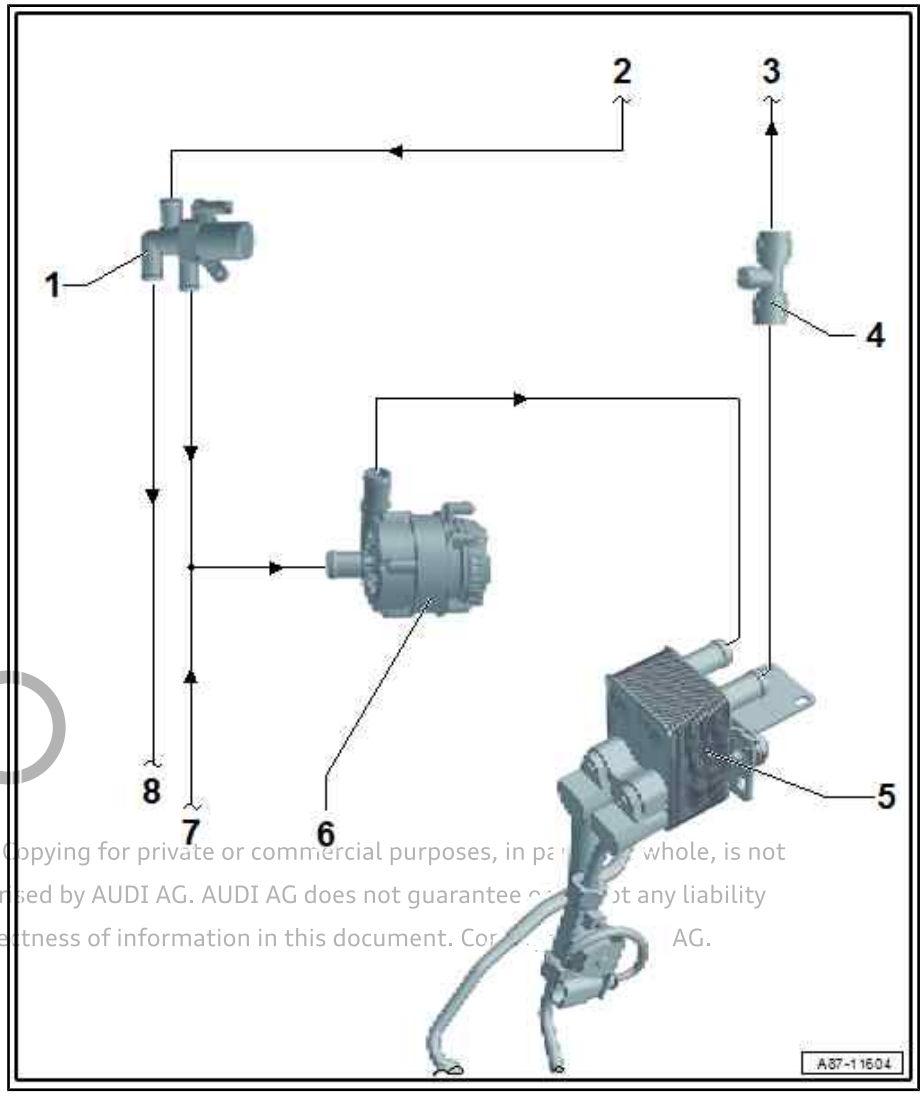
- ❑ Incorporation of auxiliary heater into coolant circuit of engine (and gearbox) ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

8.2 Incorporation of heat exchanger for high-voltage battery into coolant circuit of high-voltage system

Note

- *Topping up coolant and bleeding coolant circuit ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system (vehicles with high-voltage system).*
- *The following illustration only shows part of the components of the coolant circuit for the high-voltage system. For further components not shown here, refer to ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .*
- *Incorporation of heat exchanger for high-voltage battery into refrigerant circuit*
  ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138
- *If there is a problem because the components of the high-voltage system are not cooled and the air conditioner cooling output is OK, check that the heat exchanger for the high-voltage battery is cooled down via the cooling output test ⇒ “4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)”, page 64 . Make sure that the heat exchanger for high-voltage battery is actually cooled down. The refrigerant shut-off valve for high-voltage battery heat exchanger - N542- must operate correctly, and the restrictor fitted in the refrigerant circuit must be OK ⇒ “2.1.2 System overview - refrigerant circuit, vehicles with high-voltage system”, page 138 . If no fault is found in the refrigerant circuit, check the incorporation of the coolant pump for high-voltage battery - V590- , the coolant circulation pump before power and control electronics for electric drive - V508- , the coolant changeover valve 1 - N632- and the coolant valve for high-voltage battery - N688- into the coolant circuit of the high-voltage system as well as these components' activation and operation ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system and ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and hybrid battery energy management system).*

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1 - Coolant valve for high-voltage battery - N688-

- ❑ Incorporation into coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system
- ❑ Removing and installing ⇒ page 350 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves
- ❑ Checking operation and activation of coolant pump for high-voltage battery - V590- and - N688- ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system and ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and hybrid battery energy management system)

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2 - Coolant return from hybrid battery unit - AX1-

- ❑ Incorporation into coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system

3 - Coolant supply to hybrid battery unit - AX1-

- ❑ Incorporation into coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system

4 - Bleeder screw

- ❑ Bleeding coolant circuit ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system (vehicles with high-voltage system)

5 - High-voltage battery heat exchanger

- ❑ Incorporation into coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system
- ❑ Check operation and cooling of heat exchanger via air conditioner ⇒ “4.8.5 Checking cooling output - vehicles with automatically controlled air conditioner (with high-voltage system)”, page 64 and ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner and hybrid battery energy management system).
- ❑ Removing and installing ⇒ page 352

6 - Coolant pump for high-voltage battery - V590-

- ❑ Incorporation into coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system
- ❑ Removing and installing ⇒ page 350 and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing electric coolant pump
- ❑ Checking operation and activation of -V590- and coolant valve for high-voltage battery - N688- ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system and ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for hybrid battery energy management system)

Note

- *-V590- (and -N688-) are activated by the hybrid battery unit - AX1- (by the battery regulation control unit - J840-) if there is a request for cooling the components of the high-voltage system (hybrid battery unit - AX1- , power and control electronics for electric drive - JX1- and/or control unit for high-voltage battery charging unit - J1050-) ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for hybrid battery energy management system) and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .*
- *If there is a problem with lack of cooling output for the components of the high-voltage system, make sure they are correctly installed and function properly ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for hybrid battery energy management system) and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .*

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- *In order for the power and control electronics for electric drive - JX1- and the control unit for high-voltage battery charging unit - J1050- to be cooled, the coolant circulation pump before power and control electronics for electric drive - V508- and the coolant changeover valve 1 - N632- must also be activated correctly (by the corresponding engine control unit) and they must be functioning properly. For further information, refer to ⇒ Vehicle diagnostic tester ("Guided Fault Finding" for hybrid battery energy management system) and ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .*

7 - Coolant supply from cooler for high-voltage system

- ❑ Incorporation into coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system

8 - Coolant supply to coolant circulation pump before power and control electronics for electric drive - V508-

- ❑ Incorporation into coolant circuit of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system

8.3 Removing and installing coolant valve for high-voltage battery - N688-

Note

-N688- is installed in the coolant circuit of the high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

Removing and installing ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves

8.4 Removing and installing coolant pump for high-voltage battery - V590-

Note

-V590- is installed in the coolant circuit of the high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

Removing and installing ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves

8.5 Removing and installing continued coolant circulation pump - V51-

Note

-V51- is installed in the coolant circuit (depending on engine version) ⇒ 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 Coolant pump/thermostat assembly)

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

Note

-N82- is installed in the coolant circuit (depending on engine version) ⇒ 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 Coolant pump/thermostat assembly)

8.7 Removing and installing coolant changeover valve 1 - N632-

Note

-N632- is installed in the coolant circuit of the high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system .

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Removing and installing ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves

8.8 Removing and installing coolant changeover valve 2 - N633-

Note

-N633- is installed in the engine coolant circuit ⇒ "8.1 Incorporation of high-voltage heater (PTC) Z115 into coolant circuit", page 343 , ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses, cooling components for high-voltage system and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Removing and installing ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves

8.9 Removing and installing heat exchanger for high-voltage battery

Note

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

Special tools and workshop equipment required

- Hose clamps up to 25 mm - 3094-
- Engine bung set - VAS 6122-
- Spring-type clip pliers - VAS 5024A-
- Cooling system tester - V.A.G 1274 B-

Removing

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

– 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 .

WARNING

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.

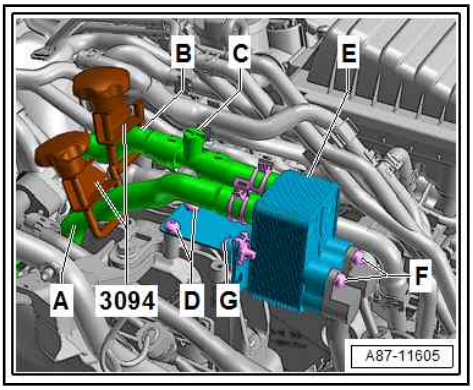
- ***Put on protective gloves.***
- ***Put on safety goggles.***
- ***Cover filler cap on expansion tank with a cloth and open carefully to release pressure.***

– Open cap on coolant expansion tank for high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system (vehicles with high-voltage system).

– Unfasten coolant expansion tank for engine coolant circuit from vehicle and tilt it slightly to the side ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant .

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– Use hose clamps -3094- to pinch off coolant hoses -A- and -B-.



Note

The heat exchanger is designed for a certain coolant flow direction. Therefore it is important to connect the coolant hoses correctly.

– Cover area beneath connections for coolant hoses at heat exchanger -E- with absorbent paper.
– Detach coolant hoses -A- and -B- from connections at heat exchanger -E-.
– Seal off open connections for coolant hoses on heat exchanger -E- with clean plugs from engine bung set - VAS 6122- .

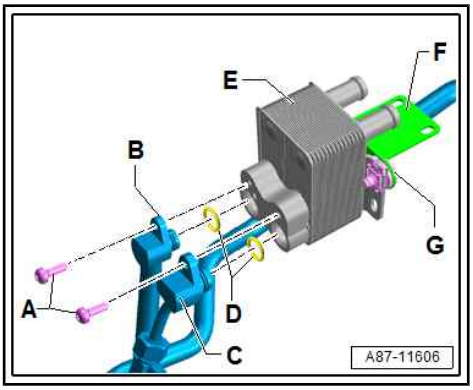
WARNING

Danger from escaping pressurised refrigerant.
Danger of frostbite on skin and other parts of the body.

- ***Extract the refrigerant and then immediately open up the refrigerant circuit.***
- ***Extract the refrigerant again if more than 10 minutes have passed since the initial extraction and the refrigerant circuit has not been opened up. Renewed evaporation leads to the build-up of pressure in the refrigerant circuit.***

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– Remove bolts -F- at refrigerant lines leading to heat exchanger -E-.
– Remove bolts -D-.
– Unfasten heat exchanger -E- from refrigerant lines -B- and -C- and remove them together with bracket -F-.
– Seal off open connections for coolant hoses on heat exchanger -E- and refrigerant lines -B- and -C- with clean plugs from engine bung set - VAS 6122- .



Note

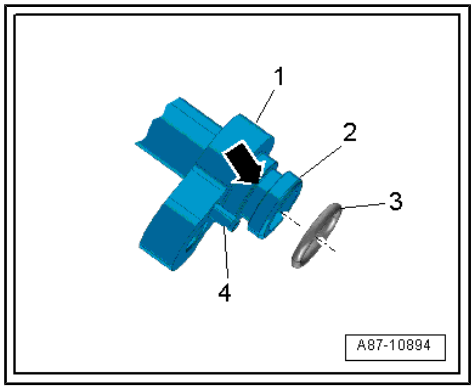
Bracket -F- is secured to heat exchanger -E- with two bolts -G-.

Installing

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

– Renew O-rings -D-; for correct version, refer to ⇒ Electronic parts catalogue .
– Check connections -B- and -C- of refrigerant lines and on heat exchanger -E- for dirt and damage.

– Insert O-ring -3- in groove -arrow- in connection for refrigerant line -1-.

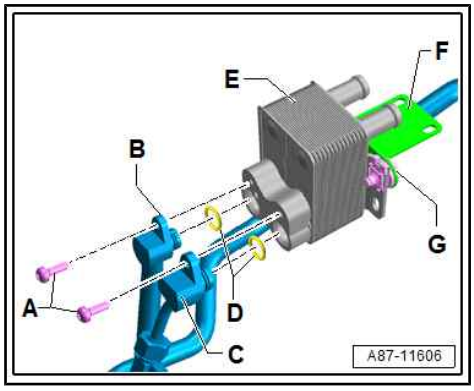


Note

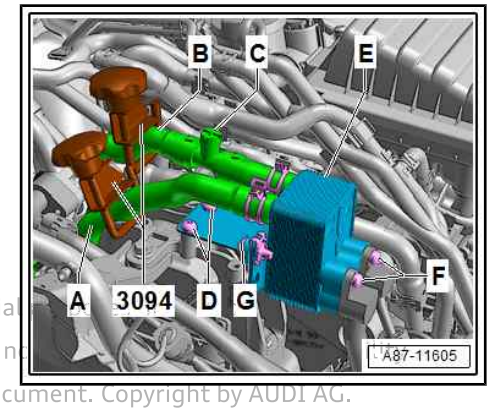
- *If fitted, check that dowel pin -4- is not damaged and is seated correctly.*
- *Lubricate O-rings with refrigerant oil before installing* *⇒ page 81* *.*
- *Make sure O-rings are seated correctly in groove of corresponding refrigerant line.*
- *Routing and attaching refrigerant lines* *⇒ page 26*

– Bracket -F- is secured to heat exchanger -E- with two bolts -G-. If bolts -G- have been loosened, insert them, but do not tighten them yet.

– Connect refrigerant lines -B- and -C- to heat exchanger -E- and secure them with bolts -A- (do not tighten bolts -A- yet).



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- Align heat exchanger -E- so it is not under strain and insert bolts -D-.
- Tighten bolts -G- (tightening torque: 8 Nm).
- Tighten bolts -D- (tightening torque: 8 Nm).
- Tighten bolts -F- (tightening torque: 8 Nm).
- Attach coolant hoses -A- and -B- to connections on heat exchanger -E-.
- Fill coolant into coolant expansion tank for high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system (vehicles with high-voltage system).
- Slightly increase pressure in coolant expansion tank for high-voltage system using e.g. cooling system tester - V.A.G 1274 B- ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system (vehicles with high-voltage system).
- Carefully open bleeder screw -C-.
- Carefully open hose clamp up to 25 mm - 3094- at coolant hose -A- and allow coolant to flow into heat exchanger -E-.
- Close bleeder screw -C- again as soon as coolant emerges at bleeder screw.

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Note

If the removal and installation of the heat exchanger for the high-voltage battery -E- has been performed as described above, there should be no air in the coolant circuit of the high-voltage system. If there is still any air in the coolant circuit despite this, it must be bled ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system (vehicles with high-voltage system).

- If necessary, fill coolant into coolant expansion tank for high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system (vehicles with high-voltage system).
- Remove hose clamps up to 25 mm - 3094- and re-install all components removed or unfastened before.
- 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 .
- Start up air conditioner after charging refrigerant circuit ⇒ page 199 .
- As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

8.10 Removing and installing high-voltage heater (PTC) - Z115- (with high-voltage heater (PTC) control unit - J848-)

Note

A different heating element was introduced in place of the old one during the model cycle. The procedure for removal and installation is identical. For allocation of parts refer to ⇒ Electronic parts catalogue .

For all work on vehicles with high-voltage system, note additional warnings for working on such vehicles
⇒ “3.1 Safety precautions when working on vehicles with high-voltage system”, page 19 .

The following procedure requires work to be performed in the vicinity of high-voltage components
⇒ “3.2 Safety precautions when working in the vicinity of high-voltage components”, page 19 .

The following procedure requires work to be performed on the high-voltage system; de-energise the high-voltage system.

– Switch off ignition.
– De-energise high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; De-energising high-voltage system .

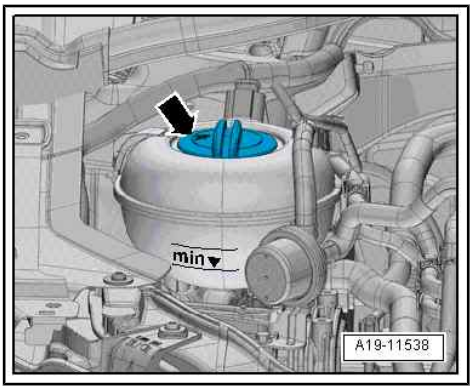
Special tools and workshop equipment required

- Five-point star bit (TS30H) with centre hole (commercially available)
- Hose clamps up to 25 mm - 3094-
- Engine bung set - VAS 6122-
- Cooling system tester - V.A.G 1274 B-
- Spring-type clip pliers - VAS 5024A-

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Removing

– De-energise high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; De-energising high-voltage system .



WARNING

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.

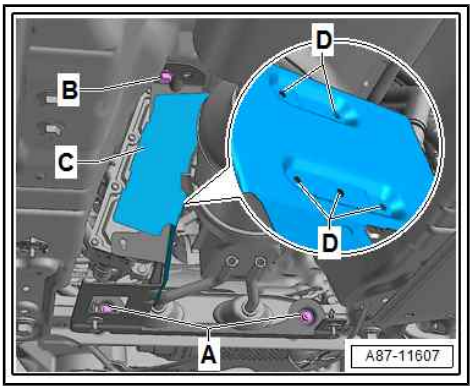
- *Put on protective gloves.*
- *Put on safety goggles.*
- *Cover filler cap on expansion tank with a cloth and open carefully to release pressure.*

– Open cap -arrow- on coolant expansion tank for engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/ coolant; Draining and filling cooling system .

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

Note

The high-voltage heater (PTC) - Z115- is installed together with the bracket and the heat shield -C- in the centre tunnel on the underbody in the vicinity of the catalytic converter.



– Remove bolts -A- and -B-.

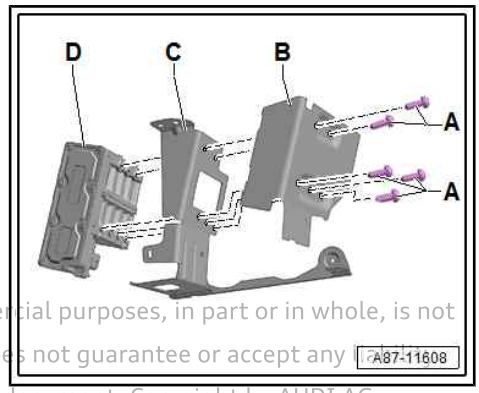
– Carefully tilt high-voltage heater (PTC) - Z115- with bracket and heat shield -C- downwards.

– Remove bolts -D-.

Note

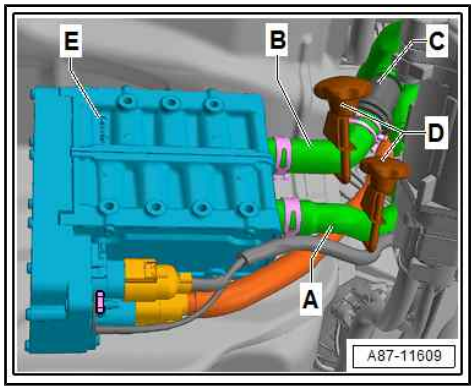
At the start of production, the heat shield is secured with thread-forming M6x12 pan-head bolts -D-. Use a five-point star bit (TS30H) with centre hole (commercially available) to remove and install these bolts.

– Detach heat shield -B- and bracket -C- from high-voltage heater (PTC) - Z115- -D-.



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



Note

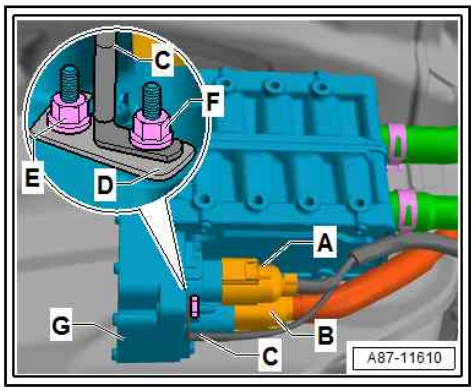
- *The high-voltage heater (PTC) - Z115- -E- is designed for a certain coolant flow direction. Therefore it is important to connect the coolant hoses correctly.*
- *On vehicles with an auxiliary heater (optional extra), a non-return valve is fitted in the coolant line -C- ⇒ Auxiliary/supplementary heater; Rep. gr. 82 ; Coolant circuit with auxiliary/supplementary heater .*

– Detach coolant hoses -A- and -B- from connections at high-voltage heater (PTC) - Z115- -E-.

– Seal off open connections for coolant hoses on high-voltage heater (PTC) - Z115- -E- with clean plugs from engine bung set - VAS 6122- .

– Detach electrical connectors -A- (low voltage) and -B- (high voltage) from high-voltage heater (PTC) - Z115- ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– Cover high-voltage wire connector and mating plug at -Z115- -G- to prevent damage and contamination (e.g. with clean plugs from engine bung set - VAS 6122-).

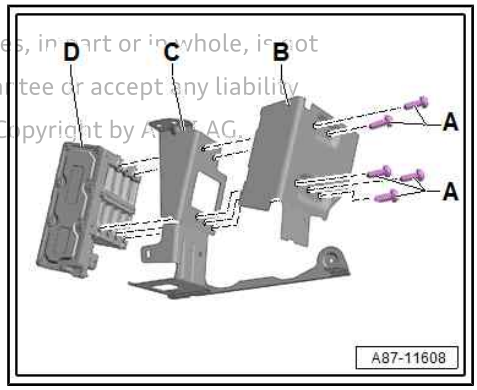


Unscrew nut -F- (or -E-) and detach earth wire -C- (or earth wire -C- with bracket -D-).

Installing

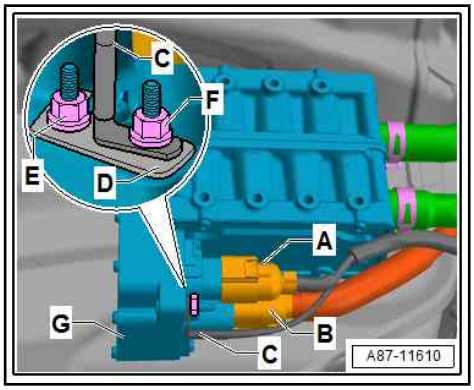
Installation is carried out in reverse order; note the following:

Heat shield -B- and bracket -C- are bolted onto high-voltage heater (PTC) - Z115- -D- with thread-forming M6x12 pan-head bolts -A-. If a new high-voltage heater (PTC) - Z115- -D- is installed, note that the holes are not threaded yet. To make it easier to insert the bolts when installing a new -Z115- -D-, position bolts -A- and screw them in approx. 6 mm before installing -Z115- -D-.



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Check and, if necessary, clean contact surfaces for earth wire -C- on bracket -D- and for bracket -D- on -Z115- -G- before bolting on ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .



Note

Prior to installation, check attachment points on -Z115- -G- and on bracket -D- as well as earth wire -C- at nut -F-. The contact surfaces must be clean and free from rust and grease. If this is not the case, treat the contact surfaces accordingly with the contact surface cleaning set - VAS 6410- ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .

Bolt bracket -D- and earth wire -C- onto -Z115- -G-.

Component	Tightening torque
Nuts -E- and -F- (M6 thread)	8 Nm

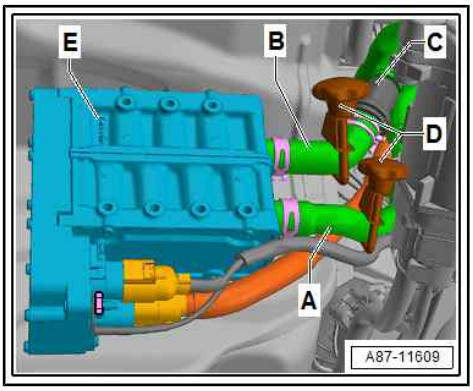
– Plug in electrical connectors -A- (low voltage) and -B- (high voltage) at -Z115- -G- ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; High-voltage wires; Overview of fitting locations - high-voltage wires .

– If necessary, fill coolant into coolant expansion tank for engine ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Attach coolant hose -A- to -Z115- -E-.

– Carefully open hose clamp up to 25 mm - 3094- -D- at coolant hose -A- and allow coolant to flow into high-voltage heater (PTC) - Z115- -E-.

– As soon as coolant emerges from connection for coolant hose -B- at -Z115- -E- (-Z115- -E- filled completely with coolant), connect coolant hose -B- to -Z115- -E-.



Note

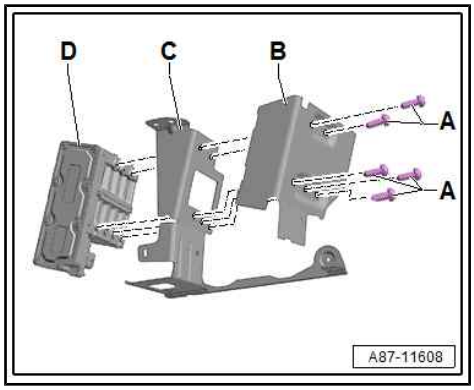
- *Hold connection for coolant hose -B- up as high as possible while allowing coolant to flow into -Z115- -E- to make sure it is filled completely with coolant.*
- *If the removal and installation of -Z115- -E- has been performed as described above, there should be no air in the engine coolant circuit. Should there still be air in the coolant circuit despite this, it must be bled ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .*

– Remove both hose clamps -D-.

– Check and, if necessary, clean contact surfaces for bracket -C- on -Z115- -D- and on heat shield -B- before bolting on ⇒ Electrical system; Rep. gr. 97 ; Cleaning contact surfaces .

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– Fit heat shield -B- and bracket -C- at high-voltage heater (PTC) - Z115- -D-.



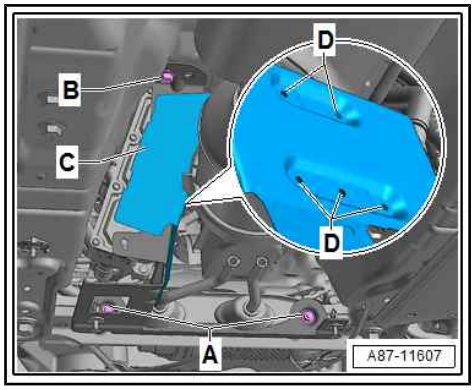
Note

Heat shield -B- and bracket -C- are bolted onto high-voltage heater (PTC) - Z115- -D- with thread-forming M6x12 pan-head bolts -A-.

Tightening torques:

Component	Tightening torque
Bolts -A-	8 Nm

– Install bracket -C- with high-voltage heater (PTC) - Z115- .



Tightening torques:

Component	Tightening torque
Bolts -A-	8 Nm
Bolts -B-	20 Nm

– Re-install all removed/unfastened components.

– If necessary, fill coolant into coolant expansion tank for engine coolant circuit ⇒ Engine, mechanics; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

– Remove hose clamps up to 25 mm - 3094- and re-install all components removed or unfastened before.

– Re-energise power supply of high-voltage system ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Re-energising high-voltage system .

– After installing high-voltage heater (PTC) - Z115- , switch on ignition and activate drive system (READY - engine does not have to be running), set air conditioner to maximum heat output and allow it to run in this setting for two minutes.

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9 Further control components

⇒ “9.1 Removing and installing sunlight penetration photosensor G107 ”, page 361

⇒ “9.2 Removing and installing ambient temperature sensor G17 ”, page 362

⇒ “9.3 Operation of air quality sensor G238 ”, page 364

⇒ “9.4 Checking air quality sensor G238 ”, page 366

⇒ “9.5 Operation of humidity sender in fresh air intake duct G657 ”, page 370

⇒ “9.6 Removing and installing air quality sensor G238 / humidity sender in fresh air intake duct G657 ”, page 371

⇒ “9.7 Removing and installing sensors G355 / G397 / G107 ”, page 372

⇒ “9.8 Removing and installing fuse for electrical air conditioner compressor”, page 372

9.1 Removing and installing sunlight penetration photosensor - G107-

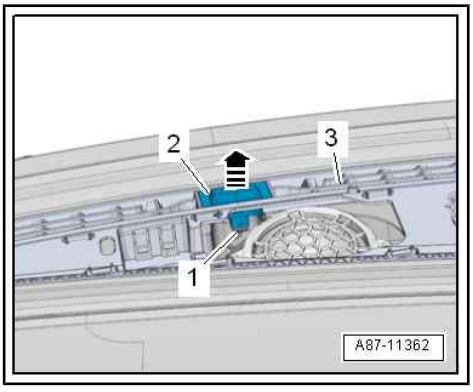
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Only installed on Audi A3 vehicles with automatic air conditioner

Note

- *On Audi Q2 vehicles with automatic air conditioner, the sunlight penetration photosensor is fitted in the mirror base ⇒ “9.7 Removing and installing sensors G355 / G397 / G107 ”, page 372 .*
- *The sunlight penetration photosensor - G107- is only installed on vehicles with automatically controlled air conditioners.*
- *Checking sunlight penetration photosensor - G107- ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for air conditioner)*

Removing



– Remove loudspeaker trim ⇒ General body repairs, interior; Rep. gr. 70 ; Dash panel; Removing and installing loudspeaker trim .
– Press sunlight penetration photosensor - G107- -item 2- upwards out of defroster vent -3- -arrow-.
– Unplug electrical connector -1-.

Installing

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

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

9.2 Removing and installing ambient temperature sensor - G17-

⇒ “9.2.1 Removing and installing ambient temperature sensor G17 - A3”, page 362

⇒ “9.2.2 Removing and installing ambient temperature sensor G17 - Q2, Q2 China”, page 362

⇒ “9.2.3 Removing and installing ambient temperature sensor G17 - SQ2”, page 363

9.2.1 Removing and installing ambient temperature sensor - G17- - A3

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Note

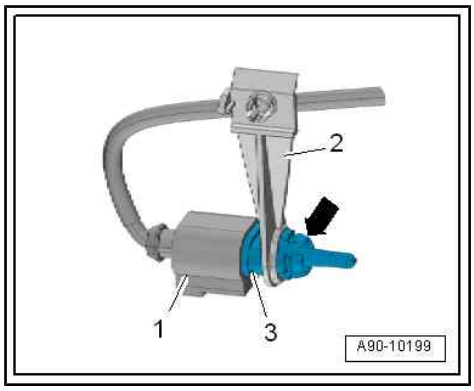
An incorrect measured value for ambient temperature sensor - G17- may lead to problems with the control of the air conditioner and supplementary heater on vehicles with TDI engine. Checking ⇒ Vehicle diagnostic tester (“Guided Fault Finding” for instrument cluster)

Removing

– Switch off ignition.

– Reach through opening in radiator grille, carefully compress retaining clips -arrow- and pull ambient temperature sensor - G17- -item 3- out of bracket -2-.

– Unplug electrical connector -1-.



Note

If the ambient temperature sensor cannot be removed as described, the closure plate for the front bumper cover must be removed ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) ; Exploded view - bumper (front).

Installing

Installation is carried out in reverse sequence.

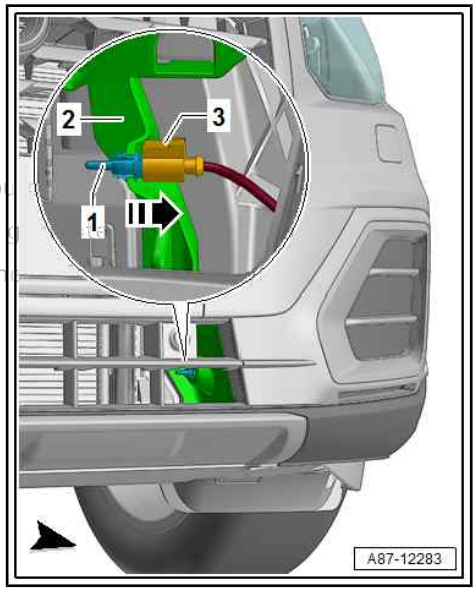
9.2.2 Removing and installing ambient temperature sensor - G17- - Q2, Q2 China

Removing

– Switch off ignition.

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

– Unplug electrical connector -3-.
– Pull ambient temperature sensor - G17- -1- out of air duct -2- in direction of -arrow-.



Installing

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

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Tightening torque

- Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

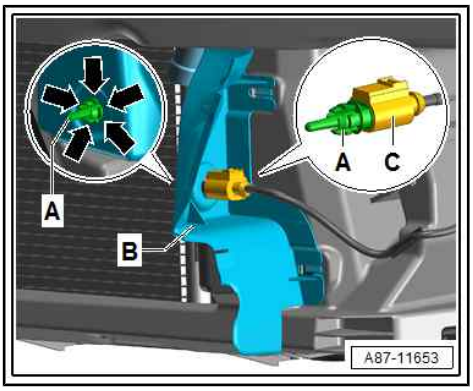
9.2.3 Removing and installing ambient temperature sensor - G17- - SQ2

Note

If the measured value for the ambient temperature sensor - G17- -A- is incorrect, the air conditioner (and the supplementary heater on vehicles with TDI engine) may be regulated incorrectly; checking measured value ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Removing

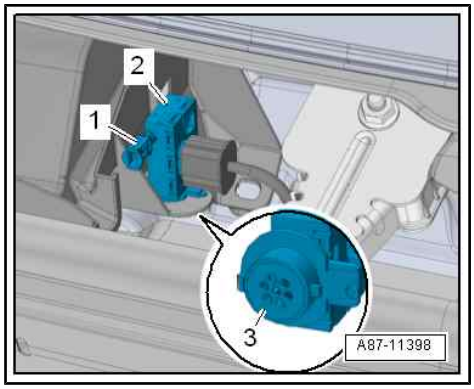
– Remove closure plate for bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
– Carefully squeeze together retaining clips -arrows- while detaching ambient temperature sensor - G17- -A- from duct on radiator (left-side) -B-.
– Unplug electrical connector -C-.



Installing

Installation is carried out in reverse sequence.

9.3 Operation of air quality sensor -G238-



Note

- *The air quality sensor - G238- -3- is only installed on vehicles with automatically controlled air conditioners. It is integrated in housing -2- together with the humidity sender in fresh air intake duct - G657- -1-.*
- *There are different versions of -G238- -3- and -G657- -1-. For correct versions refer to ⇒ Electronic parts catalogue .*

- -G238- uses one sensor each to determine the NOx (nitrogen oxide) content and the CO (carbon monoxide) content of the air flowing past and exchanges this information with the on-board supply control unit - J519- via the data bus.
- The measured value of -G238- is evaluated by -J519- and transmitted to the operating unit (Climatronic control unit - J255-) via the data bus. When it detects a request, -J255- switches on air recirculation mode if there is no shut-off criterion ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

Note

Certain air conditioner functions (including e.g. regulation of “automatic air recirculation mode”) can be activated and deactivated on the MMI (Multi Media Interface) using the “A/C” function on the “Car”/“Car systems” menu.

- After the ignition is switched on, it takes -G238- a short while to reach its operating temperature; the function of -G238- is restricted during the warm-up phase.
- -G238- detects pollutants in the ambient atmosphere (generally petrol and/or diesel emissions) and causes -J255- to switch the air conditioner to air recirculation mode.
- The operating unit (Climatronic control unit - J255-) recognises the nature and level of the air pollution from the signal it receives from -G238- . In addition, -J255- receives the sensitivity setting from the multimedia system operating unit - E380- via the data bus. -J255- then uses this information to determine if and when to switch the air conditioner to air recirculation mode.

Example:

– At ambient temperatures above approx. +2 °C, even a slight increase in the pollutant concentration causes the system to switch to air recirculation mode when requested to do so by -G238- .

– At ambient temperatures below approx. -1 °C with the air conditioner compressor switched off, switch-over only occurs if there is a major increase in the pollutant concentration for approx. 15 seconds. If there is a renewed increase in the pollutant concentration within approx. 2 minutes, -J255- does not switch to “automatic air recirculation mode” within this period.

• If the lamp in the A/C button is not on, the maximum duration of “automatic air recirculation” is restricted to approx. 15 seconds by -J255- to prevent the windows in the passenger compartment from misting up.

– A decrease in the concentration of pollutants in the fresh air drawn in results in the air conditioner being switched back to fresh air mode.

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- The duration of “automatic air recirculation mode” depends on the version of -J255- , the setting on -E380- and the measured values for -G355- .

– At ambient temperatures below approx. +10 °C and with maximum sensitivity set on -E380- , the system remains in “automatic air recirculation mode” for e.g. approx. 30 sec. After this period, the system switches to fresh air mode. If there is a renewed increase in the pollutant concentration within approx. 2 minutes, -J255- does not switch to “automatic air recirculation mode” within this period.

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- The “automatic air recirculation” function can be deactivated at any time. If the function is active, the air conditioner compressor will be switched on even at ambient temperatures below + 2 °C when there is a request for “automatic air recirculation”. However, at temperatures below approx. -5 °C, compressor operation is no longer possible.
- If “automatic air recirculation” mode has been set on the MMI (Multi Media Interface), the air conditioner compressor may be switched on down to temperatures of approx. -5 °C.
- To prevent the air conditioner from constantly operating in air recirculation mode in areas with a persistently high level of pollutant emissions, -G238- is adaptive (sensitivity is matched to environmental conditions).
- If the pollutant level in the ambient air remains relatively high for a lengthy period, -G238- starts to adapt to the change in ambient conditions via an adaption program, with the result that a request for air recirculation is generally applied for less than 12 minutes if the ambient air pollution remains the same. If there are several consecutive peak pollutant levels, the air conditioner may also operate in air recirculation mode for a longer period.
- It takes the air conditioner compressor a certain length of time to re-position the flaps. To prevent gaseous pollutants from entering the passenger compartment together with the fresh air drawn in before the air flow/fresh air flaps can close (and the air recirculation flaps can open) when there is a sudden increase in pollutant levels (e.g. when driving through a cloud of diesel emissions), the vehicle is fitted with a dust and pollen filter with an activated charcoal layer. Once a filter is saturated with pollutants, it can no longer perform this function and must be renewed.
- To prevent the air flow/fresh air flap and the air recirculation flap from being switched too frequently, switching does not take place immediately if there is a slight increase in the pollutant level in the ambient atmosphere (-G238- does not transmit a request to -J255-). In such cases, the filter effect of the activated charcoal layer in the dust and pollen filter is enough.
- To prevent the air flow/fresh air and air recirculation flaps from being switched too frequently, a request from -G238- for “automatic air recirculation mode” is applied for at least 25 seconds (minimum dwell time) even if the pollutant concentration in the air has decreased to such an extent that air recirculation mode would no longer be necessary.
- To demist the windscreen, rear window and door windows as quickly as possible, -J255- does not permit air recirculation in “Defrost” mode (a request from -G238- is not implemented).
- After the ignition is switched on, the air quality sensor - G238- requires a short period before it is ready for operation (warm-up time). During this period, no request is transmitted to the operating unit (Climatronic control unit - J255-) for “automatic air recirculation mode”.

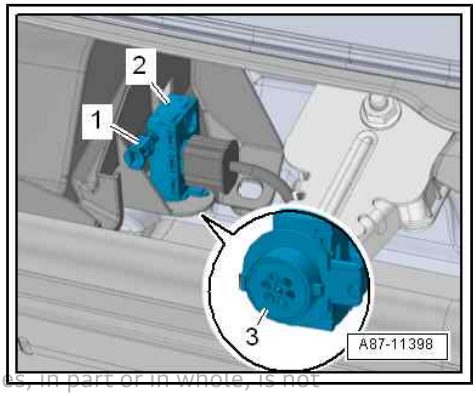
- When the ignition is switched on, certain ambient influences (e.g. high pollutant content in the air) during the warm-up phase of the air quality sensor - G238- may result in a fault being stored for the -G238- in the onboard supply control unit - J519- although the sensor is OK. In this case, proceed as follows:

– Switch off the ignition for at least 2 minutes.

– Switch on ignition and wait at least 2 minutes.

– Interrogate event memory of onboard supply control unit - J519- . If a static fault is still displayed for the air quality sensor - G238- , perform “Guided Fault Finding” (⇒ Vehicle diagnostic tester). If -G238- is no longer displayed as being faulty or if the fault becomes sporadic, -G238- is OK (and requires no further attention). Erase the event memory.

9.4 Checking air quality sensor - G238-



Note

- *After switching on the ignition, it takes -G238- -item 3- a short while to reach its operating temperature.*
- *Operation is restricted during the warm-up phase, and a fault may be indicated under certain ambient conditions. Only renew -G238- if the entry indicates that it is permanently defective. If the fault display for -G238- changes from “static” to “sporadic” after the ignition is switched off and on again (wait at least 2 minutes in each case), -G238- is OK and the event memory entry requires no further attention (erase event memory) ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*
- *Certain air conditioner functions (including e.g. regulation of “automatic air recirculation mode”) can be activated and deactivated on the MMI (Multi Media Interface) using the “A/C” function on the “Car” / “Car systems” menu. In addition, the operation of the air conditioner can also be influenced by the settings on the MMI (Multi Media Interface) in the “A/C” function of the “Car” / “Car systems” menu. Therefore, if there are problems with these components, first check the settings on the MMI ⇒ Infotainment/MMI Operating Manual .*

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Special tools and workshop equipment required

- Vehicle diagnostic tester
- Commercially available gas lighter

Test requirements

- The vehicle must be stationary in a clean atmosphere, away from running engines, air extractor outlets etc.
- The engine compartment and plenum chamber must be clean (not contaminated with oil or fuel).
- The engine compartment and plenum chamber must not have been sprayed with solvent-based cleaning agents or anti-corrosion material.
- The “automatic air recirculation” function must be activated.

Note

The “automatic air recirculation” function can be activated and deactivated via the “AC” function in the “Car”/“Car systems” menu of the MMI (Multi Media Interface) ⇒ Infotainment/MMI Operating Manual .

Checking operation

– Remove air quality sensor - G238- . Leave connector plugged in ⇒ page 371 .

– Start engine.

– Set -J255- to “Auto” mode.

– Use MMI (Multi Media Interface) to set -J255- to automatic air recirculation mode ⇒ Infotainment/MMI Operating Manual .

• The -G238- is ready for operation after a warm-up period of approx. 2 minutes.

– Interrogate event memory of operating unit (Climatronic control unit - J255-) and select “Read measured values” ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

– Select “Read measured values” function and read out current status for fresh air or air recirculation mode ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

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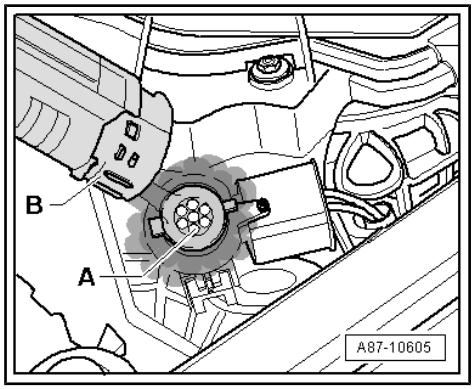
Note

♦ *For explanatory notes on possible displays, refer to ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).*

♦ *-E87- uses the measured values from -G238- (for air pollution) and various settings to determine the status for fresh air or air recirculation mode ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.*

• The heating and air conditioning system is operating in fresh air mode.

– Allow a small quantity of gas from cigarette lighter -B- to flow past section -A- of -G238- (from above).



Note

The air quality sensor - G238- reacts when exposed to cigarette smoke or cigarette lighter gas. Cigarette lighter gas is heavier than air. Therefore -G238- must be removed and the gas applied from above.

– Select “Read measured values” for status of fresh air mode and air recirculation mode (observe measured values for air quality sensor - G238-) ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

- Specification: In the display zones, the measured values for fresh air mode/air recirculation mode change with respect to the initial value, thereby indicating that the air quality sensor - G238- is functioning properly and that the electronics of the -G238- are correctly evaluating the measured values.
- Specification: The display zone shows that the air conditioner is operating in air recirculation mode.

Note

It is not currently possible to check the sensor itself using workshop equipment. However, if the composition of the air surrounding the sensor changes, the signal from the air quality sensor - G238- changes together with value displayed for the requested status of fresh air and air recirculation mode ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

– Wait briefly (approx. 1 minute, depending on amount of gas applied to sensor).

– Select “Read measured values” for status of fresh air mode and air recirculation mode (depending on measured value of -G238-).

- Specification: The measured values in the display fields refer to the initial levels, thereby indicating that the sensors in - G238- are functioning properly and the -G238- electronics are evaluating the measured values correctly ⇒ Vehicle diagnostic tester in “Guided Fault Finding” mode.

Note

Due to changes in pollutant levels, the values currently displayed may differ from those measured initially.

– “Read measured value” for air recirculation/fresh air mode of air conditioner.

- Specification: The display zone shows that the air conditioner is operating in fresh air mode.

– Install air quality sensor - G238- ⇒ page 371 .

Proceed as follows if the air quality sensor -G238- functions properly in this test but a customer complaint has been received:

– Check dust and pollen filter for dirt ⇒ page 293 .

– Select “Read measured values” ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

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Note

A second person is required to read out the values displayed while the other is driving.

Observe safety precautions
⇒ “3.6 Safety precautions when using testers and measuring instruments during a road test”, page 21 .

– “Read measured values” alternately for air quality sensor - G238- and request for air recirculation/fresh air mode.

– Start by driving vehicle into an area with a relatively clean atmosphere.

• Specification: System operating in fresh air mode.

– Then drive vehicle into an area where the atmosphere is polluted (e.g. onto an uphill road with heavy commercial traffic).

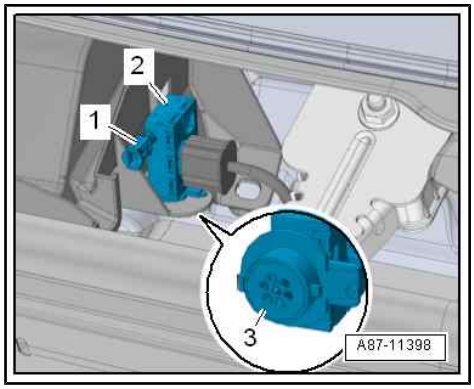
• Specification: The displays in the various zones should change, e.g. when driving through a cloud of diesel emissions.

Note

Also refer to description of operation of -G238- / -G657-
⇒ page 364 .

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9.5 Operation of humidity sender in fresh air intake duct -G657-



Note

- *Vehicles with automatically controlled air conditioner: Air quality sensor - G238- -item 3- is integrated in the housing -2- in addition to humidity sender in fresh air intake duct - G657- -item 1-.*
- *There are different versions of -G238- -3- and -G657- -1-. For correct versions refer to ⇒ Electronic parts catalogue .*

- -G657- is a highly sensitive electronic component which could be damaged irreparably by direct exposure to liquids, solvents, fuels and certain chemical compounds.
- 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.
- -G657- determines the temperature and the moisture content of the air flowing past and exchanges information with the on-board supply control unit - J519- via the data bus.
- The measured value of -G657- is evaluated by -J519- and transmitted to the operating unit (Climatronic control unit - J255-) via the data bus.

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Note

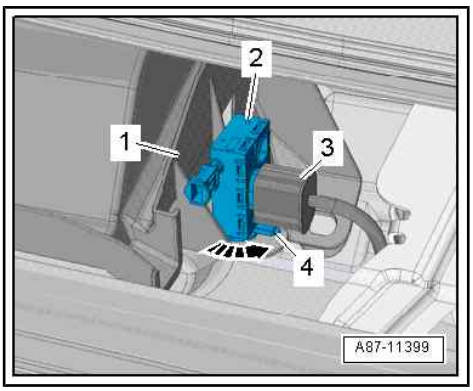
Certain air conditioner functions (including e.g. regulation of "automatic air recirculation mode") can be activated and deactivated on the MMI (Multi Media Interface) using the "A/C" function on the "Car"/"Car systems" menu. In addition, the operation of the air conditioner can also be influenced by the settings on the MMI (Multi Media Interface) in the "A/C" function of the "Car" / "Car systems" menu. Therefore, if there are problems with these components, first check the settings on the MMI ⇒ Infotainment/MMI Operating Manual .

- -J255- uses the measured values to calculate the current relative humidity of the fresh air drawn in and uses the measured values of -G355- to calculate the humidity in the passenger compartment. The calculated humidity value then indicates whether there is a risk of the windscreen, rear window and door windows misting up from the inside. If this is the case, -J255- takes corrective action by altering various characteristic curves. This may involve reducing the evaporator temperature (by activating air conditioner compressor), increasing the response thresholds for the request for "automatic air recirculation mode" or preventing engine shut-off via the start/stop function etc.

Note

Checking humidity sender in fresh air intake duct - G657- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

9.6 Removing and installing air quality sensor - G238- / humidity sender in fresh air intake duct - G657-



Note

- *There are different versions of -G238- -3- and -G657- -1-. For correct versions refer to ⇒ Electronic parts catalogue .*
- *-G238- -3- is only installed in vehicles with automatically controlled air conditioners. It is integrated in housing -2- together with -G657- -1-.*

Removing

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber cover .

– Release retaining tab -4- and turn housing -2- for -G238- / -G657- anti-clockwise -arrow-.

– Take housing out of fresh air intake grille -1-.

– Unplug electrical connector -3-.

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Note

Following removal, do not set down air quality sensor - G238- with humidity sender in fresh air intake duct - G657- in areas where it could come into contact with solvents, fuels or certain chemical compounds (liquids or vapours).

Installing

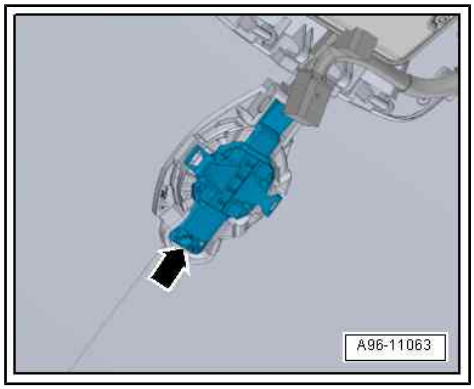
Installation is carried out in reverse order; note the following:

Note

Water can enter the fresh air intake via the drip rail if the plenum chamber cover is damaged or not installed properly.

– As a final step, interrogate event memory and erase any entries displayed ⇒ Vehicle diagnostic tester (“Guided Fault Finding”).

9.7 Removing and installing sensors - G355- / -G397- / -G107-



Note

- *On Audi Q2 vehicles with automatic air conditioner, the sunlight penetration photosensor is combined as one unit with humidity sender - G355- / rain and light sensor - G397- / sunlight penetration photosensor - G107- (depending on equipment version) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- *On Audi A3 vehicles, humidity sender - G355- / rain and light sensor - G397- are installed if an automatic air conditioner is fitted (depending on equipment version).*
- *-G355- and sunlight penetration photosensor - G107- are only installed on vehicles with Climatronic control unit - J255- (with automatic air conditioner).*
- *On vehicles with air conditioning system control unit - J301- no -G355- or sunlight penetration photosensor - G107- is installed. The permissible stop time is calculated using characteristic curves which are influenced by the measured outside temperature, the "air recirculation" function and the status of the windscreen wipers. In order for -J301- to allow the stop function, the time calculated must be greater than approx. 20 seconds. To prevent the front and door windows from misting up, the stop time may be reduced at low outside temperatures when the air recirculation mode is active or if it is raining. If the time calculated for the stop function is less than approx. 20 seconds, this will be prevented.*
- *Humidity sender - G355- is integrated into rain and light sensor - G397- and cannot be renewed separately in the event of a fault ⇒ Electronic parts catalogue .*
- *The removal procedure for rain and light sensor - G397- (with humidity sender - G355-) is described in different assembly groups depending on the vehicle.*

– Renewing rain and light sensor - G397- (with humidity sender - G355-) ⇒ General body repairs, exterior; Rep. gr. 64 ; Windscreen; Exploded view - windscreen or ⇒ Electrical system; Rep. gr. 92 ; Windscreen wiper system .

9.8 Removing and installing fuse for electrical air conditioner compressor

Removing and installing

– Removing and installing fuse for electrical air conditioner compressor ⇒ 4-cylinder direct injection engine (1.2, 1.4 ltr. 4-valve TFSI EA 211); Rep. gr. 93 ; Power and control electronics for electric drive .

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